XTRALINK IP

Multi-Interface

Ethernet XTRALINK IP

(RS-232/422/485)
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Chapter 1: INTRODUCTION

The XTRALINK IP provides Ethernet to Serial connections for RS-232, RS-422 or RS-485 devices. The XTRALINK IP features a single serial port. The serial port can be accessed over a LAN/WAN using Direct IP Mode, Virtual COM Port, or Paired Mode connections. The 10/100 Mbps Ethernet connection auto-selects 10BaseT or 100BaseTX and indicates the type of connection with a bi-color link light.

Features

- Multi-interface serial ports
  - XTRALINK IP and Port 1 software selectable for RS-232, RS-422, RS-485 (DIP Switch selects Console Mode)

- 10/100 Mbps Ethernet with Auto Selection

Communication Modes

The XTRALINK IP enables communication with serial devices over a LAN or WAN. Serial devices no longer are limited to a physical connection to the PC COM port. They can be installed anywhere on the LAN using TCP/IP or UDP/IP communications. This allows traditional Windows PC software access to serial devices anywhere on the LAN/WAN network.
**Direct IP Mode**

Direct IP connections allow applications using TCP/IP or UDP/IP socket programs to communicate with the asynchronous serial ports on the XTRALINK IP. In this type of application the XTRALINK IP is configured as a TCP or UDP server. The socket program running on the PC establishes a communication connection with the XTRALINK IP. The data is sent directly to and from the serial port on the server. When using UDP protocol the server can be configured to broadcast data to and receive data from multiple IP addresses.

**Virtual COM Mode**

Install Virtual COM Mode allows the user to add a driver, to provide a virtual COM port on the computer. The new COM port shows up in the Device Manager. Windows programs using standard Windows API calls are able to interface to virtual COM ports. When a program on the PC opens the new COM port, it communicates with the remote serial device connected to one of the ports on the XTRALINK IP.

After connection, the LAN is transparent to the program and serial device. Applications are able to work just as if the serial device is connected directly to a physical COM port on the computer. The virtual COM port software converts the application’s data into IP packets, sends it across the network to the XTRALINK IP, which converts the IP packet back to serial data and sends the data out a serial port located on the XTRALINK IP.

To use this mode, the XTRALINK IP must be set to either TCP/server or UDP/server with a designated communication port number. The virtual COM driver is the TCP or UDP client.

**Paired Mode**

Paired Mode is also called serial tunneling. In this mode any two serial devices that can communicate with a serial link will be able to communicate using two XTRALINK IP’s and the LAN.

Two XTRALINK IP’s are connected to a network, one configured as a TCP or UDP client and the other as a TCP/UDP server. When setting up the server the remote IP address section must contain the address of the client. This will allow the client’s IP address to pass the IP address-filtering feature of the server. Conversely, the Remote IP address of the client must contain the server’s IP address. Both communication port numbers must be the same.

**Heart Beat**

The Heart Beat protocol connection provides a reliable communications connection in Virtual COM Port Mode or with Paired Connection Mode. This feature restores the connection if communications are temporarily lost at either end due to loss of power or Ethernet connection.

Without this feature a device that loses a connection and stops communicating would not be able to reconnect without human intervention. A TCP data connection can be lost when there is a power failure or temporary loss of an Ethernet connection on either the client or server. If a loss occurs the Heart Beat feature will try to reconnect the TCP data connection every five seconds until communications is established again. The Heart Beat feature is available for use in Virtual COM Port Mode and Paired Connection Mode. This is not available when using a UDP application.
For descriptive purposes this Quick Start Guide considers a typical configuration consisting of a PC connected via an Ethernet LAN to an XTRALINK IP connected to the RS-232 port of a serial device.

**Hardware Setup**

![Typical Hardware Setup Diagram]

**Step 1:** Connect the XTRALINK IP to the network using a standard network cable.

**Step 2:** Connect the XTRALINK IP to the RS-232 port on the serial device.

**Note:**

If the serial device is configured as a DCE use a straight-through serial cable. If the serial device is configured as a DTE use a crossover (null modem) cable.

**Step 3:** Set all the DIP switches to the OFF position.

**Step 4:** Apply power to the XTRALINK IP.

**Software Installation**

Using the CD included with the XTRALINK IP, install the XTRALINK IP IPRS23202 Manager software on the configuring computer.

**XTRALINK IP Configuration**

**Step 1:** Open the XTRALINK IP IPRS23202 Manager software. It will automatically search for any reachable XTRALINK IP DEVICES. A list of all XTRALINK IP connected to the LAN will appear in the XTRALINK IP List window.

**Step 2:** Double click the desired XTRALINK IP port on the list to bring up the Server Properties configuration screen.

![Server Properties Window]

**Step 3:** Change the Server Properties as required.

- Enable DHCP to allow the XTRALINK IP to generate its own IP address
  OR
- Obtain appropriate static IP, Netmask and Gateway addresses from your Network Administrator (recommended)
- Set the Serial Port Mode property to RS-232 to match the serial device connected to the XTRALINK IP.
- Set Baud Rate, Data/Parity/Stop, and Flow Control to match the configuration of the serial device connected to the XTRALINK IP port

**Step 4:** When the parameters have been set, click Update. Following the prompts in the dialogue boxes, Restart the XTRALINK IP and Search all reachable servers again.

**Step 5:** Re-enter Server Properties to verify the changes have taken effect, or to view/change the configuration of other ports. Each port must be configured separately.
Install Virtual COM Ports on PC

Step 1: From the Windows Start menu, run the Install Virtual COM Ports utility included with the XTRALINK IP IPRS23202 Manager software.

Step 2: Search for all servers on the network

Step 3: Select a port and map it to an unused COM port (e.g. Port 15). Configure it for TCP protocol and the appropriate IP address (determined in the last section).

Check Communications

Step 1: From the Windows Start menu, run HyperTerminal

Step 2: Configure HyperTerminal to connect using the COM port configured in the last section (e.g. Port 15).

Step 3: Set Baud Rate, Data/Parity/Stop, and Flow Control to match the configuration of the serial device connected to the XTRALINK IP serial port.

Step 4: Communications with the serial device should now be operational.
Chapter 2: MAKING THE HARDWARE CONNECTIONS

Package Checklist

The XTRALINK IP is shipped with the following items included:

- XTRALINK IP Module
- Power supply
- This Operation Manual
- Supplemental Operation Manual
- CD-ROM disc with manual, XTRALINK IP IPRS23202 Manager and Virtual COM Driver software for Windows 98/ME/2000/XP/NT 4.0

XTRALINK IP/ Connections, Indicators and Reset Switch

Connectors, Indicators and Switches:
- Three indicator LEDs
- One Ethernet connector (RJ-45 female)
- A power connector
- A recessed reset switch
- Triple DIP switch
- XTRALINK IP: One serial port connector (DB-9M)

Indicator Lights

<table>
<thead>
<tr>
<th>Light</th>
<th>Indication</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power</td>
<td>Red - power is applied</td>
</tr>
<tr>
<td>Link</td>
<td>Yellow – 10BaseT Ethernet connection established</td>
</tr>
<tr>
<td></td>
<td>Green – 100BaseTX Ethernet connection established</td>
</tr>
<tr>
<td>Ready</td>
<td>Flashing Green – system is ready</td>
</tr>
</tbody>
</table>

![Figure 6. Indicator Lights](image)

Ethernet Connector

The XTRALINK IP has a standard RJ-45 receptacle mounted in the top edge of the chassis. The XTRALINK IP can be connected to an Ethernet hub, switch, or wall plate using a standard straight-through RJ-45 (male) Ethernet cable. To connect directly to an RJ45 Ethernet port on a PC or laptop a crossover Ethernet cable must be used.

Note:
Refer to Appendix D for details on Network Cables

Power Connector

Plug the ultra-miniature 2.5mm phone plug from the included power supply into the power jack and then plug the supply in. When power is applied the Red power light will illuminate. The tip of the power plug is positive; the sleeve is negative.
**Reset Button**

This switch resets the unit, similar to the effect of removing/applying power. The Reset switch is recessed to avoid accidental operation. To reset the unit, insert a small plastic tool, press lightly and hold for three seconds. The Link and Ready lights will go out and then come back on.

