Wireless Automation Control

Wireless solutions

To offer the best in wireless industrial data products, we teamed with Cirronet, a premier wireless device manufacturer since 1987. You can depend on AutomationDirect's wireless modems, both serial and Ethernet, to deliver data quickly, reliably, and securely - while eliminating the high cost of wiring.

CR Series Radios feature:

- Transmission at 2.4 GHz, the only truly international unlicensed frequency band
- Frequency Skip feature that prevents interference with/from any co-located 802.11 wireless LANs
- Reliable data throughput using Cirronet's patented FHSS technology; assures reliable performance even in high-multipath and noisy RF environments. CRC error checking and ARQ (automatic repeat-request) schemes for auto-retransmission of bad packets assures errorless data reception.
- Long range with high speed (up to 1.23 Mbps total over-the-air bandwidth in point-to-point and multipoint applications), up to 1.5 miles (farther with high gain antenna)
- License-free operation avoids the hassles and expense of obtaining an FCC license
- Wide operating temperature range from 30 degrees Celcius to +70 Celcius
- Rugged packaging well suited to varied operating conditions; external radios are housed in NEMA 4X/IP 66 enclosures ideal for outdoor and harsh environments.
- Easy-to-understand configuration tools for uick setup
- Fully programmable setup to meet specific site and performance requirements
- UL 2279 listed and CE marked

Adding up network costs?

In the simplest wiring installations, the cost of cable, conduit, and labor range from <10 to <40 per foot. These costs can quickly increase to hundreds or even thousands of dollars per foot, depending on the following factors:

Obstacles: Industrial settings typically offer challenging environments where wiring must extend around, below, or above production lines, vehicle paths, and other barriers. The more complex the workaround, the higher the installation expense.

Trenching: Sometimes, the only way to run wiring from point A to point B is to burrow. Any time wiring must go through concrete, asphalt, or the ground, costs soar.

Distance: This can be an issue with Ethernet cabling; any wired Ethernet link that extends over 100 meters requires the addition of expensive hubs.

Production line shutdown: Unless you're wiring a brand new facility that's not yet up and running, you'll probably need to halt production when running cables through the footprint of a production line.

Reconfiguration: When it's time for process reconfiguration or production line changes, costs associated with the initial wiring are usually incurred again.

The advantages of wireless!

Zero wiring costs! Wireless networking eliminates all wiring costs, limiting the actual cost of data links to the radios being deployed. That's significant savings for the initial setup, and means no repeated expense when it's time to reconfigure.

Security: Our radio modems incorporate patented frequency hopping spread spectrum (FHSS) technology; unlike open-standards such as 802.11b, FHSS renders transmitted data meaningless to unintended receivers. For further security, the sending and receiving devices must be configured to use the same hopping pattern (out of 64 possibilities). There is no need for encryption - the data inherently enjoys substantial protection built into the data stream.

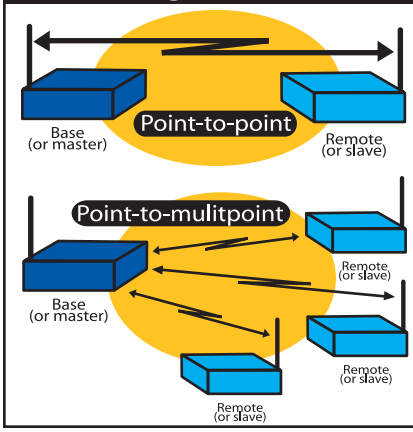
Resistance to interference and noise: In FHSS transmission, radio signals are broadcast in very short bursts and "hop" around the entire frequency band, with transmitter and receiver synchronized to the same hopping pattern. This makes them impervious to industrial electrical noise and interference from other wireless sources, such as wireless LANs.

Mobility: When automation elements are untethered, network nodes can include hand-held devices as well as trucks, forklifts, cranes, and other vehicles.

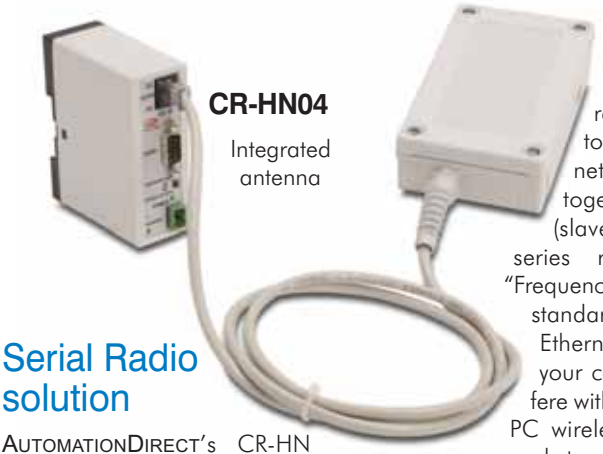
Long-distance transmission: AutomationDirect's radio modems offer line-of-sight ranges of over five miles with the proper antenna, which is ample coverage for all but the most far-flung applications. Unlike wired connections, distance doesn't increase the cost of wireless links.

