



The M Series is a range of wireless modems designed for the transmission of data communications for SCADA, telemetry and any other information and control applications that utilise ASCII messaging techniques. The M Series uses advanced "digital" modulation and signal processing techniques to achieve exceptionally high data throughput efficiency using traditional licensed narrow band radio channels. These products are available in many frequency band and regulatory formats, to suit spectrum bandplans in various continental regions. The range is designed for both fixed point to point (PTP), and multiple address (MAS) or point to multipoint (PMP) systems.



.: Industries & applications

The M Series products are widely used in point-to-point and point-to-multipoint (multiple access) applications for remote interconnection of PLCs, RTUs, dataloggers, and other data monitoring and control devices - including specialist utility devices (such as powerline ACRs). In addition, other applications such as area wide security and alarm systems, public information systems (traffic flow and public signage systems) and environmental monitoring systems.

.: Scada systems

This is where one or more centralised control sites are used to monitor and control remote field devices over wide areas. Examples include regional utilities monitoring and controlling networks over entire shires or a greater city metropolis. Industry sectors include energy utilities (gas and electricity distribution), water and sewerage utilities, catchment and environment groups (rivers, dams and catchment management authorities).

.: Telemetry systems

Dedicated telemetry control systems interconnecting sequential devices either where cabling is not practical or distances are considerable.

Examples include:

- ore conveyor or slurry pipeline systems
- simple water systems (pump and reservoir interlinking)
- broadcast industry (linking studio to transmitter) etc.

.: Information systems

Public Information systems such as freeway vehicle flow, travel time monitoring, feedback signage, parking signage systems and meteorological stations etc.



