

X8200 Radio Modem

FEATURES

- Operates on international licensed and licence free radio bands.
- RF Bands: 147MHz to 174MHz VHF
400MHz to 500MHz UHF
868MHz to 920MHz UHF
- Conforms to ETSI 300-220, ETSI 300-113, ETSI 300-683, MPT1329, MPT1411.
- Distant Modems can be monitored and configured over the radio link.
- 17 to 99 selectable radio channels.
- Range 10km to 20km line of sight and 1km to 3km in buildings for ERP of 500mW.
- RS232 & RS485 serial Interface with baud rates of 1.2K to 115.2K.
- Ethernet Interface Option.
- Commissioning and diagnostic futures.
- Store and Forward Repeater Mode to extend range.
- Addressable individually and globally.
- On-line AT commands.
- Packetised Data, and Forward Error Correction options.
- Low power standby mode.



DESCRIPTION

The X8200 Radio Modem transmits and receives half duplex serial data at baud rates of 1.2K to 115.2K by means of a FM Radio Transceiver operating on the UK and European licence exempt bands and most other world wide data frequencies.

A 4K buffer memory is provided so that data can be passed asynchronously between the host and modem without the need for handshaking. The CTS output signal can be used for flow control in duplex applications. The over air data speed can be configured at either 5K bits/sec or 10K bits/sec. This is independent of the baud rate and should be set to a lower value where possible for the best radio propagation.

The set up menu of the X8200 can be accessed either by a PC running any terminal emulation program like Hyper Terminal in the accessories section or remotely over the radio link. The set up menu is selected either by connecting pin 6 on the 9 way D Connector to 0v or typing \$ then ESC directly after the power has been applied. The menu configuration is permanently stored on EEPROM.

On-line "AT" commands can be sent to the modem to change the address configuration, repeater path or RF frequency during normal operation so that any modem can "dial up" any other modem on the network.

Data can be formed into packets and passed from one modem to another. If the received packet has errors detected then the data will automatically be sent again. Both size of the data packet and the number of retries can be set in the menu.

The X8200 radio modem is powered from DC source of between 10V or 26VDC. In receive mode it will take 80mA and in transmit 350mA. Taking DTR low will switch the modem into a power saving stand-by mode. In this state it will consume approximately 0.1mA. It will take approximately 20mSec for the modem to become fully operational after DTR is taken high or power is applied.

X8200 Radio Modem

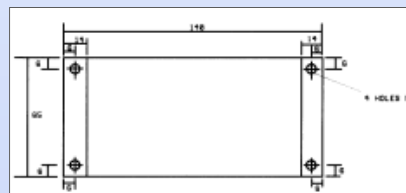
SPECIFICATION

ABSOLUTE MAXIMUM RATINGS

Storage Temperature.....	-30 to +85 Celsius
Operating Temperature	-10 to +55 Celsius
DIMENSIONS X8200 UHF 500mW.....	Length = 140mm Width = 65mm Height = 26mm
DIMENSIONS X8200HP UHF 5W	Length = 147mm Width = 65mm Height = 52mm
DIMENSIONS X8200HP VHF 5W	Length = 174mm Width = 80mm Height = 58mm

ELECTRICAL CHARACTERISTICS	MIN	TYPICAL	MAX	DIMENSION	NOTE
Frequency Range	458.500		458.950	MHz	UK
	400.000		480.000	MHz	World
	147.000		174.000	MHz	Si
Channels		17			
Channel Separation	12.5	25.0	25.0	KHz	
Start up Time	5.0	10.0	30.0	mSecs	With \$ Selected
Modulation		F3D, F1D			
Power Supply	10	12	26V	V	
TRANSMITTER					
RF Power X8200	5		500	mW	
RF Power X8200HP	1		5	W	
Data Input RS232	-10		10	V	
Data Input RS485	0		5	V	
Frequency Deviation		+/- 3.0		KHz	25KHz Channel
Modulation Rate	DC		10.0	Kbps	
Supply Current	330	340	360	mA	at 500mW
RECEIVER					
IF Frequencies		45/455		MHz	
Sensitivity		0.9		μ V	
Bandwidth	+/-7.5	KHz			
Data Output RS232	-10		10	V	
Data Output RS485	0		5	V	
Carrier Detect	-10		10	V	
Supply Current	80	90	105	mA	
Supply Current Standby	0.005	0.007	0.01	mA	

MECHANICAL DETAILS X8200



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CONNECTIONS

9 Way D Type Connector RS232/RS485

1	+10V to +26V INPUT
6	CONFIGURATION MODE INPUT
2	RS232 RD RECEIVE DATA INPUT
7	-VE RS485 INPUT/OUTPUT
3	RS232 TD TRANSMIT DATA OUTPUT
8	CTS OUTPUT
4	DTR (STANDBY) INPUT
9	+VE RS485 INPUT/OUTPUT
5	0V INPUT

