2011
PRODUCT CATALOG

MEDIA CONVERSION
SWITCHING
CONNECTIVITY
AGGREGATION

YOUR NETWORK OVER FIBER. FROM ANYWHERE. TO ANYWHERE.

TRANSITION NETWORKS®

Corporate Overview

Founded in 1987 as Transition Engineering, the company's first products adapted coaxial cable to twisted-pair cables; connecting terminals to mainframe computers. The company was renamed Transition Networks, Inc. in 1995 and experienced continued rapid growth as its products evolved from general Ethernet networking equipment to a complete line of conversion technology solutions. In 1998, Transition Networks was purchased by Communication Systems, Inc, (NASDAQ: JCS).

Today, Transition Networks, Inc. offers a full suite of fiber connectivity products that enable you to deliver and manage your network traffic reliably over fiber optics. The company's Transition Networks brand of devices make assimilation between disparate media types possible; while helping companies leverage their existing network infrastructure. These media conversion technologies are offered across a broad spectrum of networking protocols including Ethernet, Fast Ethernet, Gigabit, 10 Gigabit, T1/E1, DS3, ATM, RS232/485, video, Power-over-Ethernet, and many more.

In the fall of 2005, Communication Systems, Inc. announced the integration of MILAN Technologies into Transition Networks. This integration expanded the Transition Networks product portfolio to include a complete line of multilayer switches. The MILAN By Transition Networks product family of Ethernet switches offers customers unique configurations and a high level of service and reliability. These switches are designed to facilitate low-cost network evolution with unique solutions, all while easing the stress on networks caused by high-bandwidth applications. Based in Minneapolis, Transition Networks distributes hardware-based connectivity solutions exclusively through a network of resellers in more than 100 countries.

Market Opportunity

Computer networks have evolved into an indispensable business component for corporations around the world. These complex systems of cables, jacks, patch panels, switches, routers, and servers provide the foundation for the communications of our global economy. Many corporations view their networks as a strategic advantage over their competition and focus on constant improvement in performance and capabilities of their networks.

While network managers yearn for the latest equipment and higher speeds, budgetary restrictions impose limitations and precipitate a less than homogenous network. Inevitably, network administrators must contend with a variety of protocols, speeds, and media in their networks. NIDs were developed to address these problems and has evolved from a stop gap technology into a technology that offers network administrators new choices for deploying fiber optics into their networks in a cost effective manner.

Conversion technology enables network evolution, allowing network planners to migrate to new technologies without overhauling existing infrastructure investments or being locked into less flexible and more expensive networking equipment. Fiber provides the distance and bandwidth capability needed for the network backbone, making it the core technology for network evolution.

Transition Networks leverages its expertise in fiber and the physical layer into a full suite of fiber connectivity products, which are unmatched by other industry players. Our products are used by a wide variety of customers including enterprise, government, education, retail, industrial, security, and service providers.

Transition Networks' Portfolio of Products

The company's Transition Networks brand of Network Interface Devices make conversion between disparate media types possible, providing conversion technology solutions that offer the necessary adaptations without affecting the performance, nature or appearance of the network. The company designs and markets these media conversion technologies across a broad spectrum of networking protocols including Ethernet, Fast Ethernet, ATM, Gigabit Ethernet, T1/E1, DS3, video, Power-over-Ethernet, and more. Transition Networks offers its products in chassis, stand alone, and PCI form factors. Our devices are SNMP manageable and can be managed via our graphical user interface Focal Point, a web browser, or a command line interface.

MILAN by Transition Networks

The MILAN by Transition Networks portfolio of multilayer Ethernet switching products are designed to facilitate low-cost network evolution by allowing customers to only pay for the port counts and features that they need. The MILAN by Transition Networks switch line offers customers unique configurations and a high level of service and reliability, all while serving to ease the stress caused on networks by high-bandwidth applications.

Product Overview

With over 20 years of growth and expertise in hardware manufacturing, Transition Networks offers the ability to affordably integrate the benefits of fiber optics into any data network – in any application – in any environment. Offering support for multiple protocols, any interface, and a multitude of hardware platforms; Transition's portfolio gives you the power to deliver and manage your network traffic reliably over fiber.

Product Quality

Transition Networks' fiber optic/networking products are known for their ruggedness and reliability. They have a 99.4 percent customer acceptance rating, meaning that approximately one in 1,000 experience any sort of failure in the field. All Transition Networks branded products carry a lifetime warranty, while MILAN switches by Transition Networks products offer a five-year warranty.

For further information call
800-526-9267 or +1-952-941-7600.
Visit our website at www.transition.com.

- **Free Worldwide Technical Support**
  via the web or telephone
- **Built to Perfection**
  99.4% of Transition Networks' products are delivered without functional failure
- **ISO 9001 2000**
  Quality System Certified
- **ISO 14001**
  Environmental Certification
- **Lifetime Warranty**
  Hassle-free Lifetime Warranty on Transition Networks brand products (including power supply and fan)
- **100% Channel**
  100% of Transition Networks' products are distributed exclusively through the channel
- **Transition NOW**
  - "Chat" Live via the Web
  - Free Live Web-based training with 8-12 seminars per month

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Product Guide

The Point System™ [pg 30-66]

- Slide-In-Module Media Converters housed in a multi-slot chassis
- SNMP Management
- High-density applications
- Redundant power

Stand-Alone Media Converters & Network Interface Devices [pg 67-121]

- Single point of conversion
- Mid to low density applications
- Rack or Wall Mountable

The ION Platform [pg 137-158]

- All new intelligent, high density, multi-protocol system supportin ga variety of network interface devices and media converter modules.
- Designed for network applications where multiple points of fiber intergration and secure network management of the fiber devices are essential.

Switching Solutions [pg 178-199]

- Full selection of low port count to high port count Ethernet switching solutions.

Corning Plug and Play™ Gigabit Ethernet Media Conversion Module [pg 99]

- Integrate fiber optic cabling into your Data Center with the highest density, scalable copper-to-fiber solution on the market today.

Analog Video Media Conversion [pg 66, 121]

- Our Analog Only and Analog with Data video products give you the flexibility and functionality you need to build or extend your video surveillance system.

Industrial Stand-Alone Media Converters, Switches & Device Servers [pg 122-134]

- Hardened devices designed to reliably operate in harsh environments such as those found on factory floors, outdoor enclosures or other hazardous environments.

PCI Powered Media Converters [pg 159]

- Installs directly into the PCI slot on a workstation or server; No additional power required.

GBICs and Small Form Factor Pluggables (SFPs) [pg 161-169]

- Copper to fiber connections via the GBIC or SFP port on switches and routers
- Economical
- Hot-swappable.

CWDM for Optical Networks [pg 170]

- While utilizing existing infrastructure, CWDM products allow you to transmit multiple protocols over an existing duplex fiber link.

Network Interface Cards & PCMCIA Adapter Cards [pg 171-175]

- Low-cost fiber connectivity
- Redundant fiber connections available

PoE Switches, Converters & Accessories [pg 72, 82, 94, 105, 130, 131, 183-185, 190, 200]

- Power & data over a single CAT-5: a new technology for wireless access points, VoIP phones & network cameras.

Fiber & Copper Patch Cords [pg 201-203]

Application Overviews

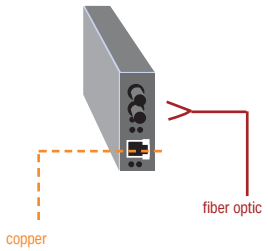
Transition Networks offers the widest variety of media conversion and switching solutions for network extension. Our solutions section explores some typical applications that illustrate how our products can be utilized in your network.

What is Media Conversion?

Put simply, media converters transparently connect one type of media, or cabling, to another-for example: copper to fiber.

Media converters allow the use of fiber where and when it is needed; effectively integrating new equipment into your existing cabling network. This gives the network administrator power to:

- Integrate data and telecommunication networks over fiber
- Extend the lifespan of existing non-fiber based equipment
- Extend the distance of an existing network
- Extend the distance between two like devices



Enterprise

You need your Enterprise network to do more, for more users – for less. As a result, new technologies may have outpaced your cabling infrastructure. You could begin an expensive upgrade of your network equipment. Or, you could use Transition Networks solutions to migrate to a fiber-based cabling system at a fraction of the cost.

#1 Choice for Fiber Integration

Transition Networks solutions can link new fiber cabling with legacy copper-based network devices – including RJ-45 based switches, routers, and NICs – to greatly reduce the expense of a fiber upgrade while improving bandwidth, distance and security throughout the Enterprise.

Designed to support fiber integration in a variety of communication environments, these solutions can accommodate LAN protocols (Ethernet, Fast Ethernet, 10/100, Gigabit Ethernet, 10/100/1000), WAN protocols like TDM lines (T1/E1, 4xT1/E1 Mux, DS3/E3, and POTS), SCADA protocols like Serial Communications (RS323, RS422, RS485, V.35, X.21), and physical security protocols like Analog video (CCTV).

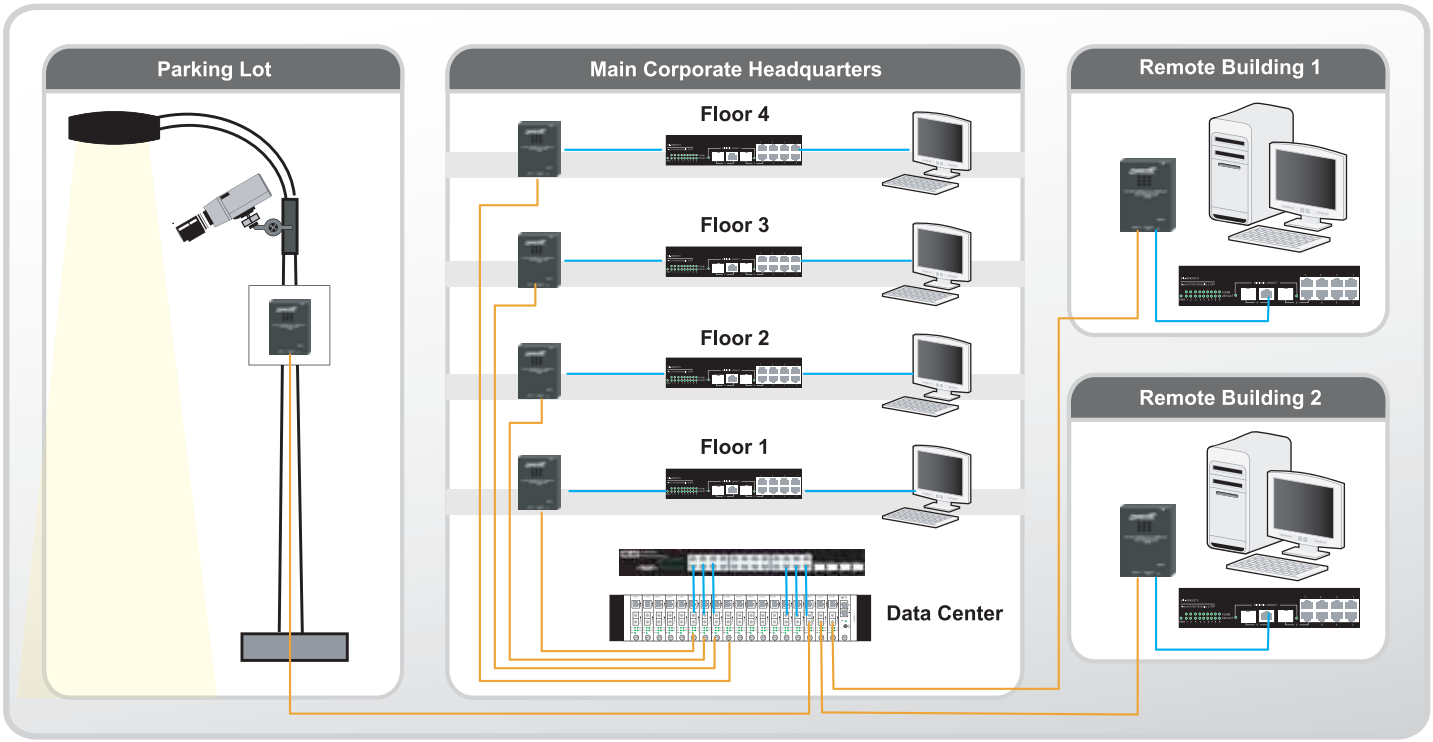
With unparalleled experience serving the unique needs of Enterprise customers, world-class 24x7 technical support, and a product Lifetime Warranty, Transition Networks is the choice for cost-effective fiber integration in the Enterprise.

Use Media Converters for Internal LAN Deployments

- Connect enterprise switches to a fiber backbone running up the vertical risers in a multi-story office building
- Connect legacy workgroup switches with copper interfaces to a fiber backbone

Applications for Media Conversion Solutions:

- **Easy Migration & Flexibility**
  Simple to install and transparent to the network, media converters allow for network growth when and where you need it.
- **Maximize Rack Space or Real Estate**
  Using high-density conversion solutions.
- **Monitor & Configure Remote Devices**
  With the SNMP management provided with Transition's managed conversion solutions.
- **Maximize Distance & Savings**
  Using media converters to convert to fiber signaling, with long haul transmitters.
- **Future Proof Your Network**
  Upgrade your infrastructure to fiber and support tomorrow's faster technologies.
- **Avoid EMI & Security Issues**
  Protect your data from noise & interference using fiber optic technology.
- **Keep Up With Technology Without Forklift Upgrades**
  Using low cost media conversion solutions.



Enterprise

Managers of Enterprise level networks must deal with constant change. The need to evaluate new technology, meet corporate goals, and accommodate new users is a daily reality that must be addressed. Easing the migration to optical fiber is one area where Transition Network can help.

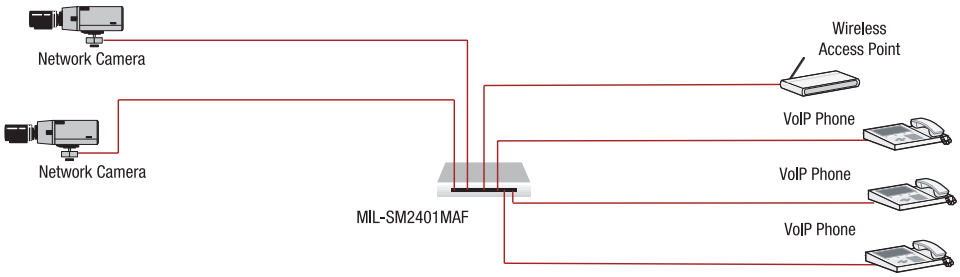
Transition Networks solutions can link new fiber cabling with legacy copper-based network devices – including RJ-45 based switches, routers, and NICs – to greatly reduce the expense of a fiber upgrade while improving bandwidth, distance and security throughout the Enterprise.

Whether you're connecting the copper ports on your core enterprise switches or connecting the fiber in your vertical risers to your horizontal cabling plant, media conversion provides the cost effective solution for maintaining our copper based equipment.

Fiber connectivity in the Campus Area Network will allow your network to grow and include remote buildings and as well as video surveillance around parking lots and building entrances.

With unparalleled experience serving the unique needs of Enterprise customers, word-class 24x7 technical support, and a product Lifetime Warranty, Transition Networks is the choice for cost-effective fiber integration in the Enterprise.

Use MILAN PoE Switches to Connect and Power WAPs, VoIP and Surveillance Cameras



- Media converters connect disparate media types:
  - Transparently connect coax, twisted pair, and fiber cable
  - Connect new technologies to legacy systems
- Fiber cable in the outside plant protects data from the negative effects of electrical storms:
  - Data can be corrupted and networks can fail due to lightening strikes
  - Protect data from EMI, RFI, and noise from fluorescent lights
  - Government agencies will value the security benefits of transmitting sensitive data through unsecured areas on fiber cable
- An all-inclusive Ethernet network provides communications at LAN network speeds:
  - Combine media converters, fiber cable, and existing copper switches to create a high-speed backbone between buildings
  - Take advantage of PoE and Fiber cabling with PoE media converters
  - PoE switch can connect to fiber backbones and power IP camera, WAP, and IP phones
- Protect investments in RJ-45 based copper networking equipment:
  - Experience the benefits of fiber without the expense of replacing copper-based networking equipment
- Fiber offers unlimited bandwidth possibilities:
  - Future Proofing - Fiber can handle tomorrow's faster technologies

Recommended Product Families

- Point System™ or ION Chassis
- Ethernet, Fast Ethernet and Gigabit media converters
- Long Haul Media Conversion Products

Industrial

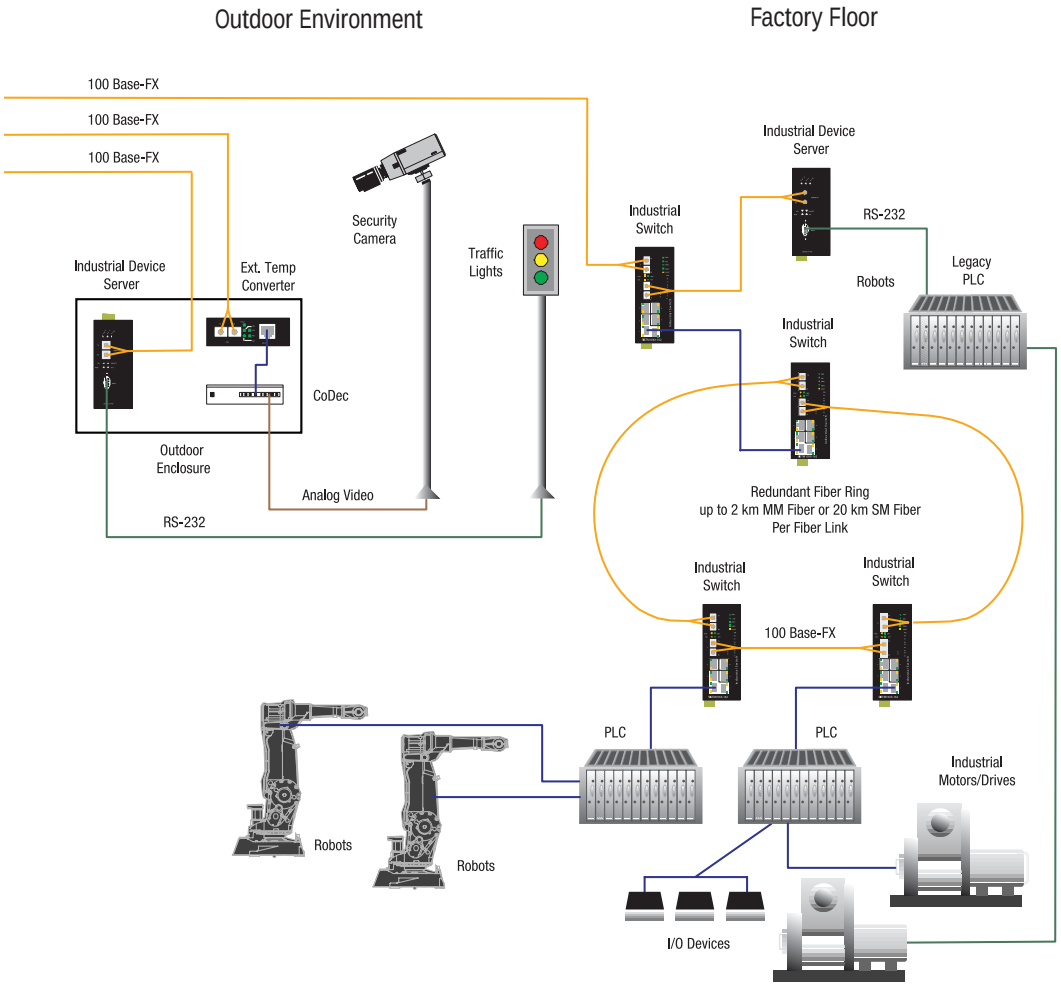
Conversion & Switching for Industrial Applications

From the office cubicle to the warehouse floor to industrial automation to the network edge, Transition Networks offers world-class Ethernet solutions backed by seamless technical, maintenance and logistical support. Industrial Ethernet has never been more robust, reliable and cost-effective. Guaranteed.

Media conversion and switching solutions are available with ST, SC fixed optic or SFP ports, in multimode and singlemode, and either standard or extended temperature ranges for virtually any network protocol. Fully hardened managed switches offer recovery times in as fast as 20 milliseconds to ensure mission-critical operations in even the harshest environments.

Lifetime Guarantee
Our exclusive “no-small-print” Lifetime Warranty covers any Transition Networks equipment in your industrial network. Even your power supplies and SFP modules are covered. As a network equipment supplier that has served the industry for more than 20 years, we’ll insure your entire network lasts as long as your plant.

Industrial



Industrial Conversion & Switching Solutions from Transition Networks:

- Eliminate EMI concerns easily & affordably by converting electrical signaling into fiber optic signaling.
- Extend the life of copper equipment & avoid costly equipment upgrades by using SNMP management to access remote devices.
- Maximize efficiency and control allowing companies to keep up with technology while keeping within budget.
- Future proof PLCs and automation systems for high speed networks.
- Connect Industrial equipment by using Extended Temperature converters in non-climate controlled environments.
- Increase production uptime and reliability.
- Reduce reliability issues using quality converters and Industrial networking equipment from Transition Networks, all backed by a lifetime warranty including power supplies.
- Use Transition's Class 1 Div 2 certified products to manage data in hazardous locations.

Recommended Product Families

- **Extended Temperature Ethernet and Fast Ethernet**
  E-TBT-FRL-05(xxHT) [pg 74]
  E-100BTX-FX-05(xxHT) [pg 79]
- **High Speed Serial**
  CPSVT26xx [pg 58]
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- **RS232 and RS485**
  CRS2F311x [pg 59]
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  CRS4F3x1x [pg 60]
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- **Industrial Media Converters**
  M/E-ISW-FX-01(xx) [pg 122]
  SISTF101x-211-LRT [pg 123]
  SISTG10xx-211-LRT [pg 132]
- **Industrial Unmanaged Switches**
  SISTF101x-241 [pg 124]
  SISTF1040-162D-LRT [pg 125]
  SISTF1010-2x0-LRT [pg 133]
- **Industrial Managed Switches**
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- **Industrial PoE Switches**
  SISPM1040-182D-LRT [pg 130]
  SISTP10xx-141-LRT [pg 131]
- **Serial Device Services**
  SDSFE3110-120 [pg 134]

Government

Municipal and military agencies protect more than constituents – they protect information. As a result, most government agencies are choosing fiber optic cabling to ensure superior data security

Copper cabling is easy to tap. Any attempts to tap fiber cabling, however, usually involve link loss accompanied by traps sent by the network management system (NMS). Transition Networks offers a wide range of high-density chassis-based copper-to-fiber solutions for connecting fiber cabling to the copper ports on enterprise or core Ethernet switches.

Transition Toward Greater Security

While Stand-alone media converters work well at the end points of a star topology where fiber is converted back to copper for the horizontal UTP Cabling to any networked device, PCI-power media converters can foster cost-effective fiber migration at the desktop for VoIP applications or a copper network interface card (NIC). A wide range of fiber optic NICs is also available for fiber-to-the-desk (FTTD) connectivity.

PoE technology can reduce network cabling complexities often associated with IP telephone installations by transporting both data and power over the UTP cable. PoE is supported in switches injectors, and media converters to meet your individual networking requirements. And, it's all backed by a product lifetime warranty and free around-the-clock technical support to ensure a cost-effective transition to fiber in any copper-based environment.

Three Options for Fiber-to-the-Desk

- Stand-Alone Media Converter
- Fiber Network Interface Card (NIC)
- PCI-Powered Media Converter

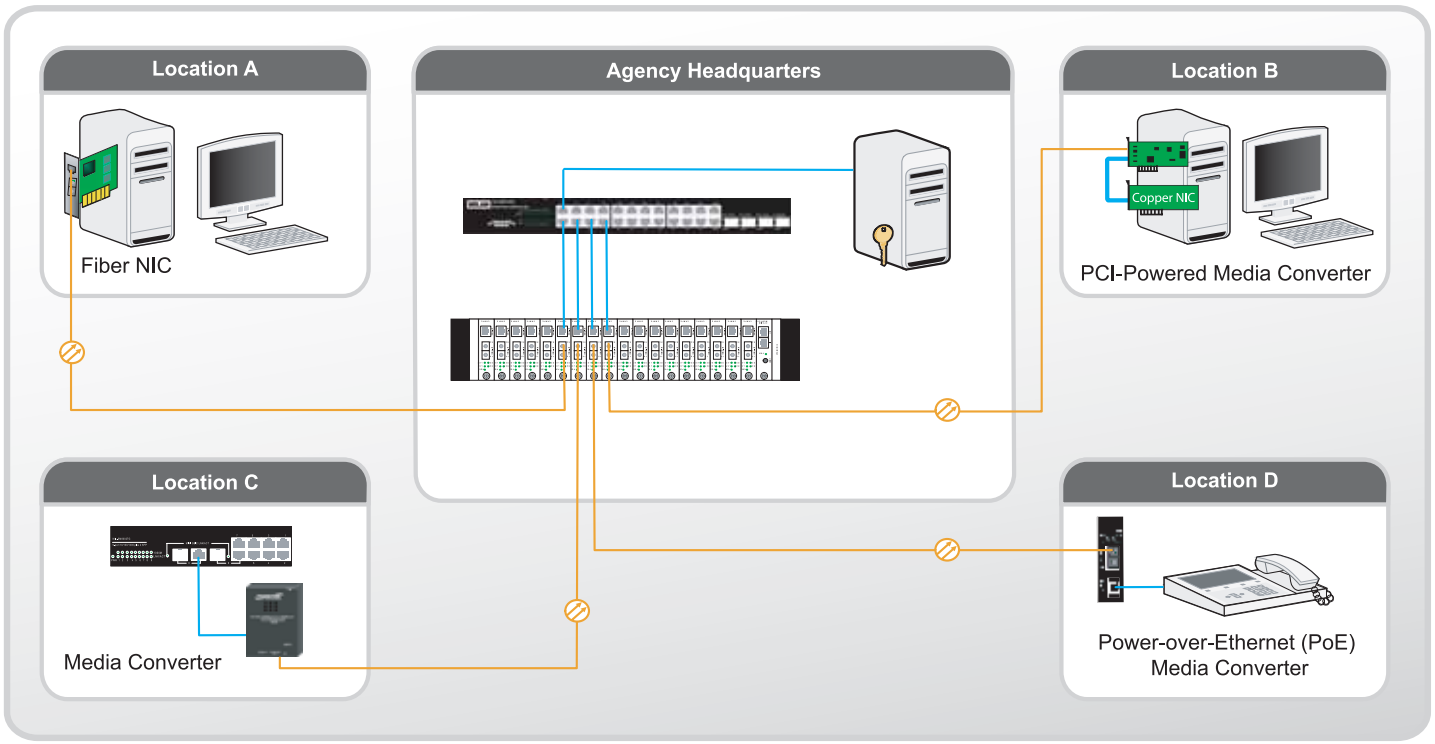
Experience the Benefits of PoE While Still Deploying Fiber

- PoE Media Converters for Fast Ethernet and Gigabit Ethernet

Recommended Product Families

- Point System™ and ION Chassis loaded with Ethernet media converters
- Redundant Power Supplies for Point System™ Chassis
- SNMP Management Module
- Fiber NIC's
- Stand-Alone Ethernet Media Converters
- PoE Media Converters (PSE)

Media Conversion in Government Applications



Education

Whether it's connecting several buildings in a school district or campus setting or adding Ethernet switches in the classroom, academic institutions use fiber in the Enterprise to capitalize on the latest technological advances. Fiber offers greater transmission distances, cabling infrastructure scalability, and data protection from noise and interference.

Transition Networks offers small-port count Ethernet switches with fiber uplinks to allow copper-based network devices in the classroom to connect with fiber cabling that extends back to the main computer room. Chassis-based copper-to-fiber media converters are used to connect the same fiber to the copper ports of core Ethernet switches for more reliable and versatile performance.

Learn From the Industry Leader

Transition Networks has more than 20 years of experience developing media converters and other Enterprise solutions to help users deploy fiber optic cabling while protecting current copper-based equipment investments. The preservation of existing equipment offers significant cost savings.

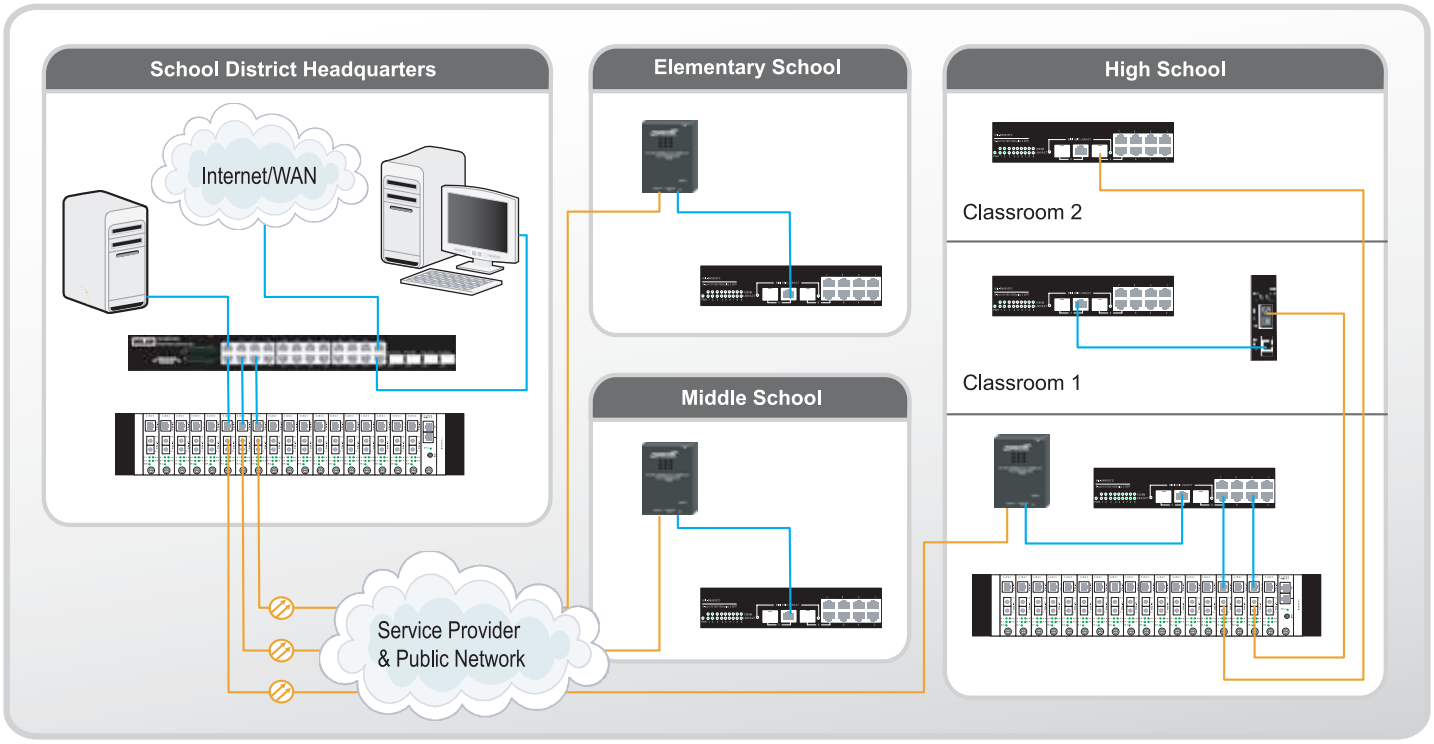
School District Headquarters

- Chassis based solution
- Use existing copper equipment
- Hot swappable media converter cards
- Redundant Power Supplies
- SNMP Management Module

Each School

- Stand-Alone media converter to receive fiber and connect to main copper switch
- Optional remote management
- Chassis based converters may be helpful if fiber is used within individual schools
- Fiber to the classroom

Media Conversion in Educational Applications



Retail

Networked devices and technologies have enabled retailers – from small boutiques to the largest warehouse super stores – to streamline operations and realize significant cost savings.

Retailers use wireless access points, point-of-sale cash registers, security cameras, credit card processing machines, hand-held barcode scanners, access control systems, IP telephones with Ethernet switches, workstations and servers for critical business functions.

Networking technologies include T1/E1 lines for connecting stores with the data center, Ethernet LANs, PoE switches, media converters used for fiber integration, CWDM modules for maximizing the data volume, Voice over IP (VoIP), RS232 links for access control, and analog video CCTV systems for security.

Your One-Stop Shop

Transition Networks offers an extensive portfolio of cost-effective solutions for integrating fiber cabling into your existing retail Enterprise network. With its industry-leading multi-protocol support, wide variety of products and form factors, and lifetime warranty, Transition Networks offers everything retailers need to ensure bottom line savings.

Stand-Alone Converters at the End Stations

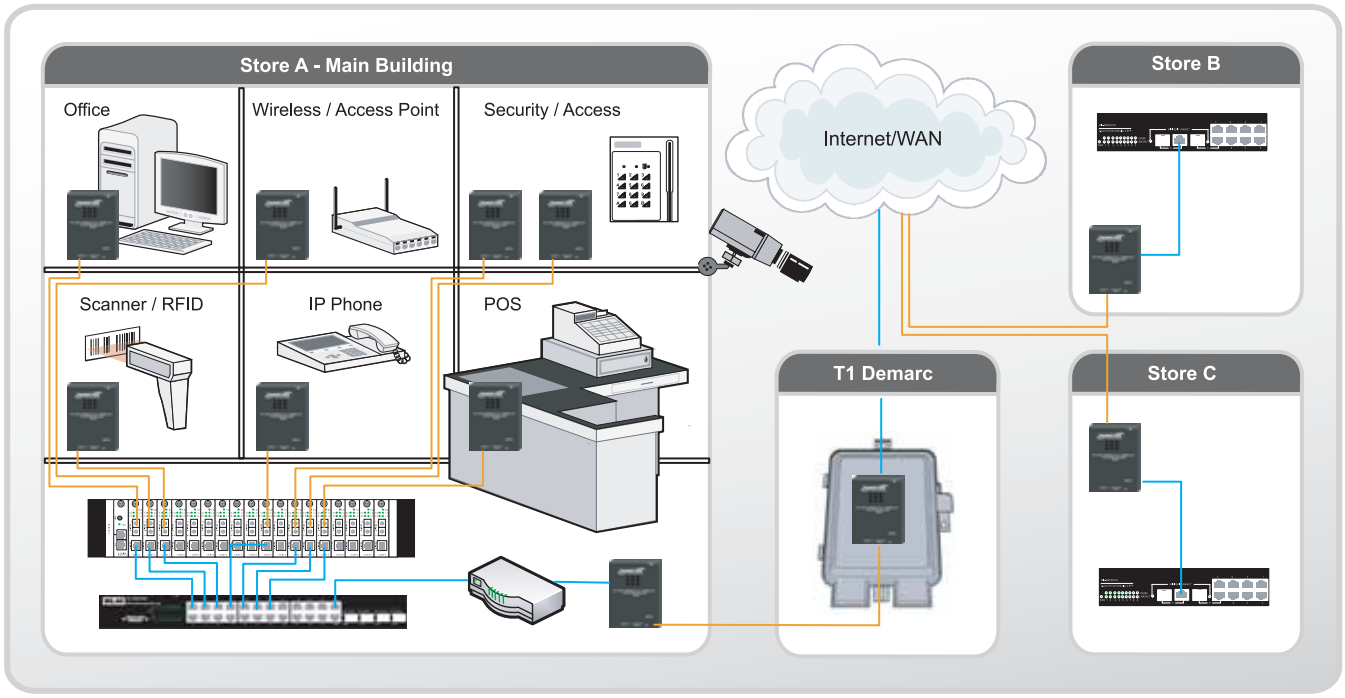
- Extended transmission distance with fiber cable
- Optional Remote Management [pg 17]
- Allows use of copper NIC's
- Wall mount brackets are available
- Save money on solutions requiring less equipment
  - Reduce the number of communication closets required with a copper solution
  - Use fiber to create direct links between the main computer room and the end equipment
- Media converters allow fiber to be deployed into twisted pair networks
  - Protect investments made in UTP copper based media converters, switches, servers and routers
- PoE switches allow for centralized and managed power distribution and backup
- Low port count switches connect multiple devices over fiber in a very cost-effective and space saving manner

Chassis Based Solution in Main Computer Room

- Hot swappable media converters
- Redundant Power Supplies
- SNMP Management
- Increased visibility and control

Recommended Product Families

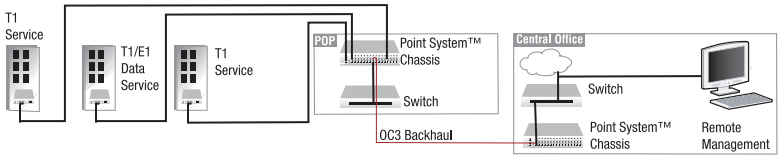
- Point System™ and ION Chassis loaded with Ethernet media converters, a redundant power supply, and a management module
- Stand-Alone Ethernet media converters
- 8, 24 or 48-port switches



Traditional Voice & Data

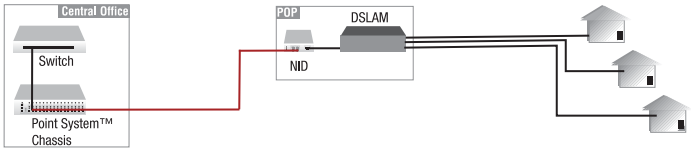
Remotely Managed NIDs for Data Solutions

- T1/E1 NIDs offer remote end management to assist in troubleshooting without sending a technician to the remote site.
- Loopback allows the network to be fully tested during installation and assist in troubleshooting the network.



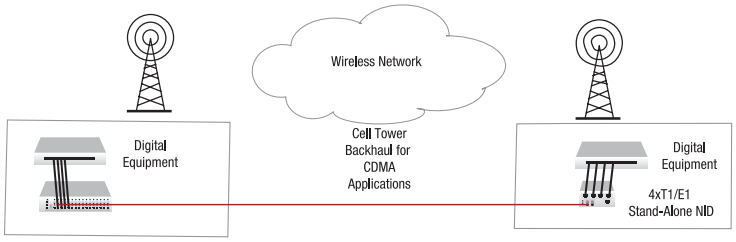
Remotely Managed NIDs in DSL Backhaul Applications

- OC3, V.35, IP DSLAM Backhaul applications



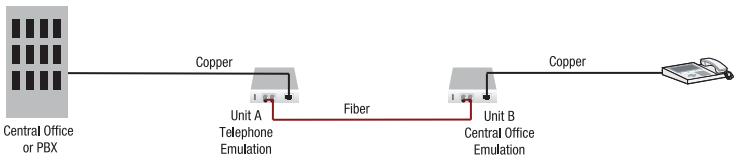
Remotely Managed NIDs in Cell Tower Applications

- Use Transition Networks 4xT1/E1 devices to connect remote cell towers.



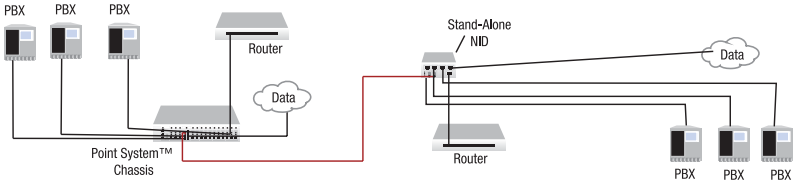
Remotely Managed NIDs in POTS Applications

- Transition Networks' POTS devices connect central-office voice grade signals to distant POTS equipment.
- Extend an analog phone extension over Fiber.



4x T1/E1, 10/100 Ethernet & RS232 Fiber Mux

- Use 4x T1/E1 NIDs to transport multiple T1/E1 lines and RS232 data channel over fiber
- Monitor local & remote end devices
- Configure remote devices using in-band management
- Troubleshoot the segment using loopback and channel monitor port



T1/E1, ATM, V.35/X.21/RS232, POTS

Fiber Network Interface Devices (NIDs) allow service providers to deploy traditional voice and data solutions to customers in the first mile of service.

Stand-Alone Devices Used For Customer Premise Equipment

- Low Cost
- Ease of Installation
- Remote Management available for many protocols [pg 17]

Recommended Product Families

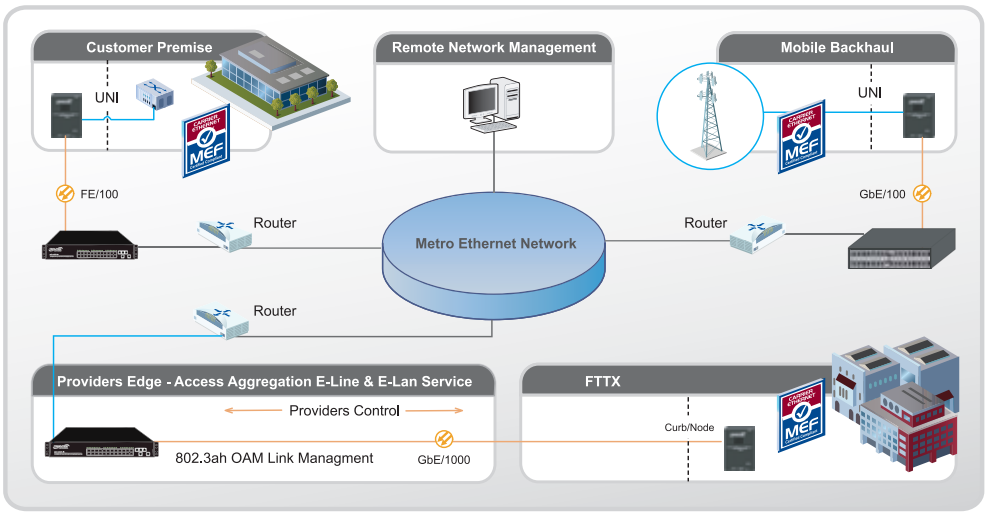
- 4xT1/E1 + Ethernet
- 4xT1/E1
- T1/E1
- DS3/T3/E3
- POTS
- OC3
- V.35/x.21

Carrier Ethernet & CWDM

Carrier-grade Ethernet services are convenient, scalable and can accelerate key revenue streams. As a result, it's no surprise that the emerging Metro Ethernet market will continue to revolutionize communications well into the future.

Revenue-generating advanced services aren't enough. You need to meet strict service level agreement (SLA) requirements, too. Fortunately, Transition Networks offers a wide range of Network Interface Devices (NIDs) that allow for seamless troubleshooting and maintenance when installed as a demarcation point between your network and your customer's network. Transition Networks NIDs have the latest IEEE and ITU standards; 802.1ag Service OAM, 802.3ah Link OAM and Y.1731 Performance Monitoring, to ensure your current and future troubleshooting and monitoring needs are met.

NIDs have bandwidth allocation, quality of service (QoS), virtual local area network (VLAN), and other advanced features that enable you to provide revenue-generating tiered services to customers. Plus, remote management capabilities allow you to upgrade service for customers without dispatching a technician or replacing equipment for optimal OpEx savings.



Ethernet Solutions

The simplicity, ease of use, and low costs have made Ethernet an excellent option for many service providers that are offering data solutions. NIDs are a perfect choice for first mile delivery, back haul applications and any network extension need.

- 10 Mbps, 100 Mbps, 10/100 Mbps, 1000 Mbps, 10/100/1000 Mbps NIDs
- Reduce fiber strand counts with Transition Networks' CWDM products
- Complete control of the equipment with unified SNMP management
- Modular chassis allows hardware to be purchased as services are deployed
- Remotely Managed Stand-alone devices offer a low cost, easy to install CPE device
- Reach customers up to 160 km (99.4 mi.)
- Reduce meantime to repair (MTTR)

Chassis-Based Solution in Point of Presence (POP)

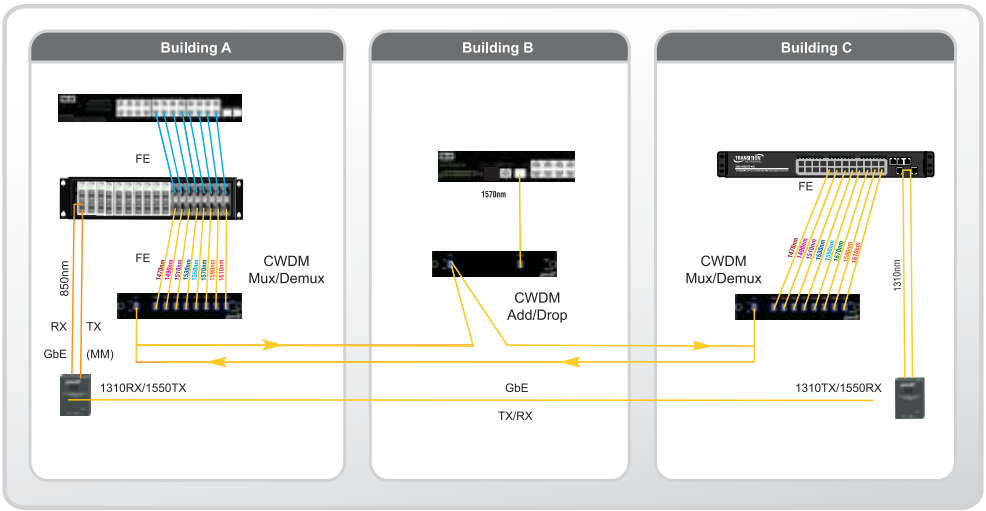
- Hot-swappable NIDs/ Slide-in-Cards
- Power Supplies:
  - AC
  - 48VDC
  - Redundant power
  - Hot-swappable
- SNMP Management
- NEBS Compliance
- MEF Certification

Broadband has unveiled a new world for subscribers, full of advanced capabilities and faster speeds. Your challenge is to meet their demands without compromising your budget.

Because of its bandwidth, speed and security potential, fiber optics has become the choice for many service providers. Fiber optic connections typically require two strands of fiber – one for transmitting and one for receiving signals. But, what happens when you need to add services or customers, but you've exhausted your fiber lines?

Bury the idea for additional fiber lines. That's a long, expensive and unnecessary risk. Transition Networks offers a wide range of Coarse Wave Division Multiplexing (CWDM) products . These low-cost, passive options leverage your existing network and provide new and additional revenue generating services to customers.

Transition Networks CWDM products come with our industry-standard lifetime warranty so you can be assured your subscribers will receive the highest levels of service quality and reliability.



Video Surveillance

Life moves pretty fast. If you're not prepared, it could pass you by in the blink of an eye. Fortunately, video security and access control systems enable you to see the world around you – and protect it.

From retail theft prevention to corporate identity access to law enforcement to your own backyard, the demand for video security and access control applications has increased exponentially in the past decade. The technology to support these applications has advanced, too.

Video and access security applications rely on cables to transport videos and information from one place to another. The choice of cable technology – coaxial, twisted pair or fiber optics – directly affects the quality, capabilities and reliability of the applications.

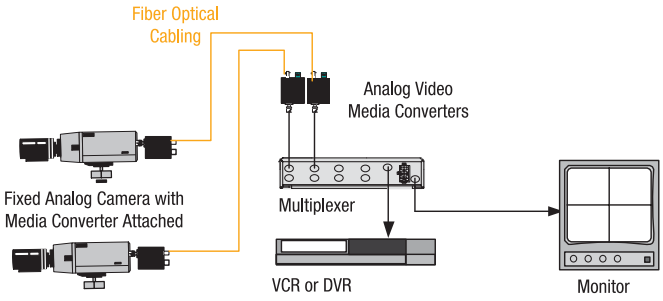
Video Media Conversion Solutions From Transition Networks Can Help You To

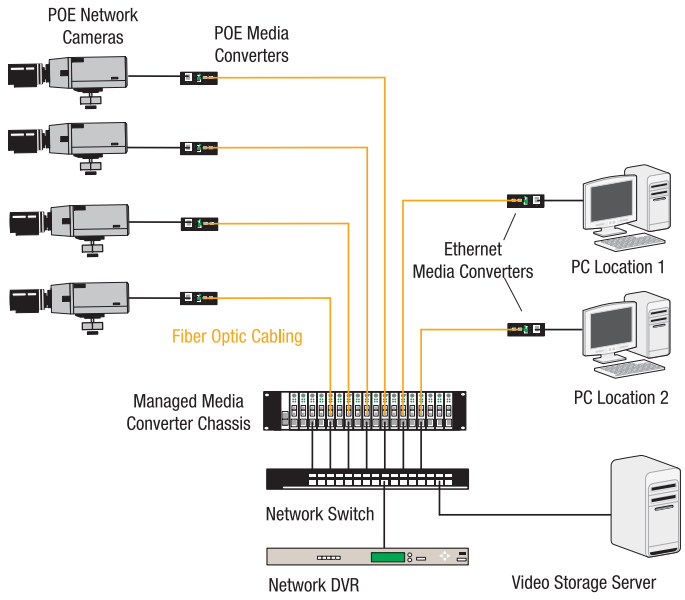
- Integrate fiber optic cabling into your existing video surveillance network
- Access existing fiber infrastructure to transport video to the established surveillance network
- Realize the benefits of fiber optic cabling
  - Extend surveillance network with increased video transport distances up to 10 km
  - Reduce video quality issues common with UTP and coaxial cabling
  - Improved security of the closed video system
  - Immunity to interference from high voltages, EMI and RFI
  - Improved reliability and overall transmission performance
- Experience the benefits of PoE with your IP camera while still deploying Fiber cable
  - PoE media converters
  - For Fast Ethernet or Gigabit Ethernet

Media Conversion

Many applications combine various cable technology techniques. Media converters bridge the gap between legacy copper infrastructures and fiber expansion. As a result, they can cost-effectively extend the life of non-fiber based equipment while expanding the distance of an existing network or between two devices.

Media converters enable you to leverage evolving technology, including burgeoning IP Ethernet networks, to ensure you can see everything, including lower OpEx costs throughout your network.





Copper Facts

- IP-based video security systems are limited to 100 m (328 ft.) or less over UTP cabling infrastructure

Analog Video Networks

- Transport analog video over fiber optic cabling
- Realize the improved bandwidth, quality and transmission distance of fiber optics
- Media converters available for Fixed analog cameras
- Available in stand alone or chassis-based form factors

IP Video Networks

Cost-effectively integrate IP cameras into your network with:

- Industry-leading Ethernet Media Conversion portfolio:
  - Managed or unmanaged
  - Chassis-based or stand-alone
  - Office-grade, extended temp or Industrial grade
- Multi-layer managed and unmanaged Ethernet switches
- Power-over-Ethernet (PoE) MediaConverters, injectors and switches
- Extended operating temperature for non-temp controlled environments

Advanced Features

Auto-Negotiation (802.3u)

Auto-Negotiation allows devices to perform automatic configuration to achieve the best possible mode of operation over a link. Devices with this feature will broadcast their speed and duplex capabilities to other devices and negotiate the best mode of operation between the two devices.

- No user intervention required to determine best mode of operation
- Optimal link established automatically
- Quick and easy installation

While the inclusion of this feature is beneficial, the ability to disable it is equally beneficial. In the event of a non-negotiating end device trying to connect to a negotiating device, the mode of operation will drop to the least common denominator between the two devices (i.e. 100 Mbps, half-duplex). Disabling this feature gives the user the ability to force the connection to the best mode of operation when trying to link with a non-negotiating device. Most Transition converters with Auto-Negotiation will allow you to disable this feature.

AutoCross™

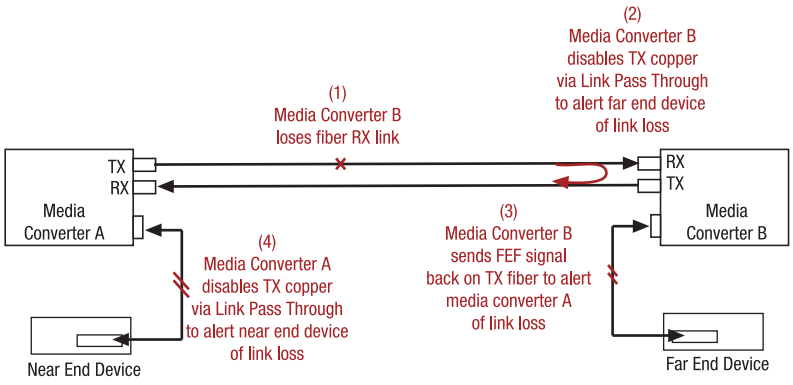
Automatically detects and configures the twisted pair port on the converter to the correct MDI or MDI-X configuration.

- Eliminates an entire category of troubleshooting
- No need to identify cable type—straight-through or crossover
- No user intervention required to determine correct button / switch settings

Far-End-Fault (802.3u)

Far-End-Fault (FEF) is a troubleshooting feature that is generally used in conjunction with Link Pass Through to notify both end devices of a loss of link by monitoring the fiber receive (Rx) signal. In the event of a loss of the fiber RX signal on the far end, the converter will automatically generate a Far-End-Fault signal and send it on its TX fiber port to notify the near end converter of a fiber link loss. Link Pass Through will then disable the copper links on both ends; alerting both end devices of network trouble (see diagram below).

- Both end devices automatically notified of link loss
- Prevents loss of valuable data unknowingly transmitted over invalid link
- Allows for quick diagnosis and resolution of network problems



If someone tells you media conversion is a commodity product that anyone can bring to market, they probably haven't looked at the extensive product suite offered by Transition Networks. With the industry's most comprehensive offering of full-featured products, Transition's media converters stand out as "the choice" among industry IT professionals.

Generally, media converters are low-level OSI model devices with no IP or MAC addresses and therefore are transparent to the network. This "transparency" makes them very inexpensive and easy to use, but also can make troubleshooting the network very difficult. In an effort to overcome this difficulty and to make media converters "visible" to network managers, Transition has designed our full-featured products to include the most advanced features on the market today such as:

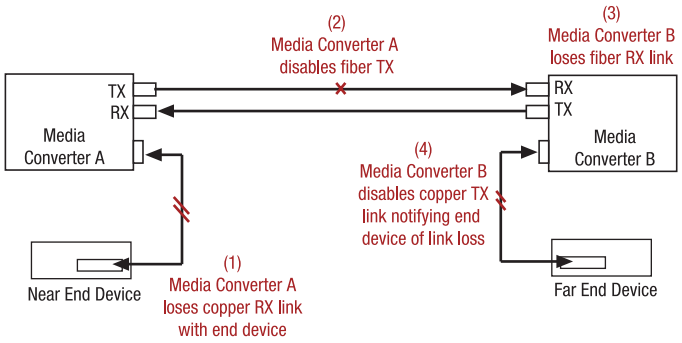
- Auto-Negotiation
- AutoCross™
- Far-End-Fault
- Link Pass Through
- Transparent Link Pass Through
- Pause
- Remote Management
- Automatic Link Restoration
- Loopback
- Bandwidth Allocation
- Field Upgradeable Firmware
- Source Address Change
- Last Gasp
- Single Fiber Optics

Transition Networks' media converters that include the FEF feature do not need to be used as pictured left as they will work with other network devices that support Far-End-Fault per IEEE standards.

Link Pass Through

Link Pass Through is a troubleshooting feature that prevents media converters from isolating link failures and it allows end devices to be notified in the event of a loss of link. Link Pass Through provides the media converter with the ability to monitor both the fiber and the copper RX ports for a loss of signal. If a loss of RX signal occurs on one media port, the converter will automatically disable the TX signal on the other port. By shutting down the fiber TX port, the link failure is "passed through" to the remote converter and device (see diagram below).

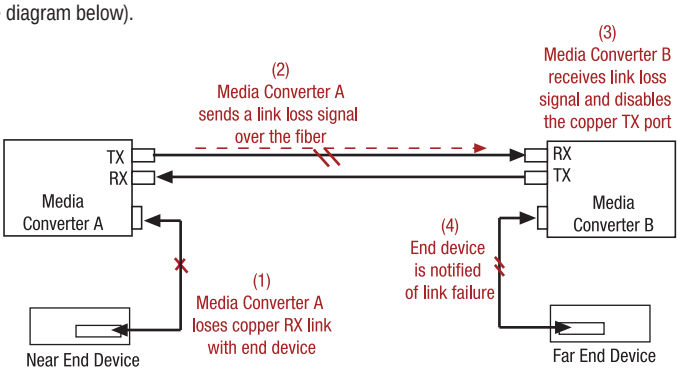
- End device automatically notified of link loss
- Prevents loss of valuable data unknowingly transmitted over an invalid link



Transparent Link Pass Through

Transparent Link Pass Through will notify an end device of a link failure just like Link Pass Through, however it uses a different method for "passing through" this information. Transparent Link Pass Through sends a link loss signal over the fiber, instructing the remote converter to shut down the copper port thus notifying the end device, while maintaining the fiber link between the two converters (see diagram below).

- End device automatically notified of link loss
- Fiber link remains up as it carries a link loss signal



Pause (IEEE 802.3x)

PAUSE signaling is an IEEE feature that temporarily suspends data transmission between two devices in the event that one of the devices becomes overwhelmed. In the event that a device needs some time to clear network congestion, it will send out a PAUSE signal to the other end device, which will then wait a pre-determined amount of time before re-transmitting the data. Transition's converters will pass PAUSE signaling unhindered; ensuring that the message is delivered to the end device.

- PAUSE enabled devices allowed to work properly
- Prevents loss of valuable data transmission
- Reduces bottlenecks and allows for efficient use of network devices
- PAUSE signaling is not standardized over fiber media. Transition's media converters will communicate this signaling over fiber between the converters to pass this signaling on to the other end device.

Remote Management

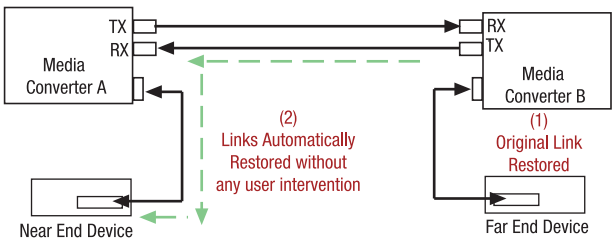
All chassis-based converters from Transition Networks can be managed through SNMP. Select stand-alone products can also be managed through SNMP. Some remotely managed converters are IP addressable, while others must be used in conjunction with a managed chassis based converter. While chassis based products are generally placed in the telecommunications room, stand-alone converters are generally placed in remote locations away from network administrators. Remote in-band management over fiber allows administrators access to the remote device to check status and enable/disable features or the device itself.

- Visibility of remote converters for network administrators
- Allows for centralized management of media converters

Automatic Link Restoration

After a link failure condition has been corrected, Transition Networks' converters will automatically re-establish the link in all network conditions.

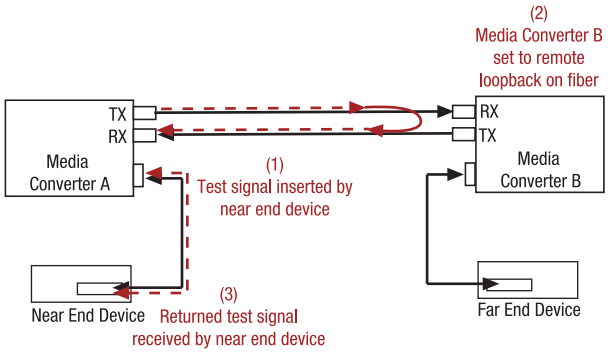
- No need to reset devices: Transition Networks' converters will automatically re-establish the link when connected to switches if link was lost. With other manufacturers' converters the user must reset the converter to re-establish the link.
- Auto-Negotiation Enabled: Automatic Link Restoration allows the users to continue using Auto-Negotiation with Link Loss Notification features. With other manufacturers' converters the user must disable Auto-Negotiation and hard set the link.
- Link Pass Through Activated in both directions: Automatic Link Restoration on Transition Networks' products allows users to continue using Link Loss Notification feature activated in both directions. Many competitive solutions allow for Link Loss Notification activation only in one direction. If Link Loss feature is activated in both directions, competitive products are put in a "deadly embrace" and they cannot restore the link without resetting the converters.



Loopback

Select Transition Networks' products are equipped with Loopback. This feature puts a converter in a special mode that enables the device to loop back the signal from the RX port to the TX port on either media for testing and troubleshooting purposes. Test signals from a tester (Firebird, etc.) can then be inserted into the link and looped back as received by a device to test a particular segment of the link (i.e. copper or fiber). Loopback can be either local or remote depending on the location of the converter in the link.

- Allows network diagnostics from local or remote location
- Quickly pinpoints problem areas of end to end link by testing a particular segment. Some converters have separate copper and fiber loopback functions that can be enabled separately, while others will loopback both copper and fiber at the same time when enabled. Please refer to the specific product page for details.



Bandwidth Allocation

Bandwidth allocation is an important feature found on select devices which allows network administrators to set the bandwidth of the device ports for both ingress and egress bandwidth allocation. The bandwidth can be allocated in a variety of rates up to the full bandwidth capability of the device. See the device product manual for the rates available for that device.

- Effectively manage bandwidth usage in the network to support critical processes or activities
- Provide only the contracted amount of bandwidth to paying customers
- Provide only the bandwidth necessary to end users

Field Upgradeable Firmware

New product features are continuously being added to Transition Networks' products. These improvements are also available for many products already installed in the field. Management modules and many media converters can be updated remotely via firmware upgrade. The field upgradeable feature eliminates the need to ship the products back to the manufacturer. The firmware upgrades can be performed by a user either locally via a Console port or remotely via TFTP. The upgrades do not require the reconfiguration of the SNMP management or converter feature settings.

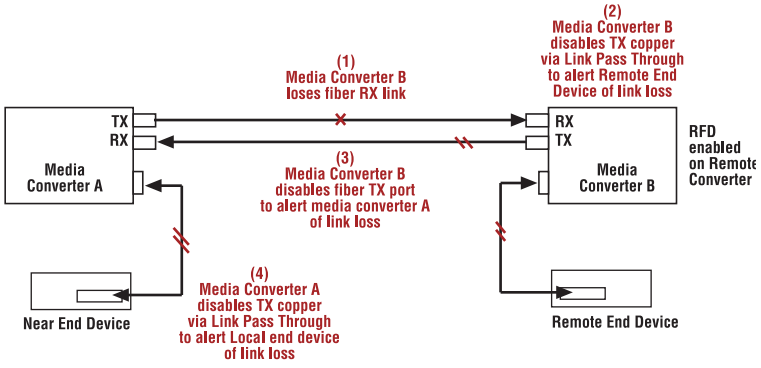
Single Fiber

Single fiber technology offers a 50% savings in fiber utilization. It is an attractive solution to maximize the usage of a limited number of fiber runs. In a traditional optical link, a fiber pair consists of two uni-directional strands. The single fiber technology multiplexes two optical wavelengths of 1310nm and 1550nm into a single strand fiber. In a single fiber media converter each wavelength is responsible for either the transmit or receive function. Consequently, the bi-directional transmission is achieved by using a single strand. The converters in a single fiber scenario "match" each other's wavelengths. Converter A transmits at the wavelength of 1310nm and receives at 1550nm while the other converter transmits at 1550nm and receives at 1310nm. Therefore, converters are usually used in pairs. Single fiber technology is available on all Transition Networks Media Converters in maximum distance ranges from 20 to 120 km.

Remote Fault Detect

Remote Fault Detect (RFD) is a trouble shooting feature found on Gigabit Ethernet copper-to-fiber media converters. By enabling Remote Fault Detect on the remotely located media converter, the status of the fiber link will be monitored and any link failures will be reported back to the local converter. Should the remote converter lose its fiber RX signal, Remote Fault Detect will force the converter to shut down its fiber TX port. If Link Pass Though is enabled on both ends, then the copper ports will also be shut down to notify both end devices of the link failure.

- Enable Remote Fault Detect on the remote device
- Local end-device will be notified of remote fiber RX loss



Last Gasp

Select Transition Networks products are equipped with Last Gasp. This feature enables the device to store a small amount of power to enable it to send out an SNMP trap to alert the management console in the event of a power failure.

- Notification of an impending power loss before it happens
- Allows for quicker resolution of the power loss

Source Address Change

Select bridging media converters are capable of detecting and reporting changes in the MAC (Ethernet hardware) address of the attached equipment. This feature is very useful when administrators intend that only a particular physical device be attached to a particular port. When the MAC address of a connected device changes (new device is inserted) the administrator receives the trap with the notification of a change.

Certification(s)

Metro Ethernet Forum (MEF)

Many of Transition Networks' families of remotely managed network interface devices have been certified to comply with the requirements for MEF certification.

The Metro Ethernet Forum (MEF) is a global industry alliance comprising more than 145 organizations including telecommunications service providers, cable operators, MSOs, network equipment, test vendors, labs and software manufacturers, semiconductor vendors and testing organizations.

The MEF develops technical specifications and implementation agreements to promote interoperability and deployment of Carrier Ethernet worldwide. The MEF's mission is to accelerate the worldwide adoption of Carrier-class Ethernet networks and services.

Transition Networks is a member of the MEF to promote Carrier Ethernet services and products while ensuring interoperability based on standards.

Network Equipment Building System (NEBS)

Transition's Point System™ Chassis has been built to meet NEBS (Network Equipment Building System) requirements. NEBS standards are a major test of quality that is extremely valuable for any organization supplying or purchasing network equipment. A product that is NEBS certified has passed a suite of tests ensuring that the product will:

- Operate reliably and be serviceable
- Not negatively affect other service providing equipment
- Operate properly in adverse environmental conditions
- Not cause harm to the environment or personnel

There Are Three levels of NEBS Approvals. Transition Networks' Point System™ Meets The NEBS Level 3 Requirements:

- **Level 1:**
  - Minimum environmental compatibility
  - Applications: Prototype equipment, equipment used for non-vital services
- **Level 2:**
  - Assures limited equipment operability in controlled or normal environment
  - Applications: equipment used in data centers or failure-tolerant services
- **Level 3:**
  - Assures maximum equipment operability
  - Applications: critical network equipment (e.g. switches, transport products, power systems)

ROHS Compliance

All Transition Networks products are now available for shipment in compliance with the European Union Commission Decision of August 18, 2005, Directive 2002/95/EC on the Reduction of Hazardous Substances (RoHS), which took effect on July 1, 2006.

The RoHS Directive prohibits the sale into the European Union of electronic equipment containing certain amounts of lead, mercury, hexavalent chromium, polybrominated biphenyls (PBBs) and polybrominated diphenylethers (PBDEs). Their maximum contents are defined at a maximum concentration value of less than 0.1% by weight in homogenous material. An additional substance, cadmium, is restricted to 0.01% in homogenous material.

The RoHS Directive allows a lead-in-solder exemption for telecommunication products and Transition Networks will be taking this exemption. Our component vendors and sub-contract manufacturers are continuing to remove lead from the entire process whereby this exemption will no longer be required.

There is no change in the model number or ordering procedure.

Environmental Stewardship

While the RoHS and WEEE directives are limited to the European Union other countries are considering similar legislation. Transition Networks will continue to monitor the development of new legislation and implement any new requirements. Transition Networks is currently ISO14001 compliant and will continue to work to minimize our impact on the environment.

CISPR Class A

FCC (Federal Communications Commission) is the regulatory body that establishes standards for interstate telecommunication services in the United States. Part of the FCC's responsibilities is to establish standards for radiated emissions for a variety of operating environments such as residential and commercial structures. FCC Class A describes requirements for radiated emissions in commercial structures while FCC Class B describes emissions requirements for residential applications.

In addition to being FCC & CISPR Class A compliant (commercial use), Transition's 18-slot Point System™ chassis (CPSMC1800-200) is also FCC Class B and CISPR Class B compliant (residential).

CISPR Class B

CISPR is the acronym standing for the Comité International Spécial des Perturbations Radioélectriques (International Special Committee on Radio Interference) of IEC.

CISPR Class B is an international standard that covers the amount of interference from electromagnetic signals allowed from electronics in homes and multi-tenant dwellings. It is more stringent than the Class A certifications required of most electronics. Point System™ products have been tested to meet all requirements of Class A. Transition's 18-slot Point System™ chassis (CPSMC1800-200) is also FCC Class B and CISPR Class B compliant (residential).

In order to maintain Class B rating all devices in the system must also be Class B rated.

Waste Electronic Equipment (WEEE)

Transition Networks is also working to implement the WEEE recycling program with its partners in the EU. The WEEE directive addresses the problem of recycling products and requires product to be labeled to identify participation in the program. The EU approved "double-crossed wheelie bin" symbol will be affixed to the product, and recycling instructions included in the user's manual.

Conversion Features

Transition Networks' Chassis-based systems are cost effective, fully configurable, managed modular media conversion systems, that provide users with the flexibility to build their own custom media conversion platform. The system includes rack mountable chassis' and modular, hot-swappable slide-in-cards. Each Modular media converter, regardless of protocol, can be slid into the same chassis and provide managed media conversion services to a custom network application.

- Cost Savings
- Flexibility
- Maximum Control
- Reliability
- Potential for Future Growth

Cost Savings

Transition's media converters allow users to only pay for fiber ports as needed when adding fiber to their networks. Combining media conversion with copper-based equipment can save up to 45% in cost. Modular media converters allow users to add converters as they need to add fiber to their network. Therefore, users can utilize their existing copper-based equipment and not buy fixed multiport fiber devices.

Flexibility

(☑ I NEED ONE PLACE TO CONVERT MULTIPLE LINKS)
(☑ I NEED ONE PLACE TO CONVERT MULTIPLE PROTOCOLS/SPEEDS)

Because the cards are modular, users can add them gradually when fiber is added to the network and when the network grows. All card blades are hot-swappable and powered by chassis power supplies. The modularity also means that the Chassis supports a mix of various protocols. For example, a 19-slot chassis could be populated with 19 homogenous or unique converters (e.g. Ethernet, T1/E1, ATM or OC-12). Network designs differ widely, so Transition Networks has introduced a variety of chassis models, with different port densities to address each specific need.

Maximum Control

(☑ I NEED SNMP MANAGED MEDIA CONVERTERS)

Administrators continuously monitor the network, allowing them to quickly respond to and troubleshoot possible issues. Configuring the network is essential to the administrators as no one has a perfect network that can run without any intervention. To improve the efficiency and lower the response time, administrators turn to SNMP management because it offers them considerable cost savings by eliminating the need to send a technician to a remote location and by improving the accuracy of the configuration.The Point System™ offers full control over the media conversion process. This full control translates into three major aspects of network management. It offers:

- A complete monitoring capability where cards can be monitored for power status, link status, individual card settings and connection options. The chassis cabinet itself provides information about internal temperature conditions, redundancy configuration of each power supply and current power consumption by each power supply.
- Active configuration of the media conversion platform (drive-by-wire). The users have the ability to power on or off chassis card slots and reconfigure each power supply's mode (where available). Each media converter card provides a distinct set of user configurable features such as Auto-negotiation Disable/Enable; Force 100 Mbps/Full Duplex; Assign priority level threshold (IEEE 802.1P); etc.
- Alarm notification capability. Failure conditions and specific events discovered by Point System™ are reported to multiple user-defined destinations in the form of an SNMP Trap.

This full control is protected by sophisticated SNMP Management Security Features to ensure that only authorized personnel can access the management.

Is a Chassis-Based System What I Need?

- ☑ I need one place to convert multiple links.
- ☑ I need redundant power supplies.
- ☑ I need SNMP managed media converters.
- ☑ I will be adding links in the future.
- ☑ I will be upgrading protocols in the future.

If you answered YES to the majority of the questions then the Chassis system was designed for you.

Why a Chassis System?

- Complete Modularity
- SNMP Management
- Management Redundancy
- Power Redundancy
- Power Surge Protection
- Hot-swappable converters
- Field Upgradeable Firmware
- Scalability

Chassis-Based Conversion Features

Reliability

(☑ I NEED REDUNDANT POWER SUPPLIES OR REDUNDANT MANAGEMENT)

Network uptime is crucial and Transition Networks offers several features that will ensure that your network will stay up and running. Chassis-based systems offer a redundant power option. Each chassis is shipped with one power supply. The chassis can accommodate a second power supply. Power supplies are available for AC or DC power. The power supplies are hot swappable so they can be replaced while the chassis is running. The instant fail-over bus ensures that if one power supply fails, the second power supply will keep the chassis up and running.

Redundancy of SNMP management is also available by placing two primary management modules in a chassis or a stack of chassis. The management modules negotiate primary and secondary responsibility to manage the chassis. In the event the primary management module fails the secondary unit takes control.

Furthermore, each individual converter maintains its feature configuration within a microcontroller on the converter card. If a management module fails the cards will stay up and running because the configuration information is not lost with the loss of a management module. Each card and power supply has a built in surge protection to protect the unit from power surges. The power supplies are equipped with a standard 4-Amp fuse and can be repaired in the field.

When multiple chassis are connected to each other the SNMP management protection becomes critical. Healing Bus enables the users to maintain full control of the daisy chained chassis so that the failure of any one module will not effect remaining modules in the stack.

Future Growth

(☑ I WILL BE ADDING LINKS IN THE FUTURE)

Chassis-based conversion systems bridge the gap between continuous development of new networking technologies and the long-term nature of an investment in networking gear. Transition Networks has implemented several features that will allow you to keep your conversion platform current.

- Each of the management modules can be updated via firmware upgrade. So, as network technologies advance and new converters are introduced, the management module of today can support the media converter of tomorrow.
- Similarly, our media converters can also be updated in the field. The firmware upgrade can be performed either:
  - locally via a Console port or
  - remotely via TFTP
- Furthermore, a new converter addition does not require the reconfiguration of the SNMP management settings

Chassis System Components

The typical system will consist of four major components:

- Chassis Cabinet (19-, 18-, 13-, 8-, 2-, or 1-slot(s))
- Management card for SNMP management
- Media Converter Slide-In-Modules
- System Accessories (GUI, redundant power supplies, fans, rack extensions, etc.)

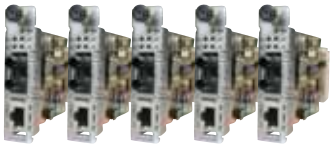
All Point System™ & ION Slide-In-Modules Can Be SNMP Managed

The card inside the chassis slot is connected to the backplane. Through the backplane, the management card communicates with each card in the chassis and sends requests for status and configuration. Each card has a set of predefined features that are known to the management card so the user can receive current statuses and can enable or disable all configurable features. The information about these manageable features is included in the MIB document so the management application software can access this document and ask for a particular feature to be changed accordingly. The user communicates with the management card over the Ethernet cloud or directly through the serial port.

Product Family

Chassis

Slide-In-Module Media Converters



Management Modules

Focal Point SNMP Management Platform

Point System™ and ION Management

Remote Management

Select Transition devices can be remotely managed. This enables administrators to monitor & configure remotely located stand-alone converters straight from the Network Management Station (NMS) without leaving the office.

Transition Networks also offers devices using the IEEE802.3ah and IEEE 802.1ag standard for remote management and fault detection. Select Network Interface Devices (NIDs) are MEF certified compliant.

SNMP, Telnet, HTTP and TFTP are some of the standard protocols used by the Point System™ and ION management. Point System™ Chassis cabinets can be daisy chained (a maximum of 8 can be stacked) and managed via a single IP.

The following is a partial list of features that are currently available and manageable on select Transition Networks' devices:

- Auto-Negotiation enabled/disabled [pg 16]
- AutoCross™enabled/disabled [pg 16]
- Link Pass Through enabled/disabled [pg 17]
- Far-End-Fault enabled/disabled [pg 16]
- Bandwidth Allocation [pg 18]
- Remote Loopback [pg 18]
- Pause enabled/disabled [pg 17]
- 802.1P enabled/disabled
- Port mirroring enabled/disabled
- Source Address Change [pg 19]
- AIS fiber enabled/disable
- AIS Copper enabled/disabled
- Loopback copper enabled/disabled [pg 18]
- Loopback fiber enabled/disabled [pg 18]
- Chassis reset
- Module reset
- Module - software mode/hardware mode
- Power Supply - hardware mode/software mode
- Signal detect
- Line build out
- Redundant management mode (Primary/Secondary)
- Redundant Power Supply mode (Primary/Secondary)

** Please refer to the product manual for a complete list of manageable features for a specific device.*

Alert Notification Features

Users can receive information about failures happening in the network through SNMP notifications. These notifications are referred to as traps. The traps inform administrators either about the failure or when the failure was corrected and the network is back to its full operational capability. Several events are considered trappable. The following is a list of some of the traps that are generated by a Transition Networks management module:

pSError (111)
A monitored MIB variable (e.g. Fiber Link) has changed from its 'operational' state to its 'error' state.

pSErrorClear (112)
A monitored MIB variable has changed from its 'error' state back to its 'operational' state.

pSDeviceInserted (113)
A new slide-in device was detected on the bus.

pSDeviceRemoved (114)
A slide-in device that had previously been detected on the bus has not been recording its presence for a long time, and is presumed to have been physically removed.

pSDeviceColdStart (115)
A slide-in device has indicated that it has rebooted. This is most common when the device is initially powered up, but in some cases this trap indicates a warm start.

pSPowerLost (116)
The cabinet (e.g. chassis) into which this management module is installed has lost power and is running on capacitors. Both the cabinet and the management module must support the Last Gasp feature for this trap to be sent.

pSCabinetInserted (117)
A new cabinet was detected.

pSCabinetRemoved (118)
A cabinet that had previously been detected has not been heard from in a long time, and is presumed to have been physically removed.

Point System™ and ION Management Specifications

Management Access Methods

There are several ways to access the Point System™ and the ION management modules to perform maintenance or monitoring functions.

The Point System™ and the ION management module can be accessed via:

- Transition's Focal Point Graphical User Interface (GUI) Application
- Web-Based application, standard web browser already installed on the network (Internet Explorer, Netscape, Opera)
- Command line interface via:
  - Console Port
  - Telnet

The management capabilities of Focal Point and Web Based are almost identical. Users who already use other management platforms such as HPOV or SNMP can also manage Transition Networks' device with these applications. Other NMS applications can also be used to manage Transition's products provided the users import the Transition MIB's (available on-line) into these NMS platforms. This process is called Compiling the MIBs.

Focal Point (Free of Charge)

Transition Networks' SNMP software management platform, Focal Point, is free of charge and is available to users with any chassis or management card purchase. Focal Point is designed to offer full SNMP read/write management capabilities via a user friendly graphical user interface (GUI).

Focal Point software allows the user to enable and disable features incorporated into each of the devices. Focal Point has several new unique features to simplify network administration. The new features include:

- Tree View for all loaded/discovered IPs
- Pop-up eliminator/minimizer
- Save settings tab required to implement changes
- GUI interface divided into 3 distinct sections that can be re-sized or hidden at user discretion
- GUI interface displays entire chassis within a single screen viewer
- Enable/Disable buttons for each feature
- Zoom in view for all cards in chassis
- Universal Trap Viewer allows viewers to receive all traps, including traps from third party devices, on the network
- One-click-telnet
- Upgrade tool
- Live-chat with Transition Networks' Tech support personnel
- Direct links to product literature such as datasheets, manuals and release notes
- Email notification and audible alarms

Focal Point's newly designed screens are very intuitive and easy to navigate. Customers can now navigate between multiple agents from within one screen and switch between chassis cabinets through the drop down menu. Focal Point has two types of views: a summary screen, that reports the devices' link status and its critical features, and a detailed screen that brings up everything about the particular device. These views provide quick access to network management.

One of the most important features of this package is an integrated Trap Viewer application. It allows users to see and log received traps from IP based network equipment (including third party devices). Traps are displayed in a user friendly, readable format. Users can filter traps to read desired messages only.

focal point SNMP SOFTWARE

Focal Point Features

- Graphical User Interface (GUI)
- Status monitoring
- Enables/disables converter features
- Universal Trap Viewer Allows viewers to receive all traps, including traps from third party devices, on the network.
- One-click-telnet
- Upgrade tool
- Links to product literature

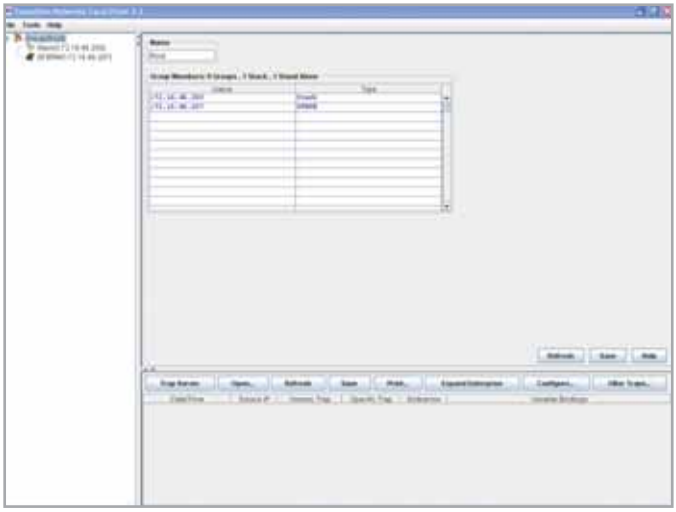
Product Configuration

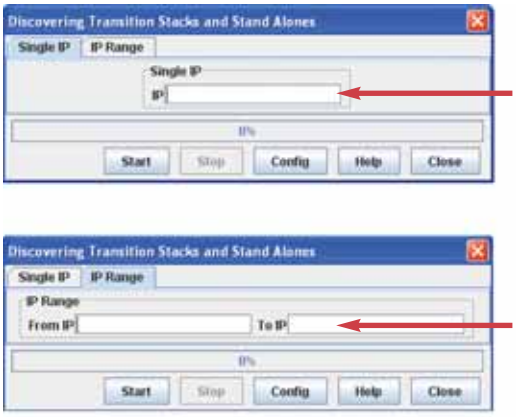
Transition's Focal Point supports the following software platforms:

- MS Windows® XP and Vista.
- HP-UX 10.x or Higher
- Sun Solaris 2.6 or Higher
- Requires Java™ Runtime Environment (JRE™) version 1.5.0 or higher

Focal Point Main Screen

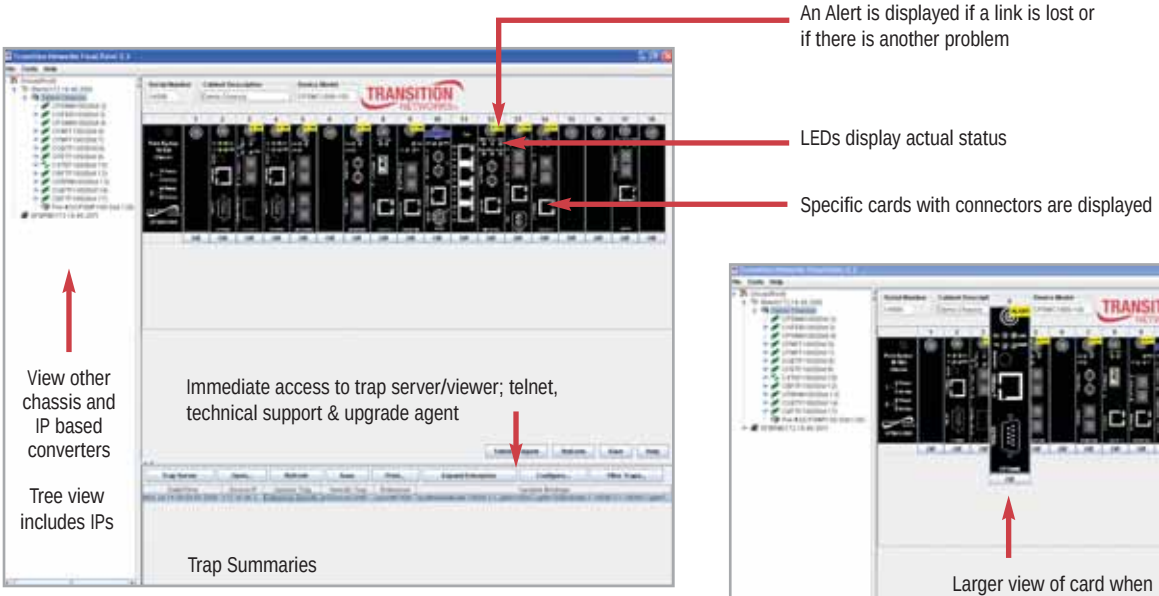
The main screen allows users to enter new or existing IPs of all agents (management cards). When the IP is entered/selected the list of available chassis is displayed.





Focal Point View Screen

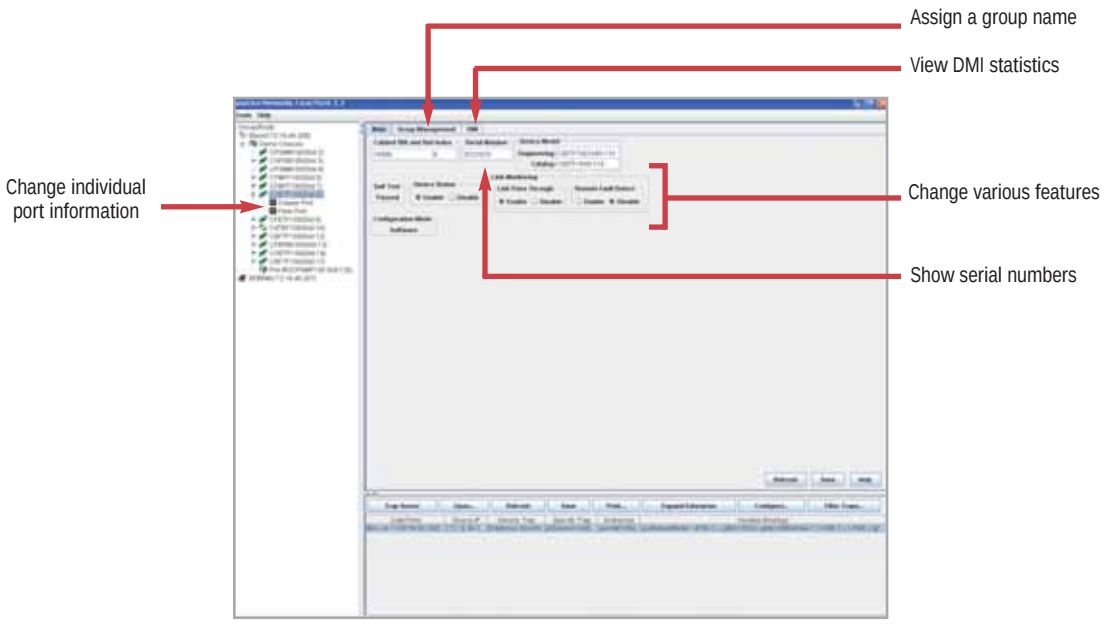
Displays the selected chassis information. Each converter is displayed with connectors, LEDs, and status (e.g. ALERT).



* Above screen shots are from Point System™

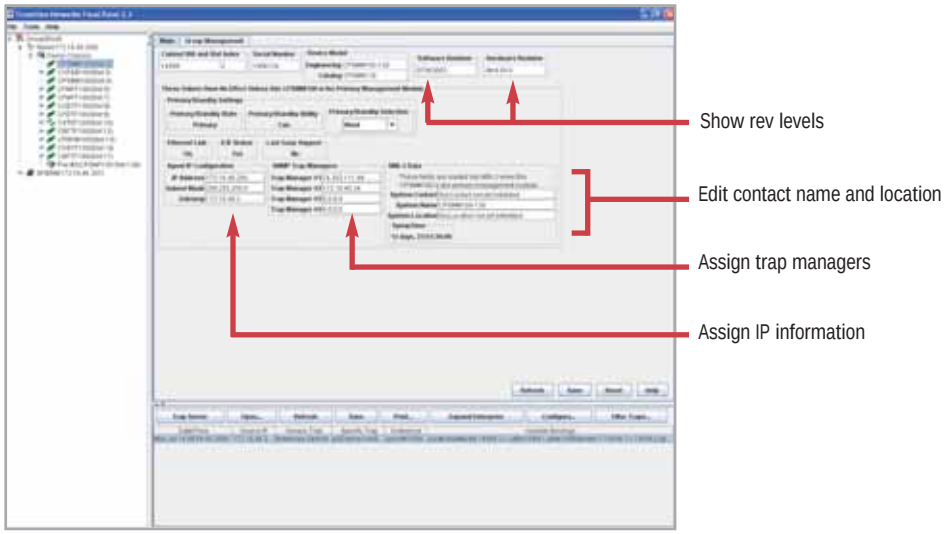
Focal Point Card Screen

An individual card can be highlighted by clicking on the card in the Chassis Screen. A screen is displayed that allows the network administrator to edit the card's configuration.



Focal Point Management Module Screen

Displays the interface for the management card.

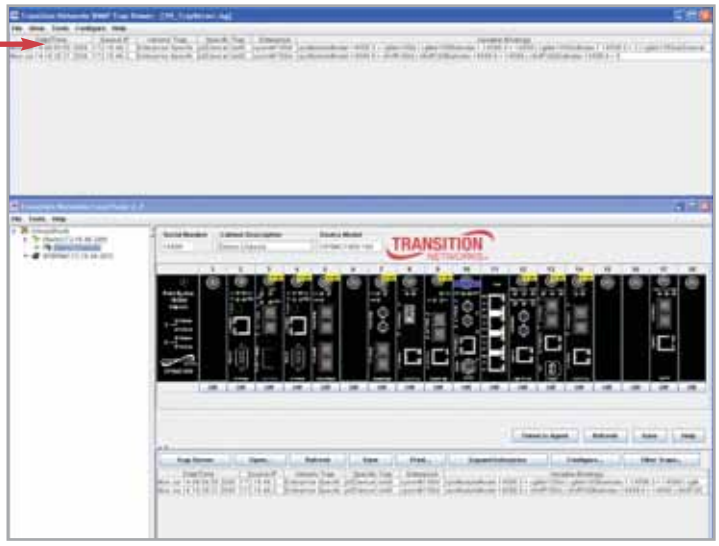


* Above screen shots are from Point System™

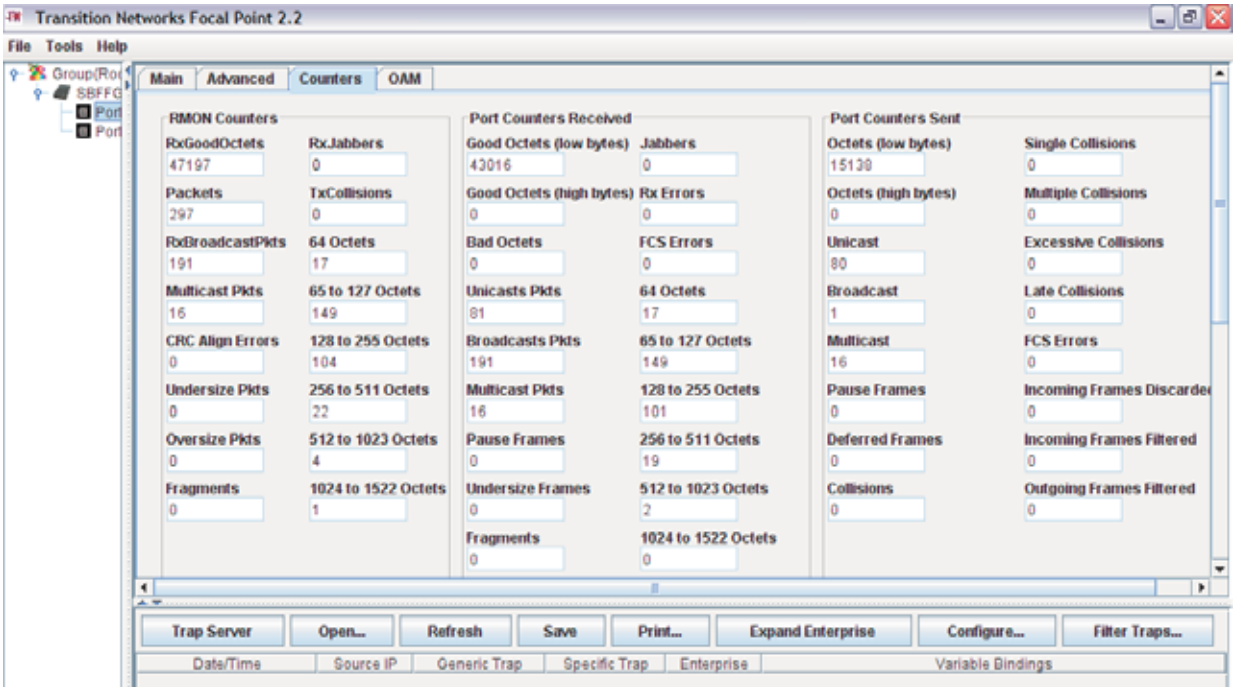
Focal Point TrapViewer Screen

Displays traps received from Transition as well as third party devices.

See trap history time & date stamp



Focal Point RMON Statistics

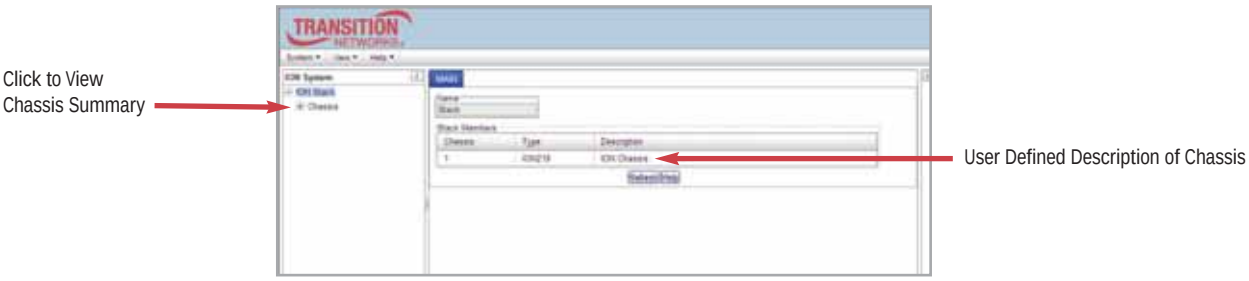


* Above screen shots are from Point System™

Point System™ and ION Management Specifications

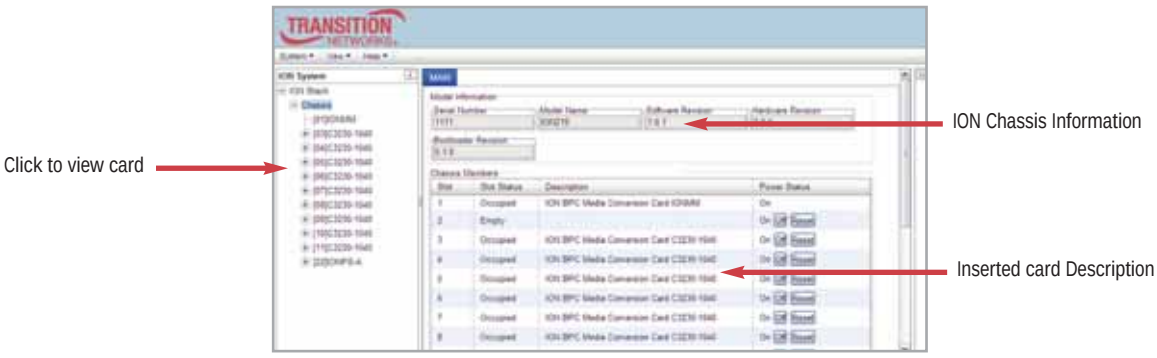
Web Agent Summary Screen

Transition Networks Point System™ and the ION platform can be managed using a standard web browser. Full configuration is available via the web browser.



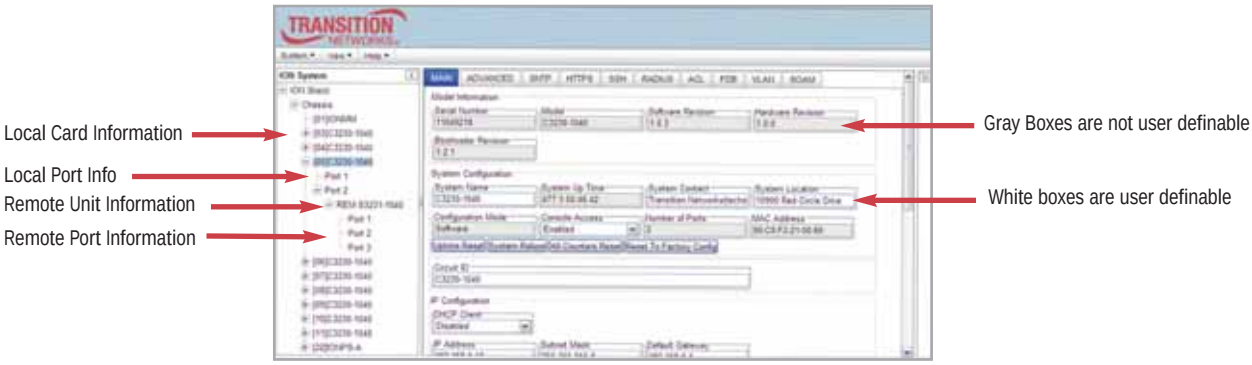
Web Cabinet View Screen

Displays all of the cards in the selected chassis.



Web Card View Screen

Allows user to view and change settings.

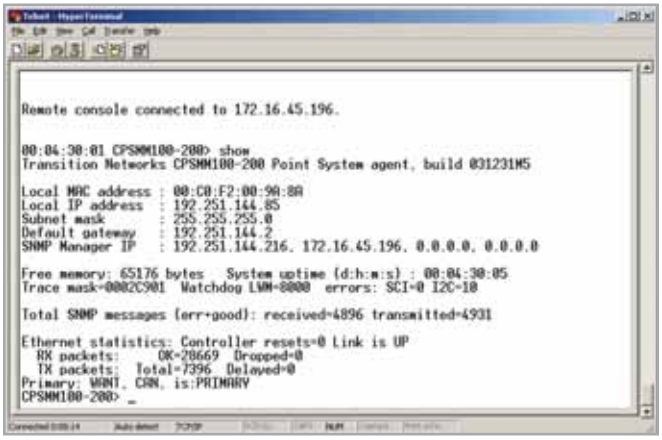


* Above screen shots are from The ION Platform

Point System™ and ION Management Specifications

Command Line Interface (CLI)

CLI offers the most comprehensive set of management features. CLI is used during the initial setup (set IPs etc.) and trouble shooting, but can also be used for day-to-day management (device management, firmware upgrades, management security features, etc.)



Security Features

Point System™ offers a comprehensive approach to SNMP management security. It was designed with several levels of access protection to ensure that network management is accessible only to those who are authorized.

Password (a.k.a. Community Names)

Two levels of access privileges are password protected.

- Read access (monitor ONLY) - a Community Name with a particular set of privileges to monitor the network without the right to change any of its configuration
- Read/Write (View & make changes) - a Community Name with an extended set of privileges to monitor the network as well as actively change any of its configuration

Firewall

Transition Networks' management agent contains an internal IP firewall. This built-in filter examines each incoming packet to determine whether to forward it to the management or to discard it. The decision is based on user-defined rules. These rules are entered in the Command Line Interface. Once the rule is entered the firewall matches packets based on source IP address, destination protocol, destination port, or some combination of the three. Each rule also contains a "drop" or "pass" action, making it possible to configure the filter with either a "default accept" or a "default deny" philosophy.

FILTERMAC

Filtermac can be used in conjunction with its firewall feature. The FILTERMAC allows the user to specify up to four trusted Ethernet Hardware addresses (i.e. MAC addresses) that are permitted to send IP packets to the Agent. Once this feature is used no other MAC addresses are permitted access to the management information.

SNMP Lock

SNMP messages originating from outside of the local subnet are ignored unless the Management Module has a Telnet session connected to the same IP address. This feature is designed to make it much more difficult for outside intruders to make changes to management settings via a method known as "IP Spoofing." In an IP Spoofing attack, the intruder configures an attacking computer to assume the identity of a trusted computer (NMS) in order to bypass firewall security measures. This deters intrusions by making the IP spoofing of SNMP datagrams much more difficult.

Lock/Unlock CLI

LOCK / UNLOCK - The LOCK command allows the CLI to be locked so that no commands can be entered. (Unsolicited log messages are still displayed, and SNMPLOCK functionality is still active when the console is locked.) Once the console is locked, it remains locked to all users regardless of the access method until UNLOCK command is used.

Traps

The Agent sends Coldstart traps when it is rebooted and enterprise specific Error/Error Clear traps when Ethernet link goes down or up. Unexpected receipt of these traps could indicate that an attack is in progress.

* Above screen shots are from Point System™

Transition Networks understands that every network is managed differently and that different security levels and management interfaces are often required depending on the deployment of the Point System or ION Chassis.

With that in mind, we have a variety of security features available in the Point System and ION Management Modules.

The ION Platform Key Security Features

These security features allow you to control access to the ION Chassis via the ION Management Module to ensure that only authorized personnel are able to view and change the settings to the slide-in-modules.

- Management VLAN
- SSL
- SSH
- 802.1x
- SNMPv1 & V2

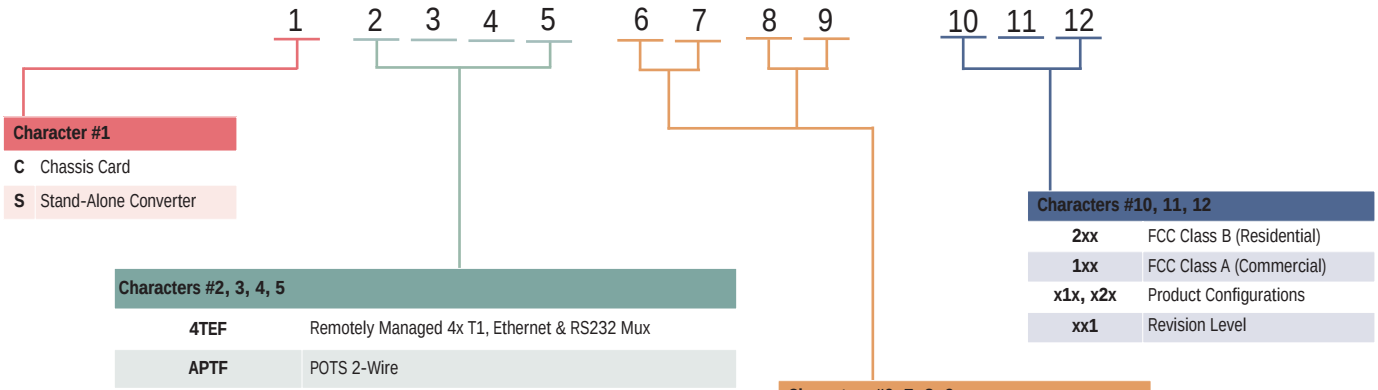
Point System Key Security Features

These security features allow you to control access to the Point System Chassis via the Point System Management Module to ensure that only authorized personnel are able to view and change the settings to the slide-in-modules.

- Firewall
- FILTERMAC
- SNMP Lock
- Lock/Unlock CLI
- SNMPv1

For complete details on all of the security features for the Point System and ION management modules please refer to the specific product manual.

Point System™ Part Number Key



Character #1	
C	Chassis Card
S	Stand-Alone Converter

Characters #2, 3, 4, 5	
4TEF	Remotely Managed 4x T1, Ethernet & RS232 Mux
APTF	POTS 2-Wire
BFFG	OAM/IP-Based Remotely Managed Bridging Media Converter
BFTF	10/100 Bridging
CSCF	DS3
DSFE	Fast Ethernet Device Server
EPOE	Power-Over-Ethernet
ETTF	10BASE-T to 10BASE-FL
FBRM	10/100BASE-TX to 100BASE-FX OAM/IP Based Remotely Managed
FEPE	Power Over Fast Ethernet
FETF	100BASE-TX to 100BASE-FX
FMFF	Single Mode to Multimode Fiber or Optical Line Converter
GETF	1000BASE-T to 1000BASE-SX/LX
GFEB	10/100/1000BASE-T to 1000BASE-SX/LX
GPOE	Power-Over-Ethernet 10/100/1000Base-T to 1000
ISGM	Gigabit Industrial Managed
ISPM	Industrial Managed Power-Over-Ethernet
ISTF	Industrial Stand-Alone Converter (10/100BASE-TX to 100BASE-FX)
ISTG	10/100/1000 Industrial Media Converter
ISTM	Industrial Stand-Alone Managed (10/100BASE-TX to 100BASE-FX)
ISTP	Industrial Unmanaged Power-Over-Ethernet
POEB	Power-Over-Ethernet 10/100BASE-TX to 100BASE-FX
PSVT	High Speed Serial to Fiber
RMFE	Remotely Managed Fast Ethernet
RS2F	RS232 to Fiber
RS4F	RS422/485 to Fiber
SDTF	T1/E1
SEFE	10BASE-T to 10BASE-FL or 100BASE-TX to 100BASE-FX Speed Selectable
SETF	10/100BASE-TX to 10/100BASE-SX
SRFB	Status Reporting 10/100 Bridging Converter
TGFF	10Gig Fiber to Fiber
VIDF	Analog CCTV Video: NTSC, PAL, SECAM

Characters #6, 7, 8, 9	
10	RJ-45
11	Multimode (ST)
12	Single Mode (ST)
13	Multimode (SC)
14	Single Mode (SC)
15	Single Mode (SC) Long Haul
16	Single Mode (SC) Xtra Long Haul
17	Single Mode (SC) Long Wave 1550
18	Multimode (MT-RJ)
19	Single Mode (LC)
20	Single BNC
22	Single Mode (ST) Long Haul
24	Extended Multimode (SC)
26	26-Pin Connector
27	Multimode (ST) Long Haul
29	Single Fiber (SC)
30	Dual BNC
31	DB-9 Connector
32	Terminal Block Connector
33	RJ-11
35	Single Mode (SC) Long Wave 1550 Extended
39	Multimode (LC)
40	SFP Slot
41	5-Position Terminal Block
47	XFP Slot
48	SFP+ Slot

Characters #10, 11, 12	
2xx	FCC Class B (Residential)
1xx	FCC Class A (Commercial)
x1x, x2x	Product Configurations
xx1	Revision Level

Point System™ Chassis Specifications

1-Slot Chassis


external power


internal power

Ordering Information

CPSMC0100-200	1-Slot Point System™ Chassis with external power supply
CPSMC0100-210	1-Slot Point System™ Chassis with internal power supply
CPSMC0100-226	1-Slot Point System™ Chassis with (2) external power supplies

Note: The following slide-in-modules cannot be used with any of the 1-Slot Point System™ Chassis: C4TEF, CAPTF, CBFTF-120, CBFTF-140, or CGFEB .

1-Slot Chassis Specifications

Dimensions	
-200 model:	**Width:** 3.85" [98 mm] **Depth:** 5.67" [145 mm] **Height:** 1.06" [27 mm]
-210 model:	**Width:** 6.1" [155 mm] **Depth:** 5.88" [149 mm] **Height:** 1.5" [38 mm]
-226 model:	**Width:** 4.4" [113 mm] **Depth:** 5.67" [145 mm] **Height:**1.06" [27 mm]
Power	
-200 model:	**External AC/DC included:** wall mount 12 VDC, 0.8A unregulated
-210 model:	**Internal AC/DC included:** 12 VDC, 1.25A, unregulated
-226 model:	**First External AC/DC included:** 12 VDC, 1.25A, 100-240 VAC, 50/60 Hz, Regulated, UL Listed Second External AC/DC included: 12 VDC, 2.5A, 100-240 VAC, 50/60 Hz, Regulated, UL Listed
Environment	0-50°C operating; 5%-95% humidity, non-condensing; 0-10,000 ft. altitude
Shipping Weight	2.0 lbs. [0.90 kg]
Compliance	
-226 model:	UL Listed
-200, -210, -226 models:	EN55024; CISPR22/EN55022 Class A & B; FCC Class A & B; [Class B-compliant only when using Class B-compliant media converters.] CE Mark
Warranty	Lifetime

Optional Accessories *(sold separately)*

SPS-2460-SA [pg 69]	18-60 VDC; 17-30 VMRS input; external power supply; output 12.6 VDC; 1.0A max.
CPSRE1-190	19" Eack Mount Ears for CPSMC0100-210

Mounting Options

WMBD [pg 68]	DIN Rail Mount Bracket
WMBP [pg 68]	Wall Mount Bracket
WMBV [pg 68]	Vertical Wall Mount Bracket

2-Slot Chassis

Ordering Information

CPSMC0200-200	2-Slot Point System™ Chassis
CPSMC0200-210	2-Slot Point System™ Chassis with Last Gasp option
CPSMC0200-226	2-Slot Point System™ Chassis with (2) external power supplies

2-Slot Chassis Specifications

Slots	(2) slots for slide-in-modules
Dimensions	**Width:** 5.5" [140 mm] **Depth:** 5.7" [145 mm] **Height:** 2.2" [56 mm]
Power	
-200 & -210 models:	**External AC/DC:** 12 VDC 1.5 A
-226 models:	**First External AC/DC included:** 12 VDC, 1.25A, 100-240 VAC, 50/60 Hz, Regulated, UL Listed **Second External AC/DC included:** 12 VDC, 2.5A, 100-240 VAC, 50/60 Hz, Regulated, UL Listed
Environment	0-50°C; 5%-95% humidity, non-condensing; 0-10,000 ft. altitude
Shipping Weight	2.0 lbs. [0.90 kg]
Compliance	
-226 models:	UL Listed
-200, -210, -226 models:	EN55024; CISPR22/EN55022 Class A&B; FCC & CISPR Class A&B [Class B-compliant only when using Class B-compliant media converters.] CE Mark
Warranty	Lifetime

Optional Accessories *(sold separately)*

CPSMM-120 [pg 33]	Single Slot Master Management Module
CPSMM-210 [pg 33]	Single Slot Expansion Management Module
SPS-2460-SA [pg 69]	18-60 VDC; 17-30 VMRS input; external power supply; output 12.6 VDC; 1.0A max.
CPSRE2-190	19" Rack Mount Ears

Mounting Options

WMBD [pg 68]	DIN Rail Mount Bracket
WMBP [pg 68]	Wall Mount Bracket
WMBV [pg 68]	Vertical Wall Mount Bracket

8-Slot Chassis

Ordering Information

CPSMC0800-100	8-Slot Point System™ Chassis with (1) AC Power Supply
CPSMC0810-100	8-Slot Point System™ Chassis with (1) -48V power supply

8-Slot Chassis Specifications

Slots	(8) slots in front for slide-in-modules
Unit LEDs	Power and In-Use LED's for each power supply (with use of optional LED module)
Dimensions	**Width:** 17.0" [430 mm] **Depth:** 10.5" [267 mm] **Height:** 1.75" [45 mm]
Power	Universal Input 100-240V, 50/60 Hz, 3.0-1.5 A
Environment	0-40°C; humidity: 5%-95% non-condensing; 0-10,000 ft. altitude
Shipping Weight	8.0 lbs. [3.6 kg]
Compliance	UL Listed; EN60950; FCC & CISPR Class A; CE Mark
Warranty	Lifetime

Optional Accessories *(sold separately)*

CPSMM-120 [pg 33]	Single Slot Master Management Module
CPSMM-200 [pg 33]	Dual Slot Master Management Module
CPSMM-210 [pg 33]	Single Slot Expansion Management Module
CPSMP-180	Redundant power supply 120/240 VAC (external)
CPSMP-190	Redundant -48V power supply (external)
CPSFP-200	Face Plate (required for all empty slots) [5 included with chassis]
CPSLD-100	LED power status panel
CPSRE-238	23" Rack Mount Ears (1 set)
WMBC-1RU	Wall Mount Bracket for 8-Slot Point System™ Chassis

Point System™ Chassis Options

No. of Ports	Class	Redundant Power Option
19-Slot	Class A	CPSMP-200 (AC), CPSMP-210 (DC) [rear loading]
18-Slot	Class B*	CPSMP-200 (AC), CPSMP-210 (DC) [rear loading]
13-Slot	Class A	CPSMP-120 (AC), CPSMP-130 (48 VDC) CPSMP-140 (24 VDC) [front loading]
8-Slot	Class A	CPSMP-180 (AC), CPSMP-190 [rear DC connection]
2-Slot	Class B*	yes
1-Slot	Class B*	yes

when using Class B compliant Slide-In-Modules

Point System™ Chassis Specifications

13-Slot Chassis

Ordering Information

CPSMC1300-100	13-Slot Point System™ Chassis with (1) AC Power Supply
CPSMC1310-100	13-Slot Point System™ Chassis with (1) 48V power supply
CPSMC1320-100	13-Slot Point System™ Chassis with (1) 24 VDC power supply

13-Slot Chassis Specifications

Slots	(13) slots in front for slide-in-modules (2) slots in front for power supplies
Unit LED	Power
Dimensions	**Width:** 17.0" [430 mm] **Depth:** 12.0" [305 mm] **Height:** 3.5" [89 mm]
Power	Universal Input 100-240V; 50/60 Hz; 3.0-1.5 A
Environment	0-50°C; humidity; 5%-95% non-condensing; 0-10,000 ft. altitude
Shipping Weight	15 lbs. [7.0 kg]
Compliance	UL Listed; EN55022 Class A; EN55024; EN61000; CE Mark
Warranty	Lifetime

Optional Accessories *(sold separately)*

CPSMM-120 [pg 33]	Single Slot Master Management Module
CPSMM-200 [pg 33]	Dual Slot Master Management Module
CPSMM-210 [pg 33]	Single Slot Expansion Management Module
CPSMP-120	Redundant power supply 120/240 VAC
CPSMP-130	Redundant -48V power supply
CPSMP-140	Redundant 24 VDC power supply
CPSFP-200	Face Plate (required for all empty slots) [10 included with chassis]
CPSRE-230	23" Rack Mount Ears (1 set)
WMBC-2RU	Wall mount bracket for 13-, 18- or 19-Slot Point System™ Chassis

	Rack Height	LEDs
	2U	Optional LED Module: Power, Link, Receive, Transmit
	2U	Power, Link, Receive, Transmit
	2U	Power
	1U	Optional LED Module: Power, Link, Receive, Transmit
	2.2" [56 mm]	First Power, Second Power
	1.0" [25 mm]	First Power, Second Power

18-Slot Chassis

Ordering Information

CPSMC1800-200	18-Slot Point System™ Chassis with (1) AC Power Supply
CPSMC1810-200	18-Slot Point System™ Chassis with (1) 48V power supply

18-Slot Chassis Specifications

Slots	(18) slots in front for slide-in-modules (2) slots in back for power supply modules
Unit LEDs	Power & In-Use LEDs for each installed power supply module
Dimensions	**Width:** 17.0" [430 mm] **Depth:** 14.3" [363 mm] **Height:** 3.5" [89 mm]
Power	Universal Input 100-240V; 50/60 Hz; 3.0-1.5 A, Dual power supplies can function in Instant Fail-Over Mode or Load Share Mode.
Environment	0 – 60°C*; 5% – 95% humidity non-condensing; 0 – 10,000 ft. altitude (*0 – 60°C when redundant power or fan module is used; 0 – 50°C if single power supply is used.)
Shipping Weight	17.5 lbs. [7.9 kg]
Compliance	CPSMC18x0-200: UL Listed, CE Mark, EN55022, EN55024, EN61000, FCC Class B, CISPR Class B and NEBS
Warranty	Lifetime

Optional Accessories *(sold separately)*

CPSMM-120 [pg 33]	Single Slot Master Management Module
CPSMM-200 [pg 33]	Dual Slot Master Management Module
CPSMM-210 [pg 33]	Single Slot Expansion Management Module *Note: To maintain FCC Class B rating, CPSMM-200 should be used.
CPSMP-205	Redundant power supply 120/240 VAC
CPSMP-210	Redundant -48V power supply
CPSFM-200	Fan Module
CPSFP-200	Face Plate (required for all empty slots) [15 included with chassis]
CPSRE-230	23" Rack Mount Ears (1 set)
WMBC-2RU	Wall mount bracket for 13-, 18- or 19-Slot Point System™ Chassis

19-Slot Chassis

Ordering Information

CPSMC1900-100	19-Slot Point System™ Chassis with (1) AC Power Supply
CPSMC1910-100	19-Slot Point System™ Chassis with (1) 48V power supply

19-Slot Chassis Specifications

Slots	(19) slots in front for slide-in-modules (2) slots in back for power supply modules
Unit LEDs	Power and In-Use LED's for each installed power supply module (with use of optional LED module)
Dimensions	**Width:**17.0" [430 mm] **Depth:** 14.3" [363 mm] **Height:** 3.5" [89 mm]
Power	Universal Input 100-240V; 50/60 Hz; 3.0-1.5 A, Dual power supplies can function in Instant Fail-Over Mode or Load Share Mode.
Environment	0 – 60°C*; humidity: 5% – 95% non-condensing; 0 – 10,000 ft. altitude (*0 – 60°C when redundant power or fan module is used; 0 – 50°C if single power supply is used.)
Shipping Weight	17.5 lbs. [7.9 kg]
Compliance	UL Listed; EN60950; FCC & CISPR Class A; CE Mark
Warranty	Lifetime

Optional Accessories *(sold separately)*

CPSMM-120 [pg 33]	Single Slot Master Management Module
CPSMM-200 [pg 33]	Dual Slot Master Management Module
CPSMM-210 [pg 33]	Single Slot Expansion Management Module
CPSMP-205	Redundant power supply 120/240 VAC
CPSMP-210	Redundant -48V power supply
CPSFM-200	Fan Module
CPSFP-200	Face Plate (required for all empty slots) [15 included with chassis]
CPSLD-100	LED power status panel
CPSRE-230	23" Rack Mount Ears (1 set)
WMBC-2RU	Wall mount bracket for 13-, 18- or 19-Slot Point System™ Chassis

Point System™ Management Modules Specifications

Point System™ Management Modules

CPSMM-120

Single Slot Master Management Module

This device occupies a single slot in the Point System™ Chassis and supports all management features. The CPSMM-120 has a DB-9 serial interface for the CLI (command line interface) as well as a 10BASE-T RJ-45 interface for network management. The CPSMM-120 should be used when the Point System™ Chassis is intended to be used as a single device (when the user does not intend to stack multiple Point System™ Chassis together).

Specifications

Product Number	
CPSMM-120	Single Slot Master Management Module
Ports	DB-9 (x1), RJ-45 (x1)
LEDs	Power, Link, TX, RX
Storage Temp	-40 – 80°C
Operating Temp	See Chassis Specifications
Shipping Weight	1 lb. [0.45 kg]
Dimensions	**Width:** 0.86" [22 mm] **Depth:** 5.0" [127 mm] **Height:** 3.4" [86 mm]
Compliance	FCC & CISPR Class A; CE Mark
Warranty	Lifetime

Optional Accessories *(sold separately)*

Null Modem Configuration Cable

SC-NM-9F9F-06F
6 ft Cable

SC-NM-9F9F-10F
10 ft Cable

CPSMM-200

Dual Slot Master Management Module

The CPSMM-200 should be used when the user intends to manage multiple stacked chassis (up to 8 chassis per stack) via a single IP or if the application requires an FCC/CISPR Class B rating. This device occupies two slots in a Point System™ Chassis and will also fully support all management features. The CPSMM-200 has a DB-9 serial interface as well as a 10BASE-T interface similar to the CPSMM-120. However, it also includes two (2) additional RJ-45 ports ("in" and "out") to accommodate stacking of multiple Point System™ Chassis'. The CPSMM-200 also differs from the CPSMM-120 in that it is FCC/CISPR Class B rated.

Specifications

Product Number	
CPSMM-200	Dual Slot Master Management Module
Ports	DB-9 (x1), RJ-45 (x3)
LEDs	Power, Link, TX, RX
Storage Temp	-40 – 80°C
Operating Temp	See Chassis Specifications
Shipping Weight	2 lbs. [0.90 kg]
Dimensions	**Width:** 2.0" [51 mm] **Depth:** 5.0" [127 mm] **Height:** 3.4" [86 mm]
Compliance	FCC & CISPR Class B; CE Mark
Warranty	Lifetime

Optional Accessories *(sold separately)*

Null Modem Configuration Cable

SC-NM-9F9F-06F
6 ft Cable

SC-NM-9F9F-10F
10 ft Cable

CPSMM-210

Single Slot Expansion Management Module

This device, used in conjunction with the CPSMM-200 (or CPSMM-120 when inserted in the same chassis) management module, allows the user to manage up to eight Point System™ Chassis together in a "virtual cabinet". This brings the total number of cards managed by a single IP to 143. The CPSMM-210 has two RJ-45 ports ("in" and "out") used for stacking multiple Point System™ Chassis. The CPSMM-210 incorporates a self-healing bus so that the failure of any one module will not effect remaining modules in the stack. The CPSMM-210 should be used when the user has a requirement to stack multiple chassis.

Specifications

Product Number	
CPSMM-210	Single Slot Expansion Management Module: Used in conjunction with CPSMM-120 or CPSMM-200
Ports	RJ-45 (x2)
LEDs	Power, Link
Storage Temp	-40 – 80°C
Operating Temp	See Chassis Specifications
Shipping Weight	1 lb. [0.45 kg]
Dimensions	**Width:** .086" [22 mm] **Depth:** 5.0" [127 mm] **Height:** 3.4" [86 mm]
Compliance	FCC & CISPR Class B; CE Mark
Warranty	Lifetime

Optional Accessories *(sold separately)*

Null Modem Configuration Cable

SC-NM-9F9F-06F
6 ft Cable

SC-NM-9F9F-10F
10 ft Cable

CETTF10xx-x0x

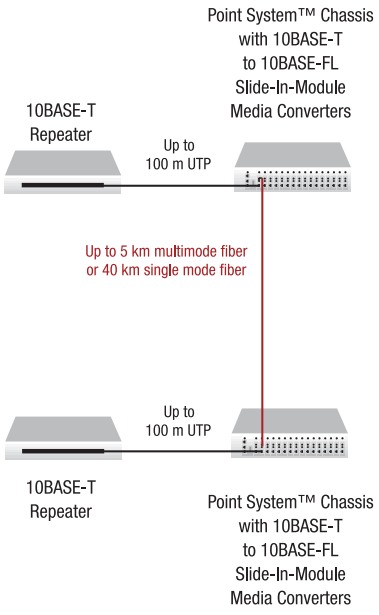
Ethernet Copper to Fiber Media Converter

Extend Network Distance

Two 10BASE-T to 10BASE-FL Media Converters used back-to-back extend the distance between two 10BASE-T devices up to 5 km (3.1 mi.) using multimode fiber, up to 40 km (24.9 mi.) using single mode fiber without a repeater.

Connect Unlike Devices

Connect your workgroup to a distant server or a central switch; or extend distances between like and unlike devices in either full or half-duplex modes.



FCC & CISPR Class A devices comply with radiated emissions standards for commercial applications in the United States (FCC Class A) and Europe (CISPR Class A).

- Integrate mixed cabling environments in either switched or shared Ethernet networks.
- Connect legacy 10BASE-T devices to a fiber based cabling infrastructure.

Features

- Can be used with any Point System™ Chassis
- AutoCross™ [pg 16]
- Link Pass Through [pg 17]
- Automatic Link Restoration [pg 18]
- Field Upgradeable Firmware [pg 18]

Specifications

Complete list of fiber optic connector specifications [pg 212-224]

Standards	IEEE Std. 802.3, 10BASE-T; 10BASE-FL
4-position Switch	**Fiber Port:** Enables/disables network traffic on the fiber port; (Up = enabled) **Copper Port:** Enables/disables network traffic on the copper port; (Up = enabled) **AutoCross™:** Enables/disables AutoCross™ function; (Up = enabled) **Link Pass Through:** Enables/disables Link Pass Through function; (Up = enabled)
3-position Jumper	**Hardware:** Converter mode is determined by 4-position switch settings **Software:** Converter mode is determined by most recently saved on-board microprocessor setting
Status LEDs	**PWR (Power):** On for normal operation; **LKF (Link Fiber):** Steady LED indicates good fiber link and normal operation; **RXF (Receive Fiber):** Flashing LED indicates data reception on fiber link; **LKC (Link Copper):** Steady LED indicates good copper link and normal operation; **RXC (Receive Copper):** Flashing LED indicates data reception on copper link
Dimensions	**Width:** 0.86" [22 mm] **Depth:** 5.0" [127 mm] **Height:** 3.4" [86 mm]
Power Consumption	2.3 Watts
Environment	See chassis specifications
Shipping Weight	1 lb. [0.45 kg]
Regulatory Compliance	EN55022; EN55024; EN61000; CE Mark, Class A
Warranty	Lifetime

Ordering Information: Class B

CETTF1011-105
10BASE-T (RJ-45) **[100 m/328 ft.]**
to 10BASE-FL 850nm MM (ST)
[2 km/1.2 mi.] Link Budget: 13.5 dB

CETTF1013-105
10BASE-T (RJ-45) **[100 m/328 ft.]**
to 10BASE-FL 850nm MM (SC)
[2 km/1.2 mi.] Link Budget: 13.5 dB

CETTF1027-105
10BASE-T (RJ-45) **[100 m/328 ft.]**
to 10BASE-FL 1300nm MM (ST)
[5 km/3.1 mi.] Link Budget: 13.5 dB

CETTF1012-105
10BASE-T (RJ-45) **[100 m/328 ft.]**
to 10BASE-FL 1310nm SM (ST)
[20 km/12.4 mi.] Link Budget: 7.0 dB

CETTF1014-105
10BASE-T (RJ-45) **[100 m/328 ft.]**
to 10BASE-FL 1310nm SM (SC)
[20 km/12.4 mi.] Link Budget: 15.0 dB

CETTF1022-105
10BASE-T (RJ-45) **[100 m/328 ft.]**
to 10BASE-FL 1310nm SM (ST)
[40 km/24.9 mi.] Link Budget: 19.0 dB

CETTF1015-105
10BASE-T (RJ-45) **[100 m/328 ft.]**
to 10BASE-FL 1310nm SM (SC)
[40 km/24.9 mi.] Link Budget: 14.0 dB

Single Fiber Products

Recommended use in pairs [pg 19]

CETTF1029-105
10BASE-T (RJ-45) **[100 m/328 ft.]**
to 10BASE-FL 1310nm TX/1550nm RX single fiber SM (SC)
[20 km/12.4 mi.] Link Budget: 19.0 dB

CETTF1029-106
10BASE-T (RJ-45) **[100 m/328 ft.]**
to 10BASE-FL 1550nm TX/1310nm RX single fiber SM (SC)
[20 km/12.4 mi.] Link Budget: 19.0 dB

10BASE-T to 10BASE-FL or 100BASE-TX to 100BASE-FX

see also: Ethernet or Fast Ethernet Speed Selectable Stand-Alone Media Converters [pg 76]

Ethernet or Fast Ethernet

CSEFE10xx-10x

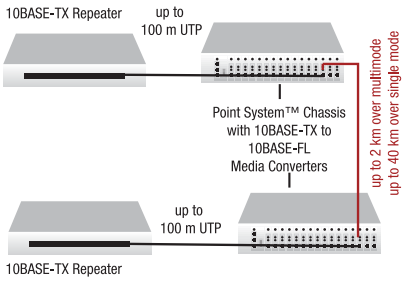
Speed Selectable Media Converter

Transition Networks' speed selectable copper to fiber Media Converter allows you to extend the distance between copper based connections with the use of fiber optic cable. The ability to select the speed of converter allows for easy migration from a 10 Mbps network today to a 100 Mbps network in the future. This converter is a true layer 1 device as both the copper and fiber ports operate at the same speed setting (i.e. 100BASE-T to 100BASE-FX). For 10 Mbps applications, these devices must be used in pairs.

Extend Network Distance

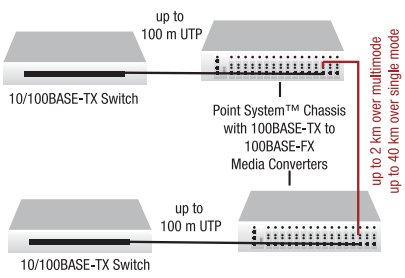
Ethernet

Use the 10BASE-T to 10BASE-FL speed setting (back-to-back) to extend the distance between two 10BASE-T devices up to 40 km (24.9 mi.) using single mode fiber without a repeater.



Fast Ethernet

Use the 100BASE-TX to 100BASE-FX setting to extend the distance between any two 100BASE-T devices up to 40 km (24.9 mi.) using single mode fiber or interface directly with a 100BASE-FX compliant port on any device to provide a 100BASE-T port interface.



- **Selectable speed setting:** The converter can be set to 10 Mbps or 100 Mbps. Both copper and fiber ports are automatically set to the same speed
- **Provides easy migration path:** from 10 Mbps to 100 Mbps networks
- **Converts copper to fiber:** to assist with fiber integration into your copper network

Features

- AutoCross™ [pg 16]
- Link Pass Through [pg 17]
- Automatic Link Restoration [pg 18]
- Field Upgradeable Firmware [pg 18]
- Supports single mode fiber [pg 19]

Specifications

Complete list of fiber optic connector specifications [pg 212-224]

Standards	IEEE Std. 802.3
Switches	**Switch 1:** Link Pass Through on/off **Switch 2:** 10 Mbps or 100 Mbps operation
3-position Jumper	**Hardware:** Converter mode is determined by DIP switch settings **Software:** Converter mode is determined by most recently saved on-board microprocessor settings
Status LEDs	**PWR (Power):** Lit for normal operation **F-ACT (Fiber Activity):** Blinking = data reception on the fiber link **F-100 (Fiber Speed):** ON = link at 100 Mbps **F-10 (Fiber Speed):** ON = link at 10 Mbps **C-ACT (Copper Activity):** Blinking = data reception on the copper link **C-100 (Copper Speed):** ON = link at 100 Mbps **C-10 (Copper Speed):** ON = link at 10 Mbps
Dimensions	**Width:** 0.86" [22 mm] **Depth:** 5.0" [127 mm] **Height:** 3.4" [86 mm]
Power Consumption	3.6 Watts
Environment	See chassis specifications
Shipping Weight	1 lb. [0.45 kg]
Regulatory Compliance	CISPR/EN55022 Class B; EN55024; EN60950 Class B; FCC Class B; CE Mark
Warranty	Lifetime

Ordering Information

Complete list of fiber optic connector specifications [pg 212-224]

CSEFE1012-100
10BASE-T or 100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 10BASE-FL or 100BASE-FX 1310nm SM (ST)
[20 km/12.4 mi.] Link Budget: 17.0 dB

CSEFE1014-100
10BASE-T or 100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 10BASE-FL or 100BASE-FX 1310nm SM (SC)
[20 km/12.4 mi.] Link Budget: 17.0 dB

CSEFE1022-100
10BASE-T or 100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 10BASE-FL or 100BASE-FX 1310nm SM (ST)
[40 km/24.9 mi.] Link Budget: 26.0 dB

CSEFE1015-100
10BASE-T or 100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 10BASE-FL or 100BASE-FX 1310nm SM (SC)
[40 km/24.9 mi.] Link Budget: 26.0 dB

Single Fiber Products

Recommended use in pairs [pg 19]

CSEFE1029-100
10BASE-T or 100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 10BASE-FL or 100BASE-FX 1310nm TX/1550nm RX single fiber SM (SC)
[20 km/12.4 mi.] Link Budget: 19.0 dB

CSEFE1029-101
10BASE-T or 100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 10BASE-FL or 100BASE-FX 1550nm TX/1310nm RX single fiber SM (SC)
[20 km/12.4 mi.] Link Budget: 19.0 dB

Management Features

- Report local converter status to chassis:
  - Copper/fiber link status
  - Hardware/Software mode
  - 10 Mbps or 100 Mbps speed setting
  - Link Pass Through on/off setting [pg 17]
- Write operation includes:
  - Enable/disable Link Pass Through [pg 17]
  - Set speed to 10 Mb or 100 Mb
- Can be used with any Point System™ Chassis [pg 31-32]

CFETF10xx-110

Fast Ethernet Class A Media Converter

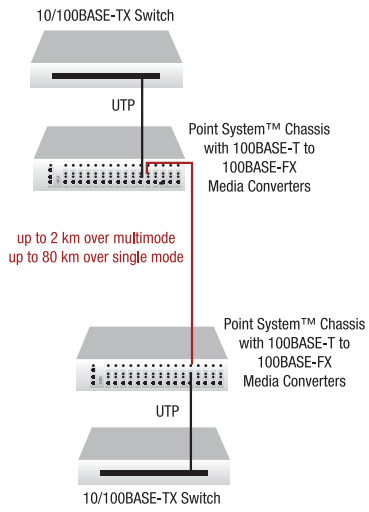
- Integrate fiber into a 100BASE -TX copper environment
- Provides a fiber interface when connected to devices with RJ-45 ports

Features

- Round trip delay of only 40 bit times, far below the Class II rating of 92 bit times
- Auto-Negotiation [pg 16]
- AutoCross™ [pg 16]
- Link Pass Through [pg 17]
- Automated Link Restoration [pg 18]
- Field Upgradeable Firmware [pg 18]
- Can be used with any Point System™ Chassis [pg 31-32]

Extend Network Distance

Deploy fiber in a strategic and economical manner by using Fast Ethernet converters, which can extend to distances that copper cannot reach.



Specifications

Complete list of fiber optic connector specifications [pg 212-224]

Standards	IEEE Std. 802.3
3-position Jumper	**Hardware:** Converter mode is determined by 4-position switch settings **Software:** Converter mode is determined by most recently saved on-board microprocessor settings
4-position Switch	**1. Auto-Negotiation (UP = enabled):** Allows detection of, and adaptation to, full-duplex or half-duplex mode in device attached to copper link **2. Link Pass Through (UP = enabled):** Allows a fault EITHER on the copper OR on the fiber side of the media converter to stop signal and data transmission on the other side **3. AutoCross™ (UP = enabled):** Allows straight-through twisted pair cable to be used for crossover connections **4. Not Used**
Status LEDs	**Power:** Indicates that DC power is connected **TX (Link Copper):** ON indicates TP link; Blinking indicates TP receive; **FX (Link Fiber):** ON indicates fiber link; Blinking indicates Fiber receive
Dimensions	**Width:** 0.86" [22 mm] **Depth:** 5.0" [127 mm] **Height:** 3.4" [86 mm]
Power Consumption	2.5 Watts
Environment	See chassis specifications
Shipping Weight	1 lb. [0.45 kg]
Regulatory Compliance	CE Mark, FCC Class A; CISPR Class A; VCCI Class 1
Warranty	Lifetime

Ordering Info [Class A]

Complete list of fiber optic connector specifications [pg 212-224]

CFETF1011-110
100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1300nm MM (ST)
[2 km/1.2 mi.] Link Budget: 11.0 dB

CFETF1013-110
100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1300nm MM (SC)
[2 km/1.2 mi.] Link Budget: 11.0 dB

CFETF1014-110
100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1310nm SM (SC)
[20 km/12.4 mi.] Link Budget: 16.0 dB

CFETF1015-110
100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1310nm SM (SC)
[40 km/24.9 mi.] Link Budget: 29.0 dB

CFETF1016-110
100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1310nm SM (SC)
[60 km/37.3 mi.] Link Budget: 29.0 dB

CFETF1017-110
100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1550nm SM (SC)
[80 km/49.7 mi.] Link Budget: 29.0 dB

CFETF1040-110
100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-X SFP slot (empty)

Optional Accessories *(sold separately)*

SFP Modules [pg 161-167]

FCC & CISPR Class A devices comply with radiated emissions standards for commercial applications in the United States (FCC Class A) and Europe (CISPR Class A).

FCC & CISPR Class B devices comply with radiated emissions standards for residential applications in the United States (FCC Class B) and Europe (CISPR Class B).

[See CFETF10xx-205 for Class B product.]

AUTO NEG | AUTO CROSS | LINK PASS THRU | FAR END FAULT | AUTO LINK RESTORE | PAUSE | FIELD UPGRADEABLE FIRMWARE | SINGLE FIBER

100BASE-TX to 100BASE-FX [Class B]

see also: Fast Ethernet Stand-Alone Media Converters [pg 78, 79]

Fast Ethernet

CFETF10xx-2xx

Fast Ethernet Class B Media Converter

Features

- Round trip delay of only 40 bit times, far below the Class II rating of 92 bit times
- Auto-Negotiation [pg 16]
- AutoCross™ [pg 16]
- Far-End-Fault (FEF) Detection [pg 16]
- Link Pass Through [pg 17]
- Pause [pg 17]
- Automatic Link Restoration [pg 18]
- Field Upgradeable Firmware [pg 18]

The following converter management features are available in conjunction with the Point System™:

Reporting Features

- Report converter status to management software:
  - TP & Fiber Link status
  - Hardware switch settings
  - Fault
  - TP cable length
- Write operation includes:
  - Power on/off device
  - Pause enable/disable [pg 17]
  - LPT enable/disable
  - FEF enable/disable
  - AutoCross™ enable/disable [pg 16]

- Integrate fiber into copper based environments that require Class B rated products.
- Can be used with any Point System™ Chassis [pg 31-32]
- Should be used in the 18-Slot Class B Point System™ Chassis if Class B ratings are required.

Specifications

Complete list of fiber optic connector specifications [pg 212-224]

Standards	IEEE Std. 802.3
Switches	**SW1:** Auto-Negotiation (UP = ON) **SW2:** Pause (UP = ON) **SW3:** Link Pass Through (UP = ON) **SW4:** Far-End-Fault (UP = ON)
Internal Jumpers	**AutoCross™ Jumper:** Enable/disable AutoCross™
Hardware/Software Jumper:	**Hardware:** Converter mode is determined by 4-position switch settings **Software:** Converter mode is determined by most recently saved on-board microprocessor settings
Status LEDs	**PWR (Power):** ON = connection to external power **LKF (Fiber Link):** ON = Fiber Link **RXF (Fiber Receive):** Blinking = data reception on fiber link **RXC (Copper Receive):** Blinking = data reception on copper link **LKC (Copper Link):** ON = Copper Link
Dimensions	**Width:** 0.86" [22 mm] **Depth:** 5.0" [127 mm] **Height:** 3.4" [86 mm]
Power Consumption	3.4 Watts
Environment	See chassis specifications
Shipping Weight	1 lb. [0.45 kg]
Regulatory Compliance	CISPR/EN55022 Class A & B; FCC Class A & B; CE Mark
Warranty	Lifetime

Ordering Info [Class B]

Complete list of fiber optic connector specifications [pg 212-224]

CFETF1011-205
100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1300nm multimode (ST)
[2 km/1.2 mi.] Link Budget: 11.0 dB

CFETF1013-205
100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1300nm multimode (SC)
[2 km/1.2 mi.] Link Budget: 11.0 dB

CFETF1039-205
100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1300nm multimode (LC)
[2 km/1.2 mi.] Link Budget: 11.0 dB

CFETF1018-205
100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1300nm MM (MT-RJ)
[2 km/1.2 mi.] Link Budget: 14.5 dB

CFETF1014-205
100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1310nm SM (SC)
[20 km/12.4 mi.] Link Budget: 16.0 dB

CFETF1019-205
100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1310nm SM (LC)
[20 km/12.4 mi.] Link Budget: 17.3 dB

CFETF1015-205
100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1310nm SM (SC)
[40 km/24.9 mi.] Link Budget: 26.0 dB

CFETF1016-205
100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1310nm SM (SC)
[60 km/37.3 mi.] Link Budget: 29.0 dB

CFETF1017-205
100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1550nm SM (SC)
[80 km/49.7 mi.] Link Budget: 29.0 dB

Single Fiber Products

Recommended use in pairs [pg 19]

CFETF1029-205
100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX1310nm TX/1550nm RX single fiber single mode (SC)
[20 km/12.4 mi.] Link Budget: 19.0 dB

CFETF1029-206
100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1550nm TX/1310nm RX single fiber single mode (SC)
[20 km/12.4 mi.] Link Budget: 19.0 dB

CFETF1029-207
100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1310nm TX/1550nm RX single fiber single mode (SC)
[40 km/24.9 mi.] Link Budget: 25.0 dB

CFETF1029-208
100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1550nm TX/1310nm RX single fiber single mode (SC)
[40 km/24.9 mi.] Link Budget: 25.0 dB

CFETF1029-209
100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1310nm TX/1550nm RX single fiber single mode (SC)
[60 km/37.3 mi.] Link Budget: 29.0 dB

CFETF1029-210
100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1550nm TX/1310nm RX single fiber single mode (SC)
[60 km/37.3 mi.] Link Budget: 28.0 dB

CFETF1029-211
100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1310nm TX/1550nm RX single fiber single mode (SC)
[80 km/49.7 mi.] Link Budget: 33.0 dB

CFETF1029-212
100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1550nm TX/1310nm RX single fiber single mode (SC)
[80 km/49.7 mi.] Link Budget: 32.0 dB

CRMFE10xx-20x

Remotely Managed Fast Ethernet NID (Network Interface Device)

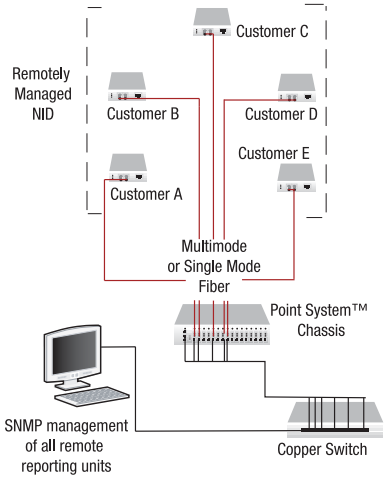
With the Remotely Managed Fast Ethernet NID, service providers can now monitor and manage the entire optical link from the Central Office (CO) to the Customer Premise Equipment (CPE). They also have the ability to remotely change the bandwidth offered to the customer and choose the appropriate mode of connection straight from their Network Management Centers.

Devices should be used in pairs. Typical installation will include a chassis card installed in the Point System™ locally and a stand-alone device [SRMFE, pg 80] installed at the remote location.

Features

- Auto-Negotiation [pg 16]
- AutoCross™ [pg 16]
- Far-End-Fault (FEF) [pg 16]
- Link Pass Through [pg 17]
- Pause [pg 17]
- Remote Management [pg 17]
- Loopback [pg 18]
- Automatic Link Restoration [pg 18]
- Bandwidth Allocation [pg 18]
- Field Upgradeable Firmware [pg 18]
- Can be used with any Point System™ Chassis [pg 31-32]

Remotely Managed Fast Ethernet



- In-band management of stand alone Fast Ethernet NID
- Remote Loopback assists in diagnosing network problems [pg 18]
- Upstream and downstream Bandwidth Control allows service providers to offer an array of services

Specifications

Complete list of fiber optic connector specifications [pg 212-224]

Standards	IEEE Std. 802.3
3-position Jumpers	**Jumper (J2):** Enable/Disable AutoCross™ **Jumper (J6):** Hardware/Software **Hardware:** mode is determined by 4-position switch settings **Software:** mode is determined by most recently saved on-board microprocessor settings.
4 position Switch	**Pos 1: Auto-Neg:** ON = Advertises 100 Mbps full/half-duplex during auto-negotiation; (OFF) Used primarily when connecting to hub. Operates at 100 Mbps in duplex mode of attached device. **Pos 2: PAUSE:** Applies only if Switch 1 is UP AND device is connected to Auto-Negotiating device(s) capable of Pause Control Frame propagation. (UP) ALLOWS negotiation of Pause Control Frame. DOWN = Does NOT allow negotiation of Pause Control Frame. **Pos 3: Link Pass Through:** UP = enabled; DOWN = disabled **Pos 4: Far-End-Fault:** UP = enabled; DOWN = disabled
Status LEDs	Power **LKF** (Fiber Link) **RXF** (Fiber Receive) **RXC** (Copper Receive) **LKC** (Copper Link)
Dimensions	**Width:** 0.86" [22 mm] **Depth:** 5.0" [127 mm] **Height:** 3.4" [86 mm]
Power Consumption	3.4 Watts
Environment	See chassis specifications
Shipping Weight	1 lb. [0.45 kg]
Regulatory Compliance	CISPR/EN55022 Class A & B + EN55024; FCC Class A & B; CE Mark
Warranty	Lifetime

Ordering Information

Complete list of fiber optic connector specifications [pg 212-224]

CRMFE1011-200
100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1300nm MM (ST)
[2 km/1.2 mi.] Link Budget: 11.0 dB

CRMFE1013-200
100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1300nm MM (SC)
[2 km/1.2 mi.] Link Budget: 11.0 dB

CRMFE1014-200
100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1310nm SM (SC)
[20 km/12.4 mi.] Link Budget: 16.0 dB

CRMFE1015-200
100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1310nm SM (SC)
[40 km/24.9 mi.] Link Budget: 26.0 dB

CRMFE1016-200
100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1310nm SM (SC)
[60 km/37.3 mi.] Link Budget: 29.0 dB

CRMFE1017-200
100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1550nm SM (SC)
[80 km/49.7 mi.] Link Budget: 29.0 dB

CRMFE1035-200
100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1550nm SM (SC)
[120 km/74.6 mi.] Link Budget: 36.0 dB

Single Fiber Products

Recommended use in pairs [pg 19]

CRMFE1029-200
100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1310nm TX/1550nm RX single fiber SM (SC)
[20 km/12.4 mi.] Link Budget: 19.0 dB

CRMFE1029-201
100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1550nm TX/1310nm RX single fiber SM (SC)
[20 km/12.4 mi.] Link Budget: 19.0 dB

CRMFE1029-202
100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1310nm TX/1550nm RX single fiber SM (SC)
[40 km/24.9 mi.] Link Budget: 25.0 dB

CRMFE1029-203
100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1550nm TX/1310nm RX single fiber SM (SC)
[40 km/24.9 mi.] Link Budget: 25.0 dB

Fast Ethernet or ATM/OC-3/SDH/SONET

see also: Fast Ethernet ot ATM/OC-3/SDH/SONET Stand-Alone Optical Mode Converter [pg 81]

CFMFF1xxx-20x

Single Mode to Multimode Optical Mode Converter

- Connect single mode fiber cable to devices with multimode ports
- Protocol Transparency
- Can be used with any Point System™ Chassis [pg 31-32]

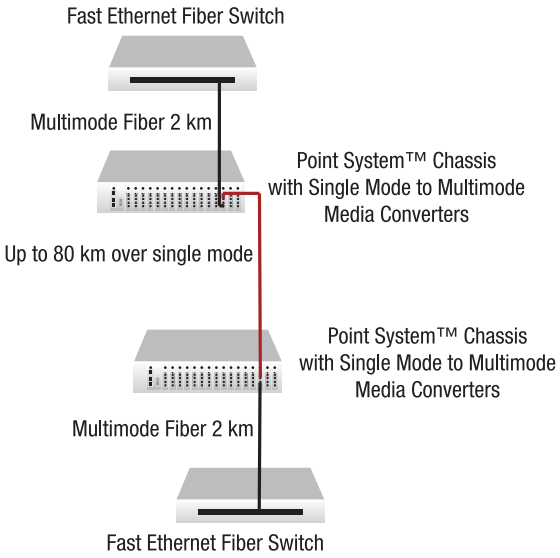
Features

- Link Pass Through [pg 17]
- Automatic Link Restoration [pg 18]
- Field Upgradeable Firmware [pg 18]
- Card Manageability:
  - MM/SM signal detect
  - Hardware/software mode
  - Fiber port enable/disable multimode or single mode

Extend Network Distance

Convert multimode 100-155 Mbps interfaces to single mode fiber on a port-by-port basis and extend ATM or Fast Ethernet over single mode fiber up to 80 km.

