
WARWICK WIRELESS LIMITED

TX8000 / RX8000
SYNTHESISED
DATA RADIOS

DATASHEET 134-1

FEATURES

- No operating licence required.
- 32 Selectable RF Channels.
- Range 10-20km line of sight
1-3km in buildings
- RF frequency range: 400.00 MHz to 490.00 MHz
860.00 MHz to 930.00 MHz
In 1.3MHz bands
- RF power output 5mW to 500mW
- Data rates: up to 10Kpbs
- TX8000 transmitter power 7.5 at 270mA
- RX8000 receiver power 5V at 35mA
- Approvals: ETSI 300-220, MPT1329
- Size 36mm by 51mm by 14.5mm



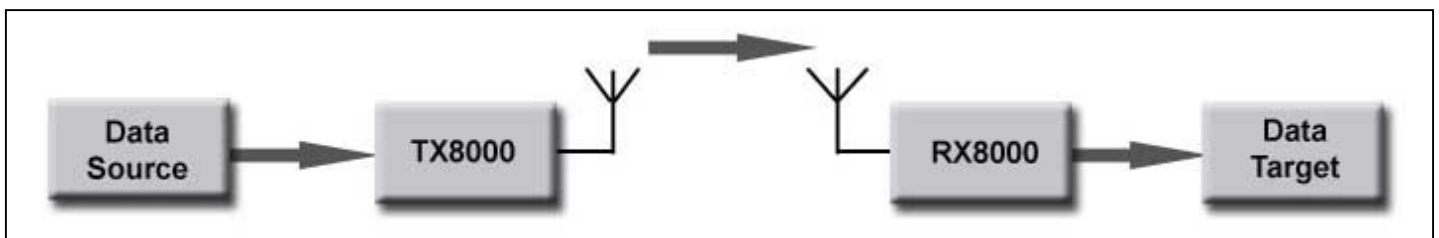
DESCRIPTION

The synthesised TX8000 Transmitter and RX8000 Receiver can be set to one of 32 switch selectable RF frequencies. The modules can transmit data at 10Kbps for a distance of up to 20km line of sight and 1-3km in buildings.

The radios are ideal for general telemetry applications. The TX8000 will transmit analogue data such as FSK, FFSK, GMSK and PWM from its analogue input or accept direct TTL digital data from its digital input. The RX8000 will receive analogue and digital data and present it to its analogue and digital outputs in the same format as it was transmitted.

The units conform to ETSI 300-220 and ETSI 300-683.

TYPICAL OPERATION



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SPECIFICATION

ABSOLUTE MAXIMUM RATINGS

Storage Temperature..... -30 to +85 Celsius
Operating Temperature -25 to +55 Celsius

DIMENSIONS

Length = 36mm Width = 51mm Height = 14.5mm

| ELECTRICAL CHARACTERISTICS | MIN | TYPICAL | MAX | DIMENSION | NOTE |
|----------------------------|---------|---------|---------|-----------|-------------|
| Frequency Range | 458.500 | | 485.950 | MHz | UK |
| | 400.000 | | 490.000 | MHz | World |
| | 860.000 | | 930.000 | MHz | World |
| Channels | | 1 | | | |
| Channel Separation | 12.5 | 25.0 | 25.0 | KHz | Factory |
| Start up Time | 3.0 | 5.0 | 7.0 | mSecs | |
| Modulation | | F3D | | | |
| TRANSMITTER | | | | | |
| RF Output Power | 5.0 | | 500.0 | mW | |
| Analogue Input | | 0.5 | | Vp-p | mod. |
| Digital Input | 3.5 | 4.7 | 5.0 | V | TTL |
| Power Supply | 7.2 | 8 | 10.0 | V | |
| | 270.0 | 290.0 | 390.0 | mAmps | |
| RECEIVER | | | | | |
| Sensitivity | | -112 | | dBm | 10dB SIN AD |
| Analogue Output | | 2.0 | | Vp-p | +/-5KHz |
| Digital Output | | 5.0 | | V | TTL |
| Power Supply | 5.0 | 5.5V | 12 | V | |
| | 12.0 | 15.0 | 18.0 | mAmps | |

Note: Switch mode power supplies can produce RF frequencies that will interfere with the receiver signal.

| PART No. | DESCRIPTION |
|------------|-------------------------------------|
| TX8000.XXX | Transmitter XXX = RF Frequency Band |
| RX8000.XXX | Receiver XXX = RF Frequency Band |

RADIO PROPAGATION

With any radio system there are a number of factors which affect the system performance. These are:
Transmitter power output.

Height of transmitter and receiver antenna.

Length and type of coaxial feeder cable to the antenna.

Type and efficiency of the antenna.

Topography between transmitter and receiver.

The weather.

ANTENNA

X603 Quarter Wave Antenna

Low cost, mobile, omni-directional, short range approximately 2km

X604 Mast Mounted Dipole Antenna

Omni-directional, base station, range approximately 10km

X605 High Gain Yagi Antenna

Directional beam of 40°, range approximately 10-20km, usually used on receivers only.

