

Four Reasons

NL900S



Wireless Highspeed Ethernet
Transceiver

NL6000



VHF/UHF Modem

NL5500



VHF/UHF Modem
Cost-Effective Performance

NL900



900MHz Spread Spectrum

To Go Wireless

7610 Miramar Road, San Diego, CA 92126-4202
Phone: (800) 233-1728 or (858) 549-6340 Fax: (858) 549-6349
Email: rwhite@rfneulink.com Website: www.rfneulink.com

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A Division of RF Industries

Select the radio modem that works for you

RF Neulink's NL900S

Wireless Highspeed Ethernet Transceiver



Incorporates advanced features such as:

- Sophisticated Error Correction
- 128-bit AES Encryption
- RJ45, USB, DB-9 Serial Input
- TCPIP – LAN Connection
- 38.4 kb/s – 500,000 bps Over-the-air
- Wide Area Networking
- Mobile or Fixed Applications
- Supply Voltage 10-16 VDC
- Compact size 4.2" x 4.2" x 1.6"

RF Neulink's NL6000

VHF/UHF Modem



Incorporates advanced features such as:

- Conventional VHF/UHF Frequencies
- Forward Error Correction
- Configurable as Data Repeater
- Tx Output Power 1-6 Watts
- Available in 6.25, 12.5 and 25 KHz Channel Spacing
- -115 dbm for 99% Msg Reliability
- Serial DB-9 RS232 I/O
- PC Configurable Via Serial Port
- Fully Compatible With NL5500

RF Neulink's NL5500

Cost-Effective VHF/UHF Modem



Incorporates features such as:

- Conventional VHF/UHF Frequencies
- Tx output power 1-6 Watts
- Available in 6.25, 12.5 and 25 KHz Channel Spacing
- -107 dbm for 99% Msg Reliability
- Serial DB-9 RS232 I/O
- PC Configurable Via Serial Port
- Fully Compatible With NL6000

RF Neulink's NL900

900MHz Spread Spectrum



Incorporates features such as:

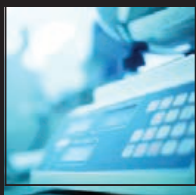
- Data Encryption Standard (DES)
- DB-9 Serial Input
- Serial Data Rates Up To 115.2 Kbps
- Includes AC Power Supply
- Supply Voltage 7-18 VDC
- PC Configurable Via Serial Port
- Point to Point & Multi-point

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NL900

- Simple cable replacement for retrofits & new installs
- Transmits around corners, through walls & obstructions
- Reliable communication at rates up to 115.2 Kbps

APPLICATION IDEAS



Weigh Scales —

Instantly access weight and measurement data. Link virtually cuts wires to all brands of scale equipment, from indicators to receipt printers.



Process Control —

Set up any factory more conveniently. Engineers and technicians can quickly move data links from machine to machine without costly wiring.



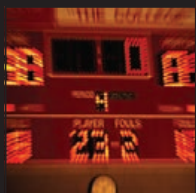
Kiosks & P.O.S. —

Small & portable, links make it possible to set up equipment where it best serves customers. Use at retail stores, service stations, events, etc.



Data Logging —

Upload data to your PC from your logger or monitor without getting up from the chair. Use Link for tank level-monitoring, control instruments, etc.



Electronic Signs —

Faster, cheaper & less invasive than trenching to lay cable, Links simply attach to the serial ports of the PC and sign or scoreboard.

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Industrial Wireless Modem



PRODUCT OVERVIEW

RF NEULINK'S NL900 stand-alone transceiver can be set up in minutes to virtually cut the cables between RS232 devices. Its flexibility and price allows users to quickly upgrade wired terminals to cordless operation in industrial, commercial, even residential applications.

Powered by a 1000mW 900 MHz radio, each NL900 unit is small and easily portable for use in mobile and temporary settings as well as for fixed installations. Optional software enables custom configurations based on user needs.

This modem implements a proprietary communication protocol to provide secure local data transmissions. Because it uses FHSS technology, the data remains reliable over distances of up to 10 miles line-of-sight (900 MHz). Use of a license-free frequency band ensures that the NL900 is ready to use with no further certification requirements. Every unit is backed by a 30-day guarantee and full warranty with technical support.

