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Wireless Serial Modem

WM-01

USER MANUAL

Notice

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WARNING!!

ALWAYS CONNECT AND DISCONNECT YOUR FIELD CABLING WITH THE COMPUTER POWER OFF. ALWAYS TURN COMPUTER POWER OFF BEFORE INSTALLING A CARD. CONNECTING AND DISCONNECTING CABLES, OR INSTALLING CARDS INTO A SYSTEM WITH THE COMPUTER OR FIELD POWER ON MAY CAUSE DAMAGE TO THE I/O CARD AND WILL VOID ALL WARRANTIES, IMPLIED OR EXPRESSED.

Warranty

Prior to shipment, ACCES equipment is thoroughly inspected and tested to applicable specifications. However, should equipment failure occur, ACCES assures its customers that prompt service and support will be available. All equipment originally manufactured by ACCES which is found to be defective will be repaired or replaced subject to the following considerations.

Terms and Conditions

If a unit is suspected of failure, contact ACCES' Customer Service department. Be prepared to give the unit model number, serial number, and a description of the failure symptom(s). We may suggest some simple tests to confirm the failure. We will assign a Return Material Authorization (RMA) number which must appear on the outer label of the return package. All units/components should be properly packed for handling and returned with freight prepaid to the ACCES designated Service Center, and will be returned to the customer's/user's site freight prepaid and invoiced.

Coverage

First Three Years: Returned unit/part will be repaired and/or replaced at ACCES option with no charge for labor or parts not excluded by warranty. Warranty commences with equipment shipment.

Following Years: Throughout your equipment's lifetime, ACCES stands ready to provide on-site or in-plant service at reasonable rates similar to those of other manufacturers in the industry.

Equipment Not Manufactured by ACCES

Equipment provided but not manufactured by ACCES is warranted and will be repaired according to the terms and conditions of the respective equipment manufacturer's warranty.

General

Under this Warranty, liability of ACCES is limited to replacing, repairing or issuing credit (at ACCES discretion) for any products which are proved to be defective during the warranty period. In no case is ACCES liable for consequential or special damage arriving from use or misuse of our product. The customer is responsible for all charges caused by modifications or additions to ACCES equipment not approved in writing by ACCES or, if in ACCES opinion the equipment has been subjected to abnormal use. "Abnormal use" for purposes of this warranty is defined as any use to which the equipment is exposed other than that use specified or intended as evidenced by purchase or sales representation. Other than the above, no other warranty, expressed or implied, shall apply to any and all such equipment furnished or sold by ACCES.

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Chapter 1: Introduction

The Wireless Serial Modems are capable of providing seamless dependable serial communications via radio transmission. This unit can be used together with other Wireless Serial Modems or paired up with our distributed I/O REMOTE ACCES products with a radio modem integrated in to it.

These units consists of two boards, a radio modem and a serial interface board. The interface board can be either RS232, or RS485/422 compatible. The radio is a frequency hopping module that uses a standard asynchronous serial data stream.

Input Power

The unit requires a externally supplied power and has two options to select from (regulated +5VDC or unregulated +12VDC). Three terminals labeled +5V, GND, and +12V are provided.

5 Volts DC Regulated

The +5V is not regulated and is fed directly to the VCC circuit. Therefore if +5VDC is supplied to power the module it must be from a regulated source.

12 Volts DC Unregulated

The +12VDC input has a range of +7V to +18V with an on-board 5V regulator in series with the line. A optional DC to DC converter is available for lower power consumption when battery savings or heat dissipation considerations are important.

Warning: The Wireless Modem requires that you supply only +5VDC *or* +12VDC, but never both.

Serial Connections

RS-232:

If wired "one to one" the DB-9 cable connection follows the standard for **RS-232**, 9 pin connections. The connection should be wired as shown in Table 1. A female DB-9 cable should mate directly to any standard RS-232 host mating connector.

RS-422 full duplex:

The HOST serial connection signal pinouts may vary from one manufacturer to another. The Host Serial signals should be wired as above in Table 1. **RS-422** protocol is provided on the board via jumper selection (install a jumper in the RS422 position on the 485/422 jumper selection).

