PRODUCT CATALOG

SICK Automatic Identification Catalog

Laser-Based Bar Code Scanning • Vision-Based Bar Code Scanning
Laser Measurement Systems • Dimensioning Systems

SICK

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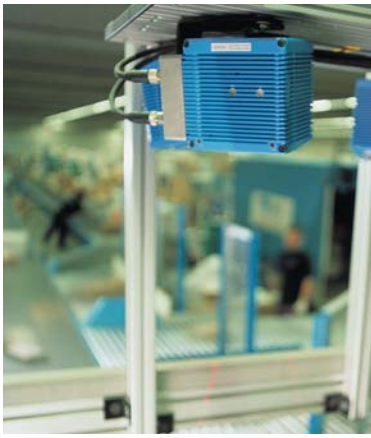
AUTOMATIC IDENTIFICATION SOLUTIONS





SICK

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SICK – Company Profile

Leadership

SICK is a global leader in factory and process automation solutions. We offer customers a wide range of products that provide solutions at every phase of production and automation. Automatic identification solutions, safety systems, and industrial sensors from SICK are used within diverse industries such as material handling, automotive, food & beverage, and packaging.

From automotive assembly lines to retail distribution centers and ports and harbors, products and services from SICK optimize production and logistics processes, help ensure worker safety, and provide consistent high quality.

Innovation

SICK continues to lead the way, leveraging a long history of innovation and rich tradition of quality industry solutions. Inventor and entrepreneur, Dr. Erwin Sick, founded the company in 1946. Soon after, he unveiled the industry's first print registration control device. A few years later, the company developed the industry's first safety light curtain, setting the standard for industrial safety applications. SICK also created the first bar code reader and measuring light curtain. These designs were first in an extensive line of innovations. Today, SICK holds more than 450 patents for its automatic identification solutions, safety systems, and industrial sensors.

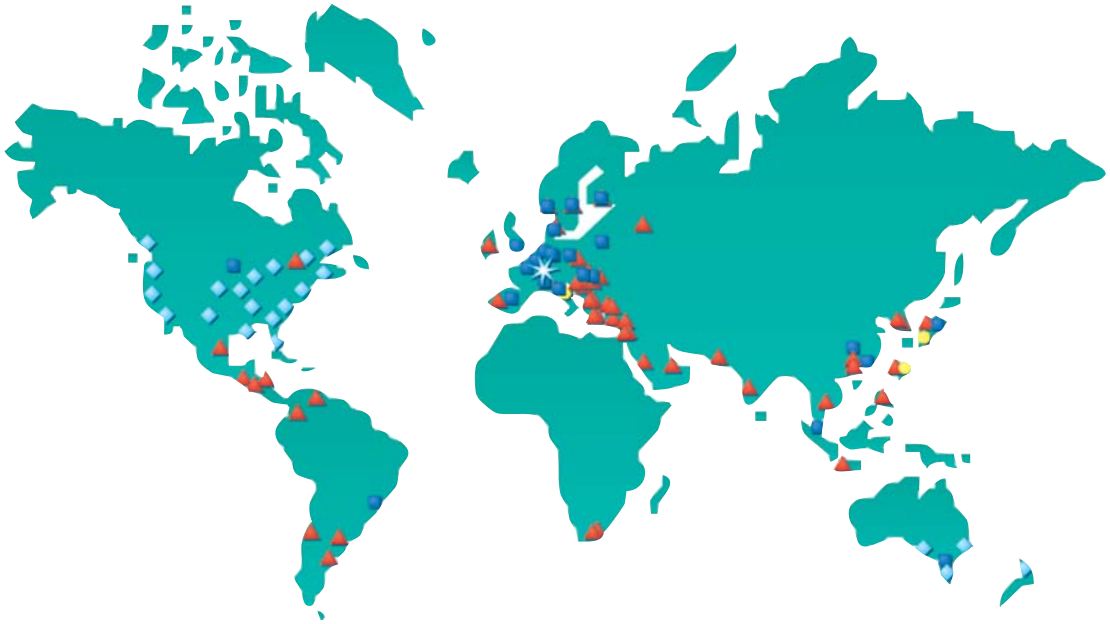
Dr. Erwin Sick

SICK in the US and in the World

SICK Worldwide

Founded by Erwin Sick in 1946 in Munich, Germany, the company now has a significant worldwide presence that includes 60 subsidiaries and agencies around the globe as well as production centers in Germany, the United States, Italy, Poland, Hungary, and Japan. Through its automatic identification solutions, safety systems, and industrial sensors, SICK currently employs more than 4,000 people worldwide.

Today, the company's headquarters, research and development centers— which are essential to our innovation-driven enterprise— as well as two main production plants, are located in Waldkirch and Reute, Germany. SICK Germany ranks amongst the best industrial employers in Europe.



SICK in the US and in the World

SICK North America

Established in 1976, the North American subsidiary of SICK is headquartered in Minneapolis, MN. With sales throughout the United States, Canada, and Mexico, SICK North America helps its customers achieve their goals: increased production rates, increased package flow, safe environments, and consistent high quality.

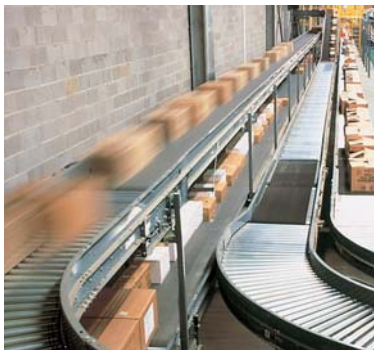
SICK designs and manufactures cost-effective products to achieve a high level of precision, reliability and versatility. SICK North America leverages its factory and process automation expertise into diverse industries such as material handling, automotive, food & beverage, and packaging and many others. With U.S. manufacturing and research and development facilities in Minnesota, Ohio, and Massachusetts, and sales offices around the country, SICK is positioned to provide a broad, innovative product portfolio and comprehensive services that our customers demand.

All of this translates to an unchallenged leadership in market share for automatic identification solutions, safety systems, and industrial sensors.

SICK North America - Divisions

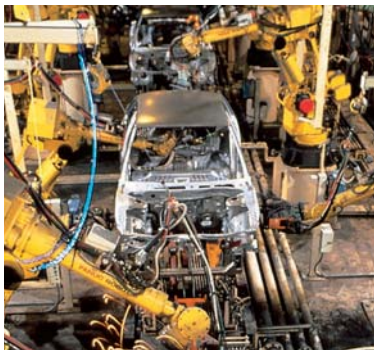
SICK Industrial Sensors

SICK's complete line of photoelectric, inductive, magnetic and capacitive sensors meet the growing efficiency of industrial processes. SICK has become a world leader in factory automation solutions by continually offering innovative product enhancements like reduced housing size and increased range, while maintaining the highest quality production process in the industry. The application possibilities of our comprehensive line of sensors are virtually endless.



SICK Safety Systems

Innovative products from SICK provide comprehensive safeguarding of both personnel and machinery. As specialists in sensor technology, SICK develops and manufactures pioneering products that provide protection in hazardous zones, dangerous locations and for safeguarding access points. By providing products and services which encompass all aspects of machine safety and security, SICK is setting a new standard in safety technology.



SICK North America - Divisions

SICK Automatic Identification

SICK develops innovative, high performance scanning and data capture solutions to meet the demanding requirements of the automatic identification industry. From bar code readers to complex vision systems, SICK has solutions for your applications. SICK offers an unmatched combination of technological expertise, a world-class customer support network and the broadest base of application experience in the industry.

SICK Stegmann

SICK Stegmann is a leading manufacturer of shaft encoders (also known as rotary sensors) and actuators for automation technology. The addition of these technologies to SICK's factory automation solutions has provided access to the growth market of drive technology. Continuous innovation combined with the highest levels of precision and quality enable SICK Stegmann to provide customers with encoder systems that are among the best in the world.

SICK | STEGMANN

SICK North America - Divisions

SICK Maihak

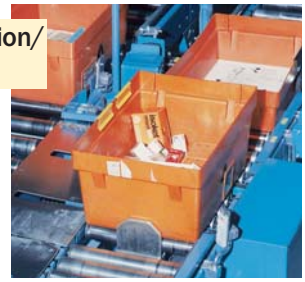
SICK Maihak offers in-situ and extractive analyzers for gas and liquid analysis and measurement instrumentation for dust, opacity, volume flow and level.

SICK Maihak has more than 50 years of combined technical experience serving the industries of power, cement, refining, petrochemical, chemical, pharmaceutical, waste incineration, water treatment, pulp and paper, steel, food and beverage, glass and other areas.

SICK | MAIHAK

Our Main Markets

Retail Distribution/ Warehouse

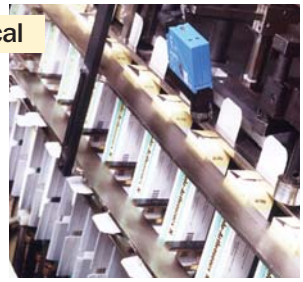


Airports

Ports/Harbors

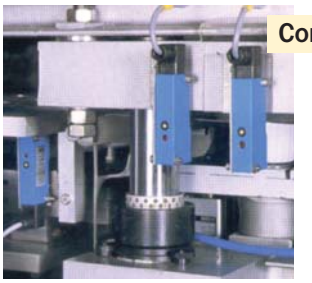
Postal/Parcel

Pharmaceutical



Automotive

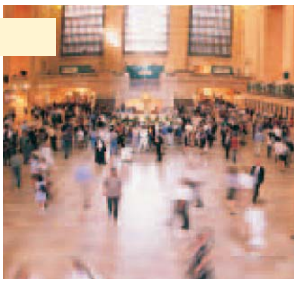
Packaging



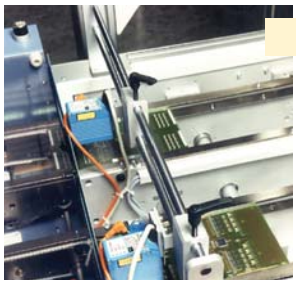
Consumer Goods

Our Main Markets

Security

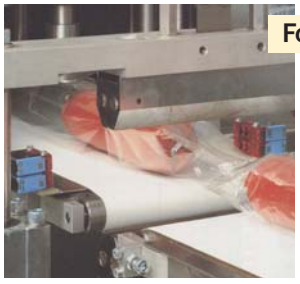


Electronics



Textile

Food & Beverage



Traffic Management

Machine Tool

Robotics

AGV

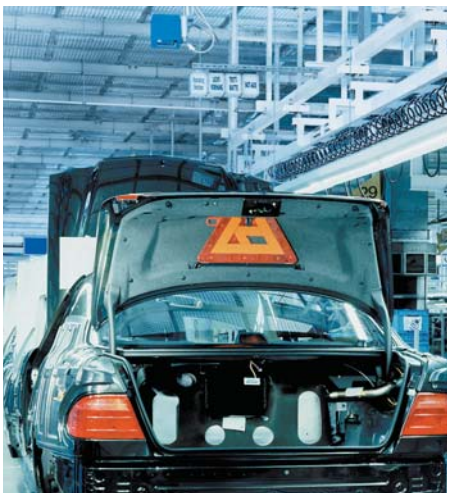
SICK Automatic Identification Solutions

Speed, accuracy, and reliability are the three primary demands placed on automatic identification solutions today. In every manufacturing, packaging, and logistics environment, automatic identification is playing an increasingly critical role in helping companies achieve their productivity and profit goals. The proper implementation of automatic identification solutions ensure the right components are added to an assembly, contents are packaged correctly, and cartons arrive quickly at their proper destination.

SICK's linear and 2D bar code scanning products, dimensioning systems, and laser measurement solutions address these and countless other identification requirements. As a worldwide leader in the manufacture of automatic identification hardware, SICK is committed to providing product solutions and services that ensure accuracy and maximize operational throughput to make any company more competitive.

SICK's product and service value is driven by three competitive factors: Technology, Support, and Experience. Today, SICK leads the industry with the most innovative scanning and dimensioning products. Each of its laser-based and vision-based solutions is designed for the highest performance and reliability and backed from selection to implementation by the industry's best sales and service engineers.

SICK's Automatic Identification solutions provide our customers with the lowest cost of ownership and greatly reduce our customers' risk factors.



Unmatched Value for Today's Most Demanding Operations

Technology

SICK products are designed and built using state-of-the-art manufacturing methods for the highest quality reliability. Extensive research and development efforts in all product lines have led to a constant flow of product innovations and manufacturing improvements since the company was founded. As a result, users expect the highest level of performance from SICK products. Each product provides a variety of convenience features, including common setup software and connectivity options to fit virtually any application. Advanced optical designs for optimal reading performance and intelligent maintenance features that minimize downtime have made SICK products the best value for any automatic identification project.

Support

SICK's application and service support capabilities are unmatched in the data collection business. As a result of continuous staff development and strategic acquisitions, SICK established the very best sales, service, and application support teams. That means the right solution is specified the first time, every time, without compromise. SICK support teams are committed to work with customers to guarantee total satisfaction from start to finish, regardless of project size.

Experience

Today's SICK organization is made up of a wide variety of talents from around the industry. As a result of recent external growth initiatives, SICK is proud to boast the most experienced sales and service capabilities. The perspectives of the world's leading automatic identification suppliers have been combined into a single organization that best understands the needs of its customers. With this experience and a commitment to excellence from product selection through implementation, SICK can be trusted to provide the best value for projects large and small.

Technology Features

CAN

CLV scanners can be quickly and easily networked using the SICK CAN Scanner Network. CAN networks are easily set up using CLV Setup Software and easy-to-connect network cabling. On a CAN network, a user can group multiple CLV scanners to form entities that communicate with a common host in pass-though or master slave modes. Scanners can also each be configured via the CAN network from any single scan point on the network to simplify commissioning of more complex networks.

SMART Technology

SMART Technology is used in CLV/x 43x-490 and ICR 8xx scanners to decode hard to read, partially hidden, or damaged bar codes. This capability ensures that even the hardest to read bar codes are read for the highest possible read rate performance. SMART is user selectable in CLV Setup Software.

Cloning

When used with a CDB or CDM Connectivity Device, the CMC Cloning Module makes exchanging CLV Scanners as easy as changing a light bulb. The CMC automatically downloads the pre-set scanner parameters when the new device is connected. There is no need for a laptop or PC to reconfigure a scanner, so downtime can be reduced to minutes without the need to reconfigure the scanner.

Connectivity

SICK offers two standard connectivity devices for its CLV and ICR models that simplify installation for any single or multi-scanner application. The CDB-xxx is a basic 24 V DC solution with optional cloning capability. It is the ideal low cost solution for stand-alone and CAN network applications. The CDM-xxx is a modular, 24 V DC connectivity device with optional 110 V AC power, CMC cloning, or an LCD display. The CDM-xxx is also available with optional Profibus, DeviceNet or Ethernet fieldbus communications modules to meet the needs of the most up-to-date communications protocols. Ask your sales representative which device is right for your application.

Profile Programming

In addition to conventional programming through the CLV Setup Software, all CLV 41x, 42x, 43x, 44x, and 45x Scanners can also be configured using a feature known as Profile Programming. This feature allows a user to scan a series of unique bar codes upon power up and automatically set all the scanner parameters for a specific application. The bar codes, which are generated out of the CLV Setup Software, represent the scanner's configuration (profile). This technique helps to greatly reduce downtime and service-related costs.

Quick Release Bracket (realign)

CLV Scanner accessories are designed with convenience in mind. A variety of mounting options are available, including the SICK Quick Release Bracket. The CLV Quick Release Bracket uses a single set-screw to ease scanner mounting and exchange. Simply remove the set-screw from an existing scanner mount and alignment is solidly maintained. The need to realign scanners is eliminated, minimizing downtime.

CLV Setup Software

SICK provides its Windows™-based CLV Setup Software with each of its scanner models at no charge. A single software application supports all CLV and ICR models to simplify configuration of a stand-alone scanner or a complex CAN network of scanners. Complete user selectable parameters include focus control, data filtering, real-time performance statistics, and scan rate control.

Technology Features

Dynamic Focus

Dynamic Focus is available on CLV 44x, 45x, 480 and 490 models. This unique focus control method allows a user to optimize the scanner's focal position based on trigger input for the best possible read rate performance over varying ranges. Trigger sources may include external switches, host commands, oscillating mirror, or timer input. Focus parameters are configurable using CLV Setup Software.

Automatic Focus Control

The CLV 490 and CLX 490 use an optical focus technique called Automatic Focus Control. Automatic Focus allows these scanners to determine the ideal focal point for scanning items over varying heights and at high speeds. The response is quick so that even on the fastest conveyor lines, these scanners read and transmit data rapidly. Focus parameters are further configurable using the CLV Setup Software.

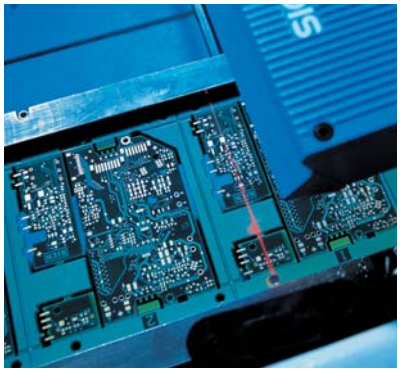
Raster Optics

A raster scan pattern is emitted from CLV Scanners with optional raster optics. Line scanners with a raster pattern produce a slightly larger read area by projecting multiple scan lines over a single code. Raster optics provide higher read rates on poorly printed codes and on codes passing the scanner in a picket fence orientation. Raster optics are available on the CLV 41x, 42x and 43x models.

Oscillating Mirror Optics

Scanners equipped with an optional oscillating mirror are able to scan a wider area than raster scanners and are capable of reading multiple codes passing the scanner in picket fence orientation. The scan line on an oscillating mirror scanner is swept in fixed intervals over the surface of the item to read over a wide area with a single scan line. Oscillation frequency is user selectable using SICK CLV Setup Software. Oscillating mirrors are available on the CLV 43x-490 models.

"Performance, Simplicity, Flexibility"



Laser Measurement Definitions

Measuring Accuracy Definitions

Resolution: The resolution of a measuring device is the smallest possible distance difference between two consecutive individual measurement values. The resolution can be reduced by using averaged values.

Systematic Error: Systematic error is the sum of all the deviations over a defined range and reflectivity, which cannot be reduced even using averaged values.

Standard Deviation: The standard deviation is calculated using the measured distance and reflectivity values on one particular target.

Time-of-flight Measurement Principle

The LMS and LD Sensors operate by measuring the time-of-flight of laser light pulses: a pulsed laser beam is emitted and reflected if it meets an object. The reflection is registered by the scanner's receiver. The time between transmission and reception of the impulse is directly proportional to the distance between the scanner and the object (time-of-flight).

The pulsed laser beam is deflected by an internal rotating mirror so that a fan-shaped scan is made of the surrounding area (laser radar). The contour of the target object is determined from the sequence of impulses received. The measurement data is available in real time for further evaluation via a serial interface.

Pixel-oriented Evaluation

Pixel-oriented evaluation is a filtering technique for suppressing airborne particles, and makes the system less sensitive to environmental factors. This filtering technique compares each measured value over the entire field of view to the previous number of measured values selected by the user. Erroneous measurements can be filtered out by repeatedly examining the reported spot (multiple scanning whose number depends on the setting selected).

Phase Shift Principle

The LMS 400 Sensor uses the phase shift (continuous wave) principle. The propagation time of the light and the wavelength result in a phase shift between the beam sent and the beam received. This phase difference is converted to a frequency. The LMS 400 Sensor determines the distance of the object based on this frequency.

Service and Support

Manufacturing and Design Excellence

Convenience features and added capabilities are only as good as the hardware they are designed to compliment. So, SICK designs, engineers, and manufactures its bar code scanning hardware to be the best in the industry.

Product reliability and longevity is no accident at SICK. More than nine percent of all sales and revenue is reinvested each year into research and development to make SICK Automatic Identification solutions the best on the market. It has more than 300 employees dedicated to research and development and in the past five years SICK has submitted more than 150 patent applications for product designs and Automatic Identification manufacturing procedures.

Rugged dependability is evidenced in the many solutions that SICK provides. Each is designed for the harshest environment. All CLV Scanners conform to strict international standards for emissions, temperature, shock, vibration, and moisture and all are classified to to IP 65 standards. Optional enclosures are even available for maximum scanner and connectivity protection in wash down applications.

SICK product performance and long-term dependability can be attributed to extensive component qualification and product testing prior to shipment. SICK employs state-of-the-art manufacturing practices and automated test fixtures to ensure that each product meets the strictest quality standards. At the component level, critical parts such as lasers and motors are evaluated for lifetime reliability. Subassembly level evaluations are then conducted to ensure that the buildup of products is documented fully. In fact, 100% of all electronic boards and all main sub assemblies are fully tested. Complete failure analysis is conducted and corrective actions taken so that no faulty component goes out the door. Finally, product level testing is completed on 100% of products prior to shipment. This virtually eliminates out-of-box failures and provides the data necessary to continually improve product quality.

From design engineering to manufacture and shipment, the strictest quality standards are enforced. The result…the most dependable bar code scanning solutions on the market.

Customer Service

Customer Service Representatives are centrally located at our headquarters in Minneapolis, MN and can assist you with the most common inquiries, including order status and delivery confirmation. They are also ready to assist you with any questions you have about our services and can connect you to technical support when you need help quickly.

Service and Support

Application Support

SICK Automatic Identification solutions are easy to use and maintain, but it is always reassuring to know that you have an expert available to assist with your applications whenever you need help. Our application support team is the best in the industry. With decades of combined experience, our team can assist you with basic to the most complex application inquiries. They can also determine solution feasibility and recommend exactly the right products for your application. The application support team is available for routine inquires from 8 AM to 6 PM Eastern Time.

Field Service

SICK Field Service Engineers are strategically located throughout North America so they may respond to your installation, maintenance and repair issues quickly. Each service engineer has years of experience dealing with the industry's most advanced conveying and controls systems and is an expert in the science of data collection. Our Field Service Engineers will ensure that your SICK hardware is installed and maintained properly for optimum performance throughout its product life and, should it ever require repair, we will respond quickly so your operations can continue to run smoothly. For emergency after hours service, a Field Service Engineer will be notified, via our after hours call center, to return your call quickly to address your service needs.

Repair Service

Experienced Repair Technicians in our Stoughton, MA facility service and test each product returned for repair to meet new product performance standards. Products under the original factory warranty or covered by an annual service contract receive priority attention and are typically returned within five business days from the time the item is received at SICK. Non-warranty products will be returned to the customer within 3-6 weeks. All repairs include a 90-day warranty. Our Repair Technicians can also recommend spare parts for your data collection systems that can help minimize downtime during routine maintenance and repair periods.

Training: Online and On-site

Get fast orientation and updates on all of SICK's scanner technologies. SICK offers regularly scheduled online training sessions so you can learn more about the performance and maintenance of your scanner hardware. You don't even have to leave your facility! Each quarter, SICK provides training via the Internet through its Online Meeting Center. SICK Product Specialists present basic product information and application training. It's fast and easy…and totally free. For more information, visit our web site at www.sickusa.com and click on the Online Meeting Center.

For more sophisticated scanning systems, SICK can visit your site to conduct application-specific training with your staff. The training includes an overview of the product and basic maintenance procedures. This level of training is ideal for systems in critical applications that include multiple scan stations and/or modular scanning systems. Custom training programs designed around your unique requirements are also available.

Spare Parts

SICK offers a full line of spare parts for your critical application. Contact your Sales Representative or an Application Specialist to find out which spares are recommended for your application. In most cases, having the right spare equipment will keep your operation running smoothly and minimize downtime.

Service and Support

Upgrade Assistance

Your applications run optimally when you have the latest available technology, so SICK makes it easy for you to upgrade to new technologies. New technologies are easier to install, easier to maintain and are usually more affordable than your existing hardware. Whenever you upgrade to new scanning or dimensioning hardware from existing SICK technologies or competitor technologies, SICK will provide you with free expert application support to determine the best possible solution for your application. Contact your Sales Representative or the Application Support Team for upgrade information and to inquire about special program offers.

Site Surveys

For customers implementing fully integrated or modular Omni Scanning Systems (i.e. CLX 490, OPS xxx), we recommend a site survey prior to the installation of hardware. The site survey allows a SICK service or application specialist to evaluate the site where we will install each scanning station. Scanner placement and frame design is optimized using the data gathered from the site survey to expedite installation and commissioning.

Manuals/Product Literature

SICK's manuals provide complete product operating specifications and instructions for setup and maintenance. If you install and maintain hardware yourself, these manuals are key to keeping your systems running smoothly and without interruption. You can stay up to date on SICK's latest product offerings by downloading product literature from our web site at www.sickusa.com, or by contacting a local Sales Representative or Authorized Distributor.

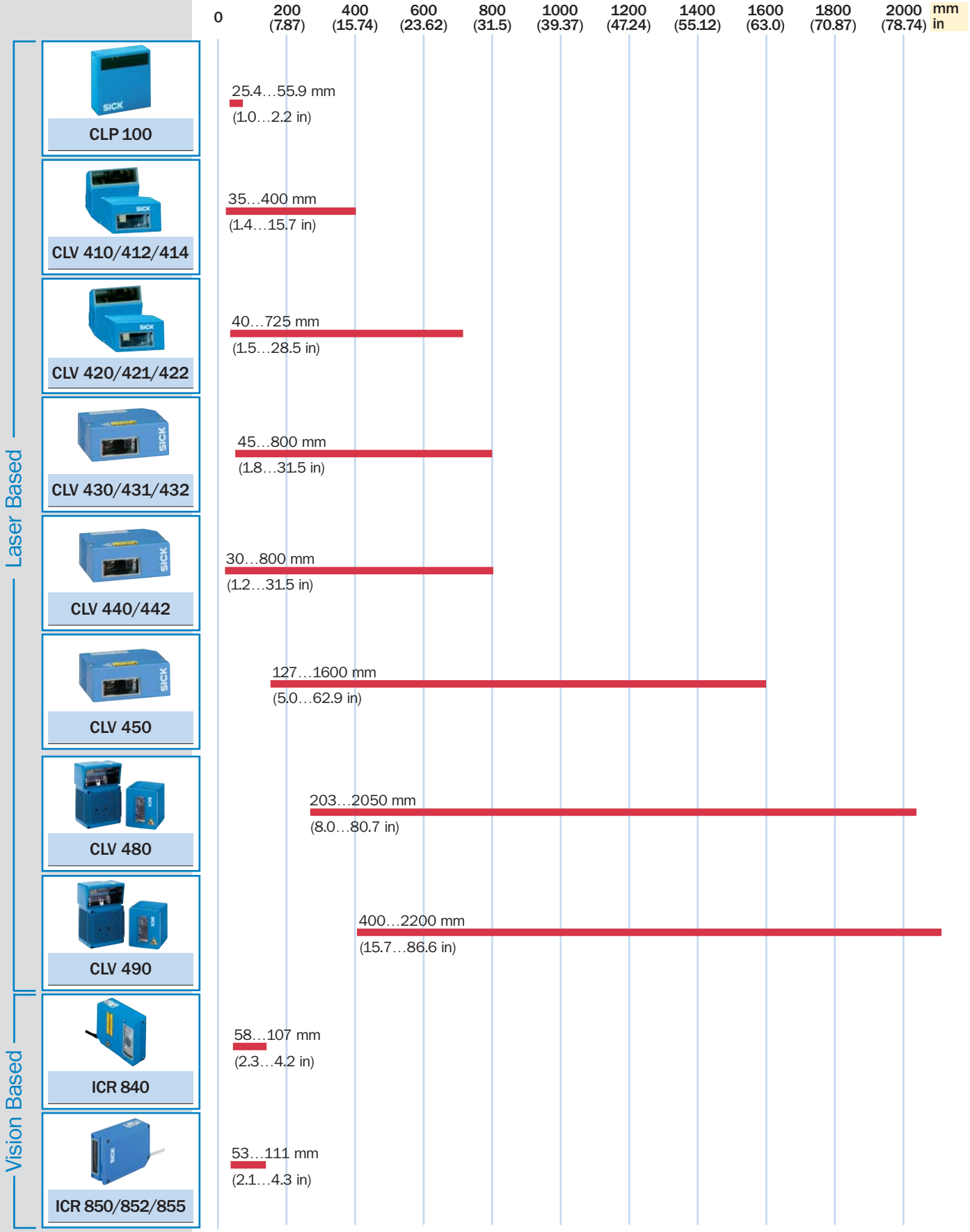
Warranty

SICK offers a full 12-month warranty on all its products. The warranty covers hardware and any SICK peripheral devices used in your application. The standard warranty includes expedited equipment repair (typical 5-day turnaround on bar code scanners) and 24-hour phone support for your application and maintenance questions.

Contact us...

1-800-325-SICK (7425)

Introduction



	Scan Options	Focus Type	Decoding Method	Host Data Interface	Page
CLP 100	CCD	Fixed Focus	Standard	RS 232	22
CLV 410/412/414	Line, Raster	Fixed Focus	Standard	RS 232, RS 422/485, Ethernet TCP/IP, DeviceNet Profibus, Ethernet IP	28
CLV 420/421/422	Line, Raster	Fixed Focus	Standard	RS 232, RS 422/485, Ethernet TCP/IP, DeviceNet Profibus, Ethernet IP	34
CLV 430/431/432	Line, Raster, Oscillating Mirror	Fixed Focus	Standard, SMART	RS 232, RS 422/485, Ethernet TCP/IP, DeviceNet Profibus, Ethernet IP	40
CLV 440/442	Line, Oscillating Mirror	Dynamic Focus Control	Standard, SMART	RS 232, RS 422/485, Ethernet TCP/IP, DeviceNet Profibus, Ethernet IP	46
CLV 450	Line, Oscillating Mirror	Dynamic Focus Control	Standard, SMART	RS 232, RS 422/485, Ethernet TCP/IP, DeviceNet Profibus, Ethernet IP	52
CLV 480	Line, Oscillating Mirror	Dynamic Focus Control	Standard, SMART	RS 232, RS 422/485, Ethernet TCP/IP, DeviceNet Profibus, Ethernet IP	58
CLV 490	Line, Oscillating Mirror	Automatic Focus, Dynamic Focus Control	Standard, SMART	RS 232, RS 422/485, Ethernet TCP/IP, DeviceNet Profibus, Ethernet IP	64
ICR 840	CMOS, Area Array	Fixed Focus	Standard, SMART	RS 232, RS 422/485, Ethernet TCP/IP, DeviceNet Profibus, Ethernet IP	70
ICR 850/852/855	CCD, Line	Fixed Focus	Standard, SMART	RS 232, RS 422/485, Ethernet TCP/IP, DeviceNet Profibus, Ethernet IP	76

CLP 100
Fixed Position Scanner

Features

- Outstanding reading performance at short distances
- Short capture time due to high scanning frequency
- Scanning and decoding frequency of 500 Hz
- Optimized focus distance at 1.38 in (35 mm)
- Front or side scanning models

The CLP 100 Bar Code Scanner can solve many simple bar code identification tasks - convenient for any situation and any application.

The task is to identify bar codes at short reading distances, while having little or no distance variation and with limited space for mounting a bar code "sensor." Additionally, this scanning solution has to fit into a limited budget.

These are ideal requirements for the use of the CLP 100 - a fixed mount bar code scanner, which is based on CCD-Technology.

The CLP 100 offers all the features required to solve simple identification tasks in OEM applications. Due to its small housing size and the straight or lateral oriented reading window, this scanner can be integrated into nearly all mounting situations.

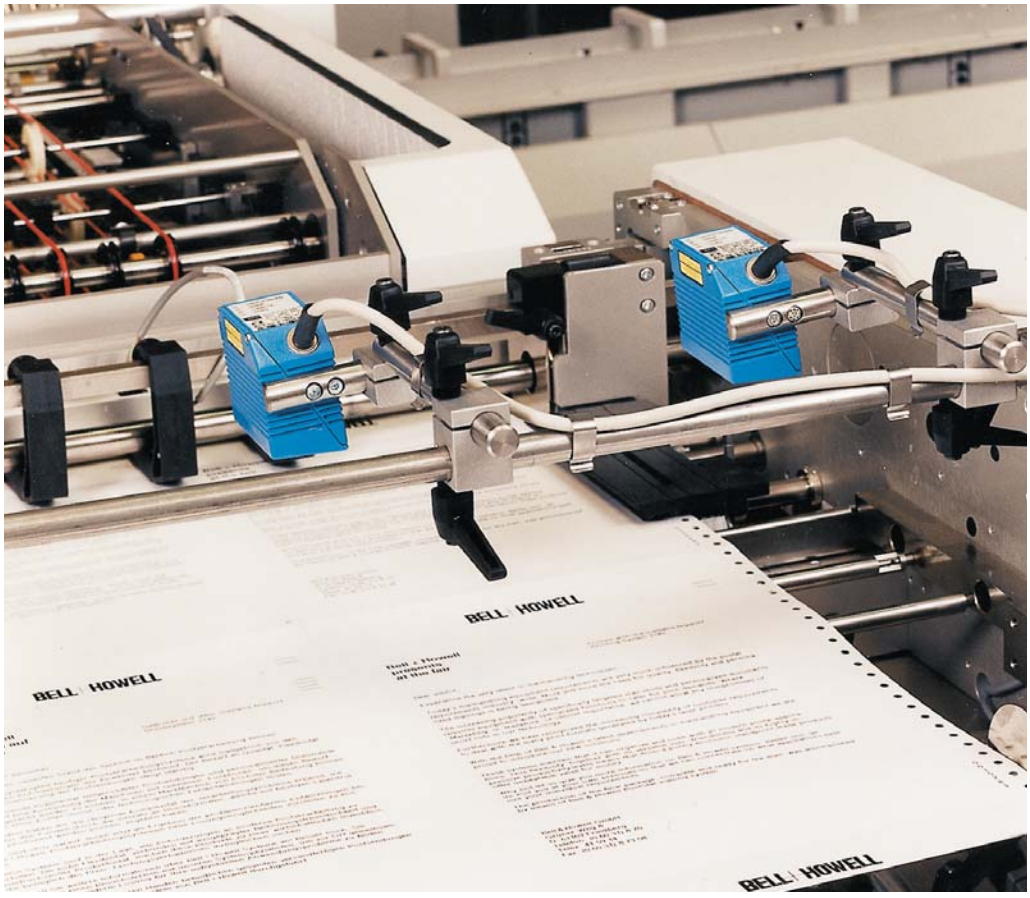
The high scanning rate of 500 Hz is the base for solving high speed applications. This is also true for reading high density bar codes with a minimal resolution as small as 0.005 inches (0.125 mm).

The extremely high-performing decoder is integrated in this miniature bar code scanner and transmits ASCII data via RS 232 interface to the assigned host computer.

The configuration of the CLP 100 is adaptable to various customer needs. This is supported by a Windows™-based setup software or by the use of the Host Command language - fast and user-friendly.

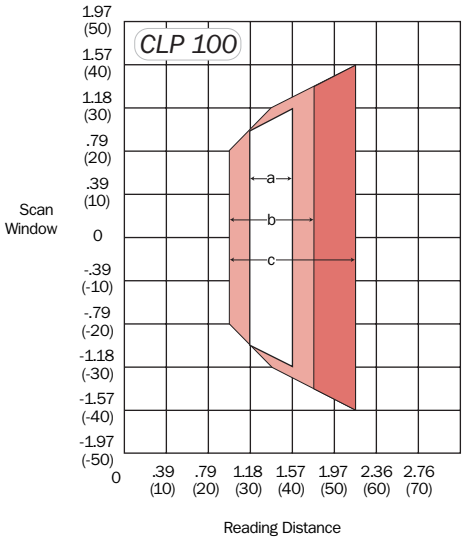
Comparison Table

	CLP 100 Standard Density
Reading Range	1.0…2.2 in (25.4…55.9 mm)
Scan Frequency	500 Hz
Cloning	
Fixed Focus	■
Dynamic Focus	
Auto Focus	
Standard Decoding	■
SMART Decoding	
Line Scanner	CCD Line
Raster Scanner	
Oscillating Mirror Scanner	
Front Emitting	■
Side Emitting	■
Plastic Window	
Low Contrast	



Reading Ranges

Dimensions in inches (mm)



Code Resolution

- a: 0.006 in (0.15 mm)
- b: .008 in (0.2 mm), .01 in (0.25 mm)
- c: .014 in (0.35 mm), .02 in (0.5 mm), .04 in (1.0 mm)

Technical Specifications

	CLP 100
Scanning Characteristics	
Scanning Method	CCD
Scanning Frequency	500 Hz
Light Source	Visible red light (630 nm)
Reading Distance	1.0…2.2 in (25.4…55.9 mm)
Resolution	0.005…0.040 in (0.125…1.0 mm)
Bar Code Types	
Bar Code Symbology	Code 39, Interleaved 2/5, Code 128, EAN, Codabar, Interleaved 2/5 B
Readability	10 bar codes per reading gate
Auto Discrimination	6 different symbologies per scan or reading gate
Communications / I/O / Indicators	
Host Interface	RS 232, variable data output format
Baud Rate	1,200…19,200 (software selectable)
Data Format	Data bits, stop bits, parity (software selectable)
LED Indicators	CCD on, reading gate on, good read, no read
Switching Inputs	1 x NPN, maximum 30 V DC
Switching Outputs	1 x NPN, maximum 50 mA
Trigger Methods	Sensor input (I/O interface)/Serial (host interface)
Mechanical/Electrical	
Supply Voltage	Operating voltage 5 V DC ± 5%
Current Consumption	350 mA
Weight	Approx. 7 oz (200 g)
Housing	Metal
Enclosure Rating	IP 40
Connectivity	Open cable, 9-pin D-Sub connector
Environmental	
Ambient Operating Temperature	32…104°F (0…40°C)
Storage Temperature	-4…158°F (-20…70°C)
EMV	To IEC 801
Maximum Relative Humidity	30%…85%, non-condensing
Programming	Windows™-based CLP Setup Software

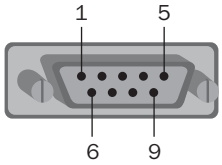
Models and Part Numbers

	CLP 100 Open Cable End	CLP 100 9-Pin Connector
Front Emitting Scanner		
Model	CLP 100-0110	CLP 100-0010
Part Number	1 018 333	1 018 331
Side Emitting Scanner		
Model	CLP 100-2110	CLP 100-2010
Part Number	1 018 334	1 018 332

NOTE: Accessories information is located on page 86.

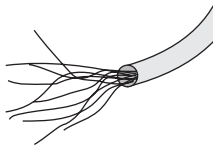
Pinouts

9-pin connector



Pin	Signal
1	Sensor
2	RxD (RS 232), Host
3	TxD (RS 232), Host
4	Result “GO/NG”
5	GND
6	Not assigned
7	RxD (RS 232, TTL), Terminal
8	TxD (RS 232, TTL), Terminal
9	DC +5 V

Open cable end

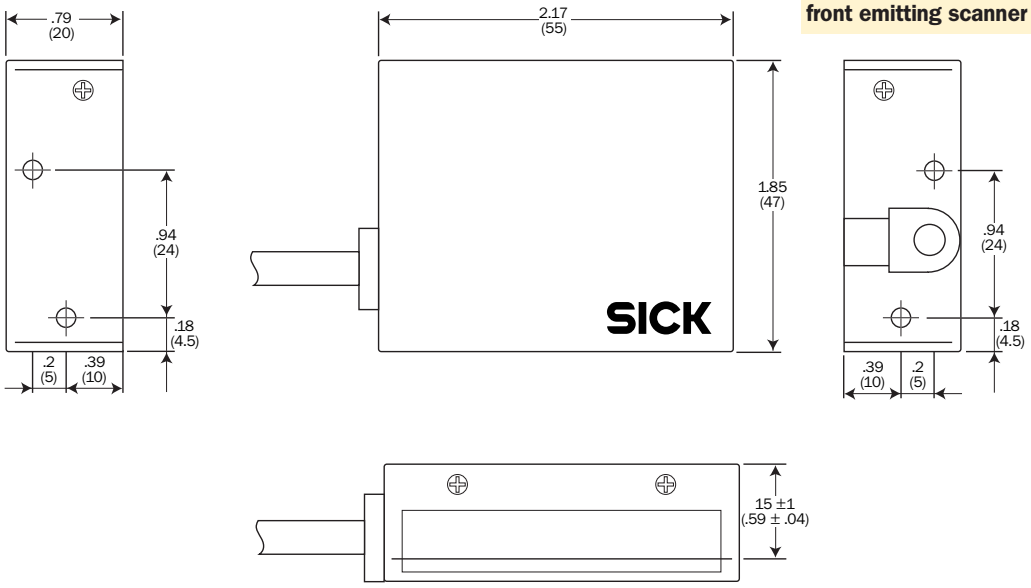


Color	Signal
Pink	Sensor
Brown	RxD (RS 232), Host
Gray	TxD (RS 232), Host
White	Result “GO/NG”
Black	GND
-	Not assigned
Yellow	RxD (RS 232, TTL), Terminal
Orange	TxD (RS 232, TTL), Terminal
Red	DC +5 V
Blue	RTS
Green	CTS

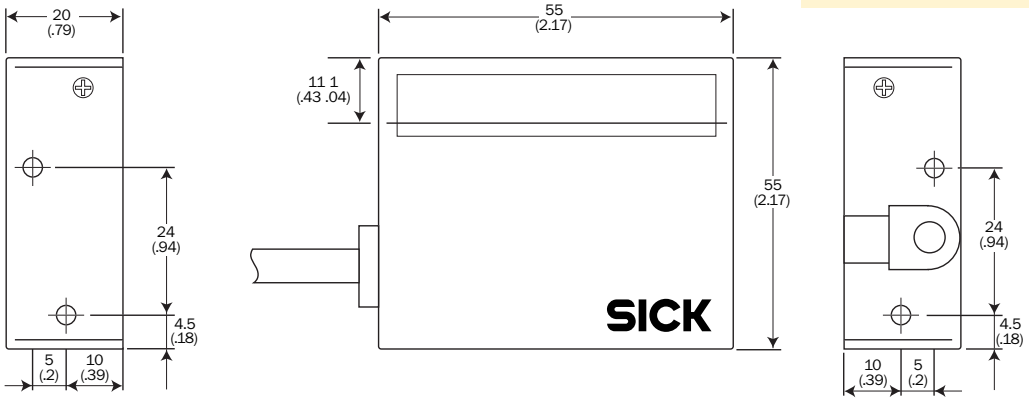
Drawings

Dimensions in inches (mm)

CLP 100
front emitting scanner



CLP 100
side emitting scanner



CLV 410/412/414
Fixed Position Scanner

Features

- Profile programming – Auto setup
- Match code capability
- Automatic triggering
- Front and side emitting housing
- Integrated scanner and decoder
- Real-time diagnostics

The CLV 41x Series Bar Code Scanners' compact design makes it ideal for limited space applications. Its high-performance scan rate, real-time decoding, and integrated decoder make it an excellent solution in applications where high throughput is needed.

The CLV 41x Series has a user-selectable scan rate of 200 to 800 Hz at a reading range of 2 to 16 inches. All parameters of the CLV 41x, including minimum reading distance, bar code resolution, scan frequency, bar code label specifications and data format, are selectable via our Windows™-based CLV Setup Software. This user-friendly, unique, stand-alone software program guides the user through complete scanner configuration.

In addition to conventional programming through the CLV Setup Software, all CLV 41x Scanners can also be configured using a feature known as Profile Programming. This feature allows a user to scan a series of unique bar codes upon power up and automatically set all scanner parameters for a specific application. The bar codes, which are generated out of the CLV Setup Software, represent the scanner's configuration (profile). This technique helps to greatly reduce downtime and service-related costs - you will be up and running with no need for a PC.

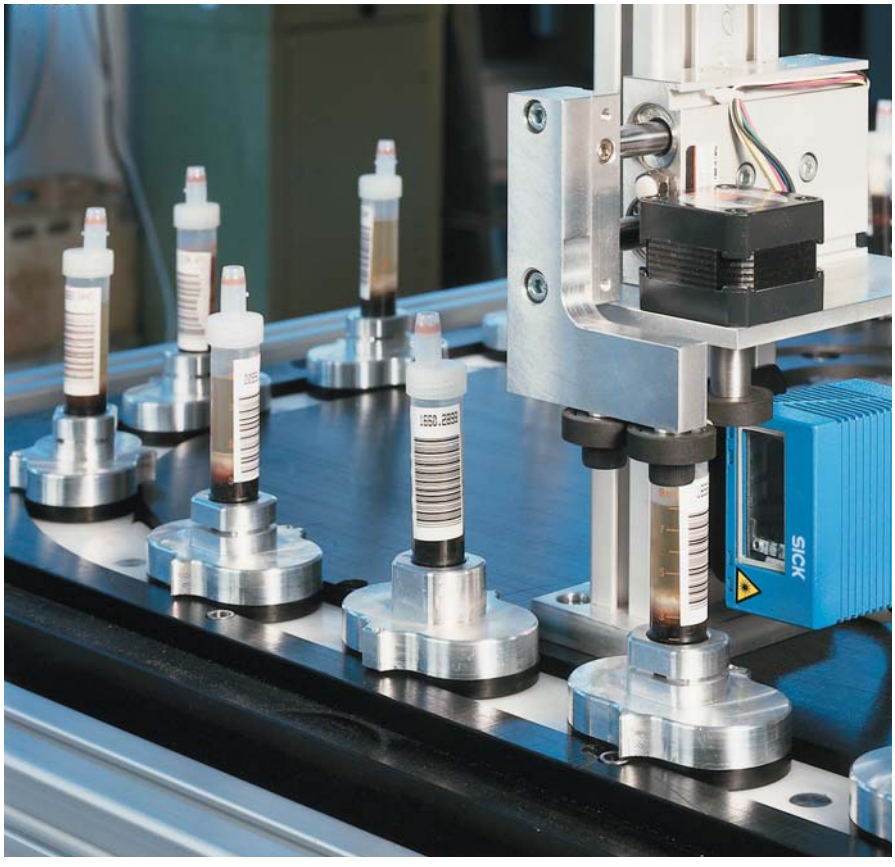
In addition, SICK's Automatic Triggering technology allows the scanner to automatically sense a package to activate the bar code reading process. Its rugged zinc die cast housing, precision optics, and powerful electronics create a highly reliable system for industrial applications.

The CLV 41x Series is ideal for medical instrumentation, test fixtures, packaging machines, and small conveyor applications.

Comparison Table

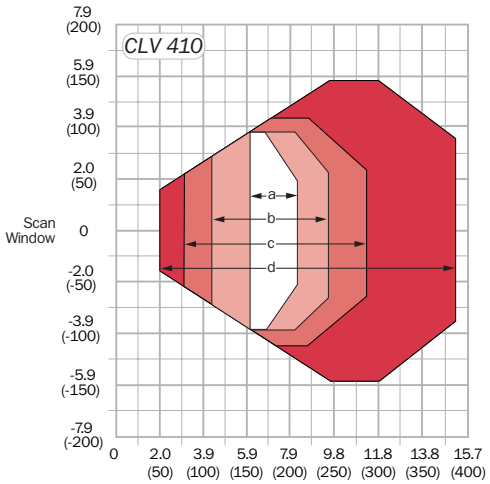
	CLV 410 Standard	CLV 412 High Density	CLV 414 Close Range
Reading Range	2.0…15.7 in (50…400 mm)	1.4…3.7 in (35…95 mm)	1.6…3.9 in (40…100 mm)
Scan Frequency	200…800 Hz (software selectable)	200…800 Hz (software selectable)	200…800 Hz (software selectable)
Cloning			
Fixed Focus	■	■	■
Dynamic Focus			
Auto Focus			
Standard Decoding	■	■	■
SMART Decoding			
Line Scanner	■	■	■
Raster Scanner	■	■	■
Oscillating Mirror Scanner			
Front Emitting	■	■	■
Side Emitting	■	■	■
Plastic Window	■	■	■
Low Contrast	■	■	■
Plastic Window	■ *		■ *
Low Contrast	■ *		■ *

* Not available in all configurations.



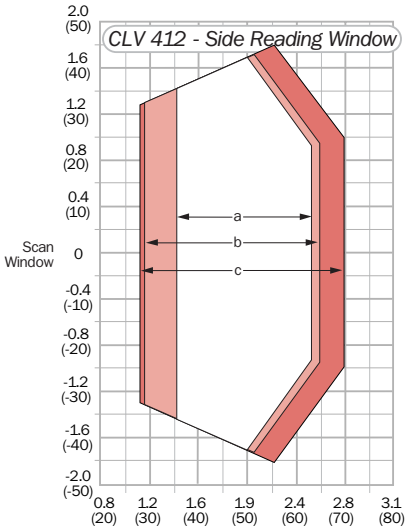
Reading Ranges

Dimensions in inches (mm)



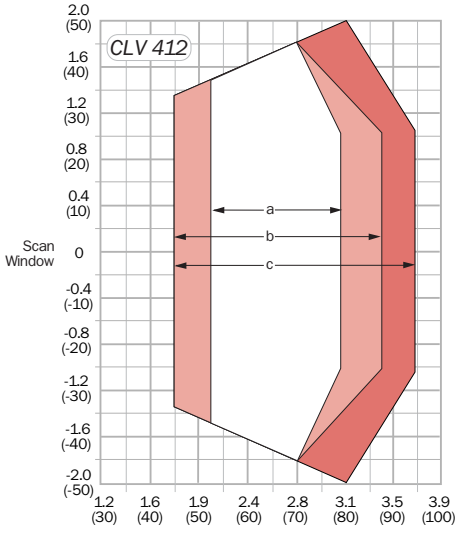
Code Resolution
- a: 0.008 in (0.20 mm)
- b: 0.013 in (0.35 mm)
- c: 0.020 in (0.50 mm)
- d: 0.040 in (1.0 mm)

NOTE: Side Emitting Scanner: The entire reading field is shifted 0.71 in (18 mm) toward the reading window

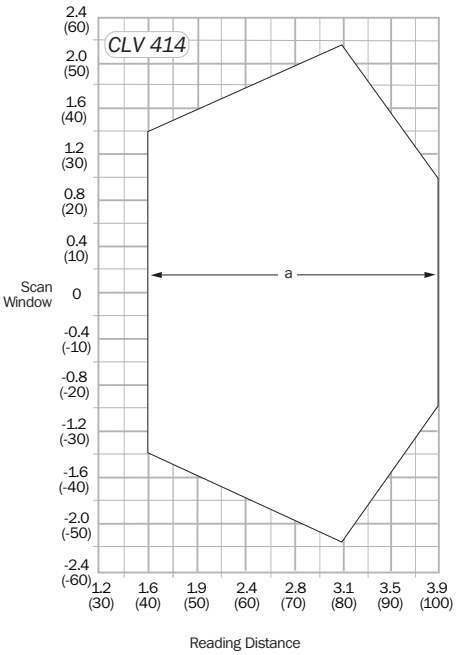


Code Resolution
- a: 0.004 in (0.10 mm)
- b: 0.006 in (0.15 mm)
- c: 0.008 in (0.20 mm)

NOTE: Side Emitting Scanner: The entire reading field is shifted 0.71 in (18 mm) toward the reading window



Code Resolution
- a: 0.004 in (0.10 mm)
- b: 0.006 in (0.15 mm)
- c: 0.008 in (0.20 mm)



Code Resolution
- a: 0.008 in (0.20 mm)

NOTE: Side Emitting Scanner: The entire reading field is shifted 0.71 in (18 mm) toward the reading window

Technical Specifications

	CLV 410	CLV 412	CLV 414
Scanning Characteristics			
Scanning Method	8-sided polygon mirror wheel		
Aperture Angle			
Line/raster scanner	60°		
Side emitting scanner	50°		
Scanning Frequency	200…800 Hz (software selectable)		
Light Source	Visible laser diode (670 nm); CDRH Class II		
Reading Distance	2.0…15.7 in (50…400 mm)	1.4…3.7 in (35…95 mm)	1.6…3.9 in (40…100 mm)
Resolution	0.008…0.040 in (0.2…1.0 mm)	0.004…0.008 in (0.1…0.2 mm)	0.008…0.020 in (0.2…0.5 mm)
Bar Code Types			
Bar Code Symbology	Code 39, Interleaved 2/5, Industrial 2/5, Codabar, Code 93, EAN/EAN 128, UPC, Code 128, Pharmacode		
Readability	1…3 bar codes per scan		
Auto Discrimination	1…50 bar codes per reading gate		
Communications / I/O / Indicators			
Host Interface	RS 232 and RS 422/485, variable data output format		
Baud Rate	300…57,600 (software selectable)		
Data Format	Data bits, stop bits, parity (software selectable)		
Network Configuration	Pass-through; master/slave; RS 485 network		
LED Indicators	Device ready, result, laser on, data		
Switching Inputs	2 x PNP, opto-decoupled, maximum 30 V DC		
Switching Outputs	3 x PNP, maximum 100 mA / 24 V DC; Output 1, Output 2, Output 3		
Trigger Methods	Sensor input (I/O interface) / Serial (Host interface) / Free running / Reflector polling (automatic)		
Mechanical/Electrical			
Supply Voltage	Operating voltage 5…30 V DC		
Current Consumption	125 mA at 24 V DC / 3.0 W		
Dimensions			
Line/raster scanner	2.3 x 2.5 x 1.4 in (59 x 62.7 x 35.2 mm)		
Side emitting scanner	2.8 x 2.5 x 1.4 in (72 x 62.7 x 35.2 mm)		
Weight	Approx. 8.75 oz (250 g)		
Housing / Enclosure Rating	Die cast zinc / IP 54		
Connectivity	15-pin male D-Sub high density cable, 3 ft (0.9 m) cable length		
Environmental			
Ambient Operating Temperature	32…104°F (0…40°C)		
Storage Temperature	-4…158°F (-20…70°C)		
Vibration	To IEC 68-2-6 test FC		
Shock	To IEC 68-2-27 test EA		
EMV	To IEC 801		
Maximum Relative Humidity	90%, non-condensing		
Programming	Windows™-based CLV Setup Software		

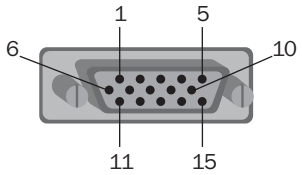
Models and Part Numbers

	CLV 410	CLV 412	CLV 414
Front Emitting Line Scanner			
Model	CLV 410-0010	CLV 412-0010	CLV 414-0010
Part Number	1 015 421	1 017 527	1 017 368
Front Emitting Raster Scanner			
Model	CLV 410-1010	CLV 412-1010	CLV 414-1010
Part Number	1 015 427	1 017 528	1 016 767
Side Emitting Line Scanner			
Model	CLV 410-2010	CLV 412-2010	CLV 414-2010
Part Number	1 017 534	1 017 538	1 017 396
Side Emitting Raster Scanner			
Model	CLV 410-3010	CLV 412-3010	CLV 414-3010
Part Number	1 017 536	1 017 540	1 016 831

NOTE: Accessories information is located on pages 86 - 87.