![Reset Button Diagram](image)

*Figure 7. Top View of the XTRALINK IP and (when mounted vertically)*

**DIP Switches**

A triple DIP (dual inline package) switch allows the XTRALINK IP to be placed into Console Mode. When all three switches are moved into the ON position the XTRALINK IP enters Console Mode, allowing configuration of the XTRALINK IP (using an RS-232 connection through the serial port on the XTRALINK IP) from a PC running a terminal program such as HyperTerminal. When the XTRALINK IP enters Console Mode the Console Mode screen will appear in the HyperTerminal program window. The serial port settings must be 8-N-1 at 9600 baud.

![DIP Switches Diagram](image)

When any of the DIP switches are switched back to the OFF position, the XTRALINK IP will revert to the mode it was in before Console Mode.

**Note:**

The XTRALINK IP can be put into Console mode using either of two methods:

1. Switching all the DIP switches to the ON position
2. With any DIP switch in the OFF position set the Server Properties Console Mode field to Console and Update/Save the configuration

**Serial Ports**

The XTRALINK IP has one serial port. The port can be configured as a Console Mode connection or as an RS-232, RS-422 or RS-485 interface to the XTRALINK IP (if any of the DIP switches are in the OFF position) using the XTRALINK IP IPRS23202 Manager software, via Telnet, or using the Web Server.
Serial Port
DB-9 Male

Figure 9. The XTRALINK IP Serial Port Connector

XTRALINK IP /Port Operational Modes

Using the XTRALINK IP IPRS23202 Manager the XTRALINK IP can be put into Console Mode, Default Mode or Upgrade Mode. The serial ports can be configured for RS-232, RS-422 or RS-485 operation. The server also can be put into Console Mode by placing all the DIP switches into the ON position.

Default Mode

When Default Mode is selected and the server properties are Updated (Saved) all the configuration settings return to their default values.

Note:
Refer to Chapter 5 for details on XTRALINK IP Configuration settings.
See Chapter 12 for XTRALINK IP default parameters.

Console Mode

In Console Mode the Configuration Menu can be accessed from a PC by connecting its RS-232 serial port to the XTRALINK IP serial port or Serial Port 1. Since the computer is a DTE device, and the serial ports are configured as DTEs (with DB-9M connectors), a null modem crossover cable must be used.

In Console Mode the default serial port settings are: 9600 baud, 8 data bits, No parity, and 1 stop bit. From Windows, HyperTerminal with VT100 terminal emulation can be used for Console Mode configuration.

Note:
Refer to Chapter 9 for details on Console Mode

Upgrade Mode

In Upgrade Mode firmware can be uploaded from a PC via its serial port to the XTRALINK IP serial port or Serial Port 1. Upgrading also can be accomplished via the network connection, using the XTRALINK IP IPRS23202 Manager software and a virtual COM port.

Note:
Refer to Chapter 8 for details on Upgrade Mode

RS-232 Mode

In RS-232 Mode the currently selected serial port is configured as an RS-232 interface supporting eight RS-232 signal lines plus Signal Ground and is configured as a DTE, like a computer. Signals are single ended and referenced to Ground. To use handshaking, Flow Control must be set to RTS/CTS during Configuration.

Note:
Refer to Appendix A for RS-232 connection pin-outs.

RS-422 Mode

In RS-422 Mode the currently selected serial port is configured as an RS-422 interface supporting four RS-422 signal channels with full duplex operation for Receive, Transmit, RTS (Request To Send) and CTS (Clear To Send). The data lines are differential pairs (A & B) in which the B line is positive relative to the A line in the idle (mark) state. Ground provides a common mode reference. To use handshaking, Flow Control must be set to RTS/CTS during configuration.

Note:
Refer to Appendix B for RS-422 connection pin-outs.

RS-485 Mode

In RS-485 Mode the currently selected port is configured as an RS-485 interface supporting transmit (TX) and receive (RX) signal channels using 2-wire, half-duplex operation. The data lines are differential with the Data B line positive relative to Data A in the idle (mark) state. Ground provides a common mode reference.

Note:
Refer to Appendix C for RS-485 connection pin-outs.
RS-485 Receiver Biasing

RS-485 Receiver Biasing can be implemented from the XTRALINK IP if the network does not supply it. Remove the two side-cover screws of the XTRALINK IP, slide the cover off and re-position the bias jumpers (shown open in the figure below) to enable biasing (shorting).

![Figure 10. Internal Setting to Select RS-485 Bias](image)

**Note:**
(For more information on RS-485 Receiver Biasing, see Xantech RS-422/485 Application Note available at www.xantech.com)

XTRALINK IP Serial Port Connector Pin-outs

Pin-outs for RS-232, RS-422 and RS-485 operation are shown below.

<table>
<thead>
<tr>
<th>DB-9M Pin</th>
<th>RS-232 Signal Name</th>
<th>DTE</th>
<th>RS-422</th>
<th>RS-485</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Carrier Detect</td>
<td>DCD</td>
<td>In</td>
<td>RXDA (-)</td>
</tr>
<tr>
<td>2</td>
<td>Receive Data</td>
<td>RXD</td>
<td>In</td>
<td>RXDB (+)</td>
</tr>
<tr>
<td>3</td>
<td>Transmit Data</td>
<td>TXD</td>
<td>Out</td>
<td>TXDB (+)</td>
</tr>
<tr>
<td>4</td>
<td>Data Terminal Ready</td>
<td>DTR</td>
<td>Out</td>
<td>TXDA (-)</td>
</tr>
<tr>
<td>5</td>
<td>Signal Ground</td>
<td>GND</td>
<td>---</td>
<td>GND</td>
</tr>
<tr>
<td>6</td>
<td>Data Set Ready</td>
<td>DSR</td>
<td>In</td>
<td>CTSA (-)</td>
</tr>
<tr>
<td>7</td>
<td>Request To Send</td>
<td>RTS</td>
<td>Out</td>
<td>CTSB (+)</td>
</tr>
<tr>
<td>8</td>
<td>Clear To Send</td>
<td>CTS</td>
<td>In</td>
<td>RTSB (+)</td>
</tr>
<tr>
<td>9</td>
<td>Ring Indicator</td>
<td>RI</td>
<td>In</td>
<td>RTSA (-)</td>
</tr>
</tbody>
</table>

![Figure 11. Serial Connection Pin-outs for RS-232/RS-422/RS-485](image)

**Note:**
(For more information on RS-232, RS-422 and RS-485 pin-outs, cable connections and loopback connections refer to Appendices A, B and C)
Chapter 3: INSTALLING THE XTRALINK IP IPRS23202 MANAGER SOFTWARE

The Windows-based XTRALINK IP IPRS23202 Manager and Virtual COM Port software makes configuration fast and easy. If using Windows, installing the XTRALINK IP IPRS23202 Manager software and setting up virtual COM ports to configure the XTRALINK IP is recommended.

Software Installation

The XTRALINK IP IPRS23202 MANAGER software includes:

- XTRALINK IP IPRS23202 Manager
- Install Virtual COM Ports
- Uninstall Virtual COM Ports

Automatic Installation

Step 1a: Inserting the CD in the CD-ROM should automatically launch the Install Shield Wizard.

Manual Installation

Step 1b: To manually start the software installation, from the Windows Desktop, click Start button. At the Run command line type D:start.exe then click OK. (D: is the drive letter for the CD ROM.)

The Install Shield Wizard window will be displayed.

Figure 12. The Run Dialogue Box

Step 2: When the XTRALINK IP IPRS23202 MANAGER Setup window appears, click Next.

Figure 13. The Install Shield Wizard Window

Step 3: When Choose Destination Location appears, click Next.

Figure 14. XTRALINK IP IPRS23202 MANAGER Setup Window

Figure 15. The Choose Destination Window

The installation progress will be shown until complete.
Step 4: Click Finish when the Install Shield Wizard Complete dialogue appears. When finished, dialogue box will close.

Updating an Existing Installation

If an older version of the XTRALINK IP IPRS23202 Manager software is already installed, the Modify, repair or remove the program window will appear when the installation process is initiated:

The recommended procedure is to Remove all installed components first. Once the software has been removed, Install the new software.

Opening the XTRALINK IP IPRS23202 Manager

Step 5: If the XTRALINK IP is not already connected to the network or to the Ethernet port on the computer, connect it. Set all the DIP switches to the OFF position. Apply power.