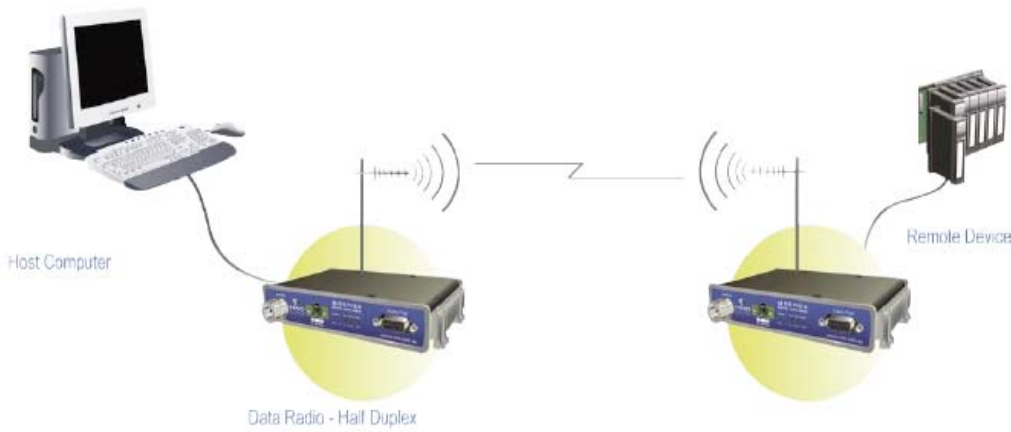
∴ Features & benefits

- 395-520 MHz band operation
- 0.1 to 5 watt transmitter output power
- Software selectable Tx and Rx frequencies
- Simplex or half duplex operation with any Tx-Rx splits
- One model suitable for 12.5 and 25 kHz channel spacing
- Flash upgrade-able firmware – insurance against obsolescence.
- Remote over-the-air configuration of any radio from any location.
- Multistream™ simultaneous data streams allows for multiple vendor devices / protocols to be transported on the one radio network.
- Flexible data stream routing and steering providing optimum radio channel efficiency – complex data radio systems can be implemented with fewer radio channels.
- Multi-function radio capable of dropping off one stream to a port and forward on or repeat (store and forward) the same or other data.
- Stand-alone internal store and forward operation – buffered store and forward operation even in the ER remote units.
- Professional N Type antenna connector
- High data integrity - CRC error checking
- User configurable 300-19,200 bps asynch RS-232 port
- Fully transparent 3 wire user interface. Compatible with most industry standard data protocols, e.g., MODBUS, DNP-3, IEC 870-5-101 etc.
- Multi-function bi-colour Tx/Rx data LEDs showing Port activity (breakout box style), as well as LEDs indicating Tx, Rx, RF Signal, Data Synchronisation and DC Power status of the radio.
- Compatible with E-Series Base / Repeater Station (EB) and Hot Standby Base Station (EH)
- Unique integrated C/DSMA collision avoidance technology permits simultaneous polling and spontaneous reporting operation in the same system.
- Network wide non intrusive diagnostics which runs simultaneously with the application.
- Network wide diagnostics interrogation which can be performed from anywhere in the system including any remote site.
- Diagnostics will route its way to any remote or base / repeater site regardless of how many base / repeater stations are interconnected.
- Full range of advanced features available within Network Management and Remote Diagnostics package – BER testing, trending, channel occupancy, client / server



∴ Point-to-Point

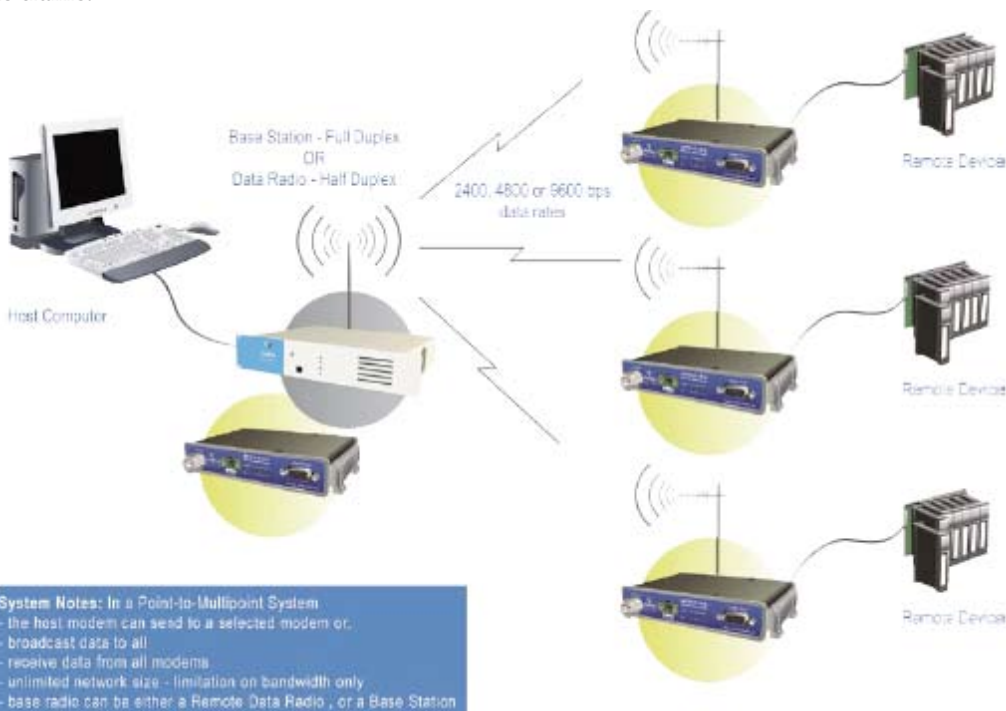
This simple system architecture provides a virtual connection between the two points, similar to a cable. Operation is half-duplex.



∴ Point-to-Multipoint

In a multiple access radio system, messages can be broadcast from one (master) site to all others, either using a half duplex radio system or from any site to all others, using a simplex radio channel. Half duplex systems often utilise a full duplex master (EB or EH), to make the system simpler and for faster operation.