RS-485 (two wire) half duplex:

The HOST serial connection signal pinouts may vary from one manufacturer to another. The Host Serial signals should be wired as above in Table 1. The HOST serial transmit and receive signals are connected together via jumpers on the board (install jumpers on the RS-485+, RS-485-, and in the RS485 position on the 485/422 jumper selection).

Termination & Bias

In order to avoid noise and reflections in long lines, a cable with a characteristic impedance of 120Ω should be selected and the line should be terminated on both ends with 120Ω resistors. Termination is provided on the board via jumper selection (**TERM**). For short lines (when the propagation of the signal is less than 4% of the time to transmit a bit), the termination might not be needed

Specifications

External Regulated Power:	+5 VDC +/-5%
Alternate Unregulated Power:	+7 VDC to +18V
Connections:	All connections made by removable screw terminal block
Baud Rate serial port to the modem:	1200 to 57.6K Baud between wireless module and serial port
Baud Rate over the air:	Factory selectable 9600 or 19.2K Baud transmission data rates
Serial Data Format:	8 Character, No Parity, 1 Stop Bit 7 Character, Even Parity, 1 Stop Bit 7 Character, Odd Parity, 1 Stop Bit 7 Character, No Parity, 2 Stop Bits
Radio Data Buffers	132 Byte Data Input 132 Byte Data Output
Operating Temperature Range	-45 to +85 C
Storage Temperature Range	-50 to +120 C
Humidity	5% to 95% Non-condensing

Table 1-1: Base Station Specs

900MHz model	9600 bps throughput	19200 bps throughput
General		
Frequency range	902 to 928 MHz, Unlicensed ISM Band	
Type	Frequency Hopping Spread Spectrum Transceiver	
Throughput	9600 bps	19200 bps
Performance		
Transmit output power	100mW	100mW
Rx Sensitivity	-110dBm	-107dBm
Range	Indoor: 600' to 1500' Outdoor: 7 mi. with dipole, over 20 mi with a high gain antenna	Indoor: 425' to 1060' Outdoor: 5 mi. with dipole, over 14 mi with a high gain antenna
Interference Rejection	70dB at Pager and Cellular Phone Frequencies	

Table 1-2: 900 MHz Radio Specification

2.4GHz model	9600 bps throughput	19200 bps throughput
General		
Frequency range	2.40 to 2.4835 GHz, Unlicensed ISM Band	
Type	Frequency Hopping Spread Spectrum Transceiver	
Performance		
Transmit output power	50mW	50mW
Rx Sensitivity	-104dBm	-101dBm
Range	Indoor: 150' to 375' Outdoor: 1.4 mi. with dipole, over 12 mi with a high gain antenna	Indoor: 106' to 265' Outdoor: 1 mi. with dipole, over 8.5 mi with a high gain antenna
Interference Rejection	70dB at Pager and Cellular Phone Frequencies	