Extend Network Distance



Specifications

Complete list of fiber optic connector specifications [pg 212-224]

Standards	IEEE Std. 802.3™
3-position Jumper	**Hardware:** Software mode is disabled **Software:** Converter mode is determined by most recently saved on-board microprocessor settings
Status LEDs	**Power:** Steady green LED indicates connection to external AC power **LKS (Single mode Fiber Link):** Steady LED indicates single mode fiber link **LKM (Multimode Fiber Link):** Steady LED indicates multimode fiber link
Dimensions	**Width:** 0.86" [22 mm] **Depth:** 5.0" [127 mm] **Height:** 3.4" [86 mm]
Power Consumption	3.5 Watts
Environment	See chassis specifications
Shipping Weight	1 lb. [0.45 kg]
Regulatory Compliance	UL Listed; C-UL Listed (Canada); CISPR/EN55022 Class B; EN55024; EN61000; FCC Class B; CE Mark
Warranty	Lifetime

Ordering Info: Class B

CFMFF1313-200
1300nm multimode (SC)
[2 km/1.2 mi.] Link Budget: 11.0 dB
to 1300nm multimode (SC)
[2 km/1.2 mi.] Link Budget: 11.0 dB

CFMFF1314-200
1300nm multimode (SC)
[2 km/1.2 mi.] Link Budget: 11.0 dB
to 1310nm single mode (SC)
[20 km/12.4 mi.] Link Budget: 16.0 dB

CFMFF1315-200
1300nm multimode (SC)
[2 km/1.2 mi.] Link Budget: 11.0 dB
to 1310nm single mode (SC)
[40 km/24.9 mi.] Link Budget: 26.0 dB

CFMFF1316-200
1300nm multimode (SC)
[2 km/1.2 mi.] Link Budget: 11.0 dB
to 1310nm single mode (SC)
[60 km/37.3 mi.] Link Budget: 29.0 dB

CFMFF1317-200
1300nm multimode (SC)
[2 km/1.2 mi.] Link Budget: 11.0 dB
to 1550nm single mode (SC)
[80 km/49.7 mi.] Link Budget: 29.0 dB

CFMFF1414-200
1310nm single mode (SC)
[20 km/12.4 mi.] Link Budget: 16.0 dB
to 1310nm single mode (SC)
[20 km/12.4 mi.] Link Budget: 16.0 dB

CFMFF1415-200
1310nm single mode (SC)
[20 km/12.4 mi.] Link Budget: 16.0 dB
to 1310nm single mode (SC)
[40 km/24.9 mi.] Link Budget: 26.0 dB

Single Fiber Products [pg 19]

CFMFF1329-200
1300nm multimode (SC)
[2 km/1.2 mi.] Link Budget: 11.0 dB
to 1310nm TX/1550nm RX
single fiber SM (SC)
[20 km/12.4 mi.] Link Budget: 19.0 dB

CFMFF1329-201
1300nm multimode (SC)
[2 km/1.2 mi.] Link Budget: 11.0 dB
to 1550nm TX/1310nm RX
single fiber single mode (SC)
[20 km/12.4 mi.] Link Budget: 19.0 dB

CFMFF1329-202
1300nm multimode (SC)
[2 km/1.2 mi.] Link Budget: 11.0 dB
to 1310nm TX/1550nm RX
single fiber SM (SC)
[40 km/24.9 mi.] Link Budget: 25.0 dB

CFMFF1329-203
1300nm multimode (SC)
[2 km/1.2 mi.] Link Budget: 11.0 dB
to 1550nm TX/1310nm RX
single fiber SM (SC)
[40 km/24.9 mi.] Link Budget: 25.0 dB

CFMFF1429-200
1310nm single mode (SC)
[20 km/12.4 mi.] Link Budget: 16.0 dB
to 1310nm TX/1550nm RX
single fiber SM (SC)
[20 km/12.4 mi.] Link Budget: 19.0 dB

CFMFF1429-201
1310nm single mode (SC)
[20 km/12.4 mi.] Link Budget: 16.0 dB
to 1550nm TX/1310nm RX
single fiber SM (SC)
[20 km/12.4 mi.] Link Budget: 19.0 dB

CFMFF1429-202
1310nm single mode (SC)
[20 km/12.4 mi.] Link Budget: 16.0 dB
to 1310nm TX/1550nm RX
single fiber SM (SC)
[40 km/24.9 mi.] Link Budget: 25.0 dB

CFMFF1429-203
1310nm single mode (SC)
[20 km/12.4 mi.] Link Budget: 16.0 dB
to 1550nm TX/1310nm RX
single fiber SM (SC)
[40 km/24.9 mi.] Link Budget: 25.0 dB

CSETF101x-205

10/100BASE-SX Media Converter

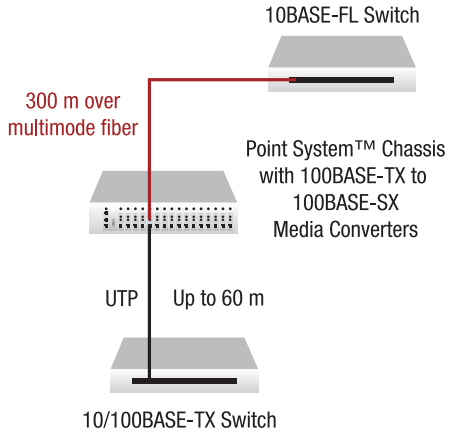
- Lowest possible cost solution for fiber installation up to 300 m (100BASE-SX).
- 10/100 on fiber is possible with 10/100BASE-SX.
- Ideal for building backbone and horizontal cabling applications where cost and 10/100 auto-negotiation are critical.

Features

- Auto-Negotiation [pg 16]
- AutoCross™ [pg 16]
- Link Pass Through [pg 17]
- Automatic Link Restoration [pg 18]
- Field Upgradeable Firmware [pg 18]
- Can be used with any Point System™ Chassis [pg 31-32]

Extend Network Distance

Used in pairs, this media converter can extend distances between two twisted pair switches or a switch and a server up to 300 m over multimode fiber (100BASE-SX).



Specifications

Complete list of fiber optic connector specifications [pg 212-224]

Standards	IEEE Std. 802.3; compliant with pending TIA/EIA 785 specification
Status LEDs	**PWR** (Power) **SX-ACT** (Fiber Activity) **SX-100** (Fiber Speed) **SX-10** (Fiber Speed) **TX-ACT** (Copper Activity) **TX-100** (Copper Speed) **TX-10** (Copper Speed)
Dimensions	**Width:** 0.86" [22 mm] **Depth:** 5.0" [127 mm] **Height:** 3.4" [86 mm]
Power Consumption	3.6 Watts
Environment	See chassis specifications
Shipping Weight	1 lb. [0.45 kg]
Regulatory Compliance	CISPR/EN55022 Class A & B; FCC Class A & B; CE Mark
Warranty	Lifetime

Ordering Information

Complete list of fiber optic connector specifications [pg 212-224]

CSETF1011-205
10/100BASE-TX (RJ-45)
[60 m/197 ft.]
to 10/100BASE-SX 850nm multimode (ST)
[300 m/984 ft.]

CSETF1013-205
10/100BASE-TX (RJ-45)
[60 m/197 ft.]
to 10/100BASE-SX 850nm multimode (SC)
[300 m/984 ft.]

10/100BASE-TX Redundant Link Protector

see also: 10/100 Redundant Link Protector Stand-Alone Media Converter [pg 86]

10/100

CBFTF1010-130

Fault-Tolerant Redundant Link Protector

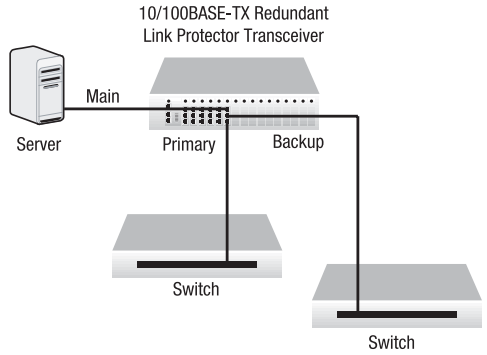
Features

- Fault-tolerant redundant connections
- Easy to install and use
- Supports half and full-duplex transmission
- AutoCross™ on all 3 ports [pg 16]
- Auto-Negotiation [pg 16]
- IEEE 802.3 compliant
- Nine diagnostic LEDs
- Optional 3-port switch mode
- Can be used with any Point System™ Chassis [pg 31-32]

The following management features are available when the converter is used in a managed Point System™ Chassis:

- Read Management features:
  - Media Converter Power
  - Copper Link Status
  - Copper Port Speed
  - Duplex Mode
  - Hardware Switch Settings
- Write Management features:
  - Power on/off device
  - Enable Redundancy/3-port Switch mode
- Individual Port Control:
  - Enable/disable Auto-Negotiation [pg 16]
  - Force Full or Half Duplex
  - Force 10 Mbps or 100 Mbps

Fault-Tolerant Redundant Connections



Specifications

Standards	IEEE Std. 802.3
RJ-45 Connectors	Type: 8-position, RJ-45 receptacle: 1: TX+ 5: NC (no connection) 2: TX- 6: RX- 3: RX+ 7: NC (no connection) 4: NC (no connection) 8: NC (no connection)
Dip Switches	**SW1:** Auto-Negotiation Enable/Disable **SW2:** 10/100 Mbps **SW3:** Full/Half Duplex **SW4:** Redundancy/Switch
System LEDs	**Power (PWR):** Indicates the presence of POWER **Primary (PRI):** Indicates a link is established on the Primary port **Backup (BKP):** Indicates the link has moved over to the Backup port
Per Port LEDs	**Lower Right:** Green indicates 100 Mbps; Orange indicates 10 Mbps; Flashing indicates Activity **Lower Left:** Green indicates full-duplex; Off half-duplex
Dimensions	**Width:** 0.86" [12 mm] **Depth:** 5.0" [127 mm] **Height:** 3.4" [86 mm]
Power Consumption	2.4 Watts
Environment	See chassis specifications
Shipping Weight	1 lb. [0.45 kg]
Regulatory Compliance	FCC Class A, EN55024, UL 60950, CE Mark
Warranty	Lifetime

Ordering Information

CBFTF1010-130
10/100BASE-TX Link Protector Transceiver
(3) 10/100BASE-TX (RJ-45)
[100 m/328 ft.]

The Redundant Link Protector is a 10/100 Ethernet fault-tolerant transceiver. It significantly reduces network downtime, adding a new level of redundancy to 10/100 Ethernet connections. It also provides a redundant path for critical 10/100 devices. In a 10/100 Ethernet network, a critical device such as a file server may be connected to the rest of the network through a hub or a switch. A common problem in this configuration is that the server is often connected to the network through a single cable. If the cable fails, then the server is disconnected from the rest of the network. Similarly, if a port of a hub or switch to which the server is connected fails, the server is disconnected from the network.

The Redundant Transceiver has three ports: one for the critical (main) device, one for the default (primary) path for the critical device, and another (backup) for the backup path. It is a smart device that will not send any signal on a path that is not active. If the primary path loses its link, then the transceiver will switch to the backup path in approximately 189 milliseconds.

When the primary path re-establishes its link, the Redundant Link Protector will automatically switch back to the primary path.

Optional functionality, controlled via a dip switch, allows the unit to move from the fault-tolerant mode to a 3-port switch mode.

10/100 Bridging
10/100BASE-TX to 100BASE-FX

see also: 10/100 Bridging Stand-Alone Media Converters [pg 87]

CBFTF10xx-10x

10/100 Bridging Media Converter

- Extend network distance up to 120 km
- Bridging media converters will provide conversion and integration solutions for half and full-duplex environments.
- Convert 10/100 on copper to straight 100 on fiber
- Half or Full-Duplex on both ports

Features

- Fully manageable
- LED indications for all operation modes
- Auto-Negotiation [pg 16]
- AutoCross™ [pg 16]
- Link Pass Through [pg 17]
- Far-End-Fault (FEF) [pg 16]
- Automatic Link Restoration [pg 18]
- Field Upgradeable Firmware [pg 18]
- Can be used with any Point System™ Chassis [pg 31-32]

Read Management Features

- Media Converter Power
- Copper & Fiber Link Status
- Copper Port Speed
- Hardware Switch Settings

Write Management Features

- Enable/disable Auto-negotiation on Copper [pg 16]
- Force 10 Mbps or 100 Mbps on Copper
- Force Full or Half-duplex on Copper or Fiber
- Select Advertised Modes (when Auto-Negotiation is Enabled)
- Enable/disable:
  - Pause [pg 17]
  - Monitor Port (advanced filters available)
  - Link Pass Through [pg 17]
  - Far-End-Fault [pg 16]

Specifications

Complete list of fiber optic connector specifications [pg 212-224]

Standards	IEEE Std. 802.3
Data Rate	10 Mbps; 100 Mbps
Filtering Addresses	1K MAC addresses
Filtering & Forwarding Rate	14,880 pps for Ethernet; 148,800 pps for Fast Ethernet
RAM Buffers	512 KB
Max Packet Size	2048 bytes untagged 2044 tagged
Switches	**SW1 (TP):** Auto-Negotiation On/Off **SW2 (TP):** 10 Mbps or 100 Mbps **SW3 (TP):** Half or Full-duplex **SW4 (Fiber):** Half or Full-duplex **SW5:** Far-End-Fault On/Off **SW6:** Link Pass Through On/Off
Status LEDs	**PWR** (Power) **FDPX** (Fiber Duplex) **FLNK** (Fiber Link/Activity) **TSPD** (Copper Speed) **TDPX** (Copper Duplex) **TLNK** (Copper Link/Activity)
Dimensions	**Width:** 0.86" [22 mm] **Depth:** 5.0" [127 mm] **Height:** 3.4" [86 mm]
Power Consumption	4.0 Watts
Environment	See chassis specifications
Shipping Weight	1 lb. [0.45 kg]
Regulatory Compliance	FCC Class A, VCCI Class 1, CISPR22/EN55022 Class A, EN55024, EN61000, CE Mark
Warranty	Lifetime

Ordering Info [Class B]

Complete list of fiber optic connector specifications [pg 212-224]

CBFTF1011-105
10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1300nm MM (ST) **[2 km/1.2 mi.] Link Budget: 11.0 dB**

CBFTF1013-105
10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1300nm MM (SC) **[2 km/1.2 mi.] Link Budget: 11.0 dB**

CBFTF1039-105
10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1300nm MM (LC) **[2 km/1.2 mi.] Link Budget: 11.0 dB**

CBFTF1014-105
10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1310nm SM (SC) **[20 km/12.4 mi.] Link Budget: 16.0 dB**

CBFTF1019-105
10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1310nm SM (LC) **[20 km/12.4 mi.] Link Budget: 17.3 dB**

CBFTF1015-105
10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1310nm SM (SC) **[40 km/24.9 mi.] Link Budget: 26.0 dB**

CBFTF1016-105
10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1310nm SM (SC) **[60 km/37.3 mi.] Link Budget: 32.0 dB**

CBFTF1017-105
10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1550nm SM (SC) **[80 km/49.7 mi.] Link Budget: 29.0 dB**

CBFTF1035-105
10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1550nm SM (SC) **[120 km/74.6 mi.] Link Budget: 36.0 dB**

CBFTF1040-105
10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-X SFP Slot (empty)

Single Fiber Products

Recommended use in pairs [pg 19]

CBFTF1029-105
10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1310nm TX/1550nm RX single fiber SM (SC) **[20 km/12.4 mi.] Link Budget: 19.0 dB**

CBFTF1029-106
10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1550nm TX/1310nm RX single fiber SM (SC) **[20 km/12.4 mi.] Link Budget: 19.0 dB**

CBFTF1029-107
10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1310nm TX/1550nm RX single fiber SM (SC) **[40 km/24.9 mi.] Link Budget: 25.0 dB**

CBFTF1029-108
10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1550nm TX/1310nm RX single fiber SM (SC) **[40 km/24.9 mi.] Link Budget: 25.0 dB**

10/100 Bridging Multiport 10/100BASE-TX to 100BASE-FX

see also: 10/100 Bridging Stand-Alone Media Converters [pg 88, 89]

CBFTF10xx-1xx

10/100 Bridging Multiport Media Converter

(-110)

(-120)

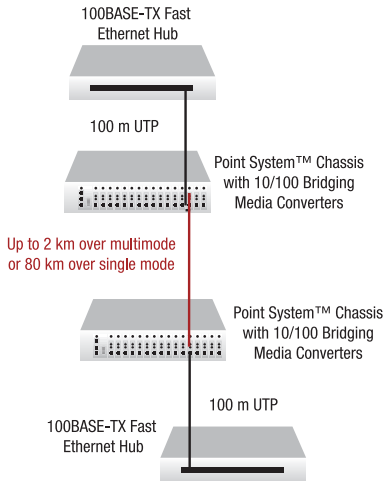
(-140)

- 10 or 100 Mbps on all TP ports
- Half or full-duplex on all ports, including fiber

Applications

- Extend network distance up to 80 km
- Bridging media converters will provide conversion and integration solutions for half-duplex and full-duplex environments.

Extend Network Distance



Specifications

Complete list of fiber optic connector specifications [pg 212-224]

Standards	IEEE Std. 802.3
Data Rate	10 Mbps; 100 Mbps
Filtering Addresses	4K MAC addresses
Filtering & Forwarding Rate	14,880 pps for Ethernet; 148,800 pps for Fast Ethernet
RAM Buffers	256 KB
Max Packet Size	1536 bytes
Switches	**SW1 (TP1):** Auto-Negotiation On/Off **SW2 (TP1):** 10 Mbps or 100 Mbps with Auto-Negotiation Off **SW3 (TP1):** Half or Full-duplex with Auto-Negotiation Off **SW4 (Fiber1):** Half or Full-duplex **SW5:** AutoCross™ On/Off **SW6:** Fiber Redundancy On/Off (xBFTF10xx-14x only) **SW7 (TP2):** Auto-Negotiation On/Off **SW8 (TP2):** 10 Mbps or 100 Mbps with Auto-Negotiation Off **SW9 (TP2):** Half or Full-duplex with Auto-Negotiation Off **SW10 (TP2):** Monitor On/Off
Status LEDs	**PWR** (Power) **FD** (Fiber Duplex) **LACT** (Fiber Link/Activity) **Duplex/Link** (Copper) **Speed** (Copper)
Dimensions **CBFTF10xx-11x:** **CBFTF10xx-12x & -14x:**	 **Width:** 0.86" [22 mm] **Depth:** 5.0" [127 mm] **Height:** 3.4" [86 mm] **Width:** 1.72" [44 mm] **Depth:** 5.0" [127 mm] **Height:** 3.4" [86 mm]
Power Consumption **CBFTF10xx-11x:** **CBFTF10xx-12x & -14x:**	 4.9 Watts 9.0 Watts
Environment	See chassis specifications
Shipping Weight	1 lb. [0.45 kg]
Regulatory Compliance	FCC Class A, VCCI Class 1, CISPR22/EN55022 Class A, EN55024, EN61000, CE Mark
Warranty	Lifetime

Features

- Auto-Negotiation [pg 16]
- AutoCross™ [pg 16]
- Far-End-Fault (FEF) [pg 16]
- Automatic Link Restoration [pg 18]
- Each port fully manageable
- Individual switches for both TP ports (-110 only)
- LED indications for all operation modes
- Port mirroring mode on TX ports
- Field Upgradeable Firmware [pg 18]
- Source Address Change (SAC) [pg 19]
- Fiber Redundancy Mode (-140 only)

  When failure on primary fiber occurs it is detected by a converter; fiber two (secondary) is activated and becomes the primary link. The original fiber link (1) is put in the disabled state. It becomes secondary until the failure on primary Fiber occurs.

- Read Management features:
  - Media Converter Power
  - Fiber Link Status
  - Copper Link Status
  - Copper Port Speed
  - Hardware Switch Settings
- Write Management features:
  - Enable/disable Auto-negotiation on Copper [pg 16]
  - Force 10 Mbps or 100 Mbps on Copper
  - Force Full or Half-duplex on Copper
  - Force Full or Half-duplex on Fiber
  - Select Advertised Modes (When Auto-Negotiation is Enabled)
  - Enable/disable Pause [pg 17]
  - Enable/disable Source Address Change [pg 19]
  - Enable/disable Monitor Port (Advanced filters available)
  - Enable/disable Far-End-Fault [pg 16]

10/100 Bridging Multiport 10/100BASE-TX to 100BASE-FX

see also: 10/100 Bridging Stand-Alone Media Converters [pg 88, 89]

CBFTF10xx-1xx

10/100 Bridging Multiport Media Converter

-110 models can be used with any Point System™ Chassis [pg 31-32]

Ordering Information

Complete list of fiber optic connector specs [pg 212-224]

CBFTF1011-110
(2) 10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to (1) 100BASE-FX 1300nm multimode (ST)
[2 km/1.2 mi.] Link Budget: 11.0 dB

CBFTF1013-110
(2) 10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to (1) 100BASE-FX 1300nm multimode (SC)
[2 km/1.2 mi.] Link Budget: 11.0 dB

CBFTF1018-110
(2) 10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to (1) 100BASE-FX 1300nm multimode (MT-RJ)
[2 km/1.2 mi.] Link Budget: 14.5 dB

CBFTF1014-110
(2) 10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to (1) 100BASE-FX 1310nm single mode (SC)
[20 km/12.4 mi.] Link Budget: 16.0 dB

CBFTF1015-110
(2) 10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to (1) 100BASE-FX 1310nm single mode (SC)
[40 km/24.9 mi.] Link Budget: 26.0 dB

CBFTF1016-110
(2) 10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to (1) 100BASE-FX 1310nm single mode (SC)
[60 km/37.3 mi.] Link Budget: 29.0 dB

CBFTF1017-110
(2) 10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to (1) 100BASE-FX 1550nm single mode (SC)
[80 km/49.7 mi.] Link Budget: 29.0 dB

Single Fiber Products

Recommended use in pairs [pg 19]

CBFTF1029-110
(2) 10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to (1) 100BASE-FX 1310nm TX/1550nm RX
single fiber single mode (SC)
[20 km/12.4 mi.] Link Budget: 19.0 dB

CBFTF1029-111
(2) 10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to (1) 100BASE-FX 1550nm TX/1310nm RX
single fiber single mode (SC)
[20 km/12.4 mi.] Link Budget: 19.0 dB

CBFTF1029-112
(2) 10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to (1) 100BASE-FX 1310nm TX/1550nm RX
single fiber single mode (SC)
[40 km/24.9 mi.] Link Budget: 25.0 dB

CBFTF1029-113
(2) 10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to (1) 100BASE-FX 1550nm TX/1310nm RX
single fiber single mode (SC)
[40 km/24.9 mi.] Link Budget: 25.0 dB

-120 models cannot be used with the 1-Slot Point System™ Chassis [pg 31-32]

Ordering Information

Complete list of fiber optic connector specs [pg 212-224]

CBFTF1011-120
(5) 10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to (1) 100BASE-FX 1300nm multimode (ST)
[2 km/1.2 mi.] Link Budget: 11.0 dB

CBFTF1013-120
(5) 10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to (1) 100BASE-FX 1300nm multimode (SC)
[2 km/1.2 mi.] Link Budget: 11.0 dB

CBFTF1018-120
(5) 10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to (1) 100BASE-FX 1300nm multimode (MT-RJ)
[2 km/1.2 mi.] Link Budget: 14.5 dB

CBFTF1014-120
(5) 10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to (1) 100BASE-FX 1310nm single mode (SC)
[20 km/12.4 mi.] Link Budget: 16.0 dB

CBFTF1015-120
(5) 10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to (1) 100BASE-FX 1310nm single mode (SC)
[40 km/24.9 mi.] Link Budget: 26.0 dB

CBFTF1016-120
(5) 10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to (1) 100BASE-FX 1310nm single mode (SC)
[60 km/37.3 mi.] Link Budget: 29.0 dB

CBFTF1017-120
(5) 10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to (1) 100BASE-FX 1550nm single mode (SC)
[80 km/49.7 mi.] Link Budget: 29.0 dB

Single Fiber Products

Recommended use in pairs [pg 19]

CBFTF1029-120
(5) 10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to (1) 100BASE-FX 1310nm TX/1550nm RX
single fiber single mode (SC)
[20 km/12.4 mi.] Link Budget: 19.0 dB

CBFTF1029-121
(5) 10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to (1) 100BASE-FX 1550nm TX/1310nm RX
single fiber single mode (SC)
[20 km/12.4 mi.] Link Budget: 19.0 dB

CBFTF1029-122
(5) 10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to (1) 100BASE-FX 1310nm TX/1550nm RX
single fiber single mode (SC)
[40 km/24.9 mi.] Link Budget: 25.0 dB

CBFTF1029-123
(5) 10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to (1) 100BASE-FX 1550nm TX/1310nm RX
single fiber single mode (SC)
[40 km/24.9 mi.] Link Budget: 25.0 dB

-140 models cannot be used with the 1-Slot Point System™ Chassis [pg 31-32]

Ordering Information

Complete list of fiber optic connector specs [pg 212-224]

CBFTF1011-140
(4) 10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to (2) 100BASE-FX 1300nm multimode (ST)
[2 km/1.2 mi.] Link Budget: 11.0 dB

CBFTF1013-140
(4) 10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to (2) 100BASE-FX 1300nm multimode (SC)
[2 km/1.2 mi.] Link Budget: 11.0 dB

CBFTF1018-140
(4) 10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to (2) 100BASE-FX 1300nm multimode (MT-RJ)
[2 km/1.2 mi.] Link Budget: 14.5 dB

CBFTF1014-140
(4) 10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to (2) 100BASE-FX 1310nm single mode (SC)
[20 km/12.4 mi.] Link Budget: 16.0 dB

CBFTF1015-140
(4) 10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to (2) 100BASE-FX 1310nm single mode (SC)
[40 km/24.9 mi.] Link Budget: 26.0 dB

CBFTF1016-140
(4) 10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to (2) 100BASE-FX 1310nm single mode (SC)
[60 km/37.3 mi.] Link Budget: 29.0 dB

CBFTF1017-140
(4) 10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to (2) 100BASE-FX 1550nm single mode (SC)
[80 km/49.7 mi.] Link Budget: 29.0 dB

Single Fiber Products

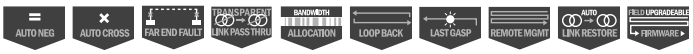
Recommended use in pairs [pg 19]

CBFTF1029-140
(4) 10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to (2) 100BASE-FX 1310nm TX/1550nm RX
single fiber single mode (SC)
[20 km/12.4 mi.] Link Budget: 19.0 dB

CBFTF1029-141
(4) 10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to (2) 100BASE-FX 1550nm TX/1310nm RX
single fiber single mode (SC)
[20 km/12.4 mi.] Link Budget: 19.0 dB

CBFTF1029-142
(4) 10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to (2) 100BASE-FX 1310nm TX/1550nm RX
single fiber single mode (SC)
[40 km/24.9 mi.] Link Budget: 25.0 dB

CBFTF1029-143
(4) 10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to (2) 100BASE-FX 1550nm TX/1310nm RX
single fiber single mode (SC)
[40 km/24.9 mi.] Link Budget: 25.0 dB



CSRFB10xx-10x

Remotely Managed 10/100 Bridging NID (Network Interface Device)

Ideal for both Enterprise and Service Provider applications where entry level management information is needed on both the local and the remote device. This management information is accessible through the local unit installed in a managed Point System™ Chassis [pg 31-32].

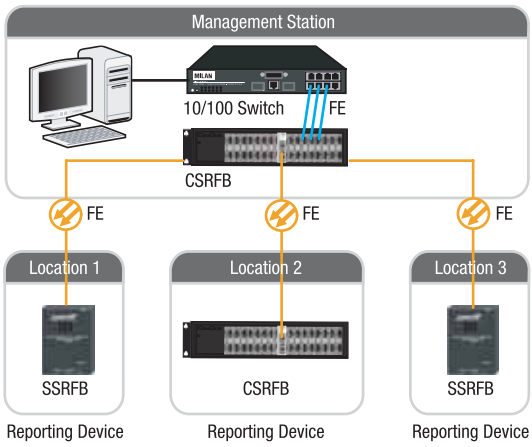
Devices should be used in pairs with the remotely managed device being another chassis card (CSRFB10xx-100) or stand-alone unit (SSRFB10xx-100).

- **Integrate fiber** into 10/100 copper environments
- **Remote Mangement** Local managed unit receives status updated from remote unit
- **Remote Loopback** assists in identifying network problems [pg 18]
- **Bandwidth Control** Independent ingress rate limiting on both ports

Features

- Auto-Negotiation [pg 16]
- AutoCross™ [pg 16]
- Far-End-Fault (FEF) [pg 16]
- Transparent Link Pass Through [pg 17]
- Bandwidth Allocation [pg 18]
- Loopback [pg 18]
- Last Gasp [pg 19]
- Remote Management [pg 17]
- Automatic Link Restoration [pg 18]
- Link Test
- Field Upgradeable Firmware [pg 18]

Remote Status Reporting Conversion



Specifications

Complete list of fiber optic connector specifications [pg 212-224]

Standards	IEEE Std. 802.3, TS-1000 OAM v2
Data Rate	**Copper:** 10/100 Mbps **Fiber:** 100 Mbps
Filtering Addresses	1K MAC addresses
RAM Buffers	256K
Max Frame Size	1916 bytes untagged 1914 bytes tagged
Switches	**SW1:** TP Auto-Negotiation **SW2**: TP Duplex with Auto-Negotiation Off **SW3**: TP Speed with Auto-Negotiation Off **SW4**: Fiber Duplex **SW5**: Link Pass Through **SW6**: Mode: Terminal or Center
Status LEDs	Power TP Duplex/Link/Activity TP 10 Mbps/100 Mbps Fiber Link/Activity Fiber Duplex
Dimensions	**Width:** 0.86" [22 mm] **Depth:** 5.0" [127 mm] **Height:** 3.4" [86 mm]
Power Consumption	3.4 Watts
Environment	0 – 50 C; 5% - 95% humidity non-condensing; 0 – 10,000 ft. altitude
Shipping Weight	2 lbs. [.90 kg]
Regulatory Compliance	EN55022 Class A, EN55024; CE Mark
Warranty	Lifetime

Ordering Information

Complete list of fiber optic connector specifications [pg 212-224]

CSRFB1011-100
10/100Base-TX (RJ-45) **[100 m/328 ft.]**
100Base-FX 1300nm MM ST
[2 km/1.2 mi.] Link Budget: 11.0 dB

CSRFB1013-100
10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1300nm MM (SC)
[2 km/1.2 mi.] Link Budget: 11.0 dB

CSRFB1014-100
10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1310nm SM (SC)
[20 km/12.4 mi.] Link Budget: 16.0 dB

CSRFB1040-100
10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to SFP slot (empty)

Single Fiber Products

Recommended use in pairs [pg 19]

CSRFB1029-100
10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1310nm TX/1550nm RX
Bi-Di SM (SC)
[20 km/12.4 mi.] Link Budget: 19.0 dB

CSRFB1029-101
10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1550nm TX/1310nm RX
Bi-Di SM (SC)
[20 km/12.4 mi.] Link Budget: 19.0 dB

CSRFB1029-102
10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1310nm TX/1550nm RX
Bi-Di SM (SC)
[40 km/24.9 mi.] Link Budget: 19.0 dB

CSRFB1029-103
10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1550nm TX/1310nm RX
Bi-Di SM (SC)
[40 km/24.9 mi.] Link Budget: 19.0 dB

Optional Accessories *(sold separately)*

SFP Modules [pg 161-167]

AUTO CROSS | AUTO NEG | PAUSE | TRANSPARENT LINK PASS THRU | FAR END FAULT | LOOP BACK | BANDWIDTH ALLOCATION | FIELD UPGRADEABLE FIRMWARE | REMOTE MGMT | AUTO LINK RESTORE | SINGLE FIBER | LAST GASP

OAM/IP-Based Remotely Managed 10/100BASE-TX to 100BASE-X

see also: OAM/IP-Based Remotely Managed Stand-Alone NIDs [pg 91, 92]

10/100 Bridging

CFBRM10xx-1xx

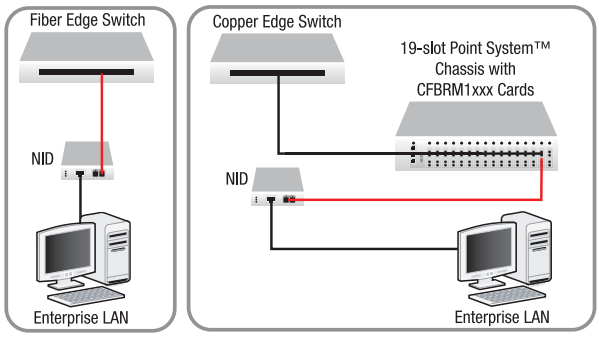
OAM/IP-Based Remotely Managed NID (Network Interface Device)

CARRIER ETHERNET MEF Certified Compliant™

Features

- MEF 9 & MEF 14 Carrier Ethernet Certification
- Two Remote Management modes:
  - IP-Based Remote Management [pg 17]
  - In-Band Link OAM 802.3ah (remote device managed by local peer)
- SNMP v1
- AutoCross™ [pg 16]
- Auto-Negotiation [pg 16]
- Pause [pg 17]
- Transparent Link Pass Through [pg 17]
- Far-End-Fault [pg 16]
- Remote Loopback [pg 18]
- IEEE 802.1p QoS packet classification with 4 egress queues
- Ipv4 IP TOS and DiffServ QoS classification, IPv6 Traffic class
- IEEE 802.1q VLAN
- Static MAC, 64 entries
- Double VLAN tagging (C-tag/S-tag) (Q-in-Q)
- IEEE 802.1x Port based security
- RADIUS client
- RMON counters for each port
- Bandwidth Allocation per port [pg 18]
- DMI Optical Management
- USB port for basic setup
- Cable diagnostic function for TP ports
- 8K MAC addresses
- Field Upgradeable Firmware [pg 18]

Remotely Managed 10/100 NID IP or OAM Management



Applications

- Ethernet in the First Mile (EFM)
- Fiber to the Premise (FTTP), E-Line and E-LAN
- Enterprise markets

Specifications

Complete list of fiber optic connector specifications [pg 212-224]

Standards	IEEE Std. 802.3, IEEE Std. 802.3ah, IEEE Std. 802.1P, IEEE Std. 802.1Q, IEEE Std. 802.1X
Data Rate	**Copper:** 10/100 Mbps **Fiber:** 100 Mbps
Filtering Addresses	8K MAC Addresses
Max Frame Size	1628 bytes
Dimensions	**Width:** 0.86" [22 mm] **Depth:** 5.0" [127 mm] **Height:** 3.4" [86 mm]
Power Consumption	5.1 Watts
Environment	See chassis specifications
Shipping Weight	1 lb. [0.45 kg]
Regulatory Compliance	EN55024, FCC Class A, CE Mark
Warranty	Lifetime

Ordering Information

Complete list of fiber optic connector specifications [pg 212-224]

CFBRM1011-100
CFBRM1011-110 (DMI model)
10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1300nm MM (ST)
[2 km/1.2 mi.] Link Budget: 11.0 dB

CFBRM1013-100
CFBRM1013-110 (DMI model)
10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1300nm MM (SC)
[2 km/1.2 mi.] Link Budget: 11.0 dB

CFBRM1014-100
CFBRM1014-110 (DMI model)
10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-LX10 1310nm SM (SC)
[20 km/6.2 mi.] Link Budget: 16.0 dB

CFBRM1015-100
CFBRM1015-110 (DMI model)
10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1310nm SM (SC)
[40 km/24.8 mi.] Link Budget: 26.0 dB

CFBRM1016-100
10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1310nm SM (SC)
[60 km/37.3 mi.] Link Budget: 29.0 dB

CFBRM1017-100
10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1550nm SM (SC)
[80 km/49.7 mi.] Link Budget: 29.0 dB

CFBRM1035-100
10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1550nm SM (SC)
[120 km/74.6 mi.] Link Budget: 36.0 dB

CFBRM1040-100
10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to SFP slot (empty)

Single Fiber Products

Recommended use in pairs [pg 19]

CFBRM1029-100
CFBRM1029-110 (DMI model)
10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-BX-U 1310nm TX/1550nm RX Bi-Di single mode (SC)
[20 km/12.4 mi.] Link Budget: 19.0 dB

CFBRM1029-101
CFBRM1029-111 (DMI model)
10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-BX-D 1550nm TX/1310nm RX Bi-Di SM (SC)
[20 km/12.4 mi.] Link Budget: 19.0 dB

CFBRM1029-102
10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1310nm TX/1550nm RX Bi-Di SM (SC)
[40 km/24.8 mi.] Link Budget: 25.0 dB

CFBRM1029-103
10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1550nm TX/1310nm RX Bi-Di SM (SC)
[40 km/24.8 mi.] Link Budget: 25.0 dB

Note: all units feature USB port for local management application.

Optional Accessories *(sold separately)*

SFP Modules [pg 161-167]

USB Cables

USBC-AM-BM-03
USB 2.0 Cable A male to B male [3 ft. Gray]

USBC-AM-BM-06
USB 2.0 Cable A male to B male [6 ft. Gray]

Gigabit Ethernet
1000BASE-T to 1000BASE-SX/LX

see also: Gigabit Etherner Stand-Alone Converter [pg 96]

CGETF10xx-11x

Gigabit Ethernet Media Converter

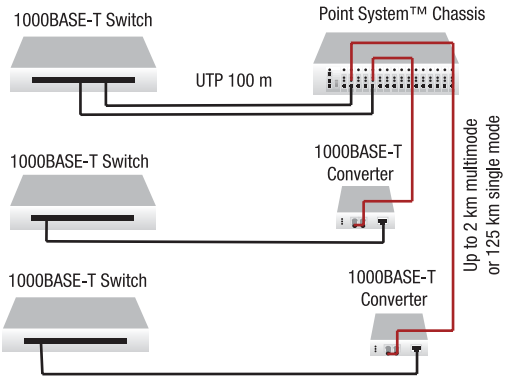
- Migrate to Gigabit Ethernet in a cost-effective manner. Used in conjunction with lower cost 1000BASE-T switches, companies can take advantage of the high bandwidth Gigabit Ethernet offers, without all of the higher costs. Transition Networks 1000BASE-T to SX/LX converters allow users to extend the bandwidth to those users outside the reach of the 1000BASE-T standard (up to 125 km).

Features

- Copper & Fiber Auto-Negotiation [pg 16]
- Transparent Link Pass Through [pg 17]
- Automatic Link Restoration [pg 18]
- Remote Fault Detect [pg 19]
- Loopback [pg 18]
- Pause [pg 17]
- Field Upgradeable Firmware [pg 18]
- DMI - Diagnostic Monitoring Interface supported on CGETF1040-110 when an SFP supporting DMI is used
- DMI models have four functions:
  - Transmit Power
  - Receive Power
  - Transmit bias current
  - Temperature

Within each function, the device will send a trap *(i.e. error)* whenever a high or low warning event or a high or low alarm event occurs *(for a total of 16 traps).*

Migrate to Gigabit Ethernet



Specifications

Complete list of fiber optic connector specifications [pg 212-224]

Standards	IEEE Std. 802.3ab and IEEE Std. 802.3
6-position Switch	**SW1:** Remote Fiber Fault Detect (Down=Enabled) **SW2:** Symmetric Pause **SW3:** Asymmetric Pause **SW4:** Transparent Link Pass Through (UP=Enabled) **SW5:** Fiber Auto-Negotiation (Down=Enabled) **SW6:** Loopback (Down=Enabled)
3-position Jumper	**Hardware:** Converter mode is determined by 6-position switch settings **Software:** Converter mode is determined by most recently saved on-board microprocessor settings
Status LEDs	**PWR (Power):** ON=connection to external AC power **LKF (Fiber Link):** ON=fiber connection **RXC (Copper Receive):** Flashing=Receiving data on copper link; ON=Copper Link connection **Duplex:** ON=Copper Link connection
Dimensions	**Width:** 0.86" [22 mm] **Depth:** 5.0" [127 mm] **Height:** 3.4" [86 mm]
Power Consumption	5.4 Watts
Environment	See chassis specifications
Shipping Weight	1 lb. [0.45 kg]
Regulatory Compliance	CISPR/EN55022 Class A + EN55024; FCC Class A; CE Mark
Warranty	Lifetime

Ordering Information

Complete list of fiber optic connector specifications [pg 212-224]

CGETF1013-110
1000BASE-T (RJ-45) **[100 m/328 ft.]**
to 1000BASE-SX 850nm multimode (SC)
[62.5/125 µm fiber: 220 m/722 ft.]
LInk Budget: 7.0 dB
[50/125 µm fiber: 550 m/1804 ft.]
Link Budget: 7.0 dB

CGETF1039-110
1000BASE-T (RJ-45) **[100 m/328 ft.]**
to 1000BASE-SX 850nm multimode (LC) via SFP
[62.5/125 µm fiber: 220 m/722 ft.]
LInk Budget: 8.0 dB
[50/125 µm fiber: 550 m/1804 ft.]
Link Budget: 8.0 dB

CGETF1024-110
1000BASE-T (RJ-45) **[100 m/328 ft.]**
to 1000BASE-LX 1310nm Extended MM (62.5/125 µm fiber only) (SC)
[2 km/1.2 mi.] Link Budget: 7.0 dB

CGETF1014-110
1000BASE-T (RJ-45) **[100 m/328 ft.]**
to 1000BASE-LX 1310nm SM (SC)
[10 km/6.2 mi.] Link Budget: 10.5 dB

CGETF1015-110
1000BASE-T (RJ-45) **[100 m/328 ft.]**
to 1000BASE-LX 1310nm SM (SC)
[25 km/15.5 mi.] Link Budget: 15.0 dB

CGETF1017-110
1000BASE-T (RJ-45) **[100 m/328 ft.]**
to 1000BASE-LX 1550nm SM (SC)
[65 km/40.4 mi.] Link Budget: 21.0 dB

CGETF1035-110
1000BASE-T (RJ-45) **[100 m/328 ft.]**
to 1000BASE-LX 1550nm SM (SC)
[125 km/77.7 mi.] Link Budget: 27.0 dB

CGETF1040-110
1000BASE-T (RJ-45) **[100 m/328 ft.]**
to 1000BASE-X SFP Slot (empty)

Single Fiber Products

Recommended use in pairs [pg 19]

CGETF1029-110
1000BASE-T (RJ-45) **[100 m/328 ft.]**
to 1000BASE-LX 1310nm TX/1550nm RX single fiber single mode (SC)
[20 km/12.4 mi.] Link Budget: 13.0 dB

CGETF1029-111
1000BASE-T (RJ-45) **[100 m/328 ft.]**
to 1000BASE-LX 1550nm TX/1310nm RX single fiber single mode (SC)
[20 km/12.4 mi.] Link Budget: 13.0 dB

CGETF1029-112
1000BASE-T (RJ-45) **[100 m/328 ft.]**
to 1000BASE-LX 1310nm TX/1550nm RX single fiber single mode (SC)
[40 km/24.9 mi.] Link Budget: 20.0 dB

CGETF1029-113
1000BASE-T (RJ-45) **[100 m/328 ft.]**
to 1000BASE-LX 1550nm TX/1310nm RX single fiber single mode (SC)
[40 km/24.9 mi.] Link Budget: 20.0 dB

CGETF1029-116
1000BASE-T (RJ-45) **[100 m/328 ft.]**
to 1000BASE-LX 1510nm TX/1590nm RX single fiber single mode (SC)
[80 km/49.7 mi.] Link Budget: 24.0 dB

CGETF1029-117
1000BASE-T (RJ-45) **[100 m/328 ft.]**
to 1000BASE-LX 1590nm TX/1510nm RX single fiber single mode (SC)
[80 km/49.7 mi.] Link Budget: 24.0 dB

Optional Accessories *(sold separately)*

SFP Modules [pg 161-167]

Gigabit Ethernet/Fiber Channel 1000BASE-SX to 1000BASE-LX

see also: Gigabit Ethernet Stand-Alone Optical Mode Converter [pg 97]

CFMFF1xxx-22x

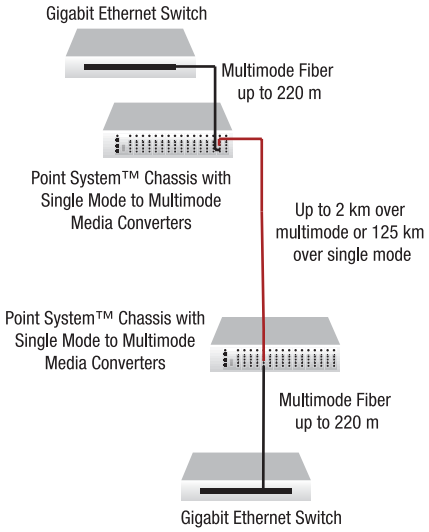
Gigabit Ethernet/Fiber Channel Optical Mode Converter

Used individually or in pairs, this media converter can extend Gigabit Ethernet over single mode fiber up to 125 km. Convert 1000BASE-SX ports on a Gigabit Ethernet switch to 1000BASE-LX on a port-by-port basis. Ideal for campus area networks or other applications requiring the distance advantages of single mode fiber.

Features

- Link Pass Through [pg 17]
- Protocol Transparency
- Extended Multimode SX capability (up to 2 km 62.5/125 µm fiber)
- Field Upgradeable Firmware [pg 18]
- Card manageability:
  - Multimode signal detect
  - Hardware/software mode
  - Fiber port enable/disable multimode
  - Fiber port enable/disable single mode
- Can be used with any Point System™ Chassis [pg 31-32]

Extend Network Distance



Specifications

Complete list of fiber optic connector specifications [pg 212-224]

Standards	IEEE Std. 802.3
3-position Jumper	**Hardware:** Software mode is disabled **Software:** Converter mode is determined by most recently saved on-board microprocessor settings
Status LEDs	**PWR (Power):** Steady green LED indicates connection to external AC power **LKS (Single mode fiber link):** Steady LED indicates single mode fiber link **LKM (Multimode fiber link):** Steady LED indicates multimode fiber link
Dimensions	**Width:** 0.86" [22 mm] **Depth:** 5.0" [127 mm] **Height:** 3.4" [86 mm]
Power Consumption	3.5 Watts
Environment	See chassis specifications
Shipping Weight	1 lb. [0.45 kg]
Regulatory Compliance	UL LIsted; C-UL Listed (Canada); CISPR/EN55022 Class A & B + EN55024; FCC Class A & B; CE Mark
Warranty	Lifetime

Ordering Information

Complete list of fiber optic connector specifications [pg 212-224]

CFMFF1313-220
1000BASE-SX 850nm multimode (SC)
[62.5/125 µm fiber: 220 m/722 ft.]
[50/125 µm fiber: 550 m/1804 ft.]
Link Budget 7.0 dB
to 1000BASE-SX 850nm multimode (SC)
[62.5/125 µm fiber: 220 m/722 ft.]
[50/125 µm fiber: 550 m/1804 ft.]
Link Budget 7.0 dB

CFMFF1324-220
1000BASE-SX 850nm multimode (SC)
[62.5/125 µm fiber: 220 m/722 ft.]
[50/125 µm fiber: 550 m/1804 ft.]
Link Budget 7.0 dB
to 1000BASE-LX 1310nm Extended MM (62.5/125 µm fiber only) (SC)
[up to 2 km] Link Budget: 7.0 dB

CFMFF1424-220
1000BASE-LX 1310nm SM (SC)
[10 km/6.2 mi.] Link Budget: 7.0 dB
to 1000BASE-LX 1310nm Extended MM (62.5/125 µm fiber only) (SC)
[up to 2 km] Link Budget: 7.0 dB

CFMFF1314-220
1000BASE-SX 850nm multimode (SC)
[62.5/125 µm fiber: 220 m/722 ft.]
[50/125 µm fiber: 550 m/1804 ft.]
Link Budget: 7.0 dB
to 1000BASE-LX 1310nm SM (SC)
[10 km/6.2 mi.] Link Budget: 7.0 dB

CFMFF1414-220
1000BASE-LX 1310nm SM (SC)
[10 km/6.2 mi.] Link Budget: 7.0 dB
to 1000BASE-LX 1310nm SM (SC)
[10 km/6.2 mi.] Link Budget: 7.0 dB

CFMFF1315-220
1000BASE-SX 850nm multimode (SC)
[62.5/125 µm fiber: 220 m/722 ft.]
[50/125 µm fiber: 550 m/1804 ft.]
Link Budget: 7.0 dB
to 1000BASE-LX 1310nm SM (SC)
[25 km/15.5 mi.] Link Budget: 15.0 dB

CFMFF1317-220
1000BASE-SX 850nm multimode (SC)
[62.5/125 µm fiber: 220 m/722 ft.]
[50/125 µm fiber: 550 m/1804 ft.]
Link Budget: 7.0 dB
to 1000BASE-LX 1550nm SM (SC)
[65 km/40.4 mi.] Link Budget: 20.0 dB

CFMFF1335-220
1000BASE-SX 850nm multimode (SC)
[62.5/125 µm fiber: 220 m/722 ft.]
[50/125 µm fiber: 550 m/1804 ft.]
Link Budget: 7.0 dB
to 1000BASE-LX 1550nm SM (SC)
[125 km/77.7 mi.] Link Budget: 27.0 dB

Single Fiber Products

Recommended use in pairs [pg 19]

CFMFF1329-220
1000BASE-SX 850nm multimode (SC)
[62.5/125 µm fiber: 220 m/722 ft.]
[50/125 µm fiber: 550 m/804 ft.]
Link Budget: 7.0 dB
to 1000BASE-LX 1310nm TX/1550nm RX single fiber single mode (SC)
[20 km/12.4 mi.] Link Budget: 13.0 dB

CFMFF1329-221
1000BASE-SX 850nm multimode (SC)
[62.5/125 µm fiber: 220 m/22 ft.]
[50/125 µm fiber: 550 m/1804 ft.]
Link Budget: 7.0 dB
to 1000BASE-LX 1550nm TX/1310nm RX single fiber single mode (SC)
[20 km/12.4 mi.] Link Budget: 13.0 dB

CFMFF1329-222
1000BASE-SX 850nm multimode (SC)
[62.5/125 µm fiber: 220 m/722 ft.]
[50/125 µm fiber: 550 m/1804 ft.]
Link Budget: 7.0 dB
to 1000BASE-LX 1310nm TX/1550nm RX single fiber single mode (SC)
[40 km/24.9 mi.] Link Budget: 20.0 dB

CFMFF1329-223
1000BASE-SX 850nm multimode (SC)
[62.5/125 µm fiber: 220 m/722 ft.]
[50/125 µm fiber: 550 m/804 ft.]
Link Budget: 7.0 dB
to 1000BASE-LX 1550nm TX/1310nm RX single fiber single mode (SC)
[40 km/24.9 mi.] Link Budget: 20.0 dB

Gigabit Ethernet 1000BASE-SX to 1000BASE-LX

see also: Gigabit Ethernet Optical Mode Stand-Alone Media Converters [pg 98]

CFMFF13xx-28x

Gigabit Optical Mode Converter with Signal Retiming & Regeneration

- Transition Networks Gigabit Ethernet optical mode converters now include signal retiming, regeneration and re-amplification to maintain signal integrity and allow for maximum network distance without signal degradation.
- Distances of hundreds of kilometers are possible when cascading two or more devices in the same link.
- Can be used with any Point System™ Chassis [pg 31-32]

Features

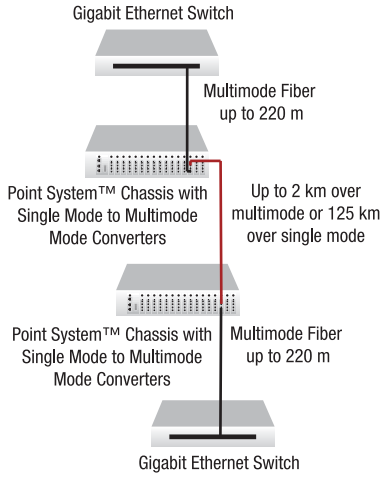
- Auto-Negotiation [pg 16]
- Link Pass Through [pg 17]
- Automatic Link Restoration [pg 18]
- Pause [pg 17]
- Field Upgradeable Firmware [pg 18]
- Extended multimode SX capability (up to 2 km 62.5/125 µm fiber)
- Supports 3R optical signal regeneration
  - Reamplify, Reshape & Retrieve

Management Features

- Report local converter status to chassis management software:
  - Converter power status
  - Hardware/Software mode status
  - Single Mode and Multimode link status
  - Auto-Negotiation, Link Pass Through and Pause setting
- Write operation includes:
  - Power on/off converter
  - Enable/disable Single Mode port
  - Enable/disable Multimode port
  - Enable/disable Auto-Negotiation [pg 16]
  - Enable/disable Link Pass Through [pg 17]
  - Select Pause Advertisement(s) [pg 17]

Extend Network Distance

Convert 1000BASE-SX ports over to 1000BASE-LX on a port-by-port basis. Used individually or in pairs, this media converter can extend Gigabit Ethernet over single mode fiber up to 125 km. Or cascade two or more converters in a link to achieve even greater distances.



Specifications

Complete list of fiber optic connector specifications [pg 212-224]

Standards	IEEE Std. 802.3
Status LEDs	**PWR (Power):** Lit for normal operation **LKS (Single Mode Fiber Link):** ON = Fiber Link **LKM (Multimode Fiber Link):** ON = Fiber Link **ACT (Activity):** Blinking = data reception on either fiber link
Switches	**Switch 1:** Fiber Auto-Negotiation on/off **Switch 2:** Link Pass Through on/off **Switch 3&4:** Pause configuration determined by combined setting
3-position Jumper	**Hardware:** Converter mode is determined by DIP switch settings **Software:** Converter mode is determined by most recently saved on-board microprocessor settings
Dimensions	**Width:** 0.86" [22 mm] **Depth:** 5.0" [127 mm] **Height:** 3.4" [86 mm]
Power Consumption	3.5 Watts
Environment	0 – 50°C operating; 5% – 95% humidity non-condensing; 0 – 10,000 ft. altitude
Shipping Weight	1 lb. [0.45 kg]
Regulatory Compliance	EN55024; CISPR22/EN55022 Class B; FCC Class B; CE Mark
Warranty	Lifetime

Ordering Info [Class B]

Complete list of fiber optic connector specifications [pg 212-224]

CFMFF1324-280
1000BASE-SX 850nm multimode (SC)
[220 m/722 ft.]* Link Budget: 7.0 dB
[550 m/1804 ft.]* Link Budget: 7.0 dB
to 1000BASE-LX 1310nm Extended MM (SC) (62.5/125 µm fiber only)
[up to 2 km] Link Budget: 7.0 dB

CFMFF1314-280
1000BASE-SX 850nm multimode (SC)
[220 m/722 ft.]* Link Budget: 7.0 dB
[550 m/1804 ft.]* Link Budget: 7.0 dB
to 1000BASE-LX 1310nm SM (SC)
[10 km/6.2 mi.] Link Budget: 33.0 dB

CFMFF1414-280
1000BASE-LX 1310nm SM (SC)
[10 km/6.2 mi.] Link Budget: 7.0 dB
to 1000BASE-LX 1310nm SM (SC)
[10 km/6.2 mi.] Link Budget: 7.0 dB

CFMFF1315-280
1000BASE-SX 850nm multimode (SC)
[220 m/722 ft.]* Link Budget: 7.0 dB
[550 m/1804 ft.]* Link Budget: 7.0 dB
to 1000BASE-LX 1310nm SM (SC)
[25 km/15.5 mi.] Link Budget: 15.0 dB

CFMFF1317-280
1000BASE-SX 850nm multimode (SC)
[220 m/722 ft.]* Link Budget: 7.0 dB
[550 m/1804 ft.]* Link Budget: 7.0 dB
to 1000BASE-LX 1550nm SM (SC)
[65 km/40.4 mi.] Link Budget: 21.0 dB

CFMFF1335-280
1000BASE-SX 850nm multimode (SC)
[220 m/722 ft.]* Link Budget: 7.0 dB
[550 m/1804 ft.]* Link Budget: 7.0 dB
to 1000BASE-LX 1550nm SM (SC)
[125 km/77.7 mi.] Link Budget: 27.0 dB

Single Fiber Products

Recommended use in pairs [pg 19]

CFMFF1329-280
1000BASE-SX 850nm multimode (SC)
[220 m/722 ft.]* Link Budget: 7.0 dB
[550 m/1804 ft.]* Link Budget: 7.0 dB
to 1000BASE-LX 1310nm TX/1550nm RX single fiber single mode (SC)
[20 km/12.4 mi.] Link Budget: 13.0 dB

CFMFF1329-281
1000BASE-SX 850nm multimode (SC)
[220 m/722 ft.]* Link Budget: 7.0 dB
[550 m/1804 ft.]* Link Budget: 7.0 dB
to 1000BASE-LX 1550nm TX/1310nm RX single fiber SM (SC)
[20 km/12.4 mi.] Link Budget: 13.0 dB

CFMFF1329-282
1000BASE-SX 850nm multimode (SC)
[220 m/722 ft.]* Link Budget: 7.0 dB
[550 m/1804 ft.]* Link Budget: 7.0 dB
to 1000BASE-LX 1310nm TX/1550nm RX single fiber single mode (SC)
[40 km/24.9 mi.] Link Budget: 20.0 dB

CFMFF1329-283
1000BASE-SX 850nm multimode (SC)
[220 m/722 ft.]* Link Budget: 7.0 dB
[550 m/1804 ft.]* Link Budget: 7.0 dB
to 1000BASE-LX 1550nm TX/1310nm RX single fiber single mode (SC)
[40 km/24.9 mi.] Link Budget: 20.0 dB

CFMFF1329-286
1000BASE-SX 850nm multimode (SC)
[220 m/722 ft.]* Link Budget: 7.0 dB
[550 m/1804 ft.]* Link Budget: 7.0 dB
to 1000BASE-LX 1510nm TX/1590nm RX single fiber single mode (SC)
[80 km/49.6 mi.] Link Budget: 24.0 dB

CFMFF1329-287
1000BASE-SX 850nm multimode (SC)
[220 m/722 ft.]* Link Budget: 7.0 dB
[550 m/1804 ft.]* Link Budget: 7.0 dB
to 1000BASE-LX 1590nm TX/1510nm RX single fiber single mode (SC)
[80 km/49.6 mi.] Link Budget: 24.0 dB

**[62.5/125 µm fiber: 220 m/722 ft.];*
**[50/125 µm fiber: 550 m/1804 ft.]*

see also: 10/100/1000 Bridging Stand-Alone Media Converters [pg 101]

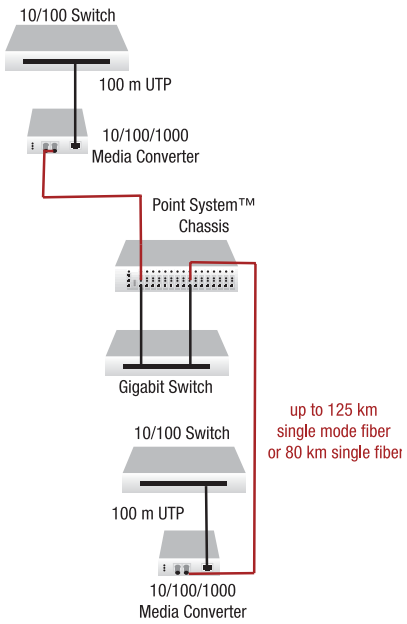
CGFEB10xx-12x

10/100/1000 Ethernet Media Converter

Features

- Auto-Negotiation (copper and fiber ports) [pg 16]
- Switch Selectable Speeds (UTP) when Auto-Negotiation is off
- AutoCross™ [pg 16]
- Link Pass Through [pg 17]
- Remote Fault Detect [pg 19]
- Pause [pg 17]
- Automatic Link Restoration [pg 18]
- IEEE 802.1P QoS, IPv4 Tos/Diffserv, IPv6 traffic class
- IEEE 802.1q VLAN tagging and double tagging (Q in Q)
- Field Upgradeable Firmware [pg 18]
- Virtual Cable Test (VCT) on UTP port
- Uni-directional data transmission allows secure traffic forwarding in only one direction via port based VLAN
- Bandwidth Allocation [pg 18]
- DMI, Digital diagnostics per SFF-8472
- RMON Counters for each port

Extend Network Distance



- Extend Network Distance
- Bridge legacy 10/100 devices to a Gigabit backbone
- Secure Uni-directional transmission via port-based VLAN

Specifications

Complete list of fiber optic connector specifications [pg 212-224]

Standards	IEEE 802.3, IEEE 802.3ab, IEEE 802.3u, IEEE 802.3z, IEEE 802.1P, IEEE 802.1q
Data Rate	**Copper:** 10/100/1000 Mbps **Fiber:** 1000 Mbps
Filtering Addresses	8K MAC Addresses
Max Frame Size	**802.3ac tagged:** 1628 bytes **Untagged:** 1632 bytes
Status LEDs	**PWR:** ON green = Power applied to card **TP (Duplex/Link/Activity):** Orange: ON = Half-duplex Link; BLINK = Activity; Green: ON = Full-duplex Link; BLINK = Activity **TP (10 Mbps/100 Mbps/1000 Mbps):** Off = 10 Mbps; Orange = 100 Mbps; Green = 1000 Mbps **LACT (Fiber Link/Activity):** Green: ON = Link; BLINK = Activity
Dip Switches	**Switch 1:** TX - Enable/Disable Auto-Negotiation **Switch 2:** TX - Force 10 Mbps or 100 Mbps with Switch 1 off **Switch 3:** TX - Force Half or Full duplex with Switch 1 off **Switch 4:** Enable/Disable LPT **Switch 5:** not used **Switch 6:** not used
Dimensions	**Width:** 0.86" [22 mm] **Depth:** 5.0" [127 mm] **Height:** 3.4" [86 mm]
Power Consumption	4.8 Watts
Environment	See chassis specifications
Shipping Weight	1 lb. [0.45 kg]
Regulatory Compliance	CISPR/EN55022 Class A, EN55024, EN61000, FCC Class A, CE Mark
Warranty	Lifetime

Ordering Information

Complete list of fiber optic connector specifications [pg 212-224]

CGFEB1013-120
10/100/1000BASE-T (RJ-45) **[100 m]**
to 1000BASE-SX 850nm multimode (SC)
[62.5/125 µm: 220 m/722 ft.]
[50/125 µm: 550 m/1804 ft.]
Link Budget: 7.0 dB

CGFEB1024-120
10/100/1000BASE-T (RJ-45) **[100 m]**
to 1000BASE-SX 1300nm Extended MM (62.5/125 µm fiber only) (SC)
[up to 2 km] Link Budget: 7.0 dB

CGFEB1014-120
10/100/1000BASE-T (RJ-45) **[100 m]**
to 1000BASE-LX 1310nm SM (SC)
[10 km/6.2 mi.] Link Budget: 7.0 dB

CGFEB1015-120
10/100/1000BASE-T (RJ-45) **[100 m]**
to 1000BASE-LX 1310nm SM (SC)
[25 km/15.5 mi.] Link Budget: 15.0 dB

CGFEB1017-120
10/100/1000BASE-T (RJ-45) **[100 m]**
to 1000BASE-LX 1550nm SM (SC)
[65 km/40.4 mi.] Link Budget: 20.0 dB

CGFEB1035-120
10/100/1000BASE-T (RJ-45) **[100 m]**
to 1000BASE-LX 1550nm SM (SC)
[125 km/77.7 mi.] Link Budget: 27.0 dB

CGFEB1040-120
10/100/1000BASE-T (RJ-45) **[100 m]**
to 1000BASE-X SFP Slot (empty)

Single Fiber Products

Recommended use in pairs [pg 19]

CGFEB1029-120
10/100/1000BASE-T (RJ-45) **[100 m]**
to 1000BASE-LX 1310nm TX/1550nm RX single fiber single mode (SC)
[20 km/12.4 mi.] Link Budget: 13.0 dB

CGFEB1029-121
10/100/1000BASE-T (RJ-45) **[100 m]**
to 1000BASE-LX 1550nm TX/1310nm RX single fiber single mode (SC)
[20 km/12.4 mi.] Link Budget: 13.0 dB

CGFEB1029-122
10/100/1000BASE-T (RJ-45) **[100 m]**
to 1000BASE-LX 1310nm TX/1550nm RX single fiber single mode (SC)
[40 km/24.9 mi.] Link Budget: 20.0 dB

CGFEB1029-123
10/100/1000BASE-T (RJ-45) **[100 m]**
to 1000BASE-LX 1550nm TX/1310nm RX single fiber single mode (SC)
[40 km/24.9 mi.] Link Budget: 20.0 dB

CGFEB1029-126
10/100/1000BASE-T (RJ-45) **[100 m]**
to 1000BASE-LX TX/RX single fiber single mode (SC)
[80 km/49.7 mi.] Link Budget :24 dB

CGFEB1029-127
10/100/1000BASE-T (RJ-45) **[100 m]**
to 1000BASE-LX TX/RX single fiber single mode (SC)
[80 km/49.7 mi.] Link Budget :24 dB

Optional Accessories *(sold separately)*

SFP Modules [pg 161-167]

CGFEB1040-140 & CGFEB4040-180

10/100/1000 Ethernet Multiport Media Converter

(-140) (-180)

- Extend Network Distance
- Bridge legacy 10/100 devices to a Gigabit backbone
- Protect critical networks with fiber redundancy

Features

- Auto-Negotiation (copper and fiber ports)[pg 16]
- Switch Selectable Speeds (UTP) when Auto-Negotiation is off
- AutoCross™ [pg 16]
- Pause [pg 17]
- Far-End-Fault (100Base-FX setting on **-180 model** port 1 only) [pg 16]
- Automatic Link Restoration [pg 18]
- Fiber Redundancy (<50ms switching time)
- IEEE 802.1P QoS, IPv4 Tos/Diffserv, IPv6 traffic class
- IEEE 802.1q VLAN tagging and double tagging (Q in Q)
- Field Upgradeable Firmware [pg 18]
- Virtual Cable Test (VCT) on UTP port **(-140 model only)**
- Bandwidth Allocation [pg 18]
- SGMII support on port 1 for use with 10/100/1000Base-T copper SFPs **(-180 model only)**
- 100/1000Base-X, dual speed support on port 1 for use with 100Base-FX or 1000Base-SX/LX SFPs **(-180 model only)**
- DMI, Digital diagnostics per SFF-8472
- RMON Counters for each port

Specifications

Complete list of fiber optic connector specifications [pg 212-224]

Standards	IEEE 802.3, IEEE 802.3ab, IEEE 802.3u, IEEE 802.3z, IEEE 802.1P, IEEE 802.1q
Data Rate	**TP (port 1):** 10/100/1000 Mbps **(-140 model only)** **SFP (port 1):** 100/1000 Mbps **(-180 model only)** **SFP (port 2,3):** 1000 Mbps
Filtering Addresses	8K MAC Addresses
Max Frame Size	**802.3ac tagged:** 1628 bytes **Untagged:** 1632 bytes
Status LEDs	**PWR:** ON green = Power applied to card **TP (Duplex/Link/Activity):** Orange: ON = Half-duplex Link; BLINK = Activity; Green: ON = Full-duplex Link; BLINK = Activity **TP (10 Mbps/100 Mbps/1000 Mbps):** Off = 10 Mbs; Orange = 100 Mbs; Green = 1000 Mbs **LACT (Fiber SFP Link/Activity):** Green: ON = Link; BLINK = Activity
Dip Switches	**Switch 1:** TX - Enable/Disable Auto-Negotiation **Switch 2:** TX - Force 10 Mbps or 100 Mbps with Switch 1 off **Switch 3:** TX - Force Half or Full duplex with Switch 1 off **Switch 4:** Enable/Disable Fiber Redundancy port 2/3) **Switch 5:** Enable/Disable primary/secondary revert with Switch 4 on **Switch 6:** Enable/Disable P2 to P3 blocking
Dip Switches	**Switch 1:** Port 1 speed 100 Mbps/1000 Mbps **Switch 2:** Port 1 duplex full/half **Switch 3:** Port 1 mode 1000Base-X/SGMII **Switch 4:** Enable/Disable Fiber Redundancy (port 2/3) **Switch 5:** Enable/Disable primary/secondary revert with Switch 4 on **Switch 6:** Enable/Disable P2 to P3 blocking
Dimensions	**Width:** 0.86" [22 mm] **Depth:** 5.0" [127 mm] **Height:** 3.4" [86 mm]
Power Consumption	6 Watts
Environment	See chassis specifications
Shipping Weight	1 lb. [0.45 kg]
Regulatory Compliance	CISPR/EN55022 Class A, EN55024, EN61000, FCC Class A, CE Mark
Warranty	Lifetime

Ordering Information

Complete list of fiber optic connector specifications [pg 212-224]

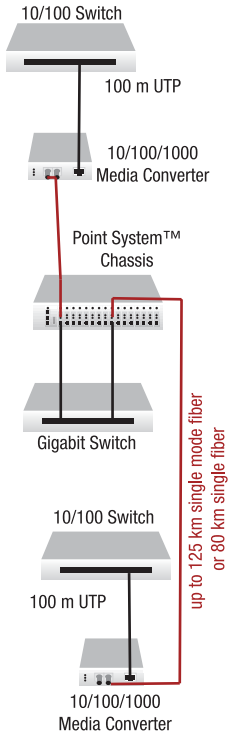
CGFEB1040-140
10/100/1000BASE-T (RJ-45) **[100 m/328 ft.]**
to (2) 1000BASE-X SFP Slots (empty)

CGFEB4040-180
100/1000BASE-X SFP Slot (empty)
to (2) 1000BASE-X SFP Slots (empty)

Optional Accessories *(sold separately)*

SFP Modules [pg 161-167]

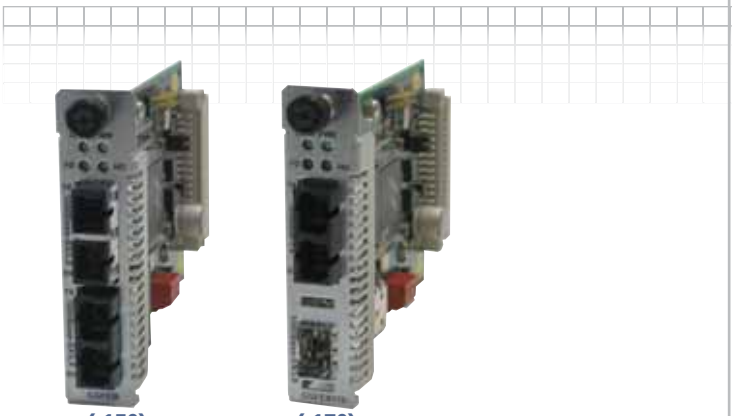
Extend Network Distance



AUTO NEG | AUTO CROSS | LINK PASS THRU | AUTO LINK RESTORE | PAUSE | FIELD UPGRADEABLE FIRMWARE | SOURCE ADDRESS CHANGE

CGFEB1xxx-15x & CGFEB1x40-170

100/1000 Bridging Media Converter



(-150) (-170)

Features

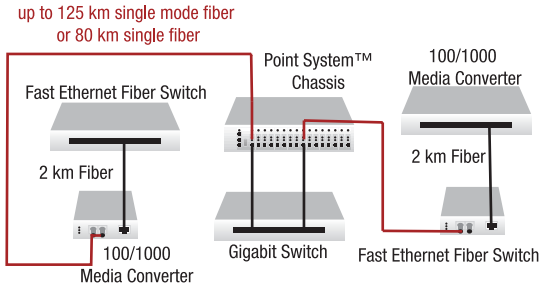
- Auto-Negotiation (1000Base-X ports) [pg 16]
- Link Pass Through [pg 17]
- Far-End-Fault (100Base-FX ports) [pg 16]
- Pause [pg 17]
- Automatic Link Restoration [pg 18]
- IEEE 802.1P QoS, IPv4 Tos/Diffserv, IPv6 traffic class
- IEEE 802.1q VLAN tagging and double tagging (Q in Q)
- Field Upgradeable Firmware [pg 18]
- Uni-directional data transmission allows secure traffic forwarding in only one direction
- Bandwidth Allocation [pg 18]
- DMI, Digital diagnostics per SFF-8472 **(-170 models)**
- RMON Counters for each port

Specifications

Complete list of fiber optic connector specifications [pg 212-224]

Standards	IEEE Std. 802.3, IEEE 802.3ab, IEEE 802.3u, IEEE 802.3z, IEEE 802.1P, IEEE 802.1q
Data Rate	**Fiber (fixed):** 100 Mbps **Fiber (SFP):** 1000 Mbps
Filtering Addresses	8K MAC Addresses
Max Frame Size	**802.3ac tagged:** 1628 bytes **Untagged:** 1632 bytes
Status LEDs	**PWR:** ON green = Power applied to card **FD (Duplex):** 100Base-FX port only Green: ON = Full-duplex Link; OFF =Half-duplex **LK1 (Fiber Link/Activity):** Port 1 Green: ON = Link; BLINK = Activity **LK2 (Fiber Link/Activity):** Port 2Green: ON = Link; BLINK = Activity
Dip Switches	**Switch 1:** Port 1 - half/full duplex **Switch 2:** Enable/Disable LPT **Switch 3:** not used **Switch 4:** not used **Switch 5:** not used **Switch 6:** not used
Dimensions	**Width:** 0.86" [22 mm] **Depth:** 5.0" [127 mm] **Height:** 3.4" [86 mm]
Power Consumption	4.0 Watts
Environment	See chassis specifications
Shipping Weight	1 lb. [0.45 kg]
Regulatory Compliance	CISPR/EN55022 Class A, EN55024, EN61000, FCC Class A, CE Mark
Warranty	Lifetime

Extend Network Distance



Ordering Information

Complete list of fiber optic connector specifications [pg 212-224]

CGFEB1313-150
100BASE-FX 1300nm MM (SC) **[2 km/1.2 mi.] Link Budget: 11.0 dB**
to 1000BASE-SX 850nm MM (SC) **[62.5/125 µm: 220 m/722 ft.] [50/125 µm: 550 m/1804 ft.] Link Budget: 7.0 dB**

CGFEB1324-150
100BASE-FX 1300nm MM (SC) **[2 km/1.2 mi.] Link Budget: 11.0 dB**
to 1000BASE-SX 1300nm Extended MM (62.5/125 µm fiber only) (SC) **[up to 2 km] Link Budget: 7.0 dB**

CGFEB1314-150
100BASE-FX 1300nm MM (SC) **[2 km/1.2 mi.] Link Budget: 11.0 dB**
to 1000BASE-LX 1310nm SM (SC) **[10 km/6.2 mi.] Link Budget: 7.0 dB**

CGFEB1315-150
100BASE-FX 1300nm MM (SC) **[2 km/1.2 mi.] Link Budget: 11.0 dB**
to 1000BASE-LX 1310nm SM (SC) **[25 km/15.5 mi.] Link Budget: 15.0 dB**

CGFEB1317-150
100BASE-FX 1300nm MM (SC) **[2 km/1.2 mi.] Link Budget: 11.0 dB**
to 1000BASE-LX 1550nm SM (SC) **[65 km/40.4 mi.] Link Budget: 20.0 dB**

CGFEB1335-150
100BASE-FX 1300nm MM (SC) **[2 km/1.2 mi.] Link Budget: 11.0 dB**
to 1000BASE-LX 1550nm SM (SC) **[125 km/77.7 mi.] Link Budget: 27.0 dB**

CGFEB1340-170
100BASE-FX 1300nm MM (SC) **[2 km/1.2 mi.] Link Budget: 11.0 dB**
to 1000BASE-X SFP Slot (empty)

CGFEB1440-170
100BASE-FX 1310nm SM (SC) **[20 km/12.4 mi.] Link Budget: 16.0 dB**
to 1000BASE-X SFP Slot (empty)

Optional Accessories *(sold separately)*

SFP Modules [pg 161-167]

Single Fiber Products

Recommended use in pairs [pg 19]

CGFEB1329-150
100BASE-FX 1300nm MM (SC) **[2km/1.2 mi.] Link Budget: 11.0 dB**
to 1000BASE-LX 1310nm TX/1550nm RX single fiber SM (SC) **[20 km/12.4 mi.] Link Budget: 13.0 dB**

CGFEB1329-151
100BASE-FX 1300nm MM (SC) **[2km/1.2 mi.] Link Budget: 11.0 dB**
to 1000BASE-LX 1550nm TX/1310nm RX single fiber SM (SC) **[20 km/12.4 mi.] Link Budget: 13.0 dB**

CGFEB1329-152
100BASE-FX 1300nm MM (SC) **[2km/1.2 mi.] Link Budget: 11.0 dB**
to 1000BASE-LX 1310nm TX/1550nm RX single fiber SM (SC) **[40 km/24.9 mi.] Link Budget: 20.0 dB**

CGFEB1329-153
100BASE-FX 1300nm MM (SC) **[2km/1.2 mi.] Link Budget: 11.0 dB**
to 1000BASE-LX 1550nm TX/1310nm RX single fiber SM (SC) **[40 km/24.9 mi.] Link Budget: 20.0 dB**

CGFEB1429-150
100BASE-FX 1310nm SM (SC) **[20 km/12.4 mi.] Link Budget: 16.0 dB**
to 1000BASE-LX 1310nm TX/1550nm RX single fiber SM (SC) **[20 km/12.4 mi.] Link Budget: 13.0 dB**

CGFEB1429-151
100BASE-FX 1310nm SM (SC) **[20 km/12.4 mi.] Link Budget: 16.0 dB**
to 1000BASE-LX 1550nm TX/1310nm RX single fiber SM (SC) **[20 km/12.4 mi.] Link Budget: 13.0 dB**

CGFEB1429-152
100BASE-FX 1310nm SM (SC) **[20 km/12.4 mi.] Link Budget: 16.0 dB**
to 1000BASE-LX 1310nm TX/1550nm RX single fiber SM (SC) **[40 km/24.9 mi.] Link Budget: 20.0 dB**

CGFEB1429-153
100BASE-FX 1310nm SM (SC) **[20 km/12.4 mi.] Link Budget: 16.0 dB**
to 1000BASE-LX 1550nm TX/1310nm RX single fiber SM (SC) **[40 km/24.9 mi.] Link Budget: 20.0 dB**

see also: 10/100/1000 Bridging Stand-Alone Media Converters [pg 101]

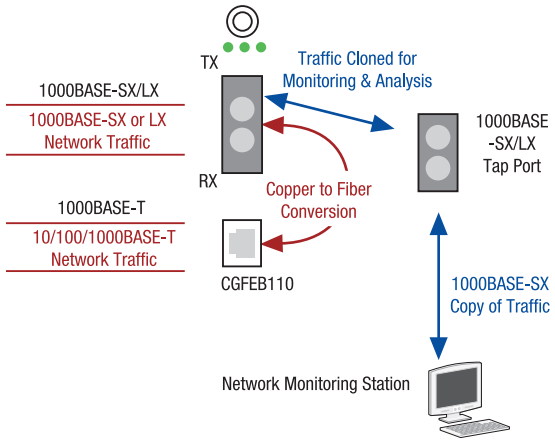
CGFEB10xx-11x

10/100/1000 Ethernet with Built-In Fiber Tap

Features

- Auto-Negotiation [pg 16]
- AutoCross™ [pg 16]
- Link Pass Through [pg 17]
- Pause [pg 17]
- Automatic Link Restoration [pg 18]
- Field Upgradeable Firmware [pg 18]
- Source Address Change (SAC) [pg 19]
- 802.1P Priority Mapping
- 1000BASE-SX Tap Port
- Fiber tap clones traffic; offering complete access to network traffic at line rate
- No latency associated with the fiber tap. No dB loss on fiber. Active device does not compro mise optical budget to monitor network performance.
- Users can view all fiber traffic including faults & timing errors
- SNMP managed TX or RX monitoring
- CGFEB cards cannot be used in the 1-Slot Point System™ Chassis [pg 31-32]

Convert 10/100/1000 Copper to Fiber & Monitor Critical Network Segments



Specifications

Complete list of fiber optic connector specifications [pg 212-224]

Standards	IEEE Std. 802.3ab, IEEE Std. 802.1P, IEEE Std. 802.3
Data Rate	**Copper:** 10/100/1000 Mbps **Fiber:** 1000 Mbps
Filtering Addresses	4K MAC Addresses
RAM Buffers	256K
Dip Switches	**Switch 1:** TX - Enable/Disable Auto-Negotiation **Switch 2:** TX - Force 10 Mbs or 100 Mbs with Auto-Negotiation off **Switch 3:** TX - Force Half or Full duplex with Auto-Negotiation off **Switch 4:** FBR - Enable/Disable Auto-Negotiation **Switch 5:** not used **Switch 6:** Enable/Disable LPT
Jumpers	**Jumper (ED):** Enable/Disable AutoCross™ **Jumper (HS):** Hardware/Software **Hardware:** Converter mode is determined by 6-position switch settings **Software:** Converter mode is determined by most recently saved on-board microprocessor settings
Status LEDs	**TP** (Duplex/Link/Activity) **TP** (10 Mbps/100 Mbps/1000 Mbps) **DPX** (Fiber Duplex) **LACT** (Fiber Link/Activity) **PWR** (Power)
Dimensions	**Width:** 1.68" [43 mm] **Depth:** 4.91" [125 mm] **Height:** 3.42" [87 mm]
Power Consumption	6.5 Watts
Environment	See chassis specifications
Shipping Weight	1 lb. [0.45 kg]
Regulatory Compliance	CISPR/EN55022 Class A, EN55024, EN61000, FCC Class A, CE Mark
Warranty	Lifetime

Ordering Information

CGFEB1013-110
Port 1 10/100/1000BASE-T (RJ-45) **[100 m/328 ft.]**
Port 2 1000BASE-SX 850nm multimode (SC) **[220/550 m/722/1804 ft.]*** **Link Budget: 7.0 dB**
Port 3 1000BASE-SX 850nm multimode (SC) **[220/550 m/722/1804 ft.]*** **Link Budget: 7.0 dB**

CGFEB1024-110
Port 1 10/100/1000BASE-T (RJ-45) **[100 m/328 ft.]**
Port 2 1000BASE-SX 1300nm Extended multimode (62.5/125 µm fiber only) (SC) **[up to 2 km]** **Link Budget: 7.0 dB**
Port 3 1000BASE-SX 850nm multimode (SC) **[220/550 m/722/1804 ft.]*** **Link Budget: 7.0 dB**

CGFEB1014-110
Port 1 10/100/1000BASE-T (RJ-45) **[100 m/328 ft.]**
Port 2 1000BASE-LX 1310nm single mode (SC) **[10 km/6.2 mi.]** **Link Budget: 7.0 dB**
Port 3 1000BASE-SX 850nm multimode (SC) **[220/550 m/722/1804 ft.]*** **Link Budget: 7.0 dB**

CGFEB1015-110
Port 1 10/100/1000BASE-T (RJ-45) **[100 m/328 ft.]**
Port 2 1000BASE-LX 1310nm single mode (SC) **[25 km/15.5 mi.]** **Link Budget: 15.0 dB**
Port 3 1000BASE-SX 850nm multimode (SC) **[220/550 m/722/1804 ft.]*** **Link Budget: 7.0 dB**

CGFEB1017-110
Port 1 10/100/1000BASE-T (RJ-45) **[100 m/328 ft.]**
Port 2 1000BASE-LX 1550nm single mode (SC) **[65 km/40.4 mi.]** **Link Budget: 20.0 dB**
Port 3 1000BASE-SX 850nm multimode (SC) **[220/550 m/722/1804 ft.]*** **Link Budget: 7.0 dB**

Single Fiber Products

Recommended use in pairs [pg 19]

CGFEB1029-110
Port 1 10/100/1000BASE-T (RJ-45) **[100 m/328 ft.]**
Port 2 1000BASE-LX 1310nm TX/1550nm RX single fiber single mode (SC) **[20 km/12.4 mi.]** **Link Budget: 13.0 dB**
Port 3 1000BASE-SX 850nm multimode (SC) **[220/550 m/722/1804 ft.]*** **Link Budget: 7.0 dB**

CGFEB1029-111
Port 1 10/100/1000BASE-T (RJ-45) **[100 m/328 ft.]**
Port 2 1000BASE-LX 1550nm TX/1310nm RX single fiber single mode (SC) **[20 km/12.4 mi.]** **Link Budget: 13.0 dB**
Port 3 1000BASE-SX 850nm multimode (SC) **[220/550 m/722/1804 ft.]*** **Link Budget: 7.0 dB**

**62.5/125 µm fiber: 220 m/722 ft.; 50/125 µm fiber: 550 m/1804 ft.*

AUTO CROSS | AUTO NEG | PAUSE | LINK PASS THRU | FAR END FAULT | LOOP BACK | BANDWIDTH ALLOCATION | FIELD UPGRADEABLE FIRMWARE | REMOTE MGMT | AUTO LINK RESTORE | SINGLE FIBER | LAST GASP

OAM/IP Remotely Managed 10/100/1000BASE-TX to 1000BASE-X

see also: 10/100/1000 OAM/IP-Based Remotely Managed Stand-Alone NIDs [pg 104]

CBFFG10xx-1xx

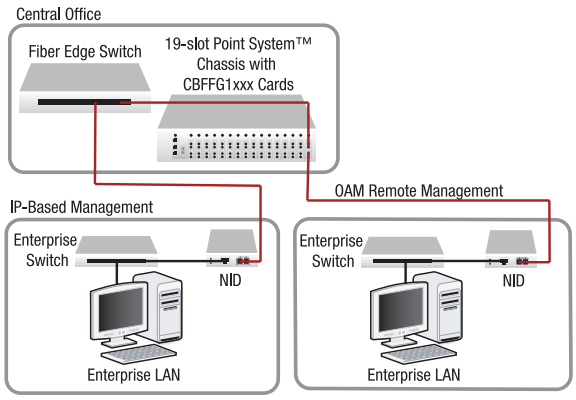
OAM/IP-Based Remotely Managed NID (Network Interface Device)

CARRIER ETHERNET MEF Certified Compliant™

Features

- 10K Jumbo Frame Support
- MEF 9 & MEF 14 Carrier Ethernet Certification
- Two selectable remote management modes:
  - IP-Based Remote Management [pg 17]
  - In-Band Link OAM 802.3ah (remote device managed by local peer)
- SNMP v1
- AutoCross™ [pg 16]
- Auto-Negotiation [pg 16]
- Pause [pg 17]
- Transparent Link Pass Through [pg 17]
- Far-End-Fault [pg 16]
- Remote Loopback [pg 18]
- IEEE 802.1p QoS packet classification with 4 egress queues
- Ipv4 IP TOS and DiffServ QoS classification, IPv6 Traffic class
- IEEE 802.1q VLAN, 4096 entries
- Static MAC, 64 entries
- Double VLAN tagging (C-tag/S-tag)
- VLAN Tunneling
- Selectable Ethertype for S-Tag when using Double VLAN Tagging 0x8100, 0x9100 or 0x88A8
- IEEE 802.1x Port based security
- RADIUS client
- RMON counters for each port
- Bandwidth Allocation per port [pg 18]
- DMI Optical Management
- USB port for basic setup
- Cable diagnostic function for TP ports
- 8K MAC addresses
- Field Upgradeable Firmware [pg 18]

Remotely Managed 10/100/1000 NID



- Applications:
  - Ethernet in the First Mile (EFM)
  - Fiber to the Premise (FTTP), E-Line and E-LAN
  - Enterprise markets

Specifications

Complete list of fiber optic connector specifications [pg 212-224]

Standards	IEEE Std. 802.3, IEEE Std. 802.3ah, IEEE Std. 802.1P, IEEE Std. 802.1Q, IEEE Std. 802.1X
Data Rate	**Copper:** 10/100/1000 Mbps **Fiber:** 1000 Mbps
Filtering Addresses	8K MAC Addresses
Max Frame Size	10,240 bytes
Dimensions	**Width:** 0.86" [22 mm] **Depth:** 5.0" [127 mm] **Height:** 3.4" [86 mm]
Power Consumption	5.1 Watts
Environment	See chassis specifications
Shipping Weight	1 lb. [0.45 kg]
Regulatory Compliance	EN55024, FCC Class A, CE Mark
Warranty	Lifetime

**CBFFG1040-105 and CBFFG4040-105 have SGMII support for use with 10/100/1000BASE-T copper SFPs.*

Ordering Information

Complete list of fiber optic connector specifications [pg 212-224]

CBFFG1013-105
CBFFG1013-115 (DMI Options)
10/100/1000BASE-T (RJ-45) **[100 m]**
to 1000BASE-SX 850nm MM (SC)
[62.5/125 µm fiber: 220 m/722 ft.]
[50/125 µm fiber: 550 m/1804 ft.]
Link Budget: 7.5 dB

CBFFG1014-105
CBFFG1014-115 (DMI Options)
10/100/1000BASE-T (RJ-45) **[100 m]**
to 1000BASE-LX 1310nm SM (SC)
[10 km/6.2 mi.] Link Budget: 10.5 dB

CBFFG1015-105
CBFFG1015-115 (DMI Options)
10/100/1000BASE-T (RJ-45) **[100 m]**
to 1000BASE-LX 1310nm SM (SC)
[25 km/15.5 mi.] Link Budget: 15.0 dB

CBFFG1017-105
10/100/1000BASE-T (RJ-45) **[100 m]**
to 1000BASE-X 1550nm SM (SC)
[65 km/40.4 mi.] Link Budget: 21.0 dB

CBFFG1024-105
10/100/1000BASE-T (RJ-45) **[100 m]**
to 1000BASE-LX 1310nm Extended MM (62.5/125 µm fiber only) (SC)
[2 km/1.2 mi.] Link Budget: 7.0 dB

CBFFG1035-105
10/100/1000BASE-T (RJ-45) **[100 m]**
to 1000BASE-X 1550nm SM (SC)
[120 km/77.7 mi.] Link Budget: 27.0 dB

***CBFFG1040-105**
10/100/1000BASE-T (RJ-45) **[100 m]**
to 100/1000BASE-X SFP Slot (empty)

***CBFFG4040-105**
100/1000BASE-X SFP Slot (empty)
to 100/1000BASE-X SFP Slot (empty)

Single Fiber Products

Recommended use in pairs [pg 19]

CBFFG1029-105
CBFFG1029-115 (DMI Options)
10/100/1000BASE-T (RJ-45) **[100 m]**
to 1000BASE-BX-U 1310nm TX/1490nm RX Bi-Di SM (SC)
[20 km/12.4 mi.] Link Budget: 14.0 dB

CBFFG1029-106
CBFFG1029-116 (DMI Options)
10/100/1000BASE-T (RJ-45) **[100 m]**
to 1000BASE-BX-D 1490nm TX/1310nm RX Bi-Di SM (SC)
[20 km/12.4 mi.] Link Budget: 14.0 dB

CBFFG1029-107
10/100/1000BASE-T (RJ-45) **[100 m]**
to 1000BASE-LX 1310nm TX/1490nm RX Bi-Di SM (SC)
[40 km/24.8 mi.] Link Budget: 20.0 dB

CBFFG1029-108
10/100/1000BASE-T (RJ-45) **[100 m]**
to 1000BASE-LX 1490nm TX/1310nm RX Bi-Di SM (SC)
[40 km/24.8 mi.] Link Budget: 20.0 dB

Optional Accessories *(sold separately)*

SFP Modules [pg 161-167]

USB Cables

USBC-AM-BM-03
USB 2.0 Cable A male to B male [3 ft. Gray]

USBC-AM-BM-06
USB 2.0 Cable A male to B male [6 ft. Gray]

CFMFF4040-100

Small Form Factor Pluggable Converter

These converters offer an excellent upgrade path for networks. Today's Fast Ethernet applications can be upgraded to Gigabit speeds tomorrow with a simple SFP swap. The converter remains installed, managed and fully operational at any of these speeds.

Using two similar data rate SFP modules allows for seamless connectivity between different wavelengths or fiber modes for speeds up to 2.5Gbps. Protocol independence allows for use in broad range of applications including Fast and Gigabit Ethernet, FDDI, ESCON, SONET OC-3, OC-12, OC-48 and Fibre Channel.

Digital diagnostics provide vital information about the state of your optical connection.

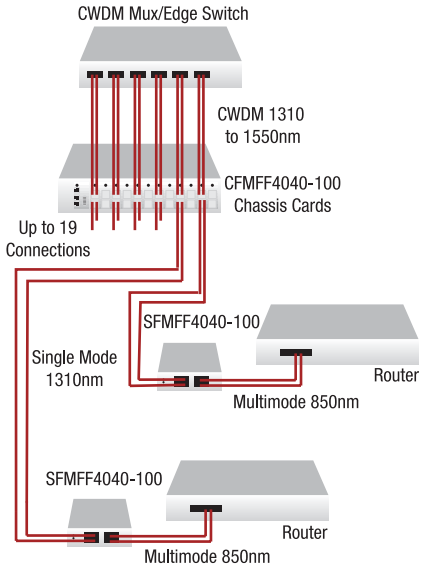
Features

- CWDM and DWDM SFP-ready platform allowing for cost-effective transponder functionality
- Link Pass Through [pg 17]
- DMI, Digital diagnostics per SFF-8472
- Automatic Link Restoration [pg 18]
- Field Upgradeable Firmware [pg 18]
- Can be used with any Point System™ Chassis [pg 31-32]
- Optical Intrusion Detection

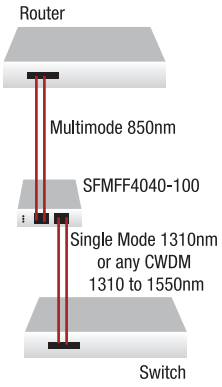
Monitor the physical layer of optical networks for signal strength degradation. The user can specify the threshold for sudden signal strength deterioration. Such a change often indicates a physical intrusion or fiber damage.

- Universal platform to accommodate any optical conversion options available via SFP interfaces
- Provides wavelength conversion while maintaining the same data rate
- (2) SFP Slots for SFP interfaces
- Protocol Transparency

Service Provider Application



Enterprise Application



Specifications

Standards	Multi-Source Agreement (MSA); Small Form Factor Pluggable (SFP) Status
LEDs	**LK1:** Link on Port 1 **LK2:** Link on Port 2 **PWR:** Power
Dimensions	**Width:** 0.86" [22 mm] **Depth:** 5.0" [127 mm] **Height:** 3.4" [86 mm]
Power Consumption	2 Watts with TN-SFP-xx modules installed
Environment	See chassis specifications
Regulatory Compliance	FCC Class A; EN55024 (CISPR 22) Class A; ICES-003; CISPRB; CE Mark
Warranty	Lifetime

Ordering Information

CFMFF4040-100
SFP Slot (empty) to SFP Slot (empty)

Optional Accessories *(sold separately)*

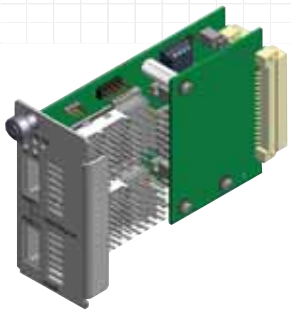
SFP Modules [pg 161-167]

10GBase-SR/LR/ER/ZR to10GBase-SR/LR/ER/ZR Optical Line Converter with XFP Slots

see also: 10GBase Optical Line Stand-Alone Media Converter [pg 107]

CTGFFxxxx-100

10 Gigabit Ethernet Fiber to Fiber Converter Module



The Transition Networks' 10 Gigabit Ethernet fiber to fiber converter is a two-port 10G pluggable media converter, supporting a variety of XFP and SFP+ modules allowing network designers to utilize the module to meet their network requirements.

The media converter can use either Transition Networks' or third party MSA compatible 10G XFP or SFP+ modules including support for the following standards; 10GBase-SR, 10GBase-LR, 10GBase-ER, 10GBase-LRM, and 10GBase-ZR.

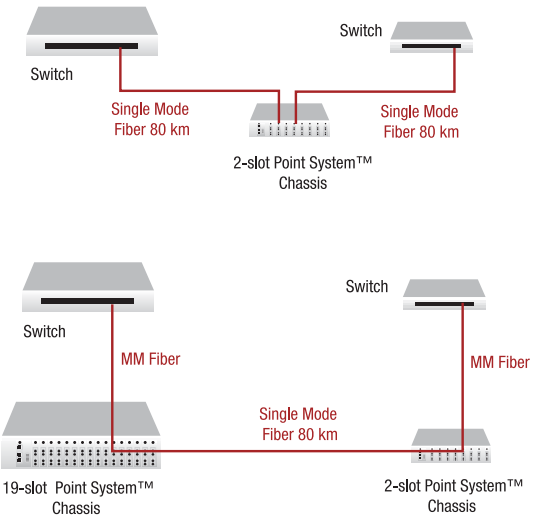
Copper to fiber conversion is also supported with the use of a 10GBase-CX4 XFP module in one of the ports.

This converter provides 3R (reamplify, reshape, and retime) optical signal regeneration.

Features

- Supports 10 Gigabit Ethernet Fiber to Fiber full duplex conversion
- LED Link Status Indicators
- Link Pass Through [pg 17]
- Auto Link Restore [pg 18]
- Loopback [pg 18]
- Supports +5V, +3.3V, and +1.8V MSA compliant XFP modules
- Supports 3R (Reamplify, Reshape, and Retime) optical signal regeneration
- For use in all Point System™ Chassis' except for the 1-Slot Chassis
- Manageable when installed in a managed Point System™ Chassis

10 Gigabit Ethernet Fiber to Fiber Converter Application



Specifications

Standards	IEEE Std. 802.3ae, IEEE 802.3ak, IEEE 802.3ag, IEEE 802.3, IEEE 802.3x, Multisource Agreement (MSA) XFP and SFP+
Data Rate	10 Gbps
Status LED	PWR (power): GREEN- power on 1LNK- fiber #1 link: GREEN- On link 1ACT- fiber #1 activity/fault: GREEN- BLINK activity, YELLOW- Fault 2LNK- fiber #2 link: GREEN- On link 2ACT- fiber #2 activity/fault: GREEN- BLINK activity, YELLOW- Fault
DIP Switches **SW1- Port 1 mode** **SW2- Port 2 mode** **SW3- LPT** **SW4-**	 **UP:** Limiting (xR); **DOWN:** Linear (LRM) **UP:** Limiting (xR); **DOWN:** Linear (LRM) **UP:** Enabled; **DOWN:** Disabled Interface loopback, forces each fiber to loop its RX to TX
Dimensions	**Width:** 1.72" [44 mm] **Depth:** 5.0" [127 mm] **Height:** 3.4" [86 mm]
Power Consumption	7 Watts
Environment	See chassis specifications
Shipping Weight	1 lb. [0.45 kg]
Regulatory Compliance	FCC Class A, EN55024 (CISPR22) Class A; CE Mark; EN55022 Class A
Warranty	Lifetime

Ordering Information

CTGFF4747-100
(2) Port 10GBase-xx open XFP to Open XFP

CTGFF4848-100
(2) Port 10GBase-xx open SFP+ to Open SFP+

CTGFF4748-100
(2) Port 10GBase-xx open XFP to Open SFP+

Optional Accessories *(sold separately)*

SFP+ Modules

TN-10GSFP-LR1
10GBase-LR/LW, SFP+ w/ Digital Diagnostics (DMI) 1310 DFB nm
[10 km/6.2 mi.] Link Budget: 6.4 dB

TN-10GSFP-LR2
10GBase-LR/LW, SFP+ w/ Digital Diagnostics (DMI) 1310 DFB nm
[20 km/12.4 mi.] Link Budget: 11.4 dB

TN-10GSFP-LR4
10GBase-LR/LW, SFP+ w/ Digital Diagnostics (DMI) 1310 DFB nm
[40 km/24.8 mi.] Link Budget: 16.5 dB

TN-10GSFP-LR7
10GBase-LR/LW, SFP+ w/ Digital Diagnostics (DMI) 1310 DFB nm
[70 km/43.4 mi.] Link Budget: 25 dB

TN-10GSFP-SR
10GBase-LR/LW, SFP+ w/ Digital Diagnostics (DMI) 850 DFB nm
[300/82/33 m; 985/269/108 ft.]
Link Budget: 2.6 dB

XFP Modules

TN-XFP-SR
10GBase-SR/SW/10G Fibre Channel, XFP w/ Digital Diagnostics (DMI) 850nm (LC)
[62.5/125 uM: 33 m/108 ft.]
[50/125 uM with 500 MHZ-km: 269 ft.]
[50/125 uM: 300 m/985 ft.]
Modal dispersion 39.cB

TN-XFP-LR1
10GBase-LR/LW/10G Fibre Channel, XFP w/Digital Diagnostics (DMI) 1310nm (LC)
[10 km/6.2 mi.] Link Budget: 6.2 dB

TN-XFP-LR2
10GBase-LR/LW/10G Fibre Channel, XFP w/ Digital Diagnostics (DMI) 1310nm (LC)
[20 km/12.4 mi.] Link Budget: 12.0 dB

TN-XFP-ER
10GBase-LR/ER/10G Fibre Channel, XFP w/ Digital Diagnostics (DMI) 1310nm (LC)
[40 km/24.9 mi.] Link Budget: 16.5 dB

TN-XFP-ZR
10GBase-LR/ER/10G Fibre Channel, XFP w/ Digital Diagnostics (DMI) 1550nm (LC)
[80 km/49.7 mi.] Link Budget: 23.0 dB

DS3-T3/E3 & STS-1 Coax to Fiber

see also: DS3-T3/E3 Point System™ Stand-Alone NID [pg 109]

CCSCF30xx-11x

DS3-T3/E3 and STS-1 Coax to Fiber NID

The DS3 – T3/E3 & STS-1 copper to fiber network interface device (NID) provides a solution for those users that need to extend DS3 connections over fiber.

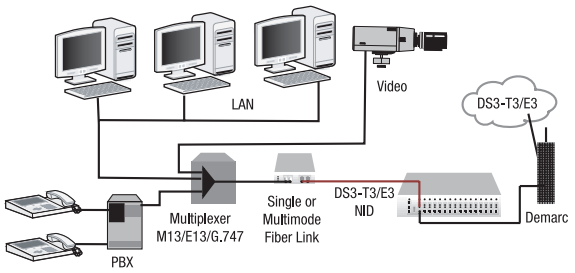
The DS3 – T3/Es & STS-1 supports Small Form Pluggable (SFP) transceivers to support a variety of fiber types, distances and wavelengths to provide maximum flexibility across a variety of network topologies. The use of Coarse Wave Division Multiplexing (CWDM) SFPs can be utilized to further increase the bandwidth capacity of the fiber infrastructure.

The DS3 – T3/E3 & STS-1 NID must be used in pairs*. A typical installation will include a chassis card installed in the Point System™ locally and a stand-alone device [SCSCF, pg 109] installed at the remote location.

Features

- AIS (Alarm Indication Signal)
- Coax Line Build Out
- Switch selectable for DS3/T3 or E3
- Loopback – Coax and Fiber [pg 18]
- LEDs for immediate visual status
- Supports dual or single fiber
- Supports multimode and single mode fiber at a variety of distances
- Supports CWDM SFPs
- SNMP management when used with Point System™ chassis and management module
- Field Upgradeable Firmware [pg 18] when used with Point System™ Chassis and management module

Integrate Voice & Data on Fiber Network



Specifications

Complete list of fiber optic connector specifications [pg 212-224]

Standards	ANSI, ITU-TS, ETSI, AT&T, G.703, G.921 & G.955
Coax Conectors	75 ohm coax **TX output** min: +2.5 dBm max: +9.1 dBm **RX input** min: -9.7dBm max: +10.5 dBm
Fiber Connectors	SFP: LC connector Uses standard 100BASE-X/OC-3 SFP
Data Rates	DS3/T3 = 44.7 Mbps; E3 = 34.4 Mbps; STS-1 = 51.8 Mbps
Status LED	Power, Coax link status, coax loop-back status, AIS on coax link; Fiber link status, fiber loop-back status, AIS on fiber link
Dimensions	Width: .87" [22 mm]; Depth: 5.0" [127 mm]; Height: 3.4" [86 mm]
Power Consumption	3.0 Watts
Environment	see chassis specifications
Shipping Weight	1.0 lbs. [0.45 kg]
Regulatory Compliance	CISPR/EN55022 Class A; FCC Class A; CE Mark
MTBF	Greater than 250,000 hours (MIL-HDBD-217F) Greater than 687,000 hours (Bellcore)
Warranty	Lifetime

Ordering Information

Complete list of fiber optic connector specifications [pg 212-224]

CCSCF3011-110
(2) Coax (BNC)
to 1300nm multimode (ST)
[2 km/ 1.2 mi.] Link Budget: 14.0 dB

CCSCF3013-110
(2) Coax (BNC)
to 1300nm multimode (SC)
[2 km/ 1.2 mi.] Link Budget: 14.0 dB

CCSCF3014-110
(2) Coax (BNC)
to 1310nm single mode (SC)
[20 km/12.4 mi.] Link Budget: 19.0 dB

CCSCF3015-110
(2) Coax (BNC)
to 1310nm single mode (SC)
[40 km/24.9 mi.] Link Budget: 29.0 dB

CCSCF3016-110
(2) Coax (BNC)
to 1310nm single mode (SC)
[60 km/37.3 mi.] Link Budget: 32.0 dB

CCSCF3017-110
(2) Coax (BNC)
to 1550nm single mode (SC)
[80 km/49.7 mi.] Link Budget: 29.0 dB

CCSCF3040-110
(2) Coax (BNC)
to SFP slot (empty)

Single Fiber Products

Recommended use in pairs [pg 19]

CCSCF3029-110
(2) Coax (BNC)
to 1310nm TX/1550nm RX single fiber single mode (SC)
[20 km/12.4 mi.] Link Budget: 19.0 dB

CCSCF3029-111
(2) Coax (BNC)
to 1550nm TX/1310nm RX single fiber single mode (SC)
[20 km/12.4 mi.] Link Budget: 19.0 dB

CCSCF3029-112
(2) Coax (BNC)
to 1310nm TX/1550nm RX single fiber single mode (SC)
[40 km/24.9 mi.] Link Budget: 25.0 dB

CCSCF3029-113
(2) Coax (BNC)
to 1550nm TX/1310nm RX single fiber single mode (SC)
[40 km/24.9 mi.] Link Budget: 25.0 dB

CCSCF3029-114
(2) Coax (BNC)
to 1310nm TX/1550nm RX single fiber single mode (SC)
[60 km/37.3 mi.] Link Budget: 29.0 dB

CCSCF3029-115
(2) Coax (BNC)
to 1550nm TX/1310nm RX single fiber single mode (SC)
[60 km/37.3 mi.] Link Budget: 29.0 dB

CCSCF3029-116
(2) Coax (BNC)
to 1310nm TX/1550nm RX single fiber single mode (SC)
[80 km/49.7 mi.] Link Budget: 33.0 dB

CCSCF3029-117
(2) Coax (BNC)
to 1550nm TX/1310nm RX single fiber single mode (SC)
[80 km/49.7 mi.] Link Budget: 32.0 dB

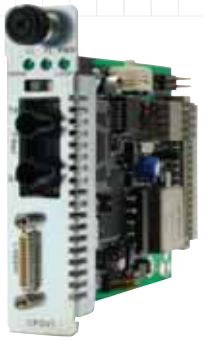
**The CCSCF30xx-110 will only work with another CCSCF30xx-110 or SCSCF30xx110. The product does not work with a -10x model.*

High Speed Serial: V.35/X.21/RS449/RS530/RS232 with Remote Management

see also: Stand-Alone Network Interface Device [pg 113]

CPSVT26xx-10x

Remotely Managed High Speed Serial NID (Network Interface Device)



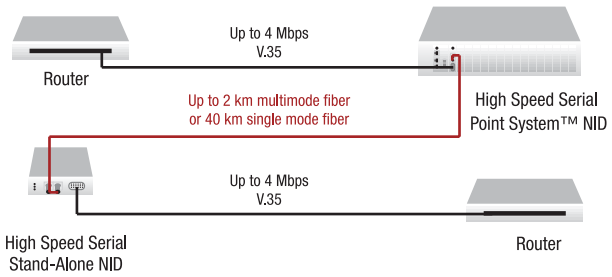
Features

- Connect High Speed Serial signals on copper to fiber
- Supports multiple protocols through the use of a universal 26-pin serial interface connector
- Extend the point of presence of a copper V.35/X.21/RS449/RS530/RS232 connection at data rates up to 10 Mbps.
- Supports Remote Management of a stand-alone NID [pg 17]
- Copper & Fiber Loopback [pg 18]
- LED indications for Fiber Link, Loopback & Data [pg 18]
- Ability to use a combination of any copper interface (RS449 to V.35, RS530 to X.21, DTE-DTE, DTE-DCE, DCE-DCE, etc.)
- All interfaces converted at the physical level
- Synchronous or asynchronous capability
- Field Upgradeable Firmware [pg 18]

Management Features

- Report device status to chassis management software
  - Local Fiber Link status
  - Local/Remote Hardware/ Software mode
  - Local/Remote Speed select
  - Local/Remote Loopback [pg 18]
  - Local/Remote Cable type reporting, near end
  - Local/Remote Clock polarity setting
- Write operation includes:
  - Local or Remote Loopback
  - Local or Remote Speed Select

Extend Distance Between Routers



Specifications

Complete list of fiber optic connector specifications [pg 212-224]

Standards	ITU-T; ISO-2593
Data Rate	1.2 Kbps to 10 Mbps
Switches	• 0 – TT = Receive CLK • 1 – 56 Kbps • 2 – 64 Kbps • 3 – 112 Kbps • 4 – 128 Kbps • 5 – 256 Kbps • 6 – 384 Kbps • 7 – 512 Kbps • 8 – 768 Kbps • 9 – 1.024 Mbps • A – 1.544 Mbps • B – 2.048 Mbps • C – 3.072 Mbps • D – 4.096 Mbps • E – 6.144 Mbps • F – Asynchronous Mode Side panel, external **DCE speed switch**, sixteen positions: Speeds can also be set on DCE converters locally or remotely via software. Front Panel, **Loop-back Selector Switch**: Right Position: Loop Fiber Back & Loop Copper Back Left Position: Normal Operation
Jumpers	**Jumper (J4):** Hardware/Software mode **Jumper (J6): RX Clock Polarity:** Set to sample the receive data on the *rising* or *falling* edge of the receive clock **Jumper (J7): TX Clock Polarity:** Set to sample the transmit data on the *rising* or *falling* edge of the receive clock
Status LEDs	**Smart Serial Link:** Green - Link is up; Green Flashing - In loop-back mode; **Fiber:** Green - Link is up; Green Flashing - In loop-back mode; **PWR (Power):** Green - ON power applied to board
Dimensions	**Width:** 0.86" [22 mm] **Depth:** 5.0" [127 mm] **Height:** 3.4" [86 mm]
Power Consumption	5.0 Watts
Environment	See chassis specifications
Shipping Weight	1 lb. [0.45 kg]
Regulatory Compliance	CISPR/EN55022, EN55024, EN60950 Class A; FCC Class A; CE Mark
Warranty	Lifetime

Ordering Information

Complete list of fiber optic connector specifications [pg 212-224]

CPSVT2611-100
26-pin to 1300nm multimode (ST)
[2 km/1.2 mi.] Link Budget: 11.0 dB

CPSVT2613-100
26-pin to 1300nm multimode (SC)
[2 km/1.2 mi.] Link Budget: 11.0 dB

CPSVT2614-100
26-pin to 1310nm single mode (SC)
[20 km/12.4 mi.] Link Budget: 16.0 dB

Single Fiber Products

Recommended use in pairs [pg 19]

CPSVT2629-100
26-pin to 1310nm TX/1550nm RX single fiber single mode (SC)
[20 km/12.4 mi.] Link Budget: 19.0 dB

CPSVT2629-101
26-pin to 1550nm TX/1310nm RX single fiber single mode (SC)
[20 km/12.4 mi.] Link Budget: 19.0 dB

CPSVT2629-102
26-pin to 1310nm TX/1550nm RX single fiber single mode (SC)
[40 km/24.9 mi.] Link Budget: 25.0 dB

CPSVT2629-103
26-pin to 1550nm TX/1310nm RX single fiber single mode (SC)
[40 km/24.9 mi.] Link Budget: 25.0 dB

Cable Assemblies

21DCE-3
DB-15 (FT) (26-pin) to (DCE) [3 m/10 ft.]

21DTE-3
DB-15 (MT) (26-pin) to (DTE) [3 m/10 ft.]

232DCE-3
DB-25 (FT) (26-pin) to (DCE) [3 m/10 ft.]

232DTE-3
DB-25 (MT) (26-pin) to(DTE) [3 m/10 ft.]

35DCE-3
V.35 (FT) (26-pin) to (DCE) [3 m/10 ft.]

35DTE-3
V.35 (MT) (26-pin) to (DTE) [3 m/10 ft.]

449DCE-3
DB-37 (FT) (26-pin) to (DCE) [3 m/10 ft.]

449DTE-3
DB-37 (MT) (26-pin) to (DTE) [3 m/10 ft.]

530DCE-3
DB-25 (FT) (26-pin) to (DCE) [3 m/10 ft.]

530DTE-3
DB-25 (MT) (26-pin) to (DTE) [3 m/10 ft.]

Copper Distances

Standard	Range*
RS232/V.24	15 m
RS449/V.36	1.2 km
V.35	600 m
X.21	1.2 km
RS530	1.2 km

*For reference only. Contact Transition Networks for detailed range information.

RS232 Copper to Fiber with Remote Management

see also: RS232 Stand-Alone Media Converter [pg 111]

RS232

CRS2F311x-100

Remotely Managed RS232 Media Converter

- Ideal for campus or business environments where remote devices can be networked in a point to-point configuration and distances are greater than the 15 m limitation of conventional copper serial cables.

Features

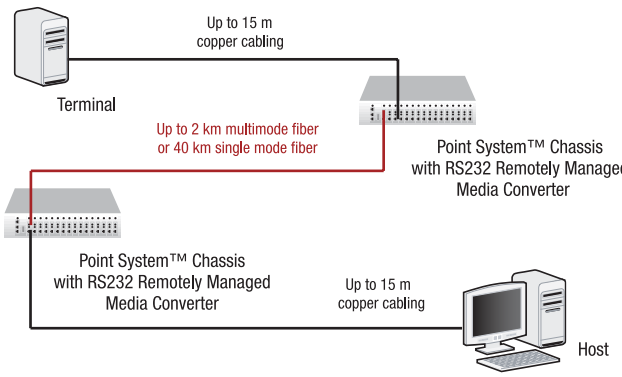
- Read/write access to remote stand-alone unit
- Local or Remote Loopback on copper and fiber [pg 18]
- DTE/DCE switch for easy installation with straight-through cabling
- Full/Half-duplex asynchronous transmission at speeds up to 115 Kbps
- Supports the following flow control signaling:
  1. DCD - Data Carrier Detect
  2. RXD - Receive Data
  3. TXD - Transmit Data
  4. DTR - Data Terminal Ready
  5. SG - Signal Ground
  6. DSR - Data Set Ready
  7. RTS - Request To Send
  8. CTS - Clear To Send
- Field Upgradeable Firmware [pg 18]

Extend Network Distance

Link a remote terminal to a host computer: Connect multiple devices, such as security scanners, POS devices, remote terminals and building access/alarming systems to a host computer.

Transition Networks' serial RS232 to Fiber converters allow you to extend the distance between serial connections with the use of fiber optic cable. These full-featured converters transmit the full complement of RS232 flow control/handshaking signals optically and supports full or half-duplex asynchronous data transmission at speeds up to 115 Kbps.

The diagnostic features included on these converters make installation easy and intuitive. A DTE/DCE switch eliminates the frustration over selecting the appropriate cable. A Loopback [pg 18] switch allows for complete diagnostic testing prior to system turn-up or during troubleshooting. Unit and Port LEDs allow for quick status information of the device.



Specifications

Complete list of fiber optic connector specifications [pg 212-224]

Standards	EIA/TIA-574, EIA/TIA RS-232E
Data Rate	115 Kbps
Switches	**DTE/DCE:** Select appropriate position **Loop-back:** Norm = normal operation; Loop = Fiber and copper loop-back
Status LEDs	**P (Power):** Lit for normal operation **RX:** Steady = Copper Link; Flashing = Rx Data **FL:** Steady = Fiber Link; Flashing = Loop back mode
Dimensions	**Width:** 0.86" [22 mm] **Depth:** 5.0" [127 mm] **Height:** 3.4" [86 mm]
Power Consumption	5.0 Watts
Environment	See chassis specifications
Shipping Weight	1 lb. [0.45 kg]
Regulatory Compliance	CISPR22/EN55022 Class A + EN55024; EN60950 Class A; FCC Class A; CE Mark
Warranty	Lifetime

Ordering Information

Complete list of fiber optic connector specifications [pg 212-224]

CRS2F3111-100
DB-9 [15 m/49 ft.]
to 1300nm multimode (ST)
[2 km/1.2 mi.] Link Budget: 11.0 dB

CRS2F3113-100
DB-9 [15 m/49 ft.]
to 1300nm multimode (SC)
[2 km/1.2 mi.] Link Budget: 11.0 dB

CRS2F3114-100
DB-9 [15 m/49 ft.]
to 1310nm single mode (SC)
[20 km/12.4 mi.] Link Budget: 16.0 dB

CRS2F3115-100
DB-9 [15 m/49 ft.]
to 1310nm single mode (SC)
[40 km/24.9 mi.] Link Budget: 26.0 dB

CRS2F3129-100
DB-9 [15 m/49 ft.]
to 1310TX/1550RX single fiber SM (SC)
[20 km/12.4 mi.] Link Budget: 19.0 dB

CRS2F3129-101
DB-9 [15 m/49 ft.]
to 1550TX/1310RX single fiber SM (SC)
[20 km/12.4 mi.] Link Budget: 19.0 dB

CRS2F3129-102
DB-9 [15 m/49 ft.]
to 1310TX/1550RX single fiber SM (SC)
[40 km/24.8 mi.] Link Budget: 25.0 dB

CRS2F3129-103
DB-9 [15 m/49 ft.]
to 1550TX/1310RX single fiber SM (SC)
[40 km/24.8 mi.] Link Budget: 25.0 dB

Management Features

- Report Converter status to chassis management software:
  - Local Fiber Link status
  - Local/Remote Hardware/Software mode
  - Local/Remote Loopback [pg 18]
  - Local/Remote DTE/DCE mode
  - Local/Remote link status
- Write operation includes:
  - Local Loopback [pg 18]
  - Remote Loopback [pg 18]
- Can be used with any Point System™ Chassis [pg 31-32]

CRS4F3x1x-100

RS422/485 Copper to Fiber Media Converter

- Ideal for campus or business environments where remote devices can be networked in either a point-to-point or point to multi point configuration.

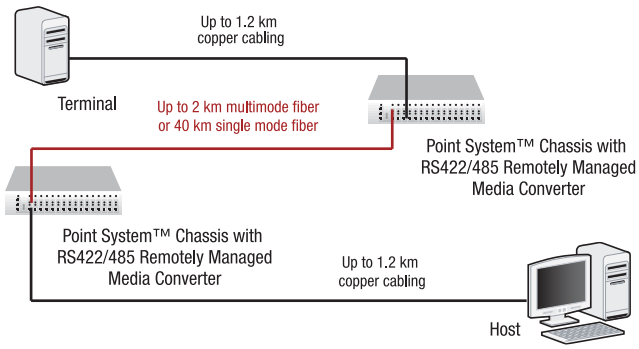
Link a remote terminal to a host computer. Connect multiple devices, such as security scanners, POS devices, remote terminals and building access/alarming systems to a host computer.

Transition Networks' serial RS-422/485 to Fiber Media Converter allows you to extend the distance between serial connections with the use of fiber optic cable. This full-featured converter operates in 2-wire mode for RS-422 and either 2-wire or 4-wire mode for RS-485 and supports full or half-duplex data transmission at speeds up to 1.25 Mbps.

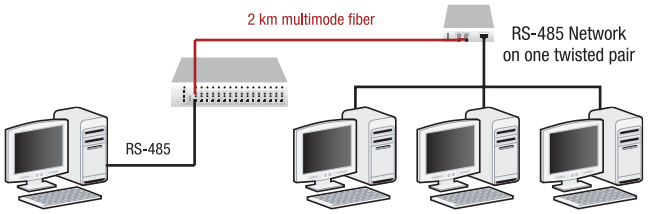
Features

- RS422 or RS485 operation
- 2-wire or 4-wire in operation in RS-485 mode
- Full/Half-duplex transmission at speeds up to 1.25 Mbps
- Field Upgradeable Firmware [pg 18]
- Can be used with any Point System™ Chassis [pg 31-32]

Extend Network Distance



Connect Multiple Devices



Specifications

Complete list of fiber optic connector specifications [pg 212-224]

Standards	EIA/TIA RS-422, EIA/TIA RS-485
Switches	**SW1:** 130 ohm resistor Rx (Down = enable) **SW2:** 130 ohm resistor Tx (Down = enable) **SW3:** 1k ohm "pull-down" (Down = enable) **SW4:** 1k ohm "pull-up" (Down = enable) **SW5:** 2-wire/4-wire (Down = 4-wire) **SW6:** RS-485/RS-422 (Down = RS-422)
Status LEDs	**PWR (Power):** Lit for normal operation **RXC:** Steady = Data Rx on copper link; Flashing = Rx Data at low speed **RXF:** Steady = Fiber Link
Dimensions	**Width:** 0.86" [22 mm] **Depth:** 5.0" [127 mm] **Height:** 3.4" [86 mm]
Power Consumption	5.0 Watts
Environment	See chassis specifications
Shipping Weight	1 lb. [0.45 kg]
Regulatory Compliance	CISPR22/EN55022; EN55024; EN60950 Class A; FCC Class A; CE Mark; UL 1950
Warranty	Lifetime

Ordering Information

Complete list of fiber optic connector specifications [pg 212-224]

CRS4F3111-100
DB-9 **[1.2 km/0.7 mi.]**
to 1300nm multimode (ST)
[2 km/1.2 mi.] Link Budget: 11.0 dB

CRS4F3113-100
DB-9 **[1.2 km/0.7 mi.]**
to 1300nm multimode (SC)
[2 km/1.2 mi.] Link Budget: 11.0 dB

CRS4F3114-100
DB-9 **[1.2 km/0.7 mi.]**
to 1310nm single mode (SC)
[20 km/12.4 mi.] Link Budget: 16.0 dB

CRS4F3115-100
DB-9 **[1.2 km/0.7 mi.]**
to 1310nm single mode (SC)
[40 km/24.9 mi.] Link Budget: 26.0 dB

CRS4F3211-100
Terminal Block **[1.2 km/0.7 mi.]**
to 1300nm multimode (ST)
[2 km/1.2 mi.] Link Budget: 11.0 dB

CRS4F3213-100
Terminal Block **[1.2 km/0.7 mi.]**
to 1300nm multimode (SC)
[2 km/1.2 mi.] Link Budget: 11.0 dB

CRS4F3214-100
Terminal Block **[1.2 km/0.7 mi.]**
to 1310nm single mode (SC)
[20 km/12.4 mi.] Link Budget: 16.0 dB

CRS4F3215-100
Terminal Block **[1.2 km/0.7 mi.]**
to 1310nm single mode (SC)
[40 km/24.9 mi.] Link Budget: 26.0 dB

Management Features

Report converter status to chassis management software:

- Local Fiber Link status
- Receive data activity on the copper link
- Local Switch settings
  - 130 ohm resistor on RX
  - 130 ohm resistor on TX
  - 1K ohm "pull down"
  - 1K ohm "pull up"
  - 2-wire/4-wire operation
  - RS-485/RS-422 operation

CSDTFx0xx-12x

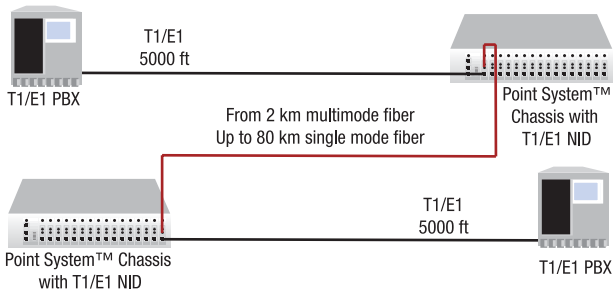
Remotely Managed T1/E1 NID (Network Interface Device)

Features

- Remote in-band management [pg 17]
- Local or Remote Loopbacks on copper or fiber in software mode
- Loopback switch facilitates local installation [pg 18]
- Converts the copper ports on T1/E1 devices, such as a PBX or T1/E1 Router, to multimode or single mode fiber
- Switch selectable RJ-48 connectors for T1 or E1
- Jitter attenuators optimize Bit Error Rate (BER) performance
- Network debug procedures make BER testing more convenient
- Built-in troubleshooting with the addition of a selectable TAOS (Transmit All Ones) switch on the fiber and copper interfaces allows the network engineer to test all T1/E1 equipment on that network segment and ensure the network link
- Dry Relay Contacts enable the device to be tied into a separate alarm circuit commonly found in a T1/E1 twisted pair environment. Contacts will be activated on loss of power or loss of fiber link.
- Field Upgradeable Firmware [pg 18]
- LED provides Alarm Indication Signal (AIS)
- Can be used with fractional T1/E1 circuits

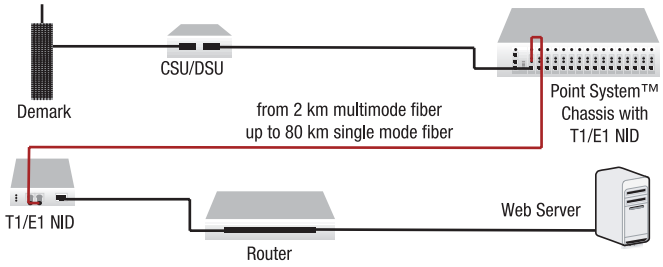
Provide Campus Interconnects

With the exception of Ethernet, T1/E1 is one of the most common campus/ metropolitan area networking interconnects. A copper to fiber conversion on the premise side of the T1/E1 makes it easier to integrate voice traffic, frame relay or IP type traffic on your fiber network.



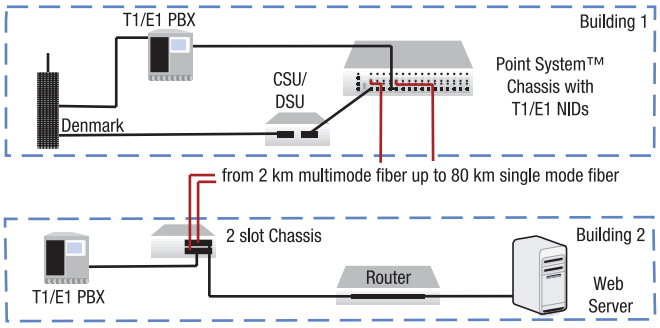
Remote Management

Stand-alone can be managed remotely when used with a managed chassis.



Extend T1 Networks

Extend T1 to other buildings in a campus or MAN from 2 km to 80km for voice or data applications.



Point System™ Management Features

- Report local or remote NID status:
  - Copper & Fiber Link status
  - Hardware switch settings: LBO, AIS Copper, AIS Fiber, HW/SW
  - AIS detected Copper & Fiber
  - Model Number
  - Copper & Fiber Connector
- Local or remote command operations include:
  - Loopback Copper & Fiber [pg 18]
  - AIS transmitted on Fiber on loss of Copper link
  - AIS Transmitted on Copper on loss of Fiber link
  - Boot-load firmware

- The Remotely Managed T1/E1 copper to fiber NID will provide a solution for users who desire to extend their T1 or E1 circuits over fiber and remotely manage them “in-band” from admin locations.

T1/E1 NID (Network Interface Device) with Remote Management

Devices must be used in pairs. Typical installation will include a chassis card installed in the Point System™ locally and a stand-alone device [SSDTF, pg 114-115] installed at the remote location.

Specifications

Complete list of fiber optic connector specifications [pg 212-224]

Standards	ITU-T, ANSI, AT&T, ETSI
3-position Jumper	**Hardware:** NID mode is determined by 4-position switch settings **Software:** NID mode is determined by most recently saved on-board microprocessor settings
Status LEDs	**PWR (Power):** Steady green LED indicates connection to external AC power **SDC (Signal Detect/Copper):** On indicates twisted pair link is up **SDF (Signal Detect/Fiber):** On indicates fiber link is up
Dimensions	**Width:** 0.86" [22 mm] **Depth:** 5.0v [127 mm] **Height:** 3.4" [86 mm]
Power Consumption	6.0 Watts
Environment	See chassis specifications
Shipping Weight	1 lb. [0.45 kg]
Regulatory Compliance	CISPR/EN55022 Class A; FCC Class A; CE Mark
Warranty	Lifetime

Ordering Information

Complete list of fiber optic connector specifications [pg 212-224]

CSDTF1011-120
Twisted Pair (RJ-48) **[1.5 km/0.9 mi.]**
to 850nm multimode (ST)
[2 km/1.2 mi.] Link Budget: 13.5 dB

CSDTF1013-120
Twisted Pair (RJ-48) **[1.5 km/0.9 mi.]**
to 850nm multimode (SC)
[2 km/1.2 mi.] Link Budget: 13.5 dB

CSDTF1027-120
Twisted Pair (RJ-48) **[1.5 km/0.9 mi.]**
to 1300nm multimode (ST)
[5 km/3.1 mi.] Link Budget: 13.5 dB

CSDTF1012-120
Twisted Pair (RJ-48) **[1.5 km/0.9 mi.]**
1310nm single mode (ST)
[8 km/5 mi.] Link Budget: 7.0 dB

CSDTF1022-120
Twisted Pair (RJ-48) **[1.5 km/0.9 mi.]**
to 1310nm single mode (ST)
[15 km/9.3 mi.] Link Budget: 10.0 dB

CSDTF1014-120
Twisted Pair (RJ-48) **[1.5 km/0.9 mi.]**
to 1310nm single mode (SC)
[20 km/12.4 mi.] Link Budget: 16.0 dB

CSDTF1015-120
Twisted Pair (RJ-48) **[1.5 km/0.9 mi.]**
to 1310nm single mode (SC)
[40 km/24.9 mi.] Link Budget: 30.0 dB

CSDTF1016-120
Twisted Pair (RJ-48) **[1.5 km/0.9 mi.]**
to 1310nm single mode (SC)
[60 km/37.3 mi.] Link Budget: 33.0 dB

CSDTF1017-120
Twisted Pair (RJ-48) **[1.5 km/0.9 mi.]**
to 1550nm single mode (SC)
[80 km/49.7 mi.] Link Budget: 29.0 dB

Single Fiber Products

Recommended use in pairs [pg 19]

CSDTF1029-120
Twisted Pair (RJ-48) **[1.5 km/0.9 mi.]**
to 1310nm TX /1550nm RX single fiber SM (SC)
[20 km/12.4 mi.] Link Budget: 19.0 dB

CSDTF1029-121
Twisted Pair (RJ-48) **[1.5 km/0.9 mi.]**
to 1550nm TX /1310nm RX single fiber SM (SC)
[20 km/12.4 mi.] Link Budget: 19.0 dB

CSDTF1029-122
Twisted Pair (RJ-48) **[1.5 km/0.9 mi.]**
to 1310nm TX /1550nm RX single fiber SM (SC)
[40 km/24.9 mi.] Link Budget: 25.0 dB

CSDTF1029-123
Twisted Pair (RJ-48) **[1.5 km/0.9 mi.]**
to 1550nm TX /1310nm RX single fiber SM (SC)
[40 km/24.9 mi.] Link Budget: 25.0 dB

see also: 4xT1 Transport Mux Stand-Alone NIDs [pg 116, 117]

C4TEF10xx-10x

4x T1/E1/J1 Copper to Fiber Transport Mux

- Low cost transport capability: (4) T1/E1/J1 and (1) RS232 data channel line
- Target applications of the device include: FTTx, such as Fiber-to-the-Business, Fiber-to-the-Building, Fiber-to-the-MDU and Fiber-to-the-Home; Cell Tower backhaul

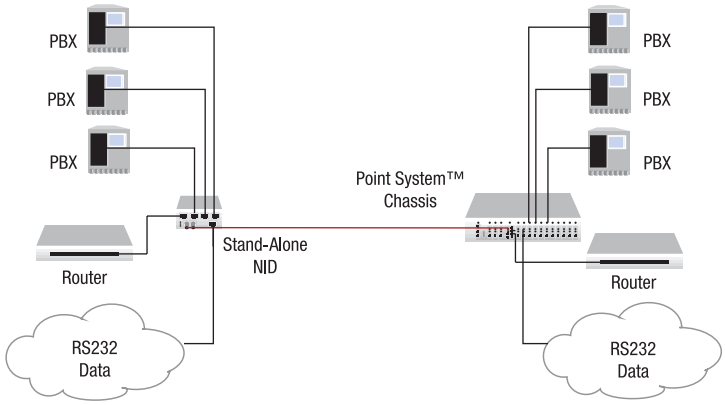
Features

- Automatic Link Restoration [pg 18]
- Remote Management [pg 17]
- Local & Remote Loopback [pg 18]
- AIS/TAOS
- LEDs for each data port
- DIP switches for line code, line length, local loopback or remote loopback [pg 18]
- T1/E1/J1 mode settings
- Dry Relay Contacts on each TDM port
- Mirror Port (SNMP selectable)
- Local (AUX) Management Interface (RS232 connector)
- Switch selection for Data or Management mode on RS232
- Access to complete status information on local and remote device
- Access to local and remote configuration
- Switch or SNMP selected Baud rate operation
- Field Upgradeable Firmware [pg 18]

Management Features

- Report local device status:
  - Fiber Link Status
  - Copper Link Status for each T1/E1
  - Hardware switch settings: LBO, AIS on C/F, HW/SW, speed
  - AIS detected Fiber & Copper
  - Model Number
  - Copper & Fiber Connectors
- Local command operations include:
  - Loopback Fiber & T1/E1 per channel
  - AIS TX on fiber on loss of copper link & AIS TX on copper on loss of fiber link [pg 18]
  - Serial connection speed and parity (Software Mode)
  - T1/E1 Mirror Port Modes (Port Trapping)
  - Boot-load firmware upgrades
- Remote device status:
  - Fiber Link status
  - Copper Link Status for each T1/E1
  - Hardware switch settings: LBO, AIS on C/F, HW/SW, speed
  - AIS detected Fiber & Copper
  - Model Number
  - Copper & Fiber Connectors
- Remote Commands:
  - Loopback Fiber & T1/E1 per channel
  - Serial connection speed and parity (Software Mode)
  - AIS TX on fiber on loss of copper link & AIS TX on copper on loss of fiber link

Application



Specifications

Complete list of fiber optic connector specifications [pg 212-224]

Standards	AMI/B8ZS/HDB3; G.703 Telecordia TR-NWT-001089: FCC Part 68, UL1459; ITU-T, ANSI, AT&T, ETSI; TBR 12; PD 7024: 1994 (NTR 4)
Switches	Numerous switch settings for line coding, line buildout, loopback (per port), AIS setting, data/mgmt RS-232 and RS-232 port speed and parity
Jumper	**Hardware:** device mode is determined by DIP switch settings **Software:** device mode is controlled by the most recently saved, on-board microprocessor settings
Dimensions	**Width:** 1.72" [44 mm] **Depth:** 5.0" [127 mm] **Height:** 3.4" [86 mm]
Power Consumption	6.0 Watts
Environment	See chassis specifications
Shipping Weight	1 lb. [0.45 kg]
Regulatory Compliance	FCC Class A; VCCI Class A; EN 55022 (CISPR 22) Class A; ICES-003
Warranty	Lifetime

*Note: C4TEF cards cannot be used with the 1-Slot Point System™ Chassis [pg 31].

The product provides physical layer status monitoring and alarm classification functions for Telecom operators to manage their fiber optic network and reduce OPEX and maintenance costs.

Copper connections are compatible with G.703 and AMI/B8ZS/HDB3; while the optical connection will run at 155 Mbps. A hardware-based solution guarantees the constant bit rate of TDM transport without requiring traffic management.

Devices must be used in pairs. Typical installation will include a chassis card installed in the Point System™ locally and a stand-alone device [S4TEF, pg 116-117] installed at the remote location.

Ordering Information

Complete list of fiber optic connector specifications [pg 212-224]

C4TEF1011-100
1300nm multimode (ST)
[2 km/1.2 mi.] Link Budget: 11.0 dB
to (4) RJ-48 **[1.5 km/0.9 mi.]**
plus 6-pin DIN **[3 m/10 ft.]**

C4TEF1013-100
1300nm multimode (SC)
[2 km/1.2 mi.] Link Budget: 11.0 dB
to (4) RJ-48 **[1.5 km/0.9 mi.]**
plus 6-pin DIN **[3 m/10 ft.]**

C4TEF1014-100
1310nm single mode (SC)
[20 km/12.4 mi.]
Link Budget: 16.0 dB
to (4) RJ-48 **[1.5 km/0.9 mi.]**
plus 6-pin DIN **[3 m/10 ft.]**

C4TEF1015-100
1310nm single mode (SC)
[40 km/24.9 mi.]
Link Budget: 26.0 dB
to (4) RJ-48 **[1.5 km/0.9 mi.]**
plus 6-pin DIN **[3 m/10 ft.]**

C4TEF1016-100
1310nm single mode (SC)
[60 km/37.3 mi.]
Link Budget: 29.0 dB
to (4) RJ-48 **[1.5 km/0.9 mi.]**
plus 6-pin DIN **[3 m/10 ft.]**

C4TEF1017-100
1550nm single mode (SC)
[80 km/49.7 mi.]
Link Budget: 29.0 dB
to (4) RJ-48 **[1.5 km/0.9 mi.]**
plus 6-pin DIN **[3 m/10 ft.]**

C4TEF1035-100
1550nm single mode (SC)
[120 km/74.6 mi.]
Link Budget: 36.0 dB
to (4) RJ-48 **[1.5 km/0.9 mi.]**
plus 6-pin DIN **[3 m/10 ft.]**

Single Fiber Products

Recommended use in pairs [pg 19]

C4TEF1029-100
1310nm TX/1550nm RX single fiber single mode (SC)
[20 km/12.4 mi.] Link Budget: 19.0 dB
to (4) RJ-48 **[1.5 km/0.9 mi.]**
plus6-pin DIN **[3 m/10 ft.]**

C4TEF1029-101
1550nm TX/1310nm RX single fiber single mode (SC)
[20 km/12.4 mi.] Link Budget: 19.0 dB
to (4) RJ-48 **[1.5 km/0.9 mi.]**
plus 6-pin DIN **[3 m/10 ft.]**

C4TEF1029-102
1310nm TX/1550nm RX single fiber single mode (SC)
[40 km/24.9 mi.] Link Budget: 25.0 dB
to (4) RJ-48 **[1.5 km/0.9 mi.]**
plus 6-pin DIN **[3 m/10 ft.]**

C4TEF1029-103
1550nm TX/1310nm RX single fiber single mode (SC)
[40 km/24.9 mi.] Link Budget: 25.0 dB
to (4) RJ-48 **[1.5 km/0.9 mi.]**
plus 6-pin DIN **[3 m/10 ft.]**

*Note: RS-232 cable included with each card (6-pin DIN to DB-9)

AUTO NEG | AUTO CROSS | TRANSPARENT LINK PASS THRU | AUTO LINK RESTORE | PAUSE | REMOTE MGMT | LOOP BACK | FIELD UPGRADEABLE FIRMWARE | SINGLE FIBER

4x T1/E1/J1 + 10/100 Ethernet Copper to Fiber Transport Mux

see also: Stand-Alone NID [pg 118, 119]

C4TEF10xx-11x

4x T1/E1/J1 + 10/100 Ethernet Transport Mux

Features

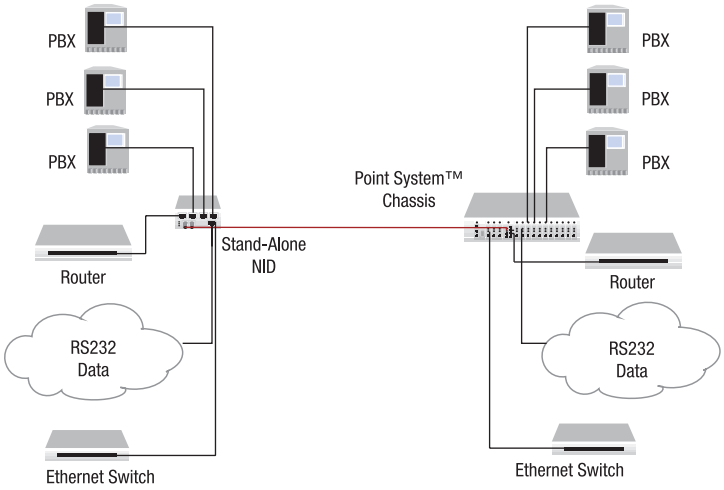
- Auto-Negotiation for 10/100BASE-TX [pg 16]
- AutoCross™ (auto MDI/MDI-X) [pg 16]
- Transparent Link Pass Through for Ethernet [pg 17]
- Automatic Link Restoration [pg 18]
- Pause (Flow Control) [pg 17]
- Remote Management [pg 17]
- Local and Remote Loopback [pg 18]
- Remote Fiber Loss Signaling
- AIS/TAOS
- LEDs for each data port
- DIP switches for line code, line length, local loopback or remote loopback [pg 18]
- T1/E1/J1 mode settings
- Dry Relay Contacts on each TDM port
- Local (AUX) Management Interface (RS232 connector)
- Switch selection for Data or Management mode on RS232 interface
- Access to complete status information on local and remote device
- Access to local and remote configuration
- Switch or SNMP selected Baud rate operation
- Field Upgradeable Firmware [pg 18]

Management Features

- Report local device status:
  - Fiber Link Status
  - Copper Link Status for each T1/E1
  - Hardware switch settings: LBO, AIS on C/F, HW/SW, speed
  - AIS detected Fiber & Copper
  - Model Number
  - Copper & Fiber Connectors
- Local command operations include:
  - Loopback Fiber & T1/E1 per channel
  - AIS TX on fiber on loss of copper link & AIS TX on copper on loss of fiber link
  - Serial connection speed and parity (Software Mode)
  - T1/E1 Mirror Port Modes
  - Boot-load firmware upgrades
  - Ethernet settings:
    - Auto-Negotiation Enable/Disable
    - Force speeds and modes on 10/100TX
- Remote device status:
  - Fiber Link status
  - Copper Link status for each T1/E1
  - Hardware switch settings: LBO, AIS on C/F, HW/SW, speed
  - AIS detected Fiber & Copper
  - Model Number
  - Copper & Fiber Connectors
- Remote Commands:
  - Loopback Fiber & T1/E1 per channel
  - Serial connection speed and parity (Software Mode)
  - AIS TX on fiber on loss of copper link & AIS TX on copper on loss of fiber link
  - T1/E1 Monitor Modes
  - Ethernet settings (Software Mode)
  - Force speeds and modes on 10/100TX
  - Enable/Disable: Auto-Negotiation; Link Pass Through; Flow Control; & AutoCross™

- Low cost transport capability: (4) T1/E1/J1; (1) Ethernet and (1) RS232 data channel line.
- Target applications include: FTTx, such as Fiber-to-the-Business, Fiber-to-the-Building, Fiber-to-the-MDU, Fiber-to-the-Home and Cell tower backhaul.
- Copper connections compatible with G.703, AMI/B8ZS/HDB3, 10/100BASE-TX, and RS232 channel; while the optical connection runs at 155Mbps.
- TDM traffic is not mapped to Ethernet. A hardware-based solution guarantees the constant bit rate of TDM transport without requiring traffic management. Provides physical layer status monitoring and alarm classification functions for Telecom operators to manage their fiber optic network and reduce operation and maintenance costs.

Application



Specifications

Complete list of fiber optic connector specifications [pg 212-224]

Standards	IEEE Std. 802.3 2003; Telecordia TR-NWT-001089: FCC Part 68, UL1459; ITU-T, ANSI, AT&T, ETSI; TBR 12; PD 7024: 1994 (NTR 4); AMI/B8ZS/HD83; G.703
Switches	Numerous switch settings for line coding, line buildout, loopback (per port), AIS setting, data/mgmt RS-232 RS-232 port speed and parity Ethernet port settings: Auto-Negotiation, Force speed/duplex and enable Transparent Link Pass Through
Jumper	**Hardware:** mode is determined by DIP switch settings **Software:** mode is controlled by the most recently saved, on-board microprocessor setting
Dimensions	**Width:** 1.72" [44 mm] **Depth:** 5.0" [127 mm] **Height:** 3.4" [86 mm]
Power Consumption	6.0 Watts
Environment	See chassis specifications
Shipping Weight	1 lb. [0.45 kg]
Regulatory Compliance	FCC Class A; VCCI Class A; EN 55022 (CISPR 22) Class A; ICES-003
Warranty	Lifetime

*Note: C4TEF cards cannot be used with the 1-Slot Point System™ Chassis [pg 31]. Devices must be used in pairs. Typical installation will include a chassis card installed in the Point System™ locally and a stand-alone device [S4TEF, pg 118-119] installed at the remote location.

Ordering Information

Complete list of fiber optic connector specifications [pg 212-224]

C4TEF1011-110
1300nm multimode (ST)
[2 km/1.2 mi.] Link Budget: 11.0 dB
to (4) RJ-48 **[1.5 km/0.9 mi.]**
plus 10/100BASE-TX (RJ-45) **[100 m]**
plus 6-pin DIN **[3 m/10 ft.]**

C4TEF1013-110
1300nm multimode (SC)
[2 km/1.2 mi.] Link Budget: 11.0 dB
to (4) RJ-48 **[1.5 km/0.9 mi.]**
plus 10/100BASE-TX (RJ-45) **[100 m]**
plus 6-pin DIN **[3 m/10 ft.]**

C4TEF1014-110
1310nm single mode (SC)
[20 km/12.4 mi.] Link Budget: 16.0 dB
to (4) RJ-48 **[1.5 km/0.9 mi.]**
plus 10/100BASE-TX (RJ-45) **[100 m]**
plus 6-pin DIN **[3 m/10 ft.]**

C4TEF1015-110
1310nm single mode (SC)
[40 km/24.9 mi.] Link Budget: 26.0 dB
to (4) RJ-48 **[1.5 km/0.9 mi.]**
plus 10/100BASE-TX (RJ-45) **[100 m]**
plus 6-pin DIN **[3 m/10 ft.]**

C4TEF1016-110
1310nm single mode (SC)
[60 km/37.3 mi.] Link Budget: 29.0 dB
to (4) RJ-48 **[1.5 km/0.9 mi.]**
plus 10/100BASE-TX (RJ-45) **[100 m]**
plus 6-pin DIN **[3 m/10 ft.]**

C4TEF1017-110
1550nm single mode (SC)
[80 km/49.7 mi.] Link Budget: 29.0 dB
to (4) RJ-48 **[1.5 km/0.9 mi.]**
plus 10/100BASE-TX (RJ-45) **[100 m]**
plus 6-pin DIN **[3 m/10 ft.]**

C4TEF1035-110
1550nm single mode (SC)
[120 km/74.6 mi.] Link Budget: 36.0 dB
to (4) RJ-48 **[1.5 km/0.9 mi.]**
plus 10/100BASE-TX (RJ-45) **[100 m]**
plus 6-pin DIN **[3 m/10 ft.]**

Single Fiber Products

Recommended use in pairs [pg 19]

C4TEF1029-110
1310nm TX/1550nm RX single fiber SM (SC) **[20 km/12.4 mi.] LB: 19.0 dB**
to (4) RJ-48 **[1.5 km/0.9 mi.]**
plus 10/100BASE-TX (RJ-45) **[100 m]**
plus 6-pin DIN **[3 m/10 ft.]**

C4TEF1029-111
1550nm TX/1310nm RX single fiber SM (SC) **[20 km/12.4 mi.] LB: 19.0 dB**
to (4) RJ-48 **[1.5 km/0.9 mi.]**
plus 10/100BASE-TX (RJ-45) **[100 m]**
plus 6-pin DIN **[3 m/10 ft.]**

C4TEF1029-112
1310nm TX/1550nm RX single fiber SM (SC) **[40 km/24.9 mi.] LB: 25.0 dB**
to (4) RJ-48 **[1.5 km/0.9 mi.]**
plus 10/100BASE-TX (RJ-45) **[100 m]**
plus 6-pin DIN **[3 m/10 ft.]**

C4TEF1029-113
1550nm TX/1310nm RX single fiber SM (SC) **[40 km/24.9 mi.] LB: 25.0 dB**
to (4) RJ-48 **[1.5 km/0.9 mi.]**
plus 10/100BASE-TX (RJ-45) **[100 m]**
plus 6-pin DIN **[3 m/10 ft.]**

*Note: RS-232 cable included with each card (6-pin DIN to DB-9)

CAPTF33xx-1xx

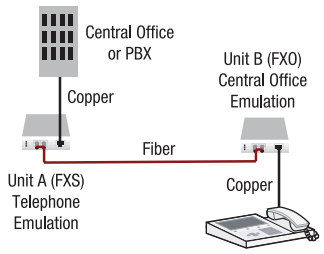
POTS 2-Wire Copper to Fiber NID (Network Interface Device)

Connect central-office voice grade signals to distant Plain Old Telephone equipment (POTS) utilizing standard telephone signaling. Two units are required to implement an end to end system. Unit A connects to a telephone line or PBX and has the ability to detect ringing voltages and to act as a telephone (LINE SIDE FXS). Unit B is the reciprocal unit and has the ability to act as a Central Office and connects to a telephone device (CUSTOMER SIDE FXO).

