

TSAN 033 INTEGRA H SIXNET

Dataradio Technical Support

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*This note was provided by **SIXNET**

Abstract: This SIXNET Technical Note explains the procedure to communicate to a SIXNET IPm through Dataradio Integra-H Radio Modems.

The SIXNET IO Tool Kit can successfully Poll I/O, Load configurations, and access Datalog files from the SixTRAK and VersaTRAK IPm via radio frequencies using Dataradio Integra-H Radio Modems.

Software Used:

Windows NT 4.0 (Service Pack 6)
SIXNET I/O Tool Kit V2.1 (For pass thru use V2.2 or later)
Integra-H Field Programming Software V2.02.00

Hardware Used:

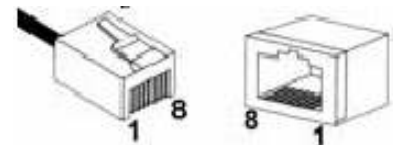
- (1) VT-IPM-1410 (Remotely controlled IPm)
- (1) ST-IPM-1350 (Optionally used for Modbus Master or SIXNET Pass thru station)
- (2) Integra-H Radio Modems
 - (1) Straight thru Male-to-Female DB9 serial cable (connect computer to Integra-H)
 - (2) Straight thru RJ45 Male-to-DB9 Male (connect the IPm to the Integra -H)

Creating Cables to connect to connect the IPm to the Integra-H

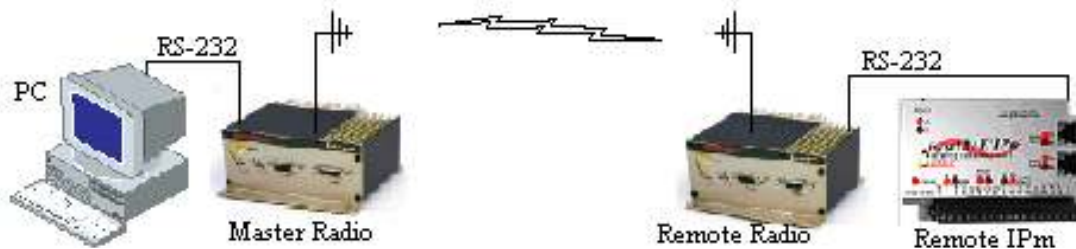
□ Straight thru RJ45 Male-to-DB9 Male

This cable is used to connect an Integra-H to the RJ45 serial port on the VersaTRAK or SixTRAK IPm. The pin designations and pin out are displayed below.

RS232 IPm (Male RJ45)		RS232 Radio (Male DB9)	
DCD in	2	→ 1	DCD out
RXD in	5	← 2	RXD out
TXD out	6	→ 3	TXD in
GND	4	- 5	GND
DTR out	3	→ 4	NC
DSR in	1	← 6	NC
CTS in	7	← 7	NC
RTS out	8	→ 8	NC



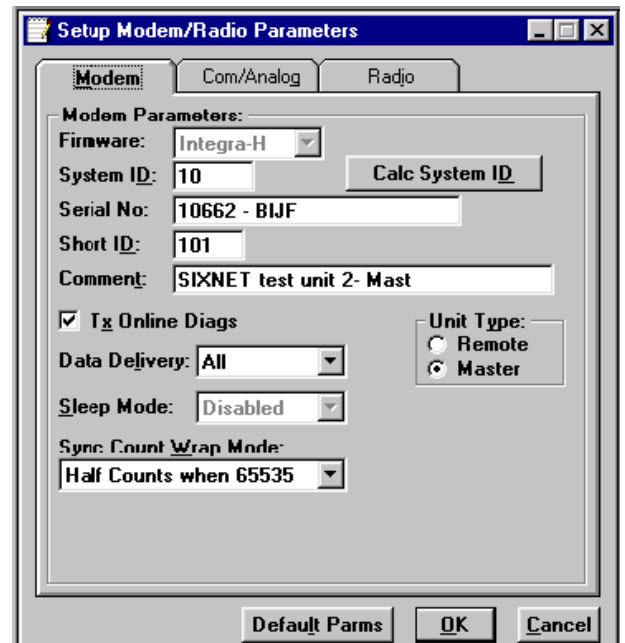
Configuring Stations for PC to IPm Applications