In either case, it will be necessary for the application to support an addressing system, since the master needs to be able to select which remote device it wishes to communicate with. The radio system operates “transparently”, allowing the application’s protocol to provide the addressing, and thus control the traffic.



System Notes: In a Point-to-Multipoint System

- the host modem can send to a selected modem or...
- broadcast data to all
- receive data from all modems
- unlimited network size - limitation on bandwidth only
- base radio can be either a Remote Data Radio, or a Base Station



.: Radio

Frequency Range: 395-465 MHz or 450-520 MHz

Frequency Splits: Various Tx/Rx frequency splits - programmable

Channel Selection: 6.25 kHz channel step

Channel Spacing: One model suitable for 12.5 and 25 kHz

Frequency Accuracy: ± 1.5 ppm (-30 to 60°C) (-22 to 140°F) ambient

Aging: ≤ 1 ppm/annum

Operational Modes: Simplex and Half duplex

Configuration: All configuration via Windows based software

Compliances:

FCC PART 15, PART 90

IC RS119, ICES-001

ACA AS4295-1995 (Data)

ETSI EN300 113

CSA Class I, Division II, Groups (A,B,C,D) for Hazardous Locations (ANSI/UL equivalent)

Note : Optional

.: Transmitter

Tx Power: 0.1 to 5W (+20 to +37 dBm) ± 1 dB software adjustable

Modulation: Narrow band GMSK

Timeout Timer: Programmable 0-255 seconds

Tx Spurious: ≤ -30 dBm

PTT Control: Auto (Data) / RTS line

.: Receiver

Sensitivity: -116 dBm for 12 dB SINAD

Intermodulation: Better than 65 dB

Spurious Response: Better than 70 dB

Mute: Programmable digital mute

.: Diagnostics (optional)

Non intrusive local diagnostics - runs simultaneously with the modem.

Local and remote measurement of Tx Power, Rx Signal Strength, DC Volts and Internal Temperature.

.: Connections

User Data Ports: DB9 female port wired as DCE (modem). (Separate connections on DB9 for simultaneous User and Diagnostic Data)

Antenna: N female bulkhead

Power: 2 pin screw locking (mating connector supplied)

LED Display: Multimode LED Indicators for Pwr, Tx, Rx, Sync, Data Port Tx/D and Rx/D data

.: Modem

Data Serial Port: RS232, DCE, 300-19,200 bps asynchronous

Diagnostics Connection: RS232, 19,200 bps asynchronous

Data Interface: 3 wire data interface. (Tx/D, Rx/D & GND). RF carrier driven DCD output for collision management.

Analog Interface: TX/RX Analog interface for external FSK/FFSK modems.

RF Channel Data Rate:

Three models:-

2400/4800 bps (MR450-x001-xx)

4800/9600 bps (MR450-x002-xx)

9600 bps (MR450-x003-xx) FCC

Data Buffer: 8 kbyte of on-board RAM

Bit Error Rate:

$< 1 \times 10^{-6}$ @ -115 dBm (2400 bps)

$< 1 \times 10^{-6}$ @ -114 dBm (4800 bps)

$< 1 \times 10^{-6}$ @ -106 dBm (9600 bps)

.: General

Power Supply: 13.8 Vdc nominal (10-16 Vdc)

Transmit Current: 600 mA nom. @ 1 W 1500 mA nom. @ 5 W

Receive Current: < 170 mA nominal

Dimensions: Solid Diecast Alloy Housing 154 x 102 x 29 mm (6.1 x 4.1 x 1.2 inches)

Mounting: Integral Solid Diecast feet

Weight: 0.32 kg (0.71 lbs)

.: Options

TVIEW+™ Configuration, Network Management and Diagnostic Windows GUI Software

DIAGS/M Remote Diagnostics Facilities per Radio Modem

.: Related products

EB450 Base Station*

EH450 Hot Standby Base Station*

* **Configured for M Series compatibility**