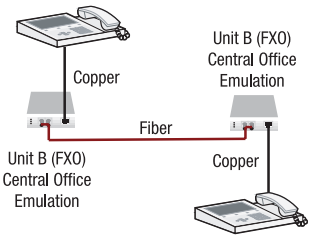
Features

- Audio transmission
- Caller ID
- Automatic Ring Down
- Dual or single fiber options
- SNMP Management
- Ringing at the distant end
- Electrical interface is provided through an RJ-11 female connector
- Field Upgradeable Firmware [pg 18]

Loop Extender/Isolator



Automatic Ring Down



Specifications

Complete list of fiber optic connector specifications [pg 212-224]

Standards		FCC Part 68, TBR21
Analog Port (Telephone Emulation or FXS)		**Connector:** RJ-11 **Impedance:** 600 ohms **REN:** 0.48 **Loop Current:** 20 to 60ma. **Insertion Loss:** 0.0 +/-1.0 dB at 1000 Hz when both ports are terminated at 600 ohms
Analog Port (Central Office Emulation or FXO)		**Impedance:** 600 ohms **Battery Source:** 48 VDC +/- 5V **Ringing Supply:** 90Vp-p **Ring Frequency:** 25 Hz. (Reproduces frequency detected by side A) **Ring Cadence:** Reproduces cadence detected by side A **Insertion Loss:** 1.0 +/- 1.0 dB @ 1000 Hz when both ports are terminated at 600 ohms
Voice Frequency		300 Hz – 3 KHz
Switches/Option Jumpers		Automatic Ring Down/Normal
Status LEDs		LED colors are Green **SDF (Fiber Link):** On indicates fiber link up; **ACT (In Use):** On indicates unit in use; Flashing indicates ringing; **PWR (Power):** On indicates power is on
Dimensions	**105 Model:**	**Height:** 3.4" [86 mm] **Depth:** 5.0" [182 mm] **Width:** 0.86" [22 mm]
	115 Model:	**Height:** 3.4" [86 mm] **Depth:** 5.0" [182 mm] **Width:** 1.75" [43 mm]
Power Consumption	**105 Model:**	4 Watts
	115 Model:	7 Watts
Environment		See chassis specifications
Shipping Weight		1 lb. [0.45 kg]
Emissions Compliance		FCC Class A; VCCI Class A; EN 55022 (CISPR 22) Class A; ICES 003
Safety Compliance		CISPR A; CE Mark
Warranty		Lifetime

*Note: CAPTF cards cannot be used with the 1-Slot Point System™ Chassis™ [pg 31]. Devices must be used in pairs. Typical installation will include a chassis card installed in the Point System™ locally and a stand-alone device [SAPTF, pg 120] installed at the remote location.

Ordering Information

Complete list of fiber optic connector specifications [pg 212-224]

Line Side FXS: CAPTF3311-105
Customer Side FXO: CAPTF3311-115
Twisted Pair (RJ-11) **[5 km/3.1 mi.]**
to 1300nm multimode (ST)
[2 km/1.2 mi.] Link Budget: 11.0 dB

Line Side FXS: CAPTF3313-105
Customer Side FXO: CAPTF3313-115
Twisted Pair (RJ-11) **[5 km/3.1 mi.]**
to 1300nm multimode (SC)
[2 km/1.2 mi.] Link Budget: 11.0 dB

Line Side FXS: CAPTF3314-105
Customer Side FXO: CAPTF3314-115
Twisted Pair (RJ-11) **[5 km/3.1 mi.]**
to 1310nm single mode (SC)
[20 km/12.4 mi.] Link Budget: 16.0 dB

Line Side FXS: CAPTF3315-105
Customer Side FXO: CAPTF3315-115
Twisted Pair (RJ-11) **[5 km/3.1 mi.]**
to 1310nm single mode (SC)
[40 km/24.9 mi.] Link Budget: 26.0 dB

Line Side FXS: CAPTF3316-105
Customer Side FXO: CAPTF3316-115
Twisted Pair (RJ-11) **[5 km/3.1 mi.]**
to 1310nm single mode (SC)
[60 km/37.3 mi.] Link Budget: 33.0 dB

Line Side FXS: CAPTF3317-105
Customer Side FXO: CAPTF3317-115
Twisted Pair (RJ-11) **[5 km/3.1 mi.]**
to 1310nm single mode (SC)
[80 km/49.7 mi.] Link Budget: 29.0 dB

Single Fiber Products

Recommended use in pairs [pg 19]

Line Side FXS: CAPTF3329-105*
Customer Side FXO: CAPTF3329-115*
Twisted Pair (RJ-11) **[5 km/3.1 mi.]**
to 1310nm TX/1550nm RX single fiber single mode (SC)
[20 km/12.4 mi.] Link Budget: 19.0 dB

Line Side FXS: CAPTF3329-106*
Customer Side FXO: CAPTF3329-116*
Twisted Pair (RJ-11) **[5 km/3.1 mi.]**
to 1550nm TX/1310nm RX single fiber single mode (SC)
[20 km/12.4 mi.] Link Budget: 19.0 dB

Line Side FXS: CAPTF3329-107*
Customer Side FXO: CAPTF3329-117*
Twisted Pair (RJ-11) **[5 km/3.1 mi.]**
to 1310nm TX/1550nm RX single fiber single mode (SC)
[40 km/24.9 mi.] Link Budget: 25.0 dB

Line Side FXS: CAPTF3329-108*
Customer Side FXO: CAPTF33129-118*
Twisted Pair (RJ-11) **[5 km/3.1 mi.]**
to 1550nm TX/1310nm RX single fiber single mode (SC)
[40 km/24.9 mi.] Link Budget: 25.0 dB

* Note: Single Fiber products should be paired by application:

Loop Extender/Isolator Application
Line Side FXS: CAPTF3329-105
Customer Side FXO: CAPTF3329-116

Automatic Ring Down Application
Line Side FXS: CAPTF3329-107
Customer Side FXO: CAPTF3329-108

Analog CCTV Video: NTSC, PAL, SECAM Copper to Fiber

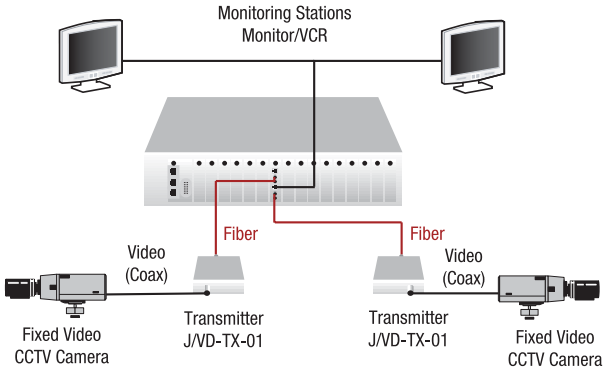
see also: Analog CCTV Video Stand-Alone Media Converters [pg 121]

CVIDF20xx-15x

Analog CCTV Video Copper to Fiber Media Converter

- Extended Fiber Receive Mode
- Single or Dual Video Channel configurations

Connect Uni-Directional Analog Video Devices Over Fiber



Transition Networks' Point System™ Chassis Video Media Receiver, when paired with our camera-mounted transmitter J/VD-TX-01, enables the transport of analog CCTV video over fiber infrastructure for extended reach video surveillance or security installations. And with Transition's unique Extended Fiber Receive Mode, the RX sensitivity can be adjusted to accommodate even greater fiber link distances.

The chassis card is available in either a single video channel or the dual video channel configuration, allowing for density flexibility that can be tailored to your application. All video conversion is performed in real time and the Automatic Gain Control feature automatically adjusts the video contrast and brightness to maintain the quality and integrity of the original video stream.

Features

- AM Modulation
- NTSC, PAL, SECAM compatibility
- Compatible with all video CCTV equipment
- Real Time Full Color Video
- Automatic Gain Control
- Video Specification:
  - Input Video: .5 to 2-volt pk-pk (75 ohms)
  - Bandwidth: 5 Hz – 10 MHz
  - Differential Gain: < 5 %
  - Differential Phase: < 5°
  - Tilt: < 1%
  - Signal/Noise Ratio: 60 dB

Specifications

Video Formats	NTSC, PAL, SECAM
Optical Specs	**Multimode:** 850nm 6.0 dB Link Budget or 11.0 dB Link Budget **Single Mode:** 1310nm 10.0 dB Link Budget or 15.0 dB Link Budget
Status LEDs	**PWR (Power):** ON = power connected **RX1:** ON=Fiber Video feed in Channel 1 **RX2:** ON = Fiber Video feed in Channel 2 (dual only)
Jumpers	**JP1:** Normal/Extended Mode (Circuit 1) **JP5:** Normal/Extended Mode (Circuit 2)
Dimensions	**Width:** 0.86" [22 mm] **Depth:** 5.0" [127 mm] **Height:** 3.4" [86 mm]
Power Consumption	2 Watts (single card) 3 Watts (dual card)
Environment	See chassis specifications
Shipping Weight	1 lb. [0.45 kg]
Regulatory Compliance	FCC Class A, EN55022 Class A, EN55024, CE Mark
Warranty	Lifetime

Ordering Information

CVIDF2011-150: Video Receiver (single)
BNC (75 ohm)
to Multimode (ST)
[1 km/0.6 mi.] (normal mode)
[2 km/1.2 mi.] (extended mode)

CVIDF2011-155: Video Receiver (dual)
(2) BNC (75 ohm)
to (2) Multimode (ST)
[1 km/0.6 mi.] (normal mode)
[2 km/1.2 mi.] (extended mode)

CVIDF2013-150: Video Receiver (single)
BNC (75 ohm)
to Multimode (SC)
[1 km/0.6 mi.] (normal mode)
[2 km/1.2 mi.] (extended mode)

CVIDF2013-155: Video Receiver (dual)
(2) BNC (75 ohm)
to (2) Multimode (SC)
[1 km/0.6 mi.] (normal mode)
[2 km/1.2 mi.] (extended mode)

CVIDF2012-150: Video Receiver (single)
BNC (75 ohm)
to Single Mode (ST)
[10 km/6.2 mi.] (normal mode)
[20 km/12.4 mi.] (extended mode)

CVIDF2012-155: Video Receiver (dual)
(2) BNC (75 ohm)
to (2) Single Mode (ST)
[10 km/6.2 mi.] (normal mode)
[20 km/12.4 mi.] (extended mode)

E-MCR-05

12-Slot Media Converter Rack

Flexible Design for Growing Networks

Simplify your installation of Transition Networks' stand-alone media converters with the Media Converter Rack. This 19" rack-mountable unit supports up to twelve media converters while the unique design allows for multiple connections, consolidated into a single device, making network connections easier and more efficient.

Space Saving Design

This device is powered by a single internal universal power supply; eliminating the need for the multiple power connections often associated with multiple converter installations. The unit saves space in the wiring closet by providing a means for mounting (12) converters in (3) units of rack space while reducing the number of wall outlet power connections required.

Convenience

The media converters are hot-swappable. They can also be removed from the rack, powered externally, and used as stand-alone units in new applications as your network needs change in the future.

Cost Effective

Easily rack mount the single-wide, 12 volt powered, Transition Networks' media converters that you already own, or buy stand-alone units today and rack mount them in the future.

Includes

(12) univeral rack mount media converter brackets.

(Media Converter Sold Seperately)

Specifications

Dimensions	**Width:** 17.0" [432 mm] **Depth:** 15.0" [381 mm] **Height:** 4.75" [121 mm]
Power Supply	Universal, internal power supply; AC 85 – 264V, 47 – 63 Hz.
Environment	0 – 50°C, 10% – 90% humidity (non-condensing), 0 – 10,000 ft.
Shipping Weight	12 lbs. [5.2 kg]
Regulatory Compliance	UL Listed; C-UL Listed (Canada); CISPR/EN55022 Class A; FCC Class A; CE Mark
Warranty	Lifetime

Ordering Information

E-MCR-05
12-Slot Media Converter Rack

Optional Accessories *(sold separately)*

Mounting Options

RMBU
Universal Rack Mount Bracket for Stand-Alone Converters

RMBM
Rack Mount Bracket for Mini Media Converters

- 19" Rack-Mountable Chassis
- Securely houses up to (12) stand-alone media converters with the use of universal converter mounting brackets
- One AC power source will independently power up to (12) hot-swappable converters
- Supports any combination of single wide, 12 VDC powered, Transition Networks' media converters

RMS19-SA4-01

4-Slot Media Converter Shelf

Space Saving Design

Save rack space in low density deployments: 19" rack mount, 1RU high.

Flexible

Mix and match up to (4) Transition Networks stand-alone media converters (excluding double-high models).

Non-Power Design

Don't pay for power supplies twice. This low cost design allows the use of the power supplies that ship with the media converter.

Power Cord Tie-Downs

Eliminates the accidental disconnection of power supplies from the media converters.

Converter Mounting Brackets

Securely mounts the converters to the shelf.

Includes

(4) univeral rack mount media converter brackets.

(Media Converter Sold Seperately)

- Rackmount up to (4) stand-alone devices in (1) convenient un-powered shelf.

Specifications

Dimensions	**Width:** 17.0" [432 mm] **Depth:** 6.0" [152 mm] **Height:** 1.75" [44 mm]
Shipping Weight	3 lbs. [1.35 kg]
Warranty	Lifetime

Ordering Information

RMS19-SA4-01
4-Slot Media Converter Shelf

Optional Accessories *(sold separately)*

Mounting Options

RMBU
Universal Rack Mount Bracket for Stand-Alone Converters

RMBM
Rack Mount Bracket for Mini Media Converters

Mounting Brackets

Stand-Alone Media Converters

Wall Mount Brackets are small simple "L-shaped" tabs that allow a single Transition Networks' media converter to be mounted anywhere needed. The brackets are sold in pairs and are available in several sizes and types to match the different sized media converters and space requirements.

Din Rail Brackets allow stand-alone media converters to be mounted to a Din Rail, common in industrial environments, in either a flat mount against the Din Rail or in a vertical mount in which the converter mounts on its edge.

Mini wall mount brackets allow a mini media converter to be securely mounted to a wall or any other flat surface.

WMBL; WMBP; WMBS

WMBV; WMBD

WMBM

Specifications

Shipping Weight	1 lb. [0.45 kg]
Warranty	Lifetime

Ordering Information

WMBD
5.0" [127 mm] DIN Rail Mount Bracket
Fits all Stand-Alone Converters; Single or Dual Slot Point System™ Chassis

WMBD-E
4.3" [109 mm] DIN Rail Mount Bracket (Extended) Fits all Stand-Alone Converters with piggyback power supply attached

WMBD-F
3.3" [84 mm] DIN Rail Mount Bracket (flat)
Fits all Stand-Alone Converters
3.25" [82 mm] wide

WMBD-FS
3.1" [79 mm] DIN Rail Mount Bracket (flat, small) Fits Stand-Alone Converters 3.0" [76 mm] wide

WMBJ-V
2.75" [70 mm] Wall mount bracket kit for Analog Video products including:
J/VD-TX-01xx
J/VD-MRX-01xx

WMBL
4.0" [102 mm]
Fits Stand-Alone Converters size 4.7" [119 mm]

WMBM
3.3" [84 mm]
Fits all "Mini" Media Converters

WMBP
5.0" [127 mm]
Fits Single or Dual Slot Point System™ Chassis

WMBS
3.2" [81 mm]
Fits Stand-Alone Converters size 3.9" [99 mm]

WMBV
5.0" [127 mm]
Vertical Mount
Fits all Stand-Alone Converters;
Single or Dual Slot Point System™ Chassis

WMBV-E
4.7" [119 mm]
Extended Vertical Mount Fits all Stand-Alone Converters with piggyback power supply attached

NEW PRODUCT

SPS-2460-xx

Extended Temperature Power Supply

SPS-2460-CC
Piggy-Back Power Supply

SPS-2460-PS
Piggy-Back Power Supply

SPS-2460-SA
Stand-Alone Power Supply

Specifications

Input Voltage	24 – 60 VDC; 24 – 42VMRS
Isolation Voltage	(Dielectric withstand) Meets IEC 950 for one minute 1500 VAC: Output/Input 1500 VAC: Input/Safety GND 1500 VAC: Output/CASE
Output Voltage	12.25 VDC
Output Current	1.0A
Load Regulation	±5% at 10% load to full rated load
Over Load Protection (OLP)	When the average power rating exceeds 125%-150% of maximum power, output voltages reduced to a safe dissipation level; protects against short circuit of any output
No Load Protection	No damage to power supply when operating at no load
Transient Protection	No voltage spike at power-on, power-off, or power failure
Power Distribution	+12.25 VDC at 1.0A maximum
Power Consumption	3 Watts max. @ 24 VDC input, 12.25 VDC output
Efficiency	80% (typical)
Noise and Ripple	±40 mV peak-to-peak of output voltage (typical)
MTBF	Greater than 250,000 hours with typical load operating at 25°C temperature (calculated according to MIL-HDBK-217E)
Regulatory Compliance	CISPR/EN55022; Class A; FCC Class A
Dimensions **SPS-2460-SA:** **SPS-2460-CC:** **SPS-2460-PS:**	 **Width:** 3.75" [95 mm] **Depth:** 3.1" [79 mm] **Height:** 1.0" [25 mm] **Width:** 4.5" [114 mm] **Depth:** 3.1" [79 mm] **Height:** 1.0" [25 mm] **Width:** 4.5" [114 mm] **Depth:** 3.4" [86 mm] **Height:** 1.0" [25 mm]
Shipping Weight	1 lb. [0.45 kg]
Environment	Operating: -20°C to +65°C Storage: -40°C to +85°C 5 – 95% non-condensing 0 – 10,000 ft.
Warranty	Lifetime

Ordering Information

SPS-2460-CC
Piggy-Back
For use with: Non-Point System™ stand-alone media converters 3.0" wide (E-TBT-FRL-05; E-100BTX-FX-05; etc.)

SPS-2460-PS
Piggy-Back
For use with: Point System™ stand-alone media converters 3.25" wide (SBFTF1011-100; SGETF1013-100, etc.)

SPS-2460-SA
Stand-Alone
For use with: All stand-alone media converters; Single-Slot Point System™ Chassis; Dual-Slot Point System™ Chassis

Transition Networks' wide input external power supplies allow you to provide a wide range of input voltages to power your stand-alone converters and chassis. Input voltages of 24 – 60 VDC and 24 – 42VRMS allow for installation of any of Transition's stand-alone media converters in most industrial, telecom and commercial applications, as well as HVAC and building controlled environments.

Multiple form factors allow flexibility to meet your application. The stand-alone form factor can be used with all Transition stand-alone media converters as well as the single-slot and dual-slot Point System™ Chassis. The piggy back form factor allows the power supply to attach directly to the converter and eliminate the power cable commonly found between the power supply and the converter. Once the piggy back supply is attached to the converter, the combined assembly is much easier to wall mount or attach to Din Rail environments than using a separate supply.

Just Convert-IT™

The Just Convert-IT™ line of media converters is a low-cost, no-frills model, which offers the same quality and reliability as our full-featured product line.

Transition Networks' Just Convert-IT™ Line has several offerings:

When to use Just Convert-IT™ media converters:

- Network management is NOT an issue
- Cost is a critical factor
- Mid to low density applications
- Minimal features are required

Ethernet: Convert 10BASE-T to 10BASE2

Convert a coaxial segment into a twisted pair segment. Provides (1) BNC 10BASE2 compliant port and (1) RJ-45 twisted pair connector.

Fast Ethernet: Convert 100BASE-TX to 100BASE-FX

Connect copper to fiber in a Fast Ethernet environment. Available for single mode and multimode fiber.

10/100 Bridging: Convert 10/100BASE-TX to 100BASE-FX

Connect a half-duplex device, such as a hub, to fiber. Available for single mode and multimode fiber.

Gigabit: Convert 1000BASE-T to 1000BASE-SX/LX

Connect copper to fiber in a Gigabit Ethernet environment. Available for single mode and multimode fiber.

RS232: Convert Copper to Fiber

Extend the distance between serial connections with the use of fiber optic cable.

Analog CCTV Video: NTSC, PAL, SECAM

Connect uni-directional analog video devices over fiber.

Ordering Information

Ethernet [pg 71]

J/E-CX-TBT-02
10BASE-T to 10BASE2 (BNC))
[185 m/607 ft.]

Fast Ethernet [pg 77]

J/FE-CF-04
100BASE-TX to 100BASE-FX MM (ST)
[2 km/1.2 mi.] Link Budget: 11.0 dB

J/FE-CF-04(SC)
100BASE-TX to 100BASE-FX MM (SC)
[2 km/1.2 mi.] Link Budget: 11.0 dB

J/FE-CF-04(LC)
100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1300nm multimode (LC)
[2 km/1.2 mi.] Link Budget: 11.0 dB

J/FE-CF-04(SM)
100BASE-TX to 100BASE-FX SM (SC)
[20 km/12.4 mi.] Link Budget: 16.0 dB

J/FE-CF-04(LH)
100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1310nm single mode (SC)
[40 km/24.9 mi.] Link Budget: 26.0 dB

J/FE-CF-04(100)
100BASE-TX to 100BASE-FX 1310nm TX/ 1550nm RX single fiber single mode (SC)
[20 km/12.4 mi.] Link Budget: 19.0 dB

J/FE-CF-04(101)
100BASE-TX to 100BASE-FX 1550nm TX/ 1310nm RX single fiber single mode (SC)
[20 km/12.4 mi.] Link Budget: 19.0 dB

10/100 Bridging [pg 84]

J/E-PSW-FX-03
10/100BASE-TX to 100BASE-FX MM (ST)
[2 km/1.2 mi.] Link Budget: 11.0 dB

J/E-PSW-FX-03(SC)
10/100BASE-TX to 100BASE-FX MM (SC)
[2 km/1.2 mi.] Link Budget: 11.0 dB

J/E-PSW-FX-03(SM)
10/100BASE-TX to 100BASE-FX SM (SC)
[20 km/12.4 mi.] Link Budget: 16.0 dB

J/E-PSW-FX-03(100)
10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1310nm TX/1550nm RX single fiber single mode (SC)
[20 km/12.4 mi.] Link Budget: 19.0 dB

J/E-PSW-FX-03(101)
10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1550nm TX/1310nm RX single fiber single mode (SC)
[20 km/12.4 mi.] Link Budget: 19.0 dB

Gigabit Ethernet [pg 95]

J/GE-CF-01(SX)
1000BASE-T to 1000BASE-SX MM (SC)
[62.5/125 µm: 220 m/722 ft.]
[50/125 µm: 550 m/1804 ft.]
Link Budget 7.0 dB

J/GE-CF-01(LX1)
1000BASE-T to 1000BASE-LX SM (SC)
[10 km/6.2 mi.] Link Budget: 10.5 dB

Gigabit Ethernet [pg 95]

J/GE-CF-01(LX2)
1000BASE-T to 1000BASE-LX SM (SC)
[25 km/15.5 mi.] Link Budget: 15.0 dB

J/GE-CF-01(LX6)
1000BASE-T to 1000BASE-LX SM (SC)
[65 km/40.4 mi.] Link Budget: 21.0 dB

J/GE-CF-01(LX100)
1000BASE-T (RJ-45) **[100 m/328 ft.]**
to 1000BASE-LX 1310nm/1550nm RX single fiber single mode (SC)
[20 km/12.4 mi.] Link Budget: 13.0 dB

J/GE-CF-01(LX101)
1000BASE-T to 1000BASE-LX 1550nm TX/ 1310nm RX single fiber single mode (SC)
[20 km/12.4 mi.] Link Budget: 13.0 dB

RS232 [pg 110]

J/RS232-CF-01
(DB-9) (female) **[15 m/49 ft.]**
to MM (ST) **[2 km/1.2 mi.]**
Link Budget: 11.0 dB

J/RS232-CF-01(SC)
(DB-9) (female) **[15 m/49 ft.]**
to MM (SC) **[2 km/1.2 mi.]**
Link Budget: 11.0 dB

J/RS232-TF-01
(DB-9) (male) **[15 m/49 ft.]**
to MM (ST) **[2 km/1.2 mi.]**
Link Budget: 11.0 dB

J/RS232-TF-01(SC)
(DB-9) (male) **[15 m/49 ft.]**
to MM (SC) **[2 km/1.2 mi.]**
Link Budget: 11.0 dB

Analog Video [pg 121]

J/VD-TX-01: Video Transmitter
BNC (75 ohm)
to Multimode (ST) **[1 km/0.6 mi.]**

J/VD-RX-01: Video Receiver
BNC (75 ohm)
to Multimode (ST) **[1 km/0.6 mi.]**

J/VD-MRX-01: Miniature Video Receiver
BNC (75 ohm)
to Multimode (ST) **[1 km/0.6 mi.]**

J/VD-TX-01(SC): Video Transmitter
BNC (75 ohm)
to Multimode (SC) **[1 km/0.6 mi.]**

J/VD-RX-01(SC): Video Receiver
BNC (75 ohm)
to Multimode (SC) **[1 km/0.6 mi.]**

J/VD-MRX-01(SC): Miniature Video Receiver
BNC (75 ohm)
to Multimode (SC) **[1 km/0.6 mi.]**

J/VD-TX-01(SM): Video Transmitter
BNC (75 ohm)
to Single Mode (ST) **[10 km/6.2 mi.]**

J/VD-RX-01(SM): Video Receiver
BNC (75 ohm)
to Single Mode (ST) **[10 km/6.2 mi.]**

J/VD-MRX-01(SM): Miniature Video Receiver
BNC (75 ohm)
to Single Mode (ST) **[10 km/6.2 mi.]**

J/E-CX-TBT-02

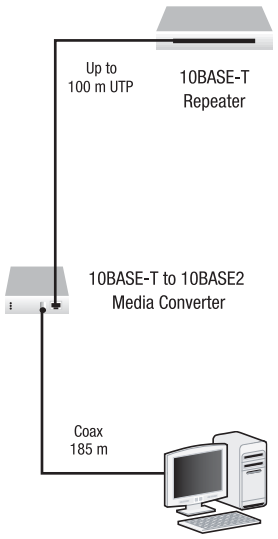
Twisted Pair to Coax Media Converter

Features

- Protects your equipment investment by allowing you to upgrade-not replace-your current network.
- Provides (1) RJ-45 twisted pair connector and (1) BNC 10BASE2 compliant port.
- Supports up to (24) devices daisy-chained on (1) coax segment per twisted pair segment.
- MDI/MDI-X selection switch allows converter to be connected to either a workstation/NIC or hub, switches and routers without changing the cable type.
- BNC T-connector included for daisy chain applications.

**Note: not rack-mountable*

Connect Legacy Equipment



- Connect legacy coax devices to a 10BASE-T network

Specifications

Standards	IEEE Std. 802.3, 10BASE-T, 10BASE2
Switches	**MDI/MDI-X:** Selects correct RJ-45 port setting
Status LEDs	**PWR (Power):** ON = Connected to external power **BNC/ACT (BNC Activity):** Flashing = 10BASE2 data traffic **TP/ACT (TP Activity):** ON = 10BASE-T link connection; Flashing = 10BASE-T data traffic **COL (Collision):** Flashing = Collision present
Dimensions	**Width:** 2.75" [71 mm] **Depth:** 3.7" [94 mm] **Height:** 1.0" [25 mm]
Power	External AC/DC: 5 VDC, 1.0 A
Environment	0 – 50°C, 5% – 90% humidity non-condensing, 0 – 10,000 ft. altitude
Shipping Weight	2 lbs. [0.90 kg]
Safety Compliance	**Wall Mount Power Supply:** UL Listed and CSA certified
Regulatory Compliance	CISPR22/EN55022 Class A, FCC Class A, CE Mark
Warranty	Lifetime

Ordering Information

J/E-CX-TBT-02
10BASE-T (RJ-45)
[100 m/328 ft.]
to 10BASE2 (BNC)
[185 m/607 ft.]

SEPOE101x-150

Power-over-Ethernet Copper to Fiber PSE Media Converter

Enables enterprises to power network devices directly over the existing CAT5 data connection. The Power-over-Ethernet (PoE) converter emulates IEEE 802.3af Power Sourcing Equipment (PSE), and is compatible with Powered Devices (PD) that comply with the IEEE 802.3af standard. The Power-over-Ethernet converter will detect the presence of a device that needs power and inject the applicable current into the data cable.

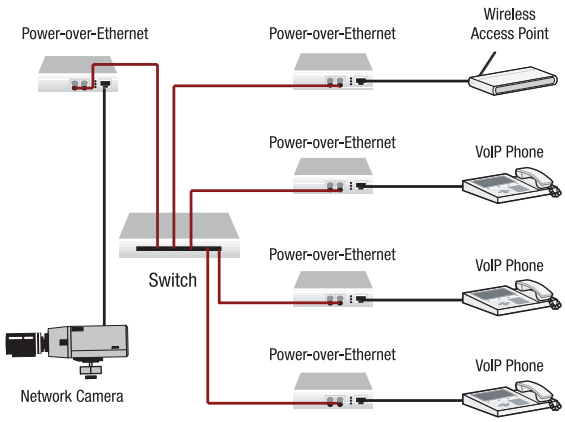
Attractive solution for delivering power over CAT5 to powered devices such as access points, Voice over IP (VoIP) products, access servers, outdoor routers, and internet kiosks.

Allows for use of fiber switches with PoE solution on remote end.

Features

- 48VDC input power supply
- -48VDC output per port
- 12W max load
- Overload protection
- PD Auto-sensing
- Enable/Disable power MDI
- Auto-Negotiation [pg 16]
- Link Pass Through [pg 17]
- Automatic Link Restoration [pg 18]

Power over CAT5 to Remotely Located Devices



Specifications

Complete list of fiber optic connector specifications [pg 212-224]

Standards	IEEE Std. 802.3
Switches	**Switch 1:** MDI Power: UP = Enable; DOWN = Disable **Switch 2:** MDI Link Pass Through: UP = Enable; DOWN = Disable
Status LEDs	**PWR (Power):** Lit for normal operation **MDI Fault:** ON = over-current detected **MDI ON:** ON = MDI port supplying power **TP Link:** ON = Link on copper port **Fiber Link:** ON = Link on fiber port **TP ACT:** Flashing = data activity on copper link **Fiber Act:** Flashing = data activity on fiber link
Dimensions	**Width:** 7.3" [185 mm] **Depth:** 4.4" [112 mm] **Height:** 1.2" [30 mm]
Power Consumption	45 Watts max.
Power Output	16.8 Watts max.
Power	48 VDC +/- 5% @ 1 A maximum
Operating Temperature	0 – 50° C [32° – 122°F]
Storage Temperature	-25° – 85° C [-13° – 185°F]
Environment	5 – 95% humidity non-condensing; altitude 0 – 10,000 ft.
Shipping Weight	2 lbs. [0.90 kg]
Regulatory Compliance	UL Listed; CISPR22/EN55022 Class A; EN 55024 Class A; CE Mark
Warranty	Lifetime

Ordering Information

Complete list of fiber optic connector specifications [pg 212-224]

SEPOE1011-150
10BASE-T (RJ-45) **[100 m/328 ft.]**
to 10BASE-FL 850 nm multimode (ST)
[2 km/ 1.2 mi.] Link Budget: 13.5 dB

SEPOE1013-150
10BASE-T (RJ-45) **[100 m/328 ft.]**
to 10BASE-FL 850 nm multimode (SC)
[2 km/ 1.2 mi.] Link Budget: 13.5 dB

Optional Accessories *(sold separately)*

Mounting Options

WMBL [pg 68]
Wall Mount Bracket 4.0" [102 mm]

WMBD-P [pg 68]
DIN Rail Mount Bracket PoE

E-TBT-FRL-05(xx)

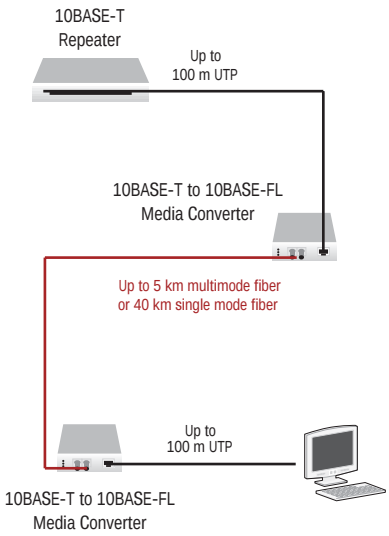
Ethernet Copper to Fiber Media Converter

Extend Network Distance

(2) 10BASE-T to 10BASE-FL Media Converters used back-to-back extend the distance between (2) 10BASE-T devices up to 5 km (3.1 mi.) using multimode fiber or up to 40 km (24.9 mi.) using single mode fiber without a repeater.

Connect Unlike Devices

Connect your workgroup to a distant server or a central switch; or extend distances between like and unlike devices in either full or half-duplex modes.



- Integrate mixed cabling environments using either switched or shared Ethernet

Features

- AutoCross™ [pg 16]
- Link Pass Through [pg 17]
- Automatic Link Restoration [pg 18]

Specifications

Complete list of fiber optic connector specifications [pg 212-224]

Standards	IEEE Std. 802.3 10BASE-T, 10BASE-FL
Switch	**S1:** Enables/disables Link Pass Through
Status LEDs	**PWR (Power):** ON = connection to external AC power **Link:** ON = unit is receiving link pulses from a compliant device **RX (Receive):** ON = packets are being received
Dimensions	**Width:** 3.0" [76 mm] **Depth:** 3.9" [99 mm] **Height:** 1.0" [25 mm]
Power	External AC/DC required; 12 VDC, 0.5A, unregulated, standard
Environment	0 – 50°C; 5% – 95% humidity non-condensing; 0 – 10,000 ft. altitude
Shipping Weight	2 lbs. [0.90 kg]
Safety Compliance	**Wall Mount Power Supply:** UL Listed, C-UL Listed (Canada)
Regulatory Compliance	FCC Class A, CISPR22/EN55022 Class A, EN55024, EN61000, CE Mark
Warranty	Lifetime

Ordering Information

Complete list of fiber optic connector specifications [pg 212-224]

E-TBT-FRL-05
10BASE-T (RJ-45) **[100 m/328 ft.]**
10BASE-FL 850nm multimode (ST)
[2 km/1.2 mi.] Link Budget: 13.5 dB

E-TBT-FRL-05(SC)
10BASE-T (RJ-45) **[100 m/328 ft.]**
10BASE-FL 850nm multimode (SC)
[2 km/1.2 mi.] Link Budget: 13.5 dB

E-TBT-FRL-05(L)
10BASE-T (RJ-45) **[100 m/328 ft.]**
10BASE-FL 1300nm MM (ST)
[5 km/3.1 mi.] Link Budget: 13.5 dB

E-TBT-FRL-05(SM)
10BASE-T (RJ-45) **[100 m/328 ft.]**
10BASE-FL 1310nm SM (ST)
[20 km/12.4 mi.] Link Budget: 7.0 dB

E-TBT-FRL-05(XC)
10BASE-T (RJ-45) **[100 m/328 ft.]**
10BASE-FL 1310nm single mode (SC)
[20 km/12.4 mi.] Link Budget: 7.0 dB

E-TBT-FRL-05(LH)
10BASE-T (RJ-45) **[100 m/328 ft.]**
10BASE-FL 1310nm single mode (ST)
[40 km/24.9 mi.] Link Budget: 19.0 dB

Optional Accessories *(sold separately)*

Wide Input (24 - 60 VDC) Power Supplies

SPS-2460-CC [pg 69]
Piggy Back Power Supply

SPS-2460-SA [pg 69]
Stand-Alone Power Supply

Mounting Options

E-MCR-05 [pg 67]
12-Slot Media Converter Rack

RMS19-SA4-01 [pg 67]
4-Slot Media Converter Shelf

WMBD [pg 68]
DIN Rail Bracket 5.0" [127 mm]

WMBD-FS [pg 68]
DIN Rail Bracket (flat, small) 3.1" [79 mm]

WMBS [pg 68]
Wall Mount Bracket 3.2" [81 mm]

WMBV [pg 68]
Vertical Wall Mount Bracket 5.0" [127 mm]

E-TBT-FRL-05(xxHT)

Ethernet Copper to Fiber Media Converter

Connect Remote Devices

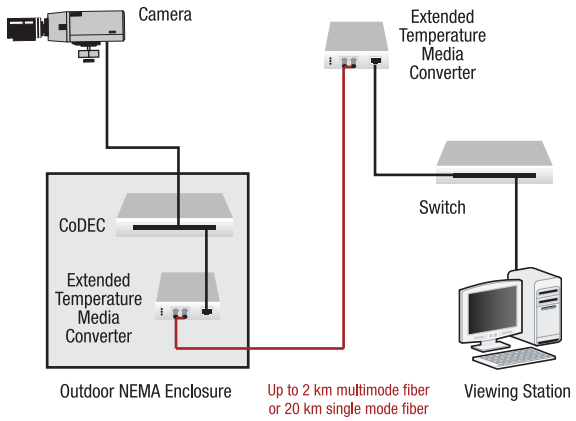
Connect remote devices such as IP based surveillance cameras or signaling equipment in a non-climate controlled enclosure. Deliver 10 Mbps data access in residential or commercial environments inside a non-climate controlled pedestal enclosure.

This converter can also be deployed in industrial environments where excessive heat may be a concern. (Note that this device is rated to meet "temperature" requirements of industrial environments only.)

Features

- Connect legacy coax devices to a 10BASE-T network
- Extended Temperature Capable: Designed to operate in environments where ambient temperatures can rise as high as 70°C (158°F)
- AutoCross™ [pg 16]
- Link Pass Through [pg 17]
- Automatic Link Restoration [pg 18]

Extended Temperature Applications (to 70°C)



Specifications

Complete list of fiber optic connector specifications [pg 212-224]

Standards	IEEE Std. 802.3; 10BASE-T; 10BASE-FL
Switch	**S1:** Enables/disables Link Pass Through
Status LEDs	**PWR (Power):** On for normal operation **Link:** Steady LED indicates unit is receiving link pulses from a compliant device **Receive:** Flashing or lit LED indicates packets are being received
Dimensions	**Width:** 3.0" [76 mm] **Depth:** 3.9" [99 mm] **Height:** 1.0" [25 mm]
Power	External AC/DC required; 9 VDC. 1.0A; unregulated; standard
Environment	-25°C to +70°C; 5% – 95% humidity non-condensing; 0 – 10,000 ft. altitude
Shipping Weight	2 lbs. [0.90 kg]
Safety Compliance	**Wall Mount Power Supply:** UL Listed and CSA certified
Regulatory Compliance	CISPR22/EN55022 Class A; FCC Class; CE Mark
Warranty	Lifetime

Ordering Information

Complete list of fiber optic connector specifications [pg 212-224]

E-TBT-FRL-05(HT)
10BASE-T (RJ-45) **[100 m/328 ft.]**
to 10BASE-FL 850nm multimode (ST)
[2 km/1.2 mi.] Link Budget: 13.5 dB

E-TBT-FRL-05(SCHT)
10BASE-T (RJ-45) **[100 m/328 ft.]**
to 10BASE-FL 850nm multimode (SC)
[2 km/1.2 mi.] Link Budget: 13.5 dB

E-TBT-FRL-05(XCHT)
10BASE-T (RJ-45) **[100 m/328 ft.]**
10BASE-FL 1310nm single mode (SC)
[20 km/12.4 mi.] Link Budget: 14.0 dB

Optional Accessories *(sold separately)*

Wide Input (24 - 60 VDC) Power Supplies

SPS-2460-CC [pg 69]
Piggy Back Power Supply

SPS-2460-SA [pg 69]
Stand-Alone Power Supply

Mounting Options

RMS19-SA4-01 [pg 67]
4-Slot Media Converter Shelf

WMBD [pg 68]
DIN Rail Bracket 5.0" [127 mm]

WMBD-FS [pg 68]
DIN Rail Bracket (flat, small) 3.1" [79 mm]

WMBS [pg 68]
Wall Mount Bracket 3.2" [81 mm]

WMBV [pg 68]
Vertical Wall Mount Bracket 5.0" [127 mm]

F-SM-MM-05

Single Mode to Multimode Media Converter

- Protocol Transparency: 500 Kbps - 30 Mbps speed range in continuous duty cycle

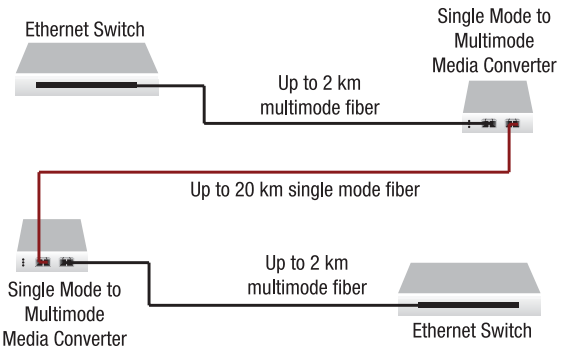
Features

- AutoCross™ [pg 16]
- Link Pass Through [pg 17]
- Automatic Link Restoration [pg 18]

Extend Network Distance

Ethernet or Token Ring Networks: Connect distant networks or devices up to 20 km in an existing single mode network.

Save money by purchasing Ethernet devices with lower cost multimode fiber interfaces and use converters to introduce single mode fiber only where you need it.



Specifications

Complete list of fiber optic connector specifications [pg 212-224]

Standards	IEEE Std. 802.5j
Status LEDs	**PWR (Power):** Lit for normal operation **Link:** (Left) Lit for MM link **Link:** (Right) Lit for SM link
Dimensions	**Width:** 3.0" [76 mm] **Depth:** 4.7" [119 mm] **Height:** 1.0" [25 mm]
Power	External AC/DC required; 12 VDC. 0.5A; unregulated; standard
Power Consumption	3.1 Watts
Environment	Operating temperature 0° – 50°C; 5% – 90% humidity non-condensing; 0 – 10,000 ft. altitude
Shipping Weight	2 lbs. [0.90 kg]
Safety Compliance	**Wall Mount Power Supply:** UL Listed and CSA certified
Regulatory Compliance	CISPR/EN55022 Class A; EN55024; EN61000; FCC Class A; CE Mark
Warranty	Lifetime

Ordering Information

Complete list of fiber optic connector specifications [pg 212-224]

F-SM-MM-05
850nm multimode (ST)
[2 km/1.2 mi.] Link Budget: 13.5 dB
to 1310nm single mode (ST)
[20 km/12.4 mi.] Link Budget: 7.0 dB

Optional Accessories *(sold separately)*

Wide Input (24 - 60 VDC) Power Supplies

SPS-2460-CC [pg 69]
Piggy Back Power Supply

SPS-2460-SA [pg 69]
Stand-Alone Power Supply

Mounting Options

E-MCR-05 [pg 67]
12-Slot Media Converter Rack

RMS19-SA4-01 [pg 67]
4-Slot Media Converter Shelf

WMBD [pg 68]
DIN Rail Bracket 5.0" [127 mm]

WMBD-FS [pg 68]
DIN Rail Bracket (flat, small) 3.1" [79 mm]

WMBL [pg 68]
Wall Mount Bracket 4.0" [102 mm]

WMBV [pg 68]
Vertical Wall Mount Bracket 5.0" [127 mm]

10BASE-T to 10BASE-FL or 100BASE-TX to 100BASE-FX

see also: Ethernet or Fast Ethernet Speed Selectable Point System™
Slide-In-Module Media Converters [pg 35]

Ethernet or Fast Ethernet

SSEFE10xx-10x

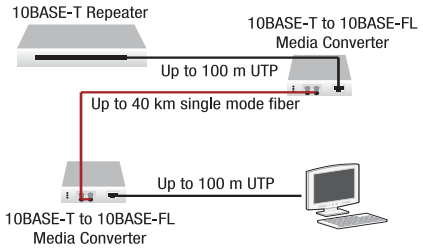
Speed Selectable Media Converter

Features

- AutoCross™ [pg 16]
- Link Pass Through [pg 17]
- Automatic Link Restoration [pg 18]

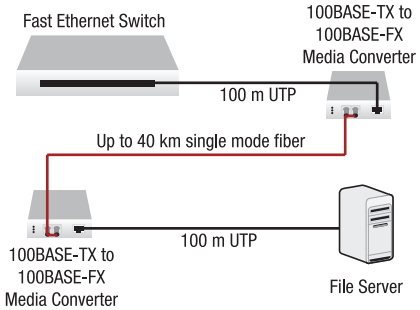
Ethernet

Use the 10BASE-T to 10BASE-FL speed setting (back-to-back) to extend the distance between two 10BASE-T devices up to 40 km (24.9 mi.) using single mode fiber without a repeater.



Fast Ethernet

Use the 100BASE-TX to 100BASE-FX setting to extend the distance between any two 100BASE-TX devices up to 40 km (24.9 mi.) using single mode fiber. Or interface directly with a 100BASE-FX compliant port on any device to provide a 100BASE-TX port interface.



Selectable speed setting:
The converter can be set to 10 Mbps or 100 Mbps. Both copper and fiber ports are automatically set to the same speed.

Transition Networks' speed selectable copper to fiber Media Converter allows you to extend the distance between copper based connections with the use of fiber optic cable. The ability to select the speed of converter allows for easy migration from a 10 Mbps network today to a 100 Mbps network in the future. This converter is a true layer 1 device as both the copper and fiber ports operate at the same speed setting (i.e. 100BASE-TX to 100BASE-FX). For 10 Mbps applications, these devices must be used in pairs.

Specifications

Complete list of fiber optic connector specifications [pg 212-224]

Standards	IEEE Std. 802.3
Switches	**Switch 1:** Link Pass Through on/off **Switch 2:** 10 Mb or 100 Mb operation
Status LEDs	**PWR (Power):** Lit for normal operation **F-ACT (Fiber Activity):** Blinking = data reception on the fiber link **F-100 (Fiber Speed):** ON = link at 100 Mb **F-10 (Fiber Speed):** ON = link at 10 Mb **C-ACT (Copper Activity):** Blinking = data reception on the copper link **C-100 (Copper Speed):** ON = link at 100 Mb **C-10 (Copper Speed):** ON = link at 10 Mb
Dimensions	**Width:** 3.25" [82 mm] **Depth:** 4.8" [122 mm] **Height:** 1.0" [25 mm]
Power Consumption	3.6 Watts
Power	External AC/DC required; 12 VDC, 0.5A; unregulated; standard (provided)
Environment	0 – 50°C operating; 5% – 95% humidity non-condensing; 0 – 10,000 ft. altitude
Shipping Weight	2 lbs. [0.90 kg]
Safety Compliance	**Wall Mount Power Supply:** UL Listed; C-UL Listed (Canada)
Regulatory Compliance	CISPR/EN55022 Class A; EN55024; EN60950 Class A; FCC Class A; CE Mark
Warranty	Lifetime

Ordering Information

Complete list of fiber optic connector specifications [pg 212-224]

SSEFE1012-100
10BASE-T or 100BASE-TX (RJ-45)
[100 m/328 ft.]
to 10BASE-FL or 100BASE-FX 1310nm SM (ST)
[20 km/12.4 mi.] Link Budget: 17.0 dB

SSEFE1014-100
10BASE-T or 100BASE-TX (RJ-45)
[100 m/328 ft.]
to 10BASE or 100BASE 1310nm SM (SC)
[20 km/12.4 mi.] Link Budget: 17.0 dB

SSEFE1015-100
10BASE-T or 100BASE-TX (RJ-45)
[100 m/328 ft.]
to 10BASE or 100BASE 1310nm SM (SC)
[40 km/24.9 mi.] Link Budget: 26.0 dB

SSEFE1022-100
10BASE-T or 100BASE-TX (RJ-45)
[100 m/328 ft.]
to 10BASE or 100BASE 1310nm SM (ST)
[40 km/24.9 mi.] Link Budget: 26.0 dB

Single Fiber Products

Recommended use in pairs [pg 19]

SSEFE1029-100
10BASE-T or 100BASE-TX (RJ-45)
[100 m/328 ft.]
to 10BASE-FL or 100BASE-FX 1310nm TX/1550nm RX single fiber SM (SC)
[20 km/12.4 mi.] Link Budget: 19.0 dB

SSEFE1029-101
10BASE-T or 100BASE-TX (RJ-45)
[100 m/328 ft.]
to 10BASE-FL or 100BASE-FX 1550nm TX/1310nm RX single fiber SM (SC)
[20 km/12.4 mi.] Link Budget: 19.0 dB

Optional Accessories *(sold separately)*

Wide Input (24 - 60 VDC) Power Supplies

SPS-2460-PS [pg 69]
Piggy Back Power Supply

SPS-2460-SA [pg 69]
Stand-Alone Power Supply

Mounting Options

E-MCR-05 [pg 67]
12-Slot Media Converter Rack

RMS19-SA4-01 [pg 67]
4-Slot Media Converter Shelf

WMBD [pg 68]
DIN Rail Bracket 5.0" [127 mm]

WMBD-E [pg 68]
DIN Rail Bracket (Extended) 4.3"[109 mm]

WMBD-F [pg 68]
DIN Rail Bracket (flat) 3.3" [84 mm]

WMBL [pg 68]
Wall Mount Bracket 4.0" [102 mm]

WMBV [pg 68]
Vertical Wall Mount Bracket 5.0" [127 mm]

WMBV-E [pg 68]
Extended Vertical Mount 4.7" [119 mm]

J/FE-CF-04(xx)

Fast Ethernet Media Converter

Extend Network Distance In Full-Duplex Networks

Used in pairs, this media converter can extend distances between two twisted pair switches or a switch and a server up to 2 km over multimode fiber or up to 40 km over single mode fiber.

Connect Remote Devices

Using a single 100BASE-TX to FX media converter, a switch with a copper port can be connected to a switch or any other 100BASE compliant device with an existing fiber interface.

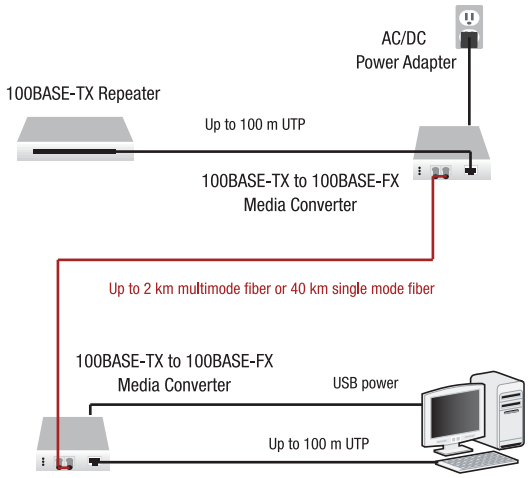
Dual Power Options

This media converter can be powered through the supplied AC/DC power adapter or through the USB 2.0 port. Additionally, both power sources can be used simultaneously, providing the security of redundant power.

Features

- Auto-Negotiation [pg 16]
- AutoCross™ [pg 16]
- Automatic Link Restoration [pg 18]
- Interoperable with other 100BASE-TX/FX NICs, hubs or switches
- Provides LEDs for easy network monitoring
- Rack-mountable in the E-MCR-05
- USB Power Option, requires standard USB cable, not provided

Extend Network Distance



Specifications

Standards	IEEE Std. 802.3u, 100BASE-TX and 100BASE-FX
Switches	**SW1:** Auto-Negotiation On/Off **SW2:** Full/Half Duplex Advertisement
Status LEDs	**PWR(Power)** **Copper:** Link & Receive **Fiber:** Link
Dimensions	**Width:** 3.0" [76 mm] **Depth:** 3.93" [100 mm] **Height:** 0.98" [25 mm]
Power Sources	External AC/DC: +12 VDC, 0.5A USB 2.0 port: +5 VDC, 0.5A
Environment	0 – 50°C; 5% – 95% humidity non-condensing; 0 – 10,000 ft. altitude
Shipping Weight	2 lbs. [0.90 kg]
Safety Compliance	**Wall Mount Power Supply:** UL Listed and CSA certified
Regulatory Compliance	CISPR/EN55022 Class A + EN55204; FCC Class A; CE Mark
Warranty	Lifetime

Ordering Information

J/FE-CF-04
100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1300nm multimode (ST)
[2 km/1.2 mi.] Link Budget: 11.0 dB

J/FE-CF-04(SC)
100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1300nm multimode (SC)
[2 km/1.2 mi.] Link Budget: 11.0 dB

J/FE-CF-04(LC)
100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1300nm multimode (LC)
[2 km/1.2 mi.] Link Budget: 11.0 dB

J/FE-CF-04(SM)
100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1310nm SM (SC)
[20 km/12.4 mi.] Link Budget: 16.0 dB

J/FE-CF-04(SMLC)
100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1310nm single mode (LC)
[20 km/1.2 mi.] Link Budget: 17.3 dB

J/FE-CF-04(LH)
100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1310nm single mode (SC)
[40 km/24.9 mi.] Link Budget: 26.0 dB

Single Fiber Products

Recommended use in pairs [pg 19]

J/FE-CF-04(100)
100BASE-TX (RJ-45) **[100 m/328 ft.]**
100BASE-FX 1310nm TX/1550nm RX
single fiber single mode (SC)
[20 km/12.4 mi.] Link Budget: 19.0 dB

J/FE-CF-04(101)
100BASE-TX (RJ-45) **[100 m/328 ft.]**
100BASE-FX 1550nm TX/1310nm RX
single fiber single mode (SC)
[20 km/12.4 mi.] Link Budget: 19.0 dB

Optional Accessories *(sold separately)*

Wide Input (24 - 60 VDC) Power Supplies

SPS-2460-CC [pg 69]
Piggy Back Power Supply

SPS-2460-SA [pg 69]
Stand-Alone Power Supply

Mounting Options

E-MCR-05 [pg 67]
12-Slot Media Converter Rack

WMBD [pg 68]
DIN Rail Bracket 5.0" [127 mm]

WMBD-FS [pg 68]
DIN Rail Bracket (flat, small) 3.1" [79 mm]

WMBS [pg 68]
Wall Mount Bracket 3.2" [81 mm]

USB Cables

USBC-AM-BM-03
USB 2.0 Cable A male to B male [3 ft. Gray]

USBC-AM-BM-06
USB 2.0 Cable A male to B male [6 ft. Gray]

AUTO NEG | AUTO CROSS | LINK PASS THRU | FAR END FAULT | AUTO LINK RESTORE | PAUSE

100BASE-TX to 100BASE-FX

see also: Fast Ethernet 100BASE-TX to 100BASE-FX Point System™ Slide-In-Module Media Converters [pg 36, 37]

Fast Ethernet

E-100BTX-FX-05(xxxx)

Fast Ethernet Media Converter

single fiber model

- Extend Network Distance
  Used in pairs, this media converter can extend distances between two twisted pair switches or a switch and a server up to 2 km over multimode fiber or up to 120 km over single mode fiber.
- Connect Remote Devices
  Using one media converter, a switch with a copper port can be connected to a switch with an existing fiber interface.

Features

- Operates under heavy traffic loads without excess heat, so there is no need for a failure-prone internal fan
- Round trip delay of only 40 bit times - far below the Class II rating of 92 bit times
- Auto-Negotiation [pg 16]
- AutoCross™ [pg 16]
- Link Pass Through [pg 17]
- Far-End-Fault (FEF) [pg 16]
- Pause [pg 17]
- Automatic Link Restoration [pg 18]

Optional Accessories *(sold separately)*

Wide Input (24 - 60 VDC) Power Supplies

SPS-2460-CC [pg 69]
Piggy Back Power Supply

SPS-2460-SA [pg 69]
Stand-Alone Power Supply

Mounting Options

E-MCR-05 [pg 67]
12-Slot Media Converter Rack

RMS19-SA4-01 [pg 67]
4-Slot Media Converter Shelf

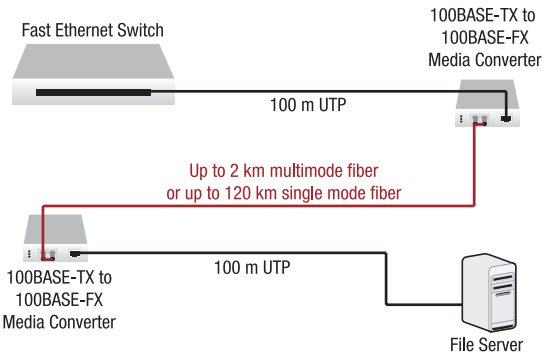
WMBD [pg 68]
DIN Rail Bracket 5.0" [127 mm]

WMBD-FS [pg 68]
DIN Rail Bracket (flat, small) 3.1" [79 mm]

WMBL [pg 68]
Wall Mount Bracket 4.0" [102 mm]

WMBV [pg 68]
Vertical Wall Mount Bracket 5.0" [127 mm]

Extend Network Distance



The converters will automatically re-establish link when connected to two 10/100 auto-negotiating switches, after the fault condition has been corrected. With other manufacturers' converters the user must intervene to re-establish link.

Specifications

Complete list of fiber optic connector specifications [pg 212-224]

Standards	IEEE Std. 802.3 100BASE-FX, 100BASE-TX
Switches	**SW1:** Auto-Negotiation On/Off **SW2:** Pause TX On/Off **SW3:** Link Pass Through On/Off **SW4:** Far-End-Fault On/Off
Jumpers	**Jumper Block 1:** AutoCross™ enable
Status LEDs	**PWR (Power)** SDF or LKF (Link Fiber) SDC or LKC (Link Copper) RXF (Receive Fiber) RXC (Receive Copper)
Dimensions	**Width:** 3.0" [76 mm] **Depth:** 4.7" [119 mm] **Height:** 1.0" [25 mm]
Power	External AC/DC required: 12 VDC, 0.5 A, unregulated, standard
Environment	0 – 50°C, 5% – 95% humidity non-condensing, 0 – 10,000 ft. altitude
Shipping Weight	2 lbs. [0.90 kg]
Safety Compliance	**Wall Mount Power Supply:** UL Listed and CSA certified
Regulatory Compliance	FCC Class A, EN55024, EN55022 Class A, EN61000, CE Mark
Warranty	Lifetime

Ordering Information

Complete list of fiber optic connector specifications [pg 212-224]

E-100BTX-FX-05
100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1300nm MM (ST)
[2 km/1.2 mi.] Link Budget: 11.0 dB

E-100BTX-FX-05(SC)
100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1300nm multimode (SC)
[2 km/1.2 mi.] Link Budget: 11.0 dB

E-100BTX-FX-05(LC)
100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1300nm multimode (LC)
[2 km/1.2 mi.] Link Budget: 11.0 dB

E-100BTX-FX-05(MT)
100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1300nm MM (MT-RJ)
[2 km/1.2 mi.] Link Budget: 14.5 dB

E-100BTX-FX-05(SM)
100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1310nm SM (SC)
[20 km/12.4 mi.] Link Budget: 16.0 dB

E-100BTX-FX-05(SMLC)
100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1310nm SM (LC)
[20 km/12.4 mi.] Link Budget: 17.3 dB

E-100BTX-FX-05(LH)
100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1310nm SM (SC)
[40 km/24.9 mi.] Link Budget: 26.0 dB

E-100BTX-FX-05(XL)
100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1310nm SM (SC)
[60 km/37.3 mi.] Link Budget: 29.0 dB

E-100BTX-FX-05(LW)
100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1550nm SM (SC)
[80 km/49.7 mi.] Link Budget: 29.0 dB

E-100BTX-FX-05(XLW)
100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1550nm SM (SC)
[120 km/74.6 mi.] Link Budget: 36.0 dB

Single Fiber Products

Recommended use in pairs [pg 19]

E-100BTX-FX-05(100)
100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1310nm TX/1550nm RX single fiber single mode (SC)
[20 km/12.4 mi.] Link Budget: 19.0 dB

E-100BTX-FX-05(101)
100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1550nm TX/1310nm RX single fiber single mode (SC)
[20 km/12.4 mi.] Link Budget: 19.0 dB

E-100BTX-FX-05(102)
100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1310nm TX/1550nm RX single fiber single mode (SC)
[40 km/24.9 mi.] Link Budget: 25.0 dB

E-100BTX-FX-05(103)
100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1550nm TX/1310nm RX single fiber single mode (SC)
[40 km/24.9 mi.] Link Budget: 25.0 dB

E-100BTX-FX-05(104)
100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1310nm TX/1550nm RX single fiber single mode (SC)
[60 km/37.3 mi.] Link Budget: 16.0 dB

E-100BTX-FX-05(105)
100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1550nm TX/1310nm RX single fiber single mode (SC)
[60 km/37.3 mi.] Link Budget: 26.0 dB

E-100BTX-FX-05(106)
100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1310nm TX/1550nm RX single fiber single mode (SC)
[80 km/49.7 mi.] Link Budget: 33.0 dB

E-100BTX-FX-05(107)
100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1550nm TX/1310nm RX single fiber single mode (SC)
[80 km/49.7 mi.] Link Budget: 32.0 dB

AUTO NEG | AUTO CROSS | LINK PASS THRU | FAR END FAULT | AUTO LINK RESTORE | PAUSE

Fast Ethernet 100BASE-TX to 100BASE-FX Extended Temperature

see also: Fast Ethernet 100BASE-TX to 100BASE-FX Point System™ Slide-In-Module Media Converters [pg 36, 37]

E-100BTX-FX-05(xxHT)

Fast Ethernet Media Converter

Connect Remote Devices

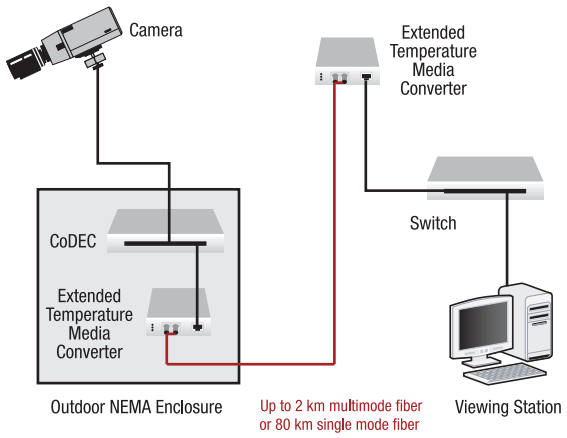
Connect remote devices such as IP based surveillance cameras or signaling equipment in a non-climate controlled enclosure. Deliver 100 Mbps data access in residential or commercial environments inside a non-climate controlled pedestal enclosure.

This converter can also be deployed in industrial environments where excessive heat may be a concern. (Note that this device is rated to meet "temperature" requirements of industrial environments only.)

Features

- Extended Temperature Capable: Designed to operate in environments where ambient temperatures can rise as high as 65°C (149°F)
- Auto-Negotiation [pg 16]
- AutoCross™ [pg 16]
- Link Pass Through [pg 17]
- Far-End-Fault Detection [pg 16]
- Automatic Link Restoration [pg 18]
- Pause [pg 17]

Extended Temperature Applications (to 65°C)



Specifications

Complete list of fiber optic connector specifications [pg 212-224]

Standards	IEEE Std. 802.3, 100BASE-FX, 100BASE-TX
Jumpers	Jumper Block 1: AutoCross™ enable
Switches	**SW1:** Auto-Negotiation On/Off **SW2:** Pause TX On/Off **SW3:** LPT On/Off **SW4:** FEF On/Off
Status LEDs	**PWR (Power):** Lit for normal operation **SDF (Signal Detect Fiber):** Lit for fiber link **SDC (Signal Detect Copper):** Lit for copper link **RXF (Receive Fiber):** Flashing = RX data **RXC (Receive Copper):** Flashing = RX data
Dimensions	**Width:** 3.0" [76 mm] **Depth:** 4.7" [119 mm] **Height:** 1.0" [25 mm]
Power	External AC/DC required; 9 VDC. 1.0A; unregulated; standard
Environment	-25°C to +65°C; 5% – 95% humidity non-condensing; 0 – 10,000 ft. altitude
Shipping Weight	2 lbs. [0.90 kg]
Safety Compliance	**Wall Mount Power Supply:** UL Listed and CSA certified
Regulatory Compliance	FCC Class A; EN55024; EN55022 Class A; EN61000; CE Mark
Warranty	Lifetime

Ordering Information

Complete list of fiber optic connector specifications [pg 212-224]

E-100BTX-FX-05(HT)
100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1300nm multimode (ST)
[2 km/1.2 mi.] Link Budget: 11.0 dB

E-100BTX-FX-05(SCHT)
100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1300nm multimode (SC)
[2 km/1.2 mi.] Link Budget: 11.0 dB

E-100BTX-FX-05(SMHT)
100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1310nm SM (SC)
[20 km/12.4 mi.] Link Budget: 16.0 dB

E-100BTX-FX-05(LHHT)
100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1310nm SM (SC)
[40 km/24.9 mi.] Link Budget: 26.0 dB

E-100BTX-FX-05(XLHT)
100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1310nm SM (SC)
[60 km/37.3 mi.] Link Budget: 33.0 dB

E-100BTX-FX-05(LWHT)
100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1550nm SM (SC)
[80 km/49.7 mi.] Link Budget: 29.0 dB

Optional Accessories *(sold separately)*

Wide Input (24 - 60 VDC) Power Supplies

SPS-2460-CC [pg 69]
Piggy Back Power Supply

SPS-2460-SA [pg 69]
Stand-Alone Power Supply

Mounting Options

RMS19-SA4-01 [pg 67]
4-Slot Media Converter Shelf

WMBD [pg 68]
DIN Rail Bracket 5.0" [127 mm]

WMBD-FS [pg 68]
DIN Rail Bracket (flat, small) 3.1" [79 mm]

WMBL [pg 68]
Wall Mount Bracket 4.0" [102 mm]

WMBV [pg 68]
Vertical Wall Mount Bracket 5.0" [127 mm]

SRMFE10xx-20x

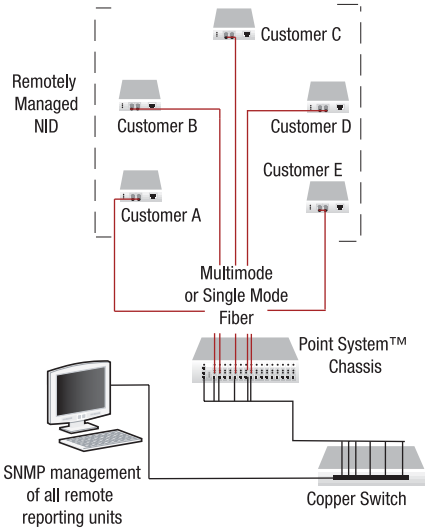
Remotely Managed Fast Ethernet NID (Network Interface Device)

- In-band management of stand-alone Fast Ethernet NID
- Remote Loopback assists in diagnosing network problems [pg 18]
- Upstream and downstream Bandwidth Control allows service providers to offer an array of services

Features

- Auto-Negotiation [pg 16]
- AutoCross™ [pg 16]
- Link Pass Through [pg 17]
- Far-End-Fault (FEF) [pg 16]
- Automatic Link Restoration [pg 18]
- Pause [pg 17]
- Loopback [pg 18]
- Remote Management [pg 17]

Remotely Managed Fast Ethernet



With the Remotely Managed Fast Ethernet NID, service providers can now monitor and manage the entire optical link from the Central Office (CO) to the Customer Premise Equipment (CPE).

When used in conjunction with a managed Point System™ Chassis card, [CRMFE pg 38], this stand-alone unit can be managed remotely. This Fast Ethernet NID provides a fully-managed conversion between 100BASE-TX and 100BASE-FX signals at Customer Premises.

Devices should be used in pairs. Typical installation will include a chassis card installed in the Point System locally and a stand-alone device (SRMFE) installed at the remote location.

Specifications

Complete list of fiber optic connector specifications [pg 212-224]

Standards	IEEE Std. 802.3
3-position Jumper	**Jumper J2:** Enable/disable AutoCross™ **Jumper J6:** **Hardware:** Device mode determined by 4-position switch settings **Software:** Device mode determined by most recently saved on-board microprocessor settings
4 position Switch	**Pos 1** Enable/disable twisted pair auto-negotiation **Pos 2** Enable/disable twisted pair pause **Pos 3** (UP) Enables Link Pass Through (DOWN) Disables Link Pass Through **Pos 4** (UP) Enables Far-End-Fault (DOWN) Disables Far-End-Fault
Status LEDs	**Power** **LKF (Fiber Link)** **RXF (Fiber Receive)** **RXC (Copper Receive)** **LKC (Copper Link)**
Dimensions	**Width:** 3.25" [83 mm] **Depth:** 4.8" [122 mm] **Height:** 1.0" [25 mm]
Power Consumption	4 Watts
Power	External AC/DC required; 12 VDC 0.5A; unregulated; standard
Environment	0 – 50°C; 5% – 95% humidity non-condensing; 0 – 10,000 ft. altitude
Shipping Weight	2 lbs. [0.90 kg]
Safety Compliance	**Wall Mount Power Supply:** UL Listed and CSA certified
Regulatory Compliance	CISPR/EN55022 Class A & B + EN55024; FCC Class A & B; CE Mark
Warranty	Lifetime

Ordering Information

Complete list of fiber optic connector specifications [pg 212-224]

SRMFE1011-200
100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1300nm multimode (ST)
[2 km/1.2 mi.] Link Budget: 11.0 dB

SRMFE1013-200
100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1300nm multimode (SC)
[2 km/1.2 mi.] Link Budget: 11.0 dB

SRMFE1014-200
100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1310nm SM (SC)
[20 km/12.4 mi.] Link Budget: 16.0 dB

SRMFE1015-200
100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1310nm SM (SC)
[40 km/24.9 mi.] Link Budget: 26.0 dB

SRMFE1016-200
100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1310nm SM (SC)
[60 km/37.3 mi.] Link Budget: 29.0 dB

SRMFE1017-200
100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1550nm SM (SC)
[80 km/49.7 mi.] Link Budget: 29.0 dB

Single Fiber Products

Recommended use in pairs [pg 19]

SRMFE1029-200
100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1310nm TX/1550nm RX single fiber single mode (SC)
[20 km/12.4 mi.] Link Budget: 19.0 dB

SRMFE1029-201
100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1550nm TX/1310nm RX single fiber single mode (SC)
[20 km/12.4 mi.] Link Budget: 19.0 dB

SRMFE1029-202
100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1310nm TX/1550nm RX single fiber single mode (SC)
[40 km/24.9 mi.] Link Budget: 25.0 dB

SRMFE1029-203
100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1550nm TX/1310nm RX single fiber single mode (SC)
[40 km/24.9 mi.] Link Budget: 25.0 dB

Optional Accessories *(sold separately)*

Wide Input (24 - 60 VDC) Power Supplies
SPS-2460-PS or SPS-2460-SA [pg 69]

Mounting Options
E-MCR-05 [pg 67]
12-Slot Media Converter Rack

WMBD or WMBL [pg 68]
Wall Mount Brackets

RMS19-SA4-01 [pg 67]
4-Slot Media Converter Shelf

F-SM-MM-02 & SFMFF1xxx-20x

Single Mode to Multimode Optical Mode Converter

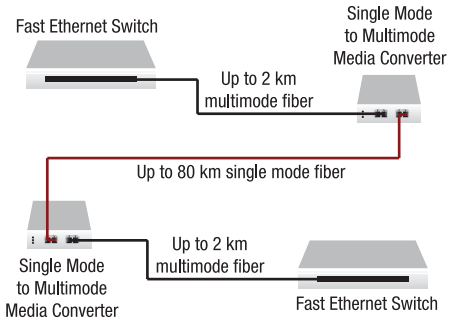
Features

- Link Pass Through [pg 17]
- Automatic Link Restoration [pg 18]

Extend Network Distance

Extend distances up to 80 km with network protocols that use 1300nm wavelength for fiber optic transmission. In fact, distances can be extended in any networking protocol between 100 Mbps and 155 Mbps.

Save money by purchasing Fast Ethernet devices with lower cost multimode fiber interfaces and use converters to introduce single mode fiber only where you need it.



Specifications

Complete list of fiber optic connector specifications [pg 212-224]

Standards	IEEE Std. 802.3
Status LEDs	**PWR (Power):** Steady green LED indicates connection to external AC power **LKM or Link (Left):** Lit for MM Link **LKS or Link (Right):** Lit for SM Link
Dimensions	**Width:** 3.0" [76 mm] **Depth:** 4.7" [119 mm] **Height:** 1.0" [25 mm]
Power	External AC/DC required; 12 VDC. 0.5A; unregulated; standard
Environment	0 – 50°C; 5% – 90% humidity non-condensing; 0 – 10,000 ft. altitude
Shipping Weight	2 lbs. [0.90 kg]
Safety Compliance	**Wall Mount Power Supply:** UL Listed and CSA certified
Regulatory Compliance	CISPR/EN55022 Class A; EN55024; EN61000; FCC Class A; CE Mark
Warranty	Lifetime

Ordering Information

Complete list of fiber optic connector specifications [pg 212-224]

SFMFF1313-200
1300nm multimode (SC)
[2 km/1.2 mi.] Link Budget: 11.0 dB
to 1300nm multimode (SC)
[2 km/1.2 mi.] Link Budget: 11.0 dB

F-SM-MM-02
1300nm multimode (SC)
[2 km/1.2 mi.] Link Budget: 11.0 dB
to 1310nm single mode (SC)
[20 km/12.4 mi.] Link Budget: 16.0 dB

F-SM-MM-02(LH)
1300nm multimode (SC)
[2 km/1.2 mi.] Link Budget: 11.0 dB
to 1310nm single mode (SC)
[40 km/24.9 mi.] Link Budget: 26.0 dB

F-SM-MM-02(XL)
1300nm multimode (SC)
[2 km/1.2 mi.] Link Budget: 11.0 dB
to 1310nm single mode (SC)
[60 km/37.3 mi.] Link Budget: 29.0 dB

F-SM-MM-02(LW)
1300nm multimode (SC)
[2 km/1.2 mi.] Link Budget: 11.0 dB
to 1550nm single mode (SC)
[80 km/49.7 mi.] Link Budget: 29.0 dB

SFMFF1414-200
1310nm single mode (SC)
[20 km/12.4 mi.] Link Budget: 16.0 dB
to 1310nm single mode (SC)
[20 km/12.4 mi.] Link Budget: 26.0 dB

SFMFF1415-200
1310nm single mode (SC)
[20 km/12.4 mi.] Link Budget: 16.0 dB
to 1310nm single mode (SC)
[40 km/24.9 mi.] Link Budget: 26.0 dB

SFMFF1417-200
1310nm single mode (SC)
[20 km/12.4 mi.] Link Budget: 16.0 dB
to 1550nm single mode (SC)
[80 km/49.7 mi.] Link Budget: 29.0 dB

Single Fiber Products

Recommended use in pairs [pg 19]

SFMFF1329-200
1300nm multimode (SC)
[2 km/1.2 mi.] Link Budget: 11.0 dB
to 1310nm TX/1550nm RX single fiber single mode (SC)
[20 km/12.4 mi.] Link Budget: 19.0 dB

SFMFF1329-201
1300nm multimode (SC)
[2 km/1.2 mi.] Link Budget: 11.0 dB
1550nm TX/1310nm RX single fiber single mode (SC)
[20 km/12.4 mi.] Link Budget: 19.0 dB

SFMFF1329-202
1300nm multimode (SC)
[2 km/1.2 mi.] Link Budget: 11.0 dB
1310nm TX/1550nm RX single fiber single mode (SC)
[40 km/24.9 mi.] Link Budget: 25.0 dB

SFMFF1329-203
1300nm multimode (SC)
[2 km/1.2 mi.] Link Budget: 11.0 dB
1550nm TX/1310nm RX single fiber single mode (SC)
[40 km/24.9 mi.] Link Budget: 25.0 dB

Ordering Information

Complete list of fiber optic connector specifications [pg 212-224]

SFMFF1329-204
1300nm multimode (SC)
[2 km/1.2 mi.] Link Budget: 11.0 dB
1310nm TX/1550nm RX single fiber single mode (SC)
[60 km/37.3 mi.] Link Budget: 28.0 dB

SFMFF1329-205
1300nm multimode (SC)
[2 km/1.2 mi.] Link Budget: 11.0 dB
1550nm TX/1310nm RX single fiber single mode (SC)
[60 km/37.3 mi.] Link Budget: 27.0 dB

SFMFF1429-200
1310nm single mode (SC)
[20 km/12.4 mi.] Link Budget: 16.0 dB
1310nm TX/1550nm RX single fiber single mode (SC)
[20 km/12.4 mi.] Link Budget: 19.0 dB

SFMFF1429-201
1310nm single mode (SC)
[20 km/12.4 mi.] Link Budget: 16.0 dB
to 1550nm TX/1310nm RX single fiber single mode (SC)
[20 km/12.4 mi.] Link Budget: 19.0 dB

SFMFF1429-202
1310nm single mode (SC)
[20 km/12.4 mi.] Link Budget: 16.0 dB
to 1310nm TX/1550nm RX single fiber single mode (SC)
[40 km/24.9 mi.] Link Budget: 25.0 dB

SFMFF1429-203
1310nm single mode (SC)
[20 km/12.4 mi.] Link Budget: 16.0 dB
to 1550nm TX/1310nm RX single fiber single mode (SC)
[40 km/24.9 mi.] Link Budget: 25.0 dB

Optional Accessories *(sold separately)*

F-SM-MM-02

SPS-2460-CC [pg 69]
Wide Input (24 - 60 VDC) Piggy Back Power Supply for the F-SM-MM-02

WMBD-FS [pg 68]
DIN Rail Bracket (flat, small) 3.1" [79 mm]

SFMFF1x29-20x

SPS-2460-PS [pg 69]
Wide Input (24 - 60 VDC) Piggy Back Power Supply for the SFMSS1xxx-20x

WMBD-F [pg 68]
DIN Rail Bracket (flat) 3.3" [84 mm]

F-SM-MM-02 or SFMFF1x29-20x

SPS-2460-SA [pg 69]
Wide Input (24 - 60 VDC) Stand-Alone Power Supply

E-MCR-05 [pg 67]
12-Slot Media Converter Rack

RMS19-SA4-01 [pg 67]
4-Slot Media Converter Shelf

WMBD [pg 68]
DIN Rail Bracket 5.0" [127 mm]

WMBL [pg 68]
Wall Mount Bracket 4.0" [102 mm]

WMBV [pg 68]
Vertical Wall Mount Bracket 5.0" [127 mm]

SFEPE101x-1x0

Power-Over-Ethernet PSE Media Converter

Transition's AC or DC powered PoE media converters are Power Sourcing Equipment (PSE) and are fully compatible with Powered Devices (PD) that comply with the IEEE802.3af: 2003 standard. The converters also include a PD signature sensing and power monitoring features per the IEEE 802.3af standard.

SFEPE10xx-1xx products can operate in two modes: IEEE 802.3af mode as well as "legacy mode". In the IEEE 802.3af mode the PoE is fully compatible with devices that comply with the IEEE802.3af standard. The PoE converter is also capable of inserting power on either the spare pairs or data pairs of the MDI.

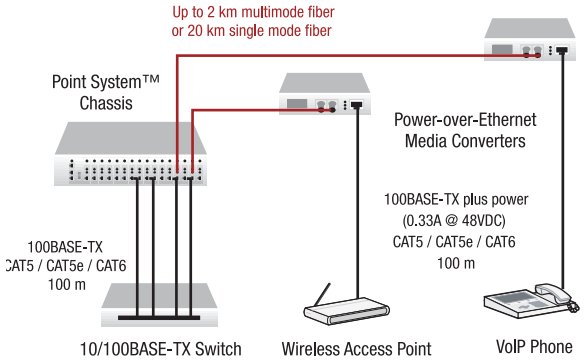
In the "legacy mode" PoE can be configured for reverse polarity, 12 VDC, 24 VDC, or 48 VDC power insertion; as well as for other non-IEEE802.3af compatible PDs.

Different voltages & modes are switch selectable.

Features

- Internal AC or DC power supply
- IEEE802.3af Power-Over-Ethernet Compatible Mode
- Legacy Mode (Non IEEE802.3af)
- 12, 24, or 48 VDC PSE Output Voltage with Reverse Polarity Selection
- Signal Pair and Spare Pair Power Insertion
- Over-Current Protection
- Under-Current Detection
- Minimum Load Sensing
- Fault Protection Input
- Exceeds IEEE802.3af ripple requirements on PSE MDI power leads
- Max 16.8 Watts Power output capacity at legacy 48 VDC
- PSE MDI Power Enable/Disable
- Auto-Negotiation [pg 16]
- AutoCross™ [pg 16]
- Link Pass Through [pg 17]
- Far-End-Fault (FEF) [pg 16]
- Automatic Link Restoration [pg 18]
- Pause [pg 17]

Power over CAT5 to Remotely Located Devices



Specifications

Complete list of fiber optic connector specifications [pg 212-224]

Standards	IEEE Std. 802.3; IEEE Std. 802.3af
Switches	**1&2:** Set voltage output on twisted pair **3:** IEEE 802.3af mode/Legacy mode **4:** Voltage polarity **5:** MDI power on signal pairs/spare pairs **6:** Enable/disable Auto-negotiation **7:** Enable/disable Pause **8:** Enable/disable Link Pass Through **9:** Enable/disable Far-End-Fault **10:** Enable/disable AutoCross™
Status LEDs	**PWR (power):** Lit for normal operation **MDI Fault:** ON = over-current detected **MDI ON:** ON = MDI port supplying power **TX Link:** ON = Link on copper port **TX Act:** Flashing = data activity on copper link **FX Link:** ON = Link on fiber port **FX Act:** Flashing = data activity on fiber link
Dimensions	**Width:** 7.3" [185 mm] **Depth:** 4.4" [112 mm] **Height:** 1.2" [30 mm]
Power Models SFEPE10xx-100: Models SFEPE10xx-110:	90 – 250 VAC Internal (Power Cord Supplied) 18 – 60 VDC; 24 – 48 VAC Internal
Power Consumption	45 Watts Max
Operating Temperature	0 – 50°C [32° – 122°F]
Storage Temperature	-25° – 85°C [-13° – 185°F]
Environment	5 – 95% humidity non-condensing; altitude 0 – 10,000 ft.
Shipping Weight	2 lbs. [0.90 kg]
Regulatory Compliance	EN55022:1994+A1:1996+A2:1997 Class A; FCC Part 15 Subpart B; UL 1950
Warranty	Lifetime

Ordering Information

Complete list of fiber optic connector specifications [pg 212-224]

SFEPE1011-100: AC Powered PSE
SFEPE1011-110: DC Powered PSE
100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1300nm multimode (ST)
[2 km/1.2 mi.] Link Budget: 11.0 dB

SFEPE1013-100: AC Powered PSE
SFEPE1013-110: DC Powered PSE
100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1300nm multimode (SC)
[2 km/1.2 mi.] Link Budget: 11.0 dB

SFEPE1014-100: AC Powered PSE
SFEPE1014-110: DC Powered PSE
100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1310nm SM (SC)
[20 km/12.4 mi.] Link Budget: 16.0 dB

Optional Accessories *(sold separately)*

Mounting Options

WMBD-P [pg 68]
DIN Rail Mount Bracket POE

WMBL [pg 68]
Wall Mount Bracket 4.0" [102 mm]

- Enables enterprises to provide power to network devices over the existing CAT5 data connection.
- Combine data received over a fiber optic link with -48 VDC power; providing power to Data Terminal Equipment (DTE); Power Devices (PD) over unshielded twisted pair cable

SSETF101x-205

10/100BASE-SX Media Converter

- Low cost solution for fiber installation up to 300 m (100BASE-SX)
- Ideal for building backbone and horizontal cabling applications where cost and 10/100 auto-negotiation are critical.

Features

- Auto-Negotiation [pg 16]
- AutoCross™ [pg 16]
- Link Pass Through [pg 17]
- Efficient and Reliable
  The 10/100 SX Media Converter operates easily under heavy traffic loads without generating excess heat; meaning a failure-prone internal fan is unnecessary
- Automatic Link Restoration [pg 18]

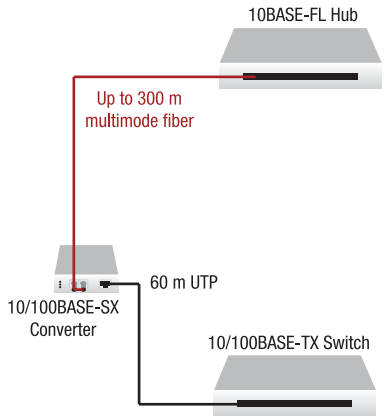
Extend Network Distance

Used in pairs, this media converter can extend distances between two twisted pair switches or a switch and a server up to 300 m over multimode fiber (100BASE-SX).

Connect Remote Devices

Using a single 10/100BASE-SX media converter, a switch with a copper port can be connected to a switch or any other 10/100BASE-SX compliant device with an existing fiber interface.

Extend Network Distance



Specifications

Operation	Operates as TIA SP4360A Type I, II device
Standards	IEEE Std. 802.3, 100BASE-TX, 10BASE-FL, Draft TIA 100BASE-SX-SP-4360A
Recommended Optic Cable	62.5/125 µm multimode fiber; 50/125 µm multimode fiber
Optional Optic Cable	100/140 µm multimode fiber; 85/125 µm multimode fiber
Status LEDs	**PWR (Power):** ON = Connection to the external AC or DC power **SX-ACT (Fiber Activity):** Flashing = Data reception on the fiber link **SX-100 (Fiber Speed):** ON = Fiber link at 100 Mbps **SX-10 (Fiber Speed):** ON = Fiber link at 10 Mbps **TX-ACT (Copper Activity):** Flashing = Data reception on the copper link **TX-100 (Copper Speed):** ON = Copper link at 100 Mbps **TX-10 (Copper Speed):** ON = Copper link at 10 Mbps
Dimensions	**Width:** 3.25" [82 mm] **Depth:** 4.8" [122 mm] **Height:** 1.0" [25 mm]
Power	External AC/DC required; 12V DC. 0.5A; unregulated; standard
Environment	0 – 50°C; 5% – 90% humidity non-condensing; 0 – 10,000 ft. altitude
Shipping Weight	2 lbs. [0.90 kg]
Safety Compliance	**Wall Mount Power Supply:** UL listed and CSA certified
Regulatory Compliance	FCC Class A, CISPR/EN55022 Class A, CE Mark
Warranty	Lifetime

Ordering Information

SSETF1011-205
10/100BASE-TX (RJ-45) **[60 m/197 ft.]**
to 10/100BASE-SX 850nm multimode (ST) **[300 m/984 ft.]**

SSETF1013-205
10/100BASE-TX (RJ-45) **[60 m/197 ft.]**
to 10/100BASE-SX 850nm multimode (SC) **[300 m/984 ft.]**

Optional Accessories *(sold separately)*

Wide Input (18 – 72VDC) Power Supplies

SPS-2460-PS [pg 69]
Piggy Back Power Supply

SPS-2460-SA [pg 69]
Stand-Alone Power Supply

Mounting Options

E-MCR-05 [pg 67]
12-Slot Media Converter Rack

RMS19-SA4-01 [pg 67]
4-Slot Media Converter Shelf

WMBD [pg 68]
DIN Rail Bracket 5.0" [127 mm]

WMBD-E [pg 68]
DIN Rail Bracket (extended) 4.3" [109 mm]

WMBD-F [pg 68]
DIN Rail Bracket (flat) 3.3" [84 mm]

WMBL [pg 68]
Wall Mount Bracket 4.0" [102 mm]

WMBV [pg 68]
Vertical Wall Mount Bracket 5.0" [127 mm]

WMBV-E [pg 68]
Vertical Wall Mount Bracket (extended) 4.7" [119 mm]

J/E-PSW-FX-03(xx)

10/100 Bridging Media Converter

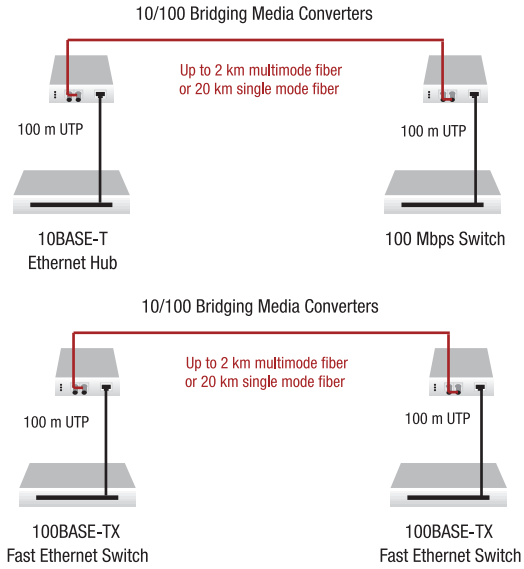
- Connect Legacy Networking Equipment:
  Connect an existing 10 Mbps device to 100 Mbps devices.
- Eliminate Collision Domains:
  Connect two half-duplex hubs with a full-duplex connection over fiber containing no collisions

Features

- Unit & Port LEDs allow for quick status information
- Auto-Negotiation [pg 16]
- AutoCross™ [pg 16]
- Far-End-Fault (FEF) Detection [pg 16]
- Ability to force 10 Mbps or 100 Mbps (TP port) and full or half-duplex on both copper and fiber
- Automatic Link Restoration [pg 18]

The "Just Convert-It™" Bridging Media Converter is an inexpensive, no frills way to extend the distance between connections with different speeds or duplex using fiber optic cable, while maintaining the same quality and reliability found on Transition's full-featured line of products.

10/100 Bridging



Specifications

Standards	IEEE Std. 802.3, IEEE Std. 802.3ab
Max. Packet Size	1522 bytes untagged 1518 bytes tagged (802.3ac)
Switches	**SW1:** Auto-Negotiation (UP = enable) **SW2:** Full/Half Duplex (Copper) (UP = full-duplex) **SW3:** Force Speed (Copper) (UP = 100 Mbps) **SW4:** Full/Half Duplex (Fiber) (UP = full-duplex)
Dimensions	**Width:** 3.0" [76 mm] **Depth:** 3.9" [100 mm] **Height:** 1.0" [25 mm]
Status LEDs	**PWR (Power):** Lit for normal operation **LNK Act (fiber):** Steady = Link; Flashing = RX Data **FD (fiber duplex):** ON = Full duplex **LNK Act (copper):** Steady = Link; Flashing = RX Data **FD (copper duplex):** ON = Full duplex **100 (copper speed):** ON = 100 Mbps
Power	External AC/DC required; +12 VDC, 0.5 A min
Power Consumption	2.5 Watts
Environment	0 – 50°C operating; 5% – 95% humidity non-condensing; 0 – 10,000 ft. altitude
Shipping Weight	2 lbs. [0.90 kg]
Safety Compliance	**Wall Mount Power Supply:** UL Listed, C-UL Listed (Canada)
Regulatory Compliance	FCC Class A, CISPR22/EN55022 Class A, EN55024, CE Mark
Warranty	Lifetime

Ordering Information

J/E-PSW-FX-03
10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1300nm multimode (ST)
[2 km/1.2 mi.] Link Budget: 11.0 dB

J/E-PSW-FX-03(SC)
10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1300nm multimode (SC)
[2 km/1.2 mi.] Link Budget: 11.0 dB

J/E-PSW-FX-03(SM)
10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1310nm SM (SC)
[20 km/12.4 mi.] Link Budget: 16.0 dB

Single Fiber Products

Recommended use in pairs [pg 19]

J/E-PSW-FX-03(100)
10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1310nm TX/1550nm RX
single fiber single mode (SC)
[20 km/12.4 mi.] LB: 19.0 dB

J/E-PSW-FX-03(101)
10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1550nm TX/1310nm RX
single fiber single mode (SC)
[20 km/12.4 mi.] LB: 19.0 dB

Optional Accessories *(sold separately)*

Wide Input (24 - 60 VDC) Power Supplies

SPS-2460-CC [pg 69]
Piggy Back Power Supply

SPS-2460-SA [pg 69]
Stand-Alone Power Supply

Mounting Options

E-MCR-05 [pg 67]
12-Slot Media Converter Rack

RMS19-SA4-01 [pg 67]
4-Slot Media Converter Shelf

WMBD [pg 68]
DIN Rail Bracket 5.0" [127 mm]

WMBD-FS [pg 68]
DIN Rail Bracket (flat, small) 3.1" [79 mm]

WMBS [pg 68]
Wall Mount Bracket 3.2" [81 mm]

AUTO NEG | AUTO CROSS | FAR END FAULT | LINK PASS THRU | AUTO LINK RESTORE

10/100 Bridging
10/100BASE-FX to 100BASE-X

Mx/E-PSW-FX-01(xx)

Mini 10/100 Bridging Media Converter

- **Connect Legacy Networking Equipment**
  Connect an existing 10 Mbps device to 100 Mbps devices.
- **Eliminate Collision Domains**
  Separate Collision Domains while linking two half-duplex hubs with a collision free full-duplex connection over fiber.

  The Mini Media Converters provide a cost-effective method for integrating fiber optic cabling into a 10/100 UTP environment. With its miniature size, the Mini offers a space saving alternative while it converts copper to fiber with the smallest footprint available in the industry.
- **Powering Options**
  Depending upon the unit, this plug-and-play media converter offers three methods for powering the unit. All Mini's can be powered with the included power adapter, while other options include powering through a USB port or through an 802.3af Power-Over-Ethernet enabled RJ-45 port. Two power options can be used simultaneously, providing the security of redundant power supplies. The Mini is available with either ST or SC fiber interfaces and is available for either multimode or single mode fiber.

Features

- Unit and Port LEDs allow for quick status information
- Auto-Negotiation [pg 16]
- Fixed Full-Duplex on fiber
- AutoCross™ [pg 16]
- Fixed Link Pass Through on PoE and USB powered units [pg 17]
- Automatic Link Restoration [pg 18]
- Far-End-Fault on all three versions [pg 16]
- Powering Options: Standard power adapter; PoE enabled RJ-45; or USB port

M/E-PSW-FX-01(xx) features:

- Auto-Negotiation
- AutoCross™
- Far-End-Fault

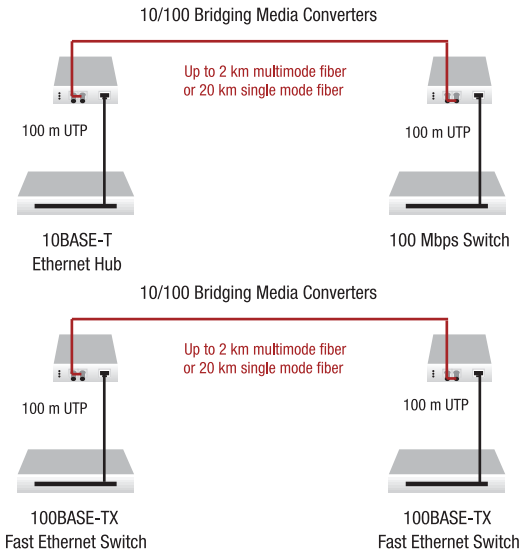
MP/E-PSW-FX-01(xx) features:

- Auto-Negotiation
- AutoCross™
- Link Pass Through
- Far-End-Fault
- PoE PD

MU/E-PSW-FX-01(xx) features:

- Auto-Negotiation
- AutoCross™
- Link Pass Through
- Far-End-Fault

Connect Legacy Devices & Eliminate Collision Domains



Specifications

Standards	IEEE Std. 802.3, 802.3af
Status LEDs	**PWR (Power):** (below RJ-45) ON = Link; Flashing = Activity **FX-Link/Act (Fiber Link/Activity):** (Upper Left on RJ-45) ON = Link; Flashing = Activity **TX-Link/Act (Copper Link/Activity):** (Upper Right on RJ-45) ON = Link; Flashing = Activity
Dimensions	**Width:** 1.8" [46 mm] **Depth:** 3.3" [85 mm] **Height:** 0.85" [22 mm]
Power Consumption	2.6 Watts
Power Sources	Unit accepts 5 VDC to 50 VDC on barrel Wall Mount AC adapter: 12 VDC 400mA USB connector: 5 VDC: TP connector IEEE802.3af PD device: 36 to 57 VDC
Operating Temp	0°C to 50°C (32°F to 122°F)
Storage Temp	-15°C to 65°C (-5°F to 149°F)
Humidity	5% – 95% humidity non-condensing
Altitude	0 – 10,000 ft. altitude
Shipping Weight	2 lbs. [0.90 kg]
Safety Compliance	**Wall Mount Power Supply:** UL Listed, C-UL Listed (Canada)
Regulatory Compliance	FCC Class A, CISPR22/EN55022 Class A, EN55024, CE Mark
Warranty	Lifetime

Optional Accessories *(sold separately)*

USB Cables

USBC-AM-BM-03
USB 2.0 Cable A male to B male [3 ft. Gray]

USBC-AM-BM-06
USB 2.0 Cable A male to B male [6 ft. Gray]

Wide Input Power Supplies

SPS-2460-SA [pg 69]

Mounting Options

WMBM [pg 68]
Wall Mount Bracket for Mini

RMBM
Rack Mount Bracket for use with RMS19-SA4-01 and/or E-MCR-05

Ordering Information

Standard Power Adapter

M/E-PSW-FX-01
10/100BASE-TX (RJ-45) **[100 m/328 ft.]** to 100BASE-FX 1300nm multimode (ST) **[2 km/1.2 mi.] Link Budget: 11.0 dB**

M/E-PSW-FX-01(SC)
10/100BASE-TX (RJ-45) **[100 m/328 ft.]** to 100BASE-FX 1300nm multimode (SC) **[2 km/1.2 mi.] Link Budget: 11.0 dB**

M/E-PSW-FX-01(SM)
10/100BASE-TX (RJ-45) **[100 m/328 ft.]** to 100BASE-FX 1310nm SM (SC) **[20 km/12.4 mi.] Link Budget: 16.0 dB**

M/E-PSW-FX-01(100)
10/100BASE-TX (RJ-45) **[100 m/328 ft.]** to 100BASE-FX 1310nm TX/1550nm RX single fiber single mode (SC) **[20 km/12.4 mi.] LB: 19.0 dB**

M/E-PSW-FX-01(101)
10/100BASE-TX (RJ-45) **[100 m/328 ft.]** to 100BASE-FX 1550nm TX/1310nm RX single fiber single mode (SC) **[20 km/12.4 mi.] LB: 19.0 dB**

M/E-PSW-FX-01(102)
10/100BASE-TX (RJ-45) **[100 m/328 ft.]** to 100BASE-FX 1310nm TX/1550nm RX single fiber single mode (SC) **[40 km/24.9 mi.] LB: 25.0 d**

M/E-PSW-FX-01(103)
10/100BASE-TX (RJ-45) **[100 m/328 ft.]** to 100BASE-FX 1550nm TX/1310nm RX single fiber single mode (SC) **[40 km/24.9 mi.] LB: 25.0 d**

MP/E-PSW-FX-01
10/100BASE-TX (RJ-45) **[100 m/328 ft.]** to 100BASE-FX 1300nm multimode (ST) **[2 km/1.2 mi.] Link Budget: 11.0 dB**

MP/E-PSW-FX-01(SC)
10/100BASE-TX (RJ-45) **[100 m/328 ft.]** to 100BASE-FX 1300nm multimode (SC) **[2 km/1.2 mi.] Link Budget: 11.0 dB**

MP/E-PSW-FX-01(SM)
10/100BASE-TX (RJ-45) **[100 m/328 ft.]** to 100BASE-FX 1310nm SM (SC) **[20 km/12.4 mi.] Link Budget: 16.0 dB**

MU/E-PSW-FX-01
10/100BASE-TX (RJ-45) **[100 m/328 ft.]** to 100BASE-FX 1300nm multimode (ST) **[2 km/1.2 mi.] Link Budget: 11.0 dB**

MU/E-PSW-FX-01(SC)
10/100BASE-TX (RJ-45) **[100 m/328 ft.]** to 100BASE-FX 1300nm multimode (SC) **[2 km/1.2 mi.] Link Budget: 11.0 dB**

MU/E-PSW-FX-01(SM)
10/100BASE-TX (RJ-45) **[100 m/328 ft.]** to 100BASE-FX 1310nm SM (SC) **[20 km/12.4 mi.] Link Budget: 16.0 dB**

MU/E-PSW-FX-01(100)
10/100BASE-TX (RJ-45) **[100 m/328 ft.]** to 100BASE-FX 1310nm TX/1550nm RX single fiber single mode (SC) **[20 km/12.4 mi.] LB: 19.0 dB**

MU/E-PSW-FX-01(101)
10/100BASE-TX (RJ-45) **[100 m/328 ft.]** to 100BASE-FX 1550nm TX/1310nm RX single fiber single mode (SC) **[20 km/12.4 mi.] LB: 19.0 dB**

MU/E-PSW-FX-01(102)
10/100BASE-TX (RJ-45) **[100 m/328 ft.]** to 100BASE-FX 1310nm TX/1550nm RX single fiber single mode (SC) **[40 km/24.9 mi.] LB: 25.0 dB**

MU/E-PSW-FX-01(103)
10/100BASE-TX (RJ-45) **[100 m/328 ft.]** to 100BASE-FX 1550nm TX/1310nm RX single fiber single mode (SC) **[40 km/24.9 mi.] LB: 25.0 dB**

SBFTF1010-130

Fault-Tolerant Redundant Link Protector

Features

- Fault-tolerant redundant connections
- Easy to install and use
- Supports half and full-duplex transmission
- AutoCross™ on all 3 ports [pg 16]
- Auto-Negotiation [pg 16]
- IEEE 802.3 compliant
- Nine diagnostic LEDs
- Optional 3-port switch mode

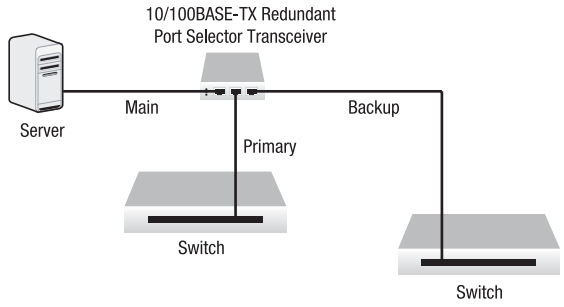
The Redundant Link Protector is a 10/100 Ethernet fault-tolerant transceiver. It significantly reduces network downtime, adding a new level of redundancy to 10/100 Ethernet connections. It also provides a redundant path for critical 10/100 devices. In a 10/100 Ethernet network, a critical device such as a file server may be connected to the rest of the network through a hub or a switch. A common problem in this configuration is that the server is often connected to the network through a single cable. If the cable fails, then the server is disconnected from the rest of the network. Similarly, if a port of a hub or switch to which the server is connected fails, the server is disconnected from the network.

The Redundant Transceiver has three ports: one for the critical (main) device, one for the default (primary) path for the critical device, and another (backup) for the backup path. It is a smart device that will not send any signal on a path that is not active. If the primary path loses its link, then the transceiver will switch to the backup path in approximately 189 milliseconds.

When the primary path re-establishes its link, the Redundant Link Protector will automatically switch back to the primary path.

Optional functionality, controlled via a dip switch, allows the unit to move from the fault-tolerant mode to a 3-port switch mode.

Fault-Tolerant Redundant Connections



Specifications

Standards	IEEE Std. 802.3
RJ-45 Connectors	Type: 8-position, RJ-45 receptacle: 1: TX+ 5: NC (no connection) 2: TX- 6: RX- 3: RX+ 7: NC (no connection) 4: NC (no connection) 8: NC (no connection)
Dip Switches	**SW1:** Auto-Negotiation Enable/Disable **SW2:** 10/100 Mbps **SW3:** Full/Half Duplex **SW4:** Redundancy/Switch
System LEDs	**Power (PWR):** Indicates the presence of POWER **Primary (PRI):** Indicates a link is established on the Primary port **Backup (BKP):** Indicates the link has moved over to the Backup port
Per Port LEDs	**Lower Right:** Green indicates 100 Mbps; Orange indicates 10 Mbps; Flashing indicates Activity **Lower Left:** Green indicates full-duplex; Off half-duplex
Dimensions	**Width:** 3.25" [82 mm] **Depth:** 4.8" [122 mm] **Height:** 1.0" [25 mm]
Power	**Domestic** Input: 120 VAC @ 60 Hz. Output: 12 VDC, 0.5 Amp **International** Input: 100 – 240 VAC @ 50 Hz. Output: 12 VDC, 1.25 Amp
Operating temperature	0 – 50°C (32°F – 122°F)
Storage temperature	-15°C – 65°C (-5°F – 149°F)
Relative humidity	5% – 95%
Altitude	0 – 10,000 ft.
Shipping Weight	2 lbs. [0.90 kg]
Safety Compliance	**Wall Mount Power Supply:** UL Listed & CSA Certified
Regulatory Compliance	FCC Class A, EN55024, UL 60950, CE Mark
Warranty	Lifetime

Ordering Information

SBFTF1010-130
10/100BASE-TX Link Protector Transceiver
(3) 10/100BASE-TX (RJ-45) **[100 m/328 ft.]**

Optional Accessories *(sold separately)*

Wide Input (24 - 60 VDC) Power Supplies

SPS-2460-PS [pg 69]
Piggy Back Power Supply

SPS-2460-SA [pg 69]
Stand-Alone Power Supply

Mounting Options

E-MCR-05 [pg 67]
12-Slot Media Converter Rack

RMS19-SA4-01 [pg 67]
4-Slot Media Converter Shelf

WMBD [pg 68]
DIN Rail Bracket 5.0" [127 mm]

WMBD-F [pg 68]
DIN Rail Bracket (flat) 3.3" [84 mm]

WMBL [pg 68]
Wall Mount Bracket 4.0" [102 mm]

WMBV [pg 68]
Vertical Wall Mount Bracket 5.0" [127 mm]

AUTO NEG | AUTO CROSS | LINK PASS THRU | FAR END FAULT | AUTO LINK RESTORE

10/100 Bridging
10/100BASE-TX to 100BASE-FX

see also: 10/100 Bridging Point System™
Slide-In-Module Media Converters [pg 42]

SBFTF10xx-10x

10/100 Bridging Media Converter

- Extend network distance up to 120 km
- Bridging media converters will provide conversion and integration solutions for half and full-duplex environments.
- 10 Mbps or 100 Mbps on all TP ports
- Half or full-duplex on all ports including fiber

Features

- Auto-Negotiation [pg 16]
- AutoCross™ [pg 16]
- Link Pass Through [pg 17]
- Far-End-Fault (FEF) Detection [pg 16]
- Automatic Link Restoration [pg 18]

Optional Accessories *(sold separately)*

SFP Modules [pg 161-167]

Wide Input (24 - 60 VDC) Power Supplies

SPS-2460-PS [pg 69]
Piggy Back Power Supply

SPS-2460-SA [pg 69]
Stand-Alone Power Supply

Mounting Options

E-MCR-05 [pg 67]
12-Slot Media Converter Rack

RMS19-SA4-01 [pg 67]
4-Slot Media Converter Shelf

WMBD [pg 68]
DIN Rail Bracket 5.0" [127 mm]

WMBD-F [pg 68]
DIN Rail Bracket (flat) 3.3" [84 mm]

WMBL [pg 68]
Wall Mount Bracket 4.0" [102 mm]

WMBV [pg 68]
Vertical Wall Mount Bracket 5.0" [127 mm]

Specifications

Complete list of fiber optic connector specifications [pg 212-224]

Standards	IEEE Std. 802.3
Data Rate	10 Mbps; 100 Mbps
Filtering Addresses	1K MAC addresses
Filtering & Forwarding Rate	14,880 pps for Ethernet; 148,800 pps for Fast Ethernet
RAM Buffers	512 KB
Max Packet Size	2044 bytes untagged 2048 bytes tagged
Switches	**SW1 (TP):** Auto-Negotiation On/Off **SW2 (TP):** Half or Full-duplex with Auto-Negotiation Off **SW3 (TP):** 10 Mbps or 100 Mbps with Auto-Negotiation Off **SW4 (Fiber):** Half or Full-duplex **SW5:** Link Pass Through On/Off **SW6:** Far-End-Fault On/Off
Status LEDs	**PWR (Power):** ON = connection to external power **FD (Fiber Duplex):** ON = Full-duplex; OFF = Half-duplex **LNK/ACT (Fiber Link/Activity):** ON = Link; Blinking = Activity **CD (Copper Duplex):** ON = Full-duplex; OFF = Half-duplex **LNK/ACT** (**Copper Link/Activity**): ON = Link; Blinking = Activity **100 (Copper):** OFF = 10 Mbps; ON = 100 Mbps
Dimensions	**Width:** 3.25" [82 mm] **Depth:** 4.8" [122 mm] **Height:** 1.0" [25 mm]
Power	External AC/DC; 12 VDC, 0.8A min
Environment	0 – 50°C; 5% – 90% humidity non-condensing; 0 – 10,000 ft. altitude
Shipping Weight	2 lbs. [0.90 kg]
Safety Compliance	**Wall Mount Power Supply:** UL Listed
Regulatory Compliance	FCC Class A, VCCI Class 1, CISPR22/EN55022 Class A, EN55024, EN61000, CE Mark
Warranty	Lifetime

Ordering Information

Complete list of fiber optic connector specifications [pg 212-224]

SBFTF1011-105
10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1300nm MM (ST) **[2 km/1.2 mi.] Link Budget: 11.0 dB**

SBFTF1013-105
10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1300nm MM (SC) **[2 km/1.2 mi.] Link Budget: 11.0 dB**

SBFTF1039-105
10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1300nm MM (LC) **[2 km/1.2 mi.] Link Budget: 11.0 dB**

SBFTF1014-105
10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1310nm SM (SC) **[20 k m/12.4 mi.] Link Budget: 16.0 dB**

SBFTF1019-105
10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1310nm SM (LC) **[20 km/12.4 mi.] Link Budget: 17.3 dB**

SBFTF1015-105
10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1310nm SM (SC) **[40 km/24.9 mi.] Link Budget: 29.0 dB**

SBFTF1016-105
10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1310nm SM (SC) **[60 km/37.3 mi.] Link Budget: 32.0 dB**

SBFTF1017-105
10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1550nm SM (SC) **[80k m/49.7 mi.] Link Budget: 29.0 dB**

SBFTF1035-105
10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1550nm SM (SC) **[120 km/74.6 mi.] Link Budget: 33.0 dB**

SBFTF1040-105
10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to Open SFP Slot

Single Fiber Products

Recommended use in pairs [pg 19]

SBFTF1029-105
10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1310nm TX/1550nm RX single fiber SM (SC) **[20 km/12.4 mi.] Link Budget: 19.0 dB**

SBFTF1029-106
10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1550nm TX/1310nm RX single fiber SM (SC) **[20 km/12.4 mi.] Link Budget: 19.0 dB**

SBFTF1029-107
10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1310nm TX/1550nm RX single fiber SM (SC) **[40 km/24.9 mi.] Link Budget: 25.0 dB**

SBFTF1029-108
10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1550nm TX/1310nm RX single fiber SM (SC) **[40 km/24.9 mi.] Link Budget: 25.0 dB**

SBFTF10xx-1xx

10/100 Bridging Multiport Media Converter

Features

- Auto-Negotiation [pg 16]
- AutoCross™ [pg 16]
- 10 Mbps or 100 Mbps on all TP ports
- Half or full-duplex on all ports including fiber
- Far-End-Fault (FEF) Detection [pg 16]
- Each port fully manageable
- Individual switches for both TP ports (-110 only)
- LED indications for all operation modes
- Automatic Link Restoration [pg 18]
- Source Address Change (SAC) [pg 19]
- Fiber Redundancy Mode (-140 only)

When failure on primary fiber occurs it is detected by a converter; fiber two (secondary) is activated and becomes the primary link. The original fiber link (1) is put in the disabled state. It becomes secondary until the failure on primary fiber occurs.

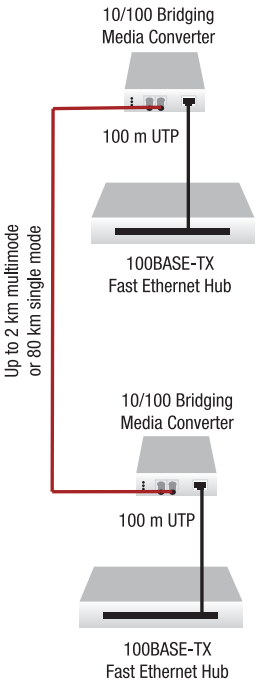
Specifications

Complete list of fiber optic connector specifications [pg 212-224]

Standards	IEEE Std. 802.3
Data Rate	10 Mbps; 100 Mbps
Filtering Addresses	4K MAC addresses
Filtering & Forwarding Rate	14,880 pps for Ethernet; 148,800 pps for Fast Ethernet
RAM Buffers	256 KB
Max Packet Size	1536 bytes
Switches	**SW1 (TP1):** Auto-Negotiation On/Off **SW2 (TP1):** 10 Mbps or 100 Mbps with Auto-Negotiation Off **SW3 (TP1):** Half or Full-duplex with Auto-Negotiation Off **SW4 (Fiber1):** Half or Full-duplex **SW5:** AutoCross™ On/Off **SW6:** Fiber Redundancy On/Off (xBFTF10xx-14x only) **SW7 (TP2):** Auto-Negotiation On/Off **SW8 (TP2):** 10 Mbps or 100 Mbps with Auto-Negotiation Off **SW9 (TP2):** Half or Full-duplex with Auto-Negotiation Off **SW10 (TP2):** Monitor On/Off
Status LEDs	**PWR (Power)** **FD (Fiber Duplex)** **LACT (Fiber Link/Activity)** **Duplex/Link (Copper)** **Speed (Copper**)
Dimensions SBFTF10xx-11x:	**Width:** 3.25" [82 mm] **Depth:** 4.8" [122 mm] **Height:** 1.0" [25 mm]
SBFTF10xx-12x & -14x:	**Width:** 3.25" [82 mm] **Depth:** 4.8" [122 mm] **Height:** 2.0" [50 mm]
Power	External AC/DC; 12 VDC, 0.8A min
Environment	0 – 50°C; 5% – 90% humidity non-condensing; 0 – 10,000 ft. altitude
Shipping Weight	3 lbs. [1.35 kg]
Safety Compliance	**Wall Mount Power Supply:** UL Listed
Regulatory Compliance	FCC Class A, VCCI Class 1, CISPR22/EN55022 Class A, EN55024, EN61000, CE Mark
Warranty	Lifetime

Extend Network Distance Up To 120 km

Bridging media converters will provide conversion and integration solutions for half-duplex and full-duplex environments.



10/100BASE-TX to 100BASE-FX Multiport

see also: 10/100 Bridging Point System™ Slide-In-Module Media Converters [pg 43, 44]

Ordering Information

Complete list of fiber optic connector specifications [pg 212-224]

SBFTF1011-110
(2) 10/100BASE-TX (RJ-45) [100 m/328 ft.]
to (1) 100BASE-FX 1300nm multimode (ST)
[2 km/1.2 mi.] Link Budget: 11.0 dB

SBFTF1013-110
(2) 10/100BASE-TX (RJ-45) [100 m/328 ft.]
to (1) 100BASE-FX 1300nm multimode (SC)
[2 km/1.2 mi.] Link Budget: 11.0 dB

SBFTF1018-110
(2) 10/100BASE-TX (RJ-45) [100 m/328 ft.]
to (1) 100BASE-FX 1300nm multimode (MT-RJ)
[2 km/1.2 mi.] Link Budget: 14.5 dB

SBFTF1014-110
(2) 10/100BASE-TX (RJ-45) [100 m/328 ft.]
to (1) 100BASE-FX 1310nm single mode (SC)
[20 km/12.4 mi.] Link Budget: 16.0 dB

SBFTF1015-110
(2) 10/100BASE-TX (RJ-45) [100 m/328 ft.]
to (1) 100BASE-FX 1310nm single mode (SC)
[40 km/24.9 mi.] Link Budget: 26.0 dB

SBFTF1016-110
(2) 10/100BASE-TX (RJ-45) [100 m/328 ft.]
to (1) 100BASE-FX 1310nm single mode (SC)
[60 km/37.3 mi.] Link Budget: 29.0 dB

SBFTF1017-110
(2) 10/100BASE-TX (RJ-45) [100 m/328 ft.]
to (1) 100BASE-FX 1550nm single mode (SC)
[80 km/49.7 mi.] Link Budget: 29.0 dB

Single Fiber Products [pg 19]

SBFTF1029-110
(2) 10/100BASE-TX (RJ-45) [100 m/328 ft.]
to (1) 100BASE-FX 1310nm TX/1550nm RX single fiber single mode (SC)
[20 km/12.4 mi.] Link Budget: 19.0 dB

SBFTF1029-111
(2) 10/100BASE-TX (RJ-45) [100 m/328 ft.]
to (1) 100BASE-FX 1550nm TX/1310nm RX single fiber single mode (SC)
[20 km/12.4 mi.] Link Budget: 19.0 dB

SBFTF1029-112
(2) 10/100BASE-TX (RJ-45) [100 m/328 ft.]
to (1) 100BASE-FX 1310nm TX/1550nm RX single fiber single mode (SC)
[40 km/24.9 mi.] Link Budget: 25.0 dB

SBFTF1029-113
(2) 10/100BASE-TX (RJ-45) [100 m/328 ft.]
to (1) 100BASE-FX 1550nm TX/1310nm RX single fiber single mode (SC)
[40 km/24.9 mi.] Link Budget: 25.0 dB

Optional Accessories *(sold separately)*

Wide Input (24 - 60 VDC) Power Supplies

SPS-2460-PS [pg 69]
Piggy Back Power Supply

SPS-2460-SA [pg 69]
Stand-Alone Power Supply

Mounting Options

E-MCR-05 [pg 67]
12-Slot Media Converter Rack

RMS19-SA4-01 [pg 67]
4-Slot Media Converter Shelf

WMBD [pg 68]
DIN Rail Bracket 5.0" [127 mm]

WMBD-F [pg 68]
DIN Rail Bracket (flat) 3.3" [84 mm]

WMBL [pg 68]
Wall Mount Bracket 4.0" [102 mm]

WMBV [pg 68]
Vertical Wall Mount Bracket 5.0" [127 mm]

Ordering Information

Complete list of fiber optic connector specifications [pg 212-224]

SBFTF1011-120
(5) 10/100BASE-TX (RJ-45) [100 m/328 ft.]
to (1) 100BASE-FX 1300nm multimode (ST)
[2 km/1.2 mi.] Link Budget: 11.0 dB

SBFTF1013-120
(5) 10/100BASE-TX (RJ-45) [100 m/328 ft.]
to (1) 100BASE-FX 1300nm multimode (SC)
[2 km/1.2 mi.] Link Budget: 11.0 dB

SBFTF1018-120
(5) 10/100BASE-TX (RJ-45) [100 m/328 ft.]
to (1) 100BASE-FX 1300nm multimode (MT-RJ)
[2 km/1.2 mi.] Link Budget: 14.5 dB

SBFTF1014-120
(5) 10/100BASE-TX (RJ-45) [100 m/328 ft.]
to (1) 100BASE-FX 1310nm single mode (SC)
[20 km/12.4 mi.] Link Budget: 16.0 dB

SBFTF1015-120
(5) 10/100BASE-TX (RJ-45) [100 m/328 ft.]
to (1) 100BASE-FX 1310nm single mode (SC)
[40 km/24.9 mi.] Link Budget: 26.0 dB

SBFTF1016-120
(5) 10/100BASE-TX (RJ-45) [100 m/328 ft.]
to (1) 100BASE-FX 1310nm single mode (SC)
[60 km/37.3 mi.] Link Budget: 29.0 dB

SBFTF1017-120
(5) 10/100BASE-TX (RJ-45) [100 m/328 ft.]
to (1) 100BASE-FX 1550nm single mode (SC)
[80 km/49.7 mi.] Link Budget: 29.0 dB

Single Fiber Products

Recommended use in pairs [pg 19]

SBFTF1029-120
(5) 10/100BASE-TX (RJ-45) [100 m/328 ft.]
to (1) 100BASE-FX 1310nm TX/1550nm RX single fiber single mode (SC)
[20 km/12.4 mi.] Link Budget: 19.0 dB

SBFTF1029-121
(5) 10/100BASE-TX (RJ-45) [100 m/328 ft.]
to (1) 100BASE-FX 1550nm TX/1310nm RX single fiber single mode (SC)
[20 km/12.4 mi.] Link Budget: 19.0 dB

SBFTF1029-122
(5) 10/100BASE-TX (RJ-45) [100 m/328 ft.]
to (1) 100BASE-FX 1310nm TX/1550nm RX single fiber single mode (SC)
[40 km/24.9 mi.] Link Budget: 25.0 dB

SBFTF1029-123
(5) 10/100BASE-TX (RJ-45) [100 m/328 ft.]
to (1) 100BASE-FX 1550nm TX/1310nm RX single fiber single mode (SC)
[40 km/24.9 mi.] Link Budget: 25.0 dB

Optional Accessories *(sold separately)*

Wide Input (24 - 60 VDC) Power Supplies

SPS-2460-DPS [pg 69]
Piggy Back Power Supply

SPS-2460-SA [pg 69]
Stand-Alone Power Supply

Mounting Options

WMBD [pg 68]
DIN Rail Bracket 5.0" [127 mm]

WMBD-F [pg 68]
DIN Rail Bracket (flat) 3.3" [84 mm]

WMBL [pg 68]
Wall Mount Bracket 4.0" [102 mm]

WMBV [pg 68]
Vertical Wall Mount Bracket 5.0" [127 mm]

Ordering Information

Complete list of fiber optic connector specifications [pg 212-224]

SBFTF1011-140
(4) 10/100BASE-TX (RJ-45) [100 m/328 ft.]
to (2) 100BASE-FX 1300nm multimode (ST)
[2 km/1.2 mi.] Link Budget: 11.0 dB

SBFTF1013-140
(4) 10/100BASE-TX (RJ-45) [100 m/328 ft.]
to (2) 100BASE-FX 1300nm multimode (SC)
[2 km/1.2 mi.] Link Budget: 11.0 dB

SBFTF1018-140
(4) 10/100BASE-TX (RJ-45) [100 m/328 ft.]
to (2) 100BASE-FX 1300nm multimode (MT-RJ)
[2 km/1.2 mi.] Link Budget: 14.5 dB

SBFTF1014-140
(4) 10/100BASE-TX (RJ-45) [100 m/328 ft.]
to (2) 100BASE-FX 1310nm single mode (SC)
[20 km/12.4 mi.] Link Budget: 16.0 dB

SBFTF1015-140
(4) 10/100BASE-TX (RJ-45) [100 m/328 ft.]
to (2) 100BASE-FX 1310nm single mode (SC)
[40 km/24.9 mi.] Link Budget: 26.0 dB

SBFTF1016-140
(4) 10/100BASE-TX (RJ-45) [100 m/328 ft.]
to (2) 100BASE-FX 1310nm single mode (SC)
[60 km/37.3 mi.] Link Budget: 29.0 dB

SBFTF1017-140
(4) 10/100BASE-TX (RJ-45) [100 m/328 ft.]
to (2) 100BASE-FX 1550nm single mode (SC)
[80 km/49.7 mi.] Link Budget: 29.0 dB

Single Fiber Products

Recommended use in pairs [pg 19]

SBFTF1029-140
(4) 10/100BASE-TX (RJ-45) [100 m/328 ft.]
to (2) 100BASE-FX 1310nm TX/1550nm RX single fiber single mode (SC)
[20 km/12.4 mi.] Link Budget: 19.0 dB

SBFTF1029-141
(4) 10/100BASE-TX (RJ-45) [100 m/328 ft.]
to (2) 100BASE-FX 1550nm TX/1310nm RX single fiber single mode (SC)
[20 km/12.4 mi.] Link Budget: 19.0 dB

SBFTF1029-142
(4) 10/100BASE-TX (RJ-45) [100 m/328 ft.]
to (2) 100BASE-FX 1310nm TX/1550nm RX single fiber single mode (SC)
[40 km/24.9 mi.] Link Budget: 25.0 dB

SBFTF1029-143
(4) 10/100BASE-TX (RJ-45) [100 m/328 ft.]
to (2) 100BASE-FX 1550nm TX/1310nm RX single fiber single mode (SC)
[40 km/24.9 mi.] Link Budget: 25.0 dB

Optional Accessories *(sold separately)*

Wide Input (24 - 60 VDC) Power Supplies

SPS-2460-DPS [pg 69]
Piggy Back Power Supply

SPS-2460-SA [pg 69]
Stand-Alone Power Supply

Mounting Options

WMBD [pg 68]
DIN Rail Bracket 5.0" [127 mm]

WMBD-F [pg 68]
DIN Rail Bracket (flat) 3.3" [84 mm]

WMBL [pg 68]
Wall Mount Bracket 4.0" [102 mm]

WMBV [pg 68]
Vertical Wall Mount Bracket 5.0" [127 mm]

AUTO NEG | AUTO CROSS | FAR END FAULT | TRANSPARENT LINK PASS THRU | BANDWIDTH ALLOCATION | LOOP BACK | LAST GASP | REMOTE MGMT | AUTO LINK RESTORE | FIELD UPGRADEABLE FIRMWARE

SSRFB10xx-10x

Remotely Managed 10/100 Bridging NID (Network Interface Device)

Ideal for both Enterprise and Service Provider applications where entry level management information is needed on both the local and the remote device. This management information is accessible through the local unit installed in a managed Point System™ Chassis as the remote stand-alone unit reports its current operating status back to a local unit.

Devices should be used in pairs with the remotely managed stand-alone unit used in conjunction with the managed chassis card CSRFB10xx-100.

- **Integrate fiber** into 10/100 copper environments
- **Remote Mangement** Remote stand-alone units report their status to local managed unit
- **Remote Loopback** assists in identifying network problems [pg 18]
- **Bandwidth Control** sets throughput to user's requirements

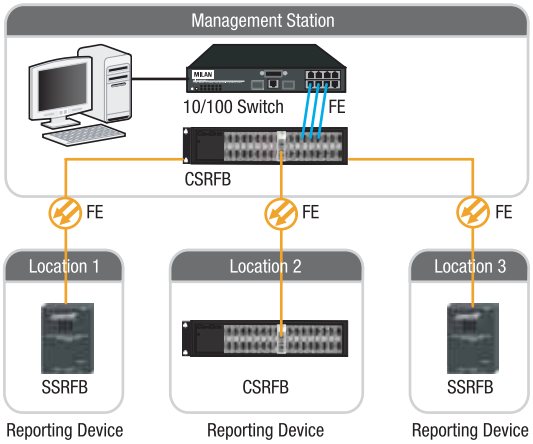
Features

- Auto-Negotiation [pg 16]
- AutoCross™ [pg 16]
- Far-End-Fault (FEF) [pg 16]
- Transparent Link Pass Through [pg 17]
- Bandwidth Allocation [pg 18]
- Loopback [pg 18]
- Last Gasp [pg 19]
- Remote Management [pg 17]
- Automatic Link Restore [pg 18]
- Link Test

Read Management Features

- Power
- Copper Link Status
- Copper Speed
- Copper Duplex
- Fiber Link Status
- Fiber Duplex
- Fiber Loop Back Status

Remote Status Reporting Conversion



Specifications

Complete list of fiber optic connector specifications [pg 212-224]

Standards	IEEE Std. 802.3, TS-1000 OAM v2
Data Rate	**Copper:** 10/100 Mbps **Fiber:** 100 Mbps
Filtering Addresses	1K MAC addresses
RAM Buffers	256K
Max Frame Size	1916 bytes untagged 1914 bytes tagged
Switches	**SW1**: TP Auto-Negotiation **SW2:** TP Duplex with Auto-Negotiation Off **SW3:** TP Speed with Auto-Negotiation Off **SW4**: Fiber Duplex **SW5:** Link Pass Through **SW6:** Mode: Terminal or Center
Status LEDs	**PWR (Power)** **TP Duplex/Link/Activity** **TP 10 Mbps/100 Mbps** **Fiber Link/Activity** **Fiber Duplex**
Dimensions	**Width:** 3.25" [82 mm] **Depth:** 4.8" [122 mm] **Height:** 1.0" [25 mm]
Power Consumption	3.4 Watts
Environment	0 – 50 C; 5% - 95% humidity non-condensing; 0 – 10,000 ft. altitude
Power	External AC/DC required; 12 VDC 1.25A
Shipping Weight	2 lbs. [.90 kg]
Safety Compliance	Wall Mount Power Supply: UL Listed and CSA certified
Regulatory Compliance	EN55022 Class A, EN55024; CE Mark
Warranty	Lifetime

Ordering Information

Complete list of fiber optic connector specifications [pg 212-224]

SSRFB1011-100
10/100Base-TX (RJ-45) **[100 m/328 ft.]**
100Base-FX 1300nm MM ST
[2 km/1.2 mi.] Link Budget: 11.0 dB

SSRFB1013-100
10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1300nm MM (SC)
[2 km/1.2 mi.] Link Budget: 11.0 dB

SSRFB1014-100
10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1310nm SM (SC)
[20 km/12.4 mi.] Link Budget: 16.0 dB

SSRFB1040-100
10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to SFP slot (empty)

Single Fiber Products

Recommended use in pairs [pg 19]

SSRFB1029-100
10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1310nm TX/1550nm RX
Bi-Di SM (SC)
[20 km/12.4 mi.] Link Budget: 19.0 dB

SSRFB1029-101
10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1550nm TX/1310nm RX
Bi-Di SM (SC)
[20 km/12.4 mi.] Link Budget: 19.0 dB

SSRFB1029-102
10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1310nm TX/1550nm RX
Bi-Di SM (SC)
[40 km/24.9 mi.] Link Budget: 19.0 dB

SSRFB1029-103
10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1550nm TX/1310nm RX
Bi-Di SM (SC)
[40 km/24.9 mi.] Link Budget: 19.0 dB

Optional Accessories *(sold separately)*

SFP Modules [pg 161-167]

Wide Input (24 - 60 VDC) Power Supplies

SPS-2460-PS [pg 69]
Piggy Back Power Supply

SPS-2460-SA [pg 69]
Stand-Alone Power Supply

Mounting Options

E-MCR-05 [pg 67]
12-Slot Media Converter Rack

RMS19-SA4-01 [pg 67]
4-Slot Media Converter Shelf

WMBL [pg 68]
Wall Mount Bracket 4.0" [102 mm]

WMBV [pg 68]
Vertical Wall Mount Bracket 5.0" [127 mm]

WMBD [pg 68]
DIN Rail Bracket 5.0" [127 mm]

WMBD-F [pg 68]
DIN Rail Bracket (flat) 3.3" [84 mm]

AUTO CROSS | AUTO NEG | PAUSE | TRANSPARENT LINK PASS THRU | FAR END FAULT | LOOP BACK | BANDWIDTH ALLOCATION | FIELD UPGRADEABLE FIRMWARE | REMOTE MGMT | AUTO LINK RESTORE | SINGLE FIBER | LAST GASP

OAM/IP-BASED Remotely Managed 10/100BASE-TX to 100BASE-X

see also: 10/100 OAM/IP-Based Point System™ Slide-In-Modules [pg 46]

SFBRM10xx-1xx

10/100 Bridging

OAM/IP-Based Remotely Managed NID (Network Interface Device)

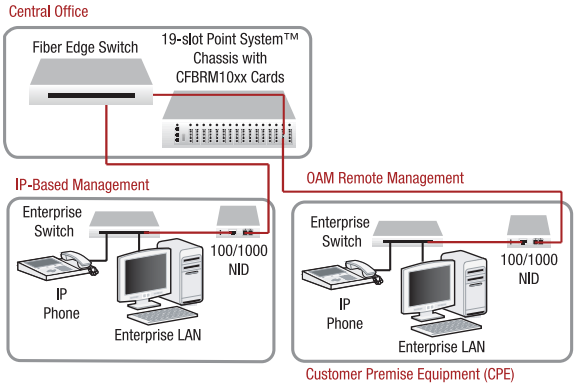
CARRIER ETHERNET MEF Certified Compliant

- Applications:
  - Ethernet in the First Mile (EFM)
  - Fiber to the Premise (FTTP), E-Line and E-LAN
  - Enterprise markets

Features

- MEF 9 & MEF 14 Carrier Ethernet Certification
- Two remote management modes:
  - IP-Based Remote Management [pg 17]
  - In-Band Link OAM 802.3ah (remote device managed by local peer)
- SNMP v1
- AutoCross™ [pg 16]
- Auto-Negotiation [pg 16]
- Pause [pg 17]
- Transparent Link Pass Through [pg 17]
- Far-End-Fault [pg 16]
- Remote Loopback [pg 18]
- IEEE 802.1p QoS packet classification with 4 egress queues
- Ipv4 IP TOS and DiffServ QoS classification, IPv6 Traffic class
- IEEE 802.1q VLAN
- Static MAC, 64 entries
- Double VLAN tagging (C-Tag/S-Tag) (Q-in-Q)
- IEEE 802.1x Port based security
- RADIUS client
- RMON counters for each port
- Bandwidth Allocation per port [pg 18]
- DMI Optical Management on select models
- USB port for basic setup
- Cable diagnostic function for TP ports
- 8K MAC addresses
- Field Upgradeable Firmware [pg 18]

Remotely Managed 10/100 NID



Specifications

Complete list of fiber optic connector specifications [pg 212-224]

Standards	IEEE Std. 802.3, IEEE Std. 802.3ah, IEEE Std. 802.1P, IEEE Std. 802.1Q, IEEE Std. 802.1X
Data Rate	**Copper:** 10/100 Mbps **Fiber:** 100 Mbps
Filtering Addresses	8K MAC Addresses
Max Frame Size	1628 bytes
Dimensions	**Width:** 3.25" [82 mm] **Depth:** 4.8" [122 mm] **Height:** 1.0" [25 mm]
Environment	0 – 50°C; 5% – 95% humidity non-condensing; 0 – 10,000 ft. altitude
Power	**Input:** 100-240 VAC, 1A **Output:** 12 VDC, 1.25A
Shipping Weight	2 lbs. [0.90 kg]
Regulatory Compliance	EN55024, FCC Class A, CE Mark, UL
Warranty	Lifetime

Ordering Information

SFBRM1011-100
SFBRM1011-110 (DMI model)
10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1300nm MM (ST)
[2 km/1.2 mi.] Link Budget: 11.0 dB

SFBRM1013-100
SFBRM1013-110 (DMI model)
10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1300nm MM (SC)
[2 km/1.2 mi.] Link Budget: 11.0 dB

SFBRM1014-100
SFBRM1014-110 (DMI model)
10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-LX10 1310nm SM (SC)
[20 km/6.2 mi.] Link Budget: 16.0 dB

SFBRM1015-100
SFBRM1015-110 (DMI model)
10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1310nm SM (SC)
[40 km/24.9 mi.] Link Budget: 26.0 dB

SFBRM1016-100
10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1310nm SM (SC)
[60 km/37.3 mi.] Link Budget: 29.0 dB

SFBRM1017-100
10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1550nm SM (SC)
[80 km/49.7 mi.] Link Budget: 29.0 dB

SFBRM1035-100
10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1550nm SM (SC)
[120 km/74.6 mi.] Link Budget: 36.0 dB

SFBRM1040-100
10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to SFP slot (empty)

Single Fiber Products [pg 19]

SFBRM1029-100
SFBRM1029-110 (DMI model)
10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-BX-U 1310nm TX/1550nm RX Bi-Di single mode (SC)
[20 km/12.4 mi.] Link Budget: 19.0 dB

SFBRM1029-101
SFBRM1029-111 (DMI model)
10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-BX-D 1550nm TX/1310nm RX Bi-Di SM (SC)
[20 km/12.4 mi.] Link Budget: 19.0 dB

SFBRM1029-102
10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1310nm TX/1550nm RX Bi-Di SM (SC)
[40 km/24.8 mi.] Link Budget: 25.0 dB

SFBRM1029-103
10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1550nm TX/1310nm RX Bi-Di SM (SC)
[40 km/24.8 mi.] Link Budget: 25.0 dB

Note: all units feature USB port for local management application.

Optional Accessories *(sold separately)*

Wide Input (24 - 60 VDC) Power Supplies

SPS-2460-PS [pg 69]
Piggy Back Power Supply

SPS-2460-SA [pg 69]
Stand-Alone Power Supply

Mounting Options

E-MCR-05 [pg 67]
12-Slot Media Converter Rack

RMS19-SA4-01 [pg 67]
4-Slot Media Converter Shelf

WMBD [pg 68]
DIN Rail Bracket 5.0" [127 mm]

WMBL [pg 68]
Wall Mount Bracket 4.0" [102 mm]

USB Cables

USBC-AM-BM-03
USB 2.0 Cable A male to B male [3 ft. Gray]

USBC-AM-BM-06
USB 2.0 Cable A male to B male [6 ft. Gray]

AUTO CROSS | AUTO NEG | PAUSE | TRANSPARENT LINK PASS THRU | FAR END FAULT | LOOP BACK | BANDWIDTH ALLOCATION | FIELD UPGRADEABLE FIRMWARE | REMOTE MGMT | AUTO LINK RESTORE | SINGLE FIBER | LAST GASP

OAM/IP-BASED Remotely Managed 10/100BASE-TX to 100BASE-X

see also: 10/100 OAM/IP-Based System™ Slide-In-Modules [pg 46]

SFBRM10xx-18x

10/100 Bridging

OAM/IP-Based NID (Network Interface Device) For Indoor and Protected Outdoor Applications

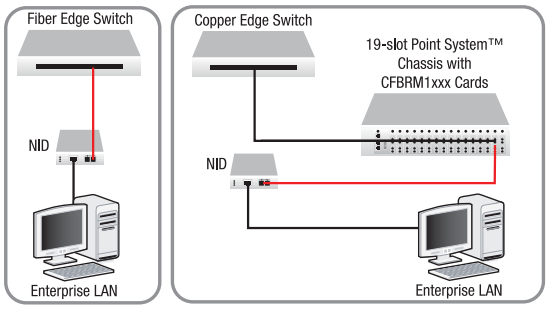
CARRIER ETHERNET MEF Certified Compliant

- Indoor/Protected Outdoor Applications (-40°C – 65°C)
  - Ethernet in the First Mile (EFM)
  - Fiber to the Premise (FTTP), E-Line and E-LAN
  - Enterprise markets

Features

- MEF 9 & MEF 14 Carrier Ethernet Certification
- Two Remote Management modes:
  - IP-Based Remote Management [pg 17]
  - In-Band Link OAM 802.3ah (remote device managed by local peer)
- SNMP v1
- AutoCross™ [pg 16]
- Auto-Negotiation [pg 16]
- Pause [pg 17]
- Transparent Link Pass Through [pg 17]
- Far-End-Fault [pg 16]
- Remote Loopback [pg 18]
- IEEE 802.1p QoS packet classification with 4 egress queues
- Ipv4 IP TOS and DiffServ QoS classification, IPv6 Traffic class
- IEEE 802.1q VLAN, 4096 entries
- Static MAC, 64 entries
- Double VLAN tagging (C-tag/S-tag)(Q-in-Q)
- IEEE 802.1x Port based security
- RADIUS client
- RMON counters for each port
- Bandwidth Allocation per port [pg 18]
- DMI Optical Management
- USB port for basic setup
- Cable diagnostic function for TP ports
- 8K MAC addresses
- Field Upgradeable Firmware [pg 18]

Remotely Managed 10/100 NID IP or OAM Management



Specifications

Complete list of fiber optic connector specifications [pg 212-224]

Standards	IEEE Std. 802.3, IEEE Std. 802.3ah, IEEE Std. 802.1P, IEEE Std. 802.1Q, IEEE Std. 802.1X
Data Rate	**Copper:** 10/100 Mbps **Fiber:** 100 Mbps
Filtering Addresses	8K MAC Addresses
Max Frame Size	1628 bytes
Dimensions	**Width:** 3.25" [82 mm] **Depth:** 4.8" [122 mm] **Height:** 1.0" [25 mm]
Environment	-40-65°C; 5%-95% humidity non-condensing; 0-10,000 ft. altitude
Power	**Input:** 100-240 VAC, 1A **Output:** 12 VDC, 1.25A
Shipping Weight	2 lbs. [0.90 kg]
Regulatory Compliance	EN55024, FCC Class A, CE Mark, UL
Warranty	Lifetime

Ordering Information

Complete list of fiber optic connector specifications [pg 212-224]

SFBRM1011-180
SFBRM1011-190 (DMI model)
10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1300nm MM (ST)
[2 km/1.2 mi.] Link Budget: 11.0 dB

SFBRM1013-180
SFBRM1013-190 (DMI model)
10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1300nm MM (SC)
[2 km/1.2 mi.] Link Budget: 11.0 dB

SFBRM1014-180
SFBRM1014-190 (DMI model)
10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-LX10 1310nm SM (SC)
[20 km/12.4 mi.] Link Budget: 19.0 dB

SFBRM1015-180
10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1310nm SM (SC)
[40 km/24.9 mi.] Link Budget: 26.0 dB

SFBRM1016-180
10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1310nm SM (SC)
[60 km/37.3 mi.] Link Budget: 29.0 dB

SFBRM1017-180
10/100BASE-TX (RJ-45)**[100 m/328 ft.]**
to 100BASE-FX 1550nm SM (SC)
[80 km/49.7 mi.] Link Budget: 29.0 dB

SFBRM1035-180
10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1550nm SM (SC)
[120 km/74.6 mi.] Link Budget: 36.0 dB

SFBRM1040-180
10/100BASE-TX (RJ-45)**[100 m/328 ft.]**
to SFP slot (empty)

Single Fiber Products [pg 19]

SFBRM1029-180
SFBRM1029-190 (DMI model)
10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-BX-U 1310nm TX/1550nm RX Bi-Di single mode (SC)
[20 km/12.4 mi.] Link Budget: 19.0 dB

SFBRM1029-181
SFBRM1029-191 (DMI model)
10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-BX-D 1550nm TX/1310nm RX Bi-Di SM (SC)
[20 km/12.4 mi.] Link Budget: 19.0 dB

SFBRM1029-182
10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1310nm TX/1550nm RX Bi-Di SM (SC)
[40 km/24.8 mi.] Link Budget: 25.0 dB

SFBRM1029-183
10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1550nm TX/1310nm RX Bi-Di SM (SC)
[40 km/24.8 mi.] Link Budget: 25.0 dB

Note: all units feature USB port for local management application.

Optional Accessories *(sold separately)*

Wide Input (24 - 60 VDC) Power Supplies

SPS-2460-PS [pg 69]
Piggy Back Power Supply

SPS-2460-SA [pg 69]
Stand-Alone Power Supply

Mounting Options

E-MCR-05 [pg 67]
12-Slot Media Converter Rack

RMS19-SA4-01 [pg 67]
4-Slot Media Converter Shelf

WMBD [pg 68]
DIN Rail Bracket 5.0" [127 mm]

WMBL [pg 68]
Wall Mount Bracket 4.0" [102 mm]

USB Cables

USBC-AM-BM-03
USB 2.0 Cable A male to B male [3 ft. Gray]

USBC-AM-BM-06
USB 2.0 Cable A male to B male [6 ft. Gray]

AUTO CROSS | AUTO NEG | PAUSE | TRANSPARENT LINK PASS THRU | FAR END FAULT | LOOP BACK | BANDWIDTH ALLOCATION | FIELD UPGRADEABLE FIRMWARE | REMOTE MGMT | AUTO LINK RESTORE | SINGLE FIBER | LAST GASP

OAM/IP-Based Remotely Managed 10/100BASE-TX to (2) 100BASE-X 10/100 Bridging

SFBRM1040-140

Redundant OAM/IP-Based Remotely Managed NID (Network Interface Device)

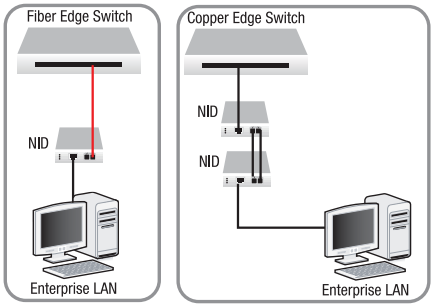
CARRIER ETHERNET MEF Certified Compliant

- Applications:
  - Ethernet in the First Mile (EFM)
  - Fiber to the Premise (FTTP), E-Line and E-LAN
  - Enterprise markets

Features

- MEF 9 & MEF 14 Carrier Ethernet Certification
- Two remote management modes:
  - IP-Based Remote Management [pg 17]
  - In-Band Link OAM 802.3ah (remote device managed by local peer)
- SNMP v1
- AutoCross™ [pg 16]
- Auto-Negotiation [pg 16]
- Pause [pg 17]
- Transparent Link Pass Through [pg 17]
- Far-End-Fault [pg 16]
- Remote Loopback [pg 18]
- IEEE 802.1p QoS packet classification with 4 egress queues
- Ipv4 IP TOS and DiffServ QoS classification, IPv6 Traffic class
- IEEE 802.1q VLAN, 4096 entries
- Static MAC, 64 entries
- Double VLAN tagging (C-tag/S-tag)(Q-in-Q)
- IEEE 802.1x Port based security
- RADIUS client
- RMON counters for each port
- Bandwidth Allocation per port [pg 18]
- DMI Optical Management
- USB port for basic setup
- Cable diagnostic function for TP ports
- 8K MAC addresses
- Field Upgradeable Firmware [pg 18]

Remotely Managed 10/100 NID IP or OAM Management



Specifications

Complete list of fiber optic connector specifications [pg 212-224]

Standards	IEEE Std. 802.3, IEEE Std. 802.3ah, IEEE Std. 802.1P, IEEE Std. 802.1Q, IEEE Std. 802.1X
Data Rate	**Copper:** 10/100 Mbps **Fiber:** 100 Mbps
Filtering Addresses	8K MAC Addresses
Max Frame Size	1628 bytes
Dimensions	**Width:** 3.4" [86 mm] **Depth:** 5.0" [127 mm] **Height:** 1.0" [25 mm]
Power Consumption	4.8 Watts
Power	Input 100-240VAC, 1A Output 12 VDC, 1.25A
Environment	0 – 50°C; 5% – 95% humidity non-condensing; 0 – 10,000 ft. altitude
Shipping Weight	2 lbs. [0.90 kg]
Regulatory Compliance	EN55024, FCC Class A, CE Mark, UL
Warranty	Lifetime

Ordering Information

Complete list of fiber optic connector specifications [pg 212-224]

SFBRM1040-140
10/100BASE-TX (RJ-45) **[100 m/328 ft.]** to (2) 100BASE-X SFP Slots (empty)

Note: unit features USB port for local management application.

Optional Accessories *(sold separately)*

SFP Modules [pg 161-167]

Wide Input (24 - 60 VDC) Power Supplies

SPS-2460-PS [pg 69]
Piggy Back Power Supply

SPS-2460-SA [pg 69]
Stand-Alone Power Supply

Mounting Options

E-MCR-05 [pg 67]
12-Slot Media Converter Rack

RMS19-SA4-01 [pg 67]
4-Slot Media Converter Shelf

WMBD [pg 68]
DIN Rail Bracket 5.0" [127 mm]

WMBL [pg 68]
Wall Mount Bracket 4.0" [102 mm]

USB Cables

USBC-AM-BM-03
USB 2.0 Cable A male to B male [3 ft. Gray]

USBC-AM-BM-06
USB 2.0 Cable A male to B male [6 ft. Gray]

SPOEB10xx-100

Power-Over-Ethernet PSE Media Converter

Enables enterprises to provide power to network devices over the existing CAT5 data connection.

Transition's AC powered PoE media converters combine data received over a fiber optic link with -48 VDC power; providing power to Data Terminal Equipment (DTE) Power Devices (PD) over unshielded twisted pair cable. The PoE converters are Power Sourcing Equipment (PSE) and are fully compatible with Powered Devices (PD) that comply with the IEEE802.3af: 2003 standard. The converters also include a PD signature sensing and power monitoring features per the IEEE 802.3af standard. Other features include Over-Current Protection, Under-Current Detection and Fault Protection Input.