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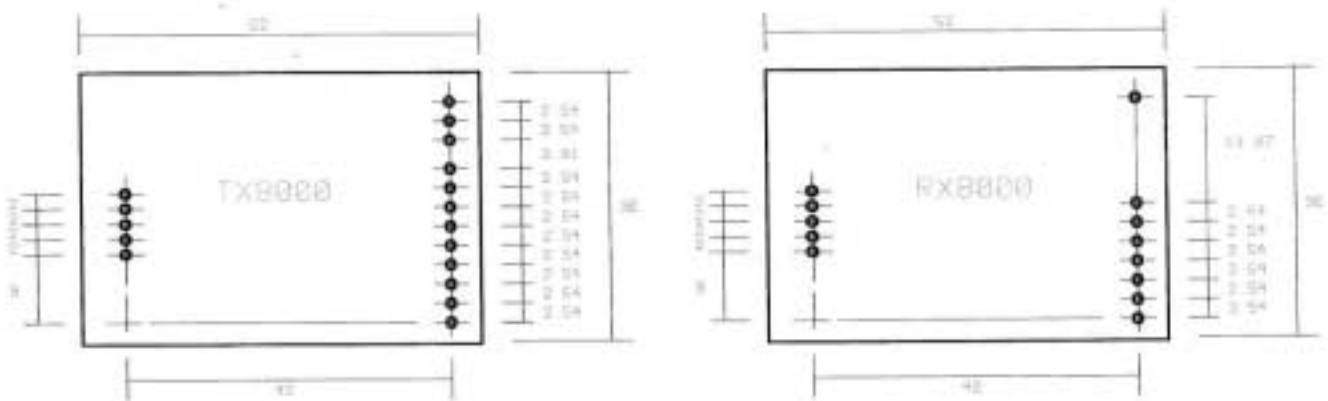
TRANSMITTER CONNECTIONS: Pins on underside of Module

| PIN | DESCRIPTION | DIRECTION |
|-----|--|-----------|
| 1 | Ground | Input |
| 2 | | |
| 3 | | |
| 4 | Digital Data Input (TTL) | Input |
| 5 | Switched +5V | Output |
| 6 | | |
| 7 | Regulated +5V | Output |
| 8 | Transmitter ON (Connected to Ground to start the Transmitter) | Input |
| 9 | Supply Voltage to Module (7.2 - 10V) | Input |
| 10 | Receiver RF Output (for use in transceiver) | Output |
| 11 | Ground | Input |
| 12 | Antenna | Output |

RECEIVER CONNECTIONS: Pins on underside of Module

| PIN | DESCRIPTION | DIRECTION |
|-----|---|-----------|
| 1 | Ground | Input |
| 2 | Receiver Signal Strength Indicator (RSSI) | Output |
| 3 | Demodulated Output | Output |
| 4 | | |
| 5 | Power Supply | Input |
| 6 | Digital Data Output | Output |
| 7 | Power Supply (5 to 12V) | Input |
| | | |
| 8 | Antenna | Output |