Pinouts

15-pin connector



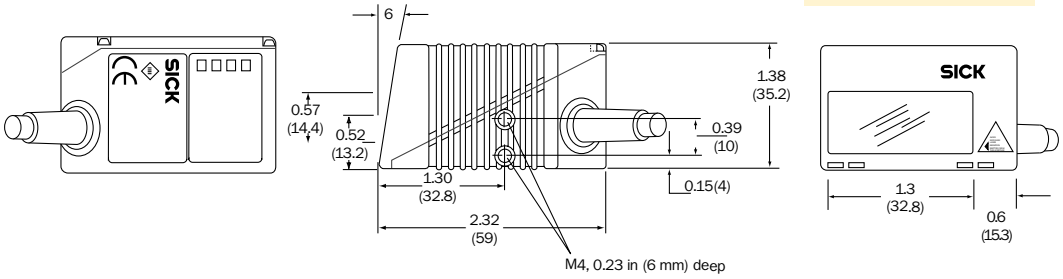
Pin	Signal	Function
1	DC 4.5…30 V	Supply voltage
2	Sensor 2[1)]	Switching input teach-in (match code 1)
3	Sensor 3[2)]	Switching output (to PLC)
4	Term RS 422	Termination for data interface 1
5	GND	Ground
6	RD+ (RS 422/485)	Data interface 1 (receiver)
7	RD- (RS 422/485)	Data interface 1 (receiver)
8	TD+ (RS 422/485)	Data interface 1 (transmitter)
9	TD- (RS 422/485)	Data interface 1 (transmitter)
10	RxD (RS 232)	Data interface 2 (receiver)
11	TxD (RS 232)	Data interface 2 (transmitter)
12	Result 1[2)]	Switching output (to PLC)
13	Result 2[2)]	Switching output (to PLC)
14	Sensor 1[3)]	Switching input for ext. reading pulse
15	Sensor GND	Common ground (all inputs)
-	-	Shield

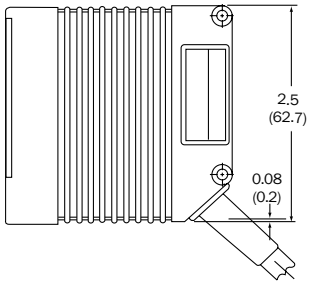
1) 24 V DC input for Teach Mode
2) 24 V DC output
3) External sensor input (24 V DC at 100 mA) for trigger

Drawings

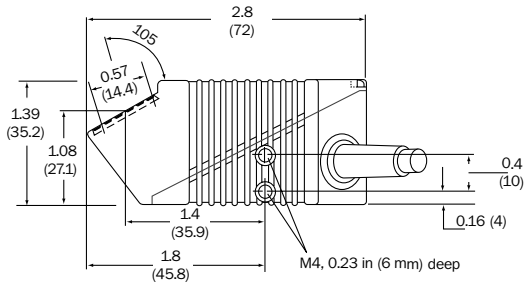
Dimensions in inches (mm)

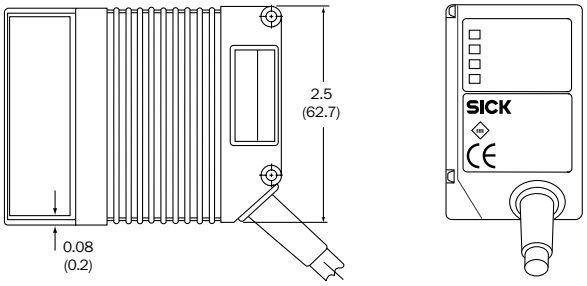
CLV 410/412/414
front emitting scanner





CLV 410/412/414
side emitting scanner





CLV 420/421/422
Fixed Position Scanner

Features

- High speed (1200 Hz)
- Integrated CAN bus
- Cloning module capabilities
- Extremely large depth of field (2…29 in)
- Automatic Triggering
- Profile programming – Auto setup
- Real-time decoding and diagnostics
- Extended communications
- Optional display

The CLV 42x Series fits in the palm of your hand, and at 400 to 1200 scans per second, with a 27-inch depth of field, it is the most powerful bar code scanner of its size. Its rugged zinc die cast housing, precision optics, and powerful electronics create a highly reliable system for industrial applications. Its high-performance scan rate, real-time decoding, and integrated decoder make it an excellent solution in applications where high throughput is needed.

The CLV 42x is equipped with an integrated CAN bus interface which allows you to seamlessly and easily connect multiple scanners together in a single high-speed network. This allows for easy setup, reduced cabling, and lowered system cost due to reduced hardware.

The CLV 42x Bar Code Scanner has multiple programming options for the most flexibility on the market. You can use the Windows™-based CLV Setup Software package included with the bar code scanner, our Profile Programming functionality which allows for extremely quick swap out without the use of a PC on the plant floor, or our exclusive cloning capabilities that are available with the CDM connectivity device. Application-specific parameters are automatically copied to a new scanner once it is connected to a connection device with a CMC Cloning Module.

All parameters, including minimum reading distance, bar code resolution, scan frequency, bar code label specifications, and data format are software selectable to optimize the performance of the scanner for your specific application.

The CLV 42x is ideal for material handling, packaging, document handling and electronics applications.

Comparison Table

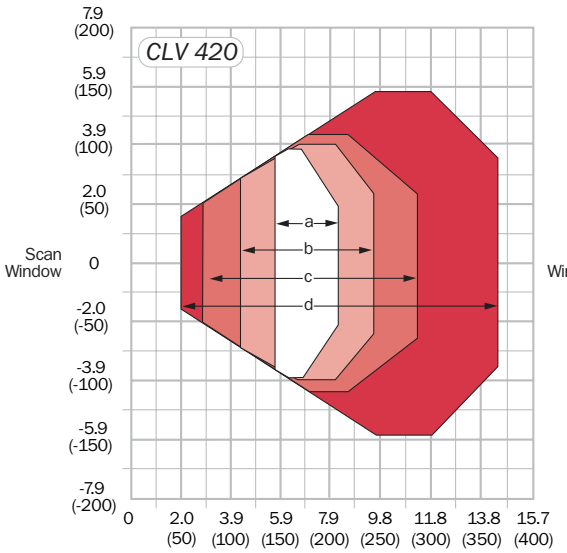
	CLV 420 Standard	CLV 421 Standard (Long Range)	CLV 422 High Density
Reading Range	2.0…14.0 in (50…365 mm)	2.0…28.5 in (50…725 mm)	1.5…8.0 in (40…200 mm)
Scan Frequency	400…1200 Hz (software selectable)	400…1200 Hz (software selectable)	400…1200 Hz (software selectable)
Cloning*	■	■	■
Fixed Focus	■	■	■
Dynamic Focus			
Auto Focus			
Standard Decoding	■	■	■
SMART Decoding			
Line Scanner	■	■	■
Raster Scanner	■	■	■
Oscillating Mirror Scanner			
Front Emitting	■	■	■
Side Emitting	■	■	■
Plastic Window	■ **		■ **
Low Contrast			

* Requires use of CDM 420 or CDB 420 Connectivity Device with optional CMC 400 Cloning Module.

** Not available in all configurations.

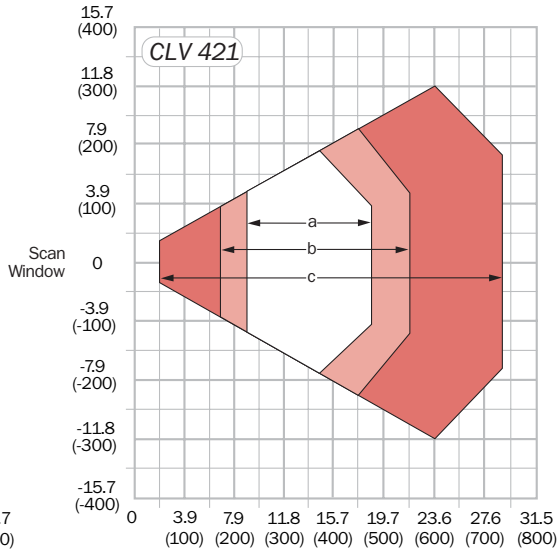
Reading Ranges

Dimensions in inches (mm)



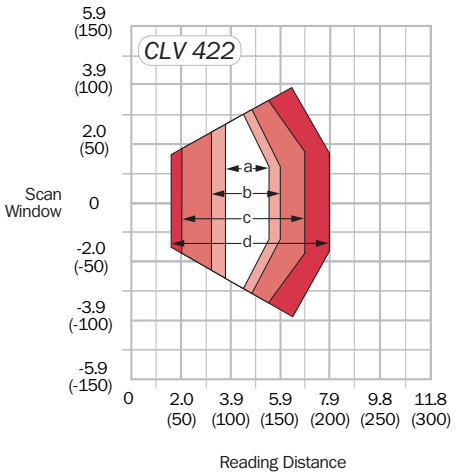
Code Resolution
- a: 0.008 in (0.20 mm)
- b: 0.013 in (0.35 mm)
- c: 0.020 in (0.50 mm)
- d: 0.040 in (1.0 mm)

NOTE: Side Emitting Scanner: The entire reading field is shifted 0.71 in (18 mm) toward the reading window



Code Resolution
- a: 0.013 in (0.35 mm)
- b: 0.020 in (0.50 mm)
- c: 0.040 in (1.0 mm)

NOTE: Side Emitting Scanner: The entire reading field is shifted 0.71 in (18 mm) toward the reading window



Code Resolution
- a: 0.006 in (0.15 mm)
- b: 0.008 in (0.20 mm)
- c: 0.013 in (0.35 mm)
- d: 0.020 in (0.50 mm)

NOTE: Side Emitting Scanner: The entire reading field is shifted 0.71 in (18 mm) toward the reading window

Technical Specifications

	CLV 420	CLV 421	CLV 422
Scanning Characteristics			
Scanning Method	8-sided polygon mirror wheel		
Aperture Angle	50°		
Scanning Frequency	400…1200 Hz (software selectable)		
Light Source	Visible laser diode (670 nm); CDRH Class II		
Reading Distance	2.0…14 in (50…365 mm)	2.0…28.5 in (50…725 mm)	1.5…8.0 in (40…200 mm)
Resolution	0.008…0.040 in (0.2…1.0 mm)	0.014…0.04 in (0.35…1.0 mm)	0.006…0.02 in (0.15…0.5 mm)
Bar Code Types			
Bar Code Symbology	Code 39, Interleaved 2/5, Industrial 2/5, Codabar, Code 93, EAN/EAN 128, UPC, Code 128, Pharmacode		
Readability	1…3 bar codes per scan line		
Auto Discrimination	1…10 bar codes per reading gate		
Communications / I/O / Indicators			
Host Interface	RS 232 and RS 422/485, variable data output (software selectable)		
Baud Rate	300…57,600 (software selectable)		
Data Format	Data bits, stop bits, parity (software selectable)		
Network Configuration	Pass-through; master/slave; RS 485 network, CAN Bus, CAN scanner, CANopen		
LED Indicators	Device ready, result, laser on, data		
Switching Inputs	2 x PNP, opto-decoupled, maximum 30 V DC		
Switching Outputs	2 x PNP, maximum 100 mA / 24 V DC; Output 1, Output 2		
Trigger Methods	Sensor input (I/O interface) / Serial (Host interface) / Free running / Reflector polling (automatic)		
Mechanical/Electrical			
Supply Voltage	Operating voltage 10…30 V DC		
Current Consumption	145 mA at 24 V DC / 3.5 W		
Dimensions			
Line/raster scanner	2.3 x 2.5 x 1.4 in (59 x 62.7 x 35.2 mm)		
Side emitting scanner	2.8 x 2.5 x 1.4 in (72 x 62.7 x 35.2 mm)		
Weight	Approx. 8.75 oz (250 g) including cable		
Housing / Enclosure Rating	Die cast zinc / IP 65		
Connectivity	15-pin male D-Sub high density cable, 3 ft (0.9 m) cable length		
Environmental			
Ambient Operating Temperature	32…104°F (0…40°C)		
Storage Temperature	-4…158°F (-20…70°C)		
Vibration	To IEC 60-2-6 test FC		
Shock	To IEC 60-2-27 test EA		
EMV	To IEC 801		
Maximum Relative Humidity	90%, non-condensing		
Programming	Windows™-based CLV Setup Software		

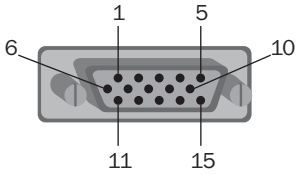
Models and Part Numbers

	CLV 420	CLV 421	CLV 422
Front Emitting Line Scanner			
Model	CLV 420-0010	CLV 421-0010	CLV 422-0010
Part Number	1 022 031	1 022 547	1 022 548
Front Emitting Raster Scanner			
Model	CLV 420-1010	CLV 421-1010	CLV 422-1010
Part Number	1 022 032	1 022 616	1 022 619
Side Emitting Line Scanner			
Model	CLV 420-2010	CLV 421-2010	CLV 422-2010
Part Number	1 022 033	1 022 617	1 022 620
Side Emitting Raster Scanner			
Model	CLV 420-3010	CLV 421-3010	CLV 422-3010
Part Number	1 022 034	1 022 618	1 022 621

NOTE: Accessories information is located on pages 87 - 88.

Pinouts

15-pin connector

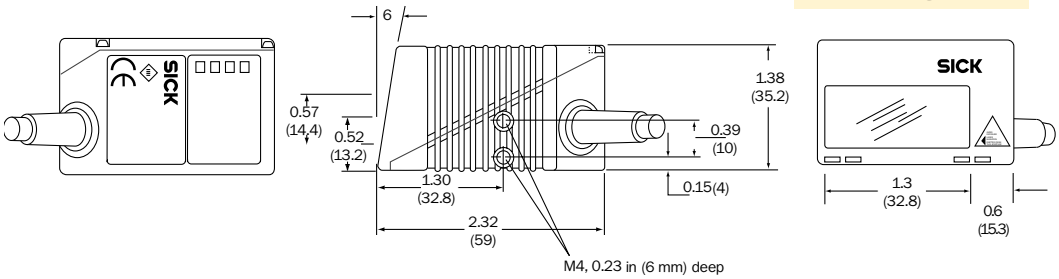


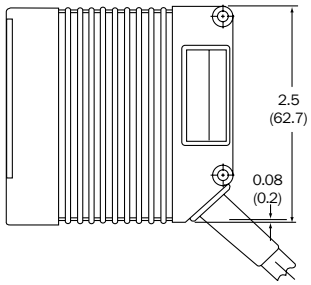
Pin	Signal	Function
1	10…30 V	Power supply
2	RxD (Terminal)	Terminal interface (receiver)
3	TxD (Terminal)	Terminal interface (transmitter)
4	Sensor 2	Switching input, variable function
5	GND	Ground
6	RD+ (RS 422/485)	Host interface (receiver)
7	RD- (RS 422/485)	Host interface (receiver)
	RxD (RS 232)	-
8	TD+ (RS 422/485)	Host interface (transmitter)
9	TD- (RS 422/485)	Host interface (transmitter)
	TxD (RS 232)	-
10	CAN H	CAN Bus (IN/OUT)
11	CAN L	CAN Bus (IN/OUT)
12	Result 1	Switching output, variable function
13	Result 2	Switching output, variable function
14	Sensor 1	Switching input for ext. reading pulse
15	Sensor GND	Common ground (all inputs)
-	-	Shield

Drawings

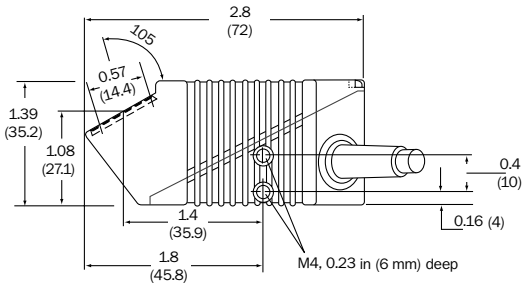
Dimensions in inches (mm)

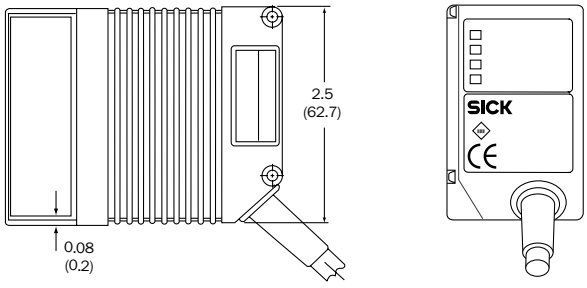
CLV 420/421/422
front emitting scanner





CLV 420/421/422
side emitting scanner





CLV 430/431/432
Fixed Position Scanner

Features

- SMART Technology
- Compact design
- Cloning module capabilities
- Integrated CAN bus network
- Optional display
- Profile Programming – Auto setup
- Automatic Triggering
- Extended communications

The compact size of the CLV 43x Series allows it to fit into any application, even ones in tight spaces. The strong performance characteristics of this scanner are not limited by its size; SMART Technology (SICK's Modular Advanced Recognition Technology) enables the scanner to read bar codes that could not be read by other scanners. The CLV 43x processes complete bar code images before decoding. This translates into a much higher percentage of successful reads, even with bar codes presented at high tilt angles, or bar codes damaged by tearing, smearing or splotches.

The CLV 43x has a user-selectable scan rate of 300 to 800 Hz at a reading range of 2 to 32 inches. All parameters of the CLV 43x, including bar code resolution, scan frequency, bar code label specifications and data format, are selectable via included Windows™-based CLV Setup Software.

Other setup options are our integrated Profile Programming, which simplifies scanner setup without the need of a PC and our external CMC Cloning Module, which allows for all application-specific parameters to be automatically copied to a new scanner. Either of these options results in extremely fast setup or seamless swap out.

The CLV 43x Series also has integrated CAN bus networking. This enables you to easily connect up to 32 scanners in a single high-speed network for easy setup, reduced cabling, and lowered system cost due to reduced hardware. The CLV 43x is designed to save you time and money.

The CLV 43x is especially suited to applications such as material handling, print and apply verification, product label verification, automated medical instrumentation, automotive assembly, electronic circuit board identification, and packaging.

Comparison Table

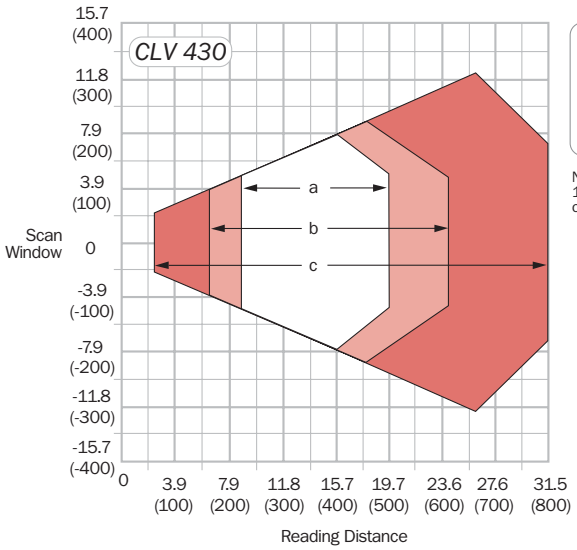
	CLV 430 Standard	CLV 431 Standard	CLV 432 Standard (Close Range)
Reading Range	2.0…31.5 in (51…800 mm)	3.5…16.7 in (89…424 mm)	2.0…10.0 in (51…254 mm)
Scan Frequency	300…800 Hz (software selectable)	300…800 Hz (software selectable)	300…800 Hz (software selectable)
Cloning*	■	■	■
Fixed Focus	■	■	■
Dynamic Focus			
Auto Focus			
Standard Decoding	■	■	■
SMART Decoding	■	■	■
Line Scanner	■	■	■
Raster Scanner	■	■	■
Oscillating Mirror Scanner	■	■	■
Front Emitting	■	■	■
Side Emitting		■	■
Plastic Window	■ **	■ **	■ **
Low Contrast	■ **		■ **

* Requires use of CDM 420 or CDB 420 Connectivity Device with optional CMC 400 Cloning Module.

** Not available in all configurations.

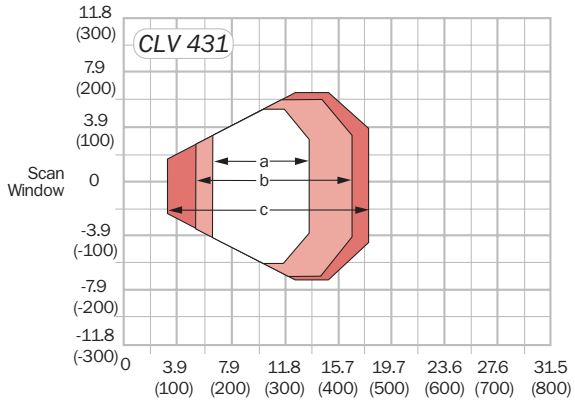
Reading Ranges

Dimensions in inches (mm)



Code Resolution
- a: 0.013 in (0.35 mm)
- b: 0.02 in (0.50 mm)
- c: 0.040 in (1.0 mm)

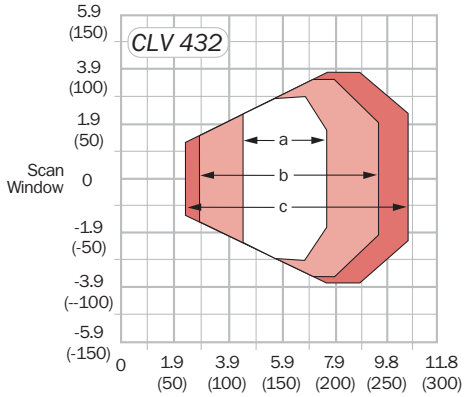
NOTE: Raster Height: The raster height is 15 mm [0.60 in (8 lines)] at a reading distance of 200 mm (7.87 in)



Code Resolution
- a: 0.010 in (0.25 mm)
- b: 0.013 in (0.35 mm)
- c: 0.020 in (0.50 mm)

NOTE: Side Emitting Scanner: The entire reading field is shifted 20 mm (0.79 in) toward the reading window

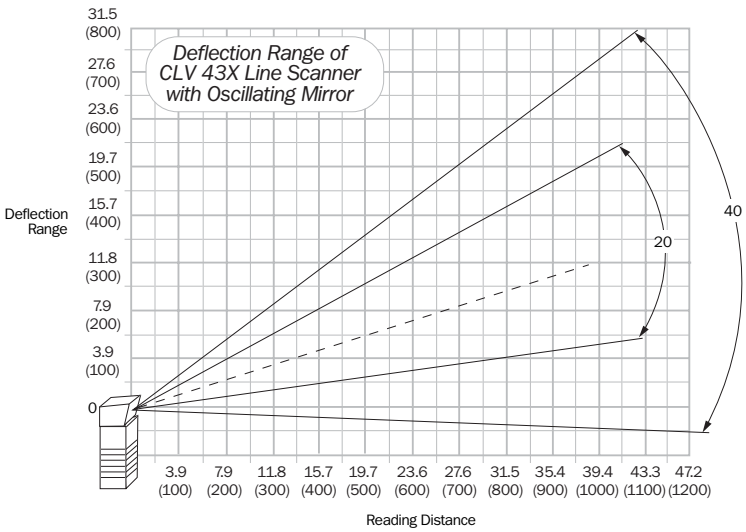
NOTE: Raster Height: The raster height is 15 mm [0.60 in (8 lines)] at a reading distance of 200 mm (7.87 in)



Code Resolution
- a: 0.008 in (0.20 mm)
- b: 0.013 in (0.35 mm)
- c: 0.020 in (0.50 mm)

NOTE: Side Emitting Scanner: The entire reading field is shifted 20 mm (0.79 in) toward the reading window

NOTE: Raster Height: The raster height is 15 mm [0.60 in (8 lines)] at a reading distance of 200 mm (7.87 in)



Technical Specifications

	CLV 430	CLV 431	CLV 432
Scanning Characteristics			
Scanning Method	8-sided polygon mirror wheel		
Aperture Angle	50°		
Scanning Frequency	300…800 Hz (software selectable)		
Light Source	Visible laser diode (670 nm); CDRH Class II		
Reading Distance	2.0…31.5 in (51…800 mm)	3.5…16.7 in (89…424 mm)	2.0…10.0 in (51…254 mm)
Resolution	0.008…0.040 in (0.2…1.0 mm)		
Bar Code Types			
Bar Code Symbology	Code 39, Interleaved 2/5, Codabar, Code 93, EAN/EAN 128, UPC, Code 128, Pharmacode		
Readability	1 to 20 bar codes per scan (standard decoder); 1 to 6 (SMART)		
Auto Discrimination	1…50 bar codes per reading gate		
Communications / I/O / Indicators			
Host Interface	RS 232 and RS 422/485, variable data output format (software selectable)		
Baud Rate	300…57,600 (software selectable)		
Data Format	Data bits, stop bits, parity (software selectable)		
Network Configuration	Pass-through; master/slave; RS 485 network; CAN scanner, CANopen		
LED Indicators	Device ready, result, sensor, data		
Switching Inputs	2 x PNP, opto-decoupled, maximum 30 V DC		
Switching Outputs	2 x PNP, maximum 100 mA / 24 V DC		
Trigger Methods	Sensor input (I/O interface) / Serial (Host interface) / Free running / Reflector polling (automatic)		
Mechanical/Electrical			
Supply Voltage	Operating voltage 10…30 V DC		
Current Consumption			
Line/raster scanner	166 mA at 24 V DC / 4 W		
Osc mirror scanner	258 mA at 24 V DC / 6.2 W		
Dimensions			
Line/raster scanner	3.5 x 2.4 x 1.4 in (90 x 60 x 35.7 mm)		
Osc mirror scanner	3.9 x 3.6 x 1.5 in (99.8 x 92.2 x 37.8 mm)		
Weight	Approx. 14.7 oz (420 g)		
Housing / Enclosure Rating	Die cast zinc / IP 65		
Connectivity	15-pin male D-Sub high density connector		
Environmental			
Ambient Operating Temperature	32…104°F (0…40°C)		
Storage Temperature	-4…158°F (-20…70°C)		
Vibration	To IEC 68-2-6 test FC		
Shock	To IEC 68-2-27 test EA		
EMV	To IEC 801		
Maximum Relative Humidity	90%, non-condensing		
Programming	Windows™-based CLV Setup Software		

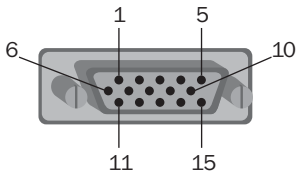
Models and Part Numbers

	CLV 430	CLV 431	CLV 432
Front Emitting Line Scanner			
Model	CLV 430-0010	CLV 431-0010	CLV 432-0010
Part Number	1 017 585	1 017 622	1 017 623
Front Emitting Raster Scanner			
Model	CLV 430-1010	CLV 431-1010	CLV 432-1010
Part Number	1 016 705	1 016 679	1 016 680
Side Emitting Line Scanner			
Model	-	CLV 431-2010	CLV 432-2010
Part Number	-	1 016 746	1 016 748
Side Emitting Raster Scanner			
Model	-	CLV 431-3010	CLV 432-3010
Part Number	-	1 016 747	1 016 749
Oscillating Mirror Scanner			
Model	CLV 430-6010	CLV 431-6010	CLV 432-6010
Part Number	1 017 981	1 017 982	1 017 983

NOTE: Accessories information is located on pages 88 - 89.

Pinouts

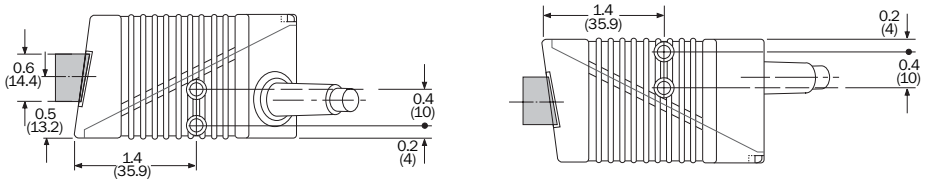
15-pin connector



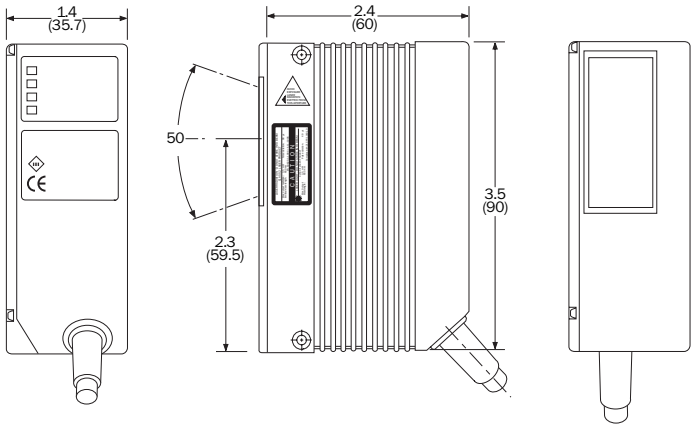
Pin	Signal	Function
1	10…30 V	Supply voltage
2	RxD (Terminal)	Data interface 2 (receiver)
3	TxD (Terminal)	Data interface 2 (transmitter)
4	Sensor 2	Switching input, variable function
5	GND	Ground
6	RD+ (RS 422/485)	Data interface 1 (receiver)
7	RD- (RS 422/485)	Data interface 1 (receiver)
	RxD (RS 232)	-
8	TD+ (RS 422/485)	Data interface 1 (transmitter)
9	TD- (RS 422/485)	Data interface 1 (transmitter)
	TxD (RS 232)	-
10	CAN H	CAN Bus (IN/OUT)
11	CAN L	CAN Bus (IN/OUT)
12	Result 1	Switching output, variable function
13	Result 2	Switching output, variable function
14	Sensor 1	Switching input for ext. reading pulse
15	Sensor GND	Common ground (all inputs)
-	-	Shield

Drawings

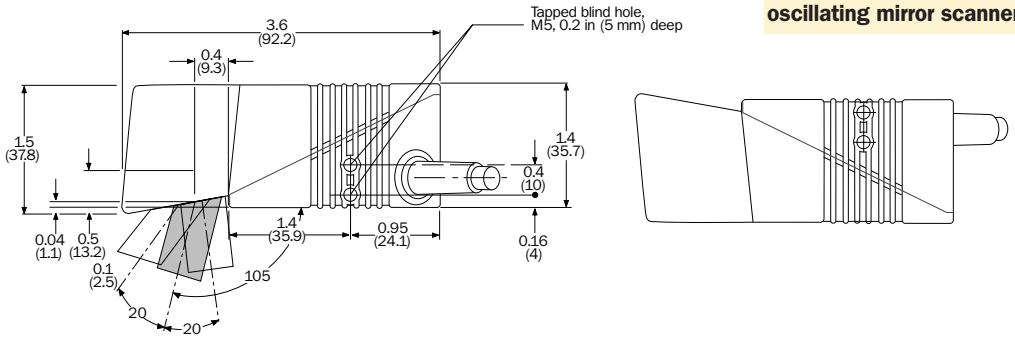
Dimensions in inches (mm)

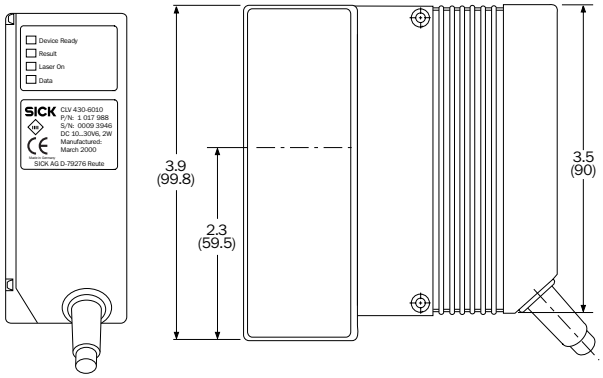


CLV 430/431/432
front emitting scanner



CLV 430/431/432
oscillating mirror scanner





CLV 440/442
Fixed Position Scanner

Features

- Dynamic Focus Control
- SMART Technology
- Cloning module capabilities
- Integrated CAN bus network
- Optional display
- Compact design
- Extended communications
- Profile programming – Auto setup

The CLV 44x Series Bar Code Scanner has Dynamic Focus Control which accommodates a large depth of field by dynamically adjusting its focus position to the object distance, making the CLV 44x ideal for decoding bar codes on objects of different heights.

The strong performance characteristics of the CLV 44x Series is not limited by its size. SMART Technology (SICK's Modular Advanced Recognition Technology) enables the scanner to read bar codes that could not be read by other scanners. This translates to a much higher percentage of successful reads, even with damaged or high tilt angle bar codes.

The CLV 44x has a user-selectable scan rate of 300 to 800 Hz at a reading range of 1.2 to 32 inches (30 to 800 mm). All parameters of the CLV 44x are selectable via included Windows™-based CLV Setup Software.

Other setup options are our integrated Profile Programming, which allows for scanner setup without the need of a PC and our external CMC Cloning Module, which allows for all application-specific parameters to be automatically copied to a new scanner. Either of these options results in extremely fast setup or seamless swap out.

The CLV 44x also has integrated CAN bus networking. This enables you to easily connect up to 32 scanners in a single high-speed network, allowing for easy setup, reduced cabling, and lowered system cost due to reduced hardware.

The CLV 44x is especially suited for material handling, print and apply verification, product label verification, automated medical instrumentation, automotive assembly, electronic circuit board identification, and packaging applications.

Comparison Table

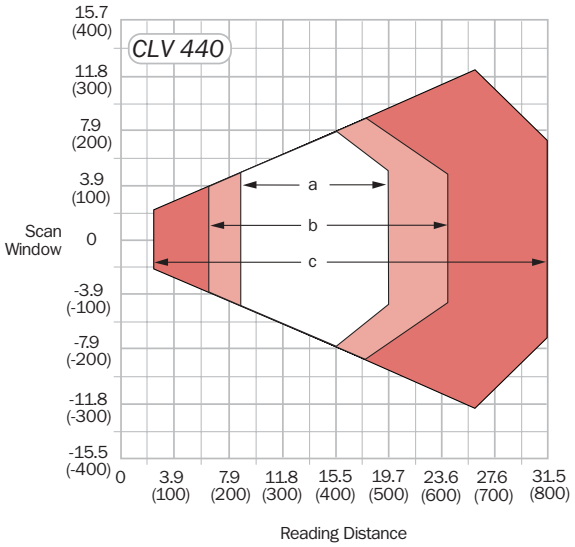
	CLV 440 Standard	CLV 442 High Density
Reading Range	2.0…31.5 in (51…800 mm)	1.2…13.4 in (30…340 mm)
Scan Frequency	300…800 Hz (software selectable)	300…800 Hz (software selectable)
Cloning*	■	■
Fixed Focus		
Dynamic Focus	■	■
Auto Focus		
Standard Decoding	■	■
SMART Decoding	■	■
Line Scanner	■	■
Raster Scanner		
Oscillating Mirror Scanner	■	■
Front Emitting	■	■
Side Emitting		
Plastic Window		
Low Contrast	■ **	

* Requires use of CDM 420 or CDB 420 Connectivity Device with optional CMC 400 Cloning Module.

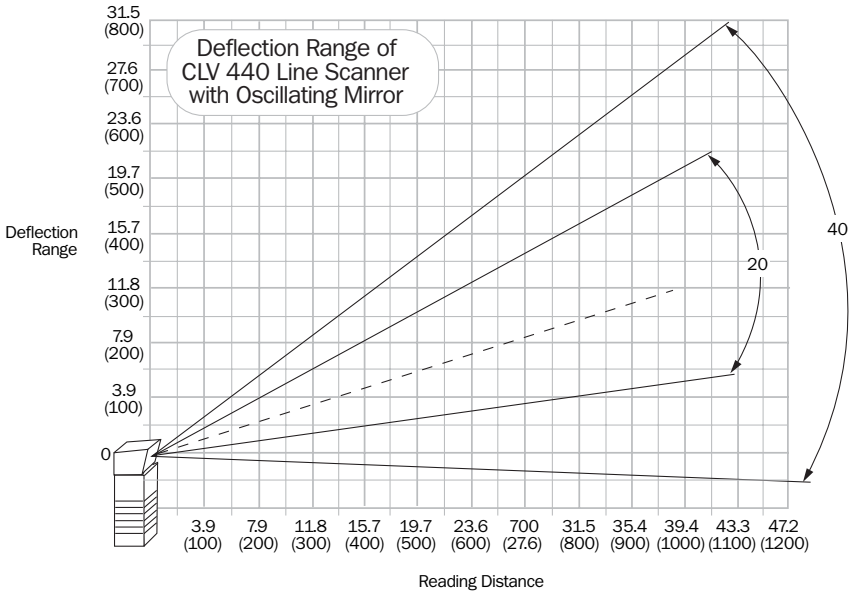
** Not available in all configurations.

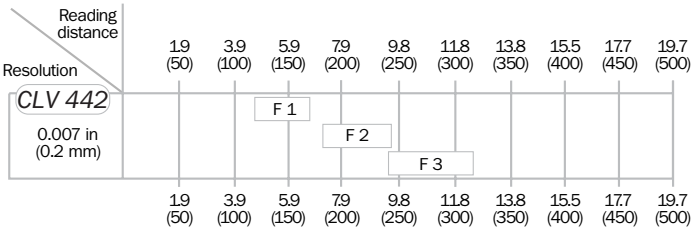
Reading Ranges

Dimensions in inches (mm)



Code Resolution
- a: 0.013 in (0.35 mm)
- b: 0.02 in (0.50 mm)
- c: 0.040 in (1.0 mm)





Focus Position
- F 1: 5.5 in (140 mm)
- F 2: 8.5 in (215 mm)
- F 3: 11.0 in (280 mm)

Technical Specifications

	CLV 440	CLV 442
Scanning Characteristics		
Scanning Method	8-sided polygon mirror wheel	
Aperture Angle	Maximum 50°	
Scanning Frequency	300…800 Hz (software selectable)	
Light Source	Visible laser diode (670 nm); CDRH Class II	
Reading Distance	2.0…31.5 in (51…800 mm)	1.2…13.4 in (30…340 mm)
Resolution	0.008…0.040 in (0.2…1.0 mm)	0.005…0.013 in (0.15…0.35 mm)
Bar Code Types		
Bar Code Symbology	Code 39, Interleaved 2/5, Codabar, Code 93, EAN/EAN 128, UPC, Code 128, Pharmacode	
Readability	1…20 bar codes per scan (standard decoder), 1…6 (SMART)	
Auto Discrimination	1…50 bar codes per reading gate	
Communications / I/O / Indicators		
Host Interface	RS 232 and RS 422/485, variable data output format (software selectable)	
Baud Rate	300…57,600 (software selectable)	
Data Format	Data bits, stop bits, parity (software selectable)	
Network Configuration	Pass-through; master/slave; RS 485 network; CAN scanner, CANopen	
LED Indicators	Device ready, result, laser on, data	
Switching Inputs	2 x PNP, opto-decoupled, maximum 30 V DC	
Switching Outputs	2 x PNP, maximum 100 mA / 24 V DC; variable pulse duration (10…990 ms)	
Trigger Methods	Sensor input (I/O interface) / Serial (Host interface) / Free running / Reflector polling (automatic)	
Mechanical/Electrical		
Supply Voltage	Operating voltage 10…30 V DC	
Current Consumption		
Line/raster scanner	208 mA at 24 V DC / 5.0 W	
Osc mirror scanner	258 mA at 24 V DC / 6.2 W	
Dimensions		
Line/raster scanner	3.5 x 2.4 x 1.4 in (90 x 60 x 35.7 mm)	
Osc mirror scanner	3.9 x 3.6 x 1.5 in (99.8 x 92.2 x 37.8 mm)	
Weight	Approx. 1.0 lb (480 g)	
Housing / Enclosure Rating	Die cast zinc / IP 65	
Connectivity	15-pin male D-Sub high density connector	
Environmental		
Ambient Operating Temperature	32…104°F (0…40°C)	
Storage Temperature	-4…158°F (-20…70°C)	
Vibration	To IEC 68-2-6 test FC	
Shock	To IEC 68-2-27 test EA	
EMV	To IEC 801	
Maximum Relative Humidity	90%, non-condensing	
Programming	Windows™-based CLV Setup Software	

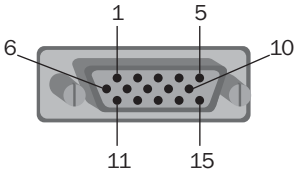
Models and Part Numbers

	CLV 440	CLV 442
Front Emitting Line Scanner		
Model	CLV 440-0010	CLV 442-0010
Part Number	1 017 588	1 017 595
Oscillating Mirror Scanner		
Model	CLV 440-6010	-
Part Number	1 017 984	-

NOTE: Accessories information is located on page 90.

Pinouts

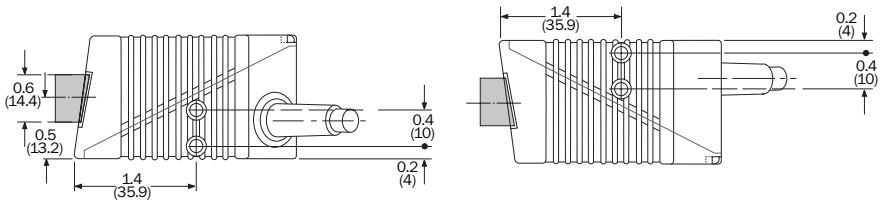
15-pin connector



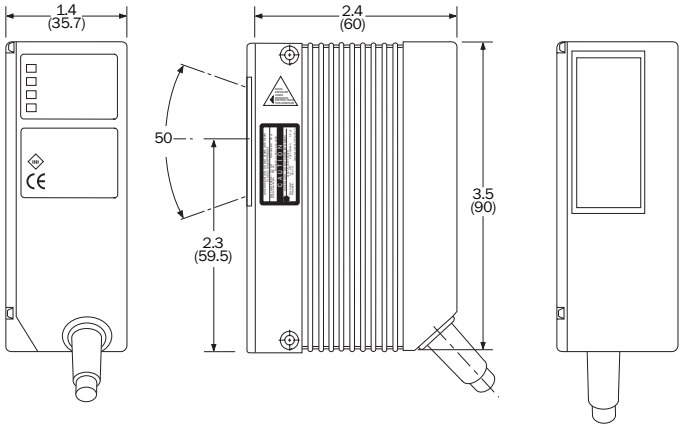
Pin	Signal	Function
1	10…30 V	Supply voltage
2	RxD (Terminal)	Data interface 2 (receiver)
3	TxD (Terminal)	Data interface 2 (transmitter)
4	Sensor 2	Switching input, variable function
5	GND	Ground
6	RD+ (RS 422/485)	Data interface 1 (receiver)
7	RD- (RS 422/485)	Data interface 1 (receiver)
	RxD (RS 232)	-
8	TD+ (RS 422/485)	Data interface 1 (transmitter)
9	TD- (RS 422/485)	Data interface 1 (transmitter)
	TxD (RS 232)	-
10	CAN H	CAN Bus (IN/OUT)
11	CAN L	CAN Bus (IN/OUT)
12	Result 1	Switching output, variable function
13	Result 2	Switching output, variable function
14	Sensor 1	Switching input for ext. reading pulse
15	Sensor GND	Common ground (all inputs)
-	-	Shield

Drawings

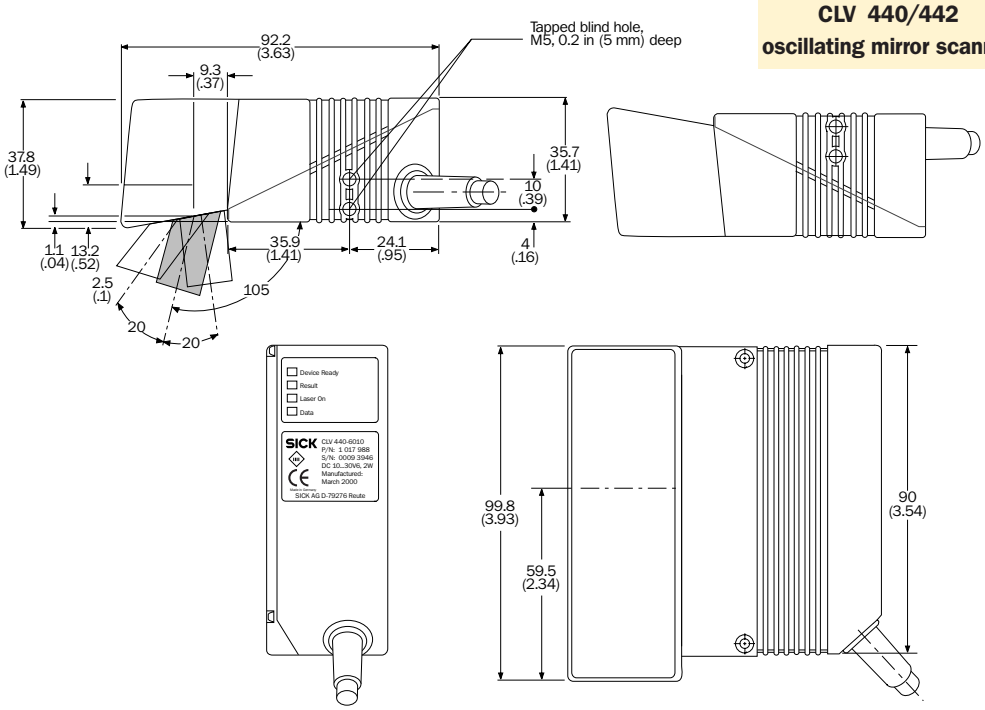
Dimensions in inches (mm)



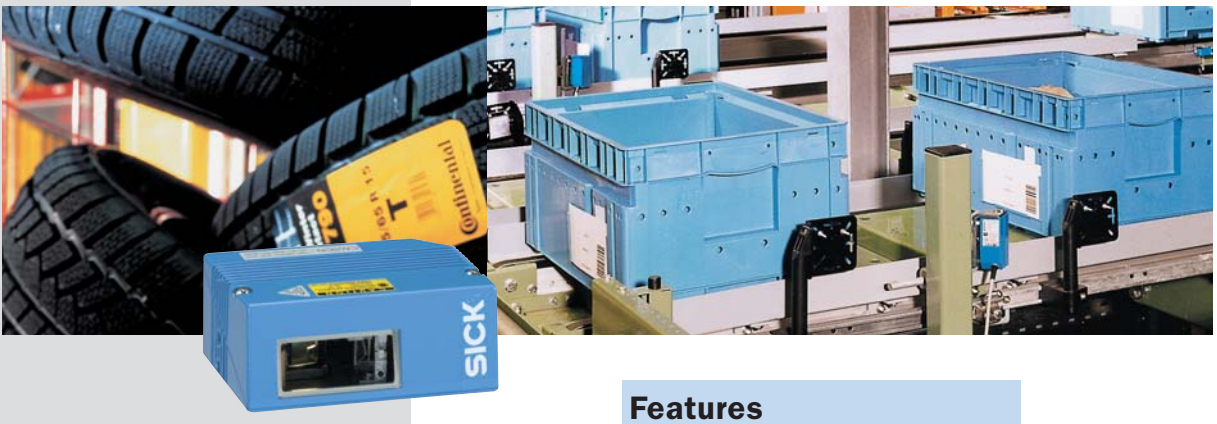
CLV 440/442
front emitting



CLV 440/442
oscillating mirror scanner



CLV 450
Fixed Position Scanner



Features

- Dynamic Focus Control
- SMART Technology
- Integrated CAN bus network
- Extremely large depth of field
- Cloning module capabilities
- High speed (1000 Hz)
- Optional display
- Extended communications

The CLV 45x is a powerful product in an extremely small package. With a reading range from 6 to 62 inches and a user-selectable scan rate from 400 to 1000 Hz, it is easily the most powerful scanner in its class. Our patented SMART Technology (SICK's Modular Advanced Recognition Technology) enables the CLV 45x to read damaged, tilted, partially hidden or dirty bar codes. It can read bar codes other scanners can not.

Dynamic Focus Control allows the CLV 45x to accommodate a large depth of field by dynamically adjusting its focus position to the object distance. This makes the CLV 45x a perfect choice for applications where bar codes will be affixed to objects of varying heights.

The CLV 45x also has integrated CAN bus networking. This enables you to easily connect up to 32 scanners in a single high-speed network, allowing for easy setup, reduced cabling, and lowered system cost due to reduced hardware.

Also available for the CLV 45x is the CMC Cloning Module in conjunction with our CDx Series of connection devices. The CMC will store all the setup parameters of the connected bar code scanner in external memory. Application-specific parameters are automatically copied to a new device if a bar code scanner should need replacement. An optional display provides for immediate visualization of read results and diagnostic data without the need of a PC. Not only is the CLV 45x flexible and effective, its accessories are as well.

The CLV 45x is ideally suited for applications in the packaging, material handling, automotive, and distribution industries.

Comparison Table

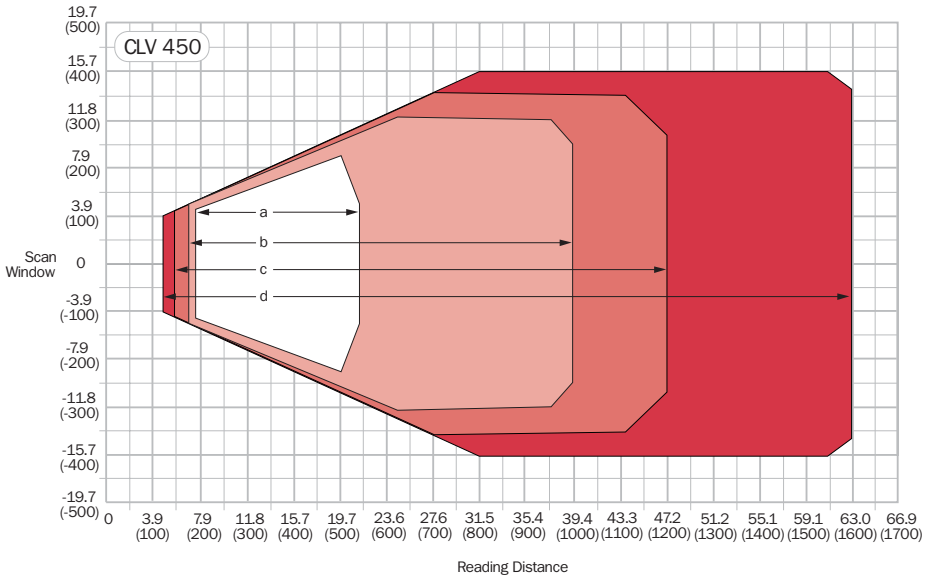
	CLV 450 Standard
Reading Range	6.2…62.9 in (160…1600 mm)
Scan Frequency	400…1000 Hz (software selectable)
Cloning*	■
Fixed Focus	
Dynamic Focus	■
Auto Focus	
Standard Decoding	■
SMART Decoding	■
Line Scanner	■
Raster Scanner	
Oscillating Mirror Scanner	■
Front Emitting	■
Side Emitting	
Plastic Window	■ **
Low Contrast	

* Requires use of CDM 420 or CDB 420 Connectivity Device with optional CMC 400 Cloning Module.

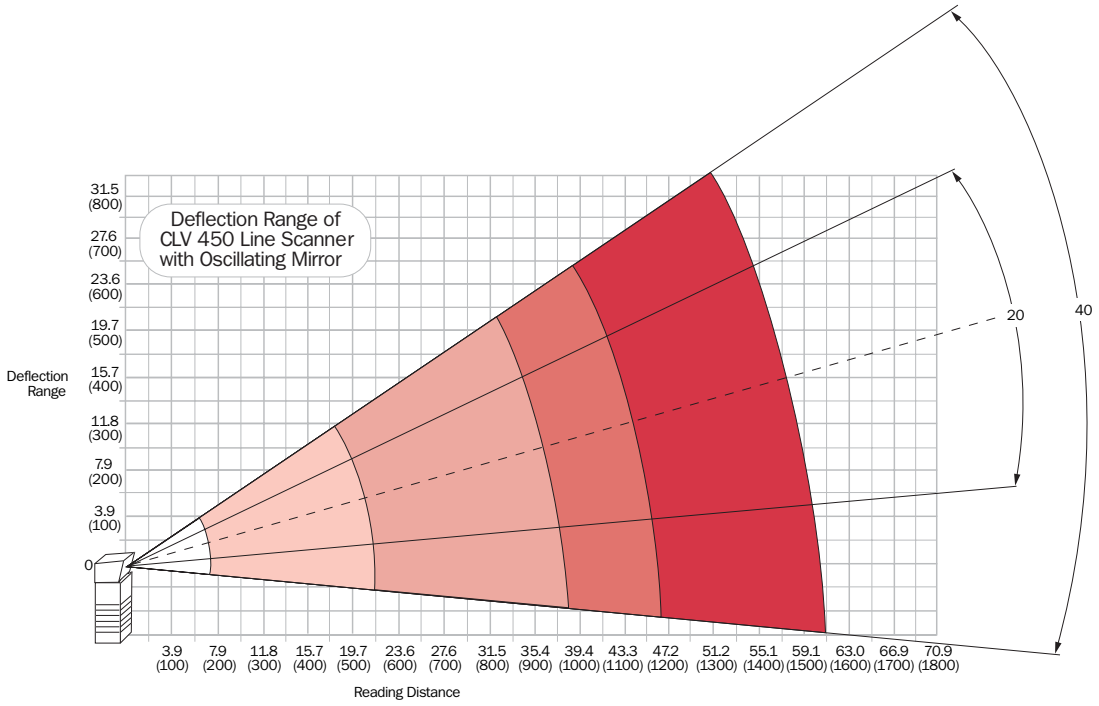
** Not available in all configurations.

Reading Ranges

Dimensions in inches (mm)



Code Resolution
- a: 0.010 in (0.25 mm)
- b: 0.014 in (0.35 mm)
- c: 0.020 in (0.50 mm)
- d: 0.040 in (1.00 mm)



Technical Specifications

	CLV 450
Scanning Characteristics	
Scanning Method	8-sided polygon mirror wheel
Aperture Angle	Maximum 50°
Scanning Frequency	400…1000 Hz (software selectable)
Light Source	Visible laser diode (650 nm); CDRH Class II
Reading Distance	6.2…62.9 in (160…1600 mm)
Resolution	0.010…0.040 in (0.25…1.0 mm)
Bar Code Types	
Bar Code Symbology	Code 39, Interleaved 2/5, Codabar, Code 93, EAN/EAN 128, UPC, Code 128, Pharmacode
Readability	1 to 20 bar codes per scan (standard decoder); 1 to 6 (SMART)
Auto Discrimination	1…50 bar codes per reading gate
Communications / I/O / Indicators	
Host Interface	RS 232 and RS 422/485, variable data output format (software selectable)
Baud Rate	300…57,600 (software selectable)
Data Format	Data bits, stop bits, parity (software selectable)
Network Configuration	Pass-through; master/slave; RS 485 network; CAN scanner, CANopen
LED Indicators	Device ready, result, laser on, data
Switching Inputs	2 x PNP, opto-decoupled, maximum 30 V DC
Switching Outputs	2 x PNP, maximum 100 mA
Trigger Methods	Sensor input (I/O interface) / Serial (Host interface) / Free running / Reflector polling (automatic)
Mechanical/Electrical	
Supply Voltage	Operating voltage 10…30 V DC
Current Consumption	
Line scanner	250 mA at 24 V DC / 6.0 W
Osc mirror scanner	300 mA at 24 V DC / 7. 2W
Dimensions	
Line scanner	3.5 x 2.4 x 1.4 in (90 x 60 x 35.7 mm)
Side mirror scanner	3.9 x 3.6 x 1.5 in (99.8 x 92.2 x 37.8 mm)
Weight	Approx. 18.6 oz (530 g)
Housing / Enclosure Rating	Die cast zinc / IP 65
Connectivity	15-pin male D-Sub high density connector
Environmental	
Ambient Operating Temperature	32…104°F (0…40°C)
Storage Temperature	-4…158°F (-20…70°C)
Vibration	To IEC 68-2-6 test FC
Shock	To IEC 68-2-27 test EA
EMV	To IEC 801
Maximum Relative Humidity	90%, non-condensing
Programming	Windows™-based CLV Setup Software

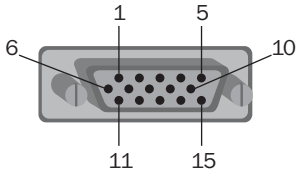
Models and Part Numbers

	CLV 450
Front Emitting Line Scanner	
Model	CLV 450-0010
Part Number	1 018 556
Oscillating Mirror Scanner	
Model	CLV 450-6010
Part Number	1 019 218

NOTE: Accessories information is located on page 91.

