Synetcom
Your Industrial Wireless Source

WISE Serial DIN Rail Radio
Serial RS-232, 485, 422
900 MHz / 2.4 GHz Frequency Hopping Spread Spectrum

Model #: WISE DIN-S

FEATURES

o High Speed – up to 220 Kbps @ 2.4 GHz

o Long Range – up to 35 miles with 20 dB fade margin

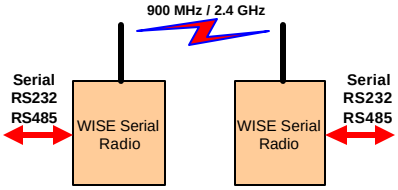
o Selectable Serial I/O format - using DIP switches behind front panel. Select RS-232, RS-485 or RS-422 I/O formats

o Industrial Grade - -40°C to +70°C, DIN Rail enclosure with ESD and RF filtering on all I/O

o Two Radio Types – Frequency hopping spread spectrum (FHSS) 900 MHz & 2.4 GHz (license-free) – other radio types available

o Data Security - FHSS – proprietary hopping algorithm

o Low DC Power - self-contained battery / solar operation options



WISE Serial Radio: Send serial RS-232, RS-485 signals up to 35 miles.

WISE Serial Applications:
PLC / RTU Networks
PC to PC Connections

WISE System Transmission Range

WISE 900 MHz	20 miles
WISE 2.4 GHz	35 miles

Overview
The WISE Serial DIN rail radio system is designed to reliably and securely replace cable in industrial applications. Serial data is sent over an error-protected digital radio link at 900 MHz or 2.4 GHz. RS-232, 485 or 422 formats are available on the front panel DB-9 connector. Depending on the radio option installed, the link operates from 2,400 to 220,000 bps.

Installation
WISE gear is shipped factory-configured and tested. There is no field configuration necessary. Typical installation involves simply mounting and powering the units and connecting the antennas and serial interface.

Transmission Range Note
Fade Margin or Link Margin is typically not considered when many companies specify the range of license-free wireless devices – leading to optimistic claims for distance

Synetcom specifies a 20 mile range for 900 MHz and 35 miles for 2.4 GHz systems. This includes at least 20 dB of margin (if the link fades as much as 20 dB – a factor of 1/100 – the link will continue to operate).

Contact our factory in California to speak directly to an engineer: (310) 379-2000

Configuration
A 'Configuration' button on the front panel (press while powering up) enables the configuration mode. Baud rate and radio parameters can be changed by the user while in this mode.

Frequency Hopping Spread Spectrum Technology
Both the 900 MHz and 2.4 GHz systems utilize frequency hopping spread spectrum (FHSS) radios with advanced protocols that greatly increase the communications reliability in high noise and interference environments.

Radio Options

Radio Options	Serial Speed	Communication Distance *
A: 2.4 GHz – high speed	220,000 bps	35 miles
B: 2.4 GHz – high speed NEMA	220,000 bps	35 miles
C: 2.4 GHz – low cost	19,200 bps	10 miles
D: 900 MHz – high speed	19,200 bps	15-20 miles
E: 900 MHz - low cost	9,600 bps	15-20 miles

*Includes 20 dB fade margin

Our factory engineers can help with the radio selection. The flexible radio option allows you to trade speed, communications distance and cost.

Repeaters
WISE Repeaters are used whenever either distance or major obstructions cause the radio signals to be weak. We offer several versions, including one for each radio type, and a high-speed repeater that uses the NEMA 2.4 GHz radios shown in the photo.

Data Acquisition & Control Networks
A 'poll-response' network of PLCs or RTUs can be linked to a host location and to each other using WISE Serial radios. The radios operate in point-to-point and point-to-multipoint modes.

System Accessories
Synetcom offers a complete line of accessories and system enhancements including:

- Antennas and coaxial cable compatible to the various radio types for short and long distance applications.

- Lightning protection systems

- NEMA plastic and metal enclosures with internal DIN rail mounts – designed to house the radio, power supply and other options

- Solar panel / battery / radio enclosure systems optimized for installations where AC power is not available

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WISE System Selector – Which radio is the best choice for my application?

o 900 MHz – Lower cost - Local operation with small whip antennas (2,500'). Also suitable for longer range applications (up to 10 miles or more) outside of urban areas.

o 2.4 GHz – High speed – Local operation with small whip antennas (1,000') where electrical noise or RF intereference is present. .Also suitable for longer range applications (up to 35 miles or more) even in high-interference areas. Highest serial baud rate (220 kb/s).

Eliminate Coaxial Cable with the NEMA Radio Option

Long runs of coaxial cable at 2.4 GHz are expensive and lossy. The WISE NEMA 2.4 GHz radio module allows you to place the radio near the antenna, outdoors.

WISE NEMA 2.4 GHz FHSS Radio

Signals and power are fed to the NEMA radio with an inexpensive category 5 cable run, up to 150' long. The cable connects to the DIN rail enclosure via screw terminals.

Specifications: WISE Serial DIN Rail Radio

Item	Specification
Data Throughput	2,400 to 220,000 bps (radio dependent – see below)
I/O Data Rate	1,200 to 220,000 bps – configurable
Operating Frequency	902-928 MHz or 2.4000-2.4835 GHz - License Free
Interface	DB-9, switch-selectable RS-232/422/485
Interface Protection	Transient Suppressors all I/O
Network Topologies	Point-to-point, point-to-multipoint
Communications Range	Depends on radio option and antenna utilized – contact factory
RF Modulation	Frequency Hopped Spread Spectrum (FHSS)
DC Power	7 VDC to 18VDC; 70 mA RX, 200 mA TX
Enclosure Material	Housing: Glassfilled Polycarbonate, Cover: Polycarbonate
Enclosure Size	5.0" x 4.0" x 3.0" (L x W x H)
Enclosure Mounting	35mm DIN rail
Environmental	-40ºC to +70ºC
Licensing	FCC Type Certified – License free operation

Radio Options	Maximum Serial Speed	TX Power	RX Sensitivity	# Hopping Channels	# Networks	Communications Range
A: 2.4 GHz – high speed	220,000 bps	+18 dBm	-93 dBm	75	63	35 miles
B: 2.4 GHz – high speed NEMA	220,000 bps	+18 dBm	-93 dBm	75	63	35 miles
C: 2.4 GHz – low cost	19,200 bps	+17 dBm	-102 dBm	25	7	10 miles
D: 900 MHz – high speed	19,200 bps	+20 dBm	-107 dBm	25	7	15-20 miles
E: 900 MHz - low cost	9,600 bps	+20 dBm	-110 dBm	25	7	15-20 miles

Specifications subject to change without notice

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