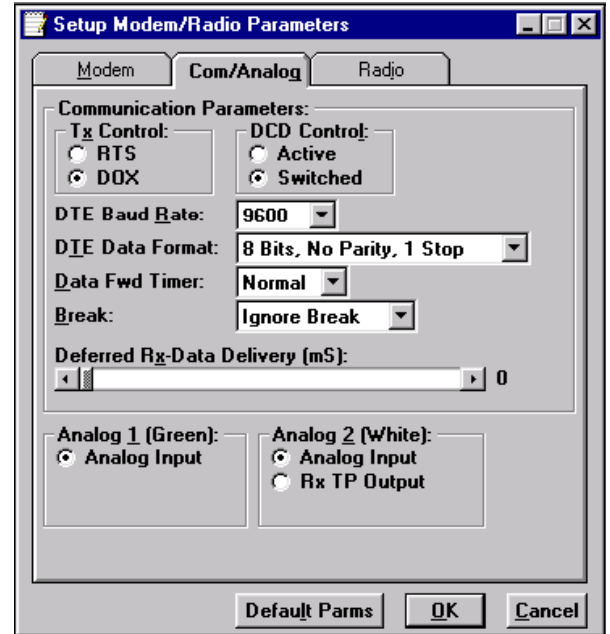
Master Radio (Integra-H)

Connect the Master Radio to your PC using a Straight-thru DB9 Female to Male serial cable. Plug the female connector into the desired PC COM port (Default COM1) and the male connector to the Integra-H Setup port.

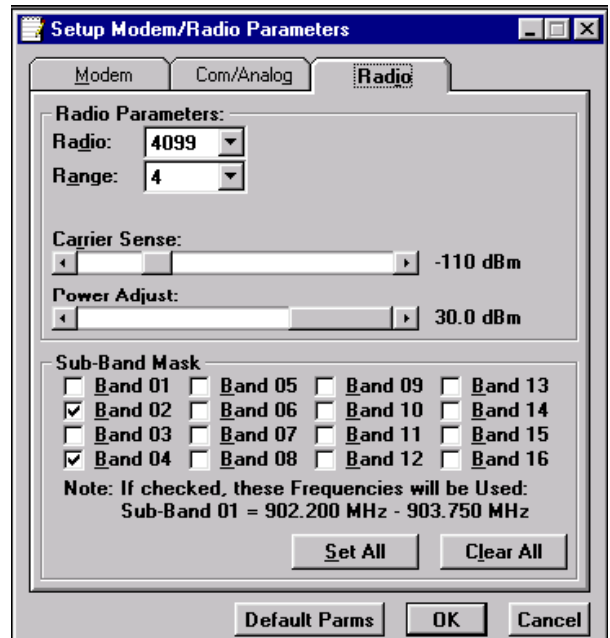
Use the Dataradio Integra-H Field Programming software to configure and load the Integra-H. Consult the Integra-H Programmers Help for a detailed instruction and description of Integra-H functionality. Go to Edit→Setup Modem/Radio Parameters. In the Radio tab configure the Unit type to Master, and enter a System ID of 10, a unique number (or let the setup software calculate a system ID). In the Serial No field enter the Master Integra's Serial Number. The short ID, in this case, was set to 101. Check the 'TX Online Diags' checkbox. The 'Data Delivery' and 'Sync Count Wrap Mode' drop down lists should be set to 'All' and 'Half Counts when 65535' respectively. See screen to the right.




Next, go to the Com/Analog tab. Select the 'DOX' Radio button for the 'TX Control' Parameter, and the 'Switched' radio button for the 'DCD Control' parameter. Configure the DTE COM parameters as follows: 9600 Baud Rate, 8 Data Bits, No Parity, 1 Stop bit. Set the 'Data Fwd Timer' to 'Normal', and the 'Break' to 'Ignore Break'. The 'Deferred Rx-Data Delivery' should equal 0 ms. Set the 'Analog 2' parameter to 'Analog Input'. See screen shot to the right.



Then, go to the Radio tab to configure the 'Radio Parameters'. Configure the Radio parameters as listed below: Radio = 4099, Range = 4, Carrier Sense = -110 dBm, Power Adjust = 30.0 dBm. Check the Band 02 and 04 checkboxes in the Sub-Band Mask parameters. These settings may vary from application to application. Consult the Integra-H Help to get the parameters that best fit your application.