The Power indicator should light red, the Link light should indicate which type of Ethernet connection has been made and the Ready LED will flash indicating configuration can begin.

Step 6: Start the XTRALINK IP IPRS23202 Manager software. In Windows Desktop, click:

Start → Programs → Xantech→ XTRALINK IP → IPRS23202 → XTRALINK IP IPRS23202 Manager.

As soon as the XTRALINK IP IPRS23202 Manager opens it will initiate Searching Server and after a few seconds the XTRALINK IP List will display all XTRALINK IP DEVICES on the network.
Chapter 4: USING XTRALINK IP IPRS23202 MANAGER

The XTRALINK IP IPRS23202 Manager software allows:

- Searching for servers connected to the network
- Displaying and changing the configuration of those servers
- Installing virtual COM ports on a computer
- Displaying and configuring virtual COM ports
- Uninstalling virtual COM ports on a computer
- Upgrading the XTRALINK IP firmware
- Monitoring Port Status
- Saving and Loading Configuration Files

**Hardware Setup**

**Step 1:** Connect the XTRALINK IP to the LAN or to a computer Ethernet port. Set all the DIP switches on the XTRALINK IP to the OFF position.

**Step 2:** Apply power. The red Power indicator will light, the Link indicator lights when an Ethernet connection is made, and the Ready indicator will flash.

**Software Setup**

**Step 3:** To run the XTRALINK IP IPRS23202 Manager, from the Windows Desktop click:

Start → Programs → Xantech → XTRALINK IP → IPRS23202 → XTRALINK IP IPRS23202 Manager.

As soon as the XTRALINK IP IPRS23202 Manager opens it will initiate Searching Server and after a few seconds the XTRALINK IP List will display all XTRALINK IP DEVICES on the network.
Figure 21. The XTRALINK IP IPRS23202 Manager Window

Software Overview

The XTRALINK IP IPRS23202 Manager window provides the following information:

- **Menus** (Server, View, Exit, Help)
- **Server Icons** (Firmware Upgrade, Virtual COM Configuration, Searching Server, Uninstall Virtual COM, Monitor Port Status)
- **XTRALINK IP / Virtual COM Lists**
- **Software Status** (Ready, Updating, Searching, etc)

**Menus**

- **Server**
-  - **Firmware Upgrade** - Used when downloading new firmware to the XTRALINK IP.
  
  **Note:**
  
  See Chapter 8 for more information on upgrading firmware.

  - **Virtual COM Configuration** - Selects the Virtual COM List. Double clicking on any COM port in the Virtual COM List brings up a window that allows changing the virtual COM settings such as Flow Control, Protocol, IP address, and Port Number. Virtual COM settings must match XTRALINK IP port settings.

  - **Searching Server** - Searches for XTRALINK IP’s on the network and brings back configuration information that will be displayed in the Server Properties window.

**View**

Provides three viewing options for the XTRALINK IP IPRS23202 Manager screen:

- **Toolbar** – allows the toolbar (directly under the menu bar) to be viewable or hidden
- **Status Bar** – allows the Status Bar (at the bottom of the screen to be viewable or hidden
- **Split** – allows the position of the split between the Icons pane and the Virtual COM List / XTRALINK IP List panes to be dragged horizontally using the mouse

**Exit**

- Allows you to Exit the XTRALINK IP IPRS23202 Manager program

**Save Configuration File** - Allows the user to save the current configuration information to a file with a .vcom extension.

**Load Configuration File** - Allows the user to load a configuration file.

- **Uninstall Virtual COM** - Allows virtual COM ports to be uninstalled from the XTRALINK IP IPRS23202 Manager window.

- **Monitor Port Status** - Brings up a screen that displays the following information associated with the selected serial port:
  
  - **Serial TX**: Displays the number of bytes of data sent to the **serial device** since the IP connection was established.
  
  - **Serial RX**: Displays the number of bytes of data received from the connected **serial device** since the IP connection was established.
  
  - **DTR/RTS**: The **DTR/RTS Port Status** indicator displays the current logic state of the DTR and RTS hardware handshake (output) lines for the selected XTRALINK IP port (1 = asserted, 0 = not asserted).
  
  - **DCD/DSR/CTS**: The **DCD/DSR/CTS Port Status** indicator displays the current logic state being received on the DCD, DSR and CTS hardware handshake (input) lines for the selected XTRALINK IP port (1 = asserted, 0 = not asserted).
  
  - **Status**: Indicates whether the client software has made a connection with the XTRALINK IP.
  
  - **IP Address**: Displays the IP address of the connected client when there is a client connection.
Help

- Accesses the About vcomui (virtual com user interface) dialogue box, which indicates the software version number

Server Icons Pane

Firmware Upgrade, Virtual COM Configuration, Searching Server, Uninstall Virtual COM and Monitor Port Status can also be selected using icons located in the left window.

XTRALINK IP / Virtual COM Lists

To make management of lists of XTRALINK IP easier, lists can be sorted by clicking on any tab heading. Scrolling bars facilitate scrolling through long lists.

XTRALINK IP List

- Server Name - Displays the name of the XTRALINK IP. The name is listed once for each port.
- IP Address - Displays the IP Address for the XTRALINK IP. All ports in a XTRALINK IP have the same the same IP address.
- Protocol - Displays the currently selected TCP or UDP mode for the XTRALINK IP.
- Port - Displays the port number for each XTRALINK IP port.
- COM Name - Displays the name of the computer COM port mapped to each XTRALINK IP port. If no computer port has been mapped it displays Not mapped.
- Status - The Status indicates the mapped virtual COM port condition.
  - Not Connected is shown when a program does not have the port Open.
  - Connected is shown when that mapped port is Open for use.

Virtual COM List

- COM Name - Displays the number of the COM port mapped to each XTRALINK IP port.
- IP Address - Displays the IP Address for the XTRALINK IP. All ports in a XTRALINK IP have the same IP address.
- Protocol - Displays the currently selected TCP or UDP mode for the XTRALINK IP.
- Port - Displays the port number for each XTRALINK IP port.
- Flow Control - Indicates what type of flow control is configured for each port.

Status Bar

Displays the current status of the software in the bottom, left corner of the screen
- Ready
- Updating
- Searching reachable servers…

Search for Servers

Upon opening the XTRALINK IP IPRS23202 Manager software it will automatically execute Searching Server and search for all reachable XTRALINK IP DEVICES.

Step 4: To manually initiate a search for servers, click Searching Servers (under the Servers menu or the icon on the left side of the screen). The Search Setup box will appear. It provides two options for searching for servers on the network:

- Specify the IP Address of the XTRALINK IP
- Search all reachable servers

Step 5: Enter the IP Address assigned to the desired XTRALINK IP or click Search all reachable servers, then OK. IP Address is used to find XTRALINK IP units that are not on the same subnet. (Routers on the network will block the standard broadcast used to find servers if Search all reachable servers is selected.) The user must set an IP address that conforms to the LAN addressing scheme.
The Searching window is shown until all active XTRALINK IP's on the LAN are listed in the XTRALINK IP List window.

**Configure Server Properties**

The Server Properties window displays the current configuration properties for the currently selected server.

**Step 6:** To open the Server Properties window, highlight the XTRALINK IP in the XTRALINK IP List window, double-click to open.

The Server Properties window is used to configure and store the Server configuration settings. Details for setting Properties are described in the next chapter.

**Step 7:** After configuring as needed, click Update to store the configuration in the server. The following window will appear:

![Restart Dialogue Box](image)

**Step 8:** Click Yes to restart. The following dialogue box will appear:

![Restarting Dialogue Box](image)

After eight seconds a dialogue box will ask whether you want to search for all reachable servers again.

![Server Search Dialogue Box](image)

While the XTRALINK IP is searching for all reachable servers the following dialogue box appears:
After that port has been updated you may want to re-enter **Server Properties** to verify the changes have taken effect, or to view/change the configuration of other ports. Each port must be configured separately.
Chapter 5: CONFIGURING THE XTRALINK IP PROPERTIES

The XTRALINK IP can be configured using any of four different user interfaces: the XTRALINK IP IPRS23202 Manager software, Console Mode, Telnet or the Web Server. The Server Properties described in this chapter can be changed from any of these user interfaces.

