



**PRECIDIA**  
TECHNOLOGIES

*Empowering your Business  
with IP Enabling Technologies*

# **Ether232Plus**

## User Guide

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The *Ether232Plus* User Guide also applies to the *Ether232*.

Both the menu and features in this release may have changed from the previous release. Please contact [support@precidia.com](mailto:support@precidia.com) if you wish to upgrade your software, obtain a User Guide for an earlier software version, or if you have questions or comments about using the product or document. For general inquiries, please contact [info@precidia.com](mailto:info@precidia.com).

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# 1 Before You Start

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## 1.1 Preview

Each section in this Guide is a step in the process of installing and configuring your Precidia unit:

- 1 Before You Start**  
Familiarize yourself with the features and installation requirements of the unit.
- 2 Setting up the Ether232*Plus***  
Set up the hardware and configure the unit via terminal software.
- 3 Configuring the Ethernet Settings**  
Input the IP address, subnet mask, and gateway address for the unit.
- 4 Configuring the Serial Port Settings**  
Configure the protocol, speed, connection control, and port information.
- 5 Configuring the Security Settings**  
Configure the remote, console, and Web passwords, SNMP, and IPSec.
- 6 System Settings**  
If necessary, have your network administrator configure the advanced settings, including downloads and system logging options.
- 7 Accessing System Information**  
Find out how to access the system information locally or remotely.

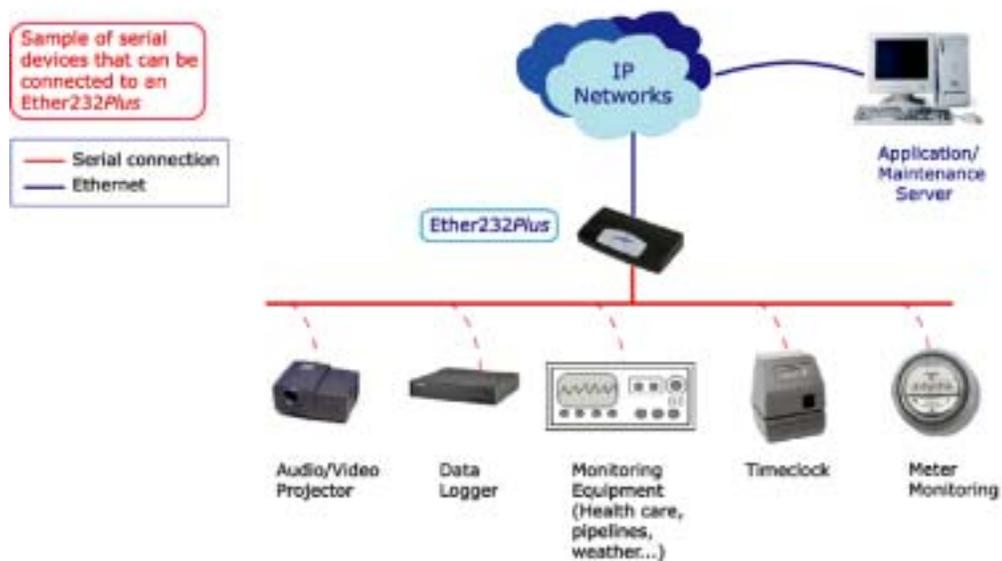
Appendices at the back of this guide also provide valuable reference information:

- A Glossary of Terms and Acronyms**
- B Troubleshooting and Support**
- C Specifications and Warranty**
- D Connecting with Telnet**
- E Pinouts and Power Supply**

## 1.2 Functionality and Features

### How It Works

Precidia products connect serial devices and IP networks. A device sends information to the unit through the serial port. This information is processed according to the protocol set in the Serial Port Settings, then transferred to the Ethernet side of the unit. The unit then converts the information to IP compatible format and sends it out the Ethernet port to the remote server according to the parameters set in the Ethernet Settings. The process is reversed when information is received from the remote server. The figure below illustrates an example configuration of the Ether232Plus in a network.



**Ether232Plus — Network Configuration**

### Features

The Ether232Plus has many useful features, allowing you to:

- Configure settings locally via the COM port *or* remotely using telnet
- Display static Web pages using a built-in Web page server
- Display dynamic System Status and System Log pages through the built-in Web server or the Configuration screen
- Manage information with SNMPv2c (Simple Network Management Protocol)
- Tap remotely into the datastream to monitor data and assist in debugging
- Provide security through passwords and IPsec
- Use a primary and a backup server (automatic switchover on failure)
- Capture statistics and log system information internally
- Upload firmware upgrades using TFTP (Trivial File Transfer Protocol) or via the local com port

- Control and refine connection settings with options that include:
  - Automatic connection in tcp(tunnel) and tcp-client modes to establish a connection to the server as soon as the first data byte is received on the serial port
  - Connection recovery to ensure the session remains active
  - COM Port Redirector Software compatibility using the Com Port Control protocol option
  - Modem Connection Control that allows the Precidia unit to appear as a Hayes-compatible modem to your serial device
- Connect an RS-422/485 device *or* an RS-232 device to one of two ports
- Support the following network protocols:

|        |                      |                        |
|--------|----------------------|------------------------|
| Telnet | ARP                  | DHCP                   |
| TCP    | HTTP                 | SNMPv2c                |
| UDP    | TFTP (download only) | IPsec (manually keyed) |
| ICMP   | FTP                  | Ethernet, IEEE 802.3   |
| IP     | SNTp                 |                        |

### 1.3 Ether232Plus Layout

#### Front Panel



**Ether232Plus Front Panel**

Table 1.1 describes the function of each indicator lamp.

**Table 1.1: Front Panel Indicator Lamps**

| Indicator Lamp | Description  |
|----------------|--|
| ON             | Illuminates constantly when power is applied to the unit.  |
| LINK           | Illuminates constantly when the Ethernet port has a valid connection to a 10BaseT Ethernet network.  |
| COLLISION      | Illuminates under high traffic loading, when network congestion results in collisions. Collisions are resolved by the Ethernet protocol and do not necessarily indicate data loss. Lamp flashes to indicate this activity.                                   |
| TRANSMIT       | Illuminates when the unit has control of the line and is sending data on the network. Lamp flashes to indicate this activity. Does not illuminate when receiving data.   |
| TRANSMIT       | Illuminates when the unit is sending or receiving data out the COM port. Lamp flashes to indicate this activity. Illuminates constantly while in configuration mode.   |
| STATUS         | <b>Off:</b> Unit incorrectly configured or the COM port is disabled.<br><b>Slow flash:</b> Correctly configured, in idle mode.<br><b>Fast flash:</b> Correctly configured, terminal has communicated.<br><b>On (solid):</b> Correctly configured, connected. |

**NOTE:** See Appendix B, *Troubleshooting and Support*, for descriptions of how indicator lamps can be used for troubleshooting.

**Back Panel**



**Back Panel of the Ether232Plus**

**Table 1.2: Back Panel Ports**

| Port      | Description   |
|-----------|---|
| POWER     | Accepts the Precidia-supplied 9V power adapter.   |
| CONFIGURE | Press and hold the recessed CONFIGURE button for several seconds to activate local configuration through the COM port.  |
| ETHERNET  | Accepts RJ-45 connector for direct connection to 10BaseT Ethernet network.<br><br><i><b>NOTE:</b> If connecting directly to another Ethernet device, use a cross-over cable. If connecting to a 100BaseT network, your hub must support automatic switching to 10BaseT.</i> |
| RS422     | <b>RS-422 and RS-485 mode only:</b> Accepts RJ-45 connector for RS-422 or RS-485 serial devices. Please see Appendix E: Pinouts and Power Supply, for cable and connector pinouts.  |
| COM       | Accepts DB-9 null modem serial cable for configuration.<br><br><b>Ether232 mode only:</b> Accepts DB-9 null modem serial cable for operation and configuration (typical).   |

## 1.4 Hardware Requirements

### Installation and Configuration

The Precidia package includes:

- one (1) power adapter
- one (1) Ether232Plus device

To complete the installation you also need:

- one (1) PC with terminal software, or a dumb terminal for configuration
- one (1) Ethernet cable

- For RS-232 connections:
  - If you are connecting the Precidia unit to a DTE (Data Terminal Equipment) device, you need one (1) null modem serial cable for configuration *and* for connecting your DTE serial device *after* configuration
  - If you are connecting the Precidia unit to a DCE (Data Communication Equipment) device you need one (1) null modem serial cable for configuration and one (1) RS-232 serial cable for connecting your DCE serial device to the Ether232Plus
  - If you are connecting the Precidia unit as a Hayes-compatible modem, or to a Hayes-compatible modem, you need: one (1) specialized null modem serial cable. *Some POS terminals may also require this type of cable.*
- For RS-422 connections:
  - One (1) null modem serial cable for configuration, and one (1) RS-422 serial cable with an RJ-45 connector
- For RS-485 connections:
  - one (1) null modem serial cable for configuration and one (1) RS-485 serial cable with an RJ-45 connector

---

**IMPORTANT!** Please see Appendix E: Pinouts and Power Supply, for cable and connector pinouts.

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**TIP** How do you know if your serial device is DCE or DTE?

*DCE devices generally have a female (receptacle) DB-9 connector. Examples of DCE devices include modems, Digital Service Units (DSU), Channel Service Units (CSU), and most communications equipment.*

*DTE devices generally have a male (pin) DB-9 connector. Examples of DTE devices include communications servers, terminals, serial printers, and PCs with native RS-232-E serial ports.*

---

## Reconfiguration

After your Precidia unit is operational, you will require one null modem serial cable, and a PC or dumb terminal to locally reconfigure the unit.

---

**NOTE:** You can reconfigure the Precidia unit remotely using telnet if you have set the Remote Password. See Appendix D: Connecting with Telnet.

---

## 1.5 Software Requirements

You will need terminal software (or a dumb terminal) to locally configure the unit. Please see Section 2.2, Setting Up the Terminal for further details.

## 1.6 Configuration Requirements

The following settings represent the basic requirements for configuring the unit. You may need to configure other settings depending on your set-up and the protocol you are using.

### Ethernet Settings

- IP Address, Subnet Mask, Gateway: These are the addressing information of the unit and the network. Leave at zero if using a DHCP (Dynamic Host Configuration Protocol) server to configure the IP addresses.

### Serial Port Settings

- Protocol: Used by the attached device
- Port Setting: Port settings of the attached device
- Local Port: Port number on the unit (as required)
- Remote Port and Remote IP: Port number and IP address of remote host (as required)

### Security Settings

- Remote Password: *Must* be configured to enable remote access and configuration



# 2 Setting up the Ether232Plus

---

## 2.1 Installing the Hardware



**CAUTION:** Use the 9V power adapter supplied by Precidia or an adapter conforming exactly to the specifications in Appendix E: Pinouts and Power Supply. Use of alternate power adapters can result in hardware damage and will render the warranty null and void!

---

- 1 Connect the power adapter to the POWER port of the unit.
- 2 Connect the Ethernet cable to the ETHERNET port of the unit.
- 3 Connect the null modem cable to the COM port of the unit.
- 4 Plug the power adapter into a power outlet.
- 5 Connect the null modem cable to one of the COM ports on your PC.
- 6 Follow Section 2.2 to set up your terminal software and access the Configuration screen.
- 7 Configure the unit (Sections 3 through 6).

---

**NOTE:** You must set the Remote Password locally **before** you can configure the Ether232Plus remotely.

---

### After Configuration

- 1 Disconnect the null modem cable from the COM port of your PC.
- 2 Connect your serial device to the COM port of the Ether232Plus using the *appropriate cable*. (See Section 1.4, Hardware Requirements, on page 5.)

- 3 Connect the Ethernet cable to a hub or router if you have not already done so.
- 4 Ensure the LINK lamp is lit to indicate a valid Ethernet connection, and the STATUS lamp is flashing to indicate the unit is ready to transmit/receive data.
- 5 If you know the IP address of the Precidia unit, ping the unit to ensure you have a valid network connection. (See *Check IP Address (Ping)* on page B-3.)

## 2.2 Setting Up the Terminal

Once the Precidia unit is connected to your PC, you can access the Configuration screen using terminal software.

You may use any terminal emulation software as HyperTerminal, which comes standard with Windows operating systems, or Procomm Plus (Symantec). For further help on using Hyper Terminal, please refer to our Help Guide: **Working With HyperTerminal** at <http://www.precidia.com/products/documentation.html>.

---

**IMPORTANT! WINDOWS NT/2000/XP USERS:**

*If using HyperTerminal to perform firmware upgrades, or to download static Web pages to the Precidia unit, you need to use the latest version of HyperTerminal. To obtain your free HyperTerminal upgrade, visit <http://www.hilgraeve.com>.*

---

- 1 Start your terminal program.
- 2 Select the correct COM port in your terminal program (usually Com1 or Com2).
- 3 Configure the terminal with the following settings:
  - Bits per second: 9600 (required)
  - Data bits: 8
  - Parity: None
  - Stop bits: 1
  - Flow control: Hardware

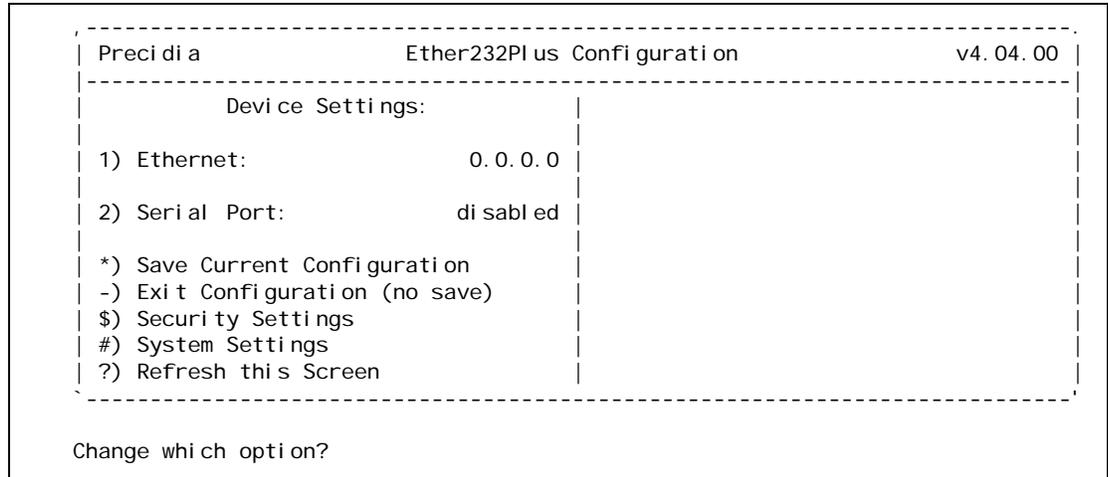
---

**NOTE:** *The Data Bits, Parity, Stop Bits, and Flow control settings listed above are recommended settings. Configuration can be accessed using **any settings at 9600 bps.***

---

- 4** Using a ballpoint pen or similar item, press and hold the recessed CONFIGURE button at the rear of the unit for several seconds until the initial Configuration screen appears, as shown below:

If the screen does not appear, refer to Appendix B:, Troubleshooting and Support..



**Initial Configuration Screen**

---

**NOTE:** The COM TRANSMIT lamp stays illuminated throughout the configuration process.

---

## 2.3 Understanding the Configuration Screen

The left half of the Configuration screen displays the Device Settings menu and the right half of the screen displays the sub-menu of the option you select.

Table 2.1 provides a description of the menu items. Type the number or character bracketed at the start of the line to chose a menu item.

---

**NOTE:** Pressing **ESC** cancels the current action and returns you to the previous prompt.

---

**Table 2.1: Device Settings Menu Options**

| Menu No. | Menu Item                    | Description   |
|----------|------------------------------|---|
| 1)       | Ethernet                     | Configure the local network information before the device is placed on a network so it does not cause a problem with the existing LAN, or configure automatically with a DHCP server. |
| 2)       | Serial Port                  | Configure host addresses and the protocols being used by the serial device.   |
| *)       | Save Current Configuration   | Save changes and exit from configuration mode. Resets the unit.   |
| -)       | Exit Configuration (no save) | Exit from the configuration mode without saving any changes. Resets the unit if configuring locally.  |
| \$)      | Security Settings            | Configure all passwords (Console, Remote and Web Server), IPsec, and SNMP.  |
| #)       | System Settings              | For administrator only. Perform Web page and firmware downloads, and view system information.   |
| ?)       | Refresh this Screen          | Refresh the current Configuration screen.   |

## 2.4 Timeout During Configuration

**After 4 minutes of inactivity** the timeout notification appears under the prompt, as shown below. Any unsaved changes will be lost.

Change which option?  
!timeout! (changes not saved)

### Timeout Notification

You must then press and hold the recessed CONFIGURE button for several seconds, or re-establish your remote telnet connection, to access configuration and re-enter your changes.