In short, for all the advantages of wireless automation networking - and elimination of the drawbacks of wiring - turn to AutomationDirect!

Configurations



CR-HN Series Serial Radio Modems



CR-HN04

Integrated antenna

Serial Radio solution

AUTOMATIONDIRECT's CR-HN series serial radios are versatile, low cost, 2.4 GHz frequency-hopping spread spectrum wireless data modems. The CR-HN radios are ideal for SCADA applications as remote modems in multipoint configurations and are an extremely cost-effective solution for point-to-point installations.

A DIN-rail mounted Serial Adapter Box, one of the major components of the CR-HN series, resides in the control panel while the NEMA 4X radio module is mounted externally to the control panel to achieve the best line-of-sight link to the other radio antennas in the system. For most purposes, the CR-HN radio module incorporates an integral 6dB antenna, creating a "single piece" modem. The integral 6dB patch antenna provides a line-of-sight range of several miles. For extended distances or in obstructed environments, higher gain and/or directional antennas are available. A standard serial cable connects the communicating device to the CR-HN serial adapter. Similar "serial-quality" cabling is used for the link between the serial adapter and radio module. In most cases, no expensive, troublesome RF quality cabling is required. The CR-HN radio module simply installs on the side of a building or attaches to a mast where the antenna would normally be mounted.

When using a specialty antenna, a short, pre-manufactured, RF cable connects the antenna to the radio module. The Serial Adapter Box accepts 10-30 VDC via a removable screw terminal plug. An adapter is provided for connection to a standard 120 VAC receptacle. The radio module is powered over the cable linking the radio module to the serial adapter.

The CR-HN series has exceptional multipath fade rejection as well as immunity to jamming. Up to 16 networks can be grouped together with 63 remotes (slaves) per network. The HN series radios have a unique "Frequency Skip" feature to avoid the standard 802.11 wireless WI-FI Ethernet channels. This means your control radios will not interfere with or suffer interference from PC wireless networks that may be grouped together. Selectable transmit power levels of 10 mW and 100 mW allow the CR-HN series to be used worldwide even with the gain of the patch antenna. The CR-HN series radios communicate over the air at 460.8 kbps and support both point-to-point and point-to-multipoint networks.

They are field proven performers that deliver robust, reliable performance in hostile industrial environments. The CR-HN series is UL, FCC and CE marked.

Features:

- 2.4 GHz Frequency Hopping Spread Spectrum Technology
- Unique **"Frequency Skip"** setting to avoid 802.11 Wireless Ethernet LANs
- 460 kbps over the air and 115 kbps I/O data rates
- 64 hopping patterns
- FCC Certified and CE marked
- Integral 6dB patch antenna
- RS-232 asynchronous serial interface
- Transparent and Modbus support modes

Benefits:

- Exceptional immunity to multipath fading and jamming
- Grouping of multiple networks
- No interference with/from 802.11 Wireless Ethernet networks
- License-free applications
- Cost-effective, simple installation
- Connects to PC Serial ports
- Point-to-point and point-to-multipoint

CR-HN Series Serial Radio Modems

Part Number	Description	Price
CR-HN50	Hop-Net radio with 50ft cable and integral antenna	<--->
CR-HN50X	Hop-Net radio with 50ft cable and external antenna connector	<--->
CR-HN04	Hop-Net radio with 4ft cable and integral antenna	<--->
CR-HN04X	Hop-Net radio with 4ft cable and external antenna connector	<--->
CR-HNSA	Replacement Serial Adapter for all CR radios	<--->
CR-OMN2402	Replacement Dipole Antenna, 2.4GHz, 2dB, right angle	<--->
CR-OMN2409	9dB, 2.4 GHz, Omni Antenna	<--->
CR-CRN2409	9dB, 2.4 GHz, Corner Reflector Antenna	<--->
CR-PAR2418	18dB, 2.4 GHz, Parabolic Dish Antenna	<--->
CR-CBL24N	24" RF Cable, Reverse TNC to N connects an external antenna to a CR radio	<--->
CR-CBL60N	60" RF Cable, Reverse TNC to N connects an external antenna to a CR radio	<--->
CR-REPETR	Dual radio repeater with rechargeable lead-acid battery. Requires two CR series antennas and two series CR-CBLxxN RF cables. Non-stock item, 3 week delivery.	<--->

