Trio M-Series
Licensed Digital Data Radios

Features:

- 400-520MHz band operation
- Up to 9600bps true over-air data rates
- Unique C/DSMA collision avoidance
- Synthesized digital data radio design
- High-frequency stability
- Compatible with E-Series Base/Repeater and Hot-Standby Base stations
- Local and Remote programming/diagnostics
- Multistream™ simultaneous data stream
- Configurable Stream Identifier Codes
- TView+ - user friendly configuration and diagnostics interface
- 3-Year Warranty (parts and labor)

Trio M-Series licensed UHF radio modems are designed to provide the reliable transmission of data for SCADA, telemetry and other information, and control applications. M-Series radios use advanced digital modulation and signal processing techniques to achieve exceptionally high data throughput efficiency using traditional licensed narrow band radio channels. M-Series radios are available in a wide range of frequency bands and carry the best warranty in the industry.

As with all Trio radio solutions, M-Series radios can be rapidly deployed as a permanent or temporary alternative to wired communication networks which are costly to install and difficult to modify. When integrated into legacy systems or used as the communications backbone of a new system, Trio radios instantly bring up-to-date communication technology and performance to your network.

Applications

Trio M-Series radios are used across a wide range of industrial markets in point-to-point and point-to-multipoint applications. They are often used for remote interconnection of PLCs, RTUs, data loggers, and other data monitoring and control devices. M-Series radios are compatible with the powerful Trio E-Series Base Stations and Hot-Standby units and can be ordered as a CSA Class I, Division II-compliant product.

Features

Designed for maximum value and functionality Control Microsystems has incorporated a wide range of state-of-the-art features in the M-Series radio:

Data modem: Advanced technology DSP-based GMSK digital data modem featuring built-in error checking and true 2400/4800bps, 4800/9600bps or 9600bps over-the-air data rates. M-Series radios boast intelligent transmitter control (auto Tx on data), simplex and half-duplex operational modes and support industry-standard protocols including Modbus, DNP3 and IEC 60870-5-101.

Radio: Synthesized digital data radio design with High-frequency stability and software-selectable Tx and Rx frequencies. These highly flexible radios are universally applicable with compliance to FCC and ETSI radio communication regulatory requirements.

Configuration and Management

All Trio radios offer maximum versatility by providing local and over-the-air configuration options.

TView+

As the Network Management and Remote Diagnostics environment for all Trio radios this tool helps to eliminate system down-time and reduce maintenance costs. The software incorporates a wide range of efficient network management utilities including error rate testing, channel occupancy statistics and data error statistics. TView+ also includes a diagnostics utility that permits monitoring and logging of radio performance parameters for all units in the network.

Design and Environmental

Trio M-Series radios are built using a compact, lightweight housing ensuring maximum reliability together with ease-of-installation and serviceability. Full specification operation is guaranteed over the entire -30 to +60ºC, (-22 to 140ºF) temperature range.

MR450 Specifications

Functional	
Location	Remote station
Licensed Radio Frequency Range	400-470MHz or 450-520MHz
Operational Modes	Simplex and half-duplex
RF Channel Data Rate	2400/4800bps, 4800/9600bps or 9600bps

