

QRT RADIO MODEM SERIES

ADVANCED
RADIO
TECHNOLOGIES



The QRT Series have been designed as low cost versatile radio modems, transceivers, receivers, and transmitters for stand alone applications or for integration into OEM products. Applications include security, command and control, data logging, SCADA, telemetry, remote switching, radio modems and paging.

PRODUCTS

The QRT Series are available in two ranges: the low power QRT450 and QRT869 which meet the licence exempt ETS300-220 specification and the QRT170, QRT470 and QRT870 which are available in a 1Watt and 5Watt configuration and meet the tougher ETS300-113 and the USA and Canadian specifications.

CHANNEL SELECTION

The QRT products are PC programmable with access to 9 selectable channels via a channel switch located on the top of the product.

PROGRAMMABILITY

Most of the parameters of the QRT Series can be programmed via the serial port using either a DOS or Windows 95/98 based software. The individual program can be stored on disc for future use.

RF POWER

The QRT Series is available in two power ranges: 10mW to 750mW and 50mW to 5Watts. There are no internal power adjustment points inside the modem: the RF power level can be adjusted by up/down arrow keys on a connected PC software.

POWER SAVE

By using a combination of the RTS and data lines the QRT can be put into a power save mode to reduce current consumption. Alternatively the QRT can be PC programmed for "Internal Powersave": in this mode the microprocessor controls the on/off function of the receiver and after a pre-programmed time the MPU will switch on the receiver to look for a carrier. If a carrier is not detected then the transceiver goes back into sleep mode. If during the time the transceiver is awake a carrier is received, the unit will stay awake. After the carrier drops out, the receiver will stay awake until the programmed resume time elapses. Once the resume time has elapsed the transceiver will go back into sleep mode. The save on/off and resume time are all programmable via the PC program.

TX TIME-OUT TIMER

The transmitter within the QRT 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.

'RSSI' RECEIVE SIGNAL STRENGTH INDICATION

A DC voltage representing the Received Signal Strength is measured by an A-D converter within the QRT module. This level can be read via the PC programming software.

STATUS LED

Each radio has a system LED to indicate the status of the product. If the software detects an error, a code is flashed on the LED to indicate the error and the radio will reset.

SOFT MODEM

The "soft modem" within QRT offers a wide range of programmable speeds and formats. The QRT can be programmed for 150-2400bps FFSK with Bell202 and V23 supported, 150 - 4800bps FSK and 4800bps GMSK within a 12.5KHz channel and 512, 1220 and 2400bps POCSAG for paging systems.

PRODUCTS AND CONFIGURATION

The QRT Series can be supplied as transceivers, receivers or transmitters in the following configurations:

Transmitters

T/A Audio and 5VTTL Data Transmitter

The unit has an audio input and a 5VTTL serial interface, with a programmable serial speed of 1200 – 19200bps and an over the radio link data speed 150 – 4800bps or POCSAG for paging at 512, 1200 and 2400bps.

T/RS RS232 Data Transmitter

The unit has an RS232 serial port with a programmable serial speed of 1200 – 19200bps and an over the radio link data speed of 150 – 4800bps or POCSAG for paging at 512, 1200 and 2400bps.

T/P Paging Message Transmitter

With four closing contact inputs, each input can be programmed with either a 40 character message for reception on pagers, or as a on/off, momentary or timed switch function, when used with a R/P paging receiver switch. The units supports 512, 1200 and 2400bps POCSAG.

T/D Digital Transmitter Switch

With four programmable closing contacts that can be programmed for different addresses, repeat transmissions and on/off, momentary or timed functions. The unit is designed to work with the R/D receiver.

Receivers

R/A Audio and 5VTLL Data Receiver

The unit has an audio output and a 5VTTL serial interface with a programmable serial speed of 1200 – 19200bps and an over the radio link speed of 150 – 4800bps or POCSAG at 512, 1200 and 2400bps.

R/RS RS232 Data Receiver

The unit has an RS232 serial port with a programmable serial speed of 1200 – 19200bps and an over the radio link data speed of 150 – 4800bps or POCSAG at 512, 1200 and 2400bps.