Serial Radio Modem Specifications

CR-HN04X

Reverse TNC male connector requires CR series antenna

CR-HN04

Integrated antenna

CR-HN Series Specification	
Electrical Specifications	
Frequency Band	2.4 GHz
Licensing	Unlicensed under FCC Part 15, ETSI 300.328
Number of Channels	75 or 25
Hopping Patterns	User configurable, 64 patterns (networks) available
I/O Data Rate	Up to 115.2 Kbps Asynchronous
RF Channel Rate	460 Kbps
Line of Sight Range	> 5 Miles
RF Bandwidth	750 KHz
Modulation Type	GFSK
Output Impedance	50 Ω
Network Protocol	Dynamically Assigned TDMA with ARQ
Transmit Power	EIRP: +16dBm/+24dBm
Receive Sensitivity	-99dBm
Power Requirements	10 - 30 VDC, 160 mA typical, 750 mA surge
Serial Data Interface	Asynchronous RS-232
Mechanical Specifications	
Antenna	CR-HN50 & CR-HN04: Integrated 6dB Patch CR-HN50X & CR-HN04X: Reverse TNC Male Connector, requires CR series antenna
Case Materials	Polycarbonate, NEMA 4X
Dimensions: in(mm)	5.13 (130) x 3.13 (79) x 1.38 (35) (excl. flange)
Weight excl. cable	235g
Data Connector	9-Pin D
Power Connector	2 Pin, plug-in, screw terminal
Cables	CR-HN04 comes with 4 feet of cable CR-HN50 comes with 50 feet of cable
LED Indicator	Power, Tx, Rx, Carrier Detect
Environmental Specifications	
Temperature Range	-30°C to 70°C (radio enclosure)
Humidity	95% at 40°C, Non-condensing
Approvals	
UL 508 (file #E235438), CE	

CR-SE Series Ethernet Radio Modems

Ethernet Radio solution

AUTOMATIONDIRECT's CR-SE series Ethernet radios are based on the same patented Cirronet radio technology as the CR-HN serial radios. These are low cost, 2.4 GHz frequency-hopping spread spectrum wireless data modems. They provide long range, high-speed wireless connectivity among Ethernet devices in industrial settings. The CR-SE radios have exceptional multipath fade rejection as well as immunity to jamming. Typical CR-SE applications include wireless industrial automation and data collection, network bridging, PLC networking and SCADA. CR-SE radios can function as a high speed bridge to a distant Ethernet network node or a CR-SE radio base station can be connected to multiple remote CR-SE radios to build a wireless Ethernet network. The higher gain antennas increase the range up to 5-plus miles. All CR-SE models enable long range connectivity far beyond cabled Ethernet maximums.

Up to 16 separate CR-SE radio networks can be placed together with 63 remote units (slaves) per network. The HN series radios have a unique **"Frequency Skip"** feature to avoid the standard 802.11 wireless WI-FI Ethernet channels. This means your control radios will not interfere with or suffer interference from PC wireless networks that may be grouped together. Selectable transmit power levels of 10 mW and 100 mW allow the CR-SE series to be used worldwide. The CR-SE series radios support both point-to-point and point-to-multipoint networks. They are field proven performers that deliver robust, reliable performance in hostile industrial environments. The CR-SE series is UL, FCC and CE marked.

Choose from four models

Local Radio

The radio modem and a Network Interface unit are combined into one DIN-rail mountable module. A 2dB whip antenna, which is provided, can be attached directly to the unit or mounted externally to the enclosure via an optional CR-CBLxxN RF cable.

Remote Radio

For extended distances or in obstructed environments, higher gain and /or directional antennas are available. A Network Interface Unit (NIU) is housed in an enclosure and is connected via its terminal strip to the remote radio module located up to 300 feet away. The remote radio module, housed in a weatherproof NEMA 4X/IP 66 enclosure, mounts directly to the antenna mast or side of a building. A short, pre-manufactured, RF cable connects the antenna to the radio module. No need to hassle with expensive and troubling RF custom cables. Choose the proper CR-CBLx cable, in respect to the distance between the NIU and the radio module, and the proper antenna; both are ordered separately.