MECHANICAL DETAILS

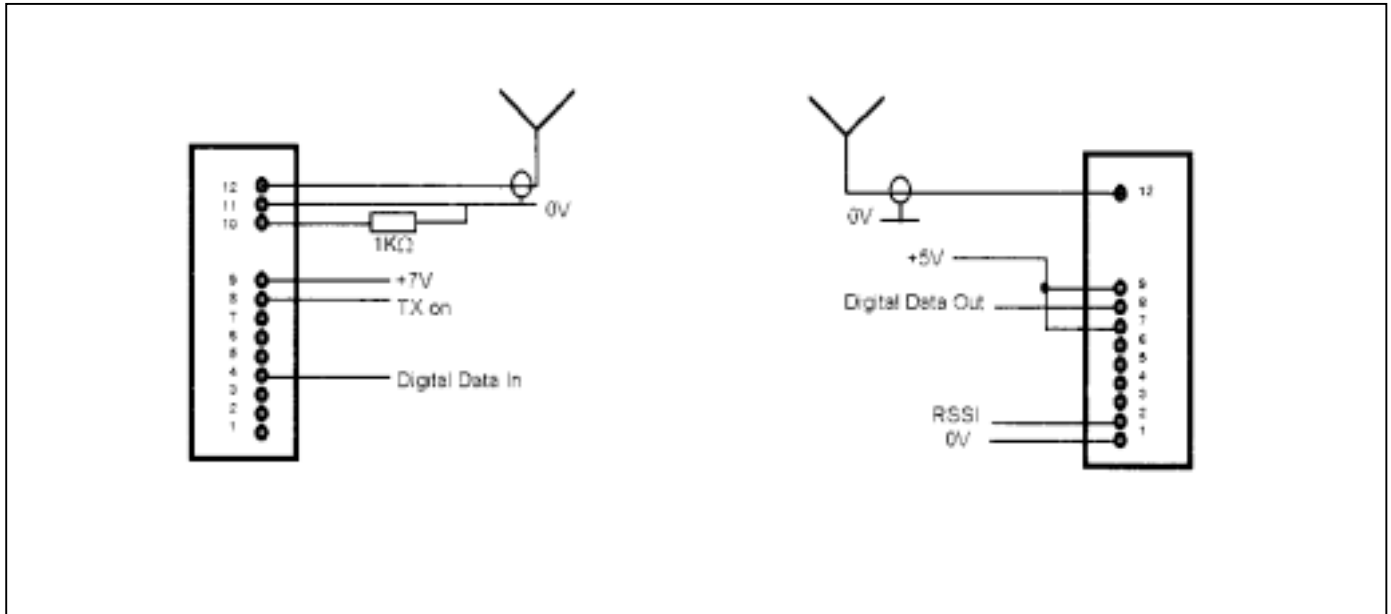


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CIRCUIT CONNECTIONS



Note: On the standard RX8000, pins 4 & 5 are not present. Therefore the pins are numbered 1 to 7

RF FREQUENCY

An example of how the RF Frequency is set using the Programming Pins is shown below. The frequency band can be factory set in the range 400.00MHz to 490.00MHz and 860.00MHz to 930.00MHz at 12.5KHz or 25KHz spacing in bands of 1.3MHz.

| Hex Ch | RF Freq MHz | PIN 1 | PIN 2 | PIN 3 | PIN 4 | PIN 5 |
|--------|-------------|-------|-------|-------|-------|-------|
| 00H | 458.500 | LOW | LOW | LOW | LOW | LOW |
| 02H | 458.525 | HIGH | LOW | LOW | LOW | LOW |
| 04H | 458.550 | LOW | HIGH | LOW | LOW | LOW |
| 06H | 458.575 | HIGH | HIGH | LOW | LOW | LOW |
| 08H | 458.600 | LOW | LOW | HIGH | LOW | LOW |
| 0AH | 458.625 | HIGH | LOW | HIGH | LOW | LOW |
| 0CH | 458.650 | LOW | HIGH | HIGH | LOW | LOW |
| 0EH | 458.675 | HIGH | HIGH | HIGH | LOW | LOW |
| 10H | 458.700 | LOW | LOW | LOW | HIGH | LOW |
| 12H | 458.725 | HIGH | LOW | LOW | HIGH | LOW |
| 14H | 458.750 | LOW | HIGH | LOW | HIGH | LOW |
| 16H | 458.775 | HIGH | HIGH | LOW | HIGH | LOW |
| 18H | 458.800 | LOW | LOW | HIGH | HIGH | LOW |
| 1AH | 458.825 | HIGH | LOW | HIGH | HIGH | LOW |
| 1CH | 458.850 | LOW | HIGH | HIGH | HIGH | LOW |
| 1EH | 458.875 | HIGH | HIGH | HIGH | HIGH | LOW |

| Hex Ch | RF Freq MHz | PIN 1 | PIN 2 | PIN 3 | PIN 4 | PIN 5 |
|--------|-------------|-------|-------|-------|-------|-------|
| 20H | 458.900 | LOW | LOW | LOW | LOW | HIGH |
| 22H | 458.925 | HIGH | LOW | LOW | LOW | HIGH |
| 24H | 458.950 | LOW | HIGH | LOW | LOW | HIGH |
| 26H | 458.975 | HIGH | HIGH | LOW | LOW | HIGH |
| 28H | 459.000 | LOW | LOW | HIGH | LOW | HIGH |
| 2AH | 459.025 | HIGH | LOW | HIGH | LOW | HIGH |
| 2CH | 459.050 | LOW | HIGH | HIGH | LOW | HIGH |
| 2EH | 459.075 | HIGH | HIGH | HIGH | LOW | HIGH |
| 30H | 459.100 | LOW | LOW | LOW | HIGH | HIGH |
| 32H | 459.125 | HIGH | LOW | LOW | HIGH | HIGH |
| 34H | 459.150 | LOW | HIGH | LOW | HIGH | HIGH |
| 36H | 459.175 | HIGH | HIGH | LOW | HIGH | HIGH |
| 38H | 459.200 | LOW | LOW | HIGH | HIGH | HIGH |
| 3AH | 459.225 | HIGH | LOW | HIGH | HIGH | HIGH |
| 3CH | 459.250 | LOW | HIGH | HIGH | HIGH | HIGH |
| 3EH | 459.275 | HIGH | HIGH | HIGH | HIGH | HIGH |

Note: Each Country has different rules and regulations on the use of RF Spectrum.

Information contained in this document is believed to be accurate, however no representation or warranty is given and Warwick Wireless Ltd. assumes no liability with respect to the accuracy of such information. Use of Warwick Wireless's products as critical components in life support systems is not authorised except with express written approval from Warwick Wireless Ltd.

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