The XTRALINK IP IPRS23202 Manager Server Properties Window

Server Name

This field displays the name that has been assigned to the XTRALINK IP. A new Server Name of up to 16 characters can be entered. If more than one XTRALINK IP is connected on the LAN it is recommended that a new name be assigned to each. When the XTRALINK IP IPRS23202 Manager finds a XTRALINK IP on the LAN it displays the server name and IP Address allowing the user to distinguish between XTRALINK IP.

Serial Number

Each XTRALINK IP has a unique serial number. This is fixed and cannot be changed.

Password

Entering a password activates a security feature on the XTRALINK IP. Once a password is entered it will be required to access the menu and make changes.

DHCP

DHCP servers are a part of numerous LAN management systems. The DHCP field provides two choices: Disable and Enable. Disable is the normal, or default, setting. When enabled, the XTRALINK IP will send a DHCP request to the DHCP server, which will assign a dynamic IP address, net mask, and gateway to the XTRALINK IP. If a DHCP server

Figure 29. The Four Methods of Configuring Server Properties

Figure 30. XTRALINK IP IPRS23202 Manager Server Properties Window
is not available on the network the XTRALINK IP will time out after 10 seconds and the default values will remain. When DHCP is enabled, the IP Address, Netmask and Gateway fields become inaccessible and cannot be changed by the user.

**Note:**
A dynamic address assigned by the DHCP server may change if the server loses the Ethernet connection or power is removed. The host (client) communication software requests a connection to the specific IP address of the XTRALINK IP. If the DHCP reassigns a different IP address the software will not be able to communicate with the hardware. Therefore, using a static IP address is recommended.

**IP Address**

Software or hardware attempting to access the XTRALINK IP via the network must know the **IP Address** of the server. A static IP address is retained and remains the same each time the server is powered up or starts/restarts. The default IP address of the XTRALINK IP is printed on a label on its bottom cover. Entering an appropriate address in the IP Address field and updating the server will change the server’s IP address. The network administrator can assign/establish the static address or group of addresses to be used.

The IP Address of the XTRALINK IP can be confirmed using the DOS Ping command.

**Note:**
To use Ping to check for communications:
- Access a DOS window (in XP click **Start**, then **Run**)
- At run prompt enter: **CMD**
- In the DOS window enter: **Ping xxx.xxx.xxx.xxx** (IP address for the server to be confirmed)
- The command will return the Ping results indicating 4 replies

---

**Netmask**

The default LAN netmask is configured for a Class C address. The user may change this. Default is 255.255.255.0

**Gateway**

The Gateway IP address allows users to access the XTRALINK IP from outside the LAN.

**MAC Address**

The MAC address is fixed and cannot be changed. It is assigned in the factory. Every Ethernet device manufactured has its own unique MAC address.

**Version & Date**

The currently loaded version of the firmware, and when it was released, is shown here.

**Link Status**

Link status automatically displays the type of Ethernet connection. It will either display 10BaseT or 100BaseTX in full duplex or half duplex. This will depend on the LAN, switches, hubs used in the LAN topology.

**Server Serial Port**

This field indicates the number of the port for with XTRALINK IP properties are currently being displayed. Changing the number in this field will cause all the other fields to display the properties for the specified port. Note, however, that before changing ports, any changes to properties must be **Updated** (Saved) or the XTRALINK IP will not retain them.

**Baud Rate**

The serial port baud rate on the XTRALINK IP must match the serial baud rate of the connected device unless using Virtual COM Mode. In Virtual COM Mode the software program will establish serial settings.

**Data/Parity/Stop**

Set this to match the data format used by the serial device connected when Virtual COM Mode is not being used.
Flow Control

The Flow Control setting must match the requirements of the serial device connected.

Note: Select None when setting the port as RS-485 or 4-wire RS-422.

TCP/UDP Protocol

Select TCP (Transmission Control Protocol) or UDP (User Datagram Protocol) protocol. If the application does not require a UDP connection, select TCP. TCP guarantees reliable communication with error checking whereas UDP provides faster transmission.

UDP Mode

When UDP mode is chosen the Serial timeout, TCP alive timeout, Connection mode, Connection at, Max connection and Remote IP address fields are replaced with the following four fields: Destination IP address range, Port number and Source IP address range. In this mode the server can be configured to broadcast data to and receive data from multiple IP addresses. Four IP address range fields are provided.

Serial Timeout

Default for the Timeout property is 0, or no timeout. Setting Timeout to any value between 1 and 65535 seconds activates it. If Timeout is set to 5 seconds and the XTRALINK IP is configured as a Server, the Client makes a connection and communications starts. If communications are idle for 5 seconds the XTRALINK IP will reset and make itself available for another client connection.

TCP Alive Timeout

The XTRALINK IP monitors TCP activity. If TCP activity stops for the length of time specified in this field the connection will be closed. This field can be set to any value between 0 and 255 minutes. If zero, or no value, is entered into this field the server will not disconnect.

Connection Mode

The Connection Mode field has three options: Server, Client and Client (no heartbeat). When Client or Client (no heartbeat) is selected the Connection at field automatically becomes active (allowing the user to select Power up or Data Arrival).

- When using the Virtual COM Port feature, select Server.
- When using a TCP or UDP Socket program, select Server.
- When using Paired Mode communication between two XTRALINK IP’s set up one as a Client and the other as a Server.
- When connecting to a server that does not support Heartbeat, select Client (no Heartbeat).

Delimiter HEX 1 and Delimiter HEX 2

These fields allow the user to enter two ASCII characters (in hex format) that delimit the beginning and end of a message. When a message with both these delimiters is received at the serial port, the data contained in the serial buffer is placed in an Ethernet packet and sent out the Ethernet port. If only Delimiter 1 is set (Delimiter 2 is zero or blank), upon receiving Delimiter 1 the XTRALINK IP will put all the data in the serial buffer in an Ethernet packet and send it out the Ethernet port. If serial data greater than 1 kilobyte is received it will automatically be placed in an Ethernet packet and sent out the Ethernet port.

Force Transmit

This field allows the user to set a maximum time limit between transmissions of data. The value set in this field multiplied by 100 ms determines the Force Transmit time. When the elapsed time reaches the time configured in this field, the TCP/IP protocol will pack the data currently in the serial buffer into a packet and send it out the Ethernet port.

Port Status

This field indicates whether a serial port is connected via the XTRALINK IP to a virtual COM port of a device on the network.
**TCP/UDP Port**

This sets the port number for connection. The default port number for the XTRALINK IP is 4000 for serial port 1.

In all modes of operation, Direct IP or Virtual COM, the port number set in the Server Properties menu must match the Virtual COM or socket software port settings.

**Note:**
Example: The Virtual COM default setting is TCP/UDP Port 4000. If the port property is changed to 4001, the virtual COM port will have to be changed to 4001. The hardware settings can be changed from the XTRALINK IP IPRS23202 Manager or Console Configuration Menu. The Virtual COM port setting also can be changed within the Device Manager of the computer on which it is installed.

**Serial Port Mode**

Serial Port Mode allows configuration of the XTRALINK IP for the following modes of operation:

- **Console** – When this mode is selected and the server is updated, a PC running a communications program such as HyperTerminal can communicate with the XTRALINK IP via the Console Mode serial port, displaying the Server Properties screen and allowing configuration of the server and its ports.

- **Upgrade** – When this mode is selected and the server is updated, firmware can be uploaded into the XTRALINK IP via the Console Mode serial port or a virtual COM port mapped to the number of the Console Mode serial port.

- **Default** – When this mode is selected and the server is updated, it will revert the server to its default configuration.

- **RS-232** – When this mode is selected and the server updated, the selected serial port will become an RS-232 serial port on the server.

- **RS-422** – When this mode is selected and the server updated, the selected serial port will become an RS-422 serial port on the server.

- **RS-485** – When this mode is selected and the server updated, the selected serial port will become an RS-485 serial port on the server.

**Connection At**

When the Connection Mode field is set to Client or Client (no heartbeat), this field becomes active, allowing the XTRALINK IP (acting as a client) to connect to the server either on Power up or on Data Arrival (first character arriving).

**Max Connection**

This field allows the user to configure the XTRALINK IP to have up to eight TCP connections.

**Remote IP Address**

This is a security feature activated by entering the IP address of the desired client. The XTRALINK IP will only communicate with the listed IP address and all other requests for connection will be filtered out. The XTRALINK IP must be set up as a TCP or UDP Server to use this feature. The default setting is 255.255.255.255.