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RF232® TRANSPARENT PROTOCOL

Change configuration commands:

Configuration can be changed through a command/data interface signal or AT commands. Change-on-the-fly parameters include base or remote designation, destination MAC address, channel number (to communicate with a different base), enter/exit low-power modes, etc. Custom settings are available by user request.

Handshaking: CTS to hold off the host; RTS to hold off the transceiver. Full modem-mode available.

In-range indicator: Hardware link indication of remote in range of base.

ERROR HANDLING

Error detection: Multi-stage error detection with transmitter retries for RF system and raw data. Duplicate packets are filtered out when data is received more than once due to retries and missed ACKs.

Data encryption standard (DES): DES uses an established algorithm and a 56-bit key stored in onboard EEPROM to protect data. Available in NL900 version only.

SETUP AND OPERATION

The complete system is comprised of a central base and any number of remote nodes that can operate in point-to-point or point-to-multipoint networks. Multiple sub-networks can be created by assigning unique radio addresses to specific device groups. RF Neulink is available to support in-system design and applications.

ORDERING INFO

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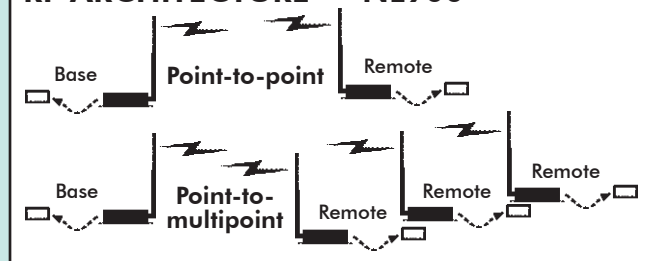
SPECIFICATIONS

Standard interface	RS232 (DB9 male)
Frequency band.....	902 to 928 MHz
Modulation.....	FHSS FSK
Serial interface data rate.....	1200-115,200 bps
Output power	1000mW variable
Input power	7Vdc to 18Vdc
Power Consumption (@12VDC).....	400mA Tx, 40mA Rx
Power Supply	AC transformer via 6-foot cable (183 cm)
Electrical requirements	Line voltage 100-120V (240V outside U.S.); Frequency 50-60 Hz
Channels.....	Up to 32
Security	1-byte system ID, DES
Sensitivity	-100 dB @ full RF data rate
Range	Up to 10 miles (16 km)
Temperature	-30° to +60°C
Humidity	90% at 40°C non-condensing
Dimensions	4.75 x 2.75 x 1.17 inches (121 x 70 x 30 mm)
Weight	<6 oz. (<170 g)
Antenna; connector	Dipole; RP-SMA jack (female)
Configuration software.....	Included, for Windows OS

RF Neulink reserves the right to change specifications of this product at any time without notice and without obligation to notify any person of such changes.

For outside operation of radio modem products a NEMA 4 enclosure is recommended.

RF ARCHITECTURE — NL900



WHO IS RF NEULINK?



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NL900S

TELEMETRY APPLICATIONS

- Data Terminals
- Water Management
- Remote Data Loggers
- Oil & Gas Monitoring
- Irrigation Control Security Systems

MOBILE APPLICATIONS

- Database Access
- Computer Aided Dispatch
- Vehicle Tracking
- Asset Tracking
- Fleet Management

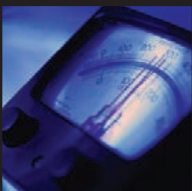
APPLICATION IDEAS



*Oil and Gas
Monitoring*



Irrigation Control



Data Logging



Water Management

High Speed Industrial Wireless Modem



PRODUCT OVERVIEW

The NL900S FHSS transceiver module is an effective, high-power solution for point-to-point and point-to-multipoint wireless systems in the 900 MHz ISM band. The RF output power of the NL900S can be set from 1 mW to 1 Watt, and the RF data rate can be set from 38.4 to 500 kb/s. The NL900S receiver includes a low-noise preamplifier protected by two SAW filters, providing an excellent combination of receiver sensitivity and out-of-band interference rejection. The NL900S provides the flexibility and versatility to serve applications ranging from cable replacements to sensor networks. The NL900S transceiver is easy to integrate and provides robust wireless communications up to 20 miles in line-of-sight installations using directional antennas.