---

**NOTE:** Typing any character, or typing “?” to refresh the screen, will restart the 4-minute timer.

---

## 2.5 Resetting to Factory (Default) Configuration

You may need to reset to “factory” settings if you have configured and subsequently lost a Console Password, or if you wish to completely reconfigure the unit. The procedure below will delete your previous configuration and revert all settings to factory default.

- 1** Unplug the power cord from the back of the unit.
- 2** Press and hold the recessed CONFIGURE button and plug the power cord back in to the POWER port.
- 3** Continue to press and hold the recessed CONFIGURE button for 15 seconds.  
The Configuration screen appears, reset to the factory settings.
- 4** Reconfigure the unit.
- 5** Type “\*” to save the new configuration.

---

**NOTE:** *If you do not save the new settings, the unit will restart with the previously saved settings.*

---



# 3 Configuring the Ethernet Settings

The Ethernet Settings sub-menu allows you to specify a unique IP address for your Precidia unit to enable communication over an IP network and with the remote host(s).

To configure or change the Ethernet Settings, choose **Ethernet** from the Device Settings menu.

The Ethernet Settings sub-menu appears on the right side of the Configuration screen, as shown below.

| Precidia                        |          | Ether232Plus Configuration |         | v4.04.00 |  |
|---------------------------------|----------|----------------------------|---------|----------|--|
| Device Settings:                |          | Ethernet Settings:         |         |          |  |
| 1) Ethernet:                    | 0.0.0.0  | A) IP Address:             | 0.0.0.0 |          |  |
| 2) Serial Port:                 | disabled | B) Subnet Mask:            | 0.0.0.0 |          |  |
|                                 |          | C) Gateway:                | 0.0.0.0 |          |  |
| *) Save Current Configuration   |          | Additional Gateway:        |         |          |  |
| -) Exit Configuration (no save) |          | D) Network Address:        | 0.0.0.0 |          |  |
| \$) Security Settings           |          | E) Network Mask:           | 0.0.0.0 |          |  |
| #) System Settings              |          | F) Gateway:                | 0.0.0.0 |          |  |
| ?) Refresh this Screen          |          |                            |         |          |  |

Change which option?

**Ethernet Settings Sub-menu**

**NOTE:** Remember to save your changes by typing "\*" to exit configuration!

## 3.1 IP Address

An IP address is an identifier for computers or devices on a TCP/IP network. Make sure that the IP address you assign is not in use by any other device on your network. IP addresses are made up of four numbers from 0 to 255, separated by periods. DHCP -

### 3.1.1 Dynamic IP Address

DHCP (Dynamic Host Configuration Protocol) allows you to dynamically allocate IP addresses to devices on a TCP/IP network.

---

**NOTE:** *The DHCP server must be on the same physical subnet as the Precidia unit.*

---

---

**NOTE:** *For further help on DHCP Administration, please refer to our **DHCP Administration Help Guide** at <http://www.precidia.com/products/documentation.html>.*

---

Precidia units come configured with the IP address and subnet mask set at 0.0.0.0, which automatically enables DHCP configuration. If you are using a DHCP server, leave all Ethernet Settings at zero (0.0.0.0). The settings will always appear as zeros in the menu regardless of the values assigned by the DHCP server.

The DHCP assigned IP addresses can be viewed in the unit's System Status. Follow the steps in 6.4, Display System Status to view the status information.

The first Local address listed under Network Routing is the IP address of the unit.

To enable DHCP configuration:

- 1** Choose **Ethernet Settings** from the Device Settings menu. (If the IP Address and Subnet Mask are both 0.0.0.0, then DHCP is already enabled.)
- 2** Choose **IP Address** from the Ethernet Settings sub-menu.
- 3** Type **0.0.0.0** at the prompt and press **Enter**.
- 4** Choose **Subnet Mask** from the Ethernet Settings sub-menu.
- 5** Type **0.0.0.0** at the prompt and press **Enter**.

The unit should automatically obtain the Ethernet Settings from the DHCP server.

---

**NOTE:** *The settings obtained from the DHCP server may change if the unit is reset, since they will be lost and re-negotiated.*

---

### 3.1.2 Static - (No DHCP) IP Address Settings

To enter or change the IP address:

- 1 Choose **Ethernet** from the Device Settings menu.
- 2 Choose **IP Address** from the Ethernet Settings sub-menu.  
You are prompted to enter the IP address of the device.
- 3 Type the unique IP address at the prompt (in the format xxx.xxx.xxx.xxx) and press **Enter**.

## 3.2 Subnet Mask (Static — No DHCP)

The subnet mask is used to determine what subnet an IP address belongs to. The mask allows a router to determine the network and host addresses, and forward data packets correctly.

To enter or change the Subnet Mask:

- 1 Choose **Ethernet** from the Device Settings menu.
- 2 Choose **Subnet Mask** from the Ethernet Settings sub-menu.  
You are prompted to enter the subnet mask of the device.
- 3 Type the subnet mask (e.g. 255.255.255.0) at the prompt (in the format xxx.xxx.xxx.xxx) and press **Enter**.

## 3.3 Gateway (Static — No DHCP)

If the device will be communicating with a host that is not on the local subnet, you must specify the router address (gateway) that will forward data to the destination. If the destination is within the LAN and can be accessed without passing through a router, you can leave this field blank (0.0.0.0). This setting is the default gateway.

To enter or change the Gateway:

- 1 Choose **Ethernet** from the Device Settings menu.
- 2 Choose **Gateway** from the Ethernet Settings sub-menu.  
You are prompted to enter the IP address of the gateway.
- 3 Type the gateway address at the prompt (in the format xxx.xxx.xxx.xxx) and press **Enter**.

## 3.4 Additional Gateway

The Additional Gateway option allows you to specify a second gateway (router) for a specific network address.

You can use the Additional Gateway to run the SNMP (Simple Network Management Protocol) manager on a computer on another network. You can also telnet to the Precidia unit, or ping to check its status, from a computer on another network. In this way, if your primary network goes down, you can still access the Precidia unit and remotely reconfigure it to another network.

---

**NOTE:** *The Additional Gateway must be on the same subnet as the device.*

---

### Network Address

If the destination IP address of a packet matches this Network Address and the Network Mask, it is forwarded to the second gateway address defined below.

To enter or change the Network Address:

- 1 Choose **Ethernet** from the Device Settings menu.
- 2 Choose **Network Address** from the Ethernet Settings sub-menu.  
You are prompted to enter the IP address of this network.
- 3 Type the address at the prompt (in the format xxx.xxx.xxx.xxx) and press **Enter**.

### Network Mask

To enter or change the Network Mask:

- 1 Choose **Ethernet** from the Device Settings menu.
- 2 Choose **Network Mask** from the Ethernet Settings sub-menu.  
You are prompted to enter the subnet mask of the device.
- 3 Type the network mask at the prompt (in the format xxx.xxx.xxx.xxx) and press **Enter**.

### Gateway

The Gateway specified under Additional Gateway defines the address of the second router (gateway). Packets with destination addresses matching the Network Address and Subnet Mask configured above are sent to the additional gateway.

---

**NOTE:** *The Additional Gateway must be on the same subnet as the device.*

---

To enter or change the Gateway:

- 1** Choose **Ethernet** from the Device Settings menu.
- 2** Choose **Gateway** under **Additional Gateway** from the Ethernet Settings sub-menu.  
You are prompted to enter the IP address of the gateway.
- 3** Type the gateway address at the prompt (in the format xxx.xxx.xxx.xxx) and press **Enter**.



# 4 Configuring the Serial Port Settings

The Serial Port Settings sub-menu allows you to choose the protocol for communicating with the remote server.

To configure or change the Serial Port Settings choose **Serial Port** from the Device Settings menu.

The Serial Port Settings sub-menu appears on the right side of the Configuration screen, an example of which is shown below.

**NOTE:** Once you choose a protocol, different options appear in the sub-menu. Set the Protocol option first.

```
Precidia Ether232Plus Configuration v4.04.00
-----
Device Settings:                               Serial Port Settings:
1) Ethernet:                                0.0.0.0  A) Protocol:      Transparent (tcp)
2) Serial Port:                             Transparent B) Port Setting:  9600 bps 8N1 [hw]
                                                C) Port Mode:    RS-232
                                                D) Connection Control: Automatic
                                                E) Local Port:   9998
                                                F) Remote IP:   0.0.0.0
                                                G) Remote Port: 0
                                                H) Fallback IP: 255.255.255.255
                                                I) Fallback Port: 0
*) Save Current Configuration                J) Packet Prefix: none
-) Exit Configuration (no save)              K) Max Inter-Char Delay: 0
$) Security Settings                         L) Preferred Packet Size: 0
#) System Settings                           M) Initial String: (not set)
?) Refresh this Screen

Change which option?
```

**Example of the Serial Port Settings Sub-menu**

**NOTE:** Remember to save your changes by typing "\*" to exit configuration!

## 4.1 Protocol

The Protocol setting defines how the Ether232Plus communicates with the remote server. The Protocol setting has two parts: **Data formatting** and **Session Mode**.

The first part of the Protocol setting, **data formatting**, indicates how to parse or process the data stream to provide compatibility with the remote server. Table 4.1 describes the data formatting options.

**Table 4.1: Data Formatting Options**

| Menu Item       | Description   |
|-----------------|---|
| disabled        | Default setting. The unit will not accept any host initiated or local sessions. You must choose a protocol for the unit to become active.   |
| ComPort Control | <p>Extends a serial link to allow remote configuration and control of a serial port. Upon receipt of a message containing Com Port Control commands, the Ether232Plus extracts the command information from the message and sets the following parameters of the serial port: baud rate, data length, parity bits, stop bits, DTR signal (often used to disconnect a call), and flow control.</p> <p>Once the serial port is set, the Ether232Plus forwards the data to the serial device unchanged. If any changes to the Com Port or modem line occur, the Ether232Plus will automatically send a notification packet to the host.</p> <p>Once the transaction/transmission is complete, the Ether232Plus automatically resets to the Port Setting defined in the Serial Port Settings sub-menu until the next message is received.</p> <p>Telnet Com Port Control is defined in <a href="#">RFC2217</a>. Refer to the Help Guide <b>Com Port Control Compliance</b> at <a href="http://www.precidia.com/products/documentation.html">http://www.precidia.com/products/documentation.html</a> for a list of the Com Port Control commands supported by the Ether232Plus.</p> <p>If you are connecting only one Ether232Plus to a PC and the application requires COM port connection, you can use Com Port Redirector software. You can find more information and purchase this software on the Precidia Web site at <a href="http://www.precidia.com/products/request_software.html">http://www.precidia.com/products/request_software.html</a>.</p> |

**Table 4.1: Data Formatting Options**

| Menu Item   | Description   |
|-------------|---|
| Telnet      | <p>Turns the Ether232Plus into either a telnet client (most common use) or a telnet server and allows the user to telnet out of the Ether232Plus to a remote server, such as a UNIX workstation.</p> <p>The standard connection control options are supported. By leaving the Connection Control parameter at Automatic (default setting), the user can initiate the telnet session by pressing any alphanumeric key. If the Connection Control parameter is set to DTR/DSR Control, the Ether232Plus tries to open a telnet session as soon as DSR is detected from the terminal, but the timeout function of most hosts makes this option somewhat unreliable.</p> <p><b>Telnet-Client:</b> The most common use of the telnet protocol. To create a telnet client, select tcp-client as the session mode. This configuration allows the Ether232Plus to communicate with the telnet server at the configured Remote IP address and Remote Port.</p> <p><b>Telnet-Server:</b> To create a telnet server, select tcp-server as the session mode when configuring this protocol. The Ether232Plus listens on port 23, and the Remote Password must be disabled so that the standard configuration program is not listening on that port. You can still use a Remote Password by configuring Telnet to listen on a port other than 23 (but above 1024 to avoid using reserved ports).</p> |
| Transparent | <p>Typical setting. No alterations are made to the data stream, nor is it parsed in any way. Data is collected until either the preferred packet size is reached or there is a pause between characters that exceeds the inter-character timer. The buffer is then transmitted as a single frame. Preferred Packet Size and Max Inter-Char Delay can be left at the default settings (0), and the unit will automatically determine a reasonable setting based on the current serial port speed.</p> <p>Transparent protocol includes the option Packet Prefix, which allows you to include a header in the packet defining its length. See Section 4.12, Packet Prefix (Transparent Protocol Only), on page 35.</p>  |

**Table 4.1: Data Formatting Options**

| Menu Item  | Description  |
|--|--|
| Terminated   | No alterations are made to the data stream, but incoming data is checked for known "end-of-record" characters, or "terminators", that identify the end of a block so that it can be transmitted as a whole to the remote host. If this mode is selected, you will be prompted to enter up to six Terminators in their ASCII decimal form (e.g. <CR> = 13). This is ideal when the host requires pre-parsing of the data, such as with an AS/400. |
| <p><b>NOTE:</b> To use zero (null) as a terminator, you must set it as Terminator #1. Any zeroes after the first terminator are ignored.</p> |  |

The second part of the Protocol setting, **session mode**, determines how the data channel between the terminal and the server is established. Communications between the device and the host can be over TCP or UDP channels. In addition, the device can initiate a session immediately or wait until either the server (host) or the terminal (client) attempts to establish a connection. Table 4.2 describes the session mode options.

**Table 4.2: Session Mode Options**

| Menu Item   | Description  |
|-------------|--|
| tcp(tunnel) | Typical configuration for most applications. Use tcp(tunnel) mode when the Ether232Plus must be able to initiate TCP connections and accept TCP connections from the host. In this configuration, the Ether232Plus can communicate with the TCP/IP host as if it were virtually connected. Local Port, Remote Port, and Remote IP must be configured. Sections 4.6 through 4.10 describe how to configure ports and IP addresses.                            |
| tcp-client  | Use tcp-client mode when all transactions must be initiated by the terminal. This ensures that a TCP/IP host (server) can never initiate communications with the terminal.   |
| tcp-server  | Use tcp-server mode when the TCP/IP host must never be interrupted by the terminal unless it authorizes a connection. This ensures that data from the terminal will be discarded until the server establishes a session. As a security feature, the host address must match the Remote IP configured in the Serial Port Settings. Local Port and Remote Port must be configured. Sections 4.6 through 4.10 describe how to configure ports and IP addresses. |

**Table 4.2: Session Mode Options**

| Menu Item | Description   |
|-----------|---|
| udp       | Similar to tcp(tunnel) mode, use UDP mode when reception acknowledgement of the data packets is not required. UDP is a connectionless channel, therefore, it is not necessary to initiate or accept connections. This makes for slightly faster data flow. Setting the Remote IP address to all zeros puts UDP into "reply mode" and the Ether232Plus will send data to the last address it received data from. For peer-to-peer communication, the host address must match the Remote IP defined in configuration. |

To set or change the Protocol:

- 1 Choose **Serial Port** from the Device Settings menu.
- 2 Choose **Protocol** from the Serial Port Settings sub-menu.

You are prompted to choose a new protocol, as shown below.

|   |                    |               |                |
|---|--------------------|---------------|----------------|
| A. disabled   | B. ComPort Control | C. Telnet     | D. Transparent |
| E. Terminated   |                    |               |                |
| 1. tcp(tunnel)  | 2. tcp-client      | 3. tcp-server | 4. udp         |
| Choose new protocol (letter+number) or press ESC to cancel: |                    |               |                |

#### Choosing a Protocol

- 3 Type the letter (**A** to **E**), plus the number (**1** to **4**), that corresponds to your selection and press **Enter**.

## 4.2 Port Setting

Port Setting defines the Serial Port Settings of the Ether232Plus. The settings must match the settings of the attached serial device to enable communication. Settings include bit rate, data width, error detect, framing, and flow control.

---

**NOTE:** To avoid data loss, choose hardware flow control if you set the port speed to 19 200 bps or higher.

---

Flow control options are none, hardware, or software as described Table 4.3 .

**Table 4.3: Flow Control Options for Port Setting Parameter**

| Option            | Description  |
|-------------------|--|
| None              | Default setting. No flow control enabled. Data may be lost due to overflow during high speed communication.  |
| h/w<br>(rts/cts)  | <p>Hardware handshaking uses the RTS/CTS (Request To Send/Clear To Send) signal lines for flow control on the COM port. Hardware handshaking works by altering voltage levels on these lines. When the remote end is ready to receive data, it asserts the CTS signal to tell the Ether232Plus to start transferring data. If the remote end is unable to accept the data as fast as it is received from the Ether232Plus, the remote end negates CTS, and the Ether232Plus suspends data transfer. When the remote end is ready for more data, it asserts CTS again.</p> <p>When the Ether232Plus is ready to receive data, it asserts the RTS signal. If the Ether232Plus cannot accept data as quickly as the device is passing data, it negates RTS. The Ether232Plus asserts RTS again when it is ready to resume receiving data. This setting can be used for the majority of installations.</p> |
| s/w<br>(xon/xoff) | <p>Software handshaking requires that XON/XOFF characters are asserted and obeyed on the COM port. XON is used by either the Ether232Plus or the remote host to signal the other end to start sending data. XOFF can also be used by either the Ether232Plus or the remote host to signal the other to stop sending data.</p>  |

**NOTE:** XON/XOFF characters included in a data transmission are interpreted as flow control characters and will cause transmission problems. This option is not recommended for binary data transmission.

