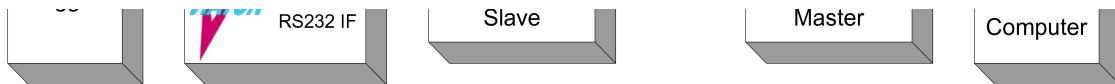


Overview

A reliable radio link can easily be established between a HART[®] master and one or more HART 5 compliant slave devices using off the shelf radio modems, a custom cable, and configuration information described in this document.

The radio modems we recommend are the Freewave DGR-115R model for the master and the FGR09RS model for the slaves. These radios operate in the 900 Mhz frequency band and have a rated range of 20 miles. With proper installation, reliable operation can extend well beyond 20 miles.



Diagnostic Serial Cable

The Freewave FGR09RS slave radios are put into “Department of Transportation” mode to establish the half duplex timing and handshaking required to communicate with the HART sensor device. In this “DOT” mode, the FGR09RS radio cannot be configured through the main serial port. A special cable is required to configure the FGR09RS via the diagnostic port. This cable can be purchased from Freewave or fabricated using the information included on page 3 of this document.

Configuration

Proper configuration of the master and slave radios is critical to the successful deployment of the wireless HART network. Detailed master and slave configuration instructions are included on pages 4 and 5 respectively.

Freewave to VIATOR serial cable

The **MACTek**[®] VIATOR HART interface and Freewave FGR09RS devices were both designed to connect directly to a personal computer serial port. A custom cable is required to connect the two devices together. The table below identifies the connections for this custom cable.

Custom Slave Side Serial Cable Pinout					
Freewave FGR09RS			Viator RS-232		
1	Red	B+	DTR (B+)		4
2	Brown	Menu			
3	Orange	DTR	DSR		6
4	Black	GND	GND		5
5	Yellow	TXD	TXD		3
6	Black	GND			
7	Green	RXD	RXD		2
8	Blue	DCD	RTS		7
9	Violet	RTS			
10	Grey	CTS			

Power

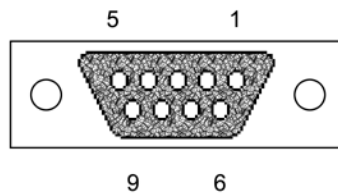
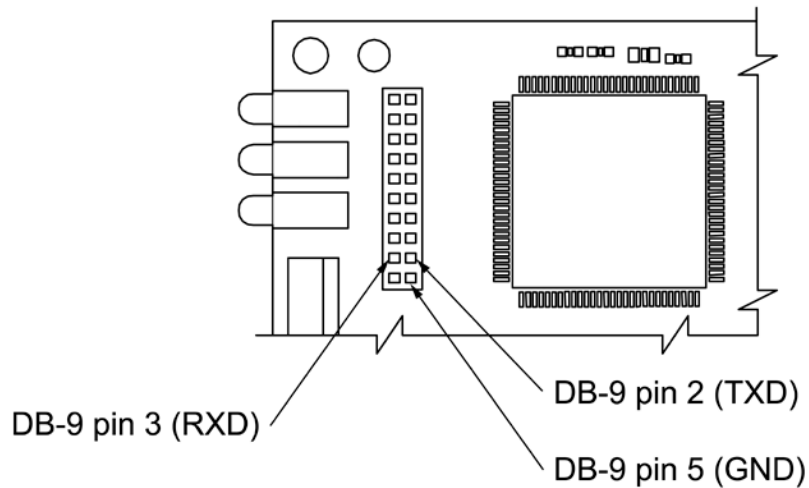
You will also need to provide a regulated 12 volt supply to the FGR09RS and the VIATOR Modem.

If the available supply voltage exceeds 12 volts then additional protection for the VIATOR modem will be required. A 1K ohm, ½ watt resistor should be placed in series with the power lead to pin 4 of the VIATOR. A 12 volt Zener diode between pins 4 and 5 of the VIATOR modem, with the cathode at pin 4, will also be required.

Required items:

- 1 Freewave DGR-115R radio to use as a system master
- 1 Standard DB-9 serial cable to connect the DGR-115R to your PC
- 1 Freewave FGR09RS radio to use as a system slave
- 1 Custom serial cable to connect the FGR09RS to the **MACTek** VIATOR RS-232 HART Interface.
See table below.
- 1 **MACTek** VIATOR RS-232 HART Interface

