

IP Serial Server

IPS-101 (1-port)

IPS-102 (2-port)

IPS-201 (1-port)

IPS-202 (2-port)

IPS-204 (4-port)

User Manual

V2.0

2009.10.22

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1. Introduction

The **IPS (IP Serial Server)** provides the serial device server for Windows hosts to control serial devices located virtually anywhere through a TCP/IP or UDP/IP Ethernet connection. The IPS has the asynchronous serial port connection on one side, and a 10/100 Mbps Ethernet connection on the other side. It connects devices, such as CNC, weight scales, and scanners. Applications include industrial/factory automation, automatic warehouse control, and hospital/laboratory automation.

The IPS Windows driver provides Virtual COM port to control the IPS. Virtual COM port provides access to any of the ports on the IPS, as if a real serial port on the computer.

IPS can function as a server or client for both TCP and UDP connection. The application scenarios are Straight IP mode, Virtual COM mode, and Paired mode. In Straight IP and Virtual COM modes, IPS should only work as a server. When in the Paired mode one IPS must set as a client and the other must set as a server in both TCP and UDP connection.

1.1 Main Features

- Multi-interface serial ports -- software selectable for RS-232, RS-422, or RS-485 interface
- TCP or UDP / Client or Server operation
- **Configuration** of the IPS settings can be accomplished using any of the following methods:
 - ✓ **Web Server** allows configuration via the network using any web browser
 - ✓ **IPS Administrator** for searching and listing the IPS/WIPS servers attached to the LAN
 - ✓ **Telnet** for **remote** configuration via the network
 - ✓ **Serial Console** for **local** configuration through the serial console port
- **Virtual COM Driver Software for Windows 2000/2300/XP/Vista** - installs virtual COM ports, viewable in the Windows Device Manager under Ports (COM & LPT). The driver installs a virtual COM on windows which maps the virtual COM port to the IP address and TCP/UDP port of the IPS, enabling the Windows applications to access remote serial devices over an IP-based Ethernet LAN. Any program running on the computer and using Windows-based COM ports can access the serial devices attached to the IPS. The LAN becomes transparent to the serial device and the software running on the PC.
- **Virtual TTY driver for Linux/Unix operating system**
- **TCP Probe** - selectable protocol ensures reliable communications in Virtual COM mode or Paired mode. This feature restores the connections if communications are temporarily lost at either end due to loss of power or the Ethernet connection.
- Firmware Upgrade for future revisions/upgrades
- Built-in Ethernet switch ports for easy cascaded wiring

1.2 Models

Model	Feature
IPS-101	1 port, dual LAN, (Serial DB9 & TB) (power Jack)
IPS-102	2 ports, dual LAN, (Serial DB9) (power Jack)
IPS-201	1 port, dual LAN, (Serial DB9 & TB) (power TB)
IPS-202	2 ports, dual LAN, (Serial DB9) (power TB)
IPS-204	4 ports, dual LAN, (Serial DB9) (power Jack & TB)

1.3 Communication Modes

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

The combinations of communication modes:

Item	Communication modes	TCP	UDP
1	Server/Socket mode	✓	✓
2	Server/VCOM mode	✓	✓
1	Client/Socket mode	✓	n/a
2	Client/VCOM mode	✓	n/a
3	Pair mode	✓	✓

1.3.1 Straight IP Mode

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

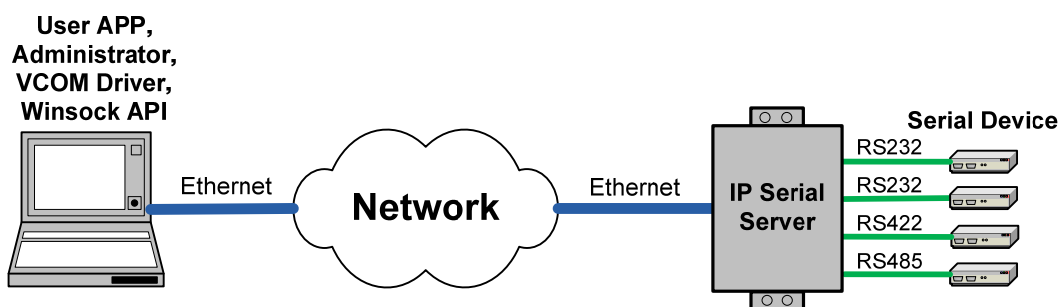


Figure 1 Straight IP Mode / Virtual COM Mode

1.3.2 Virtual COM Mode

Virtual COM mode allows the user to provide a virtual COM port on the computer. Windows programs using standard Windows API calls are able to interface to virtual COM ports. When a program on the PC opens the new COM port, it communicates with the remote serial device connected to one of the ports on the IPS.

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

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

1.3.3 Paired Mode

Paired Mode is also called **Serial Tunneling mode**. In this mode any two serial devices that can communicate with a serial link will be able to communicate using two IPS and the LAN.

Two IPS are connected to a network, one configured as a TCP/UDP client and the other as a TCP/UDP server. In the setup the **Remote IP address** field of the server must contain the address of the client. This will allow the client's IP address to pass the IP address-filtering feature of the server. Conversely, the **Remote IP address** of the client must contain the server's IP address. Both communication port numbers must be the same.

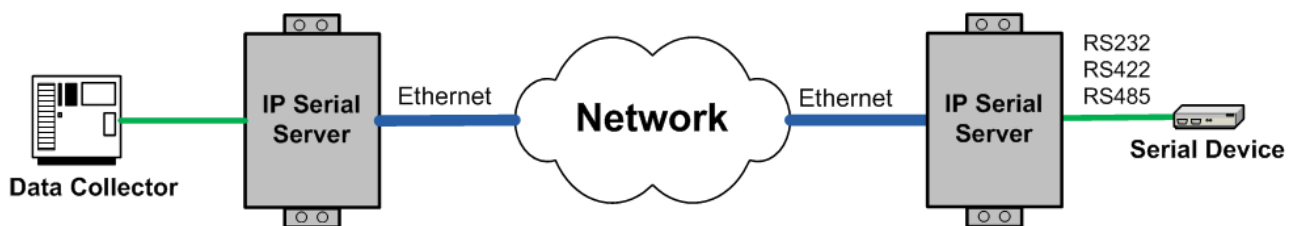


Figure 2 Paired Mode

1.3.4 TCP Probe

The TCP Probe protocol connection provides a reliable communications connection in Virtual COM mode and Paired mode. This feature can restore the connection if communications are temporarily lost at either end due to loss of power or Ethernet connection.

Without this feature a device that loses a connection and stops communicating would not be able to reconnect without human intervention. A TCP data connection can be lost when there is a power failure or temporary loss of an Ethernet connection on either the client or server. If a loss occurs the Probe feature will try to reconnect the TCP data connection every five seconds until communications is established again. The Probe feature is not applicable when using an UDP

application.