To set or change the Port Setting:

- 1 Choose **Serial Port** from the Device Settings menu.

**2** Choose **Port Setting** from the Serial Port Settings sub-menu.

You are prompted to enter one item from each column to configure the port, as shown below.

| Port configuration is made up of the several different parameters: |            |                 |                |                   |
|--|------------|-----------------|----------------|-------------------|
| Bit Rate   | Data Width | Error Detect    | Framing        | Flow Control      |
| -----  | -----      | -----           | -----          | -----             |
| A. 300   | 8. 8 bits  | N. no parity    | 1. 1 stop bit  | N. none           |
| B. 600   | 7. 7 bits  | O. odd parity   | 2. 2 stop bits | H. h/w (rts/cts)  |
| C. 1200  | 9. 9 bits  | E. even parity  |                | S. s/w (xon/xoff) |
| D. 2400  |            | M. mark parity  |                |                   |
| E. 4800  |            | S. space parity |                |                   |
| F. 9600  |            |                 |                |                   |
| G. 19200   |            |                 |                |                   |
| H. 38400   |            |                 |                |                   |
| I. 57600   |            |                 |                |                   |
| J. 115200  |            |                 |                |                   |

Enter one item from each column to configure port (eg. C-7E1-H):

**Choosing the Port Configuration**

**3** Type the letter or number from each column corresponding to your desired settings, and press **Enter**.

**NOTE:** Serial ports communicate using the RS-232 serial (bit-stream) protocol. Each byte of data transferred through the serial port consists of a predetermined number of bits: 1 start bit, 7, 8, or 9 data bits, 1 or no parity bit, and 1 or 2 stop bits, for a total between 9 and 13 bits. The port configuration "8E2", for example, results in a 12-bit data length consisting of 1 start bit + 8 data bits + 1 parity bit + 2 stop bits. Serial ports on the Precidia unit, however, support only 10- and 11-bit transfers. Port configurations of 9, 12, or 13 bits are automatically converted by adding an extra stop bit to 9-bit transfers, and dropping stop bits and parity bits (if necessary) from 12- and 13-bit transfers.

### 4.3 Port Mode

Port Mode specifies the type of serial connection the Precidia unit has with the serial device. You can choose from RS-232, RS-422, or RS-485, according to the type of connector on the attached serial device. To ensure you are using the correct cable for your serial device see Appendix E: Pinouts and Power Supply.

To set or change the Port Mode:

**1** Choose **Serial Port** from the Device Settings menu.

**2** Choose **Port Mode** from the Serial Port Settings sub-menu.

You are prompted to choose a new mode, as shown below.

|   |           |           |
|---|-----------|-----------|
| A. RS-232   | B. RS-422 | C. RS-485 |
| Choose new mode (letter) or press ESC to cancel : |           |           |

### Choosing the Port Configuration

**3** Type the letter that corresponds to the desired mode, and press **Enter**.

## 4.4 Connection Control

Connection Control specifies the method of connection between the Ether232Plus and the remote serial device. The options are described in Table 4.4 .

**Table 4.4: Connection Control Options**

| Option          | Description  |
|-----------------|--|
| Automatic       | Default setting. Useful for most setups. Initiates a connection as soon as there is data to send (except in tcp-server mode).  |
| Net-Linked      | Links the protocol connection to the status of the network (Ethernet). Attempts to keep the connection permanently open.   |
| DTR/DSR Control | <p>Uses the DTR/DSR lines to open and close connections. In tcp-client mode, the Ether232Plus establishes an IP connection to the remote host when DSR is asserted and terminates a connection when DSR is negated.</p> <p>In tcp-server mode, the Ether232Plus asserts DTR when there is a valid incoming connection attempt and accepts the connection as soon as DSR is asserted.</p> <p>In tcp(tunnel) mode the Ether232Plus both accepts and establishes connections to the host.</p> |
| RTS/CTS Control | <p>Uses the RTS/CTS lines to open and close connections. In tcp-client or tcp(tunnel) mode, the Ether232Plus establishes an IP connection to the remote host when CTS is asserted and terminates a connection when CTS is negated.</p> <p>In tcp-server or tcp(tunnel) mode, the Ether232Plus asserts RTS when there is a valid incoming connection attempt and accepts the connection if CTS is currently asserted.</p>   |

**Table 4.4: Connection Control Options**

| Option | Description   |
|--------|---|
| Modem  | <p>Enables the Ether232Plus to act as modem to a device connected to its serial port. The Ether232Plus processes a superset of the standard Hayes command set, including the ability to answer, dial, and originate a connection. FTP and HTTP are supported with extended AT commands.</p> <p>For implementation notes and a description of supported commands, see the <i>Modem Connection Control</i> Help Guide at <a href="http://www.precidia.com/products/documentation.html">http://www.precidia.com/products/documentation.html</a>.</p> |

To set or change the Connection Control:

- 1 Choose **Serial Port** from the Device Settings menu.
- 2 Choose **Connection Control** from the Serial Port Settings sub-menu.

You are prompted to enter a connection control type, as shown below.

|  |
|--|
| <p>A. Automatic    B. Net-Linked    C. DTR/DSR Control    D. RTS/CTS Control<br/>E. Modem</p> <p>Enter connection control type (letter):</p> |
|--|

#### Choosing the Connection Control

- 3 Type the letter that corresponds to the desired option and press **Enter**.

## 4.5 Terminal Type (Telnet Protocol Only)

If you select Telnet in the Protocol setting, you can enter the type of terminal you are using. If the Terminal Type is unknown, this parameter may be left at (unset). The telnet server will set a default type, but it is more effective to set it yourself. If the terminal type is incorrect, the full screen telnet applications will not work properly.

To enter or change the Terminal Type (Telnet only):

- 1 Choose **Serial Port** from the Device Settings menu.

- 2 Choose **Terminal Type** from the Serial Port Settings sub-menu.

You are prompted to enter the type of attached terminal, as shown below.

The "terminal type" is not simply an arbitrary string of characters describing the type of device attached to the serial port. It is a specific name that will be recognized by the remote host and used by it to decide how to control that type of terminal.

Common terminal types are "dumb", "ansi", "vt100", and "vt102".

Enter type of attached terminal:

### Entering the Terminal Type

- 3 Type in the terminal type and press **Enter**.

## 4.6 Local Port

Local Port is the port number that listens for incoming connections. This option must be set if the Ether232Plus will ever receive a session initiated from an outside source (in tcp(tunnel), tcp-server, and udp modes). If the Ether232Plus will only be used to initiate sessions, this setting can be left at 0 (tcp-client mode).

To enter or change the Local Port:

- 1 Choose **Serial Port** from the Device Settings menu.
- 2 Choose **Local Port** from the Serial Port Settings sub-menu.  
You are prompted to enter the port number on the local system.
- 3 Type the port number at the prompt and press **Enter**.

## 4.7 Remote IP

Remote IP is the IP address of the remote host to attempt connections to. If incoming connections are being accepted, then only connections from the Remote IP address or Fallback IP address are accepted.

Set Remote IP to all zeros (0.0.0.0) to disable outgoing connections and allow incoming connections from anywhere.

To enter or change the Remote IP:

- 1 Choose **Serial Port** from the Device Settings menu.

- 2 Choose **Remote IP** from the Serial Port Settings sub-menu.  
You are prompted to enter the IP address of the remote system.
- 3 Type the remote IP address and press **Enter**.

## 4.8 Remote Port

Remote Port is the port address on the remote device to which the Ether232Plus sends incoming data. Remote Port must be set in tcp(tunnel), tcp-client, and udp modes.

To enter or change the Remote Port:

- 1 Choose **Serial Port** from the Device Settings menu.
- 2 Choose **Remote Port** from the Serial Port Settings sub-menu.  
You are prompted to enter the port number on the remote system.
- 3 Type the remote port number at the prompt and press **Enter**.

## 4.9 Fallback IP

Fallback IP is the IP address of the machine the unit connects to if the Remote IP address (primary) is not responding, not accepting connections, or not sending data.

The unit makes one attempt to connect to the Remote IP. If that attempt fails, it attempts to connect to the Fallback IP, alternating until a connection is made. After connecting to the Fallback IP address, the unit tries the Remote IP on the next attempt. If data is received from either host, the next connection attempt is to the Remote IP address.

Fallback can also be disabled, or enabled to accept incoming connections from any host. Table 4.5 describes Fallback IP settings.

**Table 4.5: Fallback IP Configurations**

| <b>Fallback IP Setting</b> | <b>Result</b>  |
|----------------------------|--|
| 0.0.0.0                    | Fallback operation disabled.   |
| 255.255.255.255            | Incoming connections are accepted from any source as long as the unit is not already connected. Any host can establish a connection if the primary host connection is lost. This provides the same function as setting the Remote IP to 0.0.0.0 and can be used when the Remote IP must be configured, such as in tcp(tunnel) mode.<br><br><i><b>NOTE:</b> When you set the Fallback IP to 255.255.255.255, set the Fallback Port to zero (0) or an error will occur if the primary host connection is lost.</i> |
| xxx.xxx.xxx.xxx            | Type the IP address of the backup machine to attempt connections to if the primary address (Remote IP) is not responding.  |

To enter or change the Fallback IP:

- 1** Choose **Serial Port** from the Device Settings menu.
- 2** Choose **Fallback IP** from the Serial Port Settings sub-menu.  
You are prompted to enter the IP address of the fallback system.
- 3** Type the desired setting and press **Enter**.

## 4.10 Fallback Port

Fallback Port is the TCP port number to initiate connections to on the fallback host (Fallback IP), if the Remote IP is not responding or not accepting connections. Set this value to zero (0) to disable the fallback operation or if you have set the Fallback IP to 255.255.255.255. Use port numbers in the range of 1024 to 65 535 to avoid using reserved port numbers.

---

***NOTE:** If the session mode is set to udp, this option is ignored.*

---

To enter or change the Fallback Port:

- 1** Choose **Serial Port** from the Device Settings menu.

**2** Choose **Fallback Port** from the Serial Port Settings sub-menu.

You are prompted to enter the port number on the fallback system.

**3** Type the fallback port address and press **Enter**.

## 4.11 Terminators (Terminated Protocol Only)

If you select Terminated in the Protocol setting, you are able to configure up to six terminators in the Serial Port Settings sub-menu, as shown below.

| Device Settings:                |              | Serial Port Settings:  |                   |
|---------------------------------|--------------|------------------------|-------------------|
| 1) Ethernet:                    | 192.168.2.56 | A) Protocol:           | Terminated (tcp)  |
| 2) Serial Port:                 | Terminated   | B) Port Setting:       | 9600 bps 8N1 [hw] |
|                                 |              | C) Port Mode:          | RS-232            |
|                                 |              | D) Connection Control: | Modem             |
|                                 |              | E) Local Port:         | 9998              |
|                                 |              | F) Remote IP:          | 192.168.1.25      |
|                                 |              | G) Remote Port:        | 9999              |
|                                 |              | H) Fallback IP:        | 255.255.255.255   |
|                                 |              | I) Fallback Port:      | 0                 |
|                                 |              | J) Terminator #1:      | 000 < > : 000     |
|                                 |              | K) Terminator #2:      | 000 < > : 000     |
|                                 |              | L) Terminator #3:      | 000 < > : 000     |
|                                 |              | M) Terminator #4:      | 000 < > : 000     |
|                                 |              | N) Terminator #5:      | 000 < > : 000     |
|                                 |              | O) Terminator #6:      | 000 < > : 000     |
| *) Save Current Configuration   |              |                        |                   |
| -) Exit Configuration (no save) |              |                        |                   |
| \$) Security Settings           |              |                        |                   |
| #) System Settings              |              |                        |                   |
| ?) Refresh this Screen          |              |                        |                   |

Change which option?

### Setting the Terminators

The Ether232Plus continues to capture data from the serial port into the receive buffer until any one of six specific terminators is identified. Once this character is marked, the Ether232Plus continues to capture a configurable number of characters (tail bytes), then terminates the frame and transmits it to the host.

Terminators must be specified in their ASCII decimal form. For example, Carriage Return is entered as 13. The most common terminators are listed in Table 4.6 .

**NOTE:** To use zero (null) as a terminator, you must set it as Terminator #1. Any zeroes after the first terminator are ignored.

To configure or change the terminating characters:

**1** Choose **Serial Port** from the Device Settings menu.

**2** Choose a **Terminator** from Terminator #1 through #6.

You are prompted to enter a terminator character in decimal.

**3** Type in a terminator and press **Enter**.

You are prompted to enter the number of tail bytes in decimal.

**4** Enter the number of tail bytes and press **Enter**.

---

**TIP** The number of tail bytes determines how many characters to wait for after the terminator before sending the packet.

For example, if you are parsing a data frame that ends with ETX and has a 2 byte CRC that follows, you will want to terminate on 3, with 2 tail bytes. However, if you get an ACK, you may not want to collect any tail bytes at all, so you would terminate on 6 with 0 tail bytes.

---

**Table 4.6: Common Terminators**

| Terminator               | Mnemonic      | ASCII<br>Decimal | Terminator      | Mnemonic       | ASCII<br>Decimal |
|--------------------------|---------------|------------------|-----------------|----------------|------------------|
| Null                     | NUL           | 0                | Data Control 2  | DC2            | 18               |
| End of Text              | ETX           | 3                | Data Control 3  | DC3 or<br>XOFF | 19               |
| End of Transmis-<br>sion | EOT           | 4                | Data Control 4  | DC4            | 20               |
| Enquire                  | ENQ           | 5                | Neg-Acknowledge | NAK            | 21               |
| Acknowledge              | ACK           | 6                | Synchronization | SYN            | 22               |
| Line Feed                | LF            | 10               | End of Block    | ETB            | 23               |
| Vertical tab             | VT            | 11               | Cancel          | CAN            | 24               |
| Form Feed                | FF            | 12               | End of Message  | EM             | 25               |
| Carriage Return          | CR            | 13               | End of File     | EOF            | 26               |
| Data Link Escape         | DLE           | 16               | Escape          | ESC            | 27               |
| Data Control 1           | DC1 or<br>XON | 17               |                 |                |                  |

## 4.12 Packet Prefix (Transparent Protocol Only)

If you select Transparent in the Protocol setting, you have a Packet Prefix option. Packet Prefix allows you to insert a two-byte header stating the length of the data in the packet, including or not including the header itself. Some POS systems, such as ACI BASE24, may require these types of headers.

To set or change the Packet Prefix:

- 1 Choose **Serial Port** from the Device Settings menu.
- 2 Choose **Packet Prefix** from the Serial Port Settings sub-menu.

You are prompted to enter the packet prefix type, as shown below.

- |             |   |
|-------------|---|
| A. none     | - received bytes are sent in packets with nothing extra       |
| B. length   | - a 2-byte header indicating the length of the data to follow |
| C. length+2 | - a 2-byte header indicating the length of data plus header   |

Enter packet prefix type (letter):

### Choosing the Packet Prefix Type

- 3 Choose a packet prefix type and press **Enter**.

## 4.13 Maximum Inter-Character Delay (Transparent Protocol Only)

Maximum inter-character delay specifies the maximum elapsed time in milliseconds between received characters before the Ether232Plus forwards the data packet to the destination, to a maximum of 60 000 ms. This option accumulates the data before sending it and therefore tends to group related data together and reduce network overhead.

If left at zero (0), the Precidia unit determines a reasonable delay based on the configured Port Settings.

To enter or change the Max Inter-Char Delay:

- 1 Choose **Serial Port** from the Device Settings menu.
- 2 Choose **Max Inter-Char Delay** from the Serial Port Settings sub-menu.

You are prompted to enter the maximum inter-character delay in ms.

- 3 Type the time for the delay at the prompt and press **Enter**.

## 4.14 Preferred Packet Size (Transparent Protocol Only)

Preferred Packet Size specifies the maximum number of characters in a data packet. If left at 0, data will be sent in amounts equal to the maximum network packet size (usually about 1500 bytes). As with maximum inter-character delay, this option accumulates data before sending it, which can help reduce network overhead.

To enter or change the Preferred Packet Size:

- 1 Choose **Serial Port** from the Device Settings menu.
- 2 Choose **Preferred Packet Size** from the Serial Port Settings sub-menu.  
You are prompted to enter the preferred packet size.
- 3 Type your preferred packet size and press **Enter**.