Pinouts

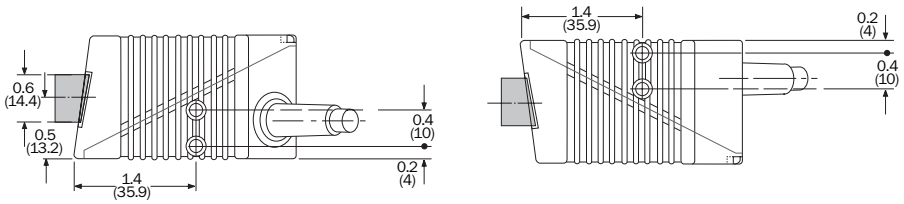
15-pin connector



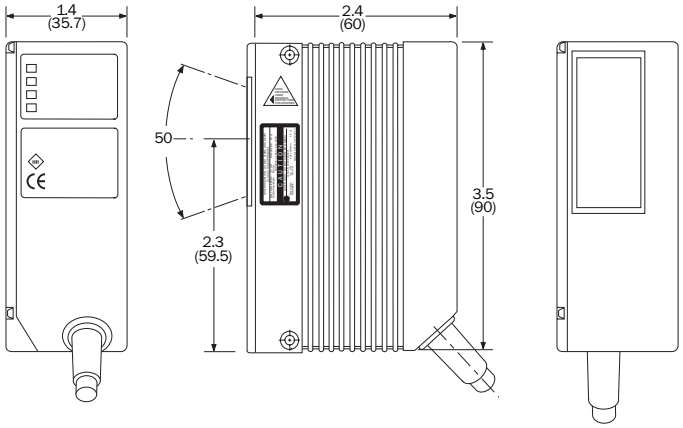
Pin	Signal	Function
1	10…30 V	Supply voltage
2	RxD (Terminal)	Data interface 2 (receiver)
3	TxD (Terminal)	Data interface 2 (transmitter)
4	Sensor 2	Switching input, variable function
5	GND	Ground
6	RD+ (RS 422/485)	Data interface 1 (receiver)
7	RD- (RS 422/485)	Data interface 1 (receiver)
	RxD (RS 232)	-
8	TD+ (RS 422/485)	Data interface 1 (transmitter)
9	TD- (RS 422/485)	Data interface 1 (transmitter)
	TxD (RS 232)	-
10	CAN H	CAN Bus (IN/OUT)
11	CAN L	CAN Bus (IN/OUT)
12	Result 1	Switching output, variable function
13	Result 2	Switching output, variable function
14	Sensor 1	Switching input for ext. reading pulse
15	Sensor GND	Common ground (all inputs)
-	-	Shield

Drawings

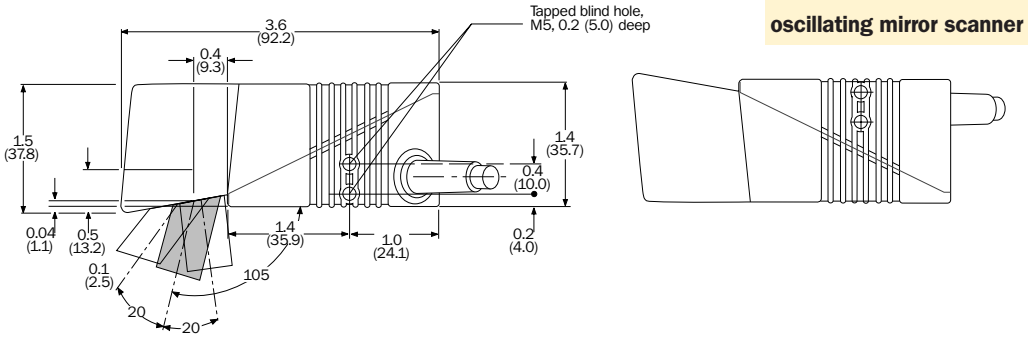
Dimensions in inches (mm)

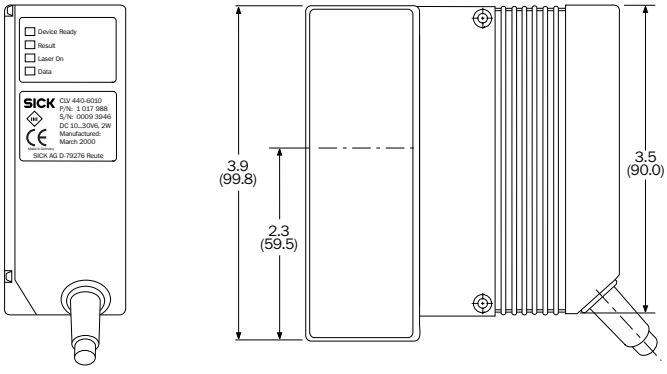


CLV 450
front emitting scanner



CLV 450
oscillating mirror scanner





CLV 480
Fixed Position Scanner

Features

- Extremely large depth of field
- Dynamic Focus Control
- Designed for high tilt angles (45°)
- SMART Technology
- Integrated CAN bus network
- Optional heater
- Cloning module capabilities
- Optional display
- Extended communications

The CLV 480 Bar Code Scanner from SICK delivers maximum, tilt-independent read rates with minimum code height. If you have pallet applications, parcel handling, heater applications or applications with large objects/depths of field, the CLV 480 is ready to work for you.

The CLV 480 has Dynamic Focus Control; a function that provides optimum read rates at maximum depths of field. The scanner dynamically adjusts its focus position to the object distance. This makes the CLV 480 a perfect choice for applications where bar codes will be affixed to objects of varying heights.

The CLV 480 is able to provide ultra-reliable code recognition thanks to SMART Technology. SMART, SICK's Modular Advanced Recognition Technology, allows the scanner to easily read bar code labels that are tilted, damaged or partially hidden from the scanner's view.

The CLV 480's integrated CAN bus networking enables you to easily connect up to 32 scanners in a single high-speed network. This allows for easy setup, reduced cabling and lowered system cost due to reduced hardware.

The CLV 480 is available with an optional heater for applications in temperatures as low as -31°F (-35°C). It has a software-selectable scan rate from 600 to 1200 Hz and a reading range of 10 to 81 inches. Due to its advanced optics, it's also ideal for low-contrast applications, like those found on corrugate boxes. The CLV 480 is ready to solve your problems!

The CLV 480 is ideally suited for material handling, manufacturing, automotive, pallet handling, and forklift applications.

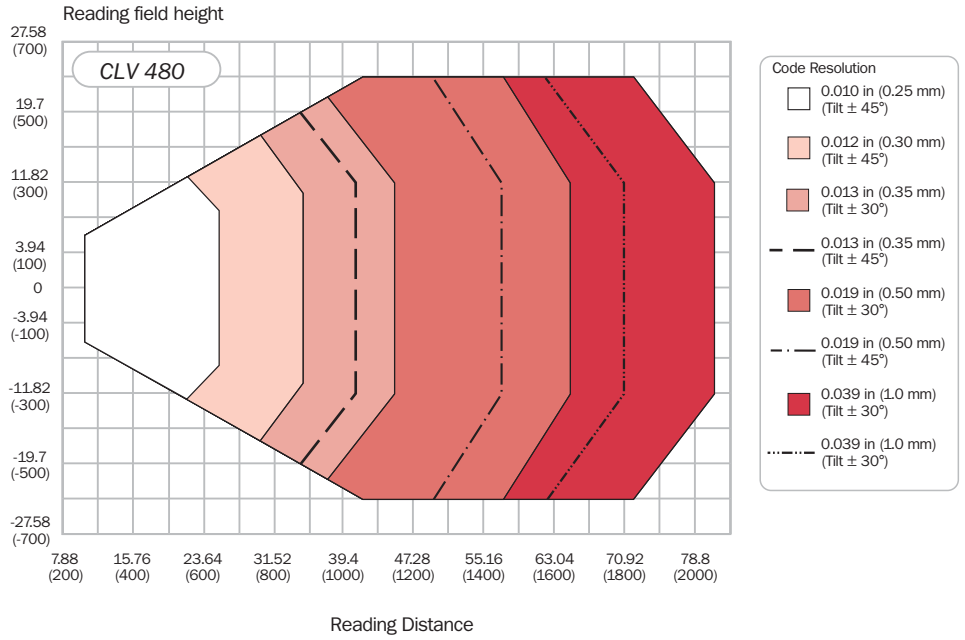
Comparison Table

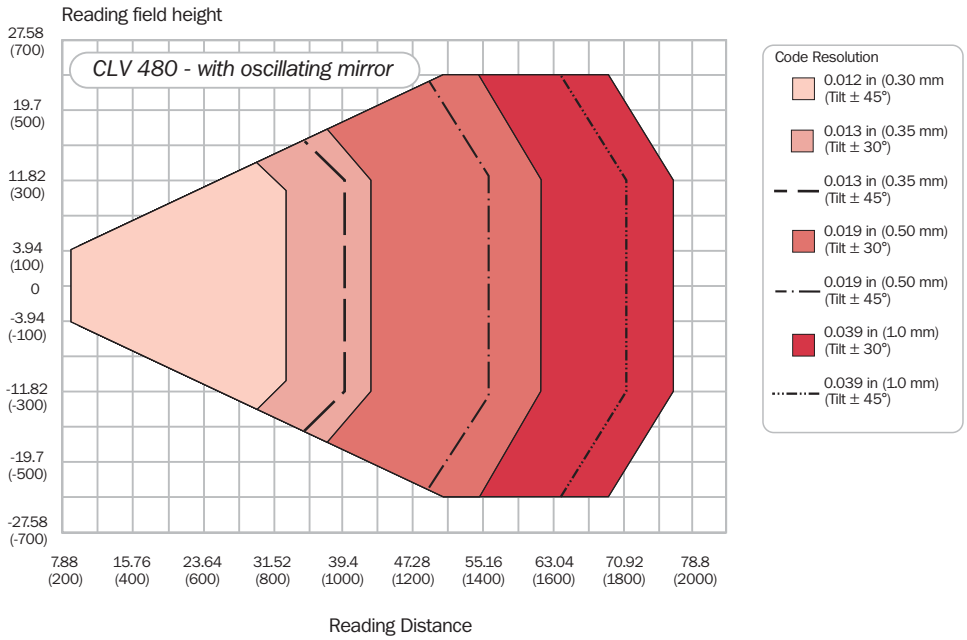
	CLV 480 Standard
Reading Range	10.2…80.7 in (259…2050 mm)
Scan Frequency	600…1200 Hz
Cloning	■ *
Fixed Focus	
Dynamic Focus	■
Auto Focus	
Standard Decoding	■
SMART Decoding	■
Line Scanner	■
Raster Scanner	
Oscillating Mirror Scanner	■
Front Emitting	■
Side Emitting	
Plastic Window	
Low Contrast	
Heater	■

* Requires use of CDM 490 or CDB 420 Connectivity Device with optional CMC 400 Cloning Module.

Reading Ranges

Dimensions in inches (mm)





Technical Specifications

	CLV 480
Scanning Characteristics	
Scanning Method	8-sided polygon mirror
Aperture Angle	
Line/Raster Scanner	Maximum 60°
Osc Mirror Scanner	Maximum 50°
Scanning Frequency	600…1200 Hz (software selectable)
Light Source	Visible laser diode (650 nm); CDRH Class II
Reading Distance	10.2…80.7 in (259.1…2049.8 mm)
Resolution	0.098…0.039 in (2.5…0.99 mm)
Bar Code Types	
Bar Code Symbology	Code 39, Interleaved 2/5, Codabar, Code 93, EAN/EAN 128, UPC, Code 128
Readability	1…12 bar codes per scan (standard decoder); 1…5 (SMART)
Auto Discrimination	1…50 bar codes per reading gate
Communications / I/O / Indicators	
Host Interface	RS 232 or RS 422/485 variable data output (software selectable)
Baud Rate	300…57,600 (software selectable)
Data Format	Data bits, stop bits, parity (software selectable)
Network Configuration	Pass-through; master/slave/RS 485 network, CAN scanner, CANopen
LED Indicators	Device ready, result, sensor, data
Switching Inputs	6 x PNP, opto-decoupled/maximum 30 V DC
Switching Outputs	4 x PNP, maximum 100 mA/24 V DC
Trigger Methods	Sensor input (I/O interface)/Serial (host interface)/Free running
Mechanical/Electrical	
Supply Voltage	Operating voltage 18…30 V DC
Current Consumption	395 mA at 24 V DC/typical 9.5 W; maximum 16.0 W
Dimensions	
Line/Raster Scanner	4.6 x 4.6 x 3.7 in (117 x 117 x 94 mm);
Osc Mirror Scanner	7.2 x 5.02 x 3.7 in (183 x 127.5 x 94 mm)
Weight	Approx. 3.3 lb (1.5 kg); with osc mirror: approx. 4.9 lb (2.2 kg)
Housing	Die cast aluminum
Enclosure Rating	IP 65
Connectivity	2 15-pin D-Sub high density connectors (1 male/1 female)
Environmental	
Ambient Operating Temperature	32…104°F (0…40°C), with heating -31…95°F (-35…35°C)
Storage Temperature	-4…158°F (-20…70°C)
Vibration	To IEC 68-2-6 test FC
Shock	To IEC 68-2-27 test EA
EMV	To IEC 801
Maximum Relative Humidity	90%, non-condensing
Programming	Windows™-based CLV Setup Software

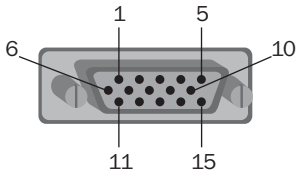
Models and Part Numbers

	CLV 480	CLV 480 (with heater)
Front Emitting Line Scanner		
Model	CLV 480-0010	CLV 480-0011
Part Number	1 024 065	1 024 067
Oscillating Mirror Scanner		
Model	CLV 480-1010	CLV 480-1011
Part Number	1 024 066	1 024 068

NOTE: Accessories information is located on pages 92 - 93.

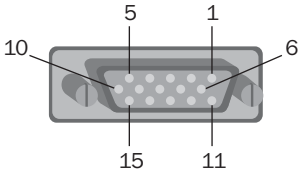
Pinouts

15-pin male D Sub HD
"Host/Term" plug



Pin	Signal	Function
1	Vs	Supply voltage
2	RxD (RS 232), Terminal	Terminal Interface (receiver)
3	TxD (RS 232), Terminal	Terminal Interface (transmitter)
4	Term (RS 422/485)	Termination host interface
5	GND	Ground
6	RD+ (RS 422/485), Host	Host interface (receiver +)
7	RD- (RS 422/485), Host RxD (RS 232), Host	Host interface (receiver -)
8	TD+ (RS 422/485), Host	Host interface (transmitter +)
9	TD- (RS 422/485), Host TxD (RS 232), Host	Host interface (transmitter -)
10	CAN H	CAN interface 1 (IN/OUT)
11	n.c.	-
12	CAN2 H	CAN interface 2 (IN/OUT)
13	CAN2 L	CAN Interface 2 (IN/OUT)
14	n.c.	-
15	CANL	CAN interface 1 (IN/OUT)
Housing	-	Shield

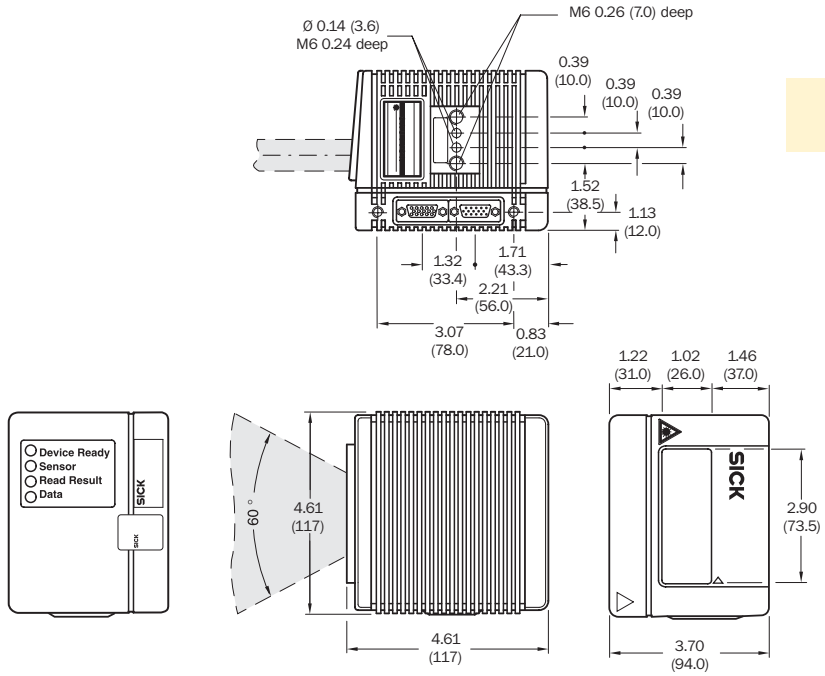
15-pin female D Sub HD
"I/O" Socket



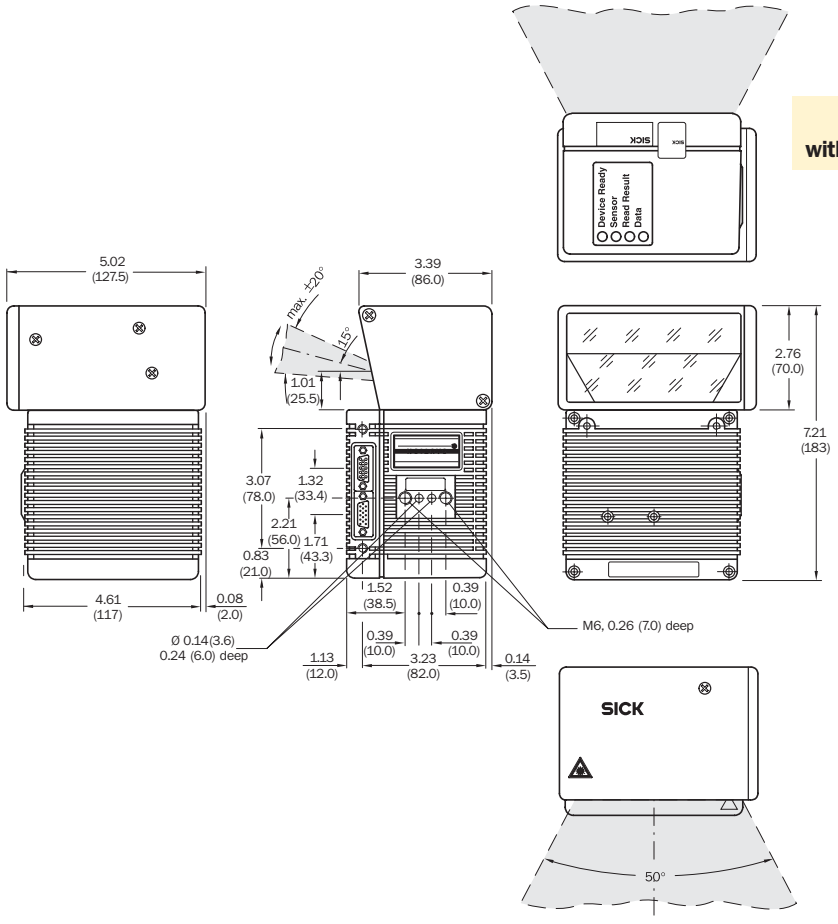
Pin	Signal	Function
1	Vs	Supply voltage
2	IN 1	Switching input (trigger for focus control)
3	Sensor	Switching input (external reading pulse)
4	Result 1	Switching output, variable function
5	GND	Ground
6	IN 0	Switching input (trigger for focus control)
7	IN 2	Switching input (trigger for focus control)
8	Result 2	Switching output, variable function
9	IN GND	Common ground for all inputs
10	Result 3	Switching output, variable function
11	IN 3	Switching input, variable function
12	IN 4	Switching input, variable function
13	12C SDA	12C Bus (for external parameter memory)
14	12C SCL	12C Bus (for external parameter memory)
15	Result 4	Switching output, variable function
Housing	-	Shield

Drawings

Dimensions in inches (mm)



CLV 480
line scanner



CLV 480
with oscillating mirror

CLV 490
Fixed Position Scanner

Features

- Patented Automatic Focus Control
- High speed (1200 Hz)
- SMART Technology
- Designed for high tilt angles (45°)
- Cloning module capabilities
- Optional heater
- Integrated CAN bus network
- Extended communications
- Optional display
- Large depth of field (62 inches)

The CLV 490 Bar Code Scanner from SICK delivers maximum, tilt-independent read rates with minimum code height. It is able to provide ultra-reliable code recognition thanks to SICK's SMART Technology. SMART allows the scanner to easily read bar code labels that are presented at high tilt angles, or are dirty or damaged.

The CLV 490 has real-time, patented Automatic Focus Control, a function that provides optimum read rates at maximum depths of field. The scanner automatically focuses according to the distance to the object. No additional components are necessary to detect the object distance, resulting in easy setup and reduced system cost.

With a reading range of 20 to 82 inches and dimensions of 4.6 x 4.6 x 3.7 inches, the CLV 490 is the most powerful scanner of its size on the market. It is especially suited to applications where space is at a premium.

Also available for the CLV 490 is the CMC Cloning Module for use in conjunction with our CDx Series of connection devices. The CMC will store all the setup parameters of the connected bar code scanner in external memory. Application-specific parameters are automatically copied to a new device if a bar code scanner should need replacement.

The CLV 490's integrated CAN bus networking enables you to easily connect up to 32 scanners in a single high-speed network. This allows for easy setup, reduced cabling and lowered system cost due to reduced hardware.

The CLV 490 is ideally suited for material handling, manufacturing, automotive, pallet handling, and forklift applications.

Comparison Table

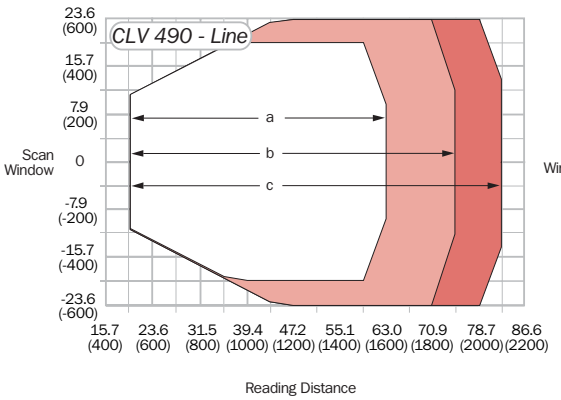
	CLV 490 Standard	CLV 490 Low Density	CLV 490 High Range
Reading Range	19.7…82.7 in (500…2100 mm)	19.7…86.6 in (500…2200 mm)	15.7…63.0 in (400…1600 mm)
Scan Frequency	600…1200 Hz (software selectable)	600…1200 Hz (software selectable)	600…1200 Hz (software selectable)
Cloning*	■	■	■
Fixed Focus			
Dynamic Focus	■	■	■
Auto Focus	■	■	■
Standard Decoding	■	■	■
SMART Decoding	■	■	■
Line Scanner	■	■	■
Raster Scanner			
Oscillating Mirror Scanner	■	■	■
Front Emitting	■	■	■
Side Emitting			
Plastic Window	■ **		
Low Contrast			
Heater	■	■	■

* Requires use of CDM 490 or CDB 420 Connectivity Device with optional CMC 400 Cloning Module.

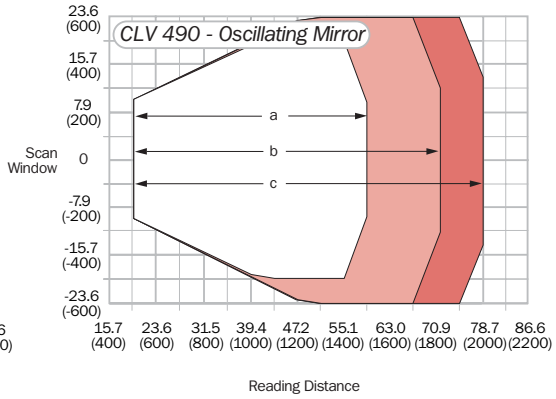
** Not available in all configurations.

Reading Ranges

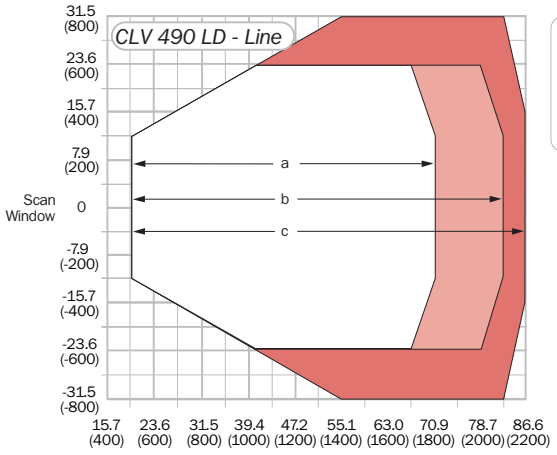
Dimensions in inches (mm)



Code Resolution
- a: 0.011 in (0.30 mm)
- b: 0.013 in (0.35 mm)
- c: 0.020 in (0.50 mm)

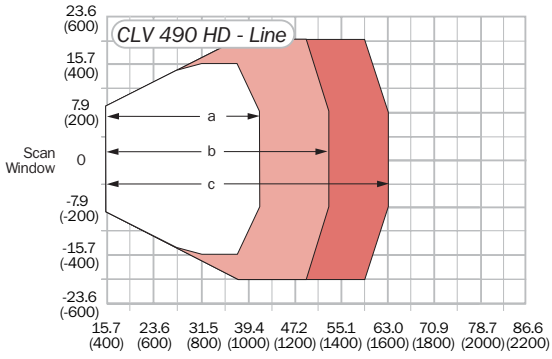


Code Resolution
- a: 0.011 in (0.30 mm)
- b: 0.013 in (0.35 mm)
- c: 0.020 in (0.50 mm)



Tilt
- a: -45…+45
- b: -30…+30
- c: -15…+15

Code resolution:
0.020 in (0.5 mm)



Code Resolution
- a: 0.008 in (0.20 mm)
- b: 0.010 in (0.25 mm)
- c: 0.011 in (0.30 mm)

Technical Specifications

	CLV 490	CLV 490 LD	CLV 490 HD
Scanning Characteristics			
Scanning Method	8-sided polygon mirror wheel		
Aperture Angle			
Line/Raster Scanner	Maximum 60°		
Osc Mirror scanner	Maximum 50°		
Scanning Frequency	600…1200 Hz (software selectable)		
Light Source	Visible laser diode (650 nm); CDRH Class II		
Reading Distance	19.7…82.7 in (500…2100 mm)	19.7…86.6 in (500…2200 mm)	15.7…63.0 in (400…1600 mm)
Resolution	0.012…0.078 in (0.30…2.0 mm)	0.014…0.047 in (0.35…1.2 mm)	0.008…0.016 in (0.2…0.4 mm)
Bar Code Types			
Bar Code Symbology	Code 39, Interleaved 2/5, Codabar, Code 93, EAN/EAN 128, UPC, Code 128		
Readability	1…12 bar codes per scan (standard decoder); 1…5 (SMART)		
Auto Discrimination	1…50 bar codes per reading gate		
Communications / I/O / Indicators			
Host Interface	RS 232 and RS 422/485, variable data output (software selectable)		
Baud Rate	300…57,600 (software selectable)		
Data Format	Data bits, stop bits, parity (software selectable)		
Network Configuration	Pass-through; master/slave; RS 485 network; CAN scanner, CANopen		
LED Indicators	Device ready, result, sensor, data		
Switching Inputs	6 x PNP, opto-decoupled, maximum 30 V DC		
Switching Outputs	4 x PNP, maximum 100 mA / 24 V DC		
Trigger Methods	Sensor input (I/O interface) / Serial (Host interface) / Free running		
Mechanical/Electrical			
Supply Voltage	Operating voltage 18…30 V DC		
Current Consumption	395 mA at 24 V DC / typical 9.0 W; maximum 13.0 W		
Dimensions			
Line/raster scanner	4.6 x 4.6 x 3.7 in (117 x 117 x 94 mm)		
Osc mirror scanner	7.2 x 5.02 x 3.7 in (183 x 127.5 x 94 mm)		
Weight	Approx. 3.3 lb (1.5 kg); with osc mirror: approx. 4.9 lb (2.2 kg)		
Housing / Enclosure Rating	Die cast aluminum / IP 65		
Connectivity	2 15-pin D-Sub high density connectors (1 female / 1 male)		
Environmental			
Ambient Operating Temperature	32…104°F (0…40°C)		
Storage Temperature	-4…158°F (-20…70°C)		
Vibration	To IEC 68-2-6 test FC		
Shock	To IEC 68-2-27 test EA		
EMV	To IEC 801		
Maximum Relative Humidity	90%, non-condensing		
Programming	Windows™-based CLV Setup Software		

Models and Part Numbers

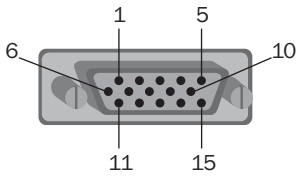
	CLV 490	CLV 490 HD	CLV 490 LD
Front Emitting Line Scanner			
Model	CLV 490-0010	CLV 490-2010	CLV 490-6010
Part Number	1 016 958	1 019 311	1 018 872
Oscillating Mirror Scanner			
Model	CLV 490-1010	CLV 490-3010	CLV 490-7010
Part Number	1 016 959	1 019 313	1 019 094

	CLV 490 (with heater)	CLV 490 HD (with heater)	CLV 490 LD (with heater)
Front Emitting Line Scanner			
Model	CLV 490-6011	CLV 490-2011	CLV 490-0011
Part Number	1 019 095	1 019 312	1 016 960
Oscillating Mirror Scanner			
Model	CLV 490-7011	CLV 490-3011	CLV 490-1011
Part Number	1 019 096	1 019 314	1 016 961

NOTE: Accessories information is located on pages 93 - 94.

Pinouts

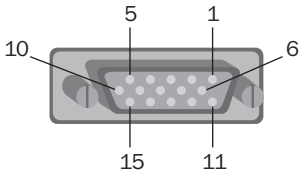
Term/Host Port
15-pin male connector



Pin	Signal	Function
1[1)]	V_S	Supply voltage
2	RxD (RS 232), Terminal	Terminal interface (receiver)
3	TxD (RS 232), Terminal	Terminal interface (transmitter)
4	Term (RS 422/485)	Termination host interface
5	GND	Ground
6	RD+ (RS 422/485), Host	Host interface (receiver+)
7	RD– (RS 422/485), Host RxD (RS 232), Host	Host interface (receiver–)
8	TD+ (RS 422/485), Host	Host interface (transmitter+)
9	TD– (RS 422/485), Host TxD (RS 232), Host	Host interface (transmitter–)
10	CAN H	CAN interface 1 (IN/OUT)
11	Reserved	-
12	CAN2 H	CAN interface 2 (IN/OUT)
13	CAN2 L	CAN interface 2 (IN/OUT)
14	Reserved	-
15	CAN L	CAN interface 1 (IN/OUT)
Housing	-	Shield

1) Pin 1 is jumpered with Pin 1 of the "I/O" connection in the CLV

Term/Host Port
15-pin female connector

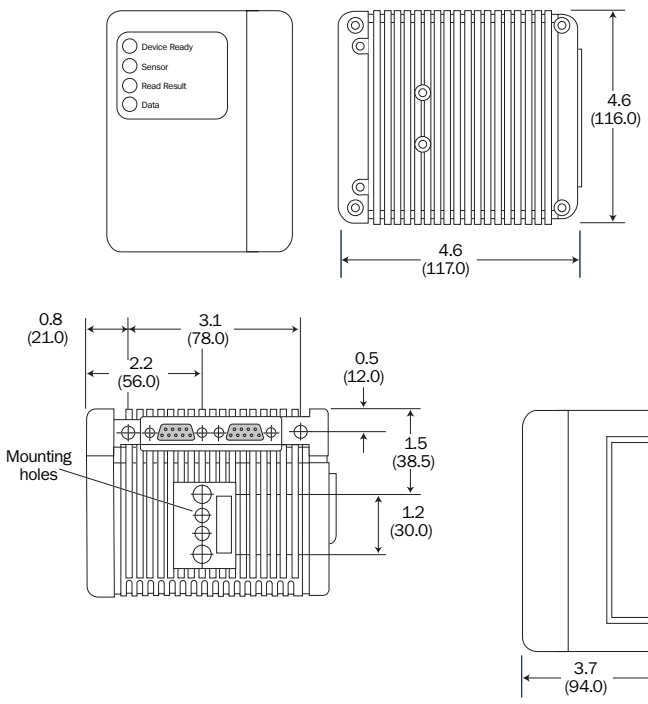


Pin	Signal	Function
1[1)]	V_S	Supply voltage
2	IN 1	Switching input (trigger for focus control)
3	Sensor	Switching input (external reading pulse)
4	Result 1	Switching output, variable function
5	GND	Ground
6	IN 0	Switching input (trigger for focus control)
7	IN 2	Switching input (trigger for focus control)
8	Result 2	Switching output, variable function
9	INGND	Common ground for all inputs
10	Result 3	Switching output, variable function
11	IN 3	Switching input, variable function
12	IN 4	Switching input, variable function
13	I2C SDA	I2C Bus (for external parameter memory)
14	I2C SCL	I2C Bus (for external parameter memory)
15	Result 4	Switching output, variable function
Housing	-	Shield

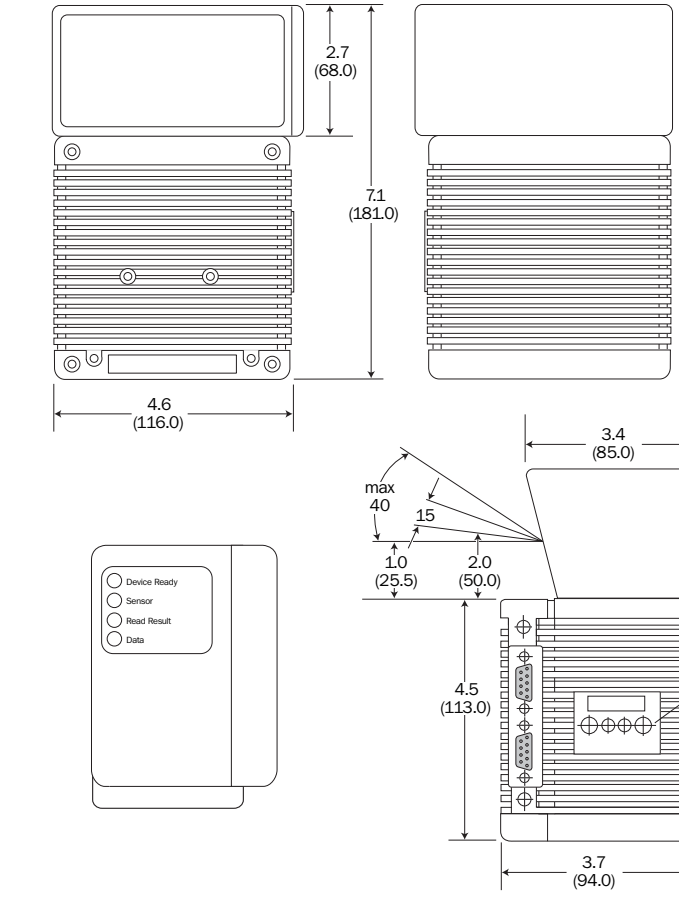
1) Pin 1 is jumpered with Pin 1 of the "I/O" connection in the CLV

Drawings

Dimensions in inches (mm)

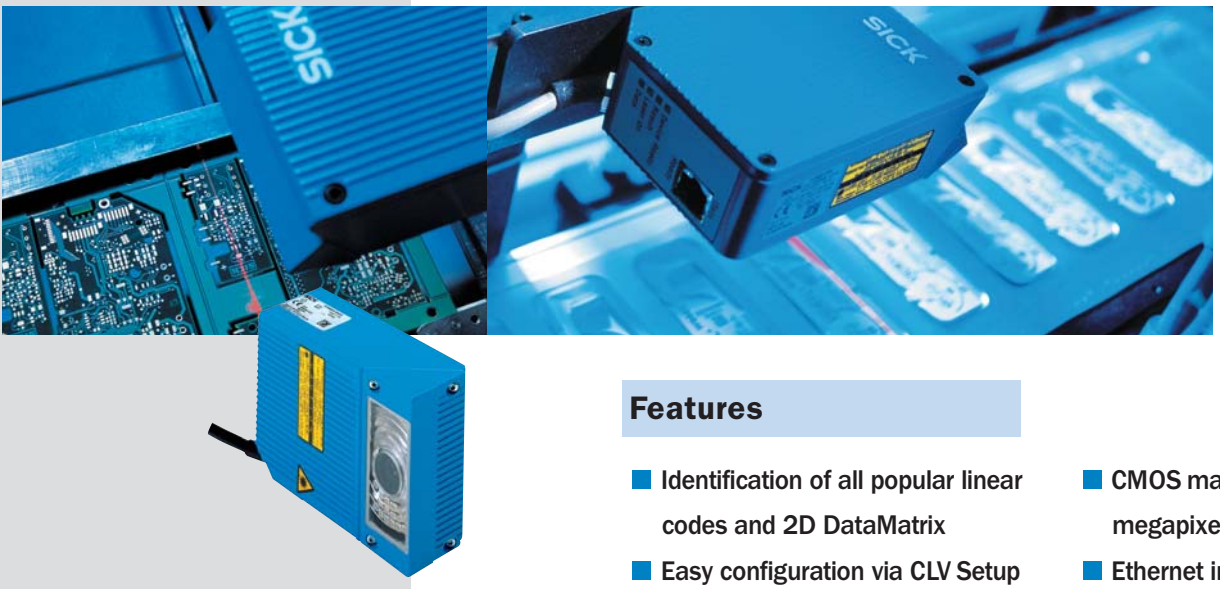


CLV 490
line scanner



CLV 490
oscillating mirror scanner

ICR 840
Fixed Position Scanner



Features

- Identification of all popular linear codes and 2D DataMatrix
- Easy configuration via CLV Setup Software
- Easy visualization of image and diagnostic data
- Omni directional reading of linear codes
- CMOS matrix sensor with 1.3 megapixels
- Ethernet interface for data and image transfer
- Integrated LED illumination
- Applications:
  - Automotive parts
  - Electrical circuit board
  - Package labels

The ICR 840 Series from SICK provides a fully integrated vision-based scanner which includes the 1280 x 1024 pixel camera, image processing, and integrated lighting in a single compact package.

The sensor technology of the ICR 840 is based upon a state-of-the-art 1.3 megapixel CMOS sensor capable of reading one- and two-dimensional codes. Features include the ability to increase the image refresh rate by adjusting the field of view. For example, if the adjustment is set to VGA resolution (640 X 480 pixels), the image refresh rate increases from 25 Hz to 60 Hz.

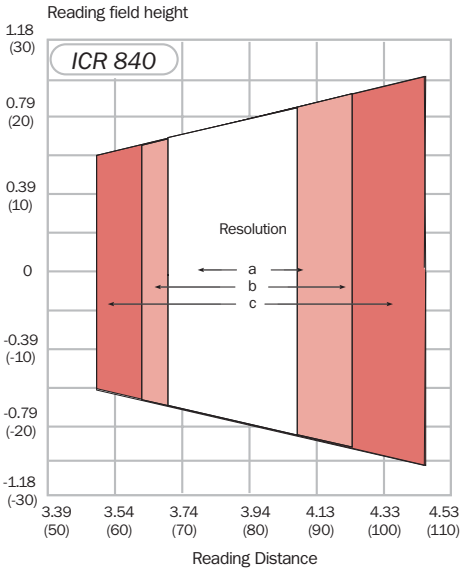
Due to special decoding functions, the ICR 840 is specially customized for reading direct part marked codes. The integrated computing performance provides short response times and the configurable LED illumination allows for outstanding performance reading a number of direct part marking methods. Whether it is laser PCB marking, laser marking on metal, dot-peening or label printed 2D codes, the ICR 840 is an excellent choice for your 2D and linear bar code reading applications.

Comparison Table

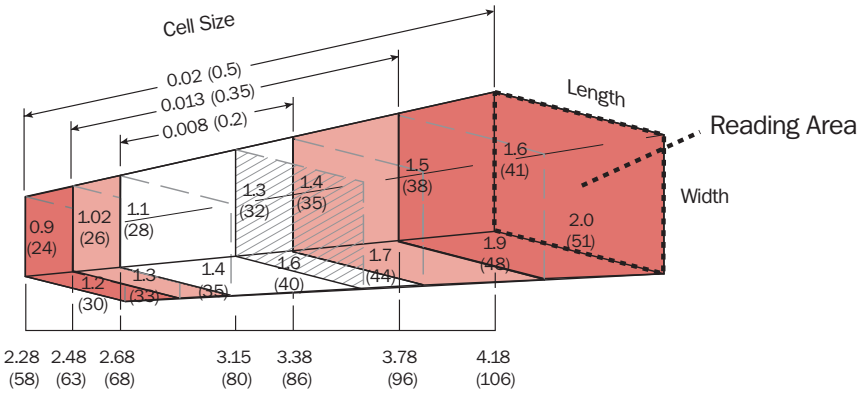
	ICR 840 Standard	ICR 840 High Density
Reading Distance Focal Position	4.5 in (115 mm)	1.9 in (50 mm)
Minimum Cell Size	0.01 in (0.25 mm)	0.004 in (0.1 mm)
DOF at Cell Size		
0.1 mm		0.24 in (6 mm)
0.2 mm		0.5 in (12 mm)
0.25 mm	0.78 in (20 mm)	
Field of View at Minimum Distance	1.7 x 2.2 in (44 x 55 mm)	0.7 x 0.8 in (17 x 21 mm)
Field of View at Maximum Distance	2.0 x 2.4 in (50 x 62 mm)	0.8 x 1.0 in (20 x 25 mm)

Reading Ranges

Dimensions in inches (mm)



Code Resolution
- a: 0.008 in (0.2 mm)
- b: 0.013 in (0.35 mm)
- c: 0.019 in (0.5 mm)



Reading Distance

Technical Specifications

	ICR 840
Scanning Characteristics	
Scanning Method	CMOS
Scanning Frequency	25 Hz @ SXGA (1280 x 1024), 60 Hz @ VGA (640 x 480)
Light Source/Illumination	Visible red light (617 ± 15 nm)
LED	Class I pursuant to EN 60825-1
MTBF of LEDs	20,000 h
Reading Distance	3.15 in (80 mm)
Reading Area	1.58 x 1.27 in (40 x 32 mm), depending on reading distance
Depth of Field	Up to 50 mm
Resolution	0.006…0.078 in (0.15…2 mm)
Bar Code Types	
Bar Code Symbology	Code 39, Code 128, Codabar, EAN, EAN 128, UPC, Interleaved 2/5
Readability	1…50 bar codes per scan
Auto Discrimination	1…50 bar codes per reading gate
Bar Code Length	Max. 50 characters (max. 4,000 characters across all codes per reading interval)
2D Code Types	DataMatrix ECC200
2D Code Length	To ISO/IEC 16022
Communications / I/O / Indicators	
LED Interface	4 x LED (status indicator)
Host Interface	RS 232 or RS 422/485, variable data output format
Baud Rate	300…57,600
“CAN” Data Interface	CANopen protocol, CAN Scanner Network
“CAN” Data Transfer Rate	10 kBit/s to 1 Mbit/s
“Ethernet” Data Interface	10 Mbit/s, TCP/IP, FTP
“Aux” Data Interface	RS 232, 9,600 bd, 8 data bits, no parity, 1 stop bit, fixed output format
Switching Inputs	2 (“Sensor 1,” “Sensor 2”)
Switching Outputs	2 (“Result 1,” “Result 2”); Result 1: low-side switch, Result 2: high-side switch
Mechanical/Electrical	
Supply Voltage/Power Consumption	15…30 V DC/typ. 7 W, max. 10 W
Dimensions	
End Scanning	3.1 x 1.5 x 4.4 in (80 x 39 x 112 mm)
Side Scanning	3.1 x 1.5 x 4.4 in (80 x 39 x 112 mm)
Weight	Approx. 900 g with connecting cable
Housing	Zinc die-cast
Enclosure Rating	Max. IP 65 (to DIN 40 050), Ethernet interface max. IP 30 when connected
Connectivity	15-pin D-Sub high density connector, cable length 0.9 m/RJ-45 socket for Ethernet
Environmental	
Ambient Operating Temperature	32…104°F (0…40°C)
Storage Temperature	-4…158°F (-20…70°C)
Vibration	To EN 61010-1
Shock	To EN 60068-2-27
EMC	Tested to EN 61000-6-2, EN 61000-6-4
Protection Class	Class III (to VDE 0106/IEC 1010-1
Maximum Relative Humidity	90%, non-condensing

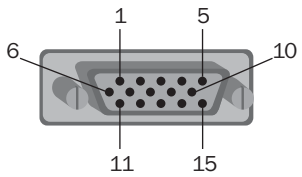
Models and Part Numbers

	ICR 840
Model	ICR 840-0020
Part Number	1 027 176
Model	ICR 840-1020
Part Number	1 028 254

NOTE: Accessories information is located on page 95.

Pinouts

15-pin D Sub HD Plug



Pin	Signal	Function
1	15…30 V DC	Power supply
2	RxD (Aux)	Auxiliary interface (receiver)
3	TxD (Aux)	Auxiliary interface (transmitter)
4	Sensor 2	Switching input, variable function
5	GND	Ground
6	RD+ (RS 422/485)	Host interface (receiver)
7	RD- (RS 422/485); RxD (RS 232)	Host interface (receiver)
8	TD+ (RS 422/485)	Host interface (transmitter)
9	TD- (RS 422/485); TxD (RS 232)	Host interface (transmitter)
10	CAN H	CAN bus (IN/OUT)
11	CAN L	CAN bus (IN/OUT)
12	Result 1	Switching output, variable function
13	Result 2	Switching output, variable function
14	Sensor 1	Switching input for external reading pulse
15	SensGND	Common ground for all inputs
-	-	Shield

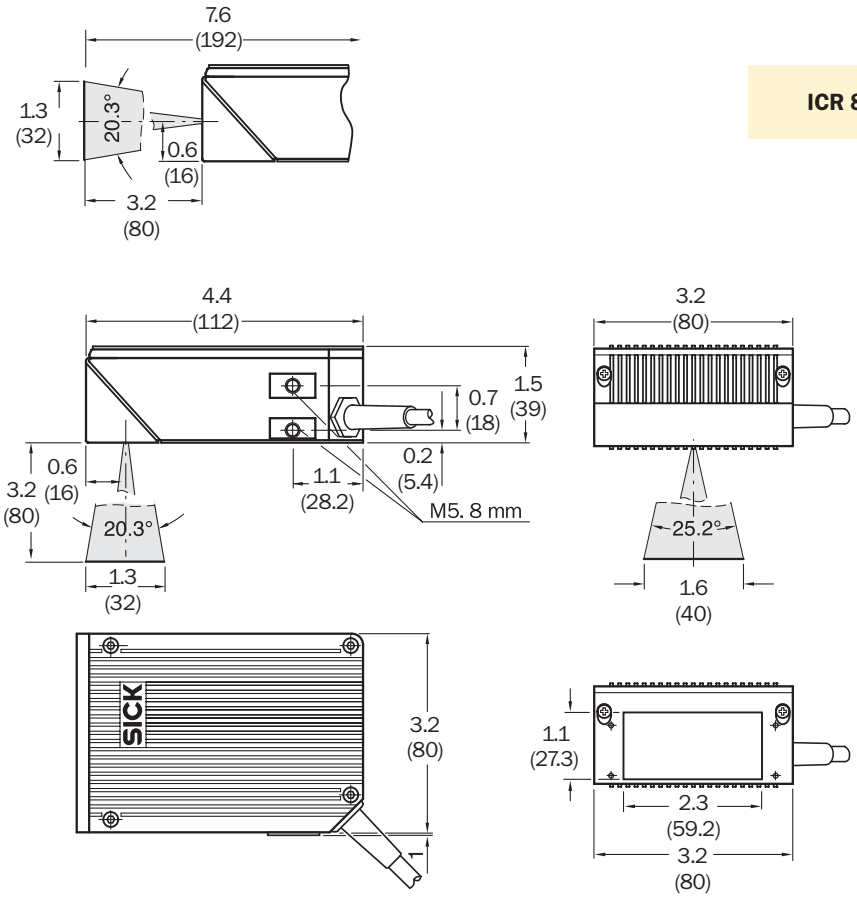
RJ 45 Socket 10Base-T Ethernet

Pin	Signal	Function
1	TX+	Transmitter +
2	TX–	Transmitter –
3	RX+	Receiver +
6	RX–	Receiver –
4, 5, 7, 8	n.c.	Not connected

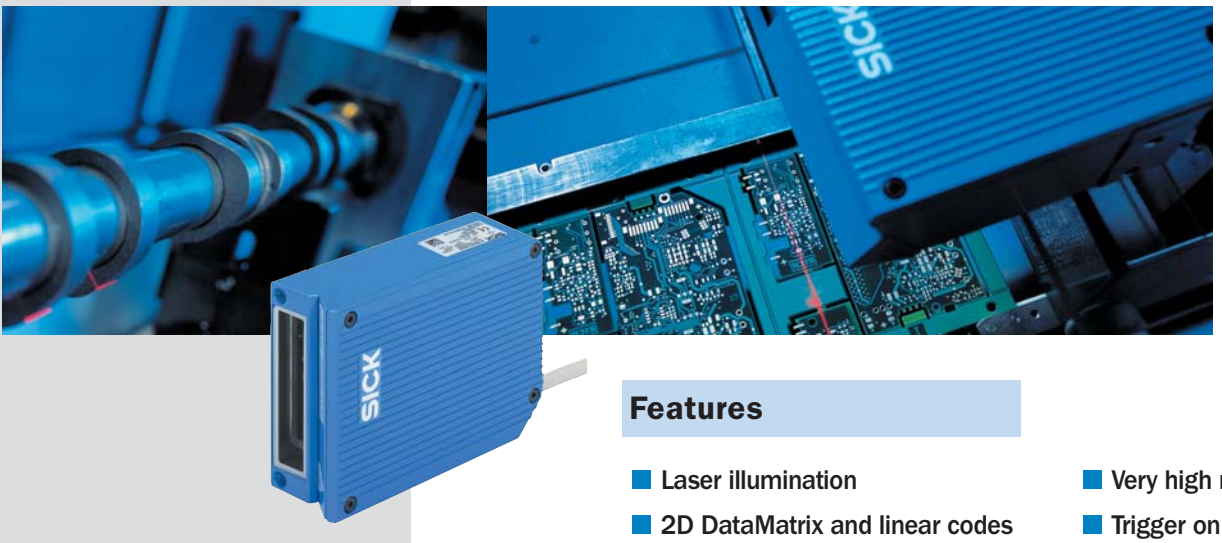
Drawings

Dimensions in inches (mm)

ICR 840



ICR 850/852/855
Fixed Position 2D Linear Imager



Features

- Laser illumination
- 2D DataMatrix and linear codes
- On-board Ethernet
- Intuitive use and setup
- Very high resolution
- Trigger on object
- Space-saving design
- High speed (45 kHz)

Utilizing a platform of powerful processing technology and an innovative illumination concept, the ICR 85x Scanner Series sets new benchmarks in reading performance for 2D and linear codes. The integrated laser line source provides a powerful illumination of the reading field for the best code reading results.

The ICR 85x Series is comprised of three different models. The ICR 850 is the standard model, the ICR 852 is designed for high-speed applications, and the ICR 855 is best suited for high-density codes.

The ICR 850 reads codes with a minimum cell size of 0.0078 inches (0.2 mm) at an internal scan frequency of 15 kHz. The ICR 855 has an internal scan frequency of up to 45 kHz and can read codes at a minimum cell size of 0.014 inches (0.35 mm). The ICR 852 can read codes on cells as small as 0.004 inches (0.1 mm) with a reading field of 1.6 inches (40 mm).

For all scanner models, the specific advantages of using laser line illumination and a CCD line sensor apply. In contrast to area sensor concepts, coded objects do not need to stop to be scanned. Codes are read as they pass the scanner “on the fly” - throughput is maximized.