Features:

- 2.4 GHz Frequency Hopping Spread Spectrum Technology
- Unique "Frequency Skip" setting to avoid 802.11 Wireless Ethernet LANs
- 64 hopping patterns (for co-locating separate networks with up to 64 radios/network
- FCC Certified, UL listed and CE marked
- 2dB right angle whip antenna
- Web browser interface

Benefits:

- Exceptional immunity to multipath fading and jamming
- Grouping of multiple networks without interference
- No interference with/from 802.11 Wireless Ethernet networks
- License-free applications worldwide
- Cost-effective, simple installation
- Connects to any 802.3 Ethernet LANs
- Point-to-point and point-to-multipoint

CR-SE Series Ethernet Radio Modems

Part Number	Description	Price
CR-SEB	10/100 Base-T Ethernet radio bridge, 460Kbps with 2dB, Rt Angle, Omni antenna	<--->
CR-SEBX	10/100 Base-T Ethernet radio bridge, 460Kbps with external antenna connector	<--->
CR-SEH	High-speed, 10/100 Base-T Ethernet radio bridge, 1.23Mbps with 2dB, Rt. angle, Omni antenna	<--->
CR-SEHX	High-speed, 10/100 Base-T Ethernet radio bridge, 1.23Mbps with external antenna connector	<--->
CR-SEAP	Serial to Ethernet Access Point, enables serial devices on CR-HN radios to appear as nodes on an Ethernet network, 10/100 Base-T, 460Kbps with integral antenna	<--->
CR-OMN2409	9dB, 2.4 GHz, Omni Antenna	<--->
CR-CRN2409	9dB, 2.4 GHz, Corner Reflector Antenna	<--->
CR-PAR2418	18dB, 2.4 GHz, Parabolic Dish Antenna	<--->
CR-CBL24N	24" RF Cable, TNC to N connects an external antenna to a CR radio	<--->
CR-CBL60N	60" RF Cable, TNC to N connects an external antenna to a CR radio	<--->
CR-REPETR	Dual radio repeater with rechargeable lead-acid battery. Requires two CR series antennas and two series CR-CBLxxN RF cables. Non-stock item, 3 week delivery.	<--->
CR-CBLE1	External Antenna Cable Kit includes weatherproof radio connector on 100ft pigtail cable	<--->
CR-CBLE2	External Antenna Cable Kit includes weatherproof radio connector on 200ft pigtail cable	<--->
CR-CBLE3	External Antenna Cable Kit includes weatherproof radio connector on 300ft pigtail cable	<--->
CR-PSCN	Replacement Power Plug for all CR radios	<--->
CR-PSAC	Replacement AC Adapter for CR radios with plug	<--->

Ethernet Radio Modem Specifications

CR-SEB

CR-SEBX

CR-SE Series Specification	
Electrical Specifications	
Frequency Band	2.4 GHz
Licensing	Unlicensed under FCC Part 15, ETSI 300.328
Number of Channels	SEB - 75, SEH - 43 (USA); SEB - 75, SEH - 27 (Canada, France, Spain & Japan)
Hopping Patterns	User configurable, 64 patterns (networks) available
Data Throughput	SEB - 400 Kbps; SEH - 1.0 Mbps
RF Channel Rate	460Kbps/1.23Mbps
Line of Sight Range	> 1 Mile
RF Bandwidth	SEB - 750 KHz; SEH - 1.5 MHz
Modulation Type	GFSK
Output Impedance	50 Ω
Network Protocol	Dynamically Assigned TDMA with ARQ
Transmit Power	EIRP: +16dBm/+24dBm
Receive Sensitivity	SEB = - 93dBm; SEH = -90dBm
Power Requirements	9-30VDC (12-30VDC SEHX & SEBX), 160mA typical, 750mA surge
Ethernet Protocol	802.3, 10/100 Base-T (for SEB and SEH10/100)
Mechanical Specifications	
Antenna	CR-SEB & CR-SEH: 6", 2dB, Rt. angle, Dipole, Omni antenna CR-SEBX & CR-SEHX: ReverseTNC Male connector, requires CR series antenna and cable
Case Materials	Polycarbonate, NEMA 4X
Dimensions (in)	5.5 x 4.5 x 1.78 (excl. flange)
Weight excl. cable	235g
Data Connector	RJ45
Configuration Connector	RJ11
Synchronization Connector	RJ11
Antenna (SEB & SEH only)	TNC Male
Transceiver (SEBX &SEHX only)	15 pin
Power Connector	2 Pin, plug-in, screw terminal
LED Indicators	Power, Tx, Rx, RF Link, Link
Environmental Specifications	
Temperature Range	-30°C to 70°C Network Interface Unit -40°C to 70° Radio enclosure (SEBX & SEHX only)
Humidity	95% at 40°C, Non-condensing
Approvals	
UL 508 (file #E235438), CE	