If Paired Mode is not being used, do not change this setting until the application has been tested and is communicating properly. Then activate the address filtering feature.

**Note:**
Refer to Chapter 1 Paired Mode

**Update/Save**

Server properties must be updated separately for each serial port. Updating varies slightly depending on which of the four configuration user interfaces are used.

**Updating the Server Properties in XTRALINK IP IPRS23202 Manager**

From the Server Properties screen, click the Update button to store the configuration settings for the currently selected port. The vcomui dialogue box will appear indicating you must restart the device before the new settings will take effect. Click Yes.

![Figure 33. The Restart Dialogue Box](image-url)
The following dialogue box will appear:

![Restarting Dialogue Box](image)

Figure 34. The Restarting Dialogue Box

After eight seconds a dialogue box will ask whether you want to search for all reachable servers again.

![Server Search Dialogue Box](image)

Figure 35. The Server Search Dialogue Box

While the XTRALINK IP is searching for all reachable servers the following dialogue box appears:

![Search XTRALINK IP IPRS23202 Manager Dialogue Box](image)

Figure 36. The Search XTRALINK IP IPRS23202 Manager Dialogue Box

After that port has been updated you may want to re-enter Server Properties to verify the changes have taken effect, or to view/change the configuration of other ports. Each port must be configured separately.

Saving Configuration Data in Console Mode or Telnet

Saving (updating) server properties is done from the Configuration screen. Access the Configuration screen by tabbing through the list of screens on the left side of the window and highlighting Configuration.

There are four options shown on the right side of the Configuration screen: Save, Default, Running and Reset. Use Tab, Backspace, or arrow keys to move the cursor to the option position, and then press Enter.

- **Save** stores the configuration data to the XTRALINK IP flash memory and resets it.
- **Default** restores the configuration data to factory default settings.
- **Running** restores the configuration data to the last values stored in the flash memory.
- **Reset** re-boots the XTRALINK IP, making it available for a client connection.

**Web Server Interface**

- The **Web Server** interface provides the same updating options as **Console Mode** and **Telnet**. These are located at the bottom of all three **Web Server** pages. If a field is changed, you must click **Save** before leaving that page or the changes will be ignored.
**Note:** If you leave any Web Server page without saving, any changes you have made will be ignored.

**Figure 38. The Web Server Page**
Chapter 6: INSTALLING VIRTUAL COM PORTS

The Virtual COM Port feature allows Windows platform software, using standard API calls, to be used in an Ethernet application.

The Install Virtual COM Port software adds a XTRALINK IP (COM#) port to the computer. This shows up in the Device Manager. The COM number can be selected from a list of available numbers. For example, in a computer already having a COM1 and COM2, COM3 to COM 254 are available for the XTRALINK IP. It is recommended that COM Port 5 or higher be selected. The virtual COM port looks like a standard COM port to most Windows based applications which allows the software to open a connection with the serial port located anywhere on the LAN/WAN. When using the virtual COM port the XTRALINK IP is configured as a TCP or UDP Server.

Virtual COM Port Installation

Step 1: From the Windows Desktop, click:

Start → Programs → Xantech → XTRALINK IP IPRS23202 MANAGER Servers → Install Virtual COM

The Search Setup window will appear.

Step 2: Select the Search all reachable servers check box, then click OK.

The program searches the LAN for all available XTRALINK IP. When complete, the Found Server window appears and displays a list of the servers that were found.

Step 3: Select the XTRALINK IP at the IP Address to be mapped to a virtual COM port, then click OK.

Windows XP provides a notice concerning Windows Logo testing for XP.
Figure 42. The Windows Logo Testing Window

This XP feature simply indicates that these drivers have not yet undergone the Microsoft testing procedures required to use the Windows XP Logo on the packaging. Driver compatibility is not affected.

Step 4: Click Continue Anyway to proceed with the installation.

The Protocol TCP/UDP, IP Address, and Port Number will mirror the settings of the selected XTRALINK IP.

Step 5: After setting all XTRALINK IP serial ports as virtual COM ports, click Cancel on the Found Server form.

Note:
Pcs may have hardware COM ports and devices such as Modems, IR ports or USB based COM ports that are not currently connected. Try selecting a COM number above COM if problems occur.

The default Flow Control setting is None. RTS/CTS can be selected if used by the application program and serial hardware. The XTRALINK IP must be set to match.

Matching the XTRALINK IP and Virtual COM Port Settings

The settings of the virtual COM ports in the Device Manager and the XTRALINK IP Configuration Menu must match. If the settings do not match, the virtual COM ports will not work. If these settings are changed in the Device Manager, it will only affect the operation of the virtual COM port. It will not change the settings stored in the XTRALINK IP. Use the XTRALINK IP IPRS23202 Manager to change the XTRALINK IP settings.

Step 1: Use Device Manager to View New Ports

Confirm the virtual COM ports in the Device Manager.

Step 2: Double-click Ports to view the list of COM port numbers.

The installed Virtual COM port will be displayed as XTRALINK IP IPRS23202 MANAGER (COM #).

Step 3: In the Device Manager select the XTRALINK IP IPRS23202 MANAGER COM #. Double-click it to bring up the Properties window.
Step 4: Click the **Configuration** or **Port Settings** tab. This screen allows the settings to be changed if necessary. Click **Cancel** to keep the existing settings.

Step 5: Click **OK** to change the settings. Use **Refresh** in the Device Manager if Windows does not auto refresh.
Chapter 7: REMOVING VIRTUAL COM PORTS

The XTRALINK IP IPRS23202 Manager software Uninstall Virtual COM Port feature will remove a mapped COM port in the Device Manager of Windows 2000 and XP operating systems. It may also be removed in the Device Manager of Windows 98, ME, NT, 2000, and XP. Windows 98 users also will find a Remove Virtual COM feature in the Programs file.

Removing the Virtual COM port with XTRALINK IP IPRS23202 Manager

Step 1: From the Windows Desktop, click:

Start → Programs → Xantech → XTRALINK IP IPRS23202 MANAGER Servers → XTRALINK IP IPRS23202 Manager

Step 2: In the XTRALINK IP IPRS23202 Manager window click the Virtual COM List tab. Highlight the mapped COM port number to be removed.

Step 3: Click the Uninstall Virtual COM icon. The Manager will ask for confirmation. Click OK to complete the uninstall procedure.

Removing the Virtual COM Port using Device Manager

Note: The screen shots were taken from a Windows XP operating system.

Step 1: From the Windows Desktop click:

Start → Settings → Control Panel.

Step 2: Click the System icon when the manager window opens.
Removing Virtual COM Ports

Figure 47. The Control Panel Window

Step 3: Click Device Manager in the Systems Properties window. In the Device Manager dialogue click the + next to Ports (COM LPT) to expand.

Figure 48. The Device Manager Window

Step 4: Highlight XTRALINK IP IPRS23202 MANAGER (COM #) to be removed and click the Action tab at the top of window, then click Uninstall. A confirm Device Removal window will appear.

Figure 49. Confirm Device Removal

Step 5: click OK to proceed.

The XTRALINK IP IPRS23202 MANAGER COM # will be removed and the Device Manager window will refresh and display the remaining COM ports.
Chapter 8: UPGRADING THE XTRALINK IP FIRMWARE

New XTRALINK IP firmware updates may become available through the Xantech website (www.xantech.com) for installation into the server. The firmware can be uploaded using either a virtual COM port connection or hardware COM port connection.

Downloading the Firmware

Make a folder to receive the firmware file. Download the compressed software file from the Xantech website (www.xantech.com). Unzip or expand the file into the (.hex) format so it will be ready to upload to the XTRALINK IP.

Upgrading Via XTRALINK IP IPRS23202 Manager

The XTRALINK IP IPRS23202 Manager software can upload new firmware to the server using a direct PC connection via the XTRALINK IP serial port or using a virtual COM port.

Preparing the Software

Step 1: In the XTRALINK IP IPRS23202 Manager XTRALINK IP List window, double click the server to be upgraded. The Server Properties window will appear.

Step 2: If using a direct connection to upload the firmware to the XTRALINK IP, set the baud rate to 115200 for the fastest possible upload.

Step 3: Set the Serial Port field to upgrade and click the Update button. (Ensure that the DIP switches on the XTRALINK IP are all in the OFF position.)