1.4 Installation and Startup

For descriptive purposes this section considers a typical configuration consisting of a computer connected via an Ethernet LAN to the IPS connected to the RS-232 port of a serial device.

1.4.1 Package Checklist

The IP Serial Server is shipped with the following items included:

- ✓ The IP Serial Server unit
- ✓ Power Adapter
- ✓ Quick Start Guide
- ✓ CD-ROM Disk (Documentation and software)
- ✓ Footpads set

1.4.2 Hardware Setup

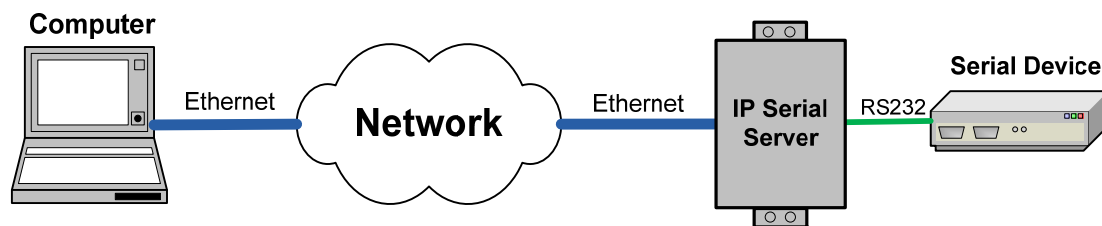


Figure 3 Typical Hardware Setup

Step 1: Connect the IPS to the network using a standard Ethernet cable.

Step 2: Connect the IPS to the RS-232 port on the serial device.

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

Step 3: Apply power to the IPS.

1.4.3 Software Installation

Using the CD included with the IP Serial Server, install the **IPS Administrator** software on the host computer.

1.4.4 IP Serial Server Configuration

Step 1: Open the **IPS Administrator** software. It will automatically search for any reachable IPS devices. A list of all IPS connected to the LAN will appear in the IPS List window.

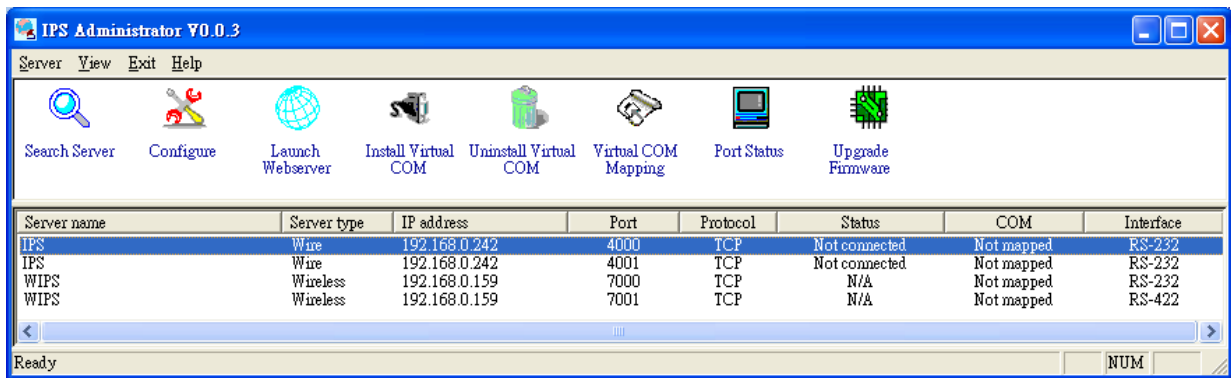
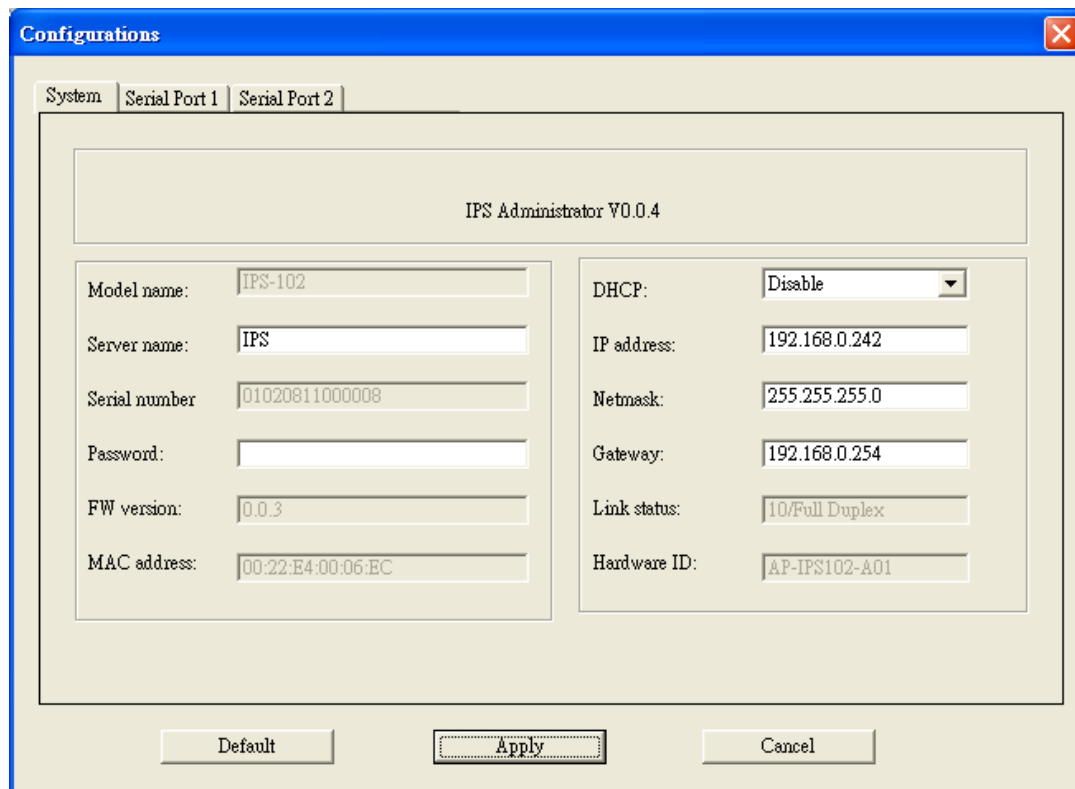


Figure 4 The IPS Administrator Server List Window

Notice !!!

Please reserve the following port numbers for the IPS operation – **6400, 6660, 6666, and 6669**. Your attached firewall device shall not block the reserved port numbers mentioned above and <the port numbers specified in **TCP/UDP port** in **Configurations** window>. Please refer to **Appendix A** for details.

Step 2: Double click the desired IPS port on the list to bring up the Server Configurations screen.