This feature enhanced model offers the ability to enable/disable many of the features as well as force port capabilities (see switch section under specifications to the right).

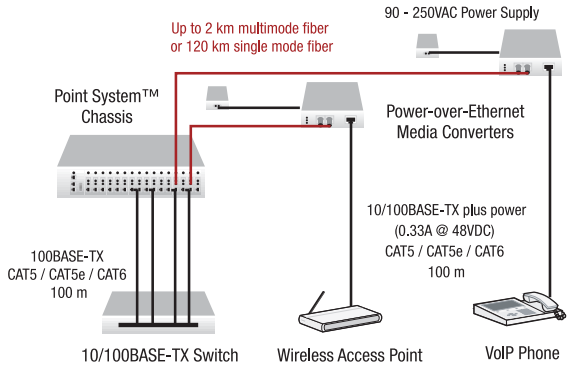
In addition, with the PSE/LPT switch enabled, a loss of Fiber RX will disable PSE power output on the UTP port for 2 seconds to allow remote device to re-initialize. (Also known as Powered Device Reset.)

The PoE converter is fully compatible with devices that comply with the IEEE802.3af standard. The PoE converter is capable of inserting power on data pairs or spare pair of the MDI.

Features

- External AC power supply
- IEEE802.3af Power-Over-Ethernet Compatible
- 48 VDC PSE Output Voltage
- Signal Pair or Spare Pair Power Insertion
- PD Detection Signature
- Over-Current Protection & Under-Current Detection
- Powered Device Reset
- Switch selectable features and port settings
- Minimum Load Sensing
- Fault Protection Input
- Auto-Negotiation [pg 16]
- AutoCross™ [pg 16]
- Link Pass Through [pg 17]
- Far-End-Fault (FEF) [pg 16]
- Automatic Link Restoration [pg 18]

Power Over CAT5 to Remotely Located Devices



Specifications

Standards	IEEE Std. 802.3, IEEE Std. 802.3af
Switches	**SW1:** Auto-Negotiation On/Off **SW2:** Speed TP: Force 10 Mbps or 100 Mbps (SW1 off) **SW3:** Duplex TP: Force Half or Full Duplex (SW1 off) **SW4:** Duplex Fiber: Half or Full Duplex **SW5:** AutoCross™ On/Off **SW6:** PSE On/Off **SW7:** PSE/LPT on/off **SW8:** Unused
Max Packet Size	1522 bytes untagged 1518 bytes tagged
Dimensions	**Width:** 3.25" [82 mm] **Depth:** 4.8" [120 mm] **Height:** 1.0" [25 mm]
Power	90 – 250 VAC external power supply
Power Consumption	20 Watts max.
Operating Temperature	0 – 40°C [32° – 104°F]
Storage Temperature	-25° to +85°C [-13° to +185°F]
Environment	5% – 95% humidity non-condensing; 0 – 10,000 ft. altitude
Shipping Weight	2 lbs. [0.90 kg]
Compliance	EN55022:1994+A1:1996+A2:1997 Class A; FCC Part 15 Subpart B; UL 1950
Warranty	Lifetime

Ordering Information

SPOEB1011-100
10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1300nm multimode (ST)
[2 km/1.2 mi.] Link Budget: 11.0 dB

SPOEB1013-100
10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1300nm multimode (SC)
[2 km/1.2 mi.] Link Budget: 11.0 dB

SPOEB1014-100
10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1310nm SM (SC)
[20 km/12.4 mi.] Link Budget: 16.0 dB

SPOEB1015-100
10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1310nm SM (SC)
[40 km/24.9 mi.] Link Budget: 26.0 dB

SPOEB1016-100
10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1310nm SM (SC)
[60 km/37.3 mi.] Link Budget: 29.0 dB

SPOEB1017-100
10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1550nm SM (SC)
[80 km/49.7 mi.] Link Budget: 29.0 dB

SPOEB1035-100
10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1310nm SM (SC)
[120 km/74.6 mi.] LB: 36.0 dB

Single Fiber Products

Recommended use in pairs [pg 19]

SPOEB1029-100
10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1310nm TX/1550nm RX
single fiber single mode (SC)
[20 km/12.4 mi.] LB: 19.0 dB

SPOEB1029-101
10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1550nm TX/1310nm RX
single fiber single mode (SC)
[20 km/12.4 mi.] LB: 19.0 dB

Optional Accessories *(sold separately)*

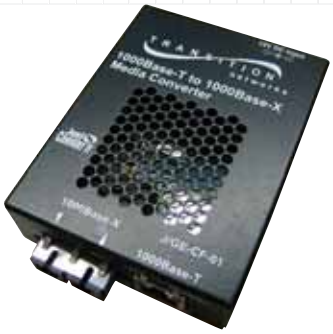
Mounting Options

WMBD or WMBL [pg 68]
Wall Mount Brackets

RMS19-SA4-01 [pg 67]
4-Slot Media Converter Shelf

J/GE-CF-01(xxx)

Gigabit Ethernet Media Converter



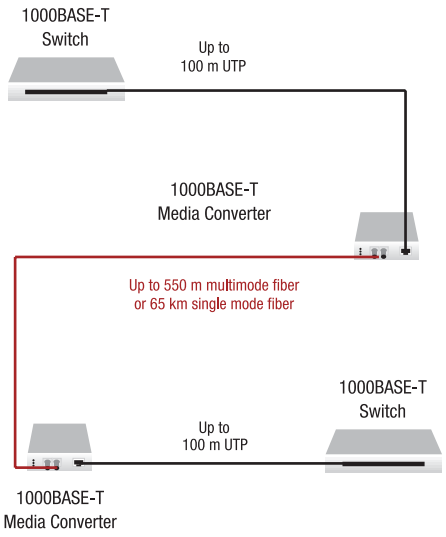
Convert 1000BASE-T ports over to 1000BASE-SX/LX on a port-by-port basis. Used individually or in pairs, this media converter can extend Gigabit Ethernet up to 2 km over multimode fiber or up to 65 km over single mode fiber.

The Just Convert-It™ 1000BASE-T to 1000BASE-SX/LX Media converter is an inexpensive, no frills way to extend the distance between Gigabit Ethernet connections with the use of fiber optic cable, while maintaining the same quality and reliability found on Transition's full-featured line of products.

Features

- Auto-Negotiation [pg 16]
- AutoCross™ [pg 16]
- Automatic Link Restoration [pg 18]
- Unit and port LEDs for quick status information
- Fixed full-duplex on fiber

Extend Network Distance



Specifications

Complete list of fiber optic connector specifications [pg 212-224]

Standards	IEEE Std. 802.3 2000
Status LEDs	**PWR (Power)**: Lit for normal operation **FLNK (Fiber Link)**: ON = fiber link **LACT (Link/Activity)**: ON = Copper link Flashing = Activity on copper link **DPX/COLL (Duplex/Collision)**: ON = Copper link Full-duplex OFF = Copper link Half-duplex; Flashing = Collisions on Half-duplex copper link
Dimensions	**Width**: 3.0" [76 mm] **Depth**: 4.0" [102 mm] **Height**: 1.0" [25 mm]
Power	External AC/DC included: 12 VDC, 0.4 A, unregulated
Power Consumption	3.2 Watts
Environment	0 – 50°C operating, 5% – 95% humidity non-condensing, 0 – 10,000 ft. altitude
Shipping Weight	2 lbs. [0.90 kg]
Safety Compliance	**Wall Mount Power Supply**: UL Listed and CSA certified
Regulatory Compliance	EN55024, CISPR22/EN55022 Class A, FCC Class A, CE Mark
Warranty	Lifetime

Ordering Information

Complete list of fiber optic connector specifications [pg 212-224]

J/GE-CF-01(SX)
1000BASE-T (RJ-45) **[100 m/328 ft.]**
to 1000BASE-SX 850nm MM (SC)
[62.5/125 um fiber: 220 m/722 ft.]
Link Budget: 7.0 dB
[50/125 um fiber: 550 m/1804 ft.]
Link Budget: 7.0 dB

J/GE-CF-01(LX1)
1000BASE-T (RJ-45) **[100 m/328 ft.]**
to 1000BASE-LX 1310nm SM (SC)
[10 km/6.2 mi.] Link Budget: 10.5 dB

J/GE-CF-01(LX2)
1000BASE-T (RJ-45) **[100 m/328 ft.]**
to 1000BASE-LX 1310nm SM (SC)
[25 km/15.5 mi.] Link Budget: 15.0 dB

J/GE-CF-01(LX6)
1000BASE-T (RJ-45) **[100 m/328 ft.]**
to 1000BASE-LX 1550nm SM (SC)
[65 km/40.4 mi.] Link Budget: 21.0 dB

J/GE-CF-01(LX100)
1000BASE-T (RJ-45) **[100 m/328 ft.]**
to 1000BASE-LX 1310nm TX/1550nm RX
single fiber single mode (SC)
[20 km/12.4 mi.] Link Budget: 13.0 dB

J/GE-CF-01(LX101)
1000BASE-T (RJ-45) **[100 m/328 ft.]**
to 1000BASE-LX 1550nm TX/1310nm RX
single fiber single mode (SC)
[20 km/12.4 mi.] Link Budget: 13.0 dB

*62.5/125 µm fiber: 220 m/722 ft.
50/125 µm fiber: 550 m/1804 ft.

Optional Accessories *(sold separately)*

Wide Input (24 - 60 VDC) Power Supplies

SPS-2460-CC [pg 69]
Piggy Back Power Supply

SPS-2460-SA [pg 69]
Stand-Alone Power Supply

Mounting Options

E-MCR-05 [pg 67]
12-Slot Media Converter Rack

RMS19-SA4-01 [pg 67]
4-Slot Media Converter Shelf

WMBD [pg 68]
DIN Rail Bracket 5.0" [127 mm]

WMBD-FS [pg 68]
DIN Rail Bracket (flat, small) 3.1" [79 mm]

WMBS [pg 68]
Wall Mount Bracket 3.2" [81 mm]

SGETF10xx-110

Gigabit Ethernet Media Converter

Migrate to Gigabit Ethernet in a cost-effective manner. Used in conjunction with lower cost 1000BASE-T switches, companies can take advantage of the high bandwidth Gigabit Ethernet offers without all of the higher costs. Transition Networks 1000BASE-T to SX/LX converters allow users to extend the bandwidth to those users outside the reach of the 1000BASE-T standard (up to 125 km).

Features

- AutoCross™ [pg 16]
- Copper & Fiber Auto-Negotiation [pg 16]
- Transparent Link Pass Through [pg 17]
- Automatic Link Restoration [pg 18]
- Pause [pg 17]
- Remote Fault Detect [pg 19]

Optional Accessories *(sold separately)*

SFP Modules [pg 161-167]

Wide Input (24 - 60 VDC) Power Supplies

SPS-2460-PS [pg 69]
Piggy Back Power Supply

SPS-2460-SA [pg 69]
Stand-Alone Power Supply

Mounting Options

E-MCR-05 [pg 67]
12-Slot Media Converter Rack

RMS19-SA4-01 [pg 67]
4-Slot Media Converter Shelf

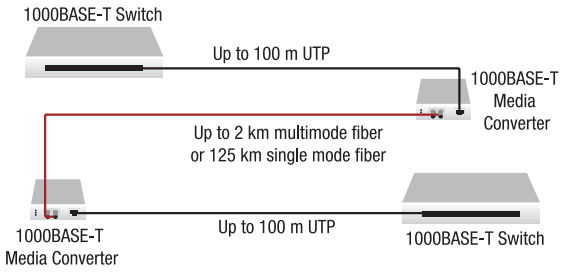
WMBD [pg 68]
DIN Rail Bracket 5.0" [127 mm]

WMBD-F [pg 68]
DIN Rail Bracket (flat, small) 3.1" [79 mm]

WMBL [pg 68]
Wall Mount Bracket 4.0" [102 mm]

WMBV [pg 68]
Vertical Wall Mount Bracket 5.0" [127 mm]

Migrate to Gigabit Ethernet



Specifications

Standards	IEEE Std. 802.3ab and IEEE Std. 802.3
6-position Switch	**SW1:** Remote Fiber Fault Detect (Down=Enabled) **SW2:** Symmetric Pause **SW3:** Asymmetric Pause **SW4:** Transparent Link Pass Through (UP=Enabled) **SW5:** Fiber Auto-Negotiation (Down=Enabled) **SW6:** Loopback (Down=Enabled)
Status LEDs	**PWR (Power):** Steady green LED indicates connection to external AC power **RXF (Fiber receive):** Flashing LED indicates reception of data on fiber link **LKF (Fiber link):** Steady LED indicates fiber link connection **RXC (Copper receive):** Flashing LED indicates reception of data on copper link **LKC (Copper link):** Steady LED indicates copper link connection
Dimensions	**Width**: 3.25" [82 mm] **Depth**: 4.8" [122 mm] **Height**: 1.0" [25 mm]
Power	External AC/DC required; 12 VDC, 0.8A min
Environment	0 – 50°C operating; 5% – 95% humidity non-condensing; 0 – 10,000 ft. altitude
Shipping Weight	2 lbs. [0.90 kg]
Safety Compliance	**Wall Mount Power Supply**: UL Listed, C-UL Listed (Canada)
Regulatory Compliance	FCC Class A, CISPR22/EN55022 Class A, EN55024, EN61000, CE Mark
Warranty	Lifetime

Ordering Information

SGETF1013-110
1000BASE-T (RJ-45) **[100 m/328 ft.]**
to 1000BASE-SX 850nm MM (SC)
[62.5/125 µm fiber: 220 m/722 ft.]
Link Budget: 7.0 dB
[50/125 µm fiber: 550 m/1804 ft.]
Link Budget: 7.0 dB

SGETF1024-110
1000BASE-T (RJ-45) **[100 m/328 ft.]**
to 1000BASE-SX 1300nm Extended MM (62.5/125 µm fiber only) (SC)
[2 km/1.2 mi.] Link Budget: 7.0 dB

SGETF1039-110
1000BASE-T (RJ-45) **[100 m/328 ft.]**
to 1000BASE-SX 850nm MM (LC) (via TN-SFP-SX)
[62.5/125 µm fiber: 220 m/722 ft.]
Link Budget: 8.0 dB
[50/125 µm fiber: 550 m/1804 ft.]
Link Budget: 8.0 dB

SGETF1014-110
1000BASE-T (RJ-45) **[100 m/328 ft.]**
to 1000BASE-LX 1310nm SM (SC)
[10 km/6.2 mi.] Link Budget: 10.5 dB

SGETF1015-110
1000BASE-T (RJ-45) **[100 m/328 ft.]**
to 1000BASE-LX 1310nm SM (SC)
[25 km/15.5 mi.] Link Budget: 15.0 dB

SGETF1017-110
1000BASE-T (RJ-45) **[100 m/328 ft.]**
to 1000BASE-LX 1550nm SM (SC)
[65 km/40.4 mi.] Link Budget: 21.0 dB

SGETF1035-110
1000BASE-T (RJ-45) **[100 m/328 ft.]**
to 1000BASE-LX 1550nm SM (SC)
[125 km/77.7 mi.] Link Budget: 27.0 dB

SGETF1040-110
1000BASE-T (RJ-45) **[100 m/328 ft.]**
to SFP slot (empty)

Single Fiber Products

Recommended use in pairs [pg 19]

SGETF1029-110
1000BASE-T (RJ-45) **[100 m/328 ft.]**
to 1000BASE-LX 1310nm TX/1550nm RX single fiber SM (SC)
[20 km/12.4 mi.] Link Budget: 13.0 dB

SGETF1029-111
1000BASE-T (RJ-45) **[100 m/328 ft.]**
to 1000BASE-LX 1550nm TX/1310nm RX single fiber SM (SC)
[20 km/12.4 mi.] Link Budget: 13.0 dB

SGETF1029-112
1000BASE-T (RJ-45) **[100 m/328 ft.]**
to 1000BASE-LX 1310nm TX/1550nm RX single fiber SM (SC)
[40 km/24.9 mi.] Link Budget: 20.0 dB

SGETF1029-113
1000BASE-T (RJ-45) **[100 m/328 ft.]**
to 1000BASE-LX 1550nm TX/1310nm RX single fiber SM (SC)
[40 km/24.9 mi.] Link Budget: 20.0 dB

SGETF1029-116
1000BASE-T (RJ-45) **[100 m/328 ft.]**
to 1000BASE-LX 1510nm TX/1590nm RX single fiber SM (SC)
[80 km/49.6 mi.] Link Budget: 24.0 dB

SGETF1029-117
1000BASE-T (RJ-45) **[100 m/328 ft.]**
to 1000BASE-LX 1590nm TX/1510nm RX single fiber SM (SC)
[80 km/49.6 mi.] Link Budget: 24.0 dB

Gigabit Ethernet/Fiber Channel Optical Mode Conversion 1000BASE-SX to 1000BASE-LX

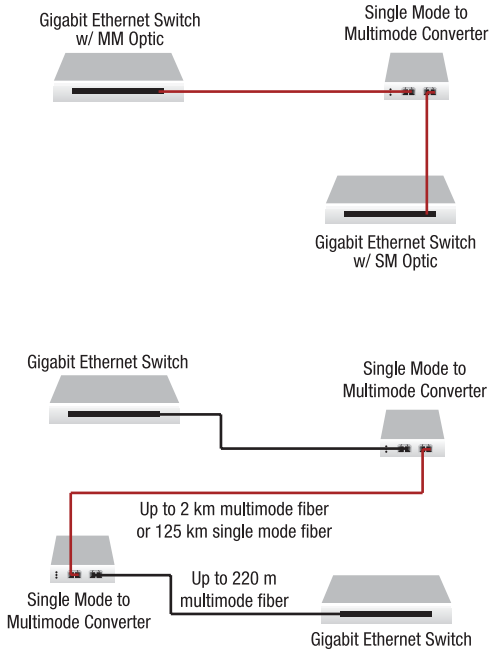
see also: Point System™ Slide-In-Module Gigabit Ethernet/Fiber Channel Optical Mode Converters [pg 48]

SFMFF1xxx-22x

Gigabit Ethernet/Fiber Channel Optical Mode Converter

Features

- Auto-Negotiation (1000Base-X ports) [pg 16]
- Link Pass Through [pg 17]
- Far-End-Fault (100Base-FX ports) [pg 16]
- Pause [pg 17]
- Automatic Link Restoration [pg 18]
- Protocol Transparency
- Convert 1000BASE-SX ports on a Gigabit Ethernet switch to 1000BASE-LX on a port-by-port basis
- Ideal for campus area networks or other applications requiring the distance advantages of single mode fiber



Used individually or in pairs, this mode converter can extend 1000 Mbps Gigabit Ethernet or Fiber Channel signals over single mode fiber up to 125 km.

Ordering Information

Complete list of fiber optic connector specifications [pg 212-224]

SFMFF1313-220
1000BASE-SX 850nm multimode (SC)
[62.5/125 µm fiber: 220 m/722 ft.]
[50/125 µm fiber: 550 m/1804 ft.]
Link Budget 7.5 dB
to 1000BASE-SX 850nm multimode (SC)
[62.5/125 µm fiber: 220 m/722 ft.]
[50/125 µm fiber: 550 m/1804 ft.]
Link Budget 7.5 dB

SFMFF1324-220
1000BASE-SX 850nm multimode (SC)
[62.5/125 µm fiber: 220 m/722 ft.]
[50/125 µm fiber: 550 m/1804 ft.]
Link Budget 7.0 dB
to 1000BASE-LX 1310nm Extended MM (62.5/125 µm fiber only) (SC)
[up to 2 km] Link Budget: 7.0 dB

SFMFF1424-220
1000BASE-LX 1310nm SM (SC)
[10km/6.2 mi.] Link Budget: 7.0 dB
to 1000BASE-LX 1310nm Extended MM (62.5/125 µm fiber only) (SC)
[up to 2 km] Link Budget: 7.0 dB

SFMFF1314-220
1000BASE-SX 850nm multimode (SC)
[62.5/125 µm fiber: 220 m/722 ft.]
[50/125 µm fiber: 550 m/1804 ft.]
Link Budget: 7.0 dB
to 1000BASE-LX 1310nm SM (SC)
[10 km/6.2 mi.] Link Budget: 7.0 dB

SFMFF1414-220
1000BASE-LX 1310nm SM (SC)
[10 km/6.2 mi.] Link Budget: 7.0 dB
to 1000BASE-LX 1310nm SM (SC)
[10 km/6.2 mi.] Link Budget: 7.0 dB

SFMFF1315-220
1000BASE-SX 850nm multimode (SC)
[62.5/125 µm fiber: 220 m/722 ft.]
[50/125 µm fiber: 550 m/1804 ft.]
Link Budget: 7.0 dB
to 1000BASE-LX 1310nm SM (SC)
[25 km/15.5 mi.] Link Budget: 15.0 dB

SFMFF1317-220
1000BASE-SX 850nm multimode (SC)
[62.5/125 µm fiber: 220 m/722 ft.]
[50/125 µm fiber: 550 m/1804 ft.]
Link Budget: 7.0 dB
to 1000BASE-LX 1550nm SM (SC)
[65 km/40.4 mi.] Link Budget: 20.0 d

SFMFF1335-220
1000BASE-SX 850nm multimode (SC)
[62.5/125 µm fiber: 220 m/722 ft.]
[50/125 µm fiber: 550 m/1804 ft.]
Link Budget: 7.0 dB
to 1000BASE-LX 1550nm SM (SC)
[125 km/77.7 mi.] Link Budget: 27.0 dB

Single Fiber Products

Recommended use in pairs [pg 19]

SFMFF1329-220
1000BASE-SX 850nm multimode (SC)
[62.5/125 µm fiber: 220 m/722 ft.]
[50/125 µm fiber: 550 m/1804 ft.]
Link Budget: 7.0 dB
to 1000BASE-LX 1310nm TX/1550nm RX single fiber single mode (SC)
[20 km/12.4 mi.] Link Budget: 13.0 dB

SFMFF1329-221
1000BASE-SX 850nm multimode (SC)
[62.5/125 µm fiber: 220 m/722 ft.]
[50/125 µm fiber: 550 m/1804 ft.]
Link Budget: 7.0 dB
to 1000BASE-LX 1550nm TX/1310nm RX single fiber single mode (SC)
[20 km/12.4 mi.] Link Budget: 13.0 dB

SFMFF1329-222
1000BASE-SX 850nm multimode (SC)
[62.5/125 µm fiber: 220 m/722 ft.]
[50/125 µm fiber: 550 m/1804 ft.]
Link Budget: 7.0 dB
to 1000BASE-LX 1310nm TX/1550nm RX single fiber single mode (SC)
[40 km/24.9 mi.] Link Budget: 20.0 dB

SFMFF1329-223
1000BASE-SX 850nm multimode (SC)
[62.5/125 µm fiber: 220 m/722 ft.]
[50/125 µm fiber: 550 m/1804 ft.]
Link Budget: 7.0 dB
to 1000BASE-LX 1550nm TX/1310nm RX single fiber single mode (SC)
[40 km/24.9 mi.] Link Budget: 20.0 dB

SFMFF1429-220
1000BASE-LX 1310nm single mode (SC)
[10km/6.2 mi.] Link Budget: 10.5.0 dB
to 1000BASE-LX 1310nm TX/1550nm RX single fiber single mode (SC)
[20 km/12.4 mi.] Link Budget: 13.0 dB

SFMFF1429-221
1000BASE-LX 1310nm single mode (SC)
[10km/6.2 mi.] Link Budget: 10.5.0 dB
to 1000BASE-LX 1550nm TX/1310nm RX single fiber single mode (SC)
[20 km/12.4 mi.] Link Budget: 13.0 dB

*62.5/125 µm fiber: 220 m/722 ft.
50/125 µm fiber: 550 m/1804 ft.

Optional Accessories *(sold separately)*

Wide Input (24 - 60 VDC) Power Supplies

SPS-2460-PS [pg 69]
Piggy Back Power Supply

SPS-2460-SA [pg 69]
Stand-Alone Power Supply

Mounting Options

E-MCR-05 [pg 67]
12-Slot Media Converter Rack

RMS19-SA4-01 [pg 67]
4-Slot Media Converter Shelf

WMBD [pg 68]
DIN Rail Bracket 5.0" [127 mm]

WMBD-F [pg 68]
DIN Rail Bracket (flat) 3.3" [84 mm]

WMBL [pg 68]
Wall Mount Bracket 4.0" [102 mm]

WMBV [pg 68]
Vertical Wall Mount Bracket 5.0" [127 mm]

stand-alone media converter

AUTO NEG | LINK PASS THRU | PAUSE | AUTO LINK RESTORE

Gigabit Ethernet Optical Mode Conversion 1000BASE-SX to 1000BASE-LX

see also: Point System™ Slide-In-Module Gigabit Ethernet Optical Mode Converters [pg 49]

SFMFF13xx-28x

Gigabit Optical Mode Converter with Signal Retiming & Regeneration

Convert 1000BASE-SX ports over to 1000BASE-LX on a port-by-port basis. Used individually or in pairs, this media converter can extend Gigabit Ethernet over single mode fiber up to 125 km. Or cascade two or more converters in a link to achieve even greater distances.

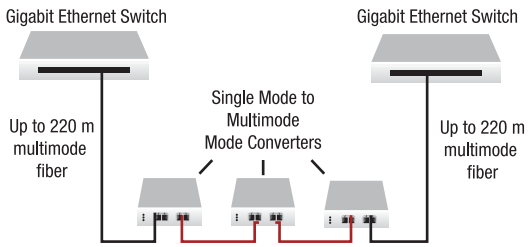
Transition Networks' Gigabit Ethernet optical mode converters now include signal retiming, re-generation & re-amplification to maintain signal integrity and allow for maximum network distance without signal degradation. Distances of hundreds of kilometers are possible when cascading two or more devices in the same link.

- Transition Networks' Gigabit Ethernet optical mode converters now include signal retiming, regeneration and re-amplification to maintain signal integrity and allow for maximum network distance without signal degradation
- Distances of hundreds of kilometers are possible when cascading two or more devices in the same link
- Supports 3R optical signal regeneration
  - Reamplify, Reshape & Retrieve

Features

- Auto-Negotiation [pg 16]
- Link Pass Through [pg 17]
- Pause [pg 17]
- Automatic Link Restoration [pg 18]

Extend Network Distance



Up to 2 km multimode fiber
or 125 km single mode fiber

Specifications

Complete list of fiber optic connector specifications [pg 212-224]

Standards	IEEE Std. 802.3
Status LEDs	**PWR (Power)**: Lit for normal operation **LKS (Single Mode Fiber Link)**: ON = Fiber Link **LKM (Multimode Fiber Link)**: ON = Fiber Link **ACT (Activity)**: Blinking = data reception on either fiber link
Switches	**Switch 1**: Fiber Auto-Negotiation on/off **Switch 2**: Link Pass Through on/off **Switch 3&4**: Pause configuration determined by combined setting
Dimensions	**Width**: 3.25" [82 mm] **Depth**: 4.8" [120 mm] **Height**: 1.0" [25 mm]
Power	External AC/DC included; 12 VDC, 0.5A; unregulated
Power Consumption	3.5 Watts
Environment	0 – 50°C operating; 5% – 95% humidity non-condensing; 0 – 10,000 ft. altitude
Shipping Weight	2 lbs. [0.90 kg]
Safety Compliance	**Wall Mount Power Supply**: UL Listed and CSA certified
Regulatory Compliance	EN55024; CISPR22/EN55022 Class A; FCC Class A; CE Mark
Warranty	Lifetime

Ordering Information

Complete list of fiber optic connector specifications [pg 212-224]

SFMFF1324-280
1000BASE-SX 850nm multimode (SC)
[220 m/722 ft.]* Link Budget: 7.0 dB
[550 m/1804 ft.]* Link Budget: 7.0 dB
to 1000BASE-LX 1310nm Extended MM (SC) (62.5/125 µm fiber only)
[up to 2 km] Link Budget: 7.0 dB

SFMFF1314-280
1000BASE-SX 850nm multimode (SC)
[220 m/722 ft.]* Link Budget: 7.0 dB
[550 m/1804 ft.]* Link Budget: 7.0 dB
to 1000BASE-LX 1310nm SM (SC)
[10 km/6.2 mi.] Link Budget: 7.0 dB

SFMFF1414-280
1000BASE-LX 1310nm SM (SC)
[10 km/6.2 mi.] Link Budget: 7.0 dB
to 1000BASE-LX 1310nm SM (SC)
[10 km/6.2 mi.] Link Budget: 7.0 dB

SFMFF1315-280
1000BASE-SX 850nm multimode (SC)
[220 m/722 ft.]* Link Budget: 7.0 dB
[550 m/1804 ft.]* Link Budget: 7.0 dB
to 1000BASE-LX 1310nm SM (SC)
[25 km/15.5 mi.] Link Budget: 15.0 dB

SFMFF1317-280
1000BASE-SX 850nm multimode (SC)
[220 m/722 ft.]* Link Budget: 7.0 dB
[550 m/1804 ft.]* Link Budget: 7.0 dB
to 1000BASE-LX 1550nm SM (SC)
[65 km/40.4 mi.] Link Budget: 21.0 dB

SFMFF1335-280
1000BASE-SX 850nm multimode (SC)
[220 m/722 ft.]* Link Budget: 7.0 dB
[550 m/1804 ft.]* Link Budget: 7.0 dB
to 1000BASE-LX 1550nm SM (SC)
[125 km/77.7 mi.] Link Budget: 27.0 dB

Single Fiber Products

Recommended use in pairs [pg 19]

SFMFF1329-280
1000BASE-SX 850nm multimode (SC)
[220 m/722 ft.]* Link Budget: 7.0 dB
[550 m/1804 ft.]* Link Budget: 7.5 dB
to 1000BASE-LX 1310nm TX/1550nm RX single fiber single mode (SC)
[20 km/12.4 mi.] Link Budget: 13.0 dB

SFMFF1329-281
1000BASE-SX 850nm multimode (SC)
[220 m/722 ft.]* Link Budget: 7.0 dB
[550 m/1804 ft.]* Link Budget: 7.0 dB
to 1000BASE-LX 1550nm TX/1310nm RX single fiber SM (SC)
[20 km/12.4 mi.] Link Budget: 13.0 dB

SFMFF1329-282
1000BASE-SX 850nm multimode (SC)
[220 m/722 ft.]* Link Budget: 7.0 dB
[550 m/1804 ft.]* Link Budget: 7.0 dB
to 1000BASE-LX 1310nm TX/1550nm RX single fiber single mode (SC)
[40 km/24.9 mi.] Link Budget: 20.0 dB

SFMFF1329-283
1000BASE-SX 850nm multimode (SC)
[220 m/722 ft.]* Link Budget: 7.0 dB
[550 m/1804 ft.]* Link Budget: 7.0 dB
to 1000BASE-LX 1550nm TX/1310nm RX single fiber single mode (SC)
[40 km/24.9 mi.] Link Budget: 20.0 dB

SFMFF1329-286
1000BASE-SX 850nm multimode (SC)
[220 m/722 ft.]* Link Budget: 7.0 dB
[550 m/1804 ft.]* Link Budget: 7.0 dB
to 1000BASE-LX 1510nm TX/1590nm RX single fiber single mode (SC)
[80 km/49.6 mi.] Link Budget: 24.0 dB

SFMFF1329-287
1000BASE-SX 850nm multimode (SC)
[220 m/722 ft.]* Link Budget: 7.0 dB
[550 m/1804 ft.]* Link Budget: 7.0 dB
to 1000BASE-LX 1590nm TX/1510nm RX single fiber single mode (SC)
[80 km/49.6 mi.] Link Budget: 24.0 dB

*62.5/125 µm fiber: 220 m/722 ft.
50/125 µm fiber: 550 m/1804 ft.

TN-CCH-MCM12-RJ-70S

Plug-n-Play Universal Module System

These Gigabit Ethernet media conversion modules offer the highest density media converter solution on the market today and are the result of a co-development effort between Transition Networks and Corning Cabling Systems. Each electrical-to-optical (EO) module includes (12) 1000Base-T RJ-45 ports on the front and (2) 12-fiber MTP 1000Base-SX optical ports on the rear to extend transmission reach (up to 750 m on 50/125 um fiber) while drastically reducing bulky copper cabling. The modules compatibility with the Plug & Play™ Universal System, part of Corning's LANscape® Pretium™ Solution, offer virtually seamless integration into embedded fiber infrastructure.

Features

- AutoCross™ [pg 16]
- Copper and Fiber Auto-Negotiation [pg 16]
- Automatic Link Restoration [pg 18]
- Link Pass Through [pg 17]
- Pause [pg 17]
- Hot-Swappable

For use in either Corning's 1u chassis or 4u chassis

Specifications

Complete list of fiber optic connector specifications [pg 212-224]

TN-CCH-MCM12-RJ-70S:

Standards	IEEE Std 802.3TM - 2005
Status LEDs	**Port 1 (TP):** ON green = TP Link ON orange = unit is operating over temperature range **Port 2 (TP):** ON green = TP Link ON orange = No link but power is detected **Port 4 (TP):** ON green = TP Link ON orange = Fan Fault **Port 3, 5-12 (TP):** ON green = TP Link **Port 1-12 (Fiber):** ON green = Fiber Link
Dimensions	**Width**: 1.4" [36 mm] **Depth**: 6.1" [155 mm] **Height**: 6.1" [155 mm]
Power Consumption	17 Watts, 1.41A @ 12 VDC
Maximum Packet Size	10 KB
MTBF	36,063 hours [MIL-217F2] 324,255 hours [Bellcore 7]
Environment	0 – 40°C operating; -15°C – 65°C storage; 5-95% humidity non-condensing; 0-10,000 ft. altitude
Shipping Weight	2 lbs. [0.9 kg]
Compliance	EN55024; CISPR22/EN55022 Class A; FCC Class A; CE Mark; UL60950
Warranty	Lifetime

Ordering Information

Complete list of fiber optic connector specifications [pg 212-224]

TN-CCH-MCM12-RJ-70S
(12) 1000BASE-T (RJ-45) to
(12) 1000BASE-SX
850nm Multimode MTP (2)
[50/125 um fiber: 750 m/2460 ft.]
[62.5/125 um fiber: 350 m/1148 ft.]
Link Budget: 8.5 dB

TN-PCH-04U-00
4U Housing/Chassis
Supports (2) power supplies
and (8) MCM devices (not included)

TN-PCH-01U-00
1U Housing/Chassis
Supports (2) power supplies
and (2) MCM devices (not included)

TN-PCH-04U-PWRS
Single power supply for 4U Corning Chassis

TN-PCH-01U-PWRS
Single power supply for 1U Corning Chassis

TN-PCH-04U-PWRS-MGMT
Power Supply SNMP Management Module for 4U Housing/Chassis

TN-PCH-01U-PWRS-MGMT
Power Supply SNMP Management Module for 1U Housing/Chassis

M/GE-PSW-xX-01

Mini 10/100/1000 Bridging Media Converter

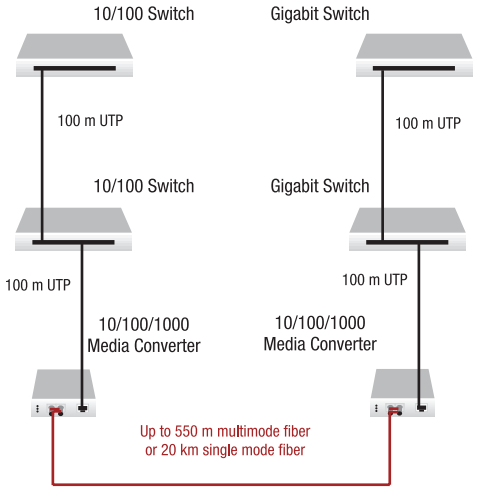
The Mini Media Converters provide a cost-effective method for integrating fiber optic cabling into a 10/100/1000 UTP environment. With its miniature size, the Mini offers a space saving alternative while it converts copper to fiber with the smallest footprint available in the industry.

- **Connect Legacy Networking Equipment**
  Connect an existing 10/100 Mbps device to 1000 Mbps devices.
- **Space Saving Design**

Features

- Unit &Port LEDs allow for quick status information
- Auto-Negotiation [pg 16]
- Fixed Full-Duplex on fiber
- AutoCross™ [pg 16]
- Fixed Link Pass Through [pg 17]
- Automatic Link Restoration [pg 18]

Extend Network Distance



Specifications

Standards	IEEE Std. 802.3
Max Frame Size	**untagged:** 1632 bytes **tagged:** 1628 bytes
Status LEDs	**PWR (Power):** (below RJ-45) ON = Lit for normal operation **FX-Link/Act (Fiber Link/Activity):** (Upper Left on RJ-45) ON = Link; Flashing = Activity **TX-Link/Act (Copper Link/Activity):** (Upper Right on RJ-45) ON = Link; Flashing = Activity
Dimensions	**Width:** 1.8" [46 mm] **Depth:** 3.3" [85 mm] **Height:** 0.85" [22 mm]
Power Consumption	3.15 Watts
Power Sources	Unit accepts 5 VDC to 28 VDC Wall Mount AC adapter: 12 VDC 400mA
Operating Temp	0°C to 50°C (32°F to 122°F)
Storage Temp	-15°C to 65°C (-5°F to 149°F)
Humidity	5% – 95% humidity non-condensing
Altitude	0 – 10,000 ft. altitude
Shipping Weight	2 lbs. [0.90 kg]
Safety Compliance	**Wall Mount Power Supply:** UL Listed, C-UL Listed (Canada)
Regulatory Compliance	FCC Class A, CISPR22/EN55022 Class A, EN55024, CE Mark
Warranty	Lifetime

Ordering Information

M/GE-PSW-SX-01
10/100/1000BASE-T (RJ-45)
[100 m/328 ft.]
to 1000BASE-SX 850nm multimode (SC)
[62.5/125 µm fiber: 220 m/722 ft.]
Link Budget: 7.0 dB
[50/125 µm fiber: 550 m/1804 ft.]
Link Budget: 7.0 dB

M/GE-PSW-LX-01
10/100/1000BASE-T (RJ-45)
[100 m/328 ft.]
to 1000BASE-LX 1310nm SM (SC)
[10 km/6.2 mi.] Link Budget: 10.5 dB

M/GE-PSW-LX-01(100)
10/100/1000BASE-T (RJ-45)
[100 m/328 ft.]
to 1000BASE-LX 1310nm TX/1550nm RX
single fiber single mode (SC)
[20 km/12.4 mi.] Link Budget: 13.0 dB

M/GE-PSW-LX-01(101)
10/100/1000BASE-T (RJ-45)
[100 m/328 ft.]
to 1000BASE-LX 1550nm TX/1310nm RX
single fiber single mode (SC)
[20 km/12.4 mi.] Link Budget: 13.0 dB

Long Haul SM and Single Strand SM are available upon request.

Optional Accessories *(sold separately)*

Wide Input (24 - 60 VDC) Power Supply

SPS-2460-SA [pg 69]
Stand-Alone Power Supply

Mounting Options

WMBM [pg 68]
Wall Mount Bracket for Mini

RMBM
Rack Mount Bracket for Mini Media Converters in the RMS19-SA4-01 and/or E-MCR-05

AUTO NEG | AUTO CROSS | LINK PASS THRU | AUTO LINK RESTORE | PAUSE | FIELD UPGRADEABLE FIRMWARE | SOURCE ADDRESS CHANGE

10/100/1000BASE-T to 1000BASE-X

see also: 10/100/1000 Bridging Point System™ Slide-In-Module Media Converters [pg 50, 53]

SGFEB10xx-12x

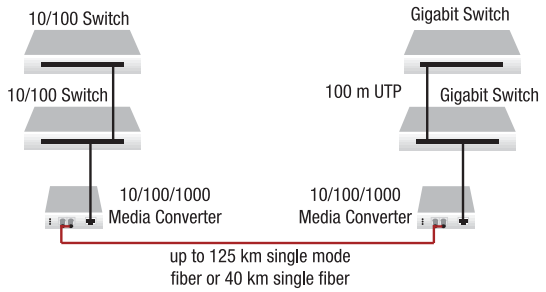
10/100/1000 Ethernet Media Converter

- Integrate 1000Base-SX/LX Fiber into 10/100/1000 Copper environments
- Extend Network Distance
- Bridge legacy 10/100 devices to a Gigabit backbone

Features

- Auto-Negotiation (copper and fiber ports) [pg 16]
- Switch-selectable speeds UTP when Auto-Negotiation is off
- AutoCross™ [pg 16]
- Link Pass Through [pg 17]
- Remote Fault Detect [pg 19]
- Pause [pg 17]

Extend Network Distance



Specifications

Standards	IEEE 802.3, IEEE 802.3ab, IEEE 802.3u, IEEE 802.3z
Data Rate	**Copper:** 10/100/1000 Mbps **Fiber:** 1000 Mbps
Filtering Addresses	8K MAC Addresses
Max Frame Size	**802.3ac tagged:** 1628 bytes **untagged:** 1632 bytes
Status LEDs	**PWR (Power):** ON green = Power applied to card **TP (Duplex/Link/Activity):** Orange: ON = Half-duplex Link; BLINK = Activity; Green: ON = Full-duplex Link; BLINK = Activity **TP (10 Mbs/100 Mbs/1000 Mbs):** Off = 10 Mbs; Orange = 100 Mbs; Green = 1000 Mbs **LACT (Fiber Link/Activity):** Green: ON = Link; BLINK = Activity
Dip Switches	**Switch 1:** TX - Enable/Disable Auto-Negotiation **Switch 2:** TX - Force 10 Mbs or 100 Mbs with Switch 1 off **Switch 3:** TX - Force Half or Full duplex with Switch 1 off **Switch 4:** Enable/Disable LPT **Switch 5:** not used **Switch 6:** not used
Jumpers	**J6:** TX - Enable/Disable AutoCross™
Dimensions	**Width:** 3.25" [82 mm] **Depth:** 4.8" [122 mm] **Height:** 1.0" [25 mm]
Power	External AC/DC required: 12 VDC, 1.25 A, unregulated, standard
Power Consumption	4.8 Watts
Environment	0 – 50°C operating, -40°C - 85°C storage 5% – 95% humidity non-condensing, 0 – 10,000 ft. altitude
Shipping Weight	2 lb. [0.9 kg]
Regulatory Compliance	CISPR/EN55022 Class A, EN55024, EN61000, FCC Class A, CE Mark
Safety Compliance	**Wall Mount Power Supply:** UL listed & CSA certified
Warranty	Lifetime

Ordering Information

SGFEB1013-120
10/100/1000BASE-T (RJ-45)
[100 m/328 ft.]
to 1000BASE-SX 850nm multimode (SC)
[62.5/125 µm: 220 m/722 ft.]
[50/125 µm: 550 m/1804 ft.]
Link Budget: 7.0 dB

SGFEB1024-120
10/100/1000BASE-T (RJ-45)
[100 m/328 ft.]
to 1000BASE-SX 1300nm Extended MM (62.5/125 µm fiber only) (SC)
[up to 2 km] Link Budget: 7.0 dB

SGFEB1014-120
10/100/1000BASE-T (RJ-45)
[100 m/328 ft.]
to 1000BASE-LX 1310nm SM (SC)
[10 km/6.2 mi.] Link Budget: 7.0 dB

SGFEB1015-120
10/100/1000BASE-T (RJ-45)
[100 m/328 ft.]
to 1000BASE-LX 1310nm SM (SC)
[25 km/15.5 mi.] Link Budget: 15.0 dB

SGFEB1017-120
10/100/1000BASE-T (RJ-45)
[100 m/328 ft.]
to 1000BASE-LX 1550nm SM (SC)
[65 km/40.4 mi.] Link Budget: 20.0 dB

SGFEB1035-120
10/100/1000BASE-T (RJ-45)
[100 m/328 ft.]
to 1000BASE-LX 1550nm SM (SC)
[125 km/77.7 mi.] Link Budget: 27.0 dB

SGFEB1040-120
10/100/1000BASE-T (RJ-45)
[100 m/328 ft.]
to 1000BASE-X SFP Slot (empty)

Single Fiber Products [pg 19]

SGFEB1029-120
10/100/1000BASE-T (RJ-45)
[100 m/328 ft.]
to 1000BASE-LX 1310nm TX/1550nm RX single fiber single mode (SC)
[20 km/12.4 mi.] Link Budget: 13.0 dB

SGFEB1029-121
10/100/1000BASE-T (RJ-45)
[100 m/328 ft.]
to 1000BASE-LX 1550nm TX/1310nm RX single fiber single mode (SC)
[20 km/12.4 mi.] Link Budget: 13.0 dB

SGFEB1029-122
10/100/1000BASE-T (RJ-45)
[100 m/328 ft.]
to 1000BASE-LX 1310nm TX/1550nm RX single fiber single mode (SC)
[40 km/24.9 mi.] Link Budget: 20.0 dB

SGFEB1029-123
10/100/1000BASE-T (RJ-45)
[100 m/328 ft.]
to 1000BASE-LX 1550nm TX/1310nm RX single fiber single mode (SC)
[40 km/24.9 mi.] Link Budget: 20.0 dB

Optional Accessories *(sold separately)*

SFP Modules [pg 161-167]

Wide Input (24 - 60 VDC) Power Supplies
SPS-2460-PS or SPS-2460-SA [pg 69]

Mounting Options

E-MCR-05 [pg 67]
12-Slot Media Converter Rack

RMS19-SA4-01 [pg 67]
4-Slot Media Converter Shelf

WMBD [pg 68]
DIN Rail Mount Bracket 5.0" [127 mm]

WMBL [pg 68]
Wall Mount Bracket 4.0" [102 mm]

10/100/1000BASE-T or 100/1000BASE-X to 1000BASE-X

see also: 10/100/1000 Bridging Point System™ Slide-In-Module Media Converters [pg 51]

SGFEB1040-140 & SGFEB4040-180

10/100/1000 Ethernet Media Converter

(-180)

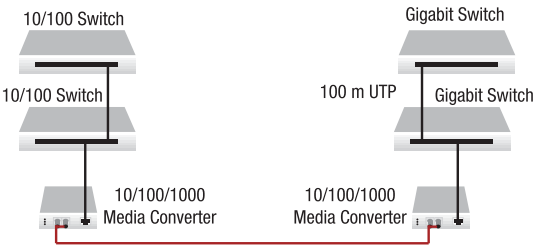
(-140)

- Extend Network Distance
- Bridge legacy 10/100 devices to a Gigabit backbone
- Protect critical networks with fiber redundancy

Features

- Auto-Negotiation (copper and fiber ports) [pg 16]
- Switch-selectable speeds (UTP) when Auto-Negotiation is off
- AutoCross™ [pg 16]
- Pause [pg 17]
- Far-End-Fault (100Base-FX setting on -180 model port 1 only) [pg 16]
- Automatic Link Restoration *[pg 18]*
- Fiber Redundancy (<50ms switching time)
- SGMII support on port 1 for use with 10/100/1000Base-T copper SFPs **(-180 model only)**
- 100/1000Base-X, dual speed support on port 1 for use with 100Base-FX or 1000Base-SX/LX SFPs (-180 model only)

Extend Network Distance



Distance on fiber based on which SFP module is used (see pages 163-169).

Specifications

Standards	IEEE 802.3, IEEE 802.3ab, IEEE 802.3u, IEEE 802.3z
Data Rate	**TP (port 1):** 10/100/1000 Mbps (**-140 model only**) **SFP (port 1):** 100/1000 Mbps (**-180 model only**) **SFP (port 2,3):** 1000 Mbps
Filtering Addresses	8K MAC Addresses
Max Frame Size	**802.3ac tagged:** 1628 bytes **untagged:** 1632 bytes
Status LEDs	**PWR (Power):** ON green = Power applied to card **TP (Duplex/Link/Activity):** Orange: ON = Half-duplex Link; BLINK = Activity; Green: ON = Full-duplex Link; BLINK = Activity **TP (10 Mbs/100 Mbs/1000 Mbs):** Off = 10 Mbs; Orange = 100 Mbs; Green = 1000 Mbs **LACT (Fiber SFP Link/Activity):** Green: ON = Link; BLINK = Activity
Dip Switches	**Switch 1:** TX - Enable/Disable Auto-Negotiation **Switch 2:** TX - Force 10 Mbs or 100 Mbs with Switch 1 off **Switch 3:** TX - Force Half or Full duplex with Switch 1 off **Switch 4:** Enable/Disable Fiber Redundancy (port 2/3) **Switch 5:** Enable/Disable primary/secondary revert with Switch 4 on **Switch 6:** Enable/Disable P2 to P3 blocking
Dip Switches	**Switch 1:** Port 1 speed 100 Mbs/1000 Mbs **Switch 2:** Port 1 duplex full/half **Switch 3:** Port 1 mode 1000Base-X/SGMII **Switch 4:** Enable/Disable Fiber Redundancy (port 2/3) **Switch 5:** Enable/Disable primary/secondary revert with Switch 4 on **Switch 6:** Enable/Disable P2 to P3 blocking
Dimensions	**Width:** 3.25" [82 mm] **Depth:** 4.8" [122 mm] **Height:** 1.0" [25 mm]
Power	External AC/DC required: 12 VDC, 1.25 A, unregulated, standard
Power Consumption	6 Watts
Environment	0 – 50°C operating, -40°C - 85°C storage 5% – 95% humidity non-condensing, 0 – 10,000 ft. altitude
Shipping Weight	2 lb. [0.9 kg]
Regulatory Compliance	CISPR/EN55022 Class A, EN55024, EN61000, FCC Class A, CE Mark
Safety Compliance	**Wall Mount Power Supply:** UL listed & CSA certified
Warranty	Lifetime

Ordering Information

SGFEB1040-140
10/100/1000BASE-T (RJ-45) **[100 m/328 ft.]**
to (2) 1000BASE-X SFP Slots (empty)

SGFEB4040-180
100/1000BASE-X SFP Slot (empty)
to (2) 1000BASE-X SFP Slots (empty)

Optional Accessories *(sold separately)*

SFP Modules [pg 161-167]

Wide Input (24 - 60 VDC) Power Supplies

SPS-2460-PS or SPS-2460-SA [pg 69]

Mounting Options

E-MCR-05 [pg 67]
12-Slot Media Converter Rack

RMS19-SA4-01 [pg 67]
4-Slot Media Converter Shelf

WMBD [pg 68]
DIN Rail Mount Bracket 5.0" [127 mm]

WMBL [pg 68]
Wall Mount Bracket 4.0" [102 mm]

see also: 100/1000 Bridging Point System™ Slide-In-Module Media Converters [pg 52]

SGFEB1xxx-15x & SGFEB1x40-170

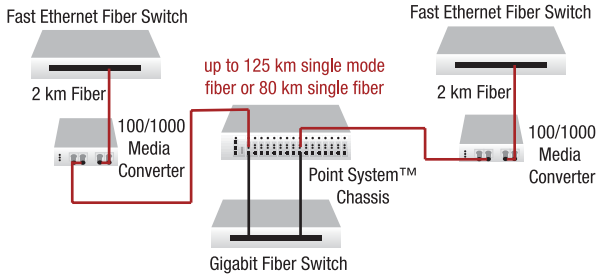
100/1000 Bridging Media Converter

(-150)

(-170)

Features

- Extend Network Distance
- Bridge legacy 100Base-FX devices to a Gigabit fiber backbone
- Secure Uni-directional transmission
- Auto-Negotiation (1000Base-X ports) [pg 16]
- Link Pass Through [pg 17]
- Far-End-Fault (100Base-FX ports) [pg 16]
- Pause [pg 17]
- Automatic Link Restoration [pg 18]



Ordering Information

Complete list of fiber optic connector specifications [pg 212-224]

SGFEB1313-150
100BASE-FX 1300nm MM (SC)
[2 km/1.2 mi.] Link Budget: 11.0 dB
to 1000BASE-SX 850nm MM (SC)
[62.5/125 µm: 220 m/722 ft.]
[50/125 µm: 550 m/1804 ft.]
Link Budget: 7.0 dB

SGFEB1324-150
100BASE-FX 1300nm MM (SC)
[2 km/1.2 mi.] Link Budget: 11.0 dB
to 1000BASE-LX 1310nm Extended MM (62.5/125 µm fiber only) (SC)
[up to 2 km] Link Budget: 7.0 dB

SGFEB1314-150
100BASE-FX 1300nm MM (SC)
[2 km/1.2 mi.] Link Budget: 11.0 dB
to 1000BASE-LX 1310nm SM (SC)
[10 km/6.2 mi.] Link Budget: 7.0 dB

SGFEB1315-150
100BASE-FX 1300nm MM (SC)
[2 km/1.2 mi.] Link Budget: 11.0 dB
to 1000BASE-LX 1310nm SM (SC)
[25 km/15.5 mi.] Link Budget: 15.0 dB

SGFEB1317-150
100BASE-FX 1300nm MM (SC)
[2 km/1.2 mi.] Link Budget: 11.0 dB
to 1000BASE-LX 1550nm SM (SC)
[65 km/40.4 mi.] Link Budget: 20.0 dB

SGFEB1335-150
100BASE-FX 1300nm MM (SC)
[2 km/1.2 mi.] Link Budget: 11.0 dB
to 1000BASE-LX 1550nm SM (SC)
[125 km/77.7 mi.] Link Budget: 27.0 dB

SGFEB1340-170
100BASE-FX 1300nm MM (SC)
[2 km/1.2 mi.] Link Budget: 11.0 dB
to 1000BASE-X SFP Slot (empty)

SGFEB1440-170
100BASE-FX 1310nm SM (SC)
[20 km/12.4 mi.] Link Budget: 16.0 dB
to 1000BASE-X SFP Slot (empty)

Single Fiber Products

Recommended use in pairs [pg 19]

SGFEB1329-150
100BASE-FX 1300nm MM (SC)
[2 km/1.2 mi.] Link Budget: 11.0 dB
to 1000BASE-LX 1310nm TX/1550nm RX single fiber SM (SC)
[20 km/12.4 mi.] Link Budget: 13.0 dB

SGFEB1329-151
100BASE-FX 1300nm MM (SC)
[2 km/1.2 mi.] Link Budget: 11.0 dB
to 1000BASE-LX 1550nm TX/1310nm RX single fiber SM (SC)
[20 km/12.4 mi.] Link Budget: 13.0 dB

Ordering Information

Complete list of fiber optic connector specifications [pg 212-224]

SGFEB1329-152
100BASE-FX 1300nm MM (SC)
[2 km/1.2 mi.] Link Budget: 11.0 dB
to 1000BASE-LX 1310nm TX/1550nm RX single fiber SM (SC)
[40 km/24.9 mi.] Link Budget: 20.0 dB

SGFEB1329-153
100BASE-FX 1300nm MM (SC)
[2 km/1.2 mi.] Link Budget: 11.0 dB
to 1000BASE-LX 1550nm TX/1310nm RX single fiber SM (SC)
[40 km/24.9 mi.] Link Budget: 20.0 dB

SGFEB1429-150
100BASE-FX 1310nm SM (SC)
[20 km/12.4 mi.] Link Budget: 16.0 dB
to 1000BASE-LX 1310nm TX/1550nm RX single fiber SM (SC)
[20 km/12.4 mi.] Link Budget: 13.0 dB

SGFEB1429-151
100BASE-FX 1310nm SM (SC)
[20 km/12.4 mi.] Link Budget: 16.0 dB
to 1000BASE-LX 1550nm TX/1310nm RX single fiber SM (SC)
[20 km/12.4 mi.] Link Budget: 13.0 dB

SGFEB1429-152
100BASE-FX 1310nm SM (SC)
[20 km/12.4 mi.] Link Budget: 16.0 dB
to 1000BASE-LX 1310nm TX/1550nm RX single fiber SM (SC)
[40 km/24.9 mi.] Link Budget: 20.0 dB

SGFEB1429-153
100BASE-FX 1310nm SM (SC)
[20 km/12.4 mi.] Link Budget: 16.0 dB
to 1000BASE-LX 1550nm TX/1310nm RX single fiber SM (SC)
[40 km/24.9 mi.] Link Budget: 20.0 dB

Optional Accessories *(sold separately)*

SFP Modules [pg 161-167]

Wide Input (24 - 60 VDC) Power Supplies

SPS-2460-PS or SPS-2460-SA [pg 69]

Mounting Options

E-MCR-05 [pg 67]
12-Slot Media Converter Rack

RMS19-SA4-01 [pg 67]
4-Slot Media Converter Shelf

WMBD [pg 68]
DIN Rail Mount Bracket 5.0" [127 mm]

WMBL [pg 68]
Wall Mount Bracket 4.0" [102 mm]

AUTO CROSS | AUTO NEG | PAUSE | TRANSPARENT LINK PASS THRU | FAR END FAULT | LOOP BACK | BANDWIDTH ALLOCATION | FIELD UPGRADEABLE FIRMWARE | REMOTE MGMT | AUTO LINK RESTORE | SINGLE FIBER | LAST GASP

OAM/IP Remotely Managed 10/100/1000BASE-T to 1000BASE-X

SBFFG10xx-1xx

OAM/IP-Based Remotely Managed NID (Network Interface Device)

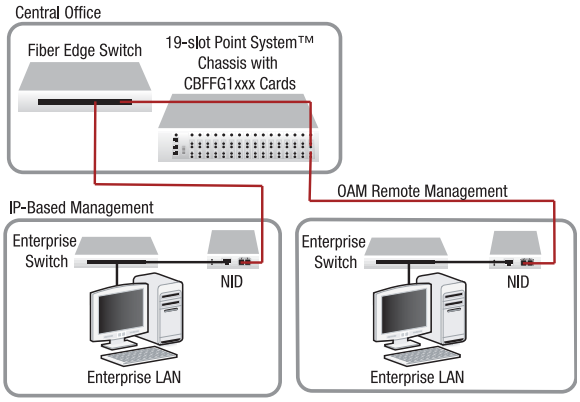
see also: OAM/IP-Based Remotley Managed Point System™ Slide-In-Modules [pg 54]

CARRIER ETHERNET MEF Certified Compliant

Features

- 10K Jumbo Frame Support
- MEF 9 & MEF 14 Carrier Ethernet Certification
- Two management modes:
  - IP-Based Remote Management [pg 17]
  - In-Band Link OAM 802.3ah (remote device managed by local peer)
- SNMP V1
- AutoCross™ [pg 16]
- Auto-Negotiation [pg 16]
- Pause [pg 17]
- Transparent Link Pass Through [pg 17]
- Far-End-Fault [pg 16]
- Remote Loopback [pg 18]
- IEEE 802.1p QoS packet classification with 4 egress queues
- Ipv4 IP TOS and DiffServ QoS classification, IPv6 Traffic class
- IEEE 802.1q VLAN
- Static MAC, entries
- Double VLAN tagging (QinQ)
- VLAN Tunneling
- Selectable Ethertype for S-TAG when using Double VLAN Tagging: 0x8100, 0x9100 or 0x88A8
- IEEE 802.1x Port based security
- RADIUS client
- RMON counters for each port
- Bandwidth Allocation per port [pg 18]
- DMI Optical Management
- USB port for basic setup
- Cable diagnostic function for TP ports
- 8K MAC addresses
- Field Upgradeable Firmware [pg 18]

Remotely Managed 10/100/1000 NID or OAM Management



- Applications:
  - Ethernet in the First Mile (EFM)
  - Fiber to the Premise (FTTP), E-Line and E-LAN
  - Enterprise markets

Specifications

Complete list of fiber optic connector specifications [pg 212-224]

Standards	IEEE Std. 802.3, IEEE Std. 802.3ah, IEEE Std. 802.1P, IEEE Std. 802.1Q, IEEE Std. 802.1X
Data Rate	**Copper:** 10/100/1000 Mbps **Fiber:** 1000 Mbps
Filtering Addresses	8K MAC Addresses
Max Frame Size	10,240 bytes
Dimensions	**Width:** 3.25" [82 mm] **Depth:** 4.8" [122 mm] **Height:** 1.0" [25 mm]
Environment	0 – 50°C; 5% – 95% humidity non-condensing; 0 – 10,000 ft. altitude
Power	Input: 100-240 VAC, 1A Output: 12 VDC, 1.25A
Shipping Weight	2 lbs. [0.90 kg]
Regulatory Compliance	EN55024, FCC Class A, CE Mark, ul
Warranty	Lifetime

**SBFFG1040-105 and SBFFG4040-105 have SGMII support for use with 10/100/1000BASE-T copper SFPs.*

Ordering Information

SBFFG1013-105
SBFFG1013-115 (DMI Options)
10/100/1000BASE-T (RJ-45) **[100 m]**
to 1000BASE-SX 850nm MM (SC)
[62.5/125 µm fiber: 220 m/722 ft.]
[50/125 µm fiber: 550 m/1804 ft.]
Link Budget: 7.5 dB

SBFFG1014-105
SBFFG1014-115 (DMI Options)
10/100/1000BASE-T (RJ-45) **[100 m]**
to 1000BASE-LX 1310nm SM (SC)
[10 km/6.2 mi.] Link Budget: 10.5 dB

SBFFG1015-105
SBFFG1015-115 (DMI Options)
10/100/1000BASE-T (RJ-45) **[100 m]**
to 1000BASE-LX 1310nm SM (SC)
[25 km/15.5 mi.] Link Budget: 15.0 dB

SBFFG1017-105
10/100/1000BASE-T (RJ-45) **[100 m]**
to 1000BASE-X 1550nm SM (SC)
[65 km/40.4 mi.] Link Budget: 21.0 dB

SBFFG1024-105
10/100/1000BASE-T (RJ-45) **[100 m]**
to 1000BASE-LX 1310nm Extended MM (62.5/125 µm fiber only) (SC)
[2 km/1.2 mi.] Link Budget: 7.0 dB

SBFFG1035-105
10/100/1000BASE-T (RJ-45) **[100 m]**
to 1000BASE-X 1550nm SM (SC)
[120 km/77.7 mi.] Link Budget: 27.0 dB

***SBFFG1040-105**
10/100/1000BASE-T (RJ-45) **[100 m]**
to 100/1000BASE-X SFP Slot (empty)

***SBFFG4040-105**
100/1000BASE-X SFP Slot (empty)
to 100/1000BASE-X SFP Slot (empty)

Single Fiber Products [pg 19]

SBFFG1029-105
SBFFG1029-115 (DMI Options)
10/100/1000BASE-T (RJ-45) **[100 m]**
to 1000BASE-BX-U 1310nm TX/1490nm RX Bi-Di SM (SC)
[20 km/12.4 mi.] Link Budget: 14.0 dB

SBFFG1029-106
SBFFG1029-116 (DMI Options)
10/100/1000BASE-T (RJ-45) **[100 m]**
to 1000BASE-BX-D 1490nm TX/1310nm RX Bi-Di SM (SC)
[20 km/12.4 mi.] Link Budget: 14.0 dB

SBFFG1029-107
10/100/1000BASE-T (RJ-45) **[100 m]**
to 1000BASE-LX 1310nm TX/1490nm RX Bi-Di SM (SC)
[40 km/24.8 mi.] Link Budget: 20.0 dB

SBFFG1029-108
10/100/1000BASE-T (RJ-45) **[100 m]**
to 1000BASE-LX 1490nm TX/1310nm RX Bi-Di SM (SC)
[40 km/24.8 mi.] Link Budget: 20.0 dB

Note: all units feature USB port for local management application

Optional Accessories *(sold separately)*

Wide Input (24 - 60 VDC) Power Supplies

SPS-2460-PS [pg 69]
Piggy Back Power Supply

SPS-2460-SA [pg 69]
Stand-Alone Power Supply

Mounting Options

E-MCR-05 [pg 67]
12-Slot Media Converter Rack

RMS19-SA4-01 [pg 67]
4-Slot Media Converter Shelf

WMBD [pg 68]
DIN Rail Bracket 5.0" [127 mm]

WMBL [pg 68]
Wall Mount Bracket 4.0" [102 mm]

USB Cables

USBC-AM-BM-03
USB 2.0 Cable A male to B male [3 ft. Gray]

USBC-AM-BM-06
USB 2.0 Cable A male to B male [6 ft. Gray]

SGPOE10xx-1x0

Power-Over-Ethernet PSE Media Converter

(-110)

Enables enterprises to provide power to network devices over the existing CAT5 data connection.

Transition's AC powered PoE media converters combine data received over a fiber optic link with -48 VDC power; providing power to Data Terminal Equipment (DTE) Power Devices (PD) over unshielded twisted pair cable. The PoE converters are Power Sourcing Equipment (PSE) and are fully compatible with Powered Devices (PD) that comply with the IEEE802.3af: 2003 standard. The converters also include a PD signature sensing and power monitoring features per the IEEE 802.3af standard. Other features include Over-Current Protection, Under-Current Detection and Fault Protection Input.

This feature enhanced model offers the ability to enable/disable many of the features as well as force port capabilities (see switch section under specifications to the right).

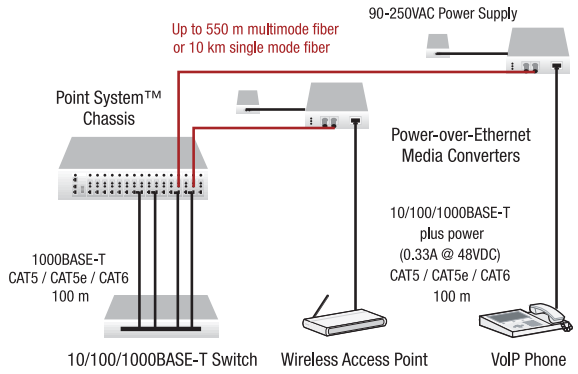
In addition, with the PSE/LPT switch enabled, a loss of Fiber RX will disable PSE power output on the UTP port for 2 seconds to allow remote device to re-initialize. Also known as Powered Device Reset.

The PoE converter is fully compatible with devices that comply with the IEEE802.3af standard as well as select legacy PD's. The PoE converter is capable of inserting power on data mode A or mode B pairs of the MDI.

Features

- SFP ports support either 100Base or 1000Base fiber
- Redundant SFP port option
- IEEE802.3af Power-Over-Ethernet Compatible
- 48 VDC PSE Output Voltage
- Mode A or Mode B Pairs Power Insertion
- PD Detection Signature
- PoE Legacy Detect for non-IEEE 802.3af compatible Powered Devices (PD)
- Over-Current Protection & Under-Current Detection
- Powered Device Reset
- Switch selectable features and port settings
- Minimum Load Sensing
- Fault Protection Input
- Auto-Negotiation [pg 16]
- AutoCross™ [pg 16]
- Link Pass Through available on SGPOE10xx-100 [pg 17]
- Automatic Link Restoration [pg 18]
- External AC power supply

Power over CAT5 to Remotely Located Devices



Specifications

Standards	IEEE Std. 802.3, IEEE Std. 802.3af
Switches	**SW1:** Auto-Negotiation TP On/Off **SW2:** Speed TP: Force 10 Mbps or 100 Mbps (SW1 off) **SW3:** Duplex TP: Force Half or Full Duplex (SW1 off) **SW4:** Duplex Fiber: Half or Full Duplex **SW5:** AutoCross™ On/Off **SW6:** PSE On/Off **SW7:** PSE/LPT on/off **SW8:** Unused
Max Packet Size	1632 bytes untagged 1628 bytes tagged
MAC Addresses	8K
Dimensions	**Width:** 4.4" [112 mm] **Depth:** 5.1" [129 mm] **Height:** 1.0" [25 mm]
Power	90 – 250VAC external power supply External AC/DC required; 48 vdc 0.67A
Power Consumption	20 Watts max.
Operating Temperature	0 – 40°C [32° – 104°F]
Storage Temperature	-25° to +85°C [-13° to +185°F]
Environment	5% – 95% humidity non-condensing; 0 – 10,000 ft. altitude
Shipping Weight	2 lbs. [0.90 kg]
Compliance	EN55022:1994+A1:1996+A2:1997 Class A; FCC Part 15 Subpart B; UL 1950
Warranty	Lifetime

Ordering Information

SGPOE1013-100
10/100/1000BASE-T (RJ-45)
[100 m/328 ft.]
to 1000BASE-SX 850nm MM (SC)
[62.5/125 µm: 220 m/722 ft.]
Link Budget: 8.0 dB
[50/125 µm: 550 m/1804 ft.]
Link Budget: 8.0 dB

SGPOE1014-100
10/100/1000BASE-T (RJ-45)
[100 m/328 ft.]
to 1000BASE-LX 1310nm SM (SC)
[10 km/6.2 mi.] Link Budget: 7.0 dB

SGPOE1040-100
10/100/1000BASE-T (RJ-45)
[100 m/328 ft.]
to 100/1000BASE-X SFP Slot (empty)

SGPOE1040-110
10/100/1000BASE-T (RJ-45)
[100 m/328 ft.]
to (2) 100/1000BASE-X SFP slots (empty)

Optional Accessories *(sold separately)*

SFP Modules [pg 161-167]

Mounting Options

WMBD [pg 68]
DIN Rail Mount Bracket 5.0" [127 mm]

WMBL [pg 68]
Wall Mount Bracket 4.0" [102 mm]

SFMFF4040-100

Small Form Factor Pluggable Conversion

- Universal platform to accommodate any optical conversion options available via SFP interfaces
- SFP Multi-rate Transponder
- Provides wavelength conversion while maintaining the same data rate
- Protocol Transparency

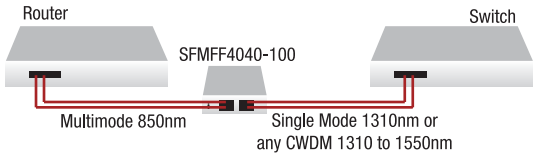
These converters offer an excellent upgrade path for networks. Today's Fast Ethernet applications can be upgraded to Gigabit speeds tomorrow with a simple SFP swap. The converter remains installed, managed and fully operational at any of these speeds.

Using two similar data rate SFP modules allows for seamless connectivity between different wavelengths or fiber modes for speeds up to 2.5 Gbps. Protocol independence allows for use in a broad range of applications including Fast and Gigabit Ethernet, FDDI, ESCON, SONET OC-3, OC-12, OC-48 and Fiber Channel.

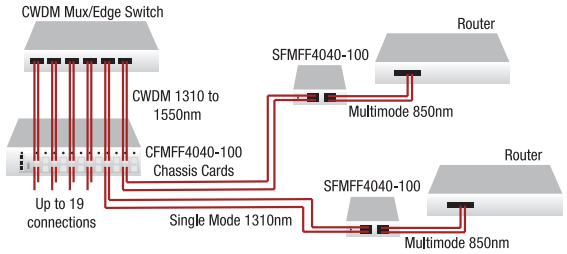
Features

- CWDM and DWDM SFP-ready platform
- Link Pass Through [pg 17]
- Automatic Link Restoration [pg 18]

Enterprise Application



Service Provider Application



Specifications

Standards	Multi-Source Agreement (MSA), Small Form Factor Pluggable (SFP)
Status LEDs	**LK1:** Link on Port 1 **LK2:** Link on Port 2 **PWR:** Power
Dimensions	**Width:** 3.25" [83 mm] **Depth:** 4.8" [122 mm] **Height:** 1.0" [25 mm]
Power Consumption	2 Watts with TN-SFP-xx modules installed
Power	External AC/DC required: 12 VDC 0.5A
Environment	**SFMFF4040-100 Board:** -10 – 60°C operating temp; See SFP Module temperature ratings; 5% to 95% humidity (non-condensing); 0 – 10,000 ft.
Safety Compliance	Wall Mount Power Supply: UL listed and CSA certified
Regulatory Compliance	FCC Class A; EN55024 (CISPR 22) Class A; ICES-003; CISPRB; CE Mark
Warranty	Lifetime

Ordering Information

SFMFF4040-100
SFP Slot (empty) to SFP Slot (empty)

Optional Accessories *(sold separately)*

SFP Modules [pg 161-167]

Wide Input (24 - 60 VDC) Power Supplies

SPS-2460-PS or SPS-2460-SA [pg 69]

Mounting Options

RMS19-SA4-01 [pg 67]
4-Slot Media Converter Shelf

E-MCR-05 [pg 67]
12-Slot Media Converter Rack

WMBD [pg 68]
DIN Rail Mount Bracket 5.0" [127 mm]

WMBL [pg 68]
Wall Mount Bracket 4.0" [102 mm]

10GBase to 10GBase Optical Line Converter with XFP Slots

see also: Point System™ 10G Slide-In-Module Optical Line Converters [pg 56]

STGFFxxxx-100

10 Gigabit Ethernet Fiber to Fiber Converter

The Transition Networks' 10 Gigabit Ethernet fiber to fiber converter is a two-port 10G pluggable media converter, supporting a variety of XFP and SFP+ modules allowing network designers to utilize the module to meet their network requirements.

The media converter can use either Transition Networks' or third party MSA compatible 10G XFP or SFP+ modules including support for the following standards; 10GBase-SR, 10GBase-LR, 10GBase-ER, 10GBase-LRM, and 10GBase-ZR.

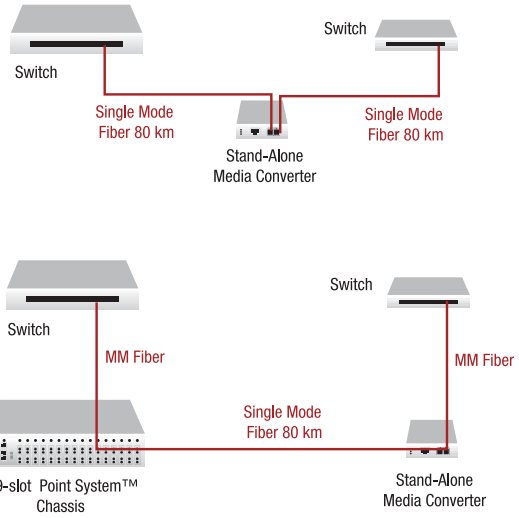
Copper to fiber conversion is also supported with the use of a 10GBase-CX4 XFP module in one of the ports.

This converter provides 3R (reamplify, reshape, and retime) optical signal regeneration.

Features

- Supports 10 Gigabit Ethernet Fiber to Fiber full duplex conversion
- LED Link Status Indicators
- Link Pass Through [pg 17]
- Full-Duplex
- Automatic Link Restoration [pg 18]
- Loopback [pg 18]
- Supports +5V, +3.3V, and +1.8V MSA compliant XFP modules
- Supports 3R (Reamplify, Reshape, and Retime) optical signal regeneration

10 Gigabit Ethernet Fiber to Fiber Converter Application



Specifications

Standards	IEEE Std. 802.3ae, IEEE 802.3ak, IEEE 802.3ag, IEEE 802.3, IEEE 802.3x, Multisource Agreement (MSA) XFP and SFP+
Data Rate	10 Gbps
Status LED	PWR (power): GREEN- power on 1LNK- fiber #1 link: GREEN- On link 1ACT- fiber #1 activity/fault: GREEN- BLINK activity, YELLOW- Fault 2LNK- fiber #2 link: GREEN- On link 2ACT- fiber #2 activity/fault: GREEN- BLINK activity, YELLOW- Fault
DIP Switches **SW1- Port 1 mode** **SW2- Port 2 mode** **SW3- LPT** **SW4-**	 **UP:** Limiting (xR); **DOWN:** Linear (LRM) **UP:** Limiting (xR); **DOWN:** Linear (LRM) **UP:** Enabled; **DOWN:** Disabled Interface loopback, forces each fiber to loop its RX to TX
Dimensions	**Width:** 1.72" [44 mm] **Depth:** 5.0" [127 mm] **Height:** 3.4" [86 mm]
Power Consumption	7 Watts
Power Supply	12 VDC barrel
Environment	0 to 50º C, dependant on ratings of the XFP and SFP+ modules used
Shipping Weight	1 lb. [0.45 kg]
Regulatory Compliance	FCC Class A, EN55024 (CISPR22) Class A; CE Mark; EN55022 Class A
Warranty	Lifetime

Ordering Information

STGFF4747-100
(2) Port 10GBase-xx open XFP to Open XFP

STGFF4848-100
(2) Port 10GBase-xx open SFP+ to Open SFP+

STGFF4748-100
(2) Port 10GBase-xx open XFP to Open SFP+

Optional Accessories *(sold separately)*

SFP+ Modules

TN-10GSFP-LR1
10GBase-LR/LW, SFP+
w/ Digital Diagnostics (DMI) 1310 DFB nm
[10 km/6.2 mi.] Link Budget: 6.4 dB

TN-10GSFP-LR2
10GBase-LR/LW, SFP+
w/ Digital Diagnostics (DMI) 1310 DFB nm
[20 km/12.4 mi.] Link Budget: 11.4 dB

TN-10GSFP-LR4
10GBase-LR/LW, SFP+
w/ Digital Diagnostics (DMI) 1310 DFB nm
[40 km/24.8 mi.] Link Budget: 16.5 dB

TN-10GSFP-LR7
10GBase-LR/LW, SFP+
w/ Digital Diagnostics (DMI) 1310 DFB nm
[70 km/43.4 mi.] Link Budget: 25 dB

TN-10GSFP-SR
10GBase-LR/LW, SFP+
w/ Digital Diagnostics (DMI) 850 DFB nm
[300/82/33 m; 985/269/108 ft.]
Link Budget: 2.6 dB

XFP Modules

TN-XFP-SR
10GBase-SR/SW/10G Fibre Channel, XFP
w/ Digital Diagnostics (DMI) 850nm (LC)
[62.5/125 uM: 33 m/108 ft.]
[50/125 uM with 500 MHZ-km: 269 ft.]
[50/125 uM: 300 m/985 ft.]
Modal dispersion 39.cB

TN-XFP-LR1
10GBase-LR/LW/10G Fibre Channel, XFP
w/ Digital Diagnostics (DMI) 1310nm (LC)
[10 km/6.2 mi.] Link Budget: 6.2 dB

TN-XFP-LR2
10GBase-LR/LW/10G Fibre Channel, XFP
w/ Digital Diagnostics (DMI) 1310nm (LC)
[20 km/12.4 mi.] Link Budget: 12.0 dB

TN-XFP-ER
10GBase-LR/ER/10G Fibre Channel, XFP
w/ Digital Diagnostics (DMI)1310nm (LC)
[40 km/24.9 mi.]Link Budget: 16.5 dB

TN-XFP-ZR
10GBase-LR/ER/10G Fibre Channel, XFP
w/ Digital Diagnostics (DMI) 1550nm (LC)
[80 km/49.7 mi.] Link Budget: 23.0 dB

Mounting Options

WMBD [pg 68]
DIN Rail Bracket 5.0" [127 mm]

WMBD-F [pg 68]
DIN Rail Bracket (flat) 3.3" [84 mm]

WMBL [pg 68]
Wall Mount Bracket 4.0" [102 mm]

WMBV [pg 68]
Vertical Wall Mount Bracket 5.0" [127 mm]

Wide Input (24 - 60 VDC) Power Supplies

SPS-2460-SA [pg 69]
Stand-Alone Power Supply

OC12 ATM/SONET/SDH Single Mode to Multimode Fiber

F-SM-MM-06(xx) & SFMFF131x-21x

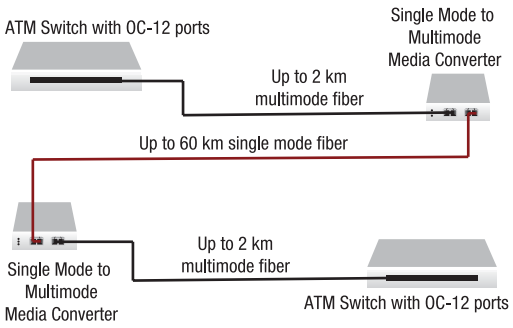
Single Mode to Multimode Optical Mode Converter

- Link Pass Through [pg 17]
- Automatic Link Restoration [pg 18]
- Protocol Transparency
- Extend Network Distance

  Convert multimode 622 Mbps interfaces to single mode fiber on a port-by-port basis and extendATM or SONET over single mode fiber.

Reduce the cost of an ATM/SONET deployment by purchasing ATM/SONET devices with lower cost multimode fiber interfaces and using a media converter to introduce single mode fiber ports only where you need them.

Extend Network Distance



Specifications

Complete list of fiber optic connector specifications [pg 212-224]

Standards	ANSI T1.646, ITU G.957
Status LEDs	**PWR(Power)**: Lit for normal operation **MMF**: Lit for active **SMF**: Lit for active
Dimensions	**Width**: 3.0" [76 mm] **Depth**: 4.7" [119 mm] **Height**: 1.0" [25 mm]
Power	External AC/DC required; 12 VDC. .5A; unregulated; standard
Power Consumption	3.1 Watts
Environment	0 – 50°C, 5% – 90% humidity (non-condensing), 0 – 10,000 ft.
Shipping Weight	2 lbs. [0.90 kg]
Safety Compliance	**Wall Mount Power Supply**: UL Listed and CSA certified
Regulatory Compliance **F-SM-MM-06:**	CE Mark CISPR/EN55022 Class A; FCC Class A
SFMFF131x-21x:	CISPR/EN55022 Class A&B; FCC Class A&B
Warranty	Lifetime

Ordering Information

Complete list of fiber optic connector specifications [pg 212-224]

F-SM-MM-06
622 Mbps fiber optic 1300nm MM (SC)
[2 km/1.2 mi.] Link Budget: 7.0 dB
to 622 Mbps fiber optic 1310nm SM (SC)
[15 km/9.3 mi.] Link Budget: 13.0 dB

F-SM-MM-06(XL)
622 Mbps fiber optic 1300nm MM (SC)
[2 km/1.2 mi.] Link Budget: 7.0 dB
to 622 Mbps fiber optic 1310nm SM (SC)
[40 km/24.9 mi.] Link Budget: 26.0 dB

SFMFF1314-210
622 Mbps fiber optic 1300nm MM (SC)
[2 km/1.2 mi.] Link Budget: 7.0 dB
to 622 Mbps fiber optic 1310nm SM (SC)
[20 km/12.4 mi.] Link Budget: 11.0 dB

SFMFF1316-210
622 Mbps fiber optic 1300nm MM (SC)
[2 km/1.2 mi.] Link Budget: 7.0 dB
to 622 Mbps fiber optic 1310nm SM (SC)
[40 km/24.9 mi.] Link Budget: 25.0 dB

SFMFF1317-210
622 Mbps fiber optic 1300nm MM (SC)
[2 km/1.2 mi.] Link Budget: 7.0 dB
to 622 Mbps 1550nm SM (SC)
[60 km/37.3 mi.] Link Budget: 25.0 dB

SFMFF1329-210
622 Mbps fiber optic 1300nm MM (SC)
[2 km/1.2 mi.] Link Budget: 7.0 dB
to 622 Mbps 1310nm TX/1550nm RX single fiber SM (SC)
[20 km/12.4 mi.] Link Budget: 14.0 dB

SFMFF1329-211
622 Mbps fiber optic 1300nm MM (SC)
[2 km/1.2 mi.] Link Budget: 7.0 dB
to 622 Mbps 1550nm TX/1310nm RX single fiber SM (SC)
[20 km/12.4 mi.] Link Budget: 14.0 dB

Optional Accessories *(sold separately)*

F-SM-MM-06(xx) or SFMFF131x-21x

SPS-2460-SA [pg 69]
Wide Input (24 - 60 VDC) Stand-Alone Power Supply

E-MCR-05 [pg 67]
12-Slot Media Converter Rack

RMS19-SA4-01 [pg 67]
4-Slot Media Converter Shelf

WMBD [pg 68]
DIN Rail Bracket 5.0" [127 mm]

WMBL [pg 68]
Wall Mount Bracket 4.0" [102 mm]

WMBV [pg 68]
Vertical Wall Mount Bracket 5.0" [127 mm]

F-SM-MM-06(xx)

SPS-2460-CC [pg 69]
Wide Input (24 - 60 VDC) Piggy Back Power Supply

WMBD-FS [pg 68]
DIN Rail Bracket (flat, small) 3.1" [79 mm]

SFMFF131x-21x

SPS-2460-PS [pg 69]
Wide Input (24 - 60 VDC) Piggy Back Power Supply

WMBD-F [pg 68]
DIN Rail Bracket (flat) 3.3" [109 mm]

LOOP BACK

DS3-T3/E3 and STS-1 Coax to Fiber

see also: DS3-T3/E3 Point System™ Slide-In-Module NID [pg 57]

DS3-T3/E3

SCSCF30xx-11x

DS3-T3/E3 and STS-1 Coax to Fiber NID

The DS3 – T3/E3 & STS-1 copper to fiber network interface device (NID) provides a solution for those users that need to extend DS3 connections over fiber.

The DS3 – T3/Es & STS-1 supports Small Form Pluggable (SFP) transceivers to support a variety of fiber types, distances and wavelengths to provide maximum flexibility across a variety of network topologies. The use of Coarse Wave Division Multiplexing (CWDM) SFPs can be utilized to further increase the bandwidth capacity of the fiber infrastructure.

The DS3 – T3/E3 & STS-1 NID must be used in pairs*. A typical installation will include a chassis card [CCSCF, pg 57] installed in the Point System™ locally and a stand-alone device installed at the remote location.

Features

- AIS (Alarm Indication Signal)
- Coax Line Build Out
- Switch selectable for DS3/T3 or E3
- Loopback – Coax and Fiber [pg 18]
- LEDs for immediate visual status
- Supports dual or single fiber
- Supports multimode and single mode fiber at a variety of distances
- Supports CWDM SFPs

Optional Accessories *(sold separately)*

Wide Input (24 - 60 VDC) Power Supplies

SPS-2460-PS [pg 69]
Piggy Back Power Supply

SPS-2460-SA [pg 69]
Stand-Alone Power Supply

Mounting Options

E-MCR-05 [pg 67]
12-Slot Media Converter Rack

WMBD [pg 68]
DIN Rail Bracket 5.0" [127 mm]

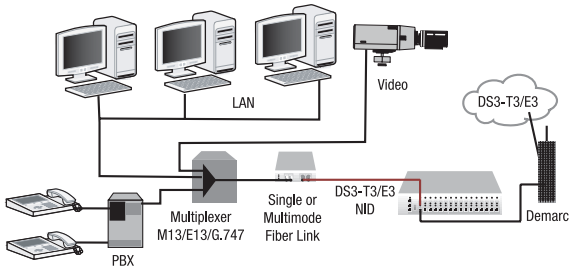
WMBD-F [pg 68]
DIN Rail Bracket (flat) 3.3" [84 mm]

WMBL [pg 68]
Wall Mount Bracket 4.0" [102 mm]

WMBV [pg 68]
Vertical Wall Mount Bracket 5.0" [127 mm]

RMS19-SA4-01 [pg 67]
4-Slot Media Converter Shelf

Integrate Voice & Data on Fiber Network



Specifications

Complete list of fiber optic connector specifications [pg 212-224]

Standards	ANSI, ITU-TS, ETSI, AT&T, G.703, G.921 & G.955
Coax Connectors	75 ohm coax **TX output** min: +2.5 dBm max: +9.1 dBm **RX input** min: -9.7dBm max: +10.5 dBm
Fiber Connectors	SFP: LC connector Uses standard 100BASE-X/OC-3 SFP
Data Rates	DS3/T3 = 44.7 Mbps; E3 = 34.4 Mbps; STS-1 = 51.8 Mbps
Status LED	Power, Coax link status, coax loop-back status, AIS on coax link; Fiber link status, fiber loop-back status, AIS on fiber link
Dimensions	Width: 3.25" [83 mm]; Depth: 4.7" [119 mm]; Height: 1.0" [25 mm]
Power Consumption	3.0 Watts
Power Supply	12 VDC, 0.8 Amp (minimum)
Environment	Operating Temperature 0º to 50ºC (32º to 122ºF) Humidity 5-95% non-condensing Storage Temperature -20º to 85ºC (-4º to 185ºF)
Shipping Weight	2.0 lbs. [0.90 kg]
Regulatory Compliance	CISPR/EN55022 Class A; FCC Class A; CE Mark
MTBF w/ Power Supply	Greater than 41,660 hours (MIL-HDBD-217F) Greater than 114,580 hours (Bellcore)
MTBF w/o Power Supply	Greater than 250,000 hours (MIL-HDBD-217F) Greater than 687,000 hours (Bellcore)
Warranty	Lifetime

Ordering Information

Complete list of fiber optic connector specifications [pg 212-224]

SCSCF3011-110
(2) Coax (BNC)
to 1300nm multimode (ST)
[2 km/ 1.2 mi.] Link Budget: 14.0 dB

SCSCF3013-110
(2) Coax (BNC)
to 1300nm multimode (SC)
[2 km/ 1.2 mi.] Link Budget: 14.0 dB

SCSCF3014-110
(2) Coax (BNC)
to 1310nm single mode (SC)
[20 km/12.4 mi.] Link Budget: 19.0 dB

SCSCF3015-110
(2) Coax (BNC)
to 1310nm single mode (SC)
[40 km/24.9 mi.] Link Budget: 29.0 dB

SCSCF3016-110
(2) Coax (BNC)
to 1310nm single mode (SC)
[60 km/37.3 mi.] Link Budget: 32.0 dB

SCSCF3017-110
(2) Coax (BNC)
to 1550nm single mode (SC)
[80 km/49.7 mi.] Link Budget: 29.0 dB

SCSCF3040-110
(2) Coax (BNC)
to SFP slot (empty)

Single Fiber Products

Recommended use in pairs [pg 19]

SCSCF3029-110
(2) Coax (BNC)
to 1310nm TX/1550nm RX single fiber single mode (SC)
[20 km/12.4 mi.] Link Budget: 19.0 dB

SCSCF3029-111
(2) Coax (BNC)
to 1550nm TX/1310nm RX single fiber single mode (SC)
[20 km/12.4 mi.] Link Budget: 19.0 dB

SCSCF3029-112
(2) Coax (BNC)
to 1310nm TX/1550nm RX single fiber single mode (SC)
[40 km/24.9 mi.] Link Budget: 25.0 dB

SCSCF3029-113
(2) Coax (BNC)
to 1550nm TX/1310nm RX single fiber single mode (SC)
[40 km/24.9 mi.] Link Budget: 25.0 dB

SCSCF3029-114
(2) Coax (BNC)
to 1310nm TX/1550nm RX single fiber single mode (SC)
[60 km/37.3 mi.] Link Budget: 29.0 dB

SCSCF3029-115
(2) Coax (BNC)
to 1550nm TX/1310nm RX single fiber single mode (SC)
[60 km/37.3 mi.] Link Budget: 29.0 dB

SCSCF3029-116
(2) Coax (BNC)
to 1310nm TX/1550nm RX single fiber single mode (SC)
[80 km/49.7 mi.] Link Budget: 33.0 dB

SCSCF3029-117
(2) Coax (BNC)
to 1550nm TX/1310nm RX single fiber single mode (SC)
[80 km/49.7 mi.] Link Budget: 32.0 dB

**The SCSCF30xx-110 will only work with another CCSCF30xx-110 or SCSCF30xx-110. The product does not work with a -10x model.*

J/RS232-xF-01(xx)

RS232 Copper to Fiber Media Converter

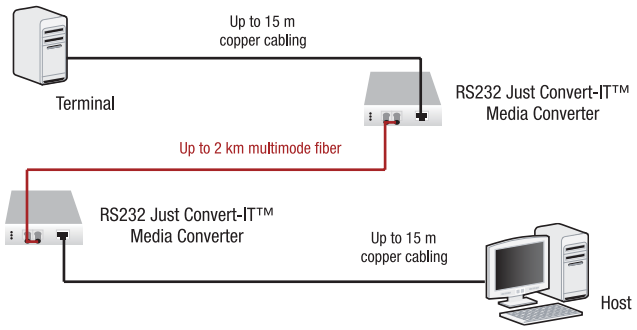
Link a remote terminal to a host computer: Connect multiple devices, such as security scanners, POS devices, remote terminals and building access/alarming systems to a host computer. Ideal for campus or business environments where remote devices can be networked in a point-to-point configuration where distances are greater than the 15 meter limitation of conventional copper serial cables.

Transition Networks' "Just Convert-IT™" serial RS-232 to Fiber Media Converter is an inexpensive, no frills way to extend the distance between serial connections with the use of fiber optic cable. This converter supports full or half-duplex data transmission at speeds up to 120 Kbps. Unit and Port LEDs allow for quick status information on the converter.

Features

- Offered with either a male or female connector
- Full/Half-duplex transmission at speeds up to 120 Kbps
- Fiber LED lights to show link with or without data transmission

Extend Network Distance



Specifications

Complete list of fiber optic connector specifications [pg 212-224]

Standards	EIA/TIA-574, EIA/TIA RS-232E
Status LEDs	**PWR (Power)**: Lit for normal operation **RX**: Steady = Link; Flashing = Rx Data **FL**: Steady = Fiber Link
Dimensions	**Width**: 3.0" [76 mm] **Depth**: 3.9" [100 mm] **Height**: 1.0" [25 mm]
Power Consumption	3.0 Watts
Power	External AC/DC; 12 VDC, 0.5A min
Environment	0 – 50°C, 5% – 95% humidity (non-condensing), 0 – 10,000 ft.
Shipping Weight	2 lbs. [0.90 kg]
Safety Compliance	**Wall Mount Power Supply**: UL Listed and CSA certified
Regulatory Compliance	CISPR22/EN55022 Class A + EN55024; EN60950 Class A; FCC Class A; CE Mark
Warranty	Lifetime

Ordering Information

Complete list of fiber optic connector specifications [pg 212-224]

J/RS232-CF-01
DB-9 (female) **[15 m/49 ft.]**
to 1300nm multimode (ST)
[2 km/1.2 mi.] Link Budget: 11.0 dB

J/RS232-CF-01(SC)
DB-9 (female) **[15 m/49 ft.]**
to 1300nm multimode (SC)
[2 km/1.2 mi.] Link Budget: 11.0 dB

J/RS232-TF-01
DB-9 (male) **[15 m/49 ft.]**
to 1300nm multimode (ST)
[2 km/1.2 mi.] Link Budget: 11.0 dB

J/RS232-TF-01(SC)
DB-9 (male) **[15 m/49 ft.]**
to 1300nm multimode (SC)
[2 km/1.2 mi.] Link Budget: 11.0 dB

Optional Accessories *(sold separately)*

Wide Input (24 - 60 VDC) Power Supplies

SPS-2460-CC [pg 69]
Piggy Back Power Supply

SPS-2460-SA [pg 69]
Stand-Alone Power Supply

Mounting Options

E-MCR-05 [pg 67]
12-Slot Media Converter Rack

RMS19-SA4-01 [pg 67]
4-Slot Media Converter Shelf

WMBD [pg 68]
DIN Rail Bracket 5.0" [127 mm]

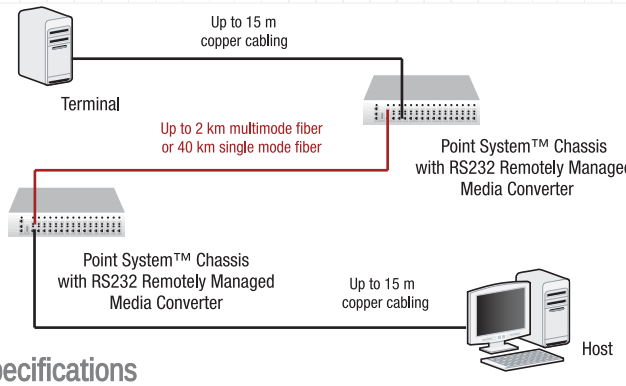
WMBD-FS [pg 68]
DIN Rail Bracket (flat) 3.1" [79 mm]

WMBS [pg 68]
Wall Mount Bracket 3.2" [81 mm]

SRS2F311x-100

Remotely Managed RS232 Media Converter

Extend Network Distance



Features

- Remote Management [pg 17]
- Local or Remote Loopback on copper and fiber [pg 18]
- DTE/DCE switch for easy installation with straight-through cabling

Additional Features

- Full/Half-duplex asynchronous transmission at speeds up to 115 Kbps
- Supports the following flow control signaling:
  1. DCD - Data Carrier Detect
  2. RXD - Receive Data
  3. TXD - Transmit Data
  4. DTR - Data Terminal Ready
  5. SG - Signal Ground
  6. DSR - Data Set Ready
  7. RTS - Request To Send
  8. CTS - Clear To Send

Specifications

Complete list of fiber optic connector specifications [pg 212-224]

Standards	EIA/TIA-574, EIA/TIA RS-232E
Data Rate	115 Kbps
Switches	**DTE/DCE**: Select appropriate position **Loopback**: Norm = normal operation; Loop = Fiber and copper loop-back
Status LEDs	**P: (Power)**: Lit for normal operation **RX**: Steady = Copper Link; Flashing = Rx Data **FL**: Steady = Fiber Link; Flashing = Loop back mode
Dimensions	**Width**: 3.3" [84 mm] **Depth**: 4.8" [122 mm] **Height**: 1.2" [30 mm]
Power Consumption	5.0 Watts
Power	External AC/DC; 12 VDC, 0.5A min
Environment	0 – 50°C, 5% – 95% humidity (non-condensing), 0 – 10,000 ft.
Shipping Weight	2 lbs. [0.90 kg]
Safety Compliance	**Wall Mount Power Supply**: UL Listed and CSA certified
Regulatory Compliance	CISPR22/EN55022 Class A + EN55024; EN60950 Class A; FCC Class A; CE Mark
Warranty	Lifetime

Link a remote terminal to a host computer: Connect multiple devices, such as security scanners, POS devices, remote terminals and building access/alarming systems to a host computer. Ideal for campus or business environments where remote devices can be networked in a point-to-point configuration where distances are greater than the 15 meter limitation of conventional copper serial cables.

Transition Networks' serial RS232 to Fiber converter allows you to extend the distance between serial connections with the use of fiber optic cable. This full-featured converter transmits the full complement of RS232 flow control/handshaking signals optically and supports full or half-duplex asynchronous data transmission at speeds up to 115 Kbps.

The diagnostic features included on this converter make installation easy and intuitive. A DTE/DCE switch eliminates the frustration over selecting the appropriate cable. A loop-back switch allows for complete diagnostic testing prior to system turn-up or during troubleshooting. Unit and Port LEDs allow for quick status information of the converter.

In addition to status LEDs and switch settings for local management, these converters can also be managed from remote locations when used in conjunction with a managed Point System™ chassis.

Ordering Information

Complete list of fiber optic connector specifications [pg 212-224]

SRS2F3111-100
DB-9 [15 m/49 ft.]
to 1300nm multimode (ST)
[2 km/1.2 mi.] Link Budget: 11.0 dB

SRS2F3113-100
DB-9 [15 m/49 ft.]
to 1300nm multimode (SC)
[2 km/1.2 mi.] Link Budget: 11.0 dB

SRS2F3114-100
DB-9 [15 m/49 ft.]
to 1310nm single mode (SC)
[20 km/12.4 mi.] Link Budget: 16.0 dB

SRS2F3115-100
DB-9 [15 m/49 ft.]
to 1310nm single mode (SC)
[40 km/24.9 mi.] Link Budget: 26.0 dB

SRS2F3129-100
DB-9 [15 m/49 ft.]
to 1310TX/1550RX single fiber SM (SC)
[20 km/12.4 mi.] Link Budget: 19.0 dB

SRS2F3129-101
DB-9 [15 m/49 ft.]
to 1550TX/1310RX single fiber SM (SC)
[20 km/12.4 mi.] Link Budget: 19.0 dB

SRS2F3129-102
DB-9 [15 m/49 ft.]
to 1310TX/1550RX single fiber SM (SC)
[40 km/24.8 mi.] Link Budget: 25.0 dB

SRS2F3129-103
DB-9 [15 m/49 ft.]
to 1550TX/1310RX single fiber SM (SC)
[40 km/24.8 mi.] Link Budget: 25.0 dB

Optional Accessories *(sold separately)*

Wide Input (24 - 60 VDC) Power Supplies

SPS-2460-PS [pg 69]
Piggy Back Power Supply

SPS-2460-SA [pg 69]
Stand-Alone Power Supply

Mounting Options

E-MCR-05 [pg 67]
12-Slot Media Converter Rack

RMS19-SA4-01 [pg 67]
4-Slot Media Converter Shelf

WMBD [pg 68]
DIN Rail Bracket 5.0" [127 mm]

WMBD-F [pg 68]
DIN Rail Bracket (flat) 3.3" [84 mm]

WMBL [pg 68]
Wall Mount Bracket 4.0" [102 mm]

WMBV [pg 68]
Vertical Wall Mount Bracket 5.0" [127 mm]

SRS4F3x1x-100

RS422/485 Copper to Fiber Media Converter

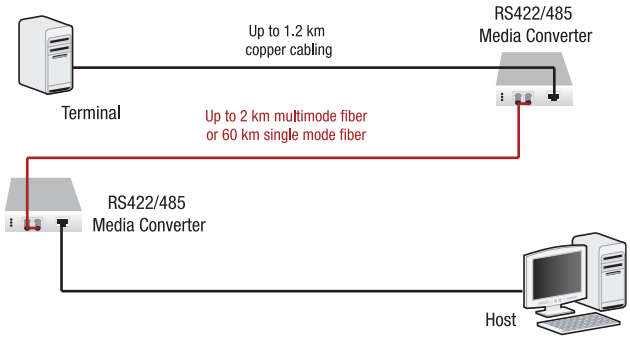
Link a remote terminal to a host computer: Connect multiple devices, such as security scanners, POS devices, remote terminals and building access/alarming systems to a host computer. Ideal for campus or business environments where remote devices can be networked in either a point-to-point or point to multi-point configuration.

Transition Networks' serial RS-422/485 to Fiber converter allows you to extend the distance between serial connections with the use of fiber optic cable. This full-featured converter operates in 2-wire mode for RS-422 and either 2-wire or 4-wire mode for RS-485 and supports full or half-duplex data transmission at speeds up to 1.25 Mbps.

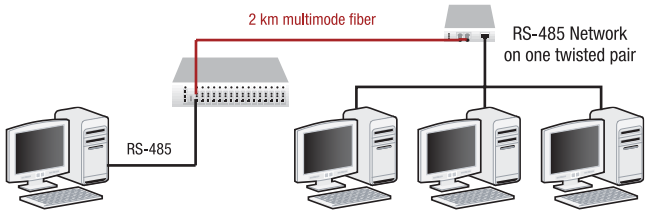
Features

- RS422 or RS485 operation
- 2-wire or 4-wire in operation in RS-485 mode
- Full/Half-duplex transmission at speeds up to 1.25 Mbps

Extend Network Distance



Connect Multiple Devices



Specifications

Complete list of fiber optic connector specifications [pg 212-224]

Standards	EIA/TIA RS-422, EIA/TIA RS-485
Switches	**SW1**: 130 ohm resistor RX (Down = enable) **SW2**: 130 ohm resistor TX (Down = enable) **SW3**: 1k ohm "pull-down" (Down = enable) **SW4**: 1k ohm "pull-up" (Down = enable) **SW5**: 2-wire/4-wire (Down = 4-wire) **SW6**: RS-485/RS-422 (Down = RS-422)
Status LEDs	**PWR (Power)**: Lit for normal operation **RXC**: Steady = Data RX on copper link; Flashing = RX Data at low speed **RXF**: Steady = Fiber Link
Dimensions	**Width**: 3.3" [84 mm] **Depth**: 4.8" [122 mm] **Height**: 0.90" [22 mm]
Power Consumption	5.0 Watts
Power	External AC/DC; 12 VDC, 0.5A min
Environment	0 – 50°C operating; 5 – 95% humidity non-condensing; 0 – 10,000 ft. altitude
Shipping Weight	2 lbs. [0.90 kg]
Safety Compliance	**Wall Mount Power Supply**: UL Listed and CSA certified
Regulatory Compliance	CISPR22/EN55022; EN55024; EN60950 Class A; FCC Class A; CE Mark; UL 1950
Warranty	Lifetime

Ordering Information

Complete list of fiber optic connector specifications [pg 212-224]

SRS4F3111-100
DB-9 [1.2 km/0.7 mi.]
to 1300nm multimode (ST)
[2 km/1.2 mi.] Link Budget: 11.0 dB

SRS4F3113-100
DB-9 [1.2 km/0.7 mi.]
to 1300nm multimode (SC)
[2 km/1.2 mi.] Link Budget: 11.0 dB

SRS4F3114-100
DB-9 [1.2 km/0.7 mi.]
to 1310nm single mode (SC)
[20 km/12.4 mi.] Link Budget: 16.0 dB

SRS4F3115-100
DB-9 [1.2 km/0.7 mi.]
to 1310nm single mode (SC)
[40 km/24.9 mi.] Link Budget: 26.0 dB

SRS4F3116-100
DB-9 [1.2 km/0.7 mi.]
to 1310nm single mode (SC)
[60 km/37.3 mi.] Link Budget: 29.0 dB

SRS4F3211-100
Terminal Block [1.2 km/0.7 mi.]
to 1300nm multimode (ST)
[2 km/1.2 mi.] Link Budget: 11.0 dB

SRS4F3213-100
Terminal Block [1.2 km/0.7 mi.]
to 1300nm multimode (SC)
[2 km/1.2 mi.] Link Budget: 11.0 dB

SRS4F3214-100
Terminal Block [1.2 km/0.7 mi.]
to 1310nm single mode (SC)
[20 km/12.4 mi.] Link Budget: 16.0 dB

SRS4F3215-100
Terminal Block [1.2 km/0.7 mi.]
to 1310nm single mode (SC)
[40 km/24.9 mi.] Link Budget: 26.0 dB

Optional Accessories *(sold separately)*

Wide Input (24 - 60 VDC) Power Supplies

SPS-2460-PS [pg 69]
Piggy Back Power Supply

SPS-2460-SA [pg 69]
Stand-Alone Power Supply

Mounting Options

E-MCR-05 [pg 67]
12-Slot Media Converter Rack

RMS19-SA4-01 [pg 67]
4-Slot Media Converter Shelf

WMBD [pg 68]
DIN Rail Bracket 5.0" [127 mm]

WMBD-E [pg 68]
DIN Rail Bracket (Extended) 4.3"[109 mm]

WMBD-F [pg 68]
DIN Rail Bracket (flat) 3.3" [84 mm]

WMBL [pg 68]
Wall Mount Bracket 4.0" [102 mm]

WMBV [pg 68]
Vertical Wall Mount Bracket
5.0" [127 mm]

REMOTE MGMT LOOP BACK

High Speed Serial: V.35/X.21/RS449/RS530/RS232 with Remote In-Band Management

see also: Point System™ Slide-In-Module NID [pg 58]

SPSVT26xx-10x

Remotely Managed High Speed Serial NID (Network Interface Device)

Features

- Connect High Speed Serial signals on copper to fiber
- Supports multiple protocols through the use of a universal 26-pin serial interface connector
- Extend the point of presence of a copper V.35/X.21/RS449/RS530/RS232 connection at data rates up to 10 Mbps.
- In-band Remote Management when used in conjunction with Point System™ card [pg 17]
- Operational speeds up to 10 Mbps
- Copper & Fiber Loopback [pg 18]
- Synchronous or asynchronous capability
- Selectable DCE speeds
- LED indications for Lock, Loopback & Data [pg 18]
- Use a combination of any copper interface: (RS449 to V.35, RS530 to X.21, DTE-DTE, DTE-DCE, DCE-DCE, etc.) All interfaces converted at the physical level.

Copper Distances

Standard	Range*
RS232/V.24	15 m
RS449/V.36	1.2 km
V.35	600 m
X.21	1.2 km
RS530	1.2 km

*For reference only. Contact Transition Networks for detailed range information.

Ordering Information

Complete list of fiber optic connector specifications [pg 212-224]

Standards	ITU-T; ISO-2593
Data Rate	1.2 Kbps to 10 Mbps
Switches	• 0 – TT = Receive CLK • 1 – 56 Kbps • 2 – 64 Kbps • 3 – 112 Kbps • 4 – 128 Kbps • 5 – 256 Kbps • 6 – 384 Kbps • 7 – 512 Kbps • 8 – 768 Kbps • 9 – 1.024 Mbps • A – 1.544 Mbps • B – 2.048 Mbps • C – 3.072 Mbps • D – 4.096 Mbps • E – 6.144 Mbps • F – Asynchronous Mode **Side panel**, external DCE speed switch, sixteen position: Speeds can also be set on DCE devices locally or remotely via software **Front Panel**, Loop-back Selector Switch: Right Position: Loop Fiber Back & Loop Copper Back Left Position: Normal Operation
Internal Jumpers	**Jumper (J4): Hardware:** The terminal timing switch controls the terminal timing function. The loop-back switch controls the loop-back function. **Software:** The terminal timing switch and the loop-back switch are disabled. These two functions are controlled by the most recently saved, on-board micro processor settings. **Jumper (J6): RX Clock Polarity:** Set to sample the receive data on the *rising* or *falling* edge of the receive clock. **Jumper (J7): TX Clock Polarity:** Set to sample the transmit data on the *rising* or *falling* edge of the receive clock.
Status LEDs	The Copper LED uses a green LED **Smart Serial Link**: Green - Link is up; Green Flashing - In loop-back mode; **Fiber**: Green - Link is up; Green Flashing - In loop-back mode; **Power**: Green - ON power applied to board
Dimensions	**Width**: 3.25" [82 mm] **Depth**: 4.8" [120 mm] **Height**: 1.0" [25 mm]
Power Consumption	5.0 Watts
Power	External AC/DC required; 12 VDC; 1A; regulated wall mount adapter via 2 mm connector
Environment	0 – 50°C, 5% – 90% humidity (non-condensing), 0 – 10,000 ft.
Shipping Weight	2 lbs. [0.90 kg]
Safety Compliance	**Wall Mount Power Supply**: UL Listed and CSA certified
Regulatory Compliance	CISPR/EN55022, EN55024, EN60950 Class A; FCC Class A; CE Mark
Warranty	Lifetime

Ordering Information

Complete list of fiber optic connector specifications [pg 212-224]

SPSVT2611-100
26-pin to 1300nm multimode (ST)
[2 km/1.2 mi.] Link Budget: 11.0 dB

SPSVT2613-100
26-pin to 1300nm multimode (SC)
[2 km/1.2 mi.] Link Budget: 11.0 dB

SPSVT2614-100
26-pin to 1310nm single mode (SC)
[20 km/12.4 mi.] Link Budget: 16.0 dB

SPSVT2615-100
26-pin to 1310nm single mode (SC)
[40 km/24.9 mi.] Link Budget: 26.0 dB

Single Fiber Products [pg 19]

SPSVT2629-100
26-pin to 1310nm TX/1550nm RX single fiber single mode (SC)
[20 km/12.4 mi.] Link Budget: 19.0 dB

SPSVT2629-101
26-pin to 1550nm TX/1310nm RX single fiber single mode (SC)
[20 km/12.4 mi.] Link Budget: 19.0 dB

SPSVT2629-102
26-pin to 1310nm TX/1550nm RX single fiber single mode (SC)
[40 km/24.9 mi.] Link Budget: 25.0 dB

SPSVT2629-103
26-pin to 1550nm TX/1310nm RX single fiber single mode (SC)
[40 km/24.9 mi.] Link Budget: 25.0 dB

Optional Accessories *(sold separately)*

Cable Assemblies

21DCE-3
DB-15 (FT) (26-pin) to (DCE) **[3 m/10 ft.]**

21DTE-3
DB-15 (MT) (26-pin) to (DTE) **[3 m/10 ft.]**

232DCE-3
DB-25 (FT) (26-pin) to (DCE) **[3 m/10 ft.]**

232DTE-3
DB-25 (MT) (26-pin) to(DTE) **[3 m/10 ft.]**

35DCE-3
V.35 (FT) (26-pin) to (DCE) **[3 m/10 ft.]**

35DTE-3
V.35 (MT) (26-pin) to (DTE) **[3 m/10 ft.]**

35DTE-3C
V.35 (MT) (26-pin) to (DTE) **[3 m/10 ft.]**

449DCE-3
DB-37 (FT) (26-pin) to (DCE) **[3 m/10 ft.]**

449DTE-3
DB-37 (MT) (26-pin) to (DTE) **[3 m/10 ft.]**

530DCE-3
DB-25 (FT) (26-pin) to (DCE) **[3 m/10 ft.]**

530DTE-3
DB-25 (MT) (26-pin) to (DTE) **[3 m/10 ft.]**

Wide Input (24 - 60 VDC) Power Supplies

SPS-2460-PS [pg 69]
Piggy Back Power Supply

SPS-2460-SA [pg 69]
Stand-Alone Power Supply

Mounting Options

E-MCR-05 [pg 67]
12-Slot Media Converter Rack

WMBD [pg 68]
DIN Rail Bracket 5.0" [127 mm]

WMBD-F [pg 68]
DIN Rail Bracket (flat) 3.3" [84 mm]

WMBL [pg 68]
Wall Mount Bracket 4.0" [102 mm]

WMBV [pg 68]
Vertical Wall Mount Bracket 5.0" [127 mm]

RMS19-SA4-01 [pg 67]
4-Slot Media Converter Shelf

REMOTE MGMT LOOP BACK

T1/E1 Copper to Fiber with Remote In-Band Management

see also: T1/E1 Point System™ Slide-In-Module NID [pg 61, 62]

T1/E1

SSDTFx0xx-12x

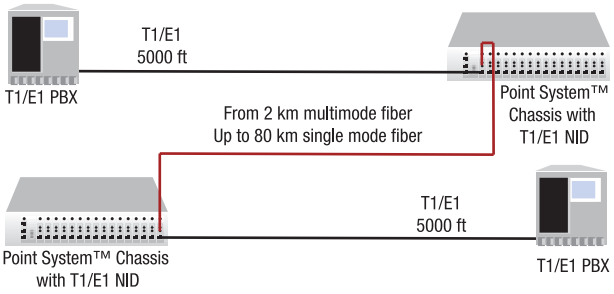
Remotely Managed T1/E1 NID (Network Interface Device)

Features

- Remote unit in-band management [pg 17]
- Local or Remote Loopbacks on copper or fiber in software mode [pg 18]
- Loopback switch facilitates local installation [pg 18]
- Converts the copper ports on T1/E1 devices, such as a PBX or T1/E1 Router, to multimode or single mode fiber
- Switch selectable RJ-48 connectors for T1 or E1
- Jitter attenuators optimize Bit Error Rate (BER) performance
- Network debug procedures make BER testing more convenient
- Built-in troubleshooting with the addition of a selectable TAOS (Transmit All Ones) switch on the fiber and copper interfaces allows the network engineer to test all T1/E1 equipment on that network segment and ensure the network link
- Dry Relay Contacts enable the device to be tied into a separate alarm circuit commonly found in a T1/E1 twisted pair environment. Contacts will be activated on loss of power or loss of fiber link.
- LED provides Alarm Indication Signal (AIS)
- Can be used with fractional T1/E1 circuits
- Report converter status
  - Copper & Fiber Link status
  - Hardware switch settings: LBO, AIS Copper, AIS Fiber, HW/SW
  - AIS detected Copper & Fiber
  - Model Number
  - Copper & Fiber Connector
- Remote commands:
  - Loopback Copper & Fiber
  - AIS transmitted on Fiber on loss of Copper link
  - AIS Transmitted on Copper on loss of Fiber link

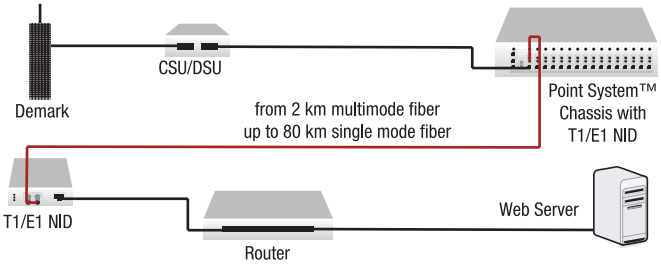
- Remote management in a stand-alone device When used in conjunction with a managed Point System™ chassis, this stand-alone unit can be managed remotely.
- The Remotely Managed T1/E1 copper to fiber media converter will provide a solution for users who desire to extend their T1 or E1 circuits over fiber and remotely manage them “in-band” from admin locations.

Provide Campus Interconnects



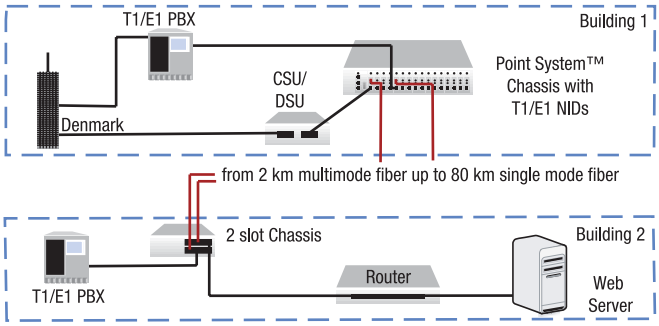
With the exception of Ethernet, T1/E1 is one of the most common campus/ metropolitan area networking interconnects. A copper to fiber conversion on the premise side of the T1/E1 makes it easier to integrate voice traffic, frame relay or IP type traffic on your fiber network.

Remote Management



Stand-alone can be managed remotely when used with a managed chassis.

Extend T1/E1 Networks



Extend T1/E1 to other buildings in a campus or MAN from 2 km to 80 km for voice or data applications.

See next page for Ordering Information

T1/E1 Copper to Fiber with Remote In-Band Management

see also: T1/E1 Point System™ Slide-In-Module NID [pg 61, 62]

Ordering Information

Complete list of fiber optic connector specifications [pg 212-224]

SSDTF1011-120
Twisted Pair (RJ-48) **[1.5 km/0.9 mi.]**
to 850nm multimode (ST)
[2 km/1.2 mi.] Link Budget: 13.5 dB

SSDTF1013-120
Twisted Pair (RJ-48) **[1.5 km/0.9 mi.]**
to 850nm multimode (SC)
[2 km/1.2 mi.] Link Budget: 13.5 dB

SSDTF1027-120
Twisted Pair (RJ-48) **[1.5 km/0.9 mi.]**
to 1300nm multimode (ST)
[5 km/3.1 mi.] Link Budget: 13.5 dB

SSDTF1012-120
Twisted Pair (RJ-48) **[1.5 km/0.9 mi.]**
1310nm single mode (ST)
[8 km/5 mi.] Link Budget: 7.0 dB

SSDTF1022-120
Twisted Pair (RJ-48) **[1.5 km/0.9 mi.]**
to 1310nm single mode (ST)
[15 km/9.3 mi.] Link Budget: 10.0 dB

SSDTF1014-120
Twisted Pair (RJ-48) **[1.5 km/0.9 mi.]**
to 1310nm single mode (SC)
[20 km/12.4 mi.] Link Budget: 16.0 dB

SSDTF1015-120
Twisted Pair (RJ-48) **[1.5 km/0.9 mi.]**
to 1310nm single mode (SC)
[40 km/24.9 mi.] Link Budget: 30.0 dB

SSDTF1016-120
Twisted Pair (RJ-48) **[1.5 km/0.9 mi.]**
to 1310nm single mode (SC)
[60 km/37.3 mi.] Link Budget: 33.0 dB

SSDTF1017-120
Twisted Pair (RJ-48) **[1.5 km/0.9 mi.]**
to 1550nm single mode (SC)
[80 km/49.7 mi.] Link Budget: 29.0 dB

Single Fiber Products [pg 19]

SSDTF1029-120
Twisted Pair (RJ-48) **[1.5 km/0.9 mi.]**
to 1310nm TX /1550nm RX single fiber SM (SC)
[20 km/12.4 mi.] Link Budget: 19.0 dB

SSDTF1029-121
Twisted Pair (RJ-48) **[1.5 km/0.9 mi.]**
to 1550nm TX/1310nm RX single fiber SM (SC)
[20 km/12.4 mi.] Link Budget: 19.0 dB

SSDTF1029-122
Twisted Pair (RJ-48) **[1.5 km/0.9 mi.]**
to 1310nm TX/1550nm RX single fiber SM (SC)
[40 km/24.9 mi.] Link Budget: 25.0 dB

SSDTF1029-123
Twisted Pair (RJ-48) **[1.5 km/0.9 mi.]**
to 1550nm TX/1310nm RX single fiber SM (SC)
[40 km/24.9 mi.] Link Budget: 25.0 dB

Specifications

Complete list of fiber optic connector specifications [pg 212-224]

Standards	ITU-T, ANSI, AT&T, ETSI
3-position Jumper	**Hardware**: mode is determined by 4-position switch settings **Software**: mode is determined by most recently saved on-board microprocessor settings.
Status LEDs	**PWR (Power)**: Steady green LED indicates connection to external AC power **SDC (Signal Detect/Copper)**: On indicates twisted pair link is up **SDF (Signal Detect/Fiber)**: On indicates fiber link is up
Dimensions	**Width**: 3.25" [82 mm] **Depth**: 4.8" [122 mm] **Height**: 1.0" [25 mm]
Power	External AC/DC provided; 12V DC; 0.5A; unregulated; standard; UL listed
Environment	0 – 50°C, 5% – 95% humidity (non-condensing), 0 – 10,000 ft.
Shipping Weight	2 lbs. [0.90 kg]
Safety Compliance	**Wall Mount Power Supply**: CSA certified
Regulatory Compliance	CISPR/EN55022 Class A; FCC Class A; CE Mark
Warranty	Lifetime

Devices must be used in pairs. Typically installation will include a chassis card [CSDTF, pg 61-62] installed in the Point System™ locally and a stand-alone device installed at the remote location.

Optional Accessories *(sold separately)*

Wide Input (18 – 72 VDC) Power Supplies

SPS-24602-PS [pg 69]
Piggy Back Power Supply

SPS-2460-SA [pg 69]
Stand-Alone Power Supply

Mounting Options

E-MCR-05 [pg 67]
12-Slot Media Converter Rack

RMS19-SA4-01 [pg 67]
4-Slot Media Converter Shelf

WMBD [pg 68]
DIN Rail Bracket 5.0" [127 mm]

WMBD-F [pg 68]
DIN Rail Bracket (flat) 3.3" [84 mm]

WMBL [pg 68]
Wall Mount Bracket 4.0" [102 mm]

WMBV [pg 68]
Vertical Wall Mount Bracket 5.0" [127 mm]

stand-alone network interface device

4x T1/E1/J1 to Fiber Transport Mux

see also: 4x T1 Transport Mux Point System™ Slide-In-Module NID [pg 63]

S4TEF10xx-10x

4x T1/E1/J1 Copper to Fiber Transport Mux

- Low cost transport capability: (4) T1/E1/J1 and (1) RS232 data channel line
- Target applications of the device include: FTTx, such as Fiber-to-the-Business, Fiber-to-the-Building, Fiber-to-the-MDU and Fiber-to-the-Home; Cell Tower Backhaul
- Automatic Link Restoration [pg 18]
- Remote Management [pg 17]

The product provides physical layer status monitoring and alarm classification functions for Telecom operators to manage their fiber optic network and reduce operation and maintenance costs.

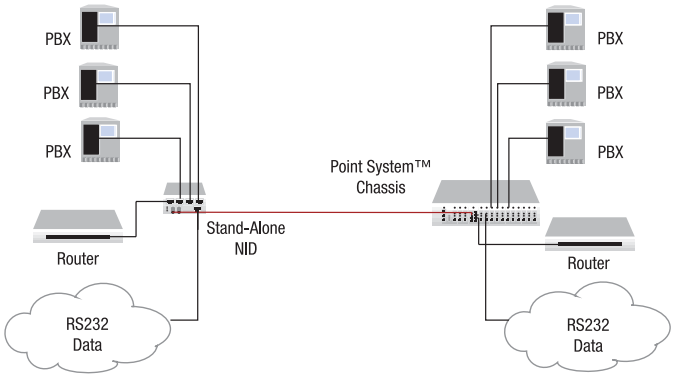
Copper connections are compatible with G.703 and AMI/B8ZS/HDB3; while the optical connection will run at 155 Mbps. A hardware-based solution guarantees the constant bit rate of TDM transport without requiring traffic management.

Features

- Local and Remote Loopback [pg 18]
- AIS/TAOS
- LEDs for each data port
- DIP switches for line code, line length, local loopback or remote loopback [pg 18]
- T1/E1/J1 mode settings
- Dry Relay Contacts on each TDM port
- Local (AUX) Management Interface (RS232 connector)
- Switch selection for Data or Management mode on RS232 interface
- Access to complete status information on local and remote device
- Access to local and remote configuration
- Switch or SNMP selected Baud rate operation
- Field Upgradeable Firmware [pg 18]

Devices must be used in pairs. Typically installation will include a chassis card [C4TEF, pg 63] installed in the Point System™ locally and a stand-alone device installed at the remote location.

Application



Specifications

Complete list of fiber optic connector specifications [pg 212-224]

Standards	AMI/B8ZS/HDB3; G.703; Telecordia TR-NWT-001089: FCC Part 68, UL1459; ITU-T, ANSI, AT&T, ETSI; TBR 12; PD 7024: 1994 (NTR 4)
Switches	Numerous switch settings for line coding, line buildout, loopback (per port), AIS setting, data/mgmt RS-232 and RS-232 port speed and parity
Dimensions	**Width**: 3.7" [94 mm] **Depth**: 4.7" [119 mm] **Height**: 1.8" [46 mm]
Power	External AC/DC provided; 12 VDC, 1.25A; unregulated; standard; UL Listed
Power Consumption	6.0 Watts
Operating Temperature	0 – 50°C
Storage Temperature	-40°C – 85°C
Altitude	0 – 10,000 ft.
Operating Humidity	5% – 95% (non-condensing)
Shipping Weight	2 lbs. [0.90 kg]
Safety Compliance	**Wall Mount Power Supply**: UL listed and CSA certified
Regulatory Compliance	FCC Class A, VCCI Class A, CISPR/EN55022 Class A, ICES-003, CE Mark
Warranty	Lifetime

Ordering Information

Complete list of fiber optic connector specifications [pg 212-224]

S4TEF1011-100
1300nm multimode (ST)
[2 km/1.2 mi.] Link Budget: 11.0 dB
to (4) RJ-48 **[1.5 km/0.9 mi.]**
plus 6-pin DIN **[3 m/10 ft.]**

S4TEF1013-100
1300nm multimode (SC)
[2 km/1.2 mi.] Link Budget: 11.0 dB
to (4) RJ-48 **[1.5 km/0.9 mi.]**
plus 6-pin DIN **[3 m/10 ft.]**

S4TEF1014-100
1310nm single mode (SC)
[20 km/12.4 mi.]
Link Budget: 16.0 dB
to (4) RJ-48 **[1.5 km/0.9 mi.]**
plus 6-pin DIN **[3 m/10 ft.]**

S4TEF1015-100
1310nm single mode (SC)
[40 km/24.9 mi.]
Link Budget: 26.0 dB
to (4) RJ-48 **[1.5 km/0.9 mi.]**
plus 6-pin DIN **[3 m/10 ft.]**

S4TEF1016-100
1310nm single mode (SC)
[60 km/37.3 mi.]
Link Budget: 29.0 dB
to (4) RJ-48 **[1.5 km/0.9 mi.]**
plus 6-pin DIN **[3 m/10 ft.]**

S4TEF1017-100
1550nm single mode (SC)
[80 km/49.7 mi.]
Link Budget: 29.0 dB
to (4) RJ-48 **[1.5 km/0.9 mi.]**
plus 6-pin DIN **[3 m/10 ft.]**

S4TEF1035-100
1550nm single mode (SC)
[120 km/74.6 mi.]
Link Budget: 36.0 dB
to (4) RJ-48 **[1.5 km/0.9 mi.]**
plus 6-pin DIN **[3 m/10 ft.]**

Single Fiber Products

Recommended use in pairs [pg 19]

S4TEF1029-100
1310nm TX/1550nm RX single fiber single mode (SC)
[20 km/12.4 mi.] Link Budget: 19.0 dB
to (4) RJ-48 **[1.5 km/0.9 mi.]**
plus 6-pin DIN **[3 m/10 ft.]**

S4TEF1029-101
1550nm TX/1310nm RX single fiber single mode (SC)
[20 km/12.4 mi.] Link Budget: 19.0 dB
to (4) RJ-48 **[1.5 km/0.9 mi.]**
plus 6-pin DIN **[3 m/10 ft.]**

S4TEF1029-102
1310nm TX/1550nm RX single fiber single mode (SC)
[40 km/24.9 mi.] Link Budget: 25.0 dB
to (4) RJ-48 **[1.5 km/0.9 mi.]**
plus 6-pin DIN **[3 m/10 ft.]**

S4TEF1029-103
1550nm TX/1310nm RX single fiber single mode (SC)
[40km/24.9 mi.] Link Budget: 25.0 dB
to (4) RJ-48 **[1.5 km/0.9 mi.]**
plus 6-pin DIN **[3 m/10 ft.]**

Optional Accessories *(sold separately)*

Wide Input (24 - 60 VDC) Power Supplies

SPS-2460-SA [pg 69]
Stand-Alone Power Supply

Mounting Options

WMBD [pg 68]
DIN Rail Bracket 5.0" [127 mm]

WMBD-F [pg 68]
DIN Rail Bracket (flat) 3.3" [84 mm]

WMBL [pg 68]
Wall Mount Bracket 4.0" [102 mm]

WMBV [pg 68]
Vertical Wall Mount Bracket 5.0" [127 mm]

*Note: RS-232 cable included with each unit (6-pin DIN to dB-9)

stand-alone network interface device

4x T1/E1/J1 to Fiber Transport Mux

see also: 4x T1 Transport Mux Point System™ Slide-In-Module NID [pg 63]

S4TEF10xx-10x

Extended Temperature
4x T1/E1/J1 Copper to Fiber Transport Mux

- Low cost transport capability: (4) T1/E1/J1 and (1) RS232 data channel line
- Target applications of the device include: FTTx, such as Fiber-to-the-Busi ness, Fiber-to-the-Building, Fiber-to-the-MDU and Fiber-to-the-Home; Cell Tower Backhaul
- Automatic Link Restoration [pg 18]
- Remote Management [pg 17]

The product provides physical layer status monitoring and alarm classification functions for Telecom operators to manage their fiber optic network and reduce operation and maintenance costs.

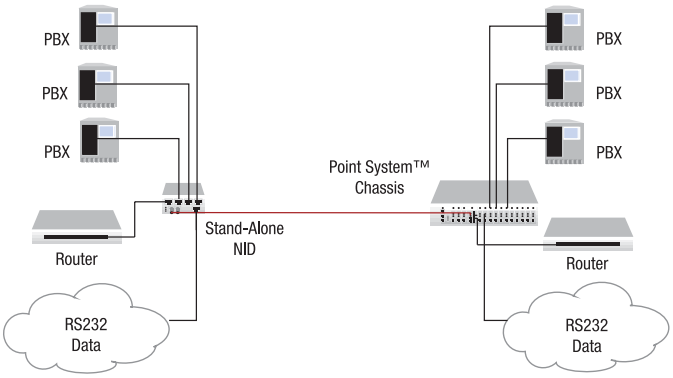
Copper connections are compatible with G.703 and AMI/B8ZS/HDB3; while the optical connection will run at 155 Mbps. A hardware-based solution guarantees the constant bit rate of TDM transport without requiring traffic management.

Features

- Local and Remote Loopback [pg 18]
- AIS/TAOS
- LEDs for each data port
- DIP switches for line code, line length, local loopback or remote loopback [pg 18]
- T1/E1/J1 mode settings
- Dry Relay Contacts on each TDM port
- Local (AUX) Management Interface (RS232 connector)
- Switch selection for Data or Management mode on RS232 interface
- Access to complete status information on local and remote device
- Access to local and remote configuration
- Switch or SNMP selected Baud rate operation
- Field Upgradeable Firmware [pg 18]

Devices must be used in pairs. Typically installation will include a chassis card [C4TEF, pg 63] installed in the Point System™ locally and a stand-alone device installed at the remote location.

Application



Specifications

Complete list of fiber optic connector specifications [pg 212-224]

Standards	AMI/B8ZS/HDB3; G.703; Telecordia TR-NWT-001089: FCC Part 68, UL1459; ITU-T, ANSI, AT&T, ETSI; TBR 12; PD 7024: 1994 (NTR 4)
Switches	Numerous switch settings for line coding, line buildout, loopback (per port), AIS setting, data/mgmt RS-232 and RS-232 port speed and parity
Dimensions	**Width**: 3.7" [94 mm] **Depth**: 4.7" [119 mm] **Height**: 1.8" [46 mm]
Power	External AC/DC provided; 12 VDC, 1.25A; unregulated; standard; UL Listed
Power Consumption	6.0 Watts
Operating Temperature	-20°C – 65°C
Storage Temperature	-40°C – 85°C
Altitude	0 – 10,000 ft.
Operating Humidity	5% – 95% (non-condensing)
Shipping Weight	2 lbs. [0.90 kg]
Safety Compliance	**Wall Mount Power Supply**: UL listed and CSA certified
Regulatory Compliance	FCC Class A, VCCI Class A, CISPR/EN55022 Class A, ICES-003, CE Mark
Warranty	Lifetime

Ordering Information

Complete list of fiber optic connector specifications [pg 212-224]

S4TEF1011-105
1300nm multimode (ST)
[2 km/1.2 mi.] Link Budget: 11.0 dB
to (4) RJ-48 **[1.5 km/0.9 mi.]**
plus 6-pin DIN **[3 m/10 ft.]**

S4TEF1013-105
1300nm multimode (SC)
[2 km/1.2 mi.] Link Budget: 11.0 dB
to (4) RJ-48 **[1.5 km/0.9 mi.]**
plus 6-pin DIN **[3 m/10 ft.]**

S4TEF1014-105
1310nm single mode (SC)
[20 km/12.4 mi.]
Link Budget: 16.0 dB
to (4) RJ-48 **[1.5 km/0.9 mi.]**
plus 6-pin DIN **[3 m/10 ft.]**

S4TEF1015-105
1310nm single mode (SC)
[40 km/24.9 mi.]
Link Budget: 26.0 dB
to (4) RJ-48 **[1.5 km/0.9 mi.]**
plus 6-pin DIN **[3 m/10 ft.]**

S4TEF1016-105
1310nm single mode (SC)
[60 km/37.3 mi.]
Link Budget: 29.0 dB
to (4) RJ-48 **[1.5 km/0.9 mi.]**
plus 6-pin DIN **[3 m/10 ft.]**

S4TEF1017-105
1550nm single mode (SC)
[80 km/49.7 mi.]
Link Budget: 29.0 dB
to (4) RJ-48 **[1.5 km/0.9 mi.]**
plus 6-pin DIN **[3 m/10 ft.]**

Single Fiber Products

Recommended use in pairs [pg 19]

S4TEF1029-105
1310nm TX/1550nm RX single fiber single mode (SC)
[20 km/12.4 mi.] Link Budget: 19.0 dB
to (4) RJ-48 **[1.5 km/0.9 mi.]**
plus 6-pin DIN **[3 m/10 ft.]**

S4TEF1029-106
1550nm TX/1310nm RX single fiber single mode (SC)
[20 km/12.4 mi.] Link Budget: 19.0 dB
to (4) RJ-48 **[1.5 km/0.9 mi.]**
plus 6-pin DIN **[3 m/10 ft.]**

Optional Accessories *(sold separately)*

Wide Input (24 - 60 VDC) Power Supplies

SPS-2460-SA [pg 69]
Stand-Alone Power Supply

Mounting Options

WMBD [pg 68]
DIN Rail Bracket 5.0" [127 mm]

WMBD-F [pg 68]
DIN Rail Bracket (flat) 3.3" [84 mm]

WMBL [pg 68]
Wall Mount Bracket 4.0" [102 mm]

WMBV [pg 68]
Vertical Wall Mount Bracket 5.0" [127 mm]

*Note: RS-232 cable included with each unit (6-pin DIN to dB-9)

AUTO NEG | AUTO CROSS | TRANSPARENT LINK PASS THRU | AUTO LINK RESTORE | PAUSE | REMOTE MGMT | LOOP BACK | FIELD UPGRADEABLE FIRMWARE | SINGLE FIBER

4x T1/E1/J1 + 10/100 Ethernet to Fiber

see also: 4x T1 Transport Mux Point System™ Slide-In-Module NID [pg 64]

S4TEF10xx-11x

4x T1/E1/J1 + 10/100 Ethernet Transport Mux

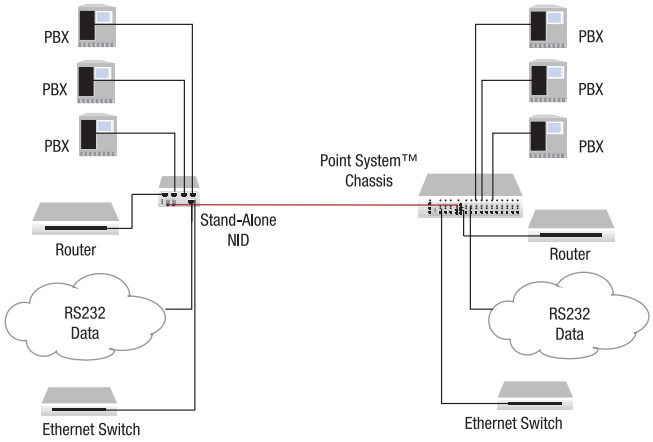
- Low cost transport capability: (4) T1/E1/J1; (1) Ethernet and (1) RS232 data channel line
- Target applications include: FTTx, such as Fiber-to-the-Business, Fiber-to-the-Building, Fiber-to-the-MDU and Fiber-to-the-Home.

Features

- Auto-Negotiation for 10/100BASE-TX [pg 16]
- AutoCross™ (auto MDI/MDI-X) [pg 16]
- Transparent Link Pass Through for Ethernet [pg 17]
- Automatic Link Restoration [pg 18]
- Pause (Flow Control) [pg 17]
- Remote Management [pg 17]
- Local and Remote Loopback [pg 18]
- Remote Fiber Loss Signaling
- AIS/TAOS
- LEDs for each data port
- DIP switches for line code, line length, local loopback or remote loopback [pg 18]
- T1/E1/J1 mode settings
- Dry Relay Contacts on each TDM port
- Local (AUX) Management Interface (RS232 connector)
- Switch selection for Data or Management mode on RS232 interface
- Access to complete status information on local and remote device
- Access to local and remote configuration
- Switch or SNMP selected Baud rate operation
- Field Upgradeable Firmware [pg 18]

These products offer a low cost transport capability for four T1/E1/J1, one Ethernet and one data channel line (x4TEF10XX-11X). The offering will provide copper connections compatible with G.703, AMI/B8ZS/HDB3, 10/100BASE-TX, as well as RS232 channel; while the optical connection will run at 155 Mbps. TDM traffic is not mapped to Ethernet. A hardware-based solution guarantees the constant bit rate of TDM transport without requiring traffic management. The product provides physical layer status monitoring, alarm classification and data classification functions for Telecom providers to manage their fiber optic network and reduce operation and maintenance costs. Target applications of the device include: FTTx, such as Fiber-to-the-Business, Fiber-to-the-Building, Fiber to-the-MDU and Fiber-to-the-Home.

Application



Specifications

Complete list of fiber optic connector specifications [pg 212-224]

Standards	IEEE Std. 802.3 2003; Telecordia TR-NWT-001089: FCC Part 68, UL1459; ITU-T, ANSI, AT&T, ETSI; TBR 12; PD 7024: 1994 (NTR 4); AMI/B8ZS/HDB3; G.703
Switches	Numerous switch settings for line coding, line buildout, loopback (per port), AIS setting, data/mgmt RS-232 and RS-232 port speed and parity
Ethernet port settings	Auto-Negotiation, Force speed/duplex and enable Transparent Link Pass Through
Dimensions	**Width**: 3.7" [94 mm] **Depth**: 4.7" [119 mm] **Height**: 1.8" [46 mm]
Power	External AC/DC provided; 12 VDC, 1.25A; unregulated; standard; UL listed
Power Consumption	6.0 Watts
Operating Temperature	0 – 50°C
Storage Temperature	-40°C – 85°C
Altitude	0 – 10,000 ft.
Operating Humidity	5% – 95% (non-condensing)
Shipping Weight	2 lbs. [0.90 kg]
Safety Compliance	**Wall Mount Power Supply**: UL listed, and CSA certified
Regulatory Compliance	FCC Class A, VCCI Class A, CISPR/EN55022 Class A, ICES-003, CE Mark
Warranty	Lifetime

Devices must be used in pairs. Typically installation will include a chassis card [C4TEF, pg 64] installed in the Point System™ locally and a stand-alone device installed at the remote location.

Ordering Information

S4TEF1011-110
1300nm multimode (ST)
[2 km/1.2 mi.] Link Budget: 11.0 dB
to (4) RJ-48 **[1.5 km/0.9 mi.]**
plus10/100BASE-TX (RJ-45) **[100 m]**
plus 6-pin DIN **[3 m/10 ft.]**

S4TEF1013-110
1300nm multimode (SC)
[2 km/1.2 mi.] Link Budget: 11.0 dB
to (4) RJ-48 **[1.5 km/0.9 mi.]**
plus10/100BASE-TX (RJ-45) **[100 m]**
plus 6-pin DIN **[3 m/10 ft.]**

S4TEF1014-110
1310nm single mode (SC)
[20 km/12.4 mi.] Link Budget: 16.0 dB
to (4) RJ-48 **[1.5 km/0.9 mi.]**
plus 10/100BASE-TX (RJ-45) **[100 m]**
plus 6-pin DIN **[3 m/10 ft.]**

S4TEF1015-110
1310nm single mode (SC)
[40 km/24.9 mi.] Link Budget: 26.0 dB
to (4) RJ-48 **[1.5 km/0.9 mi.]**
plus 10/100BASE-TX (RJ-45) **[100 m]**
plus 6-pin DIN **[3 m/10 ft.]**

S4TEF1016-110
1310nm single mode (SC)
[60 km/37.3 mi.] Link Budget: 29.0 dB
to (4) RJ-48 **[1.5 km/0.9 mi.]**
plus 10/100BASE-TX (RJ-45) **[100 m]**
plus 6-pin DIN **[3 m/10 ft.]**

S4TEF1017-110
1550nm single mode (SC)
[80 km/49.7 mi.] Link Budget: 29.0 dB
to (4) RJ-48 **[1.5 km/0.9 mi.]**
plus 10/100BASE-TX (RJ-45) **[100 m]**
plus 6-pin DIN **[3 m/10 ft.]**

S4TEF1035-110
1550nm single mode (SC)
[120 km/74.6 mi.] Link Budget: 36.0 dB
to (4) RJ-48 **[1.5 km/0.9 mi.]**
plus 10/100BASE-TX (RJ-45) **[100 m]**
plus 6-pin DIN **[3 m/10 ft.]**

Single Fiber Products [pg 19]

S4TEF1029-110
1310nm TX/1550nm RX single fiber SM (SC) **[20 km/12.4 mi.] LB: 19.0 dB**
to (4) RJ-48 **[1.5 km/0.9 mi.]**
plus 10/100BASE-TX (RJ-45) **[100 m]**
plus 6-pin DIN **[3 m/10 ft.]**

S4TEF1029-111
1550nm TX/1310nm RX single fiber SM (SC) **[20 km/12.4 mi.] LB: 19.0 dB**
to (4) RJ-48 **[1.5 km/0.9 mi.]**
plus 10/100BASE-TX (RJ-45) **[100 m]**
plus 6-pin DIN **[3 m/10 ft.]**

S4TEF1029-112
1310nm TX/1550nm RX single fiber SM (SC) **[40 km/24.9 mi.] LB: 25.0 dB**
to (4) RJ-48 **[1.5 km/0.9 mi.]**
plus 10/100BASE-TX (RJ-45) **[100 m]**
plus 6-pin DIN **[3 m/10 ft.]**

S4TEF1029-113
1550nm TX/1310nm RX single fiber SM (SC) **[40 km/24.9 mi.] LB: 25.0 dB**
to (4) RJ-48 **[1.5 km/0.9 mi.]**
plus 10/100BASE-TX (RJ-45) **[100 m]**
plus 6-pin DIN **[3 m/10 ft.]**

Optional Accessories *(sold separately)*

Wide Input (24 - 60 VDC) Power Supplies
SPS-2460-SA [pg 69]
Stand-Alone Power Supply

Mounting Options
WMBD [pg 68]
DIN Rail Bracket 5.0" [127 mm]
WMBD-F [pg 68]
DIN Rail Bracket (flat) 3.3" [84 mm]
WMBL [pg 68]
Wall Mount Bracket 4.0" [102 mm]
WMBV [pg 68]
Vertical Wall Mount Bracket 5.0" [127 mm]

*Note: RS-232 cable included with each unit (6-pin DIN to dB-9)

AUTO NEG | AUTO CROSS | TRANSPARENT LINK PASS THRU | AUTO LINK RESTORE | PAUSE | REMOTE MGMT | LOOP BACK | FIELD UPGRADEABLE FIRMWARE | SINGLE FIBER

4x T1/E1/J1 + 10/100 Ethernet to Fiber

see also: 4x T1 Transport Mux Point System™ Slide-In-Module NID [pg 64]

S4TEF10xx-11x

Extended Temperature
4x T1/E1/J1 + 10/100 Ethernet Transport Mux

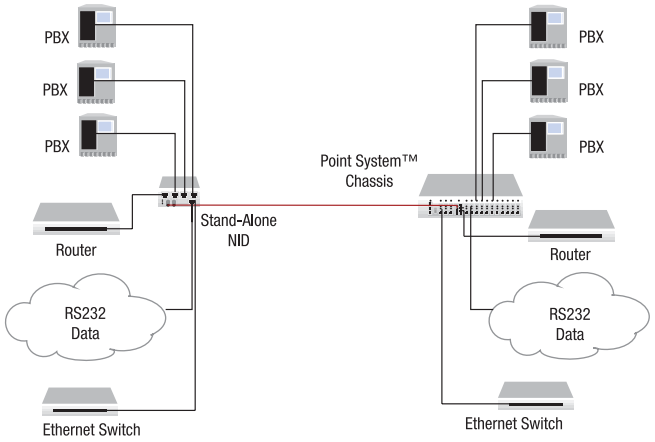
- Low cost transport capability: (4) T1/E1/J1; (1) Ethernet and (1) RS232 data channel line
- Target applications include: FTTx, such as Fiber-to-the-Business, Fiber-to-the-Building, Fiber-to-the-MDU and Fiber-to-the-Home.

Features

- Auto-Negotiation for 10/100BASE-TX [pg 16]
- AutoCross™ (auto MDI/MDI-X) [pg 16]
- Transparent Link Pass Through for Ethernet [pg 17]
- Automatic Link Restoration [pg 18]
- Pause (Flow Control) [pg 17]
- Remote Management [pg 17]
- Local and Remote Loopback [pg 18]
- Remote Fiber Loss Signaling
- AIS/TAOS
- LEDs for each data port
- DIP switches for line code, line length, local loopback or remote loopback [pg 18]
- T1/E1/J1 mode settings
- Dry Relay Contacts on each TDM port
- Local (AUX) Management Interface (RS232 connector)
- Switch selection for Data or Management mode on RS232 interface
- Access to complete status information on local and remote device
- Access to local and remote configuration
- Switch or SNMP selected Baud rate operation
- Field Upgradeable Firmware [pg 18]

These products offer a low cost transport capability for four T1/E1/J1, one Ethernet and one data channel line (x4TEF10XX-11X). The offering will provide copper connections compatible with G.703, AMI/B8ZS/HDB3, 10/100BASE-TX, as well as RS232 channel; while the optical connection will run at 155 Mbps. TDM traffic is not mapped to Ethernet. A hardware-based solution guarantees the constant bit rate of TDM transport without requiring traffic management. The product provides physical layer status monitoring, alarm classification and data classification functions for Telecom providers to manage their fiber optic network and reduce operation and maintenance costs. Target applications of the device include: FTTx, such as Fiber-to-the-Business, Fiber-to-the-Building, Fiber to-the-MDU and Fiber-to-the-Home.