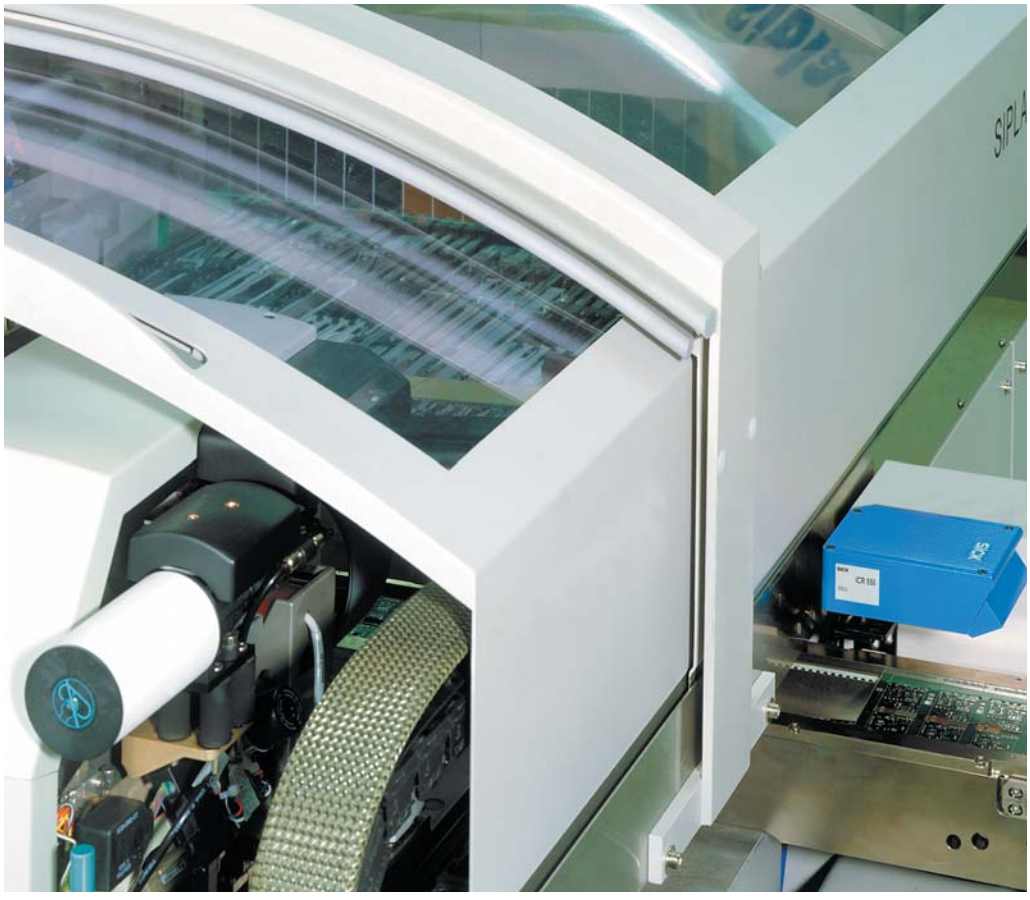
Another advantage is its ability to trigger on the object. While scanning the object surface, the ICR 85x recognizes code patterns and automatically starts decoding. Up to 50 different codes can be processed within one common reading signal.

The ICR 85x Series offers maximum flexibility for solving even the most demanding code reading tasks.

Comparison Table

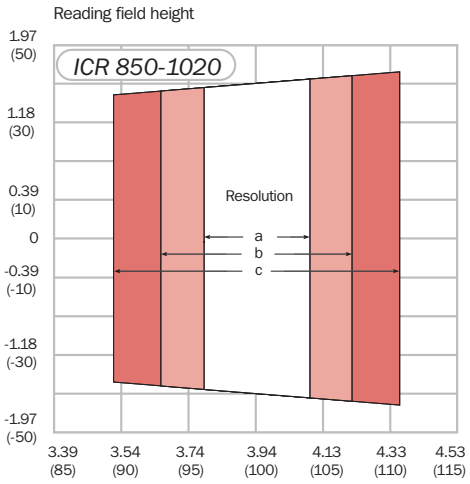
	ICR 850 Standard Density	ICR 852 High Density	ICR 855 High Speed
Reading Range	4.0 in (101 mm)	4.0 in (101 mm)	4.0 in (101 mm)
Scan Frequency	max. 15 kHz (software selectable)	max. 15 kHz (software selectable)	max. 45 kHz (software selectable)
Resolution	0.007…0.019 in (0.2…0.5 mm)	0.003…0.009 in (0.1…0.25 mm)	0.013…0.039 in (0.35…1 mm)
Cloning*	■	■	■
Fixed Focus	■	■	■
Dynamic Focus			
Auto Focus			
Standard Decoding	■	■	■
SMART Decoding	■	■	■
Linear Imager	■	■	■
Raster Scanner			
Oscillating Mirror Scanner			
Front Emitting	■	■	■
Side Emitting	■	■	■

* Requires use of CDM 420 or CDB 420 Connectivity Device with optional CMC 400 Cloning Module.

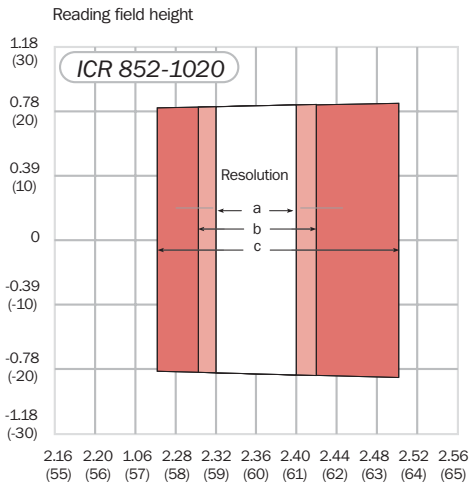


Reading Ranges

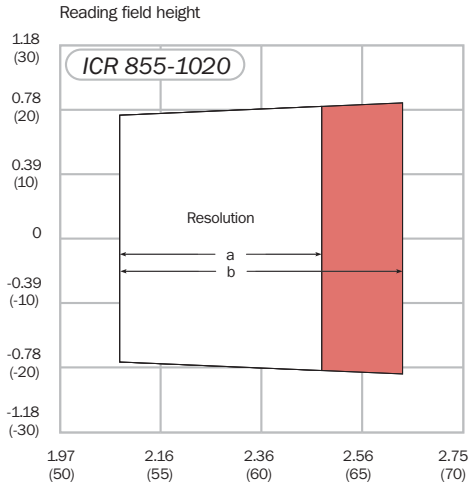
Dimensions in inches (mm)



Code Resolution
- a: 0.010 in (0.25 mm)
- b: 0.013 in (0.35 mm)
- c: 0.019 in (0.5 mm)



Code Resolution
- a: 0.004 in (0.10 mm)
- b: 0.006 in (0.15 mm)
- c: 0.010 in (0.25 mm)



Code Resolution
- a: 0.013 in (0.35 mm)
- b: 0.019 in (0.5 mm)

Technical Specifications

	ICR 850	ICR 852	ICR 855
Scanning Characteristics			
Scanning Method	Line CCD		
Scanning Frequency	Maximum 15 kHz	maximum 15 kHz	maximum 45 kHz
Light Source/Illumination	Visible laser diode, red light (650 nm)		
Laser Class	Class II pursuant to DIN EN 60825-1		
Reading Distance	4.0 in (101.6 mm) Fixed Focus		
Reading Field Height	Up to 3.1 in (80 mm)		
Depth of Field (Bar Code Dependent)	±0.4 in (±10.2 mm)		
Resolution	0.007…0.019 in (0.2…0.5 mm)	0.003…0.009 in (0.1…0.25 mm)	0.013…0.039 in (0.35…1 mm)
Bar Code Types			
Bar Code Symbology	2D: DataMatrix ECC200; Linear: UPC, Codabar, Code 39, EAN, Interleaved 2/5, Code 128, EAN 128, Pharmacode		
Readability	1…20 bar codes per scan (standard decoder), 1…6 bar codes per scan (SMART decoder)		
Auto Discrimination	1…50 bar codes per reading gate		
Bar Code Length	Max. 50 characters (max. 4000 characters across all codes per reading interval)		
2D Code Types	DataMatrix ECC200		
2D Code Length	To 1556 data bytes		
Readability	1…20 2D codes per scan		
Auto Discrimination	1…50 2D codes per reading gate		
Communications / I/O / Indicators			
LED Interface	4 x LEDs (status indicator)		
Host Interface	RS 232, RS 422/485 (software selectable)		
Baud Rate	300…57,600 (software selectable)		
“CAN” Data Interface	CAN open protocol, CAN scanner		
“CAN” Data Transfer Rate	10 kBit/s…1 MBit/s (software selectable)		
“Ethernet” Data Interface	10 MBit/s, TCP IP, FTP		
“Aux” Data Interface	RS 232, 9,600 Bd, 8 data bits, no parity, 1 stop bit, fixed output format		
Switching Inputs	2 (“sensor 1”, “sensor 2”)		
Switching Outputs	2 (“result 1”, “result 2”)		
Mechanical/Electrical			
Supply Voltage/Power Consumption	10…30 V DC		
Current Consumption	355 mA at 24 V DC / 8.5 W		
Dimensions			
End Scanning	3.1 x 1.5 x 4.4 in (80 x 39 x 111 mm)		
Side Scanning	3.1 x 1.5 x 4.5 in (80 x 39 x 115 mm)		
Weight	Approx. 1.98 lb (0.9 kg) with connecting cable		
Housing	Zinc die cast		
Enclosure Rating	Maximum IP 65 (to DIN 40 050), Ethernet interface IP 30 when connected		
Connectivity	15-pin D-Sub high density connector, cable length 0.9 m/RJ-45 socket for Ethernet		
Environmental			
Ambient Operating Temperature	32…104°F (0…40°C)		
Storage Temperature	-4…158°F (-20…70°C)		
Vibration	IEC 68-2-6 Test FC		
Shock	IEC 68-2-27 Test EA		
EMC	To EN 61000-6-2, EN 55011		
Protection Class	Class III (to VDE 0106/IEC 1010-1)		
Maximum Relative Humidity	90%, non condensing		

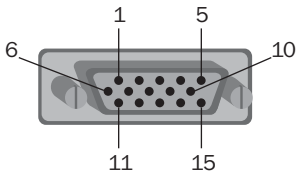
Models and Part Numbers

	ICR 850	ICR 852	ICR 855
Front Emitting Scanner			
Model	ICR 850-0020	ICR 852-0020	ICR 855-0020
Part Number	1 022 583	1 025 525	1 025 527
Side Emitting Scanner			
Model	ICR 850-1020	ICR 852-1020	ICR 855-1020
Part Number	1 022 585	1 025 526	1 025 528

NOTE: Accessories information is located on page 96.

Pinouts

15-pin connector

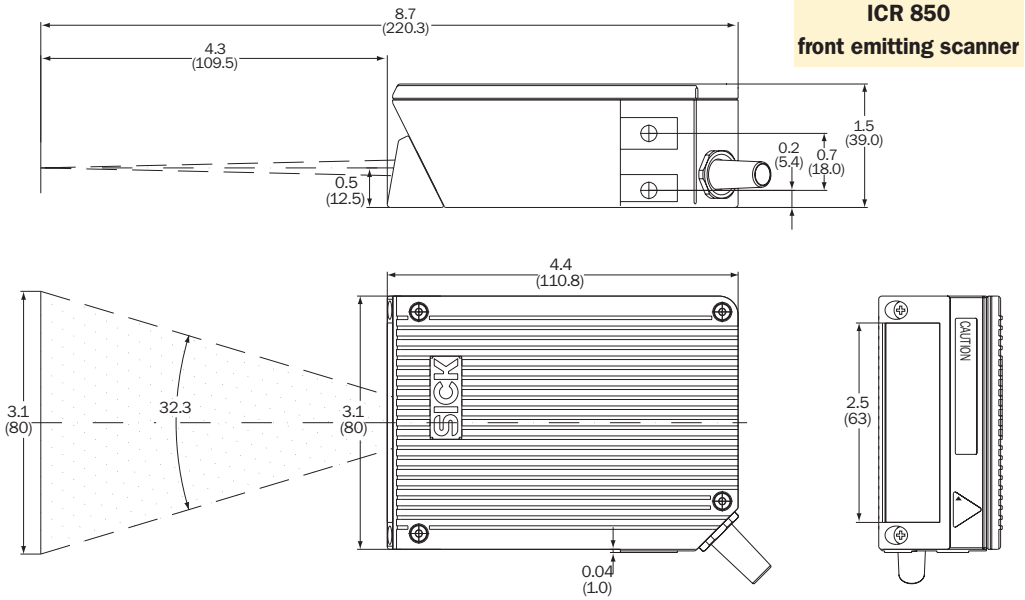


Pin	Signal	Function
1	10…30 V DC	Power supply
2	RxD (Terminal)	Auxiliary interface (receiver)
3	TxD (Terminal)	Auxiliary interface (sender)
4	Sensor 2	Switching input (Function programmable)
5	GND	Ground
6	RD+ (RS 422/485)	Host interface (receiver)
7	RD- (RS 422/485) RxD (RS 232)	Host interface (receiver)
8	TD+ (RS 422/485)	Host interface (sender)
9	TD- (RS 422/485) TxD (RS 232)	Host interface (sender)
10	CAN H	CAN Bus (In/Out)
11	CAN L	CAN Bus (In/Out)
12	Result 1	Switching output (Function programmable)
13	Result 2	Switching output (Function programmable)
14	Sensor 1	Switching input for reading gate signal
15	SensGND	Common ground for all inputs

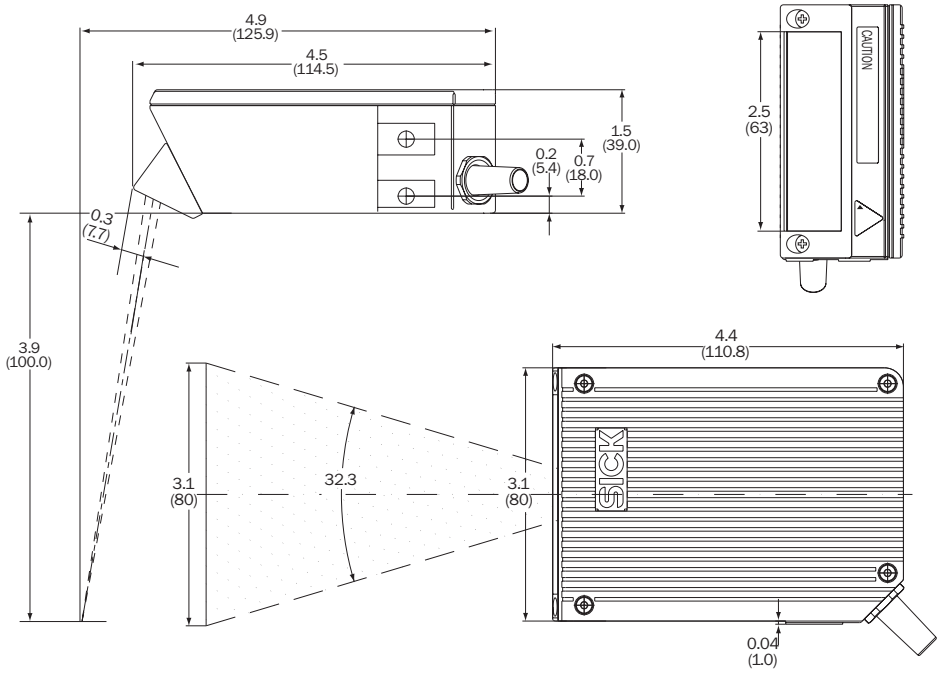
Drawings

Dimensions in inches (mm)

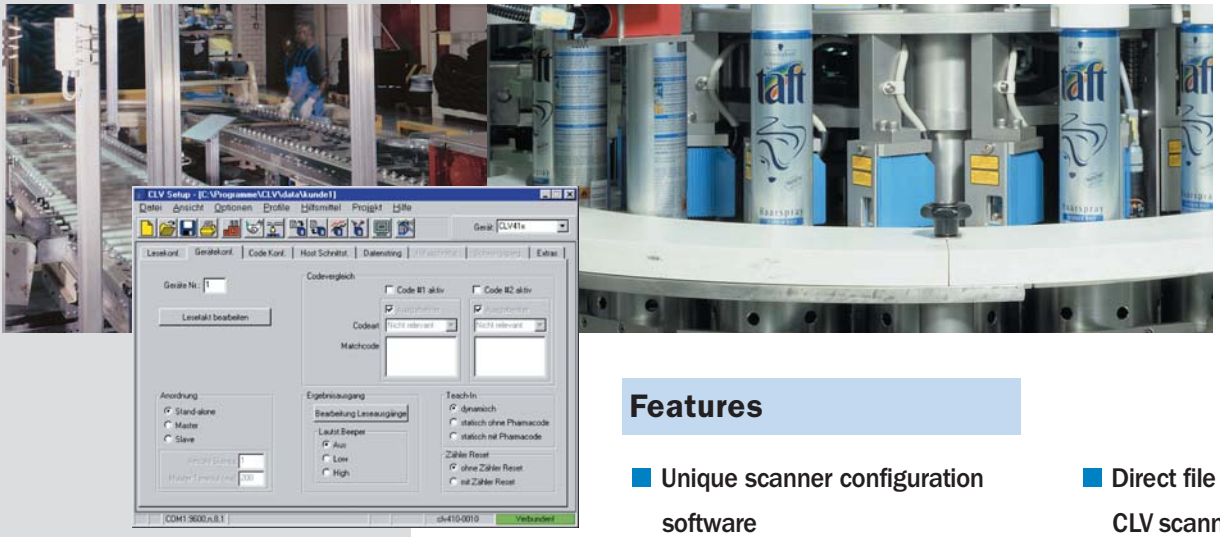
ICR 850
front emitting scanner



ICR 850
side emitting scanner



CLV Setup Software
Fixed Position Scanner



Features

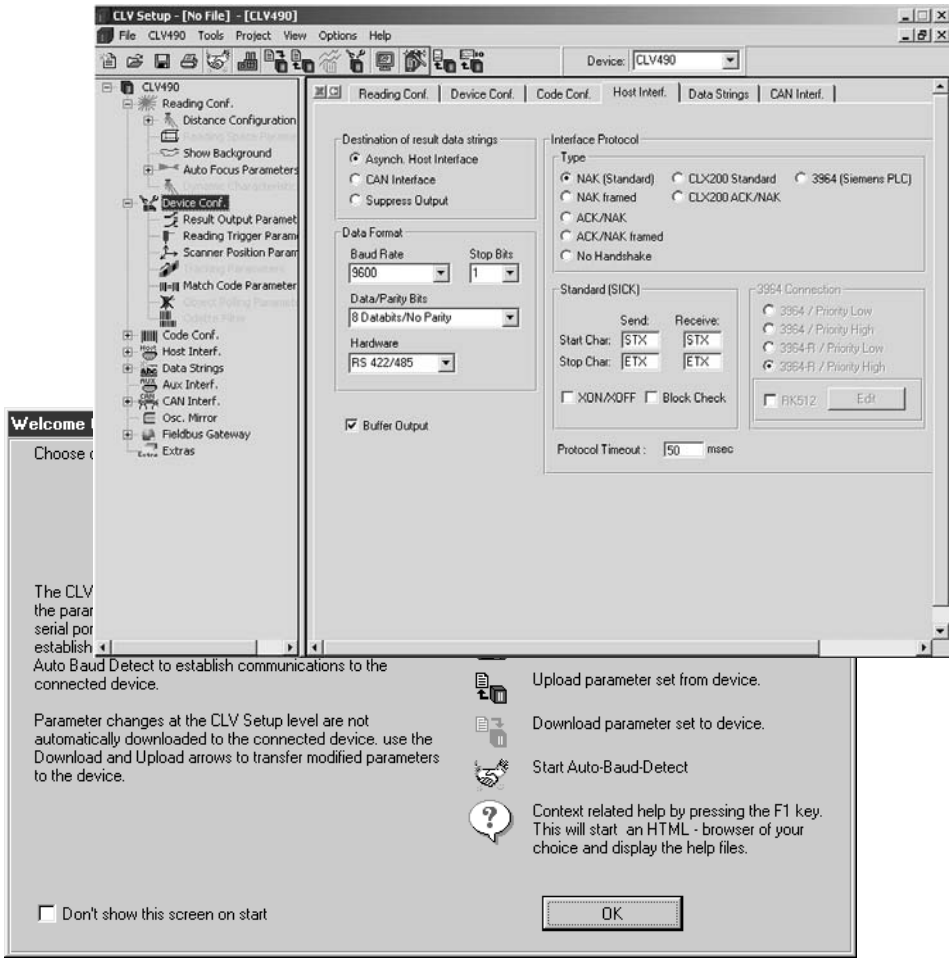
- Unique scanner configuration software
- Windows™-based, user-friendly format
- Stand-alone operation
- Direct file transfer to/from all CLV scanners
- Long term file storage on disk
- One package for all scanners

CLV Setup Software is a Windows™-based software package that allows quick and simple configuration of all user-defined scanner parameters. A single software package supports everything from our simplest line scanner to the most complex omni directional tunnel.

User-defined parameters include focus control, data filtering, real-time diagnostics, scan frequency, bar code label specifications, real-time performance statistics, networking, and communications.

Comparison Table

	CLV Setup Software
Part Number	7 026 126 (CD)
Computer	Minimum IBM 486, or true 486 IBM compatible
Hard Disk Space	10 MB of available disk space
Disk Drive	One CD ROM drive
Memory Requirements	Recommended 8 MB RAM
System Software	Windows™ 98, NT, 2000, XP, ME
Mouse	Optional but recommended
CLV Scanner Interface/ Compatibility	CLV 210/212/214/220/230/250/265,/280/295/410/412/ 414/420,/421/422/430/431/432/440/442/450/450 OTS/451/480/490, CLX 490, ICR 840, ICR 850/852/855 or OPS 400, OTC 400/MUX 400

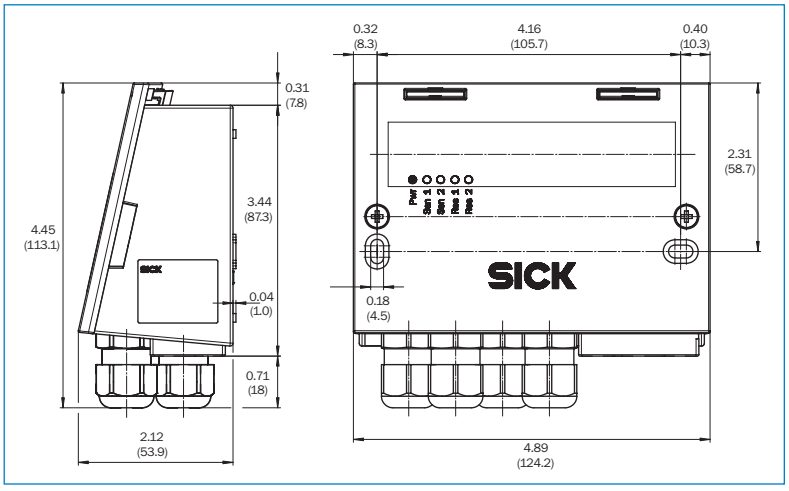


Power Supply

CDB - Connection Device Basic

- Connects CLV 4xx or ICR 85x scanners to a network or host system
- Housing for CMC 400 parameter memory unit
- Designed for ease of CAN scanner network setup
- Service connection for direct access to the AUX interface of the bar code scanner
- Connection diagram integrated in lid
- Compact footprint - 4.9 x 4.5 x 2.1 inches

Dimensions in inches (mm)

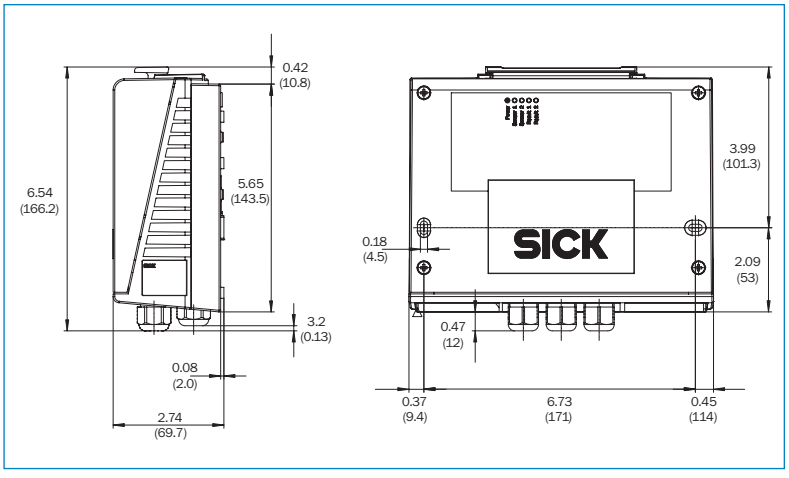


Part Number	Model
7 027 806	CDB 410-001 KIT
7 027 805	CDB 420-001 KIT

CDM - Connection Device Modular

- Connects CLV 4xx or ICR 85x scanners to a network or host system
- Housing for CMC 400 parameter memory unit
- Optional AC power supply module
- Optional Display Module for simple diagnosis and monitoring of bar code data
- 3 slots for optional field bus modules
- Designed for ease of CAN scanner network setup
- Service connection for direct access to the AUX interface of the bar code scanner

Dimensions in inches (mm)

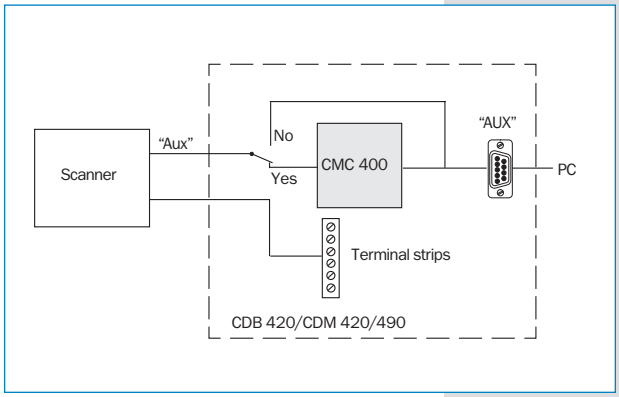


Part Number	Model
7 028 866	CDM 410-0101 KIT DC
7 028 867	CDM 410-0102 KIT AC
1 025 364	CDM 420-0101 DC
1 026 220	CDM 420-0102 AC
7 028 868	CDM 420-1101 KIT DC
7 028 869	CDM 420-1102 KIT AC
1 025 365	CDM 490-0101 DC
1 026 264	CDM 490-0102 AC
7 028 870	CDM 490-1101 KIT DC
7 028 871	CDM 490-1102 KIT AC

PS Modules

CMC - Connection Module Cloning

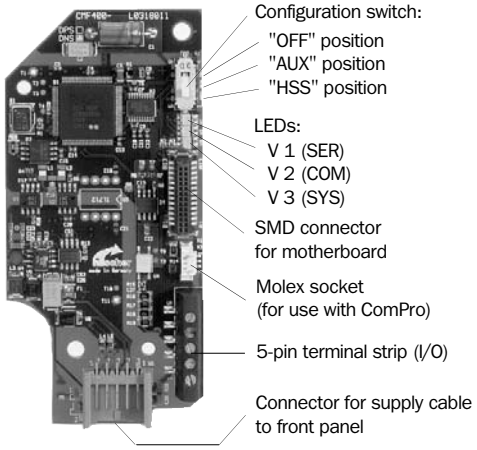
- Externally saves bar code scanner parameters
- No configuration due to “plug and play” functionality
- Visible hardware switch to define CAN network address and baud rate
- Works in conjunction with CDM and CDB connection devices
- No extra wiring or additional space required



Part Number	Model
1 023 850	CMC 400-101

CMF- Connection Module Fieldbus

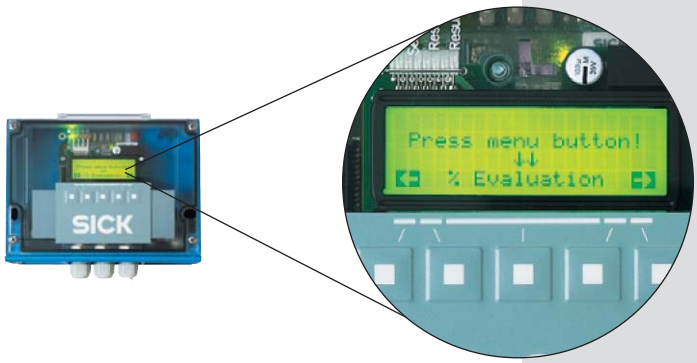
- Easy integration into Profibus-DP, DeviceNet, or Ethernet TCP/IP fieldbus systems
- Common connectivity concept for bar code scanner interfacing to fieldbus systems
- Quick and easy commissioning of SICK bar code scanners
- Comprehensive error diagnosis tools



Part Number	Model
7 028 943	CMF 400-1001 PROFIBUS KIT
7 028 942	CMF 400-2101 DNET KIT
7 029 481	CMF 400-3101 Ethernet TCP/IP KIT

CMD - Connection Module Display*

- Display of scanner data, including scanner result, diagnostics, host communications, etc.
- 4 x 20 character, background illuminated
- 6 operational modes interfaced by keypad
- Simple diagnosis of bar code scanner issues without the use of a PC



Part Number	Model
2 029 466	CMD 400 (display)

* Requires the use of CMC above

CLP 100

Line Scanners

Part Number	Model	Description
1 018 333	CLP 100-0110	Straight reading window, open cable end
1 018 334	CLP 100-2110	Right angle mirror, open cable end
1 018 331	CLP 100-0010	Straight reading window, DB9 connector
1 018 332	CLP 100-2010	Right angle mirror, DB9 connector

Setup Software

Part Number	Model	Description
2 021 674	CLP Setup Software	Windows™-based CLP programming software

CLV 410/412/414

Line Scanners

Part Number	Model	Description
1 015 421	CLV 410-0010	Line scanner, standard / Host Port RS 232, RS 422/485
1 017 534	CLV 410-2010	Line scanner, standard, right angle mirror / Host Port RS 232, RS 422/485
1 017 527	CLV 412-0010	Line scanner, high density / Host Port RS 232, RS 422/485
1 017 538	CLV 412-2010	Line Scanner, high density, right angle mirror / Host Port RS 232, RS 422/485
1 017 368	CLV 414-0010	Line scanner, close range / Host Port RS 232, RS 422/485
1 017 396	CLV 414-2010	Line scanner, close range, right angle mirror / Host Port RS 232, RS 422/ 485

Raster Scanners

Part Number	Model	Description
1 015 427	CLV 410-1010	Raster scanner, standard / Host Port RS 232, RS 422/485
1 017 536	CLV 410-3010	Raster scanner, standard, right angle mirror / Host Port RS 232, RS 422/485
1 017 528	CLV 412-1010	Raster scanner, high density / Host Port RS 232, RS 422/485
1 017 540	CLV 412-3010	Raster scanner, high density, right angle mirror / Host Port RS 232, RS 422/485
1 016 767	CLV 414-1010	Raster scanner, close range / Host Port RS 232, RS 422/485
1 016 831	CLV 414-3010	Raster scanner, close range, right angle mirror / Host Port RS 232, RS 422/485

Power Supplies

Part Number	Model	Description
7 028 866	CDM 410-0101 KIT DC	For use with CLV 41x, 24 V DC required, includes null modem connector
7 028 867	CDM 410-0102 KIT AC	For use with CLV 41x, includes 115/230 V AC power, 6 ft US line cord, null modem connector
7 026 806	CDB 410-001 KIT	24 V DC required, kit includes null modem connector

Brackets

Part Number	Model	Description
2 020 077	MB-CLV410S	Small right angle bracket for the CLV 410/420
2 020 078	MB-CLV410L	Large right angle bracket for the CLV 410/420
7 024 011	MB-W45A-43X-QR	Ball and socket bracket with Quick Release

Cables

Part Number	Model	Description
6 010 075	KP-DB15H-2E	15-pin F to 15-pin M, straight through 2 m long cable
7 021 851	KP-DB09-2E	Cable, for DME, DB 9 serial interface/PC connection, 9-pin F to 9-pin M, 2 m
7 021 849	KP-DB09-3E	Cable, for DME, DB 9 serial interface/PC connection, 9-pin F to 9-pin M, 3 m

Setup Software

Part Number	Model	Description
7 026 126	CLV Setup Software-CD	Windows™-based CLV programming software

CLV 420/421/422

Line Scanners

Part Number	Model	Description
1 022 031	CLV 420-0010	Line scanner, standard / Host Port RS 232, RS 422/485
1 022 033	CLV 420-2010	Line scanner, standard, right angle mirror / Host Port RS 232, RS 422/485
1 022 547	CLV 421-0010	Line scanner, long range / Host Port RS 232, RS 422/485
1 022 617	CLV 421-2010	Line scanner, long range, right angle mirror / Host Port RS 232, RS 422/485
1 022 548	CLV 422-0010	Line scanner, high density / Host Port RS 232, RS 422/485
1 022 620	CLV 422-2010	Line scanner, high density, right angle mirror / Host Port RS 232, RS 422/485

Raster Scanners

Part Number	Model	Description
1 022 032	CLV 420-1010	Raster scanner, standard / Host Port RS 232, RS 422/485
1 022 034	CLV 420-3010	Raster scanner, standard, right angle mirror / Host Port RS 232, RS 422/485
1 022 616	CLV 421-1010	Raster scanner, long range / Host Port RS 232, RS 422/485
1 022 618	CLV 421-3010	Raster scanner, long range, right angle mirror / Host Port RS 232, RS 422/485
1 022 619	CLV 422-1010	Raster scanner, high density / Host Port RS 232, RS 422/485
1 022 621	CLV 422-3010	Raster scanner, high density, right angle mirror / Host Port RS 232, RS 422/485

Power Supplies

Part Number	Model	Description
7 027 805	CDB 420-001 KIT DC	24 V DC required, for use with CLV 420-450, includes null modem connector
1 025 364	CDM 420-0101 DC	For use with CLV 42x-45x, 24 V DC required
1 026 220	CDM 420-0102 AC	For use with CLV 42x-45x, includes 115/230 V AC power, 6 ft US line cord
7 028 868	CDM 420-1101 KIT DC	For use with CLV 42x-45x, 24 V DC required, includes CMC cloning module
7 028 869	CDM 420-1102 KIT AC	For use with CLV 42x-45x, includes 115/230 V AC power, 6 ft US line cord, CMC cloning module
2 029 466	CMD Display Module	Use with CDM 420 or 490, must be used with a CMC cloning module
1 023 850	CMC 400-101	Cloning module for use with CDx 420-490
7 028 943	CMF 400-1001 Profibus Kit	Profibus communication module kit, use with CDM 410, 420 or 490
7 028 942	CMF 400-2101 Dnet Kit	DeviceNet communication module kit, use with CDM 410, 420 or 490
7 028 481	CMF 400-3101 Ethernet Kit	Ethernet communication module kit, use with CDM 410, 420 or 490
2 029 468	CMP 400 Power Supply	Use with CDM 410 or 420
7 020 634	6 ft Line Cable	Power cord for use with CDM 4x0 connection device

Brackets

Part Number	Model	Description
2 020 077	MB-CLV410S	Small right angle bracket for the CLV 410/420
2 020 078	MB-CLV410L	Large right angle bracket for the CLV 410/420
7 024 011	MB-W45A-43X-QR	Ball and socket bracket with Quick Release

Cables

Part Number	Model	Description
6 010 075	KP-DB15H-2E	15-pin F to 15-pin M, straight through 2 m long cable
7 021 851	KP-DB09-2E	Cable, for DME, DB 9 serial interface/PC connection, 9-pin F to 9-pin M, 2 m
7 021 849	KP-DB09-3E	Cable, for DME, DB 9 serial interface/PC connection, 9-pin F to 9-pin M, 3 m

Setup Software

Part Number	Model	Description
7 026 126	CLV Setup Software-CD	Windows™-based CLV programming software

CLV 430/431/432

Line Scanners

Part Number	Model	Description
1 017 585	CLV 430-0010	Line scanner, standard / software selectable Host Port RS 232, RS 422/485
1 017 622	CLV 431-0010	Line scanner, mid-range / software selectable Host Port RS 232, RS 422/485
1 016 746	CLV 431-2010	Line scanner, mid-range, right angle mirror / software selectable Host Port RS 232, RS 422/485
1 017 623	CLV 432-0010	Line scanner, close-range / software selectable Host Port RS 232, RS 422/485
1 016 748	CLV 432-2010	Line scanner, close-range, right angle mirror / software selectable Host Port RS 232, RS 422/485

Raster Scanners

Part Number	Model	Description
1 016 705	CLV 430-1010	Raster scanner, standard / software selectable Host Port RS 232, RS 422/485
1 016 679	CLV 431-1010	Raster scanner, mid-range / software selectable Host Port RS 232, RS 422/485
1 016 747	CLV 431-3010	Raster scanner, mid-range, right angle mirror / software selectable Host Port RS 232, RS 422/485
1 016 680	CLV 432-1010	Raster scanner, close-range / software selectable Host Port RS 232, RS 422/485
1 016 749	CLV 432-3010	Raster scanner, close-range, right angle mirror / software selectable Host Port RS 232, RS 422/485

Oscillating Mirror scanners

Part Number	Model	Description
1 017 981	CLV 430-6010	Oscillating mirror, standard / Host Port RS 232, RS 422/485
1 017 982	CLV 431-6010	Oscillating mirror, mid-range / Host Port RS 232, RS 422/485
1 017 983	CLV 432-6010	Oscillating mirror, close-range / Host Port RS 232, RS 422/485

Power Supplies

Part Number	Model	Description
7 024 454	PS 51-1000-DNET-MICRO	115/230 V AC DeviceNet unit with micro connector
7 024 686	PS 51-0000-DNET-MINI	DeviceNet unit with mini connector, 24 V DC required
7 027 805	CDB 420-001 KIT	24 V DC required, for use with CLV 420-450, includes null modem connector
1 025 364	CDM 420-0101 DC	For use with CLV 42x-45x, 24 V DC required
1 026 220	CDM 420-0102 AC	For use with CLV 42x-45x, includes 115/230 V AC power, 6 ft US line cord
7 028 868	CDM 420-1101 KIT DC	For use with CLV 42x-45x, 24 V DC required, includes CMC cloning module
7 028 869	CDM 420-1102 KIT AC	For use with CLV 42x-45x, includes 115/230 V AC power, 6 ft US line cord, CMC cloning module
2 029 466	CMD Display Module	Use with CDM 420 or 490, must be used with a CMC cloning module
1 023 850	CMC 400-101	Cloning module for use with CDx 420-490
7 028 943	CMF 400-1001 Profibus Kit	Profibus communication module kit, use with CDM 410/420/490
7 028 942	CMF 400-2101 Dnet Kit	DeviceNet communication module kit, use with CDM 410/420/490
7 028 481	CMF 400-3101 Ethernet Kit	Ethernet communication module kit, use with CDM 410, 420 or 490
2 029 468	CMP 400 Power Supply	Use with CDM 410/420
7 020 634	6 ft Line Cable	Power cord for use with CDM 4x0 communication device

Brackets

Part Number	Model	Description
2 020 410	CLV 43x/44x Bracket	Right angle bracket
7 024 011	MB-W45A-43x QR	Ball and socket bracket with Quick Release
2 022 564	U-Shaped Bracket	U-shaped bracket
2 023 691	Pole-Mount Bracket	U-shaped pole mount bracket
2 021 342	Vibration Bracket	U-shaped vibration dampening bracket

Cables

Part Number	Model	Description
6 010 075	KP-DB15H-2E	15-pin F to 15-pin M, straight through 2 m long cable
7 021 851	KP-DB09-2E	Cable, for DME, DB 9 serial interface/PC connection, 9-pin F to 9-pin M, 2 m
7 021 849	KP-DB09-3E	Cable, for DME, DB 9 serial interface/PC connection, 9-pin F to 9-pin M, 3 m

Software

Part Number	Model	Description
7 026 126	CLV Setup Software-CD	Windows™-based CLV programming software

CLV 440/442

Line Scanners

Part Number	Model	Description
1 017 588	CLV 440-0010	Line scanner, standard / software selectable Host Port RS 232, RS 422/485
1 017 595	CLV 422-0010	Line scanner, high density / software selectable Host Port RS 232, RS 422/485

Oscillating Mirror Scanners

Part Number	Model	Description
1 017 984	CLV 440-6010	Oscillating mirror, standard / software selectable Host Port RS 232, RS 422/485

Power Supplies

Part Number	Model	Description
7 027 805	CDB 420-001 KIT null modem connector	24 V DC required, for use with CLV 420-450, includes
1 025 364	CDM 420-0101 DC	For use with CLV 42x-45x, 24 V DC required
1 026 220	CDM 420-0102 AC	For use with CLV 42x-45x, includes 115/230 V AC power, 6 ft US line cord
7 028 868	CDM 420-1101 KIT DC	For use with CLV 42x-45x, 24 V DC required, includes CMC cloning module
7 028 869	CDM 420-1102 KIT AC	For use with CLV 42x-45x, includes 115/230 V AC power, 6 ft US line cord, CMC cloning module
2 029 466	CMD Display Module	Use with CDM 420 or 490, must be used with a CMC cloning module
1 023 850	CMC 400-101	Cloning module for use with CDB 420-490
7 028 943	CMF 400-1001 Profibus Kit	Profibus communication module kit, use with CDM 410/420/490
7 028 942	CMF 400-2101 Dnet Kit	DeviceNet communication module kit, use with CDM 410/420/490
7 028 481	CMF 400-3101 Ethernet Kit	Ethernet communication module kit, use with CDM 410, 420 or 490
2 029 468	CMP 400 Power Supply	Use with CDM 410/420
7 020 634	6 ft Line Cable	Power cord for use with CDM 4x0 communication device

Brackets

Part Number	Model	Description
2 020 410	CLV 43x/44x Bracket	Right angle bracket
7 024 011	MB-W45A-43x QR	Ball and socket bracket with Quick Release
2 022 564	U-Shaped Bracket	U-shaped bracket
2 023 691	Pole-Mount Bracket	U-shaped pole mount bracket
2 021 342	Vibration Bracket	U-shaped vibration dampening bracket

Cables

Part Number	Model	Description
6 010 075	KP-DB15H-2E	15-pin F to 15-pin M, straight through 2 m long cable
7 021 851	KP-DB09-2E	Cable, for DME, DB 9 serial interface/PC connection, 9-pin F to 9-pin M, 2 m
7 021 849	KP-DB09-3E	Cable, for DME, DB 9 serial interface/PC connection, 9-pin F to 9-pin M, 3 m

Setup Software

Part Number	Model	Description
7 026 126	CLV Setup Software-CD	Windows™-based CLV programming software

CLV 450

Line Scanner

Part Number	Model	Description
1 018 556	CLV 450-0010	Line scanner, standard / software selectable Host Port RS 232, RS 422/485

Oscillating Mirror

Part Number	Model	Description
1 019 218	CLV 450-6010	Oscillating mirror, standard / software selectable Host Port RS 232, RS 422/485

Power Supplies

Part Number	Model	Description
7 027 805	CDB 420-001 KIT null modem connector	24 V DC required, for use with CLV 420-450, includes
1 025 364	CDM 420-0101 DC	For use with CLV 42x-45x, 24 V DC required
1 026 220	CDM 420-0102 AC	For use with CLV 42x-45x, includes 115/230 V AC power, 6 ft US line cord
7 028 868	CDM 420-1101 KIT DC	For use with CLV 42x-45x, 24 V DC required, includes CMC cloning module
7 028 869	CDM 420-1102-KIT AC	For use with CLV 42x-45x, includes 115/230 V AC power, 6 ft US line cord, CMC cloning module
2 029 466	CMD Display Module	Use with CDM 420 or 490, must be used with a CMC cloning module
1 023 850	CMC 400-101	Cloning module for use with CDx 420-490
7 028 943	CMF 400-1001 Profibus Kit	Profibus communication module kit, use with CDM 410/420/490
7 028 942	CMF 400-2101 Dnet Kit	DeviceNet communication module kit, use with CDM 410/420/490
7 028 481	CMF 400-3101 Ethernet Kit	Ethernet communication module kit, use with CDM 410, 420 or 490
2 029 468	CMP 400 Power Supply	Use with CDM 410/420
7 020 634	6 ft Line Cable	Power cord for use with CDM 4x0 connection device

Brackets

Part Number	Model	Description
2 020 410	CLV 43x/44x Bracket	Right angle bracket
7 024 011	MB-W45A-43x-QR	Ball and socket bracket with Quick Release
2 022 564	U-Shaped Bracket	U-shaped bracket
2 023 691	Pole-Mount Bracket	U-shaped pole mount bracket
2 021 342	Vibration Bracket	U-shaped vibration dampening bracket

Cables

Part Number	Model	Description
6 010 075	KP-DB15H-2E	15-pin F to 15-pin M, straight through 2 m long cable
7 021 851	KP-DB09-2E	Cable, for DME, DB 9 serial interface/PC connection, 9-pin F to 9-pin M, 2 m
7 021 849	KP-DB09-3E	Cable, for DME, DB 9 serial interface/PC connection, 9-pin F to 9-pin M, 3 m

Setup Software

Part Number	Model	Description
7 026 126	CLV Setup Software-CD	Windows™-based CLV programming software

CLV 480

Line Scanners

Part Number	Model	Description
1 024 065	CLV 480-0010	Line scanner, standard / software selectable Host Port RS 232, RS 422/485
1 024 067	CLV 480-0011	Line scanner, standard / software selectable Host Port RS 232, RS 422/485 with heater

Oscillating Mirror Scanners

Part Number	Model	Description
1 024 066	CLV 480-1010	Oscillating mirror scanner, standard / software selectable Host Port RS 232, RS 422/485
1 024 068	CLV 480-1011	Oscillating mirror scanner, standard / software selectable Host Port RS 232, RS 422/485 with heater

Power Supplies

Part Number	Model	Description
7 026 160	RELAY 54/56	Relay module for PS 56
7 027 805	CDB 420-001 KIT	24 V DC required, for use with CLV 420-450, includes null modem connector, Y-cable required
1 025 365	CDM 490-0101 DC	For use with CLV 48x-49x, 24 V DC required
1 026 264	CDM 490-0102 AC	For use with CLV 48x-49x, includes 115/230 V AC power, 6 ft US line cord, cannot be used in conjunction with CMD display module
7 028 870	CDM 490-1101 KIT DC	For use with CLV 48x-49x, 24 V DC required, includes CMC cloning module
7 028 871	CDM 490-1102 KIT AC	For use with CLV 48x-49x, includes 115/230 V AC power, 6 ft US line cord, CMC cloning module, cannot be used in conjunction with CMD display module
1 023 850	CMC 400-101	Cloning module for use only with CDx 420-490

Brackets

Part Number	Model	Description
2 011 436	BEF-KK-W45	Mounting bracket for W.45 with ball-joint
7 023 285	MB-W45A-QR	Ball and socket, Quick Release bracket
2 013 824	MB-CLV-S	Angle bracket, single
2 013 825	MB-CLV-D	Angle bracket, double

Cables

Part Number	Model	Description
7 026 219	KP-DB15H-3E	15-pin F to 15-pin M, straight through 3 m long cable (PS 56)
7 023 386	KP-DB15M/09F-2E	15-pin M to 9-pin F, CLV I/O Port to PS 51, 2 m long cable
7 023 387	KP-DB15M/09F-3E	15-pin M to 9-pin F, CLV I/O Port to PS 51, 3 m long cable
7 023 388	KP-DB15F/09M-2E	15-pin F to 9-pin M, CLV Host/Term Port to PS 51, 2 m long cable
7 023 389	KP-DB15F/09M-3E	15-pin F to 9-pin M, CLV Host/Term Port to PS 51, 3 m long cable
7 021 851	KP-DB09-2E	Cable, for DME, DB 9 serial interface/PC connection, 9-pin F to 9-pin M, 2 m
2 020 307	KP-DB15/2-DB15-3M-EE	Cloning plug cable, 3 m long, two High Density DB15 connectors (PS 56)
2 020 981	KP-DB15/LEADS-3M-EE	Cloning plug cable, 3 m long, two 15 conductor bare lead cables
2 020 622	KP-DB9/2-2M-EE	Cloning plug cable, 3 m long, two DB 9 connectors (PS 51-DNET)
2 021 044	KP-DB15-15M-EE	Cloning plug cable, 15 m long, single cable to bare leads (Limited pins)

Cables

Part Number	Model	Description
2 021 298	KP-DB15/DB15-3M-IP65-COLD	Low Temperature cable, 3 m long without EEPROM - use w/ AMV 100
2 021 299	KP-DB15/DB15-10M-IP65-COLD	Low Temperature cable, 10 m long without EEPROM - use w/ AMV 100
2 021 689	KP-DB15/DB15-3M-EE-COLD	Low Temperature cable, 3 m long with EEPROM - Only use with AMV 100
2 021 208	KP-DB15/BareLeads-10M-COLD	Low Temperature cable, 10 m long bare leads, without EEPROM
2 027 046	Y-cable for CDB 420	Y-Cable for connection of CLV 480/490 or CLX 490 to CDB 420

Setup Software

Part Number	Model	Description
7 026 126	CLV Setup Software-CD	Windows™-based CLV programming software

CLV 490

Line Scanners

Part Number	Model	Description
1 016 958	CLV 490-0010	Line scanner, standard / software selectable Host Port RS 232, RS 422/485
1 016 960	CLV 490-0011	Line scanner, standard / software selectable Host Port RS 232, RS 422/485 with Heater
1 019 311	CLV 490-2010	Line scanner, high density / software selectable Host Port RS 232, RS 422/485
1 019 312	CLV 490-2011	Line scanner, high density / software selectable Host Port RS 232, RS 422/485 with Heater
1 018 872	CLV 490-6010	Line scanner, low density / software selectable Host Port RS 232, RS 422/485
1 019 095	CLV-490-6011	Line scanner, low density / software selectable Host Port RS 232, RS 422/485 with Heater

Oscillating Mirror Scanners

Part Number	Model	Description
1 016 959	CLV 490-1010	Oscillating mirror, standard / software selectable Host Port RS 232/422/485
1 016 961	CLV 490-1011	Oscillating mirror, standard / software selectable Host Port RS 232/422/485 with Heater
1 019 313	CLV 490-3010	Oscillating mirror, high density / software selectable Host Port RS 232/422/485
1 019 314	CLV 490-3011	Oscillating mirror, high density / software selectable Host Port RS 232/422/485 with Heater
1 019 094	CLV 490-7010	Oscillating mirror, low density / software selectable Host Port RS 232/422/485
1 019 096	CLV 490-7011	Oscillating mirror, low density / software selectable Host Port RS 232/422/485 with Heater

Power Supplies

Part Number	Model	Description
7 026 160	Relay 54/56	Relay module for PS 56
7 027 805	CDB 420-001 KIT	24 V DC required, for use with CLV 420-490, CLX 490, includes Null Modem connector, Y-cable required
1 025 365	CDM 490-0101 DC	For use with CLV 48x-49x, 24 V DC required
1 026 264	CDM 490-0102 AC	For use with CLV 48x-49x, includes 115/230 V AC power, 6 ft US line cord, cannot be used in conjunction with CMD display module
7 028 870	CDM 490-1101 KIT DC	For use with CLV 48x-49x, 24 V DC required, includes CMC cloning module
7 028 871	CDM 490-1102 KIT AC	For use with CLV 48x-49x, includes 115/230 V AC power, 6 ft US line cord, CMC cloning module, cannot be used in conjunction with CMD display module
2 029 466	CMD Display Module	Use with CDM 420 or 490, must be used with a CMC cloning module
1 023 850	CMC 400-101	Cloning module for use with CDx 420-490
7 028 943	CMF 400-1001 Profibus Kit	Profibus communication module kit, use with CDM 410/420/490
7 028 942	CMF 400-2101 Dnet Kit	DeviceNet communication module kit, use with CDM 410/420/490
2 030 091	CMP 490 Power Supply	Use with CDM 490
7 020 634	6 ft Line Cable	Power cord for use with CDM 4x0 connection device

Brackets

Part Number	Model	Description
2 011 436	BEF-KK-W45	Mounting brackets for W.45 with ball-joint
7 023 285	MB-W45A-QR	Ball and socket, Quick Release bracket
2 013 824	MB-CLV-S	Angle bracket, single
2 013 825	MB-CLV-D	Angle bracket, double

Cables

Part Number	Model	Description
7 026 219	KP-DB15H-3E	15-pin F to 15-pin M, straight through 3 m long cable (PS 56)
7 023 386	KP-DB15M/09F-2E	15-pin M to 9-pin F, CLV I/O Port to PS 51, 2 m long cable
7 023 387	KP-DB15M/09F-3E	15-pin M to 9-pin F, CLV I/O Port to PS 51, 3 m long cable
7 023 388	KP-DB15F/09M-2E	15-pin F to 9-pin M, CLV Host/Term Port to PS 51, 2 m long cable
7 023 389	KP-DB15F/09M-3E	15-pin F to 9-pin M, CLV Host/Term Port to PS 51, 3 m long cable
7 021 851	KP-DB09-2E	Cable, for DME, DB 9 serial interface/PC connection, 9-pin F to 9-pin M, 2 m
2 020 307	KP-DB15/2-DB15-3M-EE	Cloning plug cable, 3 m long, two High Density DB15 connectors (PS 56)
2 020 981	KP-DB15/LEADS-3M-EE	Cloning plug cable, 3 m long, two 15 conductor bare lead cables
2 020 622	KP-DB9/2-2M-EE	Cloning plug cable, 3 m long, two DB 9 connectors (PS 51-DNET)
2 021 044	KP-DB15-15M-EE	Cloning plug cable, 15 m long, single cable to bare leads (Limited pins)
2 021 298	KP-DB15/DB15-3M-IP65-COLD	Low Temperature cable, 3 m long without EEPROM - use w/ AMV 100
2 021 299	KP-DB15/DB15-10M-IP65-COLD	Low Temperature cable, 10 m long without EEPROM - use w/ AMV 100
2 021 689	KP-DB15/DB15-3M-EE-COLD	Low Temperature cable, 3 m long with EEPROM - Only use with AMV 100
2 021 208	KP-DB15/BareLeads-10M-COLD	Low Temperature cable, 10 m long bare leads, without EEPROM
2 027 046	Y-cable for CDB 420	Y-Cable for connection of CLV 480/490 or CLX 490 to CDB 420

Setup Software

Part Number	Model	Description
7 026 126	CLV Setup Software-CD	Windows™-based CLV programming software

ICR 840

Line Scanner

Part Number	Model	Description
1 027 176	ICR 840-0020	Straight reading window, RS 232/422/485 and Ethernet
1 028 254	ICR 840-1020	Lateral reading window, RS 232/422/485 and Ethernet

Power Supply

Part Number	Model	Description
7 027 805	CDB 420-001 KIT	24 V DC required, for use with CLV 420-450 and ICR 85x, includes null modem connector
1 025 364	CDM 420-0101 DC	For use with CLV 42x-45x and ICR 85x, 24 V DC required
1 026 220	CDM 420-0102 AC	For use with CLV 42x-45x and ICR 85x, includes 115/230 V AC power, 6 ft US line cord
7 028 868	CDM 420-1101 KIT DC	For use with CLV 42x-45x and ICR 85x, 24 V DC required, includes CMC cloning module
7 028 869	CDM 420-1102 KIT AC	For use with CLV 42x-45x and ICR 85x, includes 115/230 V AC power, 6 ft US line cord, CMC cloning module
2 029 466	CMD Display Module	Use with CDM 420 or 490, must be used with a CMC cloning module
1 023 850	CMC 400-101	Cloning module for use with CDx 420-490
7 028 943	CMF 400-1001 Profibus Kit	Profibus communication module kit, use with CDM 410/420/490
7 028 942	CMF 400-2101 Dnet Kit	DeviceNet communication module kit, use with CDM 410/420/490
2 029 468	CMP 400 Power Supply	Use with CDM 410 or 420
7 020 634	6 ft Line Cable	Power cord for use with CDM 4x0 connection device

Bracket

Part Number	Model	Description
2 025 491	ICR 850 Bracket	Mounting bracket including screws (2 x self-locking screw M 5x16)

Cables

Part Number	Model	Description
6 010 075	KP-DB15H-2E	15-pin F to 15-pin M, straight through 2 m long cable
7 021 851	KP-DB09-2E	Cable, for DME, DB 9 serial interface/PC connection, 9-pin F to 9-pin M, 2 m
7 021 849	KP-DB09-3E	Cable, for DME, DB 9 serial interface/PC connection, 9-pin F to 9-pin M, 3 m
6 026 083	ICR to Ethernet Cable	ICR to Ethernet network
6 026 084	ICR to PC Cable	ICR to PC

Setup Software

Part Number	Model	Description
7 026 126	CLV Setup Software-CD	Windows™-based CLV programming software

ICR 850/852/855

Line Scanner

Part Number	Model	Description
1 022 583	ICR 850-0020	Front reading window / RS 232, RS 422/485, CAN, Ethernet
1 022 585	ICR 850-1020	Side reading window / RS 232, RS 422/485, CAN, Ethernet
1 025 525	ICR 852-0020	High density, front reading window / RS 232, RS 422/485, CAN, Ethernet
1 025 526	ICR 852-1020	High density, side reading window / RS 232, RS 422/485, CAN, Ethernet
1 025 527	ICR 855-0020	High speed, front reading window / RS 232, RS 422/485, CAN, Ethernet
1 025 528	ICR 855-1020	High speed, side reading window / RS 232, RS 422/485, CAN, Ethernet

Power Supply

Part Number	Model	Description
7 027 805	CDB 420-001 KIT	24 V DC required, for use with CLV 420-450 and ICR 85x, includes null modem connector
1 025 364	CDM 420-0101 DC	For use with CLV 42x-45x and ICR 85x, 24 V DC required
1 026 220	CDM 420-0102 AC	For use with CLV 42x-45x and ICR 85x, includes 115/230 V AC power, 6 ft US line cord
7 028 868	CDM 420-1101 KIT DC	For use with CLV 42x-45x and ICR 85x, 24 V DC required, includes CMC cloning module
7 028 869	CDM 420-1102 KIT AC	For use with CLV 42x-45x and ICR 85x, includes 115/230 V AC power, 6 ft US line cord, CMC cloning module
2 029 466	CMD Display Module	Use with CDM 420 or 490, must be used with a CMC cloning module
1 023 850	CMC 400-101	Cloning module for use with CDx 420-490
7 028 943	CMF 400-1001 Profibus Kit	Profibus communication module kit, use with CDM 410/420/490
7 028 942	CMF 400-2101 Dnet Kit	DeviceNet communication module kit, use with CDM 410/420/490
2 029 468	CMP 400 Power Supply	Use with CDM 410 or 420
7 020 634	6 ft Line Cable	Power cord for use with CDM 4x0 connection device

Bracket

Part Number	Model	Description
2 025 491	ICR 850 Bracket	Mounting bracket including screws (2 x self-locking screw M 5x16)

Cables

Part Number	Model	Description
6 010 075	KP-DB15H-2E	15-pin F to 15-pin M, straight through 2 m long cable
7 021 851	KP-DB09-2E	Cable, for DME, DB 9 serial interface/PC connection, 9-pin F to 9-pin M, 2 m
7 021 849	KP-DB09-3E	Cable, for DME, DB 9 serial interface/PC connection, 9-pin F to 9-pin M, 3 m
6 026 083	ICR to Ethernet Cable	ICR to Ethernet network
6 026 084	ICR to PC Cable	ICR to PC

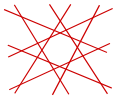
Setup Software

Part Number	Model	Description
7 026 126	CLV Setup Software-CD	Windows™-based CLV programming software

Introduction

Laser-Based Omni Directional Systems

Dimensioning Systems

	Scan Window (Conveyor Width)	Depth of Field	Maximum Conveyor Speed	Host Data Interface
 CLX 490	16”	20”	600 ft/min	RS 232, RS 422/485, Ethernet TCP/IP, Profibus, DeviceNet, CAN, Ethernet IP
 OPS 400	32”	32”	600 ft/min	RS 232, RS 422/485
 OPS 290	32”	32”	600 ft/min	RS 232, 422/485 Ethernet TCP/IP, Profibus DeviceNet, Ethernet IP
 OPS 490	59”	32”	600 ft/min	RS 232, 422/485 Ethernet TCP/IP, Profibus DeviceNet, Ethernet IP
 OPS 360	24”	32”	600 ft/min	RS 232, 422/485 Ethernet TCP/IP, Profibus DeviceNet, Ethernet IP
 OPS 560	44”	32”	600 ft/min	RS 232, 422/485 Ethernet TCP/IP, Profibus DeviceNet, Ethernet IP
 OPS Tire	28…43”	6…16”	390 ft/min	RS 232, 422/485 Ethernet TCP/IP, Profibus DeviceNet, Ethernet IP
 ALIS 400	39”	32”	390 ft/min	RS 232, 422/485 Ethernet TCP/IP, Profibus DeviceNet, Ethernet IP
 VMS 200	118”	118”	Up to 400 ft/min	RS 232, 422 Ethernet TCP/IP
 VMS 5xx, 4xx	40”	63”	410/5x0: 400 ft/min 420: 600 ft/min	RS 232, 422 Ethernet TCP/IP, CAN

	Cloning Capability	Max. Number of Bar Codes per Object	Max. Number of Objects per Reading Field	Focus Type	Page
CLX 490	yes (optional)	50	10	Automatic Focus	100
OPS 400	no	40	20	Automatic Focus	106
OPS 290	yes	40	20	Automatic Focus	112
OPS 490	yes	40	20	Automatic Focus	112
OPS 360	yes	40	20	Automatic Focus	112
OPS 560	yes	40	20	Automatic Focus	112
OPS Tire	yes	40	20	Automatic Focus	118
ALIS 400	yes	40	20	Automatic Focus	126
VMS 220	no	NA	1	NA	134
VMS 4xx, 5xx	yes (optional)	NA	1	NA	134

CLX 490
Omni Directional Scanner

Features

- Ultra compact omni directional bar code reader
- SICK's Modular Advanced Recognition Technology (SMART)
- Patented Automatic Focus Control
- Integrated tracking functionality
- High scan rate (1200 Hz)
- Large depth of field
- Automatic scanner setup (cloning module)
- Optional internal heater available

The CLX 490 is the most compact, industrial omni directional scanner on the market. It incorporates Automatic Focus Control, SMART Technology, a high scan rate and package tracking into one unit.