## 4.15 Initial String (Transparent Protocol Only)

Initial String allows you to insert a string of characters that are prepended to the initial data packet at the beginning of every established connection between the Ether232Plus and your serial device. The string can be a unique identifier for each device, a maximum of 16 characters long, and can include the special characters listed in Table 4.7.

**Table 4.7: Initial String Special Characters**

| Character | Description   |
|-----------|---|
| \r        | Carriage return   |
| \n        | Carriage return   |
| \l        | line feed   |
| \t        | tab   |
| \x??      | character ?? (two hex digits giving the ASCII value of the desired character) |

To configure an Initial String:

- 1 Choose **Serial Port** from the Device Settings menu.
- 2 Choose **Initial String** from the Serial Port Settings sub-menu.  
You are prompted to enter the string to be sent upon connection.
- 3 Type the string at the prompt and press **Enter**.

# 5 Configuring the Security Settings

The Security Settings sub-menu allows you to activate SNMP (Simple Network Management Protocol) and IPsec (Internet Protocol security), and restrict access to the Ether232Plus by specifying passwords and user IDs.

To configure or change the Security Settings, choose **Security Settings** from the bottom of the Device Settings menu.

The Security Settings sub-menu appears on the right side of the Configuration screen, as shown below.

```
Precidia Ether232Plus Configuration v4.04.00
-----
Device Settings: | Security Settings:
1) Ethernet:      | 192.168.2.56 | A) Console Password: (not set)
2) Serial Port:  | Transparent   | B) Remote Password:  (hidden)
                  |               | C) Web Server:       enabled
                  |               | D) Access User id:   (not set)
                  |               | E) Access Password:  (not set)
*) Save Current Configuration | F) SNMP Server:     enabled
-) Exit Configuration (no save) | G) SNMP Settings
$) Security Settings | H) IPsec Tunnel #1: disabled
#) System Settings   | I) IPsec Tunnel #2: disabled
?) Refresh this Screen

Change which option?
```

**Security Settings Sub-menu**

**NOTE:** Remember to save your changes by typing "\*" to exit configuration!

## 5.1 Console Password

The Console Password allows you to restrict local access to configuration mode. After creating a Console Password, anyone accessing the Ether232Plus locally through the COM port must enter the password before the Configuration screen appears.

### Setting the Console Password

---

**NOTE:** Passwords are case sensitive and can consist of uppercase letters, lowercase letters, numbers, and symbols.

---

- 1 Choose **Security Settings** from the Device Settings menu.
- 2 Choose **Console Password** from the Security Settings sub-menu.  
You are prompted to enter a console access password with a maximum of 8 characters.
- 3 Type your password (appears as a series of \*\*\* asterisks) and press **Enter**.

### Viewing the Console Password

- 1 Choose **Security Settings** from the Device Settings menu.
- 2 Choose **Console Password** from the Security Settings sub-menu.  
The current password is displayed in brackets: [was: password].
- 3 **Do not** type any characters. Press **ESC** to keep the same password and return to the menu.

### Clearing the Console Password

- 1 Choose **Security Settings** from the Device Settings menu.
- 2 Choose **Console Password** from the Security Settings sub-menu.
- 3 **Do not** type any characters. Press **Enter** to clear the password.  
The password is displayed as (not set) in the Security Settings sub-menu.

## 5.2 Remote Password

To remotely configure the Ether232Plus, you must first set the Remote Password through local configuration. This is a security option to disable unauthorized remote access. Appendix D:, Connecting with Telnet., describes how to remotely telnet into the Ether232Plus.

---

**NOTE:** You will not be able to telnet to the Ether232Plus for configuration, or perform remote firmware and Web page downloads, unless you set a remote password.

---

### Setting the Remote Password

---

**NOTE:** Passwords are case sensitive and can consist of uppercase letters, lowercase letters, numbers, or symbols.

---

- 1 Choose **Security Settings** from the Device Settings menu.
- 2 Choose **Remote Password** from the Security Settings sub-menu.  
You are prompted to enter a remote access password with a maximum of 8 characters.
- 3 Type your password (appears as a series of \*\*\* asterisks on the screen) and press **Enter**.

### Viewing the Remote Password

- 1 Choose **Security Settings** from the Device Settings menu.
- 2 Choose **Remote Password** from the Security Settings sub-menu.  
The current password is displayed in brackets: [was: password].
- 3 **Do not** type any characters. Press **ESC** to keep the same password and return to the menu.

### Clearing the Remote Password

---

**NOTE:** Clearing the Remote Password disables remote access to configuration through telnet.

---

- 1 Choose **Security Settings** from the Device Settings menu.

- 2 Choose **Remote Password** from the Security Settings sub-menu.

You are prompted to enter a remote access password with a maximum of 8 characters.

- 3 **Do not** type any characters. Press **Enter** to clear the password.

The password is displayed as (not set) in the Security Settings sub-menu.

## 5.3 Web Server

The Web Server enables or disables access to the static Web page, and the dynamic Status page and System Log stored in the unit. The default setting is “enabled”. The pages are accessible through your Web browser and are described in Section 7, Accessing System Information, on page 57.

If you enable the Web Server you can also define the Access Userid and Password to restrict access to the dynamic Status Page and System Log. If you enable the Web Server and do not configure Access Userid and Access Password (default), anyone who knows the IP address of the unit can access the pages through a Web browser.

---

**NOTE:** HTTP authentication schemes for passing the user ID and password to the HTTP daemon include Basic and Digest Access Authentication. Most Web browsers support one or both authentication schemes and should function correctly. Update your browser if problems occur.

---

To enable or disable the Web Server:

- 1 Choose **Security Settings** from the Device Settings menu.
- 2 Choose **Web Server** from the Security Settings sub-menu.

You are prompted to enable or disable the Web Server, as shown below.

The web server allows access to the set of static pages loaded in to the unit (see the system menu) and to the various dynamic pages such as system status and system log.

A. enabled                      B. disabled

Choose desired setting or press ESC to cancel:

### Web Server Options

- 3 Type the letter that corresponds to the desired setting and press **Enter**.

## 5.4 Access Userid

Along with Access Password, Access Userid provides security against unauthorized access to the Precidia unit's dynamic Web pages.

**1** Choose **Security Settings** from the Device Settings menu.

**2** Choose **Access Userid** from the Security Settings sub-menu.

You are prompted to enter an access user ID for the dynamic Web pages, with a maximum of 15 characters.

**3** Type the user ID at the prompt and press **Enter**.

## 5.5 Access Password

Along with Access Userid, Access Password provides security against unauthorized access to the Precidia unit's dynamic Web pages.

### Setting the Access Password

---

**NOTE:** Passwords are case sensitive and can consist of uppercase letters, lowercase letters, numbers, or symbols.

---

**1** Choose **Security Settings** from the Device Settings menu.

**2** Choose **Access Password** from the Security Settings sub-menu.

You are prompted to enter an access password with a maximum of 15 characters.

**3** Type your password (appears as a series of \*\*\* asterisks on the screen) and press **Enter**.

### Viewing the Access Password

**1** Choose **Security Settings** from the Device Settings menu.

**2** Choose **Access Password** from the Security Settings sub-menu.

The current password is displayed in brackets: [was: password].

**3** **Do not** type any characters. Press **ESC** to keep the same password and return to the menu.

## Clearing the Access Password

- 1 Choose **Security Settings** from the Device Settings menu.
- 2 Choose **Access Password** from the Security Settings sub-menu.
- 3 **Do not** type any characters. Press **Enter** to clear the password.

The password is displayed as (not set) in the Security Settings sub-menu.

## 5.6 SNMP Server

The SNMP Server enables or disables the SNMP function in the Precidia unit. The default setting is “enabled”.

To enable or disable the SNMP Server:

- 1 Choose **Security Settings** from the Device Settings menu.
- 2 Choose **SNMP Server** from the Security Settings sub-menu.

You are prompted to enable or disable the SNMP Server, as shown below.

|   |
|---|
| <p>The SNMP server allows access to many internal statistics as well as the values seen in the system status page.</p> <p>A. enabled                      B. disabled</p> <p>Choose desired setting or press ESC to cancel:</p> |
|---|

### SNMP Server Options

- 3 Type the letter that corresponds to the desired setting and press **Enter**.

## 5.7 SNMP Settings

Precidia products support SNMPv2c. SNMP (Simple Network Management Protocol) is a protocol for viewing network statistics and settings. An SNMP management system consists of a manager (remote) and an agent (Precidia device) using UDP as the communication protocol.

The Precidia SNMP agent supports MIB-II, and allows GET (read) commands for gathering information, SET (write) commands for managing how the information is gathered, and trap (notification) generation for alerting the Network Manager when selected or unusual events occur.

To access the SNMP Settings, choose **SNMP Settings** from the Security Settings sub-menu.

The SNMP Settings sub-menu appears, as shown below.

| Precidia Ether232Plus Configuration |              | v4.04.00                    |           |
|-------------------------------------|--------------|-----------------------------|-----------|
| Device Settings:                    |              | SNMP Settings:              |           |
| 1) Ethernet:                        | 192.168.2.56 | Community Names:            |           |
| 2) Serial Port:                     | Transparent  | A) MIB II:                  | (not set) |
|                                     |              | B) Precidia:                | (not set) |
|                                     |              | C) Set:                     | (not set) |
|                                     |              | Trap Managers:              |           |
| * ) Save Current Configuration      |              | D) IP Address #1:           | 0.0.0.0   |
| - ) Exit Configuration (no save)    |              | E) IP Address #2:           | 0.0.0.0   |
| \$) Security Settings               |              | F) Trap Check Interval (s): | 0         |
| #) System Settings                  |              | G) SNMP Trap Settings       |           |
| ? ) Refresh this Screen             |              | H) SNMP Allowed Hosts       |           |
| Change which option?                |              |                             |           |

### SNMP Settings Sub-menu

For details on configuring the SNMP feature refer to the Help Guide *SNMP Settings and Compliance*, available at <http://www.precidia.com/products/documentation.html>.

## 5.8 IPsec Tunnels #1 and #2

IPsec (Internet Protocol security) refers to a set of specifications for security at the IP layer of TCP/IP networks. IPsec tunnels are special secure channels of communication encapsulated within IP protocol that encrypt both the payload data and the packet header. Encapsulated Secure Payload (ESP) for IP is defined in RFC1827. You can define up to two tunnels to securely connect the Precidia unit to two separate networks.

---

**IMPORTANT!** *IPsec contains computationally intensive algorithms. Enabling IPsec may cause a significant decrease in the speed/performance of the Precidia unit. If your application has performance or latency requirements, please ensure that this decrease in performance does not break the timing requirements. Full baud rates may not be achievable with IPsec enabled.*

---

To access the Secure IP Association settings you must first select an IPsec protocol.

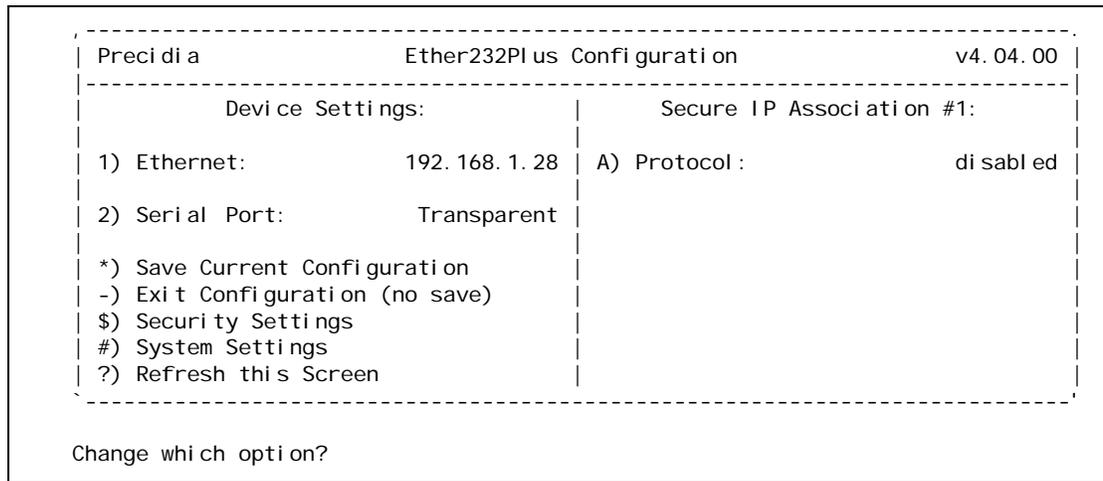
### Protocol

The IPsec protocol defines the method of encryption and authentication to use through the IPsec tunnel. You can choose between two modes: DES-MD5-96 or 3DES-MD5-96. Encoding is provided by DES (Data Encryption Standard), a secret key cryptography method. DES uses a 56-bit key, while 3DES (tripleDES) uses a 168-bit key.

Authentication is provided by MD5 (Message Digest 5). The message digest allows the receiver of a packet to ensure that a packet has not been altered en route from the sender. MD5 is described in RFC1321.

Choose **IPsec Tunnel #1** or **IPsec Tunnel #2** from the Security Settings sub-menu.

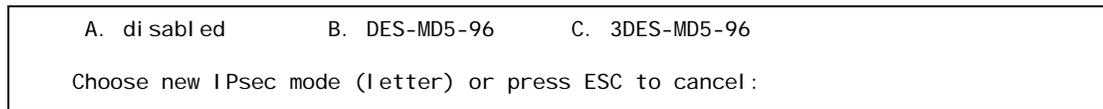
The Secure IP Association #1 or #2 sub-menu appears, as shown below.



**Secure IP Association Menu**

**4** Select **Protocol** from the Secure IP Association sub-menu.

You are prompted to select a new IPsec mode, as shown below.



**Choosing an IPsec Protocol**

**5** Type the letter that corresponds to the desired mode and press **Enter**.

The Secure IP Association sub-menu appears, with new options, as shown below.

| Precidia                        |              | Ether232Plus Configuration |                           | v4.04.00         |  |
|---------------------------------|--------------|----------------------------|---------------------------|------------------|--|
| Device Settings:                |              |                            | Secure IP Association #1: |                  |  |
| 1) Ethernet:                    | 192.168.1.28 | A) Protocol:               | DES-MD5-96                |                  |  |
| 2) Serial Port:                 | Transparent  | B) Secure Address:         | (public)                  |                  |  |
|                                 |              | C) SPI:                    | 00000000                  |                  |  |
|                                 |              | D) Network Address:        | 0.0.0.0                   |                  |  |
|                                 |              | E) Network Mask:           | 0.0.0.0                   |                  |  |
|                                 |              | F) Network Gateway:        | 0.0.0.0                   |                  |  |
|                                 |              |                            | Encode/Authenticate Keys: |                  |  |
| *) Save Current Configuration   |              |                            | G) Encode (Pt1):          | 0000000000000000 |  |
| -) Exit Configuration (no save) |              |                            | H) Encode (Pt2):          | 0000000000000000 |  |
| \$) Security Settings           |              |                            | I) Encode (Pt3):          | 0000000000000000 |  |
| #) System Settings              |              |                            | J) Auth (Pt1):            | 0000000000000000 |  |
| ?) Refresh this Screen          |              |                            | K) Auth (Pt2):            | 0000000000000000 |  |
| Change which option?            |              |                            |                           |                  |  |

### Secure IP Association Sub-menu

**6** Configure the Secure IP settings as described in the following sections.

#### Secure Address

Secure Address is an optional parameter to configure a “private” IP address for the Precidia unit on the network. This IP address can be the same or different from the IP address configured in the Ethernet Settings.

If you leave the Secure address set to zero (0.0.0.0) it will display as “public” in the menu and automatically default to the configured or dynamic IP Address of the unit.

To enter or change the Secure IP address:

**1** Choose **Secure Address** from the Secure IP Association sub-menu.

You are prompted to enter the secure IP address of this device.

**2** Type the secure IP address at the prompt (in the format xxx.xxx.xxx.xxx) and press **Enter**.

## SPI

SPI (Security Parameters Index) is a 32-bit hexadecimal number used to identify the security association of an IP packet. The SPI is used to look up the Encode and Authenticate Keys, and must be the same at both ends of the tunnel. The first 256 SPI values are reserved, but you can use any number from 100 hex up to FFFFFFFF hex as the SPI.

To enter or change the SPI:

- 1 Choose **SPI** from the Secure IP Association sub-menu.  
You are prompted to enter the SPI for this tunnel in Hex digits.
- 2 Type the SPI (up to 8 characters long) at the prompt, and press **Enter**.

## Network Address

The Network Address under the Secure IP Association sub-menu is the network address of the remote device.

To enter or change the Network Address:

- 1 Choose **Network Address** from the Secure IP Association sub-menu.  
You are prompted to enter the IP address of the secure network.
- 2 Type the address at the prompt (in the format xxx.xxx.xxx.xxx) and press **Enter**.

## Network Mask

Network Mask is the subnet mask of the network on which the remote device resides.

