

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.
- Two Independently X7200HP Radio Modems in hot standby.
- 17 to 99 selectable radio channels.
- RF Power 1W and 5W
- RS232/RS485 serial Interface with baud rates of 1,200 to 38,400.
- Service and monitoring RS232/RS485 serial port.
- Remote monitoring and configuration of outstation modems.
- Addressable individually and globally.
- On-line AT commands for network control.
- Variable Data Packets and error checking mode.
- 1U, 19 inch rack mounted enclosure.



DESCRIPTION

The X7220-2 Dual Redundant Base Station consists of two X7200 Radio Modems, two power supplies and an independent monitoring system. Only one Radio Modem is operational at any time with the other in hot standby. If any of the monitored parameters such as bit error rate, RF Power, RF sensitivity, Power Supply should exceed there pre-set limits then the second X7200 will be brought into service and the fault reported via the monitoring serial port and a relay contact closing. The in service radio modem will be changed automatically after a pre-set duty time.

A 4K buffer memory is provided on each radio modem so that data can be passed asynchronously between the host and modem without the need for handshaking. The CTS output signal on the communication port 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 X7220-2 can be accessed either by a PC running any terminal emulation program like Hyperterminal in the Accessories Section or remotely over the radio link. The set up menu is selected from the serial serves and monitoring port. The menu configuration is permanently stored on EEPROM.

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

A forward error-correcting algorithm can be configured to increase the integrity of the data transmission at high speed or over long distances.

The X7220-2 Dual Redundant Base Station is housed in a 19 inch rack and can be powered from a 12V, 24V, 110V or 240V power source.

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SPECIFICATION

ABSOLUTE MAXIMUM RATINGS

Storage Temperature..... -30 to +85 Celsius

Operating Temperature -10 to +55 Celsius

DIMENSIONS X7220HP UHF 1- 5W 1U 19 inch rack

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	12	24	30	Vdc	110V, 240Vac
TRANSMITTER					
RF Power X7220HP	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	0.89	3.1	3.2		Amps
RECEIVER					
IF Frequencies		45/455		MHz	
Sensitivity		0.9		µV	
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	

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CONNECTIONS

Communication and Service 9 Way D Type Connector RS232/RS485

1		+12V	INPUT
	6	CONFIGURATION MODE	INPUT
2		RS232 RD RECEIVE DATA	INPUT
	7	-VE RS485	INPUT/OUTPUT
3		RS232 TD TRANSMIT DATA	OUTPUT
	8	+VE RS485	INPUT/OUTPUT
4		DTR (STANDBY)	INPUT
	9	CTSI	OUTPUT
5		0V	INPUT

PIN 1+VE	9V to 30V 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 +VE	RS485 Bi-directional data.
PIN 9 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.

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.
IS1	Green	On when Modem 1 is in service.
IS2	Green	On when Modem 2 is in service.
F1	Red	On when modem 1 is in a fault condition.
F1	Red	On when modem 1 is in a fault condition.
POWER	Red	On when power is applied to the modem
RL1	Relay	Dry contacts which are closed when unit is in fault condition

CONFIGURATION MENU

Local Modem

The X7220 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. The parameters can then be modified simply by using the four Arrow Keys and the Enter Key. In addition Error Message and a Log for the last 24Hrs can be down loaded.

Remote Modem

Any distant Modem which is in radio range can be configured and monitored by entering the target modem ID number in the Advanced Menu of the X7220, setting Access Remote Modem to Y then pressing the Enter Key. This can also be done on a serial string.

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WARWICK WIRELESS LIMITED

X7220-2 / X7220HP
DUAL REDUNDANT
BASE STATION

Warwick Wireless Ltd X7200-2 Radio Modem V1.0

	Local	Remote
Advanced Menu	N	N
Modem ID	00	01
Baud	9600	9600
Parity	N	N
Odd/Even	E	E
RF Power (mW)	500	500
RF Channel	00	00
Key Transmitter	N	N
Trans Speed	S	S
Address Mode	N	N
TX Address	00	00
RX Address	00	00
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
Enable AT Instructions	N	N
TX Priority	Y	Y
Display Journal	N	N
Packetise Data	N	N
Number of Retries	05	05
Packet Size	256	256
Rx Sensitivity (uV)	0.9	0.9
Enable Remote Access	N	N
Access Remote Modem	N	N
Enable Repeater Path	N	N
Set Repeater Path	00	00
Local	M01 M02 M03 M04 M05 M06 M07 M08 M09 M10 M11 M12 M13 M14 M15 M16	
Remote	M01 M02 M03 M04 M05 M06 M07 M08 M09 M10 M11 M12 M13 M14 M15 M16	

Main Menu

Advanced Menu:	Display Advanced Menu.
Modem ID	User defined ID number.
Baud	Baud Rate 1.2K to 38.4K
Parity	Enable Parity.
Odd/Even	Select Parity.
RF Power	Set level of RF Power.
RF Channel	Set RF Frequency.
Key Transmitter	Switch on Transmitter for Radio site survey.
Address Mode	Enables Modem Address.
TX Address	Set Transmitter Address.
RX Address	Set Receiver Address.
Repeater	Enables Repeater Mode.
Restore Defaults	Set Factory Defaults.
Exit without Save	Return to Modem operation without saving settings.
Save & Exit	Return to Modem and save Settings.

Advanced Menu

Return to Main Menu	Display Main Menu.
Enable AT Instructions	AT instruction are enabled.
TX Priority	Data will be transmitted when RF noise is present.
Display Journal	Past readings of RSSI and RF Power is displayed (X7200-3).
Packetise Data	Data is formed into packets with error detections and Acknowledgments.
Number of Retries	Sets number of retries.
Packet Size	Sets packet size.
CD Threshold	Sets sensitivity of the receiver.
Enable Remote Access	Allows distant Modem to change settings.
Access Remote Modem	Displays settings of remote Modem with ID on AT Path.
Enable AT Path	Enable repeater path.
Set AT 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 the Rx Led. If the Led is lit then there is a good signal path.

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