PIN 1+VE	10V to 26V regulated power supply, rated at 1A.
PIN 2 RD	RS232 Receive serial data from host
PIN 3 TD	RS232 Transmit serial data to host.
PIN 4 DTR	A signal of between 0v to -15v will switch the modem into standby power mode.
PIN 5 0V	Power supply and common for host.
PIN 6 CON	Configuration input. Connecting 0V to this input will send the configuration menu to the host when the power is applied. It is left open circuit for normal operation
PIN 7 -VE	RS485 Bi-directional data.
PIN 8 CTS	Brought low by the modem when a RF carrier is detected or the receiver buffer memory is full. This can be connected to RTS on the host to inhibit data from the host in duplex operations.
PIN 9 +VE	RS485 Bi-directional data.

LED Indicators

Three LED on the front of the modem indicate the following states:

TX	Green	On when modem is transmitting data.
RX	Green	On when a RF carrier of greater than 0.9uV is detected by the modem. This threshold can be adjusted by a potentiometer inside the modem.
POWER	Red	On when power is applied to the modem

CONFIGURATION MENU

Local Modem

The Modem can be configured by connecting a PC running a terminal emulation program such as Hyper Terminal located in the Accessories section of most computers which is set to 9600 Baud, No Parity. Connect a PC cable to the Serial Port. Switch on the modem and then press the \$ key and then ESC key. Alternatively connect pin 6 on the D Connector to 0V then switch on. The parameters can then be modified simply by using the four Arrow Keys and the Enter Key.

Remote Modem

Any distant Modem can be configured over air by entering the target Modem ID number or 99 in the Set Repeat Path, then setting Access Remote Modem to Y and then pressing the Enter Key. The remote Modem Menu will be displayed along side the local Modem settings. The RSSI reading measured at the remote modem will also be displayed.

X8200 Radio Modem

Warwick Wireless Ltd X8200 Radio Modem V#.#		
	Local	Remote
Advanced Menu	N	N
Modem ID	01	02
Baud	9600	9600
Parity	N	N
Odd/Even	E	E
RF Power	5	5
Key Transmitter	N	N
RF Channel	17	17
RSSI	N	N
Sensitivity	00	00
Comms Speed	S	S
Address Mode	N	N
Enable AT Instr	N	N
Restore Defaults	N	N
Exit without Save	N	N
Save & Exit	N	N

Warwick Wireless Ltd Advanced Menu

	Local	Remote
Return to Main Menu	N	N
Message Tag	0000	0000
TX Priority	N	N
FEC	N	N
Packetise Data	N	N
Number of Retries	05	05
Packet Size	20	20
Logger Mode	N	N
Enable Remote Access	Y	Y
Access Remote Modem	Y	N
Engage Repeater Path	N	N
Set Repeater Path	02	00
Local	M01 M02 M03 M04 M05 M06 --- M16 02	
Remote	M01 M02 M03 M04 M05 M06 ----- M16 (use space bar to delete repeater path)	

Main Menu

Advanced Menu:	Display Advanced Menu .
Modem ID	User defined ID number.
Baud Baud	Rate 1.2K to 115.2K
Parity	Enable Parity.
Odd/Even	Select Parity.
RF Power	Set level of RF Power.
Key Transmitter	Switch on Transmitter
RF Channel Set	RF Frequency.
RSSI	Bar Graph of Rx Signal
Sensitivity	Set the Receiver Sensitivity
Comms Speed	Slow/Fast
Address Mode	Enables Modem Address.
AT Enable AT Instr	AT instruction are enabled.
Enable Remote	Access Allows
Restore Defaults	Set Factory Defaults.
Exit without Save	Return without saving operation without saving settings.
Save & Exit	Return to Modem and save Settings.

Advanced Menu

Return to Main Menu	Display Main Menu.
TX Priority	Data transmitted priority
Message Tag	Adds Ident. No. to Data
FEC Forward	Error Correction
Packetise Data	Data is formed into packets with error detections and Acknowledgments. Connect CTS to RTS on Host.
Number of Retries	Sets number of retries.
Packet Size	Sets packet size. 64-1024
Logger Mode	Data is stored until polled. distant Modem to change settings.
Access Remote Modem	Displays settings of remote Modem with ID on AT Path.
Engage Repeater Path	Enable repeater path.
Set Repeater Path	Sets AT Path M01 to M16.

SITE SURVEY

A site survey can be carried out by configuring a base station Radio Modem to continuously transmit by setting Key Transmitter in the menu to Y. A second Radio Modem can be used to move around the site observing either the Rx Led or the RSSI Bar Graph.