To enter or change the Network Mask:

- 1 Choose **Network Mask** from the Secure IP Association sub-menu.  
You are prompted to enter the subnet mask of the secure network.
- 2 Type the network mask at the prompt (in the format xxx.xxx.xxx.xxx) and press **Enter**.

## Network Gateway

The Network Gateway under the Secure IP Association sub-menu is the address of the gateway of the network on which the remote device resides.

To enter or change the Network Gateway:

- 1 Choose **Network Gateway** from the Secure IP Association sub-menu.  
You are prompted to enter the IP address of the secure network's gateway.

- 2 Type the gateway address at the prompt (in the format xxx.xxx.xxx.xxx) and press **Enter**.

## Encode/Authenticate Keys

Encode and Authenticate Keys are manually keyed in the Precidia unit by the user to provide IP packet security. Encode and Authenticate Keys must be the same on both ends of the IPsec tunnel. You must manually configure the remote end, a gateway or device, with the same encode and authentication keys as you configured in the Precidia unit.

The Encode Key is configured in up to three parts of 64 bits each. The Encode Key must be input as a 64-bit hex number for DES and a 192-bit hex number for 3DES. DES and 3DES remove the least significant bit (LSB) from each byte, making the actual DES key 56 bits and the 3DES key 168 bits.

The Authenticate Key must be input as a 128-bit number in hex format. The Auth Key is configured in two parts of 64 bits each.

To set or change the Encode Key:

- 1 Choose **Encode (Pt1)** from the Secure IP Association sub-menu.  
You are prompted to enter bits 1–64 of the encoding key in hex.
- 2 Type the 64 bits (16 characters) of the encoding key in hexadecimal format at the prompt, and press **Enter**.  
If you are using DES-MD5-96 Protocol, configure the Authenticate Key now.
- 3 For 3DES-MD5-96 Protocol, choose **Encode (Pt2)** from the Secure IP Association sub-menu.  
You are prompted to enter bits 65–128 of the encoding key in hex.
- 4 Type the next part of the encoding key (16 more characters) in hexadecimal format at the prompt, and press **Enter**.
- 5 Choose **Encode (Pt3)** from the Secure IP Association sub-menu.  
You are prompted to enter bits 129–192 of the encoding key in hex.
- 6 Type the last part of the encoding key (16 characters) in hexadecimal format at the prompt, and press **Enter**.

To set or change the Auth Key:

- 1 Choose **Auth (Pt1)** from the Secure IP Association sub-menu.  
You are prompted to enter bits 1–64 of the authentication key in hex.

**2** Type the first half of the authentication key (16 characters) in hexadecimal format at the prompt, and press **Enter**.

**3** Choose **Auth (Pt2)** from the Secure IP Association sub-menu.

You are prompted to enter bits 65–128 of the authentication key in hex.

**4** Type the second half of the authentication key (16 characters) in hexadecimal format at the prompt, and press **Enter**.

The keys are displayed in the Secure IP Association sub-menu.

---

***IMPORTANT!*** *The SPI, Encode Keys, and Authenticate Keys must be the same on both ends of the IPsec tunnel (secure connection).*

---

# 6 System Settings

The System Settings should only be configured by network administrators or advanced users who need to upgrade the firmware or view log information.

To configure or change the System Settings, select **System Settings** from the Device Settings menu.

The System Settings sub-menu appears on the right side of the Configuration screen, as shown below.

| Precidia                        |              | Ether232Plus Configuration  |                   | v4.04.00 |  |
|---------------------------------|--------------|-----------------------------|-------------------|----------|--|
| Device Settings:                |              |                             | System Settings:  |          |  |
| 1) Ethernet:                    | 192.168.1.28 | A) Unit ID value:           | 00:01:1E:00:17:46 |          |  |
| 2) Serial Port:                 | Transparent  | B) Web Page Download:       | 59kB              |          |  |
|                                 |              | C) Firmware Download:       | 2004-03-05        |          |  |
|                                 |              | D) Display System Status    |                   |          |  |
|                                 |              | E) Dump System Log (Long)   |                   |          |  |
|                                 |              | F) Delete System Log        |                   |          |  |
|                                 |              | G) Perform Self Test        |                   |          |  |
|                                 |              | H) Reset Unit               |                   |          |  |
| *) Save Current Configuration   |              | I) SNTP Settings            |                   |          |  |
| -) Exit Configuration (no save) |              | J) Disable TCP keep-alives: | no                |          |  |
| \$) Security Settings           |              |                             |                   |          |  |
| #) System Settings              |              |                             |                   |          |  |
| ? Refresh this Screen           |              |                             |                   |          |  |

Change which option?

**System Settings Sub-menu**

**NOTE:** Remember to save your changes by typing "\*" to exit configuration!

## 6.1 Unit ID Value

Unit ID Value is the hardware address of the Ether232Plus and cannot be changed. It is assigned at the factory and printed below the barcode on the bottom of the Precidia unit.

## 6.2 Web Page Download

Use Web Page Download to change or upgrade the internal static web page in the Precidia unit. You can access this page by obtaining the IP address of the unit and typing it in the address bar of your browser like this: **http://IPaddressOfUnit/**.

See Section 7.3, Static Web Page, on page 68 and refer to the Help Guide *Converting and Downloading Static Web Pages* at <http://www.precidia.com/products/documentation.html> for more information.

## 6.3 Firmware Download



**CAUTION:** Do not attempt a Firmware Download without first consulting the instructions and obtaining the correct firmware file from Precidia. Improper downloading may render the warranty null and void!

Use Firmware Download to change or upgrade the firmware. The current firmware version number is displayed in the top right corner of the Configuration screen, and the release date is displayed beside Firmware Download in the System Settings sub-menu.

| Precidia                         |             | Ether232Plus Configuration  |                   | v4.04.00 |
|----------------------------------|-------------|-----------------------------|-------------------|----------|
| Device Settings:                 |             | System Settings:            |                   |          |
| 1) Ethernet:                     | 0.0.0.0     | A) Unit ID value:           | 00:01:1E:00:17:46 |          |
| 2) Serial Port:                  | Transparent | B) Web Page Download:       | 59kB              |          |
|                                  |             | C) Firmware Download:       | 2004-03-05        |          |
|                                  |             | D) Display System Status    |                   |          |
|                                  |             | E) Dump System Log (long)   |                   |          |
|                                  |             | F) Delete System Log        |                   |          |
|                                  |             | G) Perform Self Test        |                   |          |
|                                  |             | H) Reset Unit               |                   |          |
| * ) Save Current Configuration   |             | I) SNTP Settings            |                   |          |
| - ) Exit Configuration (no save) |             | J) Disable TCP keep-alives: | yes               |          |
| \$) Security Settings            |             |                             |                   |          |
| #) System Settings               |             |                             |                   |          |
| ? ) Refresh this Screen          |             |                             |                   |          |

**Software Version and Firmware Download Date**

Refer to the Help Guides *Local Software Download* and *Remote Software Download* at <http://www.precidia.com/products/documentation.html> for instructions.

## 6.4 Display System Status

The System Status page allows you to view useful statistics about the unit. This information includes system uptime, activity through the serial port (Port #1), and network port settings. The System Status page displays the same information as the Status Web page.

You can easily determine the IP address of the unit through the System Status page, even if it is dynamically allocated. The first Local address listed under Network Routing is the IP address of the unit.

Choose **Display System Status** from the System Settings sub-menu.

The status information appears, an example of which is shown below.

```

Ether232Plus Status:

Current time is 2004-03-12 20:26:10

System Uptime
Up 0 days, 0:07:57
Load Average: 5sec=19% 30sec=7% 5min=4% 30min=0%
Firmware Revision: 4.04.00 (2004-03-05)

Port #1 [serial] (transparent/tcp-server, idle)

Received                               Transmitted
Bytes: 0                               Bytes: 0
Packets: 0                             Packets: 0
Avg-BpP: 0                             Avg-BpP: 0

Network Routing
Local      Network      Subnet Mask      Gateway      I face  Pkts-I
n Pkts-Out Pkts-Err
100.0.0.0  0.0.0.0      0.0.0.0          0.0.0.0     ipsec  0
0          0
0.0.0.0    0.0.0.0      0.0.0.0          0.0.0.0     ipsec  0
0          0
192.168.1.30 192.168.1.0 255.255.255.0   eth         142
66         0
127.0.0.1   127.0.0.0   255.0.0.0       lo          0
0          0

Please hit <return>:

```

**Example of the System Status Page**

See Section 7.1, System Status, on page 57 for a description of the System Status page.

## 6.5 Dump System Log

Dump System Log allows you to review all activity that has occurred on the Ether232Plus since it was configured, or since the Delete System Log option was used. The dump may require a few minutes to complete.

The System Log is a wrapping buffer up to 64KB. It will never run out of memory, but will write over the earlier messages once the buffer fills up. See Section 7.2, System Log, on page 61, for a description of the log information.

## 6.6 Delete System Log

Delete System Log erases the system log in the Ether232Plus. When diagnosing a problem, you can clear the System Log to start capturing relevant information. For a complete explanation of the information on the log refer to Section 7.2, System Log, on page 61.

## 6.7 Perform Self Test

Perform Self Test is a troubleshooting aid that performs a check on the unit's memory I/O system. You will not need to use this feature during the normal course of operation. The self-test takes a few minutes to run and the unit is unable to process any information during this time.

To run Perform Self Test:

- 1 Choose **Perform Self Test** from the System Settings sub-menu.

You are prompted to continue with the Self Test or not, as shown below.

During a self test, the system will not be available for normal operations and data processing until after all tests are complete. This will take a few minutes. Are you sure this is what you wish to do? (y/n)

### Perform Self Test Prompt

- 2 Type **y** to run the test.

The results of the test appear, an example of which is shown below.

```
CPU Internal Memory... passed
External Memory... passed
Application ROM... crc verification failed
Downloader ROM... passed
Ethernet Controller... passed
Com Port... skipped (external loopback not found)

All tests complete. Please hit <return>:
```

### Example of Perform Self Test Results

- 3 Press **Enter**.

The Com Port portion of the test will always return “Com Port... skipped (external loopback not found)” if you are running the Self Test from a local connection and do not have an external loopback dongle attached to the COM port. You must attach a loopback dongle and run the Self Test remotely via telnet to test the com port.

Messages that may result from the Com Port test are described in Table 6.1.

**Table 6.1: Com Port Self Test Results**

| <b>Result</b>   | <b>Meaning</b>  |
|---|---|
| Com Port... passed  | Everything is fine  |
| Com Port... character not received                            | A transmitted character was not received                                |
| Com Port... character not transmitted                         | The internal port could not transmit                                    |
| Com Port... skipped (external loopback not found)             | No loopback dongle found  |
| Com Port... control lines not looped back                     | The DTR/DSR, DTR/DCD lines, if present, are not looped back as expected |
| Com Port... transmitted and received characters are different | The data sent is not the same as the data received                      |

## 6.8 Reset Unit

Reset Unit is useful for troubleshooting, since it allows you to ensure that modem connections are dropped correctly. Reset Unit resets the Ether232Plus, and drops all active modem connections. The Configuration screen is not changed nor is the System Log cleared, however, the message “===== Ether232Plus Started =====” is appended to the System Log.

Reset Unit allows you to reset the Ether232Plus from a telnet session without saving any changes to the configuration menu.

## 6.9 SNTP Settings

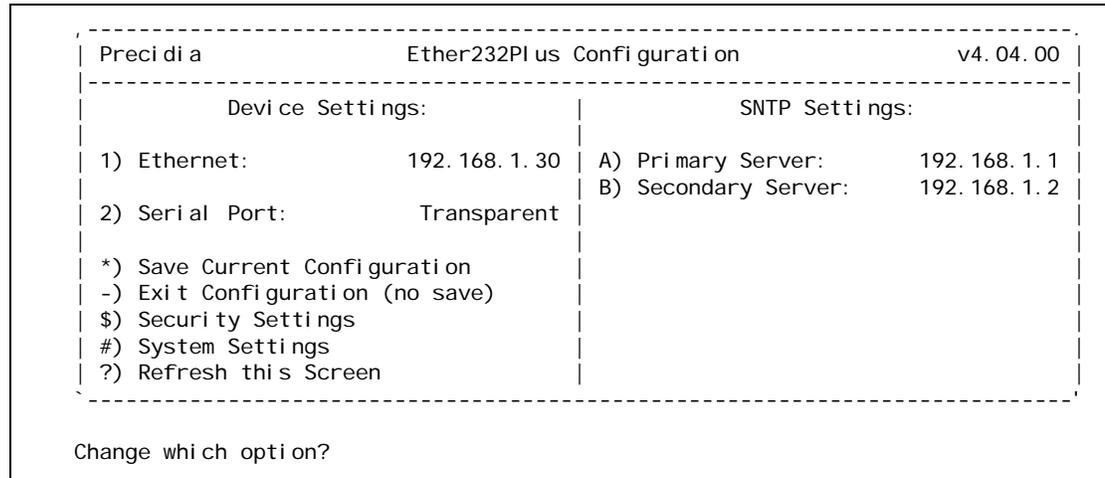
Simple Network Time Protocol (SNTP) is used to synchronize computer clocks on the Internet. Every 5 minutes, a request is sent to the **Primary Server**. If a response has not been received by the unit within one minute, a request is sent to both the **Primary Server**, and the **Secondary Server** (if defined). This feature is disabled if the Primary IP address is not defined.

The real-time clock timestamp can be viewed in the System Log. Please refer to section 7.2 System Log for further information.

If you require a real-time clock and have access to an SNTP server, you may configure the Primary Server and the Secondary Server as described below:

- 1 Choose **SNTP Settings** from the System Settings sub-menu.

The SNTP Settings sub-menu is displayed, as shown below:



### SNTP Settings Sub-menu

#### 6.9.1 Primary Server

- 1 Choose **SNTP Settings** from the System Settings sub-menu.

- 2 Choose **Primary Server** from the SNTP Settings sub-menu.

You are prompted to enter the IP address of the device.

- 3 Type the unique IP address at the prompt (in the format xxx.xxx.xxx.xxx) and press **Enter**.

#### 6.9.2 Secondary Server

- 1 Choose **SNTP Settings** from the System Settings sub-menu.

- 2 Choose **Secondary Server** from the SNTP Settings sub-menu.

You are prompted to enter the IP address of the device.

- 3 Type the unique IP address at the prompt (in the format xxx.xxx.xxx.xxx) and press **Enter**.

## 6.10 Disable TCP Keep-Alives

This option can be enabled for bandwidth-sensitive applications. When enabled, the TCP connections affected include HTTP, Telnet, and protocol traffic. Keep-alive requests responded to include requests with a data length of zero (0).

---

**IMPORTANT!** *By enabling this option, you are no longer able to detect dead connections and will hold the connections open. The default, and recommended setting for this option, is: <no>.*

---

If it is necessary to change the Disable TCP keep-alives option:

- 1 Choose **System Setting** from the Device Settings menu.
- 2 Choose **Disable TCP keep-alives** from the System Settings sub-menu.

You are prompted to choose a Disable TCP keep-alives option, shown below:

```
TCP can send keep-alive messages to determine if the peer is still
responding. Normally these are sent (every 4 minutes) on idle
connections. Disabling keep-alives will prevent sending these
packets and make it impossible to detect dead connections. It
is not recommended that you change this setting.
NOTE that the unit will always respond to keep-alive packets.
```

```
Do you wish to DISABLE the TCP keep-alive packets?
```

```
  A. yes           B. no
```

```
Choose desired setting or press ESC to cancel:
```

### Setting the Disable TCP Keep-Alives

- 3 Type the letter that corresponds to the desired setting, then press **Enter**.



# 7 Accessing System Information

---

The Ether232Plus stores information that can be used for management, diagnostics, and troubleshooting. There are three types of information pages available:

- the System Status page
- the System Log page
- the static Web page(s)

---

**NOTE:** *Ether232Plus information pages are accessible via a Web browser. To disable this feature, or establish secure access using a user ID and password, see Section 5, Configuring the Security Settings, on page 37.*

---

Additionally, you have the ability to create custom Web pages through which you can remotely control the serial device connected to the Precidia unit. Refer to 7.3 Static Web Page for further information.

## 7.1 System Status

The System Status page provides valuable statistical and operational information such as system uptime and the number of packets sent and received through the configured port.

### Accessing the System Status Page

To access the System Status page through a browser:

- 1** Ensure the Web Server in the Security Settings sub-menu is enabled and you have the Access Userid and Access Password, if set.
- 2** Open your browser.
- 3** Type **http://IPaddressOfUnit/status.html** in the address bar.

The System Status is displayed as shown in the example below:

## Ether232Plus Status

Current time is 2004-03-12 20:03:23.