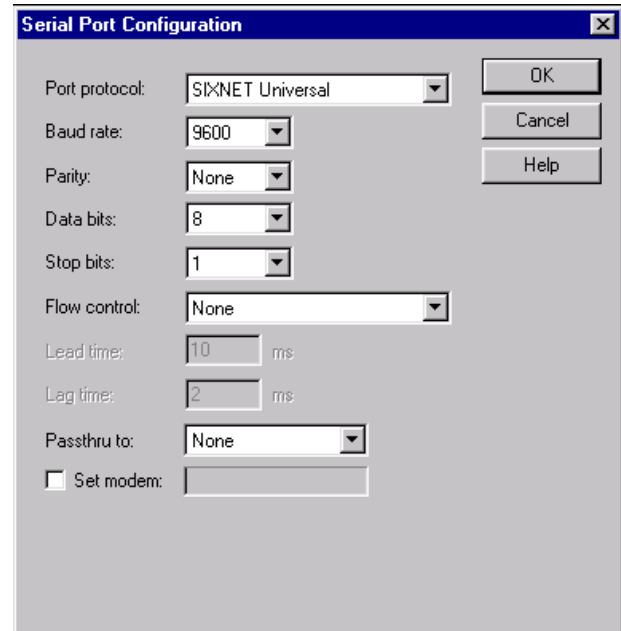
Finally, click on the  Write button to load the settings into the Integra-H.

Remote Radio (Integra-H)

The Remote Integra-H should be configured identically to the Master Integra-H with only one exception. In the 'Modem' tab of the 'Setup Modem/Radio Parameters' window select 'Remote' for the 'Unit Type'. All the wireless modems in a system share the same SYSTEM ID.

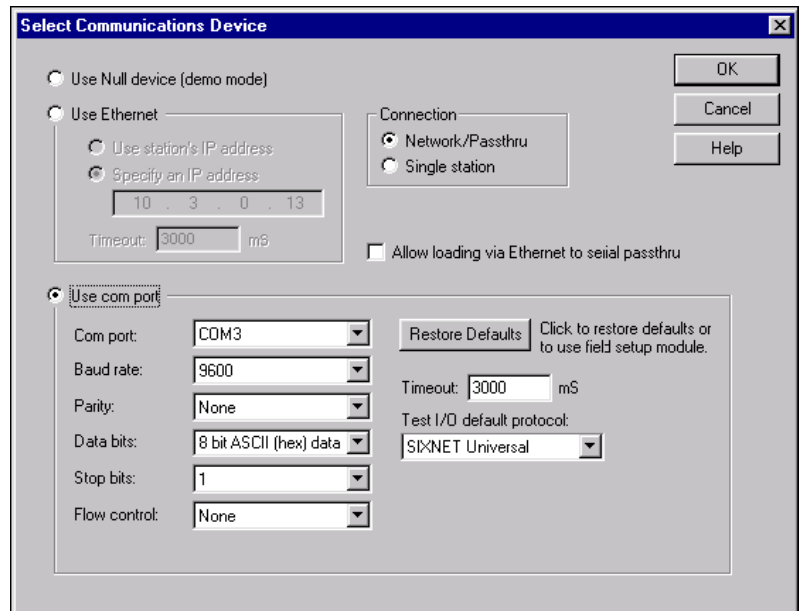
Remote IPm

First configure the VT-IPM directly through your computer using the SIXNET I/O Tool Kit software. Refer to the SIXNET On-Line Help Guide for details on how to use this utility. Configure the desired serial port with the following port parameters (Port B was used for this test): SIXNET Protocol, 9600 Baud rate, 8 Data bits, None Parity, 1 Stop bit, None Flow Control. See Screen Shot on the right.