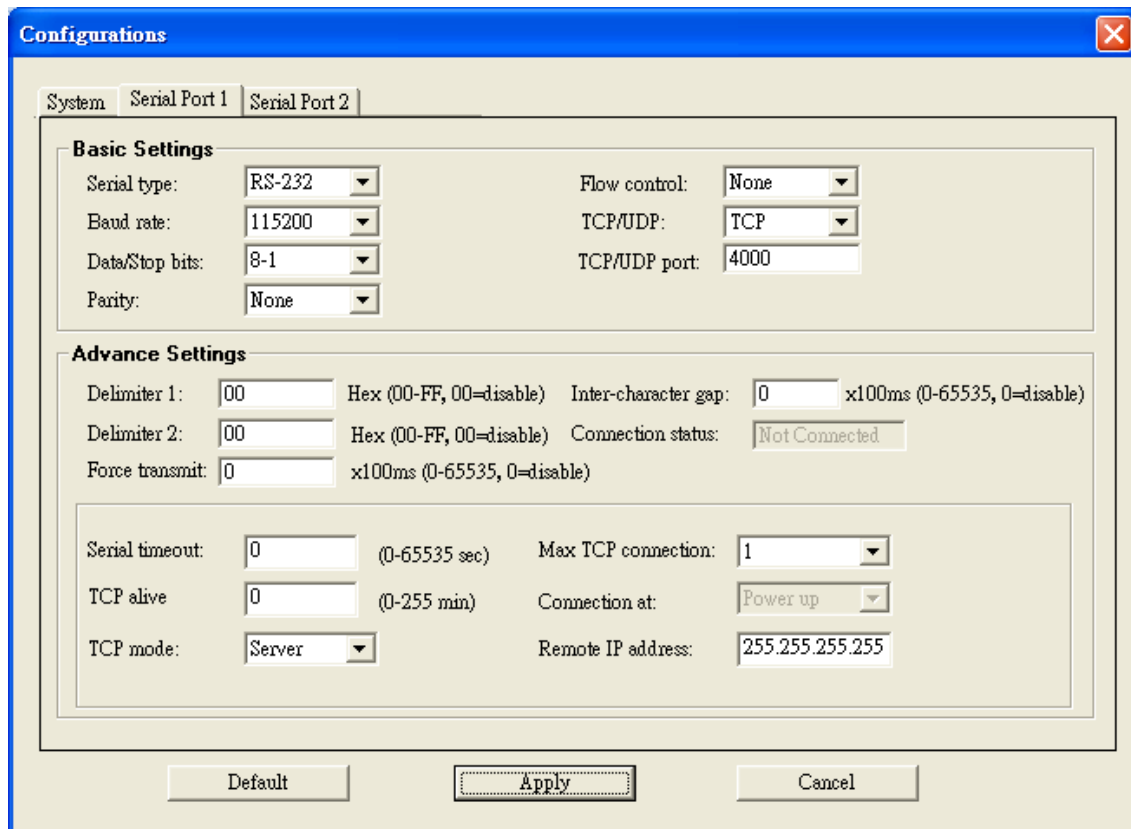


Figure 5 The Configurations Window

Step 3: Change the Server Configurations as required.

(a) Disable DHCP, set appropriate static IP, Netmask and Gateway addresses from your Network Administrator (recommended), or enable DHCP to allow the IPS to obtain an IP address from DHCP server.

(b) Set the **Serial type** to **RS-232** to match the serial device connected to the IPS.

Note: the default is at **Console** mode, so you have to change to **RS-232** mode for data transmission.

(c) Set **Baud Rate**, **Data/Parity/Stop**, and **Flow Control** to match the configuration of the serial device connected to the IPS serial port.

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

Step 5: Re-enter Server Configurations to verify the changes have taken effect, or to view/change the configuration of other ports. Each port must be configured separately.

1.4.5 Install Virtual COM Ports

Step 1: From the IPS Administrator, double click on the **Install Virtual COM** icon.

Step 2: Select a port and map it to an unused COM port (e.g. Port 3). Configure it for TCP protocol and the appropriate IP address (determined in the last section).

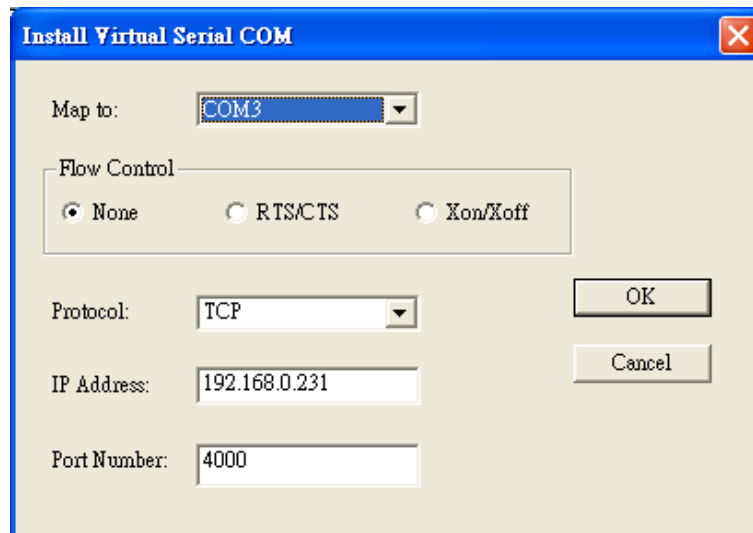


Figure 6 Configuring the Virtual COM Port

1.4.6 Check Data Communications

Step 1: Run the terminal emulation program (such as **HyperTerminal** or **PuTTY**). Select the COM port (e.g. Port 3).

Step 2: Set **Baud Rate**, **Data/Parity/Stop**, and **Flow Control** to match the configuration of the serial device connected to the **IPS** serial port.

Step 3: Communications with the serial device should now be operational.

