

MRT High Power Radio Modem Series MRT170TR-25 / MRT470TR-25

with up to 25W Transmit Power



The MRT Series data radios are high power (25W) transmitters and transceivers for mobile and fixed environments.

They are designed for low speed RS232 data transmission in situations where long range and extreme reliability are important.

The MRT170TR-25 and MRT470TR-25 both meet the tough European EN 300 113 specifications for licensed radio equipment.

SERIAL INTERFACE

The MRT modem has a full RS232 interface, including CTS, RTS, DSR, DTR and DCD handshaking lines, presented on a standard 9-pin D-type connector.

INTERNAL SOFT MODEM

The MRT features an internal “soft modem” which offers unparalleled performance and flexibility over a wide range of speeds and formats and enables future formats to be handled by software upgrade.

Within a 12.5kHz channel, the over-air transmission from the unit can be user programmed for a range of speeds. If the maximum speed is not required, the unit can be configured for a lower speed to give an improved receiver threshold. The MRT incorporates an internal buffer to cope with situations where the interface data rate differs from the over-air rate.

For 150, 300, 600, 1200 & 2400 baud, FSK/FFSK is used with both Bell202 and V.23 supported. At 4800bps GMSK modulation is used, while at 9600bps, the modulation is 4-level FSK.

CHANNEL SELECTION

The MRT can be programmed for simplex or semi-duplex operation with up to 80 discrete channels.

Once programmed, the channels can then be selected via rotary switches on the front panel.

RF POWER

The transmit power can be accurately set using a locally connected PC with the supplied software. The transmit power can be accurately set between 5W and 25W.

PROGRAMMABILITY

The parameters of the MRT can be configured through the local serial port using the Windows based WinA4P configuration software. The individual configurations can be stored on disc for future use or printed.

STATUS LEDs

The MRT has a number of LEDs to enable the operator to see at a glance the status of the radio and its interfaces. The System LED provides the operator with a quick visual health check and if the software detects an error, a code is flashed on the LED to indicate the error.

SQUELCH TAIL ELIMINATION

For old or non tolerant protocols, where the presence of a mute (squelch) tail may cause a problem at the end of a message, a simple packetisation option can be enabled using the configuration software.

FORWARD ERROR CORRECTION

Forward error correction is a programmable option at 9600bps, but as with all FECs, the associated overhead will reduce the effective data throughput rate when it is selected. Error correction offers insignificant performance improvements below 9600bps so the option is permanently disabled at those lower rates.

“RSSI” RECEIVE SIGNAL STRENGTH INDICATION

The RSSI signal is accurately measured by an internal A-D converter and compared to an individually calibrated RSSI graph within the processor. The signal strength can then be accurately read in engineering units from a PC connected to the serial port.

Tx TIME-OUT-TIMER

The transmitter within the MRT has a time-out timer which allows the maximum continuous transmission time to be set in order to prevent channel blocking due to a fault. The timer operates in all modes and can be programmed in one second steps between 0 and 255 seconds. If programmed and the time is exceeded, transmission will cease until the action that normally causes transmission is removed and then re-applied.

TECHNICAL SPECIFICATIONS

General

Frequency Ranges:	MRT170 150 - 175MHz MRT470 406 - 512MHz (in customer specified sub-bands)
Power Requirements:	12VDC (10V – 15.5V DC)
Receive:	< 80mA
Transmit:	typically 2A to 6A dependent on Tx power
Number of Channels:	80 user programmable frequencies
Min. Programmable Channel Step:	6.25 or 5kHz
Channel Spacing:	12.5kHz, 20kHz or 25kHz
Frequency Stability:	2ppm (-30 to +60°C)
Construction:	Milled aluminium enclosure
Size:	210mm L x 183mm W x 42mm H
Mounting:	Screws to a flat surface
Weight:	2kg
Connectors:	DC Power - Flying Lead RS232 I/O - 9-way D-Type RF - N-Type (50 ohm)
Led Indicators:	TX, BUSY, SYSTEM, RXD, TXD, RTS, CTS, DCD, DTR, DSR, RI
Approvals:	Products in the MRT range have been designed to meet the following specifications. (for full information please contact the sales office) European performance: EN300-113 European EMC: EN301-489

Receiver

Sensitivity:	-120dBm for 12dB SINAD de-emph. -117dBm for 12dB SINAD flat
Bandwidth:	VHF 7MHz without re- alignment UHF 12MHz without re- alignment
Spurious Response:	> 80dB
Blocking:	> 90dBuV
Intermodulation:	> 70dB
Adjacent Channel:	> 65dB down at 12.5kHz
IF Frequencies:	45MHz and 455kHz
Spurious Emissions:	< ETS 300-113
Mute Response Time:	< 3ms

Transmitter

RF Output Power:	Accurately settable from 5W to 25W
Bandwidth:	VHF 10MHz without re- alignment UHF 12MHz without re- alignment
Internal Modulation:	FFSK, 2 Level FSK, 4 Level FSK or GMSK via the internal modem.
Max. Deviation:	± 7.5kHz max – set for 1.5kHz by default
Adj. Channel Power:	< -65dB at 12.5kHz
Transient response:	As per ETS300-113
Spurious Emissions:	< 250nW and 4nW in specified bands
Rise Time:	< 9mS

Internal Modem

Radio Baud Rate:	150 – 9600bps over-air
RF Bandwidth:	12.5kHz
Signalling Formats:	Programmable for 12.5kHz channel:- Up to 1200bps - FSK with V23, Bell202 or 1200/1800Hz FFSK (MPT1327). 2400bps - coherent 1200/2400Hz FFSK. 4800bps - GMSK. 9600bps - 4 level FSK.
Bit Error Rate:	2400 baud less than 1 in 10 ⁻³ at -120dBm 4800 baud less than 1 in 10 ⁻³ at -117dBm 9600 baud less than 1 in 10 ⁻³ at -115dBm (FEC on) 9600 baud less than 1 in 10 ⁻³ at -112dBm (FEC off)
FEC:	Programmable option at 9600bps

Serial Data

Serial Interface:	RS232
Format:	Asynchronous. Programmable; Odd, Even or No Parity, 1/2 stop bits, 7/8 data bits.
Interface Rates:	Programmable 150bps to 38400bps
Signalling Lines:	RS232 interface supports full RTS, CTS, DSR, DTR & DCD handshaking, although it is also possible to use just the TXD, RXD & Ground lines.

In the interest of product improvement, the above specifications are subject to change without notice.