Features		
Configuration Interface		TView+ (Windows™-based GUI software) for configuration, network management and diagnostics
Radio Frequency Accuracy		±1.5ppm (-30 to 60ºC) (-22 to 140ºF) ambient
Transmitter	Power: Modulation: PTT Control:	0.1 to 5W (+20 to +37dBm) ±1dB, software-adjustable Narrow band GMSK Auto (Data) / RTS line
Receiver	Sensitivity: Intermodulation: Spurious Response: Mute:	-116dBm for 12dB SINAD Better than 65dB Better than 70dB Programmable digital mute
Connections	User Data Port: Antenna: Power: LED Display:	DE-9 female port wired as DCE (modem) Separate connections on DB9 for simultaneous user and diagnostics data Configurable as User or Trunk N female bulkhead 2 pin locking, mating connector supplied Multimode LED Indicators for Pwr, Tx, Rx, Sync, Data Port TxD and RxD data
Modem	Data Serial Port: Diag. Connection: Data Interface: Analog Interface: Data Buffer: Bit Error Rate: Collision Avoidance: Data Stream:	RS-232, DCE, 300-19,200bps asynchronous RS-232, 19,200bps asynchronous 3-wire data interface (TxD, RxD & GND) RF carrier-driven DCD output for collision management Tx/Rx analog interface for external FSK/FFSK modems 8Kbyte of on-board RAM < 1x10-6 @ -115dBm (2400 bps) < 1x10-6 @ -114dBm (4800 bps) < 1x10-6 @ -106dBm (9600 bps) Channelshare™ supervisory channel C/DSMA collision avoidance system Simultaneous delivery of multiple data streams (protocols) provided by Multistream™
General	Temperature: Power Supply: Transmit Current: Receive Current: Enclosure: Dimensions: Weight:	-30 to +60ºC, (-22 to 140ºF) 13.8VDC nominal (10-16VDC) 600mA nominal @ 1W 1500mA nominal @ 5W <170mA nominal Solid die-cast alloy 154 x 102 x 29 mm (6.1 x 4.1 x 1.2 inches) 0.32kg (0.71lbs)
Diagnostics		Network-wide operation from any remote terminal Non-intrusive protocol - runs simultaneously with the application Over-the-air re-configuration of all parameters Storage of data error and channel occupancy statistics In-built error rate testing capabilities
Approvals and Certifications		FCC PART 15, PART 90 IC RS119, ICES-001 ACA AS4295-1995 (Data) ETSI EN300 113 Optional CSA Class I, Division II, Groups (A, B, C, D) for Hazardous Locations (ANSI/UL equivalent)
Warranty		3-Year parts and labor

Model Code

Tyxxx-aabbb-cde represents the part number matrix

Code T	Select: Model Type
M	M-Series
Code y	**Select: Unit Type**
R	Remote Station
Code xxx	**Select: Generic Frequency Band**
450	Generic 450MHz
Code aa	**Select: Frequency (400MHz bands)**
M	400 to 470MHz (Tx & Rx)
H	450 to 520MHz (Tx & Rx)

Note: Other frequency bands available upon request.

Code bbb	Select: RF Channel Data Rate & Bandwidth (Internal Modem)
000	Analog only 12.5kHz
001	2400bps 12.5kHz / 4800bps 25kHz
002	4800bps 12.5kHz / 9600bps 25kHz
003	FCC/IC 9600bps 12.kkHz
004	ETSI 4800bps 12.5kHz

Code c	Select: Options 1
D	Diagnostics
Code d	**Select: Options 2**
H	Hazardous Environment Class1 Div2

Note: Specify internally or externally fitted duplexers. Externally fitted require feeder tails.