R/P Paging Receiver Switch

With four closing contact outputs, each output can be programmed with a different address and can be used to activate a relay or similar on receipt of the correct address from a paging local T/P or wide area transmitter. The unit supports 512, 1200 and 2400bps POCSAG.

R/D Digital Switch Receiver

The unit has four address programmable closing contact outputs and is designed to work with the T/D Transmitter.

Transceivers

TR/A Analogue and 5VTTL Data Transceiver

The unit has an audio and 5V TTL serial interface with a programmable serial speed of 1200 – 19200bps and an over the radio link speed of 150 – 4800bps.

TR/D Digital Transceiver Switch

With two programmable inputs and outputs for remote switch applications where a conformation of the action is required. The units support on/off, momentary and timed action.

TR/RS RS232 Radio Modem

The unit has an RS232 serial port with a programmable serial speed of 1200 – 19200bps and an over the radio link data speed of 150 – 4800bps.



TECHNICAL SPECIFICATIONS

General

Frequency Range:	QRT150	138 – 175MHz
	QRT450/470	406 – 512MHz
	QRT869	869 – 870MHz
	QRT870	820 – 950MHz
	50MHz – 950MHz available on special order	
Power Requirements:	12VDC (10V – 15.5DC)	
Number of Channels:	9 selectable	
Min. Programmable Channel Step:	6.25 or 5KHz	
Channel Spacing:	12.5KHz, 20KHz or 25KHz	
Operating Temp. Stability:	2ppm –30 to +60°C	
Construction:	Milled aluminium enclosure	
Size:	75mm W x 130mm L x 30mm H	
Mounting:	Screws to a flat surface	
Weight:	250gms	
Connectors:	DC power	2Way screw terminal plug
	RS232 I/O	9Way “D” Type
	15 Way “D” Type	Audio/TTL/Digital
	Antenna	BNC
Led Indicators:	TX, RX and System as appropriate	
Approvals:	Products within the range have been tested to the following specifications. For further information contact the sales office.	
	European RF:	ETS 300-220 ETS 300-113 ETS 300-224
	European CE:	ETS 301-489
	Australian:	AS4268.2-1995
	USA:	FCC Part 90/15
	Canadian:	DOC

Transmitter:

RF Output Power:	1Watt unit:	10mW to 750mW
	5Watt unit:	50mW to 5Watts
Bandwidth	Without alignment:	VHF 5MHz UHF 12MHz 900MHz 20MHz
Modulation:	FFSK, FSK, POCSAG & GMSK via the internal modem, or external audio at –15dBm to +0dBm.	
Max. Deviation:	± 7.5KHz max	
Adj. Channel Power:	>65dB	
Hum and Noise:	>–35dB	
Spurious Emissions:	<250nW and 4nW in specified bands	
Rise Time:	<9mS	

Receiver

Sensitivity:	0.25uV for 12dB SINAD		
Bandwidth	Without re-alignment	VHF 5MHz UHF 12MHz 900MHz 20MHz	
Spurious Response:	>70dB		
Blocking:	>90dB relative to 1uV		
Intermodulation:	>60dB		
Adjacent Channel:	>65dB at 12.5KHz		
IF Frequencies:	45MHz and 455KHz		
Spurious Emissions:	<2nW		
Audio Output:	–15Bm to 0dBm		
Mute Response Time:	<3msec		

Internal Soft Modem

Serial Interface:	Asynchronous or Synchronous with custom software. Baud rate programmable between 1200bps and 19200bps RS232 inverted/non-inverted, Odd Even or No Parity, 1-2 stop bits, 7-8 data bits parameters independently programmable.
Data Formats:	Programmable for a 12.5KHz channel: FFSK, V23, Bell202 up to 1200baud, 2400 baud uses coherent 1200/2400Hz (1200/1800Hz by special order) GMSK at 4800 baud
Paging Formats:	POCSAG 512,1200 & 2400bps
NRZI:	On or Off
Bit Error Rate:	POCSAG better than 99% at –120dBm 1200 baud, less than 1 in 10 ⁻³ at –120dBm 4800 baud, less than 1 in 10 ⁻³ at –117dBm