**System Uptime**  
 Up 0 days, 0:08:01  
 Load Average: 5sec=0% 30sec=0% 5min=0% 30min=0%  
 Firmware Revision: 4.04.00 (2004-03-12)  
[Link to System Log](#)

**Port #1 [serial] (transparent/tcp-server, idle)**

| Received   | Transmitted |
|------------|-------------|
| Bytes: 0   | Bytes: 0    |
| Packets: 0 | Packets: 0  |
| Avg-BpP: 0 | Avg-BpP: 0  |

**Network Routing**

| Local        | Network     | Subnet Mask   | Gateway |
|--------------|-------------|---------------|---------|
| 192.168.1.30 | 192.168.1.0 | 255.255.255.0 |         |
| 127.0.0.1    | 127.0.0.0   | 255.0.0.0     |         |

### Example of the System Status Web Page

To access the System Status page in configuration mode:

- 1** Access the Ether232Plus Configuration screen either locally or remotely.
- 2** Choose **System Settings** from the Device Settings menu.

### 3 Choose **Display System Status** from the System Settings sub-menu.

The System Status page appears, as shown below.

```

Ether232Plus Status:

Current time is 2004-03-12 20:26:10

System Uptime
Up 0 days, 0:07:57
Load Average: 5sec=19% 30sec=7% 5min=4% 30min=0%
Firmware Revision: 4.04.00 (2004-03-05)

Port #1 [serial] (transparent/tcp-server, idle)

Received                               Transmitted
Bytes: 0                               Bytes: 0
Packets: 0                             Packets: 0
Avg-BpP: 0                             Avg-BpP: 0

Network Routing
Local      Network      Subnet Mask      Gateway      I face  Pkts-I
n Pkts-Out Pkts-Err
100.0.0.0  0.0.0.0      0.0.0.0          0.0.0.0     ipsec  0
0          0
0.0.0.0    0.0.0.0      0.0.0.0          0.0.0.0     ipsec  0
0          0
192.168.1.30 192.168.1.0 255.255.255.0   eth         142
66         0
127.0.0.1   127.0.0.0   255.0.0.0       lo          0
0          0

Please hit <return>:

```

**Example of the System Status Page**

## Understanding the System Status Page

The System Status page has three sections:

- System Uptime
- Port #1
- Network Routing

### System Uptime

This section reveals how long the system has been operating, the loading on the Precidia device's CPU, and the firmware version in the Precidia unit. Table 7.1 describes each parameter.

**Table 7.1: System Uptime on the System Status Page**

| Parameter         | Description  |
|-------------------|--|
| Time              | The length of time the system has been operating since the last reset in days, hours:minutes:seconds. Note that the time is not accurate and may drift slightly. |
| Load Average      | The loading (activity) of the Ether232Plus CPU.  |
| Firmware Revision | The software version currently installed in the Ether232Plus with the date of the software build in parentheses.   |

**Port #1**

This section describes the configured serial port in the Ether232Plus. It consists of a header line and a table showing the data received and transmitted.

---

**NOTE:** *If the serial port is not configured, or incorrectly configured, this section does not appear on the System Status page.*

---

The header contains the following information:

- Port type (null, if no terminal connected, or serial) in brackets
- the Protocol (data formatting and session mode), and connection status in parentheses

Connection status can be connected, connecting, or idle. The information below the header shows the number of bytes, the number of packets, and the average bytes per packet received and transmitted by the unit.

**Network Routing**

This section reveals how the system is handling the data going through the Precidia unit in the same style as the “print-route” command. Table 7.2 describes each parameter in the Network Routing section.

**Table 7.2: Network Routing Parameters**

| Parameter       | Description   |
|-----------------|---|
| Local           | The IP Address of the unit (configured in Ethernet Settings or obtained through DHCP).                                |
| Network Address | The network address, derived from the IP address and subnet mask, for which this entry applies.                       |
| Subnet Mask     | The Subnet Mask for which this entry applies (configured in Ethernet Settings or obtained through DHCP).              |
| Gateway         | The Gateway (router) address for which this entry applies (configured in Ethernet Settings or obtained through DHCP). |
| Iface           | The interface used to connect to the remote host. eth = Ethernet  |
| Pkts-In         | Total number of packets received by the unit since the last reset.  |
| Pkts-Out        | Total number of packets sent by the unit since the last reset.  |
| Pkts-Err        | Total number of error packets received by the unit since the last reset.  |

## 7.2 System Log

The System Log, an example of which is shown below, logs transaction data and system information. Connection attempts and failures, and remote and console access attempts are logged.

```
Ether232Plus Log:

===== Ether232Plus Started =====

00000 days 00:00:00 Port #1: Listening for connections on tcp port 9999...
00000 days 09:07:22 Port #1: Incoming connection on tcp port 9999 from 192.168.1.2:2569
00000 days 09:07:22 Port #1: Connection was established with 192.168.1.2:2569
00000 days 09:07:37 Port #1: Connection closed by remote host at 192.168.1.2:2569
00000 days 09:07:37 Port #1: Connection closed by us to host at 192.168.1.2:2569
00000 days 22:09:02 Port #1: Incoming connection on tcp port 9999 from 192.168.1.2:2664
00000 days 22:09:02 Port #1: Connection was established with 192.168.1.2:2664
00000 days 22:10:32 Port #1: Connection closed by remote host at 192.168.1.2:2664
00000 days 22:10:32 Port #1: Connection closed by us to host at 192.168.1.2:2664

===== Ether232Plus Started =====

00000 days 00:00:00 Port #1: Connection attempt to 192.168.1.2:999...
00000 days 00:00:00 Port #1: Connection with 192.168.1.2:999 stopped due to connection control
00000 days 00:00:01 Port #1: Connection attempt to 192.168.1.2:999...
00000 days 00:00:01 Port #1: Connection was established with 192.168.1.2:9999
00000 days 23:01:49 current system time

Please hit <return>:
```

**Example of the System Log Page**

### Accessing the System Log

To access the System Log through a browser:

- 1** Ensure the Web Server in the Security Settings sub-menu is enabled and you have the Access Userid and Access Password, if set.
- 2** Open your browser.
- 3** Type **http://IPAddressOfUnit/log.html** in the address bar.

The System Log is displayed as shown in the example below:

## **Ether232Plus Log**

[Jump to Latest Entries](#)

```
==== Ether232Plus Started ====

00000 days 00:00:07  CONSOLE: configuration started

==== EtherPlus Started ====

00000 days 00:00:42  CONSOLE: configuration started
00000 days 00:02:25  Configuration changes saved -- restarting system
```

[Link to Status Page](#)

### **Example of the System Log Web Page**

To access the System Log in configuration mode:

- 1** Access the Ether232Plus Configuration screen either locally or remotely.
- 2** Choose **System Settings** from the Device Settings menu.
- 3** Choose **Dump System Log** from the System Settings sub-menu.

## Understanding the System Log

Table 7.3 describes System Log messages you may see when performing a System Log dump, and Table 7.4 lists possible error messages and what to do about them.

**Table 7.3: System Log Messages**

| Message   | Description   |
|---|---|
| ===== <i>Ether232Plus</i> Started=====                                      | The unit has been started by: plugging in the power adapter, saving a new configuration, timing out during local configuration, exiting configuration without saving, or choosing Reset Unit from the System Settings menu. No timestamp presented. This message indicates the unit was started in normal mode. Timestamp will start counting from zero (0) after this message. |
| ===== <i>Ether232Plus</i> Log Deleted=====                                  | The Ether232Plus had its log deleted. If present, this message will always be the first entry in the log.   |
| CONSOLE: login accepted   | The unit went into console configuration mode, a password prompt was given, and the correct password was entered.   |
| CONSOLE: login rejected (timeout)   | The unit went into console configuration mode, a password prompt was given, but no response was input within the 30 second timeout period. Unit resets.   |
| CONSOLE: login rejected (invalid password)                                  | The unit went into console configuration mode, a password prompt was given, but the password entered did not match the configured Console Password. Unit resets.  |
| TELNET: login from xxx.xxx.xxx.xxx rejected (configuration already running) | The unit went into telnet configuration mode, a password prompt was given, and the correct password was entered, but configuration was already running (probably locally through the COM port).   |

**Table 7.3: System Log Messages**

| <b>Message</b>  | <b>Description</b>   |
|---|--|
| TELNET: login from <i>xxx.xxx.xxx.xxx</i> accepted                                    | The unit went into telnet configuration mode, a password prompt was given, and the correct password (configured Remote Password) was entered.  |
| TELNET: login from <i>xxx.xxx.xxx.xxx</i> rejected (timeout)                          | The unit went into telnet configuration mode, a password prompt was given, and the correct password was entered, but no response was input within the 30 second timeout period. Unit does not reset. |
| TELNET: login from <i>xxx.xxx.xxx.xxx</i> rejected (invalid password)                 | The unit went into telnet configuration mode, a password prompt was given, but the password entered did not match the configured Remote Password. Unit does not reset.                               |
| Port #n: Listening for connection on tcp port <i>pppp</i> ...                         | The unit will allow incoming TCP connections on port <i>pppp</i> .   |
| Port #n: Connection attempt to <i>xxx.xxx.xxx.xxx:pppp</i> ...                        | The unit is contacting the remote server at the IP address and port indicated.   |
| Port #n: Incoming connection on tcp port <i>pppp</i> from <i>xxx.xxx.xxx.xxx:pppp</i> | The unit has detected an incoming communication from the remote host indicated on port <i>pppp</i> .   |
| Port #n: Connection was established with <i>xxx.xxx.xxx.xxx:pppp</i>                  | The unit has established a TCP connection with the remote host indicated on port <i>pppp</i> .   |
| Port #n: No response connecting to host at <i>xxx.xxx.xxx.xxx:pppp</i>                | The remote host has not responded to any TCP session establishment requests.   |
| Port #n: No response from host at <i>xxx.xxx.xxx.xxx:pppp</i>                         | The remote host is no longer responding to TCP traffic (after it had previously been responding).  |
| Port #n: Connection was refused by <i>xxx.xxx.xxx.xxx:pppp</i> ...                    | The remote host actively refused a connection request from the unit.   |

**Table 7.3: System Log Messages**

| <b>Message</b>  | <b>Description</b>   |
|---|--|
| Connection was not from configured remote address - refused                                       | The incoming connection attempt was not from the IP address configured as the Remote IP.   |
| Port #n: Connection reset by remote host at <i>xxx.xxx.xxx.xxx:pppp</i>                           | The remote host forcibly terminated the active TCP session with the unit.  |
| Port #n: Connection closed by remote host at <i>xxx.xxx.xxx.xxx:pppp</i>                          | The remote host is taking the steps to correctly close the TCP session with the unit.  |
| Port #n: Connection closed by us to host at <i>xxx.xxx.xxx.xxx:pppp</i>                           | The unit is taking the steps to correctly close the TCP session with the remote host.  |
| HTTP: host at <i>xxx.xxx.xxx.xxx</i> failed to authenticate properly.                             | The remote host attempted unsuccessfully to access the userid/password protected HTTP pages. Internet Explorer may attempt access using old data from previous connections, resulting in this error. |
| Configuration changes saved -- restarting system  | A configuration change was saved. Unit resets.   |
| Port #n: Listening for connections on tcp port <i>pppp</i> was not possible (Error #nn)           | The unit cannot listen on the specified port. Table 7.4 lists possible error codes.  |
| Port #n: Connection attempt to <i>xxx.xxx.xxx.xxx:pppp</i> was not possible (Error #nn)           | The unit could not connect to the specified IP address and port number. Table 7.4 lists possible error codes.  |
| Port #n: Incoming connection on tcp port <i>pppp</i> from <i>xxx.xxx.xxx.xxx:pppp</i> (Error #nn) | The unit could not accept the incoming connection. Table 7.4 lists possible error codes.   |
| Incoming connection on tcp port held waiting for connection control                               | The connection control setting dictates that the incoming connection not be established until the connection control signals are matched.  |

**Table 7.3: System Log Messages**

| <b>Message</b>  | <b>Description</b>   |
|---|--|
| Connection with xxx.xxx.xxx.xxx stopped due to connection control | The connection control setting and signal lines dictate that the session being established no longer become established.   |
| Connection with xxx.xxx.xxx.xxx dropped due to connection control | The connection control setting and signal lines dictate that the session that was established be dropped.  |
| Configuration changes could not be saved--restarting system       | The configuration failed to be saved to the unit. This could indicate bad Flash.   |
| DHCP: address xxx.xxx.xxx.xxx acquired permanently                | DHCP assigned an IP address to the unit which does not need renewal.   |
| DHCP: address xxx.xxx.xxx.xxx acquired for xxx seconds            | DHCP assigned an IP address to the unit for the indicated number of seconds. Before expiration, DHCP attempts to renew the licence. If unsuccessful, DHCP attempts to contact another DHCP server on the network by sending a broadcast message. If the unit address is not renewed, after expiration, it will no longer have an IP address. |
| SNTP: Real-time clock updated (offset = x seconds)                | If a Primary server is configured, the clock is enabled and updates every five minutes. Its offset is a measurement of the difference between the internal clock and the real-time clock. The system uses the offset to compensate for future time drifts.   |
| SNTP: Unable to update real-time clock                            | Indicates that the configured server did not respond to the time request.  |

The following table lists all possible error codes that may appear in the system log.

**Table 7.4: System Log Error Messages**

| <b>Error No.</b> | <b>Error</b>  |
|------------------|---|
| 1                | the i/o request has been scheduled but not completed  |
| 2                | no more i/o paths are available   |
| 3                | requested operation was not supported by the driver   |
| 4                | the provided i/o buffer was not valid   |
| 5                | requested operation cannot be done in current state   |
| 6                | too many connections of this type are already open  |
| 7                | socket connection type (“domain”) is unknown  |
| 8                | socket protocol type is unknown   |
| 9*               | “socket has already been bound to another port” Check that the port number is available for use. Change configuration if necessary. |
| 10               | requested port number is already in use   |
| 11               | requested address was not valid for operation   |
| 12               | operation requires bound port but socket is unbound   |
| 13               | device is not ready for the requested operation   |
| 14               | cannot open connection because socket is already connected  |
| 15               | operation requires connected socket but not connected   |
| 16               | “data message is too big for transport type” Usually occurs with UDP mode.  |
| 17               | requested operation would break this thread -- try later  |
| 18               | incoming data corruption has been detected  |
| 19               | no data is available for this operation   |
| 20*              | “no route available from this host to destination host” Check the IP address of the host. Change configuration if necessary.        |
| 21               | storage device can accept no more data  |
| 22               | requested option is not available   |

**Table 7.4: System Log Error Messages**

| Error No.   | Error |
|---|-------|
| <p>If any other error number, name, or message appears in the System Log, contact your Service Representative through the Service Request Form on our Web site <a href="http://www.precidia.com/support/service_request.html">http://www.precidia.com/support/service_request.html</a> or e-mail support@precidia.com</p> |       |

## 7.3 Static Web Page

You can host a static Web page or pages in the Precidia unit to display information such as help desk telephone numbers or updates on the latest software downloads. The Precidia unit comes loaded with a default static Web page that includes specifications and product information.

### Creating Static Web Pages

You can create one or more HTML pages that display any information that you require, including graphics. The Precidia unit looks for a page called “index.html” as the default main page. In addition to your main page, you can also create a custom page called “Error404.html” that is displayed when a requested URL is not found. A maximum of 64KB is allocated in memory for static web page(s). HTML pages and associated files must be converted to a hex file format for download.

Refer to the Help Guide *Coverting and Downloading Static Web Pages* at <http://www.precidia.com/products/documentation.html> for complete instructions.

### Accessing the Static Web Page

- 1 Ensure the Web Server in the Security Settings sub-menu is enabled.
- 2 Open your browser.
- 3 Type **http://IPaddressOfUnit/** in the address bar to display the static Web page.

---

**NOTE:** By default, your browser is directed to "index.html". To access a page with another file name, type the complete URL in the address bar of your browser. For example, to access a page called "mypage.html", type **http://IPaddressOfUnit/mypage.html**.