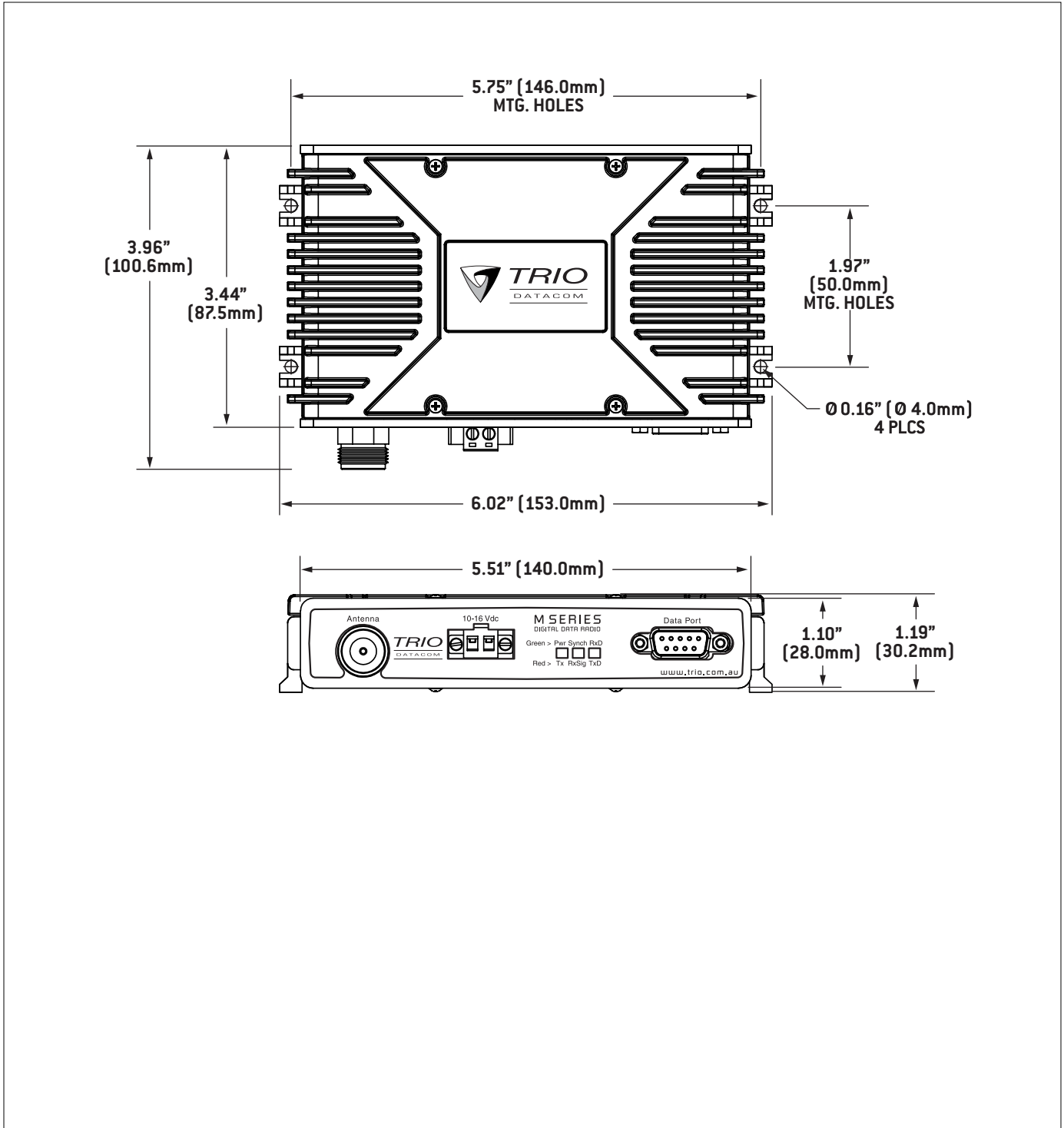| Code e	Select: Hot Standby Configurations
0	No Options

Communications Standards:
FCC – Federal Communications Commission (USA)
IC – Industry Canada
ETSI – European Telecommunication Standards Institute
ACA – Australian Communications Authority

Example: MR450-M003-DH0 specifies: Trio M-Series, Remote Station, Generic 450MHz band with a specific frequency range of 400 to 470MHz, a 9600bps modem with a bandwidth of 12.5kHz, Diagnostics, Class1 Div2.

Accessories (Contact Sales Support Department for up-to-date list)

Description	Part Number
Programming and Communication Cables	
TView+ M-Series Programming and User Data Cable	297817
Trio Communication Cable, DE-9M to DE-9F - Modem, 10 feet (3.05m)	297820
Trio Communication Cable, DE-9M to RJ45M - Modem, 10 feet (3.05m)	297821
Other	
TView+ Configuration/Diagnostics software package	297826

Physical Dimensions - Licensed Digital Data Radio - M-Series