Table 1-3: 2.4 GHz Radio Specification

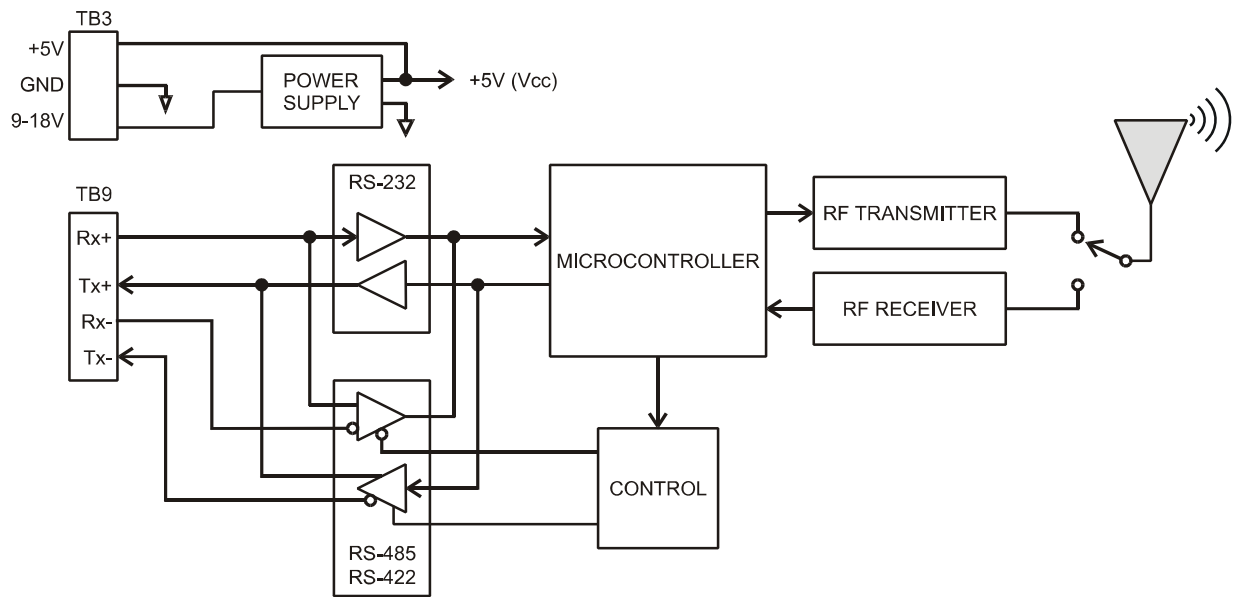


Figure 1-1 Wireless Serial Modem Block Diagram

Chapter 2: Installation

1. Configure the interface board jumpers
 - a. RS-232 requires no jumper settings
 - b. See Option Selection Section for RS-422 and RS-485 settings
2. Wire the serial port connection according to the connection table
3. Wire power connection according to the connection table
 - a. When using a regulated +5VDC
 - i. Connect +5VDC to TB4-3
 - ii. Connect ground to TB4-2
 - b. When using a Unregulated +12VDC
 - i. Connect +5VDC to TB4-3
 - ii. Connect ground to TB4-2
4. Check that your serial port settings are one of the following data configurations.
 - a. Baud Rate:
 - i. Default is 9600 baud for the 9600 baud module
 - ii. Default is 19.2K baud for the 19.2K baud module
 - b. Serial Data Format:

8 Character, No Parity, 1 Stop Bit
7 Character, Even Parity, 1 Stop Bit
7 Character, Odd Parity, 1 Stop Bit
7 Character, No Parity, 2 Stop Bits

Optional steps: To check operation of the wireless serial modem follow steps 3-5.

5. Locate and run ACCES' WINRISC.EXE application program (easy-to-use serial communication terminal program)
 - a. CD-ROM provided at :\\disks\\Tools.win\\WIN32\\.
6. WINRISC settings should be as follows:
 - Port:** Set to the serial port that the Wireless Modem is connected to (COM1, COM2, etc.).
 - Baud:** 9600
 - Parity:** Even
 - Data Bits:** 7
 - Stop Bits:** 1
7. Click the "Connect" button to connect the application to the Wireless Modem
8. Click the cursor into the large "data" area of the WINRISC screen.
9. If talking to a REMOTE ACCES Pod with a integrated wireless module send the ? command to receive a response from your pod by typing ? and entering a carriage return.
10. If talking to another Wireless Modem, set that modem up following these steps on another system or second serial port on the same system, and type anything at the keyboard to see the data appear on the other system.

RS-232 Cable	
HOST RS-232 Signals	TB-9
DCD	1
RXD	2
TXD	3
DTR	4
GND	5
DSR	6
RTS	7
CTS	8
RI+	9

RS-422 Cable	
HOST RS-422 Signals	TB-9
Rec-(RX-)	3
Trans+(TX+)	2
Trans+(TX-)	7
GND	5
Rec+(RX+)	6

RS-485 Cable	
HOST RS-485 Signals	TB-9
Trans+(TX+)	2
Trans+(TX-)	3
GND	5