Application



Specifications

Complete list of fiber optic connector specifications [pg 212-224]

Standards	IEEE Std. 802.3 2003; Telecordia TR-NWT-001089: FCC Part 68, UL1459; ITU-T, ANSI, AT&T, ETSI; TBR 12; PD 7024: 1994 (NTR 4); AMI/B8ZS/HDB3; G.703
Switches	Numerous switch settings for line coding, line buildout, loopback (per port), AIS setting, data/mgmt RS-232 and RS-232 port speed and parity
Ethernet port settings	Auto-Negotiation, Force speed/duplex and enable Transparent Link Pass Through
Dimensions	**Width**: 3.7" [94 mm] **Depth**: 4.7" [119 mm] **Height**: 1.8" [46 mm]
Power	External AC/DC provided; 12 VDC, 1.25A; unregulated; standard; UL listed
Power Consumption	6.0 Watts
Operating Temperature	0 – 50°C
Storage Temperature	-20°C – 65°C
Altitude	0 – 10,000 ft.
Operating Humidity	5% – 95% (non-condensing)
Shipping Weight	2 lbs. [0.90 kg]
Safety Compliance	**Wall Mount Power Supply**: UL listed, and CSA certified
Regulatory Compliance	FCC Class A, VCCI Class A, CISPR/EN55022 Class A, ICES-003, CE Mark
Warranty	Lifetime

Devices must be used in pairs. Typically installation will include a chassis card [C4TEF, pg 64] installed in the Point System™ locally and a stand-alone device installed at the remote location.

Ordering Information

Complete list of fiber optic connector specifications [pg 212-224]

S4TEF1011-115
1300nm multimode (ST) **[2 km/1.2 mi.] Link Budget: 11.0 dB**
to (4) RJ-48 **[1.5 km/0.9 mi.]**
plus 10/100BASE-TX (RJ-45) **[100 m]**
plus 6-pin DIN **[3 m/10 ft.]**

S4TEF1013-115
1300nm multimode (SC) **[2 km/1.2 mi.] Link Budget: 11.0 dB**
to (4) RJ-48 **[1.5 km/0.9 mi.]**
plus 10/100BASE-TX (RJ-45) **[100 m]**
plus 6-pin DIN **[3 m/10 ft.]**

S4TEF1014-115
1310nm single mode (SC) **[20 km/12.4 mi.] Link Budget: 16.0 dB**
to (4) RJ-48 **[1.5 km/0.9 mi.]**
plus 10/100BASE-TX (RJ-45) **[100 m]**
plus 6-pin DIN **[3 m/10 ft.]**

S4TEF1015-115
1310nm single mode (SC) **[40 km/24.9 mi.] Link Budget: 26.0 dB**
to (4) RJ-48 **[1.5 km/0.9 mi.]**
plus 10/100BASE-TX (RJ-45) **[100 m]**
plus 6-pin DIN **[3 m/10 ft.]**

S4TEF1016-115
1310nm single mode (SC) **[60 km/37.3 mi.] Link Budget: 29.0 dB**
to (4) RJ-48 **[1.5 km/0.9 mi.]**
plus 10/100BASE-TX (RJ-45) **[100 m]**
plus 6-pin DIN **[3 m/10 ft.]**

S4TEF1017-115
1550nm single mode (SC) **[80 km/49.7 mi.] Link Budget: 29.0 dB**
to (4) RJ-48 **[1.5 km/0.9 mi.]**
plus 10/100BASE-TX (RJ-45) **[100 m]**
plus 6-pin DIN **[3 m/10 ft.]**

Single Fiber Products [pg 19]

S4TEF1029-115
1310nm TX/1550nm RX single fiber SM (SC) **[20 km/12.4 mi.] LB: 19.0 dB**
to (4) RJ-48 **[1.5 km/0.9 mi.]**
plus 10/100BASE-TX (RJ-45) **[100 m]**
plus 6-pin DIN **[3 m/10 ft.]**

S4TEF1029-116
1550nm TX/1310nm RX single fiber SM (SC) **[20 km/12.4 mi.] LB: 19.0 dB**
to (4) RJ-48 **[1.5 km/0.9 mi.]**
plus 10/100BASE-TX (RJ-45) **[100 m]**
plus 6-pin DIN **[3 m/10 ft.]**

Optional Accessories *(sold separately)*

Wide Input (24 - 60 VDC) Power Supplies
SPS-2460-SA [pg 69]
Stand-Alone Power Supply

Mounting Options
WMBD [pg 68]
DIN Rail Bracket 5.0" [127 mm]
WMBD-F [pg 68]
DIN Rail Bracket (flat) 3.3" [84 mm]
WMBL [pg 68]
Wall Mount Bracket 4.0" [102 mm]
WMBV [pg 68]
Vertical Wall Mount Bracket 5.0" [127 mm]

*Note: RS-232 cable included with each unit (6-pin DIN to dB-9)

SAPTF33xx-1xx

POTS 2-Wire Copper to Fiber Media Converter

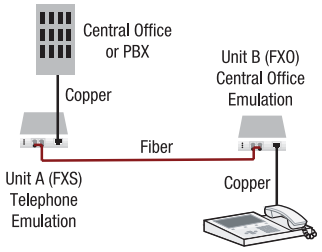
Features

- Audio Transmission
- Caller ID
- Automatic Ring Down
- Duplex or Single Fiber Options

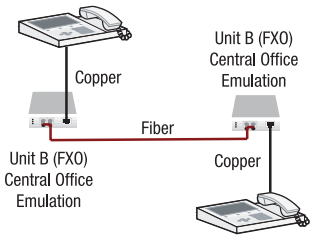
Connect central-office voice grade signals to distant Plain Old Telephone equipment (POTS) utilizing standard telephone signaling. Two units are required to implement an end to end system. Unit A connects to a telephone line or PBX and has the ability to detect ringing voltages and to act as a telephone (LINE SIDE FXS). Unit B is the reciprocal unit and has the ability to act as a Central Office and connects to a telephone device (CUSTOMER SIDE FXO).

Devices must be used in pairs. Typical installation will include a chassis card [CAPTF, pg 65] installed in the Point System™ locally and a stand-alone device installed at the remote location.

Loop Extender/Isolator



Automatic Ring Down



Specifications

Complete list of fiber optic connector specifications [pg 212-224]

Standards	FCC Part 68, TBR21
Analog Port	(Telephone Emulation or FXS) **Connector**: RJ-11 **Impedance**: 600 ohms **REN**: 0.48 **Loop Current**: 20 to 60 ma. **Insertion Loss**: 0.0 +/-1.0 dB at 1000 Hz when both ports are terminated at 600 ohms
Analog Port	(Central Office Emulation or FXO) **Impedance**: 600 ohms **Battery Source**: 48 VDC +/- 5V **Ringing Supply**: 90 Vp-p **Ring Frequency**: 15 – 25 Hz. (Reproduces frequency detected by side A) **Ring Cadence**: Reproduces cadence detected by side A **Insertion Loss**: 1.0 +/- 1.0 dB @ 1000 Hz when both ports are terminated at 600 ohms
Voice Frequency	300 Hz – 3 KHz
Switches/Optional Jumpers	Automatic Ring Down/Normal
Status LEDs	LED colors are Green **Fiber Link**: ON indicates fiber link up; **In Use**: ON indicates unit in use; Flashing indicates ringing; **Power**: ON indicates power is on
Dimensions **105 Model:** **115 Model:**	 **Width**: 3.25" [82 mm] **Depth**: 4.7" [119 mm] **Height**: 1.0" [25 mm] **Width**: 3.7" [94 mm] **Depth**: 4.7" [119 mm] **Height**: 1.8" [46 mm]
Power	External AC/DC provided; 12 VDC, 1.25A; unregulated; standard; UL Listed
Environment	0 – 50°C Operating Temperature; -25°C – 85°C Storage Temperature 5% – 95% humidity (non-condensing); 0 – 10,000 ft.
Shipping Weight	2 lbs. [0.90 kg]
Safety Compliance	**Wall Mount Power Supply:** UL Listed and CSA certified
Regulatory Compliance	FCC Class A; VCCI Class A; EN 55022 (CISPR 22) Class A; ICES 003; CE Mark
Warranty	Lifetime

Ordering Information

Complete list of fiber optic connector specifications [pg 212-224]

Line Side FXS: SAPTF3311-105
Customer Side FXO: SAPTF3311-115
Twisted Pair (RJ-11) **[5 km/3.1 mi.]**
to 1300nm multimode (ST)
[2 km/1.2 mi.] Link Budget: 11.0 dB

Line Side FXS: SAPTF3313-105
Customer Side FXO: SAPTF3313-115
Twisted Pair (RJ-11) **[5 km/3.1 mi.]**
to 1300nm multimode (SC)
[2 km/1.2 mi.] Link Budget: 11.0 dB

Line Side FXS: SAPTF3314-105
Customer Side FXO: SAPTF3314-115
Twisted Pair (RJ-11) **[5 km/3.1 mi.]**
to 1310nm single mode (SC)
[20 km/12.4 mi.] Link Budget: 16.0 dB

Line Side FXS: SAPTF3315-105
Customer Side FXO: SAPTF3315-115
Twisted Pair (RJ-11) **[5 km/3.1 mi.]**
to 1310nm single mode (SC)
[40 km/24.9 mi.] Link Budget: 26.0 dB

Line Side FXS: SAPTF3316-105
Customer Side FXO: SAPTF3316-115
Twisted Pair (RJ-11) **[5 km/3.1 mi.]**
to 1310nm single mode (SC)
[60 km/37.3 mi.] Link Budget: 33.0 dB

Line Side FXS: SAPTF3317-105
Customer Side FXO: SAPTF3317-115
Twisted Pair (RJ-11) **[5 km/3.1 mi.]**
to 1550nm single mode (SC)
[80 km/49.7 mi.] Link Budget: 29.0 dB

Single Fiber Products

Recommended use in pairs [pg 19]

Line Side FXS: SAPTF3329-105*
Customer Side FXO: SAPTF3329-115*
Twisted Pair (RJ-11) **[5 km/3.1 mi.]**
to 1310nm TX/1550nm RX single fiber single mode (SC)
[20 km/12.4 mi.] Link Budget: 19.0 dB

Line Side FXS: SAPTF3329-106*
Customer Side FXO: SAPTF3329-116*
Twisted Pair (RJ-11) **[5 km/3.1 mi.]**
to 1550nm TX/1310nm RX single fiber single mode (SC)
[20 km/12.4 mi.] Link Budget: 19.0 dB

Line Side FXS: SAPTF3329-107*
Customer Side FXO: SAPTF3329-117*
Twisted Pair (RJ-11) **[5 km/3.1 mi.]**
to 1310nm TX/1550nm RX single fiber single mode (SC)
[40 km/24.9 mi.] Link Budget: 25.0 dB

Line Side FXS: SAPTF3329-108*
Customer Side FXO: SAPTF33129-118*
Twisted Pair (RJ-11) **[5 km/3.1 mi.]**
to 1550nm TX/1310nm RX single fiber single mode (SC)
[40 km/24.9 mi.] Link Budget: 25.0 dB

*Note: Single Fiber products should be paired by application:

Loop Extender/Isolator Application
Line Side FXS: CAPTF3329-105
Customer Side FXO: CAPTF3329-116

Automatic Ring Down Application
Line Side FXS: CAPTF3329-107
Customer Side FXO: CAPTF3329-108

J/VD-xX-01

Analog CCTV Video Copper to Fiber Media Converter

Transmitter | Miniature Receiver

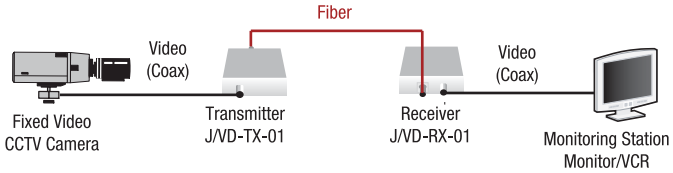
Features

- AM Modulation
- NTSC, PAL, SECAM compatibility
- Compatible with all video CCTV equipment
- Real Time Full Color Video
- Automatic Gain Control on Transmitter
- Automatic Gain Control on Receiver
- Link Pass Through [pg 17]
- Wide input power supply:
  - Transmitter: 9 – 24 VAC w/Isolated Power Supply; 9 – 40 VDC
  - Receiver: 9 – 16 VAC/DC
- Video Specification:
  - Input Video: .5 to 2-volt pk-pk (75 ohms)
  - Bandwidth: 5 Hz – 10 MHz
  - Differential Gain: < 5 %
  - Differential Phase: < 5°
  - Tilt: < 1%
  - Signal/Noise Ratio: 60 dB

Transition Networks' analog composite video media transmitter, J/VD-TX-01, converts a CCTV signal from cameras to a single strand of multimode or single mode fiber for up to 10 km. Transition Networks' analog video media receiver, J/VD-RX-01, converts the optical signal back to an analog composite video signal. All conversions are performed in real time. Automatic gain control installed on both Transmitter and Receiver maintains desired quality of video's contrast and brightness for extended distances. No field adjustments are necessary. Wide input range power supply allows for multiple choices of power source including camera power supply.

To assure best quality, Transition Networks' Transmitters & Receivers should be used on both ends of the link.

Connect Uni-directional Analog Video Devices Over Fiber



Specifications

Video Formats	NTSC, PAL, SECAM
Optical Specs	**Multimode:** 850nm 3.0 dB Link Budget **Single Mode:** 1310nm 3.0 dB Link Budget
LEDs	**J/VD-TX-01(xx) Transmitter:** **PWR(Power)**: ON = Power connected **RX**: ON = Copper Video feed IN **J/VD-RX-01(xx) Receiver**: **PWR(Power)**: ON = Power connected **RX**: ON = Fiber Video feed IN
Dimensions	**Transmitter/Miniature Receiver:** **Width**: 2.0" [51 mm] **Depth**: 2.2" [56 mm] **Height**: 1.0" [25 mm] **Receiver**: **Width**: 4.0" [102 mm] **Depth**: 3.0" [76 mm] **Height**: 1.0" [25 mm]
Power Supply	**Transmitter**: 9 – 40 VDC, 9 – 24 VAC **Receiver**: 9 – 16 VAC/DC
Power Consumption	2 Watts
Operating Temperature (Standard)	0°C to 50°C (32°F to 122°F)
Storage Temperature	-25 to 85°C (-13°F to 185°F)
Altitude	0 – 10,000 ft.
Operating Humidity	5% – 95% non-condensing
Shipping Weight	1 lb. [0.45 kg]
Safety Compliance	CE Mark **Power Supply**: UL listed, EN60950
Regulatory Compliance for Emissions	FCC Class A, EN55022 Class A
Regulatory Compliance for Immunity	EN55024
Warranty	Lifetime

Ordering Information

J/VD-TX-01: Video Transmitter
BNC (75 ohm)
to Multimode (ST)
[1 km/0.6 mi.]

J/VD-RX-01: Video Receiver
BNC (75 ohm)
to Multimode (ST)
[1 km/0.6 mi.]

J/VD-MRX-01: Miniature Video Receiver
BNC (75 ohm)
to Multimode (ST)
[1 km/0.6 mi.]

J/VD-TX-01(SC): Video Transmitter
BNC (75 ohm)
to Multimode (SC)
[1 km/0.6 mi.]

J/VD-RX-01(SC): Video Receiver
BNC (75 ohm)
to Multimode (SC)
[1 km/0.6 mi.]

J/VD-MRX-01(SC): Miniature Video Receiver
BNC (75 ohm)
to Multimode (SC)
[1 km/0.6 mi.]

J/VD-TX-01(SM): Video Transmitter
BNC (75 ohm)
to Single Mode (ST)
[10 km/6.2 mi.]

J/VD-RX-01(SM): Video Receiver
BNC (75 ohm)
to Single Mode (ST)
[10 km/6.2 mi.]

J/VD-MRX-01(SM): Miniature Video Receiver
BNC (75 ohm)
to Single Mode (ST)
[10 km/6.2 mi.]

Optional Accessories *(sold separately)*

Mounting Options

WMBJ-V [pg 69]
Wall Mount Bracket Kit

E-MCR-05 [pg 68]
12-slot Media Converter Rack *(for receivers)*

AUTO NEG | AUTO CROSS | FAR END FAULT | LINK PASS THRU | AUTO LINK RESTORE | INDUSTRIAL EXTENDED TEMPERATURE | NEW PRODUCT

Industrial Mini 10/100 Bridging 10/100BASE-TX to 100BASE-FX

M/E-ISW-FX-01(xx)

Industrial Mini 10/100 Bridging Media Converter

Easily Integrate Fiber
into industrial, hardened or outdoor locations to reach devices at the edge of the network

Tiny Mechanical Size
Allows media conversion within industrial enclosures, where space is at a premium.

No Configuration Required
These media converters are plug-and-play for transparent operation within your existing network.

The Industrial Mini is available with LC, ST or SC fiber interfaces and is available for multimode or single mode fiber. Single fiber options are also available [pg 19].

Features

- Unit and Port LEDs provide quick status
- Auto-Negotiation [pg 16]
- Fixed Full-Duplex on fiber
- AutoCross™ on copper port [pg 16]
- Link Pass Through [pg 17]
- Automatic Link Restoration [pg 18]
- Far-End-Fault [pg 16]
- DC Powered

Industrial Mini Media Converters provide a cost-effective method for integrating fiber optic cabling into industrial or outdoor 10/100 UTP Ethernet networks. Featuring wide operating temperature range, low-voltage DC power, multiple mounting methods and Transition Networks' Lifetime Warranty these problem solvers are guaranteed to be trouble-free in harsh outdoor or industrial applications.

The Industrial Mini is ideal for extending Ethernet over Fiber to outdoor security cameras.

Specifications

Standards	IEEE Std. 802.3
Status LEDs	**PWR (Power):** (below RJ-45) **FX-Link/Act (Fiber Link/Activity):** (Upper Left on RJ-45) ON = Link; Flashing = Activity **TX-Link/Act (Copper Link/Activity):** (Upper Right on RJ-45) ON = Link; Flashing = Activity
Dimensions	**Width:** 1.8" [46 mm] **Depth:** 3.3" [85 mm] **Height:** 0.85" [22 mm]
Power Consumption	2.5 Watts
Power Sources	Unit accepts 12-48 VDC
Operating Temp	-40°C to 75°C
Storage Temp	-40°C to 85°C
Humidity	5% – 95% humidity non-condensing
Altitude	0 – 10,000 ft. altitude
Shipping Weight	2 lbs. [0.90 kg]
Regulatory Compliance	FCC Class A, CISPR22/EN55022 Class A, EN55024, CE Mark
Warranty	Lifetime

Ordering Info

M/E-ISW-FX-01
10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1310 nm multimode (ST)
[2 km/1.2 mi.] Link Budget: 12.0 dB

M/E-ISW-FX-01(MMLC)
10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1310 nm multimode (LC)
[2 km/1.2 mi.] Link Budget: 11.0 dB

M/E-ISW-FX-01(SC)
10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1310 nm multimode (SC)
[2 km/1.2 mi.] Link Budget: 12.0 dB

M/E-ISW-FX-01(SM)
10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1310 nm SM (SC)
[20 km/12.4 mi.] Link Budget: 16.0 dB

M/E-ISW-FX-01(SMLC)
10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1550 nm SM (LC)
[20 km/12.4 mi.] Link Budget: 19.0 dB

M/E-ISW-FX-01(LH)
10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1310 nm single mode (SC)
[40 km/24.9 mi.] Link Budget: 30.0 dB

Single Fiber Products

Recommended use in pairs [pg 19]

M/E-ISW-FX-01(100)
10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1310nm TX/1550nm RX single fiber single mode (SC)
[20 km/12.4 mi.] Link Budget: 18.0 dB

M/E-ISW-FX-01(101)
10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1550nm TX/1310nm RX single fiber single mode (SC)
[20 km/12.4 mi.] Link Budget: 18.0 dB

M/E-ISW-FX-01(102)
10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1310nm TX/1550nm RX single fiber single mode (SC)
[40 km/24.9 mi.] Link Budget: 26.0 dB

M/E-ISW-FX-01(103)
10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1550nm TX/1310nm RX single fiber single mode (SC)
[40 km/24.9 mi.] Link Budget: 26.0 dB

Optional Accessories *(sold separately)*

AC Power Supplies

SPS-UA12DHT
(100-240 VDC input
0°C to +70°C operating temperature)

25083
Universal AC/DC Input DIN Rail Mountable +12 VDC Power Supply

Mounting Options

WMBM
Wall Mount Bracket for Mini Converters

RMBM
Rack Mount Bracket for Mini Media Converters in the RMS19-SA4-01 and/or E-MCR-05

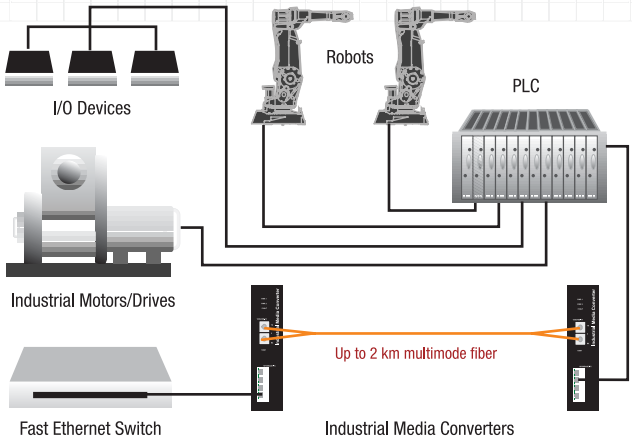
AUTO NEG | AUTO CROSS | LINK PASS THRU

Class 1 Div 2 Industrial Media Converter 10/100BASE-TX to 100BASE-FX

Industrial

SISTF101x-211-LRT

Industrial Media Converter



Transition Networks' Industrial Media Converters are hardened devices designed to reliably operate in harsh environments such as those found on factory floors, outdoor enclosures or other hazardous environments.

Eliminate EMI and RFI issues or overcome distance limitations with copper based cabling by using the Industrial Media Converter to convert your copper based equipment over to fiber optics. The media converter can connect to either 10Base-T or 100Base-TX ports and provides a 100Base-FX fiber optic connection for links up to 20 km.

Specifications

Complete list of fiber optic connector specifications [pg 212-224]

Standards	IEEE Std. 802.3, 802.3u, 802.3x
Status LEDs	**PWR (Power)**: ON = Unit has power connected **PWR 1 (Power)**: ON = primary power connected **PWR 2 (Power)**: ON = backup power connected **Fault**: ON = Power failure or port link failure **LNK/ACT (Ports 1 – 2)**: ON = Link; Flashing = data transmitting **HDX/FDX (Ports 1 – 2)**: ON = Full duplex mode **10/100 (UTP)**: ON = 100 Mbps
Dip Switches	**1:** Enable/Disable Port Alarms **2:** Enable/Disable Link Pass Through **3:** Full/Half Duplex 100BASE-FX **4:** Converter/Switch Mode
Dimensions	**Width**: 1.2" [30 mm] **Depth**: 3.7" [95 mm] **Height**: 5.5" [140 mm]
Ingress Protection	IP 30
Input Power	12 to 48 VDC, 0.2A-0.7A, redundant inputs with reverse polarity protection; Additional barrel connector; SISTF1011-211-LRT also supports 24 VAC (18~30 VAC)
Power Consumption	4.6 Watts
Environment	-40 to +75°C Ext. operating temp. 5 – 95% humidity non-condensing 0 – 10,000 ft. altitude -40 to +85°C storage temp.
Shipping Weight	2 lbs. [0.90 kg]
Safety Compliance	UL 60950; UL508; CSA C22.2 no 60950 UL Class 1 Div 2 for hazardous environments
EMI Compliance	CISPR/EN55022 Class A; FCC Class A; CE Mark; EN61000-4-2; EN61000-4-3; EN61000-4-4; EN61000-4-5; EN61000-4-6
Environmental Compliance	IEC60068-2-32 (Free fall) IEC60068-2-27 (Shock) IEC60068-2-6 (Vibration)
Warranty	Lifetime

Ordering Information

Complete list of fiber optic and connector specifications [pg 212-224]

Extended Operating Temperature -40°C to +75°C

SISTF1013-211-LRT
(1) 10/100BASE-TX (RJ-45)
[100 m/328 ft.]
to (1) 100BASE-FX 1300nm MM (SC)
[2 km/1.2 mi.] Link Budget: 11.0 dB

SISTF1014-211-LRT
(1) 10/100BASE-TX (RJ-45)
[100 m/328 ft.]
to (1) 100BASE-FX 1310nm SM (SC)
[20 km/12.4 mi.] Link Budget: 17.0 dB

SISTF1011-211-LRT
(1) 10/100BASE-TX (RJ-45)
[100 m/328 ft.]
to (1) 100BASE-FX 1300nm MM (ST)
[2 km/1.2 mi.] Link Budget: 11.0 dB

Optional Accessories *(sold separately)*

External AC/DC Power Supply

SPS-UA12DHT
(100-240 VDC input
0°C to +70°C operating temperature)

25083
Universal AC/DC Input DIN Rail Mountable +12 VDC Power Supply

Features

- Auto-Negotiation [pg 16]
- AutoCross™ [pg 16]
- Link Pass Through [pg 17]
- DIN Rail Mounting and Wall Mount Brackets Included
- Extended (-40°C to 75°C) operating temperature
- Dry Contact Relay Alarm Output
- Dual Auto-Sensing Redundant DC Power Inputs
- Media Converter Mode or Switch Converter Mode
- Barrel connector interface cable included for connecting external AC/DC power supply
- Class 1 Div 2

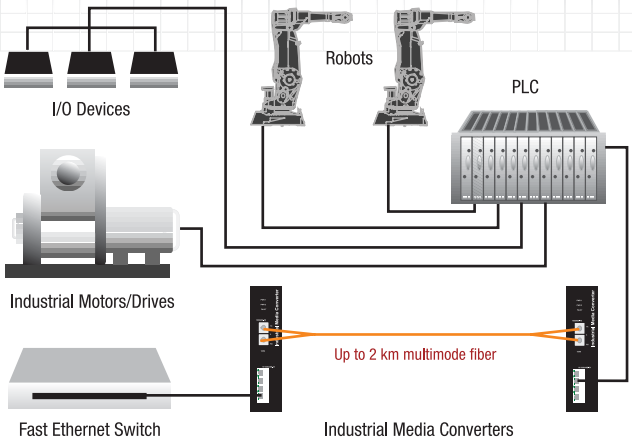
AUTO NEG | AUTO CROSS

Class 1 Div 2 Industrial Switch 10/100BASE-TX to 100BASE-FX

Industrial

SISTF101x-241-LRT

Industrial Switch



Extend Network Distance in Industrial Applications

Transition Networks' industrial switches are hardened devices designed to reliably operate in harsh environments such as those found on factory floors, outdoor enclosures or other hazardous environments.

Eliminate EMI and RFI issues or overcome distance limitations with copper based cabling by using the Industrial Media Converter to convert your copper based equipment over to fiber optics. The media converter can connect to either 10Base-T or 100Base-TX ports and provides a 100Base-FX fiber optic connection for links up to 20 km.

Features

- Auto-Negotiation [pg 16]
- AutoCross™ [pg 16]
- DIN Rail Mounting and Wall Mount Brackets Included
- Extended (-40°C to 75°C) operating temperature
- Dual Auto-Sensing Redundant DC Power Inputs
- Barrel connector interface cable included for connecting external AC/DC power supply
- Class 1 Div 2 Certified

Specifications

Complete list of fiber optic connector specifications [pg 212-224]

Standards	IEEE Std. 802.3, 802.3u, 802.3x
Status LEDs	**PWR (Power)**: ON = Unit has power connected **PWR 1 (Power)**: ON = primary power connected **PWR 2 (Power)**: ON = backup power connected **Fault**: ON = Power failure or port link failure **LNK/ACT (fiber)**: ON = Link; Flashing = data transmitting **FDX/COL (fiber)**: ON = Full duplex mode; Flashing = collisions occurring **RJ-45 (Ports 1 – 4)**: ON orange = Full duplex mode; Flashing orange = collisions occurring; ON green = UTP link; Flashing green = data transmitting
Dip Switches	**1:** Full Duplex Fiber/Half Duplex Fiber
Data Transfer Rate	**10BASE-T:** 14,880 pps **100BASE-TX:** 148,800 pps
MAC Addresses	1K
Data Memory Buffer	512 Kb
Backplane	1.0 Gbps
Dimensions	**Width**: 1.2" [30 mm] **Depth**: 3.7" [195 mm] **Height**: 5.5" [140 mm]
Ingress Protection	IP 30
Input Power	12 to 48 VDC, 0.2A-0.7A, redundant inputs with reverse polarity protection; Additional barrel connector
Power Consumption	3.3 Watts
Environment	-40 to +75°C Ext. operating temp. 5 – 95% humidity non-condensing 0 – 10,000 ft. altitude -40 to +85°C storage temp.
Shipping Weight	2 lbs. [0.90 kg]
Safety Compliance	UL 60950; UL508; CSA C22.2 no 60950 UL Class 1 Div 2 for hazardous environments
EMI Compliance	CISPR/EN55022; EN60950 Class A; FCC Class A; CE Mark; EN61000-4-2; EN61000-4-3; EN61000-4-4; EN61000-4-5; EN61000-4-6
Environmental Compliance	IEC60068-2-32 (Free fall) IEC60068-2-27 (Shock) IEC60068-2-6 (Vibration)
Warranty	Lifetime

Ordering Information

Complete list of fiber optic connector specifications [pg 212-224]

Extended Operating Temperature: -40°C to +75°C

SISTF1013-241-LRT
(4) 10/100BASE-TX (RJ-45)
[100 m/328 ft.]
to (1) 100BASE-FX 1300nm MM (SC)
[2 km/1.2 mi.] Link Budget: 11.0 dB

SISTF1014-241-LRT
(4) 10/100BASE-TX (RJ-45)
[100 m/328 ft.]
to (1) 100BASE-FX 1310nm SM (SC)
[20 km/12.4 mi.] Link Budget: 17.0 dB

SISTF1011-241-LRT
(4) 10/100BASE-TX (RJ-45)
[100 m/328 ft.]
to (1) 100BASE-FX 1300nm MM (ST)
[2 km/1.2 mi.] Link Budget: 11.0 dB

Optional Accessories *(sold separately)*

External AC/DC Power Supply

SPS-UA12DHT
(100-240 VDC input
0°C to +70°C operating temperature)

25083
Universal AC/DC Input DIN Rail Mountable +12 VDC Power Supply
DC Voltage: 12V; Current Range: 0~2A;
Output Rated Power: 24 Watts
Input Voltage Range: 85~264 VAC;
120~370 VDC
Working Temperature: -20~+60°C

SISTF1040-162D-LRT

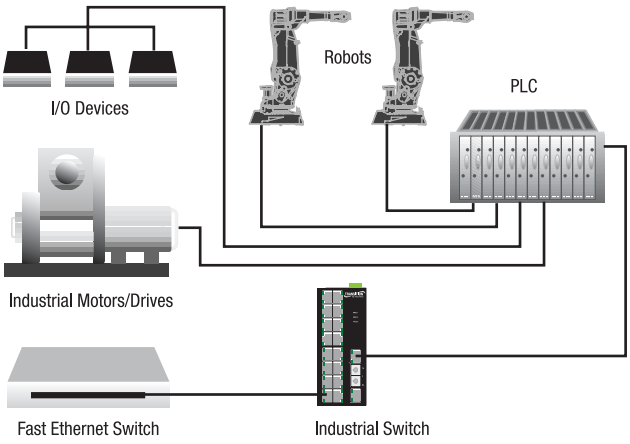
(16) 10/100Base-TX ports + (2) 10/100/1000Base-T or 100/1000Base-X SFP Combo Ports

Transition Networks' Industrial Switches are hardened devices designed to reliably operate in harsh environments such as those found on factory floors, outdoor enclosures or other hazardous environments.

Features

- Auto-Negotiation [pg 16]
- AutoCross™ [pg 16]
- Full Wire Speed Performance with 7 Gbps Backplane
- Combo SFP ports support 100Base-FX and 1000Base-X SFPs
- Combo RJ-45 ports support 10/100/1000Base-T
- Extended (-40°C to 75°C) Operating Temperature
- Dry Contact Relay Alarm Output
- Dual, Redundant, Auto-Sensing 12-48 VDC Power Inputs
- Reverse Polarity Power Input Protection
- Overload Current Protection
- DIN Rail Mounting and Wall Mount Brackets Included

Utilize Ethernet Connectivity in Industrial Automation



Specifications

Complete list of fiber optic connector specifications [pg 212-224]

Standards	IEEE 802.3, IEEE 802.3ab, IEEE 802.3u, IEEE 802.3z, IEEE 802.3x
Data Rate	**Copper (ports 1-16):** 10/100 Mbps **Copper (ports 17-18):** 10/100/1000 Mbps **SFP:** 100/1000 Mbps
Filtering Addresses	8K MAC Addresses
Data Memory Buffer	1 Mb
Backplane	7.2 Gbps
Status LEDs	**PWR 1 (Power):** ON = primary power connected **PWR 2 (Power):** ON = backup power connected **FAULT:** ON = power input failure on PWR1 or PWR2 **LNK/ACT:** ON = Link; FLASHING = data transmitting **FDX/COL:** ON = Full duplex mode; FLASHING = collisions occuring
Dimensions	**W:** 2.8" [72 mm] **D:** 4.1" [105 mm] **H:** 6.0" [152 mm]
Ingress Protection	IP 30
Input Power	12 to 48 VDC; redundant inputs with reverse polarity protection
Power Consumption	9 Watts
Environment	-40 to +75°C extended operating temperature; 5% – 95% humidity non-condensing;0-10,000 ft. altitude -40 to +85°C storage temperature
Shipping Weight	3 lbs. [1.36 kg]
Safety	UL, cUL, CE/EN60950-1
EMI Compliance	CISPR22/EN55022; EN60950 Class A; FCC Class A; CE Mark; CE EN61000-4-2; CE EN61000-4-3; CE EN-61000-4-4; CE EN61000-4-5; CE EN61000-4-6; CE EN61000-4-8; CE EN61000-4-11; CE EN61000-4-12; CE EN61000-6-2; CE EN61000-6-4
Environmental	IEC60068-2-32 (Free fall); IEC60068-2-27 (Shock); IEC60068-2-6 (Vibration)
Warranty	Lifetime

Ordering Information

Complete list of fiber optic connector specifications [pg 212-224]

Extended Operating Temperature
-40°C to +75°C

SISTF1040-162D-LRT
(16) 10/100BASE-TX (RJ-45)
[100 m/328 ft.]
with (2) 10/100/1000BASE-T (RJ-45)
or 100/1000BASE-X SFP Combo ports

Optional Accessories *(sold separately)*

SFP Modules [pg 161-167]

External AC/DC Power Supply

SPS-UA12DHT
(100-240 VDC input
0°C to +70°C operating temperature)

25083
Universal AC/DC Input DIN Rail Mountable
+12 VDC Power Supply

AUTO NEG AUTO CROSS

Class 1 Div 2 Industrial Switch 10/100BASE-TX Managed Industrial

SISTM1040-262E-LRT

(16) 10/100Base-TX ports + (2) 10/100/1000Base-T or 100/1000Base-X SFP Combo Ports

Transition Networks' managed Industrial Switches are hardened devices designed to reliably operate in harsh environments such as those found on factory floors, outdoor enclosures or other hazardous environments.

Features

- Auto-Negotiation [pg 16]
- AutoCross™ [pg 16]
- Full Wire Speed Performance with 7 Gbps Backplane
- Combo SFP ports support 100Base-FX and 1000Base-X SFPs
- 10/100/1000Base-T Combo RJ-45
- Extended (-40°C to 75°C) Operating Temperature
- Dry Contact Relay Alarm Output
- Dual, Redundant, Auto-Sensing 12-48 VDC Power Inputs
- Reverse Polarity Power Input and Overload Current Protection
- DIN Rail Mounting and Wall Mount Brackets Included
- Class 1 Div 2 Certified
- GL Certified for Marine/Shipboard Applications

Specifications

Standards	IEEE 802.3, IEEE 802.3ab, IEEE 802.3u, IEEE 802.3z, IEEE 802.3x
Data Rate	**Copper (ports 1-16):** 10/100 Mbps **Copper (ports 17-18):** 10/100/1000 Mbps **SFP:** 100/1000 Mbps
Filtering Addresses	8K MAC Addresses
Data Memory Buffer	1 Mb
Backplane	7.2 Gbps
Status LEDs	**PWR 1 (Power):** ON = primary power connected **PWR 2 (Power):** ON = backup power connected **FAULT:** ON = power input failure on PWR1 or PWR2 **LNK/ACT:** ON = Link; FLASHING = data transmitting **FDX/COL:** ON = Full duplex mode; FLASHING = collisions occuring
Dimensions	**Width:** 2.8" [72 mm] **Depth:** 4.1" [105 mm] **Height:** 6.0" [152 mm]
Ingress Protection	IP 30
Input Power	12 to 48 VDC; redundant inputs with reverse polarity protection
Power Consumption	9 Watts
Environment	-40 to +75°C extended operating temperature; 5% – 95% humidity non-condensing; 0 – 10,000 ft. altitude -40 to +85°C storage temperature
Shipping Weight	3 lbs. [1.36 kg]
Safety	UL, cUL, CE/EN60950-1, UL Class 1 Div 2 for hazardous environment
EMI Compliance	CISPR22/EN55022; EN60950 Class A; FCC Class A; CE Mark; CE EN61000-4-2; CE EN61000-4-3; CE EN-61000-4-4; CE EN61000-4-5; CE EN61000-4-6; CE EN61000-4-8; CE EN61000-4-11; CE EN61000-4-12; CE EN61000-6-2; CE EN61000-6-4; GL Certified
Environmental	IEC60068-2-32 (Free fall); IEC60068-2-27 (Shock); IEC60068-2-6 (Vibration)
Warranty	Lifetime

Ordering Information

Extended Operating Temperature: -40°C to +75°C

SISTM1040-262E-LRT
(16) 10/100BASE-TX (RJ-45)
[100 m/328 ft.]
with (2) 10/100/1000BASE-T (RJ-45) or 100/1000BASE-X SFP Combo ports

Optional Accessories *(sold separately)*

SFP Modules [pg 161-167]

External AC/DC Power Supply

SPS-UA12DHT
(100-240 VDC input
0°C to +70°C operating temperature)

25083
Universal AC/DC Input DIN Rail Mountable +12 VDC Power Supply

Management Features

VLAN

- Port Based VLAN
- 802.1 Q Tag VLAN

Port Trunk with LACP QoS (Quality of Service)

- IEEE 802.1p Class of Service, Per port provides 4 priority queues
- Port Based, Tag Based and Type of Service Priority

Port Mirror

- Monitor traffic in switched networks

Security

- Port Sercurity : MAC address entries/filter
- IP Security : IP address security management to prevent unauthorized intruder
- Login Security : IEEE802.1X/RADIUS IGMP Query mode for Multi Media Application
- Support multicast filter X-Ring
- Support X-ring, Dual Homing, Couple Ring and Dual Ring Topology. Provide redundant backup feature and recovery time below 20 ms

Management

- SNMP v1 v2c, v3/Web/Telnet/CLI
- DHCP Client/DHCP Server
- TFTP Firmware Upgrade
- TFTP Configuration Backup/Restore

AUTO NEG AUTO CROSS

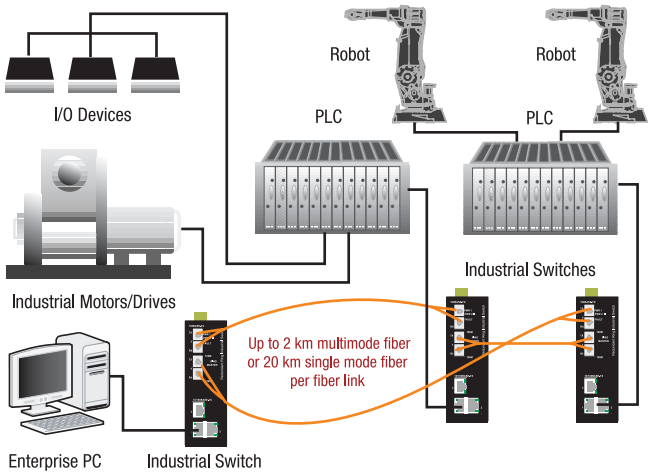
SISTM101x-1xx-LRT

Managed Redundant Industrial Switch

Features

- AutoCross™ [pg 16]
- IEEE 802.1P, 4-level priority queuing
- IGMP Snooping V1 with Query mode
- Auto-Negotiation [pg 16]
- IEEE 802.1Q VLAN capability
- Redundant Ring Switching Technology (recovery time < 300ms)
- SNMP trap and SMTP email trap support
- SNTP Clock Synchronization
- Bandwidth Allocation [pg 18]
- Ingress Packet Filtering
- DHCP Client Support
- Spanning Tree/Rapid Spanning Tree
- TFTP Firmware Update
- Dual Homing Application Support
- Auto-Sensing Redundant DC Power Inputs
- Dry Contact Relays
- System Configuration Restore/Backup
- Extended (-40°C to 75°C) operating temperature
- Barrel connector interface cable included for connecting external AC/DC power supply

Industrial Redundant Ring Topologies



Specifications

Standards	IEEE Std. 802.3, 802.1p, 802.1Q, 802.3u, 802.1d, 802.1w, 802.3x
Status LEDs	**PWR (Power)**: ON = power connected **R.M.**: ON = Device is the Master in the redundant ring network **PWR 1 (Power)**: ON = primary power connected **PWR 2 (Power)**: ON = backup power connected **Fault**: ON = Fault on port link or loss of PWR 1 or PWR 2 **LNK/ACT (Fiber)**: ON = Link on fiber 100 Mbps; Flashing = data transmitting **FDX/COL (Fiber)**: ON = Full duplex link on fiber; Flashing = collisions occurring
Data Transfer Rate	**10BASE-T:** 14,880 pps; **100BASE-TX:** 148,800 pps
MAC Addresses	2K
Max Packet Size	1536 bytes
Data Memory Buffer	1 Mb
Backplane	2.0 Gbps
SNMP MIB	RFC 1213 MIBII, RFC 1493 Bridge MIB, RMON RFC 1757, RFC 2674 VLAN MIB, RFC 1643 Ethernet like MIB, RFC 1215 Trap MIB
Dimensions	**Width**: 2.1" [54 mm] **Depth**: 4.1" [105 mm] **Height**: 5.3" [135 mm]
Ingress Protection	IP 31
Input Power	12 to 48 VDC, 0.2A, redundant inputs with reverse polarity protection; Additional barrel connector cable
Power Consumption	**-180 models:** 4.6 Watts **-162 models:** 6.0 Watts
Environment	-40 to +75°C Ext. operating temp. -40 to +85°C storage temp. 5 – 95% humidity non-condensing 0 – 10,000 ft. altitude
Shipping Weight	2 lbs. [0.90 kg]
Safety Compliance	UL 60950; cUL60950
EMI Compliance	CISPR22/EN55022; EN60950 Class A; FCC Class A; CE Mark; EN61000-4-2; EN61000-4-3; EN61000-4-4; EN61000-4-5; EN61000-4-6
Warranty	Lifetime

Ordering Information

Extended Operating Temperature -40°C to +75°C

SISTM1010-180-LRT
(8) 10/100BASE-TX (RJ-45)
[100 m/328 ft.]

SISTM1011-162-LRT
(6) 10/100BASE-TX (RJ-45)
[100 m/328 ft.]
to (2) 100BASE-FX 1300nm MM (ST)
[2 km/1.2 mi.] Link Budget: 11.0 dB

SISTM1013-162-LRT
(6) 10/100BASE-TX (RJ-45)
[100 m/328 ft.]
to (2) 100BASE-FX 1300nm MM (SC)
[2 km/1.2 mi.] Link Budget: 11.0 dB

SISTM1014-162-LRT
(6) 10/100BASE-TX (RJ-45)
[100 m/328 ft.]
to (2) 100BASE-FX 1310nm SM (SC)
[20 km/12.4 mi.] Link Budget: 17.0 dB

Optional Accessories *(sold separately)*

External AC/DC Power Supply

SPS-UA12DHT
(100-240 VDC input
0°C to +70°C operating temperature)

25083
Universal AC/DC Input DIN Rail Mountable +12 VDC Power Supply

Incorporate Redundant Ring technology into your industrial automation network to increase reliability and system uptime. Critical communication needs can now be protected using redundant copper or fiber links with switching recovery times of less than 300ms. These 8-port switches can be SNMP managed via web browser to configure all of the latest advanced industrial networking capability including IGMP snooping, VLANs, QoS, port mirroring and trunking.

Transition Networks' Industrial Switches are hardened devices designed to reliably operate in harsh environments such as those found on factory floors, outdoor enclosures or other hazardous environments.

NEW PRODUCT

SISGM1040-244-LRT

(4) 10/100/1000Base-T + (4) 100/1000 SFP Managed Industrial Switch

Transition's Industrial Managed Switches with Class 1 Div 2 Certification are hardened devices designed to reliably operate in harsh environments such as those found on factory floors, outdoor enclosures, oil and gas refining, chemical plants or other hazardous environments. Full management features include support for redundant rings,VLANs, IGMP, SNMP, Web, Telnet, and CLI.

Features

- Back-plane switch fabric: 16 Gbps
- 1 Mbits Packet Buffer
- SFP ports support 100/1000 Dual Mode
- Store-and-Forward Switching Architecture with 8K MAC Address Table
- Extended (-40°C to 75°C) operating temperature
- Dry Contact Relay Alarm Output
- Wide-range Redundant Power Design
- X-Ring and RSTP Redundancy
- DIN Rail Mounting and Wall Mount Brackets
- Barrel connector interface cable for external AC/DC power supply
- Class 1 Div 2 Certified

Specifications

Standards	IEEE802.3, IEEE802.3u, IEEE802.3ab, IEEE802.3z, IEEE802.3x, IEEE802.3ad, IEEE802.1d, IEEE802.1p, IEEE802.1Q, IEEE802.1x
Status LEDs	**PWR 1 (Power),** **PWR 2 (Power):** P-Fail, **Master, per port: LNK/ACT**
Data Transfer Rate	**Copper:** 10/100/1000 Mbps, 14,880 pps/148,800 pps
Dimensions	**Width:** 2.34" [59.6 mm]; **Depth:** 4.13" [105 mm]; **Height:** 5.98" [152 mm]
Power Consumption	13 Watts
Input Power	12 - 48 VDC; 24 VAC (18~30 VAC) redundant power with reverse polarity protection and removable terminal block
Environment	-40 to +75°C Ext. operating temp. 5%– 95% humidity non-condensing 0 – 10,000 feet altitude -40 to +85°C storage temp.
Shipping Weight	TBD
Safety Compliance	UL508, Class 1 Div 2
Regulatory Compliance	CE FCC Class A; CE Mark;CE EN61000-4-2; CE EN61000-4-3; CE EN-61000-4-4; CE EN61000- 4-5; CE EN61000-4-6; CE EN61000-4-8; CE EN61000-4-11; CE EN61000-3-2; CE EN61000-3-3; CE EN61000-6-2; CE EN61000-6-4
Warranty	Lifetime

Ordering Information

SISGM1040-244-LRT
(4) 10/100/1000Base-T
\+ (4) 100/1000 SFP Managed Industrial Switch

Optional Accessories *(sold separately)*

External AC/DC Power Supply
25083
Universal AC/DC Input DIN Rail Mountable +12 VDC Power Supply

More Features

Port Trunk with LACP QoS (Quality of Service)

- IEEE 802.1p Class of Service, Per port provides 4 priority queues
- Port Based, Tag Based and Type of Service Priority

Port Mirror

- Monitor traffic in switched networks.

Security

- Port Sercurity : MAC address entries/filter
- IP Security : IP address security management to prevent unauthorized intruder
- Login Security : IEEE802.1X/RADIUS IGMP Query mode for Multi Media Application
- Support multicast filter X-Ring
- Support X-ring, Dual Homing, Couple Ring and Dual Ring Topology. Provide redundant backup feature and recovery time below 20 ms

Management

- SNMP v1 v2c, v3/Web/Telnet/CLI
- DHCP Client/DHCP Server
- TFTP Firmware Upgrade
- TFTP Configuration Backup/Restore

SISGM1040-262x-LR(x)

(6) 10/100/1000Base-T + (2) Combo Ports 10/100/1000Base-T or 100/1000Base-X SFP

Transition Networks' Industrial Switches are hardened devices designed to reliably operate in harsh environments such as those found on factory floors, outdoor enclosures or other hazardous environments.

Features

- Dinrail Connector
- Barrel Connector
- Class 1 Div 2 Certified

System Interface/Performance

- AutoCross™ (Auto MDI/MDI-X) [pg 16]
- SFP ports support 100/1000Base-X Dual Speed
- Store-and-Forward Switching Architecture
- Back-plane (Switching Fabric): 16 Gbps
- 1 Mbits Packet Buffer
- 8K MAC Address Table

Power Supply

- Dual, Redundant, Auto-sensing Power Supply Inputs
- Power Polarity Reverse Protect
- Overload Current Protection
- Dry Contact Relay Output

VLAN

- Port Based VLAN
- 802.1 Q Tag VLAN
- GVRP
- Private VLAN

SISGM1040-262E-LRT

- SFP supports DMI function which can monitor the fiber status more efficiently

Specifications

	SISGM1040-262D-LR	SISGM1040-262E-LRT
Standards	IEEE 802.3 10Base-T Ethernet; IEEE 802.3u 100Base-TX/FX; IEEE802.3ab 1000Base-T; IEEE802.3z Gigabit fiber; IEEE802.3x Flow Control and Back Pressure; IEEE802.3ad Port trunk with LACP; IEEE802.1d Spanning Tree/IEEE802.1w Rapid Spanning Tree; IEEE802.1p Class of Service; IEEE802.1Q VLAN Tag; IEEE 802.1x User Authentication (Radius); IEEE802.1ab LLDP	
Switch Architecture	Back-plane (Switching Fabric): 16 Gbps Packet throughput ability (Full-Duplex): 23.8M pps @ 64 bytes	
Transfer Rate	14,880 pps for Ethernet port; 148,800 pps for Fast Ethernet port 1,488,000 pps for Gigabit Ethernet port	
Packet Buffer	1 Mbits	
MAC address	8K MAC address table	
Flash ROM	4 Mbytes	
DRAM	32 Mbytes	
Connector	10/100/1000T: 6 x RJ-45 10/100/1000T: 2 x RJ-45 SFP Combo ports: 2 x 100/1000 SFP RS-232 connector: RJ-45 type	
Protocol	CSMA/CD	
LED	Per unit: Power (Green), Power 1 (Green), Power 2 (Green), Fault (Red), Master (Green), Full duplex/Collision (Yellow) SFP port: LNK/ACT(Green), 1000T: LNK/ACT(Green), 1000M(Green)	
Power Supply	DC12-48V, Redundant Power and Removable Terminal Block	**SISGM1040-262E-LRT:** also, 18~30 VAC
Power Consumption	**SISGM1040-262D-LR:**18 Watts	**SISGM1040-262E-LRT:** 15.12 Watts @ 12VDC 13.3 Watts @ 24 VAC
Operating Humidity	5% to 95% (Non-condensing)	
Operating Temperature	**SISGM1040-262D-LR:** -10˚C ~ 60˚C	**SISGM1040-262E-LRT:** -40 ~ 75˚C
Storage Temperature	-40˚C to 85˚C	
Case Dimension	**SISGM1040-262D-LR:** **Width:** 2.8" [72 mm]; **Depth:** 4.1" [105 mm]; **Height:** 5.9" [152 mm]	**SISGM1040-262E-LRT:** **Width:** 5.9" [152 mm]; **Depth:** 2.3" [59.6 mm]; **Height:** 4.1" [105 mm]
Ingress Protection	IP-30	
Installation	DIN rail bracket installed/wall mount brackets included	
EMI	FCC Class A, CE EN61000-4-2, CE EN61000-4-3, CE EN-61000-4-4, CE EN61000-4-5,CE EN61000-4-6, CE EN61000-4-8, CE EN61000-4-11, CE EN61000-4-12, CE EN61000-6-2, CE EN61000-6-4	
Safety	UL, cUL, Class 1 Div 2 for hazardous environments	**SISGM1040-262D-LR only:** CE/EN60950-1
Stability Testing	IEC60068-2-32 (Free fall), IEC60068-2-27 (Shock), IEC60068-2-6 (Vibration)	
Shipping Weight	4.0 lbs	
Warranty	Lifetime	

Ordering Information

Operating Temperature -10° to +50°C

SISGM1040-262D-LR
(6) 10/100/1000BASE-T
+ (2) Combo Ports 10/100/1000BASE-T
or 100/1000BASE-X SFP

Extended Operating Temperature -40° to +75°C

SISGM1040-262E-LRT
(6) 10/100/1000BASE-T
+ (2) Combo Ports 10/100/1000BASE-T
or 100/1000BASE-X SF

Optional Accessories *(sold separately)*

SFP Modules [pg 161-167]

Industrial Power Supply

25083
Universal AC/DC Input DIN Rail Mountable
+12 VDC Power Supply

More Features

Port Trunk with LACP

QoS (Quality of Service)

- IEEE 802.1p Class of Service, Per port provides 4 priority queues
- Port Based, Tag Based and Type of Service Priority

Port Mirror

- Monitor traffic in switched networks

Security

- Port Sercurity : MAC address entries/filter
- IP Security : IP address security management to prevent unauthorized intruder
- Login Security : IEEE802.1X/RADIUS IGMP Query mode for Multi Media Application
- Support multicast filter X-Ring
- Support X-ring, Dual Homing, Couple Ring and Dual Ring Topology. Provide redundant backup feature and recovery time below 20 ms

Management

- SNMP v1 v2c, v3/Web/Telnet/CLI
- DHCP Client/DHCP Server
- TFTP Firmware Upgrade
- TFTP Configuration Backup/Restore

AUTO NEG AUTO CROSS

Industrial Power-over-Ethernet (PoE) Switch Managed

Industrial

SISPM1040-182D-LRT

(8) 10/100Base-TX ports w/PoE + (2) 10/100/1000Base-T or 100/1000Base-X SFP Combo Ports

Transition Networks' Industrial Switches are hardened devices designed to reliably operate in harsh environments such as those found on factory floors, outdoor enclosures or other hazardous environments.

Features

- DIN rail Connector
- Barrel Connector

System Interface/Performance

- AutoCross™ (Auto MDI/MDI-X) [pg 16]
- IEEE802.3af POE on (8) 10/100TX ports
- SFP ports support 100/1000Base-X Dual Speed
- Store-and-Forward Switching Architecture
- Back-plane (Switching Fabric): 16 Gbps
- 1Mbits Packet Buffer
- 8K MAC Address Table

Power Supply

- Dual, Redundant, Auto-sensing Power Supply Inputs
- Power Polarity Reverse Protect
- Overload Current Protection
- Dry Contact Relay Output

VLAN

- Port Based VLAN
- 802.1 Q Tag VLAN
- GVRP

Specifications

Standards	IEEE 802.3 10Base-T Ethernet; IEEE 802.3u 100Base-TX/FX; IEEE802.3ab 1000Base-T; IEEE802.3z Gigabit fiber; IEEE802.3x Flow Control and Back Pressure; IEEE802.3ad Port trunk with LACP; IEEE802.3af Power over Ethernet; IEEE802.1d Spanning Tree/IEEE802.1w Rapid Spanning Tree; IEEE802.1p Class of Service; IEEE802.1Q VLAN Tag; IEEE 802.1x User Authentication (Radius); IEEE802.1ab LLDP
Switch Architecture	Back-plane (Switching Fabric): 5.6 Gbps Packet throughput ability (Full-Duplex): 8.3M pps@64 bytes
Transfer Rate	14,880 pps for Ethernet port 148,800 pps for Fast Ethernet port 1,488,000 pps for Gigabit Ethernet port
Packet Buffer	1 Mbits
MAC address	8K MAC address table
Flash ROM	4 Mb
DRAM	32 Mb
Connector	10/100TX: 8 x RJ-45 10/100/1000T: 2 x RJ-45 SFP Combo ports: 2 x 100/1000 SFP RS-232 connector: RJ-45 type
PoE Pin Assignment	RJ-45 port # 1~# 8 support IEEE 802.3af End-point, Alternative A mode. Per port provides 15.4W ability. Positive (VCC+): RJ-45 pin 1,2. Negative (VCC-): RJ-45 pin 3,6.
Protocol	CSMA/CD
LED	Per unit: Power (Green), Power 1 (Green), Power 2 (Green), Fault (Red), Master (Green), FWD (Green) 8 port 10/100: Link/Activity (Green), Full duplex/Collision (Yellow) SFP port: LNK/ACT(Green), 1000T: LNK/ACT(Green), 1000M(Green)
Power Supply	External Power Supply: DC 48V, Redundant power DC 48V, removable terminal block
Power Consumption	136 Watts (Full Load)
Operating Humidity	5% to 95% (Non-condensing)
Operating Temperature	Wide Operating Temperature (-40˚C ~ 65˚C)
Storage Temperature	-40˚C to 85˚C
Case Dimension	**Width:** 2.8" [72 mm]; **Depth:** 4.1" [105 mm]; **Height:** 5.9" [152 mm]
Ingress Protection	IP-30
Installation	DIN rail bracket installed/Wall Mount Brackets included
EMI	FCC Class A, CE EN61000-4-2, CE EN61000-4-3, CE EN-61000-4-4, CE EN61000-4-5,CE EN61000-4-6, CE EN61000-4-8, CE EN61000-4-11, CE EN61000-4-12, CE EN61000-6-2, CE EN61000-6-4
Safety	UL, cUL, CE/EN60950-1
Stability Testing	IEC60068-2-32 (Free fall), IEC60068-2-27 (Shock), IEC60068-2-6 (Vibration)
Shipping Weight	4.0 lbs.
Warranty	Lifetime

Ordering Information

Extended Operating Temperature
-40°C to +65°C

SISPM1040-182D-LRT
(8) 10/100BASE-TX (RJ-45)
[100 m/328 ft.]
with (2) 10/100/1000BASE-T (RJ-45) or 100/1000BASE-X SFP Combo ports

Optional Accessories *(sold separately)*

SFP Modules [pg 161-167]

Industrial Power Supply

25080
48 VDC Industrial Power Supply

More Features

Port Trunk with LACP QoS (Quality of Service)

- IEEE 802.1p Class of Service,
- Per port provides 4 priority queues
- Port Based, Tag Based and Type of Service Priority

Port Mirror

- Monitor traffic in switched networks

Security

- Port Sercurity : MAC address entries/filter
- IP Security: Supports 10 IP addresses that have permission to access the switch management and to prevent unauthorized intruder

IGMP

- Query mode for Multi Media Application
- Support multicast filter

X-Ring

- Support X-ring, Dual Homing, Couple Ring and Dual Ring Topology. Provide redundant backup feature and recovery time below 20ms

Management

- SNMP v1 v2c, v3/Web/Telnet/CLI

AUTO NEG AUTO CROSS

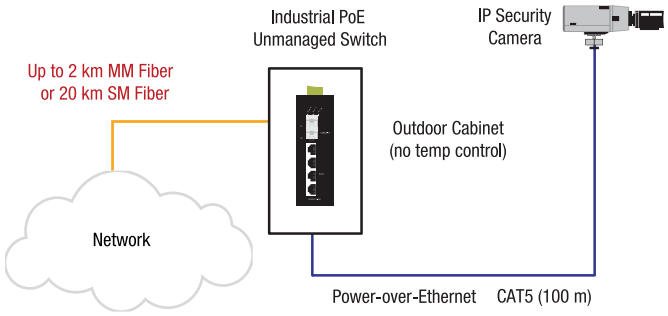
Industrial Power-over-Ethernet (PoE) Switch 10/100BASE-TX to 100BASE-FX Unmanaged

Industrial

SISTP10xx-141-LRT

10/100Base-TX to 100Base-FX Unmanaged
(4) 10/100Base-TX PoE ports to (1) 100Base-FX Port

PoE to Remotely Located Devices in Harsh Environments



Features

- Auto-Negotiation [pg 16]
- AutoCross™ [pg 16]
- Full Wire Speed Performance with 1 Gbps Backplane
- 4-port integrated PoE injector with full 15.4 Watts per port on data pairs
- IEEE 802.3af Power-over-Ethernet Compliant
- Extended (-40°C to 65°C) operating temperature
- Dry Contact Relay Alarm Output
- Dual, Redundant 48 VDC Power Inputs
- Reverse Polarity Power Input Protection
- Overload Current Protection
- DIN Rail Mounting and Wall Mount Brackets Included
- Barrel Connector

Specifications

Complete list of fiber optic connector specifications [pg 212-224]

Standards	IEEE 802.3, IEEE 802.3af, IEEE 802.3u, IEEE 802.3x
Data Rate	**Copper:** 10/100 Mbps **Fiber:** 100 Mbps
Filtering Addresses	1K MAC Addresses
Back Plane	1.0 Gbps
Status LEDs	**PWR 1 (Power):** ON = primary power connected **PWR 2 (Power):** ON = backup power connected **FAULT:** ON = power input failure on PWR1 or PWR2 **PWR FWD (ports 1-4):** ON = PoE power output **LNK/ACT (ports 1-5):** ON = Link; FLASHING = data transmitting **FDX/COL (ports 1-4):** ON = Full duplex mode; FLASHING = collisions occuring
Dimensions	**W**: 1.2" [30 mm] **D**: 3.7" [95 mm] **H**: 5.5" [140 mm]
Ingress Protection	IP30
Input Power	48 VDC; redundant inputs
Power Consumption	4.6 Watts (without PoE); 66 Watts (Full load with PoE)
Environment Compliance	-40 to +65°C Ext. operating temp. 5%– 95% humidity non-condensing 0 – 10,000 ft. altitude -40 to +85°C storage temp.
Shipping Weight	1.4 lbs. [0.64 kg]
Safety	UL, cUL, CE/EN60950-1
EMI	CISPR22/EN55022; EN60950 Class A; FCC Class A; CE Mark;CE EN61000-4-2; CE EN61000-4-3; CE EN-61000-4-4; CE EN61000-4-5; CE EN61000-4-6; CE EN61000-4-8; CE EN61000-4-11; CE EN61000-4-12; CE EN61000-6-2; CE EN61000-6-4
Environmental	IEC60068-2-32 (Free fall); IEC60068-2-27 (Shock); IEC60068-2-6 (Vibration)
Warranty	Lifetime

Ordering Information

Complete list of fiber optic connector specifications [pg 212-224]

Extended Operating Temperature
-40°C to +65°C

SISTP1011-141-LRT
(4) 10/100BASE-TX (RJ-45)
[100 m/328 ft.]
to 100BASE-FX 1300nm MM (ST)
[2 km/1.2 mi.] Link Budget: 11.0 dB

SISTP1013-141-LRT
(4) 10/100BASE-TX (RJ-45)
[100 m/328 ft.]
to 100BASE-FX 1300nm MM (SC)
[2 km/1.2 mi.] Link Budget: 11.0 dB

SISTP1014-141-LRT
(4) 10/100BASE-TX (RJ-45)
[100 m/328 ft.]
to 100BASE-FX 1310nm SM (SC)
[20 km/12.4 mi.] Link Budget: 17.0 dB

Optional Accessories *(sold separately)*

Industrial Power Supply
25080
48 VDC Industrial Power Supply

Transition's Industrial PoE switches are Power Sourcing Equipment (PSE) devices that comply with the IEEE802.3af 2003 standard and combine data received over a fiber optic link with -48 VDC power; providing power to Powered Devices (PD) over unshielded twisted pair cabling. These Industrial PoE Switches are hardened devices designed to reliably operate in harsh environments such as those found on factory floors, outdoor enclosures or other hazardous environments while providing all the benefits of PoE power.

Class 1 Div 2 Industrial Media Converter 10/100/1000BASE-T to 1000BASE-X Unmanaged

SISTG10xx-211-LRT

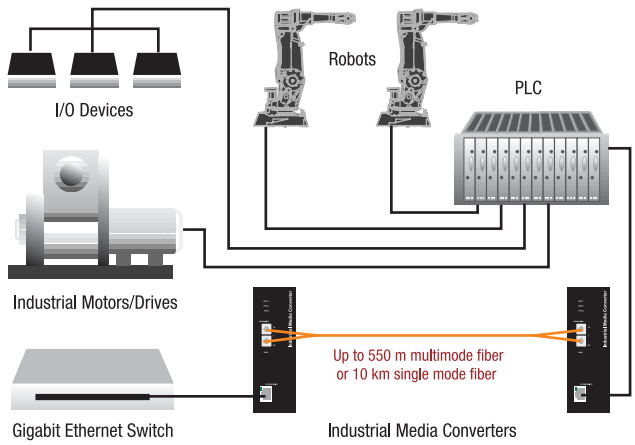
10/100/1000Base-T to 1000Base-X Unmanaged (1) 10/100/1000Base-T port to (1) 1000Base-X Port

Transition Networks' Industrial Media Converters are hardened devices designed to reliably operate in harsh environments such as those found on factory floors, outdoor enclosures or other hazardous environments.

Features

- Auto-Negotiation [pg 16]
- AutoCross™ [pg 16]
- Link Pass Through [pg 17]
- Extended (-40°C to 75°C) operating temperature
- Dry Contact Relay Alarm Output
- Dual, Redundant, Auto-Sensing 12-48 VDC Power Inputs
- Reverse Polarity Power Input Protection
- Overload Current Protection
- DIN Rail Mounting and Wall Mount Brackets Included
- Barrel connector interface cable included for connecting external AC/DC power supply
- Class 1 Div 2 Certified

Extend Network Distance in Industrial Applications



Specifications

Complete list of fiber optic connector specifications [pg 212-224]

Standards	IEEE 802.3, IEEE 802.3ab, IEEE 802.3u,IEEE 802.3x, IEEE 802.3z
Data Rate	**Copper:** 10/100/1000 Mbps **Fiber:** 1000 Mbps **SFP:** 1000 Mbps
Status LEDs	**PWR 1 (Power):** ON = primary power connected **PWR 2 (Power):** ON = backup power connected **FAULT:** ON = power input failure on PWR1 or PWR2 **1000M (port 1):** ON = Linked at 1000 Mbps **LNK/ACT (ports 1-2):** ON = Link; FLASHING = data transmitting
Dip Switches	**1:** Enable/Disable Power Alarm **2:** Enable/Disable Link Pass Through
Dimensions	**W**: 1.2" [30 mm] **D**: 3.7" [95 mm] **H**: 5.5" [140 mm]
Ingress Protection	IP30
Input Power	12 to 48 VDC, 0.2A-0.5A, redundant inputs with reverse polarity protection; Additional barrel connector
Power Consumption	5.3 Watts
Environment	-40 to +65°C Ext. operating temp. 5%– 95% humidity non-condensing 0 – 10,000 ft. altitude -40 to +85°C storage temp.
Shipping Weight	1.3 lbs. [0.59 kg]
Safety	UL, cUL, CE/EN60950-1; Class 1 Div 2 for hazardous environments
EMI	CISPR22/EN55022; EN60950 Class A; FCC Class A; CE Mark;CE EN61000-4-2; CE EN61000-4-3; CE EN-61000-4-4; CE EN61000-4-5; CE EN61000-4-6; CE EN61000-4-8; CE EN61000-4-11; CE EN61000-4-12; CE EN61000-6-2; CE EN61000-6-4
Environment Compliance	IEC60068-2-32 (Free fall); IEC60068-2-27 (Shock); I EC60068-2-6 (Vibration)
Warranty	Lifetime

Ordering Information

Complete list of fiber optic connector specifications [pg 212-224]

Extended Operating Temperature -40°C to +65°C

SISTG1013-211-LRT
10/100/1000BASE-T (RJ-45)
[100 m/328 ft.]
to 1000BASE-SX 850nm MM (SC)
[62.5/125 µm: 220 m/722 ft.]
Link Budget: 7.0 dB
[50/125µm: 550 m/1804 ft.]
Link Budget: 10.0 dB

SISTG1014-211-LRT
10/100/1000BASE-T (RJ-45)
[100 m/328 ft.]
to 1000BASE-LX 1310nm SM (SC)
[10 km/6.2 mi.] Link Budget: 10.5 dB

SISTG1040-211-LRT
10/100/1000BASE-T (RJ-45)
[100 m/328 ft.]
to 1000BASE-X SFP slot (empty)

Optional Accessories *(sold separately)*

SFP Modules [pg 161-167]

External AC/DC Power Supply:

SPS-UA12DHT
(100-240 VDC input
0°C to +70°C operating temperature)

25083
Universal AC/DC Input DIN Rail Mountable +12 VDC Power Supply

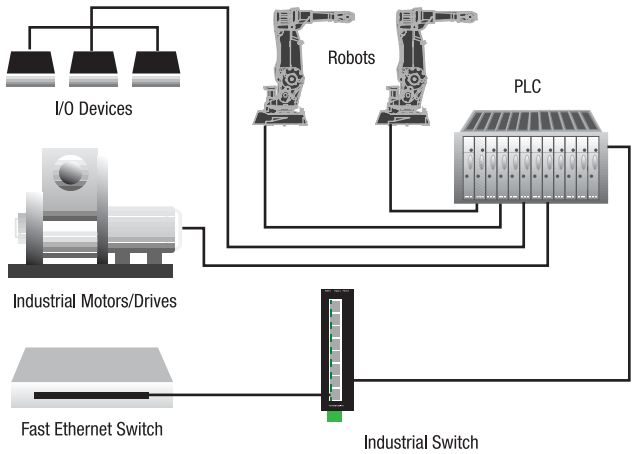
SISTF1010-2x0-LRT

Industrial Class 1 Div 2 Certified Switch

Features

- Auto-Negotiation [pg 16]
- AutoCross™ [pg 16]
- Store-and-Forward Switching Architecture with MAC Address Table
- Extended (-40°C to 75°C) operating temperature
- Dry Contact Relay Alarm Output
- Dual, Redundant DC Power Inputs
- DIN Rail Mounting and Wall Mount Brackets Included
- Reverse Polarity Power Input Protection
- Overload Current Protection
- DIN Rail Mounting and Wall Mount Brackets Included
- Barrel connector interface cable included for connecting external AC/DC power supply
- Class 1 Div 2 Certified

Utilize Ethernet Connectivity in Industrial Automation



Specifications

Standards	IEEE 802.3, IEEE 802.3u, IEEE 802.3x
Data Transfer Rate	**Copper:** 10/100 Mbps, 14,880 pps/148,800 pps
Filtering Addresses	2K MAC Address Table
Backplane	**-250 model:** 1.0 Gbps **-280 model:** 1.6 Gbps
Status LEDs	**PWR 1 (Power):** ON = primary power connected **PWR 2 (Power):** ON = backup power connected FAULT, per port: LNK/ACT, FDX/COL
Dimensions	**Width:** 1.2" [30 mm] **Depth:** 3.7" [95 mm] **Height:** 5.5" [140 mm]
Ingress Protection	IP 30
Input Power	12 - 48 VDC; redundant power with reverse polarity protection and removable terminal block
Overload Current Protection	Present
Power Consumption	**-250 models:** 2.93 Watts **-280 models:** 4.71 Watts
Environment	-40 to +75°C Ext. operating temp. 5%– 95% humidity non-condensing 0 – 10,000 ft. altitude -40 to +85°C storage temp.
Shipping Weight	1.4 lbs. [0.64 kg]
Safety Compliance	UL, cUL, CE/EN60950-1 UL Class 1 Div 2 for hazardous environments
EMI Compliance	CISPR22/EN55022; EN60950 Class A; FCC Class A; CE Mark;CE EN61000-4-2; CE EN61000-4-3; CE EN-61000-4-4; CE EN61000- 4-5; CE EN61000-4-6; CE EN61000-4-8; CE EN61000-4-11; CE EN61000-4-12; CE EN61000-6-2; CE EN61000-6-4
Environmental Compliance	IEC60068-2-32 (Free fall); IEC60068-2-27 (Shock); IEC60068-2-6 (Vibration); IEC60068-2-3, IEC60068-2-30, IEC60068-2-31
Warranty	Lifetime

Ordering Information

Extended Operating Temperature
-40°C to +75°C

SISTF1010-250-LRT (extended temp)
(5) 10/100BASE-TX (RJ-45)
[100 m/328 ft.]

SISTF1010-280-LRT (extended temp)
(8) 10/100BASE-TX (RJ-45)
[100 m/328 ft.]

Optional Accessories *(sold separately)*

External AC/DC Power Supply

SPS-UA12DHT
(100-240 VDC input
0°C to +70°C operating temperature)

25083
Universal AC/DC Input DIN Rail Mountable
+12 VDC Power Supply

Industrial Switch Certified for use in Hazardous Locations

Transition's Industrial Switches with Class 1 Div 2 Certification are hardened devices designed to reliably operate in harsh environments such as those found on factory floors, outdoor enclosures, oil and gas refining, chemical plants or other hazardous environments.

SDSFE3110-120

Remotely Managed Device Server

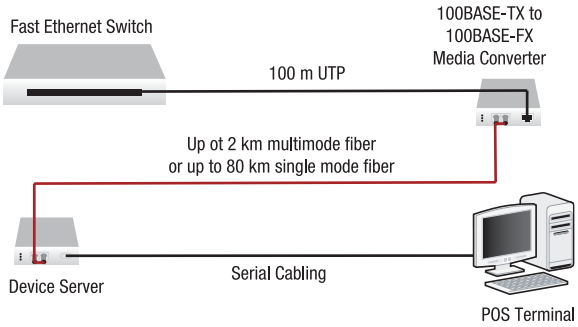
Transition Networks' Device Servers provide a serial-to-Ethernet conversion to enable customers to integrate any legacy serial-based device into their Ethernet networks.

Network-enable serial based devices quickly and cost-effectively with these serial-to-Ethernet device servers. The device server can connect to RS-232, RS-422 or RS-485 serial ports and provides a 10/100BASE-TX or 100BASE-FX Ethernet fiber optic connection for links up to 80 km.

Features

- AutoCross™ **(RJ-45 model only)** [pg 16]
- Auto-Negotiation **(RJ-45 model only)** [pg 16]
- Remote Management [pg 17]
- Supports asynchronous serial data rates up to 115 Kbps
- Supports RS-232, 4-wire RS-422 or 2/4-wire RS485 operation
- Control up to 4,096 virtual COM ports from one PC
- DIN Rail Mounting Brackets included

Network Enable Serial Devices



Specifications

Complete list of fiber optic connector specifications [pg 212-224]

Standards	EIA/TIA RS-232/422/485, EIA/TIA-574, IEEE Std. 802.3
Data Rate	**Serial:** 115 Kbps **RJ-45:** 10/100 Mbps **Fiber:** 100 Mbps
Drivers	Windows 95, 98, ME, 2000, 2003, XP, NT 4.0 Microsoft NT/2000/2003 Terminal Server
Switches	**Switch 1:** ON = console serial port (RS-232); OFF = data serial port **Switch 2:** RS-232 mode on/off **Switch 3:** RS-422/485 (4-wire) mode on/off **Switch 4:** RS-485 (2-wire) mode on/off **Switch 7:** Termination resistor on/off
Status LEDs	**PWR (Power):** ON = power connected **100 (RJ-45):** ON = Link at 100 Mbps **LNK/ACT (RJ-45):** ON = UTP link; FLASHING = activity **LNK/ACT (Fiber):** ON = fiber link; FLASHING = activity **POST:** ON = Power On Self Test successful **ACT (serial):** ON = Serial link FLASHING = activity
Dimensions	**Width:** 3.5" [90 mm] **Depth:** 4.3" [109 mm] **Height:** 1.3" [32 mm]
Input Power	External AC/DC; 9 to 32 VDC, 0.8A
Environment	0 to +50°C std. Operating temp. 5 – 90% humidity non-condensing; 0 – 10,000 ft. altitude
Shipping Weight	2 lb. [0.90 kg]
Compliance	CISPR22/EN55022 Class A + EN55024; EN60950 Class A; FCC Class A; CE Mark
Warranty	Lifetime

Ordering Information

Complete list of fiber optic connector specifications [pg 212-224]

SDSFE3110-120
DB-9 **[15 m/49 ft.]***
to RJ-45 [100 m/328 ft.]

*Max. distance on the serial port is dependent on protocol:

15 m/49 ft. (RS-232)
1.2 km/0.7 mi. (RS-422/485)

E-TBT-MC05

Ethernet AUI to RJ-45 Transceiver

Ethernet AUI to RJ-45 Transceiver

This Attachment Unit Interface (AUI) transceiver provides a method for connecting a workstation, or any other device with an AUI port, to twisted pair cabling in a 10BASE-T network. Devices with AUI ports could include: servers, hubs, bridges and routers. The E-TBT-MC05 transceiver allows twisted pair, UTP or STP, to be connected to these AUI ports.

Features

- Provides a complete interface of the AUI to Ethernet UTP cable
- Supports data transfer rate of 10 Mbps
- CSMA/CD access mechanism
- Capable of driving the UTP cable segment up to 100 m (328 ft.) without the use of a repeater
- Selectable Link test and SQE test functions
- AUI locking post design allows the E-TBT-MC05 to directly attach to a host's AUI connector
- Can be used with or without an AUI cable
- LED indicators for network monitoring and diagnosing
- The RJ-45 port will automatically detect and reverse the polarity on the receive pair if needed

Specifications

Standards	IEEE Std. 802.3 10BASE-T
Status LEDs	**COL:** Blinks when detecting collisions **STAT:** Solid Green: UTP Link established; Blinks Green: No UTP Link; 4-Blink Pattern: Polarity reversal detected on UTP cable **TX:** Blinks when transmitting data on the RJ-45 **RX:** Blinks when receiving data on the RJ-45
Switches	**SW1:** SQE Test: UP is enabled **SW2:** Link Test: UP is enabled **SW3:** Half or Full-Duplex: UP is for Half, Down is for Full
Dimensions	**Width:** 3.1" [79 mm] **Depth:** 0.8" [20 mm] **Height:** 1.7" [43 mm]
Power	No external power required
Input Voltage	10.2 to 15.75 VDC
Input Current	250mA@12 VDC
Power Consumption	Not to exceed 75mA@12 VDC
Environment	0 – 50°C, 5% – 95% humidity non-condensing, 0 – 10,000 ft. altitude
Shipping Weight	1 lb. [0.45 kg]
Compliance	FCC & CISPR Class A, CE Mark
Warranty	Lifetime

Ordering Information

E-TBT-MC05
10BASE5 (AUI) dB-15 male
[50 m/164 ft.]
to 10BASE-T (RJ-45)
[100 m/328 ft.]

E-FRL-MC05(xx)

Ethernet AUI to Fiber

The Full/Half-Duplex 10BASE-FL Transceiver provides low cost network migration options. Extend connection distances between hubs and workstations by incorporating fiber optic technology into your network.

Features

- Link Pass Through [pg 17]

Both multimode and single mode transceivers connect AUI male (DB-15) nodes to a fiber optic medium via a standard ST type connector in both full and half-duplex modes. The ability to operate in full-duplex mode allows for operation between switches, routers and servers using full-duplex Ethernet.

Specifications

Complete list of fiber optic connector specifications [pg 212-224]

Standards	IEEE Std. 802.3
Status LEDs	**COL:** Flashing or Solid: Collisions are occuring **STAT:** Solid: normal operation; Blinks once: Link down; Blinks twice: AUI packets are too long (local jabber); Off: no connection to external power **TX:** Blinking or Solid: a packet has been transmitted **RX:** Blinking or Solid: packets are being received
Switches	**SW1:** On/Off selectable SQE testing for NICs and hubs that support SQE **SW2:** Link Pass Through On/Off control **SW3:**Half/Full-duplex mode control
Dimensions	**Width:** 1.65" [42 mm] **Depth:** 3.8" [95 mm] **Height:** 0.94" [24 mm]
Power	No external power required
Environment	0 – 40°C, 10% – 90% humidity non-condensing, 0 – 10,000 ft. altitude
Shipping Weight	1 lb. [0.45 kg]
Compliance	FCC & CISPR Class A, CE Mark
Warranty	Lifetime

Ordering Information

Complete list of fiber optic connector specifications [pg 212-224]

E-FRL-MC05
10BASE5 (AUI) dB-15 male
[50 m/164 ft.]
to 10BASE-FL 850nm multimode (ST)
[2 km/1.2 mi.] Link Budget: 10.5 dB

E-FRL-MC05(SC)
10BASE5 (AUI) dB-15 male
[50 m/164 ft.]
to 10BASE-FL 850nm multimode (SC)
[2 km/1.2 mi.] Link Budget: 10.5 dB

E-FRL-MC05(L)
10BASE5 (AUI) dB-15 male
[50 m/164 ft.]
to 10BASE-FL 850nm multimode (ST)
[5 km/3.1 mi.] Link Budget: 10.5 dB

E-FRL-MC05(SM)
10BASE5 (AUI) dB-15 male
[50 m/164 ft.]
to 10BASE-FL 850nm single mode (ST)
[20 km/12.4 mi.] Link Budget: 5.0 dB

ION Chassis

A Third Generation Chassis From Transition Networks

The ION219-A is an all new intelligent, high-density, multi-protocol system supporting a variety of network interface devices. Designed for both carrier class and enterprise network applications where multiple points of fiber integration and secure network management of the fiber interface devices is essential. An end-to-end fiber integration solution can be achieve by pairing the modules in a high density ION chassis with the modules in another ION chassis, an ION stand-alone, or a Transition Networks' Point System™ stand-alone device. To take full advantage of all the features and functions available with the ION Chassis, an ION Management Module is required. The ION Management Module connects to the chassis backplane and communicates with the individual cards in the ION Chassis. Each slide-in-module for the ION Chassis has specific features and functions that are controlled via the ION Management Module. A network administrator can configure, monitor and troubleshoot ION slide-in-modules remotely via the ION Management Module.

Transition Networks understands that no network is managed in the same manner and that different security levels and management interfaces are often required depending on the deployment of the ION Chassis. With that in mind, the ION Platform has been designed to be one of the most versatile and secure fiber integration systems available today.

ION001-A

ION219-A

Access Methods

- Web-browser: Access the ION Management Module using a standard web browser such as Internet Explorer or Mozilla Firefox.
- Command Line Interface (CLI): CLI access can be done via telnet remotely or via the local console port on the ION Management Module.
- SNMP: Since the ION platform is based on public MIBs you can easily manage the ION with a standard network management system (NMS) such as SNMPc, HPOV or any other standard SNMP platform.
- Focal Point: Transition Networks offers a free SNMP graphical user interface (GUI) software (Focal Point) for the management purposes. Focal Point offers full read and read/write capabilities in a user friendly GUI.

Specifications

Slots	**ION219-A**	(19) Slots in front for ION slide-in-modules (2) Slots in rear for power supply modules
	ION001-A	(1) Slot in front for ION slide-in-module
Unit LEDs	**ION219-A**	Power On LED for each installed power supply module
	ION001-A	None
Dimensions	**ION219-A**	**Width:** 17.0" [430 mm] **Depth:** 15.8" [401 mm] **Height:** 3.5" [89 mm]
Dimensions	**ION001-A**	**Width:** 4.0" [102 mm] **Depth:** 7.1" [180 mm] **Height:** 1.4" [36 mm]
Power	**ION219-A**	Two open bays for ION power supply modules, supporting Universal Input 100 – 240 VAC, or -48 VDC rated at 200 watts max output Note: Power supply module supplies +12 VDC maximum to each slot in the chassis. Only one power supply module is required to power the chassis and the installed modules, the optional second power supply module provides reduncancy for instant fail-over.
	ION001-A	External AC/DC power supply included, 12VDC, 0.5A unregulated
Environment		0~ 50°C operating 5% - 95% humidity (non-condensing) 0 to 10,000 ft. altitude
Shipping Weight		
	ION219-A	19 lbs. [8.6 kg]
	ION001-A	2.0 lbs. [0.9 kg]
Compliance		UL listed, EN55022, EN55024, CE Mark, FCC Class A, CISPR Class A
Warranty		Lifetime

Ordering Information

ION219-A
19-Slot Chassis for The ION Platform, AC Powered

ION219-D
19-Slot Chassis for The ION Platform, DC Powered

ION001-A
1-Slot Chassis for The ION Platform

Optional Accessories *(sold separately)*

IONPS-A [pg 138]
ION Power Supply Module, Universal Input 100 – 240 VAC

IONPS-D[pg 139]
-48 VDC Power Supply Module

IONMM [pg 139]
ION Management Module

IONFP
ION Face Plate (required for all empty slots)

Security Features

When the optional management module is used, the following security features are available, allowing you to control access to the ION Chassis via the ION Management Module. Ensuring that only authorized personnel are able to view and change the settings to the slide-in-modules.

- ☑ Management VLAN
- ☑ SSL
- ☑ SSH
- ☑ 802.1x
- ☑ SNMPv1 & v2

(v3 via future firmware upgrade)

Key Management Features

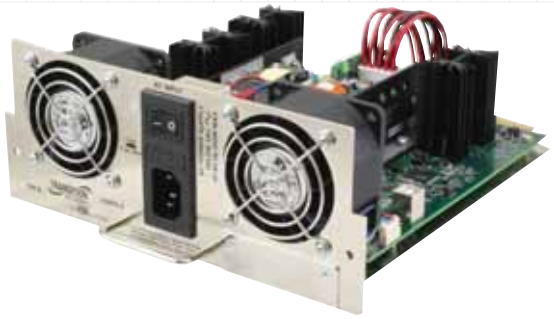
- Variety of management access methods including; telnet, web, SNMP
- Single slot design allows for more slide-in-modules to be inserted in the ION Chassis
- Management VLAN
- Based on Public MIBs
- 2 10/100 Ethernet interfaces
- USB console port
- TFTP upgrade/backup of slide-in-modules
- Import/Export configuration files in human readable/editable format
- Multiple community strings

IONPS-A

Power Supply Module For The ION Platform

The ION Platform is an all new intelligent, high-density, multi-protocol system supporting a variety of network interface devices. Designed for both carrier class and enterprise network applications where multiple points of fiber integration and secure network management of the fiber interface devices is essential.

The ION chassis can support up to two power supply modules which mount in the rear of the chassis. A single power supply can be used to power all the devices installed in the chassis; however the system can be made redundant with the use of a second power supply. In this configuration, the power supplies operate in an instant-fail-over mode.



Specifications

Application	Up to 2 power supply modules can be used in the 19-slot ION chassis, ION219-A
Unit LEDs	**PWR(Power):** Indicates the power supply module is providing power to the ION chassis
Standards	UL Listed (UL60950), FCC Class A, CISPR Class A, CE Mark
Dimensions	**Width:** 8.3" [211 mm] **Depth:** 10.0" [254 mm] **Height:** 3.4" [86 mm]
Weight	3.4 lbs. [1.5 kg]
Power Input	100 – 240 VAC, 47 – 63 Hz, 3.5 A @ 100 VAC
Environment	0 - 50ºC operating 5% - 95% humidity, non-condensing 0 to 10,000 ft. altitude
Warranty	Lifetime

Ordering Information

IONPS-A
Redundant AC Power Supply for 19-Slot ION Chassis

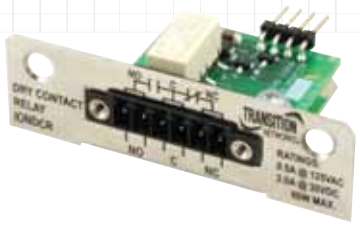
IONPS-D
Redundant -48 VDC Power Supply Module for 19-Slot ION Chassis

IONDCR

Dry Contact Relay Module

The IONDCR is a field installable dry contact relay module for the IONPS-A power supply. This module mounts in the lower right-hand corner of the IONPS-A faceplate, allowing the power supply to be tied into a separate alarm circuit. Contacts will be activated on the loss of power, enabling an external visual or audible alarm.

Applications for this type of fault alarm output would include enterprise networks as well as in industrial applications. The dry contact relay modules provides another layer of fault indicators, complementing network management software by providing a signal to either a local or remote alarm system.



Optional Accessories *(sold separately)*

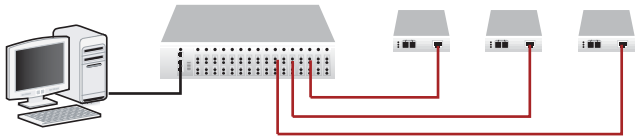
IONDCR
Dry contact relay module

IONMM

The ION Management Module

To take full advantage of the features and functions available with the ION Chassis, an ION Management Module is required. The ION Management Module connects to the chassis backplane and communicates with the individual cards in the ION Chassis. Only management traffic – no end-user data traffic - is sent across the ION Chassis backplane to maintain security.

Each slide-in-module for the ION Chassis has specific features and functions that are controlled via the ION Management Module. A network administrator can configure, monitor and troubleshoot ION slide-in-modules remotely via the ION Management Module. This remote management helps reduce operating expenses (OpEx) by reducing technician dispatches. Remote Management [pg 17] allows for faster mean-time-to-repair (MTTR) by proactively receiving traps and alerts on potential issues. With les downtime you are able to focus on revenue generating aspects of your business.



Network Management Station

Complete Visibility and Control
Remote Configuration
Remote Monitoring
Remote Fault Detection & Resolution

Access Methods

- Web-browser: Access the ION Management Module using a standard web browser such as Internet Explorer or Mozilla Firefox.
- Command Line Interface (CLI): CLI access can be done via telnet remotely or via the local console port on the ION Management Module.
- SNMP: Since the ION platform is based on public MIBs you can easily manage the ION with a standard network management system (NMS) such as SNMPc, HPOV or any other standard SNMP platform.
- Focal Point: Transition Networks offers a free SNMP graphical user interface (GUI) software (Focal Point) for the management purposes. Focal Point offers full read and read/write capabilities in a user friendly GUI.

Transition Networks understands that no network is managed in the same manner and that different security levels and management interfaces are often required depending on the deployment of the ION Chassis.

With that in mind, we have made the ION Management Module one of the most versatile and secure management modules available today.

Specifications

Standards	IEEE Std. 802.3, IEEE Std. 802.1X
Ports	(2) 10/100 Mbps RJ-45 USB 2.0 device port USB 2.0 host port
Dimensions	**Width:** 0.86" [22 mm] **Depth:** 6.5" [165 mm] **Height:** 3.4" [86 mm]
Power Consumption	2 Watts under normal operation 4.8 Watts with full 2.5 Watts used by USB host port (Example: Flash Drive connected requiring 2.5 Watts)
Environment	See chassis specifications
Shipping Weight	1 lb. [0.45 kg]
Compliance	EN55022 Class A, EN55024,CE Mark
Warranty	Lifetime

Ordering Information

IONMM
Management Module for the ION Chassis

Optional Accessories *(sold separately)*

USB Cables

USBC-AM-BM-03
USB 2.0 Cable A male to B male [3 ft. Gray]

USBC-AM-BM-06
USB 2.0 Cable A male to B male [6 ft. Gray]

Security Features

These security features allow you to control access to the ION Chassis via the ION Management Module to ensure that only authorized personnel are able to view and change the settings to the slide-in-modules.

- ☑ Management VLAN
- ☑ SSL
- ☑ SSH
- ☑ 802.1x/RADIUS
- ☑ SNMPv1& v2
  (v3 via future firmware upgrade)
- ☑ ACL Rules

Key Features

- Variety of management access methods including; telnet, web, SNMP
- Single slot design allows for more slide-in-modules to be inserted in the ION Chassis
- Based on Public MIBs
- 2 10/100 Ethernet interfaces
- USB console port
- TFTP upgrade/backup of slide-in-modules
- Import/Export configuration files in human readable/editable format
- Multiple community strings
- SNTP

Part Number Key Chassis Cards

Character #1

S	Stand-Alone
C	Chassis

Characters #2, 3

21	100BASE Ethernet
22	10/100 Ethernet
31	1000BASE Ethernet
32	10/100/1000 Ethernet
41	10GBASE Ethernet
42	10/100/1000/10G
60	T1/E1
61	4xT1
62	DS3-T3/E3

Characters #4, 5

10	Standard Conversion
20	Advanced Management
xx	Unique Identifier

Characters #6, 7, 8, 9

10	RJ-45
11	Multimode ST
13	Multimode SC
14	Single Mode SC
15	Single Mode SC Long Haul
16	Single Mode SC Extra Long Haul
17	Single Mode SC Long Wave 1550
19	Single Mode LC
24	Extended Multimode SC
29	Single Fiber SC
30	Dual BNC
33	RJ-11
35	Single Mode SC Long Wave 1550 Extended
39	Multimode LC
40	SFP Slot
47	XFP Slot
48	SFP+ Slot

Additional Expandable Characters (xx)

Part numbers grow as new products with new features or capabilities are designed. For example:

A1	Single Strand 1310TX/1550RX
A2	Single Strand 1550TX/1310RX

AUTO NEG | AUTO CROSS | LINK PASS THRU | FAR END FAULT | AUTO LINK RESTORE | PAUSE | FIELD UPGRADEABLE FIRMWARE | SINGLE FIBER

see also: Fast Ethernet 100BASE-TX to 100BASE-FX Stand-Alone Media Converters [pg 148]

C2110 Series

Fast Ethernet Media Converter 100BASE-TX to 100BASE-FX

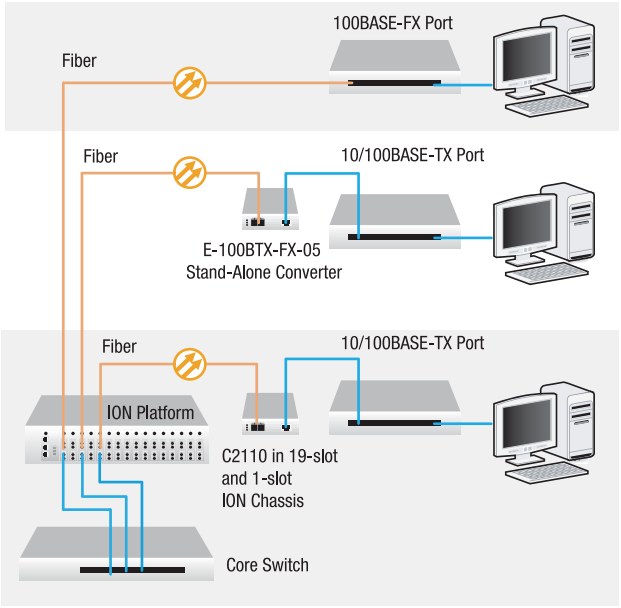
Features

- Auto-Negotiation of speed and duplex on TP port [pg 16]
- AutoCross™ on TP port [pg 16]
- Link Pass Through (LPT) fault monitoring [pg 17]
- Far-End-Fault (FEF) detection [pg 16]
- Automatic Link Restoration [pg 18]
- Pause advertisement [pg 17]
- Field Upgradeable Firmware [pg18]
- Can be used in any ION Platform Chassis
- Standards based, will link with any standard 100Base-TX and any standard 100Base-FX ports

The following manageable features are available when used in an ION chassis along with an ION Management Module

- Report converter status to chassis management software:
  - TP and Fiber Link Status
  - Hardware switch settings
  - Fault condition
  - TP cable length
- Write operation includes:
  - Power on/off device
  - Auto-Negotiation enable/disable [pg 16]
  - Pause enable/disable [pg 17]
  - LPT enable/disable [pg 17]
  - FEF enable/disable [pg 16]
  - AutoCross enable/disable [pg 16]

Fiber Integration in 10/100 Copper Environments



The ION C2110 device provides an interface between 100Base-TX ports and 100Base-FX ports allowing users to integrated fiber optic cabling into 100Base-TX copper environments.

Specifications

Complete list of fiber optic connector specifications [pg 212-224]

Standards	IEEE Std. 802.3
Data Rate	100 Mbps, Layer-1
Switches	**SW1**: Auto-Negotiation (UP = enabled) **SW2:** Pause (UP=enabled) **SW3:** Link Pass Through (UP = enabled) **SW4:** Far-End-Fault (UP = enabled)
Internal Jumpers	AutoCross™: Enable/Disable
Hardware/Software Jumpers	**Hardware:** Mode of operation is determined by the settings on the 4-position switch **Software:** Mode of operation is determined by the most recently saved on-board microprocessor settings
Status LEDs	**PWR (Power)**: ON = Connection to powered backplane **LKC (Copper Link)**: ON = Copper Link **RXC (Receive Copper)**: Blinking = Data recieved on Copper link **LKF (Fiber Link)**: ON = Fiber Link **RXF (Receive Fiber)**: Blinking = Data received on Fiber Link
Dimensions	**Width:** 0.86" [22 mm] **Depth:** 6.5" [165 mm] **Height:** 3.4" [86 mm]
Power Consumption	2.5 Watts, 200 mA @ 13.9 VDC
Environment	See chassis specifications
Shipping Weight	1 lb. [.45 kg]
Regulatory Compliance	CISPR/EN55022 Class A, FCC Class A, CE Mark
Warranty	Lifetime

Ordering Information

Complete list of fiber optic connector specifications [pg 212-224]

C2110-1011
100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1300nm MM (ST)
[2 km/1.2 mi.] Link Budget: 11.0 dB

C2110-1013
100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1300nm MM (SC)
[2 km/1.2 mi.] Link Budget: 11.0 dB

C2110-1039
100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1300nm MM (LC)
[2 km/1.2 mi.] Link Budget: 11.0 dB

C2110-1014
100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1300nm SM (SC)
[20 km/12.4 mi.] Link Budget: 16.0 dB

C2110-1019
100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1300nm SM (LC)
[20 km/12.4 mi.] Link Budget: 17.3 dB

C2110-1015
100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1300nm SM (SC)
[40 km/24.9 mi.] Link Budget: 29.0 dB

C2110-1016
100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1300nm SM (SC)
[60 km/32.3 mi.] Link Budget: 29.0 dB

C2110-1017
100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1550nm SM (SC)
[80 km/49.7 mi.] Link Budget: 29.0 dB

C2110-1035
100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1550nm SM (SC)
[120 km/77.5 mi.] Link Budget: 36.0 dB

C2110-1040
100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100Base-X SFP Slot (empty)

Single Fiber Products

Recommended use in pairs [pg 19]

C2110-1029-A1
100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1310nm TX/1550nm RX single fiber single mode (SC)
[20 km/12.4 mi.] Link Budget: 19.0 dB

C2110-1029-A2
100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1550nm TX/1310nm RX single fiber single mode (SC)
[20 km/12.4 mi.] Link Budget: 19.0 dB

C2110-1029-B1
100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1310nm TX/1550nm RX single fiber single mode (SC)
[40 km/24.9 mi.] Link Budget: 25.0 dB

C2110-1029-B2
100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1550nm TX/1310nm RX single fiber single mode (SC)
[40 km/24.9 mi.] Link Budget: 25.0 dB

see also: 10/100Base-TX to 100Base-FX Stand-Alone Media Converters [pg 149]

Fast Ethernet

C2210 Series

Fast Ethernet Media Converter 10/100BASE-TX to 100BASE-FX

The ION C2210 device provides an interface between 10/100Base-TX ports and 100Base-FX ports allowing users to integrated fiber optic cabling into 10/100Base-TX copper environments.

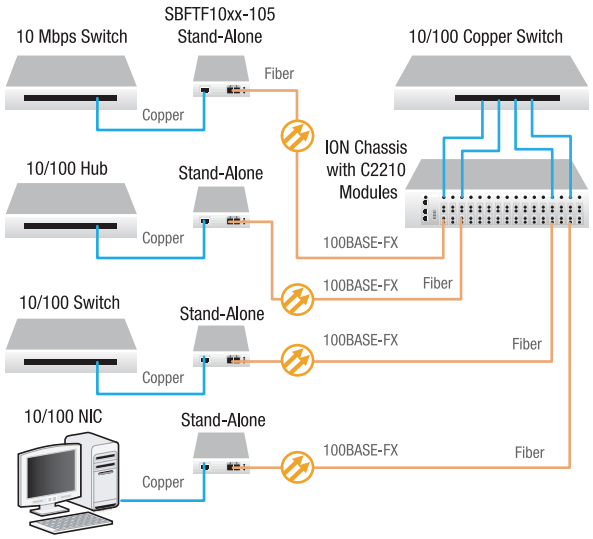
Features

- Auto-Negotiation of speed and duplex on TP port [pg 16]
- AutoCross™ on TP port [pg 16]
- Link Pass Through (LPT) fault monitoring [pg 17]
- Far-End-Fault (FEF) detection [pg 16]
- Pause (Software Controlled) [pg 17]
- Automatic Link Restoration [pg 18]
- Field Upgradeable Firmware [pg 18]
- Can be used in any ION Platform Chassis
- Standards based, will link with any standard 10/100Base-TX and any standard 100Base-FX ports

The following manageable features are available when used in an ION Platform chassis along with an ION Management Module.

- Report converter status to chassis management software:
  - TP and Fiber Link Status
  - Hardware switch settings
  - Copper Port Speed
  - TP and Fiber Port Duplex
  - Fault condition
- Write operation includes:
  - Power on/off device
  - Auto-Negotiation enable/disable [pg 16]
  - Force 10 Mbps or 100 Mbps
  - Force half or full duplex
  - Select advertising modes when Auto-Negotiation is enabled
  - LPT enable/disable
  - FEF enable/disable
  - Pause enable/disable [pg 17]
  - AutoCross™ enable/disable [pg 16]

Fiber Integration



Specifications

Complete list of fiber optic connector specifications [pg 212-224]

Standards	IEEE Std. 802.3
Data Rate	10 Mbps; 100 Mbps Layer-2
Max Frame Size	2048 bytes
Frame Buffer Memory	512 Kbits
MAC Address Table	1K
Switches	**SW1:** Auto-Negotiation (UP = enabled) **SW2:** Forced 100 Mbps/10 Mbps with Auto-Neg. off (UP = 100 Mbps) **SW3:** Forced Full/Half Duplex with Auto-Neg. off (UP = Full) **SW4:** Full/Half Duplex on fiber port (UP = Full) **SW5:** AutoCross™ on UTP (UP = enabled) **SW6:** Link Pass Through (UP = enabled)
Internal Jumpers	AutoCross™: Enable/Disable
Hardware/Software Jumpers	**Hardware:** Mode of operation is determined by the settings on the 4-position switch **Software:** Mode of operation is determined by the most recently saved on-board microprocessor settings
Status LEDs	**FD (Fiber Duplex):** ON= Full-duplex on fiber **LACT (Fiber Link/Activity):** ON = Fiber Link **PWR (Power):** ON = Connection to powered backplane **(TP. Duplex/Link):** Yellow = Half duplex, Green = Full Duplex (TP. Speed): Yellow = 10 Mbps, Green = 100 Mbps
Dimensions	**W:** 0.86" [22 mm]; **D:** 6.5" [165 mm]; **H:** 3.4" [8 6 mm]
Power Consumption	2.5 Watts, 200 mA @ 13.9 VDC
Environment	See chassis specifications
Shipping Weight	1 lb. [.45 kg]
Regulatory Compliance	CISPR/EN55022 Class A, FCC Class A, CE Mark, EN55024
Warranty	Lifetime

Ordering Information

Complete list of fiber optic connector specifications [pg 212-224]

C2210-1011
10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1300nm MM (ST)
[2 km/1.2 mi.] Link Budget: 11.0 dB

C2210-1013
10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1300nm MM (SC)
[2 km/1.2 mi.] Link Budget: 11.0 dB

C2210-1039
10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1300nm MM (LC)
[2 km/1.2 mi.] Link Budget: 11.0 dB

C2210-1014
10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1300nm SM (SC)
[20 km/12.4 mi.] Link Budget: 16.0 dB

C2210-1019
10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1300nm SM (LC)
[20 km/12.4 mi.] Link Budget: 17.3 dB

C2210-1015
10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1300nm SM (SC)
[40 km/24.9 mi.] Link Budget: 29.0 dB

C2210-1016
10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1300nm SM (SC)
[60 km/32.3 mi.] Link Budget: 32.0 dB

C2210-1017
10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1550nm SM (SC)
[80 km/49.7 mi.] Link Budget: 29.0 dB

C2210-1035
10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1550nm SM (SC)
[120 km/77.5 mi.] Link Budget: 36.0 dB

C2210-1040
10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100Base-X SFP Slot (empty)

Single Fiber Products

Recommended use in pairs [pg 19]

C2210-1029-A1
10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1310nm TX/1550nm RX single fiber single mode (SC)
[20 km/12.4 mi.] Link Budget: 19.0 dB

C2210-1029-A2
10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1550nm TX/1310nm RX single fiber single mode (SC)
[20 km/12.4 mi.] Link Budget: 19.0 dB

C2210-1029-B1
10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1310nm TX/1550nm RX single fiber single mode (SC)
[40 km/24.9 mi.] Link Budget: 25.0 dB

C2210-1029-B2
10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1550nm TX/1310nm RX single fiber single mode (SC)
[40 km/24.9 mi.] Link Budget: 25.0 dB

AUTO NEG | AUTO CROSS | LOOP BACK | FIELD UPGRADEABLE FIRMWARE | REMOTE FAULT DETECT | SINGLE FIBER | LAST GASP | BANDWIDTH ALLOCATION | REMOTE MGMT | PAUSE | TRANSPARENT LINK PASS THRU | NEW PRODUCT

C2220 Series

OAM/IP-Based Remotely Managed NID (Network Interface Device)

10/100BASE-TX to 100BASE-FX Fast Ethernet

see also: 10/100Base-TX to 100Base-FX Stand-Alone NIDs [pg 150]

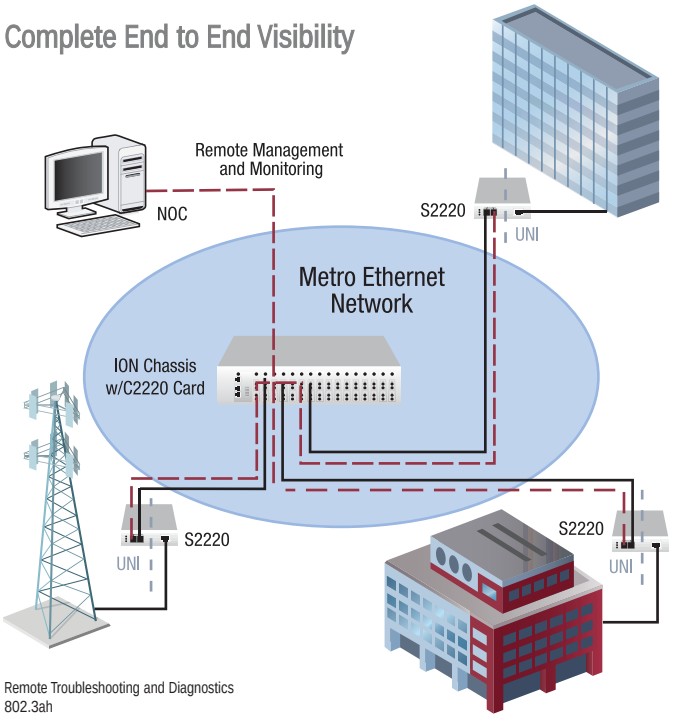
Features

- 802.3ah Link OAM
- 10K Jumbo Frame Support
- Two selectable Remote Management modes [pg 17]
  - IP-Based Remote Management
  - In-Band (remote device managed by local peer)
- AutoCross™ [pg 16]
- Auto-Negotiation [pg 16]
- Pause [pg 17]
- Transparent Link Pass Through [pg 17]
- Far-End-Fault [pg 16]
- Remote Loopback [pg 18]
- Field Upgradeable Firmware [pg 18]
- IEEE 802.1p q VLAN and double VLAN tagging with 4096 VIDs
- DHCP client
- SNTP
- TFTP
- IEEE 802.1x
- RADIUS client
- RMON counters for each port
- Bandwidth profiling [pg 18]
- DMI Optical Management
- Cable diagnostic function for copper ports
- SSH
- Telnet
- Command Line Interface (CLI)
- Web management
- Focal Point management
- SNMP v1 & v2c
- USB port for basic setup
- Management VLAN

Applications

- Ethernet in the First Mile (EFM)
- Fiber-to-the-Premise (FTTP)
- E-Line Services (EPL & EVPL)
- Enterprise Markets

Complete End to End Visibility



Remote Troubleshooting and Diagnostics
802.3ah
SNMP traps
Provider Visiblity and Control

Specifications

Complete list of fiber optic connector specifications [pg 212-224]

Standards	IEEE Std. 802.3, IEE std. 802.3ah, IEE Std. 802.1P, IEEE std. 802.1Q, IEEE Std. 802.1X
Data Rate	**Copper:** 10/100 Mbps **Fiber:** 100 Mbps
Filtering Address	8K MAC Addresses
Max Frame Size	10,240 bytes
Dimensions	**Width:** 0.86" [22 mm] **Depth:** 6.5" [165 mm] **Height:** 3.4" [86 mm]
Power Consumption	4.5 Watts
Environment	See chassis specifications
Shipping Weight	1 lb. [.45 kg]
Regulatory Compliance	EN55022 Class A, EN55024, CE Mark
Warranty	Lifetime

Ordering Information

C2220-1011
C2220-1011-D (DMI Options)
10/100BASE-TX (RJ-45) **[100 m]**
to 100BASE-FX 1310nm MM (ST)
[2 km/1.2 mi.] Link Budget: 11.0 dB

C2220-1013
C2220-1013-D (DMI Options)
10/100BASE-TX (RJ-45) **[100 m]**
to 100BASE-FX 1310nm MM (SC)
[2 km/1.2 mi.] Link Budget: 11.0 dB

C2220-1014
C2220-1014-D (DMI Options)
10/100BASE-TX (RJ-45) **[100 m]**
to 100BASE-FX 1310nm SM (SC)
[20 km/12.4 mi.] Link Budget: 16.0 dB

C2220-1015
C2220-1015-D (DMI Options)
10/100BASE-TX (RJ-45) **[100 m]**
to 100BASE-FX 1310nm SM (SC)
[40 km/24.8 mi.] Link Budget: 26.0 dB

C2220-1016
10/100BASE-TX (RJ-45) **[100 m]**
to 100BASE-FX 1310nm SM (SC)
[60 km/32.3 mi.] Link Budget: 29.0 dB

C2220-1017
10/100BASE-TX (RJ-45) **[100 m]**
to 100BASE-FX 1550nm SM (SC)
[80 km/49.7 mi.] Link Budget: 29.0 dB

C2220-1035
10/100BASE-TX (RJ-45) **[100 m]**
to 100BASE-FX 1550nm SM (SC)
[120 km/77.5 mi.] Link Budget: 36.0 dB

C2220-1040
10/100BASE-TX (RJ-45) **[100 m]**
to 100Base-X SFP Slot (empty)

Single Fiber Products

Recommended use in pairs [pg 19]

C2220-1029-A1
C2220-1029-DA1 (DMI Options)
10/100BASE-TX (RJ-45) **[100 m]**
to 100BASE-BX-U 1310nm TX/1550nm RX Bi-Di SM (SC)
[20 km/12.4 mi.] Link Budget: 19.0 dB

C2220-1029-A2
C2220-1029-DA2 (DMI Options)
10/100BASE-TX (RJ-45) **[100 m]**
to 100BASE-BX-U 1550nm TX/1310nm RX Bi-Di SM (SC)
[20 km/12.4 mi.] Link Budget: 19.0 dB

C2220-1029-B1
10/100BASE-TX (RJ-45) **[100 m]**
to 100BASE-BX-U 1310nm TX/1550nm RX Bi-Di SM (SC)
[40 km/24.9 mi.] Link Budget: 25.0 dB

C2220-1029-B2
10/100BASE-TX (RJ-45) **[100 m]**
to 100BASE-BX-D 1550nm TX/1310nm RX single fiber single mode (SC)
[40 km/24.9 mi.] Link Budget: 25.0 dB

*Note all units feature USB port for local management application.

Optional Accessories *(sold separately)*

SFP Modules [pg 161-167]

USB Cables
USBC-AM-BM-03
USB 2.0 Cable A male to B male [3 ft. Gray]
USBC-AM-BM-06
USB 2.0 Cable A male to B male [6 ft. Gray]

see also: 1000Base-T to 1000Base-SX/LX Stand-Alone Media Converters [pg 152]

C3110 Series

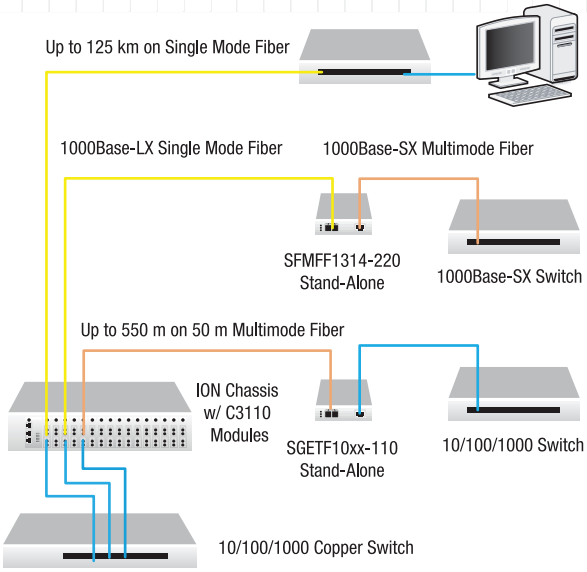
1000BASE-T to 1000BASE-SX/LX Slide-in-Module

Features

- Copper and Fiber Auto-Negotiation [pg 16]
- AutoCross™ on TP port [pg 16]
- Link Pass Through [pg 17]
- Remote Fault Detect [pg 19]
- Loopback [pg 18]
- Pause [pg 17]
- Automatic Link Restoration [pg 18]
- Field Upgradeable Firmware [pg 18]

The following manageable features are available when used in an ION Platform chassis along with an ION Management Module.

- Report converter status to chassis management software:
  - Copper and Fiber link/receive status
  - Hardware switch settings
  - Receive error count
- Write operation includes:
  - Power on/off device
  - Auto-Negotiation enable/disable
  - Remote Fiber Fault Detect enable/disable
  - Link Pass Through enable/disable [pg 17]
  - Pause enable/disable [pg 17]
  - Symetric Pause
  - Asymmetric TX Pause
  - Asymetric RX Pause



The ION C3110 device provides an interface between 1000Base-T ports and 1000Base-SX/LX ports allowing users to integrated fiber optic cabling into 1000Base-T copper environments.

Specifications

Complete list of fiber optic connector specifications [pg 212-224]

Standards	IEEE Std. 802.3ab, IEEE 802.3z, IEEE 802.3 2000
Data Rate	1000 Mbps, Layer-1
Switches	**SW1:** Remote Fiber Fault Detect **SW2:** Pause (symmetric) **SW3:** Pause (asymmetric) **SW4:** Transparent **SW5:** Fiber **SW6:** Loopback
Hardware/Software Jumpers	**Hardware:** Mode of operation is determined by the settings on the 4-position switch **Software:** Mode of operation is determined by the most recently saved on-board microprocessor settings
Status LEDs	**LKF (fiber link)**: On = Fiber Link, blinking activity **PWR (Power):** On = Connection to powered backplane **TP LED 1 (Copper Link):** On = Link, bliking activity **TP LED2 (Copper Duplex):** On = Full Duplex
Dimensions	**Width:** 0.86" [22 mm] **Depth:** 6.5" [165 mm] **Height:** 3.4" [86 mm]
Power Consumption	3.6 Watts, 300mA @ 112 VDC
Environment	See chassis specifications
Shipping Weight	1 lb [.45 kg]
Regulatory Compliance	CISPR/EN55022 Class A, FCC Class A, CE Mark, EN55024
Warranty	Lifetime

Ordering Information

Complete list of fiber optic connector specifications [pg 212-224]

C3110-1013
1000BASE-T (RJ-45) **[100 m/328 ft.]**
to 1000BASE-SX 850nm MM (SC)
[220m/721 ft. and 550 m/1804 ft.]
Link Budget: 8.5 dB

C3110-1024
1000BASE-T (RJ-45) **[100 m/328 ft.]**
to 1000BASE-SX 1310nm extended MM (SC)
[2 km/1.2 mi.] Link Budget: 7.0 dB

C3110-1014
1000BASE-T (RJ-45) **[100 m/328 ft.]**
to 1000BASE-LX 1310nm SM (SC)
[10 km/6.2 mi.] Link Budget: 10.5 dB

C3110-1015
1000BASE-T (RJ-45) **[100 m/328 ft.]**
to 1000BASE-LX 1310nm SM (SC)
[25 km/15.5 mi.] Link Budget: 15.0 dB

C3110-1017
1000BASE-T (RJ-45) **[100 m/328 ft.]**
to 1000BASE-LX 1550nm SM (SC)
[65 km/40.4 mi.] Link Budget: 21.0 dB

C3110-1035
1000BASE-T (RJ-45) **[100 m/328 ft.]**
to 1000BASE-LX 1550nm SM (SC)
[125 km/77.5 mi.] Link Budget: 27.0 dB

C3110-1040
1000BASE-T (RJ-45) **[100 m/328 ft.]**
to 1000Base-X SFP Slot (empty)

Single Fiber Products

Recommended use in pairs [pg 19]

C3110-1029-A1
1000BASE-T (RJ-45) **[100 m/328 ft.]**
to 1000BASE-LX 1310nm TX/1550nm RX single fiber single mode (SC)
[20 km/12.4 mi.] Link Budget: 13.0 dB

C3110-1029-A2
1000BASE-T (RJ-45) **[100 m/328 ft.]**
to 1000BASE-LX 1550nm TX/1310nm RX single fiber single mode (SC)
[20 km/12.4 mi.] Link Budget: 13.0 dB

C3110-1029-B1
1000BASE-T (RJ-45) **[100 m/328 ft.]**
to 1000BASE-LX 1310nm TX/1550nm RX single fiber single mode (SC)
[40 km/24.9 mi.] Link Budget: 20.0 dB

C3110-1029-B2
1000BASE-T (RJ-45) **[100 m/328 ft.]**
to 1000BASE-LX 1550nm TX/1310nm RX single fiber single mode (SC)
[40 km/24.9 mi.] Link Budget: 20.0 dB

- Can be used in any ION Platform Chassis
- Cost effective fiber deployment by pairing C3110 with lower cost 1000Base-T switches, offering the benefits of fiber without the high costs
- Standards based, will link with any standard 1000Base-T and any standard 1000Base-SX or LX ports

see also: 10/100/1000Base-T to 1000Base-SX/LX Stand-Alone Media Converters [pg 153]

Gigabit Ethernet

C3210 Series

10/100/1000BASE-T to 1000BASE-SX/LX Slide-in-Module

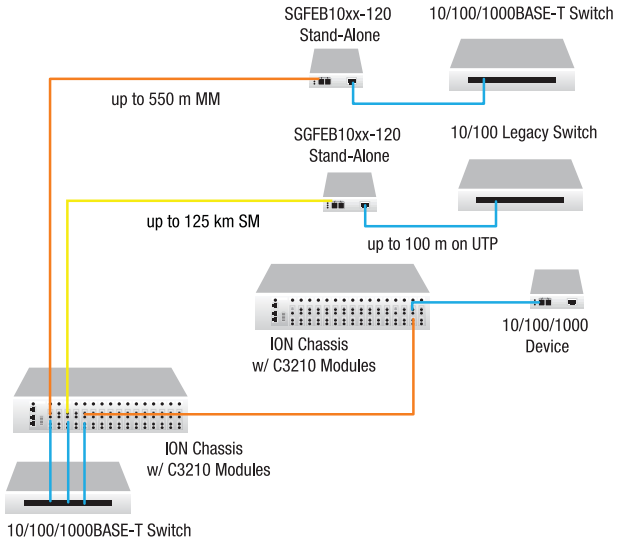
The ION C3210 device provides an interface between 10/100/1000Base-T ports and 1000Base-SX/LX ports allowing users to integrated fiber optic cabling into 10/100/1000Base-T copper environments.

- Intergrate fiber into copper based networking environments
- Can be used in any ION Platform Chassis
- Bridging legacy 10/100 devices into a Gigabit Backbone
- Secure Uni-directional transmission
- Standards based, will link with any standard 10/100/1000Base-T and any standard 1000Base-SX or LX ports

The following manageable features are available when used in an ION Platform chassis along with an ION Management Module:

Features

- Copper and Fiber Auto-Negotiation [pg 16]
- Switch Selectable Speeds
- AutoCross™ [pg 16]
- Link Pass Through [pg 17]
- Remote Fault Detect [pg 19]
- Pause [pg 17]
- Automatic Link Restoration [pg 18]
- IEEE 802.1P QoS, IPv4 TOS/Diffserv, IPv6 traffic class
- IEEE 802.1q Port VLAN, tagging and doubling tagging (Q in Q)
- Field Upgradeable Firmware [pg 18]
- Virtual Cable Test on UTP port
- Uni-directional data transmission
- Bandwidth Allocation [pg 18]
- DMI, digital diagnostics per SFF-8472
- RMON counters for each port



Report devices status to chassis management software:

- Copper and Fiber link status
- Copper and Fiber Port Duplex
- Copper Port Speed
- Hardware switch settings

Write operation includes:

- Set copper full/half duplex
- Set copper connection speed
- Enable/Disable: Link pass Through, Auto-Negotiation, Port VLAN
- Set Administrative State
- Set Egress and Ingress rate limits
- Reset Factory Defaults, Counters
- Reset Switch
- Set Speed
- Set Duplex
- Set MDI/MDI-X/Auto
- Set Pause Operations
- Set VLAN Tagging
- Set Default Priority
- Set IEEE priority remapping
- Initiate Virtual Cable Test
- Set Fiber RX Power Intrusion Threshold

Specifications

Complete list of fiber optic connector specifications [pg 212-224]

Standards	IEEE 802.3, IEEE Std. 802.3ab, IEEE 802.3u, IEEE 802.3z, IEEE 802.3p, IEEE 802.3q
Data Rate	10/100/1000 Mbps; Layer-2
Max Frame Size	10,240 Bytes (jumbo frame support)
Switches	**SW1:** TP Auto-Negotiation **SW2:** TP Speed **SW3:** TP Duplex **SW4:** Link Pass Through **SW5:** Fiber Duplex **SW6:** Unused
Hardware/SoftwareJumpers	Hardware/Software mode, AutoCross™
Status LEDs	**PWR (Power):** ON = Connection to powered backplane **LACT (Fiber Link):** ON = Fiber link, Blinking = activity **UTP Duplex/Link**: Orange = half duplex link, Blinking = half duplex activity, Green = Full duplex link, Blinking =Full duplex activity, Off = 10 Mbps operation (or no link), Orange = 100 Mbps operation, Green = 1000 Mbps operation
Dimensions	**W:** 0.86" [22 mm]; **D:** 6.5" [165 mm]; **Ht:** 3.4" [8 6 mm]
Power Consumption	3.6 Watts, 300mA @ 12 VDC
Environment	See chassis specifications
Shipping Weight	1 lb [.45 kg]
Regulatory Compliance	CISPR/EN55022 Class A, EN55024, EN61000, FCC Class A, CE Mark
Warranty	Lifetime

Ordering Information

Complete list of fiber optic connector specifications [pg 212-224]

C3210-1013
10/100/1000BASE-T (RJ-45) **[100 m]**
to 1000BASE-SX 850nm MM (SC)
[62.5/125 µm fiber: 220 m/722 ft.]
[50/125 µm fiber: 550 m/1804 ft.]
Link Budget: 8.5 dB

C3210-1024
10/100/1000BASE-T (RJ-45) **[100 m]**
to 1000BASE-SX 1310nm extended MM (SC)
[2 km/1.2 mi.] Link Budget: 7.0 dB

C3210-1014
10/100/1000BASE-T (RJ-45) **[100 m]**
to 1000BASE-LX 1310nm SM (SC)
[10 km/6.2 mi.] Link Budget: 10.5 dB

C3210-1015
10/100/1000BASE-T (RJ-45) **[100 m]**
to 1000BASE-LX 1310nm SM (SC)
[25 km/15.5 mi.] Link Budget: 15.0 dB

C3210-1017
10/100/1000BASE-T (RJ-45) **[100 m]**
to 1000BASE-LX 1550nm SM (SC)
[65 km/40.4 mi.] Link Budget: 21.0 dB

C3210-1035
10/100/1000BASE-T (RJ-45) **[100 m]**
to 1000BASE-LX 1550nm SM (SC)
[125 km/77.5 mi.] Link Budget: 27.0 dB

C3210-1040
10/100/1000BASE-T (RJ-45) **[100 m]**
to 1000Base-X SFP Slot (empty)

Single Fiber Products

Recommended use in pairs [pg 19]

C3210-1029-A1
10/100/1000BASE-T (RJ-45) **[100 m]**
to 1000BASE-LX 1310nm TX/1550nm RX single fiber single mode (SC)
[20 km/12.4 mi.] Link Budget: 13.0 dB

C3210-1029-A2
10/100/1000BASE-T (RJ-45) **[100 m]**
to 1000BASE-LX 1550nm TX/1310nm RX single fiber single mode (SC)
[20 km/12.4 mi.] Link Budget: 13.0 dB

C3210-1029-B1
10/100/1000BASE-T (RJ-45) **[100 m]**
to 1000BASE-LX 1310nm TX/1550nm RX single fiber single mode (SC)
[40 km/24.9 mi.] Link Budget: 20.0 dB

C3210-1029-B2
10/100/1000BASE-T (RJ-45) **[100 m]**
to 1000BASE-LX 1550nm TX/1310nm RX single fiber single mode (SC)
[40 km/24.9 mi.] Link Budget: 20.0 dB

C3210-1029-D1
10/100/1000BASE-T (RJ-45) **[100 m]**
to 1000BASE-LX 1510nm TX/1590nm RX single fiber single mode (SC)
[80 km/49.7 mi.] Link Budget: 24.0 dB

C3210-1029-D2
10/100/1000BASE-T (RJ-45) **[100 m]**
to 1000BASE-LX 1590nm TX/1510nm RX single fiber single mode (SC)
[80 km/49.7 mi.] Link Budget: 24.0 dB

AUTO CROSS | AUTO NEG | LOOP BACK | FIELD UPGRADEABLE FIRMWARE | REMOTE FAULT DETECT | SINGLE FIBER | LAST GASP | BANDWIDTH ALLOCATION | REMOTE MGMT | NEW PRODUCT

10/100/1000BASE-T to 1000BASE-SX/LX

see also: 10/100/1000BASE-T to 1000BASE-SX/LX Stand-Alone NIDs [pg 154]

Gigabit Ethernet

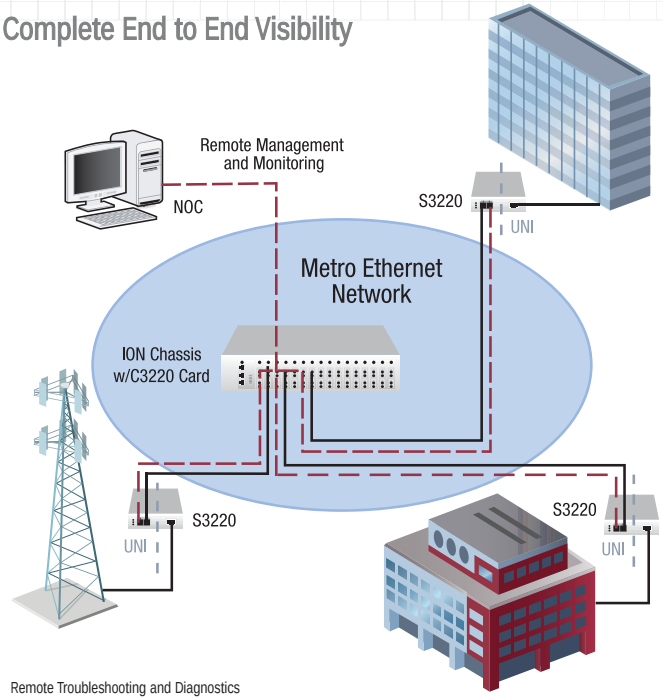
C322x Series

OAM/IP-Based Remotely Managed NID (Network Interface Device)

Features

- 802.3ah Link OAM
- 10K Jumbo Frame Support
- Two selectable Remote Management modes: [pg 17]
  - IP-Based Remote Management
  - In-Band (remote device managed by local peer)
- AutoCross™ [pg 16]
- Auto-Negotiation [pg 16]
- Pause [pg 17]
- Transparent Link Pass Through [pg 17]
- Far-End-Fault [pg 16]
- Remote Loopback [pg 18]
- Field Upgradeable Firmware [pg 18]
- IEEE 802.1p QoS packet classification
- Ipv4 IP TOS, DiffDerv and IPv6 traffic class QoS classification
- IEEE 802.1q VLAN and double VLAN tagging with 4096 VIDs
- DHCP client
- SNTP
- TFTP
- IEEE 802.1x
- RADIUS client
- RMON counters for each port
- Bandwidth profiling [pg 18]
- DMI Optical Management
- Cable diagnostic function forcopper ports
- SSH
- Telnet
- Command Line Interface (CLI)
- Web management
- Focal Point Management
- SNMP v1 & v2c
- USB port for basic setup
- Management VLAN

Complete End to End Visibility



Remote Troubleshooting and Diagnostics
802.3ah
SNMP traps
Provider Visiblity and Control

Applications

- Ethernet in the First Mile (EFM)
- Fiber-to-the-Premise (FTTP)
- E-Line Services (EPL & EVPL)
- Enterprise Markets

Specifications

Complete list of fiber optic connector specifications [pg 212-224]

Standards	IEEE Std. 802.3, IEEE Std. 802.3ah, IEEE Std 802.1P, IEEE Std 802.1Q, IEE Std. 802.1X
Data Rate	**Copper:** 10/100/1000 Mbps **Fiber:** 1000 Mbps
Filtering Addresses	8K MAC Addresses
Max Frame Size	10,240 bytes
Dimensions	**Width:** 08.6" [22 mm] **Depth:** 6.5" [165 mm] **Height:** 3.4" [86 mm]
Power Consumption	4.5 Watts
Environment	See chassis specifications
Shipping Weight	1 lb. [.45 kg]
Regulatory Compliance	EN55022 class A, EN55024, CE Mark
Warranty	Lifetime

**C3220-1040 and C3221-1040 have SGMII support for use with 10/100/1000BASE-T copper SFPs.*

Ordering Information

Complete list of fiber optic connector specifications [pg 212-224]

C3220-1013
C3220-1013-D (DMI Options)
10/100/1000BASE-T (RJ-45) **[100 m]**
to 1000BASE-SX 850nm MM (SC)
[62.5/125 µm fiber: 220 m/722 ft.]
[50/125 µm fiber: 550 m/1804 ft.]
Link Budget: 8.5 dB

C3220-1014
C3220-1014-D (DMI Options)
10/100/1000BASE-T (RJ-45) **[100 m]**
to 1000BASE-LX 1310nm SM (SC)
[10 km/6.2 mi.] Link Budget: 10.5 dB

C3220-1015
C3220-1015-D (DMI Options)
10/100/1000BASE-T (RJ-45) **[100 m]**
to 1000BASE-LX 1310nm SM (SC)
[30 km/18.6 mi.] Link Budget: 15.0 dB

C3220-1017
10/100/1000BASE-T (RJ-45) **[100 m]**
to 1000BASE-LX 1550nm SM (SC)
[80 km/49.7 mi.] Link Budget: 21.0 dB

C3220-1035
10/100/1000BASE-T (RJ-45) **[100 m]**
to 1000BASE-LX 1550nm SM (SC)
[120 km/77.7 mi.] Link Budget: 27.0 dB

***C3220-1040**
10/100/1000BASE-T (RJ-45) **[100 m]**
to (1) 100/1000Base-X SFP Slot (empty)

***C3221-1040**
10/100/1000BASE-T (RJ-45) **[100 m]**
to (2) 100/1000Base-X SFP Slots (empty)

Single Fiber Products [pg 19]

C3220-1029-A1
C3220-1029-DA1 (DMI Options)
10/100/1000BASE-T (RJ-45) **[100 m]**
to 1000BASE-BX-U 1310nm TX/1490nm RX Bi-Di SM (SC)
[20 km/12.4 mi.] Link Budget: 14.0 dB

C3220-1029-A2
C3220-1029-DA2 (DMI Options)
10/100/1000BASE-T (RJ-45) **[100 m]**
to 1000BASE-BX-D 1490nm TX/1310nm RX Bi-Di SM (SC)
[20 km/12.4 mi.] Link Budget: 14.0 dB

C3220-1029-B1
10/100/1000BASE-T (RJ-45) **[100 m]**
to 1000BASE-BX-U 1310nm TX/1490nm RX single fiber single mode (SC)
[40 km/24.8 mi.] Link Budget: 20.0 dB

C3220-1029-B2
10/100/1000BASE-T (RJ-45) **[100 m]**
to 1000BASE-BX-D 1490nm TX/1310nm RX single fiber single mode (SC)
[40 km/24.8 mi.] Link Budget: 20.0 dB

*Note all units feature USB port for local management application.

Optional Accessories *(sold separately)*

SFP Modules [pg 161-167]

USB Cables

USBC-AM-BM-03
USB 2.0 Cable A male to B male [3 ft. Gray]

USBC-AM-BM-06
USB 2.0 Cable A male to B male [6 ft. Gray]

AUTO CROSS | AUTO NEG | LOOP BACK | FIELD UPGRADEABLE FIRMWARE | REMOTE FAULT DETECT | SINGLE FIBER | LAST GASP | BANDWIDTH ALLOCATION | REMOTE MGMT | NEW PRODUCT

10/100/1000BASE-T to 1000BASE-SX/LX

see also: 10/100/1000BASE-T to 1000BASE-SX/LX Stand-Alone NIDs [pg 155]

C323x Series

OAM/IP-Based Remotely Managed NID (Network Interface Device)

Gigabit Ethernet

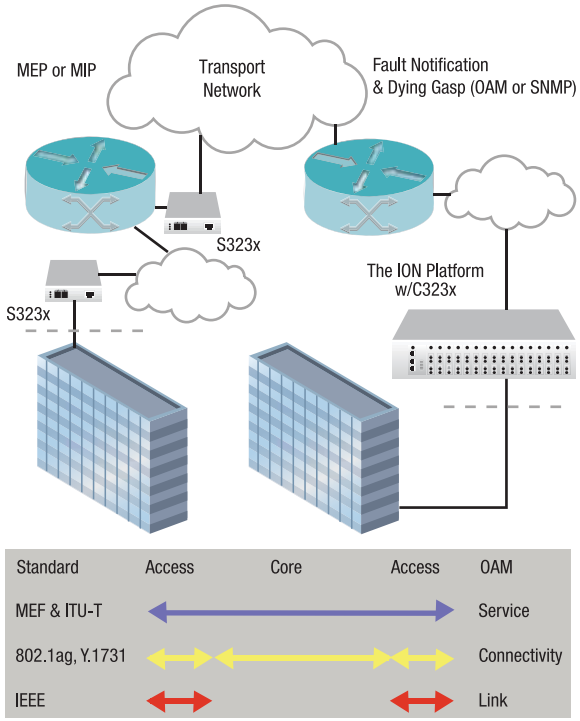
Features

- 802.3ah Link OAM
- ITU Y.1731
- 10K Jumbo Frame Support
- Two selectable Remote Management modes:
  - IP-Based Remote Management
  - In-Band (remote device managed by local peer) [pg 17]
- AutoCross [pg 16]
- Auto-Negotiation [pg 16]
- Pause [pg 17]
- Transparent Link Pass Through [pg 17]
- Far-End-Fault [pg 16]
- Remote Loopback [pg 18]
- Field Upgradeable Firmware [pg 18]
- IEEE 802.1p QoS packet classification
- Ipv4 IP TOS, DiffDerv and IPv6 traffic class QoS classification
- IEEE 802.1q VLAN and double VLAN tagging with 4096 VIDs
- DHCP client
- SNTP
- TFTP
- IEEE 802.1x
- RADIUS client
- RMON counters for each port
- Bandwidth profiling [pg 18]
- DMI Optical Management
- Cable diagnostic function for copper ports
- SSH
- Telnet
- Command Line Interface (CLI)
- Web management
- Focal Point Management
- SNMP v1 & v2c
- USB port for basic setup
- Management VLAN

Applications

- Ethernet in the First Mile (EFM)
- Fiber to the Premise (FTTP)
- E-Line Services (EPL & EVPL)
- Enterprise Markets

Complete End to End Visibility



Remote Troubleshooting and Diagnostics
802.3ah, 802.1ag, Y.1731, SNMP traps, Provider Visibility & Control

Specifications

Complete list of fiber optic connector specifications [pg 212-224]

Standards	IEEE Std. 802.3, IEEE Std. 802.3ah, IEEE Std 802.1P, IEEE Std 802.1Q, IEE Std. 802.1X
Data Rate	**Copper:** 10/100/1000 Mbps **Fiber:** 1000 Mbps
Filtering Addresses	8K MAC Addresses
Max Frame Size	10,240 bytes
Dimensions	**Width:** 0.86" [22 mm] **Depth:** 6.5" [165 mm] **Height:** 3.4" [86 mm]
Power Consumption	4.5 Watts
Environment	See chassis specifications
Shipping Weight	1 lb. [.45 kg]
Regulatory Compliance	EN55022 class A, EN55024, CE Mark
Warranty	Lifetime

**C3230-1040 and C3231-1040 have SGMII support for use with 10/100/1000BASE-T copper SFPs.*

Ordering Information

Complete list of fiber optic connector specifications [pg 212-224]

C3230-1013
C3230-1013-D (DMI Options)
10/100/1000BASE-T (RJ-45) **[100 m]**
to 1000BASE-SX 850nm MM (SC)
[62.5/125 µm fiber: 220 m/722 ft.]
[50/125 µm fiber: 550 m/1804 ft.]
Link Budget: 8.5 dB

C3230-1014
C3230-1014-D (DMI Options)
10/100/1000BASE-T (RJ-45) **[100 m]**
to 1000BASE-LX 1310nm SM (SC)
[10 km/6.2 mi.] Link Budget: 10.5 dB

C3230-1015
C3230-1015-D (DMI Options)
10/100/1000BASE-T (RJ-45) **[100 m]**
to 1000BASE-LX 1310nm SM (SC)
[30 km/18.6 mi.] Link Budget: 15.0 dB

C3230-1017
10/100/1000BASE-T (RJ-45) **[100 m]**
to 1000BASE-LX 1550nm SM (SC)
[80 km/49.7 mi.] Link Budget: 21.0 dB

C3230-1035
10/100/1000BASE-T (RJ-45) **[100 m]**
to 1000BASE-LX 1550nm SM (SC)
[120 km/77.7 mi.] Link Budget: 27.0 dB

***C3230-1040**
10/100/1000BASE-T (RJ-45) **[100 m]**
to (1) 100/1000Base-X SFP Slot (empty)

***C3231-1040**
10/100/1000BASE-T (RJ-45) **[100 m]**
to (2) 100/1000Base-X SFP Slots (empty)

Single Fiber Products [pg 19]

C3230-1029-A1
C3230-1029-DA1 (DMI Options)
10/100/1000BASE-T (RJ-45) **[100 m]**
to 1000BASE-BX-U 1310nm TX/1490nm RX single fiber single mode (SC)
[20 km/12.4 mi.] Link Budget: 14.0 dB

C3230-1029-A2
C3230-1029-DA2 (DMI Options)
10/100/1000BASE-T (RJ-45) **[100 m]**
to 1000BASE-BX-D 1490nm TX/1310nm RX single fiber single mode (SC)
[20 km/12.4 mi.] Link Budget: 14.0 dB

C3230-1029-B1
10/100/1000BASE-T (RJ-45) **[100 m]**
to 1000BASE-BX-U 1310nm TX/1490nm RX single fiber single mode (SC)
[40 km/24.8 mi.] Link Budget: 20.0 dB

C3230-1029-B2
10/100/1000BASE-T (RJ-45) **[100 m]**
to 1000BASE-BX-D 1490nm TX/1310nm RX single fiber single mode (SC)
[40 km/24.8 mi.] Link Budget: 20.0 dB

*Note all units feature USB port for local management application.

Optional Accessories *(sold separately)*

SFP Modules [pg 161-167]

USB Cables

USBC-AM-BM-03
USB 2.0 Cable A male to B male [3 ft. Gray]

USBC-AM-BM-06
USB 2.0 Cable A male to B male [6 ft. Gray]

AUTO NEG | AUTO CROSS | LINK PASS THRU | REMOTE FAULT DETECT | AUTO LINK RESTORE | PAUSE

100BASE-TX to 100BASE-FX

see also: ION Slide-in-Card 100BASE-TX to 100BASE-FX [pg 141]

E-100BTX-FX-05 Series

Fast Ethernet Media Converter

single fiber model

- Extend Network Distance
  Used in pairs, this media converter can extend distances between two twisted pair switches or a switch and a server up to 2 km over multimode fiber or up to 120 km over single mode fiber.
- Connect Remote Devices Using one media converter, a switch with a copper port can be connected to a switch with an existing fiber interface.

Features

- Operates under heavy traffic loads without excess heat, so there is no need for a failure-prone internal fan.
- Round trip delay of only 40 bit times-far below the Class II rating of 92 bit times
- Auto-Negotiation [pg 16]
- AutoCross™ [pg 16]
- Link Pass Through [pg 17]
- Far-End-Fault (FEF) [pg 16]
- Pause [pg 17]
- Automatic Link Restoration [pg 18]

Optional Accessories *(sold separately)*

Wide Input (24 - 60 VDC) Power Supplies

SPS-2460-CC [pg 158]
Piggy Back Power Supply

SPS-2460-SA [pg 158]
Stand-Alone Power Supply

Mounting Options

E-MCR-05 [pg 158]
12-slot Media Converter Rack

RMS19-SA4-01 [pg 158]
4-slot Media Converter Shelf

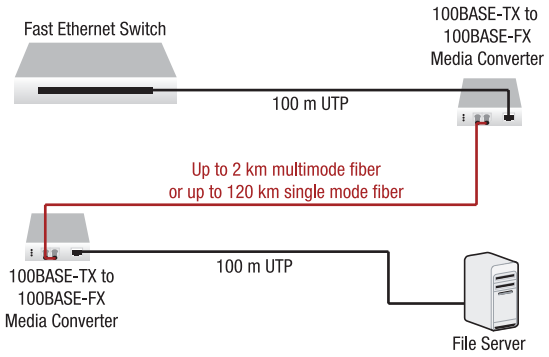
WMBD [pg 158]
DIN Rail Bracket 5.0" [127 mm]

WMBD-FS [pg 158]
DIN Rail Bracket (flat, small) 3.1" [7 9mm]

WMBL [pg 158]
Wall Mount Bracket 4.0" [102 mm]

WMBV [pg 158]
Vertical Wall Mount Bracket 5.0" [127 mm]

Extend Network Distance



The converters will automatically re-establish link when connected to two 10/100 auto-negotiating switches after the fault condition has been corrected. With other manufacturers' converters the user must intervene to re-establish link.