2. Hardware

2.1 Front/Rear Views



Figure 7 The Front/Rear Views

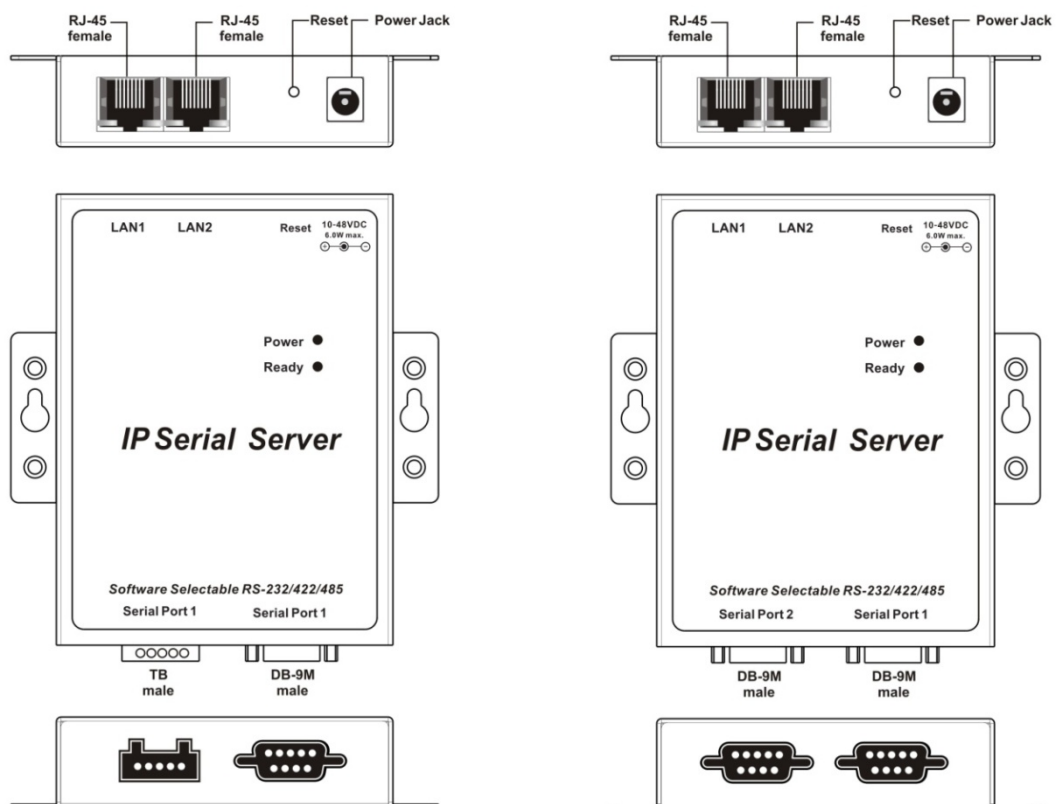


Figure 8 The Panel Layout of IPS-101 & IPS-102

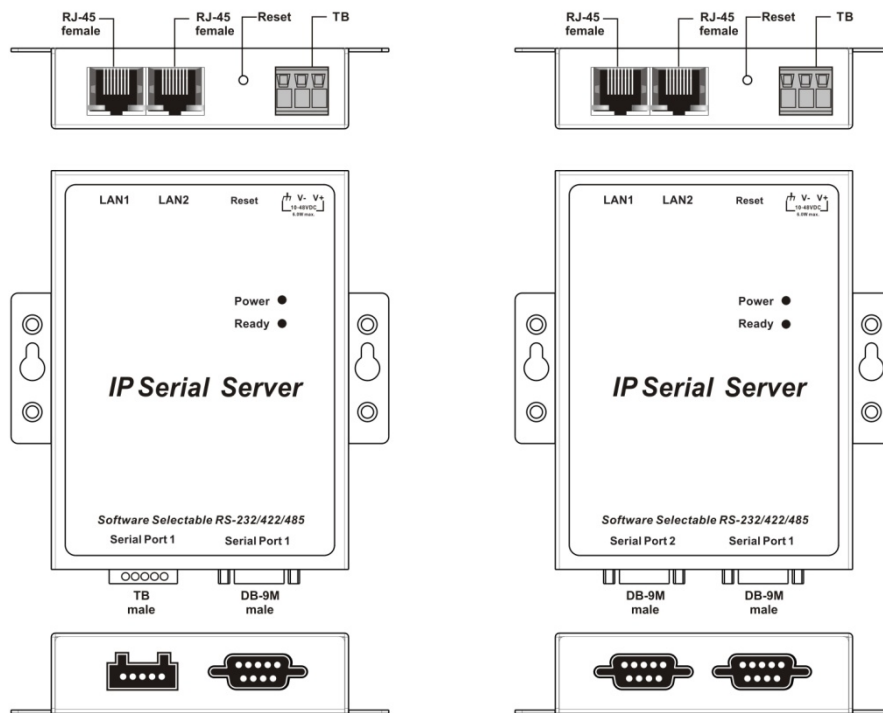


Figure 9 The Panel Layout of IPS-201 & IPS-202

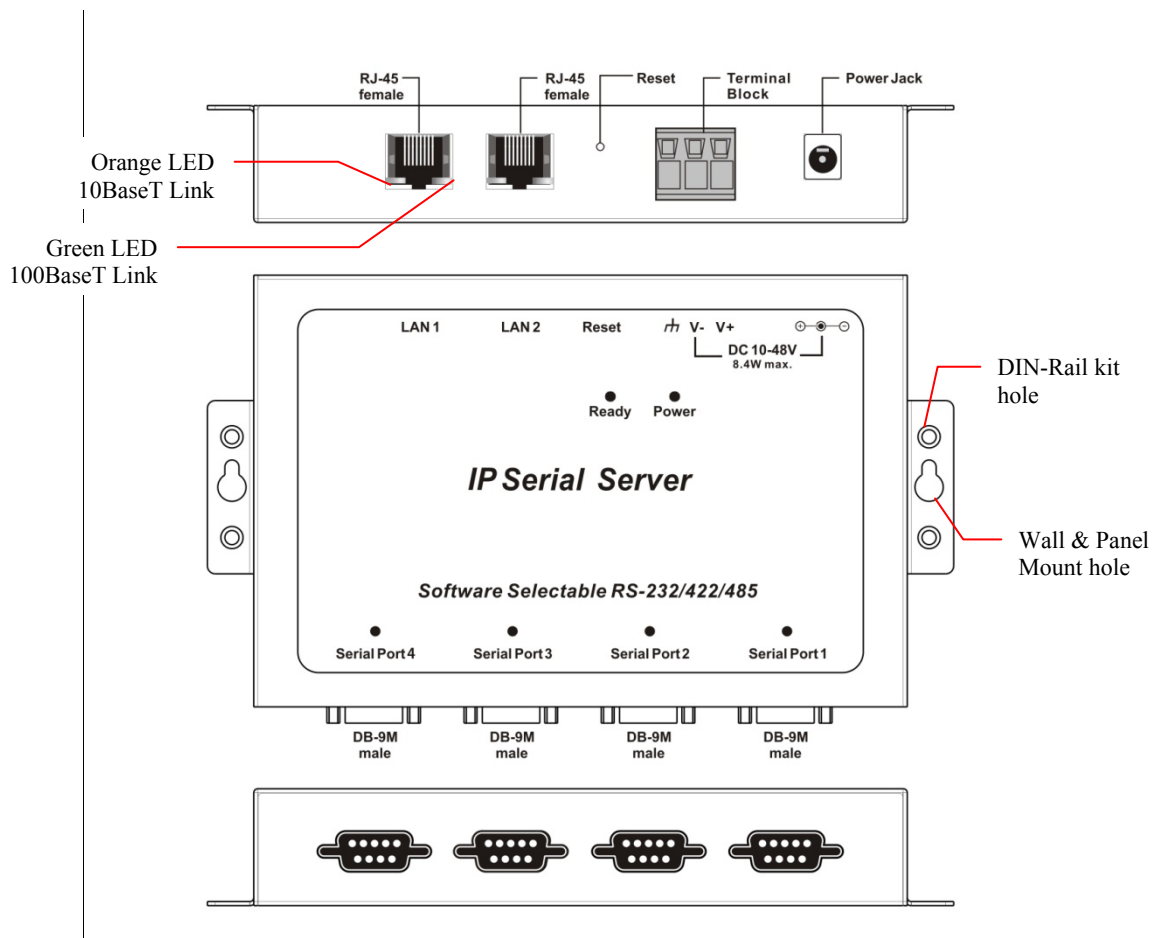


Figure 10 The Panel Layout of 4-port IPS (IPS-204)

