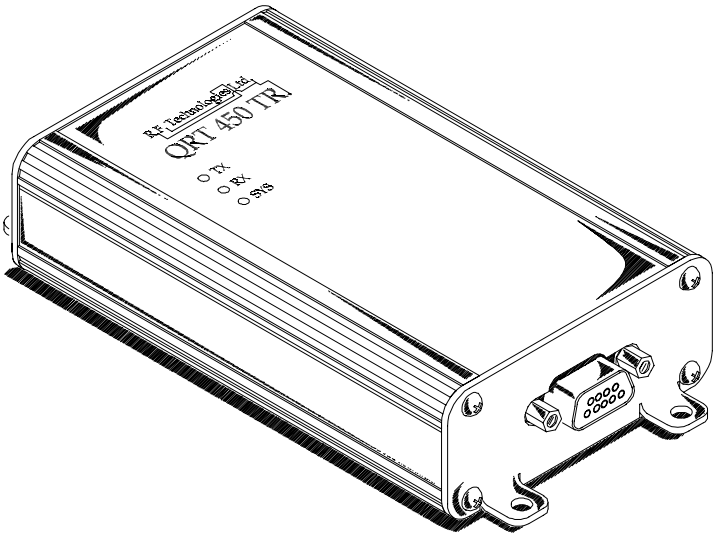
CHURCHILL CONTROLS

Data_Link 2000

QRT Narrow Band Radio Modems



- *Compliant with the relevant UK, European, Canadian, USA and Australian standards for licensed & license exempt operation*
- *Available in VHF, UHF & 900MHz*
- *PC programmable*
- *Internal soft modem with programmable speeds of: 150, 300, 600 1200 & 2400bps FFSK & FSK (including V23 & Bell 202) & 4800bps GMSK & 512, 1200 & 2400 POCSAG.*
- *Low power consumption*
- *RS232 interface*
- *Simplex & semi-duplex operation*

INTRODUCTION

The QRT Series have been designed as low cost Radio Modems, Transmitters, Receivers, & Transceivers for stand alone applications or for integration into OEM products.

Applications include: security, command & control, data logging, AVL, Remote switches, radio modems and paging.

CHANNEL SELECTION:

The QRT products are PC programmed with access to 10 selectable channels via a channel switch located adjacent to the 15Way "D".

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 or printed.

SOFT MODEM

Within the QRT is "soft modem" which offers a wide range of speeds and formats, depending on the product, the QRT can be programmed for 150…2400bps FFSK with Bell 202 & V23 supported, 150…4800bps FSK & 4800bps GMSK within a 12.5KHz channel and 512, 1220 & 2400bps POCSAG.

"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.

RF POWER

The QRT Series is available in two power ranges: 10mW to 1 Watt & 50mW to 5 Watts. There are no internal power adjustment points inside the modem, the RF power level is adjustable Up/Down via the 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.

TX TIME-OUT TIMER:

The transmitter within the ART has a time-out-timer which allows the maximum continuous transmission time to be set in order to prevent channel blocking due to a to 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.

MODES OF OPERATION

The QRT series supports two modes of operation:

Dumb mode

The radio has no knowledge of the data it is transmitting, data is simply transmitted and received under hardware control with the option of RTS control or initiation of transmit after receipt of serial data, with CTS providing an optional flow control.

This configuration is useful when expanding older systems where the radios must be compatible with others of a different manufacture.

Programming & Data

This mode allows data to be mixed with control messages by using a conventional DLE byte stuffing protocol. This mode is ideal if complete control via a MPU is required.

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.

The fault can then be determined simply by counting the number of flashes & looking up the error code in the installation, operation and programming manual. If the error persists the radio will stay in the error mode permanently.

TECHNICAL SPECIFICATIONS

General

Frequency Range:	QRT150	138…175MHz
	QRT450	406…512MHz
	QRT950	820…950MHz
Power Requirements:	12VDC (10V…15.5DC)	
Number of Channels:	10 Selectable	
Min. Programmable Channel Step:	6.25 or 5KHz	
Channel Spacing:	12.5KHz, 20KHz or 25KHz	
Operating Temp. Stability:	2ppm –30…+60ºC	
Construction:	Milled aluminium enclosure	
Size:	73mm W x 115mm L x30.5mm H	
Mounting:	Screws to a flat surface	
Weight:	350gms	
Connectors:	15 Way "D" Type	
LED Indicators:	TX, RX & System	
Approvals:	The products have been designed to meet the following approvals.	
	UK RF:	MPT1411, 1329 & 1328
	European RF:	ETS 300-220
	Australian:	AS4268.2-1995
	USA:	FCC Part 90/15
	Canadian:	DOC
	European CE:	IETS 300-683

Transmitter:

RF Output Power:	1Watt unit:	10mW…1W	
	5Watt unit:	50mW…5W	
Bandwidth:	Without alignment:	VHF	10MHz
		UHF	20MHz
		900MHz	30MHz
Modulation:	FFSK, FSK POCSAG & GMSK via the internal modem, or external audio at –20dBm to + 3dBm into 600ohm.		
Max. Deviation:	± 7.5KHz max		
Adj. Channel Power:	>65dB		
Hum and Noise:	>-35dB		
Spurious Emissions:	< 250nW & 4nW in specified bands		
Rise Time:	< 7mS		

Receiver:

Sensitivity:	0.25uV for 12dB SINAD		
Bandwidth:	Without re-alignment	VHF	5MHz
		UHF	10MHz
		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:	+3…–20dBm into 600Ω
Mute Response Time:	< 3msec

Internal Modem

Serial Interface:	Asynchronous or Synchronous with custom software. Baud rate programmable between 150bps and 19200bps RS232 or inverted/non-inverted, odd even or no Parity, 1-2 stop bits, 7-8 data bits parameters independently programmable.
Signalling Formats:	V23, Bell 202, FFSK, 2 level FSK, GMSK & POCSAG.
NRZI:	On or Off
Baud Rate:	150…4800bps within 12.5KHz
Bit Error Rate:	2400 baud: Less than 1 in 10^3 at –118dBm
	4800 baud: Less than 1 in 10^3 at –115dBm

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

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