These units implement a proprietary communication protocol to provide secure local data transmissions. Because it uses advanced Error Correction and FHSS technology, the data remains reliable over distances of up to 20 miles line-of-sight. Use of license-free frequency bands ensures that the NL900S is ready to use with no further certification requirements. Every unit is backed by a 30-day guarantee and full warranty with technical support.

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WIRELESS HIGHSPEED ETHERNET TRANSCEIVER

- Sophisticated Error Correction
- 128-bit AES Encryption
- RJ45, USB, DB-9 Serial Input
- TCP/IP – LAN Connection
- 38.4 to 500 kb/s Over-the-Air
- Wide Area Networking
- Mobile or Fixed Applications
- Supply Voltage 10-16 VDC
- Compact size 4.2" x 4.2" x 1.6"

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TECHNICAL SPECIFICATIONS

Interface

NL900S

Interface Connector.....	DB-9 Femal, RJ45, USB
RF Connector	RPSMA Jack
Impedance	50 Ohms unbalanced
Serial Interface Data	1200 bps to 115.2 kb/s
Power Consumption	180-1100 mA @ 12VDC
Channels	50
Supported Network Topologies	Point-to-Point, Point-to-Multipoint
Security.....	128-bit AES security

Operational

Frequency Band	902–928 MHz (USA)
RF Data Rate (Over the Air)	38.4 to 500 kb/s
RF Technology	FHSS or DS
Spectrum or Direct	
Output Power.....	1000mW
Supply Voltage	10–16 VDC
Sensitivity @10 ⁻⁵ BER.....	-108 dbm typical @ 38.4 kb/s
Range, Line of Site	Up to 20 miles
Encryption	128 Bit AES

Environmental

Temperature (Operating)	-30°C to +70°C
Temperature (Storage)	-40°C to +80°C
Humidity	90% non-condensing

Physical

Dimensions	4.2" x 4.2" x 1.6"
Weight	8 oz

Certifications

FCC Part 15.247
Industry Canada (IC)

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For outside operation of radio modem products, a NEMA 4 enclosure is recommended

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NL5000

TELEMETRY APPLICATIONS

- Data Terminals
- Water Management
- Remote Data Loggers
- Oil & Gas Monitoring
- Irrigation Control

MOBILE APPLICATIONS

- Database Access
- Computer Aided Dispatch
- Vehicle Tracking
- Asset Tracking
- Fleet Management

Features

- Modem and Transceiver
- Synthesized VHF and UHF
- Narrow Band or Wideband
- Complete Programmable Features
- Compact Size
- 3.6" L x 2.3" W x 1.0" H
- CRC and Forward Error Correction
- Configurable RS232 Serial Port
- Compact size 4.2" x 4.2" x 1.6"

Frequency Range

136-162 MHz VHF

148-174 MHz VHF

216-235 MHz VHF

400-420 MHz UHF

450-470 MHz UHF

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Wireless Modem



PRODUCT OVERVIEW

For over two decades RF Neulink has been providing wireless data networking solutions with applications in SCADA, telemetry, telecommunications, and water management.

The NL5000 Transceiver Series is a price/performance leader in licensed conventional radios in both the VHF and UHF frequency range. They provide increased throughput, and longer range for multiple address systems. Transparent and direct asynchronous communication offers real-time communication. No extra software or programming is needed to implement communications using standard asynchronous protocols.

The NL5000 Transceiver Series is field configurable as a master station or remote radio. They can operate as a half-duplex or simplex radios. The simplex mode facilitates peer-to-peer radio communications while using a carrier sense (CSMA) channel collision avoidance technique.