2.2 Connectors, Indicators, and Reset Switch

2.2.1 Indicator Lights

LED	Indication
Power	Red – power indication <i>ON: power is applied</i>
Ready	Green -- blinking per second when system is ready
LEDs on RJ45 connectors	Ethernet Link/Act/10/100Mbps: Orange -- 10BaseT Ethernet connection established Green -- 100BaseT Ethernet connection established <i>Blinking: when data in activity</i> <i>ON: when no data in activity and link connected</i>
LEDs of Serial port (4-port model)	When set up as a TCP server: Steady Green - client has made a connection, communications starting Flashing Green – data present at the serial port Light off – connection closed When setup in UDP mode: Steady Green – port ready Flashing Green – data is being transmitted or received

2.2.2 Power Connector

Plug the plug from the included power supply into the power jack and then plug the supply in. When power is applied the Red power light will illuminate. The tip of the power plug is positive; the sleeve is negative.

2.2.3 Reset Button

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

Press & hold the Reset button for 5sec will have the unit goes to factory default settings.

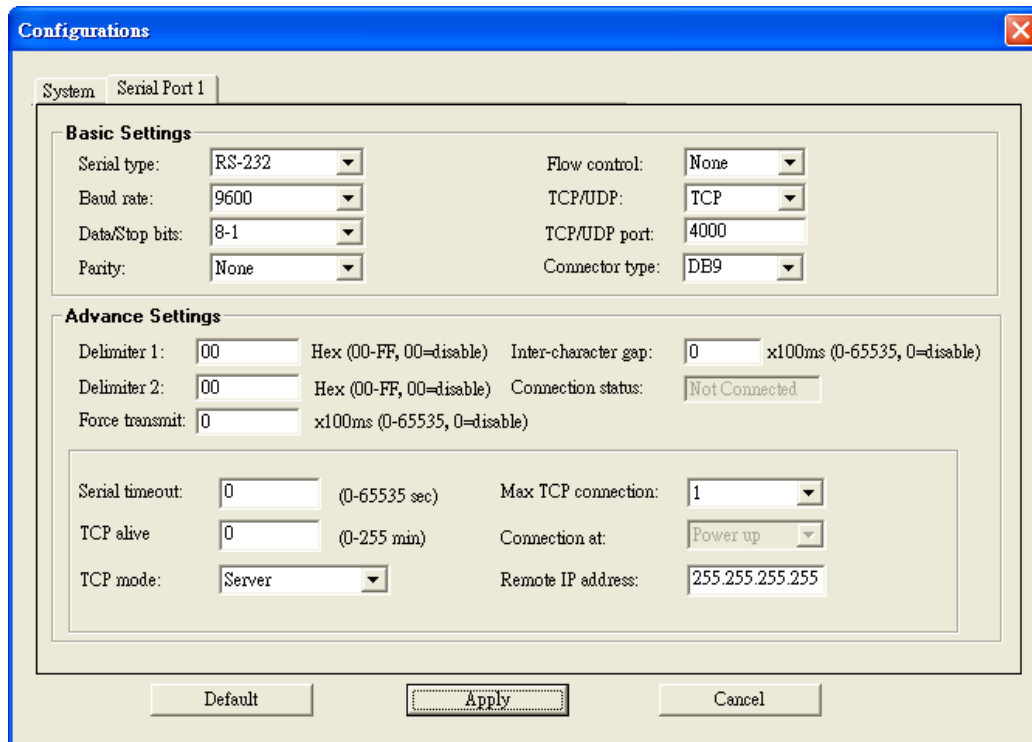
2.2.4 Ethernet Connector

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

2.2.5 Serial Connector

All serial connectors are DB9M type except one port model.

For one port model, there are two connectors to choose from, DB9 or Terminal Block, depends on which connector you will connect to. Default setting is DB9, but you can change it be TB.



The Serial type can be configured as RS-232, RS-422, RS-485 2-wire, or RS-485 4-wire.

2.3 Biasing and Termination settings for RS-422/485 mode

The IPS provides selectable $4.7\text{K}\Omega$ biasing pull high/low resistors and 120Ω terminator for the serial port set in RS-422 or 485 mode. You have to uncover the metal case in order to access to the resistors and dipswitch settings.



Figure 11 The Biasing Resistors and Termination Dipswitches (IPS-101/201)



Figure 12 The Biasing Resistors and Termination Dipswitches (IPS-102/202)

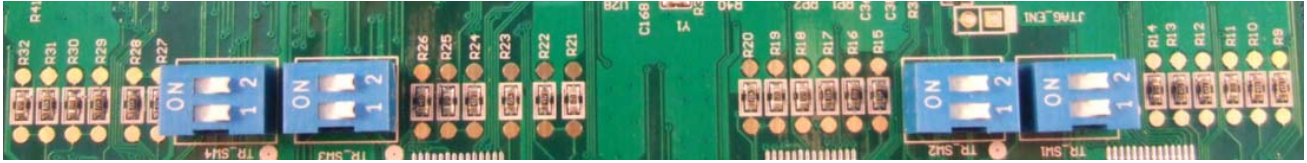


Figure 13 The Biasing Resistors and Termination Dipswitches (IPS-204)

2.3.1 Biasing

When a RS-422/485 network in an idle state, all nodes are in listen (receive) mode. Under this condition there are no active drivers on the network. All drivers are tristated. Without anything driving the network, the state of the line is unknown. In order to maintain proper idle voltage, bias resistors must be applied to force the data lines to idle condition.

Each serial port of IPS provides 4.7K Ω pull high/low resistors on the RS-422/485 receive line.

	Connector	Port No.	RS-422 / RS-485
			RXD
IPS-101 IPS-201	DB9	#1	▲:R44 ▼:R48
	Terminal Block		▲:R25 ▼:R24
IPS-102 IPS-202	DB9	#1	▲:R44 ▼:R48
		#2	▲:R25 ▼:R24
IPS-204	DB9	#1	▲:R9 ▼:R10
		#2	▲:R16 ▼:R17
		#3	▲:R26 ▼:R22
		#4	▲:R27 ▼:R29
▲: Pull-up ▼: Pull-down Resister Value (default): 4.7KΩ			
IPS-101 & IPS-102 (Fixed) IPS-104 (User replaceable)			

Figure 14 The Biasing Settings

2.3.2 Termination

In some critical environments, termination resistors may be needed to prevent the reflection of serial signals. Since no set of resistor values is universally compatible with all environments, IPS uses DIP switches to allow users to adjust termination for each serial port.