The CLX 490's SMART (SICK's Modular Advanced Recognition Technology) enables the scanner to read bar codes that can not be read by other scanners. The CLX 490 processes the complete bar code images before decoding. This translates to a much higher percentage of successful reads, even with bar codes presented at high tilt angles or partially damaged bar codes. The CLX 490 also allows small object spacing through its integrated tracking function.

The CLX 490 has real-time, patented Automatic Focus Control; the scanner automatically focuses according to the distance to the object. No additional components are necessary to detect the object distance.

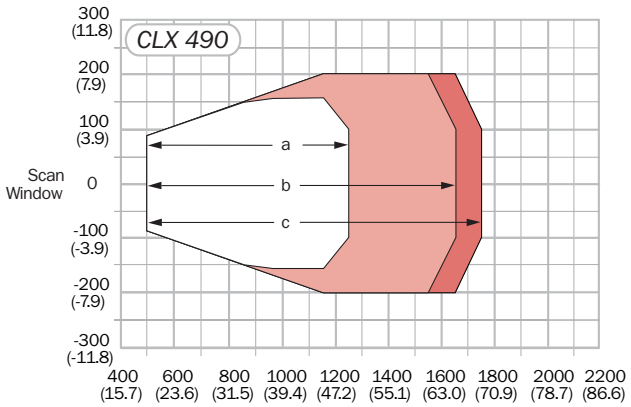
The settings of the CLX 490 are stored in the optional cloning module for quick replacement if necessary. Optional internal heating is also available. The CLX 490 is ideal for conveyor widths up to 16 inches (400 mm) and conveyor speeds up to 590 feet per minute (180 m/min).

Comparison Table

	CLX 490 Standard	CLX 490 Low Temperature
Scan Frequency	600…1200 Hz	600…1200 Hz
Coverage Width	16 in (406 mm)	16 in (406 mm)
Coverage Height	20 in (508 mm)	20 in (508 mm)
Supply Voltage	10…30 V DC	10…30 V DC +20°/-10°
Current Consumption	9 W typical, 16 W max	75 W typical, 90 W max
Ambient Operating Temperature	32…104°F (0…40°C)	-31…95°F (-35…35°C)
Storage Temperature	-4…158°F (-20…70°C)	-4…158°F (-20…70°C)

Reading Ranges

Dimensions in inches (mm)



Code Resolution
- a: 0.30 mm (0.011 in)
- b: 0.35 mm (0.013 in)
- c: 0.50 mm (0.020 in)

Technical Specifications

	CLX 490
Scanning Characteristics	
Scanner Design	X-pattern (2 lines at 45° to conveyor direction)
Scanning Method	8-sided polygon mirror wheel
Aperture Angle	maximum 60°
Scanning Frequency	600…1200 Hz (software selectable)
Coverage for 0.014…0.02 (0.35…0.5 mm)	
Width	15.7 in (400 mm)
Height	31.5 in (800 mm)
Speed	590 ft/min (180 m/min)
Light Source	Visible laser diode (650 nm); CDRH Class II
Reading Distance (bar code dependent)	23.6…68.9 in (500…1750 mm)
Resolution	0.011…0.020 in (0.30…0.50 mm)
Bar Code Types	
Bar Code Symbology	Code 39, Interleaved 2/5, Industrial 2/5, Codabar, Code 93, EAN/EAN 128, UPC, Code 128
Readability	1 to 12 bar codes per reading gate (standard decoder); 1 to 5 (SMART)
Auto Discrimination	8 different symbologies per reading gate
Communications / I/O / Indicators	
Host Interface	RS 232 or RS 422/485 variable data output (software selectable)
Baud Rate	300…57,600 (software selectable)
Data Format	Data bits, stop bits, parity (software selectable)
Network Configuration	Pass-through; master/slave; RS 485 network; CAN Bus network
LED Indicators	Device ready, result, sensor, data
Switching Inputs	6 x PNP, opto-decoupled / maximum 30 V DC
Switching Outputs	4 x PNP, maximum 100 mA / 24 V DC
Trigger Methods	Sensor input (I/O interface) / Serial (host interface) / Free Running
Mechanical/Electrical	
Supply Voltage	Operating voltage 18…30 V DC
Current Consumption	375 mA at 24 V DC / 9.0 W; maximum 16.0 W
Dimensions	6.0 x 3.6 x 8.0 in (152.5 x 93.5 x 208 mm)
Weight	Approx. 4.9 lb (2.2 kg)
Housing / Enclosure Rating	Die cast aluminum / IP 65
Connectivity	2 15 pin D-Sub high density connectors (1 male/1 female)
Environmental	
Ambient Operating Temperature	32…104°F (0…40°C)
Storage Temperature	-4…158°F (-20…70°C)
Vibration	To IEC 68-2-6 test FC
Shock	To IEC 68-2-27 test EA
EMV	To IEC 801
Maximum Relative Humidity	90%, non-condensing
Programming	Windows™-based CLV setup software

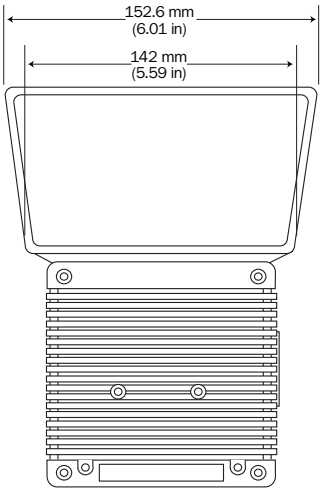
Models and Descriptions

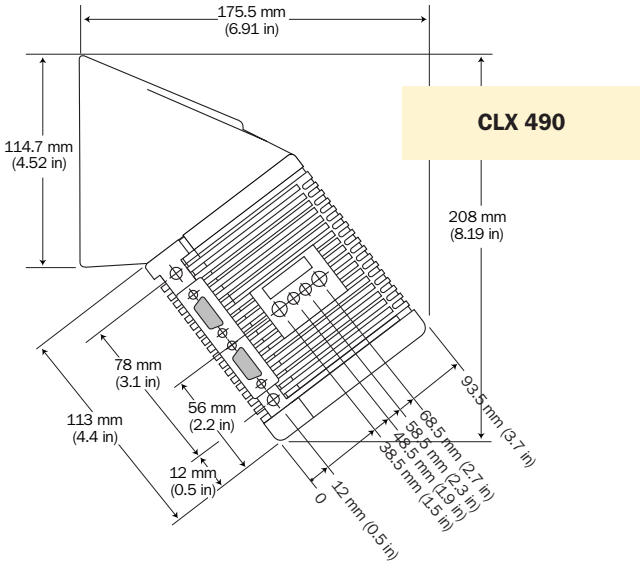
	CLX 490
Omni Directional Scanner	
Model	CLX 490-0010
Description	Integrated Omni Directional Scanner/software selectable
Omni Directional Scanner with Heater	
Model	CLX 490-0011
Description	Integrated Omni Directional Scanner with integrated heater

NOTE: Accessories information is located on pages 140 - 141.

Drawings

Dimensions in inches (mm)





OPS 400
Omni Directional

Features

- Compact, integrated housing
- Plug and play (common CLV Setup platform)
- High scan rate (up to 1200 Hz)
- Real-time Auto Focus Control
- Available in standard, high- and low-density models
- SMART code recognition
- Integrated tracking

The OPS 400 is a simple to operate, compact solution for omni directional bar code reading tasks in retail distribution, parcel logistics, and postal applications. It incorporates the same advanced functionality of the modular SICK OPS Scanning Systems, but is integrated into a single housing.

A high scan frequency (user selectable from 600 to 1200 Hz), SMART Technology, and real-time Automatic Focus Control make this solution ideal for demanding top or side reading applications with coverage requirements up to 31.5 inches (800 mm). It is available in three different configurations for reading standard, low-density, and high-density bar codes. Integrated tracking capability allows the OPS 400 to track individual items on high-speed conveyors with item gaps as small as 2 inches.

Since the OPS 400 is fully integrated, installation and commissioning is greatly simplified. Its simple plug and play operation uses the common CLV Setup Software for parameter optimization. And, 16 switching inputs and 4 programmable outputs allow for a variety of configurations with today's most advanced material handling systems.

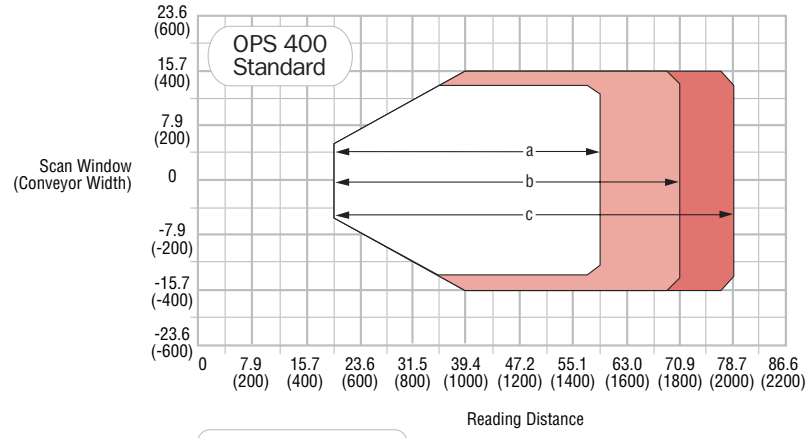
For entry level, stand-alone omni directional scanning with the optical performance of a high-end modular system, the OPS 400 is the ideal solution.

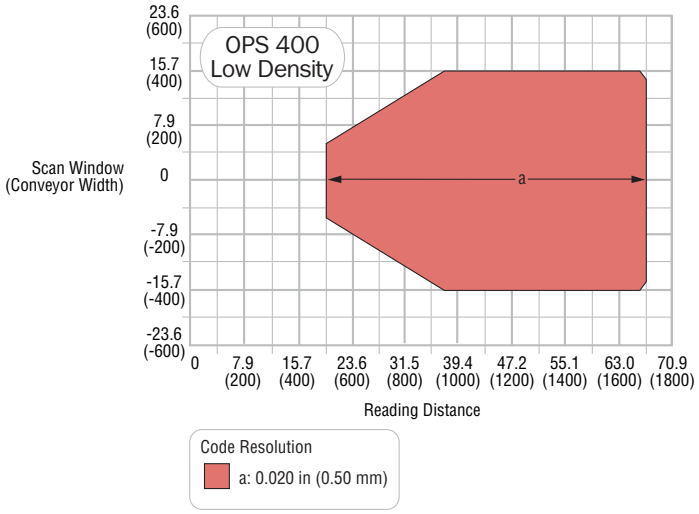
Comparison Table

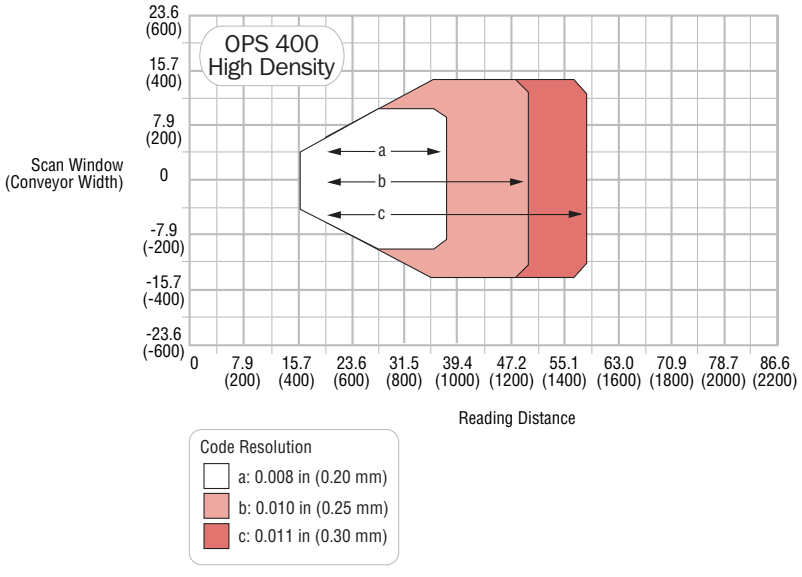
	OPS 400 Standard	OPS 400 High Density	OPS 400 Low Density
Scanner Pattern	X-pattern (2 lines at 45° to conveyor direction)	X-pattern (2 lines at 45° to conveyor direction)	X-pattern (2 lines at 45° to conveyor direction)
Scan Frequency	600…1200 Hz	600…1200 Hz	600…1200 Hz
Coverage Width	31.5 in (800 mm)	27.5 in (700 mm)	31.5 in (800 mm)
Coverage Height	31.5 in (800 mm)	22 in (558 mm)	30 in (761 mm)
Maximum Tilt	45°	45°	45°
Line Speed	Up to 600 fpm	Up to 600 fpm	Up to 600 fpm

Reading Ranges

Dimensions in inches (mm)







Technical Specifications

	OPS 400
Scanning Characteristics	
Scanner Design	X-scanner (2 lines at 90° to one another)
Light Source	Laser diode, red light (650 nm)
Laser Class	Class II (EN-60925-1)
Ambient Light Compatibility	2000 lx (on bar code)
Scanning Frequency	600…1200 Hz
Path Width Covered	Standard and low density: 31.5 in (800 mm); high density: 27.6 in (700 mm)
Operation and Parameterization	With Windows™-based CLV Setup Software or command strings
Communications / I/O / Indicators	
Data Interfaces	Host: RS 232, RS 422/485; Terminal: RS 232
Indicators	26 LED and status indicators
Switching Inputs	16 x IN
Switching Outputs	4 x OUT / 1 x OUT relay
Mechanical/Electrical	
Electrical Connection	2 x 9-pin D-Sub plugs/terminals
Operating Voltage	85…264 V AC (100…240 V AC +10%/-15%)
Power Consumption	Typical 30 W, maximum 70 W
Housing	Sheet steel with aluminum top and base
Enclosure Rating	IP 54/optics IP 65 (DIN 40 050)
Protection Class	Class III (VDE 0106)
Environmental	
Operating Temperature	32…104°F (0…40°C)
Storage Temperature	-4…158°F (-20…70°C)
Weight	23.6 lb (10.7 kg)
EMC Test	IEC 801

* For complete CLV 490 specification, please see page 64.

Models and Descriptions

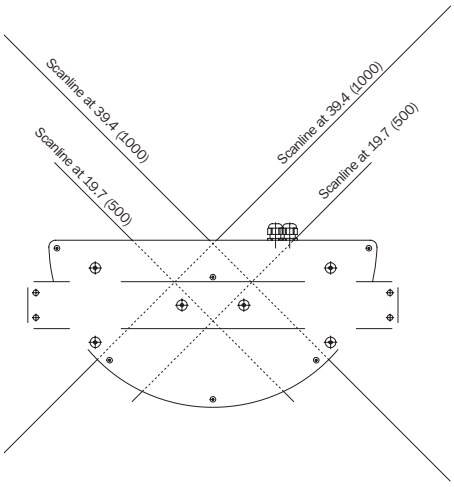
	OPS 400
Model	OPS 400-00
Description	OPS 400 - integrated Omni Scanner (standard optics)
Model	OPS 400-20
Description	OPS 400 - integrated Omni Scanner (high-density optics)
Model	OPS 400-60
Description	OPS 400 - integrated Omni Scanner (low-density optics)

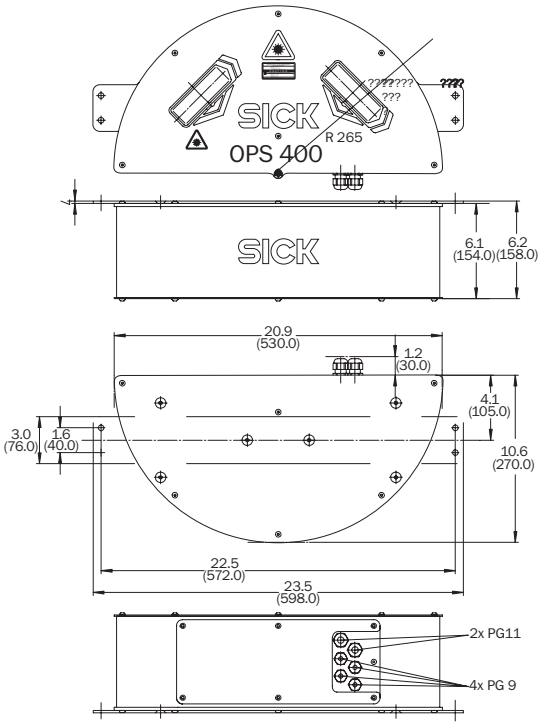
NOTE: Accessories information is located on page 142.

Drawings

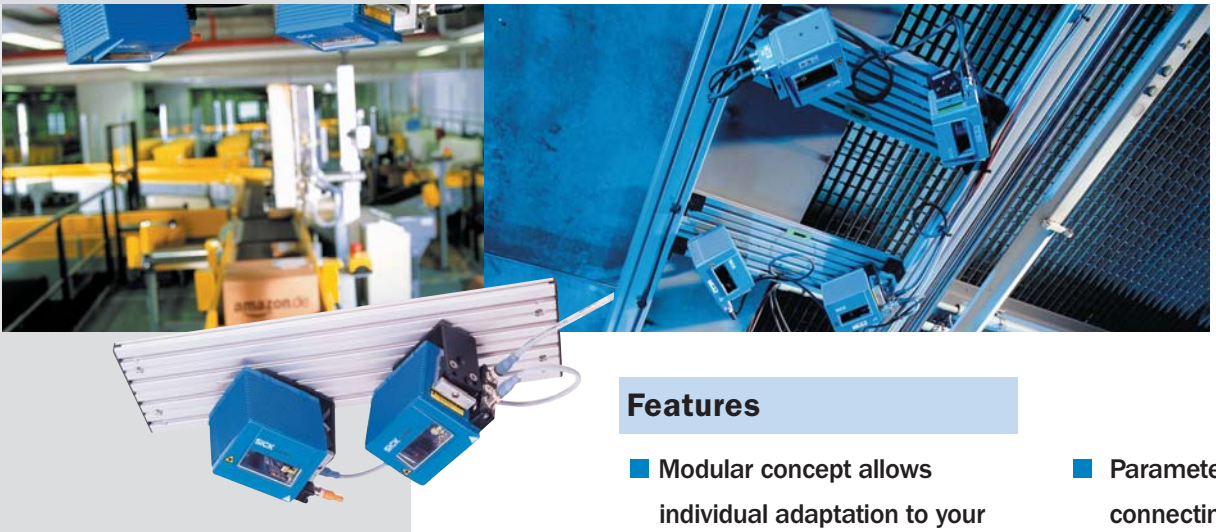
Dimensions in inches (mm)

OPS 400





OPS 290/490/360/560
Omni Directional Scanning Systems



Features

- Modular concept allows individual adaptation to your application
- Use of CLV 490 high-end scanners (see CLV 490 features, pages 58-63)
- Real-time Auto Focus Control function without additional hardware
- Parameters stored in the connecting plug and Quick Release Brackets allow easy scanner replacements
- Extremely large depths of field even with narrow module widths due to the Auto Focus Control function and state-of-the-art optics design

The SICK OPS (Omni Portal System) is a modular bar code reading system that meets the most modern logistical demands. For bar code labels to be read in random orientation, it is important to optimize the design of the scanning system according to the individual requirements of the application. The modular concept of the SICK OPS makes it easy - the use of individual scanners allows the ideal configuration for your individual application.

The SICK OPS utilizes CLV 490 Scanners with patented, real-time Automatic Focus Control to provide optimum read rates at maximum depths of field. The CLV 490 also has SMART code recognition technology to provide reliable identification even if bar codes are damaged, dirty, tilted, or partially hidden. Via its cloning capabilities, parameters for each individual scanner are stored in the connecting plug. This allows for easy device replacement with minimal downtime, resulting in extremely high productivity. All OPS Systems include a tracking module to accurately assign a bar code to a package when package gaps are small.

The OPS is ideal for identifying bar codes on goods and freight in retail distribution, warehousing, and parcel logistics environments. SICK offers a comprehensive system solution: from electronics, photoelectric switches and evaluation software to commissioning and worldwide service.

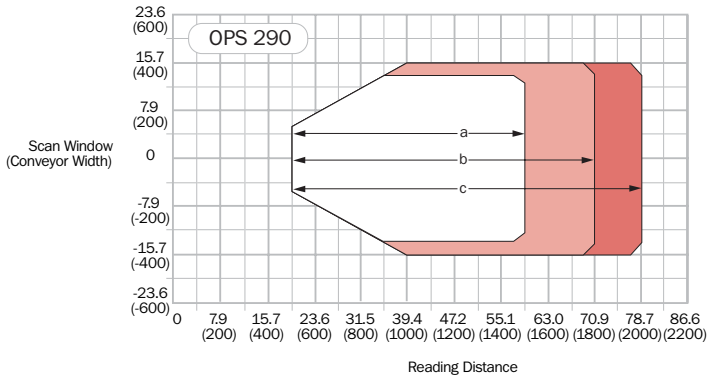
Comparison Table

	OPS 290 Standard	OPS 490 Standard
Number of Scanners and Angle to Conveyor	2 line scanners at 45°	4 line scanners at 45°
Maximum Tilt	45°	45°
Scan Frequency	600…1200 Hz per scan line	600…1200 Hz per scan line
Coverage Width	31.5 in (800 mm)	59.1 in (1500 mm)
Coverage Height	31.5 in (800 mm)	31.5 in (800 mm)
Line Speed	up to 590 ft/min (180 m/min)	up to 590 ft/min (180 m/min)

	OPS 360 Standard	OPS 560 Standard
Number of Scanners and Angle to Conveyor	2 line scanners at 30° 1 line scanner at 90°	4 line scanners at 30° 1 line scanner at 90°
Maximum Tilt	45°	45°
Scan Frequency	600…1200 Hz per scan line	600…1200 Hz per scan line
Coverage Width	23.5 in (597 mm)	42.5 in (1080 mm)
Coverage Height	31.5 in (800 mm)	31.5 in (800 mm)
Line Speed	up to 590 ft/min (180 m/min)	up to 590 ft/min (180 m/min)

Reading Ranges

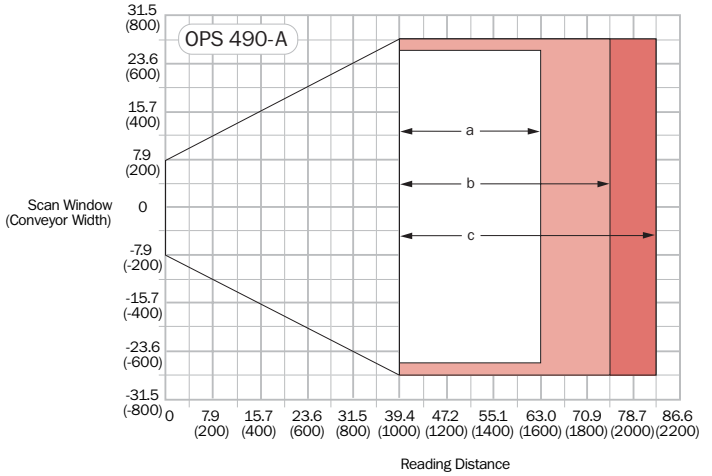
Dimensions in inches (mm)



Code Resolution
- a: 0.011 in (0.30 mm)
- b: 0.013 in (0.35 mm)
- c: 0.020 in (0.50 mm)

Conveyor Width
- a: 27.6 in (700 mm)
- b: 31.5 in (800 mm)
- c: 31.5 in (800 mm)

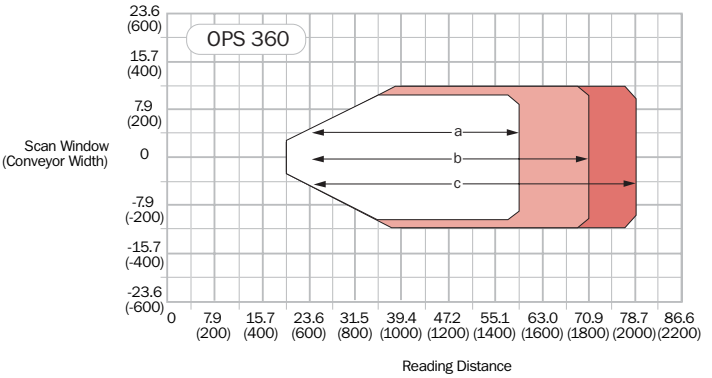
Depth of Field
- a: 21.7 in (550 mm)
- b: 31.5 in (800 mm)
- c: 37.4 in (950 mm)



Code Resolution
- a: 0.011 in (0.30 mm)
- b: 0.013 in (0.35 mm)
- c: 0.020 in (0.50 mm)

Conveyor Width
- a: 51.2 in (1300 mm)
- b: 55.2 in (1400 mm)
- c: 55.2 in (1400 mm)

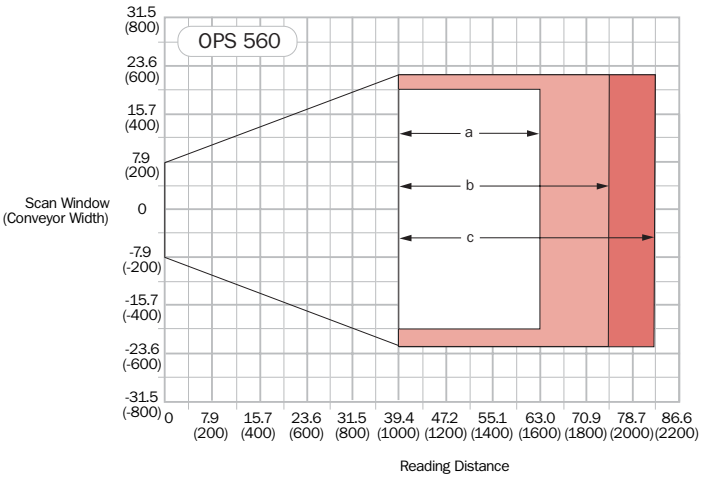
Depth of Field
- a: 23.6 in (600 mm)
- b: 31.5 in (800 mm)
- c: 39.4 in (1000 mm)



Code Resolution
- a: 0.011 in (0.30 mm)
- b: 0.013 in (0.35 mm)
- c: 0.020 in (0.50 mm)

Conveyor Width
- a: 19.7 in (500 mm)
- b: 23.6 in (600 mm)
- c: 23.6 in (600 mm)

Depth of Field
- a: 21.7 in (550 mm)
- b: 31.5 in (800 mm)
- c: 37.4 in (950 mm)



Code Resolution
- a: 0.011 in (0.30 mm)
- b: 0.013 in (0.35 mm)
- c: 0.020 in (0.50 mm)

Conveyor Width
- a: 35.5 in (900 mm)
- b: 39.4 in (1000 mm)
- c: 39.4 in (1000 mm)

Depth of Field
- a: 23.6 in (600 mm)
- b: 31.5 in (800 mm)
- c: 39.4 in (1000 mm)

Technical Specifications

	OTS Controller	OTC
Number of Bar Codes per Object	Maximum 20 (with maximum 4 scanners)	
Number of Bar Codes per Reading Field	Maximum 15 (auto-discriminating)	
Bar Code Types	Code 39, Code 128, Code 93, Codabar, EAN, EAN 128, UPS, Interleaved 2/5	
Bar Code Length	Maximum 50 characters (maximum 600 characters for all bar code per reading gate)	
Print Ratio	2:1 to 3:1	
Optical Indicators	26 x LED status and function indicators	
Reading Timing	Switching inputs “Triggers 1, 2 and 3” / Software trigger	
“Host” Data Interface	RS 232 or RS 422	
Electrical Connections	1 x AUX connection (9-pin D-Sub HD plug for diagnosis, serial) 1 x CAN connection (9-pin D-Sub HD socket)	
Operating Voltage/Power Consumption	115 V AC (230 V AC) +10%/-15%	24 V +20%/-10%
Housing	Sheet steel, lacquered, reading window from PC	Continuous cast aluminum sections
Protection Category	IP 65 (DIN 40 050)	
Protection Class	Class II (VDE 0106 / IEC 1010-1)	
EMC	IEC 801	
Vibration	IEC 68-2-6 Test FC	
Shock	IEC 68-2-27 Test EA	
Weight	Approx. 22.7 lb (10.3 kg)	Approx 2.9 lb (1.3 kg)
Operating Temperature	32…122°F (0…50°C)	
Storage Temperature	-13…158°F (-25…70°C)	
Maximum Relative Humidity	90%, non-condensing	

	OPS 290
Number of Scanners and Angle to Conveyor	2 line scanners at 45°
Maximum Tilt	45°
Scan Rate	600…1200 Hz per scan line
Coverage for 0.014…0.02 in (0.35…0.5 mm)	
Width	31.5 in (800 mm)
Height	31.5 in (800 mm)
Speed	Up to 590 ft/min (180 m/min)
Code Height for Speed 1 m/s	>0.6 in (>15 mm) (C128)
	>0.8 in (>20 mm) (ITF2/5)
Code Height for Speed 2 m/s	>0.8 in (>20 mm) (C128)
	>1.0 in (>25 mm) (ITF2/5)

	OPS 490
Number of Scanners and Angle to Conveyor	4 line scanners at 45°
Maximum Tilt	45°
Scan Rate	600…1200 Hz per scan line
Coverage for 0.014…0.02 in (0.35…0.5 mm)	
Width	59.1 in (1500 mm)
Height	31.5 in (800 mm)
Speed	Up to 590 ft/min (180 m/min)
Code Height for Speed 1 m/s	>0.6 in (>15 mm) (C128)
	>0.8 in (>20 mm) (ITF2/5)
Code Height for Speed 2 m/s	>0.8 in (>20 mm) (C128)
	>1.0 in (>25 mm) (ITF2/5)

* For complete CLV 490 specification, please see page 64.

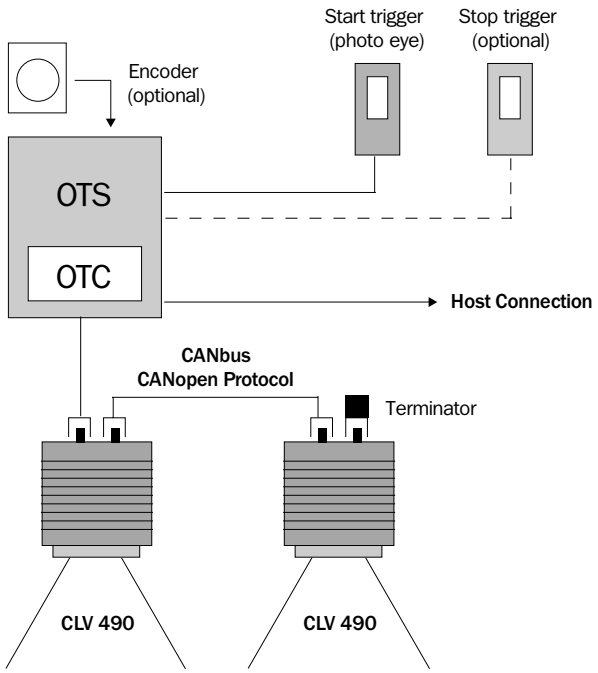
Technical Specifications

OPS 360	
Number of Scanners and Angle to Conveyor	2 line scanners at 30°, 1 line scanner at 90°
Maximum Tilt	45°
Scan Rate	600…1200 Hz per scan line
Coverage for 0.014…0.02 in (0.35…0.5 mm)	
Width	23.6 in (600 mm)
Height	31.5 in (800 mm)
Speed	Up to 590 ft/min (180 m/min)
Code Height for Speed 1 m/s	>0.5 in (>12 mm) (C128)
	>0.7 in (>17 mm) (ITF2/5)
Code Height for Speed 2 m/s	>0.7 in (>17 mm) (C128)
	>0.9 in (>23 mm) (ITF2/5)

OPS 560	
Number of Scanners and Angle to Conveyor	4 line scanners at 30°, 1 line scanner at 90°
Maximum Tilt	45°
Scan Rate	600…1200 Hz per scan line
Coverage for 0.014…0.02 in (0.35…0.5 mm)	
Width	43.3 in (1100 mm)
Height	31.5 in (800 mm)
Speed	Up to 590 ft/min (180 m/min)
Code Height for Speed 1 m/s	>0.5 in (>12 mm) (C128)
	>0.7 in (>17 mm) (ITF2/5)
Code Height for Speed 2 m/s	>0.7 in (>17 mm) (C128)
	>0.9 in (>23 mm) (ITF2/5)

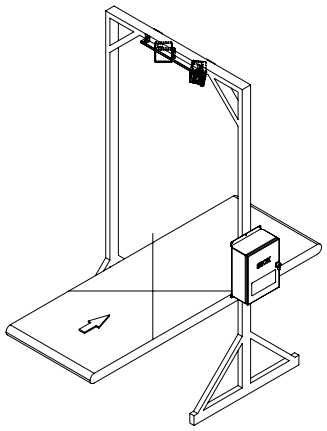
* For complete CLV 490 specification, please see page 64.

OPS-XXX System Hardware

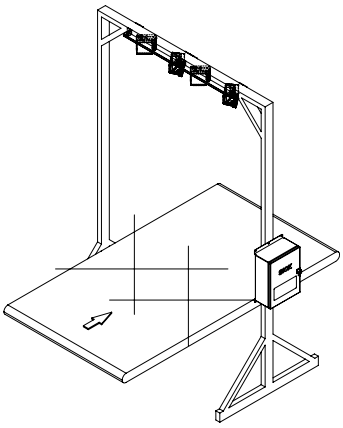


Drawings

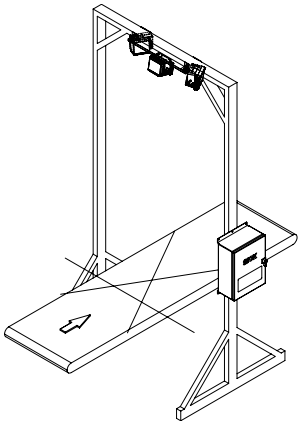
Dimensions in inches (mm)



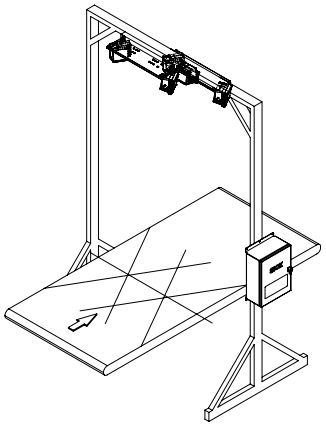
OPS 290
Omni Directional Scanner

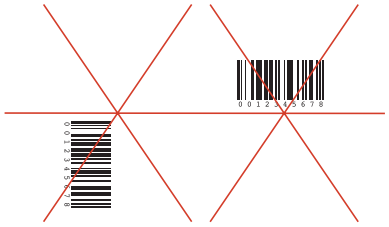


OPS 490
Omni Directional Scanner



OPS 360
Omni Directional Scanner





OPS 560
Omni Directional Scanner

OPS Tire
OPS Tire Scanning System

Features

- Designed specifically for tire manufacturing applications
- CLV 490 Bar Code Reader for best in class read-rate performance and reliability
- OTS tracking system
- SMART decoding software for damaged and poorly printed codes
- Parameter cloning module and Quick Release Brackets
- Simple to use CLV Setup Software for commissioning
- Available redundancy configurations
- RDT 400 (Remote Diagnostics Tool) optional

The OPS Tire Scanning System is designed for reading bar coded automobile and truck tires. It meets the most demanding tracking and sorting requirements of tire manufacturers.

The solution is based on SICK's OPS Omni Directional Scanner design concept. These specially designed systems produce a unique scan pattern, optimized to read low aspect bar codes that are placed on the inner bead of a tire.

The foundation of the OPS Tire System is the CLV 490 high-performance bar code reader. It provides a wide reading range, high scan frequency, and SMART decoding software for the best possible read performance. Parameter cloning, CAN networking and flexible mounting hardware simplify installation and maintenance.

An OTS 400 controller provides power, system communications and tracking capabilities. It is also the basis for RDT Software, which allows remote monitoring of system performance.

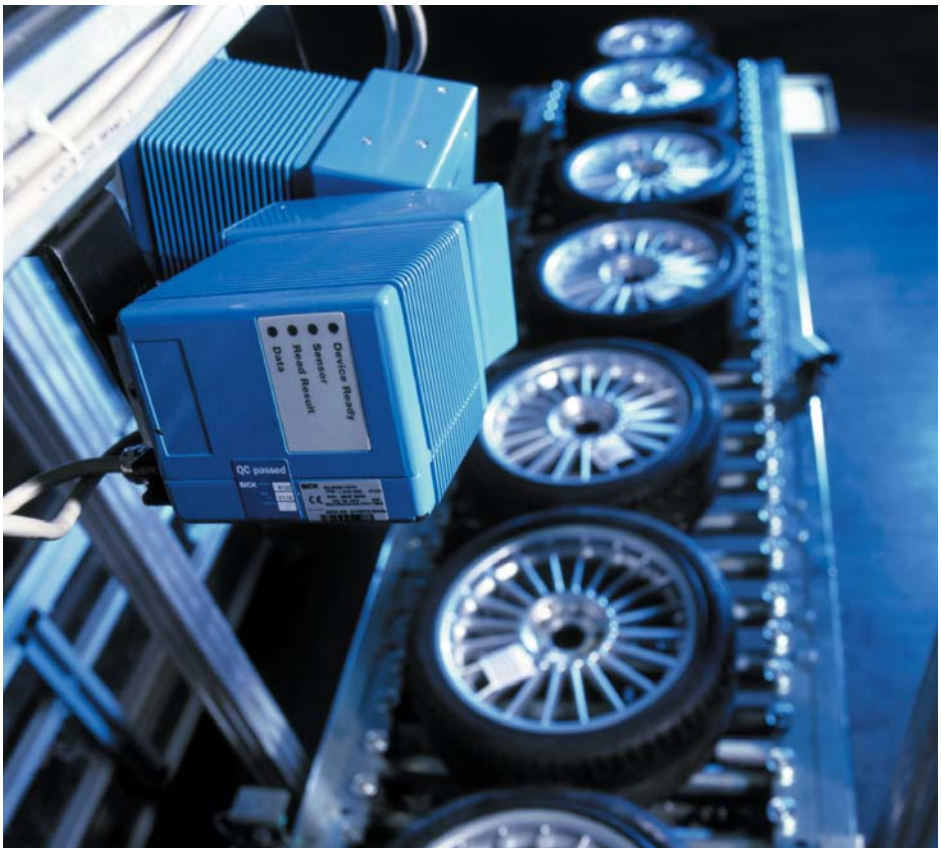
The OPS Tire System is available in a 100% redundant configuration. If a disturbance to the system causes the failure of a controller, power supply, encoder, or trigger photoelectric sensor, the system will continue to operate. A scanner can even fail with minimal reduction in read rate so production can continue uninterrupted.

Comparison Table

	OPS 622-1xxx	OPS 822-1xxx	OPS1022-1xxx
Omni Directional Scan Pattern	6 lines at 67.5° and 22.5° to conveyor travel	8 lines at 67.5° and 22.5° to conveyor travel	10 lines at 67.5° and 22.5° to conveyor travel
Maximum Conveyor Width	28 in (711 mm)	28 in (711 mm)	43 in (1092 mm)
Tire Class (recommended)	passenger	passenger/light truck	truck
Tire Justification (recommended)[1)]	center justified	center justified/ unjustified	center justified/ unjustified
Maximum Depth of Field	6 in (152 mm)	12 in (305 mm)	16 in (406 mm)
Scan Frequency	up to 1200 Hz	up to 1200 Hz	up to 1200 Hz
Minimum Code X Dimension[2)]			
Standard Density	12 mil	12 mil	12 mil
High Density	8 mil	8 mil	8 mil
Minimum Code Height[2)]	0.3 in (8mm)	0.3 in (8mm)	0.3 in (8mm)
Conveyor Speed[2)]	up to 200 fpm	up to 200 fpm	up to 200 fpm
RDT 400	optional	optional	optional
Redundancy	optional	optional	optional
Number of Scanners	6	8	10

1) Tire justification recommendation determined by calculating difference between minimum and maximum inside tire diameter relative to maximum conveyor coverage.

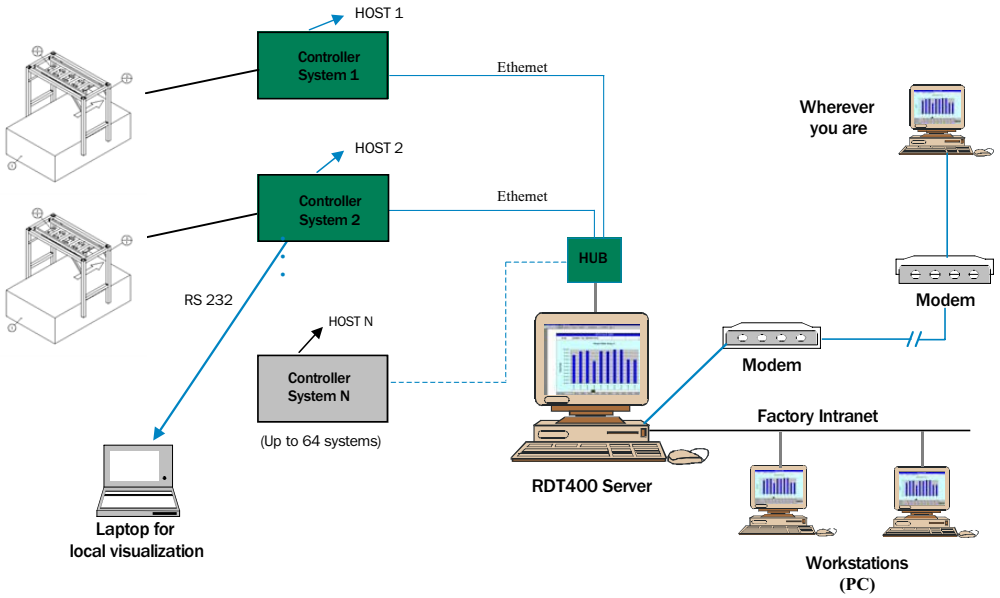
2) Application dependent. Actual specification may vary depending on conveyor speed and other application parameters.



Reading Ranges

	Depth of Field	Conveyor Width
OPS 622-1xxx		
10 mil	6 in (152.3 mm)	28 in (710.7 mm)
12 mil	8 in (203.1 mm)	30 in (761.4 mm)
OPS 822-1xxx		
10 mil	6 in (152.3 mm)	28 in (710.7 mm)
12 mil	12 in (304.6 mm)	33 in (837.6 mm)
OPS 1022-1xxx		
10 mil	10 in (253.8 mm)	36 in (913.7 mm)
12 mil	16 in (406.1 mm)	43 in (1091.4 mm)

System Architecture Using RDT Remote Diagnostic Tool



Technical Specifications

	OTS Controller	OTC
Number of Bar Codes per Object	Maximum 20 (with maximum 4 scanners)	
Number of Bar Codes per Reading Field	Maximum 15 (auto discriminating)	
Bar Code Types	Code 39, Code 128, Code 93, Codabar, EAN, EAN 128, UPS, Interleaved 2/5	
Bar Code Length	Maximum 50 characters (maximum 600 characters for all bar code per reading gate)	
Print Ratio	2:1 to 3:1	
Optical Indicators	26 x LED status and function indicators	
Reading Timing	Switching inputs “Triggers 1, 2 and 3” / Software trigger	
“Host” Data Interface	RS 232 or RS 422	
Electrical Connections	1 x AUX connection (9-pin D-Sub HD plug for diagnosis, serial) 1 x CAN connection (9-pin D-Sub HD socket)	
Operating Voltage/Power Consumption	115 V AC (230 V AC) +10%/-15%	24 V +20%/-10%
Housing	Sheet steel, lacquered, reading window from PC	Continuous cast aluminum sections
Protection Category	IP 65 (DIN 40 050)	
Protection Class	Class II (VDE 0106 / IEC 1010-1)	
EMC	IEC 801	
Vibration	IEC 68-2-6 Test FC	
Shock	IEC 68-2-27 Test EA	
Weight	Approx. 22.7 lb (10.3 kg)	Approx 2.9 lb (1.3 kg)
Operating Temperature	32…122°F (0…50°C)	
Storage Temperature	-13…158°F (-25…70°C)	
Maximum Relative Humidity	90%, non-condensing	

	OPS 622-1xxx
Number of Scanners and Angle to Conveyor	6 lines at 67.5° and 22.5° to conveyor travel
Maximum Tilt	45°
Scan Rate	600…1200 Hz
Coverage for 0.08…0.012 in (0.20…0.30 mm)	
Width	28 in (711 mm)
Height	6 in (152 mm)
Speed	up to 200 fpm (61 m per minute)
Code Height for Speed 1 m/s	0.3 in (8 mm)

	OPS 822-1xxx
Number of Scanners and Angle to Conveyor	8 lines at 67.5° and 22.5° to conveyor travel
Maximum Tilt	45°
Scan Rate	600…1200 Hz
Coverage for 0.08…0.012 in (0.20…0.30 mm)	
Width	28 in (711 mm)
Height	12 in (305 mm)
Speed	up to 200 fpm (61 m per minute)
Code Height for Speed 1 m/s	0.3 in (8 mm)

Technical Specifications

	OPS 1022-1xxx
Number of Scanners and Angle to Conveyor	10 lines at 67.5° and 22.5° to conveyor travel
Maximum Tilt	45°
Scan Rate	600…1200 Hz
Coverage for 0.08…0.012 in (0.20…0.30 mm)	
Width	43 in (1092 mm)
Height	16 in (406 mm)
Speed	up to 200 fpm (61 m per minute)
Code Height for Speed 1 m/s	0.3 in (8 mm)

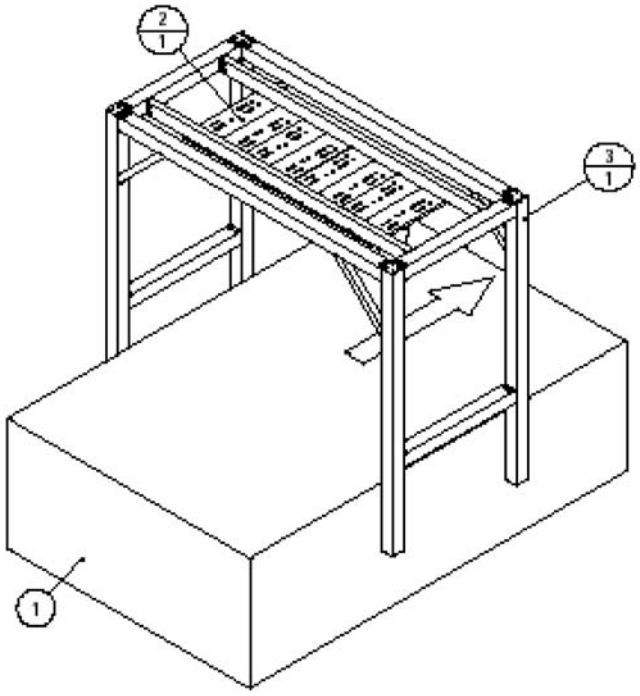
* For complete CLV 490 specification, please see page 64.

Models and Descriptions

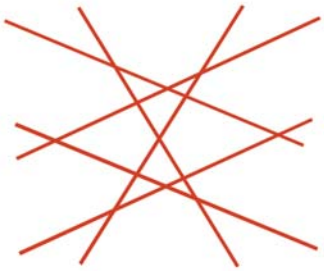
	Standard Density	High Density
Model	OPS 622-1000	OPS 622-1200
Description	OPS Tire scanning system with 6 scanners	OPS Tire scanning system with 6 scanners
Model	OPS 822-1000	OPS 822-1200
Description	OPS Tire scanning system with 8 scanners	OPS Tire scanning system with 8 scanners
Model	OPS 1022-1000	OPS 1022-1200
Description	OPS Tire scanning system with 10 scanners	OPS Tire scanning system with 10 scanners

NOTE: Accessories information is located on page 141.

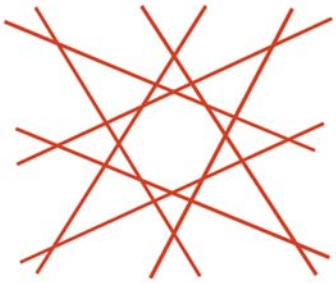
Drawings



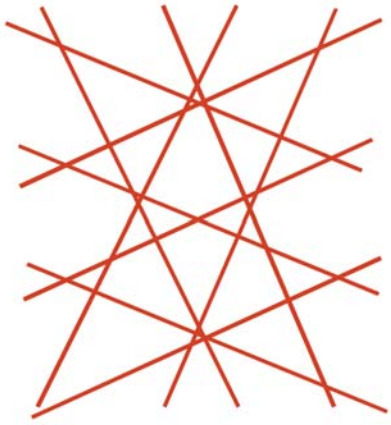
OPS 622-1xxx
Scan Pattern



OPS 822-1xxx
Scan Pattern



OPS 1022-1xxx
Scan Pattern



Advanced OPS and Tunnel Scanning Systems

Features

- Modular design configuration to optimize coverage requirements
- Optional VMS Dimensioning System
- Real-time and Automatic Focus Control for faster throughput
- Powerful integrated tracking capabilities
- Flexible communication for today's modern host network and controls systems
- High scan frequency for speeds up to 590 ft/min (180 m/min)
- Remote diagnostics tools to monitor system performance

Not every tunnel application is created equally, so SICK's modular Tunnel Scanning System allows individual adaptation of its standard OPS configurations to any application. Tunnel scanning solutions are configured using our most advanced scanning and control products. Whether your application requires ultra wide coverage on a single plane or multi-sided reading for every package side, SICK has a solution that will meet your needs reliably and accurately.