Diagnostic Port Serial Configuration Cable



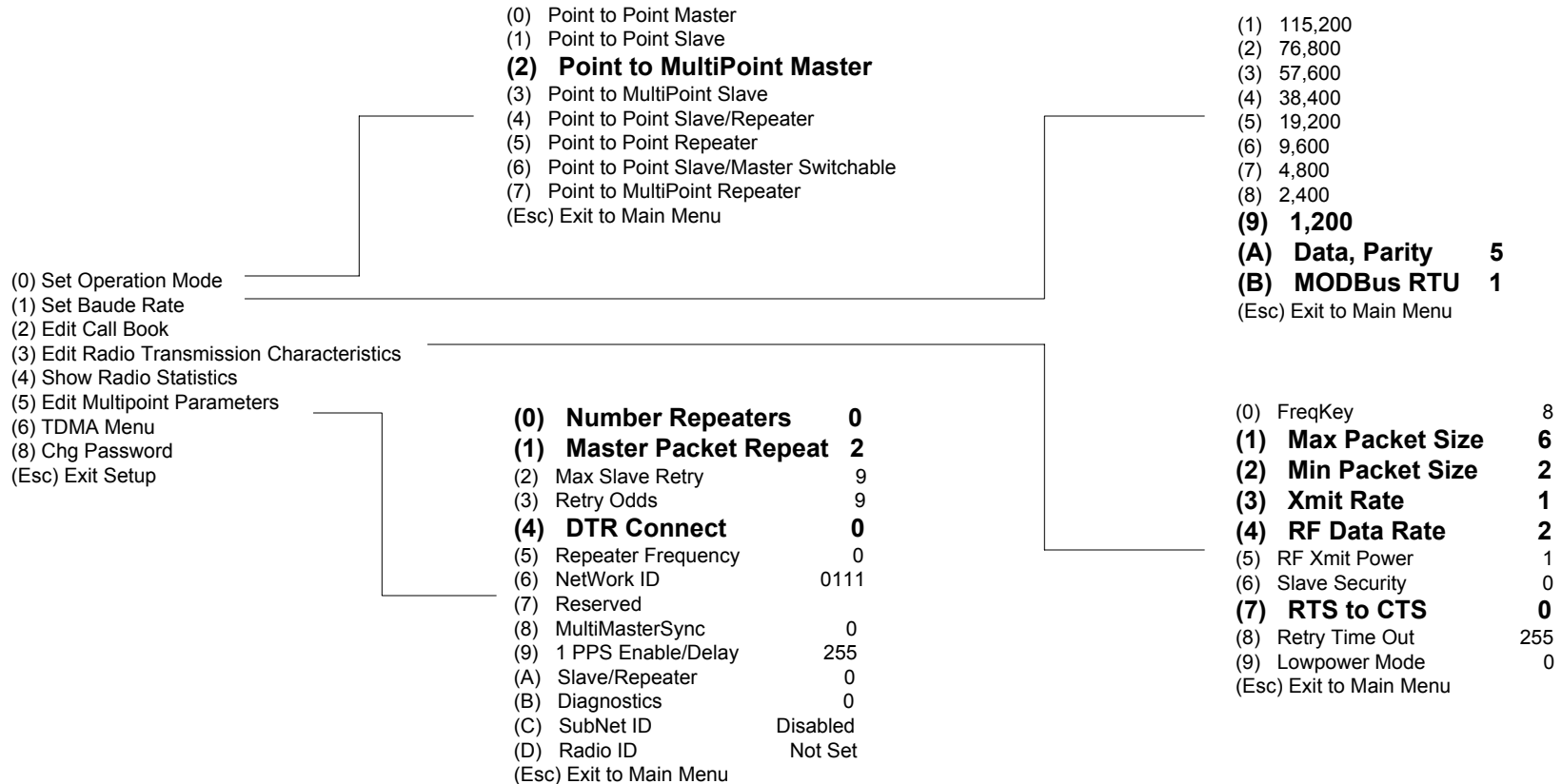
2 mm mating header

Manf	Manf PN	Digikey PN	
3M	151220-7422-TB	3M1120-ND	\$2.06
NorComp	2164-72-01-P2	2164S-36-ND	\$5.43
Sullins	PRPN102PAEN	S2210-10-ND	\$1.20
Waldom	87089-2016	WM18209-ND	\$1.73

Freewave DGR-115R

configuration as system master for use with **MACTek Viator** RS-232 HART interface

- * The firmware version must be 5.82 or higher
- * Put the radio in setup mode by pressing the button next to the power connector
- * Setup mode communication parameters:
 - baud rate - 19,2000
 - data bits - 8
 - parity - none
 - stop bits - 1
- * Items in bold are critical to establishing HART communications
- * Min and Max packet size settings can be changed to improve system bandwidth if the sensor used is fully HART compliant.
- * Min and Max packet size settings must be the same on master and slave transceivers



Freewave FGRO9RS

configuration as a system slave for use with **MACTek Viator** RS-232 HART interface

- * The firmware version must be 2.05 or higher
- * DOT mode disables setup on the main serial port so setup mode must be accessed through the "diagnostic" port with a special cable
- * Enter setup mode by sending a capitol "U" character
- * Setup mode communication parameters:
 - baud rate - 19,2000
 - data bits - 8
 - parity - none
 - stop bits - 1
- * Items in bold are critical to establishing HART communications
- * Min and Max packet size settings can be changed to improve system bandwidth if the sensor used is fully HART compliant.
- * Min and Max packet size settings must be the same on master and slave transceivers