Step 4: Click Yes on the vcomui dialogue to restart the XTRALINK IP.

Upgrading the Firmware

Step 5: Double-click the Firmware Upgrade icon (or click the Server menu and Firmware Upgrade).

Step 6: In the Upgrade window, click Browse. The Open dialogue box will appear. Locate the folder on your PC that contains the firmware .hex file. Select the file and click Open. The Open dialogue box will disappear.

Step 7: In the Upgrade window select the serial port to be used in transferring the firmware.

a. If connected directly from the PC to a XTRALINK IP port it will typically be COM1 or COM2

b. If using a virtual COM port to upgrade via the network, identify the virtual COM number and address mapped to Port 1 on the XTRALINK IP.

Step 8: Click Upgrade.

Step 9: In the Port Settings window set the Bits per second, Data bits, Parity and Stop bits to the same values as set up in the Server Properties window. Click OK.

Step 10: Upgrade progress will be shown until the Upgrade finished! message is shown. Click OK.
Chapter 9: USING CONSOLE MODE

Before the XTRALINK IP is installed on a LAN the Console Mode can be used to change the settings from the defaults. The XTRALINK IP is shipped in the RS-232 Mode. Connect a crossover (null modem) cable between the COM port on the computer and the appropriate serial port on the XTRALINK IP.

Note: See Chapter 5 for details of each Server Property Settings.

Console Mode Setup

Step 1: Apply power to the XTRALINK IP. The power and ready LED will light.

Step 2: Using a VT100 Terminal emulation program (typically HyperTerminal in Windows) open the computer COM port connected to the XTRALINK IP (via an RS-232 crossover / null modem cable).

Step 3: In the HyperTerminal Port Settings window set:
   - Baud rate: 9600
   - Data bits: 8
   - Parity: None
   - Stop bits: 1
   - Flow control: None

   Click OK

Step 4: Ensure all the DIP switches are in the ON position.

Step 5: To view the Configuration Menu, press the space bar. The menu will appear within a few seconds.
**Step 5:** Once all the changes have been made move to the **Configuration** screen, select **Save** and press **Enter**.

**Figure 52. Saving and Restarting the Configuration**

The restart message will appear.

**Step 6:** Select **Yes** to save changes. This is necessary to write the settings to the server.

**Using a Password**

If a password is used it must be entered before the Configuration screen can be seen. If the server is accessed with a password but no changes are made, **Reset** to end before disconnecting.
Chapter 10: USING THE WEB SERVER

The Web Server can be used to configure the XTRALINK IP from any web browser software (such as Internet Explorer). Server properties can be set up using three browser pages.

Note:
See Chapter 5 for details on Server Properties.

Setting Server Properties

In Internet Explorer type the IP Address of the XTRALINK IP into the address field near the top of the window and press the Enter key. The following window will appear:

Navigate and change properties as required using the mouse and keyboard.

To change serial port properties, click Serial Port on the left side of the browser window. The following page will appear:

To change other operational properties, click Operation on the left side of the browser window. The following page will appear:

Figure 53. The Web Server Page

Figure 54. The Web Server Serial Port Properties Page

Figure 55. The Web Server Operation Properties Page
Using the Web Server

Figure 55. The Web Server Operation Page

Click **Save** to store changes to the **XTRALINK IP**. Settings for each Port must be saved separately.

**Note:**
If new property settings are not **saved** before leaving this page they will not take effect.

Return to the main Server page by clicking on **Server** on the left side of the browser window.

CHAPTER 11: Using Telnet

**Telnet** can be used to configure the **XTRALINK IP** from any PC on the LAN. The **Telnet** window displays the same configuration information shown in **Console Mode** and allows server properties to be configured.

**Note:**
See Chapter 5 for details on Server Properties.

**Configuration Using Telnet**

**Step 1:** Ensure the PC and **XTRALINK IP** are connected to the LAN.

**Step 2:** Apply power to the **XTRALINK IP**. The power and ready LED will light.

**Step 3:** If the DIP switches on the **XTRALINK IP** all are in the ON position (Console mode), switch them to the OFF position. The XTRALINK IP will revert to the operational mode it was in before the switches were all set to ON.

**Step 4:** From the **Desktop**, click **Start**, then **Run**. The Run dialogue box will open.

**Step 5:** Type in **Telnet** and the IP address of the **XTRALINK IP** to be configured, then click **OK**.

Figure 56. The Run dialogue box
**Note:**
The XTRALINK IP must be in RS-232, RS-422 or RS-485 mode before you can Telnet to it and access the configuration screens. If it was last configured in Console mode you may not be able to access it using Telnet. In this case use XTRALINK IP IPRS23202 Manager, Console Mode or Web Server for configuration.

**Step 6.** The Telnet window will open (unless the server is still in Console mode) and the Server screen will appear.

**Navigating the Configuration Menu**

There are six Telnet screens: Server, Network, Serial Mode, Operation, Monitor and Configuration. Tab, Back Space and arrow keys can be used to highlight the desired function on the screen list. Pressing Enter moves the cursor to the first field with the current screen. The configuration fields can be changed by pressing Enter and selecting from the list that appears. The Escape key moves the cursor back to the screen list. Pressing the Space Bar refreshes the page.

**Figure 57.**

**Figure 58. Telnet Configuration Screens**
Step 7: Once all the changes have been made, move to the **Save** field and select **Enter**. The restart message will appear.

![Figure 59. Saving and Restarting the Configuration](image)

**Step 8:** Select **Yes** to save changes. This is necessary to write the settings to the server. The Telnet window will disappear.

**Step 9:** To view the changes, re-enter **Telnet** and re-establish communications. The configuration menu will appear and display the current settings.

---

### Chapter 12: XTRALINK IP TECHNICAL DATA

<table>
<thead>
<tr>
<th>Hardware and Included Accessories</th>
<th>XTRALINK IP module</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Power Supply:</strong></td>
<td>12 VDC/500mA (tip positive/sleeve negative)</td>
</tr>
<tr>
<td><strong>Power Plug:</strong></td>
<td>(Area Dependent: North America 120VAC/60Hz, Europe/United Kingdom 220/240VAC/50Hz)</td>
</tr>
<tr>
<td><strong>Manual:</strong></td>
<td>Paper copy of this manual, PDF available</td>
</tr>
<tr>
<td><strong>CD-ROM disc:</strong></td>
<td>XTRALINK IP IPRS23202 Manager and Virtual COM Driver software for Windows 98/ME/2000/XP/NT 4.0</td>
</tr>
</tbody>
</table>

| Dimensions                        | 3.35 x 4.5 x 0.90 in (8.5 x 11.5 x 2.3 cm) |

| Power & Environment               | Power Requirements: 12 VDC @ 200 mA |
|-----------------------------------| Operating Temperature: 0 to 50 °C (32 to 122 °F) |
|                                   | Storage Temperature: -20 to 60 °C (-4 to 140 °F) |
|                                   | Humidity: 0 – 90% non-condensing |
|                                   | Approvals: CE, FCC |

| Indicators                        | Power: Red LED |
|-----------------------------------| Link: Yellow or green LED (10BaseT or 100 BaseTX) |
|                                   | Ready: Flashing green LED |

| Connectors                        | Ethernet: Single RJ-45 female |
|-----------------------------------| Serial: one 9 pin D-type male (DB-9M) DTE (software selectable as RS-232, 422, or 485) |
|                                   | DC Power: Ultra-miniature phone jack (2.5mm), Tip (+), Sleeve (-) |
### Serial Interfaces

<table>
<thead>
<tr>
<th>RS-232(DTE):</th>
<th>TXD, RXD, RTS, CTS, DTR, DSR, DCD, GND</th>
</tr>
</thead>
<tbody>
<tr>
<td>RS-422:</td>
<td>TXDB(+), TXDA(−), RXDB(+), RXDA(−), RTS(+), RTS(−), CTS(+), CTS(−) and GND</td>
</tr>
<tr>
<td>RS-485:</td>
<td>Data B (+), Data A (−) and GND</td>
</tr>
</tbody>
</table>