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APPLICATION IDEAS



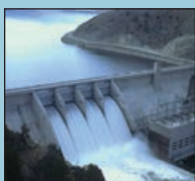
Oil and Gas Monitoring



Irrigation Control



Data Logging



Water Management

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TECHNICAL SPECIFICATIONS

General	VHF	UHF
Frequency Range.....	136–174 MHz	400–470 MHz
Channel Spacing.....	12.5 or 25 kHz	12.5 or 25 kHz
Channel Increment.....	2.5 kHz	5/6.25 kHz
Operating Temperature	–30° to +60° C	–30° to +60° C
Humidity	90% at 40° C non-condensing	
Frequency Stability (–30°to +60°C).....	1.5 PPM.....	1.5 PPM
12.5 kHz Channel Data Rate	9600 bps.....	9600 bps
25 kHz Channel Data Rate	19.2 kbps.....	19.2 kbps
6.25 kHz Channel Data Rate	4800 bps.....	4800 bps

User Interface

Data Rate of RS-232 Serial Port 2,400 – 38,400 bps configurable
Connectors 15 pin D type as DCE
Addressing..... Selective ID, Group & Broadcast

Supply Voltage

Input Voltage Range..... 11 – 16 VDC with internal regulator
NL6000 Max Current Drain ≤2.5 A..... ≤2.5 A

Transmitter

Operating Bandwidth..... 26 MHz.....20 MHz
RF Output Power 1–6 watts1–6 Watts
Duty Cycle5 to 100% depending on power and temperature
RF Load Impedance..... 50 Ohms..... 50 Ohms
Transmitter Attack Time ≤15 ms..... ≤15 ms
Spurious & Harmonics ≤–20 dbm..... ≤–20 dbm
FM Hum & Noise
12.5 kHz channel operation ≥40 db ≥40 db
25 kHz channel operation ≥45 db ≥45 db
Current Drain
1 watt ≤1.0 A..... ≤1.0 A
6 watt ≤2.4 A..... ≤2.4 A

Receiver

Operating Bandwidth..... 26 MHz.....20 MHz
Sensitivity
(12 db SINAD w de-emphasis)..... ≤0.28 μ V ≤0.28 μ V
Adjacent Channel Selectivity
+/- 12.5 w/narrow IF ≥60 db ≥60 db
+/- 25 w/wide IF ≥70 db ≥70 db
Spurious & Image Rejection ≥70 db ≥70 db
Intermodulation Rejection..... ≥70 db ≥70 db
FM Hum & Noise
12.5 kHz channel operation ≥40 db ≥40 db
25 kHz channel operation ≥45 db ≥45 db
Conducted Spurious ≤–57 dbm..... ≤–57 dbm
Receive Attack Time..... ≤15 ms..... ≤15 ms
RSSI Squelch Attack Time..... ≤15 ms..... ≤15 ms
Receive Current Drain ≤80 mA..... ≤75 mA

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For outside operation of radio modem products, a NEMA 4 enclosure is recommended

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NL5500

TELEMETRY APPLICATIONS

- Data Terminals
- Water Management
- Remote Data Loggers
- Oil & Gas Monitoring
- Irrigation Control Security Systems

MOBILE APPLICATIONS

- Database Access
- Computer Aided Dispatch
- Vehicle Tracking
- Asset Tracking
- Fleet Management

FEATURES

- Modem and Transceiver
- Synthesized VHF and UHF
- Narrow Band or Wideband
- Complete Programmable Features
- Compact Size: 3.0" L x 2.6" W x 1.4" H
- Powerful DSP - 288 MIPS
- Superior Radio Performance
- Serial Port - RS232
- CRC (For FEC use NL6000)

FREQUENCY RANGES

136-162 MHz VHF
148-174 MHz VHF
216-235 MHz VHF
400-420 MHz UHF
450-470 MHz UHF

HIGH PERFORMANCE DSP
TMS320VC5509 - 288 MIPS

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Wireless Modem

Cost-Effective VHF/UHF Performance



PRODUCT OVERVIEW

The NL5500 Transceiver Series is a price/performance leader in licensed conventional radios in both the VHF and UHF frequency range. The capability for transparent and direct asynchronous communication offers real-time communication. The NL5500 is fully compatible with RF Neulink's NL6000. It will communicate and coexist with NL6000s, while providing excellent throughput and long range for multiple address systems. The NL5500 Transceiver Series is field configurable as a master station or remote radio. These units can operate as a half-duplex or simplex radios. The simplex mode facilitates peer-to-peer radio communications while using a carrier sense (CSMA) channel collision avoidance technique.