SICK uses the latest available technologies to produce the most accurate and dependable products. State-of-the-art optics and Automatic Focus Control provide extended coverage and depth of field, while high scan rates (up to 1200 Hz) and advanced code recognition software combine to ensure reliable reading and tracking even at speeds exceeding 550 ft/min. Common CLV Setup Software, Quick Release Brackets, CAN network connectivity, and SICK's own external parameter cloning modules, which store scanner configuration data for quick replacement, allow for streamlined installation as well as extremely low cost of ownership.

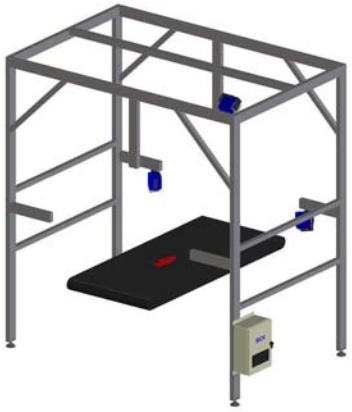
Contact SICK for more information about customized solutions for your most demanding omni directional scanning applications. SICK will work with you from design through implementation to ensure that our solution meets your specific needs.

Drawings

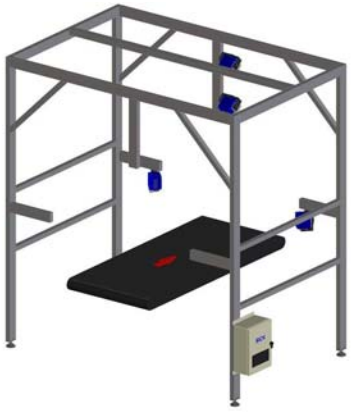
OPS 290-1xxx
Top Read Omni Directional System

OPS290-4xxx
Top Read Picket Fence / Ladder System

OPS390-1000
Front Read Omni Directional System

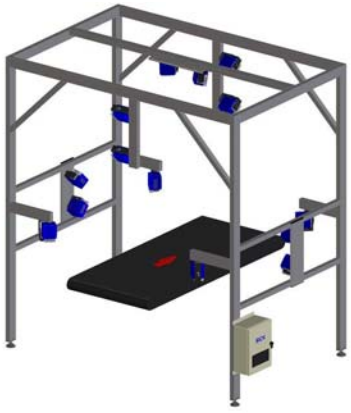


OPS490-1000
Front Read Omni Directional System



OPS690-3000
Three Sided Omni Directional System

OPS1490-5000
Five Sided Omni Directional System



ALIS
Airport Luggage Identification System

Features

- CLV 490 bar code reader for best in class read rate performance and reliability
- Reads all IATA codes (T-codes and linear codes)
- Auto Focus optics for large depth of field
- SMART decoding software for damaged and poorly printed codes
- Parameter cloning
- RDT (Remote Diagnostics Technology)
- Consultant certified for 100% redundancy

ALIS (Airport Luggage Identification System) is a flexible bar code reading system that is specially designed to identify IATA bar codes on airport luggage. This solution is based on SICK's OPS Omni Directional Scanner design concept and is equipped to meet all the requirements of today's modern baggage handling systems.

The foundation of the ALIS System is the CLV 490 high-performance bar code reader. It provides a wide reading range (up to 82 in), high scan frequency (user selectable up to 1200 Hz), Auto Focus, and SMART decoding software for the best possible read rate performance. Parameter cloning, CAN networking and flexible mounting hardware simplify installation and maintenance.

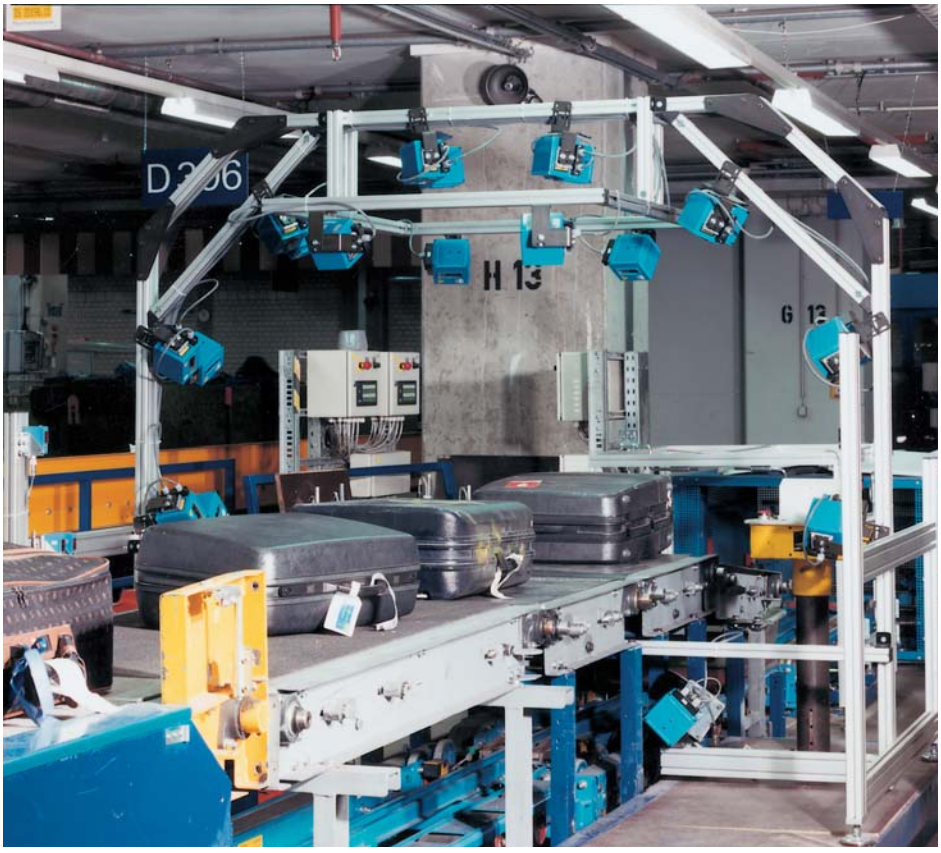
An OTS 400 Controller provides system communications and tracking capabilities and powers up to 14 CLV Scanners in a system. It is also the basis for RDT (Remote Diagnostics Tool) Software which allows comprehensive monitoring of system performance either locally or from remote locations via company Intranet or via the web.

The ALIS System is 100% redundant, and is therefore certified by the airport consultant community for use in airports around the world. If a disturbance to the system is experienced due to the failure of a scanner, controller, power supply, incremental encoder, interconnecting cables, or trigger photoelectric sensor, the system will continue to operate. Only a minimal reduction in read rates results even if a scanner fails, so operations can continue uninterrupted.

Comparison Table

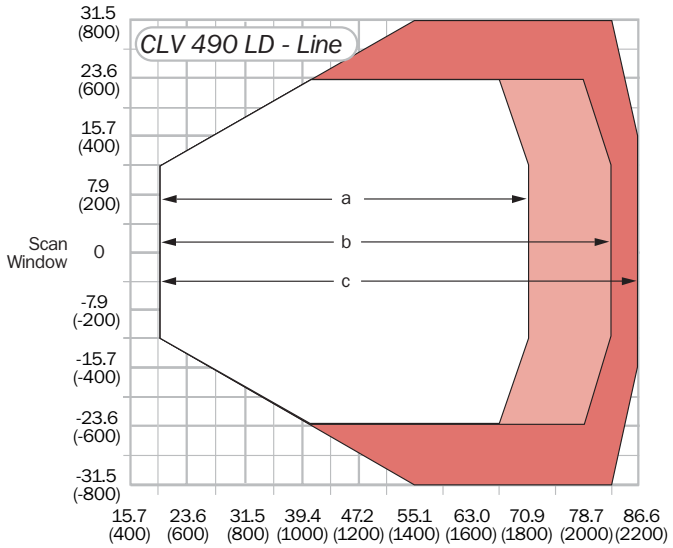
	ALIS 400/xx Tray Sorter	ALIS 400/xx Belt Conveyor
Scanner Design	Omni directional tunnel array 5-sided scan pattern (bottom scan at induction)	Omni directional tunnel array 6-sided scan pattern
Conveyor Type	Tray sorter	Belt conveyor
Code Type	IATA/DNR Mail	IATA/DNR Mail
Maximum Conveyor Width	39.4 in (1000 mm)	39.4 in (1000 mm)
Maximum Scanning Height	32 in (813 mm)	32 in (813 mm)
Optimal Number of Scanners per System (xx)[1)]		
T-Code	10	12
Linear Code	12	14
Scan Frequency	Up to 1200 Hz	Up to 1200 Hz

1) Actual scanner quantity may vary. Final scanner quantity is determined upon complete evaluation of customer application requirements. Consult a SICK Sales Engineer for more information.



Reading Ranges

Dimensions in inches (mm)



Tilt
- a: -45…+45
- b: -30…+30
- c: -15…+15

Code resolution:
0.020 in (0.5 mm)

Technical Specifications

	OTS Controller	OTC
Number of Bar Codes per Object	Maximum 20 (with maximum 4 scanners)	
Number of Bar Codes per Reading Field	Maximum 15 (auto discriminating)	
Bar Code Types	Code 39, Code 128, Code 93, Codabar, EAN, EAN 128, UPS, Interleaved 2/5	
Bar Code Length	Maximum 50 characters (maximum 600 characters for all bar code per reading gate)	
Print Ratio	2:1 to 3:1	
Optical Indicators	26 x LED status and function indicators	
Reading Timing	Switching inputs “Triggers 1, 2 and 3” / Software trigger	
“Host” Data Interface	RS 232 or RS 422	
Electrical Connections	1 x AUX connection (9-pin D-Sub HD plug for diagnosis, serial) 1 x CAN connection (9-pin D-Sub HD socket)	
Operating Voltage/Power Consumption	115 V AC (230 V AC) +10%/-15%	24 V +20%/-10%
Housing	Sheet steel, lacquered, reading window from PC	Continuous cast aluminum sections
Protection Category	IP 65 (DIN 40 050)	
Protection Class	Class II (VDE 0106 / IEC 1010-1)	
EMC	IEC 801	
Vibration	IEC 68-2-6 Test FC	
Shock	IEC 68-2-27 Test EA	
Weight	Approx. 22.7 lb (10.3 kg)	Approx 2.9 lb (1.3 kg)
Operating Temperature	32…122°F (0…50°C)	
Storage Temperature	-13…158°F (-25…70°C)	
Maximum Relative Humidity	90%, non-condensing	

Technical Specifications

ALIS-400/xx Belt Conveyor T-Code	
Number of Scanners and Angle to Conveyor	12 scan lines (including 2 scan lines projected from beneath the conveyor) optimized to cover 6 sides of an object
Maximum Tilt	45°
Scan Rate	600…1200 Hz per scan line
Coverage for 0.014…0.02 in (0.35…0.5 mm)	
Width	39.4 in (1000 mm)
Height	32 in (813 mm)
Speed	Up to 400 ft/min (2 m/s)

ALIS-400/xx Belt Conveyor Linear Code	
Number of Scanners and Angle to Conveyor	14 scan lines (including 2 scan lines projected from beneath the conveyor) optimized to cover 6 sides of an object
Maximum Tilt	45°
Scan Rate	600…1200 Hz per scan line
Coverage for 0.014…0.02 in (0.35…0.5 mm)	
Width	39.4 in (1000 mm)
Height	32 in (813 mm)
Speed	Up to 400 ft/min (2 m/s)

ALIS-400/xx Tray Sorter T-Code	
Number of Scanners and Angle to Conveyor	10 scan lines optimized to cover top, front, back and sides of an object Bottom scan capability also available and provided by UCB2 Induction Line Scanner
Maximum Tilt	45°
Scan Rate	600…1200 Hz per scan line
Coverage for 0.014…0.02 in (0.35…0.5 mm)	
Width	39.4 in (1000 mm)
Height	32 in (813 mm)
Speed	Up to 400 ft/min (m/s)

ALIS-400/xx Tray Sorter Linear Code	
Number of Scanners and Angle to Conveyor	12 scan lines optimized to cover top, front, back and sides of an object Bottom scan capability also available and provided by UCB2 Induction Line Scanner
Maximum Tilt	45°
Scan Rate	600…1200 Hz per scan line
Coverage for 0.014…0.02 in (0.35…0.5 mm)	
Width	39.4 in (1000 mm)
Height	32 in (813 mm)
Speed	Up to 400 ft/min (2 m/s)

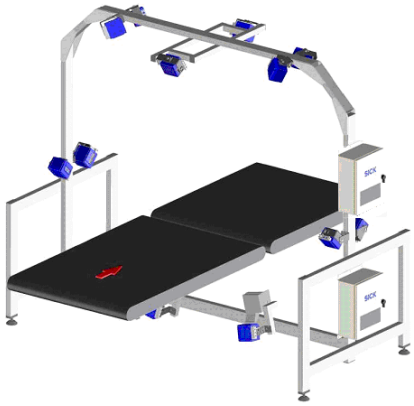
* For complete CLV 490 specification, please see page 64.

Models and Descriptions

	ALIS-400
Belt T-Code	
Model	ALIS-400/xx-Belt T-code
Description	ALIS Omni Directional Airport Luggage Identification System 12 scanners (optimal), 6-sided for IATA T-codes
Belt Linear Code	
Model	ALIS-400/xx-Belt Linear code
Description	ALIS Omni Directional Airport Luggage Identification System 14 scanners (optimal), 6-sided for IATA Linear codes
Tray T-Code	
Model	ALIS-400/xx-Tray T-code
Description	ALIS Omni Directional Airport Luggage Identification System 10 scanners (optimal), 5-sided for IATA T-codes (bottom scan at induction)
Tray Linear Code	
Model	ALIS-400/xx-Tray-Linear code
Description	ALIS Omni Directional Airport Luggage Identification System 12 scanners (optimal), 5-sided for IATA Linear codes (bottom scan at induction)

Drawings

ALIS-400/12 Belt Conveyor
6-sided tunnel scanning system
(redundant version shown)

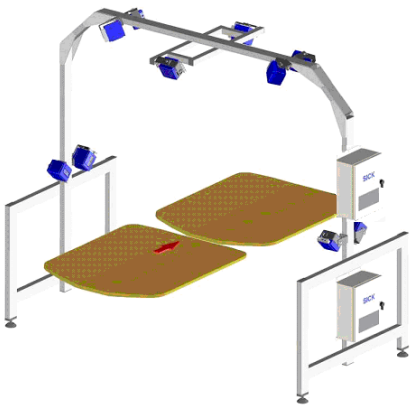


ALIS-400/12 Belt Conveyor
6-sided tunnel scanning system
(non-redundant version shown)

ALIS-400/14 Belt Conveyor
6-sided tunnel scanning system
(redundant version shown)

ALIS-400/14 Belt Conveyor
6-sided tunnel scanning system
(non-redundant version shown)

ALIS-400/10 Tilt Tray
5-sided tunnel scanning system
(redundant version shown)



UCB2 - Induction Line Scanner
(provides bottom scanning at indications on tilt tray sorter systems)

RDT 400
Remote Diagnostics Tool for OPS & ALIS

Features

- RDT 400 supports all OPS and ALIS systems
- Connect up to 64 scanner systems to a central RDT server via Ethernet
- Supports ALIS and OPS Systems consisting of up to 24 individual scanners
- Remote monitoring and log file download via Internet or company Intranet
- Easy-to-understand user interface
- Detailed system and individual scanner performance

RDT 400 (Remote Diagnostic Tool) is a comprehensive software application designed for use with OPS and ALIS Bar Code Reading Systems. It allows users to monitor their systems by providing graphic visualization of scanner performance. Users can stay on top of system performance and spot trouble before it begins.

The RDT 400 Software can be used two ways. Use it locally to monitor system performance directly at the system's site, or monitor multiple systems worldwide through your company network. Ethernet connectivity provides flexible communication for simplified use and operational efficiency.

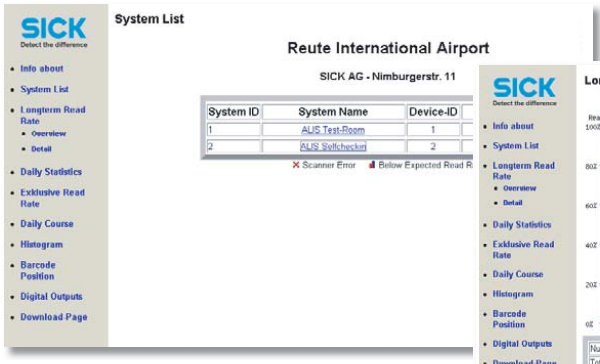
RDT uses a Windows™-based interface to provide easy-to-read information about your system's performance. Performance characteristics are provided for individual scanners as well as complete systems. Data can be gathered and logged over hourly, daily or annual intervals. You can also program alarm thresholds to monitor read rates and alert you when system performance falls below an acceptable level.

Some of the detailed information that RDT 400 provides includes: system list, long term read rate, daily read rate and daily course.

For enterprises seeking the highest level of data collection control, RDT 400 provides the performance statistics necessary to maximize operational efficiency.

RDT User Interface

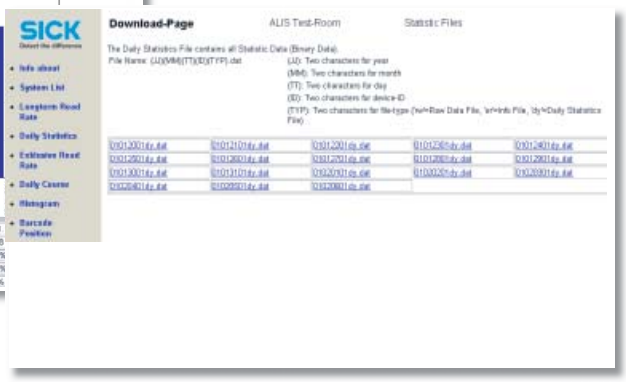
Main Menu



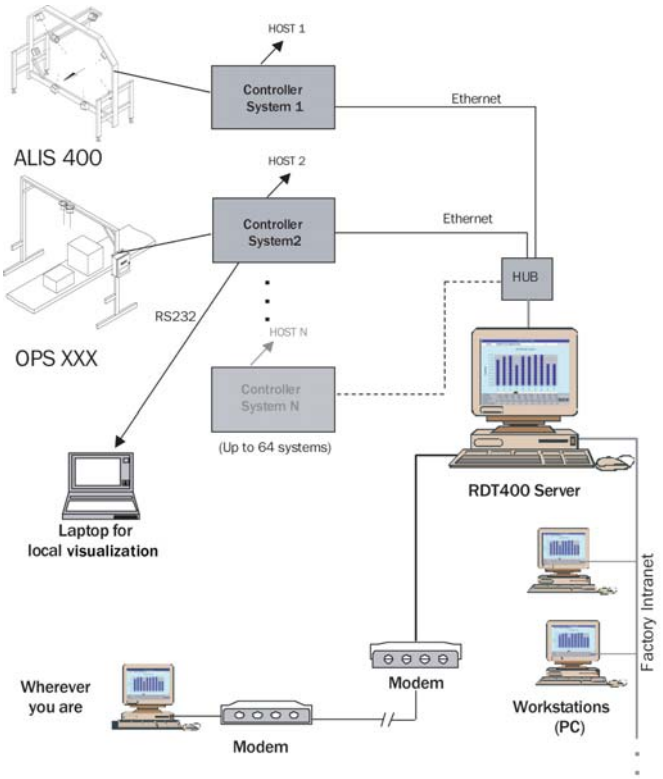
Long-term Read Rate Display

Detailed Read Rate Display

Download Page



RDT System Topology



VMS 200/4x0/5x0
Volume Measurement Systems

Features

- Non-contact measurement process measuring length, width, and height of objects
- Calculation of real volume and smallest box to enclose an object (box-volume)
- Measurement of all object shapes
- Legal-for-trade certified
- Real-time processing with optional integration of bar code data
- Low-maintenance system system – short MTTR through plug and play unit exchange

Manually determining the volume of parcels and pallets, airplane luggage, and air freight containers is relatively imprecise, difficult and sometimes not even possible. Rapid conveyor speeds, complex geometries and large dimensions require rapid automatic data processing. SICK offers several solutions with these requirements in mind so you can match the right solution to your specific application.

The VMS 420/520 Systems are standard solutions for determining parcel and freight volumes on conveyors. The VMS 420/520 are dual head systems certified "legal-for-trade" according to the standard OIML (International Organization for Legal Metrology). The VMS 410/510 are single headed systems designed for measuring the volumes of cuboidal objects or packages on flat conveyor belts. Another solution, the VMS 200, is a dual head system designed for determining volumes of extra large objects and is suitable for outdoor applications such as air freight, luggage, or pallets.

Whatever the shape or size, accurate volume measurement is the basis for calculating precise shipping charges and maximizing loads. Our VMS Systems meet the challenges of a global market, in which enterprises simply cannot afford inaccurate volume determination. With our VMS, you will be able to optimize parcel handling, improve measurement reliability and ultimately, reduce costs.

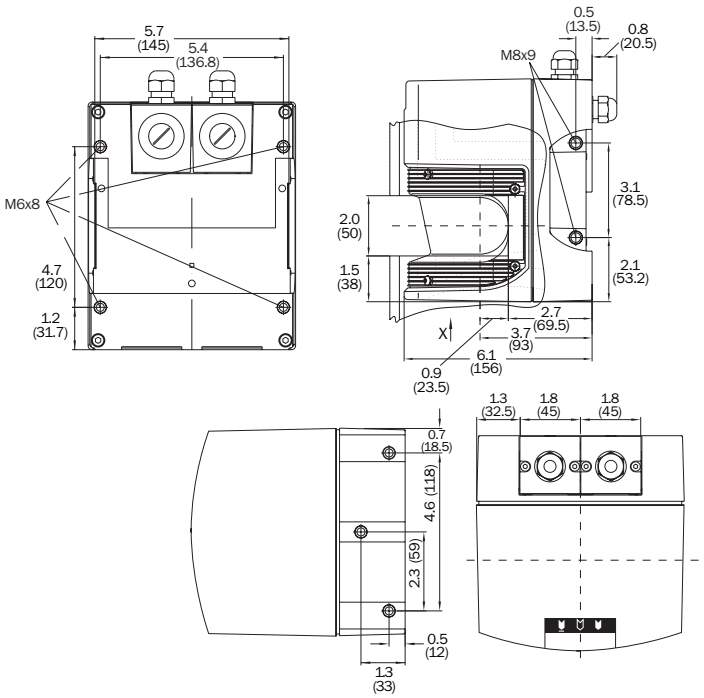
Comparison Table

	VMS 200	VMS 410/510	VMS 420/510
Design	2 - scanners	1 - scanner	2 - scanners
Aperture Angle	180°	70°	70°
Detectable Object Shape	Almost any shape	Cuboidal shape	Almost any shape
Minimum Detectable Object Size	100 x 100 x 100 mm^3	50 x 50 x 50 mm^3	50 x 50 x 50 mm^3
Maximum Detectable Object Size	7500 x 3000 x 3000 mm^3	2500 x 1000 x 1000 mm^3	2000 x 1000 x 1600 mm^3
Scan Head	LMS 200	LMS 400	LMS 400

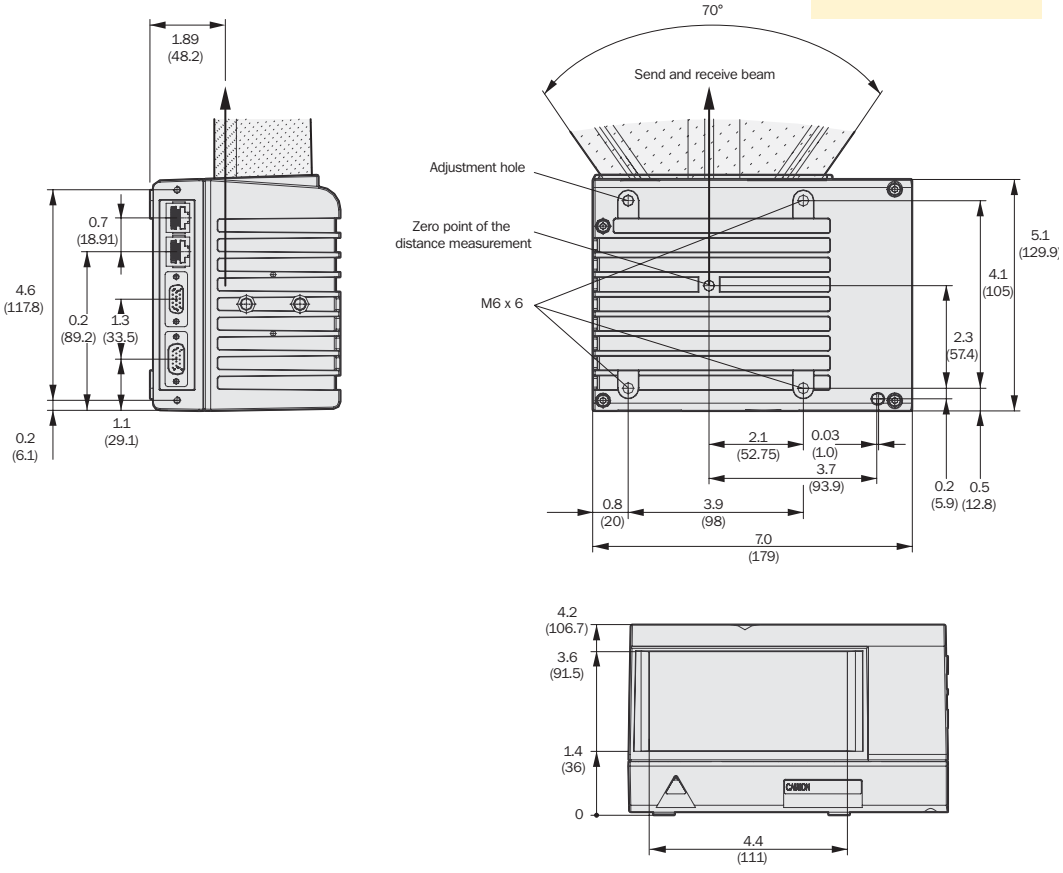
Drawings

Dimensions in inches (mm)

LMS 200-xx



LMS 400-xx



Technical Specifications

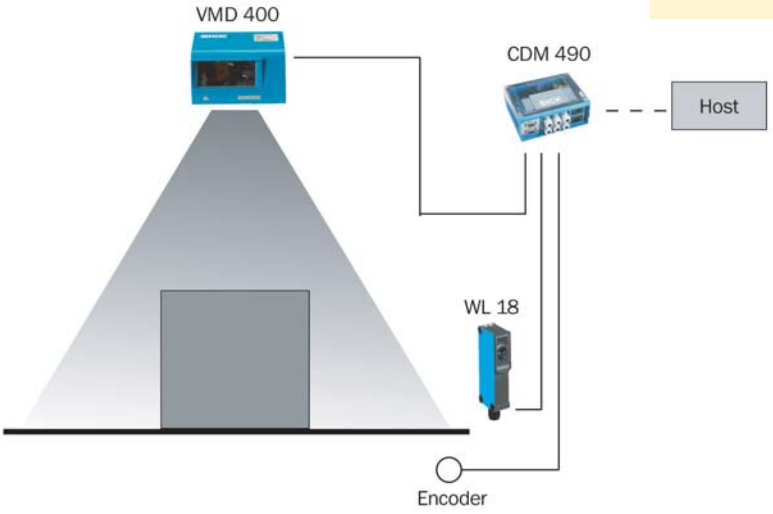
	VMS 420/520	VMS 410/510
Design	2-scanner solution	1-scanner solution
Light Source	Laser diode, red, wavelength: 650 nm	
Laser Type	Class II	
Aperture Angle	70°	
Detectable Object Shapes	Almost any shape	cuboidal objects
Max. Object Size (L x W x H)	2000 x 1000 1600 mm³	2500 x 1000 x 1000 mm³
Certified Scale Value, d	+/- 5 mm at 2 m/s	+/- 10 mm at 2 m/s, +/- 5 mm at 1.3 m/s
Min. Object Gap at V = 2 m/s	25 mm	
Max. Transport Speed	VMS 420: 3 m/s; VMS 520: 2 m/s constant or variable	up to 2 m/s constant or variable
Host Interfaces	RS 232, RS 422, or Ethernet connection to bus systems on request	RS 232, RS 422, or Ethernet
Optical Indicators	6 LEDs for status indication	
Output Data	Max. dimensions, box volumes, real volumes, index	max. dimensions, box volumes, index
Operating Voltage	24 V DC +/- 15%, max. 2 A	24 V DC +/- 15%, max. 2 V AC (115 V AC)
Housing	Die-cast aluminum	
EMC Tests	Acc. to EN 61000-6-2:2001, EN 61000-6-4:2001	
Vibration/Impact Tests	Acc. to EN 60068-2-65, -27, -29, -64	
Weight Per Scanner	2.3 kg	
Temperature (Operation/Storage)	32…104°F/-4…158°F (0…40°C/-20…70°C)	

	VMS 200
Design	2-scanner solution
Light Source	Laser diode, infrared, wavelength: 650 nm
Laser Type	Class I
Aperture Angle	80°
Detectable Object Shapes	Almost any shape
Max. Object Size (L x W x H)	7500 x 3000 x 3000 mm³
Certified Scale Value, d	+/- 10 mm at 2 m/s, +/- 5 mm at 1.3 m/s
Accuracy	+/- 20 mm at 2 m/s
Min. Object Gap at V = 2 m/s	≥ 100 mm
Max. Transport Speed	Up to 2 m/s constant or variable
Host Interfaces	RS 232, RS 422, connection to bus systems on request
Optical Indicators	3 LEDs for status indication
Output Data	Max. dimensions, box volumes, real volumes, angle of rotation, index
Operating Voltage	24 V DC +/- 15%, max. 2 A, 230 V AC (115 V AC)
Housing	Die-cast aluminum
EMC Tests	Acc. to EN 61000-6-2:2001, EN 61000-6-4:2001, etc.
Vibration/Impact Tests	Acc. to EN 60068-2-65, -27, -29, -64
Weight Per Scanner	4.5 kg
Temperature (Operation/Storage)	32…104°F/-4…158°F (0…40°C/-20…70°C)

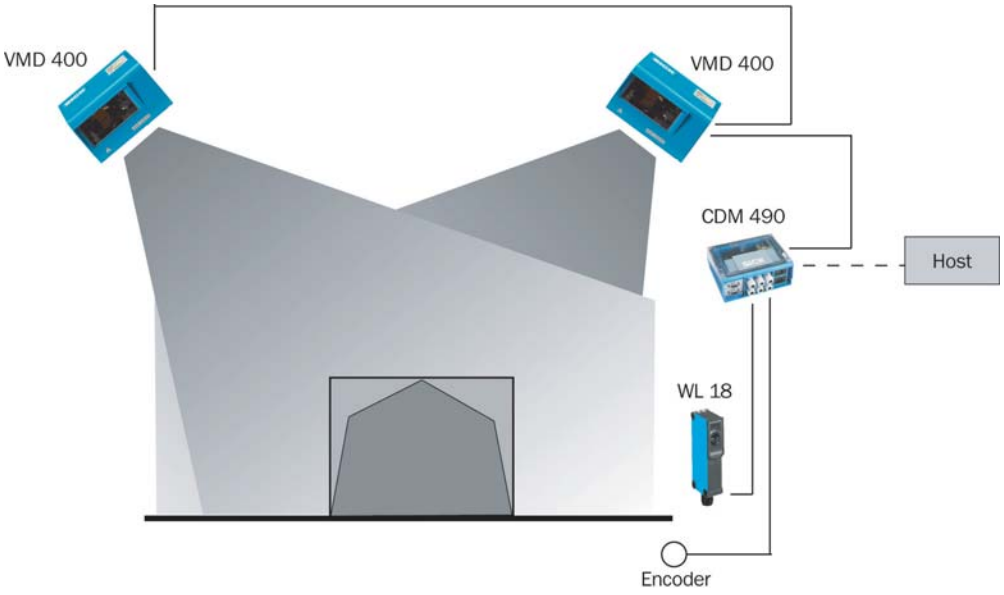
* For complete LMS specifications, please see page 64.

Drawings

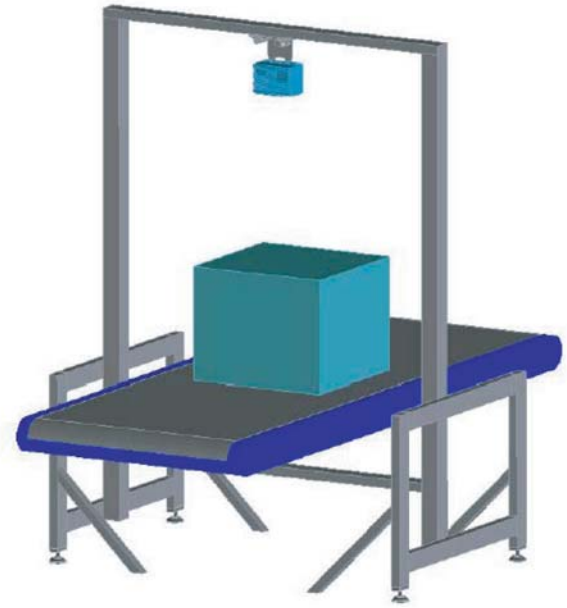
VMS 410/510



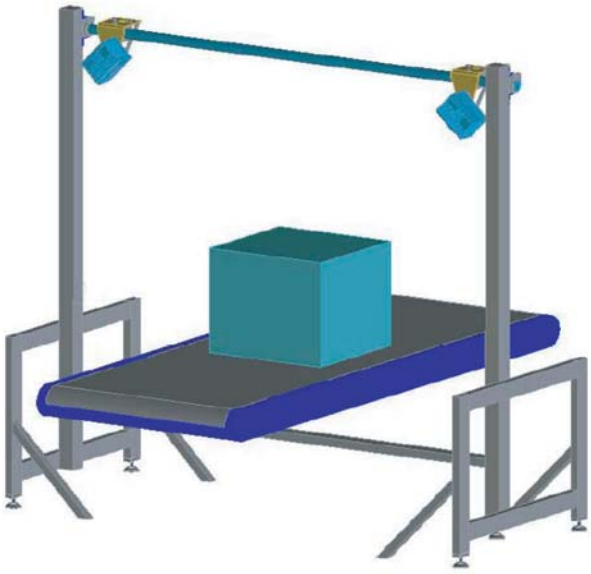
VMS 420/520



Drawings



VMS 410/510



VMS 420/520

CLX 490

CLX 490 Bar Code Scanner

Part Number	Model	Description
1 019 318	CLX 490-0010	Omni Directional / Software Selectable RS 232/422/485
1 019 319	CLX 490-0011	Omni Directional w/Heater / Software Selectable RS 232/422/485

Power Supplies

Part Number	Model	Description
7 027 805	CDB 420-001 KIT	24 V DC required, for use with CLV 420-490, CLX 490, includes Null Modem connector, Y-cable required
1 025 365	CDM 490-0101 DC	For use with CLV 48x-49x, 24 V DC required
1 026 264	CDM 490-0102 AC	For use with CLV 48x-49x, includes 115/230 V AC power, 6 ft US line cord, cannot be used in conjunction with CMD display module
7 028 870	CDM 490-1101 KIT DC	For use with CLV 48x-49x, 24 V DC required, includes CMC cloning module
7 028 871	CDM 490-1102 KIT AC	For use with CLV 48x-49x, includes 115/230 V AC power, 6 ft US line cord, CMC cloning module, cannot be used in conjunction with CMD display module
2 029 466	CMD Display Module	Use with CDM 420 or 490, must be used with a CMC cloning module
1 023 850	CMC 400-101	Cloning module for use with CDx 420-490
7 028 943	CMF 400-1001 Profibus Kit	Profibus communication module kit, use with CDM 410/420/490
7 028 942	CMF 400-2101 Dnet Kit	DeviceNet communication module kit, use with CDM 410/420/490
7 029 481	CDM 490-3101 KIT AC	Ethernet TCP/IP communication module kit, use with CDM 410/420/490
2 030 091	CMP 490 Power Supply	Use with CDM 490
7 020 634	6 ft Line Cable	Power cord for use with CDM 4x0 connection device

Brackets

Part Number	Description
2 022 996	CLX 490 Mounting Bracket

Cables

Part Number	Model	Description
7 026 219	KP-DB15H-3E	15-pin F to 15-pin M, straight through 3 m long cable (PS 56)
7 021 851	KP-DB09-2E	Programming cable, 2 m
2 020 307	KP-DB15/2-DB15-3M-EE	Cloning plug cable, 3 m long, two High Density DB15 connectors
2 020 981	KP-DB15/LEADS-3M-EE	Cloning plug cable, 3 m long, two 15 conductor bare lead cables
2 021 044	KP-DB15-15M-EE	Cloning plug cable, 15 m long, single cable to bare leads (Limited pins)
2 021 298	KP-DB15/DB15-3M-IP65-COLD	Low Temperature cable, 3 m long without EEPROM - use w/ AMV 100
2 021 299	KP-DB15/DB15-10M-IP65-COLD	Low Temperature cable, 10 m long without EEPROM - use w/ AMV 100
2 021 689	KP-DB15/DB15-3M-EE-COLD	Low Temperature cable, 3 m long with EEPROM - use with AMV 100
2 021 208	KP-DB15/BareLeads-10M-COLD	Low Temperature cable, 10 m long bare leads, without EEPROM

Setup Software

Part Number	Model	Description
7 026 126	CLV Setup Software-CD	Windows™-based CLV programming software

OPS Tire

Cables and Connectors

Part Number	Description
2 014 054	OTS/OPS Programming Cable 2m

OTS Components - sold as spares only

Part Number	Description
1 017 866	OTC 400 Tracking Controller
6 020 875	Power Supply (24 V / 10 A) for OTS

OTS Communications Modules and Accessories

Part Number	Description
6 024 931	Ethernet TCP/IP Module - UDS 100 (1 x serial inout to 1 x TCP/IP output)
6 020 893	Profibus DP Module - BMH100111
6 021 188	DeviceNet Module - BMH10-0311
4 037 002	Ethernet Module Bracket (for UDS 100 to mount in OTS cabinet)
2 025 894	Ethernet Module Cable (for UDS 100 to OTC Aux)

Light Bar and Accessories

Part Number	Description
7 029 656	Light Bar (LED) - 4 color (amber, blue green, red) for OTS (24 V DC, 100 mA)
7 029 657	Light Stack (LED) Mounting Bracket

Trigger Devices

Part Number	Description
2 034 693	Light switch WL 18-3P430 incl. reflector, bracket and cable

Encoders *

Part Number	Description
7 029 511	Incremental encoder* (1-10 mm selectable for OPS/ALIS/VMS) RH-240AJ type
7 029 510	Incremental encoder* (8-12 mm selectable for OPS/ALIS) RH-P144AJ type

* Note: Encoder ships with spring tension mounting bracket, 20 ft QD cable

OPS 400

OMNI Directional Scanners

Part Number	Model	Description
1 019 691	OPS400-00	OPS 400 - integrated omni scanner (standard density)
1 019 692	OPS400-20	OPS 400 - integrated omni scanner (high-density)
1 019 693	OPS400-60	OPS 400 - integrated omni scanner (low-density)

Cables and Connectors

Part Number	Description
2 014 054	OTS/OPS Programming cable, 2m

Trigger

Part Number	Model	Description
2 034 693	WL18-3P430	Light switch WL 18-3P430 incl. reflector and cable (1 included with each system)

Encoders *

Part Number	Description
7 029 511	Incremental encoder* (1-10 mm selectable for OPS/ALIS/VMS) RH-240AJ type
7 029 510	Incremental encoder* (8-12 mm selectable for OPS/ALIS) RH-P144AJ type

* Note: Encoder ships with spring tension mounting bracket, 20 ft QD cable

OPS 290/490/360/560

Cables and Connectors

Part Number	Description
2 014 054	OTS/OPS Programming Cable 2m

Mounting Hardware

Part Number	Description
2 032 070	CLV 480/490/OPS Folding Mirror

OTS Components - sold as spares only

Part Number	Description
1 017 866	OTC 400 Tracking Controller
6 020 875	Power Supply (24 V / 10 A) for OTS

OTS Communications Modules and Accessories

Part Number	Description
6 024 931	Ethernet TCP/IP Module - UDS 100 (1 x serial inout to 1 x TCP/IP output)
6 020 893	Profibus DP Module - BMH100111
6 021 188	DeviceNet Module - BMH10-0311
4 037 002	Ethernet Module Bracket (for UDS 100 to mount in OTS cabinet)
2 025 894	Ethernet Module Cable (for UDS 100 to OTC Aux)

Light Bar and Accessories

Part Number	Description
7 029 656	Light Bar (LED) - 4 color (amber, blue green, red) for OTS (24 V DC, 100 mA)
7 029 657	Light Bar (LED) Mounting Bracket

Trigger Devices

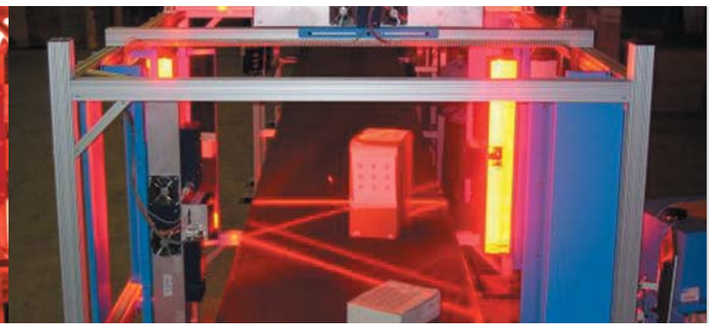
Part Number	Description
2 034 693	Light switch WL 18-3P430 incl. reflector, bracket and cable

Encoders*

Part Number	Description
7 029 511	Incremental encoder* (1-10 mm selectable for OPS/ALIS/VMS) RH-240AJ type
7 029 510	Incremental encoder* (8-12 mm selectable for OPS/ALIS) RH-P144AJ type

* Note: Encoder ships with spring tension mounting bracket, 20 ft QD cable

Modular Vision Systems and Multi-Sided Tunnel Arrays



Features

- Up to six-sided tunnel array configurations
- Linear, 2D codes and OCR decoding capability
- Conveyor speeds up to 600 ft/min
- Constant 150 dpi resolution
- Fiber optic connectivity
- Long life LED illumination
- Dynamic surface tracking
- Sealed for virtually maintenance-free operation – no fans or filters
- No contact dimensioning

SICK's Modular Vision Systems are designed for enterprises requiring complete high-speed scanning and dimensioning capabilities in their warehouses and distribution centers. These systems can be configured for overhead or up to six-sided reading applications.

Modular Vision Systems from SICK are comprised of multiple sealed cameras, LED illumination modules and SICK's LMS 200 non-contact Laser Measurement System for fully automatic dimensioning on singulated items. Each component is virtually maintenance-free and can be replaced within 15 minutes. Reliable fiber optic connectivity between the decoder PC and camera provides greater application flexibility with a range up to 1500 feet. And, since the system operates over a network, no multiplexing PC is required when using multiple cameras.

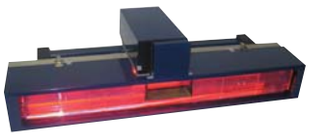
Flexible configuration options provide depth of field up to 55 inches on conveyors up to 44 inches. High, constant image resolution (150 dpi) and the industry's highest line rate in a linear CCD (up to 23 kHz) provide the highest possible read rates in high-speed applications. Modular Vision Systems are OCR and VCS ready and reliably decode the toughest linear and 2D codes.

For more information about Modular Vision Systems contact your SICK Sales Representative or authorized agent.

Product Overview

MVS 5500
Top and Side Read Cameras

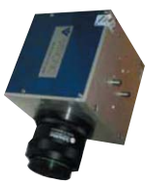
pg. 150



- Low-power solid state design
- Luxeon LED illumination modules
- Fresnel lens design
- 600+ ft/min speed
- OCR quality images
- Exceptional lifetime
- Low annoyance factor
- No fans or filters

MVS 5100
Bottom Read Camera

pg. 148



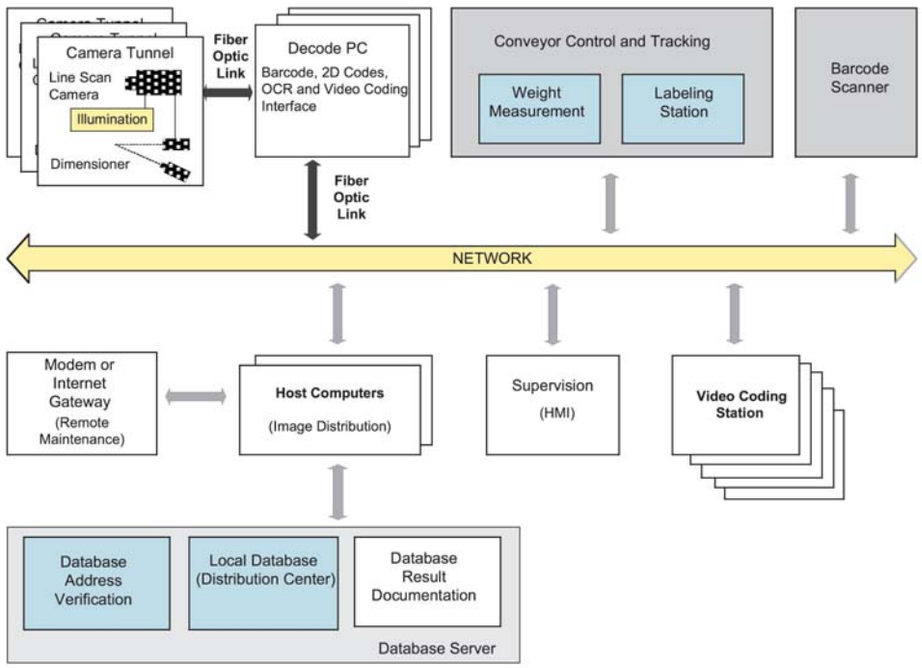
- Bottom Read camera
- Fixed Focus camera system
- Depth of focus of +/- 1”
- Image is digitized in camera
- Digital fiber optic interface to decode PC (up to 1500 ft)
- Virtually maintenance free - sealed
- Line scan frequency up to 23 kHz
- Bandwidth to PC: 2 x 125 MB/s

LMS 200
Dimensioning System

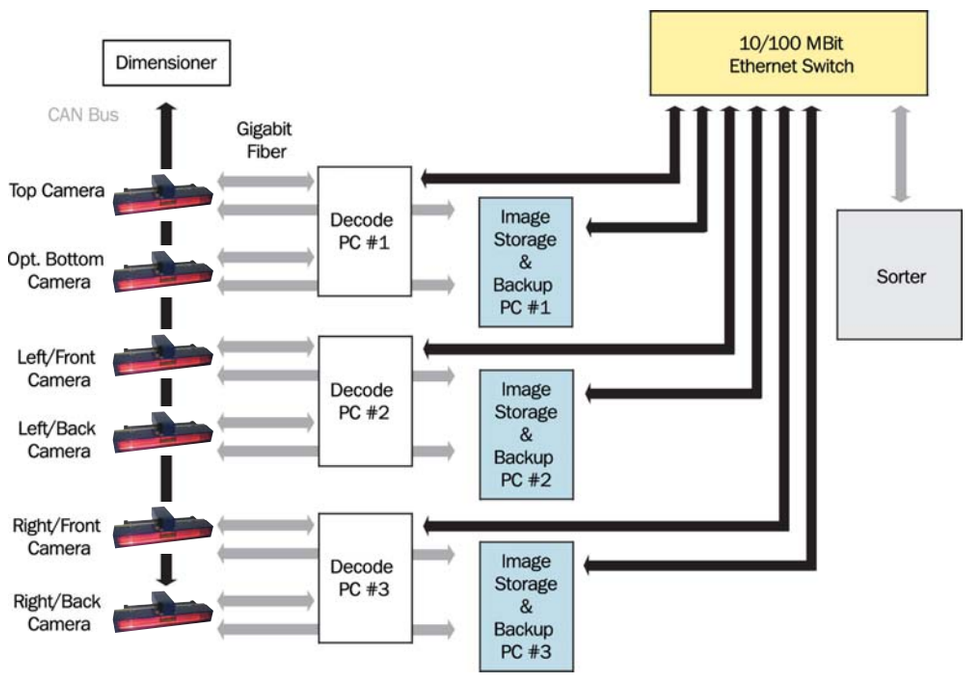
pg. 154

- Non-contact measurement technology
- Real-time processing for all transport speeds
- Effective on all surfaces, textures and colors
- Self-monitoring functionality
- No human supervision required
- Virtually maintenance-free
- IP 65 sensors, SICK standard components
- Laser Class 1 (eye-safe)
- Optional certified version (OIML R129)

Open System Architecture



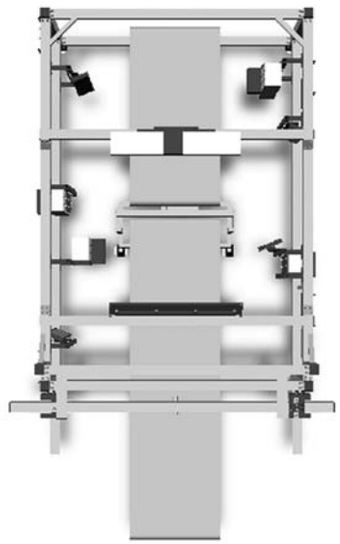
Camera Tunnel Block Diagram



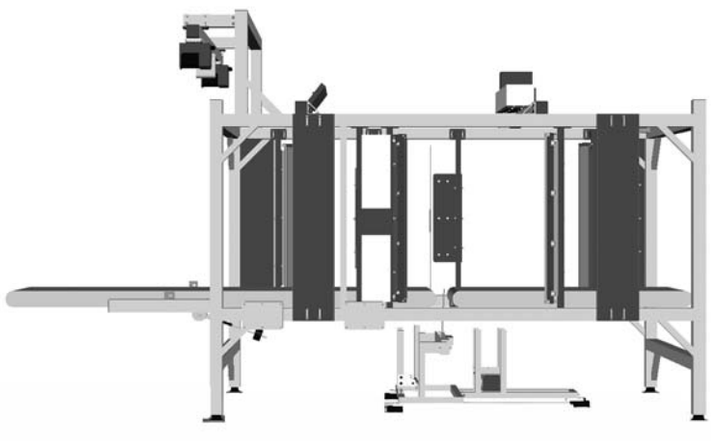
Standard 5-Sided System Drawings

front view

top view



side view



MVS 5100
Modular Vision System

Features

- Bottom Read camera
- Fixed Focus camera system
- Depth of focus of +/- 1 inch
- Digital fiber optic interface to decode PC (up to 1500 ft)
- Sealed for virtually maintenance-free operation – no fans or filters
- Line scan frequency up to 23 kHz
- Bandwidth to PC 2 x 125 MB/s
- Image is digitized in camera

The MVS 5100 from SICK is a Modular Fixed Focus camera system designed for most linear bar code, 2D code and OCR applications requiring a limited depth of field. It offers unsurpassed scanning speeds and image quality in a compact design.

Equipped with Fixed Focus and a fiber optic interface, these cameras can be used in a variety of installations, including simple scan applications (parcels, smalls, flats, letters, etc.) and cutting edge OCR and Telecoding solutions.

With Fixed Focus, the camera is able to continuously cover a depth of field up to 6 inches, allowing it to scan singulated parcels of similar heights. It is the ideal solution for sophisticated OCR applications, providing resolution up to 250 dpi.

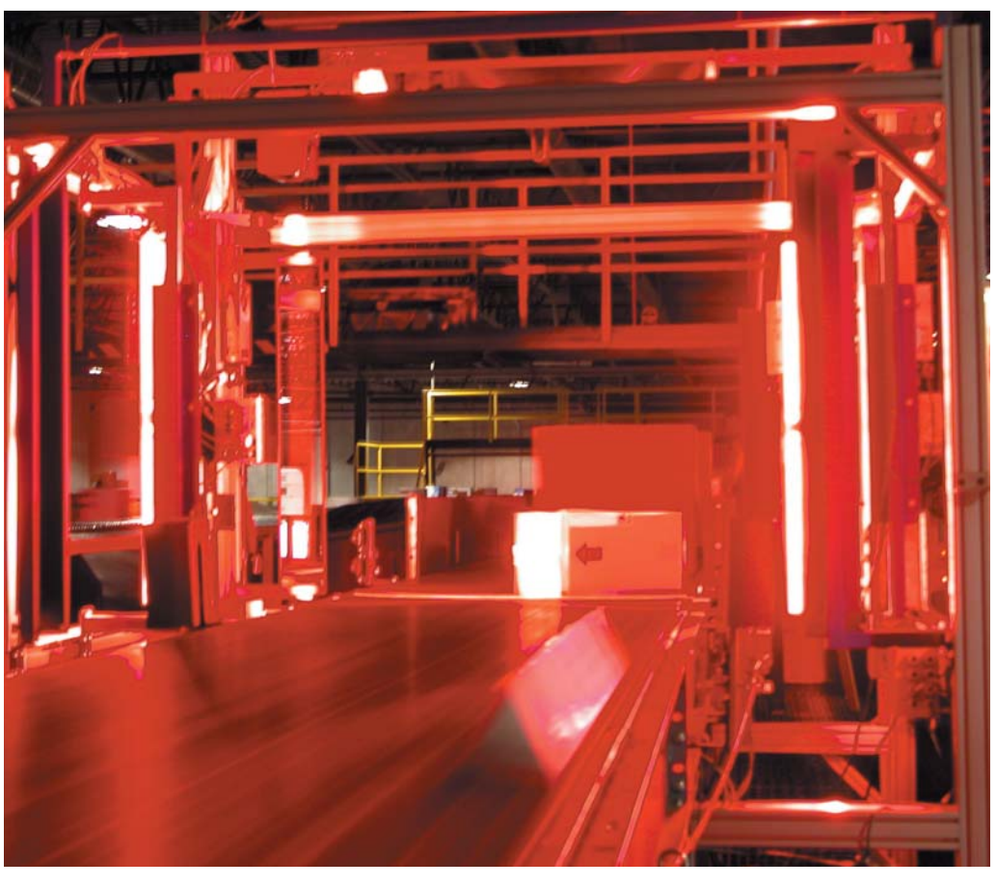
Illumination for the MVS 5100 is provided by available LEDs.

In contrast to other cameras, the pixel digitization takes place inside the camera. The image is then digitally transmitted to the processing unit (“Decode PC”) through a fiber optic interface to maintain image integrity. In addition, the Decode PC can be located up to 1500 feet away in a remote, secured environment, for optimal system control.