Each serial port of IPS provides selectable 120Ω termination resistor on the RS-422/485 receive line.

Model	Connector	Port No.	RS-422 / RS-485
			RXD
IPS-101 IPS-201	DB9	#1	R1 (TB_SW1 ; P2) ON: 120Ω OFF: Open
	Terminal Block		R3 (TB_SW1 ; P1) ON: 120Ω OFF: Open
IPS-102 IPS-202	DB9	#1	R1 (TB_SW1 ; P2) ON: 120Ω OFF: Open
		#2	R3 (TB_SW1 ; P1) ON: 120Ω OFF: Open
IPS-204	DB9	#1	R11 (TR_SW1 ; P1) ON: 120Ω OFF: Open
		#2	R18 (TR_SW2 ; P1) ON: 120Ω OFF: Open
		#3	R21 (TR_SW3 ; P1) ON: 120Ω OFF: Open
		#4	R30 (TR_SW4 ; P1) ON: 120Ω OFF: Open

Figure 15 The Termination Settings

3. Installing the IPS Administrator Software

The Windows-based **IPS Administrator** and **Virtual COM Port** software makes configuration fast and easy. If using Windows, installing the **IPS Administrator** software and setting up virtual COM ports to configure the IPS is recommended.

3.1 Software Installation

The **IPS Administrator** software includes:

- ✓ IPS Administrator
- ✓ Install/Uninstall Virtual COM

3.1.1 Automatic Installation

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

3.1.2 Manual Installation

Step 1: To manually start the software installation, from the Windows Desktop, click **Start** button and click **Run** item. At the Run command line type E:\Install_IPS\setup.exe and click OK (E: is the drive letter for the CD ROM.), or open the File manager and double click E:\Install_IPS\setup.exe.

The **Install Shield Wizard** window will be displayed.

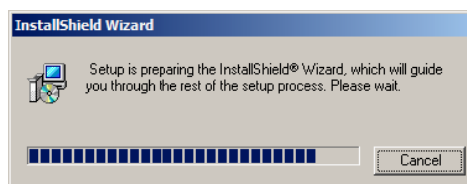


Figure 16 The Install Shield Wizard Window

Step 2: When the IPS Administrator Setup window appears, click **Next**.

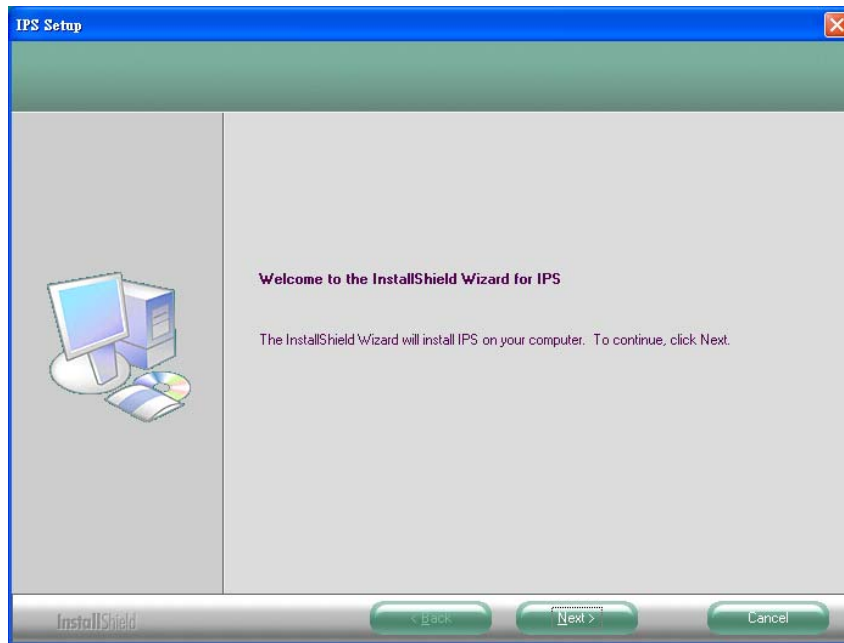


Figure 17 The Setup Window of IPS Administrator

Step 3: When Choose Destination Location appears, click **Next**. The installation progress will be shown until complete.

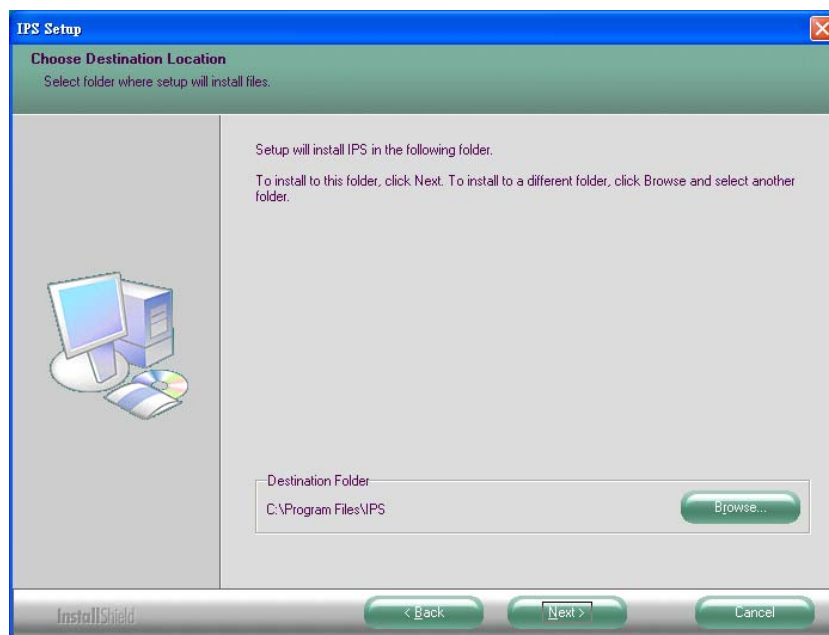


Figure 18 The Choose Destination Window

Step 4: Click **Finish** when the **Install Shield Wizard Complete** dialogue appears. When finished, dialogue box will close.