Specifications

Complete list of fiber optic connector specifications [pg 212-224]

Standards	IEEE Std. 802.3, 100BASE-FX, 100BASE-TX
Data Rate	100 Mbps; Layer-1
Switches	**SW1:** Auto-Negotiation On/Off **SW2:** Pause TX On/Off **SW3:** Link Pass Through On/Off **SW4:** Far-End-Fault On/Off
Jumpers	**Jumper Block 1:** AutoCross™ enable
Status LEDs	**PWR(Power)** **SDF or LKF (Link Fiber)** **SDC or LKC (Link Copper)** **RXF (Receive Fiber)** **RXC (Receive Copper)**
Dimensions	**Width:** 3.0" [76mm] **Depth:** 4.7" [119mm] **Height:** 1.0" [25mm]
Power	External AC/DC required: 12 VDC, 0.5 A, unregulated, standard
Environment	0 – 50°C, 5% – 95% humidity non-condensing, 0 – 10,000 ft. altitude
Shipping Weight	2 lbs. [0.90 kg]
Safety Compliance	**Wall Mount Power Supply:** UL Listed and CSA certified
Regulatory Compliance	FCC Class A, EN55024, EN55022 Class A, EN61000, CE Mark
Warranty	Lifetime

Ordering Information

Complete list of fiber optic connector specifications [pg 212-224]

E-100BTX-FX-05
100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1300nm MM (ST)
[2 km/1.2 mi.] Link Budget: 11.0 dB

E-100BTX-FX-05(SC)
100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1300nm multimode (SC)
[2 km/1.2 mi.] Link Budget: 11.0 dB

E-100BTX-FX-05(LC)
100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1300nm multimode (LC)
[2 km/1.2 mi.] Link Budget: 11.0 dB

E-100BTX-FX-05(MT)
100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1300nm MM (MT-RJ)
[2 km/1.2 mi.] Link Budget: 14.5 dB

E-100BTX-FX-05(SM)
100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1310nm SM (SC)
[20 km/12.4 mi.] Link Budget: 16.0 dB

E-100BTX-FX-05(SMLC)
100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1310nm SM (LC)
[20 km/12.4 mi.] Link Budget: 17.3 dB

E-100BTX-FX-05(LH)
100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1310nm SM (SC)
[40 km/24.9 mi.] Link Budget: 26.0 dB

E-100BTX-FX-05(XL)
100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1310nm SM (SC)
[60 km/37.3 mi.] Link Budget: 29.0 dB

E-100BTX-FX-05(LW)
100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1550nm SM (SC)
[80 km/49.7 mi.] Link Budget: 29.0 dB

E-100BTX-FX-05(XLW)
100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1550nm SM (SC)
[120 km/74.6 mi.] Link Budget: 36.0 dB

Single Fiber Products

Recommended use in pairs [pg 19]

E-100BTX-FX-05(100)
100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1310nm TX/1550nm RX
single fiber single mode (SC)
[20 km/12.4 mi.] Link Budget: 19.0 dB

E-100BTX-FX-05(101)
100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1550nm TX/1310nm RX
single fiber single mode (SC)
[20 km/12.4 mi.] Link Budget: 19.0 dB

E-100BTX-FX-05(102)
100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1310nm TX/1550nm RX
single fiber single mode (SC)
[40 km/24.9 mi.] Link Budget: 25.0 dB

E-100BTX-FX-05(103)
100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1550nm TX/1310nm RX
single fiber single mode (SC)
[40 km/24.9 mi.] Link Budget: 25.0 dB

*Note: 60 km & 80 km versions of the single strand fiber products are available. Ask your Transition Networks' representative.

see also: ION Slide-In-Card 10/100Base-TX to 100Base-FX [pg 142]

SBFTF Series

10/100BASE-TX to 100BASE-FX Bridging Media Converter

- Extend network distance up to 120 km
- Bridging devices will provide conversion and integration solutions for half and full-duplex environments
- 10 Mbps or 100 Mbps on TP port
- Half or full-duplex on all ports including fiber

Features

- Auto-Negotiation [pg 16]
- AutoCross™ [pg 16]
- Link Pass Through [pg 17]
- Far-End-Fault (FEF) Detection [pg 16]
- Automatic Link Restoration [pg 18]

Optional Accessories *(sold separately)*

SFP Modules [pg 161-167]

Wide Input (24 - 60 VDC) Power Supplies

SPS-2460-PS [pg 158]
Piggy Back Power Supply

SPS-2460-SA [pg 158]
Stand-Alone Power Supply

Mounting Options

E-MCR-05 [pg 158]
12-slot Media Converter Rack

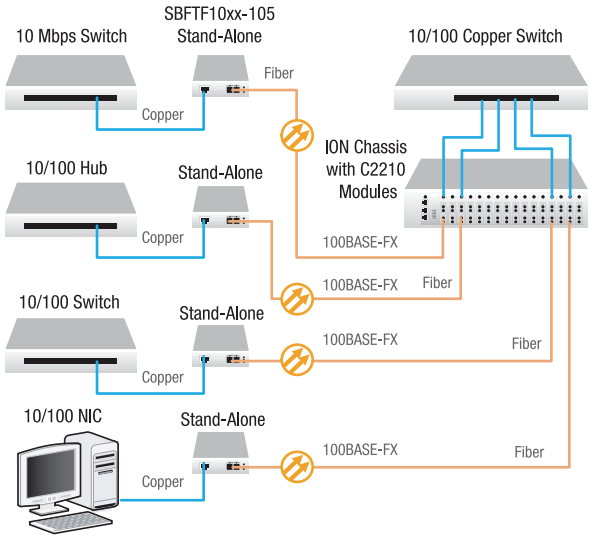
RMS19-SA4-01 [pg 158]
4-slot Media Converter Shelf

WMBD [pg 158]
DIN Rail Bracket 5.0" [127 mm]

WMBD-F [pg 158]
DIN Rail Bracket (flat) 3.3" [84 mm]

WMBL [pg 158]
Wall Mount Bracket 4.0" [102 mm]

WMBV [pg 158]
Vertical Wall Mount Bracket 5.0" [127 mm]



Specifications

Complete list of fiber optic connector specifications [pg 212-224]

Standards	IEEE Std. 802.3
Data Rate	10 Mbps; 100 Mbps, Layer-2
Filtering Addresses	1K MAC addresses
Filtering & Forwarding Rate	14,880 pps for Ethernet; 148,800 pps for Fast Ethernet
RAM Buffers	512 KB
Max Packet Size	2044 bytes untagged; 2048 bytes tagged
Switches	**SW1 (TP):** Auto-Negotiation On/Off **SW2 (TP):** Half or Full-duplex with Auto-Negotiation Off **SW3 (TP):** 10Mbps or 100 Mbps with Auto-Negotiation Off **SW4 (Fiber):** Half or Full-duplex **SW5:** Link Pass Through On/Off **SW6:** Far-End-Fault On/Off
Status LEDs	**PWR (Power):** ON = connection to external power **FD (Fiber Duplex):** ON = Full-duplex; Off = Half-duplex **LNK/ACT (Fiber Link/Activity):** ON = Link; Blinking = Activity **CD (Copper Duplex):** ON = Full-duplex; Off = Half-duplex **LNK/ACT (Copper Link/Activity):** ON = Link; Blinking = Activity **100 (Copper):** Off = 10 Mbps; ON = 100 Mbps
Dimensions	**W:** 3.25" [82 mm] **D:** 4.8" [122 mm] **H:** 1.0" [25 mm]
Power	External AC/DC; 12 VDC, 0.8A min
Environment	0 – 50°C; 5% – 90% humidity non-condensing; 0 – 10,000 ft. altitude
Shipping Weight	2 lbs. [0.90 kg]
Safety Compliance	**Wall Mount Power Supply:** UL Listed
Regulatory Compliance	FCC Class A, VCCI Class 1, CISPR22/EN55022 Class A, EN55024, EN61000, CE Mark
Warranty	Lifetime

Ordering Information

Complete list of fiber optic connector specifications [pg 212-224]

SBFTF1014-105
10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1310nm SM (SC) **[20 km/12.4 mi.] Link Budget: 16.0 dB**

SBFTF1019-105
10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1310nm SM (LC) **[20 km/12.4 mi.] Link Budget: 17.3 dB**

SBFTF1011-105
10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1300nm MM (ST) **[2 km/1.2 mi.] Link Budget: 11.0 dB**

SBFTF1013-105
10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1300nm MM (SC) **[2 km/1.2 mi.] Link Budget: 11.0 dB**

SBFTF1039-105
10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1300nm MM (LC) **[2 km/1.2 mi.] Link Budget: 11.0 dB**

SBFTF1015-105
10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1310nm SM (SC) **[40 km/24.9 mi.] Link Budget: 29.0 dB**

SBFTF1016-105
10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1310nm SM (SC) **[60 km/37.3 mi.] Link Budget: 32.0 dB**

SBFTF1017-105
10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1550nm SM (SC) **[80 km/49.7 mi.] Link Budget: 29.0 dB**

SBFTF1035-105
10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1550nm SM (SC) **[120 km/74.6 mi.] Link Budget: 33.0 dB**

SBFTF1040-105
10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-X SFP Slot (empty)

Single Fiber Products [pg 19]

SBFTF1029-105
10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1310nm TX/1550nm RX single fiber SM (SC) **[20 km/12.4 mi.] Link Budget: 19.0 dB**

SBFTF1029-106
10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1550nm TX/1310nm RX single fiber SM (SC) **[20 km/12.4 mi.] Link Budget: 19.0 dB**

SBFTF1029-107
10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1310nm TX/1550nm RX single fiber SM (SC) **[40 km/24.9 mi.] Link Budget: 25.0 dB**

SBFTF1029-108
10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1550nm TX/1310nm RX single fiber SM (SC) **[40 km/24.9 mi.] Link Budget: 25.0 dB**

AUTO CROSS | AUTO NEG | LOOP BACK | FIELD UPGRADEABLE FIRMWARE | REMOTE FAULT DETECT | SINGLE FIBER | LAST GASP | BANDWIDTH ALLOCATION | REMOTE MGMT | NEW PRODUCT

10/100BASE-TX to 100BASE-FX

see also: ION Slide-In-Card 10/100Base-TX to 100Base-FX [pg 143]

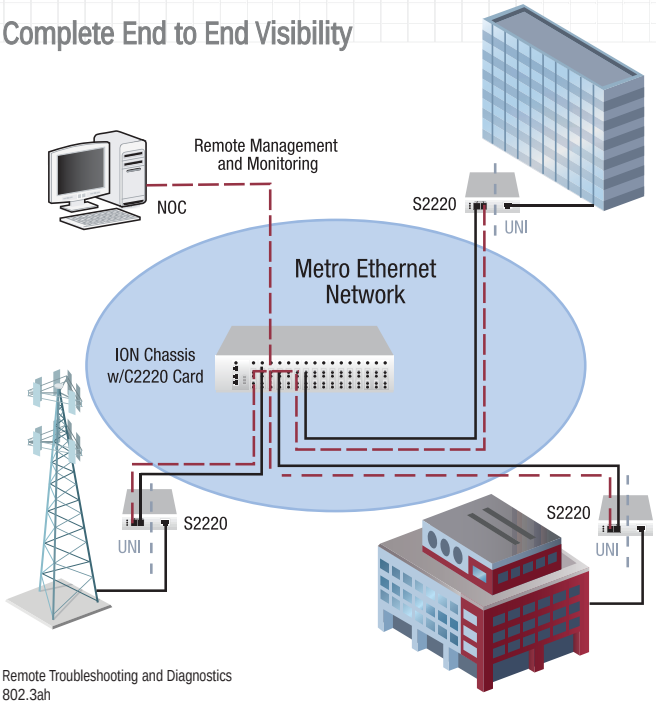
S2220 Series

OAM/IP-Based Remotely Managed NID (Network Interface Device)

Features

- 802.3ah Link OAM
- 10K Jumbo Frame Support
- Two selectable Remote Management modes:
  - IP-Based Remote Management
  - In-Band (remote device managed by local peer) [pg 17]
- AutoCross™ [pg 16]
- Auto-Negotiation [pg 16]
- Pause [pg 17]
- Transparent Link Pass Through [pg 17]
- Far-End-Fault [pg 16]
- Remote Loopback [pg 18]
- Field Upgradeable Firmware [pg 18]
- IEEE 802.1p QoS packet classification
- Ipv4 IP TOS, DiffDerv and IPv6 traffic class QoS classification
- IEEE 802.1q VLAN and double VLAN tagging with 4096 VIDs
- DHCP client
- SNTP
- TFTP
- IEEE 802.1x Port based security
- RADIUS client
- RMON counters for each port
- Bandwidth profiling [pg 18]
- DMI Optical Management
- Cable diagnostic function for copper ports
- SSH
- Telnet
- Command Line Interface (CLI)
- Web management
- Focal Point Management
- SNMP v1 & v2c
- USB port for basic setup
- Management VLAN

Complete End to End Visibility



Remote Troubleshooting and Diagnostics
802.3ah
SNMP traps
Provider Visiblity and Control

Complete End to End Visibility

- Ethernet in the First Mile (EFM)
- Fiber-to-the-Premise (FTTP)
- E-Line Services (EPL & EVPL)
- Enterprise Markets

Specifications

Complete list of fiber optic connector specifications [pg 212-224]

Standards	IEEE Std. 802.3, IEEE Std. 802.3ah, IEEE Std 802.1P, IEEE Std 802.1Q, IEE Std. 802.1X
Data Rate	**Copper:** 10/100 Mbps **Fiber:** 100 Mbps
Filtering Addresses	8K MAC Addresses
Max Frame Size	10,240 bytes
Dimensions	**Width:** 3.25" [82 mm] **Depth:** 6.5" [165 mm] **Height:** 1.0" [25 mm]
Power	**Input:** 100-240 VAC, 1A **Output:** 12 VDC, 1.25A
Operating Temperature	0°C to 50°C
Altitude	0-10,000 ft.
Operating Humidity	5%-95% (non-condensing)
Shipping Weight	2 lb. [.90 kg]
Regulatory Compliance	EN55022 class A, EN55024, UL60950, CE Mark
Warranty	Lifetime

Ordering Information

S2220-1011
S2220-1011-D (DMI Options)
10/100BASE-TX (RJ-45) **[100 m]**
to 100BASE-FX 1310nm MM (ST)
[2 km/1.2 mi.] Link Budget: 11.0 dB

S2220-1013
S2220-1013-D (DMI Options)
10/100BASE-TX (RJ-45) **[100 m]**
to 100BASE-FX 1310nm MM (SC)
[2 km/1.2 mi.] Link Budget: 11.0 dB

S2220-1014
S2220-1014-D (DMI Options)
10/100BASE-TX (RJ-45) **[100 m]**
to 100BASE-LX 1310nm SM (SC)
[10 km/6.2 mi.] Link Budget: 16.0 dB

S2220-1015
S2220-1015-D (DMI Options)
10/100BASE-TX (RJ-45) **[100 m]**
to 100BASE-FX 1310nm SM (SC)
[40 km/24.8 mi.] Link Budget: 26.0 dB

S2220-1016
10/100BASE-TX (RJ-45) **[100 m]**
to 100BASE-FX 1550nm SM (SC)
[60 km/37.3 mi.] Link Budget: 29.0 dB

S2220-1017
10/100BASE-TX (RJ-45) **[100 m]**
to 100BASE-FX 1550nm SM (SC)
[80 km/49.7 mi.] Link Budget: 29.0 dB

S2220-1035
10/100BASE-TX (RJ-45) **[100 m]**
to 100BASE-FX 1550nm SM (SC)
[120 km/77.7 mi.] Link Budget: 36.0 dB

S2220-1040
10/100BASE-TX (RJ-45) **[100 m]**
to 100Base-X SFP Slot (empty)

Single Fiber Products

Recommended use in pairs [pg 19]

S2220-1029-A1
S2220-1029-DA1 (DMI Options)
10/100BASE-TX (RJ-45) **[100 m]**
to 100BASE-BX-U 1310nm TX/1550nm RX Bi-Di SM (SC)
[20 km/12.4 mi.] Link Budget: 19.0 dB

S2220-1029-A2
S2220-1029-DA2 (DMI Options)
10/100BASE-TX (RJ-45) **[100 m]**
to 100BASE-BX-D 1550nm TX/1310nm RX Bi-Di SM (SC)
[20 km/12.4 mi.] Link Budget: 19.0 dB

S2220-1029-B1
10/100BASE-TX (RJ-45) **[100 m]**
to 100BASE-BX-U 1310nm TX/1550nm RX Bi-Di SM (SC)
[40 km/24.8 mi.] Link Budget: 25.0 dB

S2220-1029-B2
10/100BASE-TX (RJ-45) **[100 m]**
to 100BASE-BX-D 1550nm TX/1310nm RX Bi-Di SM (SC)
[40 km/24.8 mi.] Link Budget: 25.0 dB

*Note all units feature USB port for local management application.

Optional Accessories *(sold separately)*

SFP Modules [pg 161-167]

USB Cables

USBC-AM-BM-03
USB 2.0 Cable A male to B male [3 ft. Gray]

USBC-AM-BM-06
USB 2.0 Cable A male to B male [6 ft. Gray]

AUTO CROSS | AUTO NEG | LOOP BACK | FIELD UPGRADEABLE FIRMWARE | REMOTE FAULT DETECT | BANDWIDTH ALLOCATION | REMOTE MGMT

10/100BASE-TX
Fast Ethernet

S2250

OAM/IP-Based Remotely Managed NID (Network Interface Device)

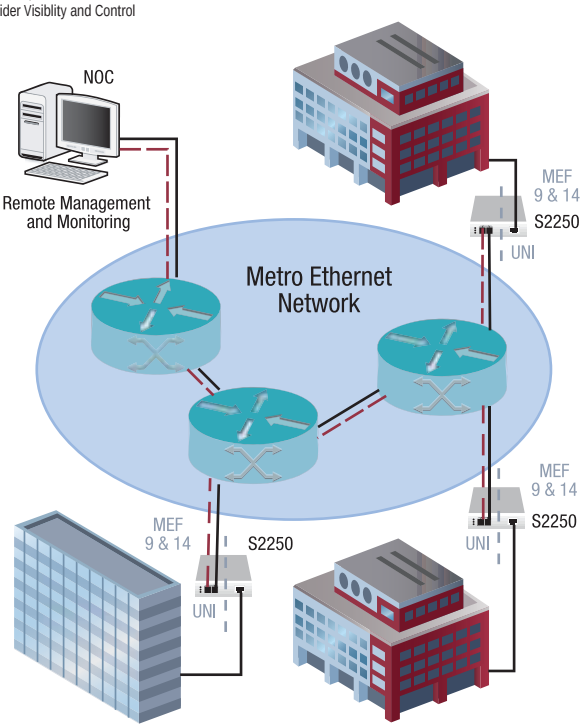
Designed to demarc the edges of your network, the S2250 device offers advanced packet performance metering and service creation directly from customer premises and cell-sites.

Features

- IEEE 802.3ah Linkt OAM
- IEEE 802.1ag Service OAM
- ITU-T Recommendation Y.1731
- Performance Monitoring
- Intelligent Loopbacks [pg 18]
- Per-Flow Statistics
- Tapping & Monitoring
- Thru-Traffic Per-flow Statistics
- Dual Monitoring Access Ports
- Fast Fault Propogation, <50 ms on all interfaces, client & network ports
- Dying Gasp (via 802.3ah or SNMP traps)
- VLAN Tagging/De-tagging and VLAN Stacking (.1Q in .1Q)
- Intergrated Copper TDR cable integrity testing
- Jumbo Frames support for all features (up to 10,240 bytes)
- Continuous in-service monitoring of Layer 2 & 3 SLA parameters
- User settable SLA threshold crossing alerts using SNMP traps
- Bandwidth policing [pg 18]
- Integrated Management
  - SNMP v1, v2c, Sets & Gets
  - Radius Authentication
  - SSL and SSH
  - Management VLAN
  - Configuration import/export
  - NTP Client (or source)
  - Syslog
  - DNS Client
  - DHCP Client

Complete End to End Visibility

Remote Troubleshooting and Diagnostics
802.3ah, 802.1ag, Y.1731
SNMP traps
Provider Visiblity and Control



Specifications

Standards	IEEE Std. 802.3ah, IEEE Std 802.1ag
Data Rate	100 Mbps
Dimensions	**Width:** 1.60" **Depth:** 5.80" **Height:** 5.34"
Power	External AC/DC adapter (120-240 VAC auto-sensing, 50-60 Hz), 5 VDC input to unit Dual (A/B) -48 VDC Central Office Supply inputs Cooling: convection cooled (no fans)
Power Consumption	5-8 Watts
Operating Temperature	-5°C to 65°C
Storage Temperature	-40°C to 70°C
Operating Humidity	5-95% (non-condensing)
Shipping Weight	1.37 lb. [.62kg]
Regulatory Compliance	IEC 60950, MTBF >53yrs(4), FCC Part 15 Class A, NEBS Level 3, Industry Canada CS-03, MEF9 Service Certification, CE Mark, MEF14 Traffic Management
Warranty	1 year hardware and software

Ordering Information

S2250
(4) 10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
(1) 10/100BASE-TX (RJ-45) **[100 m/328 ft.]**
management port

AUTO NEG | TRANSPARENT LINK PASS THRU | AUTO LINK RESTORE | PAUSE | AUTO CROSS | REMOTE FAULT DETECT

see also: ION Slide-In-Module Gigabit Ethernet Media Converters [pg 144]

SGETF Series

1000BASE-T to 1000BASE-SX/LX Gigabit Ethernet Media Converter

Migrate to Gigabit Ethernet in a cost-effective manner. Used in conjunction with lower cost 1000BASE-T switches, companies can take advantage of the high bandwidth Gigabit Ethernet offers without all of the higher costs. Transition Networks' 1000BASE-T to SX/LX converters allow users to extend the bandwidth to those users outside the reach of the 1000BASE-T standard (up to 125 km).

Features

- Copper & Fiber Auto-Negotiation [pg 16]
- Transparent Link Pass Through [pg 17]
- Automatic Link Restoration [pg 18]
- Pause [pg 17]
- Remote Fault Detect [pg 19]

Optional Accessories *(sold separately)*

SFP Modules [pg 161-167]

Wide Input (24 - 60 VDC) Power Supplies

SPS-2460-PS [pg 158]
Piggy Back Power Supply

SPS-2460-SA [pg 158]
Stand-Alone Power Supply

Mounting Options

E-MCR-05 [pg 158]
12-slot Media Converter Rack

RMS19-SA4-01 [pg 158]
4-slot Media Converter Shelf

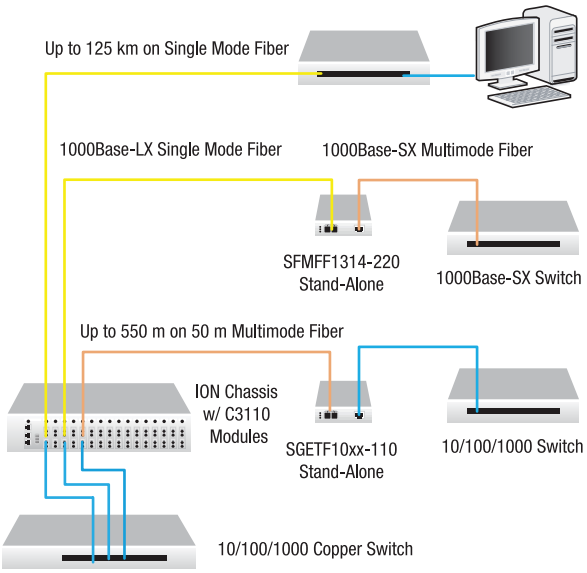
WMBD [pg 158]
DIN Rail Bracket 5.0" [127 mm]

WMBD-F [pg 158]
DIN Rail Bracket (flat, small) 3.1" [79 mm]

WMBL [pg 158]
Wall Mount Bracket 4.0" [102 mm]

WMBV [pg 158]
Vertical Wall Mount Bracket 5.0" [127 mm]

Migrate to Gigabit Ethernet



Specifications

Standards	IEEE Std. 802.3ab and IEEE Std. 802.3
Data Rate	1000 Mbps, Layer-1
6-position Switch	**SW1:** Remote Fiber Fault Detect (Down=Enabled) **SW2:** Symmetric Pause **SW3:** Asymmetric Pause **SW4:** Transparent Link Pass Through (UP=Enabled) **SW5:** Fiber Auto-Negotiation (Down=Enabled) **SW6:** Loopback (Down=Enabled)
Status LEDs	**PWR (Power):** Steady green LED indicates connection to external AC power **RXF (Fiber receive):** Flashing LED indicates reception of data on fiber link **LKF (Fiber link):** Steady LED indicates fiber link connection **RXC (Copper receive):** Flashing LED indicates reception of data on copper link **LKC (Copper link):** Steady LED indicates copper link connection
Dimensions	**Width**: 3.25" [82 mm] **Depth**: 4.8" [122 mm] **Height**: 1.0" [25 mm]
Power	External AC/DC required; 12 VDC, 0.8A min
Environment	0 – 50° C operating; 5% – 95% humidity non-condensing; 0 – 10,000 ft. altitude
Shipping Weight	2 lbs. [0.90 kg]
Safety Compliance	**Wall Mount Power Supply**: UL Listed, C-UL Listed (Canada)
Regulatory Compliance	FCC Class A, CISPR22/EN55022 Class A, EN55024, EN61000, CE Mark
Warranty	Lifetime

Ordering Information

SGETF1013-110
1000BASE-T (RJ-45) **[100 m/328 ft.]**
to 1000BASE-SX 850nm MM (SC)
[62.5/125µm fiber: 220 m/722 ft.]
Link Budget: 7.0 dB
[50/125µm fiber: 550 m/1804 ft.]
Link Budget: 7.0 dB

SGETF1024-110
1000BASE-T (RJ-45) **[100 m/328 ft.]**
to 1000BASE-SX 1300nm Extended MM (62.5/125 µm fiber only) (SC)
[2 km/1.2 mi.] Link Budget: 7.0 dB

SGETF1039-110
1000BASE-T (RJ-45) **[100 m/328 ft.]**
to 1000BASE-SX 850nm MM (LC) (via TN-SFP-SX)
[62.5/125µm fiber: 220 m/722 ft.]
Link Budget: 8.0 dB
[50/125µm fiber: 550 m/1804 ft.]
Link Budget: 8.0 dB

SGETF1014-110
1000BASE-T (RJ-45) **[100 m/328 ft.]**
to 1000BASE-LX 1310nm SM (SC)
[10 km/6.2 mi.] Link Budget: 10.5 dB

SGETF1015-110
1000BASE-T (RJ-45) **[100 m/328 ft.]**
to 1000BASE-LX 1310nm SM (SC)
[25 km/15.5 mi.] Link Budget: 15.0 dB

SGETF1017-110
1000BASE-T (RJ-45) **[100 m/328 ft.]**
to 1000BASE-LX 1550nm SM (SC)
[65 km/40.4 mi.] Link Budget: 20.0 dB

SGETF1035-110
1000BASE-T (RJ-45) **[100 m/328 ft.]**
to 1000BASE-LX 1550nm SM (SC)
[125 km/77.7 mi.] Link Budget: 27.0 dB

SGETF1040-110
1000BASE-T (RJ-45) **[100 m/328 ft.]**
to 1000BASE-X

Single Fiber Products

Recommended use in pairs [pg 19]

SGETF1029-110
1000BASE-T (RJ-45) **[100 m/328 ft.]**
to 1000BASE-LX 1310nm TX/1550nm RX single fiber SM (SC)
[20 km/12.4 mi.] Link Budget: 13.0 dB

SGETF1029-111
1000BASE-T (RJ-45) **[100 m/328 ft.]**
to 1000BASE-LX 1550nm TX/1310nm RX single fiber SM (SC)
[20 km/12.4 mi.] Link Budget: 13.0 dB

SGETF1029-112
1000BASE-T (RJ-45) **[100 m/328 ft.]**
to 1000BASE-LX 1310nm TX/1550nm RX single fiber SM (SC)
[40 km/24.9 mi.] Link Budget: 20.0 dB

SGETF1029-113
1000BASE-T (RJ-45) **[100 m/328 ft.]**
to 1000BASE-LX 1550nm TX/1310nm RX single fiber SM (SC)
[40 km/24.9 mi.] Link Budget: 20.0 dB

SGETF1029-116
1000BASE-T (RJ-45) **[100 m/328 ft.]**
to 1000BASE-LX 1510nm TX/1590nm RX single fiber SM (SC)
[80 km/49.6 mi.] Link Budget: 24.0 dB

SGETF1029-117
1000BASE-T (RJ-45) **[100 m/328 ft.]**
to 1000BASE-LX 1590nm TX/1510nm RX single fiber SM (SC)
[80 km/49.6 mi.] Link Budget: 24.0 dB

see also: ION Slide-In-Card Media Converters [pg 145]

SGFEB Series

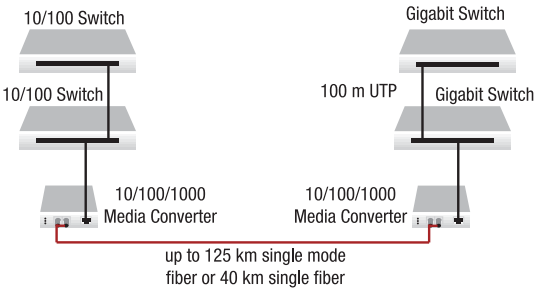
10/100/1000BASE-T to 1000BASE-SX/LX Ethernet Media Converter

- Extend Network Distance
- Bridge legacy 10/100 devices to a Gigabit backbone

Features

- Auto-Negotiation (copper and fiber ports) [pg 16]
- Switch-selectable speeds UTP when Auto-Negotiation is off
- AutoCross™ [pg 16]
- Link Pass Through [pg 17]
- Remote Fault Detect [pg 19]
- Pause [pg 17]

Extend Network Distance



Specifications

Complete list of fiber optic connector specifications [pg 212-224]

Standards	IEEE 802.3, IEEE 802.3ab, IEEE 802.3u, IEEE 802.3z
Data Rate	**Copper:** 10/100/1000 Mbps, Layer-2 **Fiber:** 1000 Mbps
Filtering Addresses	8K MAC Addresses
Max Frame Size	**802.3ac tagged:** 1628 bytes; **untagged:** 1632 bytes
Status LEDs	**PWR:** ON green = Power applied to card **TP (Duplex/Link/Activity):** Orange: ON = Half-duplex Link; BLINK = Activity; Green: ON = Full-duplex Link; BLINK = Activity **TP (10 Mbps/100 Mbps/1000 Mbps):** Off = 10 Mbps; Orange = 100 Mbps; Green = 1000 Mbps **LACT (Fiber Link/Activity):** Green: ON = Link; BLINK = Activity
Dip Switches	**Switch 1:** TX - Enable/Disable Auto-Negotiation **Switch 2:** TX - Force 10 Mbs or 100 Mbs with Switch 1 off **Switch 3:** TX - Force Half or Full duplex with Switch 1 off **Switch 4:** Enable/Disable LPT **Switch 5:** not used **Switch 6:** not used
Jumpers	**J6:** TX - Enable/Disable AutoCross™
Dimensions	**Width:** 3.25" [82 mm] **Depth:** 4.8" [122 mm] **Height:** 1.0" [25 mm]
Power	External AC/DC required: 12 VDC, 1.25 A, unregulated, standard
Power Consumption	4.8 Watts
Environment	0 – 50°C operating, -40°C - 85°C storage 5% – 95% humidity non-condensing, 0 – 10,000 ft. altitude
Shipping Weight	2 lb. [0.9 kg]
Regulatory Compliance	CISPR/EN55022 Class A, EN55024, EN61000, FCC Class A, CE Mark
Safety Compliance	**Wall Mount Power Supply:** UL listed & CSA certified
Warranty	Lifetime

Ordering Information

SGFEB1013-120
10/100/1000BASE-T (RJ-45) **[100 m]**
to 1000BASE-SX 850nm multimode (SC)
[62.5/125µm: 220 m/722 ft.]
[50/125µm: 550 m/1804 ft.]
Link Budget: 7.0 dB

SGFEB1024-120
10/100/1000BASE-T (RJ-45) **[100 m]**
to 1000BASE-SX 1300nm Extended MM (62.5/125 µm fiber only) (SC)
[up to 2 km] Link Budget: 7.0 dB

SGFEB1014-120
10/100/1000BASE-T (RJ-45) **[100 m]**
to 1000BASE-LX 1310nm SM (SC)
[10 km/6.2 mi.] Link Budget: 7.0 dB

SGFEB1015-120
10/100/1000BASE-T (RJ-45) **[100 m]**
to 1000BASE-LX 1310nm SM (SC)
[25 km/15.5 mi.] Link Budget: 15.0 dB

SGFEB1017-120
10/100/1000BASE-T (RJ-45) **[100 m]**
to 1000BASE-LX 1550nm SM (SC)
[65 km/40.4 mi.] Link Budget: 20.0 dB

SGFEB1035-120
10/100/1000BASE-T (RJ-45) **[100 m]**
to 1000BASE-LX 1550nm SM (SC)
[125 km/77.7 mi.] Link Budget: 27.0 dB

SGFEB1040-120
10/100/1000BASE-T (RJ-45) **[100 m]**
to 1000BASE-X SFP Slot (empty)

Single Fiber Products

Recommended use in pairs [pg 19]

SGFEB1029-120
10/100/1000BASE-T (RJ-45) **[100 m]**
to 1000BASE-LX 1310nm TX/1550nm RX single fiber single mode (SC)
[20 km/12.4 mi.] Link Budget: 13.0 dB

SGFEB1029-121
10/100/1000BASE-T (RJ-45) **[100 m]**
to 1000BASE-LX 1550nm TX/1310nm RX single fiber single mode (SC)
[20 km/12.4 mi.] Link Budget: 13.0 dB

SGFEB1029-122
10/100/1000BASE-T (RJ-45) **[100 m]**
to 1000BASE-LX 1310nm TX/1550nm RX single fiber single mode (SC)
[40 km/24.9 mi.] Link Budget: 20.0 dB

SGFEB1029-123
10/100/1000BASE-T (RJ-45) **[100 m]**
to 1000BASE-LX 1550nm TX/1310nm RX single fiber single mode (SC)
[40 km/24.9 mi.] Link Budget: 20.0 dB

Optional Accessories *(sold separately)*

SFP Modules [pg 161-167]

Wide Input (24 - 60VDC) Power Supplies

SPS-2460-PS or SPS-2460-SA [pg 158]

Mounting Options

E-MCR-05 [pg 158]
12-slot Media Converter Rack

WMBD [pg 158]
DIN Rail Mount Bracket 5.0" [127 mm]

WMBL [pg 158]
Wall Mount Bracket 4.0" [102 mm]

RMS19-SA4-01 [pg 158]
4-slot Media Converter Shelf

AUTO CROSS | AUTO NEG | LOOP BACK | FIELD UPGRADEABLE FIRMWARE | REMOTE FAULT DETECT | SINGLE FIBER | LAST GASP | BANDWIDTH ALLOCATION | REMOTE MGMT | NEW PRODUCT

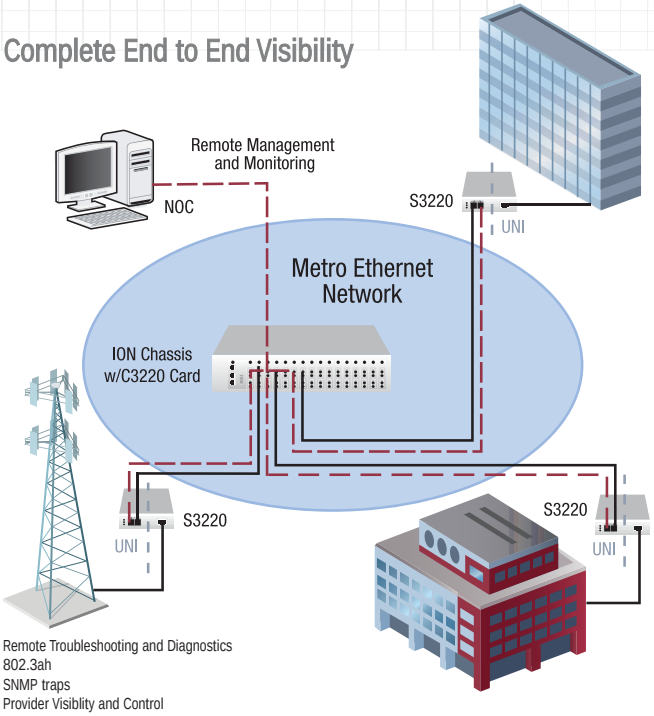
S322x Series

OAM/IP-Based Remotely Managed NID (Network Interface Device)

Features

- 802.3ah Link OAM
- 10K Jumbo Frame Support
- Two selectable Remote Management modes:
  - IP-Based Remote Management
  - In-Band (remote device managed by local peer) [pg 17]
- AutoCross™ [pg 16]
- Auto-Negotiation [pg 16]
- Pause [pg 17]
- Transparent Link Pass Through [pg 17]
- Far-End-Fault [pg 16]
- Remote Loopback [pg 18]
- Field Upgradeable Firmware [pg 18]
- IEEE 802.1p QoS packet classification
- Ipv4 IP TOS, DiffDerv and IPv6 traffic class QoS classification
- IEEE 802.1q VLAN and double VLAN tagging with 4096 VIDs
- DHCP client
- SNTP
- TFTP
- IEEE 802.1x Port based security
- RADIUS client
- RMON counters for each port
- Bandwidth profiling [pg 18]
- DMI Optical Management
- Cable diagnostic function for copper ports
- SSH
- Telnet
- Command Line Interface (CLI)
- Web management
- Focal Point Management
- SNMP v1 & v2c
- USB port for basic setup
- Management VLAN

Complete End to End Visibility



Remote Troubleshooting and Diagnostics
802.3ah
SNMP traps
Provider Visiblity and Control

Applications

- Ethernet in the First Mile (EFM)
- Fiber-to-the-Premise (FTTP)
- E-Line Services (EPL & EVPL)
- Enterprise Markets

Specifications

Complete list of fiber optic connector specifications [pg 212-224]

Standards	IEEE Std. 802.3, IEEE Std. 802.3ah, IEEE Std 802.1P, IEEE Std. 802.1Q, IEEE Std. 802.1X
Data Rate	**Copper:** 10/100/1000 Mbps **Fiber:** 1000 Mbps
Filtering Address	8K MAC Addresses
Max Frame Size	10,240 bytes
Dimensions	**Width:** 3.25" [82 mm] **Depth:** 6.5" [165 mm] **Height:**1.0" [25 mm]
Power	**Input:** 100-240 VAC,1A **Output:** 12 VDC, 1.25A
Operating Temperature	0°C to 50°C
Operating Humidity	5-95% (non-condensing)
Shipping Weight	2.0 lbs. [0.90 kg]
Regulatory Compliance	EN55022 Class A, EN55024, UL60950, CE Mark
Warranty	Lifetime

**S3220-1040 and S3221-1040 have SGMII support for use with 10/100/1000BASE-T copper SFPs.*

Ordering Information

S3220-1013
S3220-1013-D (DMI Options)
10/100/1000BASE-T (RJ-45) **[100 m]**
to 1000BASE-SX 850nm MM (SC)
[62.5/125 µm fiber: 220 m/722 ft.]
[50/125 µm fiber: 550 m/1804 ft.]
Link Budget: 8.5 dB

S3220-1014
S3220-1014-D (DMI Options)
10/100/1000BASE-T (RJ-45) **[100 m]**
to 1000BASE-LX 1310nm SM (SC)
[10 km/6.2 mi.] Link Budget: 10.5 dB

S3220-1015
S3220-1015-D (DMI Options)
10/100/1000BASE-T (RJ-45) **[100 m]**
to 1000BASE-LX 1310nm SM (SC)
[30 km/18.6 mi.] Link Budget: 15.0 dB

S3220-1017
10/100/1000BASE-T (RJ-45) **[100 m]**
to 1000BASE-ZX 1550nm SM (SC)
[80 km/49.7 mi.] Link Budget: 21.0 dB

S3220-1035
10/100/1000BASE-T (RJ-45) **[100 m]**
to 1000BASE-ZX 1550nm SM (SC)
[120 km/77.7 mi.] Link Budget: 27.0 dB

***S3220-1040**
10/100/1000BASE-T (RJ-45) **[100 m]**
to (1) 100/1000Base-X Open SFP Slot

***S3221-1040**
10/100/1000BASE-T (RJ-45) **[100 m]**
to (2) 100/1000Base-X Open SFP Slot

Single Fiber Products

Recommended use in pairs [pg 19]

S3220-1029-A1
S3220-1029-DA1 (DMI Options)
10/100/1000BASE-T (RJ-45) **[100 m]**
to 1000BASE-BX 1310nm TX/1490nm RX Bi-Di SM (SC)
[20 km/12.4 mi.] Link Budget: 14.0 dB

S3220-1029-A2
S3220-1029-DA2 (DMI Options)
10/100/1000BASE-T (RJ-45) **[100 m]**
to 1000BASE-BX 1490nm TX/1310nm RX Bi-Di SM (SC)
[20 km/12.4 mi.] Link Budget: 14.0 dB

S3220-1029-B1
10/100/1000BASE-T (RJ-45) **[100 m]**
to 1000BASE-BX 1310nm TX/1490nm RX Bi-Di SM (SC)
[40 km/24.8 mi.] Link Budget: 20.0 dB

S3220-1029-B2
10/100/1000BASE-T (RJ-45) **[100 m]**
to 1000BASE-BX 1490nm TX/1310nm RX Bi-Di SM (SC)
[40 km/24.8 mi.] Link Budget: 20.0 dB

*Note all units feature USB port for local management application.

Optional Accessories *(sold separately)*

SFP Modules [pg 161-167]

USB Cables

USBC-AM-BM-03
USB 2.0 Cable A male to B male [3 ft. Gray]

USBC-AM-BM-06
USB 2.0 Cable A male to B male [6 ft. Gray]

AUTO CROSS | AUTO NEG | LOOP BACK | FIELD UPGRADEABLE FIRMWARE | REMOTE FAULT DETECT | SINGLE FIBER | LAST GASP | BANDWIDTH ALLOCATION | REMOTE MGMT | NEW PRODUCT

10/100/1000BASE-T to 1000BASE-SX/LX

see also: ION Slide-in-Card 10/100/1000BASE-T to 1000BASE-SX/LX [pg 147]

S323x Series

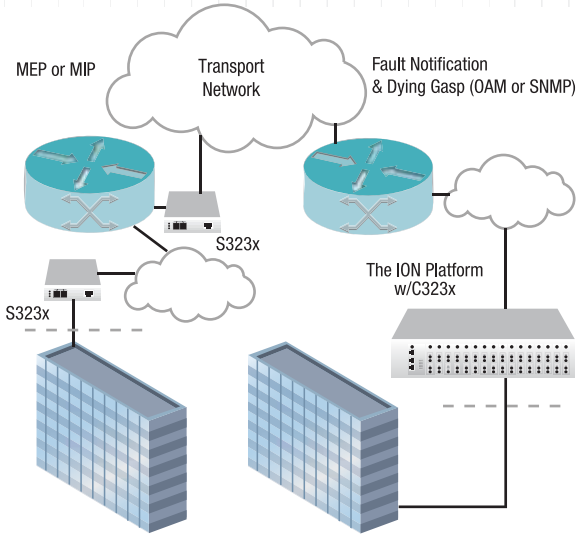
OAM/IP-Based Remotely Managed NID (Network Interface Device)

Gigabit Ethernet

Features

- 802.3ah Link OAM
- 802.1ag Services OAM
- ITU Y.1731
- 10K Jumbo Frame Support
- Two selectable Remote Management modes:
  - IP-Based Remote Management
  - In-Band Link (remote device managed by local peer) [pg 17]
- AutoCross™ [pg 16]
- Auto-Negotiation [pg 16]
- Pause [pg 17]
- Transparent Link Pass Through [pg 17]
- Far-End-Fault [pg 16]
- Remote Loopback [pg 18]
- Field Upgradeable Firmware [pg 18]
- IEEE 802.1p QoS packet classification
- Ipv4 IP TOS, DiffDerv and IPv6 traffic class QoS classification
- IEEE 802.1q VLAN and double VLAN tagging with 4096 VIDs
- DHCP client
- SNTP
- TFTP
- IEEE 802.1x Port based security
- RADIUS client
- RMON counters for each port
- Bandwidth profiling [pg 18]
- DMI Optical Management
- Cable diagnostic function for copper ports
- SSH
- Telnet
- Command Line Interface (CLI)
- Web management
- Focal Point Management
- SNMP v1 & v2c
- USB port for basic setup
- Management VLAN

Complete End to End Visibility



Standard	Access	Core	Access	OAM
MEF & ITU-T	←	→		Service
802.1ag, Y.1731	←	→	←	Connectivity
IEEE	←		←	Link

Remote Troubleshooting and Diagnostics
802.3ah, 802.1ag, Y.1731, SNMP traps, Provider Visibility & Control

Applications

- Ethernet in the First Mile (EFM)
- Fiber-to-the-Premise (FTTP)
- E-Line Services (EPL & EVPL)
- Enterprise Markets

Specifications

Complete list of fiber optic connector specifications [pg 212-224]

Standards	IEEE Std. 802.3, IEEE Std. 802.3ah, IEEE Std 802.1P, IEEE Std. 802.1Q, IEEE Std. 802.1X
Data Rate	**Copper:** 10/100/1000 Mbps **Fiber:** 1000 Mbps
Filtering Address	8K MAC Addresses
Max Frame Size	10,240 bytes
Dimensions	**Width:** 3.25" [82 mm] **Depth:** 6.5" [165 mm] **Height:**1.0" [25 mm]
Power	**Input:** 100-240 VAC,1A **Output:** 12 VDC, 1.25A
Operating Temperature	0°C to 50°C
Altitude	0-10,000 ft.
Operating Humidity	5-95% (non-condensing)
Shipping Weight	2.0 lbs. [0.90 kg]
Regulatory Compliance	EN55022 Class A, EN55024, UL60950, CE Mark
Warranty	Lifetime

**S3230-1040 and S3231-1040 have SGMII support for use with 10/100/1000BASE-T copper SFPs.*

Ordering Information

S3230-1013

S3230-1013-D (DMI Options)
10/100/1000BASE-T (RJ-45) **[100 m]**
to 1000BASE-SX 850nm MM (SC)
[62.5/125 µm fiber: 220 m/722 ft.]
[50/125 µm fiber: 550 m/1804 ft.]
Link Budget: 8.5 dB

S3230-1014

S3230-1014-D (DMI Options)
10/100/1000BASE-T (RJ-45) **[100 m]**
to 1000BASE-LX 1310nm SM (SC)
[10 km/6.2 mi.] Link Budget: 10.5 dB

S3230-1015

S3230-1015-D (DMI Options)
10/100/1000BASE-T (RJ-45) **[100 m]**
to 1000BASE-LX 1310nm SM (SC)
[30 km/18.6 mi.] Link Budget: 15.0 dB

S3230-1017
10/100/1000BASE-T (RJ-45) **[100 m]**
to 1000BASE-ZX 1550nm SM (SC)
[80 km/49.7 mi.] Link Budget: 21.0 dB

S3230-1035
10/100/1000BASE-T (RJ-45) **[100 m]**
to 1000BASE-ZX 1550nm SM (SC)
[120 km/77.7 mi.] Link Budget: 27.0 dB

***S3230-1040**
10/100/1000BASE-T (RJ-45) **[100 m]**
to (1) 100/1000Base-X Open SFP Slot

***S3231-1040**
10/100/1000BASE-T (RJ-45) **[100 m]**
to (2) 100/1000Base-X Open SFP Slots

Single Fiber Products

Recommended use in pairs [pg 19]

S3230-1029-A1

S3230-1029-DA1 (DMI Options)
10/100/1000BASE-T (RJ-45) **[100 m]**
to 1000BASE-BX 1310nm TX/1490nm RX Bi-Di SM (SC)
[20 km/12.4 mi.] Link Budget: 14.0 dB

S3230-1029-A2

S3230-1029-DA2 (DMI Options)
10/100/1000BASE-T (RJ-45) **[100 m]**
to 1000BASE-BX 1490nm TX/1310nm RX Bi-Di SM (SC)
[20 km/12.4 mi.] Link Budget: 14.0 dB

S3230-1029-B1
10/100/1000BASE-T (RJ-45) **[100 m]**
to 1000BASE-BX 1310nm TX/1490nm RX Bi-Di SM (SC)
[40 km/24.8 mi.] Link Budget: 20.0 dB

S3230-1029-B2
10/100/1000BASE-T (RJ-45) **[100 m]**
to 1000BASE-BX 1490nm TX/1310nm RX Bi-Di SM (SC)
[40 km/24.8 mi.] Link Budget: 20.0 dB

**Note all units feature USB port for local management application.*

Optional Accessories *(sold separately)*

SFP Modules [pg 161-167]

USB Cables

USBC-AM-BM-03
USB 2.0 Cable A male to B male [3 ft. Gray]

USBC-AM-BM-06
USB 2.0 Cable A male to B male [6 ft. Gray]

AUTO CROSS | AUTO NEG | LOOP BACK | FIELD UPGRADEABLE FIRMWARE | REMOTE FAULT DETECT | SINGLE FIBER | LAST GASP | BANDWIDTH ALLOCATION | REMOTE MGMT

10/100/1000BASE-T to 1000BASE-SX/LX Gigabit Ethernet

S325x Series

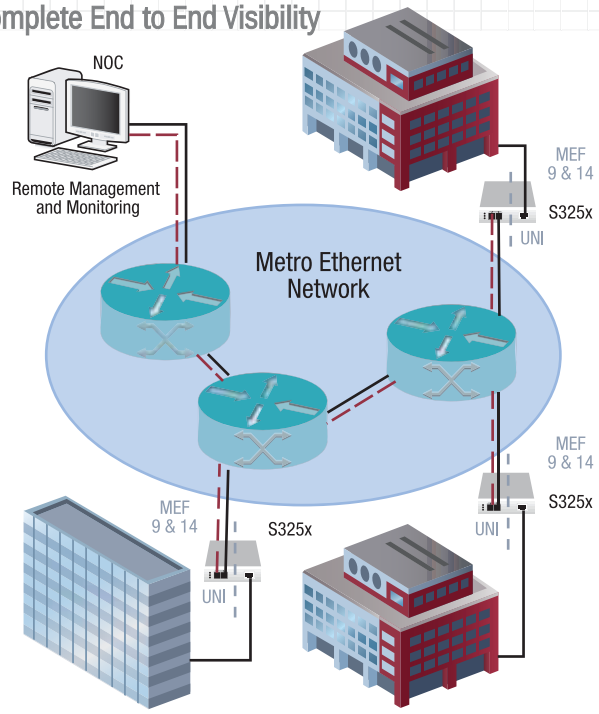
OAM/IP-Based Remotely Managed NID (Network Interface Device)

CARRIER ETHERNET MEF Certified Compliant

Features

- OAM Functionality
  - IEEE 802.3ah Link OAM
  - IEEE 802.1ag Service OAM
  - ITU-T Recommendation Y.1731
- Performance Monitoring
- In-Service Throughput Testing
- Intelligent Loopbacks [pg 18]
- Per-Flow Statistics
- Tapping & Monitoring
- Thru-Traffic Per-flow Statistics
- Dual Monitor Access Ports
- Fast Fault Propagation, <50 ms on all interfaces, client & network ports
- Optical Digital Diagnostics (SFF-8472)
- Dying Gasp (via 802.3ah or SNMP traps)
- VLAN Tagging/De-tagging and VLAN Stacking (.1Q in .1Q)
- Integrated Copper TDR cable integrity testing
- Jumbo Frames support for all features (up to 10,240 bytes)
- Continuous in-service monitoring of Layer 2 & 3 SLA parameters
- User settable SLA threshold crossing alerts using SNMP traps
- Bandwidth Policing [pg 18]
- Integrated Management
  - SNMP v1, v2c Sets & Gets
  - Radius Authentication
  - SSL and SSH
  - Management VLAN
  - Configuration import/export
  - NTP Client (or source)
  - Syslog
  - DNS Client
  - DHCP Client

Complete End to End Visibility



Remote Troubleshooting and Diagnostics
802.3ah
802.1ag

Y.1731
SNMP traps
Provider Visiblity and Control

Designed to demarc the edge of your network, the S325x devices offers advanced packet performance metering and service creation directly from customer premises and cell-sites.

Specifications

Standards	IEEE 802.3ah, IEEE 802.1ag
Data Rate	**Fiber:** 100 Mbps, 1000 Mbps **Copper:** 10/100/1000 Mbps
Max Frame Size	10,240 bytes
Dimensions	**W:** 5.34"[135 mm]; **D:** 5.8" [147 mm]; **H:** 1.6" [40 mm]
Power	External AC/DC adapter (120-240 VAC auto-sensing, 50- 60 Hz), 5 VDC input to unit, Dual (A/B) - 48 VDC Central Office Supply inputs, Cooling: convection cooled (no fans)
Power Consumption	5-8 Watts
Operating Temperature	-5°C to 65°C
Storage Temperature	-40°C to 70°C
Operating Humidity	5-95% (non-condensing)
Shipping Weight	1.37 lbs. [.62 kg]
Regulatory Compliance	IEC 60950, MTBF >53 yrs(4), FCC Part 15 Class A, NEBS Level 3, Industry Canada CS-03, MEF9 Service Certification, CE Mark, MEF14 Traffic Management
Warranty	1 year hardware and software

Ordering Information

S3250
(2) 10/100/1000Base-T (RJ-45)
[100 m/328 ft.]
(2) SFP ports (100 Mbps, 1000 Mbps, or 10/100/1000 Mbps copper SFP)
(1) 10/100BASE-TX (RJ-45)
[100 m/328 ft.]

S3251: Enhanced multi-flow processing & statistics
(2) 10/100/1000Base-T (RJ-45)
[100 m/328 ft.]
(2) SFP ports (100 Mbps, 1000 Mbps, or 10/100/1000 Mbps copper SFP)
(1) 10/100BASE-TX (RJ-45)
[100 m/328 ft.]

S3252: Advanced traffic shaping & packet processing functionality
(2) 10/100/1000Base-T (RJ-45)
[100 m/328 ft.]
(2) SFP ports (100 Mbps, 1000 Mbps, or 10/100/1000 Mbps copper SFP)
(1) 10/100BASE-TX (RJ-45)
[100 m/328 ft.]

S3253: 4 SFP port version of the S3252
(4) SFP ports (100 Mbps, 1000 Mbps, or 10/100/1000 Mbps copper SFP)
(1) 10/100BASE-TX (RJ-45)
[100 m/328 ft.]

IONADP

Point System™ Adapter Card For The ION Platform

The IONADP is an adapter card that allows the ION Platform chassis to be backwards compatible with Point System™ modules. This adapter is designed to sit between a Point System™ module and the backplane of the ION chassis. The purpose of the IONADP is to lengthen the Point System™ module so it can be securely mounted in an ION chassis while also connecting to the backplane allowing the ION chassis to power the Point System™ module.

SNMP management of the Point System™ modules installed in the ION chassis is possible by using a Point System™ management module along with IONADP. The ION modules and the Point System™ modules are managed independently by their own respective management modules. The ION management module and the Point System™ management module would each require a unique IP address assigned to them, while Focal Point can be used to access the management information from each management module simultaneously.

The IONADP adapter card for allows the ION Platform to be backwards compatible with Point System™ slide-in-modules.

- Ease the migration from the Point System™ to ION Platform
- Deploy Point System™ cards in the ION chassis
- Legnthens a Point System™ card to match the size of the ION card
- Can be used with any Point System™ card
- Manage Point System™ cards in the ION chassis
- IONADP kit includes adapter card, bracket, and four screws.

Specifications

Dimensions	**Width:** 0.5" [12.7 mm] **Depth:** 1.25" [31.75 mm] **Height:** 2.90" [73.66 mm]
Environment	See chassis specifications
Shipping Weight	0.5 lbs. [0.22 kg]
Warranty	Lifetime

Ordering Information

IONADP
Point System™ Adapter for the ION chassis, includes bracket and screws

E-MCR-05

12-Slot Media Converter Rack

RMS19-SA4-01

4-Slot Media Converter Shelf

Ordering Information

E-MCR-05 [pg 67]
12-slot Media Converter Rack

RMS19-SA4-01 [pg 67]
4-slot Media Converter Shelf

WMBL; WMBP; WMBV

Wall Mount Brackets

WMBV-E; WMBD

Wall Mount Brackets & Din Rail Brackets

WMBD-E; WMBD-F

DIN Rail Brackets

Ordering Information

WMBL [pg 68]
4.0" [102 mm]
Fits Stand-Alone Converters size 4.7" [119 mm] and ION Stand-Alone devices

WMBP [pg 68]
5.0" [127 mm]
Fits Single or Dual Slot Point System™ Chassis and single slot ION chassis

WMBV [pg 68]
5.0" [127 mm]
Vertical Mount
Fits all Stand-Alone Converters;
Single or Dual Slot Point System™ Chassis

WMBV-E [pg 68]
4.7" [119 mm]
Extended Vertical Mount Fits all Stand-Alone Converters with piggyback power supply attached

WMBD [pg 68]
5.0" [127 mm] DIN Rail Mount Bracket
Fits all Stand-Alone Converters; Single or Dual Slot Point System™ Chassis

WMBD-E [pg 68]
4.3" [109 mm] DIN Rail Mount Bracket (Extended)
Fits all Stand-Alone Converters with piggyback power supply attached

WMBD-F [pg 68]
3.3" [84 mm] DIN Rail Mount Bracket (flat)
Fits all Stand-Alone Converters 3.25" [82 mm] wide

SPS-2460-SA
SPS-2460-PS

Wide Input Ethernet External DC Power Supplies

Stand-Alone DC Power Supply

Piggy-Back DC Power Supply Attached to Stand-Alone Device

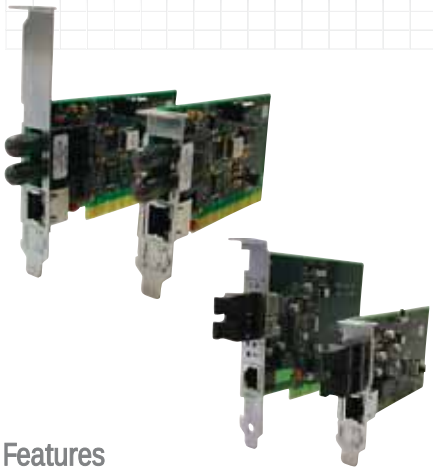
Ordering Information

SPS-2460-PS [pg 69]
Piggy-Back
For use with: Point System™ stand-alone media converters and ION Stand-Alone devices
3.25" wide
(SBFTF1011-100; SGETF1013-100, etc.)

SPS-2460-SA [pg 69]
Stand-Alone
For use with: All stand-alone media converters; Single-Slot Point System™ Chassis; Dual-Slot Point System™ Chassis, and ION Stand-Alone devices

E-TBT-FRL-Nxx-02(xx) & E-100BTX-FX-Nxx-01(xx)

PCI-Powered Copper to Fiber Media Converters



Features

Deliver low cost, fiber optic connectivity to the desktop with these full-featured PCI powered media converters, designed to install directly inside a workstation or file server and mount into any slot on a standard PCI. No configuration is required; making installation a breeze. Since power is drawn directly from the PCI slot, no additional power supply is needed, nor is there any CPU utilization.

- 2 sizes to accommodate both standard and low profile PCI slots
- AutoCross™ [pg 16]
- Link Pass Through [pg 17]
- Easily installs inside PC or file server; no configuration required; no drivers to install
- Provides LEDs for easy network monitoring
- Saves space over traditional stand-alone converters while providing a more secure installation
- No need to replace existing NICs
- Draws power directly from PCI slot; no power supply needed
- Universal PCI Compliant, supports both 3.3V and 5V signaling environments

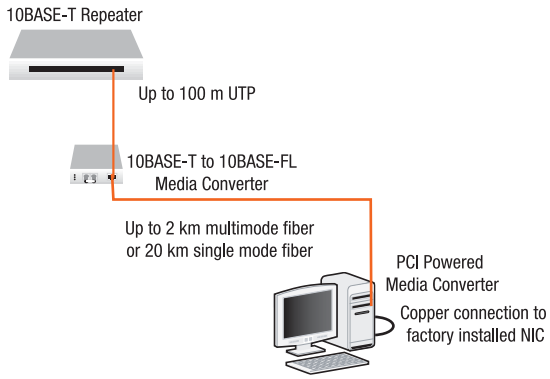
E-100BTX-FX-N-01(xx) & E-100BTX-FX-NLP-01(xx) only

- Auto-Negotiation [pg 16]
- Far-End-Fault [pg 16]
- Automatic Link Restoration [pg 18]
- Pause [pg 17]

Fiber-to-the-Desktop: Connect an existing 10BASE-T or 100BASE-TX PC, workstation or file server directly to a fiber optic backbone in either full or half-duplex by bringing the fiber directly to the device. Simply connect the twisted pair port to the existing twisted pair NIC to create a safe, effective, space-saving solution.

Extend Network Distance: Up to 2 km using multimode fiber or up to 2 km using single mode fiber.

Extended Network Distance



Specifications

Complete list of fiber optic connector specifications [pg 212-224]

Standards	IEEE Std. 802.3
Status LEDs **E-TBT-FRL-N-02(xx) & E-TBT-FRL-NLP-02(xx):** **E-100BTX-FX-N-01(xx) & E-100BTX-FX-NLP-01(xx):**	**Power**: Lit for normal operation **LKF**: Link Fiber **LKC**: Link Copper **RXF**: Receive Fiber **RXC**: Receive Copper **LED1**: Steady = Copper link **LED2**: Steady = Fiber link
Switches **E-TBT-FRL-N-02(xx) & E-TBT-FRL-NLP-02(xx):** **E-100BTX-FX-N-01(xx) & E-100BTX-FX-NLP-01(xx):**	**S1**: Switch to enable/disable LinK Pass Through **S1**: Auto-Negotiation On/Off **S2**: Pause On/Off **S3**: LPT On/Off **S4**: FEF On/Off
Dimensions **E-TBT-FRL-N-02(xx) & E-100BTX-FX-N-01(xx):** **E-TBT-FRL-NLP-02(xx) & E-100BTX-FX-NLP-01(xx):**	**Width**: 0.8" [19 mm] **Depth**: 4.8" [121 mm] **Height**: 4.8" [121 mm] **Width**: 0.8" [19 mm] **Depth**: 4.8" [121 mm] **Height**: 3.1" [79 mm]
Power Consumption **E-TBT-FRL-N-02(xx) & E-TBT-FRL-NLP-02(xx):** **E-100BTX-FX-N-01(xx) & E-100BTX-FX-NLP-01(xx):**	>450mA 600mA
Power Source	PCI edge connector
Environment	0°C – 50°C; 5% – 95% humidity non-condensing; 0 – 10,000 ft. altitude
Shipping Weight	1 lb. [0.45 kg]
Compliance	CISPR22/EN55022; EN55024; EN60950 Class A; FCC Class A; CE Mark
Warranty	Lifetime

Ordering Information

Complete list of fiber optic connector specifications [pg 212-224]

Standard Profile Cards

E-TBT-FRL-N-02(ST)
10BASE-T (RJ-45) **[100 m/328 ft.]**
to 10BASE-FL 850nm multimode (ST)
[2 km/1.2 mi.] Link Budget: 13.5 dB

E-TBT-FRL-N-02(SC)
10BASE-T (RJ-45) **[100 m/328 ft.]**
to 10BASE-FL 850nm multimode (SC)
[2 km/1.2 mi.] Link Budget: 13.5 dB

E-100BTX-FX-N-01
100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1300nm multimode (ST)
[2 km/1.2 mi.] Link Budget: 11.0 dB

E-100BTX-FX-N-01(SC)
100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1300nm multimode (SC)
[2 km/1.2 mi.] Link Budget: 11.0 dB

E-100BTX-FX-N-01(SM)
100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1310nm single mode (SC)
[20 km/12.4 mi.] Link Budget: 16.0 dB

Low Profile Cards

E-TBT-FRL-NLP-02(ST)
10BASE-T (RJ-45) **[100 m/328 ft.]**
to 10BASE-FL 850nm multimode (ST)
[2 km/1.2 mi.] Link Budget: 13.5 dB

E-TBT-FRL-NLP-02(SC)
10BASE-T (RJ-45) **[100 m/328 ft.]**
to 10BASE-FL 850nm multimode (SC)
[2 km/1.2 mi.] Link Budget: 13.5 dB

E-100BTX-FX-NLP-01
100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1300nm multimode (ST)
[2 km/1.2 mi.] Link Budget: 11.0 dB

E-100BTX-FX-NLP-01(SC)
100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1300nm multimode (SC)
[2 km/1.2 mi.] Link Budget: 11.0 dB

E-100BTX-FX-NLP-01(SM)
100BASE-TX (RJ-45) **[100 m/328 ft.]**
to 100BASE-FX 1310nm single mode (SC)
[20 km/12.4 mi.] Link Budget: 16.0 dB

TN-GB-xM5x

GBIC Modules

Transition Networks' GBIC transceiver is a plug-in module and it is hot-swappable. It allows for seamless integration of fiber with copper LAN connections wherever GBIC interface slots are available. This device is economical, saves time, offers flexibility and eliminates the necessity for replacing entire devices when the customers need to change or upgrade fiber connections.

Features

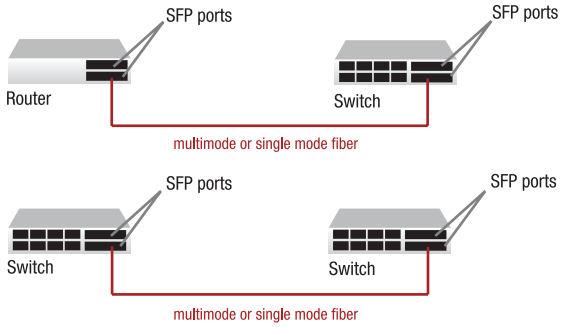
- Laser Class 1 Product
- Compliant with 802.3z 1000BASE-SX; 1000BASE-LX
- Plug-and-Play module
- Hot-swappable
- TTL Logic Interface

*Note: Using Transition Networks' GBIC modules will not void or interfere with the original equipment manufacturer's warranty or maintenance contracts.

Transition Networks' GBICs are built to comply with IEEE 802.3z which is intended to provide Gigabit interconnectivity between different vendors.

Transition's GBIC modules are compatible with all major switch and router vendors.

Fiber Connections with GBICs



Specifications

Complete list of fiber optic connector specifications [pg 212-224]

Standards	IEEE 802.3z 1000BASE-SX; 1000BASE-LX
Dimensions	**Width**: 1.2" [30 mm] **Depth**: 2.6" [65 mm] **Height**: 0.40" [10 mm]
Power	TN-GB-xxx: 5V, no external power required
Power Consumption	0.8 Watts
Environment	0°C – 70°C
Compliance	UL Registered, CSA, IEC 60825-1 and IEC 60825-2, CE Marked
Warranty	Lifetime

Ordering Information

Complete list of fiber optic connector specifications [pg 212-224]

TN-GB-MM5
1000BASE-SX 850nm multimode (SC)
[62.5/125µm: 220 m/722 ft.]
Link Budget: 8.5 dB
[50/125 µm: 550 m/1804 ft.]
Link Budget: 8.5 dB

TN-GB-SM5
1000BASE-LX 1310nm single mode (SC)
[10 km/6.2 mi.] Link Budget: 11.0 dB

TN-GB-SM53
1000BASE-LX 1310nm single mode (SC)
[30 km/18.6 mi.] Link Budget: 19.0 dB

TN-SFP-xxx

SFP Modules

Features

- Hot-Pluggable SFP Footprint Simplex LC Optical Transceiver
- Digital Diagnostic Function
- Class 1 Laser International Safety Standard IEC-60825 Compliant
- Compatible with SFP Multi-Sourcing Agreement (MSA)

Additional Features

TN-SFP-BXx or LXBxx SXBx modules

- Compliant with IEEE 802.3z Gigabit Ethernet
- Compliant with Fiber Channel 1X SM-LC-L FC-PI

Can be used on Optical Line Converter xFMFF4040-100

TN-SFP-OC3x SFP modules

- Compliant with 100BASE-FX
- Compliant with Intermediate-Reach SONET OC-3/SDH STM-1 (S-1.1)

TN-SFP-OC12x SFP modules

- Compliant with Intermediate-Reach SONET OC-12/SDH STM-4 (S-4.1)

Applications

- Gigabit Ethernet Switches and Routers
- Fibre Channel Switch Infrastructure
- XDSL Applications
- Metro Edge Switching

Specifications

Complete list of fiber optic connector specifications [pg 212-224]

Standards	IEEE 802.3 2003; ANSI X3.297-1997
Dimensions	**Width:** 0.52" [13 mm] **Depth**: 2.18" [55 mm] **Height**: 0.33" [8 mm]
Power	3.3V
Power Consumption	0.66 Watts
Environment	0°C – 70°C
Compliance	IEC-60825; FDA 21; CFR 1040.10 and 1040.11
Warranty	Lifetime

*Note: Per Cisco Systems' literature, the Cisco switches with SFP slots do not accept modules other than Cisco's own SFPs. The Cisco switch identifies the manufacturer ID along with the part number and blocks operations to this port for non-Cisco interfaces.

*Transition Networks' SFP units fully comply with Multi-Sourcing Agreement (MSA). This compliance allows Transition Networks' SFP modules to be used on other MSA-compliant SFP platforms without any problems.

Ordering Information

Complete list of fiber optic connector specifications [pg 212-224]

TN-SFP-SXB1
1000BASE-SX 1310nm TX/1550nm RX MM (LC)
[500 m/1640 ft.] Link Budget: 7.0 dB

TN-SFP-SXB2
1000BASE-SX 1550nm TX/1310nm RX MM (LC)
[500 m/1640 ft.] Link Budget: 7.0 dB

TN-SFP-BXU (model with DMI)
TN-SFP-EBXU (model without DMI)
1000BASE-BX 1310nm TX/1490nm RX SM (LC)
[10 km/6.2 mi.] Link Budget: 11.0 dB

TN-SFP-BXD (model with DMI)
TN-SFP-EBXD (model without DMI)
1000BASE-BX 1490nm TX/1310nm RX SM (LC)
[10 km/6.2 mi.] Link Budget: 11.0 dB

TN-SFP-BXU2
1000BASE-BX 1310nm TX/1490nm RX SM (LC)
[20 km/12.4 mi.] Link Budget: 14.0 dB

TN-SFP-BXD2
1000BASE-BX 1490nm TX/1310nm RX SM (LC)
[20 km/12.4 mi.] Link Budget: 14.0 dB

TN-SFP-LXB11
1000BASE-LX 1310nm TX/1550nm RX SM (LC)
[10 km/6.2 mi.] Link Budget: 11.0 dB

TN-SFP-LXB12
1000BASE-LX 1550nm TX/1310nm RX SM (LC)
[10 km/6.2 mi.] Link Budget: 11.0 dB

TN-SFP-LXB21
1000BASE-LX 1310nm TX/1550nm RX SM (LC)
[20 km/12.4 mi.] Link Budget: 14.0 dB

TN-SFP-LXB22
1000BASE-LX 1550nm TX/1310nm RX SM (LC)
[20 km/12.4 mi.] Link Budget: 14.0 dB

TN-SFP-LXB41
1000BASE-LX 1310nm TX/1550nm RX SM (LC)
[40 km/24.9 mi.] Link Budget: 20.0 dB

TN-SFP-LXB42
1000BASE-LX 1550nm TX/1310nm RX SM (LC)
[40 km/24.9 mi.] Link Budget: 20.0 dB

TN-SFP-LXB61
1000BASE-LX 1310nm TX/1550nm RX SM (LC)
[60 km/37.3 mi.] Link Budget: 23.0 dB

TN-SFP-LXB62
1000BASE-LX 1550nm TX/1310nm RX SM (LC)
[60 km/37.3 mi.] Link Budget: 23.0 dB

TN-SFP-LXB81
1000BASE-LX 1510nm TX/1590nm RX SM (LC)
[80 km/49.7 mi.] Link Budget: 24.0 dB

TN-SFP-LXB82
1000BASE-LX 1590nm TX/1510nm RX SM (LC)
[80 km/49.7 mi.] Link Budget: 24.0 dB

TN-SFP-LXB121
1000BASE-LX 1510nm TX/1590nm RX SM (LC)
[120 km/74.6 mi.] Link Budget: 31.0 dB

TN-SFP-LXB122
1000BASE-LX 1590nm TX/1510nm RX SM (LC)
[120 km/74.6 mi.] Link Budget: 31.0 dB

TN-SFP-LXB161
1000BASE-LX 1510nm TX/1590nm RX SM (LC)
[160 km/99.4 mi.] Link Budget: 37.0 dB

TN-SFP-LXB162
1000BASE-LX 1590nm TX/1510nm RX SM (LC)
[160 km/99.4 mi.] Link Budget: 37.0 dB

TN-SFP-OC3MB1
100BASE-FX 1310nm TX/1550nm RX MM (SC)
[2 km/1.2 mi.] Link Budget: 15.0 dB

TN-SFP-OC3MB2
100BASE-FX 1550nm TX/1310nm RX MM (SC)
[2 km/1.2 mi.] Link Budget: 15.0 dB

TN-SFP-OC3SB21
100BASE-FX 1310nm TX/1550nm RX SM (LC)
[20 km/12.4 mi.] Link Budget: 19.0 dB

TN-SFP-OC3SB22
100BASE-FX 1550nm TX/1310nm RX SM (LC)
[20 km/12.4 mi.] Link Budget: 19.0 dB

TN-SFP-OC3SB41
100BASE-FX 1310nm TX/1550nm RX SM (LC)
[40 km/24.9 mi.] Link Budget: 25.0 dB

TN-SFP-OC3SB42
100BASE-FX 1550nm TX/1310nm RX SM (LC)
[40 km/24.9 mi.] Link Budget: 25.0 dB

TN-SFP-OC3SB61
100BASE-FX 1310nm TX/1550nm RX SM (LC)
[60 km/37.3 mi.] Link Budget: 29.0 dB

TN-SFP-OC3SB62
100BASE-FX 1550nm TX/1310nm RX SM (LC)
[60 km/37.3 mi.] Link Budget: 29.0 dB

TN-SFP-OC3SB81
100BASE-FX 1310nm TX/1550nm RX SM (LC)
[80 km/49.7 mi.] Link Budget: 31.0 dB

TN-SFP-OC3SB82
100BASE-FX 1550nm TX/1310nm RX SM (LC)
[80 km/49.7 mi.] Link Budget: 31.0 dB

TN-SFP-OC12SB41
100BASE-FX 1310nm TX/1550nm RX SM (LC)
[40 km/24.9 mi.] Link Budget: 25.0 dB

TN-SFP-OC12SB42
100BASE-FX 1550nm TX/1310nm RX SM (LC)
[40 km/24.9 mi.] Link Budget: 25.0 dB

Extended Operating Temperature -40°C to +85°C

TN-SFP-LXB11T
1000BASE-LX 1310nm TX/1550nm RX SM (LC)
[10 km/6.2 mi.] Link Budget: 11.0 dB

TN-SFP-LXB12T
1000BASE-LX 1550nm TX/1310nm RX SM (LC)
[10 km/6.2 mi.] Link Budget: 11.0 dB

TN-SFP-LXB21T
1000BASE-LX 1310nm TX/1550nm RX SM (LC)
[20 km/12.4 mi.] Link Budget: 14.0 dB

TN-SFP-LXB22T
1000BASE-LX 1550nm TX/1310nm RX SM (LC)
[20 km/12.4 mi.] Link Budget: 14.0 dB

Small Form Factor Pluggables
MSA Compatible Duplex LC & RJ-45

TN-SFP-xxx
SFP Modules

Features

- Hot-Pluggable SFP Footprint Duplex LC Optical Transceiver
- Digital Diagnostic Function
- Class 1 Laser International Safety Standard IEC-60825 Compliant
- Compatible with SFP Multi-Sourcing Agreement (MSA)

Additional Features

TN-SFP-SX or -LXx SFP modules

- Compliant with IEEE 802.3z Gigabit Ethernet
- Compliant with Fiber Channel 1X SM-LC-L FC-PI

Can be used on Optical Line Converter xFMFF4040-100

TN-SFP-OC3x SFP modules

- Compliant with 100BASE-FX
- Compliant with Intermediate-Reach SONET OC-3/SDH STM-1 (S-1.1)

TN-SFP-OC12x SFP modules

- Compliant with Intermediate-Reach SONET OC-12/SDH STM-4 (S-4.1)

TN-SFP-TX

- Compliant with IEEE802.3u Fast Ethernet

TN-SFP-T-MG

- Compliant with IEEE 802.3:2002
- 10/100/1000BASE-T operation in host system with SGMII interface
- Compatible with 1000BASE-T auto-negotiation [pg 16]
- AutoCross™ [pg 16]

Applications

- Gigabit Ethernet Switches and Routers
- Fibre Channel Switch Infrastructure
- XDSL Applications
- Metro Edge Switching

Specifications

Standards	IEEE 802.3 2003; ANSI X3.297-1997
Dimensions	**Width:** 0.52" [13 mm] **Depth**: 2.18" [55 mm] **Height**: 0.33" [8 mm]
Power	3.3V
Power Consumption	0.66 Watts
Environment	**TN-SFP-SX** **TN-SFP-SXD** **TN-SFP-LX1** **TN-SFP-ESX5** **TN-SFP-ESX6** **TN-SFP-OC3S3** **TN-SFP-ELX1** **TN-SFP-FC2XM** **TN-SFP-FC2XS2** -10°C – 85°C **TN-SFP-LX3** **TN-SFP-LX5** **TN-SFP-LX8** **TN-SFP-LX12** **TN-SFP-LX16** **TN-SFP-OCx** **TN-SFP-FC2XS40** **TN-SFP-FC2XS15** **TN-SFP-TX** **TN-SFP-T-MG** 0°C – 70°C
Compliance	IEC-60825; FDA 21; CFR 1040.10 and 1040.11
Warranty	Lifetime

*Note: Per Cisco Systems' literature, the Cisco switches with SFP slots do not accept modules other than Cisco's own SFPs. The Cisco switch identifies the manufacturer ID along with the part number and blocks operations to this port for non-Cisco interfaces.

*Transition Networks' SFP units fully comply with Multi-Sourcing Agreement (MSA). This compliance allows Transition Networks' SFP modules to be used on other MSA-compliant SFP platforms without any problems.

Ordering Information

Complete list of fiber optic connector specifications [pg 212-224]

TN-SFP-OC3M
100BASE-FX/OC-3 1300nm multimode (LC)
[2 km/1.2 mi.] Link Budget: 11.0 dB

TN-SFP-OC3S
100BASE-FX/OC-3 1310nm single mode (LC)
[20 km/12.4 mi.] Link Budget: 17.0 dB

TN-SFP-OC3S3
100BASE-FX/OC-3 1310nm SM (LC)
[30 km/18.6 mi.] Link Budget: 20.0 dB

TN-SFP-OC3S8
100BASE-FX/OC-3 1550nm SM (LC)
[80 km/49.7 mi.] Link Budget: 29.0 dB

TN-SFP-OC3S10
100BASE-FX/OC-3 1550nm SM (LC)
[100 km/62.1 mi.] Link Budget: 31.0 dB

TN-SFP-OC3S12
100BASE-FX/OC-3 1550nm SM (LC)
[120 km/74.6 mi.] Link Budget: 34.0 dB

TN-SFP-OC12M
OC-12/STM-4 SFP 1300nm MM (LC)
[1 km/0.6 mi.] Link Budget: 7.0 dB

TN-SFP-OC12S
OC-12/STM-4 SFP 1310nm SM (LC)
[20 km/12.4 mi.] Link Budget: 14.0 dB

TN-SFP-OC12S4
OC-12/STM-4 SFP 1310nm SM (LC)
[40 km/24.9 mi.] Link Budget: 28.0 dB

TN-SFP-OC12S8
OC-12/STM-4 SFP 1310nm SM (LC)
[80 km/49.7 mi.] Link Budget: 29.0 dB

TN-SFP-OC3MT
100BASE-FX/OC-3 1300nm MM (LC)
[2 km/1.2 mi.] Link Budget: 11.0 dB

TN-SFP-OC3ST
100BASE-FX/OC-3 1310nm SM (LC)
[20 km/12.4 mi.] Link Budget: 17.0 dB

TN-SFP-SX (model without DMI)
TN-SFP-SXD (model with DMI)
1000BASE-SX 850nm multimode (LC)
[62.5/125 µm: 220 m/722 ft.]
Link Budget: 8.0 dB
[50/125 µm: 550 m/1804 ft.]
Link Budget: 8.0 dB

TN-SFP-ESX5
1000BASE-SX 1300nm Ext. MM (LC)
[50/125 µm fiber only:
up to 2 km/1.2 mi.] Link Budget: 8.0 dB

TN-SFP-ESX6
1000BASE-SX 1300nm Ext. MM (LC)
[62.5/125 µm fiber only:
up to 2 km/1.2 mi.] Link Budget: 8.0 dB

TN-SFP-FC4XM
Fiber Channel 1x/2x/4x/1000BASE-SX 850nm (LC) multimode
[62.5/125 µm:70m/246 ft.]
[50/125 µm: 150m/492 ft.]
Link Budget: 6.0 dB

TN-SFP-LX1 (model with DMI)
TN-SFP-ELX1 (model without DMI)
1000BASE-LX 1310nm single mode (LC)
[10 km/6.2 mi.] Link Budget: 11.5 dB

TN-SFP-LX3
1000BASE-LX 1310nm single mode (LC)
[30 km/18.6 mi.] Link Budget: 19.0 dB

TN-SFP-LX5
1000BASE-LX 1550nm single mode (LC)
[50 km/31.1 mi.] Link Budget: 19.0 dB

TN-SFP-LX8
1000BASE-LX 1550nm single mode (LC)
[80 km/49.7 mi.] Link Budget: 24.0 dB

TN-SFP-LX12
1000BASE-LX 1550nm single mode (LC)
[120 km/74.6 mi.] Link Budget: 32.0 dB

TN-SFP-LX16
1000BASE-LX 1550nm single mode (LC)
[160 km/99.4 mi.] Link Budget: 37.0 dB

TN-SFP-FC2XM
OC-48/STM-16/Fibre Channel 1x/2x/1000BASE-SX 850nm (LC) MM
[62.5/125 µm: 150 m/492 ft.]*
Link Budget: 6.0 dB
[50/125 µm: 300 m/984 ft.]*
Link Budget: 6.0 dB

TN-SFP-FC2XS2
Fibre Channel 2x/1x/OC-48/STM-16/ 1000BASE-LX 1310nm single mode (LC)
[2 km/1.2 mi.] Link Budget: 8.5 dB

TN-SFP-FC2XS15
Fibre Channel 2x/1x/OC-48/STM-16/1000BASE-LX 1310nm single mode (LC)
[15 km/9.3 mi.] Link Budget: 13.0 dB

TN-SFP-FC2XS40
Fibre Channel 2x/1x/OC-48/STM-16/ 1000BASE-LX 1310nm single mode (LC)
[40 km/24.9 mi.] Link Budget: 26.0 dB

TN-SFP-TX
100BASE-TX (RJ-45)
[100 m/328 ft.]

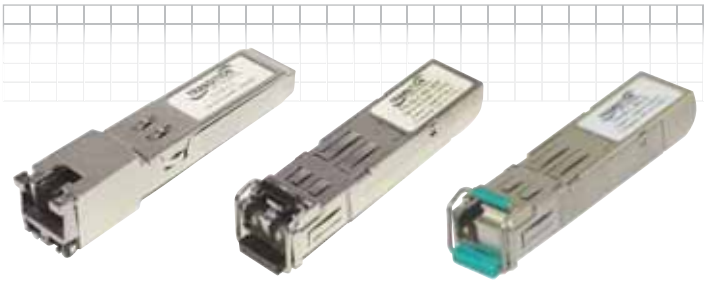
TN-SFP-T-MG
10/100/1000BASE-T (RJ-45)
[100 m/328 ft.]

Extended Operating Temperature: -40°C to +85°C

TN-SFP-LX1T
1000BASE-LX 1310nm single mode (LC)
[10 km/6.2 mi.] Link Budget: 11.5 dB

TN-GLC-xxx & TN-SFP-GE-x

SFP Modules



Features

- Hot-Pluggable SFP Footprint Duplex LC Optical Transceiver - both simplex and duplex
- Class 1 Laser International Safety
  Standard IEC-60825 Compliant
- Compatible with SFP Multi-Sourcing Agreement (MSA)

Additional Features

TN-GLX-xxx (except those below)

- Compliant with IEEE 802.3z Gigabit Ethernet
- Compliant with Fiber Channel 1X SM-LC-L FC-PI

TN-GLC-FE-xxx & TN-GLC-GE-xxx modules

- Compliant with IEEE802.3100BASE-FX
- Compliant with IEEE802.3ah100BASE-FX
- Compliant with Intermediate-Reach SONET OC-3/SDH STM-1 (S-1.1)

Can be used on Optical Line Converter xFMFF4040-100

TN-SFP-0GE-x modules

- Compliant with IEEE802.3z Gigabit Ethernet
- Digital Diagnostic Function
- Extended operating temperature

Applications

- Gigabit Ethernet Switches & Routers
- Fibre Channel Switch Infrastructure
- XDSL Applications
- Metro Edge Switching

Specifications

Complete list of fiber optic connector specifications [pg 212-224]

Standards	IEEE 802.3 2003; ANSI X3.297-1997
Dimensions (fiber)	**Width:** 0.52" [13 mm] **Depth**: 2.18" [55 mm] **Height**: 0.33" [8 mm]
Dimensions (copper)	**Width:** 0.95" [24 mm] **Depth**: 2.8" [71 mm] **Height**: 0.54" [14 mm]
Power	3.3V
Power Consumption	0.66 Watts (fiber) 1.0 Watts (copper)
Environment **TN-GLC-xxx**	0°C – 70°C operating 40°C – 85°C storage
TN-SFP-GE-x	-40°C – 85°C operating -40°C – 100°C storage
Compliance	IEC-60825; FDA 21; CFR 1040.10 and 1040.11
Warranty	Lifetime

* Note: The Transition Networks TN-GLC-xxx series small form factor pluggable (SFP) tranceiver modules are designed to install in any SFP port allowing for 1000Base-T, 1000Base-SX or 1000Base-LX interfaces to the network through the SFP connector. The TN-GLC-xxx tranceivers are Cisco compatible* and are designed for bi-directional serial-optical data communication such as Gigabit Ethernet or fiber channel at speeds up to 1.25 Gbps.

*Transition Networks' SFP modules fully comply with the Multi-Sourcing Agreement (MSA). This compliance allows our SFP modules to be used in all other MSA compliant SFP platforms. In addition, TN SFP modules are also compatible with all Cisco SFP-based routers and switches, as well as Cisco's IOS software. TN SFP modules ARE NOT Cisco OEM brand modules.

Ordering Information

Complete list of fiber optic and connector specifications [pg 212-224]

Standard Operating Temperature -0°C to +70°C

TN-GLC-T
1000BASE-T (RJ-45) **[100 m/328 ft.]**

TN-GLC-SX-MM
1000BASE-SX 850nm multimode (LC)
[62.5/125 µm: 220 m/722 ft.]
Link Budget: 8.5 dB
[50/125 µm: 550 m/1804 ft.]
Link Budget: 8.5 dB

TN-GLC-SX-MM-2K
1000BASE-SX 1300nm Ext. MM (LC)
[2 km/1.2 mi.] Link Budget: 10.0 dB

TN-GLC-LH-SM
1000BASE-LX 1310nm single mode (LC)
[10 km/6.2 mi.] Link Budget: 10.5 dB

TN-GLC-LHX-SM
1000BASE-LX 1310nm single mode (LC)
[40 km/24.9 mi.]Link Budget: 22.0 dB

TN-GLC-ZX-SM
1000BASE-LX 1550nm single mode (LC)
[80 km/49.7 mi.]Link Budget: 24.0 dB

TN-GLC-ZX-SM-15
1000BASE-LX 1550nm single mode (LC)
[150 km/93.2 mi.]Link Budget: 37.0 dB

TN-GLC-BX-U
1000BASE-BX 1310nm TX/1490nm RX single fiber single mode (LC)
[10 km/6.2 mi.] Link Budget: 12.0 dB

TN-GLC-BX-D
1000BASE-BX 1490nm TX/1310nm RX single fiber single mode (LC)
[10 km/6.2 mi.] Link Budget: 12.0 dB

TN-GLC-BX-U-40
1000BASE-BX 1310nm TX/1490nm RX single fiber single mode (LC)
[40 km/24.9 mi.]Link Budget: 20.0 dB

TN-GLC-BX-D-40
1000BASE-BX 1490nm TX/1310nm RX single fiber single mode (LC)
[40 km/24.9 mi.]Link Budget: 20.0 dB

TN-GLC-BX-U-60
1000BASE-BX 1310nm TX/1490nm RX single fiber single mode (LC)
[60 km/37.3 mi.]Link Budget: 23.0 dB

TN-GLC-BX-D-60
1000BASE-BX 1490nm TX/1310nm RX single fiber single mode (LC)
[60 km/37.3 mi.]Link Budget: 23.0 dB

TN-GLC-FE-100BX-U
100BASE-BX 1310nm TX/1550nm RX single fiber single mode (LC)
[10 km/6.2 mi.] Link Budget: 18.0 dB

TN-GLC-FE-100BX-U-20
100BASE-BX 1310nm TX/1550nm RX single fiber single mode (LC)
[20 km/12.4 mi.]Link Budget: 20.0 dB

TN-GLC-FE-100BX-U-40
100BASE-BX 1310nm TX/1550nm RX single fiber single mode (LC)
[40 km/24.9 mi.]Link Budget: 26.0 dB

TN-GLC-FE-100BX-U-80
100BASE-BX 1310nm TX/1550nm RX single fiber single mode (LC)
[80 km/49.7 mi.] Link Budget: 32.0 dB

TN-GLC-FE-100BX-D
100BASE-BX 1550nm TX/1310nm RX single fiber single mode (LC)
[10 km/6.2 mi.] Link Budget: 18.0 dB

TN-GLC-FE-100BX-D-20
100BASE-BX 1550nm TX/1310nm RX single fiber single mode (LC)
[20 km/12.4 mi.] Link Budget: 20.0 dB

TN-GLC-FE-100BX-D-40
100BASE-BX 1550nm TX/1310nm RX single fiber single mode (LC)
[40 km/24.9 mi.] Link Budget: 26.0 dB

TN-GLC-FE-100BX-D-80
100BASE-BX 1310nm TX/1550nm RX single fiber single mode (LC)
[80 km/49.7 mi.] Link Budget: 32.0 dB

***TN-GLC-FE-100FX**
100BASE-FX 1300nm multimode (LC)
[2 km/1.2 mi.] Link Budget: 8.5 dB

TN-GLC-FE-100LX
100BASE-FX 1310nm single mode (LC)
[10 km/6.2 mi.] Link Budget: 19.0 dB

***TN-GLC-GE-100FX**
100BASE-FX 1300nm multimode (LC)
[2 km/1.2 mi.] Link Budget: 8.5 dB

Extended Operating Temperature -40°C to +85°C

TN-SFP-GE-S
1000BASE-SX 850nm multimode (LC)
[62.5/125 µm: 220 m/722 ft.]
Link Budget: 8.5 dB
[50/125 µm: 550 m/1804 ft.]
Link Budget: 8.5 dB

TN-SFP-GE-L
1000BASE-LX 1310nm single mode (LC)
[10 km/6.2 mi.] Link Budget: 10.5 dB

TN-SFP-GE-Z
1000BASE-LX 1550nm single mode (LC)
[80 km/49.7 mi.] Link Budget: 24.0 dB

*Provides 100BASE-FX interface when plugged into a Gigabit SFP slot on Cisco Catalyst 2970, 3560 & 3750 series switches.

TN-SFP-xxx-Cxx

SFP Modules

Features

- Course Wavelength Division Multiplexing (CWDM) ITU Grid Compliant Wavelengths
- Hot-Pluggable SFP Footprint Duplex LC Optical Transceiver
- Digital Diagnostic Function
- Class 1 Laser International Safety Standard IEC-60825 Compliant
- Compatible with SFP Multi-Sourcing Agreement (MSA)

Additional Features

TN-SFP-LX8-Cxx/TN-SFP-LX16-Cxx SFP modules

- Compliant with IEEE 802.3z Gigabit Ethernet
- Compliant with Fiber Channel 1X SM-LC-L FC-PI (Can be used on Optical Line Converter xFMFF4040-100)

TN-SFP-OC3S8-Cxx/TN-SFP-OC3S16-Cxx SFP modules

- Compliant with 100BASE-FX
- Compliant with Intermediate-Reach SONET OC-3/SDH STM-1 (S-1.1)

TN-SFP-OC12S-Cxx SFP modules

- Compliant with Intermediate-Reach SONET OC-12/SDH STM-4 (S-4.1)

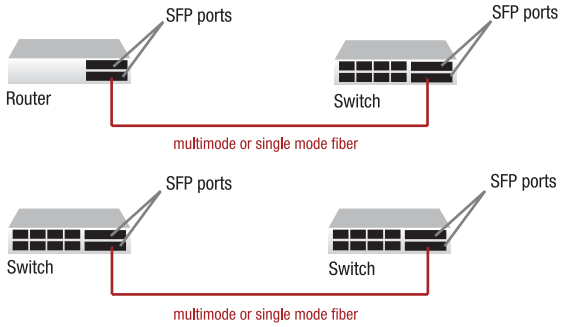
TN-SFP-OC48S-Cxx SFP modules

- Compliant with IEEE 802.3z Gigabit Ethernet
- Compliant with Fiber Channel 1X SM-LC-L FC-PI
- Compliant with Short-Reach SONET OC-48/SDH STM-16 (S-16.1)

*Note: Per Cisco Systems' literature, the Cisco switches with SFP slots do not accept modules other than Cisco's own SFPs. The Cisco switch identifies the manufacturer ID along with the part number and blocks operations to this port for non-Cisco interfaces.

*Transition Networks' SFP units fully comply with Multi-Sourcing Agreement (MSA). This compliance allows Transition Networks' SFP modules to be used on other MSA-compliant SFP platforms without any problems.

Fiber Connections with SFPs



Applications

- Gigabit Ethernet Switches and Routers
- Fibre Channel Switch Infrastructure
- XDSL Applications
- Metro Edge Switching

Specifications

Complete list of fiber optic connector specifications [pg 212-224]

Standards	IEEE 802.3 2003; ANSI X3.297-1997 (see additional standards by part number to the left)
Output Wavelength	-5.5nm < λ_c < +7.5nm
Dimensions	**Width:** 0.52" [13 mm] **Depth**: 2.18" [55 mm] **Height**: 0.33" [8 mm]
Power	3.3V
Power Consumption	0.66 Watts

SKU	Min	Typical	Max
TN-SFP-OC3S8-Cxx	--	155	200
TN-SFP-OC12S-Cxx	--	622	--
TN-SFP-LX8-Cxx	100	1250	--
TN-SFP-OC48S-Cxx	622	2488	2670

Environment	0°C – 70°C
Compliance	IEC-60825; FDA 21; CFR 1040.10 and 1040.11
Warranty	Lifetime

Ordering Information

Complete list of fiber optic connector specifications [pg 212-224]

TN-SFP-OC3S8-Cxx
SFP 100BASE-FX/OC-3 single mode (LC)
[80 km/49.7 mi.] Link Budget: 29.0 dB

TN-SFP-OC3S16-Cxx
SFP 100BASE-FX/OC-3 single mode (LC)
[160 km/99.4 mi.] Link Budget: 37.0 dB

TN-SFP-OC12S-Cxx
OC-12/STM-4 single mode (LC)
[80 km/49.7 mi.] Link Budget: 29.0 dB

TN-SFP-LX8-Cxx
1000BASE-LX/Fibre Channel 1x single mode (LC)
[80 km/49.7 mi.] Link Budget: 24.0 dB

TN-SFP-LX16-Cxx
1000BASE-LX/Fibre Channel 1x single mode (LC)
[160 km/99.4 mi.] Link Budget: 37.0 dB

TN-SFP-OC48S-Cxx
OC-48/STM-16/Fibre Channel 2x/1x/1000BASE-LX single mode (LC)
[40 km/24.9 mi.] Link Budget: 18.0 dB

xx = center wavelength (l_c)

27 = 1270nm	45 = 1450nm
29 = 1290nm	47 = 1470nm
31 = 1310nm	49 = 1490nm
33 = 1330nm	51 = 1510nm
35 = 1350nm	53 = 1530nm
37 = 1370nm	55 = 1550nm
39 = 1390nm	57 = 1570nm
41 = 1410nm	59 = 1590nm
43 = 1430nm	61 = 1610nm

NEW PRODUCT

Small Form Factor Pluggables
CWDM Wavelengths Cisco Compatible

TN-CWDM-xxx-1xx0

SFP Modules

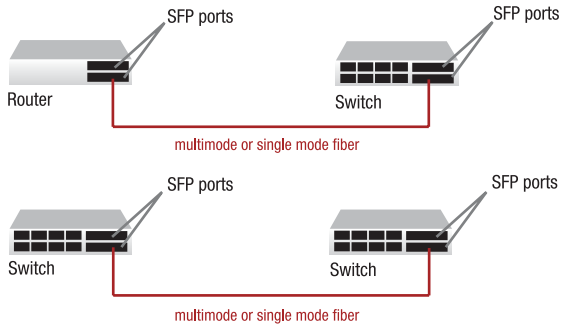
Features

- Course Wavelength Division Multiplexing (CWDM) ITU Grid Compliant Wavelengths
- Hot-Pluggable SFP Optical Transceiver With Duplex LC Connector
- Digital Diagnostic Function (DMI)
- Class 1 Laser International Safety Standard IEC-60825 Compliant
- Compatible with SFP Multi-Sourcing Agreement (MSA)
- Single +3.3 V Power Supply
- RoHS Compliant

Additional Features

- Compliant with IEEE 802.3z 1000BASE-LX/ZX
- Compliant with Fiber Channel 1x SM-LC-L FC-PI
- **TN-CWDM-SFP-1xx0 SFP Modules**
  Compliant eith IEEE 802.3z 1000Base-LX/ZX
  Compliant with Fiber Channel
  1x SM-LC-L FC-PI
- **TN-CWDM-100LX-1xx0 SFP Modules**
  Compliant with IEEE802.3 100Base-FX

Fiber Connections with SFPs



Applications

- Gigabit Ethernet Switches and Routers
- Fibre Channel Switch Infrastructure
- XDSL Applications
- Metro Edge Switching

Specifications

Complete list of fiber optic connector specifications [pg 212-224]

Standards	IEEE802.3z, IEEE802.3
Output Wavelength	-5.5nm < λ_c < +7.5nm
Dimensions	**Width:** 0.52" [13 mm] **Depth**: 2.18" [55 mm] **Height**: 0.33" [8 mm]
Power	3.3V
Environment	0°C to 70°C operating -40°C to 85°C storage
Compliance	IEC-60825; FDA 21; CFR 1040.10 and 1040.11
Warranty	Lifetime

Ordering Information

Complete list of fiber optic connector specifications [pg 212-224]

TN-CWDM-SFP-1xx0
1000Base-LX/ZX Fibre Channel
single mode (LC)
[80 km/49.7 mi.] Link Budget: 24.0 dB

TN-CWDM-100LX-1xx0
100Base-LX/SONET OC-3/SDH STM-1
single mode (LC)
[80 km/49.7 mi.] Link Budget: 29.0 dB

xx = center wavelength (l_c)

27 = 1270nm	45 = 1450nm
29 = 1290nm	47 = 1470nm
31 = 1310nm	49 = 1490nm
33 = 1330nm	51 = 1510nm
35 = 1350nm	53 = 1530nm
37 = 1370nm	55 = 1550nm
39 = 1390nm	57 = 1570nm
41 = 1410nm	59 = 1590nm
43 = 1430nm	61 = 1610nm

Note: The Transition Networks TN-CWDM-SFP-1xx0 and TN-CWDM-100LX-1xx0 small form factor pluggables (SFPs) are Cisco Compatible and are designed for bi-directional serial optical data communications such as Gigabit Ethernet, or Fibre Channel 1x. Each SFP operates at a nominal CWDM wavelength. There are 18 wavelengths available in 20nm steps from 1270nm to 1610nm.

*Transition Networks' SFP modules fully comply with the Multi-Sourcing Agreement (MSA). This compliance allows our SFP modules to be used in all other MSA compliant SFP platforms. In addition, TN-CWDM-SFP-1xx0 modules are also compatible with all Cisco SFP-based equipment, as well as Cisco's IOS software. TN SFP modules ARE NOT Cisco OEM brand modules.

TN-J48xxx

SFP Modules

Features

- Hot-Pluggable SFP Optical Transceiver with Duplex LC Connector
- Class 1 Laser International Safety Standard IEC-60825 Compliant
- Compatible with SFP Multi-Sourcing Agreement (MSA)

Additional Features

TN-J4858C module

- Compliant with IEEE802.3z 1000BASE-SX

TN-J4859C module

- Compliant with IEEE802.3z 1000BASE-LX

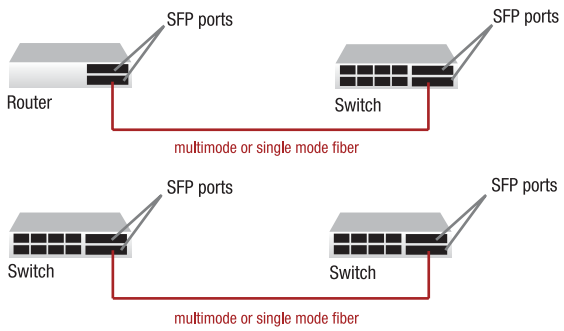
TN-J4860C module

- Compliant with IEEE802.3z 1000BASE-ZX

*Note: Per HP literature, the HP switches with SFP slots do not accept modules other than HP's own SFPs. The HP switch identifies the manufacturer ID along with the part number and blocks operations to this port for non-HP interfaces.

*Transition Networks' SFP units fully comply with Multi-Sourcing Agreement (MSA). This compliance allows Transition Networks 'SFP modules to be used on other MSA-compliant SFP platforms without any problems.

Fiber Connections with SFPs



Applications

- Gigabit Ethernet Switches and Routers
- Fibre Channel Switch Infrastructure
- XDSL Applications
- Metro Edge Switching

Specifications

Complete list of fiber optic connector specifications [pg 212-224]

Standards	IEEE802.3z
Dimensions	**Width:** 0.52" [13 mm] **Depth:** 2.2" [56 mm] **Height:** 0.33" [8 mm]
Power	3.3V
Environment	0°C to 70°C operating -40°C to 85°C storage
Compliance	IEC-60825; FDA 21; CFR 1040.10 and 1040.11
Warranty	Lifetime

Ordering Information

Complete list of fiber optic connector specifications [pg 212-224]

TN-J4858C
1000Base-SX 850nm (LC) multimode
[62.5/125 µm fiber: 220 m/722 ft.]
[50/125 µm fiber: 550 m/1804 ft.]
Link Budget: 9.0 dB

TN-J4859C
1000Base-LX 1310nm (LC) single mode
[20 km/12.4 mi.] Link Budget: 16.0 dB

TN-J4860C
1000Base-LX/ZX 1550nm (LC) single mode
[80 km/49.7 mi.] Link Budget: 24.0 dB

NEW PRODUCT

10GBase SFP+ MSA Compatible Duplex LC

TN-10GSFP-xR(x)

10GBase SFP+ Modules

Features

- SFP+ Optical Transceiver with duplex LC connector
- 10G small Form-Factor Pluggable (SFP+) MSA compatible
- SFF-8472 Digital Diagnostic Function (DMI)
- Single +3.3 V Power Supply,
- Up to 10.5 Gbps bidirectional data links
- RoHS Compliant (all models)
- 0 to 70°C Operating Temperature range
- -40 to 85°C Storage Temperature range
- Class 1 Laser International Safety Standard IEC 60825 Compliant

TN-10GSFP-SR:

- Compliant with IEEE 802.3ae 10GBASE-SR/SW
- Link Length up to 300 m with OM3 multi-mode fiber; 82 m with OM2 multi-mode fiber; 33 m with OM1 multimode fiber

TN-10GSFP-LRx:

- Compliant with IEEE 802.3ae 10GBASE-LR/LW
- Maximum Link Length of 70 KM

Specifications

Complete list of fiber optic connector specifications [pg 212-224]

Standards	IEEE802.3ae
Data Rates	10.3 Gbps
Dimensions	Width: 0.52" [13 mm] Depth: 2.2" [56 mm] Height: 0.33" [8 mm]
Power Supply	+3.3V
Operating Temp	0°C - 70°C (32°F to 158°F)
Storage Temp	-40°C - 85°C (-40°F to 185°F)
Compliance	IEC-60825; FAD 21; CFR 1040.10 and 1040.11
Warranty	Lifetime

Ordering Information

Complete list of fiber optic and connector specifications [pg 212-224]

***TN-10GSFP-SR**
10GBase-SR/SW, SFP+
w/ Digital Diagnostics (DMI) 850nm (LC)
[300/82/33 m; 985/269/108 ft.]
Link Budget: 2.6 dB

TN-10GSFP-LR1
10GBase-LR/LW, SFP+
w/ Digital Diagnostics (DMI) 1310nm (LC)
[10 km/6.2 mi.] Link Budget: 6.4 dB

TN-10GSFP-LR2
10GBase-LR/LW, SFP+
w/ Digital Diagnostics (DMI) 1310nm (LC)
[20 km/12.4 mi.] Link Budget: 11.4 dB

TN-10GSFP-LR4
10GBase-LR/LW, SFP+
w/ Digital Diagnostics (DMI) 1310nm (LC)
[40 km/24.9 mi.] Link Budget: 16.5 dB

TN-10GSFP-LR7
10GBase-LR/LW, SFP+
w/ Digital Diagnostics (DMI) 1310nm (LC)
[70 km/43.4 mi.] Link Budget: 25 dB

**Distance up to 300m on 50/125 OM3 multi-mode fiber, up to 82 m for 50/125 um multi-mode fiber with model.*

Bandwidth 500 MHz-km at 850nm, and up to 33 m for 62.5/125 um multi-mode fiber with model bandwidth 200 MHzkm at 850nm.

NEW PRODUCT

10G XFP MSA Compatible Duplex LC

TN-XFP-xxx

XFP Modules

Features

- Hot-Pluggable XFP Footprint LC Optical Transceiver
- Digital Diagnostic Function
- Class 1 Laser International Safety Standard IEC-60825 Compliant
- Compatible with XFP Multi-Sourcing Agreement (MSA)
- XFP Optical Transceiver with duplex LC connector
- 10G small Form-Factor Pluggable (XFP) MSA compatible
- INF-8077i Digital Diagnostic Function (DMI)
- Maximum Link Length of 80 km
- Single +3.3V Power Supply
- Low Power Dissipation < 2W
- RoHS Compliant (all models)

Additional Features

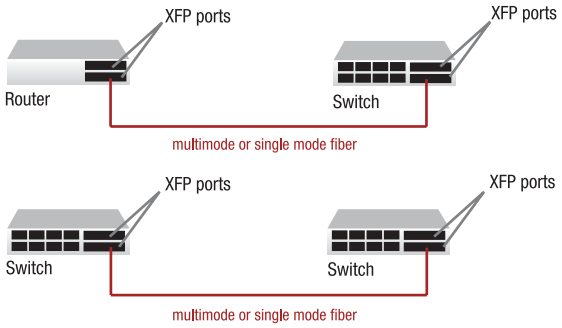
TN-XFP-SR Module

- Compliant with IEEE 802.3ae 10GBASE-SR/SW
- Compliant with 10G Fibre Channel 1200-MX-SN-I
- Low power Dissipation < 1.2W

TN-XFP-LRx & TN-XFP-ER & TN-XFP-ZR

- Compliant with IEEE 802.3ae 10GBASE-LR/LW//ER/ZR
- Compliant with 10G Fibre Channel 1200-SM-LL-L
- Compliant with XFI 10G Serial Electrical Interface
- Low power Dissipation < 2W

Fiber Connections with XFPs



Applications

- 10G Ethernet Switches and Routers
- 10G Fibre Channel Switch Infrastructure
- Metro Edge Switching

Specifications

Complete list of fiber optic connector specifications [pg 212-224]

Standards	IEEE802.3ae
Output Wavelength	-5.5nm < λ_c < +7.5nm
Dimensions	**Width:** 0.71" [18 mm] **Depth**: 3.07" [78 mm] **Height**: 0.33" [8 mm]
Power	3.3V
Power Consumption	0.66 Watts
Environment **TN-XFP-SR,TN-XFP-ZR:**	0°C – 70°C Operating
TN-XFP-LR1,TN-XFP-LR2,TN-XFP-ER:	-5°C - 70°C Operating
TN-XFP-LR1-T, TN-XFP-LR2-T:	-45°C - 80°C Operating
Operation Humidity	10% to 90% (non-condensing)
Compliance	IEC-60825; FDA 21; CFR 1040.10 and 1040.11
Warranty	Lifetime

*Note: Per Cisco Systems' literature, the Cisco switches with XFP slots do not accept modules other than Cisco's own XFPs. The Cisco switch identifies the manufacturer ID along with the part number and blocks operations to this port for non-Cisco interfaces. Other major XFP switch manufacturers do not indicate in their literature that such restrictions are imposed.

*Transition Networks' XFP units fully comply with Multi-Sourcing Agreement (MSA). This compliance allows Transition Networks' XFP modules to be used on other MSA-compliant XFP platforms without any problems.

Ordering Information

Complete list of fiber optic connector specifications [pg 212-224]

TN-XFP-SR
10GBase-SR/SW/10G Fibre Channel, XFP w/Digital Diagnostics (DMI) 850nm (LC)
[62.5/125 uM: 33 m/108 ft.]
[50/125 uM with 500 MHZ- km: 269 ft.]
[50/125 uM: 300 m/985 ft.]
Modal dispersion: 3.9 dB

TN-XFP-LR1
10GBase-LR/LW/10G Fibre Channel, XFP w/Digital Diagnostics (DMI)1310nm (LC)
[10 km/6.2 mi.] Link Budget: 6.2 dB

TN-XFP-LR2
10GBase-LR/LW/10G Fibre Channel, XFP w/Digital Diagnostics (DMI)1310nm (LC)
[20 km/12.4 mi.] Link Budget: 12.0 dB

TN-XFP-ER
10GBase-LR/ER/10G Fibre Channel, XFP w/Digital Diagnostics (DMI)1310nm (LC)
[40 km/24.9 mi.] Link Budget: 16.5 dB

TN-XFP-ZR
10GBase-ZR/10G Fibre Channel, XFP w/Digital Diagnostics (DMI)1550nm (LC)
[80 km/49.7 mi.] Link Budget: 23.0 dB

Extended Operating Temperature -40°C to +85°C

TN-XFP-LR1-T
10GBase-LR/LW/10G Fibre Channel, XFP w/Digital Diagnostics (DMI)1310nm (LC)
[10 km/6.2 mi.] Link Budget: 6.2 dB

TN-XFP-LR2-T
10GBase-LR/LW/10G Fibre Channel, XFP w/Digital Diagnostics (DMI) 1310nm (LC)
[20 km/12.4 mi.] Link Budget: 12.0 dB

NEW PRODUCT

TN-X2-10GB-xx

X2 Modules

Features

- X2 Optical Transceiver with duplex SC connector
- 10G X2 MSA Release10.b compatible
- SFF8472 Digital Diagnostic Function (DMI)
- XAUI Electrical Interface: 4 Lanes @ 3.125 Gbps
- Support +5V, +3.3V Power Supply
- RoHS Compliant (all models)
- Class 1 Laser International Safety Standard IEC 60825 Compliant

Additional Features

- **TN-X2-10GB-SR**
  Compliant with IEEE 802.3ae 10GBASE-SR
- **TN-X2-10GB-LRM**
  Compliant with IEEE 802.3aq 10GBASE-LRM
- **TN-X2-10GB-LR**
  Compliant with IEEE 802.3ae 10GBASE-LR
- **TN-X2-10GB-ER**
  Compliant with IEEE 802.3ae 10GBASE-ER

Specifications

Complete list of fiber optic connector specifications [pg 212-224]

Standards	IEEE Std. 802.3ae
Dimensions	**Width:** 1.42" [36 mm] **Depth:** 3.58" [91 mm] **Height:** 0.53" [13.46 mm]
Power	+5 V, +3.3 V
Power Consumption	4.0 Watts
Environment	0 – 70°C operating -40 – 80°C storing
Compliance	IEC-60825; FDA21; CFR 1040.10 & 1040.11
Warranty	Lifetime

Note: The Transition Networks' TN-X2-10GB-xx series X2 modules are designed to install in any X2 port allowing for 10GBASE-SR, 10GBASE-LR or 10GBASE-ER interfaces to the network through X2 connector. The TN-X2-10GB-xx modules are Cisco compatible and are designed for bi-directional serial-optical data communication such as 10G Ethernet at speeds up to 10.3 Gbps.

*Transition Networks' X2 modules fully comply with the Multi-Sourcing Agreement (MSA). This compliance allows our X2 modules to be used in all other MSA compliant X2 platforms. In addition, TN X2 modules are also compatible with all Cisco X2-based routes and switches, as well as Cisco's IOS software. TN X2 modules ARE NOT Cisco OEM brand Modules.

Ordering Information

Complete list of fiber optic connector specifications [pg 212-224]

TN-X2-10GB-SR
10GBase-SR
X2 w/Digital Diagnostics (DMI)
850nm MM (SC)
[62.5/125 uM: 33 m/108 ft]
[50/125 uM: 300 m/985 ft]
Link Budget: 4.1dB

TN-X2-10GB-LRM
10GBase-LRM
X2 w/Digital Diagnostics (DMI)
1310nm MM (SC)
[220 m/722 ft.] Link Budget: 2.0dB

TN-X2-10GB-LR
10GBase-LR
X2 w/Digital Diagnostics (DMI)
1310nm SM (SC)
[10 km/6.2 mi.] Link Budget: 9.4dB

TN-X2-10GB-ER
10GBase-ER
X2 w/Digital Diagnostics (DMI)
1550nm SM (SC)
[40 km/24.9 mi.] Link Budget: 15.5dB

Course Wavelength Division Multiplexing (CWDM)

CWDM-xxxxxxxxR

Ordering Information

CWDM- ____ ____ ____ R

Module Type

A	Add/Drop Mux
M	Mux/Demux

Connectors

LC	LC/PC
SC	SC/PC

Channel Configuration
(Module Type A Only)

1A451	1 Ch. Add/Drop 1510nm (group 451)
1B451	1 Ch. Add/Drop 1530nm (group 451)
1C451	1 Ch. Add/Drop 1550nm (group 451)
1D451	1 Ch. Add/Drop 1570nm (group 451)
1A453	1 Ch. Add/Drop 1530nm (group 453)
1B453	1 Ch. Add/Drop 1550nm (group 453)
1C453	1 Ch. Add/Drop 1570nm (group 453)
1D453	1 Ch. Add/Drop 1590nm (group 453)
1A455	1 Ch. Add/Drop 1550nm (group 455)
1B455	1 Ch. Add/Drop 1570nm (group 455)
1C455	1 Ch. Add/Drop 1590nm (group 455)
1D455	1 Ch. Add/Drop 1610nm (group 455)
1A847	1 Ch. Add/Drop 1470nm (group 847)
1B847	1 Ch. Add/Drop 1490nm (group 847)
1C847	1 Ch. Add/Drop 1510nm (group 847)
1D847	1 Ch. Add/Drop 1530nm (group 847)
1E847	1 Ch. Add/Drop 1550nm (group 847)
1F847	1 Ch. Add/Drop 1570nm (group 847)
1G847	1 Ch. Add/Drop 1590nm (group 847)
1H847	1 Ch. Add/Drop 1610nm (group 847)

East/West Lines with LC Connector
(Module Type A Only)

21847	1 Ch. Add/Drop 1470 port with E/W Lines
21849	1 Ch. Add/Drop 1490 port with E/W Lines
21851	1 Ch. Add/Drop 1510 port with E/W Lines
21853	1 Ch. Add/Drop 1530 port with E/W Lines
21855	1 Ch. Add/Drop 1550 port with E/W Lines
21857	1 Ch. Add/Drop 1570 port with E/W Lines
21859	1 Ch. Add/Drop 1590 port with E/W Lines
21861	1 Ch. Add/Drop 1610 port with E/W Lines

Channel Configuration
(Module Type M Only)

451	4 Ch. 1510/1530/1550/1570nm
453	4 Ch. 1530/1550/1570/1590nm
455	4 Ch. 1550/1570/1590/1610nm
551	5 Ch. 1510/1530/1550/1570nm + 1310nm
553	5 Ch. 1530/1550/1570/1590nm + 1310nm
555	5 Ch. 1550/1570/1590/1610nm + 1310nm
847	8 Ch. 1470 ~ 1610nm
947	9 Ch. 1470 ~ 1610nm + 1310nm
1631	16 Ch. 1310 ~ 1610nm

Accessory *(sold separately)*

CWDM-MB19R1
19" Rack Mount Bracket, 1RU High, holds 2 CWDM Modules

Examples

CWDM-M455LCR
CWDM Mux/Demux Module,
4 channel, 1550nm ~ 1610nm

CWDM-A1D847SCR
CWDM Add/Drop Mux Module,
1 channel drop (1530nm)
pass 1470nm ~ 1510nm &
pass 1500nm ~ 1610nm

Features

- Increase bandwidth on existing fiber infrastructure [pg 18]
- Alleviate fiber exhaustion
- Transmit multiple protocols over an existing duplex fiber link by combining the fiber outputs of multiple media converters
- Provide scalable bandwidth of up to 10 Gbps per channel over existing fiber links [pg 18]
- "Plug and Play," no configuration of CWDM components
- Use existing standard optical ports on switches and routers
  - Utilize Optical Line Converter as transponder
- Lifetime Warranty

**Note: 1310nm channel is wideband (+/- 50nm)*

Other channel configurations may be available upon request. Please contact Transition Networks.

Specifications

4 Channel Mux/Demux Specific Optical Specs

Operating Wavelength:	1500nm ~ 1620nm
Center Wavelength (λ_c):	1510nm ~ 1610nm
Max Insertion Loss*:	1.7 dB/channel

5 Channel Mux/Demux Specific Optical Specs

CWDM Operating Wavelength:	1500nm ~ 1620nm
CWDM Center Wavelength (λ_c):	1510nm ~ 1610nm
1310nm Ch. Operating Wavelength:	1260nm ~ 1360nm
1310nm Ch. Center Wavelength (λ_c):	1310nm
CWDM Max. Insertion Loss*:	2.0 dB/channel
1310nm Ch. Max Insertion Loss*:	1.0 dB/channel
1310nm Ch. Port Isolation:	30 dB Min. (@CWDM bands)

8 Channel Mux/Demux Specific Optical Specs

Operating Wavelength:	1460nm ~ 1620nm
Center Wavelength (λ_c):	1470nm ~ 1610nm
Max Insertion Loss*:	3.0 dB/channel

9 Channel Mux/Demux Specific Optical Specs

CWDM Operating Wavelength:	1460nm ~ 1620nm
CWDM Center Wavelength (λ_c):	1470nm ~ 1610nm
1310nm Ch. Operating Wavelength:	1260nm ~ 1360nm
1310nm Ch. Center Wavelength (λ_c):	1310nm
CWDM Max. Insertion Loss*:	3.3 dB/channel
1310nm Ch. Max Insertion Loss*:	1.0 dB/channel
1310nm Ch. Port Isolation:	30 dB Min. (@CWDM bands)

16 Channel Mux/Demux Specific Optical Specs

Operating Wavelength:	1300nm ~ 1620nm
Center Wavelength (λ_c):	1310nm ~ 1610nm
Max Insertion Loss*:	3.7 dB/channel

**Note: All Insertion Loss values include one connector pair*

1 Channel Add/Drop (4 ch. group) Specific Optical Specs

Operating Wavelength:	1500nm ~ 1620nm
Center Wavelength (λ_c):	1510nm ~ 1610nm
Add/Drop Ch. Max Insertion Loss*:	0.7 dB
Pass Ch. Max Insertion Loss*:	1.0 dB

1 Channel Add/Drop (8 ch. group) Specific Optical Specs

Operating Wavelength:	1460nm ~ 1620nm
Center Wavelength (λ_c):	1470nm ~ 1610nm
Add/Drop Ch. Max Insertion Loss*:	0.7 dB
Pass Ch. Max Insertion Loss*:	1.0 dB

General Optical Specs (applies to all CWDM configurations)

CWDM Channel Spacing:	20nm
CWDM Channel Passband:	-5.5nm < λ_c < +7.5nm
Passband Ripple:	0.5 dB max.
Adjacent Channel Isolation:	30 dB min.
Non-adjacent Channel Isolation:	40 dB min.
Directivity:	50 dB min.
Return Loss:	45 dB min.
Polarization Dependent Loss (PDL):	0.2 dB max.
Optical Operating Power:	300 mW max.

Fiber Type	Corning SMF-28
Dimensions	Module **Width:** 8.3" [212 mm] **Depth**: 7.6" [192 mm] **Height**: 1.7" [43 mm] Rack Mount Bracket **Width:** 18.9" [481 mm] **Depth**: 1.6" [40 mm] **Height**: 1.7" [44 mm]
Environment	0°C to +70°C operating temperature -40°C to +85°C storage temperature
Warranty	Lifetime

N-FX-xx-02(x)

Fast Ethernet Network Interface Cards

The Fast Ethernet NIC provides a 100BASE-FX fiber port and delivers low cost, fiber optic connectivity to the desktop in fiber rich LAN environments. With both standard and low profile form factors; driver support for most popular operating systems; and PCI 2.2 plug-and-play capability; installation is a breeze in virtually any PC in your network.

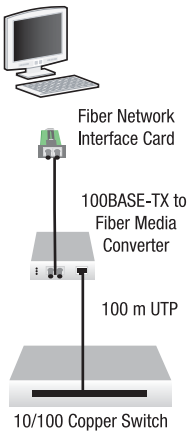
Features

- Lifetime Warranty
- 32-bit bus master
- Supports 802.1P/Q VLAN tag
- IP multicast filter
- PCI 2.1 and 2.2 compliant
- Wake-On-LAN (WOL) power management supported via included WOL cable
- Both standard and low profile form factors

Specifications

Complete list of fiber optic connector specifications [pg 212-224]

Standards	IEEE Std. 802.3 2000 IEEE Std. 802.1P IEEE Std. 802.1Q
Expansion Bus Standard	PCI 2.1, 2.2
Status LEDs	**LINK/ACT (Link/Activity)**: ON = communication link; FLASHING = activity on link **FDX (Full-duplex)**: ON = Full-duplex link
LAN Drivers	Windows 95, 98 ME, 2000, 2003, XP, NT 4.0, VISTA NDIS 2,3,4,5 NetWare Server 3.12, 4.x, 5.x, 6.x NetWare DOS Client ODI MAC OS Linux x86 Kernel 2.2.x ~ 2.6.x Linux x64 Kernal 2.4.x~2.6.x FreeBSD 3.2, 4.x, 5.x SCO Unixware 7.1, OpenUnix 8 SCO Open Server 5.0.x Solaris 8, 9, 10
Boot Server Support	PXE RPL NetWare NCP/IPX DHCP BOOTP
PCB Dimensions	**Width**: 2.2" [56 mm] **Depth**: 4.8" [122 mm] **Height**: 0.9" [23 mm]
Power	1.0A @ +5V
Environment	0° – 50°C; 5% – 95% humidity non-condensing; 0 – 10,000 ft. altitude
Shipping Weight	1 lb. [0.45 kg]
Regulatory Compliance	FCC Class B Part 15, CE Mark
Warranty	Lifetime



Ordering Information				
Product Number (standard profile)	**Product Number** (standard profile 20-pack)	**Product Number** (low profile)	**Product Number** (low profile 20-pack)	**Description**
N-FX-ST-02	N-FX-ST-02-020	N-FX-ST-02(L)	N-FX-ST-02(L)-020	100BASE-FX 1300nm multimode (ST) **[2 km/1.2 mi.] Link Budget: 12.0 dB**
N-FX-SC-02	N-FX-SC-02-020	N-FX-SC-02(L)	N-FX-SC-02(L)-020	100BASE-FX 1300nm multimode (SC) **[2 km/1.2 mi.] Link Budget: 12.0 dB**
N-FX-MT-02	N-FX-MT-02-020	N-FX-MT-02(L)	N-FX-MT-02(L)-020	100BASE-FX 1300nm multimode (MT-RJ) **[2 km/1.2 mi.] Link Budget: 12.0 dB**
N-FX-LC-02	N-FX-LC-02-020	N-FX-LC-02(L)	N-FX-LC-02(L)-020	100BASE-FX 1300nm multimode (LC) **[2 km/1.2 mi.] Link Budget: 12.0 dB**
N-FX-SC5-02		N-FX-SC5-02(L)		100BASE-FX 1310nm single mode (SC) **[5 km/3.1 mi.] Link Budget: 12.0 dB**
N-FX-SC20-02		N-FX-SC20-02(L)		100BASE-FX 1310nm single mode (ST) **[20 km/12.4 mi.] Link Budget: 16.0 dB**
Single Fiber Products				
N-FX-SB201-02		N-FX-SB201-02(L)		100BASE-FX 1310nm/1550nm single fiber single mode (SC) **[20 km/12.4 mi.] Link Budget: 18.0 dB**
N-FX-SB202-02		N-FX-SB202-02(L)		100BASE-FX 1550nm/1310nm single fiber single mode (SC) **[20 km/12.4 mi.] Link Budget: 18.0 dB**
Bundled Products				
N-FX-ST-02F (includes extra low profile bracket and Boot ROM is installed)				100BASE-FX 1300nm multimode (ST) **[2 km/1.2 mi.] Link Budget: 12.0 dB**
N-FX-SC-02F (includes extra low profile bracket and Boot ROM is installed)				100BASE-FX 1300nm multimode (SC) **[2 km/1.2 mi.] Link Budget: 12.0 dB**
Optional Accessories (sold separately) BTR-NFX				Boot ROM chip supporting both BBS (BIOS Boot Specification) and non-BBS compliant PCs

Designed for Microsoft® Windows Server™2003, Windows®2000 Server

Designed for Microsoft® Windows Server™2003 x64 Editions

Designed for Microsoft® Windows®XP Windows®2000

Designed for Microsoft® Windows®XP x64 Edition

NDM-FTX-xx-01(x)

Dual Media Network Interface Cards

The Fast Ethernet Dual Media NIC provides both a 10/100BASE-TX copper port and a 100BASE-FX fiber port to allow ultimate flexibility for installation in both new and legacy LAN environments. With both standard and low profile form factors, driver support for most popular operating systems and PCI 2.2 plug-and-play capability helps make installation a breeze in virtually any PC in your network.

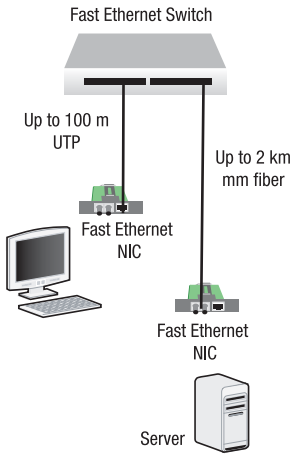
Features

- Lifetime Warranty
- 32-bit bus master
- Supports 802.1P/Q VLAN tag
- IP multicast filter
- PCI 2.1 and 2.2 compliant
- Wake-On-LAN (WOL) power management
- Both standard and low profile form factors

Specifications

Complete list of fiber optic connector specifications [pg 212-224]

Standards	IEEE Std. 802.3 IEEE Std 802.1P IEEE Std 802.1Q
Expansion Bus Standard	PCI 2.1, 2.2
Status LEDs	**LINK/ACT (Link/Activity)**: ON = communication link; FLASHING = activity on link **FDX (Full-duplex)**: ON = Full-duplex link
LAN Drivers	NetWare Server 4.1x, 5.X, NetWare DOS Client ODI Windows 95, 98, ME, 2000, 2003, XP, NT 4.0, Linux
Boot Server Support	Novell RPL Boot ROM PXE Boot ROM
PCB Dimensions	**Width**: 4.8" [122 mm] **Depth**: 7.1" [180 mm] **Height**: 0.9" [23 mm]
Power	1.0A @ +5V
Environment	0° – 50°C; 5% – 95% humidity non-condensing; 0 – 10,000 ft. altitude
Shipping Weight	1 lb. [0.45 kg]
Regulatory Compliance	FCC Part 15 Class A, CE Mark
Warranty	Lifetime



Ordering Information				
Product Number (standard profile)	**Product Number (standard profile 20-pack)**	**Product Number (low profile)**	**Product Number (low profile 20-pack)**	**Description**
NDM-FTX-ST-01	NDM-FTX-ST-01-020	NDM-FTX-ST-01(L)	NDM-FTX-ST-01(L)-020	100BASE-TX (RJ-45) **[100 m/328 ft]** 100BASE-FX 1300nm multimode (ST) **[2 km/1.2 mi.] Link Budget: 12.0 dB**
NDM-FTX-SC-01	NDM-FTX-SC-01-020	NDM-FTX-SC-01(L)	NDM-FTX-SC-01(L)-020	100BASE-TX (RJ-45) **[100 m/328 ft]** 100BASE-FX 1300nm multimode (SC) **[2 km/1.2 mi.] Link Budget: 12.0 dB**
NDM-FTX-MT-01	NDM-FTX-MT-01-020	NDM-FTX-MT-01(L)	NDM-FTX-MT-01(L)-020	100BASE-TX (RJ-45) **[100 m/328 ft]** 100BASE-FX 1300nm multimode (MT-RJ) **[2 km/1.2 mi.] Link Budget: 12.0 dB**
NDM-FTX-SC5-01		NDM-FTX-SC5-01(L)		100BASE-TX (RJ-45) **[100 m/328 ft]** 100BASE-FX 1310nm single mode (SC) **[5 km/3.1 mi.] Link Budget: 12.0 dB**
NDM-FTX-SC20-01		NDM-FTX-SC20-01(L)		100BASE-TX (RJ-45) **[100 m/328 ft]** 100BASE-FX 1310nm single mode (SC) **[20 km/12.4 mi.] Link Budget: 16.0 dB**
Single Fiber Products				
NDM-FTX-SB201-01		NDM-FTX-SB201-01(L)		100BASE-TX (RJ-45) **[100 m/328 ft]** single fiber single mode (SC) **[20 km/12.4 mi.] Link Budget: 18.0 dB**
NDM-FTX-SB202-01		NDM-FTX-SB202-01(L)		100BASE-TX (RJ-45) **[100 m/328 ft]** single fiber single mode (SC) **[20 km/12.4 mi.] Link Budget: 18.0 dB**
Optional Accessories (sold separately) BTR-NDM-PXE BTR-NDM-RPL				PXE Boot ROM RPL Boot ROM

N-FXE-xx-01

PCI Express Bus 100Base-FX Fiber NIC

N-FXE-xx-01 is a Fiber Fast Ethernet to PCI-Express (PCIe) bus adapter that fully complies with all IEEE 802.3u and 100Base-FX standards. It provides up to 200Mbps full-duplex bandwidth capacity to support high-end systems. In addition, with advanced functions like VLAN filtering packet processing, the adapter provides added performance, flexible configuration and secure networking to users in a standards-based environment.

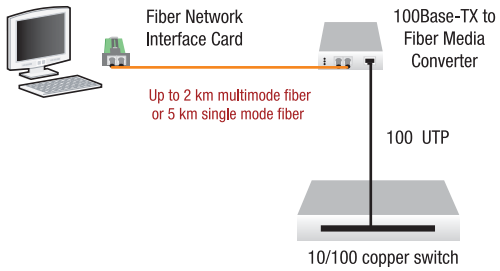
The PCI-Express (PCIe) design gives you the maximum possible bandwidth and bus efficiency, along with low power consumption.

For users equipped with PCI-Express systems, N-FXE-xx-01 provides the ability to easily build or connect to the Fast Ethernet fiber networks.

Features

- PCI-Express x1 Interface
- IEEE 802.3x Full-Duplex Flow Control
- Supports Multicast Frame Filtering
- Supports Asymmetric/Symmetric Flow control
- Supports 802.1q VLAN tagging
- Wake-on-LAN (WoL)
- Microsoft certified drivers
- PXE remote boot support
- RoHS Compliance
- Available with SC, ST, LC multimode and SC, LC single mode fiber connection
- Low-Profile Bracket Included

100Base-FX



Specifications

Complete list of fiber optic connector specifications [pg 212-224]

Standards	IEEE 802.3u Fast Ethernet 100Base-FX IEEE 802.3x Full-Duplex Flow Control IEEE 802.1Q VLAN
Bus Slot	PCIe 1.0
Status LEDs	**LINK/ACT (Link/Activity)**: ON = communication link; FLASHING = activity on link **FDX (Full-duplex)**: ON = Full-duplex link
Software Support	Windows 2000, 2003, XP, NT 4.0, Vista Novell Netware 4.x Linux, NDIS2, PXE & RPL Boot ROM
PCB Dimensions	120 mm (L) 68.5 mm (H)
Power Requirement	3W, +3.3VDC@1A max.
Environment	0° – 50°C; 5% – 90% humidity
Shipping Weight	1 lb. [0.6 kg]
Regulatory Compliance	EMI Standard, FCC Class B, CE Mark
Warranty	Lifetime

Ordering Information

Complete list of fiber optic connector specifications [pg 212-224]

N-FXE-ST-01
100BASE-FX 1300nm multimode (ST)
[2 km/1.2 mi.] Link Budget: 12.0 dB

N-FXE-SC-01
100BASE-FX 1300nm multimode (SC)
[2 km/1.2 mi.] Link Budget: 12.0 dB

N-FXE-LC-01
100BASE-FX 1300nm multimode (LC)
[2 km/1.2 mi.] Link Budget: 13.0 dB

N-FXE-SC5-01
100BASE-FX 1310nm single mode (SC)
[5 km/3.1 mi.] Link Budget: 12.0 dB

N-FXE-LC5-01
100BASE-FX 1310nm single mode (LC)
[5 km/3.1 mi.] Link Budget: 12.0 dB

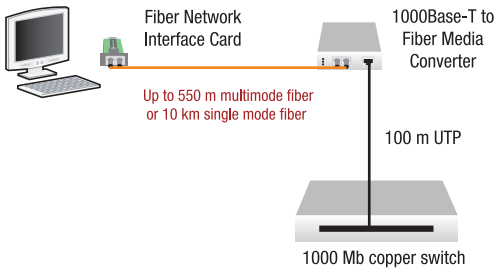
NEW PRODUCT

N-GxX-xC-02

Gigabit Ethernet Network Interface Cards

The Gigabit Ethernet NIC provides a 1000BASE-SX/LX fiber port, delivering fiber optic connectivity to the desktop for fiber rich LAN environments. With both standard and low profile form factors, driver support for most popular operating systems and PCI 2.2 plug-and-play capability, installation is a breeze in virtually any PC in your network.

Application



Features

- Lifetime Warranty
- Supports 32/64-bit PCI 2.2 bus
- Supports 802.1P/Q VLAN filtering function
- Full-duplex flow control
- Plug-and-Play auto-configuration
- TCP, UDP & IP checksum off-loading
- Supports jumbo frames up to 9014Bytes
- Ships with Standard Profile Bracket attached, Low Profile Bracket included
- Supports 802.3ad Link Aggregation (LACP)
- Integrated Remote Boot types supported: PXE, RPL and BOOTP

Specifications

Complete list of fiber optic connector specifications [pg 212-224]

Standards	IEEE Std. 802.3Z IEEE Std. 802.1P IEEE Std. 802.1Q IEEE Std. 802.3x IEEE Std. 802.3ad
Expansion Bus Standard	PCI 2.2 bus 32/64-bit
Status LEDs	**LINK/ACT (Link/Activity)**: ON = communication link; FLASHING = activity on link **FDX (Full-duplex)**: ON = Full-duplex link
LAN Drivers	NetWare Server 4.x, 5.x, 6.x, NetWare DOS Client ODI Windows 98, ME, 2000, 2003, XP, NT 4.0, VISTA Linux, SCO UnixWare 7.1.x, SCO Open Server Solaris
Boot Server Support	PXE, RPL, BOOTP
PCB Dimensions	**Width**: 2.2" [56 mm] **Depth**: 6.5" [165 mm] **Height**: 0.9" [23 mm]
Power	2.0A @ +5V
Environment	0° – 50°C; 5% – 90% humidity non-condensing; 0 – 10,000 ft. altitude
Shipping Weight	1 lb. [0.45 kg]
Regulatory Compliance	FCC Class A, CE Mark
Warranty	Lifetime

Ordering Information

Complete list of fiber optic connector specifications [pg 212-224]

N-GSX-SC-02
1000BASE-SX 850nm multimode (SC)
[62.5/125 µm fiber: 220 m/722 ft.]
Link Budget: 7.5 dB
[50/125 µm fiber: 550 m/1804 ft.]
Link Budget: 7.5 dB

N-GSX-LC-02
1000BASE-SX 850nm multimode (LC)
[62.5/125 µm fiber: 220 m/722 ft.]
Link Budget: 7.5 dB
[50/125 µm fiber: 550 m/1804 ft.]
Link Budget: 7.5 dB

N-GLX-SC-02
1000BASE-LX 1310nm single mode (SC)
[10 km/6.2 mi.] Link Budget: 10.5 dB

N-GLX-LC-02
1000BASE-LX 1310nm single mode (LC)
[10 km/6.2 mi.] Link Budget: 11.5 dB

N-GXE-xx-01

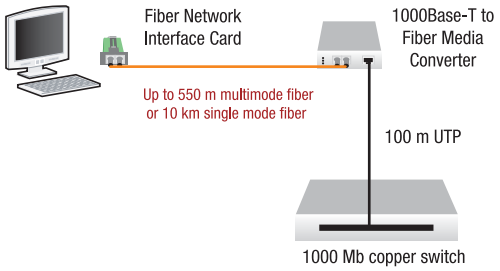
Gigabit Ethernet Network Interface Cards

N-GXE-xx-01 is a Fiber Gigabit Ethernet to PCIe bus adapter that fully complies with all IEEE 802.3z and 1000Base-SX/LX standards. It provides up to 2000 Mbps full-duplex bandwidth capacity to support high-end servers. In addition, with advanced functions like VLAN filtering packet processing, the adapter provides enhanced performance, flexible configuration and secure networking for users in a standard-based environment. Two LED indicators (LINK/ACT and FDX) on the bracket will help to oversee the board link, activities and full-duplex status.

Features

- High bandwidth 1000 Mbps Network Speed [pg 18]
- Supports Full-Duplex Mode
- Supports IEEE 802.3x Full-Duplex Flow Control
- Supports PCIe x1 bus
- Compliant with PCIe Rev.1.1 Interface
- Supports Jumbo Frame
- Supports High Level VLAN Filtering Function
- Supports IP headers and TCP/UDP checksums offload
- RoHS Compliance
- Supports on-board screening of VLAN tagged Ethernet frames
- Low-Profile Bracket Included

Application



Specifications

Standards	IEEE 802.3z Gigabit Ethernet 1000Base-SX/LX IEEE 802.3x Full-Duplex Flow Control IEEE 802.1Q VLAN
Bus Slot	PCI-e 1.1
Status LEDs	**LINK/ACT (Link/Activity)**: ON = communication link; FLASHING = activity on link **FDX (Full-duplex)**: ON = Full-duplex link
Software Support	Windows 98/ME, 2000, 2003, XP, NT 4.0, Vista Novell Netware 4.x, 5.x, 6.x, Linux, PXE & RPL Boot ROM
PCB Dimensions	108 mm (L) 68.5 mm (H)
Power Requirement	5W, + 3.3VDC@ 1.5A max.
Environment	0° – 50°C; 5% – 90% humidity
Shipping Weight	1 lb. [0.6 kg]
Regulatory Compliance	EMI Standard, FCC Class B, CE Mark
Warranty	Lifetime

Ordering Information

N-GXE-SC-01
1000BASE-SX 850nm multimode (SC)
[50/125 µm fiber: 550 m/1804 ft.]
[62.5/125 µm fiber: 220 m/722 ft.]
Link Budget: 7.5 dB

N-GXE-LC-01
1000BASE-SX 850nm multimode (LC)
[50/125 µm fiber: 550 m/1804 ft.]
[62.5/125 µm fiber: 220 m/722 ft.]
Link Budget: 7.5 dB

N-GXE-SC10-01
1000BASE-LX 1310nm single mode (SC)
[10 km/6.2 mi.] Link Budget: 10.5 dB

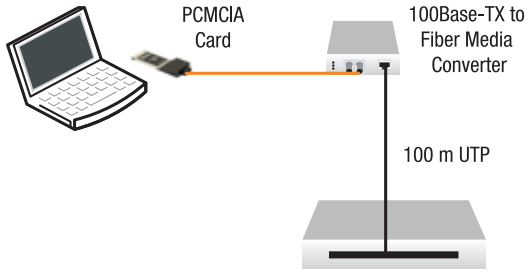
N-GXE-LC10-01
1000BASE-LX 1550nm single mode (LC)
[10 km/6.2 mi.] Link Budget: 11.5 dB

PCM32-FX-SC-01

Fast Ethernet PCMCIA Fiber Adapter Cards

Fast Ethernet PCMCIA cards provide a 100BASE-FX fiber port to deliver fiber optic connectivity to the laptop in high-security, fiber rich LAN environments. Offered in a high-performance 32-bit CardBus version to match virtually any laptop PC and help save money by eliminating the need for a docking station and a fixed, fiber NIC.

Applications



Specifications

Complete list of fiber optic connector specifications [pg 212-224]

Standards	IEEE Std. 802.3 PCMCIA Type II Car dBus PCMCIA Release 2.x JEIDA 4.x
Card Slot	PC Card 68-pin connector to PC
Status LEDs	**PCM32-FX-xx-01:** **LINK/ACT:** ON = communication link; Flashing = activity on link **FDX/COL:** ON = full duplex link; Flashing = collisions occurring
LAN Drivers	**PCM32-FX-xx-01:** NetWare 3.x, 4.0, NetWare DOS Client ODI Windows 95, 98, ME, 2000, XP, NT 3.51, NT 4.0 Windows for Workgroup 3.1/3.11, Linux
Dimensions	**Width**: 2.1" [54 mm] **Depth**: 4.7" [120 mm] **Height**: 0.6" [16 mm]
Power	0.7A @ +5V max.
Environment	0° – 50°C; 5% – 95% humidity non-condensing; 0 – 10,000 ft. altitude
Shipping Weight	1 lb. [0.45 kg]
Compliance	FCC Class A Part 15, CE Mark
Warranty	Lifetime

Ordering Information

Complete list of fiber optic connector specifications [pg 212-224]

PCM32-FX-SC-01
100BASE-FX 1300nm multimode (SC)
[2 km/1.2 mi.] Link Budget: 12.0 dB

NEW PRODUCT

PCIe ExpressCard Adapter
Fast Ethernet 100Base-FX

NEC-FXE-xx-01

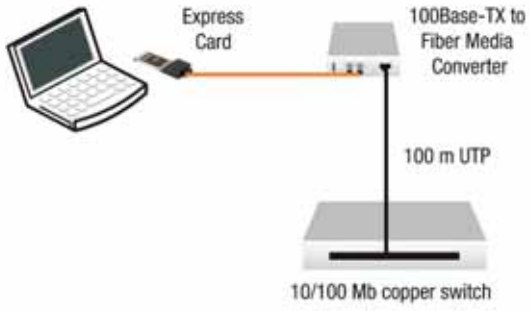
Fast Ethernet PCIe ExpressCard Fiber Adapter

Fast Ethernet ExpressCards provide a 100Base-FX fiber port for delivering fiber optic connectivity to laptop computers in high security, fiber rich LAN environments. This small sized fiber card is specifically designed to plug into laptop computers equipped with an ExpressCard compliant slot. The card includes a single LED located on top of its plastic cover indicating link and activity status. Extensive Network Operating System drivers are provided, easing installation and configuration. Preboot Execution Environment (PXE) and Bootstrap Protocol (BOOTP) are also supported.

Features

- Complies with ExpressCard/34 standard
- Complies with the IEEE 802.3 CSMA/CD 100Base-FX standards
- Full-duplex design
- Options for SC or LC fiber connectors
- Options for multimode or single mode fiber
- Driver support for wide variety of operating systems
- Integrated support for PXE remote boot

Applications



Specifications

Complete list of fiber optic connector specifications [pg 212-224]

Standards	IEEE 802.3u IEEE 802.3x ExpressCard Compliant
Card Slot	ExpressCard/34 26-pin connector
Data Transfer Rate	100 Mbps
Status LEDs	L/A - On = communication link Flashing = Activity on link
LAN Drivers	Windows 98, NT, 2000, XP, Vista, 2003 Server, 2008 Server, Netware, Linux
Dimensions	Length: 5.04 inches [128 mm] Width: 1.34 inches [34 mm]
Shipping Weight	1.0 lbs
Power consumption	3 Watts
Environment	0º - 50º C 5% - 90% humidity non-condensing 0 – 10,000 ft. altitude
Compliance	FCC Part 15 Class B, CE Mark
Warranty	Lifetime

Ordering Information

Complete list of fiber optic connector specifications [pg 212-224]

NEC-FXE-SC-01
100BASE-FX 1300nm multimode (SC)
[2 km/1.2 mi.] Link Budget: 12.0 dB

NEC-FXE-LC-01
100BASE-FX 1300nm multimode (LC)
[2 km/1.2 mi.] Link Budget: 13.0 dB

NEC-FXE-SC20-01
100BASE-FX 1310nm single mode (SC)
[20 km/12.4 mi.] Link Budget: 30.0 dB

24-port 100BASE-X 802.3ah OAM Switch

SM24-100SFP-AH

(24) 100BASE-X SFP Ports, (2) 10/100/1000 RJ-45 Ports, (2) Gigabit Combo Ports Managed Switch

Next Generation Switch

The SM24-100SFP-AH features a 1U form factor consisting of (24) 100Base-X SFP ports, (2) 10/100/1000 RJ-45 ports and (2) Gigabit combo ports. The 24 SFP ports accept industry standard 100BASE-X optical transceivers.

The SM24-100SFP-AH switch also includes Carrier Ethernet specific software, QoS and Management features which enable service providers to deliver secure services while checking end to end connectivity for customers. The SM24-100SFP–AH switch is a next generation switch designed to fulfill the needs of service providers.

Flexible Uplink Options

In addition to the (24) 100BASE-X ports the SM24-100SFP-AH has combo Gigabit uplink ports that allow copper or fiber connections to be used, depending on the network environment. The fiber ports are SFP and can accommodate a wide range of transceivers for your uplink requirements.

Carrier Ethernet Specific Software

The SM24-100SFP-AH switch was designed for use with Carrier Ethernet. Feature enhancements such as 802.3ah, Q-in-Q, Carrier Class Rate-Limit, QoS and subscriber isolation were added to help service providers deploy, manage and secure the network services they are delivering.

Single IP Management up to 36 Switches

The SM24-100SFP-AH is managed as a single switch and has a single IP address. Up to 36 of the SM24-100SFP-AH switches can be virtually stacked and managed as a single switch while using only one IP address.

Management Features

- **In-Band Management:** Telnet, Web-based HTTP or HTTPS, SNMP manager, or Secure Shell
- **Out-of-Band Management:** RS-232 dB-9 console port
- **Software Loading:** TFTP in-band or XModem out-of-band
- **SNMP:** Management access via MIB database, Trap management to specified hosts
- **RMON:** Groups 1, 2, 3, 9 (Statistics, History, Alarm, Event)

- 802.3ah Link OAM
- Supports SNMP v1, v2 & v3
- STP, RSTP and MSTP
- Advanced Quality of Service (QoS)
- Enhanced Security Features
- IGMP v1, v2 and v3

Specifications

Standards Compliance	IEEE 802.1D Spanning Tree Protocol & traffic priorities IEEE 802.1p Priority tags IEEE 802.1Q VLAN IEEE 802.1s Multiple Spanning Tree Protocol IEEE 802.1v Protocol-based VLANs IEEE 802.1w Rapid Spanning Tree Protocol IEEE 802.1X Port Authentication IEEE 802.3ah Link OAM Ethernet, Fast Ethernet, Gigabit Ethernet Full-duplex flow control Link Aggregation Control Protocol IEEE 802.3ac VLAN tagging DHCP Client (RFC 1541) HTTPS IGMP (RFC 1112) IGMPv2 (RFC 2236) Management Information Bases RADIUS+ (RFC 2618) RMON (RFC 1757 groups 1,2,3,9) SNMP (RFC 1157) SNMPv2 (RFC 2571) SNMPv3 (RFC DRAFT 3414, 3410, 2273, 3411, 3415) SNTP (RFC 2030) SSH (Version 2.0) TFTP (RFC 1350)
Physical Ports	(24) 100BASE-X SFP ports (2) 10/100/1000 BASE-TX ports (2) Combo Gigabit Ethernet (RJ-45/SFP) ports (1) RJ-45 Console port
MAC Address	17K MAC address table
Max Pocket Size	10 Kbytes jumbo packet size (on Gigabit ports) 1628 on Fast Ethernet ports
Backplane Bandwidth	12.8 Gbps
LEDs	System: Power Port: Status
Power Consumption	54 Watts maximum
AC Input	100 to 240V, 50-60 Hz, 2 A
Temperature	Operating: 0° to 50°C (32° to 122°F) Storage: -40° to 70°C (-40° to 158°F)
Operating Humidity	10% to 90% (non-condensing)
Dimensions	**Width:** 1.73" [44 mm] **Depth:** 17.3" [440 mm] **Height:** 9.0" [230 mm]
Weight	7.7 lbs [3.5 kg]
Certifications	FCC Class A, CE Mark, UL, cUL

Ordering Information

SM24-100SFP-AH
(24) 100BASE-X SFP Ports, (2) 10/100/1000 RJ-45 Ports, 2 Gigabit Combo Ports Managed Switch - Includes 19" Rackmount Kit

Optional Accessories *(sold separately)*

SFP Modules [pg 161-167]

SM24-100SFP-ACRPS [pg 179]
Redundant Power Supply

Features

- **Authentication:** Local, RADIUS, TACACS, Port (802.1X, MAC Authentication, Web Authentication), HTTPS, SSH, Port Security
- **Access Control Lists:** IP, MAC; 1000 rules per system
- **DHCP Client**
- **Port Configuration:** 100BASE-FX: 100 Mbps full duplex 1000BASE-T: 10/100 Mbps at half/full duplex, 1000 Mbps at full duplex 1000BASE-SX/LX/LH - 1000 Mbps at full duplex (SFP)
- **Flow Control:** Full Duplex: IEEE 802.3-2005 Half Duplex: Back pressure
- **Broadcast Storm Control:** Traffic throttled above a critical threshold
- **Port Mirroring:** Multiple source ports, one destination port
- **Rate Limits:** Input limit, Output limit
- **Port Trunking:** Static trunks (Cisco Ether Channel compliant) Dynamic trunks (Link Aggregation Control Protocol)
- **Spanning Tree Algorithm:** Spanning Tree Protocol (STP, IEEE 802.1D); Rapid Spanning Tree Protocol (RSTP, IEEE 802.1w); Multiple Spanning Tree Protocol (MSTP, IEEE 802.1s)
- **VLAN Support:** Up to 255 groups; port-based or tagged (802.1Q), Private VLANs, Protocol-based VLANs
- **Class of Service:** Supports 4 levels of priority and Weighted Round Robin Queueing (which can be con figured by VLAN tag or port), Layer 3/4 priority mapping: IP DSCP
- **Multicast Filtering:** IGMP Snooping (Layer 2) Multicast VLAN Registration
- **Quality of Service:** DiffServ supports class maps, policy maps, and service policies
- **BOOTP client**
- **SNTP** (Simple Network Time Protocol)
- **SNMP** (Simple Network Management Protocol)
- **RMON** (Remote Monitoring, groups 1,2,3,9)
- **SMTP Email Alerts**
- **DHCP Snooping**
- **IP Source Guard**
- **IP Clustering**

NEW PRODUCT

SM24-100SFP-ACRPS

Redundant Power Supply

The SM24-100SFP-ACRPS is a redundant power supply designed to increase availability in converged data, voice and video networks. The SM24-100SFP-ACRPS delivers redundancy and resiliency at an affordable price.

The SM24-100SFP-ACRPS provides redundant power to the SM24-100SFP-AH switch with an immediate failover capability. The SM24-100SFP-ACPRS will become the main power supply in the event of a failure of the internal power supply on the SM24-100SFP-AH [pg 178].