---

# Appendix A: Glossary of Terms and Acronyms

---

|             |   |
|-------------|---|
| <b>ARP</b>  | <i>Address Resolution Protocol.</i> A TCP/IP protocol used to convert an IP address into a physical address, such as an Ethernet address. Defined in RFC826.  |
| <b>AT</b>   | <i>Attention.</i> Modem command prefix.   |
| <b>BpP</b>  | <i>Bytes per Packet.</i>  |
| <b>bps</b>  | <i>Bits per second.</i> The standard measure of data transmission speeds.   |
| <b>CGI</b>  | <i>Common Gateway Interface.</i> A standard for running external programs from a World Wide Web HTTP server.  |
| <b>CPU</b>  | <i>Central Processing Unit.</i>   |
| <b>CRC</b>  | <i>Cyclic Redundancy Checking.</i> An error checking method that uses a 16 or 32-bit polynomial that is derived from, stored and transmitted, with a block of data, in order to detect corruption.  |
| <b>CSU</b>  | <i>Channel Service Unit.</i> A device that performs protective and diagnostic functions for a telecommunications line.  |
| <b>CTS</b>  | <i>Clear To Send.</i> A modem signal line (pin 8 of DB-9 connectors), used for hardware flow control. It is the counterpart to Request To Send (RTS). When the remote end is ready to receive data, it sends a CTS signal to the local computer to start transferring data. |
| <b>DB-9</b> | <i>DB-xx</i> is the designation for a series of port connectors for attaching devices to computers. DB-9 specifically is a standard 9-pin, D-shell connector, used for RS-232 serial communications.  |
| <b>DCD</b>  | <i>Data Carrier Detect.</i> A modem signal line (pin 1 of DB-9 connectors).   |
| <b>DCE</b>  | <i>Data Communications Equipment.</i> It is the interface that a modem or other serial devices use to exchange data with a computer.  |

|                 |   |
|-----------------|---|
| <b>DES</b>      | <i>Data Encryption Standard.</i> A standard cryptography method that uses a 56-bit private key. DES performs encryption operations on 64-bit blocks of data in 16 rounds. DES was developed by IBM in 1977 and was considered “strong” encryption.  |
| <b>3DES</b>     | <i>TripleDES</i> provides even stronger encryption than DES, by extending the 56-bit private key to 192 bits.   |
| <b>DHCP</b>     | <i>Dynamic Host Configuration Protocol.</i> A protocol for assigning dynamic IP addresses to devices on a network.  |
| <b>DLE</b>      | <i>Data Link Escape.</i> Mnemonic for ASCII 16, a transmission control character that changes the meaning of a limited number of contiguously following characters or coded representations.  |
| <b>DSR</b>      | <i>Data Set Ready.</i> A modem signal line (pin 6 of DB-9 connectors), used for RS-232 hardware flow control. It is the counterpart to Data Terminal Ready (DTR).   |
| <b>DSU</b>      | <i>Data Service Unit.</i> A device that connects a terminal or computer to a digital line.  |
| <b>DTE</b>      | <i>Data Terminal Equipment.</i> The interface used to exchange between computers.   |
| <b>DTR</b>      | <i>Data Terminal Ready.</i> A modem signal line (pin 4 of DB-9 connectors), used for RS-232 hardware flow control. It is the counterpart to Data Set Ready (DSR).   |
| <b>Ethernet</b> | An industry standard local area network architecture that serves as the basis for IEEE 802.3. Ethernet uses a bus or star topology and supports data transfer rates of 10 and 100 Mbps.   |
| <b>ETX</b>      | <i>End of Text.</i> Mnemonic for the ASCII 3 character, signaling the end of a text frame.  |
| <b>Gateway</b>  | A device that enables data to flow between different networks, forming an internet. In this case, a router connects two broadcast networks at the IP layer 3.   |
| <b>Hex</b>      | <i>Hexadecimal.</i> It refers to a base-16 numbering system, as opposed to binary, which is a base-2 numbering system. Hexadecimal numbers consist of numbers 0-9, and letters A-F. Hexadecimal numbering is commonly used to express 8-bit binary numbers. One hexadecimal digit can represent the arrangement of four binary digits. Two hexadecimal digits can represent eight binary digits, or a byte. |
| <b>ICMP</b>     | <i>Internet Control Message Protocol.</i> An extension to IP, ICMP supports packets containing error, control, and informational messages. Defined in RFC792.   |
| <b>ID</b>       | <i>Identification/Identifier/Identity.</i>  |
| <b>IEEE</b>     | <i>Institute of Electrical and Electronic Engineers.</i>  |
| <b>I/O</b>      | <i>Input/Output.</i>  |

|              |  |
|--------------|--|
| <b>IP</b>    | <i>Internet Protocol.</i> The network layer for the TCP/IP protocol suite, widely used with Ethernet networks. IP is a connectionless, best-effort packet switching protocol. It provides packet routing, fragmentation and re-assembly through the data link layer. Defined in RFC791.            |
| <b>IPsec</b> | <i>Internet Protocol Security.</i> A protocol that provides security for transmission of sensitive information over unprotected networks such as the Internet. IPsec acts at the network layer, protecting and authenticating IP packets between participating devices ("peers"), such as routers. |
| <b>LAN</b>   | <i>Local Area Network.</i> A data communications network which is geographically limited (typically to a 1 km radius), allowing easy interconnection of terminals, microprocessors and computers with adjacent buildings.  |
| <b>LRC</b>   | <i>Longitudinal Redundancy Checking.</i> An error checking method that generates a parity byte from a specified string or block of bytes.  |
| <b>LSB</b>   | <i>Least Significant Bit/Byte.</i> Bit zero, the bit in a binary number giving the number of ones, the last or rightmost bit.  |
| <b>MD5</b>   | <i>Message Digest 5.</i> An algorithm used to verify data integrity through the creation of a 128-bit message digest from data input. Defined in RFC1321.  |
| <b>MIB</b>   | <i>Management Information Base.</i> A database of managed objects accessed by network management protocols. An SNMP MIB is a set of parameters which an SNMP management station can query, or set, in the SNMP agent of a network device (e.g. router).  |
| <b>ms</b>    | <i>Milliseconds.</i>   |
| <b>MSB</b>   | <i>Most Significant Bit/Byte.</i> Bit n-1 in a binary number with n bits, the bit with the greatest weight, the first, or leftmost bit.  |
| <b>PC</b>    | <i>Personal Computer.</i>  |
| <b>PDU</b>   | <i>Protocol Data Units.</i>  |
| <b>POS</b>   | <i>Point of Sale.</i> Refers to financial transaction devices located directly in stores/businesses, where the customer pays directly from their account.  |
| <b>RFC</b>   | <i>Request For Comments.</i> A series of technical documents and organizational notes about the Internet. See <a href="http://www.rfc-editor.org/">http://www.rfc-editor.org/</a>  |
| <b>RTS</b>   | <i>Request To Send.</i> A modem signal line (pin 7 of DB-9 connectors), used for hardware flow control. It is the counterpart to Clear To Send (CTS). When the unit is ready to receive data, it sends the RTS signal to the remote host to start transferring data.                               |

|                    |   |
|--------------------|---|
| <b>SNMP</b>        | <i>Simple Network Management Protocol.</i> A set of protocols for managing complex networks. SNMP sends messages, protocol data units (PDUs), to different parts of a network. SNMP-compliant devices, called agents, collect and store the data about themselves in MIBs. The agents then return this data to the SNMP requesters. Defined in RFC1157. |
| <b>SNTP</b>        | <i>Simple Network Transport Protocol.</i> Used to synchronize computer clocks on the Internet. Defined in RFC1361. SNTP uses standard NTP timestamp format described in RFC-1305.   |
| <b>SPI</b>         | <i>Security Parameters Index.</i> A 32-bit value used to distinguish among IP packets using IP security associations and arriving at the same destination.  |
| <b>STX</b>         | <i>Start of Text.</i> Mnemonic for the ASCII 2 character, signaling the start of a text frame.  |
| <b>Subnet mask</b> | A bit mask used to identify which bits of an IP address correspond to the network address, and subnet portions of the address. The subnet mask has ones in positions corresponding to the network and subnet numbers, and zeros in the host number positions.   |
| <b>TCP</b>         | <i>Transmission Control Protocol.</i> TCP is the connection-oriented protocol built on top of Internet Protocol (IP) and is nearly always seen in the combination TCP/IP (TCP over IP). It adds reliable communication and flow-control and provides full-duplex, process-to-process connections. Defined in RFC793.                                    |
| <b>TFTP</b>        | <i>Trivial File Transfer Protocol.</i> A simple file transfer protocol used for many purposes including downloading to diskless workstations.   |
| <b>UART</b>        | <i>Universal Asynchronous Receiver-Transmitter.</i> A computer component (chip) that handles asynchronous serial communication.   |
| <b>UDP</b>         | <i>User Datagram Protocol.</i> A connectionless protocol that, like TCP, runs on top of an IP network. Unlike TCP, UDP provides no error recovery services, offering instead, a direct way to send and receive datagrams over an IP network.  |
| <b>URL</b>         | <i>Uniform Resource Locator.</i> The global address of documents and other resources on the global Internet.  |
| <b>VPN</b>         | <i>Virtual Private Network.</i>   |

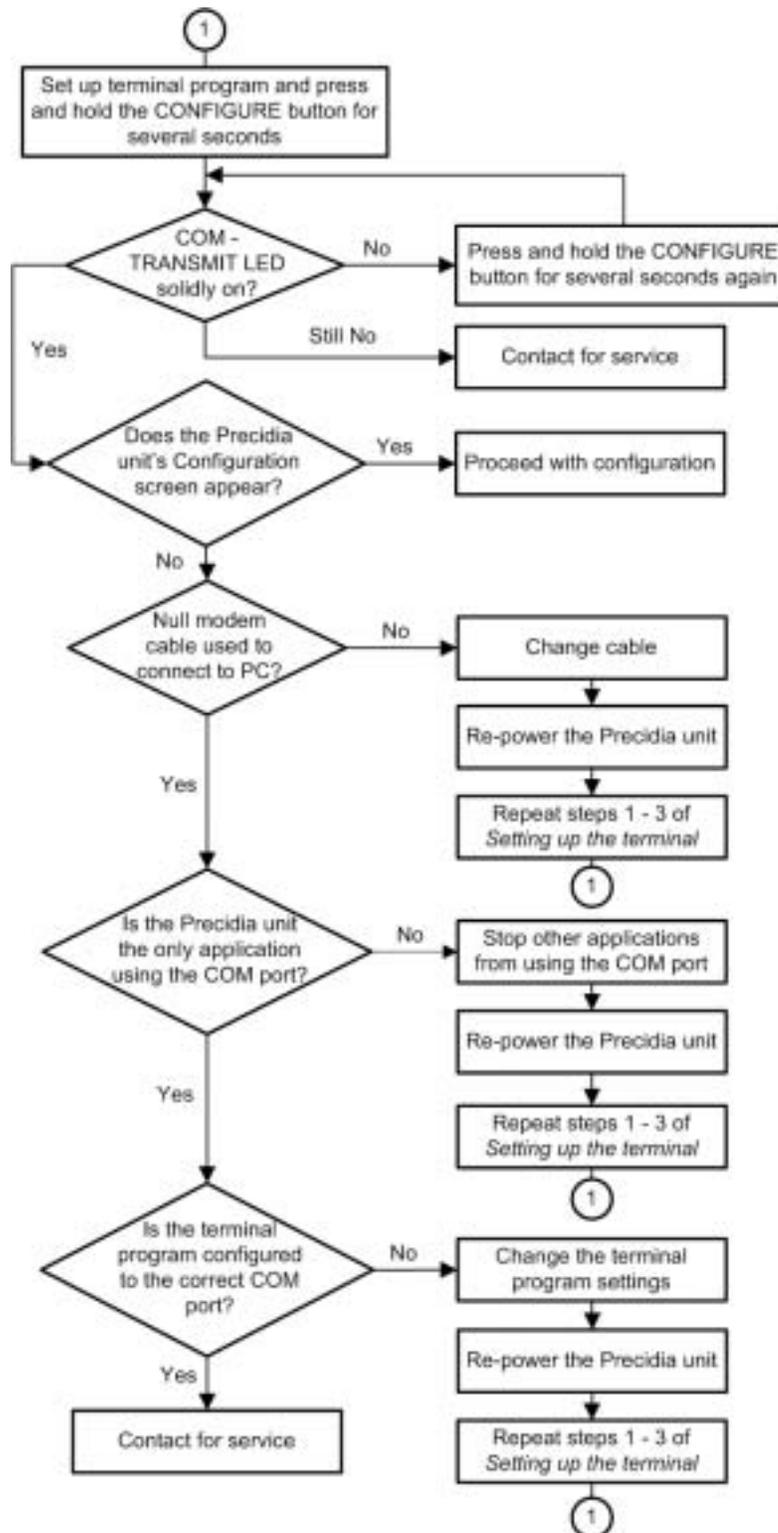
# Appendix B: Troubleshooting and Support

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## First Steps

- 1 Configure the unit with the correct settings. Follow the procedure in the figure on the following page (B-2) to troubleshoot Configuration screen access.
- 2 Ensure that you are using the correct serial cables and that all cables are properly connected and in good working order.
  - If you are connecting the Precidia unit to a DTE (Data Terminal Equipment) device, use a null modem serial cable.
  - If you are connecting the Precidia unit to a DCE (Data Communication Equipment) device, use an RS-232 serial cable.
  - If you are connecting the Precidia unit as a Hayes-compatible modem, or to a Hayes-compatible modem, use a specialized null modem serial cable. See “Specialized Null Modem Serial Cable” on page E-1. *Some POS terminals may also require this type of cable.*
- 3 If you know the IP address of the unit, you can check the network connection by pinging the unit. (See Check IP Address (Ping) on page B-3.)
- 4 Check the indicator lamps on the front panel of the unit and use the indicator lamp tables in this Appendix to diagnose the problem.
- 5 If, after following the suggestions in this guide, you are still having problems accessing configuration or gaining connectivity, contact Precidia support by filling out a Service Request Form at:  
[http://www.precidia.com/support/service\\_request.html](http://www.precidia.com/support/service_request.html).  
A support representative will contact you within one business day.  
  
For general information, User Guides and Help Guides, visit:  
<http://www.precidia.com/>  
  
See Appendix C: Specifications and Warranty for warranty information.

## Troubleshooting Configuration Access



Troubleshooting Flow for Set-Up Connection

## Check IP Address (Ping)

Use ping to check if the Precidia unit is correctly configured on the network. If you cannot reach the Precidia unit using Ping, the Precidia unit is either incorrectly configured or there is a network problem.

To “ping” the Precidia unit:

- 1 Open the MS-DOS Prompt. (Usually found under Start>Programs)
- 2 At the C:\WINDOWS> prompt type **ping** and the **IP address** you want to check.
  - If you get Reply messages, the Precidia unit has a valid connection to the network.
  - If you get a Request timed out message, the Precidia unit is incorrectly configured with the IP address, or you have a network connection problem.

---

**NOTE:** You can also use ping to check if an IP address is already in use on your network, before assigning it to a new unit.

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## Basic Troubleshooting

**Table B.1: Basic Troubleshooting**

| Problem  | Solution  |
|--|---|
| The Configuration screen does not appear when I press the CONFIGURE button                                 | <ol style="list-style-type: none"> <li>1 Follow the troubleshooting flow diagram on the previous page (B-2).</li> <li>2 Ensure your terminal software is set to 9600 bps</li> <li>3 Ensure you are pressing and holding the CONFIGURE button for at least 2 seconds</li> </ol>  |
| I can't access the unit using telnet   | <ol style="list-style-type: none"> <li>1 Ensure the unit is active on the network (check by pinging or viewing the status page locally)</li> <li>2 Set a Remote Password</li> </ol>   |
| I only see strange characters in the terminal window when I press the CONFIGURE button                     | Ensure the terminal software is set to 9600 bps.  |
| The TRANSMIT lamp illuminates but nothing appears on the terminal screen when I press the CONFIGURE button | <ol style="list-style-type: none"> <li>1 Check the terminal settings. Ideal settings are 9600 bps, 8 data bits, no parity, 1 stop bit, hardware flow control</li> <li>2 Check that the terminal is configured to the correct Com port on your PC</li> <li>3 Check that you are using a null modem cable to connect the unit to your PC</li> <li>4 Unplug the unit and plug it back in</li> <li>5 Try again</li> </ol> |

**Table B.1: Basic Troubleshooting**

| <b>Problem</b>  | <b>Solution</b>   |
|---|---|
| I completed set-up with 2 units, but they do not appear to be communicating | <ol style="list-style-type: none"> <li>1 Ensure IP Address, Subnet Mask, and Gateway are configured or automatically obtained</li> <li>2 Ensure the Local Port setting on each unit matches the Remote Port on the other unit</li> </ol>  |
| I'm trying to connect my serial device to my PC over the LAN/WAN            | You need to use Com Port Redirector software on your PC and the ComPort Control Connection Control setting for the Precidia unit.   |
| What are the pinouts for the unit?  | See "Cables" on page E-1.   |
| The unit is not connecting to the network                                   | Ensure the IP Address, Subnet Mask, and Gateway are correctly configured. This can be done manually, or through a DHCP server.  |
| The unit is not communicating with the serial device                        | <ol style="list-style-type: none"> <li>1 Ensure all cables are properly connected</li> <li>2 Ensure the proper cable is used. Modems and some POS terminals require a specialized null modem cable. See "Specialized Null Modem Serial Cable" on page E-1.</li> <li>3 Ensure you have configured a Protocol for the Serial Port and any other necessary settings</li> </ol> |
| I lost the Console Password and I cannot access Configuration               | <ol style="list-style-type: none"> <li>1 If you have defined a Remote Password, access the unit through telnet and view or change the Console Password</li> <li>2 See page 13 of the User Guide for instructions on how to reset the entire configuration to factory default settings, erasing all passwords</li> </ol>   |

## Indicator Lamps (LEDs)

### ON lamp

The ON lamp indicates power is available to the Ether232Plus.