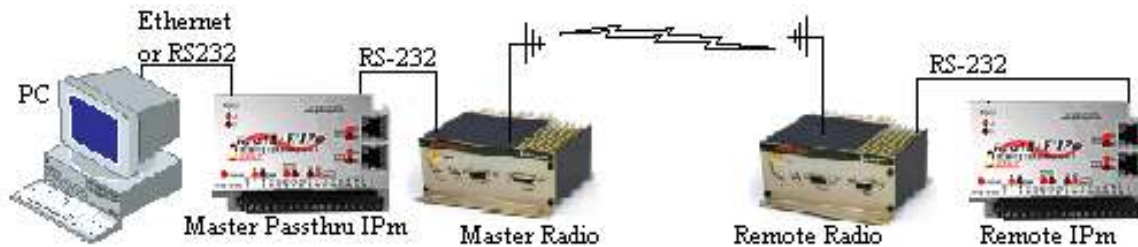


PC

Once the IPm is configured the SIXNET I/O Tool Kit and/or other HMI or communications software must be configured to talk to the IPm over the Integra-H radio modems. Go to Device→Select to gain access to the Communication Device window in the SIXNET I/O Tool Kit. Click the 'Use COM Port' and 'Network/Pass thru Mode' radio button. Choose the COM port on the computer the Master Integra-H Radio is connected to. Set the communication settings the same as the COM settings in the Remote IPm. See Screen Shot on right.



Configuring Stations for IPm to IPm Applications



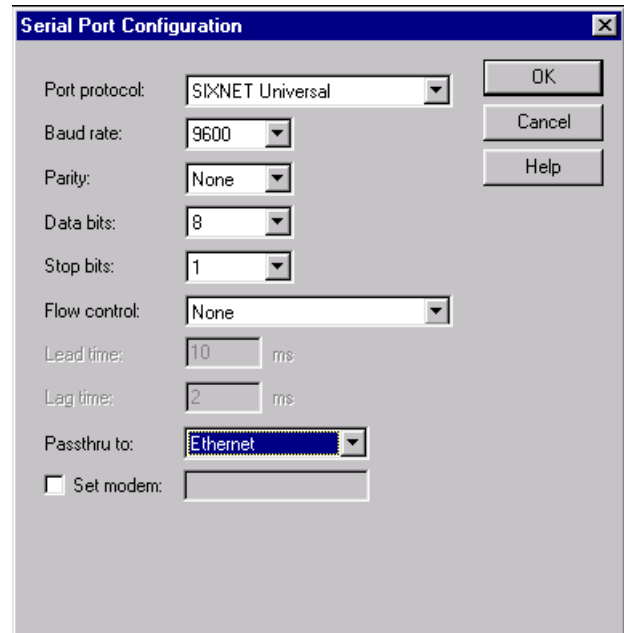
□ Master Pass thru IPm

Configure the Master Pass thru IPm through the

SIXNET IO Tool Kit. Configure the desired RS232 port on the IPm for the following: SIXNET Protocol, 8 Data Bits, None Parity, 1 Stop Bit, Pass thru to: Ethernet. With this configuration it will possible to poll I/O and Load new configurations communicate with the Remote IPm from your PC.

To configure the IPm to pass thru to another serial port simply choose the serial port to communicate through in the 'Pass thru to' drop down list.

Important: Actions communicating from the Master Pass thru IPm must be scan enabled. The actions have to be disabled before the PC can communicate with the Remote IPm via pass thru. Refer to SIXNET Help on how to configure Scan Enable Flags.



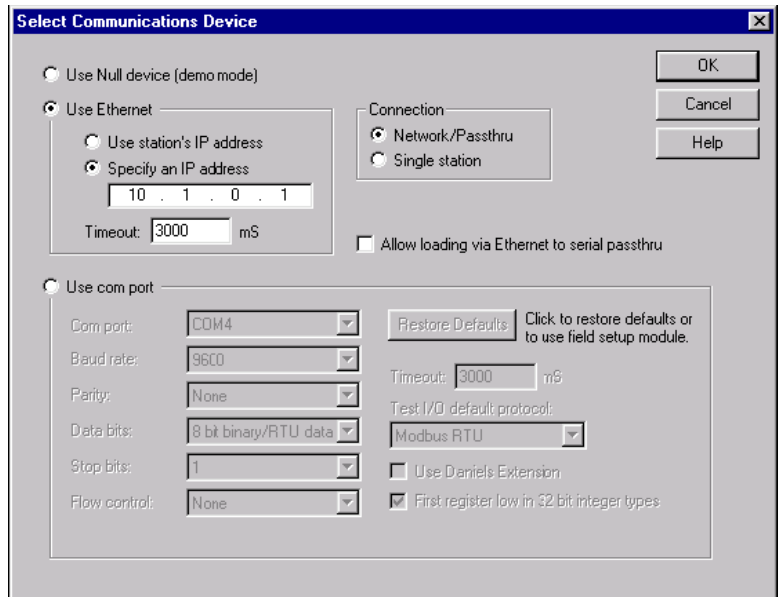
□ Remote IPm

Configure the serial port on the Remote IPm the same way it is configured in the PC to IPm application.