Features

- High Availability
- Increased Network Uptime
- Ease of Use
- Ease of Deploying
- Cost Effective
- Thermal Protection
- Overload Protection

Specifications

Dimensions	**Width:** 12.6" [320 mm] **Depth:** 6.4" [163 mm] **Height:** 1.73" [44 mm]
Power	Output: 126 Watts; 12 VDC Input: 100-240 VAC, 50 – 60 Hz
Environment	0 – 45°C operating temperature -40 – 70°C storage temperature
Shipping Weight	7.7 lbs. [3.5 kg]
Compliance	CE Mark, UL, FCC Class A
Warranty	Lifetime

Ordering Information

SM24-100SFP-ACRPS
(1) Redundant Power Supply Port with 19" Rackmount Ears
Used with: SM24-100SFP-AH

SM24-1000SFP-AH

Layer 2 Gigabit Metro Ethernet Switch

Features:

- 802.3ah Link OAM
- 10G Uplink Ports
- **Auto-negotiation:**
  for port speed and duplex mode [pg 16]
- **Flow Control:**
  IEEE 802.3x & Back Pressure
- **Spanning Tree Protocol:**
  IEEE 802.1D Spanning Tree Protocol (STP), IEEE 802.1w Rapid Spanning Tree Protocol (RSTP), IEEE 802.1s Multiple Spanning Tree Protocol (MSTP)
- **VLANs:**
  4K IEEE 802.1Q VLANs,Port-based VLAN, Protocol VLAN, Private VLAN, GVRP, IEEE 802.1ad Q-in-Q
- **Link Aggregation:**
  Static Trunk, IEEE 802.3ad LACP, Load Balancing Trunk groups: 32 Trunk links: 2~8 for Gigabit Ethernet port Trunk links: 2~4 for 10G Ethernet port
- **IGMP:**
  IGMP v1, v2, v3, 255 IGMP Groups, MVR
- **QoS:**
  8 Priority Queues, Priority Queues Scheduling, Scheme, WRR, Strict Priority, IEEE 802.1p, IP Precedence/DSCP,, TCP/UDP port number
- **DiffServ:**
  Rate Limiting, Ingress/Egress, Per Port COS
- **Switch Management:**
  CLI via console port or Telnet, Web management SNMP v1, v2c, v3
- **Firmware & Configuration:**
  Dual firmware configuration files, Firmware Configuration upgrade via TFTP/FTP/X modem server
- **RMON:**
  (groups 1,2,3 and 9)
- **SNTP**
- **Port Mirroring**
- **Event/Error/System Log**
- **Security:**
  Port Security, IP Source Guard, DHCP Snooping, IEEE 802.1X, Port-based
- **RADIUS authentication**
- **Encryption: MD5, TLS, TTLS**
- **TACACS+ authentication**
- **HTTPS/SSH**
- **Access Control List (ACL):**
  IP-based, MAC-based, IP/MAC-based, VLAN, TCP/UDP port
- **Storm Control:**
  Broadcast, Multicast, Unknown Unicast

Specifications

Standards Compliance	IEEE 802.1D Spanning Tree Protocol and traffic priorities IEEE 802.1p Priority tags IEEE 802.1Q VLAN IEEE 802.1s Multiple Spanning Tree Protocol IEEE 802.1v Protocol-based VLANs IEEE 802.1w Rapid Spanning Tree Protocol IEEE 802.1X Port Authentication IEEE 802.3-2005 (802.3ah Link OAM) Ethernet, Fast Ethernet, Gigabit Ethernet, 10 Gigabit Ethernet Full-duplex flow control Link Aggregation Control Protocol IEEE 802.3ac VLAN tagging DHCP Client (RFC 1541) HTTPS IGMP (RFC 1112) IGMPv2 (RFC 2236)
Physical Ports	(24) Gigabit SFP ports (2) 10 G XFP ports (2) expansion slots for modules (1) RJ-45 craft port (1) RS-232 console port (1) dB-15 port for alarm I/P and O/P
MAC Address	32K MAC address table
Jumbo Packet Support	9K
Switching Capacity	128 Gbps
LEDs	Power & Port Status
Power Consumption	100 Watts maximum
Power Requirement	AC Input: 100~240V, 50~60 Hz, , Output: +12 VDC DC Input: +18 VDC~+36 VDC, -36 VDC~-72 VDC, Output: +12 VDC
Temperature	-20°C to 60°C (Standard Operating) -40°C to 70°C (Non-Operating)
Operating Humidity	10% to 90% (non-condensing)
Dimensions	**Height:** 2.6" [67 mm] **Width:** 17.0" [436 mm] **Depth:** 10.0" [253 mm] (1.5RU)
Shipping Weight	11lb. (5kg)
Certifications	FCC Class A, CE Mark, UL
MTBF	80,000 hrs (min), at 40°C degree 150,000 hrs (min) at 25°C degree

Ordering Information

SM24-1000SFP-AH
(24) 1000BASE-X SFP Ports, (2) 10G XFP ports and 2 expansion slots for modules - Includes 19" Rackmount kit and Fan module. Does not include power supply. Must order Power supply(s) separately.

Optional Accessories *(sold separately)*

SFP & XFP Modules [pg 161-167]

SM24-1000SFP-ACPWR AC Power module
SM24-1000SFP-DCPWR: DC Power module
SM24-1000SFP-FAN: Fan module
SM24-1000SFP-10GM: 10G XFP expansion module (Does not include XFP)

The SM24-1000SFP-AH Gigabit Metro Ethernet Switch provides a flexible platform to enable carrier-class access technology through easy-to-maintain hardware architecture and advanced management software features. With all front panel access, field-replaceable fan tray, and redundant power supply design, SM24-1000SFP-AH eases the necessary field installation. Advanced management software enables remote trouble-shooting and management. With advanced security features and flexible, fine-grained QoS capability, SM24-1000SFP-AH allows service providers to deliver secure triple-play services. The dual 10G XFP Ethernet ports provide redundant fiber uplink connections to the edge of the optical core networks. The SM24-1000SFP-AH also includes 2 expansion slots to accommodate extra dual 10G XFP ports.

The SM24-1000SFP-AH Gigabit Metro Ethernet Switch is part of a series of purpose-built next-generation switches, designed by Transition Networks, in order to fulfill the demands of converged metro access networks.

8-port 10/100 Layer 2 Managed Switch

MIL-SM800P

8-port 10/100BASE-TX

The MIL-SM800P series of layer 2 managed switches provides high performance non-blocking switching. The switch has (8) 10/100 auto-MDI/MDIX ports.

Management features include port based, dynamic and static VLANs, GVRP, VLAN tagging, IGMP Snooping, port mirroring, and port security. Security includes static addressing, filtering and blocking of packets to identified MAC addresses. Two priority queues per port insure minimum delay for voice over IP or multimedia network data. Console port provides local management while Telnet and Web-based management is provided via any network device.

Non-blocking architecture assures rapid packet delivery while 8,000 MAC address table provides swift lookup and packet forwarding.

Other ASIC features that enhance performance are included such as 802.1d spanning tree, 802.3x flow control, 802.3ad link aggregation and broadcast storm control.

Features

- Non-blocking full wire speed performance
- Store-and-forward architecture
- 10-inch design for desktop or rackmount
- Static MAC addresses for secure network
- Backpressure and flow control
- Console port on rear panel
- Conforms to IEEE 802.3, 802.3u, and 802.3x Ethernet Standards
- Automatic MDI/MDIX crossover for each 10Base-T/100Base-TX port
- LED indicators for Power, 100M, LK/ACT, FD/COL

(8) 10/100 ports

- 8-port 10/100BASE-TX
- Non-blocking architecture for full wire speed performance
- Store and forward architecture
- IEEE 802.1q VLAN tagging
- IEEE 802.1p Class of service
- Internal Power Supply
- Auto MDI-MDIX
- IGMP/GVRP
- Port Mirroring
- 8K MAC Address
- Telnet/Web-Based management
- TFTP Firmware Upgrade

Specifications

Standards	IEEE 802.3 10BASE-T 10 Mbps, Half/Full Duplex IEEE 802.3u 100BASE-TX, 10/100 Mbps, Half/Full Duplex IEEE 802.3x Flow control and Back-pressure IEEE 802.3ad Link Aggregation IEEE 802.1Q VLAN Tagging IEEE 802.1p Class of service IEEE 802.1d Spanning Tree Protocol
MAC Address Table	8K with Auto-learning function
Packet Buffer	2 Mbits
Backplane bandwidth	Up to 3.8 Gbps
System throughput	2.67 M pps packet per second on full-duplex mode
Voltage	100~240 VAC
Frequency	50/60 HZ
Power Consumption	17 Watts
Operation Temperature	0° to 45°C (32° to 113°F)
Operation Humidity	10% to 90% (non-condensing)
Dimensions	**Width:** 10.0" [250 mm] **Depth:** 5.25" [132 mm] **Height:** 1.75" [37.5 mm]
Weight	2.0 lbs [1.18 kg]
Emissions & Safety	FCC Class A, CE Mark, UL listed
Technical Support & Warranty	Free technical support and advanced warranty support for 5 years. Includes free telephone support, 24-hour support via web and FTP.

Ordering Information

MIL-SM800P
8-port 10/100 switch

Optional Accessories *(sold separately)*

Mounting Brackets

MIL-BRSM801W [pg 199]
Wall Mount Bracket

MIL-RMS801 [pg 199]
19" Rack Mount Bracket

- **Management interface:** Console port, Web-based GUI, Telnet and SNMP
- **VLANs:** Supports port based VLAN, up to 256 Groups, and Compatible IEEE 802.1Q VLAN Tagging, VLAN Tagging ID up to 4094
- **Port Mirroring:** Supports source-port-based, destination-port-based and source-destination-port mirroring
- **Spanning Tree:** Insures only one path between any two nodes on network
- **Broadcast Storm Filtering:** Only allows a percentage of port's total bandwidth before broadcast traffic is dropped
- **Scheduling schemes:** Packets can be transmitted by different priority schemes; FIFO, WRR with Enable Delay Bound, All High before Low
- **Trunking:** Supports 802.3ad port trunking with flexible load distribution with 800 Mbps aggregate bandwidth per trunk group
- **VLAN Options:** Supports VLAN 802.1Q, port based VLANs, overlapping VLANs
- **Class of Service:** Supports 802.1p Class of service with 2-level priority queuing
- **IGMP, GVRP:** IGMP support to reduce IP multicast traffic for the multimedia applications, support for Group VLAN Resolution Protocol

8-port 10/100 Layer 2 Managed Switch with 100BASE-FX Uplink Port

MIL-SM801P(xx)

8-port 10/100BASE-TX

(8) 10/100 ports + (1) 100BASE-FX port

- 8-port 10/100BASE-TX
- Non-blocking architecture for full wire speed performance
- IEEE 802.1q VLAN tagging
- IEEE 802.1p Class of service
- Auto MDI-MDIX
- Internal Power Supply
- IGMP/GVRP
- Port Mirroring
- 8K MAC Address
- Telnet/Web-Based management
- TFTP Firmware Upgrade
- (1) 100 Mbps fiber port

The MIL-SM801P series of layer 2 managed switches provides high performance non-blocking switching. The switch has (8) 10/100 auto-MDI/MDIX ports and one fixed 100 Mbps fiber port.

Management features include port based, dynamic and static VLANs, GVRP, VLAN tagging, IGMP Snooping, port mirroring, and port security. Security includes static addressing, filtering and blocking of packets to identified MAC addresses. Two priority queues per port insure minimum delay for voice over IP or multimedia network data. Console port provides local management while Telnet and Web-based management is provided via any network device.

Non-blocking architecture assures rapid packet delivery while 8,000 MAC address table provides swift lookup and packet forwarding.

Other ASIC features that enhance performance are included such as 802.1d spanning tree, 802.3x flow control, 802.3ad link aggregation and broadcast storm control.

Features

- Non-blocking full wire speed performance
- Store-and-forward architecture
- 10-inch design for desktop or rackmount
- Static MAC addresses for secure network
- Backpressure and flow control
- Console port on rear panel
- Conforms to IEEE 802.3, 802.3u, and 802.3x Ethernet Standards
- Automatic MDI/MDIX crossover for each 10Base-T/100Base-TX port
- LED indicators for Power, 100M, LK/ACT, FD/COL

Specifications

Complete list of fiber optic connector specifications [pg 212-224]

Standards	IEEE 802.3 10BASE-T 10 Mbps, Half/Full Duplex IEEE 802.3u 100BASE-TX, 10/100 Mbps, Half/Full Duplex IEEE 802.3x Flow control and Back-pressure IEEE 802.3ad Link Aggregation IEEE 802.1Q VLAN Tagging IEEE 802.1p Class of service IEEE 802.1d Spanning Tree Protocol
MAC Address Table	8K with Auto-learning function
Packet Buffer	2 Mbps
Backplane bandwidth	Up to 3.8 Gbps
System throughput	2.67M pps packet per second on full-duplex mode
Voltage	100~240 VAC
Frequency	50/60 HZ
Power Consumption	17 Watts
Operation Temperature	0° to 45°C (32° to 113°F)
Operation Humidity	10% to 90% (non-condensing)
Dimensions	**Width:** 10.0" [250 mm] **Depth:** 5.25" [132 mm] **Height:** 1.75" [37.5 mm]
Weight	2.6 lbs [1.18 kg]
Emissions & Safety	FCC Class A, CE Mark, UL listed
Technical Support & Warranty	Free technical support and advanced warranty support for 5 years. Includes free telephone support, 24-hour support via web and FTP.

Ordering Information

Complete list of fiber optic connector specifications [pg 212-224]

MIL-SM801PST
8-port 10/100 switch plus
(1) 100BASE-FX MM (ST)
[2 km/1.2 mi.]

MIL-SM801PSC
8-port 10/100 switch plus
(1) 100BASE-FX MM (SC)
[2 km/1.2 mi.]

MIL-SM801PSC-15
8-port 10/100 switch plus
(1) 100BASE-FX SM (SC)
[15 km/9.5 mi.]

Optional Accessories *(sold separately)*

Mounting Brackets

MIL-BRSM801W [pg 199]
Wall Mount Bracket

MIL-RMS801 [pg 199]
19" Rack Mount Bracket

- **Management interface:** Console port, Web-based GUI, Telnet and SNMP
- **VLANs:** Supports port based VLAN, up to 256 Groups, and Compatible IEEE 802.1Q VLAN Tagging, VLAN Tagging ID up to 4094
- **Port Mirroring:** Supports source-port-based, destination-port-based and source-destination-port mirroring
- **Spanning Tree:** Insures only one path between any two nodes on network
- **Broadcast Storm Filtering:** Only allows a percentage of port's total bandwidth before broadcast traffic is dropped
- **Scheduling schemes:** Packets can be transmitted by different priority schemes; FIFO, WRR with Enable Delay Bound, All High before Low
- **Trunking:** Supports 802.3ad port trunking with flexible load distribution with 800 Mbps aggregate bandwidth per trunk group
- **VLAN Options:** Supports VLAN tagging, 802.1Q, port based VLANs,overlapping VLANs
- **Class of Service:** Supports 802.1p Class of service with 2-level priority queuing
- **IGMP, GVRP:** IGMP support to reduce IP multicast traffic for the multimedia applications, support for Group VLAN Resolution Protocol

AUTO NEG

8-port 10/100 Power-Over-Ethernet (PoE) Layer 2 Remotely Managed Switch

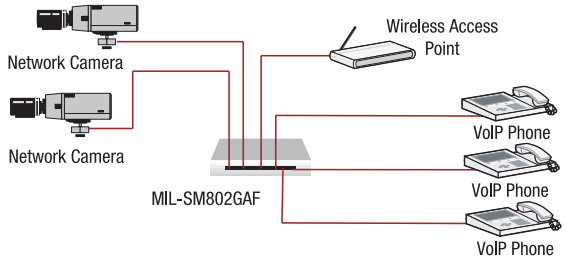
MIL-SM802GAF

8-port 10/100BASE-TX

Features

- IGMP v1 & v2
- 8-port 10/100 Base-TX plus 100/1000Base-X or 10/100/1000Base-T
- 4 ports with full PSE PoE delivery
- X-Ring Technology
- IEEE Std. 802.3af Compliant
- Full 15.4 Watts per port
- PoE Legacy and Reverse Polarity Support
- Remote Device power shutdown
- IEEE 802.1p Class of service
- Ipv4 IP TOS and DiffServ QoS classification, IPv6 Traffic class with 4 queues per port
- IEEE 802.1q VLAN, up to 256 groups, VLAN tagging ID up to 4096, Q in Q
- Static MAC, 50 entries
- IEEE 802.1x
- RADIUS client
- DHCP Client and Server, SNTP
- Auto MDI-MDIX
- IGMP/GVRP
- Port Mirroring
- 8K MAC Address
- Telnet/CLI/Web-based management
- TFTP Firmware Upgrade

Connect and Power Wireless Access Points, Network Cameras and VoIP



Specifications

Standards	IEEE Std. 802.3 10BASE-T 10 Mbps, Half/Full Duplex; IEEE Std. 802.3u 100BASE-TX, 10/100 Mbps, Half/Full Duplex; IEEE Std. 802.3x Flow control and Back-pressure; IEEE Std. 802.3ad Link Aggregation; IEEE Std. 802.1Q VLAN Tagging; IEEE Std. 802.1p Class of service; IEEE Std. 802.1d Spanning Tree Protocol; IEEE Std. 802.1X Authentication Protocol IEEE Std. 802.3ab 1000BASE-T IEEE Std. 802.3z Gigabit Fiber IEEE Std. 802.3af Power-over-Ethernet IEEE 802.1w Rapid Spanning Tree Protocol
Protocols	CSMA/CD
Technology	Store and Forward switching architecture
Transfer Rate	14,880 pps for 10 Mbps 148,800 pps for 100 Mbps 1,488,000 pps for Gigabit Fiber Ethernet Port
Connectors	**10/100 Copper:** 8x RJ-45 incl. 4x(POE) Ports **Fiber:** 1x dual speed SFP port 100BASEFX/1000BASE-X
MAC Address	8K MAC address table
Memory Buffer	384Kbytes (3Mbits)
Network Cable	**10BASE-T:** 2-pair UTP/STP Cat. 3, 4, 5 cable; EIA/TIA-568 100-ohm (100 m) **100BASE-TX:** 2-pair UTP/STP Cat. 5 cable; EIA/TIA-568 100-ohm (100 m)
Backplane	5.6 Gbps
LEDs	**RJ-45 port:** 10/100; Link/Activity; Full duplex/Collision **Fiber:** Link/Activity **Power:** On/Off
Power Supply	Built-in AC power supply: AC 100~240V, 50/60 Hz, 110 Watts;
Power Consumption	(DC) 20 Watts (Non-POE functions)
Operating Temperature	0° to 45°C (32° to 113°)
Operating Humidity	10% to 90% (non-condensing)
Dimensions	**Width:** 8.5" [217 mm] **Depth:** 5.5" [140 mm] **Height:** 1.7" [44 mm]
EMI	FCC Class A, CE Mark
Safety Compliance	UL, cUL
Technical Support & Warranty	Free technical support and advanced warranty support for 5 years. Includes free telephone support, 24-hour support via web and FTP.

Ordering Information

MIL-SM802GAF
8-port 10/100 PoE Remotely Managed switch with (4) PoE Injector ports and (1) SFP/copper port
Dual speed SFP port (100/1000)

Optional Accessories *(sold separately)*

SFP Modules [pg 161-167]

Mounting Brackets

MIL-RMSM8 [pg 199]
19" Rack Mount Bracket

MIL-BRSM8 [pg 199]
Wall Mount Bracket

For larger port-count PoE applications, please refer to:
MIL-SM8TXAF2GPA
MIL-SM2401MAF
MIL-SM8TAF1GPB
SISPM1040-162D-LRT

For smaller port-count PoE applications, please refer to our PoE media conversion products:
SPOEB10xx-100
SGPOE10xx-1x0
SISTP10xx-141-LRT

(8) 10/100 ports + (1) SFP/RJ-45 Combo port

- 8-port Managed Switch with 4-port integrated PoE injector
- 4 ports with full PoE functionality
- Power over unused pins for Legacy support
- Remote Management [pg 17]
- Optional Reverse Polarity Cable
- Supports SNMP v1, v2c and v3
- Dual speed 100/1000 SFP slot

The MIL-SM802GAF connects remote PoE segment to the network over fiber. The switch delivers a full 15.4 Watts of DC power on each of four PoE switch ports. PoE ports provide data connection and the power source (PSE) for such PoE PD devices as Wireless Access Points, VoIP phones and Network Cameras. The series includes a PD signature sensing and power monitoring features per the IEEE 802.3af standard. Other PoE features include Over-Current Protection and Under-Current Detection. The series is fully compatible with devices that comply with the IEEE 802.3af standard and it is capable of inserting power on the unused pairs of the MDI.

Management features include port based, dynamic and static VLANs, GVRP, VLAN tagging, IGMP Snooping or querying, port mirroring, port security. Security includes static addressing, filtering and blocking of packets to identified MAC addresses. Four priority queues insure minimum delay for voice over IP or multimedia network data.

Non-blocking 5.6 Gbps architecture assures rapid packet delivery while 8,000 MAC address table provides swift lookup and packet forwarding.

AUTO NEG

8-port 10/100 Power-Over-Ethernet (PoE) Layer 2 Remotely Managed Switch

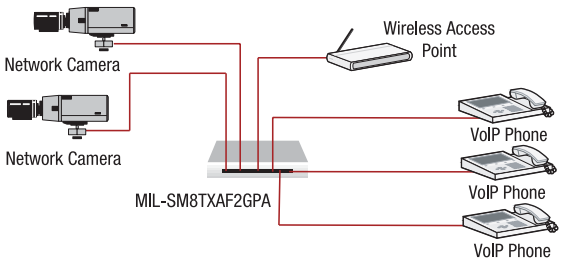
MIL-SM8TXAF2GPA

8-port 10/100BASE-TX

Features

- IGMP v1 & v2
- 8-port 10/100 Base-TX plus 100Base-FX/1000 Base-X SFP or 10/100/1000 copper combo
- 8 ports with integrated PoE injectors
- X-Ring Technology
- IEEE Std. 802.3af Compliance
- Full 15.4 Watts per port
- PoE Legacy and Reverse Polarity Support
- Non-blocking switching architecture
- IEEE 802.1p Class of service
- Ipv4 IP TOS and DiffServ QoS classification, IPv6 Traffic class with 4 queues per port
- IEEE 802.1q VLAN, up tp 256 groups, VLAN tagging ID up to 4096.
- Static MAC, 100 entries
- IEEE 802.1x
- RADIUS client
- DHCP Client and Server, SNTP
- Auto MDI-MDIX
- IGMP/GVRP
- Port Mirroring
- 8K MAC Address
- Telnet/Web-Based management
- TFTP Firmware Upgrade and configuration backup

Connect and Power Wireless Access Points, Network Cameras and VoIP



Specifications

Standards	IEEE Std. 802.3 10BASE-T 10 Mbps, Half/Full Duplex; IEEE Std. 802.3u 100BASE-TX, 10/100 Mbps, Half/Full Duplex; IEEE Std. 802.3x Flow control and Back-pressure; IEEE Std. 802.3ad Link Aggregation; IEEE Std. 802.1Q VLAN Tagging; IEEE Std. 802.3ab 1000BASE-T IEEE 802.3z Gigabit Fiber IEEE 802.3af Power-over-Ethernet IEEE Std. 802.1p Class of service; IEEE Std. 802.1d Spanning Tree Protocol; IEEE Std. 802.1w Rapid Spanning Tree Protocol; IEEE Std. 802.1X Authentication Protocol
Protocols	CSMA/CD
Technology	Store and Forward switching architecture
Transfer Rate	14,880 pps for 10 Mbps 148,800 pps for 100 Mbps 1,488,000 pps for Gigabit Fiber Ethernet Port
Connectors	**10/100 copper:** 8x RJ-45 with Auto-MDIX **Fiber:** Two dual speed SFP ports 100BASE-FX/1000 BASE-X
MAC Address	8K MAC address table
Network Cable	**10BASE-T:** 2-pair UTP/STP Cat. 3, 4, 5 cable; EIA/TIA-568 100-ohm (100 m) **100BASE-TX:** 2-pair UTP/STP Cat. 5 cable; EIA/TIA-568 100-ohm (100 m)
Backplane	5.6 Gbps
LEDs	**RJ-45 port:** 10/100; Link/Activity; Full duplex/Collision **Fiber:** Link/Activity **Power:** On/Off **POE:** PWR FWD
Power Supply	Built-in AC power supply: AC 100~240V, 50/60 Hz, 200 Watts; Optional External AC/DC Power Supply 48 VDC Input
Power Consumption	(DC) 20 Watts (Non-POE functions)
Operating Temperature	0° to 45°C (32° to 113°)
Operating Humidity	10% to 90% (non-condensing)
Dimensions	**Width:** 11" [280 mm] **Depth:** 8.3" [211 mm] **Height:** 1.7" [44 mm]
EMI	FCC Class A, CE Mark
Safety Compliance	UL, cUL
Technical Support & Warranty	Free technical support and advanced warranty support for 5 years. Includes free telephone support, 24-hour support via web and FTP.

Ordering Information

MIL-SM8TXAF2GPA
8-port 10/100 PoE Remotely Managed switch with (2) SFP Combo ports
Dual speed SFP ports (100/1000)

Optional Accessories *(sold separately)*

SFP Modules [pg 161-167]

Mounting Brackets

MIL-RMSM8TX [pg 199]
19" Rack Mount Bracket

MIL-BRSM8 [pg 199]
Wall Mount Bracket

For larger port-count PoE applications, please refer to our 24-port remotely-managed PoE switch:
MIL-SM2401MAF
SISPM1040-126D-LRT

For smaller port-count PoE applications, please refer to our PoE media conversion products:
SPOEB10xx-100
SGPOE10xx-1x0
MIL-SM802GAF
SISTP10xx-141-LRT

(8) 10/100 ports + (2) SFP/RJ-45 Combo ports

- Managed Switch
- 8 ports with full PoE functionality; power limit per classification
- Dual Speed 100/1000 SFP slot
- AC and DC power inputs
- Supports SNMP v1, v2c and v3
- Power over unused pins for legacy support
- Optional Reverse Polarity Cable

The MIL-SM8TXAF2GPA connects remote PoE segment to the network over fiber. The switch delivers a full 15.4 Watts of DC power on each of eight PoE switch ports. PoE ports provide data connection and the power source (PSE) for such PoE PD devices as Wireless Access Points, VoIP phones and Network Cameras. The series includes a PD signature sensing and power monitoring features per the IEEE 802.3af standard. Other PoE features include Over-Current Protection and Under-Current Detection. The series is fully compatible with devices that comply with the IEEE 802.3af standard and it is capable of inserting power on the unused pairs of the MDI.

Management features include port based, dynamic and static VLANs, GVRP, VLAN tagging, IGMP Snooping or querying, port mirroring, port security. Security includes static addressing, filtering and blocking of packets to identified MAC addresses. Four priority queues insure minimum delay for voice over IP or multimedia network data.

Non-blocking 5.6 Gbps architecture assures rapid packet delivery while 8,000 MAC address table provides swift lookup and packet forwarding.

AUTO NEG

24-port 10/100 Power-Over-Ethernet (PoE) Layer 2 Remotely Managed Switch

MIL-SM2401MAF

24-port 10/100BASE-TX

The MIL-SM2401MAF Power-over-Ethernet series of layer 2 managed switches provides high performance non-blocking switching. The switch has (24) auto-sensing 10/100 auto MDI/MDIX ports with full PoE functionality. The switch also has (2) SFP Gigabit ports.

Management features include port based, dynamic and static VLANs, GVRP, IGMP, port mirroring, and port security. Security includes static addressing, filtering and blocking of packets to identified MAC address. Two priority queues per port insure minimum delay for voice over IP or multimedia network data. Console port provides local management while Telnet and Web-based management is provided via any network device.

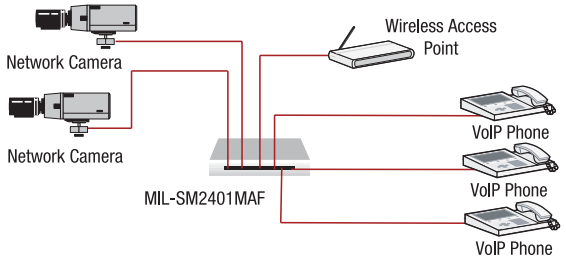
Non-blocking 8.8 Gbps architecture assures rapid packet delivery while 8,000 MAC address table provides swift lookup and packet forwarding.

Other ASIC features that enhance performance are included such as 802.1d spanning tree, 802.3x flow control, 802.3ad link aggregation and broadcast storm control.

Features

- 15.4W POE per port available to 12 ports
- 7.7W POE per port available to 24 ports
- Enable/Disable PoE function
- Power limit by classification
- Power limit by management power feeding priority
- Legacy Power Signature Detection for unique electrical signatures
- Auto-Negotiation [pg 16]
- True non-blocking switching
- 8K MAC address table
- Back pressure and flow control
- Store and forward switching architecture
- 384 Kbytes memory buffer

Connect and Power Wireless Access Points, Network Cameras and VoIP



Specifications

Standards	IEEE Std. 802.3 10BASE-T 10 Mbps, Half/Full Duplex; IEEE Std. 802.3u 100BASE-TX, 10/100 Mbps, Half/Full Duplex; IEEE Std. 802.3af Power-over-Ethernet IEEE Std. 802.1w Rapid Spanning Tree Protocol IEEE Std. 802.3z Gigabit SX/LX IEEE Std. 802.3ab Gigabit 1000T IEEE Std. 802.3x Flow control and Back-pressure; IEEE Std. 802.3ad Link Aggregation; IEEE Std. 802.1Q VLAN Tagging; IEEE Std. 802.1p Class of service; IEEE Std. 802.1d Spanning Tree Protocol; IEEE Std. 802.1X Authentication Protocol
Protocols	CSMA/CD
Technology	Store and Forward switching architecture
Transfer Rate	14,880 pps for 10 Mbps 148,800 pps for 100 Mbps
Connectors	**10/100 copper:** 24x RJ-45 with Auto-MDIX, Two SFP Gigabit ports/RJ-45 10/100/1000BASE-T
MAC Address	8K MAC address table
Memory Buffer	384 Kbytes (3 Mbits)
Network Cable	**10BASE-T:** 2-pair UTP/STP Cat. 3, 4, 5 cable; EIA/TIA-568 100-ohm (100 m) **100BASE-TX:** 2-pair UTP/STP Cat. 5 cable; EIA/TIA-568 100-ohm (100 m)
Backplane	8.8Gbps
LEDs	**RJ-45 port:** 10/100; Link/Activity; Full duplex/Collision **Fiber:** Link/Activity **Power:** On/Off
Power Supply	Built-in AC power supply: AC 90~240V, 50/60 Hz, 200 Watts; Extra power input: DC 48V
Power Consumption	20 Watts Maximum with additional DC power input
Operating Temperature	0° to 40°C (32° to 96°)
Operating Humidity	10% to 90% (non-condensing)
Dimensions	**Width:** 17.0" [440 mm] **Depth:** 11.0" [280 mm] **Height:** 1.7" [44 mm]
EMI	FCC Class A, CE Mark
Safety Compliance	UL, cUL
Technical Support & Warranty	Free technical support and advanced warranty support for 5 years. Includes free telephone support, 24-hour support via web and ftp.

Ordering Information

MIL-SM2401MAF
24-port 10/100 PoE Remotely Managed switch with (2) SFP/RJ-45 Combo ports (Gigabit SFP ports)
Includes 19" Rack Mount ears

Optional Accessories *(sold separately)*

SFP Modules [pg 161-167]

For larger port-count PoE applications, please refer to our 24-port remotely-managed PoE switch:
MIL-SM2401MAF
SISPM1040-126D-LRT

For smaller port-count PoE applications, please refer to our PoE media conversion products:
SPOEB10xx-100
SGPOE10xx-1x0
MIL-SM802GAF
SISTP10xx-141-LRT

- Managed PoE Switch
- 24 ports with full PoE functionality; power limit per classification
- High Back-plane bandwidth 8.8Gbps
- IGMP v1, v2
- Auto-MDIX on all ports
- Port Mirroring
- AC and DC power input

- **Management:** Console port, Web-based GUI, telnet and SNMP
- **Firmware update:** TFTP firmware upgrade
- **Port Trunk:** Supports IEEE 802.3ad with LACP function. Up to 7 trunk groups and group member up to 4.
- **VLAN:** Supports port based VLAN, up to 256 static VLAN groups and up to 2048 dynamic VLAN groups. VLAN tagging up to 4094. Compatible with IEEE 802.1Q and IEEE 802.1v
- **Quality of Service:** Support port based, Tag based and IPv4 ToS
- **Class of Service:** Supports 802.1p class of service with 2-level priority queuing
- **Spanning Tree:** Supports IEEE 802.1w rapid spanning tree and IEEE 802.1d spanning tree
- **Port Mirror:** Supports RX, TX and Both packet mirror
- **IGMP:** Supports IGMP V1, V2
- **Broadcast Storm:** Only allows a percentage of port's total bandwidth before broadcast traffic is dropped; Enable/Disable, 5%, 10%, 20%, 25%

AUTO NEG

8-port 10/100/1000BASE-T Layer 2 Managed Switch

MIL-SM24T4DPA

28-port 10/100/1000BASE-T

Management Features

- Switch Management:
  - CLI via console port or Telnet
  - WEB management
  - SNMP v1, v2c,v3
- Firmware & Configuration:
  - Dual firmware images
  - Firmware upgrade via TFTP server
  - Multiple configuration files
  - Configuration file upload/download via TFTP server
- Supports RMON (groups 1, 2, 3 and 9)
  - Spanning Tree Protocol support IEEE 802.1D STP, IEEE 802.1w RSTP, IEEE 802.1s MSTP
  - IEEE 802.1q VLAN, up tp 255 groups, VLAN tagging ID up to 4093, Q in Q supported
  - Support Private VLAN, IEEE802.1v Protocal-based VLAN
  - Support IEEE802.3ad Link Aggregation Control Protocol : Trunk groups: 32, Trunk links: 2~8
  - Support IGMP V1/V2 snooping, IGMP Queried, GVRP
  - Support Qos: 8 hardware queues per port, IEEE 802.1p CoS, IP Precedence, DSCP, TCP/UDP port number, Access Control List, WRR and Strict scheduling
  - Bandwidth Control: 1Mbps granularity for Egress/Ingress
  - Support IEEE802.1x port-based/ MAC-based Access Control
  - RADIUS/TACACS+ authentication
  - SSH/SSL
  - IP Source Guard
- Supports BOOTP, DHCP for IP address assignment
- Supports DHCP snooping
- Supports DHCP option 82 relay
- Supports SNTP
- Event/Error Log/Syslog
- Dynamic ARP inspection (DAI)

The Transition Networks MIL-SM24T4DPA is a Gigabit Ethernet Layer 2 standalone switch featuring 24 10/100/1000 ports and 4 combo Dual-speed 100/1000 Ethernet RJ-45/SFP ports. It is ideal for high performance server aggregations, such as enterprise data centers, high-end or network attached file servers, high speed workgroups backbone upgrades, or the desktop PC for power users.

Specifications

Standards	IEEE 802.3 10BASE-T; IEEE 802.3u 100BASE-TX; IEEE 802.3ab 1000BASE-T; IEEE 802.3z Gigabit fiber; IEEE 802.3x Flow control and Back-pressure; IEEE 802.1D Spanning Tree Protocol (STP) IEEE 802.1w Rapid Spanning Tree Protocol (RSTP) IEEE 802.1s Multiple Spanning Tree Protocol (MSTP) IEEE 802.1Q VLANs, Port-based VLANs, GVRP, IEEE802.3ad Link Aggregation Control Protocol IEEE 802.1x User Authentication; IEEE 802.1p Class of Service
Connectors	(24) RJ-45 10/100/1000BASE-T Ports (4) combo (RJ-45/SFP) Ports (1) Console Port
MAC Address	8K MAC address table
Power Consumption	54 Watts Maximum
Operating Temperature	0° to 45°C (32° to 104°)
Operating Humidity	5% to 95% (non-condensing)
Dimensions	**Width:** 17.0" [440 mm] **Depth:** 6.7" [172 mm] **Height:** 1.7" [44 mm]
EMI	FCC Class A, VCCI Class A
Safety Compliance	CSA/NRTL, TUV/GS
Technical Support Warranty	Free technical support and advanced warranty support & for 5 years. Includes free telephone support, 24-hour support via web and FTP.

Ordering Information

MIL-SM24T4DPA
24-port 10/100/1000Base-T Switch plus (4) 100/1000Base-x SFP/RJ-45 combo ports includes 19" Rack Mount ears

Optional Accessories *(sold separately)*

SFP Modules [pg 161-167]

Features

- IPV4/IPV6 Dual Stack
- IPv6 Address Types Stack: Multicast/Nicest
- IPv6 Neighbor Discovery
- ICMPv6 Redirect
- IPv6 SNMP/HTTP/Telnet/SSH/RADIUS/TACACS+/ACL

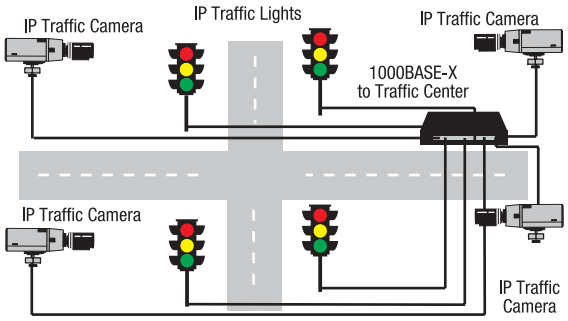
9-port 10/100/1000 Layer 2
Indoor/Protected Outdoor Remote IP-Managed Switch

MIL-SM8002TG
(7) 10/100/1000BASE-T + (2) SFP/RJ-45 Combo Ports

Additional Features

- IGMP query and snooping
- 802.1X Authentication
- RADIUS
- Port Mirroring
- 8K MAC Address
- Telnet/Web-based management
- TFTP firmware and configuration upgrade
- Enable/disable ports
- Auto-Negotiation [pg 16]
- Forced modes, 10H/10H/100H/100F/1000F
- Auto-MDIX on all ports
- 802.3X Flow control and Back-pressure
- 16 Mb System Memory
- 8 Mb Flash ROM
- 1 Mbps Buffer
- Q-inQ VLAN & COS Support
- Broadcast storm filter
- DHCP Client, Relay, Server
- SNTP and SMTP support
- MAC Address Security
- Bandwidth Allocation [pg 18]
- QoS port-based/Tag based, IPv4, Tos/Ipv4, IPv6, DiffServ
- Ingress & Egress MAC address filter & static source MAC address lock

Connect Indoor or Protected Outdoor Ethernet Devices over High Speed Dual Gigabit Links



Specifications

Standards	IEEE Std. 802.3 10BASE-T; IEEE Std. 802.3u 100BASE-TX; IEEE Std. 802.3z Gigabit fiber; IEEE Std. 802.3ab 1000BASE-T; IEEE Std. 802.3x Flow control and Back-pressure; IEEE Std. 802.3ad Port trunk with LACP; IEEE Std. 802.1d Spanning Tree Protocol; IEEE Std. 802.1w Rapid spanning tree; IEEE Std. 802.1p Class of service IEEE Std. 802.1q VLAN Tagging IEEE Std. 802.1x User Authentication
Protocols	CSMA/CD
Technology	Store and Forward switching architecture
Connectors	10/100/1000 copper: 9x RJ-45 with AutoCross™ (Auto MDI/MDI-X), Two SFP ports
MAC Address	8K MAC address table
Memory Buffer	128 Kbytes
Network Cable	**10BASE-T:** 2-pair UTP/STP Cat. 3, 4, 5 cable; EIA/TIA- 568 100-ohm (100 m) **100BASE-TX:** 2-pair UTP/STP Cat. 5 cable; EIA/TIA- 568 100-ohm (100 m); **1000BASE-T:** 4-pair UTP/STP Cat. 5e cable; EIA/TIA- 568 100-ohm (100 m)
Backplane	18 Gbps
LEDs	**RJ-45 port:** 10/100/1000; Link/Activity; Full duplex/Collision **Fiber:** Link/Activity **Power:** On/Off
Power Supply	**Internal power:** 100 – 240 VAC
Power Consumption	10 Watts max.
Operation Temperature	0° to 60°C (32° to 140°F)
Operation Humidity	10% to 90% (non-condensing)
Dimensions	**Width:** 8.5" [217 mm] **Depth:** 5.5" [140 mm] **Height:** 1.7" [43 mm]
EMI	FCC Class A, CE Mark
Safety Compliance	UL, cUL
Technical Support & Warranty	Free technical support and advanced warranty sup port for 5 years. Includes free telephone support, 24-hour support via web and FTP.

Ordering Information

MIL-SM8002TG
9-port 10/100/1000 Indoor/Outdoor Remotely Managed switch with (2) SFP combo Gigabit ports (Gigabit SFP ports)

Optional Accessories *(sold separately)*

SFP Modules [pg 161-167]

Mounting Bracket

MIL-RMSM8 [pg 199]
19" Rack Mount Bracket

MIL-BRSM8 [pg 199]
Wall Mount Bracket

(7) 10/100/1000 ports + (2) SFP/RJ-45 Combo ports

- 7-port 10/100/1000BASE-T Ports
- Auto MDI/MDI-X
- (2) 1000BASE-X SFP/RJ45 combo ports
- Indoor/Outdoor installation up to 60°C (140°F)
- Non-blocking switching architecture
- IEEE 802.1q VLAN
- IEEE 802.1p Class of Service 4 priority queues

Software Features

- **Management:** Remote IP-Based Management, Web Management, SNMP V1/2/3, Telnet, Menu based CLI
- **Firmware update:** TFTP firmware upgrade and configuration backup
- **System default:** Restore function for system default
- **Port Trunk:** Supports IEEE 802.3ad port trunk with link aggregation control protocol (LACP). Up to 3 trunk groups and maximum group member up to 8 ports.
- **VLAN:** Port Based VLAN; IEEE 802.1Q, 4096 VLAN IDs, 256/2048 static/dynamic VLAN groups, 256 GVRP Groups
- **Quality of Service:** Support port based, Tag based and IPv4 ToS, IPv4/IPv6 Diff Serve
- **Class of Service:** Per port supports 4 priority queues
- **Spanning Tree:** Supports IEEE 802.1w rapid spanning tree and IEEE 802.1d
- **Port Mirror:** Supports TX or bi-directional RX packet mirroring
- **IGMP:** Supports IGMP V1, V2
- **Broadcast Storm:** Enable/Disable, 5%, 10%, 20%, 25%

8-port Gigabit Layer 2 Remote IP-Managed Switch

MIL-SM4004TG

(4) port 10/100/1000BASE-T + (4) 100/1000 SFP ports

The MIL-SM4004TG series of layer 2 managed switches provide high performance non-blocking switching. The switch has 4 auto-sensing 10/100/1000BASE-TX RJ-45 ports and 4 dual speed 100/1000 SFP ports.

Management features include port based, dynamic and static VLANs, GVRP, VLAN tagging, IGMP Snooping or querying, port mirroring, port security. Security includes static addressing, filtering and blocking of packets to identified MAC addresses. Four priority queues insure minimum delay for voice over IP or multimedia network data. Non-blocking 16 Gbps architecture assures rapid packet delivery while 8,000 MAC address table provides swift lookup and packet forwarding.

Additional Features

- IGMP query and snooping
- 802.1X Authentication
- Port Mirroring
- 8K MAC Address
- Telnet/Web-based management
- TFTP firmware upgrade
- Enable/disable ports
- Auto-Negotiation [pg 16]
- Forced modes, 10H/10H/100H/100F/1000F
- Auto-MDIX on all ports
- 802.3X Flow control
- Back-pressure
- X-Ring Support
- 1 Mbps Buffer
- Broadcast storm filter
- DHCP Client, Relay, Server
- SNTP and SMTP support
- MAC Address Security
- Bandwidth Allocation [pg 18]
- QoS port-based/Tag based, IPv4, Tos/Ipv4, IPv6, DiffServ
- Ingress & Egress MAC address filter & static source MAC address lock

(4) 10/100/1000 Base-T ports + (4) SFP 1000BASE-X ports

- 4-port 10/100/1000BASE-T
- (4) 100/1000 SFP Ports
- Auto MDI/MDI-X
- Non-blocking switching architecture
- IEEE 802.1q VLAN tagging GVRP/MVR
- IEEE 802.1p Class of Service 4 priority queues

Specifications

Standards	IEEE Std. 802.3 10BASE-T; IEEE Std. 802.3u 100BASE-TX; IEEE Std. 802.3z Gigabit fiber; IEEE Std. 802.3ab 1000BASE-T; IEEE Std. 802.3x Flow control and Back-pressure; IEEE Std. 802.3ad Port trunk with LACP; IEEE Std. 802.1d Spanning Tree Protocol; IEEE Std. 802.1w Rapid spanning tree; IEEE Std. 802.1p Class of service IEEE Std. 802.1q VLAN Tagging IEEE Std. 802.1x User Authentication
Protocols	CSMA/CD
Technology	Store and Forward switching architecture
Connectors	10/100/1000 copper: 4x RJ-45 with AutoCross™ (Auto MDI/MDI-X), 4 100/1000 SFP ports, 1 RS-232 D B-9 Female
MAC Address	8K MAC address table
Packet Buffer	1 Mbps
Network Cable	**10BASE-T:** 2-pair UTP/STP Cat. 3, 4, 5 cable; EIA/TIA-568 100-ohm (100 m) **100BASE-TX:** 2-pair UTP/STP Cat. 5 cable; EIA/TIA-568 100-ohm (100 m); **1000BASE-T:** 4-pair UTP/STP Cat. 5e cable; EIA/TIA-568 100-ohm (100 m)
Backplane	16 Gbps
LEDs	**RJ-45 port:** 10/100/1000; Link/Activity; Full duplex/Collision **Fiber:** Link/Activity **Power:** On/Off
Power Supply	Internal power: 100 – 240 VAC 50/6 0Hz
Power Consumption	15 Watts max.
Operation Temperature	0° to 45°C (32° to 113°F)
Operation Humidity	10% to 90% (non-condensing)
Dimensions	**Width:** 8.54" [217 mm] **Depth:** 5.51" [140 mm] **Height:** 1.69" [43 mm]
EMI	FCC Class A, CE Mark
Safety Compliance	UL, cUL
Technical Support & Warranty	Free technical support and advanced warranty support for 5 years. Includes free telephone support, 24-hour support via web and FTP.

Ordering Information

MIL-SM4004TG
4-port 10/100/1000
Remotely Managed switch with
(4) Dual-Speed SFP Ports

Optional Accessories *(sold separately)*

SFP Modules [pg 161-167]

Mounting Bracket

MIL-RMSM8 [pg 199]
19" Rack Mount Bracket

MIL-BRSM8 [pg 199]
Wall Mount Bracket

Software Features

- **Management:**
  Remote IP-Based Management, Web Management, SNMP V1/2/3, Telnet, Menu based CLI
- **Firmware update:**
  TFTP firmware upgrade and configuration backup
- **System default:**
  Restore function for system default
- **Port Trunk:**
  Supports IEEE 802.3ad port trunk with link aggregation control protocol (LACP). The trunk group up to 2 and maximum trunk port member up to 2 ports.
- **VLAN:**
  Port Based VLAN; IEEE 802.1Q, 4096 VLAN IDs, 256/2048 static/dynamic VLAN groups, 256 GVRP Groups
- **Quality of Service:**
  Support port based, Tag based and IPv4 ToS
- **Class of Service:**
  4 priority queues
- **Spanning Tree:**
  Supports IEEE 802.1w rapid spanning tree and IEEE 802.1d
- **Port Mirror:**
  Supports TX/RX/Bi-Directional packet mirror
- **IGMP:**
  Supports IGMP V1, V2
- **Storm Control**
  Bandwidth Allocation on Broadcast [pg 18]

NEW PRODUCT

8-port 10/100/1000BASE-T Web Managed Switch

MIL-SW8T1GPA

(7) 10/100/1000BASE-T + (1) SFP/RJ-45 Port

The MIL-SW8T1GPA is a Web Smart Layer 2 switch with eight 10/100/1000BASE- ports, one of which is a Gigabit combination port that is shared with a Gigabit SFP slot.

The switch uses store-and-forwarded switching architecture to ensure maximum data integrity with low latency.

Features

- Jumbo Frame to 9K bytes
- Authentication – RADIUS, IEEE802.1X
- VLAN support up to 256 VLANs, port based or tagged (802.1Q)
- Quality of Service (Qos)
- DHCP Client
- Port Trucking – Supports IEEE 802.3ad (LACP)
- Flow control full-duplex
- Back pressure half-duplex
- Firmware upgrade via Web GUI
- System Configure Backup/Restore
- 8K MAC address

Specifications

Standards	IEEE 802.3 10Base-T; IEEE 802.3u 100Base-TX; IEEE 802.3ab 1000Base-T; IEEE 802.3z Gigabit Fiber; IEEE 802.3x Flow Control and Back pressure; IEEE 802.1w Rapid Spanning Tree; IEEE 802.3ad Port trunk with LACP; IEEE 802.1p Class of Service; IEEE 802.1x User Authentication; IEEE 802.1Q VLAN Tagging
Protocols	CSMA/CD
Technology	Store and Forward switching architecture
Transfer Rate	14,880 pps for 10 Mbps 148,800 pps for 100 Mbps 1,488,000 pps for 1000 Mbps
Connectors	Gigabit copper: 8 x RJ-45 with Auto-MDIX 1 SFP port – shared with RJ-45 port 1
MAC Address	8K MAC address table
Memory Buffer	144 Kbytes embedded
Jumbo packet	Support 9 Kbytes Jumbo Frame
Network Cable	**10BASE-T:** 2-pair UTP/STP Cat. 3, 4, 5 cable; EIA/TIA-568 100-ohm (100 m) **100BASE-TX:** 2-pair UTP/STP Cat. 5 cable; EIA/TIA-568 100-ohm (100 m); **1000BASE-T:** 4-pair UTP/STP Cat. 5e cable; EIA/TIA-568 100-ohm (100 m)
Backplane	16Gbps
LEDs	**RJ-45 port** **Fiber:** Link/Activity
Power Supply	Internal power (AC): 100 – 240VAC 50/60 Hz
Power Consumption (DC)	10.8 Watts max.
Operation Temperature	0° to 45°C (32° to 113°F)
Operation Humidity	10% to 90% (non-condensing)
Dimensions	**Width:** 8.54" [217 mm] **Depth:** 5.51" [140 mm] **Height:** 1.69" [43 mm]
EMI	FCC Class A, CE Mark
Safety Compliance	UL, cUL
Technical Support & Warranty	Free technical support and advanced warranty support for 5 years. Includes free telephone support, 24-hour support via web and FTP.

Ordering Information

MIL-SW8T1GPA
7-port 10/100/1000BASE-T
+ (1) Combo port SFP/RJ-45

Optional Accessories *(sold separately)*

SFP Modules [pg 161-167]

Mounting Bracket

MIL-RMSM8 [pg 199]
19" Rack Mount Bracket

MIL-BRSM8 [pg 199]
10" Wall Mount Bracket

Software Features

- **VLAN:**
  Port Based VLAN; IEEE 802.1Q Tag VLAN groups up to 256
- **Port Trunk:**
  Supports IEEE802.3ad port trunk with link aggregation control protocol (LACP). 4 trunk groups/2 trunk member maximum
- **Spanning Tree:**
  Support IEEE802.1w rapid spanning tree and IEEE802.1d spanning tree
- **Quality of Service/Class of Service :**
  Support port based, Tag based and IPv4 Type of Service; Supports IEEE802.1p Class of Service; Per port provides 4 priority queues;
- **Firmware Update:**
  Support Web GUI firmware upgrade

AUTO NEG

8-port 10/100/1000 PoE Layer 2 Remotely Managed Switch

MIL-SM8TAF1GPB

(7) port 10/100/1000BASE-T + (1) SFP/RJ-45 Combo Port

The MIL-SM8TAF1GPB is an intelligent Layer 2 switch with eight 10/100/1000BASE-T ports, one of which is a Gigabit combination port that is shared with a Gigabit SFP slot.

The switch employs a wire-speed, non-blocking switching fabric which permits simultaneous wire-speed transport of multiple packets at low latency on all ports. The switch also features full-duplex capability on all ports that effectively doubles the bandwidth of each connection.

The switch uses store-and-forward switching to ensure maximum data integrity.

The switch's eight 10/100/1000 Mbps ports support the IEEE 802.3af Power-over-Ethernet (PoE) standard that enables DC power to be supplied to attached devices using the Ethernet cable. For each attached 802.3af-compliant device, the switch automatically senses the load and dynamically supplies the required power. Independent overload and short-circuit protection for each port allows the switch to automatically shut down a port's power when limits are exceeded.

Port 1 on the switch can provide up to 25 Watts of power to an attached device at the standard 48 DC voltage. Ports 2-8 can provide up to 15.4 Watts of power.

The switch contains a comprehensive array of LEDs for "at-a-glance" monitoring of network and port status. It also includes a management agent that allows you to configure or monitor the switch using its embedded management software.

Features

- Jumbo Frame to 9.6 Kbytes
- IEEE 802.3af compliance
- Authentication – RADIUS, 802.1X
- DHCP Client
- Broadcast Storm Control
- Port Mirroring
  One source port, one destination port
- Link Layer Discovery Protocol (LLDP)
- Port Trunking – Supports IEEE 802.3ad (LACP) with up to 4 port trunks.
- VLAN Support Up to 64 VLANs, port-based or tagged (802.1Q)
- Management via web-based interface or SNMP
- Firmware and Configuration upgrade via HTTP
- Cable Diagnostics
- 8K MAC Address

Specifications

Standards	IEEE Std. 802.3 10BASE-T; IEEE Std. 802.3u 100BASE-TX; IEEE Std. 802.3z Gigabit fiber; IEEE Std. 802.3ab 1000BASE-T; IEEE Std. 802.3x Flow control and Back-pressure; IEEE Std. 802.1ad Link Aggregation; IEEE Std. 802.1Q VLAN Tagging; IEEE Std. 802.1D Bridge, Spanning Tree; IEEE Std. 802.1X Authentication Protocol; IEEE 802.1P; IEEE 802.1W; DHCP Client (RFC 1541); IGMP (RFC1112); SNMPv2 (RFC 2571)
Protocols	CSMA/CD
Technology	Store and Forward switching architecture
Connectors	8 10/100/1000BASE-T, with auto-negotiation 1 Gigabit SFP slot
MAC Address	8K MAC address table
Jumbo packet support	Max 9.6 Kbytes jumbo packet size
Network Cable	**Ports 1-8:** RJ-45 connector, auto MDI/X **10BASE-T:** RJ-45 (100-ohm, UTP cable; Category 3 or better) **100BASE-TX:** RJ-45 (100-ohm, UTP cable; Category 5 or better) **1000BASE-T:** RJ-45 (100-ohm, UTP or STP cable; Category 5, 5e, or 6) *Max Cable Length - 100 m (328 ft)
Buffer Architecture	144 Kbytes
Backplane	16 Gbps
LEDs	**System:** Power **Port:** Link/Act; Status for SFP ports; PoE
Power Supply	Internal, auto-ranging transformer: 100 to 240 VAC, 50 to 60 Hz
Power Consumption	90 Watts maximum (full PoE load) "Green" low power mode cuts power consumption by up to 50%
AC Input	100 to 240 V, 50-60 Hz, 1.5 A
Maximum Current	1.5 A @ 110 VAC 0.75 A @ 220 VAC
Power-over-Ethernet	**Maximum output power 70 Watts:** 15.4 W for any four ports simultaneously 7.5 W for all eight ports simultaneously Port 1 can provide up to 25 Watts **Maximum output current per port:** 350 mA DC port 1 can reach 565 mA DC **Output Voltage:** 44 - 57 VDC **Maximum output current per port:** 350 mA DC
Temperature	**Operating:** 0° to 45°C (32° to 114°F) **Storage:** -40° to 70°C (-40° to 158°F)
Operating Humidity	10% to 90% (non-condensing)
Dimensions	**W:** 13.0" [330 mm] **D:** 8.0" [203 mm] **H:** 1.7" [44 mm]
Weight	4.54 lbs. (2.06 kg)
Certifications	FCC Class A, CE Mark, UL, cUL
Technical Support & Warranty	Free technical support and advanced warranty support for 5 years. Includes free telephone support, 24-hour support via web and FTP.

Ordering Information

MIL-SM8TAF1GPB
8-port 10/100/1000 POE Layer 2 Remotely Managed switch with (1) Gigabit SFP Combo port
Includes 19" Rack Mount ears
(Gigabit SFP port)

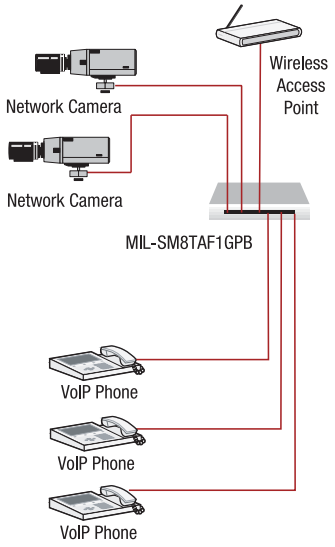
Optional Accessories *(sold separately)*

SFP Modules [pg 161-167]

For larger port-count PoE applications, please refer to our 24-port remotely-managed PoE switch:
MIL-SM2401MAF
SISPM1040-126D-LRT

For smaller port-count PoE applications, please refer to our PoE media conversion products:
SPOEB10xx-100
SGPOE10xx-1x0
MIL-SM802GAF
SISTP10xx-141-LRT

Connect and power Wireless Access Points, Network Cameras and VoIP Phones



(7) 10/100/1000 ports + (1) SFP/RJ-45 Combo port

- Managed Switch
- Supports SNMP v1 & v2c
- Supports 7.5W/8-ports or 15.4W/4-ports
- Port 1 can provide up to 25 Watts PoE power when in High Mode
- "Green" low power mode
- Advanced Quality of Service (QoS)
- Enhanced Security Features
- Gigabit SFP slot
- Fanless design for quiet operation

20-port 10/100/1000 + (4) RJ-45/SFP Combo Ports Remotely Managed Switch

MIL-SEM24T4GPA

(20) 10/100/1000 ports + (4) RJ-45/SFP Combo Ports

- 4 Gigabit SFP ports
- IEEE 802.1x User Authentication
- SNMP v1 and v2c support
- IGMP v1, v2

Additional Features

- TFTP configuration backup and restore
- CSMA/CD
- DHCP Client
- Quality of Service (QoS)
- Bandwidth control [pg 18]
- Broadcast/Multicast Packet Filter Control
- Ingress Packet Filter and Egress Rate Limit
- Port trunk with LACP
- Auto-Negotiation [pg 16]
- Auto-MDIX on all ports
- 10K Jumbo Frame support
- True non-blocking switching
- 8K MAC address table
- Back pressure half-duplex
- Flow control full-duplex
- Store and forward switching architecture
- 48 Gbps backplane
- 500 Kbytes memory buffer

Specifications

Standards	IEEE Std. 802.3 10BASE-T; IEEE Std. 802.3u 100BASE-TX; IEEE Std. 802.3ab 1000BASE-T; IEEE Std. 802.3z Gigabit fiber; IEEE Std. 802.3x Flow control and Back-pressure; IEEE Std. 802.1ad Link Aggregation; IEEE Std. 802.1q VLAN Tagging IEEE Std. 802.1p Class of service IEEE Std. 802.3ad Port trunk with LACP; IEEE Std. 802.1d Spanning Tree Protocol; IEEE Std. 802.1w Rapid spanning tree; IEEE Std. 802.1x Authentication Protocol
Protocols	CSMA/CD
Technology	Store and Forward switching architecture
Transfer Rate	14,880 pps for 10 Mbps 148,800 pps for 100 Mbps 1,488,000 pps for 1000 Mbps
Connectors	RS232 Console: Female DB-9 24 10/100/1000 RJ-45 4 SFP ports - shared with RJ-45 ports 21, 22, 23 & 24
MAC Address	8K MAC address table
Memory Buffer	500 Kbytes
Jumbo packet support	Max 10 Kbytes jumbo packet size
Network Cable	**10BASE-T:** 2-pair UTP/STP Cat. 3, 4, 5 cable; EIA/TIA-568 100-ohm (100 m) IEEE Std. 802.3u 100BASE-TX, 10/100 Mbps, **BASE-TX:** 100-ohm (100 m) Gigabit Copper: 4-pair UTP/STP Cat 5 cable EIA/TIA-568 100-ohm (100 m)
Backplane	48 Gbps
LEDs	**RJ-45 port:** Link/Activity; 1000 - port operating at 1000 Mbps **Fiber:** Link/Activity **Power:** On/Off
Power Supply	Built-in AC power supply: AC 100~240V, 50/60 Hz
Power Consumption	17.9 Watts max.
Operation Temperature	0° to 50°C (32° to 113°F)
Operation Humidity	10% to 95% (non-condensing)
Dimensions	**Width:** 17.0" [440 mm] **Depth:** 6.4" [161 mm] **Height:** 1.7" [44 mm]
EMI	FCC Class A, CE Mark
Safety Compliance	UL, cUL
Technical Support Warranty	Free technical support and advanced warranty support & for 5 years. Includes free telephone support, 24-hour support via web and FTP.

Ordering Information

MIL-SEM24T4GPA
20-port 10/100/1000 +
(4) combo ports RJ-45/SFP
includes 19" Rack Mount ears

Reporting Features

- **Management:**
  SNMPv1, SNMP v2c, Telnet, Console (CLI) Web Management
- **Firmware update:**
  TFTP firmware upgrade
- **System default:**
  Restore function for system default
- **Port Trunk:**
  Supports IEEE 802.3ad port trunk with link aggregation control protocol (LACP). 8 trunk groups/12 trunk members maximum.
- **VLAN:**
  Port based VLAN; IEEE 802.1Q Tag VLAN (255 entries)/VLAN ID (VLAN ID can be assigned from 1 to 4094).
- **Quality of Service/Class of Service:**
  Supports IEEE 802.1p Class of Service; Per port provides 4 priority queues; Port Base, Tag Base and Type of Service Priority
- **Spanning Tree:**
  Supports IEEE 802.1w rapid spanning tree and IEEE 802.1d spanning tree
- **Port Mirror:**
  Supports RX packet mirror
- **IGMP:**
  - Supports IGMP V1, V2,
  - Supports 255 multicast groups
- **Broadcast Storm:**
  Enable/Disable, 5%, 10%, 20%, 25%
- **SNMP Trap:**
  - Device coldstart
  - Port Link up/Link down
  - Up to 1 trap station

MIL-S500 & MIL-S800

(5) or (8) 10/100BASE-TX ports

With award-winning performance in an incredibly compact design, MILAN by Transition's MIL-S500 and MIL-S800 Switches auto-negotiate 10/100 Mbps connections for fast and simple switching in workgroup, small office, and home environments. Features include:

Full/Half Duplex
Each port capable of operating at full or half duplex, allowing up to 200 Mbps for end users. Flow control and back pressure minimize packet loss and maximize performance.

High-performance Switching
Non-blocking architecture assures rapid packet delivery, while extensive MAC address tables and memory buffering provide swift lookup and packet forwarding.

Automatic MDI/MDIX
Provides automatic cable detection on 10/100BASE-TX ports for adjusting to straight-through or crossover cables during installation.

Ruggedized Chassis
Sturdy metal enclosures with optional mounting brackets and magnets for installation in nontraditional environments.

Straightforward Diagnostics
Perpetual port status provided via front-side LEDs to simplify troubleshooting.

Secure and Safe
UL, cUL, and TUV Certifications; conforms to IEEE 802.3, 802.3u, and 802.3x standards.

- Full Duplex Flow Control
- Store-and-Forward
- Auto-Negotiating

Specifications

Standards Compliance	IEEE Std. 802.3 10BASE-T Ethernet; IEEE Std. 802.3 100BASE-TX Ethernet; IEEE Std. 802.3x full-duplex flow control
MAC Address Table **MIL-S500:** **MIL-S800:**	 1K 2K
Packet Buffer **MIL-S500:** **MIL-S800:**	 128 KB 128 KB
Network Interface	**10BASE-T:** RJ-45 Categories 3, 4, 5 100-ohm UTP **100BASE-TX:** RJ-45 Category 5 100-ohm UTP
Dimensions **MIL-S500:** **MIL-S800:**	 **Width:** 4.3" [110 mm] **Depth:** 2.8" [70 mm] **Height**: 0.7" [19 mm] **Width:** 6.5" [165 mm] **Depth:** 4.0" [100 mm] **Height:** 1.0" [24 mm]
Operating Temperature	0° to 45°C (32°F to 113°F)
Storage Temperature	-25°C to 70°C (-13°F to 158°F)
Operating Humidity	10% to 90% (non-condensing)
Relative Humidity	10% to 90%
Weight **MIL-S500:** **MIL-S800:**	 0.26 kg (9 oz) 0.45 kg (1 lb.)
External Power Supply	DC Output Power: 9 VDC, 700 mA
Power Consumption **MIL-S500:** **MIL-S800:**	 1.5 Watts maximum 4.2 Watts maximum
Compliance	**Safety:** UL, cUL, TUV **Emissions:** FCC Class B, CISPR 22 Class B, CE Mark
Technical Support & Warranty	Free technical support and advanced warranty support for 5 years. Includes free telephone support, 24-hour support via web and FTP.

Ordering Information

MIL-S500
5-Port 10/100BASE-TX Micro Switch

MIL-S800
8-Port 10/100BASE-TX Switch

Optional Accessories *(sold separately)*

MIL-BRSW [pg 199]
Wall Mount Bracket for MIL-S800 and MIL-S500

Features

- Filtering/Forwarding/Learning: Non-blocking, full wire speed
- Ports: Auto-negotiating for speed and duplex
- Forwarding mode: Store-and-forward
- Auto-MDI/MDIX: Crossover cables not needed
- LEDs: Power, 100 Mbps, Link/Activity, FDX/COL

8-port 10/100BASE-TX Compact Switch with Internal Power

MIL-S800i-v2

(8) 10/100BASE-TX ports

- 10/100 Unmanaged Switch
- Compact Size
- Internal power supply
- Store-and-Forward
- Auto-MDI/MDIX

The industry's smallest 8-port compact switch with an internal power supply, the MIL-S800i-v2 auto-negotiates 10/100 Mbps connections for fast and simple switching in workgroup, small office, and home environments. Features include:

Full/Half Duplex
Each port is capable of operating at full or half duplex, allowing up to 200 Mbps for end users. Flow control and back pressure minimize packet loss and maximize performance.

High-performance Switching
Non-blocking architecture assures rapid packet delivery, while 1K MAC address table and memory buffering provide swift lookup and packet forwarding.

MDI/MDIX
Provides automatic cable detection on 10/100BASE-TX ports for adjusting to straight-through or crossover cables during installation.

Ruggedized Chassis
Sturdy metal enclosures with wall holes mounts for installation in non-traditional environments.

Straightforward Diagnostics
Perpetual port status provided via LEDs on top of switch to simplify troubleshooting.

Secure and Safe
Class B, UL, cUL, and TUV Certifications; conforms to IEEE 802.3, 802.3u, and 802.3x standards.

Specifications

Standards	IEEE Std. 802.3 10BASE-T Ethernet; IEEE Std. 802.3u 100BASE-TX Ethernet; IEEE Std. 802.3x full-duplex flow control
Network Interface	10BASE-T: RJ-45 Categories 3, 4, 5 100-ohm UTP; 100BASE-TX: RJ-45 Category 5 100-ohm UTP
Buffer Memory	768 KB
Backplane	1.6 Gbps
Dimensions	**Width:** 6.3" [160 mm] **Depth:** 4.0" [100 mm] **Height:** 1.28" [32.5 mm]
Operating Temperature	0 to 45°C (32°F to 113°F)
Operating Humidity	5% to 95% (non-condensing)
Storage Temperature	-40°C to 70°C (-40°F to 158°F)
Weight	1 lb. [0.45 kg]
Internal Power Supply	AC Power: 100 – 240 VAC Line Frequency: 50/60 Hz
Power Consumption	4.5 Watts maximum
Compliance	**Safety:** UL, cUL, TUV/GS, CE **Emissions:** FCC Class B, CISPR 22 Class B, CE Mark, VCCI Class B
Installation	Integrated keyholes for wall mounting; twin magnets and desktop rubber feet included
Technical Support & Warranty	Free technical support and advanced warranty support for 5 years. Includes free telephone support, 24-hour support via web and FTP.

Ordering Information

MIL-S800i-v2
8-port 10/100BASE-TX Micro Switch with internal power supply

5-port 10/100BASE-TX Switch with Built-in Fiber

MIL-S501xx

(5) 10/100BASE-TX ports + (1) fiber port

MILAN's 10/100 Mbps Switches with Fiber provide multiple 10/100BASE-TX ports with one 100BASE-FX fiber port.

The MIL-S501 is ideal for alleviating traffic bottlenecks in workgroup environments; by combining copper and fiber ports in the same chassis, it offers an inexpensive solution for segmenting LANs and easily interconnecting networks in campus or multi-tenant environments.

High-Powered Switching
Each switch operates at wire speed with automatic MAC address learning and aging, requiring no user configuration.

Half/Full Duplex
All ports running at 100 Mbps operate in either half or full duplex mode, providing up to 200 Mbps of bandwidth for end users.

Simple Configuration
Flow control minimizes packet loss, while all copper ports auto negotiate for speed.

Fiber Connectivity
Available in SC or ST connection types.

Compact and Flexible
Sturdy metal enclosure with optional mounting brackets.

- Auto-Negotiation [pg 16]
- Full/Half duplex Flow Control
- Full/Half duplex Fiber Mode Control
- Compact Size
- Sturdy Metal Enclosure

Specifications

Complete list of fiber optic connector specifications [pg 212-224]

Standards Compliance	IEEE 802.3 10BASE-T; IEEE 802.3u 100BASE-TX/FX
System LEDs	Power, Speed, Link, Activity, and Duplex
Packet Forwarding	Store-and-Forward
MAC Address Support	4K
Packet Buffer Memory	256 KB
Operating Temperature	0° to 45°C (32°F to 113°F)
Storage Temperature	-25°C to 70°C (-13°F to 158°F)
Operating Humidity	10% to 90% (non-condensing)
Relative Humidity	10% to 90%
Chassis	Metal
Power Supply	External
AC Input Voltage	100 – 240 VAC
DC Output Power	9 VDC, 700 mA (MIL-S501)
Power Consumption	5.5 Watts maximum
Dimensions	**Width:** 6.5" [165 mm] **Depth:** 4.0" [100 mm] **Height:** 1.0" [24 mm]
Weight	1 lb. [0.45 kg]
Safety	UL, cUL, TUV
Emissions	FCC Class B, CISPR 22 Class B, CE Mark
Technical Support Warranty	Free technical support and advanced warranty support & for 5 years. Includes free telephone support, 24-hour support via web and FTP.

Ordering Information

Complete list of fiber optic and connector specifications [pg 212-224]

MIL-S501ST
5-Port 10/100BASE-TX +
(1) 100BASE-FX multimode (ST)
[2 km/1.2 mi.]

MIL-S501SC
5-Port 10/100BASE-TX +
(1) 100BASE-FX multimode (SC)
[2 km/1.2 mi.]

MIL-S501SC-15
5-Port 10/100BASE-TX +
(1) 100BASE-FX single mode (SC)
[15 km/9.3 mi.]

MIL-S501SC-30
5-Port 10/100BASE-TX +
(1) 100BASE-FX single mode (SC)
[30 km/18.6 mi.]

MIL-S501SC-60
5-Port 10/100BASE-TX +
(1) 100BASE-FX single mode (SC)
[60 km/37.3 mi.]

Optional Accessories *(sold separately)*

Mounting Bracket

MIL-BRSW [pg 199]
Wall Mount Bracket

MIL-S2400S

(24) 10/100BASE-TX ports

The MIL-S2400S compact Fast Ethernet Switch has twenty-four 10/100 Base-TX ports with low latency and error-free performance provided via an advanced store-and-forward architecture. Other features include:

Automatic MDI/MDIX
Cable detection and correction is automatic as the switch adjusts for straight-through or crossover cables during installation—no uplink port necessary.

High-performance Switching
Non-blocking architecture assures rapid packet delivery and the extensive 8,000 MAC address table and memory buffering provide swift lookup and packet forwarding.

Full Duplex Operation
Bandwidth for each port is effectively doubled, increasing the speed of a 100 Mbps port to 200 Mbps.

Flow Control
Enhances packet transmission by full-duplex flow control and half-duplex back pressure, providing congestion control on busy ports.

Rugged Chassis
Sturdy metal enclosures for added durability.

Straight Forward Diagnostics
Perpetual port status provided via LEDs to simplify troubleshooting.

Standards
Conforms to IEEE 802.3, 802.3u, and 802.3x standards.

- Automatic MDI/MDIX
- Wire Speed Performance
- Auto-Negotiation for Speed and Duplex [pg 16]
- Store and Forward Architecture
- Ruggedized metal chassis with internal power supply
- Front panel LED status indicators

Specifications

Ports	24 fixed 10/100BASE-TX ports: RJ-45 connectors
Standards	IEEE 802.3 10BASE-T; IEEE 802.3u 100BASE-TX/FX; IEEE 802.3x
Packet Forwarding	Store-and-Forward
Address Support	4K MAC address table
System LEDs	Power, Link/Activity
Switch Fabric	4.8 Gbps for MIL-S2400S
Latency	5 ms
Buffer Memory	512 Kb
Operating Temperature	0 to 45°C (32°F to 113°F)
Storage Temperature	-40°C to 70°C (-40°F to 158°F)
Operating Humidity	10% to 90% (non-condensing)
Relative Humidity	10% to 90%
Dimensions	**Width:** 9.8" [250 mm] **Depth:** 5.2" [132 mm] **Height:** 1.5" [37 mm]
Weight	3 lbs. [1.35 kg]
Chassis	Metal
Mounting	Desktop rubber feet
Safety	UL, cUL
Emissions	FCC Class A, CE Mark
Power Supply	Universal AC power input: 100 to 240 VAC 50 – 60 Hz; Output rate: +3.3V/3A
Technical Support & Warranty	Free technical support and advanced warranty support for 5 years. Includes free telephone support, 24-hour support via web and FTP.

Ordering Information

MIL-S2400S
24-port 10/100BASE-TX switch
"small form factor"
Includes 19" Rack Mount ears

8-Port 10/100/1000BASE-T Compact Workgroup Switch

MIL-S8TA

(8) 10/100/1000BASE-T ports

The 8-port 10/100/1000BASE-T Switch with Auto MDI/MDIX is an unmanaged multi-port Switch that can be used to build high-performance switched networks. This switch is a store-and-forward device that offers low latency for high-speed networking. The Switch is designed for the core of the network backbone computing environment to solve traffic block problems at SME (small, meduim enterprise) businesses.

The 8-port 10/100/1000BASE-T Switch features a "store-and-forward" switching technology. This allows the switch to auto-learn and store source addresses in an 8K-entry MAC address table.

Features

- Conforms to IEEE 802.3, 802.3u, 802.3ab, and 802.3x
- 8 Gigabit copper SOHO switch, compact size with universal internal power
- Auto-MDIX on all ports
- 16 Gbps back-plane
- N-Way Auto-Negotiation [pg 16]
- 8K Mac address table
- Back pressure half duplex
- Flow control full duplex
- Store-and-Forward switching architecture
- 144 Kbytes memory buffer
- True non-blocking switching
- Support 8 Kbytes Jumbo Frame

- Small Form factor
- Internal Power Supply
- 8 10/100/1000BaseT Auto-negotiating ports
- Auto-MDI/MDIX which eliminates cabling confusion

Specifications

Physical Characteristics	
Enclosure Case	Rugged metal chassis
Dimensions	**Width:** 6.5" [165 mm] **Depth:** 4.0" [100 mm] **Height:** 1.3" [33 mm]
Internal Power Supply	AC 100 – 240V, 50/60 Hz
Connectors	(8) 10/100/1000 Mbps Gigabit Ethernet (10BASE-T, 100BASE-TX, 1000BASE-T) RJ-45
Status Indicators	3 indicators per RJ-45 port: Link/Activity, 10/100 Mbps, 1000 Mbps
Performance	**Flow Control:** Supports IEEE802.3x Flow Control **CoS:** Two queues, WRR 4:1 **Memory**: Embedded 144KB packet buffer **MAC Address Table:** 8K entries **MDI/MDI-X**: Auto
Standards Compliance	
Network:	IEEE 802.3 2002
Environmental Range	
Operating Temperature:	32° to 113°F (0° to 45°C)
Relative Humidity:	10% to 90% non-condension
Power:	Internal power supply
Power Consumption:	7.6 Watts (max.)
Emissions:	FCC Class A and CE Mark
Technical Support & Warranty	Free technical support and advanced warranty support for 5 years. Includes free telephone support, 24-hour support via web and FTP.

Ordering Information

MIL-S8TA
8-port 10/100/1000BASE-T switch
Includes Wall Mount Bracket

MIL-S4800

(48) 10/100BASE-TX Switch Plus (1) 10/100/1000 RJ-45 and (1) Gigabit SFP Port

The MIL-S4800 Ethernet Switch has forty-eight 10/100 BASE-TX ports; (1) 10/100/1000 RJ-45 port and (1) Gigabit SFP port with low latency and error-free performance provided via an advanced store-and-forward architecture. Other features include:

Automatic MDI/MDIX
Cable detection and correction is automatic as the switch adjusts for straight-through or crossover cables during installation—no uplink port necessary.

High-performance Switching
Non-blocking architecture assures rapid packet delivery and the extensive 8,000 MAC address table and memory buffering provide swift lookup and packet forwarding.

Full Duplex Operation
Bandwidth for each port is effectively doubled, increasing the speed of a 100 Mbps port to 200 Mbps.

Flow Control
Enhances packet transmission by full-duplex flow control and half-duplex back pressure, providing congestion control on busy ports.

Rugged Chassis
Sturdy metal enclosure with internal power supply.

Straight Forward Diagnostics
Perpetual port status provided via LEDs to simplify troubleshooting.

Standards
Conforms to IEEE 802.3, 802.3u, 802.3ab, 802.3z and 802.3x standards.

Specifications

Standards	IEEE 802.3 10BASE-T IEEE 802.3u 100BASE-TX IEEE 802.3ab 1000BASE-T IEEE 802.3z Gigabit Fiber IEEE 802.3x Flow control and Back Pressure
Connector	10/100BASE-T: 48 x RJ-45 10/100/1000BASE-T: 1 x RJ-45 SFP: 1 x SFP socket
Switch Architecture	Store and forward switch architecture. Back-plane up to 20Gbps
Address Support	8K MAC address table with auto learning function
Packet Buffer	6 Mbits
System LEDs	System power (Green) 10/100TX port: Link/Activity (Green) Gigabit copper port: Link/Activity (Green), Speed (Yellow) SFP: Link/Activity (Green)
Power	AC 100~240V, 50/60 Hz, 0.26A
Power Consumption	22 Watts (Maximum)
Ventilation	1 Fan
Operating Temperature	0 to 45°C (32°F to 113°F)
Storage Temperature	-40°C to 70°C (-40°F to 158°F)
Operating Humidity	5% to 95% (non-condensing)
Storage Humidity	95%
Dimensions	**Width:** 17.32" [440 mm] **Depth:** 8.86" [225 mm] **Height:** 1.75" [44 mm]
Chassis	Metal
EMI	FCC Class A, CE
Safety	UL, cUL, CE/EN60950
Technical Support & Warranty	Free technical support and advanced warranty support for 5 years. Includes free telephone support, 24-hour support via web and FTP.

Ordering Information

MIL-S4800
48-port 10/100BASE-TX switch
Plus (2) Gigabit ports
(1) 10/100/1000 RJ-45 and (1) SFP port
Includes 19" Rack Mount ears

Optional Accessories *(sold separately)*

SFP Modules [pg 161-167]

- Automatic MDI/MDIX
- Wire Speed Performance
- Auto-Negotiation for Speed and Duplex [pg 16]
- Store and Forward Architecture
- Ruggedized metal chassis with internal power supply
- Front panel LED status indicators
- 19" Rack Mount Design

24-port (22) 10/100/1000BASE-T Switches with (2) RJ45/SFP Combo Ports

MIL-S24T2GPA

(22) 10/100/1000BASE-T Ports + (2) Combo RJ45/SFP Ports

Next Generation of Copper and Fiber Switching

The switch provides 48 Gbps Gigabit switching performance with an added benefit of combining copper and fiber interfaces in a compact 1U design. The MIL-S24T2GPA delivers cost-efficient switching capability for 22 ports of Copper Gigabit Ethernet and two combo ports for SFP based Gigabit Ethernet.

Two Combo SFP Ports

The switch enables fiber connectivity through two hot-swappable Small Form-factor Pluggable (SFP) gigabit interfaces.

With Gigabit Ethernet rapidly gaining in popularity, network administrators are demanding higher density 10/100/1000 Mbps switches.

(24) 10/100/1000BASE-T Ports

The MIL-S24T2GPA is a hard-working switch that delivers exceptional performance. Combining wire-speed switch fabric together with shared memory architecture design, they eliminate head-of-line blocking and easily out perform other first generation Gigabit switches using old-fashioned "bridge" architecture. Whether you need 10BASE-T, 100BASE-TX or 1000BASE-T, this switch is ready to run with any version of Ethernet over copper cabling.

Performance, Performance, Performance

MILAN by Transition Networks delivers the highest performance switch in its class. A single integrated switch engine automatically filters and forwards traffic at full line rate for all 24 ports simultaneously. With a Jumbo Frame compatible network infrastructure, you'll be transferring data at Ethernet Packet of 9KB instead of 1.5 KB—that's almost 4X larger than conventional switches.

Specifications

Connectors	(24) 10/100/1000 Mbps Gigabit Ethernet (10BaseT, 100BaseTX, 1000BaseT): RJ-45 plus 2 SFP combo open slots for 1000Base-x, optical or copper SFP modules
Status Indicators	Power plus LED indicators per RJ-45 port (duplex, link/activity, 10/100 Mbps, 1000 Mbps)
Performance	
Backplane Speed:	48 Gbps
Switch Architecture:	Shared memory
Maximum Frame Size:	9 KB Jumbo Frame
Filtering & Forwarding:	Includes multi-layer filtering and forwarding
Forwarding Table:	8K MAC addresses
RAM Buffer:	4 Mbps
Case	Ruggedized Metal Chassis
Dimensions	**Width:** 17.3" [440 mm] **Depth:** 6.33" [161 mm] **Height:** 1.7" [44 mm]
Weight	8.25 lbs. [3.74 kg]
Standards Compliance	
Network:	IEEE 802.3ab Gigabit Ethernet over 4 pairs of UTP Category 5 (1000BaseT); IEEE 802.3z Gigabit Ethernet over Fiber optics (1000Base-SX/LX); IEEE 802.3u Fast Ethernet over 2 pairs of UTP Category 5 (100BaseTX); IEEE 802.3 Ethernet (10BaseT)
Protocol:	CSMA/CD
Expansion:	Auto-MDI/MDIX on all RJ-45 ports
Operating Temperature	32° to 104°F (0° to 40° C)
Relative Humidity	10% to 95% non-condensing
Power	100 – 240 VAC, 50/60 Hz, internal switching supply
Power Consumption	Watts (max.)
Emissions	FCC Class A and CE Mark
Technical Support & Warranty	Free technical support and advanced warranty support for 5 years. Includes free telephone support, 24-hour support via web and FTP.

Ordering Information

MIL-S24T2GPA
22-port 10/100/1000BASE-T switch with (2) combo RJ45/SFP ports
Includes 19" Rack Mount ears

Optional Accessories *(sold separately)*

SFP Modules [pg 161-167]

- Full wire speed reception and transmission with 48 Gbps backplane speed
- 2 SFP Combo Ports for Optical Connectivity
- 802.3x Flow Control
- Full Duplex Pause [pg 17]
- Half Duplex Backpressure
  Ruggedized metal chassis with external power supply
- Supports IEEE 802.3x Flow Control for full duplex
- JUMBO Frames Support
- Internal Power Supply
- Front panel LED status indicators

Switch Mounting

Wall Mount Accessories & Rack Mount Assembly

The MILAN range of switches have the power and design to operate in multiple environments; as a desktop, workgroup or departmental switch.

In order to meet the demands of various operating environments, these products have been designed to accommodate switch mounting accessories to allow for wall or rack mounting of the devices.

MIL-BRSW

MIL-BRSW801W

MIL-RMSM8; MIL-RMS801; MIL-SM8TX MIL-BRSM8

Ordering Information

MIL-BRSW
Wall Mount Accessory for MIL-S500, MIL-S501 and MIL-S800

MIL-BRSM801W
Wall Mount Accessory for MIL-SM800

MIL-RMSM8
19" Rack Mount Assembly for MIL-SM8002TG, MIL-SM4004TG and MIL-SM802GAF

MIL-RMS801
19" Rack Mount Assembly for MIL-SM800x

MIL-RMSM8TX
19" Rack Mount Assembly for MIL-SM8TXAF2GPA

MIL-BRSM8
Wall Mount Bracket for MIL-SM8002TG, MIL-SM4004TG, MIL-SM8T1GPA, MIL-SM802GAF, and MIL-SM8TXAF2GPA

Features

- Flexibility in design and deployment
- Securely fasten to wall or desk
- 19" rack mount options

Specifications

Warranty	Comprehensive 5 years

MIL-L100i

1-port PoE Injector

IEEE 802.3af Compliant

The EmPowered Ethernet™ Series Power-over-Ethernet solutions are IEEE802.3af compliant, which means that you are ensured of the following:

Legacy Installation

Ensures safe delivery of power to existing legacy devices as well as power-enabled terminals.

Preservation of Cabling Infrastructure

Avoids altering existing wiring and does not damage cabling infrastructure already in place.

Data Integrity

Power delivery over Ethernet cables does not cause data degradation or loss of data integrity.

Power Shut Off

When data is disconnected PoE power is not provided to the PD device. This provides an easy PD reset option.

Power-over-Ethernet (PoE) Injectors

- Ensures uninterrupted network operation by providing a "power safe" path to the user
- Intelligent detection process to detect Power-over-Ethernet enabled terminals and protect legacy endpoints
- Furnishes easy and cost-effective installation with fewer cables and electrical outlets
- Provides one central secure location for power

Best Way to Bring Power to Your Network

MILAN by Transition's new EmPowered Ethernet Series Power-over-Ethernet solutions deliver unified supply of data, voice, and video as well as electrical power through a single source by sending power over standard Category 5 and above twisted pair cables. Power-over-Ethernet simplifies installation and eliminates the need to run separate power cords and LAN cables to each Access Point or port locations.

Our PoE products provide organizations with affordable, easy-to-use solutions that enable them to migrate their network infrastructure to support a growing number of advanced cost-saving, performance enhancing applications, such as streamlining wireless, VoIP, Network IP camera deployments, and centralized power backup solutions. Whether on a factory floor or in an enterprise facility, running power to hard to reach locations with MILAN by Transition's Power-over-Ethernet solutions significantly reduce cabling and outlet requirements while providing the lowest total cost of ownership.

Specifications

Standards	IEEE 802.3af Compliant IEEE 802.3 10BASE-T IEEE 802.3u 100BASE-TX
LEDs	**System:** Power
Ports	(1) DATA IN RJ-45 Ethernet Port (1) DATA OUT PoE Injector RJ-45 Ethernet Port
Cable Requirements	**10BASE-T:** 2-pair UTP/STP Cat.3,4,5 cable EIA/TIA-568 100-ohm(100 m) **100BASE-TX:** 2-pair UTP/STP Cat.5 cable EIA/TIA-568 100-ohm(100 m)
Weight	0.44 lbs. [0.2 kg]
Dimensions	**Width:** 4.6" [117 mm] **Depth:** 2.3" [60 mm] **Height:** 1.3" [35 mm]
Power Output	-48 VDC, 300 mA
Power Input	AC 100~240V, 50~60 Hz, 0.3A
Operating Environment	0~ 40°C , 90% Relative Humidity (non-condensing)
Storage Temperature	0~70°C, 95% Relative Humidity (non-condensing)
EMI and Safety	FCC Class B, CE Mark; UL, cUL, CE/EN60950

Ordering Information

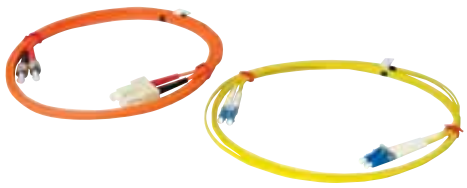
MIL-L100i
EmPowered™ Ethernet 1-port PoE Injector

FPC-xxx-xxxx-xxM

Fiber Optic Patch Cords

Features

- 10-Gigabit Ethernet laser-optimized multimode cable for runs up to 550 meters. Ideal for campus LAN backbone and storage area network (SAN) applications.
- Factory terminated and 100% optical testing to guarantee test results.
- Individually packaged with IL and RL test results included.
- Available fiber types include single mode 8/125 µm and multimode 50/125 µm or 62.5/125 µm.
- Lifetime Warranty



Transition Networks' high-quality fiber optic patch cords are designed to meet or exceed industry specifications and are offered in a wide variety of connector styles, fiber types and lengths. Each cable assembly is 100% optically inspected, tested and individually packaged with descriptive labeling and test results included.

Ordering Information

FPC-____-____-__M

Cable Type — Connector Type — Length

Examples:

FPC-MD6-LCMT-03M *Fiber Patch Cord, duplex multimode 62.5/125 µm, LC to MT-RJ, 3 m long*

FPC-SD-SCSC-01M *Fiber Patch Cord, duplex single mode 8/125 µm, SC to SC, 1 mlong*

Cable Type	
MD5	Multimode 50/125 µm duplex
MD6	Multimode 62.5/125 µm duplex
SD	Single Mode 8/125 µm duplex
MD5G	Multimode 50/125 µm duplex (10-Gigabit Optimized)

Connector Type	
LC	LC/PC
MT	MT-RJ/PC
SC	SC/PC
ST	ST/PC

(List each end separately)

Length	
xx	Length in meters

Available lengths: 1, 2, 3 and 5 meters

Note: Other lengths may be available upon request.

Specifications

Multimode Fiber

Standards	ITU-T G.651; IEC 60793-2-10 Type A1A.1, A1B
Fiber Optic Connector Specs	**Max. Insertion Loss:** < 0.5 dB **Max. Insertion Loss:** < 0.7 dB (MT-RJ only) **Typical Insertion Loss:** < 0.3 dB
Core/Cladding Diameter	50/125 µm or 62.5/125 µm
Jacketing	2 mm or 3 mm tight buffered, OFNR, orange PVC (diameter will depend on connector type)
Bandwidth	**50/125 µm:** 500 MHz/km @ 850nm; 500 MHz/km @ 1300nm **62.5/125 µm:** 160 MHz/km @ 850nm; 500 MHz/km @ 1300nm
Attenuation	**Max:** 3.5 dB/km @850nm; 1.5 dB/km @1300nm **Typical:** 3.0 dB/km @850nm; 1.0 dB/km @1300nm
Length Tolerance	**Length specified:** + 0.15m (+6.0")/-0.0m (-0.0")
Environment	-40°C to +85°C operating temperature, 5% – 95% humidity non-condensing
Warranty	Lifetime

Specifications

Multimode Fiber (10-Gigabit Optimized)

Standards	TIA/EIA-492-AAAC; IEC 60793-2-10 Type A1A.2; ISO/IEC 11801 OM-3
Fiber Optic Connector Specs	**Max. Insertion Loss:** < 0.5 dB **Max. Insertion Loss:** < 0.7 dB (MT-RJ only) **Typical Insertion Loss:** < 0.3 dB
Core/Cladding Diameter	50/125 µm
Jacketing	2 mm or 3 mm tight buffered, OFNR, purple PVC (diameter will depend on connector type)
Bandwidth	**LED w/OFL:** 3500 MHz/km @ 850nm; 500 MHz/km @ 1300nm **Laser:** 4700 MHz/km @ 850nm; 500 MHz/km @ 1300nm
Attenuation	**Max:** 2.4 dB/km @ 850nm; 0.6 dB/km @ 1300nm **Typical:** 2.0 dB/km @ 850nm; 0.5 dB/km @ 1300nm
Length Tolerance	**Length specified:** + 0.15m (+6.0")/-0.0m (-0.0")
Environment	-40°C to +85°C operating temperature, 5% – 95% humidity non-condensing
Warranty	Lifetime

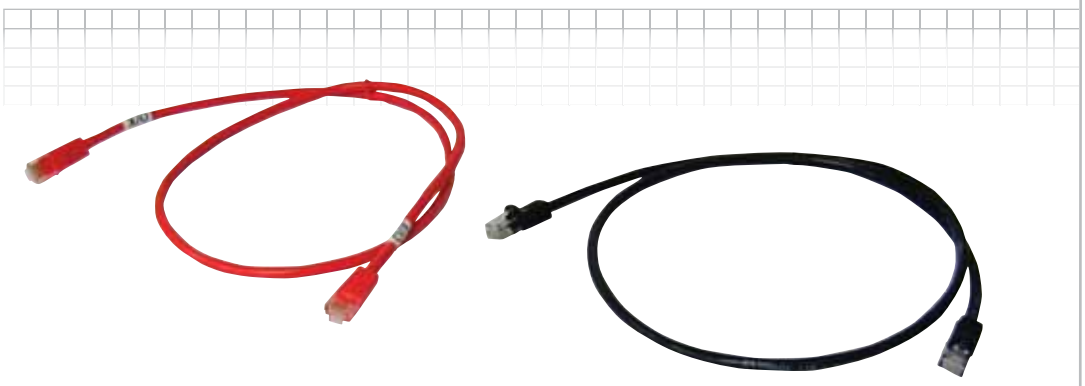
Specifications

Single Mode Fiber

Standards	Telcordia GR-20, GR-326-CORE; TIA/EIA-492-CAAB; ITU-T G.652.D; IEC 60793-2-50 Type B1.3
Fiber Optic Connector Specs	**Max. Insertion Loss:** < 0.3 dB **Typical Insertion Loss:** < 0.2 dB **Max. Reflectance:** < -55.0 dB **Typical Reflectance:** < -57.0 dB
Core/Cladding Diameter	8.3/125 µm
Jacketing	2 mm or 3 mm tight buffered, OFNR, yellow PVC (diameter will depend on connector type)
Attenuation	**Max:** 0.35 dB/km @ 1310nm; 0.21 dB/km @ 1550nm
Length Tolerance	**Length specified:** + 0.15 m (+6.0")/-0.0 m (-0.0")
Environment	-40°C to +85°C operating temperature, 5% – 95% humidity non-condensing
Warranty	Lifetime

CPC-xxxx-xxF

Copper Patch Cords



Ordering Information

CPC- ____ - __ F

Cable Type — Length

Cable Type	
5EB	CAT 5e Straight-through
X5ER	CAT 5e Crossover
6B	CAT 6 Straight-through
X6R	CAT 6 Crossover

Length	
xx	Length in ft.

03 = 3 ft. [0.91 m]

Available lengths:

1, 2, 3, 5, 7 and 10 ft.

*Note:
All cables include molded boot; same color as the cable.
Standard color for straight-through cables is black.
Standard color for crossover cables is red.
Custom colors and lengths may be available upon request.

Features

- Snagless, molded boots provide strain relief and prevent kinking as well as snagless cable mining.
- All CAT5e cables tested to 350 MHz; CAT6 cables tested to 250 MHz. construction with RJ-45 connectors.
- Available in both straight or crossover pinning.
- Lifetime Warranty

Specifications

Standards	TIA/EIA-568-A, B
Cable Specs	CAT 5e
Cable Type	4-pair UTP
Conductor Gauge	24 AWG, stranded
Jacket	PVC, 80C, OD=5.3 mm
Frequency	up to 350 MHz
Impedance	100 +/- 15 ohms
Attenuation (max.)	24 dB/100 m @ 100 MHz; 49 dB/100 m @ 350 MHz
Cable Specs	CAT 6
Cable Type	4-pair UTP
Conductor Gauge	24 AWG, stranded
Jacket	PVC, 80C, OD=6.2 mm
Frequency	up to 250 MHz
Impedance	100 +/- 15 ohms @ 100 MHz
Attenuation (max.)	24 dB/100 m @ 100 MHz; 39 dB/100 m @ 250 MHz
Length Tolerance	Length specified +/- 2%
Environment Operating Temperature: Humidity:	 -40°C to +85°C 5% – 95% non-condensing
Warranty	Lifetime

Gigabit Ethernet Mode Conditioning Cable

see also: Ethernet 10BASE-T to 10BASE-FL Stand-Alone Media Converters [pg 73 & 74]

1000MCC-1

Gigabit Ethernet Media Converter Accessory

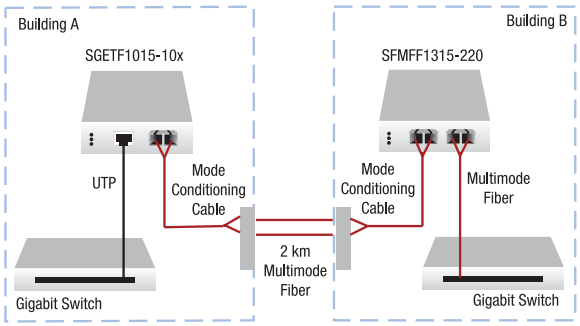
Corporate, industrial or education campuses can now utilize the multimode infrastructure already in place. Users can now upgrade their networks to Gigabit speeds in the most economical manner.

Features

- Extend Gigabit Ethernet over multimode cable up to 500 m* when used in conjunction with xFMFF1314-220, xGETF1014-110 or xGFEB1014-100. It can also extend the distance up to 2 km* when used in conjunction with xFMFF1315-220, xGFEB1015-100 or xGETF1015-110.
- Low cost alternative to recabling IEEE-802.3z compliant Gigabit Mode Conditioning cable allows network managers to upgrade theirmultimode backbone to gigabit speeds without costly recabling.

The Mode Conditioning Cable eliminates the effects of Differential Mode Delay (DMD) by providing an offset launch of the single mode core, into the 62.5 or 50 µm multimode core. Alternative solution to Gigabit products with "24" connector designation for distances up to 2 km on multimode fiber.

Low Cost Alternative to Recabling



Specifications

Standards	IEEE Std. 802.3z
Connectors	SC
Warranty	Lifetime

Ordering Information

1000MCC-1
Mode Conditioning Cable 62.5/50 µm (1 meter cable length); SC connectors
To be used in conjunction with any of the following converters:

CFMFF1314-220 [pg 52]
1000BASE-SX 850nm multimode (SC)
[62.5/125 µm fiber: 220 m/722 ft.]
[50/125 µm fiber: 550 m/1804 ft.]
to 1000BASE-LX 1310nm SM (SC)
[500 m/1640 ft.]

SFMFF1314-220 [pg 104]
1000BASE-SX 850nm multimode (SC)
[62.5/125 µm fiber: 220 m/722 ft.]
[50/125 µm fiber: 550 m/1804 ft.]
to 1000BASE-LX 1310nm SM (SC)
[500 m/1640 ft.]

CFMFF1315-220 [pg 52]
1000BASE-SX 850nm multimode (SC)
[62.5/125 µm fiber: 220 m/722 ft.]
[50/125 µm fiber: 550 m/1804 ft.]
to 1000BASE-LX 1310nm SM (SC)
[2 km/1.2 mi.]

SFMFF1315-220 [pg 104]
1000BASE-SX 850nm multimode (SC)
[62.5/125 µm fiber: 220 m/722 ft.]
[50/125 µm fiber: 550 m/1804 ft.]
to 1000BASE-LX 1310nm SM (SC)
[2 km/1.2 mi.]

CGETF1014-110 [pg 51]
1000BASE-T (RJ-45) **[100 m/328 ft.]**
to 1000BASE-LX 1310nm SM (SC)
[500 m/1640 ft.]

SGETF1014-110 [pg 101]
1000BASE-T (RJ-45) **[100 m/328 ft.]**
to 1000BASE-LX 1310nm SM (SC)
[500 m/1640 ft.]

CGETF1015-110 [pg 51]
1000BASE-T (RJ-45) **[100 m/328 ft.]**
to 1000BASE-LX 1310nm SM (SC)
[2 km/1.2 mi.]

SGETF1015-110 [pg 101]
1000BASE-T (RJ-45) **[100 m/328 ft.]**
to 1000BASE-LX 1310nm SM (SC)
[2 km/1.2 mi.]

CGFEB1014-120 [pg 49]
1000BASE-T (RJ-45) **[100 m/328 ft.]**
to 1000BASE-LX 1310nm SM (SC)
[500 m/1640 ft.]

SGFEB1014-120 [pg 96]
1000BASE-T (RJ-45) **[100 m/328 ft.]**
to 1000BASE-LX 1310nm SM (SC)
[500 m/1640 ft.]

CGFEB1015-120 [pg 49]
1000BASE-T (RJ-45) **[100 m/328 ft.]**
to 1000BASE-LX 1310nm SM (SC)
[2 km/1.2 mi.]

SGFEB1015-120 [pg 96]
1000BASE-T (RJ-45) **[100 m/328 ft.]**
to 1000BASE-LX 1310nm SM (SC)
[2 km/1.2 mi.]

1000MCC-1LC
Mode Conditioning Cable 62.5/50 µm (1 m cable length); SC to LC connectors
To be used in conjunction with any of the following converters:

TN-SFP-LX1 [pg 164] (model with DMI)
1000BASE-LX 1310nm (LC) SM
[500 m/1640 ft.] Link Budget: 11.5 dB

TN-SFP-LX3 [pg 164]
1000BASE-LX 1310nm (LC) SM
[2 km/1.2 mi.] Link Budget: 19.0 dB
Connect Single Mode connector from the cable to TX port of an LX converter.

Fiber Optic Reference Guide

Calculating Fiber Loss and Distance Estimates

There are a number of ways to tackle the problem of determining the power requirements for a particular fiber optic link. The easiest and most accurate way is to perform an Optical Time Domain Reflectometer (OTDR) trace of the actual link. This will give you the actual loss values for all events (connectors, splices and fiber loss) in the link. In the absence of an actual OTDR trace, there are two alternatives that can be used to estimate the power requirements of the link:

1. Estimate the total link loss across an existing fiber optic link if the fiber length and loss variables are known.

2. Estimate the maximum fiber distance if optical budget and loss variable are known.

Loss variables are connectors, splices and attenuation per kilometer of the fiber. If actual values for all of the loss variables are not known, an estimation for each is needed to complete the calculations. In this case, one would want to take a worst case approach to assure that there is adequate power available for the link. The following table includes commonly accepted loss values used in these calculations:

Fiber Type	Wavelength	Fiber attenuation / km *	Fiber attenuation / km #	Connector Loss	Splice Loss
Multimode 50/125 µm	850nm	3.5 dB	2.5 dB	0.75 dB	0.3 dB
	1300nm	1.5 dB	0.8 dB	0.75 dB	0.3 dB
Multimode 62.5/125 µm	850nm	3.5 dB	3.0 dB	0.75 dB	0.3 dB
	1300nm	1.5 dB	0.7 dB	0.75 dB	0.3 dB
Single Mode 9 µm	1310nm	0.4 dB	0.35 dB	0.75 dB	0.3 dB
Single Mode 9 µm	1550nm	0.3 dB	0.22 dB	0.75 dB	0.3 dB

**These values are per TIA/EIA and other industry specifications and are the values used by Transition Networks in all link loss calculations.*

#These values are one example of the performance that can be obtained with a new fiber installation.

The IEEE also recommends maximum cable distances as defined in the table below:

Standard	Data Rate (Mbps)	Cable Type	IEEE Standard Distance
10BASE-FL	10	850nm Multimode 50/125 µm or 62.5/125 µm	2 km
100BASE-FX	100	1300nm Multimode 50/125 µm or 62.5/125 µm	2 km
100BASE-SX	100	850nm Multimode 50/125 µm or 62.5/125 µm	300 m
1000BASE-SX	1000	850nm Multimode 50/125 µm	550 m
		850nm Multimode 62.5/125 µm	220 m
1000BASE-LX	1000	1300nm Multimode 50/125 µm or 62.5/125 µm	550 m
		1310nm Single mode 9/125 µm	5 km
1000BASE-LH	1000	1550nm Single mode 9/125 µm	70 km

Transition Networks assumes the multimode standard distances defined by IEEE for all of its products.

Fiber Optic Definitions

Before discussing actual fiber optic budget calculations, please review the following commonly used terms:

- **Maximum Transmit Power**
  The maximum output power in dBm (decibels relative to 1mW) of the optical transmitter/transceiver. This is abbreviated as Max TX PWR in the connector specifications listed in this catalog.
- **Minimum Transmit Power**
  The minimum output power in dBm (decibels relative to 1mW) of the optical transmitter/transceiver. This is abbreviated as Min. TX PWR in the connector specifications listed in this catalog.
- **Launch Power**
  The actual output power in dBm (decibels relative to 1mW) of the optical transmitter/transceiver. This value will reside somewhere within the max. and min. transmit power levels listed.
- **Receive Sensitivity**
  The minimum input power in dBm (decibels relative to 1mW) necessary to correctly drive the optical receiver. This is abbreviated as RX Sensitivity in the connector specifications listed in this catalog.
- **Maximum Receive Power**
  The maximum input power in dBm (decibels relative to 1mW) the optical receiver can safely accept without overdriving the receiver. This is abbreviated as Max In PWR in the connector specifications listed in this catalog.
- **Link Budget**
  The amount of power available for dissipation over the fiber link between end devices. It is calculated using worst case assumptions by subtracting the receive sensitivity from the minimum transmit power.
- **Link Loss**
  The total amount of power dissipation over the fiber link between end devices. It is calculated using maximum loss values for distance, splices and connectors.
- **Splice Loss**
  The amount of power loss attributable to a fiber optic spliced connection.
- **Connector Loss**
  The amount of power loss attributable to a fiber optic connector pair.
- **Attenuation**
  The amount of power loss per kilometer over the fiber link. Attenuation is wavelength specific and will depend greatly on type and condition of the optical fiber found in the link.
- **Safety Margin**
  It is common practice to add a couple of dB loss as a safety buffer to account for items such as fiber aging, splice and connector degradation over time and environmental factors such as temperature and humidity.

Calculating Fiber Loss & Distance Estimates

Estimate Total Link Loss

This calculation will estimate the total link loss through a particular fiber optic link where the fiber length, as well as the number of splices and connectors, are known. This calculation is simply the sum of all worst-case loss variables in the link:

Link Loss = [fiber length (km) x fiber attenuation per km] +
[splice loss x # of splices] +
[connector loss x # of connectors] + [safety margin]

For example: Assume a 40 km single mode link at 1310nm with 2 connector pairs and 5 splices.

Link Loss = [40 km x 0.4 dB/km] + [0.3 dB x 5] + [0.75 dB x 2] + [3.0 dB]
= 21.0 dB

In this example, an estimated 21.0 dB of power would be required to transmit across this link. Of course, it is very important to measure and verify the actual link loss values once the link is established to identify any potential performance issues.

Estimate Fiber Distance

This calculation will estimate the maximum distance of a particular fiber optic link given the optical budget and the number of connectors and splices contained in the link:

$$\text{Fiber Length} = \frac{[\text{Optical budget}] - [\text{link loss}]}{[\text{fiber loss/km}]}$$

Fiber Length = {[(min. TX PWR) - (RX sensitivity)]
- [splice loss x # of splices]
- [connector loss x # of connectors]
- [safety margin]}
÷ [fiber lost/km]

For example: Assume a Fast Ethernet Single mode link at 1310nm with 2 connector pairs and 5 splices.

$$\text{Fiber Length} = \frac{[(-8.0\ \text{dB}) - (-34.0\ \text{dB})] - [0.3\ \text{dB} \times 5] - [0.75\ \text{dB} \times 2] - [3.0\ \text{dB}]}{[0.4\ \text{dB/km}]}$$

$$\text{Fiber Length} = \frac{[26.0\ \text{dB}] - [0.5\ \text{dB}] - [1.5\ \text{dB}] - [3.0\ \text{dB}]}{[0.4\ \text{dB/km}]} = 52.5\ \text{km}$$

In this example, an estimated 52.5 km distance is possible before dissipating the optical power to a value below the RX sensitivity. As always, it is very important to measure and verify the actual link loss values once the link is established to identify any potential performance issues. Actual maximum distances will very depending on:

- Actual optical fiber attenuation per km
- Optical fiber design and age
- Quality of connectors and actual loss per pair
- Quality of splices and actual loss per splice
- Quantity of splices and connectors in the link

Note: The recommended fiber distances listed in this catalog are based on calculations similar to those shown above. These distances are a suggestion at best and are no substitute for actual measurements of link loss using an OTDR or other similar optical loss test sets. Transition Networks has no way of guaranteeing distance results due to the myriad of variables involved in a fiber link loss calculation.

Switching Terminology/Feature Glossary

Feature / Protocol	Known As	Standard	Description
Auto-Negotiation	N-WAY Protocol	IEEE 802.3u	With Auto-Negotiation in place, Ethernet can determine the common set of options supported between a pair of "link partners." Twisted-pair link partners can use Auto-Negotiation to figure out the highest speed that they each support as well as automatically setting full-duplex operation if both ends support that mode.
Auto MDI / MDIX	Auto MDI / MDIX	-	Auto MDI/MDIX automatically detects the MDI or MDIX setting on a connecting device in order to obtain a link. This means installers can use either a straight through or crossover cable and when connecting to any device, the feature is pretty self explanatory.
Flow Control	Flow Control	IEEE 802.3X	Prevents congestion and overloading when a sending port is transmitting more data than a receiving port can receive.
Port Labeling	Port Labeling	-	The ability to assign names to ports through the management interface.
IP Stacking	IP Stacking	Proprietary	The capability to stack multiple switches together and manage them under one IP address.
Jumbo Frames	Jumbo Frames	-	Jumbo frames are frames larger than the standard Ethernet frame size, which is 1518 bytes (1522 if VLAN-tagged). Though this is not a standard, more and more vendors are adding support for jumbo frames.
MAC Table Size	FDB, CAM, MAC	-	MAC Table also known as CAM table or Forwarding Data Base (FDB) is where switches store learned addresses. The size of the MAC table determines how many unicast streams the switch can support without flooding.
Static MAC Entry	Static MAC Entry	-	Static MAC entry support means that users can assign MAC addresses to ports manually that never age out.
MAC-based Security	MAC Lockdown	-	MAC Lockdown is the ability to lock the learning mechanism down on a port. This means that no further MACs will be learned on those ports.
Private Virtual-LAN	PVLANs	Proprietary	Private VLANs are the non standardized way of segmenting ports into separate groups.
802.1Q Virtual-LAN	VLAN, VID, dot1Q	IEEE 802.1Q	802.1Q is a standardized way of segmenting and distributing VLAN information. Switches that support 802.1Q can recognize, forward, a tag packets upon egress.
Max VLAN Support	Max VLANs	-	The number of VLANs supported on a single switch
GVRP	GVRP	Part of IEEE 802.1Q and IEEE 802.1p	The GARP (Generic Attribute Registration Protocol) VLAN Registration Protocol (GVRP) defines a GARP application that provides the 802.1Q-compliant VLAN pruning and dynamic VLAN creation on 802.1Q ports. GVRP is an application defined in the IEEE 802.1P standard that allows for the control of 802.1Q VLANs.
Spanning-Tree	STP	IEEE 802.1D	Spanning-Tree Protocol prevents loops from being formed when switches are interconnected via multiple paths.
Rapid Spanning Tree	RSTP	IEEE 802.1w	IEEE 802.1w Rapid Spanning Tree Protocol is an improvement to 802.1D standard that provides faster spanning tree convergence after a topology change.
Link Aggregation Control Protocol	LACP	IEEE 802.3ad	Link Aggregation Control Protocol allows you to bundle several physical ports together to form a single logical channel. LACP allows a switch to negotiate an automatic bundle by sending LACP packets to the peer.
Internet Group Multicast Protocol	IGMP snooping	-	IGMP snooping allows a switch to "listen in" on the IGMP conversation between hosts and routers. Based on the query and reports being passed through the switch, a forwarding database for multicast is created.
IGMP Query Mode	IGMP Query Mode	-	IGMP Query Mode allows MILAN switches to advertise Multicast groups.
Port-based Authentication	802.1X	IEEE 802.1X	802.1X allows each user's access to the LAN to be conditioned on who the user is, not which Ethernet receptacle he or she happened to plug into.
L2/L3/L4 Access Control List Port Based	ACLs	-	ACLs allow administrators to create permit and deny lists based on various traffic characteristics such as Source MAC, Destination MAC, Source IP, Destination IP, and UDP/TCP ports.
Remote Access Dial In User Services	RADIUS Authentication	RFC 2865 and RFC 2866	Allows secure centralized authentication management using UDP to the switches management.
Terminal Access Controller Access Control System Plus Authentication	TACACS + Authentication	Cisco Proprietary	TACACS+ is Cisco's proprietary implementation of centralized authentication using TCP to access switch management.
Secure Shell (Secured Telnet)	SSH	RFC 1034	SSH is used to provide a secure Telnet session to the console/command line interface of a network device through an insecure environment.

Switching Terminology/Feature Glossary

Feature / Protocol	Known As	Standard	Description
Secure Sockets Layer (HTTPS)	SSL	RFC 2818	SSL is used to manage a network device via it's web interface.
802.1p Prioritization	CoS	IEEE 802.1p	The ability to send traffic to various prioritization queues based on the 802.1q VLAN Tag priority field.
CoS Queues	CoS Queues	IEEE 802.1p	Class of Service allows traffic to be directed into different priority levels or "internal queues" in the switch on a particular network transaction. When network traffic congestion occurs, the data assigned to a higher queue will get through first.
Weighted Fair Queue Forwarding	WFQ Forwarding	-	A method of scheduling the number of forwarding packets per CoS queued.
Strict Priority Forwarding	SPF	-	A method of scheduling CoS queued traffic where high priority queues always take precedence over low priority queues.
Differentiated Services Prioritization	DSCP / DiffServ Prioritization	RFC 3290	The ability to prioritize traffic internally based on the DSCP field in the IP header of a packet.
DiffServ Modification	DSCP / DiffServ Remark	RFC 3290	The ability to change the DSCP field value on egress.
IP Type of Service Prioritization	IPToS	-	The ability to prioritize traffic internally based on the IPToS field in the IP header of a packet.
TCP/UDP Port Prioritization	Layer 4 Prioritization	-	The ability to prioritize traffic internally based on the a TCP or UDP port number.
Port-Based Rate Limiting / metering	Rate Limiting	-	The ability to regulate throughput per port.
Simple Network Management Protocol	SNMP	RFC 1157	A set of protocols for managing complex IP networks.
Remote Monitoring	RMON	RFC 1271	A part of SNMP, RMON is a network management protocol that gathers remote network information.
Dynamic Host Configuration Protocol	DHCP	RFC 2131	DHCP lets a network administrator supervise and distribute IP addresses from a central point, and automatically sends a new address when a computer is plugged into a different place in the network.
Command Line Interface	CLI	-	Allows users to setup switch configurations by using simple command phrases through a console / telnet session.
Web-based Management	Web GUI	-	Allows users to manage the switch through a web browser.
Telnet	Telnet	RFC 854	A terminal emulation program for TCP/IP networks that runs on your computer and connects your PC to a switch management.
Event log	Event log	-	Logs events such as port link down, configuration changes, etc. in a database.
Simple Network Time Protocol	SNTP	RFC 2030	Used to synchronize times on IP devices over a network.
TFTP download/upload	TFTP	RFC 1350	The ability to load the firmware and configuration files through a TFTP server.
Auto-provisioning	-	-	Auto-provisioning is a process that enables centralized management for multiple end user devices. It uses DHCP option 60, 66 and 67 to provide centralized firmware and configuration management. The feature provides mass firmware upgrade capability as well as booting-up full end device configuration without any manual intervention. Select MILAN switches implement this solution to support automated firmware and configuration control.

Industrial Test Levels

EMS Type Tests				
Test		**Description**	**Test Levels**	**Severity Level**
IEC61000-4-2	ESD	Air Discharge	+/- 8KV	3
		Contact Discharge	+/- 6KV	3
		ESD Contact Indirect	+/- 6KV	3
IEC61000-4-3	Radiated RFI	Housing	10V/m, 80 MHz – 1 GHz AM 1 KHz, 80% modulation 10V/m, 0.9 – 1.8 GHz FM 200 Hz, 50% modulation	3
IEC61000-4-4	Burst (Fast Transient)	PWR Supply Lines	+/- 2KV	3
		Communication Lines	+/- 1KV	3
		Relay	+/- 1KV	3
IEC61000-4-5	Surge	PWR Supply Lines	+/- 2KV, 12 ohm, CM +/- 1KV, 2 ohm, DM	3
		Relay	+/- 2KV, 12 ohm, CM +/- 1KV, 2 ohm, DM	3
IEC61000-4-6	Induced (Conducted RFI)	PWR Supply Lines	10 Vrms, 150 KHz – 80 MHz AM 1 KHz, 80% modulation	3
		Communication Lines	10 Vrms, 150 KHz – 80 MHz AM 1 KHz, 80% modulation	3
		Relay	10 Vrms, 150 KHz – 80 MHz AM 1 KHz, 80% modulation	3

Environmental Type Tests		
Test	**Description**	**Test Levels**
IEC60068-2-6	Vibration	10 – 500 – 10 HZ, 0.5 oct./min, 4g, X, Y, Z (3 axes)
IEC60068-2-27	Shock	50 g, 11ms, 4g, +/- X, +/- Y, +/- Z (6 direction)
IEC60068-2-32	Free Fall	75 cm, 1 corner, 3 edges, 6 faces (total 10 drops)

Managed Switch Selection Table

	10/100		Industrial 10/100				10/100 PoE			Gig PoE	10/100/1000					All Fiber 100M/1000M	
Feature/Protocol	MIL-SM800P	MIL-SM801PXX	SISTM1010-180-LRX	SISTM101X-162-LRX	SISGM1040-262D-LR	SISPM1040-182D-LRT	MIL-SM802GAF	MIL-SM8TX4F2GPA	MIL-SM2401MAF	MIL-SM8TAF1GPB	MIL-SM4004TG	MIL-SM8002TG	MIL-SEM24T4GPA	MIL-SM24T4DPA	MIL-SW8T1GPA	SM24-100SFP-AH	SM24-1000SFP-AH
see page #	181	182	127	127	129	130	183	184	185	190	188	187	191	186	189	178	180
Security Features																	
802.1Q VLANs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
802.1x Authentication					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
L2/L3/L4 ACLs														Yes		Yes	Yes
MAC-based Security					Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes		Yes	Yes
Private VLANs														Yes		Yes	Yes
RADIUS Authentication (Management)					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
SSHv2														Yes		Yes	Yes
SSL														Yes		Yes	Yes
TACACS+ Authentication (Management)														Yes		Yes	Yes
Network Performance Features																	
802.1p Prioritization (QoS)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes
Bandwidth Allocation			Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes		Yes	Yes
CoS Queues Per Port (802.1p)	2	2	4	4	4	4	4	4	2		4	4	4	8	4	4	4
IP ToS			Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes		Yes	Yes
LACP (802.3ad Port Trunking)	Yes	Yes			Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Rapid Spanning Tree (RSTP)			Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes
Spanning Tree (STP)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes
TCP/UDP Port Prioritization														Yes		Yes	Yes
Redundant Ring			Yes	Yes	Yes	Yes	Yes	Yes			Yes	Yes					
Management & Monitoring Features																	
Command Line Interface (CLI)					Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes		Yes	Yes
DHCP Client			Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
DHCP Server					Yes	Yes	Yes	Yes			Yes	Yes					
Event log			Yes	Yes	Yes	Yes					Yes	Yes		Yes		Yes	Yes
RMON	Yes	Yes	Yes	Yes							Yes	Yes		Yes			Yes
SNMPv1	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes
SNMPv2					Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes		Yes	Yes
SNMPv3					Yes	Yes	Yes	Yes			Yes	Yes		Yes		Yes	Yes
SNTP			Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes		Yes	Yes
Telnet	Yes	Yes			Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes		Yes	Yes
TFTP download/upload	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes
Web-based Management	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
General Features																	
Auto MDI / MDI-X	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Auto-Negotiation	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Flow Control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
GVRP/MVR	Yes	Yes			Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes		Yes	Yes
IGMP	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes		Yes	Yes
IP Stacking																Yes	Yes
Passes Jumbo Frames							Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
MAC Table Size	8k	8k	2k	2k	8k	8k	8k	8k	8k	8k	8k	8k	8k	8k	8k	17k	17k
Max Static VLANs	256	256	64	64	256	256	256	256	256	64	256	256	256	255	256	256	256
# of Gigabit Uplinks			4		2	2	1**	2**	2	1	4	2	4	4	1	4	4
Static MAC Entry	Yes	Yes			Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes		Yes	Yes
Minimum Operating Temp °C	0	0	0, -40*	0, -40*	-10	-40	0	0	0	0	0	0	0	0	0	0	-20
Maximum Operating Temp °C	45	45	60, 75*	60, 75*	50	65	45	45	40	45	45	60	45	40	45	50	65
# of PoE Ports 802.3af	0	0		**0**	0	8	4	8	24	8***	0	0	0	0	0	0	0
DC Power Input			Yes	Yes	Yes	Yes		Yes									Yes

*Temperatures only available on -LRT model

**SFP Port(s) is 100/1000 capable

***Includes 1 PoE plus port up to 25W

Media Converters by Network Type

Ethernet Based Products

Network Type	Product Number	Description	Product Type	Page #
AUI	E-TBT-MC05	AUI to 10Base-T	Stand-Alone Transceiver	135
10Base2	J/E-CX-TBT-02	10Base-T to 10Base2	Just Convert-It Stand-Alone	71
10 Mbps/Ethernet	E-TBT-FRL-05(xx)	10Base-T to 10Base-FL	Stand-Alone	73
10 Mbps/Ethernet	CETTF10xx-x0x	10Base-T to 10Base-FL	Point System™ Chassis Card	34
10 Mbps	F-SM-MM-05	Fiber Line Converter (i.e. MM to SM)	Stand-Alone	75
100 Mbps/Fast Ethernet	J/FE-CF-04(xx)	100Base-TX to 100Base-FX	Just Convert-It Stand-Alone	77
100 Mbps/Fast Ethernet	CFETF101x-11x	100Base-TX to 100Base-FX	Point System™ Chassis Card Class A	36
100 Mbps/Fast Ethernet	C2110	100Base-TX to 100Base-FX	ION Platform Slide-In-Module	141
100 Mbps/Fast Ethernet	E-100BTX-FX-05(xxxx)	100Base-TX to 100Base-FX	Stand-Alone/ION Platform	78/148
100 Mbps/Fast Ethernet	CFETF10xx-20x	100Base-TX to 100Base-FX	Point System™ Chassis Card Class B	37
100 Mbps/Fast Ethernet	SRMFE10xx-20x	100Base-TX to 100Base-FX w/Remote Mgmt	Stand-Alone	80
100 Mbps/Fast Ethernet	CRMFE10xx-20x	100Base-TX to 100Base-FX w/Remote Mgmt	Point System™ Chassis Card	38
100 Mbps-155 Mbps Fast E/ATM	SFMFF1xxx-20x	Fiber Line Converter (i.e. MM to SM)	Stand-Alone	81
100 Mbps-155 Mbps Fast E/ATM	CFMFF1xxx-20x	Fiber Line Converter (i.e. MM to SM)	Point System™ Chassis Card	39
10/100 Bridging	J/E-PSW-FX-03(xx)	10/100Base-TX to 100Base-FX	Just Convert-It Stand-Alone	84
10/100 Bridging	Mx/E-PSW-FX-01(xx)	10/100Base-TX to 100Base-FX	Mini Just Convert-It Stand-Alone	100
10/100 Bridging	SBFTF1010-130	10/100Base-TX Redundant Link Protector	Stand-Alone/ION Platform	86/149
10/100 Bridging	CBFTF1010-130	10/100Base-TX Redundant Link Protector	Point System™ Chassis Card	41
10/100 Bridging	SBFTF10xx-xxx	10/100Base-TX to 100Base-FX	Stand-Alone	87
10/100 Bridging	CBFTF10xx-1xx	10/100Base-TX to 100Base-FX	Point System™ Chassis Card	44
10/100 Bridging	C2210	10/100Base-TX to 100Base-FX	ION Platform Slide-In Module	142
10/100 Ethernet	SSETF101x-205	10/100Base-TX to 10/100Base-SX	Stand-Alone	83
10/100 Ethernet	CSETF101x-205	10/100Base-TX to 10/100Base-SX	Point System™ Chassis Card	40
10/100 Bridging	SSRFB10xx-10x	10/100Base-TX to 100Base-FX w/Remote Mgmt	Stand-Alone - NID	90
10/100 Bridging	CSRFB10xx-10x	10/100Base-TX to 100Base-FX w/Remote Mgmt	Point System™ - NID	45
10/100 Bridging	SFBRM10xx-1xx	10/100Base-TX to 100Base-FX w/Remote Mgmt	Stand-Alone - NID/UNI	91
10/100 Bridging	S2220	10/100Base-TX to 100Base-FX w/Remote Mgmt	ION Platform Stand-Alone	150
10/100 Bridging	SFBRM10xx-18x	10/100Base-TX to 100Base-FX w/Remote Mgmt	Stand-Alone - NID/UNI w/Ex.Temp	92
10/100 Bridging	CFBRM10xx-1xx	10/100Base-TX to 100Base-FX w/Remote Mgmt	Point System™ - NID/UNI	46
10/100 Bridging	C2220	10/100Base-TX to 100Base-FX w/Remote Mgmt	ION Platform Slide-In Module	143
10/100 Bridging	S2250	10/100Base-TX w/Remote Mgmt	Stand-Alone - NID/UNI	151
1000 Mbps/Gigabit Ethernet	J/GE-CF-01(xxx)	1000Base-TX to 1000Base-SX/LX	Just Convert-It Stand-Alone	95
1000 Mbps/Gigabit Ethernet	SGETF10xx-11x	1000Base-TX to 1000Base-SX/LX	Stand-Alone/ION Platform	96/152
1000 Mbps/Gigabit Ethernet	CGETF10xx-11x	1000Base-TX to 1000Base-SX/LX	Point System™ Chassis Card	47
1000 Mbps/Gigabit Ethernet	C3110	1000Base-TX to 1000Base-SX/LX	ION Platform Slide-In Module	144
1000 Mbps/Gigabit Ethernet	SFMFF1xxx-22x	Fiber Line Converter (i.e. MM to SM)	Stand-Alone	97
1000 Mbps/Gigabit Ethernet	CFMFF1xxx-22x	Fiber Line Converter (i.e. MM to SM)	Point System™ Chassis Card	48
1000 Mbps/Gigabit Ethernet	SFMFF1xxx-28x	Fiber Line Converter (i.e. MM to SM)	Stand-Alone - w/retime-regen	98
1000 Mbps/Gigabit Ethernet	CFMFF1xxx-28x	Fiber Line Converter (i.e. MM to SM)	Point System™ - w/retime-regen	49
1000 Mbps/Gigabit Ethernet	TN-CCH-MCMxx-xx-xxx	1000Base-TX to 1000Base-SX	High Density Chassis Card	99
10/100/1000 Bridging	M/GE-PSW-xX-01	10/100/1000Base-TX to 1000Base-SX/LX	Mini - Just Convert-It Stand-Alone	100
10/100/1000 Bridging	SGFEB10xx-12x	10/100/1000Base-TX to 1000Base-X	Stand-Alone/ION Platform	101/153
10/100/1000 Bridging	CGFEB10xx-12x	10/100/1000Base-TX to 1000Base-X	Point System™ Chassis Card	50
10/100/1000 Bridging	C3210	10/100/1000Base-T to 1000Base-SX/LX	ION Platform Slide-In Module	145
10/100/1000 Bridging	SBFFG10xx-1xx	10/100/1000Base-TX to 1000Base-X w/Rem Mgmt	Stand-Alone - NID/UNI	104
10/100/1000 Bridging	S3220	10/100/1000Base-T to 1000Base-SX/LX	ION Platform Stand-Alone	154
10/100/1000 Bridging	CBFFG10xx-1xx	10/100/1000Base-TX to 1000Base-X w/Rem Mgmt	Point System™ - NID/UNI	54
10/100/1000 Bridging	C3220	10/100/1000Base-T to 1000Base-SX/LX	ION Platform Slide-In Module	146
10/100/1000 Bridging	S3230	10/100/1000Base-T to 1000Base-SX/LX	ION Platform Stand-Alone	155
10/100/1000 Bridging	C3230	10/100/1000Base-T to 1000Base-SX/LX	ION Platform Slide-In Module	147
10/100/1000 Bridging	S325x	10/100/1000Base-TX to 1000Base-X w/Rem Mgmt	Stand-Alone - NID/UNI	156
Protocol Independent	SFMFF4040-100	Fiber Line Converter (2 Open SFP Slots)	Stand-Alone	106
Protocol Independent	CFMFF4040-100	Fiber Line Converter (2 Open SFP Slots)	Point System™ Chassis Card	55
10GigE	STGFFxx-100	10GBaseto 10GBase Optical Line Converter	Stand-Alone	107
10GigE	CTGFFxx-100	10GBaseto 10GBase Optical Line Converter	Point System™ Chassis Card	56
1000 Mbps/Gigabit Ethernet	1000MCC-1	Mode Conditioning Cable SC	Mode Conditioning Cable	203

Media Converters by Network Type

Slide-In-Modules (SFP, XFP, etc.)