**Table B.2: ON Lamp Troubleshooting**

| Lamp | Status              | Standard Troubleshooting Procedure  |
|------|---------------------|---|
| On   | OK - unit has power | None  |
| Off  | Unit has no power   | <ul style="list-style-type: none"> <li>• Check connection of the power adapter into the Ether232Plus</li> <li>• Check to confirm the opposite end (with the black transformer) is plugged into a power outlet</li> <li>• Check the power outlet by plugging in a "known operational" power plug</li> <li>• Replace the power adapter with one approved by Precidia</li> </ul> |

### ETHERNET – LINK lamp

Illuminates when the Ethernet port has a 10BaseT Ethernet network connection.

**Table B.3: LINK Lamp Troubleshooting**

| Lamp | Status                            | Standard Troubleshooting Procedure   |
|------|-----------------------------------|--|
| On   | OK - Ethernet connection in place | <p>None</p> <hr/> <p><b>NOTE:</b> This light may be on if the Ether232Plus is not configured.</p>  |
| Off  | No Ethernet connection            | <ul style="list-style-type: none"> <li>• Ensure the Ethernet cable is properly plugged into the Ether232Plus.</li> <li>• Ensure the Ethernet cable's opposite end is properly plugged into your LAN hub.</li> </ul> <hr/> <p><b>NOTE:</b> The hub also has Link lamps that will provide further troubleshooting information.</p> |

## ETHERNET – COLLISION lamp

Illuminates when more than one device is trying to use the Ethernet at the same time. The IP protocol automatically attempts to rectify the situation and data is rarely lost.

**Table B.4: COLLISION Lamp Troubleshooting**

| Lamp | Status                                      | Standard Troubleshooting Procedure   |
|------|---|--|
| On   | Collision between data streams has occurred | <ul style="list-style-type: none"> <li>Ensure the Ethernet cable is properly plugged into the Ether232Plus.</li> <li>Check that the Ethernet cable's opposite end is properly plugged into your LAN hub.</li> </ul> <p><b>NOTE:</b> The hub also has Link lamps that will provide further troubleshooting information.</p> |
| Off  | OK  | None   |

## ETHERNET – TRANSMIT lamp

Illuminates when the Ether232Plus is sending or receiving data via the Ethernet port. Normally you will see very short data bursts.

**Table B.5: TRANSMIT Lamp Troubleshooting**

| Lamp     | Status                         | Standard Troubleshooting Procedure   |
|----------|--------------------------------|--|
| Flashing | OK - data is being transmitted | None   |
| Off      | No data is being transmitted   | Ensure the Ethernet cable between the Ether232Plus and the Ethernet device is properly connected |

## COM – TRANSMIT lamp

Illuminates when the Ether232Plus is sending or receiving data via the COM port. Normally you will see very short data bursts.

**Table B.6: COM TRANSMIT Lamp Troubleshooting**

| Lamp     | Status                         | Standard Troubleshooting Practice  |
|----------|--------------------------------|--|
| On       | OK - In configuration mode     | Finish configuring the Ether232Plus and exit from configuration mode.  |
| Flashing | OK - data is being transmitted | None   |
| Off      | No data is being transmitted   | <ul style="list-style-type: none"> <li>• Ensure the serial cable between the Ether232Plus and the serial device is properly connected</li> <li>• Was the configuration recently changed? Look at the System Status page to check the system uptime. If it is a short period, check the configuration of the Ether232Plus to see if it has been modified recently. Please refer to Sections 3 and 4 for further information.</li> </ul> |

## COM – STATUS lamp

This lamp indicates the status of the network connection.

**Table B.7: COM STATUS Lamp Troubleshooting**

| Lamp       | Status                                    | Standard Troubleshooting Practice |
|------------|---|-----------------------------------|
| On         | Network connection is established         | None                              |
| Slow Flash | OK - no activity present                  | None                              |
| Fast Flash | OK - attempting connection to remote host | None                              |

**Table B.7: COM STATUS Lamp Troubleshooting**

| Lamp | Status  | Standard Troubleshooting Practice   |
|------|---|---|
| Off  | Unit may be incorrectly connected or configured | <ul style="list-style-type: none"><li>• Ensure cable between the Ether232Plus and the RS-232 device is properly connected with the correct serial cable</li><li>• Check configuration of unit</li></ul> |

## Service and Support

Fill out the Service Request Form at

[http://www.precidia.com/support/service\\_request.html](http://www.precidia.com/support/service_request.html)

and a support representative will contact you within one business day.

General information, User Guides and Help Guides available at

<http://www.precidia.com/>

See Appendix C, Specifications and Warranty, for warranty information.

# Appendix C: Specifications and Warranty

## Ether232Plus Specifications

|                              | <b>RS-232 mode<br/>(COM Port)</b>  | <b>RS-422 mode<br/>(RS422 Port)</b> | <b>RS-485 mode<br/>(RS422 Port)</b> |
|------------------------------|--|-------------------------------------|-------------------------------------|
| Serial interface:            | RS-232 DTE   | RS-422 4-wire                       | RS-485 2-wire                       |
| Serial connector:            | DB-9 male  | RJ-45 full duplex                   | RJ-45 half duplex                   |
| Serial speed:                | 300 – 115200 bps   | 300 – 115200 bps                    | 300 – 115200 bps                    |
| Device support:              | Asynchronous serial devices with 7- or 8-bit data, with or w/out parity  |                                     |                                     |
| Ethernet interface:          | Ethernet, IEEE 802.3, 10baseT  |                                     |                                     |
| Ethernet connector:          | RJ-45  |                                     |                                     |
| Ethernet speed:              | 10 Mbps  |                                     |                                     |
| Indicators:                  | Power (on), Ethernet (link, collision, transmit), COM (transmit, status)   |                                     |                                     |
| Protocols/Services:          | ARP, ICMP, UDP, TCP, IP, HTTP, telnet, TFTP, Com Port Control (RFC2217), SNMPv2c, FTP, IPsec (manually keyed), SNTTP |                                     |                                     |
| Configuration:               | Serial interface protocol and IP addresses for device, subnet mask, gateway router, and destination                  |                                     |                                     |
| Power adapter:               | 9V DC external, 500mA (power req. 8.5V, 220mA)   |                                     |                                     |
| Operating temp.:             | 0-50°C / 32-125°F  |                                     |                                     |
| Dimensions (h x w x d):      | 28mm x 155mm x 80mm / 1.1" x 6.0" x 3.1"   |                                     |                                     |
| Weight (incl. power supply): | 500g / 17.14oz.  |                                     |                                     |
| Security:                    | IPsec (manually keyed), and Web, Remote and Console password protection  |                                     |                                     |

## Warranty

Precidia products are warranted against manufacturing defects in materials and workmanship for a period of one year. This warranty is conditional on the unit being installed and used as directed in the User Guide. The warranty is extended to cover the Precidia Unit as well as the power adapter.

Precidia's obligation under this warranty shall be limited to the repair, including all necessary parts and the cost of labour connected therewith, or at our option the exchange of a unit, which shows manufacturing defect within the warranty period with a like new unit.

### Customer obligations

The customer is responsible for transportation to the service depot and any applicable brokerage fees.

### Warranty exclusions

This warranty shall not apply to appearance or any accessory items including but not limited to cables. This warranty shall, in addition, not apply to damages due to handling, transportation, and unpacking. The warranty also does not extend to cover any malfunction caused by, or resulting from, abnormal environmental conditions, unauthorized service, improper maintenance, modifications or repairs by the customer, abuse, misuse, neglect, accident, fire, flood, or other acts of nature, or incorrect line voltage.

The customer may have other rights under existing state/provincial or federal laws, and where such laws prohibit any terms of this warranty, they are deemed null and void, but the remainder of the warranty shall remain in effect.

### Service and Support

Fill out the warranty form at

[http://www.precidia.com/support/service\\_request.html](http://www.precidia.com/support/service_request.html)

and a support representative will contact you within one business day.

General information, user guides and help guides available at

[www.precidia.com](http://www.precidia.com)

# Appendix D: Connecting with Telnet

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Before you can access and reconfigure Precidia products remotely, you must configure the following settings locally:

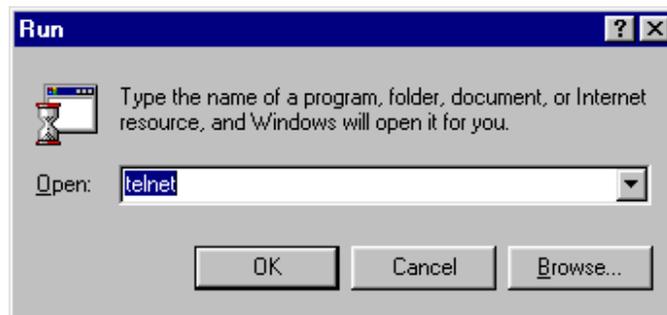
- the IP Address and Subnet Mask (or automatically with DHCP)
- the Gateway address if necessary (or automatically with DHCP)
- the Remote Password

Refer to the User Guide for more information on configuring these settings.

To connect to the Precidia unit remotely using Telnet:

- 1 From the **Start menu**, select **Run...**

The Run window appears.

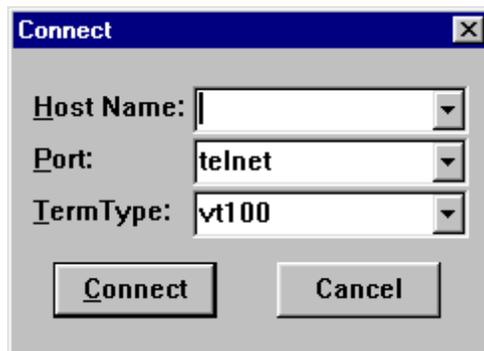


- 2 Type **telnet** in the Open field and click **OK**.

The Telnet application window appears.

- 3 From the **Connect** menu, chose **Remote Systems...**

The Connect window appears.



- 4 Type the **IP address** of the unit in the Host Name field, and choose **Telnet** in the Port field.
- 5 Click **Connect**.

You are prompted to enter your password in the Telnet window.



- 6 Type the **Remote Password** you created during local configuration, and press **Enter**.

The Configuration screen appears in the Telnet window.

If you typed an invalid password, the connection to the host will be dropped. Ensure you have the correct IP address and Remote Password, and go back to Step 3.

---

**NOTE:** *The Remote Password is case sensitive.*

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# Appendix E: Pinouts and Power Supply

## Cables

### Standard Null Modem Serial Cable

| DB-9 Female | DB-9 Female |
|-------------|-------------|
| 1           | 1           |
| 2           | 3           |
| 3           | 2           |
| 4           | 6           |
| 5           | 5           |
| 6           | 4           |
| 7           | 8           |
| 8           | 7           |

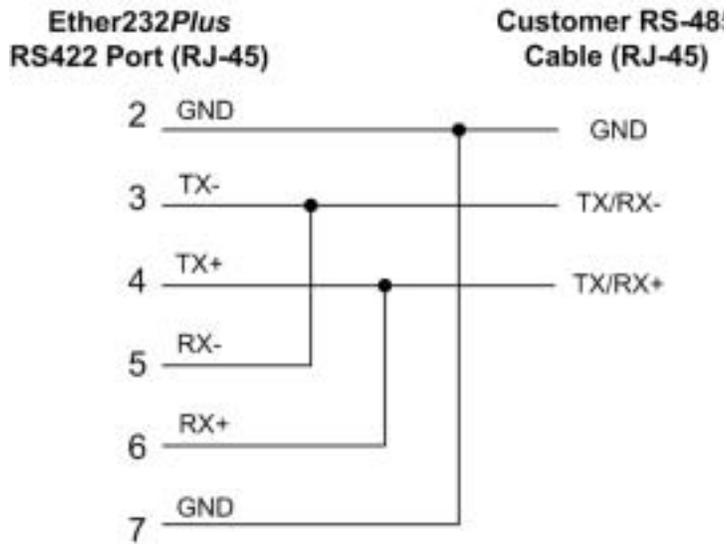
### Specialized Null Modem Serial Cable

If you are connecting a Precidia device to a Hayes-compatible modem, or the Precidia device is acting as a Hayes-compatible modem (modem connection control) you will need a null modem cable with the wiring below. *This cable may also be required for certain POS terminals.* The cable below is available through Cables To Go and various resellers in North America. Search part number “03044”.

| DB-9 Female | DB-9 Female |
|-------------|-------------|
| 2           | 3           |
| 3           | 2           |
| 4           | 1, 6        |
| 5           | 5           |
| 1, 6        | 4           |
| 7           | 8           |
| 8           | 7           |

### RS-485 Serial Cable

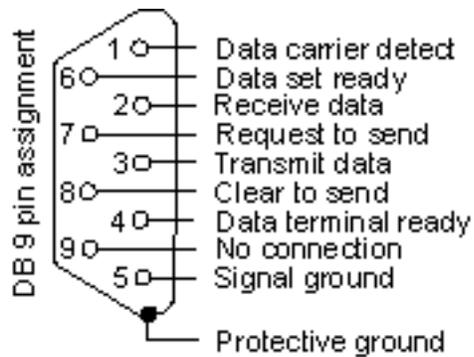
If you are connecting an RS-485 serial device to the Ether232Plus you will need a 2-wire cable with an RJ-45 connector as illustrated below:



## Connectors

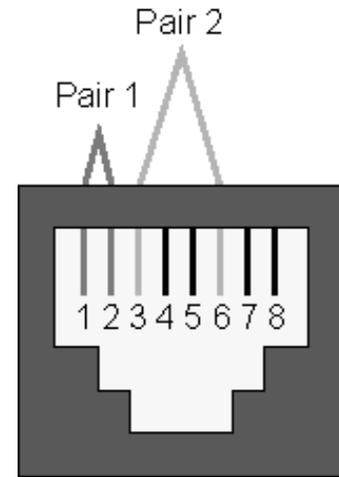
### COM Port Pinout (DB-9)

| Pin | Signal                    | Type  |
|-----|---------------------------|-------|
| 1   | Data Carrier Detect (DCD) | In    |
| 2   | Receive Data (RD)         | In    |
| 3   | Transmit Data (TD)        | Out   |
| 4   | Data Terminal Ready (DTR) | Out   |
| 5   | Signal Ground (GND)       | Power |
| 6   | Data Set Ready (DSR)      | In    |
| 7   | Request to Send (RTS)     | Out   |
| 8   | Clear to Send (CTS)       | In    |
| 9   | No Connect/Power          | Out   |



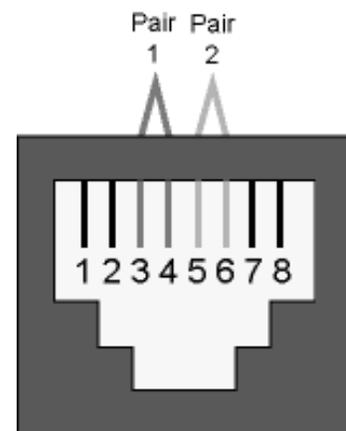
### ETHERNET Port Pinout (RJ-45)

| Pin | Signal                   | Type |
|-----|--------------------------|------|
| 1   | Transmit positive (TX +) | Out  |
| 2   | Transmit negative (TX-)  | Out  |
| 3   | Receive positive (RX+)   | In   |
| 4   | NC                       | —    |
| 5   | NC                       | —    |
| 6   | Receive negative (RX-)   | In   |
| 7   | NC                       | —    |
| 8   | NC                       | —    |



### RS422 Port Pinout (RJ-45, full duplex)

| Pin | Signal                  | Type |
|-----|-------------------------|------|
| 1   | NC                      | —    |
| 2   | GND                     | —    |
| 3   | Transmit negative (TX-) | Out  |
| 4   | Transmit positive (TX+) | Out  |
| 5   | Receive negative (RX-)  | In   |
| 6   | Receive positive (RX+)  | In   |
| 7   | GND                     | —    |
| 8   | NC                      | —    |



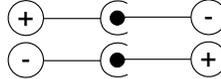
**NOTE:** The RS422 port is also used for RS-485 connections using an RS-485 cable with an RJ-45 connector, as illustrated on page E-2.

## Power Supply

Customers in North America are supplied with an AC power adapter conforming to the specifications below. Customers in other parts of the world should obtain a power supply that meets these requirements.

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|                        |   |
|------------------------|---|
| <b>Output Voltage:</b> | 9 VDC @ 500 mA                          |
| <b>Polarity:</b>       | Center Pin Negative (-) or Positive (+) |



|                          |        |
|--------------------------|--------|
| <b>Inside Diameter:</b>  | 2.1 mm |
| <b>Outside Diameter:</b> | 5.5 mm |
| <b>Barrel Length:</b>    | 9.5 mm |

**Class 2 Transformer**

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