# JMS-SE WIRELESS

Base Radio Gateway
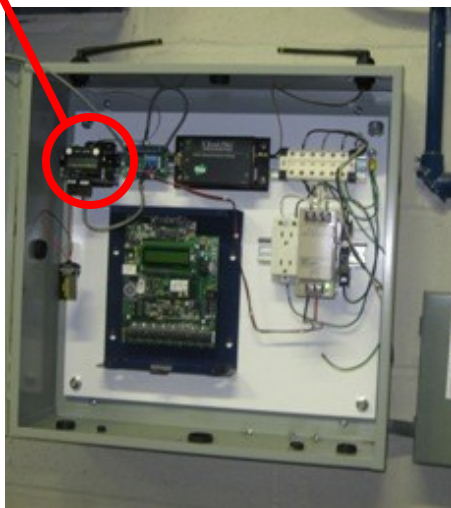900/868 MHz Frequency Range

Description

The JMS Base Radio Gateway is the component of a wireless solution that provides two way communication between wireless sensors and data management/control systems. It collects and validates data from all of the deployed wireless sensor field units attached to it in a local area network and passes validated values to the data management and/or control system through a secure buffer. The Base Radio Gateway is normally configured as a slave, ensuring that acquired data is not pushed beyond the buffer for added security. Output options include RS-485, serial Modbus RTU, TCP/IP, or other digital protocols through converter modules. I/O formats including 4-20 mA signals and discrete switch outputs are available through DIN rail mounted modules for easy interface to existing I/O utilities. One Base Radio can communicate with up to 100 Field Units. Multiple Base Radios can be used to accommodate additional field units and provide redundancy. Control commands can be relayed from the Base Radio Gateway to field unit I/O. Local data storage can be provided in the gateway for backup and retrieval.

When connected to a PC with JMS configuration software, the entire network of sensor, gateway and output devices can be managed and monitored. The Base Radio Gateway is available in a wide variety of packages or in module form to fit application and system design.
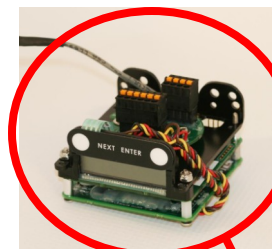
A base radio gateway shown at left in module form and as part of data acquisition system below.

Data acquisition system shown at right includes multi-function RTU, remote base radio wireless modem for inclusion of data from related local area wireless networks, power supply and DSL connection to wide area network.

Technical Specifications

Power Requirements
- 24 VDC @ .2A, standard 2-wire
- 120/240 VAC adapter (optional)

RF Characteristics
- 902 MHz – 928 MHz Frequency Hopping Spread Spectrum (FHSS), FCC and IC certified ISM license-free band.
- 868 MHz FHSS EC certified
- Limited span 900MHz FHSS for Region 3 (Asia-Pacific)
- Up to 3000' range to Field Units with clear line of sight; 500' to 1000' range with obstructions – range doubles with use of high gain antenna.
- The RF module in each radio is individually tested and calibrated over the full temperature range to ensure reliable wireless operation
- Secure industrial wireless protocol to optimize power consumption, communication distance, response time and reliability.
- For other frequency ranges and protocols, consult JMS

Output Options
- RS-485 digital communications with conversion to RS-232 or USB for interface with PC or server and JMS Instrument Manager.
- Multiple 4-20 mA analog outputs with RS-485 digital communications to Analog/Digital Output Modules
- Serial Modbus RTU over RS-485 (compatible with most HMI application packages, PLC's and DCS's)
- Other industrial protocols such as Profibus, Devicenet or BACnet (with optional off-the shelf converter)
- Ethernet format of digital bus (with optional off-the-shelf converter)

Self-Diagnostics
- Contains extensive self-checking software and hardware that continuously monitors the operation. Any sensor or device parameter out of spec is identified and reported

Electromagnetic Compatibility (CE Compliance)
- Operates within specification in fields from 80 to 1,000 MHz with field strengths to 30 V/m. Meets EN 50082-1 general immunity standard and EN 55011 compatibility emissions standard

Industrial Certification with integral antenna
- Rated for industrial use FM Rated -40° F to +185° F (-40° C to +85° C);
- CSA Rated -40° F to +104° F (-40° C to +40° C) and EN 55011 compatibility emissions standard.
- FM Approved as explosion-proof (XP) for Class I, Division 1, Groups B,C,&D, T6 @ ambient temperatures ≤+40°; T5 @ ambient temperatures ≤+85°C; as dust ignition-proof for Class II/III, Division 1, Groups E, F, & G, T6; indoor and outdoor (Type 4X) hazardous (classified) locations.
- CSA Approved as explosion-proof (XP) for Class I, Division 1, Groups B, C, & D, T4@ ambient temperatures ≤+40° C; as dust ignition-proof for Class II/III, Division 1, Groups E, F, & G; indoor and outdoor (Type 4X) hazardous (classified) locations.
- NEMA 4X weather-proof housing

JMS Base Radio Gateway

Base Radio Modbus Output Option

The Modbus Base Radio output option allows the user flexibility to implement serial Modbus RTU for monitoring and the JMS Instrumentation Manager for remote configuration of wireless sensor field units. The data streams run continuously in parallel enabling network management and diagnostics without interrupting data flow. More information on implementing Serial Modbus RTU can be obtained at http://www.Modbus.org.   JMS supports conversion to Modbus TCP/IP with an optional DIN rail mounted module.

JMS Configuration and Diagnostic Software Option

The JMS Instrument Manager software provides access to the Base Radio Gateway and field units for configuration, network management, field unit diagnostics and limited duty data logging. This software enables remote configuration with administrative security functions. The JMS Instrument Manager has a client/server architecture. Using a battery powered laptop and Base Radio Gateway in conjunction with self powered field units creates a totally portable rapidly deployed diagnostic capability for any process.

Analog and/or Discrete Output Options

When existing data management infrastructure favors the use of traditional 4-20 mA and contact closure outputs, the RS-485 data stream can be converted to analog and discrete values with DIN rail mounted modules.

Base Radio Gateway DIN rail mounted with power supply and output module having 4 Analog signals and 8 Switches

JMS - your technology partner

JMS develops, manufactures and supports partner specific, high value, industrial grade wireless measurement and control solutions that enable our clients to achieve their business goals. Knowing that each solution needs to be customized for client needs, we offer both wireless and traditional wired solutions. Our contribution to your success is realized through:

- Reduced time to market
- Extending your engineering and support resources
- Integrating design and manufacturing

JMS provides solution driven integration with virtually any legacy system for data acquisition, monitoring and control.

Remote antenna mounted on control room roof to optimize communication to wireless sensor units.

Base Radio Gateway mounted inside control room for ready access and integration with control system I/O

Remote Antenna Options

The base radio is available with remote antenna options that provide greater range and convenient mounting flexibility for integration to control systems. Antenna accessories are carefully selected to comply with FCC regulations and ensure best radio reception.

These antennas provide considerably more range, and the Base Radio can be connected in conformance with Class 1 Div. 2 requirements when remote antennas are deployed in hazardous areas. Typical installation with remote antenna is to mount the Base Radio in or near the control room in an ordinary area with coax cable to an optional lightning arrestor. An additional cable to the externally mounted high gain antenna provides maximum range for field unit communication. Mounting the antenna on a roof or other high unobstructed locations is the recommended installation practice.

Base Radio Gateway in field mount enclosure with integral antenna. Rated XP Class 1 Div 2