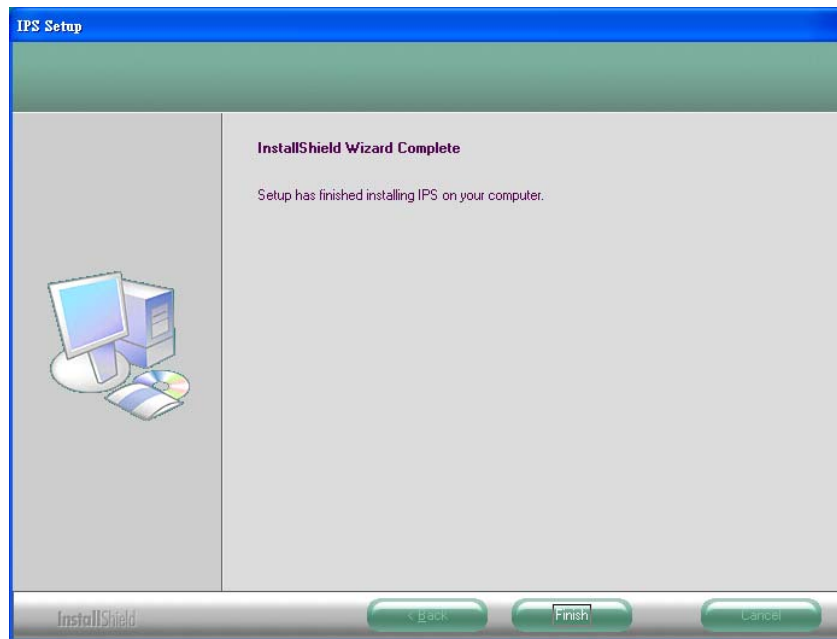


Figure 19 The Install Shield Wizard Complete Window

3.1.3 Updating an Existing Installation

If an **IPS Administrator** software is already installed, the setup window will prompt for removing it. Please remove all installed components first. Once the software has been removed, Install (run setup.exe) the new software.

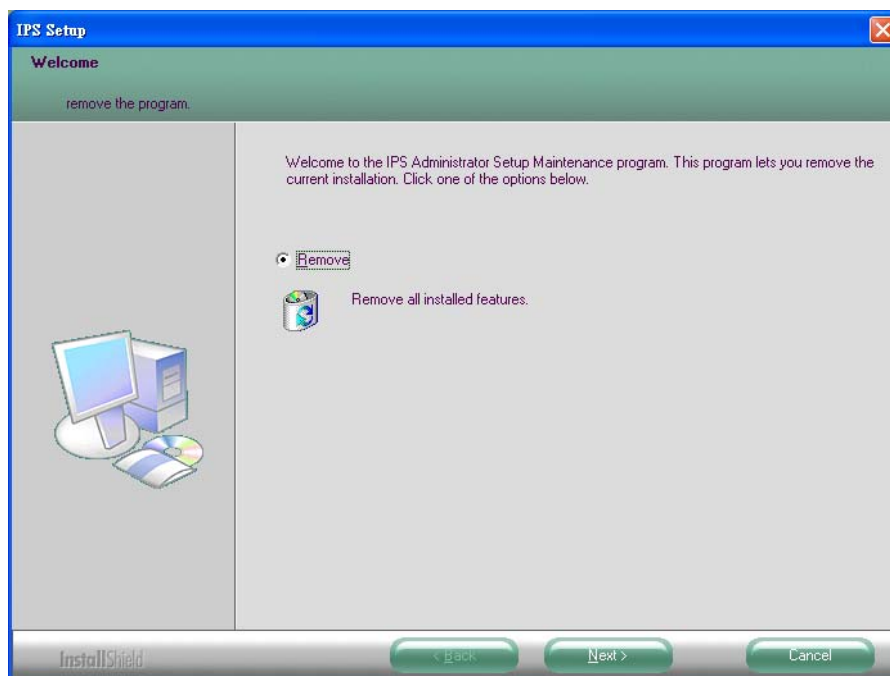


Figure 20 The InstallShield Wizard Modify, Repair or Remove Screen

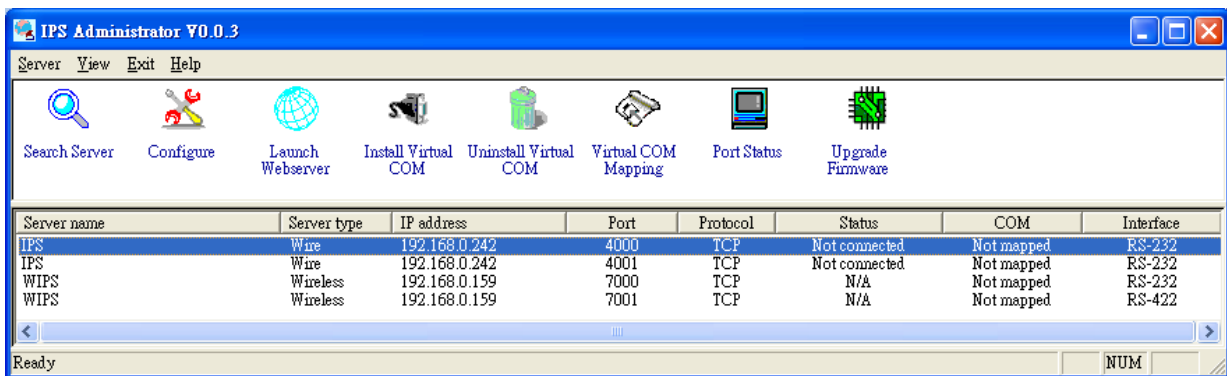
3.1.4 Opening the IPS Administrator

Step 5: If the **IPS** is not already connected to the network or to the Ethernet port on the computer, connect it. Apply power. The **Power** indicator should light red, the **Link** LEDs on the Ethernet connector should indicate which type of Ethernet connection has been made and the **Ready** LED will flash indicating configuration can begin.

Step 6: Start the **IPS Administrator** software. In Windows Desktop, click:

Start > All Programs > IPS > IPS Administrator

As soon as the **IPS Administrator** opens it will initiate **Searching Server** and after a few seconds the **IP Serial Server List** will display all IP Serial Server devices (wire or wireless models) on the network.



4. Using the IPS Administrator

The **IPS Administrator** software allows:

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

4.1 Hardware Setup

Step 1: Connect the IPS to the LAN or to a computer Ethernet port.