The NL5500 is ideal for any system where cost-effective performance, reliable data rates, and compact size are a requirement.

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SPECIFICATIONS

General	VHF	UHF
Frequency Range	136–174 MHz	400–470 MHz
Channel Spacing	12.5 or 25 kHz	12.5 or 25 kHz
Channel Increment	2.5 kHz	5/6.25 kHz
Operating Temperature.....	–30° to +60° C	–30° to +60° C
Operating Humidity.....	90% at 40° C non-condensing	90% at 40° C non-condensing
Frequency Stability (-30°to+60°C).....	1.5 PPM	1.5 PPM
12.5 kHz Channel Data Rate.....	12 kbps	12 kbps
25 kHz Channel Data Rate.....	22 kbps	22 kbps
User Interface		
Data Rate of RS-232 Serial Port	1200 – 38,400 bps configurable	
Connectors	9 pin D type as DCE	
Addressing	Selective ID, Group & Broadcast	
Supply Voltage		
Input Voltage Range	11 – 16 VDC with internal regulator	
NL6000 Max Current Drain.....	≤2.5 A	≤2.5 A
Transmitter		
Operating Bandwidth.....	26 MHz	20 MHz
RF Output Power.....	1–6 watts	1–6 Watts
Duty Cycle	5 to 100% depending on power and temperature	
RF Load Impedance	50 ohms	50 Ohms
Transmitter Attack Time.....	≤15 ms	≤15 ms
Spurious & Harmonics.....	≤–20 dbm	≤–20 dbm
FM Hum & Noise		
12.5 kHz channel operation.....	≥40 db	≥40 db
25 kHz channel operation.....	≥45 db	≥45 db
Current Drain		
1 watt.....	≤1.0 A	≤1.0 A
6 watt.....	≤2.4 A	≤2.4 A
Receiver		
Operating Bandwidth.....	26 MHz	20 MHz
Sensitivity (12 db SINAD w/de-emphasis)	≤0.28 μ V	≤0.28 μ V
Adjacent Channel Selectivity		
+/- 12.5 w/narrow IF	≥60 db	≥60 db
+/- 25 w/wide IF	≥70 db	≥70 db
Spurious & Image Rejection.....	≥70 db	≥70 db
Intermodulation Rejection	≥70 db	≥70 db
FM Hum & Noise		
12.5 kHz channel operation.....	≥40 db	≥40 db
25 kHz channel operation.....	≥45 db	≥45 db
Conducted Spurious.....	≤–57 dbm	≤–57 dbm
Receive Attack Time	≤15 ms	≤15 ms
RSSI Squelch Attack Time	≤15 ms	≤15 ms
Receive Current Drain	≤80 mA	≤75 mA

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NL6000

TELEMETRY APPLICATIONS

- Data Terminals
- Water Management
- Remote Data Loggers
- Oil & Gas Monitoring
- Irrigation Control Security Systems

MOBILE APPLICATIONS

- Database Access
- Computer Aided Dispatch
- Vehicle Tracking
- Asset Tracking
- Fleet Management

FEATURES

- Modem and Transceiver
- Synthesized VHF and UHF
- Narrow Band or Wideband
- Complete Programmable Features
- Compact Size
- 3.0" L x 2.6" W x 1.6" H
- CRC and Forward Error Correction
- Separate Telemetry and Mobile Media Access Control layers
- Powerful DSP - 288 MIPS
- Superior Radio Performance
- RS232 Serial Port

FREQUENCY RANGES

136-162 MHz VHF
148-174 MHz VHF
216-235 MHz VHF
400-420 MHz UHF
450-470 MHz UHF

**CONFIGURABLE AS
DATA REPEATER AND
WITH ERROR CORRECTION**

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VHF/UHF Wireless Modem



PRODUCT OVERVIEW

The RF NEULINK NL6000 Wireless Data Modem sets new standards for the wireless telemetry and mobile data industry. The modem and VHF or UHF transceiver are enclosed in one package. NL6000 radio channel data rates exceed typical Land Mobile Radio (LMR) frequency standards while maintaining radio channel reliability.