Network Type	Product Number	Description	Product Type	Page #
1000 Mbps/Gigabit Ethernet	TN-GB-xxxx	1000Base-X GBIC Transceivers	GBIC Modules	160
1000 Mbps/Gigabit Ethernet	TN-GLC-xx-xx	1000Base-X SFPs	Cisco Compatible SFPs	163
1000 Mbps/Gigabit Ethernet	TN-J48xxC	1000Base-X SFPs	HP Compatible SFPs	166
100/155/1G/1.25G/OC-48	TN-SFP-xxx	100/155/1G/1.25G/OC-48 SFPs	Small Form Factor Pluggables	161
100/155/1G/1.25G/OC-48	TN-SFP-xxx-Cxx	100/155/1G/1.25G/OC-48 SFPs w/Wavelength	CWDM Wavelength SFPs	164
100/1000 Mbps	TN-CWDM-xxxx-1xx0	100/155 w/Wavelength	CWDM (Cisco Compatible)	165
10GigE	TN-XFP-xxx	10 Gigabit Ethernet XFPs	XFP Modules	168
10GigE	TN-10GSFP-xx	10 Gigabit Ethernet SFP+	SFP+ Modules	167
10GigE	TN-X2-10GB-xx	10 Gigabit X2	X2 Modules (Cisco Compatible)	162

PoE Converters

Network Type	Product Number	Description	Product Type	Page #
10 Mbps/Ethernet	SEPOE101x-150	10Base-T to 10Base-FL w/PoE	Stand-Alone PoE	72
100 Mbps/Fast Ethernet	SFEPE101x-1xx	100Base-TX to 100Base-FX w/PoE	Stand-Alone PoE	82
10/100 Bridging	SPOEB10xx-100	10/100Base-TX to 100Base-FX w/PoE	Stand-Alone PoE	94
10/100/1000 Bridging	SGPOE10xx-1xx	10/100/1000Base-TX to 100/1000Base-FX w/PoE	Stand-Alone PoE	105

PCI Based Solutions

Network Type	Product Number	Description	Product Type	Page #
10 Mbps/Ethernet	E-TBT-FRL-Nxx-02(xx)	10Base-T to 10Base-FL	PCI Based Media Converter	159
100 Mbps/Fast Ethernet	E-100BTX-FX-Nxx-01(xx)	100Base-TX to 100Base-FX	PCI Based Media Converter	159
100 Mbps/Fast Ethernet	N-FX-xx-02x	100Base-FX	NIC Card	171
100 Mbps/Fast Ethernet	N-FXE-xx-01	100Base-FX	PCI Express NIC Card	177
1000 Mbps/Gigabit Ethernet	N-GXE-xx-01	1000Base-X	PCI Express NIC Card	175

Non-Ethernet Protocols

Network Type	Product Number	Description	Product Type	Page #
ATM-OC-X	SFMFF1xxx-20x	Fiber Line Converter (i.e. MM to SM)	Stand-Alone	81
T1/E1	SSDTFx0xx-1xx	BNC or RJ-48 to MM or SM	Stand-Alone	115
T1/E1	CSDTFx0xx-1xx	BNC or RJ-48 to MM or SM	Point System™ Chassis Card	62
4xT1/E1/J1	S4TEF10xx-10x	(4) RJ-48 to MM or SM + 6-Pin DIN	Stand-Alone	117
4xT1/E1/J1	C4TEF10xx-10x	(4) RJ-48 to MM or SM + 6-Pin DIN	Point System™ Chassis Card	63
4xT1/E1/J1 +10/100 Ethernet	S4TEF10xx-11x	(4) RJ-48 + (1) 10/100 RJ-45 to MM or SM + 6-Pin DIN	Stand-Alone	118
4xT1/E1/J1 +10/100 Ethernet	C4TEF10xx-11x	(4) RJ-48 + (1) 10/100 RJ-45 to MM or SM + 6-Pin DIN	Point System™ Chassis Card	64
DS3-E3/T3	SCSCF30xx-11x	BNC to MM or SM	Stand-Alone	109
DS3-E3/T3	CCSCF30xx-11x	BNC to MM or SM	Point System™ Chassis Card	57
POTS 2 Wire	SAPTF33xx-1xx	Twisted Pair to MM or SM	Stand-Alone	120
POTS 2 Wire	CAPTF33xx-1xx	Twisted Pair to MM or SM	Point System™ Chassis Card	65
RS232	J/RS232-xF-01(xx)	DB9 to MM or SM	Just Convert-It Stand-Alone	110
RS232	SRS2F31xx-10x	DB9 to MM or SM	Stand-Alone	111
RS232	CRS2F31xx-10x	DB9 to MM or SM	Point System™ Chassis Card	59
RS422/485	SRS4F3x1x-100	DB9 or Terminal Block to MM or SM	Stand-Alone	112
RS422/485	CRS4F3x1x-100	DB9 or Terminal Block to MM or SM	Point System™ Chassis Card	60
High Speed Serial	SPSVT26xx-10x	26-Pin to MM or SM	Stand-Alone	113
High Speed Serial	CPSVT26xx-10x	26-Pin to MM or SM	Point System™ Chassis Card	58
Analog Video - Fixed	J/VD-xX-01(xx)	BNC to MM or SM (CCTV Transmitters and Receivers)	Just Convert-It™ Stand-Alone	121
Analog Video - Fixed	CVIDF20xx-15x	BNC to MM or SM (CCTV Receivers Only)	Point System™ Chassis Card	66

Unmanaged Industrial Solutions

Network Type	Product Number	Description	Product Type	Page #
10/100 Industrial Bridging	M/E-ISW-FX-01(xx)	10/100Base-TX to 100Base-FX	Industrial Mini Stand-Alone Converter	122
10/100 Industrial Bridging	SISTF1011-211-LRx	10/100Base-TX to 100Base-FX	Stand-Alone Industrial Converter	123
10/100 Industrial Bridging	SISTF1010-2x0-LRT	(5) or (8) 10/100Base-TX	Stand-Alone Industrial Switch	133
10/100 Industrial Bridging + PoE	SISTP10xx-141-LRT	(4) 10/100Base-TX to 100Base-FX w/PoE	Stand-Alone Industrial Switch	131
10/100/1000 Industrial Bridging	SISTF1040-162D-LRT	(16) 10/100Base-TX (2) 10/100/1000 SFP Combo Ports	Stand-Alone Industrial Switch	126
10/100/1000 Industrial Bridging	SISTG10xx-211-LRT	10/100/1000Base-TX to 1000Base-X	Stand-Alone Industrial Converter	132

Fiber Specification Table

Product SKU	Min TX PWR	Max TX PWR	RX Sensitivity	Max In PWR	Link Budget	Page
C2110-1011	-19.0 dBm	-13.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	141
C2110-1013	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	141
C2110-1014	-15.0 dBm	-8.0 dBm	-31.0 dBm	-8.0 dBm	16.0 dB	141
C2110-1015	-5.0 dBm	-2.0 dBm	-34.0 dBm	-7.0 dBm	29.0 dB	141
C2110-1016	-5.0 dBm	0.0 dBm	-34.0 dBm	-7.0 dBm	29.0 dB	141
C2110-1017	-5.0 dBm	0.0 dBm	-34.0 dBm	-7.0 dBm	29.0 dB	141
C2110-1019	-15.2 dBm	-8.0 dBm	-32.5 dBm	-3.0 dBm	17.3 dB	141
C2110-1029-A1	-14.0 dBm	-8.0 dBm	-33.0 dBm	-3.0 dBm	19.0 dB	141
C2110-1029-A2	-14.0 dBm	-8.0 dBm	-33.0 dBm	-3.0 dBm	19.0 dB	141
C2110-1029-B1	-8.0 dBm	-3.0 dBm	-33.0 dBm	-3.0 dBm	25.0 dB	141
C2110-1029-B2	-8.0 dBm	-3.0 dBm	-33.0 dBm	-3.0 dBm	25.0 dB	141
C2110-1029-C1	-5.0 dBm	0.0 dBm	-34.0 dBm	-3.0 dBm	29.0 dB	141
C2110-1029-C2	-8.0 dBm	-2.0 dBm	-34.0 dBm	-7.0 dBm	26.0 dB	141
C2110-1029-D1	-2.0 dBm	3.0 dBm	-35.0 dBm	-3.0 dBm	33.0 dB	141
C2110-1029-D2	-3.0 dBm	2.0 dBm	-35.0 dBm	-3.0 dBm	32.0 dB	141
C2110-1035	0.0 dBm	5.0 dBm	-36.0 dBm	-3.0 dBm	36.0 dB	141
C2110-1039	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	141
C2210-1011	-19.0 dBm	-13.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	142
C2210-1013	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	142
C2210-1014	-15.0 dBm	-8.0 dBm	-31.0 dBm	-8.0 dBm	16.0 dB	142
C2210-1015	-5.0 dBm	-2.0 dBm	-34.0 dBm	-7.0 dBm	29.0 dB	142
C2210-1016	-5.0 dBm	0.0 dBm	-34.0 dBm	-7.0 dBm	32.0 dB	142
C2210-1017	-5.0 dBm	0.0 dBm	-34.0 dBm	-7.0 dBm	29.0 dB	142
C2210-1019	-15.2 dBm	-8.0 dBm	-32.5 dBm	-3.0 dBm	17.3 dB	142
C2210-1029-A1	-14.0 dBm	-8.0 dBm	-33.0 dBm	-3.0 dBm	19.0 dB	142
C2210-1029-A2	-14.0 dBm	-8.0 dBm	-33.0 dBm	-3.0 dBm	19.0 dB	142
C2210-1029-B1	-8.0 dBm	-3.0 dBm	-33.0 dBm	-3.0 dBm	25.0 dB	142
C2210-1029-B2	-8.0 dBm	-3.0 dBm	-33.0 dBm	-3.0 dBm	25.0 dB	142
C2210-1035	0.0 dBm	5.0 dBm	-36.0 dBm	-3.0 dBm	36.0 dB	142
C2210-1039	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	142
C2220-1011	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	143
C2220-1011-D	-19.0 dBm	-12.0 dBm	-31.0 dBm	-8.0 dBm	12.0 dB	143
C2220-1013	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	143
C2220-1013-D	-19.0 dBm	-12.0 dBm	-31.0 dBm	-8.0 dBm	12.0 dB	143
C2220-1014	-15.0 dBm	-8.0 dBm	-31.0 dBm	-8.0 dBm	16.0 dB	143
C2220-1014-D	-14.0 dBm	-8.0 dBm	-32.0 dBm	-8.0 dBm	18.0 dB	143
C2220-1015	-5.0 dBm	-2.0 dBm	-34.0 dBm	-7.0 dBm	29.0 dB	143
C2220-1015-D	-10.0 dBm	-4.0 dBm	-34.0 dBm	-8.0 dBm	24.0 dB	143
C2220-1016	-5.0 dBm	0.0 dBm	-34.0 dBm	-7.0 dBm	29.0 dB	145
C2220-1017	-5.0 dBm	0.0 dBm	-34.0 dBm	-7.0 dBm	29.0 dB	143
C2220-1035	0.0 dBm	5.0 dBm	-36.0 dBm	-3.0 dBm	36.0 dB	143
C2220-1029-A1	-14.0 dBm	-8.0 dBm	-33.0 dBm	-3.0 dBm	19.0 dB	143
C2220-1029-A2	-14.0 dBm	-8.0 dBm	-33.0 dBm	-3.0 dBm	19.0 dB	143
C2220-1029-B1	-8.0 dBm	-3.0 dBm	-33.0 dBm	-3.0 dBm	25.0 dB	143
C2220-1029-B2	-8.0 dBm	-3.0 dBm	-33.0 dBm	-3.0 dBm	25.0 dB	143
C2220-1029-DA1	-14.0 dBm	-8.0 dBm	-33.0 dBm	-8.0 dBm	19.0 dB	143
C2220-1029-DA2	-14.0 dBm	-8.0 dBm	-33.0 dBm	-8.0 dBm	19.0 dB	143
C3110-1013	-9.5 dBm	-4.0 dBm	-18.0 dBm	0.0 dBm	8.5 dB	144
C3110-1014	-9.5 dBm	-3.0 dBm	-20.0 dBm	-3.0 dBm	10.5 dB	144
C3110-1015	-5.0 dBm	0.0 dBm	-20.0 dBm	-3.0 dBm	15.0 dB	144
C3110-1017	-3.0 dBm	2.0 dBm	-24.0 dBm	-3.0 dBm	21.0 dB	144
C3110-1024	-10.0 dBm	-3.0 dBm	-17.0 dBm	-3.0 dBm	7.0 dB	144
C3110-1029-A1	-8.0 dBm	-3.0 dBm	-21.0 dBm	-3.0 dBm	13.0 dB	144
C3110-1029-A2	-8.0 dBm	-3.0 dBm	-21.0 dBm	-3.0 dBm	13.0 dB	144
C3110-1029-B1	-3.0 dBm	2.0 dBm	-23.0 dBm	-3.0 dBm	20.0 dB	144
C3110-1029-B2	-3.0 dBm	2.0 dBm	-23.0 dBm	-3.0 dBm	20.0 dB	144
C3110-1035	0.0 dBm	5.0 dBm	-27.0 dBm	-3.0 dBm	27.0 dB	144
C3210-1013	-9.5 dBm	-4.0 dBm	-18.0 dBm	0.0 dBm	8.5 dB	145
C3210-1014	-9.5 dBm	-3.0 dBm	-20.0 dBm	-3.0 dBm	10.5 dB	145
C3210-1015	-5.0 dBm	0.0 dBm	-20.0 dBm	-3.0 dBm	15.0 dB	145
C3210-1017	-3.0 dBm	2.0 dBm	-24.0 dBm	-3.0 dBm	21.0 dB	145
C3210-1024	-10.0 dBm	-3.0 dBm	-17.0 dBm	-3.0 dBm	7.0 dB	145
C3210-1029-A1	-8.0 dBm	-3.0 dBm	-21.0 dBm	-3.0 dBm	13.0 dB	145
C3210-1029-A2	-8.0 dBm	-3.0 dBm	-21.0 dBm	-3.0 dBm	13.0 dB	145
C3210-1029-B1	-3.0 dBm	2.0 dBm	-23.0 dBm	-3.0 dBm	20.0 dB	145
C3210-1029-B2	-3.0 dBm	2.0 dBm	-23.0 dBm	-3.0 dBm	20.0 dB	145
C3210-1029-D1	-2.0 dBm	3.0 dBm	-26.0 dBm	-3.0 dBm	24.0 dB	145
C3210-1029-D2	-2.0 dBm	3.0 dBm	-26.0 dBm	-3.0 dBm	24.0 dB	145
C3210-1035	0.0 dBm	5.0 dBm	-27.0 dBm	-3.0 dBm	27.0 dB	145
C3220-1013	-9.5 dBm	-4.0 dBm	-18.0 dBm	0.0 dBm	8.5 dB	146
C3220-1013-D	-9.0 dBm	-4.0 dBm	-18.0 dBm	0.0 dBm	9.0 dB	146
C3220-1014	-9.5 dBm	-3.0 dBm	-20.0 dBm	-3.0 dBm	10.5 dB	146
C3220-1014-D	-9.0 dBm	-3.0 dBm	-21.0 dBm	-3.0 dBm	12.0 dB	146
C3220-1015	0.0 dBm	0.0 dBm	-20.0 dBm	-3.0 dBm	15.0 dB	146
C3220-1015-D	0.0 dBm	0.0 dBm	-24.0 dBm	-3.0 dBm	19.0 dB	146
C3220-1017	-3.0 dBm	2.0 dBm	-24.0 dBm	-3.0 dBm	21.0 dB	146
C3220-1029-A1	-8.0 dBm	-3.0 dBm	-22.0 dBm	-3.0 dBm	14.0 dB	146
C3220-1029-A2	-8.0 dBm	-3.0 dBm	-22.0 dBm	-3.0 dBm	14.0 dB	146
C3220-1029-B1	-3.0 dBm	2.0 dBm	-23.0 dBm	-3.0 dBm	20.0 dB	146
C3220-1029-B2	-3.0 dBm	2.0 dBm	-23.0 dBm	-3.0 dBm	20.0 dB	146
C3220-1029-DA1	-9.0 dBm	-3.0 dBm	-20.0 dBm	-3.0 dBm	11.0 dB	146
C3220-1029-DA2	-9.0 dBm	-3.0 dBm	-20.0 dBm	-3.0 dBm	11.0 dB	146
C3220-1035	0.0 dBm	5.0 dBm	-27.0 dBm	-3.0 dBm	27.0 dB	146
C3230-1013	-9.5 dBm	-4.0 dBm	-18.0 dBm	0.0 dBm	8.5 dB	147
C3230-1013-D	-9.0 dBm	-4.0 dBm	-18.0 dBm	0.0 dBm	9.0 dB	147
C3230-1014	-9.5 dBm	-3.0 dBm	-20.0 dBm	-3.0 dBm	10.5 dB	147
C3230-1014-D	-9.0 dBm	-3.0 dBm	-21.0 dBm	-3.0 dBm	12.0 dB	147
C3230-1015	0.0 dBm	0.0 dBm	-20.0 dBm	-3.0 dBm	15.0 dB	147
C3230-1015-D	0.0 dBm	0.0 dBm	-24.0 dBm	-3.0 dBm	19.0 dB	147
C3230-1017	-3.0 dBm	2.0 dBm	-24.0 dBm	-3.0 dBm	21.0 dB	147
C3230-1029-A1	-8.0 dBm	-3.0 dBm	-22.0 dBm	-3.0 dBm	14.0 dB	147
C3230-1029-A2	-8.0 dBm	-3.0 dBm	-22.0 dBm	-3.0 dBm	14.0 dB	147
C3230-1029-B1	-3.0 dBm	2.0 dBm	-23.0 dBm	-3.0 dBm	20.0 dB	147
C3230-1029-B2	-3.0 dBm	2.0 dBm	-23.0 dBm	-3.0 dBm	20.0 dB	147
C3230-1029-DA1	-9.0 dBm	-3.0 dBm	-20.0 dBm	-3.0 dBm	11.0 dB	147
C3230-1029-DA2	-9.0 dBm	-3.0 dBm	-20.0 dBm	-3.0 dBm	11.0 dB	147
C3230-1035	0.0 dBm	5.0 dBm	-27.0 dBm	-3.0 dBm	27.0 dB	147
C4TEF1011-100	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	63
C4TEF1011-110	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	64
C4TEF1013-100	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	63
C4TEF1013-110	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	64
C4TEF1014-100	-15.0 dBm	-8.0 dBm	-31.0 dBm	-8.0 dBm	16.0 dB	63
C4TEF1014-110	-15.0 dBm	-8.0 dBm	-31.0 dBm	-8.0 dBm	16.0 dB	64
C4TEF1015-100	-8.0 dBm	-2.0 dBm	-34.0 dBm	-7.0 dBm	26.0 dB	63

Fiber Specification Table

Product SKU	Min TX PWR	Max TX PWR	RX Sensitivity	Max In PWR	Link Budget	Page
C4TEF1015-110	-8.0 dBm	-2.0 dBm	-34.0 dBm	-7.0 dBm	26.0 dB	64
C4TEF1016-100	-5.0 dBm	0.0 dBm	-34.0 dBm	-7.0 dBm	29.0 dB	63
C4TEF1016-110	-5.0 dBm	0.0 dBm	-34.0 dBm	-7.0 dBm	29.0 dB	64
C4TEF1017-100	-5.0 dBm	0.0 dBm	-34.0 dBm	-7.0 dBm	29.0 dB	63
C4TEF1017-110	-5.0 dBm	0.0 dBm	-34.0 dBm	-7.0 dBm	29.0 dB	64
C4TEF1029-100	-13.0 dBm	-6.0 dBm	-32.0 dBm	-3.0 dBm	19.0 dB	63
C4TEF1029-101	-13.0 dBm	-6.0 dBm	-32.0 dBm	-3.0 dBm	19.0 dB	63
C4TEF1029-102	-8.0 dBm	-3.0 dBm	-33.0 dBm	-3.0 dBm	25.0 dB	63
C4TEF1029-103	-8.0 dBm	-3.0 dBm	-33.0 dBm	-3.0 dBm	25.0 dB	63
C4TEF1029-110	-13.0 dBm	-6.0 dBm	-32.0 dBm	-3.0 dBm	19.0 dB	64
C4TEF1029-111	-13.0 dBm	-6.0 dBm	-32.0 dBm	-3.0 dBm	19.0 dB	64
C4TEF1029-112	-8.0 dBm	-3.0 dBm	-33.0 dBm	-3.0 dBm	25.0 dB	64
C4TEF1029-113	-8.0 dBm	-3.0 dBm	-33.0 dBm	-3.0 dBm	25.0 dB	64
C4TEF1035-100	0.0 dBm	5.0 dBm	-36.0 dBm	-3.0 dBm	36.0 dB	63
C4TEF1035-110	0.0 dBm	5.0 dBm	-36.0 dBm	-3.0 dBm	36.0 dB	64
CAPTF3311-105	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	65
CAPTF3311-115	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	65
CAPTF3313-105	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	65
CAPTF3313-115	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	65
CAPTF3314-105	-15.0 dBm	-8.0 dBm	-31.0 dBm	-8.0 dBm	16.0 dB	65
CAPTF3314-115	-15.0 dBm	-8.0 dBm	-31.0 dBm	-8.0 dBm	16.0 dB	65
CAPTF3315-105	-27.0 dBm	-10.0 dBm	-34.0 dBm	-14.0 dBm	7.0 dB	65
CAPTF3315-115	-8.0 dBm	-2.0 dBm	-34.0 dBm	-7.0 dBm	26.0 dB	65
CAPTF3316-105	-5.0 dBm	0.0 dBm	-38.0 dBm	-7.0 dBm	33.0 dB	65
CAPTF3316-115	-5.0 dBm	0.0 dBm	-38.0 dBm	-7.0 dBm	33.0 dB	65
CAPTF3317-105	-5.0 dBm	0.0 dBm	-34.0 dBm	-3.0 dBm	29.0 dB	65
CAPTF3317-115	-5.0 dBm	0.0 dBm	-34.0 dBm	-3.0 dBm	29.0 dB	65
CAPTF3329-105	-13.0 dBm	-6.0 dBm	-32.0 dBm	-3.0 dBm	19.0 dB	65
CAPTF3329-106	-13.0 dBm	-6.0 dBm	-32.0 dBm	-3.0 dBm	19.0 dB	65
CAPTF3329-107	-8.0 dBm	-3.0 dBm	-33.0 dBm	-3.0 dBm	25.0 dB	65
CAPTF3329-108	-8.0 dBm	-3.0 dBm	-33.0 dBm	-3.0 dBm	25.0 dB	65
CAPTF3329-110	-13.0 dBm	-6.0 dBm	-32.0 dBm	-3.0 dBm	19.0 dB	65
CAPTF3329-116	-13.0 dBm	-6.0 dBm	-32.0 dBm	-3.0 dBm	19.0 dB	65
CAPTF3329-117	-8.0 dBm	-3.0 dBm	-33.0 dBm	-3.0 dBm	25.0 dB	65
CAPTF3329-118	-8.0 dBm	-3.0 dBm	-33.0 dBm	-3.0 dBm	25.0 dB	65
CBFFG1013-105	-9.5 dBm	-4.0 dBm	-17.0 dBm	0.0 dBm	7.5 dB	54
CBFFG1013-115	-9.0 dBm	-4.0 dBm	-18.0 dBm	0.0 dBm	9.0 dB	54
CBFFG1014-105	-9.5 dBm	-3.0 dBm	-20.0 dBm	-3.0 dBm	10.5 dB	54
CBFFG1014-115	-9.0 dBm	-3.0 dBm	-21.0 dBm	-3.0 dBm	12.0 dB	54
CBFFG1015-105	-5.0 dBm	0.0 dBm	-20.0 dBm	-3.0 dBm	15.0 dB	54
CBFFG1015-115	-5.0 dBm	0.0 dBm	-24.0 dBm	-3.0 dBm	19.0 dB	54
CBFFG1017-105	-3.0 dBm	2.0 dBm	-24.0 dBm	-3.0 dBm	21.0 dB	54
CBFFG1024-105	-10.0 dBm	-3.0 dBm	-17.0 dBm	-3.0 dBm	7.0 dB	54
CBFFG1029-105	-8.0 dBm	-3.0 dBm	-22.0 dBm	-3.0 dBm	14.0 dB	54
CBFFG1029-115	-8.0 dBm	-3.0 dBm	-22.0 dBm	-3.0 dBm	14.0 dB	54
CBFFG1029-106	-8.0 dBm	-3.0 dBm	-22.0 dBm	-3.0 dBm	14.0 dB	54
CBFFG1029-116	-8.0 dBm	-3.0 dBm	-22.0 dBm	-3.0 dBm	14.0 dB	54
CBFFG1029-107	-3.0 dBm	2.0 dBm	-23.0 dBm	-3.0 dBm	20.0 dB	54
CBFFG1029-108	-3.0 dBm	2.0 dBm	-23.0 dBm	-3.0 dBm	20.0 dB	54
CBFFG1035-105	0.0 dBm	5.0 dBm	-27.0 dBm	-3.0 dBm	27.0 dB	54
CBFTF1011-105	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	42
CBFTF1011-110	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	44
CBFTF1011-120	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	44
CBFTF1011-140	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	44
CBFTF1013-105	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	42
CBFTF1013-110	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	44
CBFTF1013-120	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	44
CBFTF1013-140	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	44
CBFTF1014-105	-15.0 dBm	-8.0 dBm	-31.0 dBm	-8.0 dBm	16.0 dB	42
CBFTF1014-110	-15.0 dBm	-8.0 dBm	-31.0 dBm	-8.0 dBm	16.0 dB	44
CBFTF1014-120	-15.0 dBm	-8.0 dBm	-31.0 dBm	-8.0 dBm	16.0 dB	44
CBFTF1014-140	-15.0 dBm	-8.0 dBm	-31.0 dBm	-8.0 dBm	16.0 dB	44
CBFTF1015-105	-8.0 dBm	-2.0 dBm	-34.0 dBm	-7.0 dBm	26.0 dB	42
CBFTF1015-110	-8.0 dBm	-2.0 dBm	-34.0 dBm	-7.0 dBm	26.0 dB	44
CBFTF1015-120	-8.0 dBm	-2.0 dBm	-34.0 dBm	-7.0 dBm	26.0 dB	44
CBFTF1015-140	-8.0 dBm	-2.0 dBm	-34.0 dBm	-7.0 dBm	26.0 dB	44
CBFTF1016-105	-5.0 dBm	0.0 dBm	-34.0 dBm	-7.0 dBm	32.0 dB	42
CBFTF1016-110	-5.0 dBm	0.0 dBm	-34.0 dBm	-7.0 dBm	29.0 dB	44
CBFTF1016-120	-5.0 dBm	0.0 dBm	-34.0 dBm	-7.0 dBm	29.0 dB	44
CBFTF1016-140	-5.0 dBm	0.0 dBm	-34.0 dBm	-7.0 dBm	29.0 dB	44
CBFTF1017-105	-5.0 dBm	0.0 dBm	-34.0 dBm	-7.0 dBm	29.0 dB	42
CBFTF1017-110	-5.0 dBm	0.0 dBm	-34.0 dBm	-7.0 dBm	29.0 dB	44
CBFTF1017-120	-5.0 dBm	0.0 dBm	-34.0 dBm	-7.0 dBm	29.0 dB	44
CBFTF1017-140	-5.0 dBm	0.0 dBm	-34.0 dBm	-7.0 dBm	29.0 dB	44
CBFTF1018-110	-19.0 dBm	-14.0 dBm	-33.5 dBm	-14.0 dBm	14.5 dB	44
CBFTF1018-120	-19.0 dBm	-14.0 dBm	-33.5 dBm	-14.0 dBm	14.5 dB	44
CBFTF1018-140	-19.0 dBm	-14.0 dBm	-33.5 dBm	-14.0 dBm	14.5 dB	44
CBFTF1019-105	-15.2 dBm	-8.0 dBm	-32.5 dBm	-3.0 dBm	17.3 dB	42
CBFTF1029-105	-13.0 dBm	-6.0 dBm	-32.0 dBm	-3.0 dBm	19.0 dB	42
CBFTF1029-106	-13.0 dBm	-6.0 dBm	-32.0 dBm	-3.0 dBm	19.0 dB	42
CBFTF1029-107	-8.0 dBm	-3.0 dBm	-33.0 dBm	-3.0 dBm	25.0 dB	42
CBFTF1029-108	-8.0 dBm	-3.0 dBm	-33.0 dBm	-3.0 dBm	25.0 dB	42
CBFTF1029-110	-13.0 dBm	-6.0 dBm	-32.0 dBm	-3.0 dBm	19.0 dB	44
CBFTF1029-111	-13.0 dBm	-6.0 dBm	-32.0 dBm	-3.0 dBm	19.0 dB	44
CBFTF1029-112	-8.0 dBm	-3.0 dBm	-33.0 dBm	-3.0 dBm	25.0 dB	44
CBFTF1029-113	-8.0 dBm	-3.0 dBm	-33.0 dBm	-3.0 dBm	25.0 dB	44
CBFTF1029-120	-13.0 dBm	-6.0 dBm	-32.0 dBm	-3.0 dBm	19.0 dB	44
CBFTF1029-121	-13.0 dBm	-6.0 dBm	-32.0 dBm	-3.0 dBm	19.0 dB	44
CBFTF1029-122	-8.0 dBm	-3.0 dBm	-33.0 dBm	-3.0 dBm	25.0 dB	44
CBFTF1029-123	-8.0 dBm	-3.0 dBm	-33.0 dBm	-3.0 dBm	25.0 dB	44
CBFTF1029-140	-13.0 dBm	-6.0 dBm	-32.0 dBm	-3.0 dBm	19.0 dB	44
CBFTF1029-141	-13.0 dBm	-6.0 dBm	-32.0 dBm	-3.0 dBm	19.0 dB	44
CBFTF1029-142	-8.0 dBm	-3.0 dBm	-33.0 dBm	-3.0 dBm	25.0 dB	44
CBFTF1029-143	-8.0 dBm	-3.0 dBm	-33.0 dBm	-3.0 dBm	25.0 dB	44
CBFTF1035-105	0.0 dBm	5.0 dBm	-36.0 dBm	-3.0 dBm	36.0 dB	42
CBFTF1039-105	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	42
CBFTF1040-105	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	42
CCH-MCM12-RJ-70S	-7.5 dBm	-2.0 dBm	-16.0 dBm	-2.0 dBm	8.5 dB	99
CCSCF3011-110	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	57
CCSCF3013-110	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	57
CCSCF3014-110	-15.0 dBm	-8.0 dBm	-31.0 dBm	-8.0 dBm	16.0 dB	57
CCSCF3015-110	-8.0 dBm	-2.0 dBm	-34.0 dBm	-7.0 dBm	26.0 dB	57
CCSCF3016-110	-5.0 dBm	0.0 dBm	-34.0 dBm	-7.0 dBm	29.0 dB	57
CCSCF3017-110	-5.0 dBm	0.0 dBm	-34.0 dBm	-7.0 dBm	29.0 dB	57

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Product SKU	Min TX PWR	Max TX PWR	RX Sensitivity	Max In PWR	Link Budget	Page
CCSCF3029-110	-13.0 dBm	-6.0 dBm	-32.0 dBm	-3.0 dBm	19.0 dB	57
CCSCF3029-111	-13.0 dBm	-6.0 dBm	-32.0 dBm	-3.0 dBm	19.0 dB	57
CCSCF3029-112	-8.0 dBm	-3.0 dBm	-33.0 dBm	-3.0 dBm	25.0 dB	57
CCSCF3029-113	-8.0 dBm	-3.0 dBm	-33.0 dBm	-3.0 dBm	25.0 dB	57
CCSCF3029-114	-5.0 dBm	0.0 dBm	-34.0 dBm	-3.0 dBm	29.0 dB	57
CCSCF3029-115	-5.0 dBm	0.0 dBm	-34.0 dBm	-3.0 dBm	29.0 dB	57
CCSCF3029-116	-3.0 dBm	2.0 dBm	-35.0 dBm	-3.0 dBm	32.0 dB	57
CCSCF3029-117	-8.0 dBm	-3.0 dBm	-33.0 dBm	-3.0 dBm	25.0 dB	57
CETTF1011-105	-19.0 dBm	-14.0 dBm	-32.5 dBm	-14.0 dBm	13.5 dB	34
CETTF1012-105	-27.0 dBm	-10.0 dBm	-34.0 dBm	-14.0 dBm	7.0 dB	34
CETTF1013-105	-19.0 dBm	-14.0 dBm	-32.5 dBm	-14.0 dBm	13.5 dB	34
CETTF1014-105	-19.0 dBm	-14.0 dBm	-34.0 dBm	-3.0 dBm	15.0 dB	34
CETTF1015-105	-18.0 dBm	-7.0 dBm	-32.0 dBm	-7.0 dBm	14.0 dB	34
CETTF1022-105	-15.0 dBm	-5.0 dBm	-34.0 dBm	-14.0 dBm	19.0 dB	34
CETTF1027-105	-19.0 dBm	-15.0 dBm	-32.5 dBm	-14.0 dBm	13.5 dB	34
CETTF1029-105	-14.0 dBm	-8.0 dBm	-33.0 dBm	-3.0 dBm	19.0 dB	34
CETTF1029-106	-14.0 dBm	-8.0 dBm	-33.0 dBm	-3.0 dBm	19.0 dB	34
CFBRM1011-100	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	46
CFBRM1011-110	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	46
CFBRM1013-100	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	46
CFBRM1013-110	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	46
CFBRM1014-100	-15.0 dBm	-8.0 dBm	-31.0 dBm	-8.0 dBm	16.0 dB	46
CFBRM1014-110	-15.0 dBm	-8.0 dBm	-31.0 dBm	-8.0 dBm	16.0 dB	46
CFBRM1015-100	-8.0 dBm	-2.0 dBm	-34.0 dBm	-7.0 dBm	26.0 dB	46
CFBRM1015-110	-8.0 dBm	-2.0 dBm	-34.0 dBm	-7.0 dBm	26.0 dB	46
CFBRM1016-100	-5.0 dBm	0.0 dBm	-34.0 dBm	-7.0 dBm	29.0 dB	46
CFBRM1017-100	-5.0 dBm	0.0 dBm	-34.0 dBm	-7.0 dBm	29.0 dB	46
CFBRM1029-100	-13.0 dBm	-6.0 dBm	-32.0 dBm	-3.0 dBm	19.0 dB	46
CFBRM1029-101	-13.0 dBm	-6.0 dBm	-32.0 dBm	-3.0 dBm	19.0 dB	46
CFBRM1029-102	-8.0 dBm	-3.0 dBm	-33.0 dBm	-3.0 dBm	25.0 dB	46
CFBRM1029-103	-8.0 dBm	-3.0 dBm	-33.0 dBm	-3.0 dBm	25.0 dB	46
CFBRM1029-110	-13.0 dBm	-6.0 dBm	-32.0 dBm	-3.0 dBm	19.0 dB	46
CFBRM1029-111	-13.0 dBm	-6.0 dBm	-32.0 dBm	-3.0 dBm	19.0 dB	46
CFBRM1035-100	0.0 dBm	5.0 dBm	-36.0 dBm	-3.0 dBm	36.0 dB	46
CFETF1011-110	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	36
CFETF1011-205	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	37
CFETF1013-110	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	36
CFETF1013-205	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	37
CFETF1014-110	-15.0 dBm	-8.0 dBm	-31.0 dBm	-8.0 dBm	16.0 dB	36
CFETF1014-205	-15.0 dBm	-8.0 dBm	-31.0 dBm	-8.0 dBm	16.0 dB	37
CFETF1015-110	-8.0 dBm	-2.0 dBm	-34.0 dBm	-7.0 dBm	26.0 dB	36
CFETF1015-205	-8.0 dBm	-2.0 dBm	-34.0 dBm	-7.0 dBm	26.0 dB	37
CFETF1016-110	-5.0 dBm	0.0 dBm	-34.0 dBm	-7.0 dBm	29.0 dB	36
CFETF1016-205	-5.0 dBm	0.0 dBm	-34.0 dBm	-7.0 dBm	29.0 dB	37
CFETF1017-110	-5.0 dBm	0.0 dBm	-34.0 dBm	-7.0 dBm	29.0 dB	36
CFETF1017-205	-5.0 dBm	0.0 dBm	-34.0 dBm	-7.0 dBm	29.0 dB	37
CFETF1018-205	-19.0 dBm	-14.0 dBm	-33.5 dBm	-14.0 dBm	14.5 dB	37
CFETF1019-205	-15.2 dBm	-8.0 dBm	-32.5 dBm	-3.0 dBm	17.3 dB	37
CFETF1029-205	-13.0 dBm	-6.0 dBm	-32.0 dBm	-3.0 dBm	19.0 dB	37
CFETF1029-206	-13.0 dBm	-6.0 dBm	-32.0 dBm	-3.0 dBm	19.0 dB	37
CFETF1029-207	-8.0 dBm	-3.0 dBm	-33.0 dBm	-3.0 dBm	25.0 dB	37
CFETF1029-208	-8.0 dBm	-3.0 dBm	-33.0 dBm	-3.0 dBm	25.0 dB	37
CFETF1029-209	-5.0 dBm	0.0 dBm	-34.0 dBm	-3.0 dBm	29.0 dB	37
CFETF1029-210	-6.0 dBm	0.0 dBm	-34.0 dBm	-3.0 dBm	28.0 dB	37
CFETF1029-211	-2.0 dBm	3.0 dBm	-35.0 dBm	-3.0 dBm	33.0 dB	37
CFETF1029-212	-3.0 dBm	2.0 dBm	-35.0 dBm	-3.0 dBm	32.0 dB	37
CFETF1039-205	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	37
CFMFF1313-200	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	39
CFMFF1313-220	-10.0 dBm	-4.0 dBm	-17.0 dBm	0.0 dBm	7.0 dB	48
CFMFF1314-200 MM	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	39
CFMFF1314-200 SM	-15.0 dBm	-8.0 dBm	-31.0 dBm	-8.0 dBm	16.0 dB	39
CFMFF1314-220 MM	-10.0 dBm	-4.0 dBm	-17.0 dBm	0.0 dBm	7.0 dB	48
CFMFF1314-220 SM	-13.0 dBm	-3.0 dBm	-20.0 dBm	-3.0 dBm	7.0 dB	48
CFMFF1314-280 MM	-10.0 dBm	-4.0 dBm	-17.0 dBm	0.0 dBm	7.0 dB	49
CFMFF1314-280 SM	-2.0 dBm	3.0 dBm	-35.0 dBm	-3.0 dBm	33.0 dB	49
CFMFF1315-200 MM	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	39
CFMFF1315-200 SM	-8.0 dBm	-2.0 dBm	-34.0 dBm	-7.0 dBm	26.0 dB	39
CFMFF1315-220 MM	-10.0 dBm	-4.0 dBm	-17.0 dBm	0.0 dBm	7.0 dB	48
CFMFF1315-220 SM	-5.0 dBm	0.0 dBm	-20.0 dBm	-3.0 dBm	15.0 dB	48
CFMFF1315-280 MM	-10.0 dBm	-4.0 dBm	-17.0 dBm	0.0 dBm	7.0 dB	49
CFMFF1315-280 SM	-5.0 dBm	0.0 dBm	-20.0 dBm	-3.0 dBm	15.0 dB	49
CFMFF1316-200 MM	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	39
CFMFF1316-200 SM	-5.0 dBm	0.0 dBm	-34.0 dBm	-7.0 dBm	29.0 dB	39
CFMFF1317-200 MM	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	39
CFMFF1317-200 SM	-5.0 dBm	0.0 dBm	-34.0 dBm	-7.0 dBm	29.0 dB	39
CFMFF1317-220 MM	-10.0 dBm	-4.0 dBm	-17.0 dBm	0.0 dBm	7.0 dB	48
CFMFF1317-220 SM	-3.0 dBm	2.0 dBm	-23.0 dBm	-3.0 dBm	20.0 dB	48
CFMFF1317-280 MM	-10.0 dBm	-4.0 dBm	-17.0 dBm	0.0 dBm	7.0 dB	49
CFMFF1317-280 SM	-3.0 dBm	2.0 dBm	-24.0 dBm	-3.0 dBm	21.0 dB	49
CFMFF1324-220 MM	-10.0 dBm	-4.0 dBm	-17.0 dBm	0.0 dBm	7.0 dB	48
CFMFF1324-220 MME	-10.0 dBm	-3.0 dBm	-17.0 dBm	-3.0 dBm	7.0 dB	48
CFMFF1324-280 MM	-10.0 dBm	-4.0 dBm	-17.0 dBm	0.0 dBm	7.0 dB	49
CFMFF1324-280 MME	-10.0 dBm	-3.0 dBm	-17.0 dBm	-3.0 dBm	7.0 dB	49
CFMFF1329-200 MM	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	39
CFMFF1329-200 SM	-13.0 dBm	-6.0 dBm	-32.0 dBm	-3.0 dBm	19.0 dB	39
CFMFF1329-201 MM	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	39
CFMFF1329-201 SM	-13.0 dBm	-6.0 dBm	-32.0 dBm	-3.0 dBm	19.0 dB	39
CFMFF1329-202 MM	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	39
CFMFF1329-202 SM	-8.0 dBm	-3.0 dBm	-33.0 dBm	-3.0 dBm	25.0 dB	39
CFMFF1329-203 MM	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	39
CFMFF1329-203 SM	-8.0 dBm	-3.0 dBm	-33.0 dBm	-3.0 dBm	25.0 dB	39
CFMFF1329-220 MM	-19.0 dBm	-14.0 dBm	-26.0 dBm	-14.0 dBm	7.0 dB	48
CFMFF1329-220 SM	-8.0 dBm	-3.0 dBm	-21.0 dBm	-3.0 dBm	13.0 dB	48
CFMFF1329-221 MM	-19.0 dBm	-14.0 dBm	-26.0 dBm	-14.0 dBm	7.0 dB	48
CFMFF1329-221 SM	-8.0 dBm	-3.0 dBm	-21.0 dBm	-3.0 dBm	13.0 dB	48
CFMFF1329-222 MM	-19.0 dBm	-14.0 dBm	-26.0 dBm	-14.0 dBm	7.0 dB	48
CFMFF1329-222 SM	-3.0 dBm	2.0 dBm	-23.0 dBm	-8.0 dBm	20.0 dB	48
CFMFF1329-223 MM	-19.0 dBm	-14.0 dBm	-26.0 dBm	-14.0 dBm	7.0 dB	48
CFMFF1329-223 SM	-3.0 dBm	2.0 dBm	-23.0 dBm	-8.0 dBm	20.0 dB	48
CFMFF1329-280 MM	-10.0 dBm	-4.0 dBm	-17.0 dBm	0.0 dBm	7.0 dB	49
CFMFF1329-280 SM	-8.0 dBm	-3.0 dBm	-21.0 dBm	-3.0 dBm	13.0 dB	49
CFMFF1329-281 MM	-10.0 dBm	-4.0 dBm	-17.0 dBm	0.0 dBm	7.0 dB	49
CFMFF1329-281 SM	-8.0 dBm	-3.0 dBm	-21.0 dBm	-3.0 dBm	13.0 dB	49
CFMFF1329-282 MM	-10.0 dBm	-4.0 dBm	-17.0 dBm	0.0 dBm	7.0 dB	49

Fiber Specification Table

Product SKU	Min TX PWR	Max TX PWR	RX Sensitivity	Max In PWR	Link Budget	Page
CFMFF1329-282 SM	-3.0 dBm	2.0 dBm	-23.0 dBm	-8.0 dBm	20.0 dB	49
CFMFF1329-283 MM	-10.0 dBm	-4.0 dBm	-17.0 dBm	0.0 dBm	7.0 dB	49
CFMFF1329-283 SM	-3.0 dBm	2.0 dBm	-23.0 dBm	-8.0 dBm	20.0 dB	49
CFMFF1329-286 MM	-10.0 dBm	-4.0 dBm	-17.0 dBm	0.0 dBm	7.0 dB	49
CFMFF1329-286 SM	-2.0 dBm	3.0 dBm	-26.0 dBm	-3.0 dBm	24.0 dBm	49
CFMFF1329-287 MM	-2.0 dBm	3.0 dBm	-26.0 dBm	-3.0 dBm	24.0 dB	49
CFMFF1329-287 SM	-2.0 dBm	3.0 dBm	-26.0 dBm	-3.0 dBm	24.0 dB	49
CFMFF1335-220 MM	-10.0 dBm	-4.0 dBm	-17.0 dBm	0.0 dBm	7.0 dB	48
CFMFF1335-220 SM	0.0 dBm	5.0 dBm	-27.0 dBm	-3.0 dBm	27.0 dB	48
CFMFF1335-280 MM	-10.0 dBm	-4.0 dBm	-17.0 dBm	0.0 dBm	7.0 dB	49
CFMFF1335-280 SM	0.0 dBm	5.0 dBm	-27.0 dBm	-3.0 dBm	27.0 dB	49
CFMFF1414-200 SM	-15.0 dBm	-8.0 dBm	-31.0 dBm	-8.0 dBm	16.0 dB	38
CFMFF1414-220 SM	-13.0 dBm	-3.0 dBm	-20.0 dBm	-3.0 dBm	7.0 dB	48
CFMFF1414-280 SM	-13.0 dBm	-3.0 dBm	-20.0 dBm	-3.0 dBm	7.0 dB	49
CFMFF1415-200 SM	-15.0 dBm	-8.0 dBm	-31.0 dBm	-8.0 dBm	16.0 dB	38
CFMFF1424-220 MM	-10.0 dBm	-3.0 dBm	-17.0 dBm	-3.0 dBm	7.0 dB	48
CFMFF1424-220 SM	-13.0 dBm	-3.0 dBm	-20.0 dBm	-3.0 dBm	7.0 dB	48
CFMFF1429-200 MM	-15.0 dBm	-8.0 dBm	-31.0 dBm	-8.0 dBm	16.0 dB	39
CFMFF1429-200 SM	-13.0 dBm	-6.0 dBm	-32.0 dBm	-6.0 dBm	19.0 dB	39
CFMFF1429-201 MM	-15.0 dBm	-8.0 dBm	-31.0 dBm	-8.0 dBm	16.0 dB	39
CFMFF1429-201 SM	-13.0 dBm	-6.0 dBm	-32.0 dBm	-3.0 dBm	19.0 dB	39
CFMFF1429-202 MM	-15.0 dBm	-8.0 dBm	-31.0 dBm	-8.0 dBm	16.0 dB	39
CFMFF1429-202 SM	-8.0 dBm	-3.0 dBm	-33.0 dBm	-3.0 dBm	25.0 dB	39
CFMFF1429-203 MM	-15.0 dBm	-8.0 dBm	-31.0 dBm	-8.0 dBm	16.0 dB	39
CFMFF1429-203 SM	-8.0 dBm	-3.0 dBm	-33.0 dBm	-3.0 dBm	25.0 dB	39
CGETF1013-110	-10.0 dBm	-4.0 dBm	-17.0 dBm	0.0 dBm	7.0 dB	47
CGETF1014-110	-9.0 dBm	-3.0 dBm	-21.0 dBm	-3.0 dBm	12.0 dB	47
CGETF1015-110	-5.0 dBm	0.0 dBm	-21.0 dBm	-3.0 dBm	16.0 dB	47
CGETF1017-110	-3.0 dBm	2.0 dBm	-24.0 dBm	-3.0 dBm	21.0 dB	47
CGETF1024-110	-10.0 dBm	-3.0 dBm	-17.0 dBm	-3.0 dBm	7.0 dB	47
CGETF1029-110	-8.0 dBm	-3.0 dBm	-21.0 dBm	-3.0 dBm	13.0 dB	47
CGETF1029-111	-9.0 dBm	-3.0 dBm	-21.0 dBm	-3.0 dBm	13.0 dB	47
CGETF1029-112	-3.0 dBm	2.0 dBm	-23.0 dBm	-3.0 dBm	20.0 dB	47
CGETF1029-113	-3.0 dBm	2.0 dBm	-23.0 dBm	-3.0 dBm	20.0 dB	47
CGETF1029-116	-2.0 dBm	3.0 dBm	-26.0 dBm	-3.0 dBm	24.0 dB	47
CGETF1029-117	-2.0 dBm	3.0 dBm	-26.0 dBm	-3.0 dBm	24.0 dB	47
CGETF1035-110	0.0 dBm	5.0 dBm	-27.0 dBm	-9.0 dBm	27.0 dB	47
CGETF1039-110	-9.0 dBm	-4.0 dBm	-17.0 dBm	-3.0 dBm	8.0 dB	47
CGFEB1013-110	-10.0 dBm	-4.0 dBm	-17.0 dBm	0.0 dBm	7.0 dB	53
CGFEB1013-120	-10.0 dBm	-4.0 dBm	-17.0 dBm	0.0 dBm	7.0 dB	50
CGFEB1014-110	-13.0 dBm	-3.0 dBm	-20.0 dBm	-3.0 dBm	7.0 dB	53
CGFEB1014-120	-13.0 dBm	-3.0 dBm	-20.0 dBm	-3.0 dBm	7.0 dB	50
CGFEB1015-110	-5.0 dBm	0.0 dBm	-20.0 dBm	-3.0 dBm	15.0 dB	53
CGFEB1015-120	-5.0 dBm	0.0 dBm	-20.0 dBm	-3.0 dBm	15.0 dB	50
CGFEB1017-110	-3.0 dBm	2.0 dBm	-23.0 dBm	-3.0 dBm	20.0 dB	53
CGFEB1017-120	-3.0 dBm	2.0 dBm	-23.0 dBm	-3.0 dBm	20.0 dB	50
CGFEB1024-110	-10.0 dBm	-3.0 dBm	-17.0 dBm	-3.0 dBm	7.0 dB	53
CGFEB1024-120	-10.0 dBm	-3.0 dBm	-17.0 dBm	-3.0 dBm	7.0 dB	50
CGFEB1029-110	-8.0 dBm	-3.0 dBm	-21.0 dBm	-3.0 dBm	13.0 dB	53
CGFEB1029-111	-8.0 dBm	-3.0 dBm	-21.0 dBm	-3.0 dBm	13.0 dB	53
CGFEB1029-120	-8.0 dBm	-3.0 dBm	-21.0 dBm	-3.0 dBm	13.0 dB	50
CGFEB1029-121	-8.0 dBm	-3.0 dBm	-21.0 dBm	-3.0 dBm	13.0 dB	50
CGFEB1029-122	-3.0 dBm	2.0 dBm	-23.0 dBm	-8.0 dBm	20.0 dB	50
CGFEB1029-123	-3.0 dBm	2.0 dBm	-23.0 dBm	-8.0 dBm	20.0 dB	50
CGFEB1029-126	-2.0 dBm	3.0 dBm	-26.0 dBm	-3.0 dBm	24.0 dB	50
CGFEB1029-127	-2.0 dBm	3.0 dBm	-26.0 dBm	-3.0 dBm	24.0 dB	50
CGFEB1035-120	0.0 dBm	5.0 dBm	-27.0 dBm	-3.0 dBm	27.0 dB	50
CGFEB1313-150 MM1	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	52
CGFEB1313-150 MM2	-10.0 dBm	-4.0 dBm	-17.0 dBm	0.0 dBm	7.0 dB	52
CGFEB1314-150 MM	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	52
CGFEB1314-150 SM	-13.0 dBm	-3.0 dBm	-20.0 dBm	-3.0 dBm	7.0 dB	52
CGFEB1315-150 MM	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	52
CGFEB1315-150 SM	-5.0 dBm	0.0 dBm	-20.0 dBm	-3.0 dBm	15.0 dB	52
CGFEB1317-150 MM	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	52
CGFEB1317-150 SM	-3.0 dBm	2.0 dBm	-23.0 dBm	-3.0 dBm	20.0 dB	52
CGFEB1324-150 MM	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	52
CGFEB1324-150 MME	-10.0 dBm	-3.0 dBm	-17.0 dBm	-3.0 dBm	7.0 dB	52
CGFEB1329-150 MM	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	52
CGFEB1329-150 SM	-8.0 dBm	-3.0 dBm	-21.0 dBm	-3.0 dBm	13.0 dB	52
CGFEB1329-151 MM	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	52
CGFEB1329-151 SM	-8.0 dBm	-3.0 dBm	-21.0 dBm	-3.0 dBm	13.0 dB	52
CGFEB1329-152 MM	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	52
CGFEB1329-152 SM	-3.0 dBm	-2.0 dBm	-23.0 dBm	-8.0 dBm	20.0 dB	52
CGFEB1329-153 MM	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	52
CGFEB1329-153 SM	-3.0 dBm	2.0 dBm	-23.0 dBm	-8.0 dBm	20.0 dB	52
CGFEB1335-150 MM	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	52
CGFEB1335-150 SM	0.0 dBm	5.0 dBm	-27.0 dBm	-3.0 dBm	27.0 dB	52
CGFEB1340-170 MM	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	52
CGFEB1429-150 SM1	-15.0 dBm	-8.0 dBm	-31.0 dBm	-8.0 dBm	16.0 dB	52
CGFEB1429-150 SM2	-8.0 dBm	-3.0 dBm	-21.0 dBm	-3.0 dBm	13.0 dB	52
CGFEB1429-151 SM1	-15.0 dBm	-8.0 dBm	-31.0 dBm	-8.0 dBm	16.0 dB	52
CGFEB1429-151 SM2	-8.0 dBm	-3.0 dBm	-21.0 dBm	-3.0 dBm	13.0 dB	52
CGFEB1429-152 SM1	-15.0 dBm	-8.0 dBm	-31.0 dBm	-8.0 dBm	16.0 dB	52
CGFEB1429-152 SM2	-3.0 dBm	2.0 dBm	-23.0 dBm	-8.0 dBm	20.0 dB	52
CGFEB1429-153 SM1	-15.0 dBm	-8.0 dBm	-31.0 dBm	-8.0 dBm	16.0 dB	52
CGFEB1429-153 SM2	-3.0 dBm	2.0 dBm	-23.0 dBm	-8.0 dBm	20.0 dB	52
CGFEB1440-170 SM	-15.0 dBm	-8.0 dBm	-31.0 dBm	-8.0 dBm	16.0 dB	52
CPSVT2611-100	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	58
CPSVT2613-100	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	58
CPSVT2614-100	-15.0 dBm	-8.0 dBm	-31.0 dBm	-8.0 dBm	16.0 dB	58
CPSVT2629-100	-13.0 dBm	-6.0 dBm	-32.0 dBm	-3.0 dBm	19.0 dB	58
CPSVT2629-101	-13.0 dBm	-6.0 dBm	-32.0 dBm	-3.0 dBm	19.0 dB	58
CPSVT2629-102	-8.0 dBm	-3.0 dBm	-33.0 dBm	-3.0 dBm	25.0 dB	58
CPSVT2629-103	-8.0 dBm	-3.0 dBm	-33.0 dBm	-3.0 dBm	25.0 dB	58
CRMFE1011-200	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	38
CRMFE1013-200	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	38
CRMFE1014-200	-15.0 dBm	-8.0 dBm	-31.0 dBm	-8.0 dBm	16.0 dB	38
CRMFE1015-200	-8.0 dBm	-2.0 dBm	-34.0 dBm	-7.0 dBm	26.0 dB	38
CRMFE1016-200	-5.0 dBm	0.0 dBm	-34.0 dBm	-7.0 dBm	29.0 dB	38
CRMFE1017-200	-5.0 dBm	0.0 dBm	-34.0 dBm	-7.0 dBm	29.0 dB	38
CRMFE1029-200	-13.0 dBm	-6.0 dBm	-32.0 dBm	-3.0 dBm	19.0 dB	38
CRMFE1029-201	-13.0 dBm	-6.0 dBm	-32.0 dBm	-3.0 dBm	19.0 dB	38
CRMFE1029-202	-8.0 dBm	-3.0 dBm	-33.0 dBm	-3.0 dBm	25.0 dB	38
CRMFE1029-203	-8.0 dBm	-3.0 dBm	-33.0 dBm	-3.0 dBm	25.0 dB	38

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Product SKU	Min TX PWR	Max TX PWR	RX Sensitivity	Max In PWR	Link Budget	Page
CRMFE1035-200	0.0 dBm	5.0 dBm	-36.0 dBm	-3.0 dBm	36.0 dB	38
CRS2F3111-100	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	59
CRS2F3113-100	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	59
CRS2F3114-100	-15.0 dBm	-8.0 dBm	-31.0 dBm	-7.0 dBm	16.0 dB	59
CRS2F3115-100	-8.0 dBm	-2.0 dBm	-34.0 dBm	-7.0 dBm	26.0 dB	59
CRS2F3129-100	-13.0 dBm	-6.0 dBm	-32.0 dBm	-3.0 dBm	19.0 dB	59
CRS2F3129-101	-13.0 dBm	-6.0 dBm	-32.0 dBm	-3.0 dBm	19.0 dB	59
CRS2F3129-102	-8.0 dBm	-3.0 dBm	-33.0 dBm	-3.0 dBm	25.0 dB	59
CRS2F3129-103	-8.0 dBm	-3.0 dBm	-33.0 dBm	-3.0 dBm	25.0 dB	59
CRS4F3111-100	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	60
CRS4F3113-100	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	60
CRS4F3114-100	-15.0 dBm	-8.0 dBm	-31.0 dBm	-8.0 dBm	16.0 dB	60
CRS4F3115-100	-8.0 dBm	-2.0 dBm	-34.0 dBm	-7.0 dBm	26.0 dB	60
CRS4F3211-100	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	60
CRS4F3213-100	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	60
CRS4F3214-100	-15.0 dBm	-8.0 dBm	-31.0 dBm	-7.0 dBm	16.0 dB	60
CRS4F3215-100	-8.0 dBm	-2.0 dBm	-34.0 dBm	-7.0 dBm	26.0 dB	60
CSDTF1011-120	-19.0 dBm	-14.0 dBm	-32.5 dBm	-14.0 dBm	13.5 dB	62
CSDTF1012-120	-27.0 dBm	-10.0 dBm	-34.0 dBm	-14.0 dBm	7.0 dB	62
CSDTF1013-120	-19.0 dBm	-14.0 dBm	-32.5 dBm	-14.0 dBm	13.5 dB	62
CSDTF1014-120	-19.0 dBm	-14.0 dBm	-34.0 dBm	-3.0 dBm	15.0 dB	62
CSDTF1015-120	-8.0 dBm	-2.0 dBm	-38.0 dBm	-8.0 dBm	30.0 dB	62
CSDTF1016-120	-5.0 dBm	0.0 dBm	-38.0 dBm	-7.0 dBm	33.0 dB	62
CSDTF1017-120	-5.0 dBm	0.0 dBm	-34.0 dBm	-7.0 dBm	29.0 dB	62
CSDTF1022-120	-15.0 dBm	-5.0 dBm	-25.0 dBm	-14.0 dBm	10.0 dB	62
CSDTF1027-120	-19.0 dBm	-15.0 dBm	-32.5 dBm	-14.0 dBm	13.5 dB	62
CSDTF1029-120	-13.0 dBm	-6.0 dBm	-32.0 dBm	-3.0 dBm	19.0 dB	62
CSDTF1029-121	-13.0 dBm	-6.0 dBm	-32.0 dBm	-3.0 dBm	19.0 dB	62
CSDTF1029-122	-8.0 dBm	-3.0 dBm	-33.0 dBm	-3.0 dBm	25.0 dB	62
CSDTF1029-123	-8.0 dBm	-3.0 dBm	-33.0 dBm	-3.0 dBm	25.0 dB	62
CSDTF3011-115	-14.0 dBm	-12.0 dBm	-25.0 dBm	-12.0 dBm	11.0 dB	62
CSDTF3012-115	-27.0 dBm	-10.0 dBm	-34.0 dBm	-14.0 dBm	7.0 dB	62
CSDTF3013-115	-19.0 dBm	-14.0 dBm	-32.5 dBm	-14.0 dBm	13.5 dB	62
CSDTF3014-115	-19.0 dBm	-14.0 dBm	-34.0 dBm	-3.0 dBm	15.0 dB	62
CSDTF3015-115	-8.0 dBm	-2.0 dBm	-38.0 dBm	-8.0 dBm	30.0 dB	62
CSDTF3016-115	-5.0 dBm	0.0 dBm	-38.0 dBm	-7.0 dBm	33.0 dB	62
CSDTF3017-115	-5.0 dBm	0.0 dBm	-34.0 dBm	-7.0 dBm	29.0 dB	62
CSDTF3022-115	-15.0 dBm	-5.0 dBm	-25.0 dBm	-14.0 dBm	10.0 dB	62
CSDTF3027-115	-19.0 dBm	-15.0 dBm	-32.5 dBm	-14.0 dBm	13.5 dB	62
CSDTF3029-115	-13.0 dBm	-6.0 dBm	-32.0 dBm	-3.0 dBm	19.0 dB	62
CSDTF3029-116	-13.0 dBm	-6.0 dBm	-32.0 dBm	-3.0 dBm	19.0 dB	62
CSDTF3029-117	-8.0 dBm	-3.0 dBm	-33.0 dBm	-3.0 dBm	25.0 dB	62
CSDTF3029-118	-8.0 dBm	-3.0 dBm	-33.0 dBm	-3.0 dBm	25.0 dB	62
CSEFE1012-100	-15.0 dBm	-8.0 dBm	-32.0 dBm	-5.0 dBm	17.0 dB	35
CSEFE1014-100	-15.0 dBm	-8.0 dBm	-32.0 dBm	-5.0 dBm	17.0 dB	35
CSEFE1015-100	-8.0 dBm	-2.0 dBm	-34.0 dBm	-5.0 dBm	26.0 dB	35
CSEFE1022-100	-8.0 dBm	-2.0 dBm	-34.0 dBm	-5.0 dBm	26.0 dB	35
CSEFE1029-100	-14.0 dBm	-8.0 dBm	-33.0 dBm	-3.0 dBm	19.0 dB	35
CSEFE1029-101	-14.0 dBm	-8.0 dBm	-33.0 dBm	-3.0 dBm	19.0 dB	35
CSETF1011-205	-19.0 dBm	-14.0 dBm	-32.5 dBm	-14.0 dBm	13.5 dB	40
CSETF1013-205	-19.0 dBm	-14.0 dBm	-32.5 dBm	-14.0 dBm	13.5 dB	40
CSRFB1011-100	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	45
CSRFB1013-100	-15.0 dBm	-8.0 dBm	-31.0 dBm	-8.0 dBm	16.0 dB	45
CSRFB1014-100	-15.0 dBm	-8.0 dBm	-31.0 dBm	-8.0 dBm	16.0 dB	45
CSRFB1029-100	-14.0 dBm	-8.0 dBm	-33.0 dBm	-3.0 dBm	19.0 dB	45
CSRFB1029-101	-14.0 dBm	-8.0 dBm	-33.0 dBm	-3.0 dBm	19.0 dB	45
CSRFB1029-102	-8.0 dBm	-3.0 dBm	-33.0 dBm	-3.0 dBm	25.0 dB	45
CSRFB1029-103	-8.0 dBm	-3.0 dBm	-33.0 dBm	-3.0 dBm	25.0 dB	45
E-100BTX-FX-05	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	78
E-100BTX-FX-05(100)	-13.0 dBm	-6.0 dBm	-32.0 dBm	-3.0 dBm	19.0 dB	78
E-100BTX-FX-05(100HT)	-14.0 dBm	-8.0 dBm	-33.0 dBm	-3.0 dBm	19.0 dB	79
E-100BTX-FX-05(101)	-13.0 dBm	-6.0 dBm	-32.0 dBm	-3.0 dBm	19.0 dB	78
E-100BTX-FX-05(101HT)	-13.0 dBm	-6.0 dBm	-32.0 dBm	-3.0 dBm	19.0 dB	79
E-100BTX-FX-05(102)	-8.0 dBm	-3.0 dBm	-33.0 dBm	-3.0 dBm	25.0 dB	78
E-100BTX-FX-05(103)	-8.0 dBm	-3.0 dBm	-33.0 dBm	-3.0 dBm	25.0 dB	78
E-100BTX-FX-05(104)	-15.0 dBm	-8.0 dBm	-31.0 dBm	-8.0 dBm	16.0 dB	78
E-100BTX-FX-05(105)	-8.0 dBm	-2.0 dBm	-34.0 dBm	-7.0 dBm	26.0 dB	78
E-100BTX-FX-05(106)	-2.0 dBm	3.0 dBm	-35.0 dBm	-3.0 dBm	33.0 dB	78
E-100BTX-FX-05(107)	-3.0 dBm	2.0 dBm	-35.0 dBm	-3.0 dBm	32.0 dB	78
E-100BTX-FX-05(HT)	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	79
E-100BTX-FX-05(LC)	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	78
E-100BTX-FX-05(LH)	-8.0 dBm	-2.0 dBm	-34.0 dBm	-7.0 dBm	26.0 dB	78
E-100BTX-FX-05(LHHT)	-8.0 dBm	-2.0 dBm	-34.0 dBm	-7.0 dBm	26.0 dB	79
E-100BTX-FX-05(LW)	-5.0 dBm	0.0 dBm	-34.0 dBm	-7.0 dBm	29.0 dB	78
E-100BTX-FX-05(LWHT)	-5.0 dBm	0.0 dBm	-34.0 dBm	-7.0 dBm	29.0 dB	79
E-100BTX-FX-05(MT)	-19.0 dBm	-14.0 dBm	-33.5 dBm	-14.0 dBm	14.5 dB	78
E-100BTX-FX-05(SC)	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	78
E-100BTX-FX-05(SCHT)	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	79
E-100BTX-FX-05(SM)	-15.0 dBm	-8.0 dBm	-31.0 dBm	-8.0 dBm	16.0 dB	78
E-100BTX-FX-05(SMHT)	-15.0 dBm	-8.0 dBm	-31.0 dBm	-8.0 dBm	16.0 dB	79
E-100BTX-FX-05(SMLC)	-15.2 dBm	-8.0 dBm	-32.5 dBm	-3.0 dBm	17.3 dB	78
E-100BTX-FX-05(XL)	-5.0 dBm	0.0 dBm	-34.0 dBm	-7.0 dBm	29.0 dB	78
E-100BTX-FX-05(XLHT)	-5.0 dBm	0.0 dBm	-38.0 dBm	-8.0 dBm	33.0 dB	79
E-100BTX-FX-05(XLW)	0.0 dBm	5.0 dBm	-36.0 dBm	-3.0 dBm	36.0 dB	78
E-100BTX-FX-N-01	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	159
E-100BTX-FX-N-01(SC)	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	159
E-100BTX-FX-N-01(SM)	-15.0 dBm	-8.0 dBm	-31.0 dBm	-8.0 dBm	16.0 dB	159
E-100BTX-FX-NLP-01	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	159
E-100BTX-FX-NLP-01(SC)	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	159
E-100BTX-FX-NLP-01(SM)	-15.0 dBm	-8.0 dBm	-31.0 dBm	-8.0 dBm	16.0 dB	159
E-FRL-MC05	-19.0 dBm	-10.0 dBm	-29.5 dBm	-7.2 dBm	10.5 dB	136
E-FRL-MC05(L)	-19.0 dBm	-14.0 dBm	-29.5 dBm	-14.0 dBm	10.5 dB	136
E-FRL-MC05(SC)	-19.0 dBm	-10.0 dBm	-29.5 dBm	-7.2 dBm	10.5 dB	136
E-FRL-MC05(SM)	-29.0 dBm	-10.0 dBm	-34.0 dBm	-14.0 dBm	5.0 dB	136
E-TBT-FRL-05	-19.0 dBm	-14.0 dBm	-32.5 dBm	-14.0 dBm	13.5 dB	73
E-TBT-FRL-05(HT)	-19.0 dBm	-14.0 dBm	-32.5 dBm	-14.0 dBm	13.5 dB	74
E-TBT-FRL-05(L)	-19.0 dBm	-15.0 dBm	-32.5 dBm	-14.0 dBm	13.5 dB	73
E-TBT-FRL-05(LH)	-15.0 dBm	-5.0 dBm	-34.0 dBm	-14.0 dBm	19.0 dB	73
E-TBT-FRL-05(SC)	-19.0 dBm	-14.0 dBm	-32.5 dBm	-14.0 dBm	13.5 dB	73
E-TBT-FRL-05(SCHT)	-19.0 dBm	-14.0 dBm	-32.5 dBm	-14.0 dBm	13.5 dB	74
E-TBT-FRL-05(SM)	-27.0 dBm	-10.0 dBm	-34.0 dBm	-14.0 dBm	7.0 dB	73
E-TBT-FRL-05(XC)	-27.0 dBm	-10.0 dBm	-34.0 dBm	-14.0 dBm	7.0 dB	73
E-TBT-FRL-05(XCHT)	-18.0 dBm	-7.0 dBm	-32.0 dBm	-7.0x dBm	14.0 dB	74
E-TBT-FRL-N-02(SC)	-16.0 dBm	-10.0 dBm	-29.5 dBm	-7.2 dBm	13.5 dB	159

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Product SKU	Min TX PWR	Max TX PWR	RX Sensitivity	Max In PWR	Link Budget	Page
E-TBT-FRL-N-02(ST)	-19.0 dBm	-14.0 dBm	-32.5 dBm	-14.0 dBm	13.5 dB	159
E-TBT-FRL-NLP-02(SC)	-16.0 dBm	-10.0 dBm	-29.5 dBm	-7.2 dBm	13.5 dB	159
E-TBT-FRL-NLP-02(ST)	-19.0 dBm	-14.0 dBm	-32.5 dBm	-14.0 dBm	13.5 dB	159
F-SM-MM-02 MM	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	82
F-SM-MM-02 SM	-15.0 dBm	-8.0 dBm	-31.0 dBm	-8.0 dBm	16.0 dB	81
F-SM-MM-02(LH) MM	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	81
F-SM-MM-02(LH) SM	-8.0 dBm	-2.0 dBm	-34.0 dBm	-7.0 dBm	26.0 dB	81
F-SM-MM-02(LW) MM	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	81
F-SM-MM-02(LW) SM	-5.0 dBm	0.0 dBm	-34.0 dBm	-7.0 dBm	29.0 dB	81
F-SM-MM-02(XL) MM	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	81
F-SM-MM-02(XL) SM	-5.0 dBm	0.0 dBm	-34.0 dBm	-7.0 dBm	29.0 dB	81
F-SM-MM-05 MM	-19.0 dBm	-14.0 dBm	-32.5 dBm	-14.0 dBm	13.5 dB	75
F-SM-MM-05 SM	-27.0 dBm	-10.0 dBm	-34.0 dBm	-14.0 dBm	7.0 dB	75
F-SM-MM-06 MM	-19.0 dBm	-14.0 dBm	-26.0 dBm	-14.0 dBm	7.0 dB	108
F-SM-MM-06 SM	-15.0 dBm	-8.0 dBm	-28.0 dBm	-7.0 dBm	13.0 dB	108
F-SM-MM-06(XL) MM	-19.0 dBm	-14.0 dBm	-26.0 dBm	-14.0 dBm	7.0 dB	108
F-SM-MM-06(XL) SM	-3.0 dBm	2.0 dBm	-29.0 dBm	-7.0 dBm	26.0 dB	108
J/E-PSW-FX-03	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	84
J/E-PSW-FX-03(SC)	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	84
J/E-PSW-FX-03(SM)	-15.0 dBm	-8.0 dBm	-31.0 dBm	-8.0 dBm	16.0 dB	84
J/E-PSW-FX-03(100)	-13.0 dBm	-6.0 dBm	-32.0 dBm	-3.0 dBm	19.0 dB	84
J/E-PSW-FX-03(101)	-13.0 dBm	-6.0 dBm	-32.0 dBm	-3.0 dBm	19.0 dB	84
J/FE-CF-04	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	77
J/FE-CF-04(LC)	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	77
J/FE-CF-04(LH)	-8.0 dBm	-2.0 dBm	-34.0 dBm	-7.0 dBm	26.0 dB	77
J/FE-CF-04(SC)	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	77
J/FE-CF-04(SM)	-15.0 dBm	-8.0 dBm	-31.0 dBm	-8.0 dBm	16.0 dB	77
J/FE-CF-04(SMLC)	-15.2 dBm	-8.0 dBm	-32.5 dBm	-3.0 dBm	17.3 dB	77
J/FE-CF-04(100)	-13.0 dBm	-6.0 dBm	-32.0 dBm	-3.0 dBm	19.0 dB	77
J/FE-CF-04(101)	-13.0 dBm	-6.0 dBm	-32.0 dBm	-3.0 dBm	19.0 dB	77
J/GE-CF-01(LX1)	9.5 dBm	-3.0 dBm	-20.0 dBm	-3.0 dBm	10.5 dB	95
J/GE-CF-01(LX2)	-5.0 dBm	0.0 dBm	-20.0 dBm	-3.0 dBm	15.0 dB	95
J/GE-CF-01(LX6)	-3.0 dBm	2.0 dBm	-24.0 dBm	-3.0 dBm	21.0 dB	95
J/GE-CF-01(LX100)	-8.0 dBm	-3.0 dBm	-21.0 dBm	-3.0 dBm	13.0 dB	95
J/GE-CF-01(LX101)	-8.0 dBm	-3.0 dBm	-21.0 dBm	-3.0 dBm	13.0 dB	95
J/GE-CF-01(SX)	-10.0 dBm	-4.0 dBm	-17.0 dBm	0.0 dBm	7.0 dB	95
J/RS232-CF-01	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	110
J/RS232-CF-01(SC)	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	110
J/RS232-TF-01	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	110
J/RS232-TF-01(SC)	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	110
M/E-ISW-FX-01(100)	-14.0 dBm	-8.0 dBm	-32.0 dBm	-3.0 dBm	18.0 dB	122
M/E-ISW-FX-01(101)	-14.0 dBm	-8.0 dBm	-32.0 dBm	-3.0 dBm	18.0 dB	122
M/E-ISW-FX-01(102)	-8.0 dBm	-3.0 dBm	-34.0 dBm	-3.0 dBm	26.0 dB	122
M/E-ISW-FX-01(103)	-8.0 dBm	-3.0 dBm	-34.0 dBm	-3.0 dBm	26.0 dB	122
M/E-ISW-FX-01(LH)	-5.0 dBm	0.0 dBm	-35.0 dBm	-3.0 dBm	30.0 dB	122
M/E-ISW-FX-01(MMLC)	-19.0 dBm	-12.0 dBm	-30.0 dBm	-8.0 dBm	11.0 dB	122
M/E-ISW-FX-01(SC)	-19.0 dBm	-12.0 dBm	-30.0 dBm	-8.0 dBm	11.0 dB	122
M/E-ISW-FX-01(SM)	-15.0 dBm	-8.0 dBm	-34.0 dBm	-3.0 dBm	19.0 dB	122
M/E-ISW-FX-01(SMLC)	-15.0 dBm	-8.0 dBm	-34.0 dBm	-3.0 dBm	19.0 dB	122
M/E-ISW-FX-01(ST)	-19.0 dBm	-14.0 dBm	-33.0 dBm	-12.0 dBm	14.0 dB	122
M/E-PSW-FX-01	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	85
M/E-PSW-FX-01(SC)	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	85
M/E-PSW-FX-01(SM)	-15.0 dBm	-8.0 dBm	-31.0 dBm	-8.0 dBm	16.0 dB	85
M/E-PSW-FX-01(100)	-13.0 dBm	-6.0 dBm	-32.0 dBm	-3.0 dBm	19.0 dB	85
M/E-PSW-FX-01(101)	-13.0 dBm	-6.0 dBm	-32.0 dBm	-3.0 dBm	19.0 dB	85
M/E-PSW-FX-01(102)	-8.0 dBm	-3.0 dBm	-33.0 dBm	-3.0 dBm	25.0 dB	85
M/E-PSW-FX-01(103)	-8.0 dBm	-3.0 dBm	-33.0 dBm	-3.0 dBm	25.0 dB	85
M/GE-PSW-LX-01	-9.5 dBm	-3.0 dBm	-20.0 dBm	-3.0 dBm	10.5 dB	100
M/GE-PSW-SX-01	-10.0 dBm	-4.0 dBm	-17.0 dBm	0.0 dBm	7.0 dB	100
M/GE-PSW-LX-01(100)	-9.5 dBm	-3.0 dBm	-20.0 dBm	-3.0 dBm	10.5 dB	100
M/GE-PSW-SX-01(101)	-10.0 dBm	-4.0 dBm	-17.0 dBm	0.0 dBm	7.0 dB	100
MIL-S501SC	-19.0 dBm	-14.0 dBm	-31.0 dBm	-14.0 dBm	12.0 dB	195
MIL-S501SC-15	-20.0 dBm	0.0 dBm	-32.0 dBm	0.0 dBm	12.0 dB	195
MIL-S501SC-30	-15.0 dBm	-8.0 dBm	-34.0 dBm	0.0 dBm	19.0 dB	195
MIL-S501SC-60	-5.0 dBm	0.0 dBm	-35.0 dBm	0.0 dBm	19.0 dB	195
MIL-S501ST	-19.0 dBm	-14.0 dBm	-31.0 dBm	-14.0 dBm	12.0 dB	195
MIL-SM801PST	-19.0 dBm	-14.0 dBm	-31.0 dBm	-14.0 dBm	12.0 dB	182
MIL-SM801PSC	-19.0 dBm	-14.0 dBm	-31.0 dBm	-14.0 dBm	12.0 dB	182
MIL-SM801PSC-15	-20.0 dBm	0.0 dBm	-32.0 dBm	0.0 dBm	12.0 dB	182
MP/E-PSW-FX-01	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	85
MP/E-PSW-FX-01(SC)	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	85
MP/E-PSW-FX-01(SM)	-15.0 dBm	-8.0 dBm	-31.0 dBm	-8.0 dBm	16.0 dB	85
MU/E-PSW-FX-01	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	85
MU/E-PSW-FX-01(SC)	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	85
MU/E-PSW-FX-01(SM)	-15.0 dBm	-8.0 dBm	-31.0 dBm	-8.0 dBm	16.0 dB	85
MU/E-PSW-FX-01(100)	-13.0 dBm	-6.0 dBm	-32.0 dBm	-3.0 dBm	19.0 dB	85
MU/E-PSW-FX-01(101)	-13.0 dBm	-6.0 dBm	-32.0 dBm	-3.0 dBm	19.0 dB	85
NDM-FTX-MT-01	-19.0 dBm	-14.0 dBm	-31.0 dBm	-17.0 dBm	12.0 dB	172
NDM-FTX-MT-01(L)	-19.0 dBm	-14.0 dBm	-31.0 dBm	-17.0 dBm	12.0 dB	172
NDM-FTX-SB201-01	-14.0 dBm	-8.0 dBm	-32.0 dBm	0.0 dBm	18.0 dB	172
NDM-FTX-SB201-01(L)	-14.0 dBm	-8.0 dBm	-32.0 dBm	0.0 dBm	18.0 dB	172
NDM-FTX-SB202-01	-14.0 dBm	-8.0 dBm	-32.0 dBm	0.0 dBm	18.0 dB	172
NDM-FTX-SB202-01(L)	-14.0 dBm	-8.0 dBm	-32.0 dBm	0.0 dBm	18.0 dB	172
NDM-FTX-SC-01	-19.0 dBm	-14.0 dBm	-31.0 dBm	-17.0 dBm	12.0 dB	172
NDM-FTX-SC-01(L)	-19.0 dBm	-14.0 dBm	-31.0 dBm	-17.0 dBm	12.0 dB	172
NDM-FTX-SC5-01	-19.0 dBm	-14.0 dBm	-31.0 dBm	-7.5 dBm	12.0 dB	172
NDM-FTX-SC5-01(L)	-19.0 dBm	-14.0 dBm	-31.0 dBm	-7.5 dBm	12.0 dB	172
NDM-FTX-SC20-01	-15.0 dBm	-8.0 dBm	-31.0 dBm	0.0 dBm	16.0 dB	172
NDM-FTX-SC20-01(L)	-15.0 dBm	-8.0 dBm	-31.0 dBm	0.0 dBm	16.0 dB	172
NDM-FTX-ST-01	-19.0 dBm	-14.0 dBm	-31.0 dBm	-17.0 dBm	12.0 dB	172
NDM-FTX-ST-01(L)	-19.0 dBm	-14.0 dBm	-31.0 dBm	-17.0 dBm	12.0 dB	172
N-FX-LC-02	-19.0 dBm	-14.0 dBm	-31.0 dBm	-17.0 dBm	12.0 dB	171
N-FX-LC-02(L)	-19.0 dBm	-14.0 dBm	-31.0 dBm	-17.0 dBm	12.0 dB	171
N-FX-MT-02	-19.0 dBm	-14.0 dBm	-31.0 dBm	-17.0 dBm	12.0 dB	171
N-FX-MT-02(L)	-19.0 dBm	-14.0 dBm	-31.0 dBm	-17.0 dBm	12.0 dB	171
N-FX-SB201-02	-14.0 dBm	-8.0 dBm	-32.0 dBm	0.0 dBm	18.0 dB	171
N-FX-SB202-02	-14.0 dBm	-8.0 dBm	-32.0 dBm	0.0 dBm	18.0 dB	171
N-FX-SC-02	-19.0 dBm	-14.0 dBm	-31.0 dBm	-17.0 dBm	12.0 dB	171
N-FX-SC-02(L)	-19.0 dBm	-14.0 dBm	-31.0 dBm	-17.0 dBm	12.0 dB	171
N-FX-SC5-02	-19.0 dBm	-14.0 dBm	-31.0 dBm	-7.5 dBm	12.0 dB	171
N-FX-SC5-02(L)	-19.0 dBm	-14.0 dBm	-31.0 dBm	-7.5 dBm	12.0 dB	171
N-FX-SC20-02	-15.0 dBm	-8.0 dBm	-31.0 dBm	0.0 dBm	16.0 dB	171
N-FX-SC20-02(L)	-15.0 dBm	-8.0 dBm	-31.0 dBm	0.0 dBm	16.0 dB	171
N-FX-ST-02	-19.0 dBm	-14.0 dBm	-31.0 dBm	-17.0 dBm	12.0 dB	171

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Product SKU	Min TX PWR	Max TX PWR	RX Sensitivity	Max In PWR	Link Budget	Page
N-FX-ST-02(L)	-19.0 dBm	-14.0 dBm	-31.0 dBm	-17.0 dBm	12.0 dB	171
NEC-FXE-LC-01	-19.0 dBm	-14.0 dBm	-32.0 dBm	0.0 dBm	13.0 dB	177
NEC-FXE-SC-01	-19.0 dBm	-14.0 dBm	-31.0 dBm	0.0 dBm	12.0 dB	177
NEC-FXE-SC20-01	-5.0 dBm	0.0 dBm	-35.0 dBm	0.0 dBm	30.0 dB	177
N-GLX-LC-02	-9.5 dBm	-3.0 dBm	-21.0 dBm	-3.0 dBm	11.5 dB	174
N-GLX-SC-02	-9.5 dBm	-3.0 dBm	-20.0 dBm	-3.0 dBm	10.5 dB	174
N-GSX-LC-02	-9.5 dBm	-4.0 dBm	-17.0 dBm	-3.0 dBm	7.5 dB	174
N-GSX-SX-02	-9.5 dBm	-4.0 dBm	-17.0 dBm	-17.0 dBm	7.5 dB	174
PCM32-FX-SC-01	-19.0 dBm	-14.0 dBm	-31.0 dBm	-17.0 dBm	12.0 dB	176
S2220-1011	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	150
S2220-1011-D	-19.0 dBm	-12.0 dBm	-31.0 dBm	-8.0 dBm	12.0 dB	150
S2220-1013	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	150
S2220-1013-D	-19.0 dBm	-12.0 dBm	-31.0 dBm	-8.0 dBm	12.0 dB	150
S2220-1014	-15.0 dBm	-8.0 dBm	-31.0 dBm	-8.0 dBm	16.0 dB	150
S2220-1014-D	-14.0 dBm	-8.0 dBm	-32.0 dBm	-8.0 dBm	18.0 dB	150
S2220-1015	-5.0 dBm	-2.0 dBm	-34.0 dBm	-7.0 dBm	29.0 dB	150
S2220-1015-D	-10.0 dBm	-4.0 dBm	-34.0 dBm	-8.0 dBm	24.0 dB	150
S2220-1016	-5.0 dBm	0.0 dBm	-34.0 dBm	-7.0 dBm	29.0 dB	150
S2220-1017	-5.0 dBm	0.0 dBm	-34.0 dBm	-7.0 dBm	29.0 dB	150
S2220-1029-A1	-14.0 dBm	-8.0 dBm	-33.0 dBm	-3.0 dBm	19.0 dB	150
S2220-1029-A2	-14.0 dBm	-8.0 dBm	-33.0 dBm	-3.0 dBm	19.0 dB	150
S2220-1029-B1	-8.0 dBm	-3.0 dBm	-33.0 dBm	-3.0 dBm	25.0 dB	150
S2220-1029-B2	-8.0 dBm	-3.0 dBm	-33.0 dBm	-3.0 dBm	25.0 dB	150
S2220-1029-DA1	-14.0 dBm	-8.0 dBm	-33.0 dBm	-8.0 dBm	19.0 dB	150
S2220-1029-DA2	-14.0 dBm	-8.0 dBm	-33.0 dBm	-8.0 dBm	19.0 dB	150
S2220-1035	0.0 dBm	5.0 dBm	-36.0 dBm	-3.0 dBm	36.0 dB	150
S3220-1013	-9.5 dBm	-4.0 dBm	-18.0 dBm	0.0 dBm	8.5 dB	154
S3220-1013-D	-9.0 dBm	-4.0 dBm	-18.0 dBm	0.0 dBm	9.0 dB	154
S3220-1014	-9.5 dBm	-3.0 dBm	-20.0 dBm	-3.0 dBm	10.5 dB	154
S3220-1014-D	-9.0 dBm	-3.0 dBm	-21.0 dBm	-3.0 dBm	12.0 dB	154
S3220-1015	0.0 dBm	0.0 dBm	-20.0 dBm	-3.0 dBm	15.0 dB	154
S3220-1015-D	0.0 dBm	0.0 dBm	-24.0 dBm	-3.0 dBm	19.0 dB	154
S3220-1017	-3.0 dBm	2.0 dBm	-24.0 dBm	-3.0 dBm	21.0 dB	154
S3220-1029-A1	-8.0 dBm	-3.0 dBm	-22.0 dBm	-3.0 dBm	14.0 dB	154
S3220-1029-A2	-8.0 dBm	-3.0 dBm	-22.0 dBm	-3.0 dBm	14.0 dB	154
S3220-1029-B1	-3.0 dBm	2.0 dBm	-23.0 dBm	-3.0 dBm	20.0 dB	154
S3220-1029-B2	-3.0 dBm	2.0 dBm	-23.0 dBm	-3.0 dBm	20.0 dB	154
S3220-1029-DA1	-9.0 dBm	-3.0 dBm	-20.0 dBm	-3.0 dBm	11.0 dB	154
S3220-1029-DA2	-9.0 dBm	-3.0 dBm	-20.0 dBm	-3.0 dBm	11.0 dB	154
S3220-1035	0.0 dBm	5.0 dBm	-27.0 dBm	-3.0 dBm	27.0 dB	154
S3230-1013	-9.5 dBm	-4.0 dBm	-18.0 dBm	0.0 dBm	8.5 dB	155
S3230-1013-D	-9.0 dBm	-4.0 dBm	-18.0 dBm	0.0 dBm	9.0 dB	155
S3230-1014	-9.5 dBm	-3.0 dBm	-20.0 dBm	-3.0 dBm	10.5 dB	155
S3230-1014-D	-9.0 dBm	-3.0 dBm	-21.0 dBm	-3.0 dBm	12.0 dB	155
S3230-1015	0.0 dBm	0.0 dBm	-20.0 dBm	-3.0 dBm	15.0 dB	155
S3230-1015-D	0.0 dBm	0.0 dBm	-24.0 dBm	-3.0 dBm	19.0 dB	155
S3230-1017	-3.0 dBm	2.0 dBm	-24.0 dBm	-3.0 dBm	21.0 dB	155
S3230-1029-A1	-8.0 dBm	-3.0 dBm	-22.0 dBm	-3.0 dBm	14.0 dB	155
S3230-1029-A2	-8.0 dBm	-3.0 dBm	-22.0 dBm	-3.0 dBm	14.0 dB	155
S3230-1029-B1	-3.0 dBm	2.0 dBm	-23.0 dBm	-3.0 dBm	20.0 dB	155
S3230-1029-B2	-3.0 dBm	2.0 dBm	-23.0 dBm	-3.0 dBm	20.0 dB	155
S3230-1029-DA1	-9.0 dBm	-3.0 dBm	-20.0 dBm	-3.0 dBm	11.0 dB	155
S3230-1029-DA2	-9.0 dBm	-3.0 dBm	-20.0 dBm	-3.0 dBm	11.0 dB	155
S3230-1035	0.0 dBm	5.0 dBm	-27.0 dBm	-3.0 dBm	27.0 dB	155
S4TEF1011-100	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	116
S4TEF1011-105	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	117
S4TEF1011-110	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	118
S4TEF1011-115	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	119
S4TEF1013-100	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	116
S4TEF1013-105	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	117
S4TEF1013-110	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	118
S4TEF1013-115	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	119
S4TEF1014-100	-15.0 dBm	-8.0 dBm	-31.0 dBm	-8.0 dBm	16.0 dB	116
S4TEF1014-105	-15.0 dBm	-8.0 dBm	-31.0 dBm	-8.0 dBm	16.0 dB	117
S4TEF1014-110	-15.0 dBm	-8.0 dBm	-31.0 dBm	-8.0 dBm	16.0 dB	118
S4TEF1014-115	-15.0 dBm	-8.0 dBm	-31.0 dBm	-8.0 dBm	16.0 dB	119
S4TEF1015-100	-8.0 dBm	-2.0 dBm	-34.0 dBm	-7.0 dBm	26.0 dB	116
S4TEF1015-105	-8.0 dBm	-2.0 dBm	-34.0 dBm	-7.0 dBm	26.0 dB	117
S4TEF1015-110	-8.0 dBm	-2.0 dBm	-34.0 dBm	-7.0 dBm	26.0 dB	118
S4TEF1015-115	-8.0 dBm	-2.0 dBm	-34.0 dBm	-7.0 dBm	26.0 dB	119
S4TEF1016-100	-5.0 dBm	0.0 dBm	-34.0 dBm	-7.0 dBm	29.0 dB	116
S4TEF1016-105	-5.0 dBm	0.0 dBm	-34.0 dBm	-7.0 dBm	29.0 dB	117
S4TEF1016-110	-5.0 dBm	0.0 dBm	-34.0 dBm	-7.0 dBm	29.0 dB	118
S4TEF1016-115	-5.0 dBm	0.0 dBm	-34.0 dBm	-7.0 dBm	29.0 dB	119
S4TEF1017-100	-5.0 dBm	0.0 dBm	-34.0 dBm	-7.0 dBm	29.0 dB	116
S4TEF1017-105	-5.0 dBm	0.0 dBm	-34.0 dBm	-7.0 dBm	29.0 dB	117
S4TEF1017-110	-5.0 dBm	0.0 dBm	-34.0 dBm	-7.0 dBm	29.0 dB	118
S4TEF1017-115	-5.0 dBm	0.0 dBm	-34.0 dBm	-7.0 dBm	29.0 dB	119
S4TEF1029-100	-13.0 dBm	-6.0 dBm	-32.0 dBm	-3.0 dBm	19.0 dB	116
S4TEF1029-101	-13.0 dBm	-6.0 dBm	-32.0 dBm	-3.0 dBm	19.0 dB	116
S4TEF1029-102	-8.0 dBm	-3.0 dBm	-33.0 dBm	-3.0 dBm	25.0 dB	116
S4TEF1029-103	-8.0 dBm	-3.0 dBm	-33.0 dBm	-3.0 dBm	25.0 dB	116
S4TEF1029-105	-13.0 dBm	-6.0 dBm	-32.0 dBm	-3.0 dBm	19.0 dB	116
S4TEF1029-106	-13.0 dBm	-6.0 dBm	-32.0 dBm	-3.0 dBm	19.0 dB	117
S4TEF1029-110	-13.0 dBm	-6.0 dBm	-32.0 dBm	-3.0 dBm	19.0 dB	118
S4TEF1029-111	-13.0 dBm	-6.0 dBm	-32.0 dBm	-3.0 dBm	19.0 dB	118
S4TEF1029-112	-8.0 dBm	-3.0 dBm	-33.0 dBm	-3.0 dBm	25.0 dB	118
S4TEF1029-113	-8.0 dBm	-3.0 dBm	-33.0 dBm	-3.0 dBm	25.0 dB	118
S4TEF1029-115	-13.0 dBm	-6.0 dBm	-32.0 dBm	-3.0 dBm	19.0 dB	119
S4TEF1029-116	-13.0 dBm	-6.0 dBm	-32.0 dBm	-3.0 dBm	19.0 dB	117
SAPTF3311-105	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	120
SAPTF3311-115	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	120
SAPTF3313-105	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	120
SAPTF3313-115	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	120
SAPTF3314-105	-15.0 dBm	-8.0 dBm	-31.0 dBm	-8.0 dBm	16.0 dB	120
SAPTF3314-115	-15.0 dBm	-8.0 dBm	-31.0 dBm	-8.0 dBm	16.0 dB	120
SAPTF3315-105	-8.0 dBm	-2.0 dBm	-34.0 dBm	-8.0 dBm	26.0 dB	120
SAPTF3315-115	-8.0 dBm	-2.0 dBm	-34.0 dBm	-8.0 dBm	26.0 dB	120
SAPTF3316-105	-5.0 dBm	0.0 dBm	-38.0 dBm	-7.0 dBm	33.0 dB	120
SAPTF3316-115	-5.0 dBm	0.0 dBm	-38.0 dBm	-7.0 dBm	33.0 dB	120
SAPTF3317-105	-5.0 dBm	0.0 dBm	-34.0 dBm	-7.0 dBm	29.0 dB	120
SAPTF3317-115	-5.0 dBm	0.0 dBm	-34.0 dBm	-7.0 dBm	29.0 dB	120
SAPTF3329-105	-13.0 dBm	-6.0 dBm	-32.0 dBm	-3.0 dBm	19.0 dB	120
SAPTF3329-106	-13.0 dBm	-6.0 dBm	-32.0 dBm	-3.0 dBm	19.0 dB	120

Fiber Specification Table

Product SKU	Min TX PWR	Max TX PWR	RX Sensitivity	Max In PWR	Link Budget	Page
SAPTF3329-107	-8.0 dBm	-3.0 dBm	-33.0 dBm	-3.0 dBm	25.0 dB	120
SAPTF3329-108	-8.0 dBm	-3.0 dBm	-33.0 dBm	-3.0 dBm	25.0 dB	120
SAPTF3329-115	-13.0 dBm	-6.0 dBm	-32.0 dBm	-3.0 dBm	19.0 dB	120
SAPTF3329-116	-13.0 dBm	-6.0 dBm	-32.0 dBm	-3.0 dBm	19.0 dB	120
SAPTF3329-117	-8.0 dBm	-3.0 dBm	-33.0 dBm	-3.0 dBm	25.0 dB	120
SAPTF3329-118	-8.0 dBm	-3.0 dBm	-33.0 dBm	-3.0 dBm	25.0 dB	120
SBFFG1013-105	-9.5 dBm	-4.0 dBm	-17.0 dBm	0.0 dBm	7.5 dB	104
SBFFG1013-115	-9.0 dBm	-4.0 dBm	-18.0 dBm	0.0 dBm	9.0 dB	104
SBFFG1014-105	-9.5 dBm	-3.0 dBm	-20.0 dBm	-3.0 dBm	10.5 dB	104
SBFFG1014-115	-9.0 dBm	-3.0 dBm	-21.0 dBm	-3.0 dBm	12.0 dB	104
SBFFG1015-105	-5.0 dBm	0.0 dBm	-20.0 dBm	-3.0 dBm	15.0 dB	104
SBFFG1015-115	-5.0 dBm	0.0 dBm	-24.0 dBm	-3.0 dBm	19.0 dB	104
SBFFG1017-105	-3.0 dBm	2.0 dBm	-24.0 dBm	-3.0 dBm	21.0 dB	104
SBFFG1024-105	-10.0 dBm	-3.0 dBm	-17.0 dBm	-3.0 dBm	7.0 dB	104
SBFFG1035-105	0.0 dBm	5.0 dBm	-27.0 dBm	-3.0 dBm	27.0 dB	104
SBFFG1029-105	-8.0 dBm	-3.0 dBm	-22.0 dBm	-3.0 dBm	14.0 dB	104
SBFFG1029-106	-8.0 dBm	-3.0 dBm	-22.0 dBm	-3.0 dBm	14.0 dB	104
SBFFG1029-107	-3.0 dBm	2.0 dBm	-23.0 dBm	-3.0 dBm	20.0 dB	104
SBFFG1029-108	-3.0 dBm	2.0 dBm	-23.0 dBm	-3.0 dBm	20.0 dB	104
SBFFG1029-115	-8.0 dBm	-3.0 dBm	-22.0 dBm	-3.0 dBm	14.0 dB	104
SBFFG1029-116	-8.0 dBm	-3.0 dBm	-22.0 dBm	-3.0 dBm	14.0 dB	104
SBFTF1011-105	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	87
SBFTF1011-110	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	89
SBFTF1011-120	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	89
SBFTF1011-140	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	89
SBFTF1013-105	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	87
SBFTF1013-110	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	89
SBFTF1013-120	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	89
SBFTF1013-140	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	89
SBFTF1014-105	-15.0 dBm	-8.0 dBm	-31.0 dBm	-8.0 dBm	16.0 dB	87
SBFTF1014-110	-15.0 dBm	-8.0 dBm	-31.0 dBm	-8.0 dBm	16.0 dB	89
SBFTF1014-120	-15.0 dBm	-8.0 dBm	-31.0 dBm	-8.0 dBm	16.0 dB	89
SBFTF1014-140	-15.0 dBm	-8.0 dBm	-31.0 dBm	-8.0 dBm	16.0 dB	89
SBFTF1015-105	-5.0 dBm	-2.0 dBm	-34.0 dBm	-7.0 dBm	29.0 dB	87
SBFTF1015-110	-8.0 dBm	-2.0 dBm	-34.0 dBm	-7.0 dBm	26.0 dB	89
SBFTF1015-120	-8.0 dBm	-2.0 dBm	-34.0 dBm	-7.0 dBm	26.0 dB	89
SBFTF1015-140	-8.0 dBm	-2.0 dBm	-34.0 dBm	-7.0 dBm	26.0 dB	89
SBFTF1016-105	-5.0 dBm	0.0 dBm	-34.0 dBm	-7.0 dBm	32.0 dB	87
SBFTF1016-110	-5.0 dBm	0.0 dBm	-34.0 dBm	-7.0 dBm	29.0 dB	89
SBFTF1016-120	-5.0 dBm	0.0 dBm	-34.0 dBm	-7.0 dBm	29.0 dB	89
SBFTF1016-140	-5.0 dBm	0.0 dBm	-34.0 dBm	-7.0 dBm	29.0 dB	89
SBFTF1017-105	-5.0 dBm	0.0 dBm	-34.0 dBm	-7.0 dBm	29.0 dB	87
SBFTF1017-110	-5.0 dBm	0.0 dBm	-34.0 dBm	-7.0 dBm	29.0 dB	89
SBFTF1017-120	-5.0 dBm	0.0 dBm	-34.0 dBm	-7.0 dBm	29.0 dB	89
SBFTF1017-140	-5.0 dBm	0.0 dBm	-34.0 dBm	-7.0 dBm	29.0 dB	89
SBFTF1018-110	-19.0 dBm	-14.0 dBm	-33.5 dBm	-14.0 dBm	14.5 dB	89
SBFTF1018-120	-19.0 dBm	-14.0 dBm	-33.5 dBm	-14.0 dBm	14.5 dB	89
SBFTF1018-140	-19.0 dBm	-14.0 dBm	-33.5 dBm	-14.0 dBm	14.5 dB	89
SBFTF1019-105	-15.2 dBm	-8.0 dBm	-32.5 dBm	-3.0 dBm	17.3 dB	87
SBFTF1029-105	-14.0 dBm	-8.0 dBm	-33.0 dBm	-3.0 dBm	19.0 dB	87
SBFTF1029-106	-14.0 dBm	-8.0 dBm	-33.0 dBm	-3.0 dBm	19.0 dB	87
SBFTF1029-107	-8.0 dBm	-3.0 dBm	-33.0 dBm	-3.0 dBm	25.0 dB	87
SBFTF1029-108	-8.0 dBm	-3.0 dBm	-33.0 dBm	-3.0 dBm	25.0 dB	87
SBFTF1029-110	-13.0 dBm	-6.0 dBm	-32.0 dBm	-3.0 dBm	19.0 dB	89
SBFTF1029-111	-13.0 dBm	-6.0 dBm	-32.0 dBm	-3.0 dBm	19.0 dB	89
SBFTF1029-112	-8.0 dBm	-3.0 dBm	-33.0 dBm	-3.0 dBm	25.0 dB	89
SBFTF1029-113	-8.0 dBm	-3.0 dBm	-33.0 dBm	-3.0 dBm	25.0 dB	89
SBFTF1029-120	-13.0 dBm	-6.0 dBm	-32.0 dBm	-3.0 dBm	19.0 dB	89
SBFTF1029-121	-13.0 dBm	-6.0 dBm	-32.0 dBm	-3.0 dBm	19.0 dB	89
SBFTF1029-122	-8.0 dBm	-3.0 dBm	-33.0 dBm	-3.0 dBm	25.0 dB	89
SBFTF1029-123	-8.0 dBm	-3.0 dBm	-33.0 dBm	-3.0 dBm	25.0 dB	89
SBFTF1029-140	-13.0 dBm	-6.0 dBm	-32.0 dBm	-3.0 dBm	19.0 dB	89
SBFTF1029-141	-13.0 dBm	-6.0 dBm	-32.0 dBm	-3.0 dBm	19.0 dB	89
SBFTF1029-142	-8.0 dBm	-3.0 dBm	-33.0 dBm	-3.0 dBm	25.0 dB	89
SBFTF1029-143	-8.0 dBm	-3.0 dBm	-33.0 dBm	-3.0 dBm	25.0 dB	89
SBFTF1035-105	5.0 dBm	0.0 dBm	-38.0 dBm	-8.0 dBm	33.0 dB	87
SBFTF1039-105	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	87
SBFTF1040-105	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	87
SCSCF3011-110	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	109
SCSCF3013-110	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	109
SCSCF3014-110	-15.0 dBm	-8.0 dBm	-31.0 dBm	-8.0 dBm	16.0 dB	109
SCSCF3015-110	-8.0 dBm	-2.0 dBm	-34.0 dBm	-7.0 dBm	26.0 dB	109
SCSCF3016-110	-5.0 dBm	0.0 dBm	-34.0 dBm	-7.0 dBm	29.0 dB	109
SCSCF3017-110	-5.0 dBm	0.0 dBm	-34.0 dBm	-7.0 dBm	29.0 dB	109
SCSCF3029-110	-13.0 dBm	-6.0 dBm	-32.0 dBm	-3.0 dBm	19.0 dB	109
SCSCF3029-111	-13.0 dBm	-6.0 dBm	-32.0 dBm	-3.0 dBm	19.0 dB	109
SCSCF3029-112	-8.0 dBm	-3.0 dBm	-33.0 dBm	-3.0 dBm	25.0 dB	109
SCSCF3029-113	-8.0 dBm	-3.0 dBm	-33.0 dBm	-3.0 dBm	25.0 dB	109
SCSCF3029-114	-5.0 dBm	0.0 dBm	-34.0 dBm	-3.0 dBm	29.0 dB	109
SCSCF3029-115	-5.0 dBm	0.0 dBm	-34.0 dBm	-3.0 dBm	29.0 dB	109
SCSCF3029-116	-3.0 dBm	2.0 dBm	-35.0 dBm	-3.0 dBm	32.0 dB	109
SCSCF3029-117	-8.0 dBm	-3.0 dBm	-33.0 dBm	-3.0 dBm	25.0 dB	109
SDSFE3111-120	-19.0 dBm	-14.0 dBm	-31.0 dBm	-14.0 dBm	12.0 dB	134
SEPOE1011-150	-19.0 dBm	-14.0 dBm	-32.5 dBm	-14.0 dBm	13.5 dB	72
SEPOE1013-150	-19.0 dBm	-14.0 dBm	-32.5 dBm	-14.0 dBm	13.5 dB	72
SFBRM1011-100	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	91
SFBRM1011-110	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	91
SFBRM1011-180	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	92
SFBRM1011-190	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	92
SFBRM1013-100	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	91
SFBRM1013-110	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	91
SFBRM1013-180	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	92
SFBRM1013-190	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	92
SFBRM1014-100	-15.0 dBm	-8.0 dBm	-31.0 dBm	-8.0 dBm	16.0 dB	91
SFBRM1014-110	-15.0 dBm	-8.0 dBm	-31.0 dBm	-8.0 dBm	16.0 dB	91
SFBRM1014-180	-15.0 dBm	-8.0 dBm	-31.0 dBm	-8.0 dBm	19.0 dB	92
SFBRM1014-190	-15.0 dBm	-8.0 dBm	-31.0 dBm	-8.0 dBm	16.0 dB	92
SFBRM1015-100	-8.0 dBm	-2.0 dBm	-34.0 dBm	-7.0 dBm	26.0 dB	91
SFBRM1015-110	-8.0 dBm	-2.0 dBm	-34.0 dBm	-7.0 dBm	26.0 dB	91
SFBRM1015-180	-8.0 dBm	-2.0 dBm	-34.0 dBm	-7.0 dBm	26.0 dB	92
SFBRM1016-100	-5.0 dBm	0.0 dBm	-34.0 dBm	-7.0 dBm	29.0 dB	91
SFBRM1016-180	-5.0 dBm	0.0 dBm	-34.0 dBm	-7.0 dBm	29.0 dB	92
SFBRM1017-100	-5.0 dBm	0.0 dBm	-34.0 dBm	-7.0 dBm	29.0 dB	91
SFBRM1017-180	-5.0 dBm	0.0 dBm	-34.0 dBm	-7.0 dBm	29.0 dB	92

Fiber Specification Table

Product SKU	Min TX PWR	Max TX PWR	RX Sensitivity	Max In PWR	Link Budget	Page
SFBRM1029-100	-13.0 dBm	-6.0 dBm	-32.0 dBm	-3.0 dBm	19.0 dB	91
SFBRM1029-101	-13.0 dBm	-6.0 dBm	-32.0 dBm	-3.0 dBm	19.0 dB	91
SFBRM1029-102	-8.0 dBm	-3.0 dBm	-33.0 dBm	-3.0 dBm	25.0 dB	91
SFBRM1029-103	-8.0 dBm	-3.0 dBm	-32.0 dBm	-3.0 dBm	25.0 dB	91
SFBRM1029-110	-13.0 dBm	-6.0 dBm	-32.0 dBm	-3.0 dBm	19.0 dB	91
SFBRM1029-111	-13.0 dBm	-6.0 dBm	-32.0 dBm	-3.0 dBm	19.0 dB	91
SFBRM1029-180	-13.0 dBm	-6.0 dBm	-32.0 dBm	-3.0 dBm	19.0 dB	92
SFBRM1029-181	-13.0 dBm	-6.0 dBm	-32.0 dBm	-3.0 dBm	19.0 dB	92
SFBRM1029-182	-8.0 dBm	-3.0 dBm	-33.0 dBm	-3.0 dBm	25.0 dB	92
SFBRM1029-183	-8.0 dBm	-3.0 dBm	-33.0 dBm	-3.0 dBm	25.0 dB	92
SFBRM1029-190	-13.0 dBm	-6.0 dBm	-32.0 dBm	-3.0 dBm	19.0 dB	92
SFBRM1029-191	-13.0 dBm	-6.0 dBm	-32.0 dBm	-3.0 dBm	19.0 dB	92
SFBRM1035-100	0.0 dBm	5.0 dBm	-36.0 dBm	-3.0 dBm	36.0 dB	91
SFBRM1035-180	0.0 dBm	5.0 dBm	-36.0 dBm	-3.0 dBm	36.0 dB	92
SFBRM1040-180	0.0 dBm	5.0 dBm	-36.0 dBm	-3.0 dBm	36.0 dB	92
SFEPE1011-100	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	82
SFEPE1011-110	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	82
SFEPE1013-100	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	82
SFEPE1013-110	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	82
SFEPE1014-100	-15.0 dBm	-8.0 dBm	-31.0 dBm	-8.0 dBm	16.0 dB	82
SFEPE1014-110	-15.0 dBm	-8.0 dBm	-31.0 dBm	-8.0 dBm	16.0 dB	82
SFMFF1313-200	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	81
SFMFF1313-220	-9.5 dBm	-4.0 dBm	-17.0 dBm	0.0 dBm	7.5 dB	97
SFMFF1314-210 MM	-19.0 dBm	-14.0 dBm	-31.0 dBm	-14.0 dBm	12.0 dB	108
SFMFF1314-210 SM	-15.0 dBm	-8.0 dBm	-26.0 dBm	-14.0 dBm	11.0 dB	108
SFMFF1314-220 MM	-10.0 dBm	-4.0 dBm	-17.0 dBm	0.0 dBm	7.0 dB	97
SFMFF1314-220 SM	-13.0 dBm	-3.0 dBm	-20.0 dBm	-3.0 dBm	7.0 dB	97
SFMFF1314-280 MM	-10.0 dBm	-4.0 dBm	-17.0 dBm	0.0 dBm	7.0 dB	98
SFMFF1314-280 SM	-13.0 dBm	-3.0 dBm	-20.0 dBm	-3.0 dBm	7.0 dB	98
SFMFF1315-220 MM	-10.0 dBm	-4.0 dBm	-17.0 dBm	0.0 dBm	7.0 dB	97
SFMFF1315-220 SM	-5.0 dBm	0.0 dBm	-20.0 dBm	-3.0 dBm	15.0 dB	97
SFMFF1315-280 MM	-10.0 dBm	-4.0 dBm	-17.0 dBm	0.0 dBm	7.0 dB	98
SFMFF1315-280 SM	-5.0 dBm	0.0 dBm	-20.0 dBm	-3.0 dBm	15.0 dB	98
SFMFF1316-210 MM	-19.0 dBm	-14.0 dBm	-26.0 dBm	-14.0 dBm	7.0 dB	108
SFMFF1316-210 SM	-3.0 dBm	2.0 dBm	-28.0 dBm	-7.0 dBm	25.0 dB	108
SFMFF1317-210 MM	-19.0 dBm	-14.0 dBm	-26.0 dBm	-14.0 dBm	7.0 dB	108
SFMFF1317-210 SM	-3.0 dBm	2.0 dBm	-28.0 dBm	-7.0 dBm	25.0 dB	108
SFMFF1317-220 MM	-10.0 dBm	-4.0 dBm	-17.0 dBm	0.0 dBm	7.0 dB	97
SFMFF1317-220 SM	-3.0 dBm	2.0 dBm	-23.0 dBm	-3.0 dBm	20.0 dB	97
SFMFF1317-280 MM	-10.0 dBm	-4.0 dBm	-17.0 dBm	0.0 dBm	7.0 dB	98
SFMFF1317-280 SM	-3.0 dBm	2.0 dBm	-24.0 dBm	-3.0 dBm	21.0 dB	98
SFMFF1324-220 MM	-10.0 dBm	-4.0 dBm	-17.0 dBm	0.0 dBm	7.0 dB	97
SFMFF1324-220 MME	-10.0 dBm	-3.0 dBm	-17.0 dBm	-3.0 dBm	7.0 dB	97
SFMFF1324-280 MM	-10.0 dBm	-4.0 dBm	-17.0 dBm	0.0 dBm	7.0 dB	98
SFMFF1324-280 MME	-10.0 dBm	-3.0 dBm	-17.0 dBm	-3.0 dBm	7.0 dB	98
SFMFF1329-200 MM	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	81
SFMFF1329-200 SM	-13.0 dBm	-6.0 dBm	-32.0 dBm	-3.0 dBm	19.0 dB	81
SFMFF1329-201 MM	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	81
SFMFF1329-201 SM	-13.0 dBm	-6.0 dBm	-32.0 dBm	-3.0 dBm	19.0 dB	81
SFMFF1329-202 MM	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	81
SFMFF1329-202 SM	-8.0 dBm	-3.0 dBm	-33.0 dBm	-3.0 dBm	25.0 dB	81
SFMFF1329-203 MM	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	81
SFMFF1329-203 SM	-8.0 dBm	-3.0 dBm	-33.0 dBm	-3.0 dBm	25.0 dB	81
SFMFF1329-204 MM	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	81
SFMFF1329-204 SM	-5.0 dBm	0.0 dBm	-34.0 dBm	-3.0 dBm	29.0 dB	81
SFMFF1329-205 MM	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	81
SFMFF1329-205 SM	-6.0 dBm	0.0 dBm	-34.0 dBm	-3.0 dBm	28.0 dB	81
SFMFF1329-210 MM	-19.0 dBm	-14.0 dBm	-26.0 dBm	-14.0 dBm	7.0 dB	108
SFMFF1329-210 SM	-14.0 dBm	-8.0 dBm	-28.0 dBm	-8.0 dBm	14.0 dB	108
SFMFF1329-211 MM	-19.0 dBm	-14.0 dBm	-26.0 dBm	-14.0 dBm	7.0 dB	108
SFMFF1329-211 SM	-14.0 dBm	-8.0 dBm	-28.0 dBm	-8.0 dBm	14.0 dB	108
SFMFF1329-220 MM	-19.0 dBm	-14.0 dBm	-26.0 dBm	-14.0 dBm	7.0 dB	97
SFMFF1329-220 SM	-8.0 dBm	-3.0 dBm	-21.0 dBm	-3.0 dBm	13.0 dB	97
SFMFF1329-221 MM	-19.0 dBm	-14.0 dBm	-26.0 dBm	-14.0 dBm	7.0 dB	97
SFMFF1329-221 SM	-8.0 dBm	-3.0 dBm	-21.0 dBm	-3.0 dBm	13.0 dB	97
SFMFF1329-222 MM	-19.0 dBm	-14.0 dBm	-26.0 dBm	-14.0 dBm	7.0 dB	97
SFMFF1329-222 SM	-3.0 dBm	2.0 dBm	-23.0 dBm	-8.0 dBm	20.0 dB	97
SFMFF1329-223 MM	-19.0 dBm	-14.0 dBm	-26.0 dBm	-14.0 dBm	7.0 dB	97
SFMFF1329-223 SM	-3.0 dBm	2.0 dBm	-23.0 dBm	-8.0 dBm	20.0 dB	97
SFMFF1329-280 MM	-10.0 dBm	-4.0 dBm	-17.0 dBm	0.0 dBm	7.0 dB	98
SFMFF1329-280 SM	-8.0 dBm	-3.0 dBm	-21.0 dBm	-3.0 dBm	13.0 dB	98
SFMFF1329-281 MM	-10.0 dBm	-4.0 dBm	-17.0 dBm	0.0 dBm	7.0 dB	98
SFMFF1329-281 SM	-8.0 dBm	-3.0 dBm	-21.0 dBm	-3.0 dBm	13.0 dB	98
SFMFF1329-282 MM	-10.0 dBm	-4.0 dBm	-17.0 dBm	0.0 dBm	7.0 dB	98
SFMFF1329-282 SM	-3.0 dBm	2.0 dBm	-23.0 dBm	-8.0 dBm	20.0 dB	98
SFMFF1329-283 MM	-10.0 dBm	-4.0 dBm	-17.0 dBm	0.0 dBm	7.0 dB	98
SFMFF1329-283 SM	-3.0 dBm	2.0 dBm	-23.0 dBm	-8.0 dBm	20.0 dB	98
SFMFF1329-286 MM	-10.0 dBm	-4.0 dBm	-17.0 dBm	0.0 dBm	7.0 dB	98
SFMFF1329-286 SM	-2.0 dBm	3.0 dBm	-26.0 dBm	-3.0 dBm	24.0 dB	98
SFMFF1329-287 MM	-10.0 dBm	-4.0 dBm	-17.0 dBm	0.0 dBm	7.0 dB	98
SFMFF1329-287 SM	-2.0 dBm	3.0 dBm	-26.0 dBm	-3.0 dBm	24.0 dB	98
SFMFF1335-220 MM	-10.0 dBm	-4.0 dBm	-17.0 dBm	0.0 dBm	7.0 dB	97
SFMFF1335-220 SM	0.0 dBm	5.0 dBm	-27.0 dBm	-3.0 dBm	27.0 dB	97
SFMFF1335-280 MM	-10.0 dBm	-4.0 dBm	-17.0 dBm	0.0 dBm	7.0 dB	98
SFMFF1335-280 SM	0.0 dBm	5.0 dBm	-27.0 dBm	-3.0 dBm	27.0 dB	98
SFMFF1414-200	-15.0 dBm	-8.0 dBm	-31.0 dBm	-8.0 dBm	16.0 dB	81
SFMFF1414-220 SM	-13.0 dBm	-3.0 dBm	-20.0 dBm	-3.0 dBm	7.0 dB	97
SFMFF1414-280	-13.0 dBm	-3.0 dBm	-20.0 dBm	-3.0 dBm	7.0 dB	98
SFMFF1415-200 SM	-15.0 dBm	-8.0 dBm	-31.0 dBm	-8.0 dBm	16.0 dB	81
SFMFF1415-200 SMLH	-8.0 dBm	-2.0 dBm	-34.0 dBm	-7.0 dBm	26.0 dB	81
SFMFF1417-200 MM	-5.0 dBm	0.0 dBm	-34.0 dBm	-7.0 dBm	29.0 dB	81
SFMFF1417-200 SM	-15.0 dBm	-8.0 dBm	-31.0 dBm	-8.0 dBm	16.0 dB	81
SFMFF1424-220 MM	-10.0 dBm	-3.0 dBm	-17.0 dBm	-3.0 dBm	7.0 dB	97
SFMFF1424-220 SM	-13.0 dBm	-3.0 dBm	-20.0 dBm	-3.0 dBm	7.0 dB	97
SFMFF1429-200 MM	-15.0 dBm	-8.0 dBm	-31.0 dBm	-8.0 dBm	16.0 dB	81
SFMFF1429-200 SM	-13.0 dBm	-6.0 dBm	-32.0 dBm	-6.0 dBm	19.0 dB	81
SFMFF1429-201 MM	-15.0 dBm	-8.0 dBm	-31.0 dBm	-8.0 dBm	16.0 dB	81
SFMFF1429-201 SM	-13.0 dBm	-6.0 dBm	-32.0 dBm	-3.0 dBm	19.0 dB	81
SFMFF1429-202 MM	-15.0 dBm	-8.0 dBm	-31.0 dBm	-8.0 dBm	16.0 dB	81
SFMFF1429-202 SM	-8.0 dBm	-3.0 dBm	-33.0 dBm	-3.0 dBm	25.0 dB	81
SFMFF1429-203 MM	-15.0 dBm	-8.0 dBm	-31.0 dBm	-8.0 dBm	25.0 dB	81
SFMFF1429-220 SM	-9.5 dBm	-3.0 dBm	-20.0 dBm	-3.0 dBm	10.5 dB	97
SFMFF1429-220 MM	-8.0 dBm	-3.0 dBm	-21.0 dBm	-3.0 dBm	13.0 dB	97
SFMFF1429-221 SM	-9.5 dBm	-3.0 dBm	-20.0 dBm	-3.0 dBm	10.5 dB	97

Fiber Specification Table

Product SKU	Min TX PWR	Max TX PWR	RX Sensitivity	Max In PWR	Link Budget	Page
SFMFF1429-221 MM	-8.0 dBm	-3.0 dBm	-21.0 dBm	-3.0 dBm	13.0 dB	97
SGETF1013-110	-9.5 dBm	-3.0 dBm	-20.0 dBm	3.0 dBm	7.0 dB	96
SGETF1014-110	-9.5 dBm	-3.0 dBm	-20.0 dBm	-3.0 dBm	10.5 dB	96
SGETF1015-110	-5.0 dBm	0.0 dBm	-21.0 dBm	-3.0 dBm	16.0 dB	96
SGETF1017-110	-3.0 dBm	2.0 dBm	-24.0 dBm	-3.0 dBm	21.0 dB	96
SGETF1024-110	-10.0 dBm	-3.0 dBm	-17.0 dBm	-3.0 dBm	7.0 dB	96
SGETF1029-110	-8.0 dBm	-3.0 dBm	-21.0 dBm	-3.0 dBm	13.0 dB	96
SGETF1029-111	-9.0 dBm	-3.0 dBm	-21.0 dBm	-3.0 dBm	12.0 dB	96
SGETF1029-112	-3.0 dBm	2.0 dBm	-23.0 dBm	-3.0 dBm	20.0 dB	96
SGETF1029-113	-3.0 dBm	2.0 dBm	-23.0 dBm	-3.0 dBm	20.0 dB	96
SGETF1029-116	-2.0 dBm	3.0 dBm	-26.0 dBm	-3.0 dBm	24.0 dB	96
SGETF1029-117	-2.0 dBm	3.0 dBm	-26.0 dBm	-3.0 dBm	24.0 dB	96
SGETF1035-110	0.0 dBm	5.0 dBm	-27.0 dBm	-9.0 dBm	27.0 dB	96
SGETF1039-110	-9.0 dBm	-4.0 dBm	-17.0 dBm	-3.0 dBm	8.0 dB	96
SGFEB1013-120	-10.0 dBm	-4.0 dBm	-17.0 dBm	0.0 dBm	7.0 dB	101
SGFEB1014-120	-13.0 dBm	-3.0 dBm	-20.0 dBm	-3.0 dBm	7.0 dB	101
SGFEB1015-120	-5.0 dBm	0.0 dBm	-20.0 dBm	-3.0 dBm	15.0 dB	101
SGFEB1017-120	-3.0 dBm	2.0 dBm	-23.0 dBm	-3.0 dBm	20.0 dB	101
SGFEB1024-120	-10.0 dBm	-3.0 dBm	-17.0 dBm	3.0 dBm	7.0 dB	101
SGFEB1029-120	-8.0 dBm	-3.0 dBm	-21.0 dBm	-3.0 dBm	13.0 dB	101
SGFEB1029-121	-8.0 dBm	-3.0 dBm	-21.0 dBm	-3.0 dBm	13.0 dB	101
SGFEB1029-122	-3.0 dBm	2.0 dBm	-23.0 dBm	-8.0 dBm	20.0 dB	101
SGFEB1029-123	-3.0 dBm	2.0 dBm	-23.0 dBm	-8.0 dBm	20.0 dB	101
SGFEB1035-120	0.0 dBm	5.0 dBm	-27.0 dBm	-3.0 dBm	27.0 dB	101
SGFEB1313-150 MM1	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	93
SGFEB1313-150 MM2	-10.0 dBm	-4.0 dBm	-17.0 dBm	0.0 dBm	7.0 dB	93
SGFEB1314-150 MM	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	93
SGFEB1314-150 SM	-13.0 dBm	-3.0 dBm	-20.0 dBm	-3.0 dBm	7.0 dB	93
SGFEB1315-150 MM	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	93
SGFEB1315-150 SM	-5.0 dBm	0.0 dBm	-20.0 dBm	-3.0 dBm	15.0 dB	93
SGFEB1317-150 MM	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	93
SGFEB1317-150 SM	-3.0 dBm	2.0 dBm	-23.0 dBm	-3.0 dBm	20.0 dB	93
SGFEB1324-150 MM	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	93
SGFEB1324-150 MME	-10.0 dBm	-3.0 dBm	-17.0 dBm	-3.0 dBm	7.0 dB	93
SGFEB1329-150 MM	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	93
SGFEB1329-150 SM	-8.0 dBm	-3.0 dBm	-21.0 dBm	-3.0 dBm	13.0 dB	93
SGFEB1329-151 MM	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	93
SGFEB1329-151 SM	-8.0 dBm	-3.0 dBm	-21.0 dBm	-3.0 dBm	13.0 dB	93
SGFEB1329-152 MM	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	93
SGFEB1329-152 SM	-3.0 dBm	2.0 dBm	-23.0 dBm	-8.0 dBm	20.0 dB	93
SGFEB1329-153 MM	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	93
SGFEB1329-153 SM	-3.0 dBm	2.0 dBm	-23.0 dBm	-8.0 dBm	20.0 dB	93
SGFEB1335-150 MM	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	93
SGFEB1335-150 SM	0.0 dBm	5.0 dBm	-27.0 dBm	-3.0 dBm	27.0 dB	93
SGFEB1340-170 MM	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	93
SGFEB1429-150 SM1	-15.0 dBm	-8.0 dBm	-31.0 dBm	-8.0 dBm	16.0 dB	93
SGFEB1429-150 SM2	-8.0 dBm	-3.0 dBm	-21.0 dBm	-3.0 dBm	13.0 dB	93
SGFEB1429-151 SM1	-15.0 dBm	-8.0 dBm	-31.0 dBm	-8.0 dBm	16.0 dB	93
SGFEB1429-151 SM2	-8.0 dBm	-3.0 dBm	-21.0 dBm	-3.0 dBm	13.0 dB	93
SGFEB1429-152 SM1	-15.0 dBm	-8.0 dBm	-31.0 dBm	-8.0 dBm	16.0 dB	93
SGFEB1429-152 SM2	-3.0 dBm	2.0 dBm	-23.0 dBm	-8.0 dBm	20.0 dB	93
SGFEB1429-153 SM1	-15.0 dBm	-8.0 dBm	-31.0 dBm	-8.0 dBm	16.0 dB	93
SGFEB1429-153 SM2	-3.0 dBm	2.0 dBm	-23.0 dBm	-8.0 dBm	20.0 dB	93
SGFEB1440-170 SM	-15.0 dBm	-8.0 dBm	-31.0 dBm	-8.0 dBm	16.0 dB	93
SGPOE1013-100	9.5 dBm	4.0 dBm	-17.0 dBm	0.0 dBm	7.5 dB	105
SGPOE1014-100	9.5 dBm	3.0 dBm	-20.0 dBm	3.0 dBm	10.5 dB	105
SISTF1011-211-LRT	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	123
SISTF1013-211-LRT	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	123
SISTF1011-241-LRT	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	124
SISTF1013-241-LRT	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	124
SISTF1014-211-LRT	-15.0 dBm	-8.0 dBm	-32.0 dBm	-5.0 dBm	17.0 dB	123
SISTF1014-241-LRT	-15.0 dBm	-8.0 dBm	-32.0 dBm	-5.0 dBm	17.0 dB	124
SISTG1013-211-LRT	-9.0 dBm	-1.0 dBm	-19.0 dBm	-1.0 dBm	10.0 dB	132
SISTG1014-211-LRT	-9.5 dBm	-3.0 dBm	-20.0 dBm	-3.0 dBm	10.5 dB	132
SISTM1011-162-LRT	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dBm	127
SISTM1013-162-LRT	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dBm	127
SISTM1014-162-LRT	-15.0 dBm	-8.0 dBm	-32.0 dBm	-5.0 dBm	17.0 dBm	127
SISTP1011-141-LRT	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	131
SISTP1013-141-LRT	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	131
SISTP1014-141-LRT	-15.0 dBm	-8.0 dBm	-32.0 dBm	-5.0 dBm	17.0 dB	131
SPOEB1011-100	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	94
SPOEB1013-100	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	94
SPOEB1014-100	-15.0 dBm	-8.0 dBm	-31.0 dBm	-8.0 dBm	16.0 dB	94
SPOEB1015-100	-8.0 dBm	-2.0 dBm	-34.0 dBm	-7.0 dBm	26.0 dB	94
SPOEB1016-100	-5.0 dBm	0.0 dBm	-34.0 dBm	-7.0 dBm	29.0 dB	94
SPOEB1017-100	-5.0 dBm	0.0 dBm	-34.0 dBm	-7.0 dBm	29.0 dB	94
SPOEB1029-100	-13.0 dBm	-6.0 dBm	-32.0 dBm	-3.0 dBm	19.0 dB	94
SPOEB1029-101	-13.0 dBm	-6.0 dBm	-32.0 dBm	-3.0 dBm	19.0 dB	94
SPOEB1035-100	0.0 dBm	5.0 dBm	-36.0 dBm	-3.0 dBm	36.0 dB	94
SPSVT2611-100	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	113
SPSVT2613-100	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	113
SPSVT2614-100	-15.0 dBm	-8.0 dBm	-31.0 dBm	-8.0 dBm	16.0 dB	113
SPSVT2615-100	-8.0 dBm	-2.0 dBm	-34.0 dBm	-7.0 dBm	26.0 dB	113
SPSVT2629-100	-13.0 dBm	-6.0 dBm	-32.0 dBm	-3.0 dBm	19.0 dB	113
SPSVT2629-101	-13.0 dBm	-6.0 dBm	-32.0 dBm	-3.0 dBm	19.0 dB	113
SPSVT2629-102	-8.0 dBm	-3.0 dBm	-33.0 dBm	-3.0 dBm	25.0 dB	113
SPSVT2629-103	-8.0 dBm	-3.0 dBm	-33.0 dBm	-3.0 dBm	25.0 dB	113
SRMFE1011-200	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	80
SRMFE1013-200	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	80
SRMFE1014-200	-15.0 dBm	-8.0 dBm	-31.0 dBm	-8.0 dBm	16.0 dB	80
SRMFE1015-200	-8.0 dBm	-2.0 dBm	-34.0 dBm	-7.0 dBm	26.0 dB	80
SRMFE1016-200	-5.0 dBm	0.0 dBm	-34.0 dBm	-7.0 dBm	29.0 dB	80
SRMFE1017-200	-5.0 dBm	0.0 dBm	-34.0 dBm	-7.0 dBm	29.0 dB	80
SRMFE1029-200	-13.0 dBm	-6.0 dBm	-32.0 dBm	-3.0 dBm	19.0 dB	80
SRMFE1029-201	-13.0 dBm	-6.0 dBm	-32.0 dBm	-3.0 dBm	19.0 dB	80
SRMFE1029-202	-8.0 dBm	-3.0 dBm	-33.0 dBm	-3.0 dBm	25.0 dB	80
SRMFE1029-203	-8.0 dBm	-3.0 dBm	-33.0 dBm	-3.0 dBm	25.0 dB	80
SRS2F3111-100	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	111
SRS2F3113-100	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	111
SRS2F3114-100	-15.0 dBm	-8.0 dBm	-31.0 dBm	-8.0 dBm	16.0 dB	111
SRS2F3115-100	-8.0 dBm	-2.0 dBm	-34.0 dBm	-7.0 dBm	26.0 dB	111
SRS2F3129-100	-13.0 dBm	-6.0 dBm	-32.0 dBm	-3.0 dBm	19.0 dB	111
SRS2F3129-101	-13.0 dBm	-6.0 dBm	-32.0 dBm	-3.0 dBm	19.0 dB	111
SRS2F3129-102	-8.0 dBm	-3.0 dBm	-33.0 dBm	-3.0 dBm	25.0 dB	111

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SRS2F3129-103	-8.0 dBm	-3.0 dBm	-33.0 dBm	-3.0 dBm	25.0 dB	111
SRS4F3111-100	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	112
SRS4F3113-100	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	112
SRS4F3114-100	-15.0 dBm	-8.0 dBm	-31.0 dBm	-7.0 dBm	16.0 dB	112
SRS4F3115-100	-8.0 dBm	-2.0 dBm	-34.0 dBm	-7.0 dBm	26.0 dB	112
SRS4F3211-100	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	112
SRS4F3213-100	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	112
SRS4F3214-100	-15.0 dBm	-8.0 dBm	-31.0 dBm	-7.0 dBm	16.0 dB	112
SRS4F3215-100	-8.0 dBm	-2.0 dBm	-34.0 dBm	-7.0 dBm	26.0 dB	112
SSDTF1011-120	-19.0 dBm	-14.0 dBm	-32.5 dBm	-14.0 dBm	13.5 dB	115
SSDTF1012-120	-27.0 dBm	-10.0 dBm	-34.0 dBm	-14.0 dBm	7.0 dB	115
SSDTF1013-120	-19.0 dBm	-14.0 dBm	-32.5 dBm	-14.0 dBm	13.5 dB	115
SSDTF1014-120	-19.0 dBm	-14.0 dBm	-34.0 dBm	-3.0 dBm	15.0 dB	115
SSDTF1015-120	-8.0 dBm	-2.0 dBm	-38.0 dBm	-8.0 dBm	30.0 dB	115
SSDTF1016-120	-5.0 dBm	0.0 dBm	-38.0 dBm	-7.0 dBm	33.0 dB	115
SSDTF1017-120	-5.0 dBm	0.0 dBm	-34.0 dBm	-7.0 dBm	29.0 dB	115
SSDTF1022-120	-15.0 dBm	-5.0 dBm	-25.0 dBm	-14.0 dBm	10.0 dB	115
SSDTF1027-120	-19.0 dBm	-15.0 dBm	-32.5 dBm	-14.0 dBm	13.5 dB	115
SSDTF1029-120	-13.0 dBm	-6.0 dBm	-32.0 dBm	-3.0 dBm	19.0 dB	115
SSDTF1029-121	-13.0 dBm	-6.0 dBm	-32.0 dBm	-3.0 dBm	19.0 dB	115
SSDTF1029-122	-8.0 dBm	-3.0 dBm	-33.0 dBm	-3.0 dBm	25.0 dB	115
SSDTF1029-123	-8.0 dBm	-3.0 dBm	-33.0 dBm	-3.0 dBm	25.0 dB	115
SSEFE1012-100	-15.0 dBm	-8.0 dBm	-32.0 dBm	-5.0 dBm	17.0 dB	76
SSEFE1014-100	-15.0 dBm	-8.0 dBm	-32.0 dBm	-5.0 dBm	17.0 dB	76
SSEFE1015-100	-8.0 dBm	-2.0 dBm	-34.0 dBm	-5.0 dBm	26.0 dB	76
SSEFE1022-100	-8.0 dBm	-2.0 dBm	-34.0 dBm	-5.0 dBm	26.0 dB	76
SSEFE1029-100	-14.0 dBm	-8.0 dBm	-33.0 dBm	-3.0 dBm	19.0 dB	76
SSEFE1029-101	-14.0 dBm	-8.0 dBm	-33.0 dBm	-3.0 dBm	19.0 dB	76
SSETF1011-205	-19.0 dBm	-14.0 dBm	-32.5 dBm	-14.0 dBm	13.5 dB	83
SSETF1013-205	-19.0 dBm	-14.0 dBm	-32.5 dBm	-14.0 dBm	13.5 dB	83
SSRFB1011-100	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	90
SSRFB1013-100	-19.0 dBm	-14.0 dBm	-30.0 dBm	-14.0 dBm	11.0 dB	90
SSRFB1014-100	-15.0 dBm	-8.0 dBm	-31.0 dBm	-8.0 dBm	16.0 dB	90
SSRFB1029-100	-14.0 dBm	-8.0 dBm	-33.0 dBm	-3.0 dBm	19.0 dB	90
SSRFB1029-101	-14.0 dBm	-8.0 dBm	-33.0 dBm	-3.0 dBm	19.0 dB	90
SSRFB1029-102	-8.0 dBm	-3.0 dBm	-33.0 dBm	-3.0 dBm	25.0 dB	90
SSRFB1029-103	-8.0 dBm	-3.0 dBm	-33.0 dBm	-3.0 dBm	25.0 dB	90
TN-10GSFP-LR1	-8.0 dBm	0.5 dBm	-14.4 dBm	0.5 dBm	6.4 dB	167
TN-10GSFP-LR2	-3.0 dBm	1.0 dBm	-14.4 dBm	1.0 dBm	11.4 dB	167
TN-10GSFP-LR4	1.5 dBm	5.0 dBm	-15.0 dBm	1.0 dBm	16.5 dB	167
TN-10GSFP-LR7	3.0 dBm	6.0 dBm	-22.0 dBm	-8.0 dBm	25.0 dB	167
TN-10GSFP-SR	-7.3 dBm	1.5 dBm	-9.9 dBm	-1.0 dBm	6.4 dB	167
TN-CCH-MCM12-RJ-70S	-7.5 dBm	-2.0 dBm	-16.0 dBm	-2.0 dBm	2.6 dB	99
TN-CWDM-SFP-1xx0	-5.0 dBm	0.0 dBm	-24.0 dBm	3.0 dBm	24.0 dBm	165
TN-CWDM-100LX-1xx0	-5.0 dBm	0.0 dBm	-34.0 dBm	0.0 dBm	29.0 dBm	165
TN-GB-MM5	-9.5 dBm	-4.0 dBm	-18.0 dBm	-3.0 dBm	8.5 dB	160
TN-GB-SM5	-9.0 dBm	-3.0 dBm	-20.0 dBm	-3.0 dBm	11.0 dB	160
TN-GB-SM53	-5.0 dBm	0.0 dBm	-24.0 dBm	-3.0 dBm	19.0 dB	160
TN-GLC-BX-U	-9.0 dBm	-1.0 dBm	-21.0 dBm	-1.0 dBm	12.0 dB	163
TN-GLC-BX-D	-9.0 dBm	-1.0 dBm	-21.0 dBm	-1.0 dBm	12.0 dB	163
TN-GLC-BX-U-40	-3.0 dBm	2.0 dBm	-23.0 dBm	-1.0 dBm	20.0 dB	163
TN-GLC-BX-D-40	-3.0 dBm	2.0 dBm	-23.0 dBm	-1.0 dBm	20.0 dB	163

Product SKU	Min TX PWR	Max TX PWR	RX Sensitivity	Max In PWR	Link Budget	Page
TN-GLC-BX-U-60	-2.0 dBm	4.0 dBm	-25.0 dBm	-1.0 dBm	23.0 dB	163
TN-GLC-BX-D-60	-2.0 dBm	4.0 dBm	-25.0 dBm	-1.0 dBm	23.0 dB	163
TN-GLC-FE-100BX-D	-14.0 dBm	-8.0 dBm	-32.0 dBm	0.0 dBm	18.0 dB	163
TN-GLC-FE-100BX-D-20	-14.0 dBm	-8.0 dBm	-34.0 dBm	-3.0 dBm	20.0 dB	163
TN-GLC-FE-100BX-D-40	-8.0 dBm	-3.0 dBm	-34.0 dBm	-3.0 dBm	26.0 dB	163
TN-GLC-FE-100BX-D-80	-2.0 dBm	3.0 dBm	-34.0 dBm	-3.0 dBm	32.0 dB	163
TN-GLC-FE-100BX-U	-14.0 dBm	-8.0 dBm	-32.0 dBm	0.0 dBm	18.0 dB	163
TN-GLC-FE-100BX-U-20	-14.0 dBm	-8.0 dBm	-34.0 dBm	-3.0 dBm	20.0 dB	163
TN-GLC-FE-100BX-U-40	-8.0 dBm	-3.0 dBm	-34.0 dBm	-3.0 dBm	26.0 dB	163
TN-GLC-FE-100BX-U-80	-2.0 dBm	3.0 dBm	-34.0 dBm	-3.0 dBm	32.0 dB	163
TN-GLC-FE-100FX	-23.5 dBm	-14.0 dBm	-32.0 dBm	-8.0 dBm	8.5 dB	163
TN-GLC-FE-100LX	-15.0 dBm	-8.0 dBm	-34.0 dBm	0.0 dBm	19.0 dB	163
TN-GLC-GE-100FX	-23.5 dBm	-14.0 dBm	-32.0 dBm	-8.0 dBm	8.5 dB	163
TN-GLC-LH-SM	-9.5 dBm	-3.0 dBm	-20.0 dBm	-3.0 dBm	10.5 dB	163
TN-GLC-LHX-SM	-3.0 dBm	2.0 dBm	-25.0 dBm	-3.0 dBm	22.0 dB	163
TN-GLC-SX-MM	-9.5 dBm	-3.5 dBm	-18.0 dBm	-1.0 dBm	8.5 dB	163
TN-GLC-SX-MM-2K	-9.0 dBm	-1.0 dBm	-19.0 dBm	-1.0 dBm	10.0 dB	163
TN-GLC-ZX-SM	0.0 dBm	5.0 dBm	-24.0 dBm	-3.0 dBm	24.0 dB	163
TN-GLC-ZX-SM-15	2.0 dBm	7.0 dBm	-35.0 dBm	-10.0 dBm	37.0 dB	163
TN-J4858C	-9.0 dBm	-3.0 dBm	-18.0 dBm	-3.0 dBm	9.0 dB	166
TN-J4859C	-9.0 dBm	-3.0 dBm	-25.0 dBm	-3.0 dBm	16.0 dB	166
TN-J4860C	0.0 dBm	5.0 dBm	-24.0 dBm	-3.0 dBm	24.0 dB	166
TN-SFP-BXD	-9.0 dBm	-3.0 dBm	-20.0 dBm	-3.0 dBm	11.0 dB	161
TN-SFP-BXD2	-8.0 dBm	-3.0 dBm	-22.0 dBm	-3.0 dBm	14.0 dB	161
TN-SFP-BXU	-9.0 dBm	-3.0 dBm	-20.0 dBm	-3.0 dBm	11.0 dB	161
TN-SFP-BXU2	-8.0 dBm	-3.0 dBm	-22.0 dBm	-3.0 dBm	14.0 dB	161
TN-SFP-ELX1	-9.5 dBm	-3.0 dBm	-21.0 dBm	-3.0 dBm	11.5 dB	162
TN-SFP-ESX5	-10.0 dBm	-3.0 dBm	-18.0 dBm	-3.0 dBm	8.0 dB	162
TN-SFP-ESX6	-10.0 dBm	-3.0 dBm	-18.0 dBm	-3.0 dBm	8.0 dB	162
TN-SFP-FC2XM	-9.0 dBm	-4.0 dBm	-15.0 dBm	-3.0 dBm	6.0 dB	162
TN-SFP-FC2XS15	-5.0 dBm	0.0 dBm	-18.0 dBm	0.0 dBm	13.0 dB	162
TN-SFP-FC2XS2	-9.5 dBm	-3.0 dBm	-18.0 dBm	-3.0 dBm	8.5 dB	162
TN-SFP-FC2XS40	-2.0 dBm	3.0 dBm	-28.0 dBm	-9.0 dBm	26.0 dB	162
TN-SFP-FC4XM	-9.0 dBm	-2.5 dBm	-15.0 dBm	0.0 dBm	6.0 dB	164
TN-SFP-GE-S	-9.0 dBm	-3.0 dBm	-17.0 dBm	-3.0 dBm	9.0 dB	163
TN-SFP-GE-L	-9.0 dBm	-3.0 dBm	-20.0 dBm	-3.0 dBm	11.0 dB	163
TN-SFP-GE-Z	0.0 dBm	5.0 dBm	-23.0 dBm	-3.0 dBm	23.0 dB	163
TN-SFP-LX1	-9.5 dBm	-3.0 dBm	-21.0 dBm	-3.0 dBm	11.5 dB	162
TN-SFP-LX12	0.0 dBm	5.0 dBm	-32.0 dBm	-9.0 dBm	32.0 dB	162
TN-SFP-LX16	1.0 dBm	5.0 dBm	-36.0 dBm	-10.0 dBm	37.0 dB	162
TN-SFP-LX16-C27	1.0 dBm	5.0 dBm	-36.0 dBm	-10.0 dBm	37.0 dB	164
TN-SFP-LX16-C29	1.0 dBm	5.0 dBm	-36.0 dBm	-10.0 dBm	37.0 dB	164
TN-SFP-LX16-C31	1.0 dBm	5.0 dBm	-36.0 dBm	-10.0 dBm	37.0 dB	164
TN-SFP-LX16-C33	1.0 dBm	5.0 dBm	-36.0 dBm	-10.0 dBm	37.0 dB	164
TN-SFP-LX16-C35	1.0 dBm	5.0 dBm	-36.0 dBm	-10.0 dBm	37.0 dB	164
TN-SFP-LX16-C37	1.0 dBm	5.0 dBm	-36.0 dBm	-10.0 dBm	37.0 dB	164
TN-SFP-LX16-C39	1.0 dBm	5.0 dBm	-36.0 dBm	-10.0 dBm	37.0 dB	164
TN-SFP-LX16-C41	1.0 dBm	5.0 dBm	-36.0 dBm	-10.0 dBm	37.0 dB	164
TN-SFP-LX16-C43	1.0 dBm	5.0 dBm	-36.0 dBm	-10.0 dBm	37.0 dB	164
TN-SFP-LX16-C45	1.0 dBm	5.0 dBm	-36.0 dBm	-10.0 dBm	37.0 dB	164
TN-SFP-LX16-C47	1.0 dBm	5.0 dBm	-36.0 dBm	-10.0 dBm	37.0 dB	164
TN-SFP-LX16-C49	1.0 dBm	5.0 dBm	-36.0 dBm	-10.0 dBm	37.0 dB	164

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TN-SFP-LX16-C51	1.0 dBm	5.0 dBm	-36.0 dBm	-10.0 dBm	37.0 dB	164
TN-SFP-LX16-C53	1.0 dBm	5.0 dBm	-36.0 dBm	-10.0 dBm	37.0 dB	164
TN-SFP-LX16-C55	1.0 dBm	5.0 dBm	-36.0 dBm	-10.0 dBm	37.0 dB	164
TN-SFP-LX16-C57	1.0 dBm	5.0 dBm	-36.0 dBm	-10.0 dBm	37.0 dB	164
TN-SFP-LX16-C59	1.0 dBm	5.0 dBm	-36.0 dBm	-10.0 dBm	37.0 dB	164
TN-SFP-LX16-C61	1.0 dBm	5.0 dBm	-36.0 dBm	-10.0 dBm	37.0 dB	164
TN-SFP-LX1T	-9.5 dBm	-3.0 dBm	-21.0 dBm	-3.0 dBm	11.5 dB	162
TN-SFP-LX3	-5.0 dBm	0.0 dBm	-24.0 dBm	-3.0 dBm	19.0 dB	162
TN-SFP-LX5	-5.0 dBm	0.0 dBm	-24.0 dBm	-3.0 dBm	19.0 dB	162
TN-SFP-LX8	0.0 dBm	5.0 dBm	-24.0 dBm	-3.0 dBm	24.0 dB	162
TN-SFP-LX8-C27	0.0 dBm	5.0 dBm	-24.0 dBm	-3.0 dBm	24.0 dB	164
TN-SFP-LX8-C29	0.0 dBm	5.0 dBm	-24.0 dBm	-3.0 dBm	24.0 dB	164
TN-SFP-LX8-C31	0.0 dBm	5.0 dBm	-24.0 dBm	-3.0 dBm	24.0 dB	164
TN-SFP-LX8-C33	0.0 dBm	5.0 dBm	-24.0 dBm	-3.0 dBm	24.0 dB	164
TN-SFP-LX8-C35	0.0 dBm	5.0 dBm	-24.0 dBm	-3.0 dBm	24.0 dB	164
TN-SFP-LX8-C37	0.0 dBm	5.0 dBm	-24.0 dBm	-3.0 dBm	24.0 dB	164
TN-SFP-LX8-C39	0.0 dBm	5.0 dBm	-24.0 dBm	-3.0 dBm	24.0 dB	164
TN-SFP-LX8-C41	0.0 dBm	5.0 dBm	-24.0 dBm	-3.0 dBm	24.0 dB	164
TN-SFP-LX8-C43	0.0 dBm	5.0 dBm	-24.0 dBm	-3.0 dBm	24.0 dB	164
TN-SFP-LX8-C45	0.0 dBm	5.0 dBm	-24.0 dBm	-3.0 dBm	24.0 dB	164
TN-SFP-LX8-C47	0.0 dBm	5.0 dBm	-24.0 dBm	-3.0 dBm	24.0 dB	164
TN-SFP-LX8-C49	0.0 dBm	5.0 dBm	-24.0 dBm	-3.0 dBm	24.0 dB	164
TN-SFP-LX8-C51	0.0 dBm	5.0 dBm	-24.0 dBm	-3.0 dBm	24.0 dB	164
TN-SFP-LX8-C53	0.0 dBm	5.0 dBm	-24.0 dBm	-3.0 dBm	24.0 dB	164
TN-SFP-LX8-C55	0.0 dBm	5.0 dBm	-24.0 dBm	-3.0 dBm	24.0 dB	164
TN-SFP-LX8-C57	0.0 dBm	5.0 dBm	-24.0 dBm	-3.0 dBm	24.0 dB	164
TN-SFP-LX8-C59	0.0 dBm	5.0 dBm	-24.0 dBm	-3.0 dBm	24.0 dB	164
TN-SFP-LX8-C61	0.0 dBm	5.0 dBm	-24.0 dBm	-3.0 dBm	24.0 dB	164
TN-SFP-LXB11	-9.0 dBm	-3.0 dBm	-20.0 dBm	-3.0 dBm	11.0 dB	161
TN-SFP-LXB11T	-9.0 dBm	-3.0 dBm	-20.0 dBm	-3.0 dBm	11.0 dB	161
TN-SFP-LXB12	-9.0 dBm	-3.0 dBm	-20.0 dBm	-3.0 dBm	11.0 dB	161
TN-SFP-LXB12T	-9.0 dBm	-3.0 dBm	-20.0 dBm	-3.0 dBm	11.0 dB	161
TN-SFP-LXB121	-2.0 dBm	3.0 dBm	-33.0 dBm	-9.0 dBm	31.0 dB	161
TN-SFP-LXB122	-2.0 dBm	3.0 dBm	-33.0 dBm	-9.0 dBm	31.0 dB	161
TN-SFP-LXB21	-8.0 dBm	-3.0 dBm	-22.0 dBm	-3.0 dBm	14.0 dB	161
TN-SFP-LXB21T	-8.0 dBm	-3.0 dBm	-22.0 dBm	-3.0 dBm	14.0 dB	161
TN-SFP-LXB22	-8.0 dBm	-3.0 dBm	-22.0 dBm	-3.0 dBm	14.0 dB	161
TN-SFP-LXB22T	-8.0 dBm	-3.0 dBm	-22.0 dBm	-3.0 dBm	14.0 dB	161
TN-SFP-LXB41	-3.0 dBm	2.0 dBm	-23.0 dBm	-3.0 dBm	20.0 dB	161
TN-SFP-LXB42	-3.0 dBm	2.0 dBm	-23.0 dBm	-3.0 dBm	20.0 dB	161
TN-SFP-LXB61	-1.0 dBm	4.0 dBm	-26.0 dBm	-3.0 dBm	25.0 dB	161
TN-SFP-LXB62	-3.0 dBm	2.0 dBm	-26.0 dBm	-3.0 dBm	23.0 dB	161
TN-SFP-LXB81	-2.0 dBm	3.0 dBm	-26.0 dBm	-3.0 dBm	24.0 dB	161
TN-SFP-LXB82	-2.0 dBm	3.0 dBm	-26.0 dBm	-3.0 dBm	24.0 dB	161
TN-SFP-OC12M	-19.0 dBm	-12.0 dBm	-26.0 dBm	-8.0 dBm	7.0 dB	162
TN-SFP-OC12S	-14.0 dBm	-8.0 dBm	-28.0 dBm	-5.0 dBm	14.0 dB	162
TN-SFP-OC12S4	-3.0 dBm	2.0 dBm	-28.0 dBm	-8.0 dBm	25.0 dB	162
TN-SFP-OC12S8	-5.0 dBm	0.0 dBm	-34.0 dBm	-8.0 dBm	29.0 dB	162
TN-SFP-OC12SB41	-5.0 dBm	0.0 dBm	-28.0 dBm	-8.0 dBm	23.0 dB	161
TN-SFP-OC12SB42	-5.0 dBm	0.0 dBm	-28.0 dBm	-8.0 dBm	23.0 dB	161
TN-SFP-OC12S-C27	0.0 dBm	5.0 dBm	-29.0 dBm	-8.0 dBm	29.0 dB	164
TN-SFP-OC12S-C29	0.0 dBm	5.0 dBm	-29.0 dBm	-8.0 dBm	29.0 dB	164
TN-SFP-OC12S-C31	0.0 dBm	5.0 dBm	-29.0 dBm	-8.0 dBm	29.0 dB	164
TN-SFP-OC12S-C33	0.0 dBm	5.0 dBm	-29.0 dBm	-8.0 dBm	29.0 dB	164
TN-SFP-OC12S-C35	0.0 dBm	5.0 dBm	-29.0 dBm	-8.0 dBm	29.0 dB	164
TN-SFP-OC12S-C37	0.0 dBm	5.0 dBm	-29.0 dBm	-8.0 dBm	29.0 dB	164
TN-SFP-OC12S-C39	0.0 dBm	5.0 dBm	-29.0 dBm	-8.0 dBm	29.0 dB	164
TN-SFP-OC12S-C41	0.0 dBm	5.0 dBm	-29.0 dBm	-8.0 dBm	29.0 dB	164
TN-SFP-OC12S-C43	0.0 dBm	5.0 dBm	-29.0 dBm	-8.0 dBm	29.0 dB	164
TN-SFP-OC12S-C45	0.0 dBm	5.0 dBm	-29.0 dBm	-8.0 dBm	29.0 dB	164
TN-SFP-OC12S-C47	0.0 dBm	5.0 dBm	-29.0 dBm	-8.0 dBm	29.0 dB	164
TN-SFP-OC12S-C49	0.0 dBm	5.0 dBm	-29.0 dBm	-8.0 dBm	29.0 dB	164
TN-SFP-OC12S-C51	0.0 dBm	5.0 dBm	-29.0 dBm	-8.0 dBm	29.0 dB	164
TN-SFP-OC12S-C53	0.0 dBm	5.0 dBm	-29.0 dBm	-8.0 dBm	29.0 dB	164
TN-SFP-OC12S-C55	0.0 dBm	5.0 dBm	-29.0 dBm	-8.0 dBm	29.0 dB	164
TN-SFP-OC12S-C57	0.0 dBm	5.0 dBm	-29.0 dBm	-8.0 dBm	29.0 dB	164
TN-SFP-OC12S-C59	0.0 dBm	5.0 dBm	-29.0 dBm	-8.0 dBm	29.0 dB	164
TN-SFP-OC12S-C61	0.0 dBm	5.0 dBm	-29.0 dBm	-8.0 dBm	29.0 dB	164
TN-SFP-OC3M	-19.0 dBm	-12.0 dBm	-30.0 dBm	-8.0 dBm	11.0 dB	162
TN-SFP-OC3MT	-19.0 dBm	-12.0 dBm	-30.0 dBm	-8.0 dBm	11.0 dB	162
TN-SFP-OC3S	-14.0 dBm	-8.0 dBm	-31.0 dBm	-8.0 dBm	17.0 dB	162
TN-SFP-OC3S16-C27	2.0 dBm	5.0 dBm	-35.0 dBm	-10.0 dBm	37.0 dB	164
TN-SFP-OC3S16-C29	2.0 dBm	5.0 dBm	-35.0 dBm	-10.0 dBm	37.0 dB	164
TN-SFP-OC3S16-C31	2.0 dBm	5.0 dBm	-35.0 dBm	-10.0 dBm	37.0 dB	164
TN-SFP-OC3S16-C33	2.0 dBm	5.0 dBm	-35.0 dBm	-10.0 dBm	37.0 dB	164
TN-SFP-OC3S16-C35	2.0 dBm	5.0 dBm	-35.0 dBm	-10.0 dBm	37.0 dB	164
TN-SFP-OC3S16-C37	2.0 dBm	5.0 dBm	-35.0 dBm	-10.0 dBm	37.0 dB	164
TN-SFP-OC3S16-C39	2.0 dBm	5.0 dBm	-35.0 dBm	-10.0 dBm	37.0 dB	164
TN-SFP-OC3S16-C41	2.0 dBm	5.0 dBm	-35.0 dBm	-10.0 dBm	37.0 dB	164
TN-SFP-OC3S16-C43	2.0 dBm	5.0 dBm	-35.0 dBm	-10.0 dBm	37.0 dB	164
TN-SFP-OC3S16-C45	2.0 dBm	5.0 dBm	-35.0 dBm	-10.0 dBm	37.0 dB	164
TN-SFP-OC3S16-C47	2.0 dBm	5.0 dBm	-35.0 dBm	-10.0 dBm	37.0 dB	164
TN-SFP-OC3S16-C49	2.0 dBm	5.0 dBm	-35.0 dBm	-10.0 dBm	37.0 dB	164
TN-SFP-OC3S16-C51	2.0 dBm	5.0 dBm	-35.0 dBm	-10.0 dBm	37.0 dB	164
TN-SFP-OC3S16-C53	2.0 dBm	5.0 dBm	-35.0 dBm	-10.0 dBm	37.0 dB	164
TN-SFP-OC3S16-C55	2.0 dBm	5.0 dBm	-35.0 dBm	-10.0 dBm	37.0 dB	164
TN-SFP-OC3S16-C57	2.0 dBm	5.0 dBm	-35.0 dBm	-10.0 dBm	37.0 dB	164
TN-SFP-OC3S16-C59	2.0 dBm	5.0 dBm	-35.0 dBm	-10.0 dBm	37.0 dB	164
TN-SFP-OC3S16-C61	2.0 dBm	5.0 dBm	-35.0 dBm	-10.0 dBm	37.0 dB	164
TN-SFP-OC3ST	-14.0 dBm	-8.0 dBm	-31.0 dBm	-8.0 dBm	17.0 dB	162
TN-SFP-OC3SB21	-14.0 dBm	-8.0 dBm	-33.0 dBm	-8.0 dBm	19.0 dB	161
TN-SFP-OC3SB22	-14.0 dBm	-8.0 dBm	-33.0 dBm	-8.0 dBm	19.0 dB	161
TN-SFP-OC3SB41	-8.0 dBm	-3.0 dBm	-33.0 dBm	-8.0 dBm	25.0 dB	161
TN-SFP-OC3SB42	-8.0 dBm	-3.0 dBm	-33.0 dBm	-8.0 dBm	25.0 dB	161
TN-SFP-OC3SB61	-5.0 dBm	0.0 dBm	-34.0 dBm	-8.0 dBm	29.0 dB	161
TN-SFP-OC3SB62	-5.0 dBm	0.0 dBm	-34.0 dBm	-8.0 dBm	29.0 dB	161
TN-SFP-OC3SB81	-2.0 dBm	3.0 dBm	-34.0 dBm	-8.0 dBm	32.0 dB	161
TN-SFP-OC3SB82	-3.0 dBm	2.0 dBm	-34.0 dBm	-8.0 dBm	31.0 dB	161
TN-SFP-OC3MB1	-15.0 dBm	-8.0 dBm	-30.0 dBm	-8.0 dBm	15.0 dB	161
TN-SFP-OC3MB2	-15.0 dBm	-8.0 dBm	-30.0 dBm	-8.0 dBm	15.0 dB	161
TN-SFP-OC3S3	-14.0 dBm	-8.0 dBm	-34.0 dBm	-8.0 dBm	20.0 dB	162
TN-SFP-OC3S8	-5.0 dBm	0.0 dBm	-34.0 dBm	-8.0 dBm	29.0 dB	162
TN-SFP-OC3S8-C27	-5.0 dBm	0.0 dBm	-34.0 dBm	-8.0 dBm	29.0 dB	164
TN-SFP-OC3S8-C29	-5.0 dBm	0.0 dBm	-34.0 dBm	-8.0 dBm	29.0 dB	164

Fiber Specification Table

Product SKU	Min TX PWR	Max TX PWR	RX Sensitivity	Max In PWR	Link Budget	Page
TN-SFP-OC3S8-C31	-5.0 dBm	0.0 dBm	-34.0 dBm	-8.0 dBm	29.0 dB	164
TN-SFP-OC3S8-C33	-5.0 dBm	0.0 dBm	-34.0 dBm	-8.0 dBm	29.0 dB	164
TN-SFP-OC3S8-C35	-5.0 dBm	0.0 dBm	-34.0 dBm	-8.0 dBm	29.0 dB	164
TN-SFP-OC3S8-C37	-5.0 dBm	0.0 dBm	-34.0 dBm	-8.0 dBm	29.0 dB	164
TN-SFP-OC3S8-C39	-5.0 dBm	0.0 dBm	-34.0 dBm	-8.0 dBm	29.0 dB	164
TN-SFP-OC3S8-C41	-5.0 dBm	0.0 dBm	-34.0 dBm	-8.0 dBm	29.0 dB	164
TN-SFP-OC3S8-C43	-5.0 dBm	0.0 dBm	-34.0 dBm	-8.0 dBm	29.0 dB	164
TN-SFP-OC3S8-C45	-5.0 dBm	0.0 dBm	-34.0 dBm	-8.0 dBm	29.0 dB	164
TN-SFP-OC3S8-C47	-5.0 dBm	0.0 dBm	-34.0 dBm	-8.0 dBm	29.0 dB	164
TN-SFP-OC3S8-C49	-5.0 dBm	0.0 dBm	-34.0 dBm	-8.0 dBm	29.0 dB	164
TN-SFP-OC3S8-C51	-5.0 dBm	0.0 dBm	-34.0 dBm	-8.0 dBm	29.0 dB	164
TN-SFP-OC3S8-C53	-5.0 dBm	0.0 dBm	-34.0 dBm	-8.0 dBm	29.0 dB	164
TN-SFP-OC3S8-C55	-5.0 dBm	0.0 dBm	-34.0 dBm	-8.0 dBm	29.0 dB	164
TN-SFP-OC3S8-C57	-5.0 dBm	0.0 dBm	-34.0 dBm	-8.0 dBm	29.0 dB	164
TN-SFP-OC3S8-C59	-5.0 dBm	0.0 dBm	-34.0 dBm	-8.0 dBm	29.0 dB	164
TN-SFP-OC3S8-C61	-5.0 dBm	0.0 dBm	-34.0 dBm	-8.0 dBm	29.0 dB	164
TN-SFP-OC3S10	-3.0 dBm	2.0 dBm	-34.0 dBm	-8.0 dBm	31.0 dB	164
TN-SFP-OC3S12	0.0 dBm	5.0 dBm	-34.0 dBm	-8.0 dBm	34.0 dB	164
TN-SFP-OC48S-C27	-2.0 dBm	3.0 dBm	-20.0 dBm	0.0 dBm	18.0 dB	164
TN-SFP-OC48S-C29	-2.0 dBm	3.0 dBm	-20.0 dBm	0.0 dBm	18.0 dB	164
TN-SFP-OC48S-C31	-2.0 dBm	3.0 dBm	-20.0 dBm	0.0 dBm	18.0 dB	164
TN-SFP-OC48S-C33	-2.0 dBm	3.0 dBm	-20.0 dBm	0.0 dBm	18.0 dB	164
TN-SFP-OC48S-C35	-2.0 dBm	3.0 dBm	-20.0 dBm	0.0 dBm	18.0 dB	164
TN-SFP-OC48S-C37	-2.0 dBm	3.0 dBm	-20.0 dBm	0.0 dBm	18.0 dB	164
TN-SFP-OC48S-C39	-2.0 dBm	3.0 dBm	-20.0 dBm	0.0 dBm	18.0 dB	164
TN-SFP-OC48S-C41	-2.0 dBm	3.0 dBm	-20.0 dBm	0.0 dBm	18.0 dB	164
TN-SFP-OC48S-C43	-2.0 dBm	3.0 dBm	-20.0 dBm	0.0 dBm	18.0 dB	164
TN-SFP-OC48S-C45	-2.0 dBm	3.0 dBm	-20.0 dBm	0.0 dBm	18.0 dB	164
TN-SFP-OC48S-C47	-2.0 dBm	3.0 dBm	-20.0 dBm	0.0 dBm	18.0 dB	164
TN-SFP-OC48S-C49	-2.0 dBm	3.0 dBm	-20.0 dBm	0.0 dBm	18.0 dB	164
TN-SFP-OC48S-C51	-2.0 dBm	3.0 dBm	-20.0 dBm	0.0 dBm	18.0 dB	164
TN-SFP-OC48S-C53	-2.0 dBm	3.0 dBm	-20.0 dBm	0.0 dBm	18.0 dB	164
TN-SFP-OC48S-C55	-2.0 dBm	3.0 dBm	-20.0 dBm	0.0 dBm	18.0 dB	164
TN-SFP-OC48S-C57	-2.0 dBm	3.0 dBm	-20.0 dBm	0.0 dBm	18.0 dB	164
TN-SFP-OC48S-C59	-2.0 dBm	3.0 dBm	-20.0 dBm	0.0 dBm	18.0 dB	164
TN-SFP-OC48S-C61	-2.0 dBm	3.0 dBm	-20.0 dBm	0.0 dBm	18.0 dB	164
TN-SFP-SX	-9.0 dBm	4.0 dBm	-17.0 dBm	-3.0 dBm	8.0 dB	162
TN-SFP-SXB1	-10.0 dBm	4.0 dBm	-17.0 dBm	-3.0 dBm	7.0 dB	161
TN-SFP-SXB2	-10.0 dBm	4.0 dBm	-17.0 dBm	-3.0 dBm	7.0 dB	161
TN-SFP-SXD	-9.0 dBm	-4.0 dBm	-17.0 dBm	-3.0 dBm	8.0 dB	162
TN-XFP-ER	-1.0 dBm	4.0 dBm	-16.5 dBm	0.5 dBm	15.5 dB	168
TN-XFP-LR	-5.0 dBm	0.5 dBm	-14.4 dBm	0.5 dBm	9.4 dB	168
TN-XFP-SR	-7.0 dBm	-1.3 dBm	-11.1 dBm	0.5 dBm	4.1 dB	168
TN-XFP-LR1	-8.2 dBm	0.5 dBm	-14.4 dBm	-14.4 dBm	6.2 dB	168
TN-XFP-LR1-T	-8.2 dBm	0.5 dBm	-14.4 dBm	-14.4 dBm	6.2 dB	168
TN-XFP-LR2	-3.0 dBm	1.0 dBm	-15.0 dBm	-15.0 dBm	12.0 dB	168
TN-XFP-LR2-T	-3.0 dBm	1.0 dBm	-15.0 dBm	-15.0 dBm	12.0 dB	168
TN-XFP-SR	-6.5 dBm	-1.5 dBm	-9.9 dBm	-7.5 dBm	3.4 dB	168
TN-XFP-ZR	-1.0 dBm	4.0 dBm	-23.0 dBm	-23.0 dBm	22.0 dB	168
TN-X2-10GB-ER	-1.0 dBm	4.0 dBm	-16.5 dBm	0.5 dBm	15.5 dB	169
TN-X2-10GB-LR	-5.0 dBm	0.5 dBm	-14.4 dBm	0.5 dBm	9.4 dB	169
TN-X2-10GB-SR	-7.0 dBm	-1.3 dBm	-11.1 dBm	0.5 dBm	4.1 dB	169

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