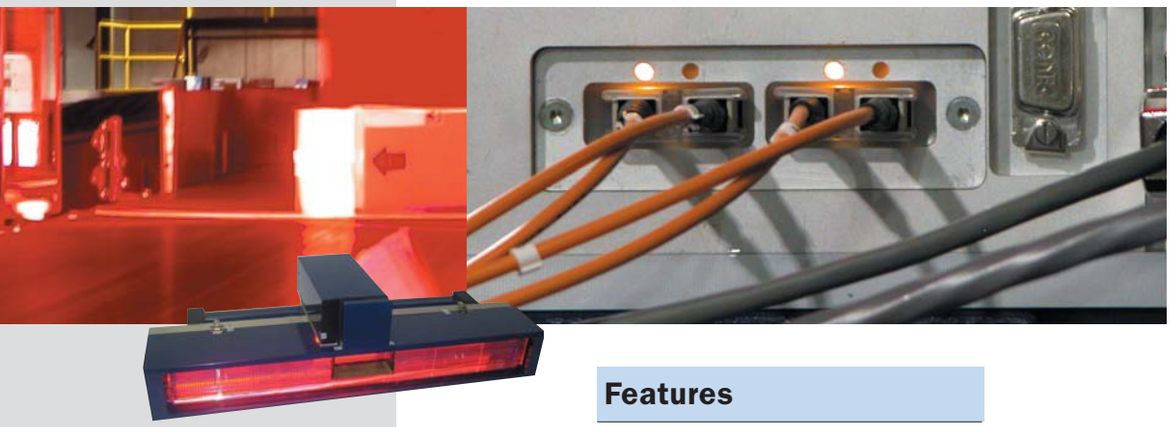
With no moving parts and a durable case, the MVS 5100 cameras are virtually maintenance-free. In fact, the camera housing is completely sealed (no fan or vents) so it can be installed in the harshest environments with confidence.

Technical Specifications

	MVS 5100
Lens	2.0 in (50 mm)
Pixel Frequency	Up to 160 MHz
Line Scan Frequency	min: 2 kHz; max: 23 kHz
Sensor Sensitivity	130 klux
Image Width	Application dependent
Resolution	Up to 250 dpi (0.10 mm, 4 mil)
Interfaces	CAN bus, Parallel I/O port, Gigabit Interface (fiber optic)
Bandwidth GigaBit Interface	Single port: 125 MB/s; Dual port: 250 MB/s or 2 x 125 MB parallel
Power Consumption	115 V AC / 1 A
Dimensions (L x W x H)	6.1 x 5.1 x 4.0 in (155 x 130 x 110 mm)



MVS 5500
Modular Vision System



Features

- Low-power solid state design
- Luxeon LED illumination modules
- Fresnel lens design
- Conveyor speeds up to 600 ft/min
- OCR quality images
- Exceptional lifetime
- Low annoyance factor
- No fans or filters

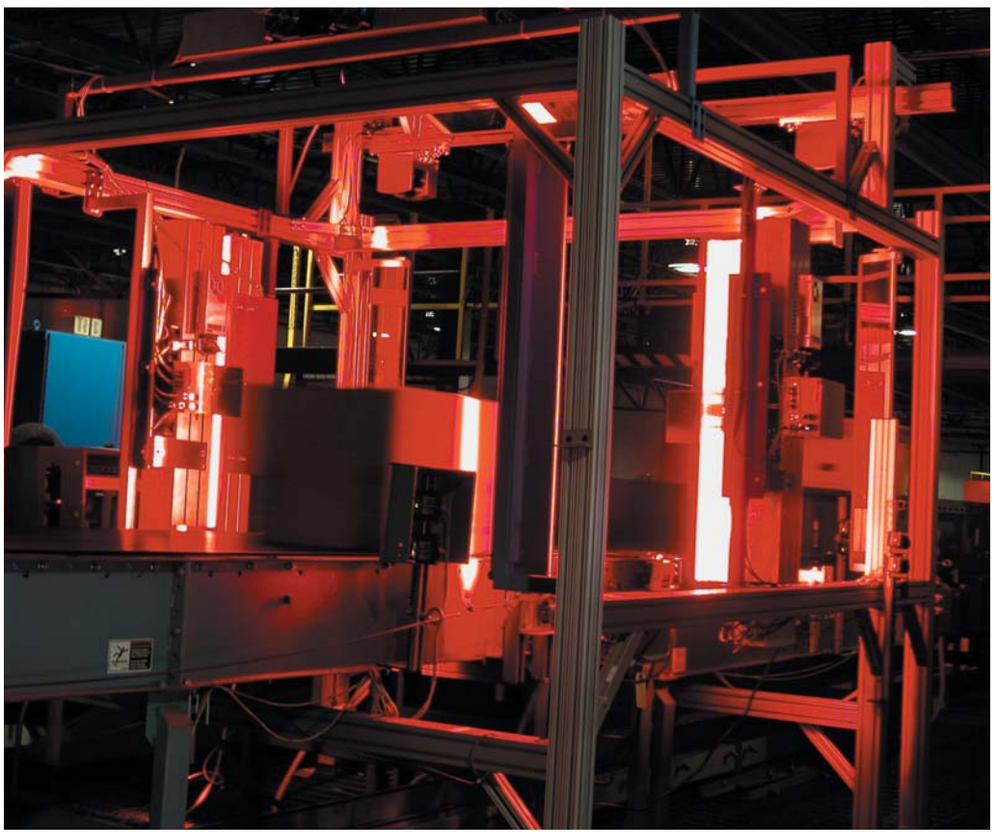
The MVS 5500 Modular Auto Focus Vision System from SICK is designed for most linear bar code, 2D code and OCR applications. The camera offers unsurpassed performance and image quality in a compact design, even at the highest conveyor speeds. One- to six-sided tunnel configurations are available for virtually any type of parcel sorting application.

Equipped with Auto Focus, LED illumination and a fiber optic interface, these cameras can be used in a variety of installations, from simple scan applications (parcels, smalls, flats, letters, etc.) to volume measurement and clear area detection to cutting-edge OCR and Telecoding solutions.

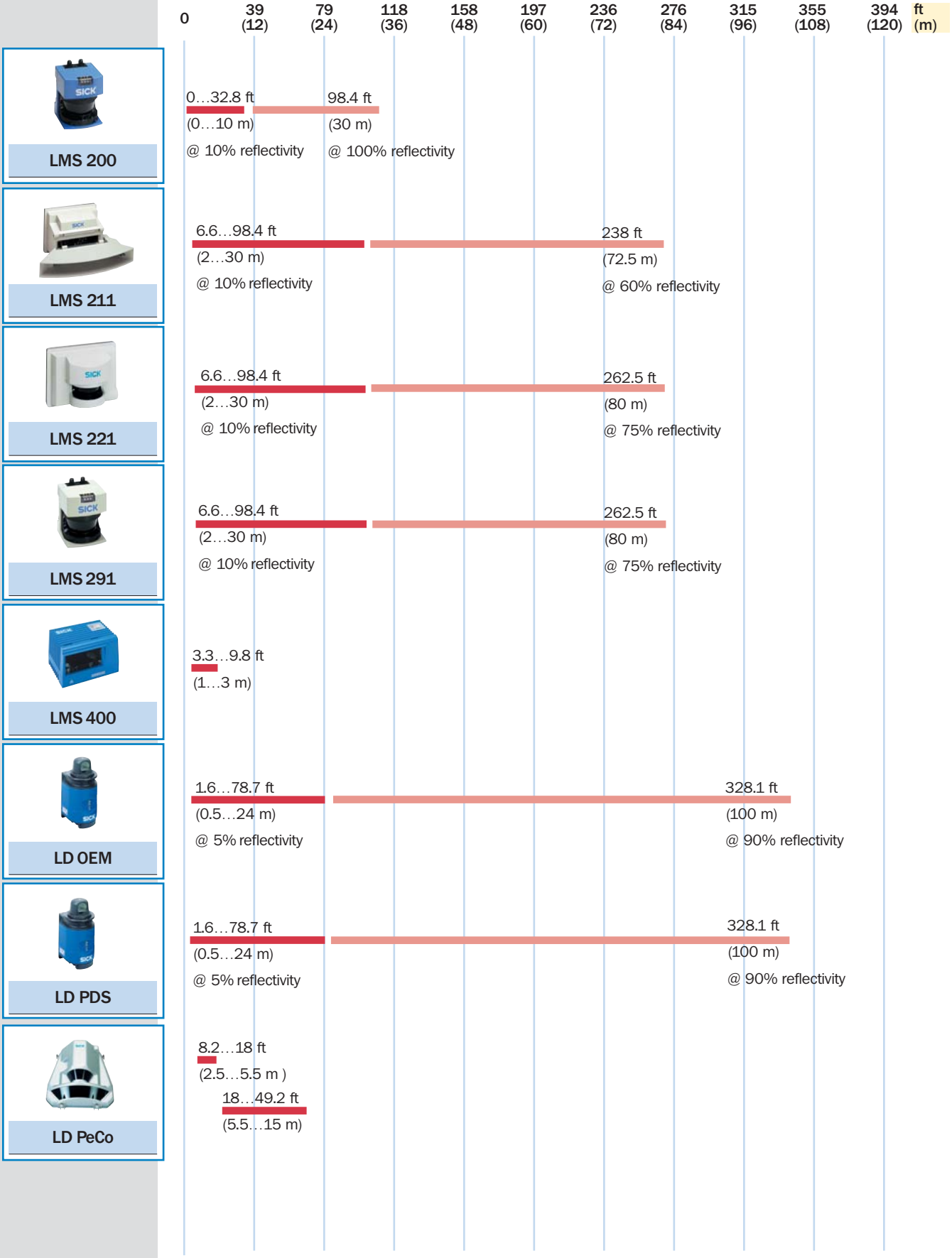
The fast Auto Focus unit of the camera is able to quickly cover a large depth of field (up to 55 inches) within milliseconds, allowing it to scan singulated parcels of different heights. In multi-sided tunnel applications, our delivered solutions are capable of providing industry leading image resolution. Further, the MVS system architecture offers the advantage of reliable bar code reading independent of package rotation. This unique capability increases throughput and reading accuracy to boost productivity in any environment.

Technical Specifications

	MVS 5500
Auto Focus Region	63…110 in (1600…2794 mm)
Lenses	41 in (105 mm); 5.3 in (135 mm) (optional)
Pixel Frequency	Up to 160 MHz
Line Scan Frequency	min: 2 kHz; max: 23 kHz
Sensor Sensitivity	130 klux
Image Width	At 110 in (2794 mm): 33.5 in (851 mm) At 74 in (1880 mm): 22.5 in (572 mm)
Resolution	At 110 in (2794 mm): 180 dpi (0.14 mm, 5.5 mil) At 74 in (1880 mm): > 250 dpi (0.10 mm, 4 mil)
Interfaces	CAN bus, Parallel I/O port, Gigabit Interface (fiber optic)
Bandwidth GigaBit Interface	Single port: 125 MB/s; Dual port: 250 MB/s or 2 x 125 MB parallel
Power Consumption	115 V AC / 3 A
Dimensions (L x W x H)	40 x 8.5 x 9.5 in (1016 x 215.9 x 241.3 mm)



Introduction



	Aperture Angle (Field of View)	Measurement Resolution	Accuracy (System Error)	Enclosure Rating	Data Interface	Scanning Frequency	Page
LMS 200	180°	10 mm	±0.6 in (±15 mm)	IP 65	RS 232, RS 422 (up to 500)	75 Hz	154
LMS 211	100°	10 mm	±1.38 in (±35 mm)	IP 67	RS 232, RS 422 (up to 500)	75 Hz	154
LMS 221	180°	10 mm	±1.38 in (±35 mm)	IP 67	RS 232, RS 422 (up to 500)	75 Hz	154
LMS 291	180°	10 mm	±1.38 in (±35 mm)	IP 65	RS 232, RS 422 (up to 500)	75 Hz	154
LMS 400	70°	1 mm	0.16 in (4 mm)	IP 65	RS 232, RS 422, Ethernet TCP/IP	150…500 Hz	162
LD OEM	360°	3.9 mm	0.99 in (25 mm)	IP 40/IP 65	RS 232, RS 422, CAN, Ethernet TCP/IP (up to 115)	5…20 Hz	168
LD PDS	360°	3.9 mm	0.99 in (25 mm)	IP 40/IP 65	RS 232, RS 422 (up to 19.2)	5…20 Hz	168
LD PeCo	90°	N/A	N/A	IP 40	RS 232, RS 422 (up to 19.2)	10 Hz	168

LMS 200/211/221/291
Laser Measurement System Sensor

Features*

- Wide 180° field of view
- Long range – up to 262 ft (80 m)
- Contact-free measurement
- Target objects require no reflectors or markings
- High (75 Hz) scanning frequency
- Transfer of measurement data in real-time
- Active system, no illumination of target objects necessary
- Measurements possible over long distances
- IP 67 enclosure
- Three programmable monitoring fields
- RS 232/RS 422 (up to 500 kBd)
- Three internally or externally powered relay outputs

Our non-contact Laser Measurement System LMS Sensors can be used for standard applications involving measurement of objects and position determination, monitoring areas, vehicle guidance and collision control.

The technology used in the LMS Sensor is based on time-of-flight measurement. An extremely short pulse of light (infrared laser beam) is transmitted towards an object. Part of the light is reflected back to the unit a fraction of a second later. A rotating mirror deflects the pulsed light beam across the entire field of view. The precise direction is given by an angular sensor on the mirror (laser RADAR).

The primary function of the LMS 200 series is to offer accurate distance measurement throughout the 180° scanning field. Within this field, the LMS can be programmed to monitor multiple zones. These zones can then be assigned to three solid state relay outputs of the LMS or the LMS can transmit distance values via an RS 232 or high-speed RS 422 serial port. The receiving host system can then use this data for specific applications.

The LMS 200 Series Sensors can be used in various industries. Using the three relay outputs, crane collisions can be prevented or open spaces can be monitored for building security. Typical measurement applications include determining the volume and position of objects or autonomous robot navigation.

*not all features available on all models

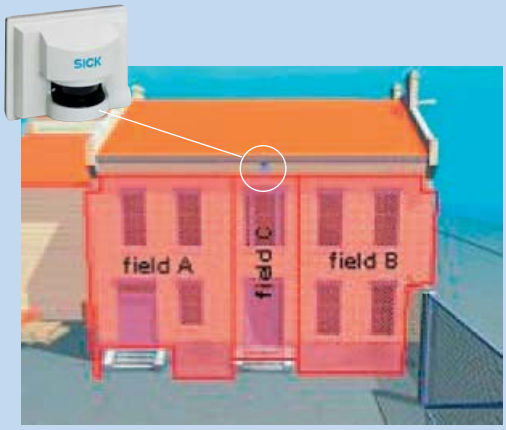
Application: Facade Surveillance

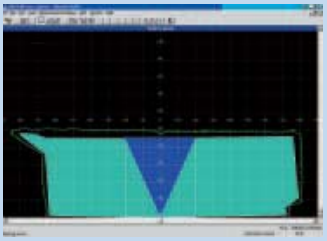
The LMS 2xx Series Sensor is used successfully in several applications throughout the world, to provide continuous 24/7 surveillance of building facades, roofs and perimeters against intrusions.

Government offices, historical sites, jails and museums are examples of buildings, which must be protected against intrusions.

When protecting a facade using the LMS 2xx Series, users are relying on a relentless guardian, which will never lower its level of attention to preventing unauthorized intrusion to the premises. One LMS 2xx Series Sensor can monitor a 31,000 square foot area.

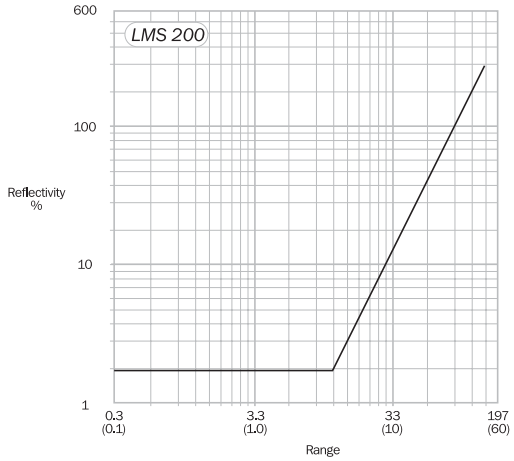
The configuration software allows three alarm fields to be defined, so that in case of intrusion, the infiltrated zone can be determined immediately. The ground level or another fixed feature can be used by the LMS to continuously monitor the functionality of the scanning system.



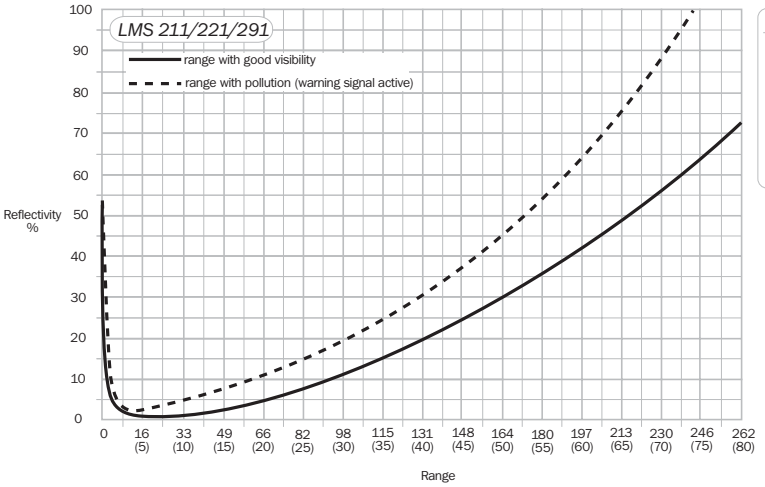


Measurement Ranges

Dimensions in feet (m)



Material	Reflectivity
Cardboard, matte black	10%
Cardboard, grey	20%
Wood (raw pine, dirty)	40%
PVC, grey	50%
Paper, matte white	80%
Aluminum, anodized, black	110…150%
Steel, rust-free shiny	120…150%
Steel, very shiny	140…200%
Reflectors	> 2000%



Material	Reflectivity
Cardboard, matte black	10%
Cardboard, grey	20%
Wood (raw pine, dirty)	40%
PVC, grey	50%
Paper, matte white	80%
Aluminum, anodized, black	110…150%
Steel, rust-free shiny	120…150%
Steel, very shiny	140…200%
Reflectors	> 2000%

Technical Specifications

	LMS 200	LMS 211	LMS 221	LMS 291
Scanning Characteristics				
Range @ 10% reflectivity	0…32.8 ft (0…10 m)	6.6…98.4 ft (2…30 m)	6.6…98.4 ft (2…30 m)	6.6…98.4 ft (2…30 m)
Scanning Frequency	75 Hz			
Angular Resolution (user-selectable)	0.25°[1]/0.5°/1.0°			
Response Time (at user-selected angular resolution)	53 ms @ 0.25°/26 ms @ 0.5°/13 ms @ 1.0°			
Measurement Resolution	0.4 in (10 mm)			
System Error (environmental conditions good visibility, Ta = 73°F (23°C), reflectivity 10…10,000%)	Typ. ± 0.6 in (15 mm) (mm-mode), range 3.2…26.2 ft (1…8 m) Typ. ± 1.57 (4 cm) (cm-mode), range 3.2…65.6 ft (1…20 m)[2]	Typ. ± 1.37 in (35 mm) (mm-mode), range 3.2…65.6 ft (1…20 m) Typ. ± 1.96 in (5 cm) (cm-mode), range 3.2…65.6 ft (1…20 m)		
Statistical Error, Standard Deviation (1 sigma)	Typ. 0.2 in (5 mm) (mm-mode) (at range ≤ 8 m/≥ 10% reflectivity/≤ 5 klux)[2]	Typ. 0.4 in (10 mm) (mm-mode) (at range 1…20 m/≥ 10% reflectivity/≤ 5 klux)		
Mechanical/Electrical				
Data Interface	RS 232/RS 422 (configurable)			
Transfer Rate	9.6/19.2/38.4/500 kBd (RS 422 only)			
Switching Outputs	3 x PNP; typ. 24 V DC; OUT A, OUT B max.250 mA, OUT C max. 100 mA			
- S07 relay variants	OUT A, OUT B (relay) max. switching voltage 48 V DC/26 V AC (protected low voltage, safe isolation from mains) max, switching current 0.7 A; max. switching power 30 W OUT C/weak (PNP) typ. 24 V DC, max. 100 mA			
Supply Voltage (scanner-electronics)	24 V DC ± 15% (max. 500 mV ripple) current requirement max. 1.8 A (including output load)			
with integral heater	24 V DC ± 15 % (max. 6 V ripple) current requirement max. 6 A (cyclic)			
Power Consumption	Approx. 20 W (without output load), approx. 140 W (with heater)			
Enclosure Rating	IP 65	IP 67	IP 67	IP 65
Weight	Approx. 9.9 lb (4.5 kg)	approx. 19.8 lb (9 kg)	approx. 19.8 lb (9 kg)	approx. 9.9 lb (4.5 kg)
Electrical Protection Class	Safety insulated, protection class 2			
Laser Protection Class	Class 1 (eye-safe)			
Interference Resistance	Acc. to IEC 801, part 2-4; EN 50081-1/50082-2			
Environmental				
Ambient Operating Temperature	32…122°F (0…50°C)	-22…122°F (-30…50°C)	-22…122°F (-30…50°C)	32…122°F (0…50°C)
Storage Temperature	-22…158°F (-30…70°C)			
Vibration Fatigue Limit	Acc. to IEC 68 part 2-6, table 2c, frequency range 10…150 Hz, amplitude 0.35 mm or 5 g single impact IEC 68 part 2-27, table 2, 15 g/11 ms permanent vibration IEC 68 part 2-29, 10 g/16 ms Shock absorbers are recommended for heavy vibration and impact demands			

1) Angular resolution 0.25° not possible in the monitoring fields mode

2) Also applicable to -30106 suffix variants

Models and Part Numbers

	LMS 200	LMS 211[1]	LMS 211	LMS 211[1]
Model	LMS 200-30106	LMS 211-30106	LMS 211-30206	LMS 211-S07
Part Number	1 015 850	1 025 629	1 018 023	1 018 966
Enclosure Rating	IP 65	IP 67	IP 67	IP 67
Range	0…32.8 ft	0…32.8 ft	0…98.4 ft	0…98.4 ft
Field of View	180°	100°	100°	100°
Integral Heater		■	■	■
Fog Correction			■	■
Fast Variant[3]				
Relay Output Variant				■

	LMS 211[1]	LMS 211[1] [2]	LMS 221	LMS 221
Model	LMS 211-S14	LMS 211-S15	LMS 221-30106	LMS 221-30206
Part Number	1 025 487	1 026 225	1 015 945	1 018 022
Enclosure Rating	IP 67	IP 67	IP 67	IP 67
Range	1…98.4 ft	1…98.4 ft	0…32.8 ft	1…98.4 ft
Field of View	90°	100°	180°	180°
Integral Heater	■	■	■	■
Fog Correction	■	■		■
Fast Variant	■			
Relay Output Variant				

	LMS 221[1]	LMS 221[1]	LMS 221[1] [2]	LMS 291
Model	LMS 221-S07	LMS 221-S14	LMS 221-S15	LMS 291-S05
Part Number	1 018 965	1 025 328	1 026 224	1 018 028
Enclosure Rating	IP 67	IP 67	IP 67	IP 65
Range	1…98.4 ft	1…98.4 ft	1…98.4 ft	1…98.4 ft
Field of View	180°	90°	180°	180°
Integral Heater	■	■	■	
Fog Correction	■	■	■	■
Fast Variant		■		
Relay Output Variant	■			

	LMS 291[1]	LMS 291[1]
Model	LMS 291-S14	LMS 291-S15
Part Number	1 025 359	1 026 226
Enclosure Rating	IP 65	IP 65
Range	1…98.4 ft	1…98.4 ft
Field of View	90°	180°
Integral Heater		
Fog Correction	■	■
Fast Variant	■	
Relay Output Variant		

1) Non-standard product

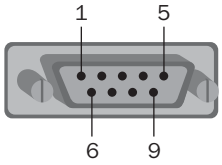
2) For use with LMI 400 product only

3) Fast variants have a fixed 90° field of view and 13.3 ms timebase and no field detection capabilities

NOTE: Accessories information is located on pages 186 - 187.

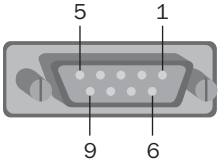
Electrical Connections

LMS 200/291 interface plug



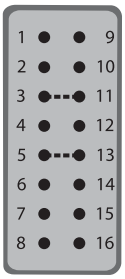
Pin	Signal RS 232	RS 422
1	NC	RxD-
2	RxD	RxD+
3	TxD	TxD+
4	NC	TxD-
5	GND	GND
6	NC	NC
7	NC	jumpered
8	NC	RS 422
9	NC	NC

LMS 200/291 power supply plug



Pin	Signal
1	GND_EXT (earth)
2	Restart
3	VCC_EXT (24 V DC ± 15%)
4	NC
5	OUT C/weak signal
6	NC
7	NC
8	OUT B
9	OUT A

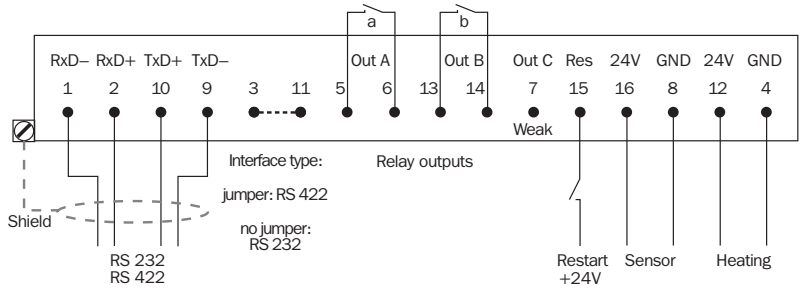
LMS 211/221
16-pin connector



Pin	Function
1	RxD- RS 232, RS 422
2	RxD+ RS 232, RS 422
3	RS 422 interface jumper[1)]
4	Heater/motor flap GND
5	Flap controls
6	Not wired
7	Weak/out c
8	Scanner GND
9	TxD- RS 232, RS 422
10	TxD+ RS 232, RS 422
11	RS 422 interface jumper[1)]
12	Do not use
13	OUT A
14	OUT B
15	Restart
GND	Sensor 24 V DC

1) If no jumper is present, communication is RS 232

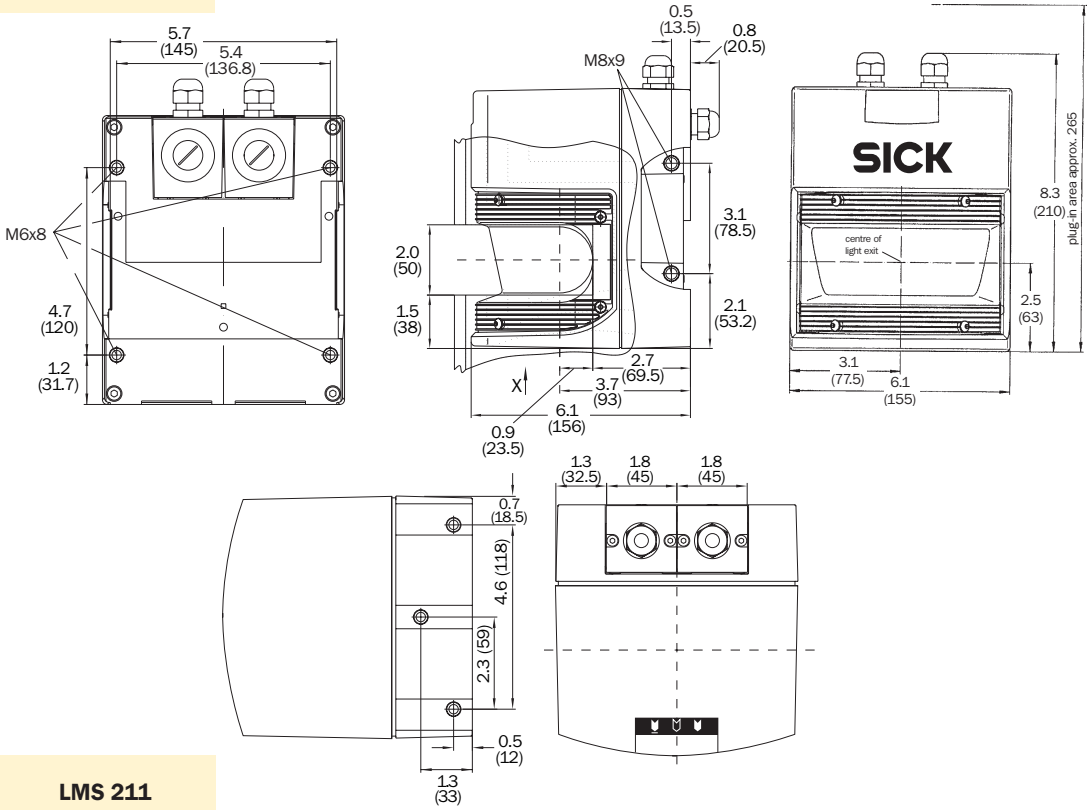
LMS 211/221 relay output variant
(-S07 suffix)



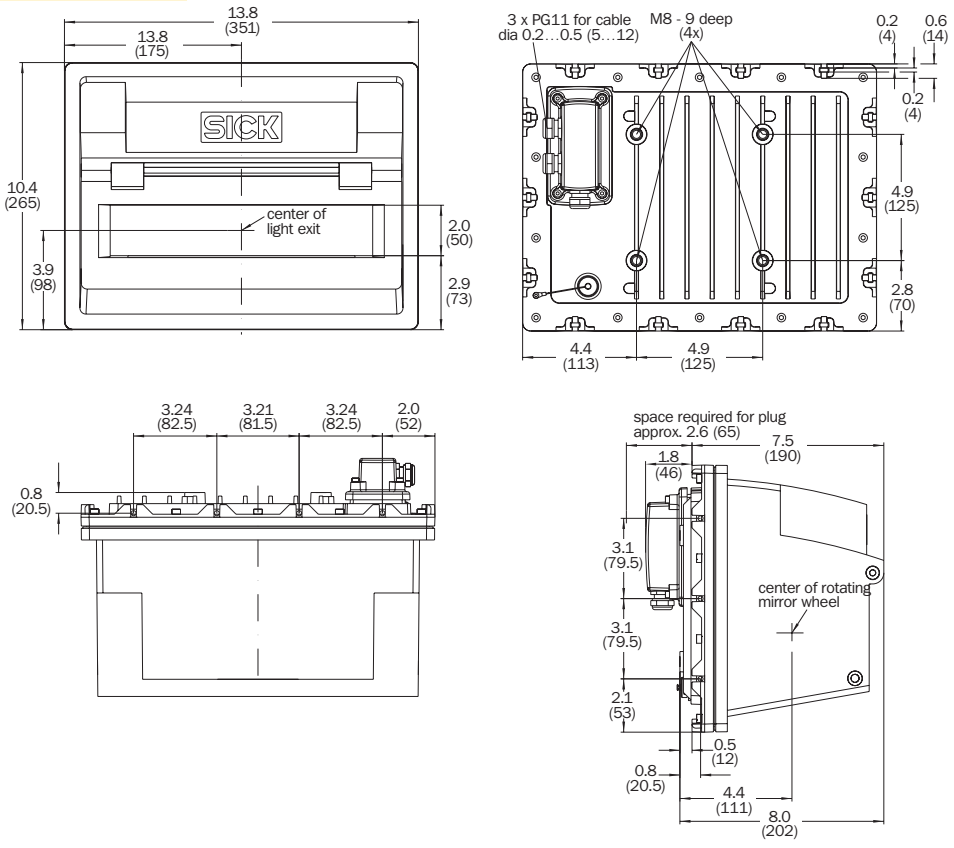
Drawings

Dimensions in inches (mm)

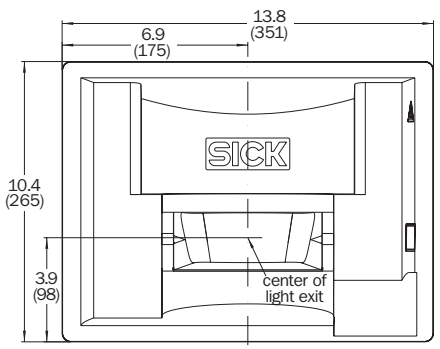
LMS 200/291

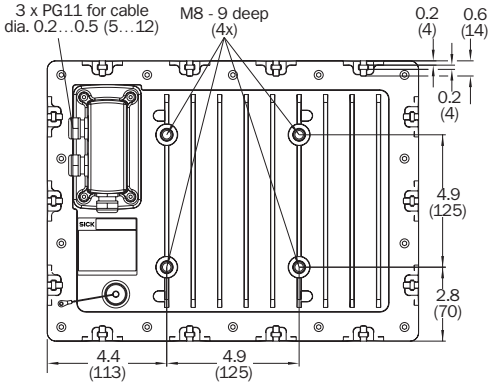


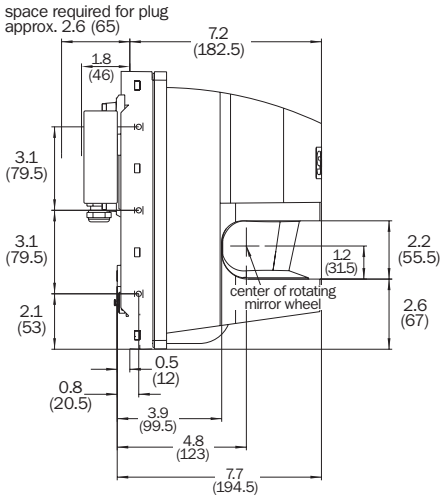
LMS 211

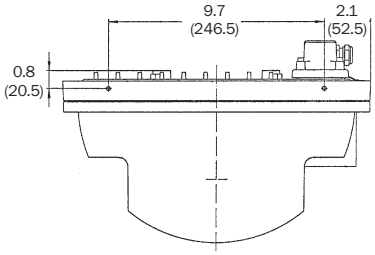


LMS 221


13.8
(351)
6.9
(175)
10.4
(265)
3.9
(98)
center of
light exit


3 x PG11 for cable
dia. 0.2…0.5 (5…12)
M8 - 9 deep
(4x)
0.2
(4)
0.6
(14)
0.2
(4)
4.9
(125)
2.8
(70)
4.4
(113)
4.9
(125)


space required for plug
approx. 2.6 (65)
7.2
(182.5)
1.8
(46)
3.1
(79.5)
3.1
(79.5)
2.1
(53)
1.2
(31.5)
2.2
(55.5)
2.6
(67)
center of rotating
mirror wheel
0.5
(12)
0.8
(20.5)
3.9
(99.5)
4.8
(123)
7.7
(194.5)


9.7
(246.5)
2.1
(52.5)
0.8
(20.5)

LMS 400
Laser Measurement System Sensor

Features

- 70° field of view
- Highly precise measurement up to 9.8 ft (3 m)
- Rapid processing and short cycle times
- Simple installation and configuration
- High resolution
- Reflectivity information available
- IP 67 construction
- Ethernet output connectivity

The world of material handling, logistics and manufacturing faces new challenges every day. Increasing quantities of goods must be transported and processed in quick turnaround times. The LMS 400 provides a measurement solution with high scanning rates, comprehensive process reliability and improved measurement resolution for close range applications.

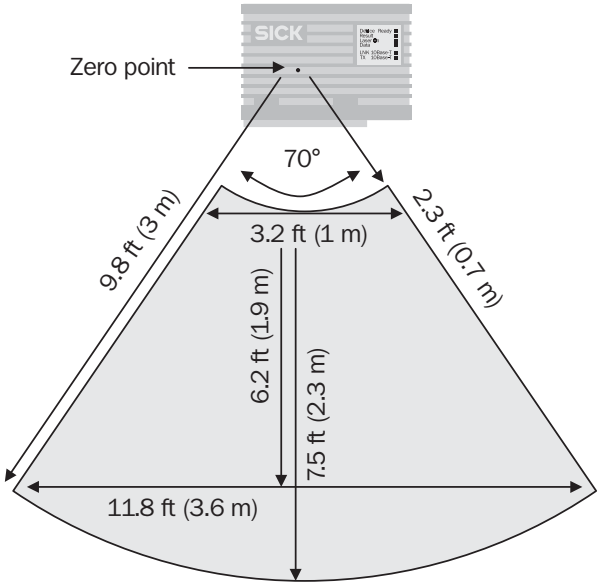
The LMS 400 Sensor is designed for applications with high resolution demands for measuring ranges up to 9.8 feet. High scanning rates enable the measurement of objects moving at high speeds.

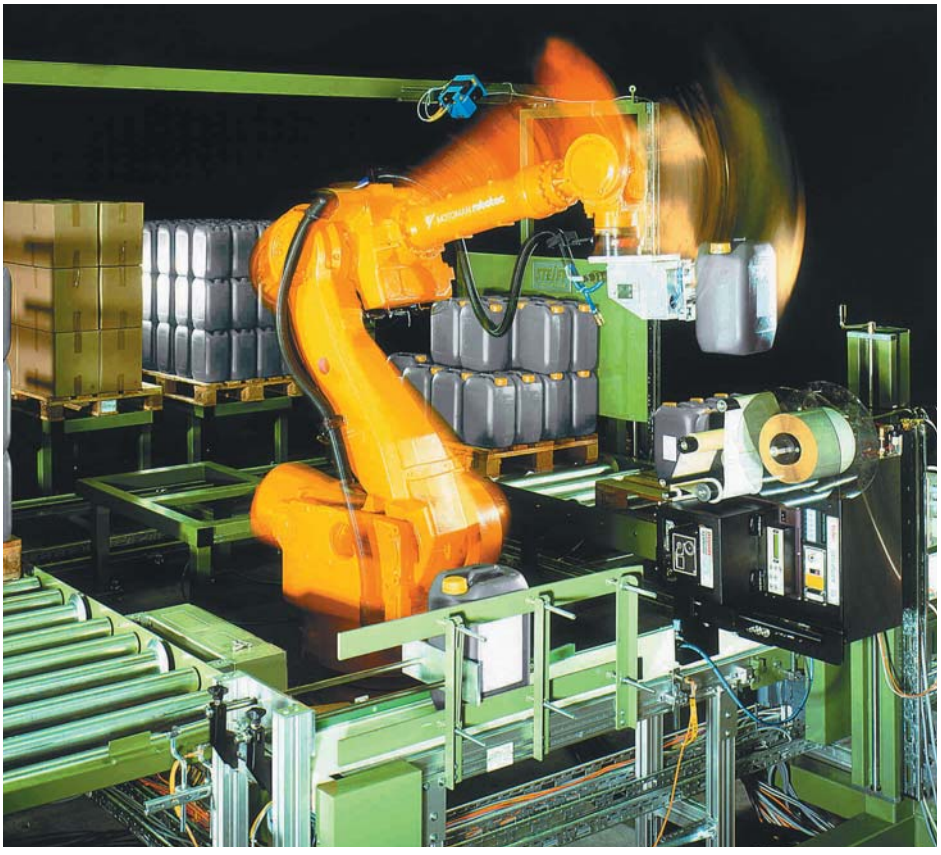
With the use of patented Frequency Signal Processing (FSP), which uses phase-shift (continuous wave) measurement, the LMS 400 is capable of detecting even the smallest of details at high speed. The propagation time of the light and the wavelength used, result in a phase shift between the beam sent and the beam received. This phase difference is converted to a frequency. The sensor determines the distance of the object from the origin based on this frequency.

System Requirements

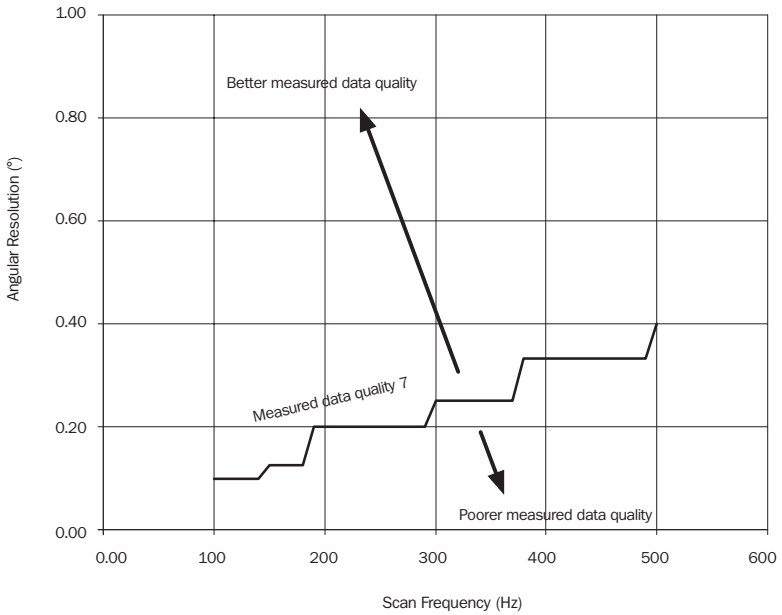
The maximum working range of the LMS 400 is 9.8 ft (3 m). The closest permitted distance of the measurement object from the zero point of the LMS 400 is 2.3 ft (0.7 m). The zero point is marked both on the top and underside of the housing.

The working area of the LMS 400 covers an angle of 70° and must have a clear view of the object to be measured.





Measurement Ranges



Note: The LMS 400 SOPAS configuration software helps users to effectively balance angular resolution and scan frequency requirements. A minimum measured data quality value of seven is required to perform at published technical specifications. For any application, lower angular resolution and higher scan frequency values are desired.

Technical Specifications

	LMS 400-0000	LMS 400-1000
Scanning Characteristics		
Range	2.3…9.8 ft (0.7…3 m)	
Angular Resolution	0.1…1° (user-selectable)	0.25…1° (user-selectable)
Angular Error	± 0.1°	
Field of View	Maximum 70°	
Scan Frequency	150…500 Hz	360…500 Hz
Required Object Remission[1)]	10…200%	6.5…200%
Display Indicators	6 x LED	
Laser Diode (wavelength)	Visible light (λ = 650 nm)	
System Error [2)]	± 0.15 in (4 mm)	
Statistical Error [2)]	± 0.23 in (6 mm) (depending on remission and distance)	
Mechanical/Electrical		
Host Data Interface	RS 232, RS 422, Ethernet	
Supply Voltage	24 V DC ± 15%	
Power Consumption	Maximum 25 W	
Electrical Protection Class	IP 65 (with plug cover)	
Laser Protection Class	Class II	
Enclosure Rating	IP 20 (according to DIN 40050)	
Housing	Aluminum die cast	
Environmental		
Ambient Operating Temperature	32…104°F (0…40°C)	
Storage Temperature	-4…158°F (-20…70°C)	
EMC	In compliance with EN 61000-6-2:2001, EN 61000-6-4:2001	
Vibration/Shock	In compliance with EN 60068-2-6, -27, -29, -64	
Weight	Approx. 5 lb (2.3 kg)	

1) The information applies with the following boundary conditions:
• Room temperature. The LMS has been switched on for at least two hours
• Measuring distance, operating temperature and object remission must be inside the specified range
• The intensity of light from external sources is ≤ 2 kLux

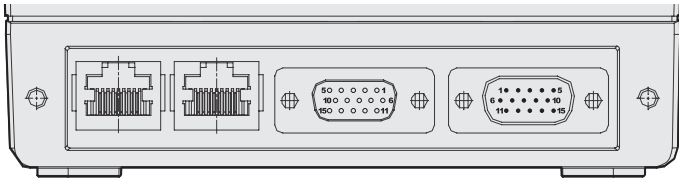
2) The remission is the capability of a material to reflect the light back. The remission value expresses the signal strength with different object surfaces

Models and Part Numbers

Model	LMS 400-0000	LMS 400-1000
Part Number	1 023 925	1 027 897
Scan Frequency	150…500 Hz	360…500 Hz
Required Object Remission	10…200%	6.5…200%

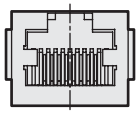
NOTE: Accessories information is located on page 188.

Electrical Connections



Connection	Type	Function
Ethernet	RJ-45	TCP/IP communication, exchange of messages
System	RJ-45	Synchronization master/slave
I/O	D-Sub	Connection of external sensors, supply voltage
Serial	D-Sub	Serial communication, exchange of messages, supply voltage

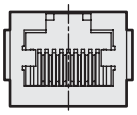
Ethernet Connection



Pin	Signal	Function
1	TPOP	Ethernet interface
2	TPON	Ethernet interface
3	TPIP	Ethernet interface
4	Not assigned	-
5	Not assigned	-
6	TPIN	Ethernet interface
7	Not assigned	-
8	Not assigned	-

A common Cat.5 patch cable is suitable for the connection

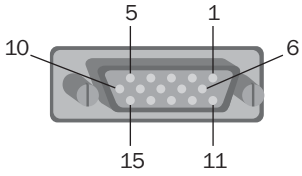
System Connection



Pin	Signal	Function
1	FSIOP	Synchronization master/slave
2	FSION	Synchronization master/slave
3	FSIIP	Synchronization master/slave
4	Not assigned	-
5	Not assigned	-
6	FSIIN	Synchronization master/slave
7	Not assigned	-
8	Not assigned	-

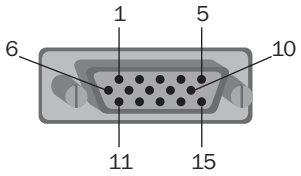
A common Cat.5 crossover cable is suitable for LMS 400 master and slave configurations

I/O Connection



Pin	Signal	Function
1	V_S	Supply voltage LMS 400
2	SENSORS3_EXT In3	Digital input 3 (trigger)
3	SENSOR1_EXT In1	Digital input 1 (trigger)
4	Reserved	Do not use!
5	GND	Ground LMS 400
6	SENSORS2_EXT	Digital input 2 (rotary encoder)
7	SENSORS4_EXT	Digital input 4 (rotary encoder)
8	Reserved	Do not use!
9	SENS_GND	Ground digital inputs
10	Reserved	Do not use!
11	Reserved	Do not use!
12	Reserved	Do not use!
13	Reserved	Do not use!
14	Reserved	Do not use!
15	Reserved	Do not use!
Housing	-	Screen/Earth

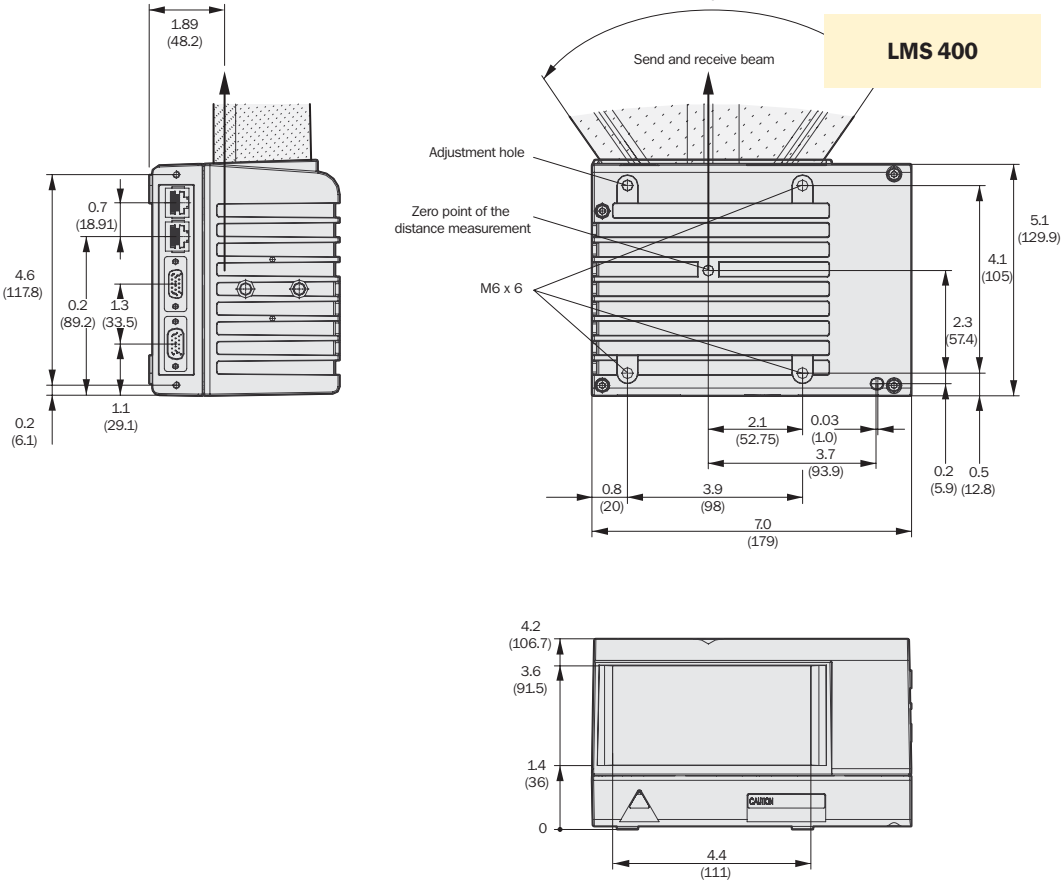
Serial Connection



Pin		Signal			Function
1		V_EXT			Supply voltage LMS 400
2	RS 232	RxD_TRM			Terminal interface (receiver)
3	RS 232	TxD_TRM			Terminal interface (sender)
4		Not assigned			-
5		GND_EXT			Ground LMS 400
6	RS 232	Not assigned	RS 422	RD_HST+	Host interface (receiver)
7	RS 232	RxD_HST	RS 422	RD_HST-	Host interface (receiver)
8	RS 232	Not assigned	RS 422	TD_HST+	Host interface (Sender)
9	RS 232	TxD_HST	RS 422	TD_HST-	Host interface (Sender)
10		Reserved			Do not use!
11		Not assigned			-
12		Reserved			Do not use!
13		Reserved			Do not use!
14		Not assigned			-
15		Reserved			Do not use!
Housing		-			Screen/earth

Drawings

Dimensions in inches (mm)



LD OEM/LD PDS/LD PeCo

Features

- LD OEM/PDS: 360° field of view
- LD PeCo: 90° field of view
- 14,400 Hz scan rate
- Class 1 (eye-safe laser)
- RS 232/RS 422 output
- 4 static outputs
- 5…20 Hz programmable scan frequency
- LD OEM: the basic platform to provide customized software programs on board and offers the possibility of incorporating your own application experience
- LD PeCo: people counting in public areas
- LD PDS: surveillance and security of buildings

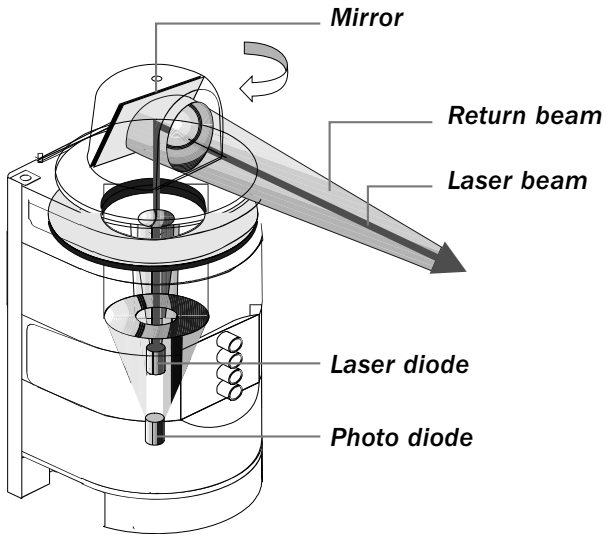
Using time-of-flight technology, SICK provides solutions throughout the world. Even the most demanding applications are being served: anti-collision for large harbor cranes, automatic parking of planes, vehicle profiling in free-flow traffic tolling, guidance and protection of autonomous vehicles, intrusion detection in building security, and people counting in public areas.

The foundation of the LD family is the LD OEM Laser Scanner. This powerful and flexible device is based on a dual-processor hardware structure. The first DSP (Digital Signal Processor) controls the laser measurement and the I/O data flow, while a second DSP is dedicated to run application programs, such as positioning algorithms for autonomous vehicles. The two processors are connected by means of a high-speed bus which enables efficient real-time data collection and processing.

The DSP in the LD PDS Scanner secures areas from intrusions. With the user-friendly configuration software, any selectable area can be monitored.

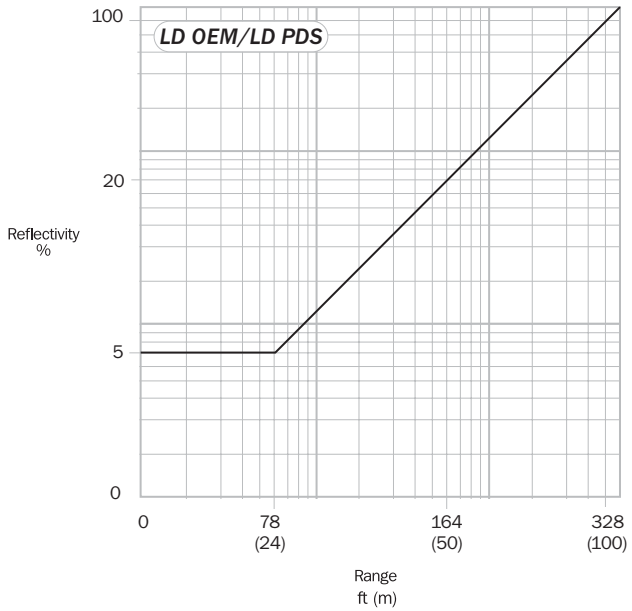
The DSP in the LD PeCo Scanner is programmed to count people in public areas, such as train stations, museums and shopping malls, to manage traffic flow for multiple commercial purposes.