#### Baud Rate:
- 110 bps to 230.4 kbps

#### Parity:
- None, Even, Odd, Mark, Space

#### Data Bits:
- 5, 6, 7 or 8

#### Stop Bits:
- 1, 1.5 or 2

### Memory

| Serial Memory: | 8K bytes per port |

### Network Communications

| LAN:            | 10/100 Mbps Auto-detecting 10 BaseT or 100 BaseTX |

### Protocols

| TCP, IP, ARP, DHCP, Telnet, HTTP, UDP, ICMP |

### Configuration Options

<table>
<thead>
<tr>
<th>Console Mode:</th>
<th>Using RS-232 with VT100 emulation (All DIP Switches ON)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Telnet Mode:</td>
<td>Using HyperTerminal with VT100 emulation</td>
</tr>
<tr>
<td>XTRALINK IP IPRS23202 Manager:</td>
<td>Using Windows 98/ME/2000/XP or NT software</td>
</tr>
<tr>
<td>Web Server:</td>
<td>Using a standard web browser such as Internet Explorer</td>
</tr>
</tbody>
</table>

### Default Server Settings

<table>
<thead>
<tr>
<th>Server Name:</th>
<th>XTRALINK IP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Serial Number:</td>
<td>xxxxxxxxx (printed on bottom of unit)</td>
</tr>
<tr>
<td>Password:</td>
<td>Blank</td>
</tr>
<tr>
<td>DHCP:</td>
<td>Disable</td>
</tr>
<tr>
<td>IP Address:</td>
<td>192.168.0.1</td>
</tr>
<tr>
<td>Net Mask:</td>
<td>255.255.255.0</td>
</tr>
<tr>
<td>Gateway:</td>
<td>192.168.0.254</td>
</tr>
<tr>
<td>MAC Address:</td>
<td>Fixed – see bottom label</td>
</tr>
<tr>
<td>Version&amp;Date:</td>
<td>current firmware version number &amp; date</td>
</tr>
<tr>
<td>XTRALINK IP port:</td>
<td>1</td>
</tr>
<tr>
<td>Baud Rate:</td>
<td>9600</td>
</tr>
<tr>
<td>Data/Stop:</td>
<td>8-1</td>
</tr>
<tr>
<td>Parity:</td>
<td>None</td>
</tr>
<tr>
<td>Flow Control:</td>
<td>None</td>
</tr>
<tr>
<td>Serial timeout:</td>
<td>0 seconds</td>
</tr>
<tr>
<td>TCP alive timeout:</td>
<td>0 minutes</td>
</tr>
<tr>
<td>Connection Mode:</td>
<td>Server</td>
</tr>
<tr>
<td>Delimiter HEX 1:</td>
<td>00</td>
</tr>
<tr>
<td>Delimiter HEX 2:</td>
<td>00</td>
</tr>
<tr>
<td>Force transmit:</td>
<td>0 ms</td>
</tr>
<tr>
<td>TCP/UDP port:</td>
<td>Default port: 4000</td>
</tr>
<tr>
<td>Serial port mode:</td>
<td>Console</td>
</tr>
<tr>
<td>Max connection:</td>
<td>1</td>
</tr>
<tr>
<td>Remote IP Address:</td>
<td>255.255.255.255</td>
</tr>
</tbody>
</table>
### APPENDIX A: RS-232 CONNECTIONS

**XTRALINK IP DB-9 Pin-outs in RS-232 Mode**

<table>
<thead>
<tr>
<th>RS-232 Signal Name</th>
<th>DTE</th>
<th>RS-232 Pin</th>
<th>DB-9M Pin</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carrier Detect</td>
<td>In</td>
<td>DCD</td>
<td>1</td>
</tr>
<tr>
<td>Receive Data</td>
<td>In</td>
<td>RXD</td>
<td>2</td>
</tr>
<tr>
<td>Transmit Data</td>
<td>Out</td>
<td>TXD</td>
<td>3</td>
</tr>
<tr>
<td>Data Terminal Ready</td>
<td>Out</td>
<td>DTR</td>
<td>4</td>
</tr>
<tr>
<td>Signal Ground</td>
<td>---</td>
<td>GND</td>
<td>5</td>
</tr>
<tr>
<td>Data Set Ready</td>
<td>In</td>
<td>DSR</td>
<td>6</td>
</tr>
<tr>
<td>Request To Send</td>
<td>Out</td>
<td>RTS</td>
<td>7</td>
</tr>
<tr>
<td>Clear To Send</td>
<td>In</td>
<td>CTS</td>
<td>8</td>
</tr>
<tr>
<td>Ring Indicator</td>
<td>In</td>
<td>RI</td>
<td>9</td>
</tr>
</tbody>
</table>

*Figure 61. RS-232 Connections in a DB-9 Connector*
RS-232 Connections

RS-232 Straight-through Cable Connections

In the RS-232 mode, the XTRALINK IP’s ports are configured as DTEs like a computer. If the device connected to the XTRALINK IP is configured as a DCE use a straight through cable wired as shown below:

<table>
<thead>
<tr>
<th>RS-232 Signal Names</th>
<th>DB-9 Pin#</th>
<th>Connections</th>
<th>DB-9 Pin#</th>
<th>Signal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carrier Detect</td>
<td>1</td>
<td>1</td>
<td>CD</td>
<td></td>
</tr>
<tr>
<td>Receive Data</td>
<td>2</td>
<td>2</td>
<td>RD</td>
<td></td>
</tr>
<tr>
<td>Transmit Data</td>
<td>3</td>
<td>3</td>
<td>TD</td>
<td></td>
</tr>
<tr>
<td>Data Terminal Ready</td>
<td>4</td>
<td>4</td>
<td>DTR</td>
<td></td>
</tr>
<tr>
<td>Signal Ground/Common</td>
<td>5</td>
<td>5</td>
<td>GND</td>
<td></td>
</tr>
<tr>
<td>Data Set Ready</td>
<td>6</td>
<td>6</td>
<td>DSR</td>
<td></td>
</tr>
<tr>
<td>Request to Send</td>
<td>7</td>
<td>7</td>
<td>RTS</td>
<td></td>
</tr>
<tr>
<td>Clear to Send</td>
<td>8</td>
<td>8</td>
<td>CTS</td>
<td></td>
</tr>
<tr>
<td>Ring Indicator</td>
<td>9</td>
<td>9</td>
<td>RI</td>
<td></td>
</tr>
</tbody>
</table>

Figure 62. Straight-through DB-9 to DB-9 RS-232 Serial Cable

RS-232 Crossover (null modem) Cable Connections

When connecting to a PC or another DTE device, use a crossover cable (also called a null modem cable).

<table>
<thead>
<tr>
<th>RS-232 Signal Names</th>
<th>DB-9 Pin#</th>
<th>Connections</th>
<th>DB-9 Pin#</th>
<th>Signal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carrier Detect</td>
<td>1</td>
<td>1</td>
<td>CD</td>
<td></td>
</tr>
<tr>
<td>Receive Data</td>
<td>2</td>
<td>2</td>
<td>RD</td>
<td></td>
</tr>
<tr>
<td>Transmit Data</td>
<td>3</td>
<td>3</td>
<td>TD</td>
<td></td>
</tr>
<tr>
<td>Data Terminal Ready</td>
<td>4</td>
<td>4</td>
<td>DTR</td>
<td></td>
</tr>
<tr>
<td>Signal Ground/Common</td>
<td>5</td>
<td>5</td>
<td>GND</td>
<td></td>
</tr>
<tr>
<td>Data Set Ready</td>
<td>6</td>
<td>6</td>
<td>DSR</td>
<td></td>
</tr>
<tr>
<td>Request to Send</td>
<td>7</td>
<td>7</td>
<td>RTS</td>
<td></td>
</tr>
<tr>
<td>Clear to Send</td>
<td>8</td>
<td>8</td>
<td>CTS</td>
<td></td>
</tr>
<tr>
<td>Ring Indicator</td>
<td>9</td>
<td>9</td>
<td>RI</td>
<td></td>
</tr>
</tbody>
</table>