The NL6000 is capable of half and full channel spacing operation. This permits installation in systems where reformatting compliant narrow band frequencies have been assigned.

Due to several advanced signal processing techniques that correct for limitations of typical land mobile radios at high data rates, the NL6000 exhibits outstanding radio channel performance.

The NL6000 is ideal for any system where high performance RF specifications, high LMR data rates, and compact size are a requirement.

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Telemetry



Oil and Gas Monitoring



Irrigation Control



Public Safety

TECHNICAL SPECIFICATIONS – NL6000

General	VHF	UHF
Frequency Range.....	136–174 MHz.....	400–470 MHz
Channel Spacing.....	*12.5 or 25 kHz.....	12.5 or 25 kHz
Channel Increment.....	2.5 kHz.....	5/6.25 kHz
Operating Temperature	–30° to +60° C	–30° to +60° C
Humidity	90% at 40° C non-condensing	
Frequency Stability (–30° to +60°C).....	1.5 PPM.....	1.5 PPM
12.5 kHz Channel Data Rate	12 kbps	12 kbps
25 kHz Channel Data Rate	22 kbps	22 kbps

User Interface

Data Rate of RS-232 Serial Port	1200 – 38,400 bps configurable
Connectors	USB and 9 pin D type as DCE
Addressing.....	Selective ID, Group & Broadcast

Supply Voltage

Input Voltage Range	11–16 VDC with internal regulator
NL6000 Max Current Drain	≤2.5 A

Transmitter

Operating Bandwidth	26 MHz	20 MHz
RF Output Power	1–6 watts.....	1–6 Watts
Duty Cycle	5 to 100% depending on power and temperature	
RF Load Impedance.....	50 Ohms.....	50 Ohms
Transmitter Attack Time	≤15 ms	≤15 ms
Spurious & Harmonics	≤–20 dbm	≤–20 dbm
FM Hum & Noise		
12.5 kHz channel operation	≥40 db.....	≥40 db
25 kHz channel operation	≥45 db.....	≥45 db
Current Drain		
1 watt	≤1.0 A ≤1.0 A	
6 watt	≤2.4 A ≤2.4 A	

Receiver

Operating Bandwidth	26 MHz	20 MHz
Sensitivity		
(12 db SINAD w de-emphasis).....	≤0.28 uV	≤0.28 uV
Adjacent Channel Selectivity		
+/- 12.5 w/narrow IF	≥60 db.....	≥60 db
+/- 25 w/wide IF	≥70 db.....	≥70 db
Spurious & Image Rejection	≥70 db.....	≥70 db
Intermodulation Rejection.....	≥70 db.....	≥70 db
FM Hum & Noise		
12.5 kHz channel operation	≥40 db.....	≥40 db
25 kHz channel operation	≥45 db.....	≥45 db
Conducted Spurious	≤–57 dbm	≤–57 dbm
Receive Attack Time.....	≤15 ms	≤15 ms
RSSI Squelch Attack Time.....	≤15 ms	≤15 ms
Receive Current Drain	≤80 mA	≤75 mA

*6.25 KHz available in 220 MHz only

RF Neulink reserves the right to change specifications of this product at any time without notice and without obligation to notify any person of such changes.

For outside operation of radio modem products, a NEMA 4 enclosure is recommended.

ORDERING INFO

Contact RF Neulink for details
Call toll-free (800) 233-1728 or
email: rfneulink@rfindustries.com

rfneulink

making **RF** the strongest link
Division of RF Industries

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WHO IS RF NEULINK?



RF Neulink has been manufacturing radio link equipment for 30 years. Our line of transmitter and receiver units for point-to-point communications, paging excitors, radio data and control products reflect our experience in this marketplace.

Our publicly held parent company, RF Industries (NASDAQ symbol RFIL), provides a well capitalized base for continued future growth and product development. RF Neulink's customers include Fortune 500 companies, municipalities, government agencies, educational and health institutions, utilities, small companies, casinos, irrigation companies, armed forces here and abroad, and many others that need or want reliable, state of the art, cost effective communications links.