□ PC

Configuring the Master Pass thru IPm for Pass thru to the Ethernet port will enable the IO Tool Kit to talk to the Master Pass thru IPm and the Remote IPm. To talk to the Master Pass thru IPm from the computer's Ethernet port go to Device→Select. In the communication device selection window click on the 'Use Ethernet' and 'Use stations IP address' radio buttons. This setting will tell the IO Tool Kit to use the IP address configured in the project file for the station you have selected.

Ethernet Pass thru: To communicate to the Remote IPm from the PC's Ethernet Port select the 'Specify an IP address' radio button and enter the IP address of the Master Pass thru IPm (In this case the IP address is 10.1.0.1). Check the 'Allow loading via Ethernet to serial pass thru' check box See screen shot to the right. With this configuration the IO Tool Kit will always use the Master Pass thru IPm's IP address to communicate with any station, but since it is configured for pass thru any message meant for the Remote IPm will get passed through the Master to the Remote.

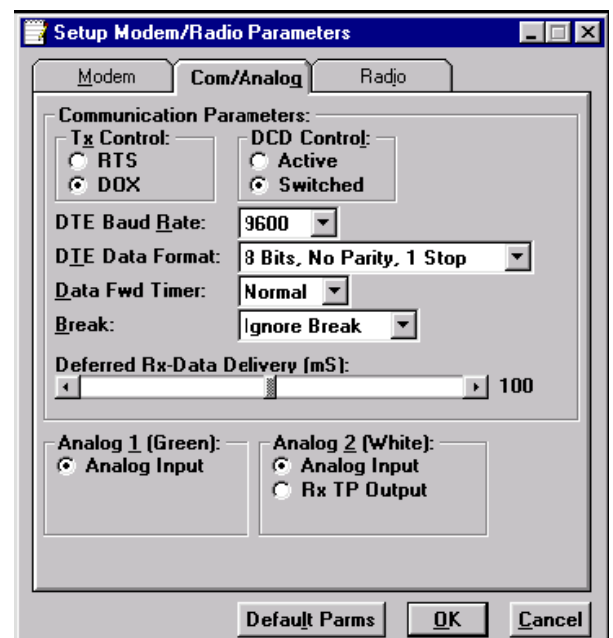


Serial Pass thru: Pass thru communication can be accomplished by configuring the I/O Tool Kits serial port parameters as defined in the PC section of the previous section.

Configuring the IPm and Integra-H to Talk Modbus

□ Master and Remote Integra-H

In most cases the radios should be configured the same as shown in the first section of this technical note. In cases involving Modbus RTU where the length of the messages exceed 100 bytes the radios should be configured to accommodate this relatively long transmission time. Go to the Com/Analog tab of the Setup Modem/Radio Parameters screen. Set the Deferred Rx-Data Delivery to approximately the size of the RTU message (in this case 100). This feature tells the radio how long to wait to receive the RTU messages. This feature helps avoid cutting messages into more than one piece, which creates data damaging delays. See screen shot to the right.



□ Master and Remote IPm

The Master Pass thru and/or Remote IPm can be configured for Modbus ASCII or RTU protocol by simply changing the port protocol to Modbus ASCII or RTU in the port configuration window (See the Master Pass thru and Remote IPm serial port configuration windows in the above sections). The Master IPm must be configured for Modbus Master and the Remote IPm must be configured for Modbus Slave. Pass thru cannot be used with Modbus Protocol.

Important: Since Modbus RTU is a gap timing based protocol it operates more reliably when the messages sent over the radios are short. Limit analog read and write messages to 20 registers or less.

Conclusion: SIXNET IPm's I/O can be polled, a configuration can be loaded, and datalog records can be downloaded through Dataradio Integra-H Radio Modems.