Figure 63. Crossover DB-9 to DB-9 RS-232 Serial Cable

RS-232 Connections

RS-232 Straight-through DB-9 to DB-25 Conversion Connections

<table>
<thead>
<tr>
<th>DB9 DTE to DCE</th>
<th>DB25</th>
</tr>
</thead>
<tbody>
<tr>
<td>Receive Data (RX)</td>
<td>RD #2</td>
</tr>
<tr>
<td>Transmit Data (TX)</td>
<td>TD #3</td>
</tr>
<tr>
<td>Data Terminal Ready</td>
<td>DTR #4</td>
</tr>
<tr>
<td>Signal Ground/Common (SG)</td>
<td>GND #5</td>
</tr>
<tr>
<td>Data Set Ready</td>
<td>DSR #6</td>
</tr>
<tr>
<td>Request to Send</td>
<td>RTS #7</td>
</tr>
<tr>
<td>Clear to Send</td>
<td>CTS #8</td>
</tr>
<tr>
<td>Ring Indicator</td>
<td>RI #9</td>
</tr>
<tr>
<td>Soldered to DB9 Metal - Shield</td>
<td>FGND #10</td>
</tr>
</tbody>
</table>

Figure 64. DB-9 to DB-25 Straight-through Cable Connections

RS-232 Crossover DB-9 to DB-25 Conversion Connections

<table>
<thead>
<tr>
<th>DB9 DTE to DTE</th>
<th>DB25</th>
</tr>
</thead>
<tbody>
<tr>
<td>Receive Data (RX)</td>
<td>RD #2</td>
</tr>
<tr>
<td>Transmit Data (TX)</td>
<td>TD #3</td>
</tr>
<tr>
<td>Data Terminal Ready</td>
<td>DTR #4</td>
</tr>
<tr>
<td>Signal Ground/Common (SG)</td>
<td>GND #5</td>
</tr>
<tr>
<td>Data Set Ready</td>
<td>DSR #6</td>
</tr>
<tr>
<td>Request to Send</td>
<td>RTS #7</td>
</tr>
<tr>
<td>Clear to Send</td>
<td>CTS #8</td>
</tr>
<tr>
<td>Ring Indicator</td>
<td>RI #9</td>
</tr>
<tr>
<td>Soldered to DB9 Metal - Shield</td>
<td>FGND #10</td>
</tr>
</tbody>
</table>

Figure 65. DB-9 to DB-25 Crossover (null modem) Cable Connections
RS-232 Connections

RS-232 DTE Loopback Connections

For Transmit and Receive loopback, connect only those lines.

When Flow Control setting on the XTRALINK IP is set for RTS/CTS, those lines must be looped. Usually DTR and DSR must also be looped. The Flow Control setting for the program must match the Server settings. The CD connection is needed by some terminal programs to simulate Carrier.

APPENDIX B: RS-422 CONNECTIONS

XTRALINK IP DB-9 Pin-outs in RS-422 Mode

<table>
<thead>
<tr>
<th>RS-422 Signal Name</th>
<th>Direction</th>
<th>RS-422 Pin</th>
<th>DB9M Pin</th>
</tr>
</thead>
<tbody>
<tr>
<td>Receive Data A (−)</td>
<td>In</td>
<td>RXDA (−)</td>
<td>1</td>
</tr>
<tr>
<td>Receive Data B (+)</td>
<td>In</td>
<td>RXDB (+)</td>
<td>2</td>
</tr>
<tr>
<td>Transmit Data B (+)</td>
<td>Out</td>
<td>TXDB (+)</td>
<td>3</td>
</tr>
<tr>
<td>Transmit Data A (−)</td>
<td>Out</td>
<td>TXDA (−)</td>
<td>4</td>
</tr>
<tr>
<td>Signal Ground</td>
<td>---</td>
<td>GND</td>
<td>5</td>
</tr>
<tr>
<td>Clear to Send A (−)</td>
<td>In</td>
<td>CTSA (−)</td>
<td>6</td>
</tr>
<tr>
<td>Clear to Send B (+)</td>
<td>In</td>
<td>CTSB (+)</td>
<td>7</td>
</tr>
<tr>
<td>Request to Send B (+)</td>
<td>Out</td>
<td>RTSB (+)</td>
<td>8</td>
</tr>
<tr>
<td>Request to Send A (−)</td>
<td>Out</td>
<td>RTSA (−)</td>
<td>9</td>
</tr>
</tbody>
</table>

Figure 67. RS-422 Connections in a DB-9 Connector
RS-422 Connections

In the RS-422 mode, TXD lines are outputs and RXD lines are inputs. Connect the XTRALINK IP TXDB(+) line to the RXDB(+) line of the serial device, and the XTRALINK IP TXDA(-) to the RXDA(-) of the serial device.

If Flow Control is set for RTS/CTS, connect the XTRALINK IP RTSB(+) to CTSB(+) of the serial device and the XTRALINK IP RTSA(-) line to the RTSA(-) of the serial device.

If connecting to Receive Only RS-422 devices, connect from the XTRALINK IP TXDB(+) and TXDA(-) lines to the receive pairs on all serial devices.

Ground is signal ground and provides a common mode reference for the RS-422 Receiver and Transmitters.

Note:
The RS-422 mode can be used for full duplex 4-wire RS-485 operation provided that the XTRALINK IP is acting as a sole master connecting to all the slave devices, and all slave devices share the Receive signal lines to the master. Set Flow Control for none, and omit connections to RTS/CTS line pairs.

RS-485 Connections

The RS-485 Connections are half duplex, either Receive or Transmit, so another half duplex device must be used to check operation.
APPENDIX C: RS-485 CONNECTIONS

XTRALINK IP DB-9 Pin-out in RS-485 Mode

<table>
<thead>
<tr>
<th>RS-485 Signal Name</th>
<th>Direction</th>
<th>RS-485</th>
<th>DB9M Pin</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data B (+)</td>
<td>In/Out</td>
<td>DATA B (+)</td>
<td>3</td>
</tr>
<tr>
<td>Data A (−)</td>
<td>In/Out</td>
<td>DATA A (−)</td>
<td>4</td>
</tr>
<tr>
<td>Signal Ground</td>
<td>---</td>
<td>GND</td>
<td>5</td>
</tr>
</tbody>
</table>

Figure 71. DB-9 Pin-out in RS-485 Mode

Note:
Some RS-485 devices are marked opposite the RS-485 standard, which defines the Data B line as positive relative to Data A during a Mark state before enabling the transmitter, and after transmitting before tri-stating. If an RS-485 device does not XTRALINK IP IPRS23202 Manager, try swapping the Data B and Data A lines.

Figure 72. 2-wire RS-485 Connection
Appendix D: Network Connections

Standard Ethernet Cable RJ-45 Pin-out

<table>
<thead>
<tr>
<th>RJ-45 Pin</th>
<th>Signal</th>
<th>Wire Color</th>
<th>RJ-45 Pin</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>TX+</td>
<td>White-Green</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>TX+</td>
<td>Green</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>RX+</td>
<td>White-Orange</td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td>Not used</td>
<td>Blue</td>
<td>4</td>
</tr>
<tr>
<td>5</td>
<td>Not used</td>
<td>White-Blue</td>
<td>5</td>
</tr>
<tr>
<td>6</td>
<td>RX-</td>
<td>Orange</td>
<td>6</td>
</tr>
<tr>
<td>7</td>
<td>Not used</td>
<td>White-Brown</td>
<td>7</td>
</tr>
<tr>
<td>8</td>
<td>Not used</td>
<td>Brown</td>
<td>8</td>
</tr>
</tbody>
</table>

Figure 73. Pin-out for a Standard Ethernet Cable

Crossover Ethernet Cable RJ-45 Pin-out

<table>
<thead>
<tr>
<th>RJ-45 Pin</th>
<th>Signal</th>
<th>Wire Color</th>
<th>RJ-45 Pin</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>TX+</td>
<td>White-Green</td>
<td>3</td>
</tr>
<tr>
<td>2</td>
<td>TX+</td>
<td>Green</td>
<td>6</td>
</tr>
<tr>
<td>3</td>
<td>RX+</td>
<td>White-Orange</td>
<td>1</td>
</tr>
<tr>
<td>4</td>
<td>Not used</td>
<td>Blue</td>
<td>4</td>
</tr>
<tr>
<td>5</td>
<td>Not used</td>
<td>White-Blue</td>
<td>5</td>
</tr>
<tr>
<td>6</td>
<td>RX-</td>
<td>Orange</td>
<td>2</td>
</tr>
<tr>
<td>7</td>
<td>Not used</td>
<td>White-Brown</td>
<td>7</td>
</tr>
<tr>
<td>8</td>
<td>Not used</td>
<td>Brown</td>
<td>8</td>
</tr>
</tbody>
</table>

Figure 74. Pin-out for a Crossover Ethernet Cable