Synthesised Radio Modules TX8000/RX8000

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

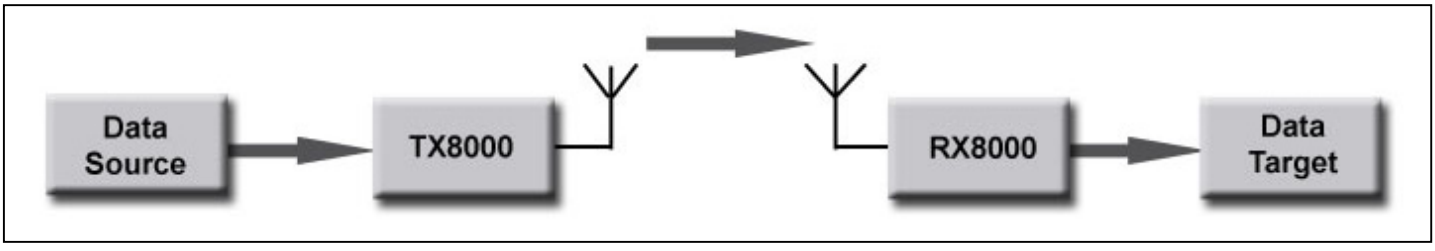
Description

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	10dBSINAD
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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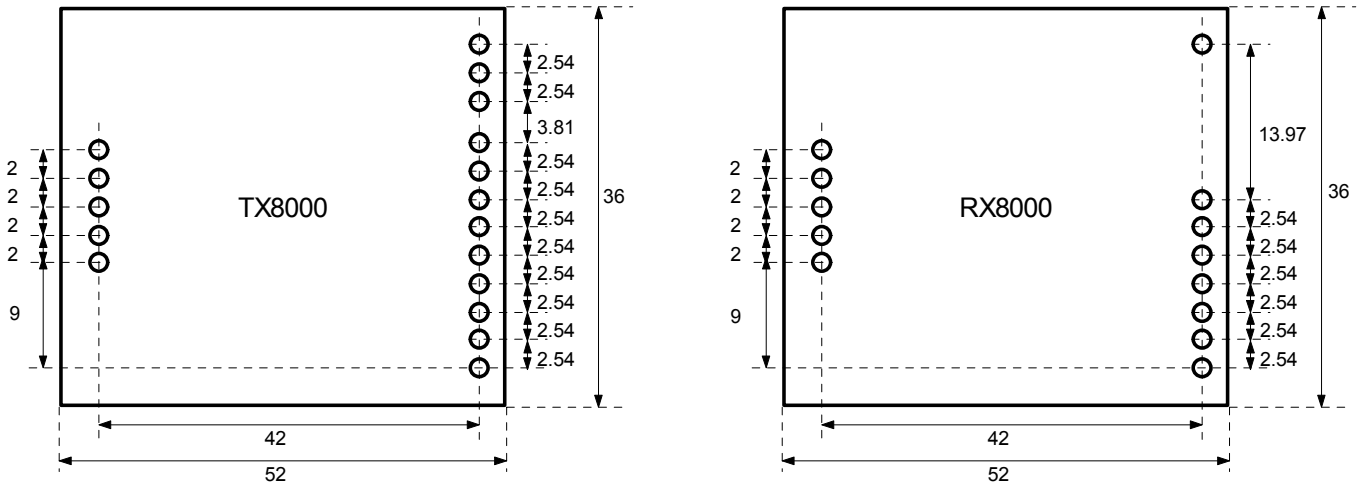
TRANSMITTER CONNECTIONS: Pins on underside of Module

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

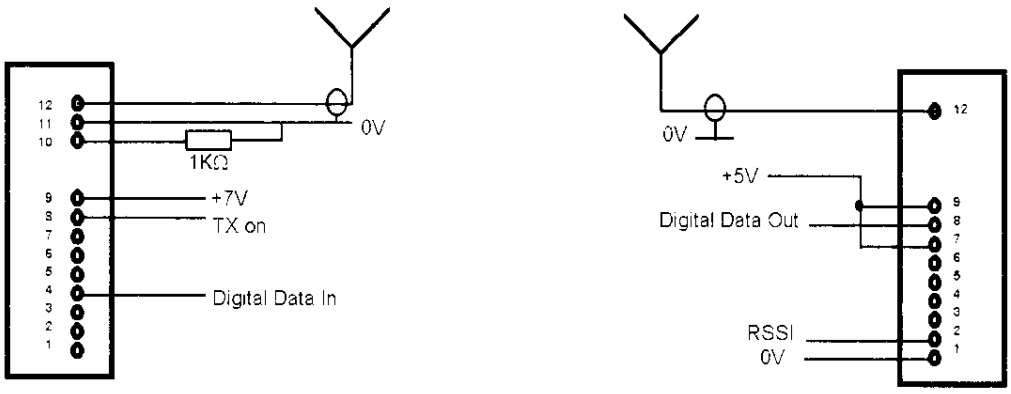
MECHANICAL DETAILS



All Dimensions in mm

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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	458.050	LOW	HIGH	HIGH	LOW	HIGH
2EH	458.075	HIGH	HIGH	HIGH	LOW	HIGH
30H	458.100	LOW	LOW	LOW	HIGH	HIGH
32H	458.125	HIGH	LOW	LOW	HIGH	HIGH
34H	458.150	LOW	HIGH	LOW	HIGH	HIGH
36H	458.175	HIGH	HIGH	LOW	HIGH	HIGH
38H	458.200	LOW	LOW	HIGH	HIGH	HIGH
3AH	458.225	HIGH	LOW	HIGH	HIGH	HIGH
3CH	458.250	LOW	HIGH	HIGH	HIGH	HIGH
3EH	458.275	HIGH	HIGH	HIGH	HIGH	HIGH

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

R. F. Solutions Ltd.,

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R F Solutions is a member of the Low Power Radio Association.

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