LD Laser Scanner



Measurement Ranges

Dimensions in feet (m)



Technical Specifications

	LD PeCo
Scanning Characteristics	
Mounting Height	8.2…49.2 ft (2.5…15 m), depends on type
Passage Width	3.3…85.3 ft (1…26 m)
Speed of Passage	Maximum 7.9 ft/s (2.4 m/s)
Scanning Angle	90°
Scanning Frequency	10 Hz ± 5%
Light Emission	Via rotating scanner head and light emission windows
Laser Diode (wavelength)	Infrared light (λ = 905 nm)
Pulse Frequency	8 kHz ± 5%
Laser Class	Class I (to DIN EN 60825-1), eye safe
Mechanical/Electrical	
RS 422 Data Interface	Serial
Transfer Rate	19,200 Bd
Data Format	8 data bits, 1 stop bit, no parity, fixed output format
Switching Outputs	2 x (Count IN, Count OUT)
Optical Indicators	4 x LED (status displays)
Power Consumption	
when switched on:	Max. 36 W (1.5 A) at 24 V DC
operation:	12 W (0.5 A) at 24 V DC, additional max. 0.5 A for each switching output
Enclosure Rating	IP 40 (to DIN 40 050)
Connectivity	1 x 10-core terminal block on an internal terminal board 2 x conduit thread 11 cable connection (cross section 8…10 mm (0.32…0.39 in)
Housing	Polystyrene
Weight	Approx. 13.2 lb (6 kg)
Ambient Operating Temperature	32…104°F (0…40°C)
Storage Temperature	-4…176°F (-20…80°C)
Relative Humidity	5…85%, non-condensing
Housing Color	White aluminum (RAL 9006)
Attachment	Pivot on the device, pipe clamping system with second pivot, safety cord

Technical Specifications

	LD OEM/LD PDS
Scanning Characteristics	
Range (condition: full spot strike	1.64…78.8 ft (0.5…24 m) on 5% black
on the object)	1.64…328 ft (0.5…100 m) with 90% reflection
	1.64…164 ft (0.5…50 m) with 20% reflection
Scanning Angle	360°
Angular Resolution	0.125°
Scanning Frequency	5…20 Hz ± 5% in increments of 1 Hz
Measurement Resolution	0.15 in (= 1/840 ft) (3.9 mm (=1/256 m))
System Error (environmental conditions: good visibility, Ta = 73°F (23°C), reflectivity 10…10,000%)	± 0.98 in (25 mm) with 20…90% reflection, from 1.64 ft (0.5 m) (as a result of temperature and drift)
Statistical Error	1 sigma ± 0.98 in (25 mm) with 20…90% reflection, from 1.64 ft (0.5 m)
Beam Divergence	5 mrad (0.286°)
Light Emission	Via rotating scanner head
Laser Diode (wavelength)	Infrared light (λ = 905 nm)
Pulse Frequency	Maximum 14.4 kHz (10.8 kHz with mean across 360°)
Laser Class	Class I (to DIN EN 60825-1), eye safe
Mechanical/Electrical	
RS 232/422 Data Interface	Serial
Transfer Rate	4,800 / 9,600 / 19,200 / 38,400 / 57,600 / 115,200 Bd
Data Format	8 data bits, 1 stop bit, no parity, fixed output format
CAN Data Transfer Rate	10 Bit/s…1 MBit/s
ARCnet Data Interface (optional)	
Data Format	CAN to CAN standard 2.0A
Transfer Rate	156.25 kBit/s…5 MBit/s
Switching Outputs	4 x (Alarm 1, Alarm 2, Safe 1, Safe 2) Highside semi-conductor, max. output current as a result of load per 0.5 A at 24 V DC”
Optical Indicators	4 x LED (status displays)
Connectivity	1 x 6-pole terminal block via conduit thread 7 cable bushing (Ø max. 5.6 mm (0.22 in), for power supply and switching outputs 1 x 9-pin D-Sub plug for data interfaces
Display Indicators	4 x LED status
Operating Voltage	24 V DC ±20% to IEC 364-4-41 (VDE 0100, Part 410)
Current Consumption	
when switched on:	Maximum 36 W (1.5 A) at 24 V DC
operation:	12 W (0.5 A) at 24 V DC, additional max. 0.5 A for each switching output
Housing	Die cast aluminum
Weight	Approx. 7 lb (3.2 kg)
Enclosure Rating	IP 40 (to DIN 40 050)
Electrical Protection Class	Class III
Environmental	
EMC	EN 61000-6-3, EN 61000-6-2
Vibration	EN 60068-2-6
Ambient Operating Temperature	32…113F° (0…45°C)
Storage Temperature	-4…176F° (-20…80C°)
Relative Humidity	5…85%, non-condensing
Housing Color	SICK blue (RAL 5012) black
Attachment	8 x securing threads M6x12mm (0.47 in)

Models and Part Numbers

	LD PeCo	LD PeCo	LD PDS	LD PDS
Part Number	1 023 382	1 023 383	1 025 993	1 026 440
Data Interface	RS 422	RS 422	RS 232	RS 422
Range	18 ft (5.5 m)	49.2 ft (15 m)	78.7 ft (24 m)	78.7 ft (24 m)

	LD OEM
Part Number	1 028 698
Data Interface	RS 232/422, CAN TCP/IP Ethernet
Range	78.7 ft (24 m)

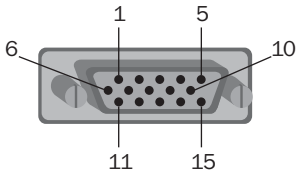
NOTE: Accessories information is located on pages 188 - 189.

Electrical Connections

LD OEM/LD PDS
Terminal Block

Terminal	Signal	Function
1	+24 V DC	Power supply
2	GND	Signal ground
3	Alarm 1	Switching output 1 (application-dependent function)
4	Alarm 2	Switching output 2 (application-dependent function)
5	Safe 1	Switching output 3 (application-dependent function)
6	Safe 2	Switching output 4 (application-dependent function)

D-Sub Plug
(Data Interface)



Pin	Signal				Function
1	24 V DC				Voltage supply, sensor (24 VDC)
2	CAN L				CAN bus (IN/OUT)
3	CAN H				CAN bus (IN/OUT)
4	GND_Data				Ground
5	GND				Ground, sensor
6	RS-422	RD+-	RS-232	Not occupied	Host interface (receiver)
7	RS-422	RD -	RS-232	RxD	
8	RS-422	TD+	RS-232	Not occupied	Host interface (transmitter)
9	RS-422	TD-	RS-232	TxD	
10	OUT 1				Output 1
11	TPIP				Ethernet interface IN
12	TPIN				Ethernet interface IN
13	TPOP				Ethernet interface OUT
14	TPON				Ethernet interface OUT
15	OUT 2				Output 2

LD PeCo
10-core Terminal Block

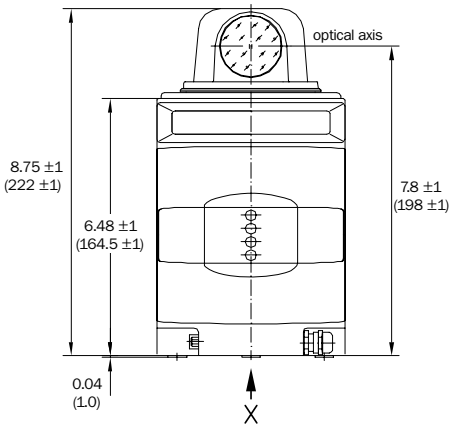
Pin	Signal	Interface
1	+24 V DC	Power Supply
2	GND	Ground
3	Count IN	Ground
4	Count OUT	Switching Output[1)]
5	RX_Hi	Switching Output[1)]
6	TX_Hi	RS-422
7	TX_Lo	RS-422
8	RX_Lo	RS-422
9	Signal GND	RS-422
10	S-GND	Signal ground

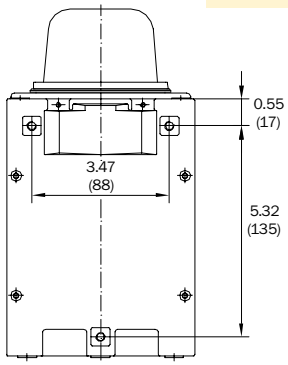
1) Function depends on the selected count direction

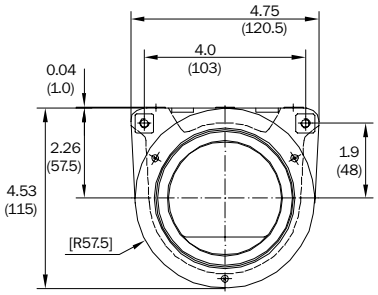
Drawings

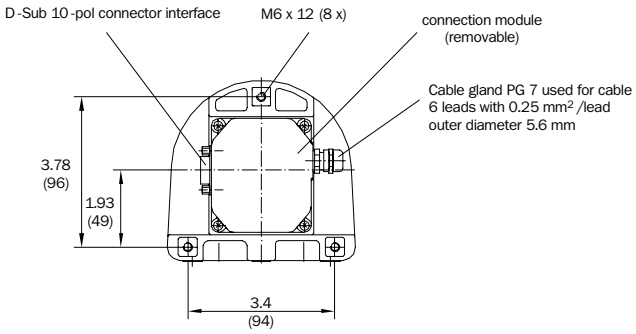
Dimensions in inches (mm)

LD OEM/LD PDS

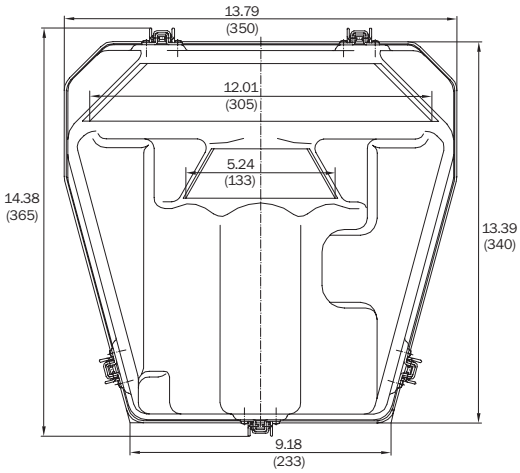


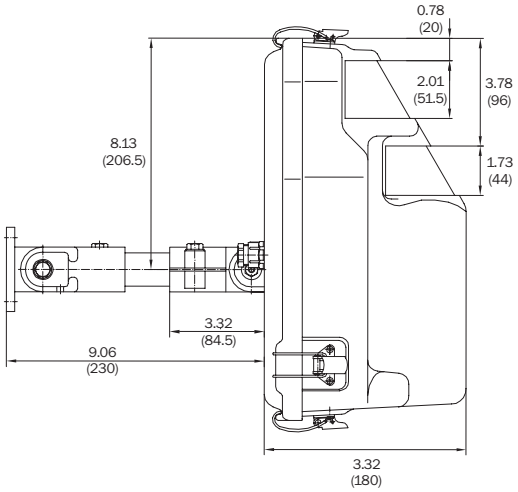


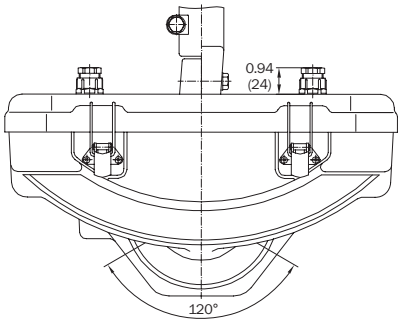


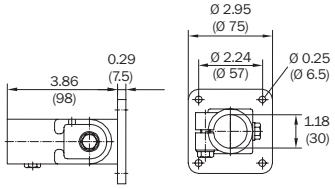


LD PeCo









LMI 200/MST 200 Software

Features

- **MST 200 Measurement Software Tool**
  - Transfer of configurations
  - Define measurement range
  - Check settings
  - Monitor fields
  - Receive, save, edit configurations
  - System diagnosis
  - Performs measurement functions for LMS Sensors
  - Pre-installed drivers for real-time communication with up to two laser scanners
- **LMI 200 Measurement Software Tool**
  - All features of the MST plus:
    - Two SICK 2xx Series Sensor inputs
    - Two analog inputs
    - Four analog outputs
    - Four digital inputs
    - 8 digital outputs
    - Two shaft encoder inputs
    - RS 232/RS 422/RS 485 interfaces

LMS Measurement Systems operate without contact and as a result of their high scanning rates are particularly suitable for measurement tasks involving dynamic operational processes. Rapidly changing object geometries are detected quickly and reliably. Varying surface properties of the target material have no influence on the measurement result.

The LMI 200 Laser Measurement Interface is a high-performance, multifunctional evaluation unit for carrying out customer-specific measurement tasks with SICK's LMS Sensors. The LMI 200 integrates all the process data of typical measurement setups by means of the digital and analog interfaces.

It combines the contour data provided by the LMS Sensors with other measurement data such as, the speed of the measured objects, according to how it has been configured. The resulting measurement data is processed in real-time by the application-specific software.

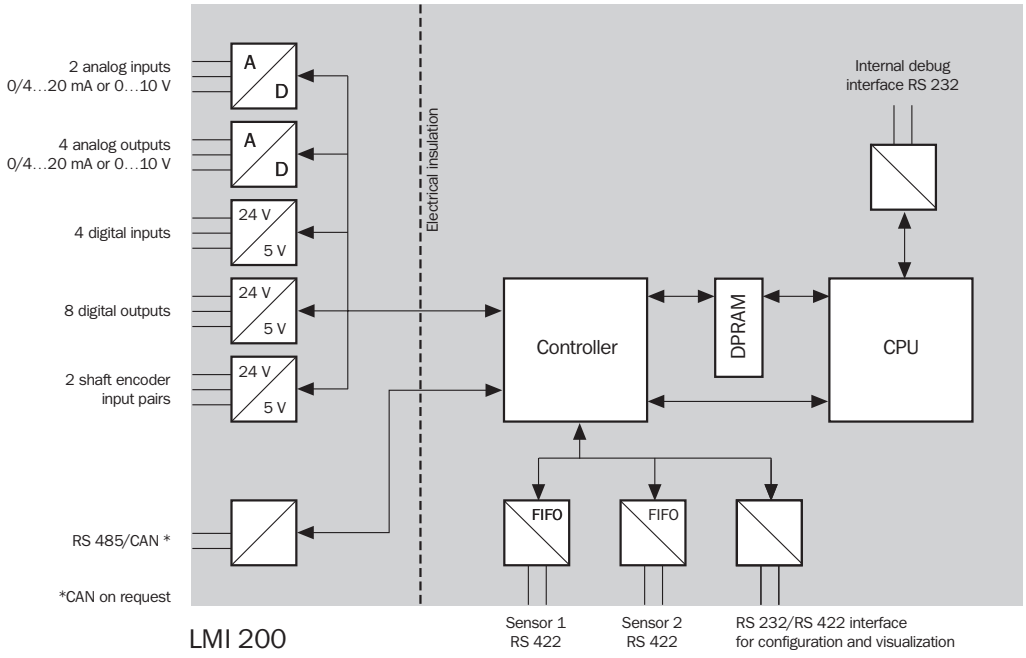
LMI 200 Laser Measurement Evaluation Unit

The LMI 200 Laser Measurement Interface consists of the evaluation unit as a hardware component and the MST 200 Measurement Software Tool.

The LMI 200 is a high-performance, 2-processor system with the following structure:

1. A controller (Siemens C167) for communication with the SICK LMS Sensors and for the pre-processing of measurement data; technically integrated by SICK Firmware.
2. A CPU (Intel i960Jx 32-bit RISC processor) for processing application-specific measurement data. Configuration and software implementation is programmable with the help of SICK's MST 200 Measurement Software Tool.

The exchange of data between the two processors takes place via a DPRAM and is a component part of SICK Firmware.



LMI 200

MST Measurement Software Tool

The MST 200 contains a software function library for carrying out customer-specific measurement tasks with LMS Sensors and the LMI 200 Evaluation Unit. The following function blocks are implemented and available:

- Function for the definition and configuration of the LMS Laser Scanners
- Function for the polar/cartesian conversion of LMS measurement data
- Function for data output via the host interface
- Function for the definition of a customer-specific co-ordinate system
- Function for the division of the co-ordinate system into individual measurement columns with maximum value output
- Function for transmitting measurement results at digital and analog outputs
- Function for the combination of the measurement values from two LMS Sensors

The MST is a software tool for carrying out measurement functions using the LMS Sensors. This toolbox can be used to handle customer-specific measurement functions quickly and efficiently, and therefore cost-effectively.

Drivers for real-time communication with several LMS Sensors are already installed. Handling of the actual application can be started directly after the simple transformation of co-ordinates and the definition of an application-specific measurement framework. The functions library already includes important filter functions such as, cutting out irrelevant measurement zones. In addition, the MST 200's tiered structure allows the simple integration of new function blocks (objects) or software drivers for later applications.

Customer 20-30%	**Application-specific component**
SICK 70-80%	**MST 200** **Software tool for a standard PC or SICK-specific hardware, the LMI 200** **Software library:** ■ Integrated software and hardware communications driver ■ Definition of an application-specific measurement zone ■ Transformation of co-ordinates ■ Combination of measurement data from 2 sensors ■ Pre-processing of sensor measurement data: √ Plausibility check √ Averaging of measured values √ Suppression of irrelevant measurement zones √ Pixel-oriented evaluation of measurements (filtering out rain. snow, etc) √ And many more ■ Visualization √ Display of measurement data in application-specific co-ordinate system

System Requirements

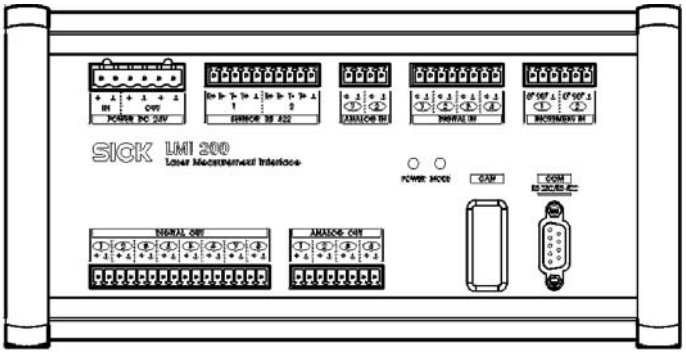
	MST 200/LMI 200
Computer	Pentium 133 MHz
Hard Disk Space	4 MB of available disk space
Disk Drive	One CD ROM drive
Memory Requirements	16 MB RAM
System Software	Windows™ 98, NT, 2000, XP, ME
Development Medium	MS Visual Basic C++ 5.0 or higher
Mouse	Optional but recommended

Models and Part Numbers

	LMI 200-1210031	LMI 200-1210041
Model	Standard Version	Development Version
Part Number	1 018 930	1 018 931
Includes MST 200	■	■
Software Library	■	■
C++ Compiler		■
Debugger		■

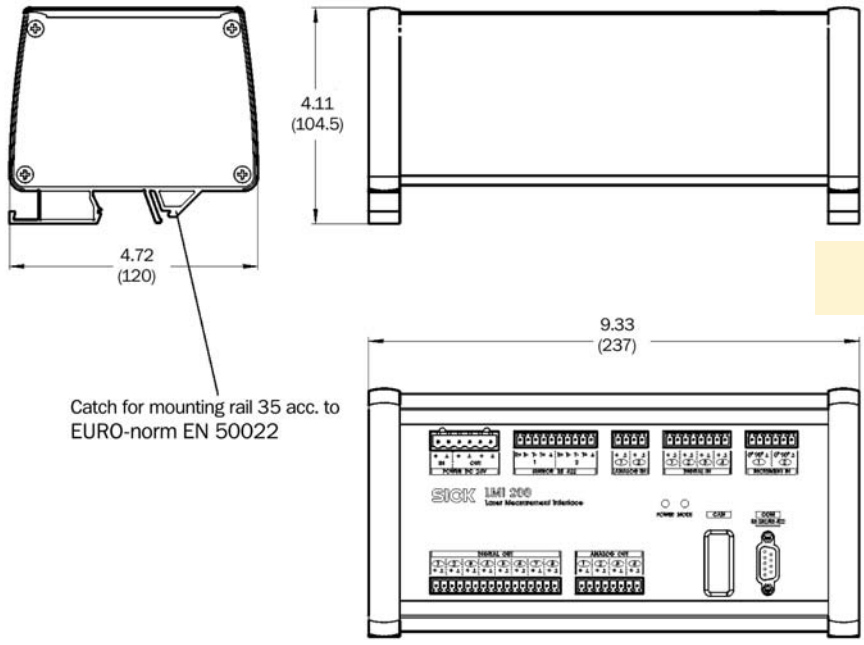
NOTE: Accessories information is located on page 189.

Drawings

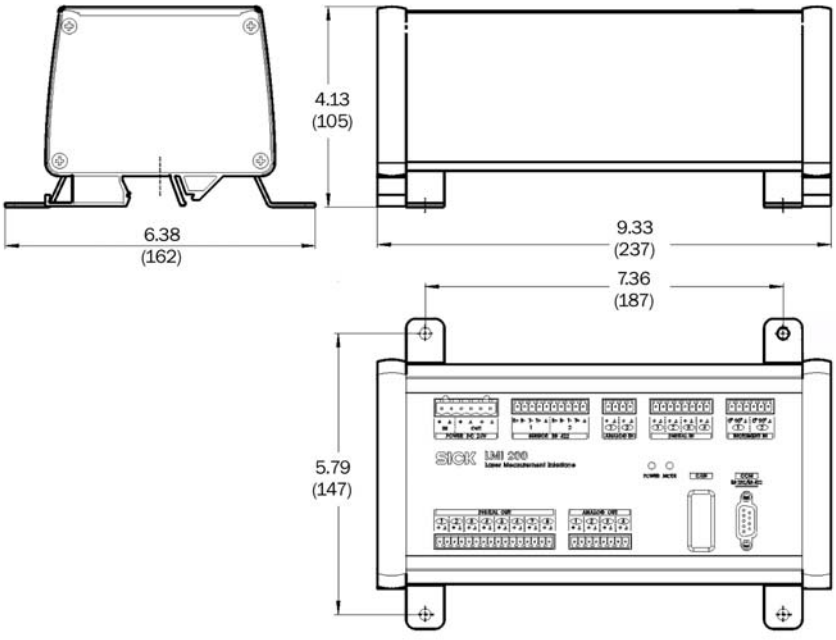


Drawings

Dimensions in inches (mm)



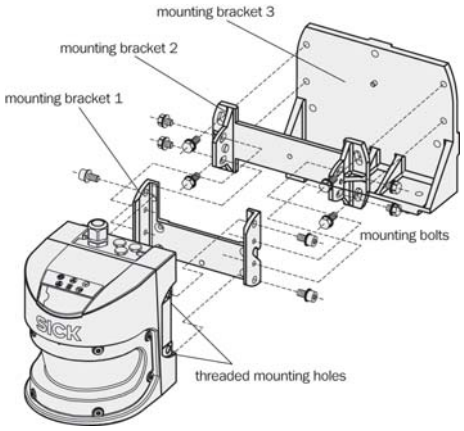
LMI 200



LMI 200
with wall mounting

Mounting Brackets

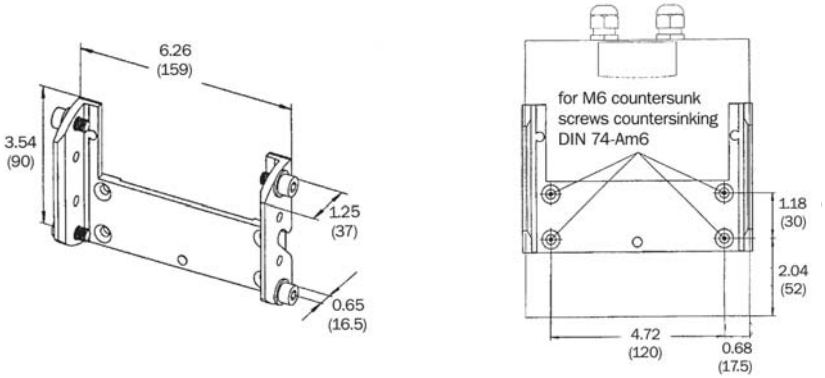
LMS 200/291



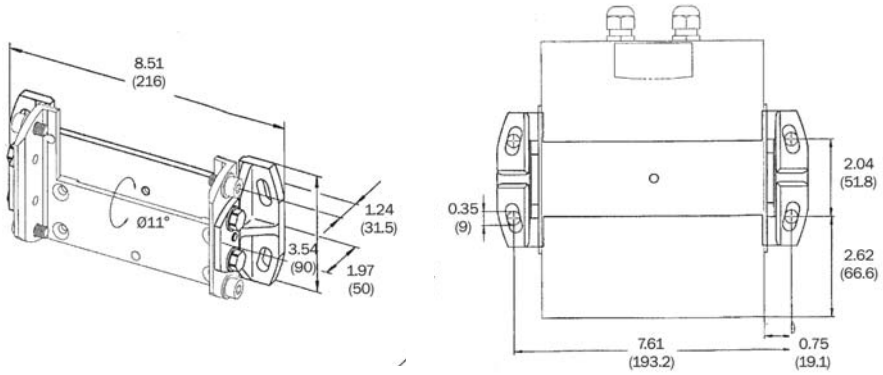
Part Number	Model
2 015 623	PLS LMS 200/291 Mtg Set 1
2 015 624	PLS LMS 200/291 Mtg Set 2
2 015 625	PLS LMS 200/291 Mtg Set 3

Dimensions in inches (mm)

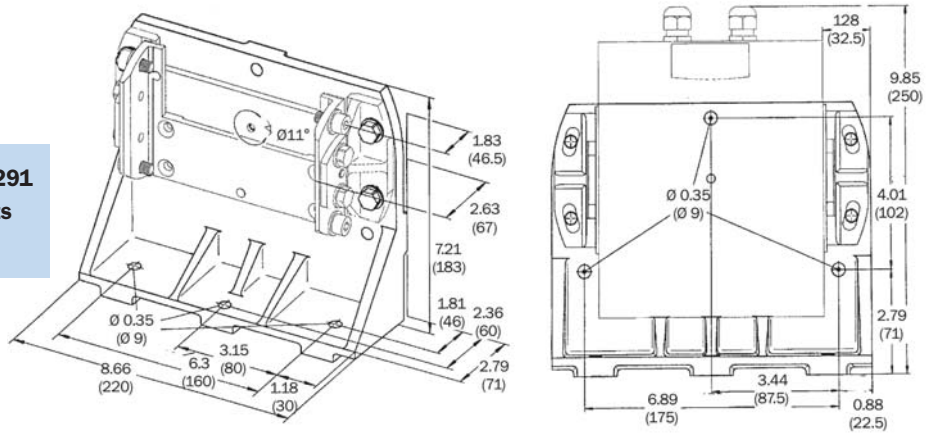
PLS LMS 200/291 Mounting Set 1



PLS LMS 200/291 Mounting Sets 1 and 2



PLS LMS 200/291 Mounting Sets 1, 2 and 3

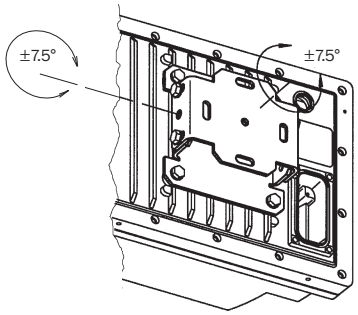


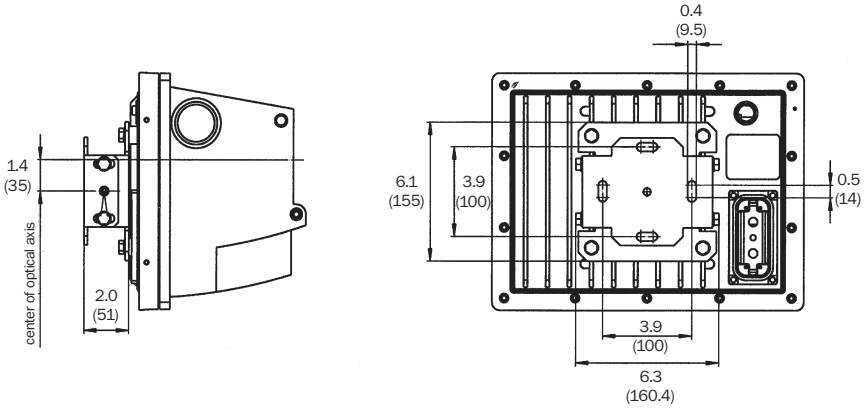
Mounting Brackets

LMS 211/221

LMS 211/221
Mounting Set
Part number
2 018 303

Dimensions in inches (mm)

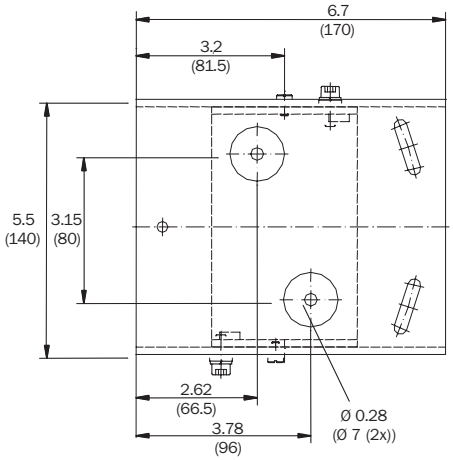


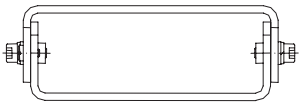


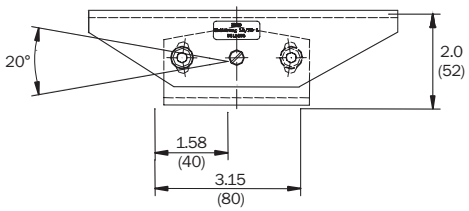
LD OEM/PDS

LD OEM/PDS
Mounting Set
Part number
5 311 055

Dimensions in inches (mm)





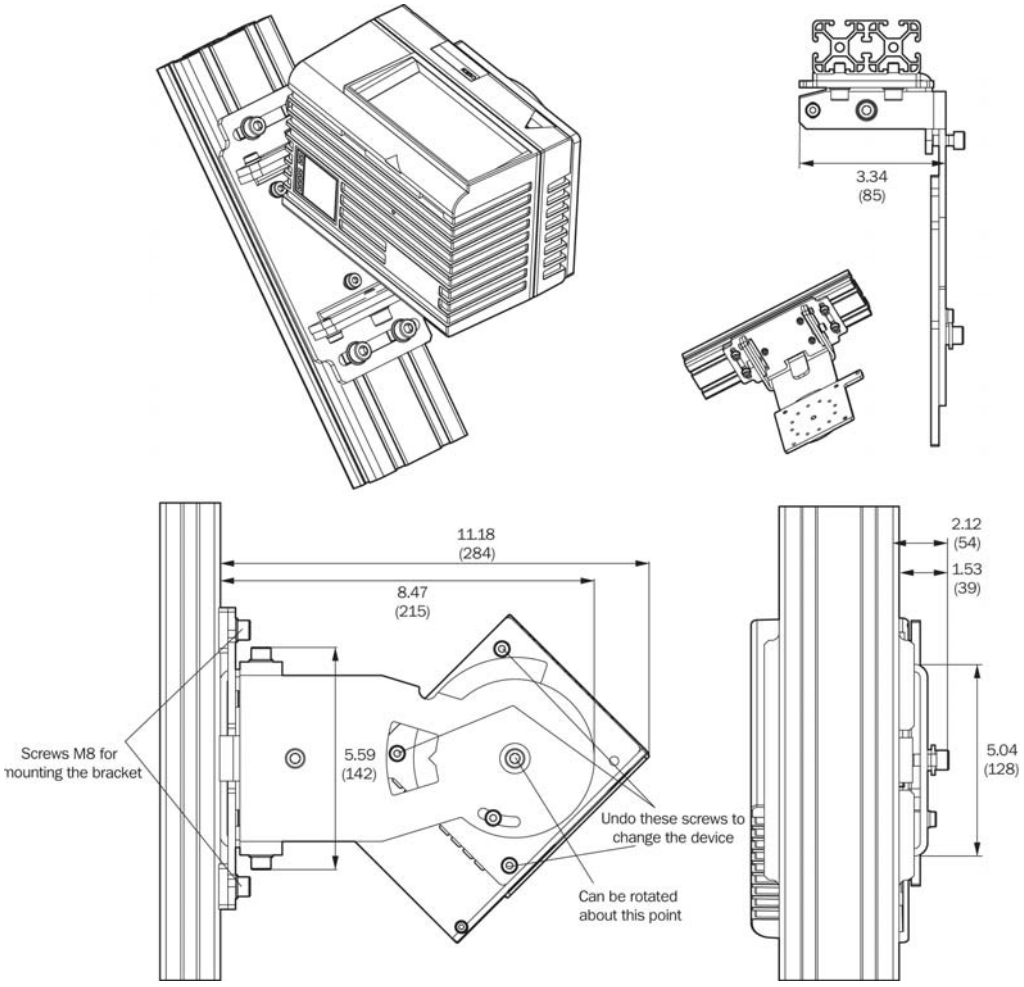


Mounting Brackets

LMS 400

LMS 400
Mounting Set
Part number
2 030 421

Dimensions in inches (mm)

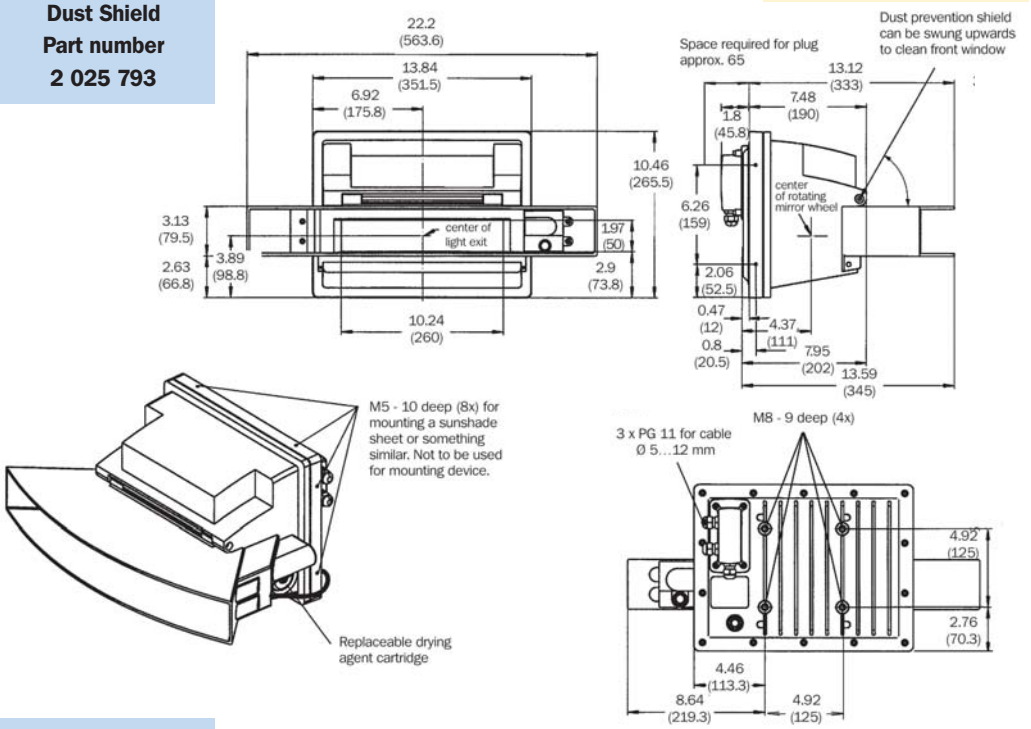


Spare Parts/Accessories

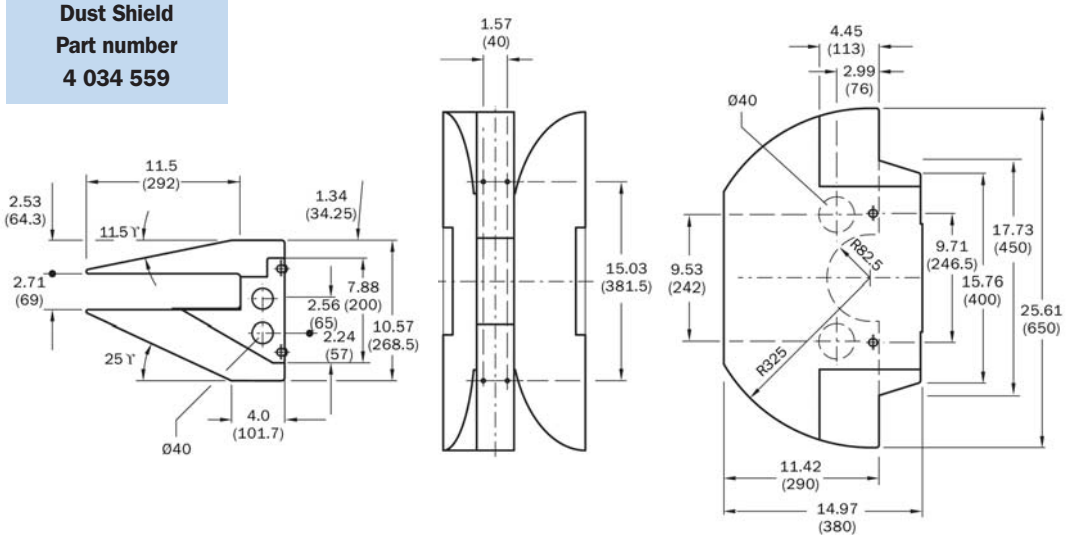
LMS 211/221

LMS 211
Dust Shield
Part number
2 025 793

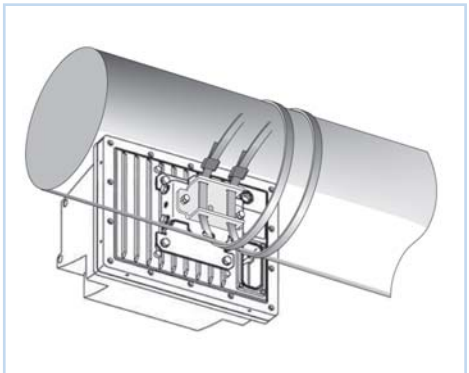
Dimensions in inches (mm)



LMS 221
Dust Shield
Part number
4 034 559



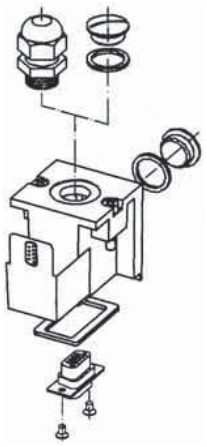
LMS 211/221
Tightening Straps
Part number
5 306 222



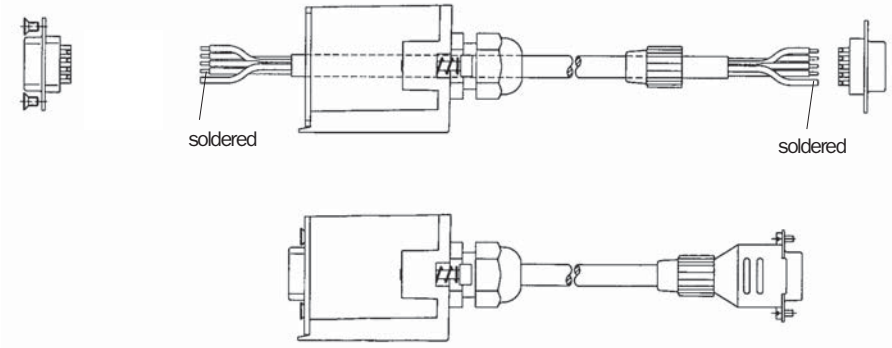
Cables

LMS 200/291

PLS LMS 200/291
Connection Blocks
Part number
2 018 963

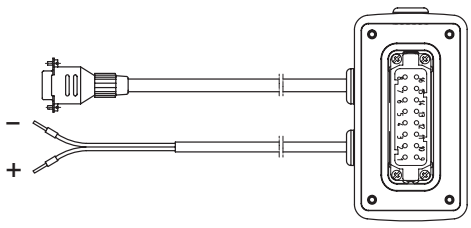


LMS 200/291
RS 232
5 m Cable
Part number
2 027 786



LMS 211/221

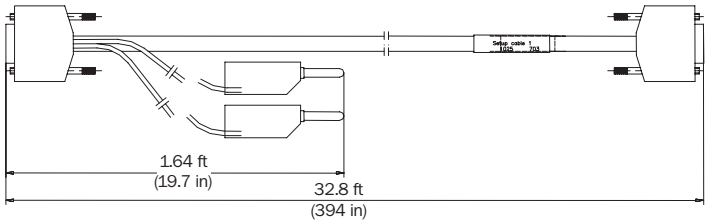
LMS 211/221
5 m Interface Cable
Part number
2 019 561



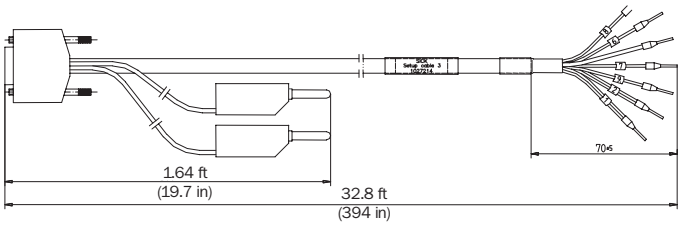
Cables

LD PeCo

LD PeCo
Setup Cable 1
Part number
1 025 703



LD PeCo
Setup Cable 3
Part number
1 027 214



LMS 200/291

Scanners

Part Number	Model	Description
1 015 850	LMS 200-30106	0-10 m range, 180° field of view, IP 65 enclosure rating
1 018 028	LMS 291-S05	1-30 m range, 180° field of view, IP 65 enclosure rating, fog correction
1 025 329	LMS 291-S14	1-30 m range, 90° field of view, IP 65 enclosure rating, fog correction, fast version
1 026 226	LMS 291-S15	1-30 m range, 180° field of view, IP 65 enclosure rating, fog correction

Cables

Part Number	Model	Description
2 106 401	LMS 200/291 3 m Inter Cable	Interface programming cable only
2 016 402	LMS 200/291 5 m Inter Cable	Interface programming cable only
2 016 403	LMS 200/291 10 m Inter Cable	Interface programming cable only
2 018 963	LMS 200/291 Connect Blocks	Connector blocks only, no cables
2 027 786	LMS 200/291 RS 232 5 m Cable	Serial Port interface and power cables, with connector blocks
2 027 787	LMS 200/291 RS 232 10 m Cable	Serial Port interface and power cables, with connector blocks
2 027 788	LMS 200/291 500kB 5 m Quat	Interface and power cables, with connector blocks, connects with interface cards p/n 6022515

Mounting Brackets

Part Number	Model	Description
2 015 623	PLS LMS 200/291 Mounting Set 1	Non adjustable bracket mounts to flat vertical surfaces
2 015 624	PLS LMS 200/291 Mounting Set 2	2 axis movement, requires LMS 200/291 mounting set 1 (p/n 2015623)
2 105 625	PLS LMS 200/291 Mounting Set 3	Mounts to flat horizontal surfaces, requires LMS 200/291 mounting set 2 (p/n 2015624)
2 020 925	LMS 200/291 2 Axis Fine	2 axis fine adjustment mounting set
2 020 926	LMS 200/291 3 Axis Fine	3 axis for fine adjustment, requires LMS 200/291 2 axis fine adjustment (p/n 2020925)

LMS 211/221

Scanners

Part Number	Model	Description
1 025 629	LMS 211-30106	0-10 m range, 100° field of view, IP 67 enclosure rating, integral heater
1 018 023	LMS 211-30206	1-30 m range, 100° field of view, IP 67 enclosure rating, integral heater, fog correction
1 018 966	LMS 211-S07	1-30 m range, 100° field of view, IP 67 enclosure rating, integral heater, fog correction, relay output variant
1 025 487	LMS 211-S14	1-30 m range, 90° field of view, IP 67 enclosure rating, integral heater, fog correction, fast version
1 026 225	LMS 211-S15	1-30 m range, 100° field of view, IP 67 enclosure rating, integral heater, fog correction, for use with LMI 400 only
1 015 945	LMS 221-30106	0-10 m range, 180° field of view, IP 67 enclosure rating, integral heater
1 018 022	LMS 221-30206	0-30 m range, 180° field of view, IP 67 enclosure rating, integral heater, fog correction
1 018 965	LMS 221-S07	0-30 m range, 180° field of view, IP 67 enclosure rating, integral heater, fog correction, relay output variant

Scanners

Part Number	Model	Description
1 025 328	LMS 221-S14	0-30 m range, 90° field of view, IP 67 enclosure rating, integral heater, fog correction, fast version
1 026 224	LMS 221-S15	0-30 m range, 180° field of view, IP 67 enclosure rating, integral heater, fog correction

Cables

Part Number	Model	Description
2 019 561	LMS 211/221 Interface Cable	Interface cable, 5 m long, connector with 2 cables for configuration and power

* To connect a LMS 211/221 sensor, a data cable (Lapp p/n LI2YCY or equal), a power cable (Lapp p/n 601402 or equal), and one 9-pin Sub-D connector is required.

Mounting Brackets

Part Number	Model	Description
2 018 303	LMS 211/221 Mounting Set	LMS 211/221 mounting set (alignment bracket)
2 018 304	LMS 211/221 Mast Bracket	Mast bracket, requires LMS 211/2211 mounting set (p/n 2018303)
5 306 222	LMS 211/221 Tighten Strap	Strap, requires LMS 211/221 mast bracket (p/n 2018304)
5 306 221	LMS 211/221 Strap Lock	Lock, requires LMS 211/221 strap (p/n 2018304)

Spare Parts/Accessories

Part Number	Model	Description
2 018 301	LMS 211/221 Plug w/Housing	Replacement outdoor LMS connection plug with housing
6 004 379	LMS 211/221 Plug w/o Housing	Replacement outdoor LMS connection plug without housing
5 306 179	LMS 211/221 Drying Cartridge	Replacement drying cartridge for LMS 211/221
2 025 793	LMS 211 Dust Shield	100° Dust shield for LMS 211
4 034 559	LMS 221 Dust Shield	180° Dust shield for the LMS 221

LMS 200 Series

Spare Parts/Accessories

Part Number	Model	Description
6 022 515	LMS PCI PC Interface Card	Serial, high speed proprietary 500 kB Quatech DSC 200/300 interface card RS 422, connects with LMS 200/291 500 kB Quat cable, connects with (p/n 2027788)
7 026 897	LMS PCMICIA Interface Card	Serial, high speed proprietary 500 kB CSM GmbH interface card RS 422, connects with LMS 200/291 500 kB MOXA cable (p/n 2022655)
7 028 789	PS50W-24V Power Supply	PS50W-24V power supply, capable of powering one indoor LMS
7 028 790	PS95W-24V Power Supply	PS95W-24V power supply, capable of powering two LMS 200, two LMS 291
6 020 756	Scanfinder LS70B	Topcon model LS70B receiver for locating scanner beams
7 025 784	LMSIBS Configuration Software	LMS/LMI user configuration software, included with LMS order. Available free online

LMS 400

Scanner

Part Number	Model	Description
1 023 925	LMS 400-0000	0.7-3 m range, 70° field of view, IP 67 enclosure rating 150…500 Hz scan frequency, 10…200% required object remission
1 027 897	LMS 400-1000	0.7-3 m range, 70° field of view, IP 67 enclosure rating 360…500 Hz scan frequency, 6.5…200% required object remission

Cables

Part Number	Model	Description
1 025 363	CDM 490-0001	Connection module CDM, connection possibility for a LMS 400 (the terminal surface is inside the housing)
1 025 365	CDM 490-0101	Connection module CDM/CMP, connection possibility for LMS 400 (the terminal interface is at the outside of the housing)
2 020 302	LMS 400 CDM 3 m Cable	Connection cable to the CDM, 3 m, 15 cores, screened, D-Sub-HD plug/socket (15 poles)
2 021 815	LMS 400 CDM 10 m Cable	Connection cable to the CDM, 10 m, 15 cores, screened, D-Sub-HD plug socket (15 poles)
2 014 054	LMS 400 RS 232 3 m Cable	Connection cable from the terminal interface to the serial interface of the PC, 3 m, 3 cores, with two 9-pole D-Sub sockets
1 023 850	LMS 400 CMC	Parameter memory module for installation in CDM
2 031 372	LMS 400 Term 3 m Cable	Communication cable to the terminal interface in the plug cover, 3 m
2 032 821	LMS 400 Crossover Cable 10 m	Crossover connection cable LMS 400 with connection hood and PC
2 030 467	LMS 400 Ethernet Cable 10 m	Connection cable LMS 400 with connection hood and Ethernet hub or switch

Mounting Brackets

Part Number	Model	Description
2 030 421	LMS 400 Mounting Bracket	Mounting bracket for mounting the LMS 400 to ITEM aluminum profiles

Spare Parts/Accessories

Part Number	Model	Description
2 030 439	LMS 400 Plug	Plug cover, M-fitting
2 030 535	LMS 400 Plug with Cable	Plug cover, M-fitting, two connection cables D-Sub 15 poles, 3 m

LD OEM/LD PDS

Scanners

Part Number	Model	Description
1 028 698	LD OEM-1000	0-24 m range, 360° field of view, IP 40 enclosure rating, on-board DSP
1 025 993	LD PDS with RS 232	0-24 m range, 360° field of view, IP 40 enclosure rating, embedded zone protect software
1 026 440	LD PDS with RS 422	0-24 m range, 360° field of view, IP 40 enclosure rating, embedded zone protect software

Cables

Part Number	Model	Description
6 032 508	LD OEM RS 232 Cable	Commissioning cable RS 232 15-pin to RS 232
6 032 509	LD OEM TCP/IP Cable	Commissioning cable Ethernet 15-pin HD to RJ45
2 039 087	LD OEM Install CD	CD-ROM LD-OEM/LD-LRS
6 025 934	LD OEM Spare Fuse	Spare fuse with holder T5A0 125V SMD

Mounting Brackets

Part Number	Model	Description
5 311 055	LD OEM/PDS Mounting Brackets	Assembly bracket, complete with securing material and tool

Spare Parts/Accessories

Part Number	Model	Description
2 039 087	LD OEM Install CD	CD-ROM LD-OEM/LD-LRS
6 025 934	LD OEM Spare Fuse	Spare fuse with holder T5A0 125V SMD

LD PeCo

Scanner

Part Number	Model	Description
1 023 382	LD PeCo 5.5 m (maximum height)	2.5-5 m range, 90° field of view, IP 40 enclosure rating, embedded people counting software
1 023 383	LD PeCo 15 m (maximum height)	5-15 m range, 90° field of view, IP 40 enclosure rating, embedded people counting software

Cables

Part Number	Model	Description
1 025 703	LD PeCo Setup Cable 1	Setup cable 1, with 9-pin D Sub socket / 9-pin D Sub plug and two power supply lines, pin assignment designed for the RS 422/RS 232 interface converter B&B model 4WSD9R
1 027 214	LD PeCo Setup Cable 3	Setup cable 3, with 9-pin D Sub connector / open leads and two lines for power supply, aligned on the RS 422/RS 232 interface converter B&B model 4WSD9R

Spare Parts/Accessories

Part Number	Model	Description
5 311 055	LD PeCo Pipe	Aluminum installation pipe, L = 130 mm, Ø = 30 mm
1 025 633	LD PeCo Fall Arrester	Mechanical fall arrester including safety cord, thimble and snap hook
4 039 006	LD PeCo Pivot	For mounting LD PeCo on the wall or roof

LMI 200

Laser Measurement Interface

Part Number	Model	Description
1 018 930	LMI 200-1210031	LMI 200 standard variant, inc. MST software library
1 018 931	LMI 200-1210041	LMI 200 development system, inc. MST software library, C++ compiler and debugger

Cables

Part Number	Model	Description
2 016 401	LMS 200/291 3 m Inter Cable	Interface programming cable only
2 016 402	LMS 200/291 5 m Inter Cable	Interface programming cable only

Mounting Bracket

Part Number	Model	Description
2 021 228	LMI 200 Mounting Set	LMI mounting set for wall mounting

Radio Frequency Identification Interrogator

Features

- High level reading security in high-speed conveyor applications
- Simultaneous reading of up to 50 tags per second
- Compliance to ISO 15693 enables reading of transponders from a variety of sources
- Variable antenna configurations that meet application requirements
- Interrogator trigger mode for object presence detection
- RS 232 data interface
- 13.56 MHz RFID system

The RFI341 Interrogator is an ISO 15693 standard compatible 13.56 MHz transponder read/write unit. Based on its high output and high input sensitivity – dependent on the antenna and transponder type used – a reading performance with a single antenna of up to 1.2 meters can be achieved. The anti-collision feature enables the detection of up to 50 tag IDs simultaneously within one second.

The Interrogator contains an internal splitter, which enables the use of two antennas simultaneously. Because of this feature, the Interrogator is well suited for use in high-speed conveyor belt applications (e.g. in combination with totes).

Technical Specifications

	RFI341-1520
Air Interface	
Frequency	13.56 MHz
Standard	ISO 15693 (others on request), ISO 18000-3 “Mode 1”
Antenna	
Sending Performance	2 x 2 W (at 50 Ohm), splitter configuration
Optical Indicators	2 (Power, Tag Data)
Data Interface	RS 232 (Ethernet via CDM 420 with CMF 400-3101)
Data Transfer Rate	9,600 / 19,200 / 38,400 / 57,600 / 115,200 Bd
Protocol	STX/ETX
Switching Inputs	2 x, V_{in} = 24 V DC, for e.g. triggering via photoelectric switches
Switching Outputs	2 x, open collector (R_i - 100 Ohm), V_{OUTmax} = 36 V, I_{OUTmax} = 30 mA
Electrical Connections	Terminal strip, BNC connectors (antenna)
Power Supply Voltage	230 V AC, 50 Hz (115 V AC, 50…60 Hz)
Current Consumption	< 1 A
Housing	Metal
Dimensions	400 x 200 x 120 mm
Enclosure Rating	IP 65
CE Approval	Acc. to EN 301489-1, -3 / acc. to EN 60950 / acc. to EN 50364 / acc. to EN 50357
Radio Approval	Acc. to EN 300330 (with released antennas), FCC Part 15 in preparation
Operating Temperature	32…122°F (0…50°C)
Storage Temperature	-4…158°F (-20…70°C)

Accessories

Antennas	
RFA331-1020	200 x 200 mm, range max. 550 mm (2 W, Tag ISO card size), IP 40
RFA341-3520	400 x 400 mm, range max. 750 mm (2 W, Tag ISO card size), IP 65

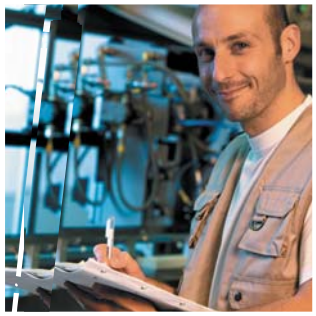
RANGE OF EXPERTISE

INDUSTRIAL SENSORS

SICK is one of the world's leading manufacturers of sensors, safety systems, and automatic identification products for industrial applications. SICK holds more than 450 patents for its innovative products. Through its Industrial Sensors, Safety Systems, Automatic Identification, and Environmental and Process Analysis divisions, the company has operations in 65 countries. SICK North America is headquartered in Minneapolis, MN.

SAFETY SYSTEMS

Products from SICK provide comprehensive safeguarding of both workers and machinery. As experts in sensor technology, SICK develops and manufactures pioneering products that provide protection in hazardous zones, dangerous locations and for safeguarding access points. By providing services, which encompass all aspects of machine safety and security, SICK is setting new standards in safety technology.



AUTOMATIC IDENTIFICATION

Our wide range of sensors provides solutions to suit any application in the field of automation. Even under rugged ambient conditions, objects are reliably detected, counted and positioned regardless of their form, location and surface finish.

ANALYZERS AND PROCESS INSTRUMENTATION

Whether the tasks involve identification, handling, classification or volume measurement, innovative automatic identification systems and laser measurement systems from SICK function reliably, even under rapid cycle times. Products from SICK conform to the latest standards and can be easily integrated in all industrial environments and external applications.

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