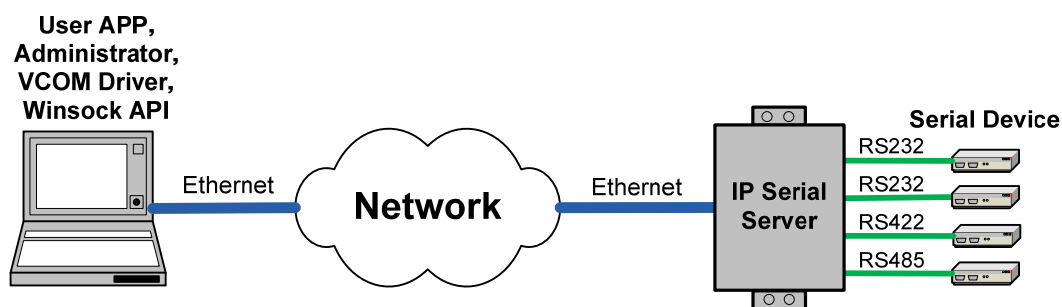


Figure 21 Ethernet Connection via LAN

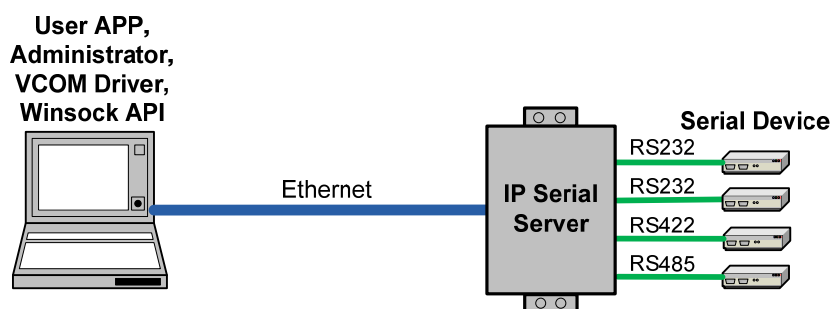


Figure 22 Direct Ethernet Connection using a Crossover Cable

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

4.2 Software Setup

Step 3: To run the **IPS Administrator**, from the **Windows Desktop** click:

Start > All Programs > IPS > IPS Administrator

As soon as the IPS Administrator opens it will initiate Searching Server and after a few seconds the IPS List will display all IPS devices on the network.

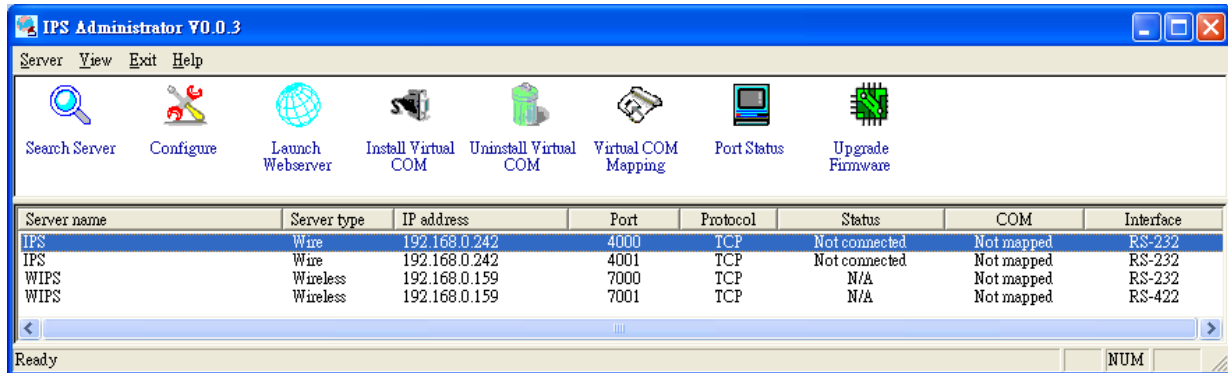


Figure 23 The IPS Administrator Window

4.3 Software Overview

The **IPS Administrator** can be operated via **Menus** and **Icons**.

4.3.1 Menus (Icons)

Server (Icon)

- **Search Server** - Searches for IPSs on the network and brings back configuration information that will be displayed in the Server Configurations window.
- **Configure** – To bring up the configuration window
- **Launch Web Browser** – To bring up the Internet Browser to the login page of the unit
- **Install Virtual COM** - Allows virtual COM ports to be installed from the IPS Administrator window.
- **Uninstall Virtual COM** - Allows virtual COM ports to be uninstalled from the IPS Administrator window.
- **Virtual COM Mapping** - Selects the Virtual COM List. Double clicking on any COM port in the Virtual COM List brings up a window that allows changing the virtual COM settings such as Flow Control, Protocol, IP address, and Port Number. Virtual COM settings must match IPS port settings.
- **Port Status** - Brings up a screen that displays the following information associated with the selected serial port:

Serial TX: Displays the number of bytes of data sent to the serial device since the IP connection was established.

Serial RX: Displays the number of bytes of data received from the connected serial device since the IP connection was established.

DTR/RTS: The DTR/RTS Port Status indicator displays the current logic state of the DTR and RTS hardware handshake (output) lines for the selected IPS port (1 = asserted, 0 = not asserted).

DCD/DSR/CTS: The DCD/DSR/CTS Port Status indicator displays the current logic state being received on the DCD, DSR and CTS hardware handshake (input) lines for the selected IPS port (1 = asserted, 0 = not asserted)

Status: Indicates whether the client software has made a connection with the IPS.

IP Address: Displays the IP address of the connected client when there is a client connection

- **Upgrade Firmware** - Used when downloading new firmware to the IPS.
- **Save Configuration File** - Allows the user to save the current configuration information to a file with a .vcom extension.
- **Load Configuration File** - Allows the user to load a configuration file.

View

Provides three viewing options for the **IPS Administrator** screen:

- **Status Bar** – allows the Status Bar at the bottom of the screen to be viewable or hidden.
- **Split** – allows the position of the split between the Icons pane and the Virtual COM List / IP Serial Server List panes to be dragged horizontally using the mouse.

Exit

- Allows you to Exit the IPS Administrator program

Help

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

4.3.2 Serial Server List / Virtual COM List

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

Serial Server List (Search Server)

- **Server Name** - Displays the name of the IPS. The name is listed once for each port.
- **IP Address** - Displays the IP Address for the IPS. All ports in an IPS have the same the same IP address.

- **Port** - Displays the port number for each IPS port.
- **Protocol** - Displays the currently selected TCP or UDP mode for the IPS.
- **Status** - The Status indicates the mapped virtual COM port condition.

Not Connected is shown when a program does not have the port Open.

Connected is shown when that mapped port is Open for use.

- **COM** - Displays the name of the computer COM port mapped to each IPS port. If no computer port has been mapped it displays **Not mapped**.
- **Interface** – Displays the interface type of the serial port.

Virtual COM List (Virtual COM Mapping)

- **COM Name** - Displays the number of the COM port mapped to each IPS port.
- **IP Address** - Displays the IP Address for the IPS. All ports in an IPS have the same IP address.
- **Protocol** - Displays the currently selected TCP or UDP mode for the IPS.
- **Port** - Displays the port number for each IPS port.
- **Flow Control** - Indicates what type of flow control is configured for each port.
- **Status** - Indicates whether each port is currently **In Use** or **Not Used**.

4.3.3 Status Bar

Displays the current status of the software in the bottom, left corner of the screen

- Ready
- Waiting for the server to restart...
- Searching reachable servers...

4.4 Search for Servers

Upon opening the IPS Administrator software it will automatically execute **Search Server** to search for all reachable IPSs.

Step 4: To manually initiate a search for servers, click the **Search Servers** icon. The **Search Setup** box will appear. It provides two options for searching for servers on the network:

- Specify the IP Address of the IPS or
- Search all reachable servers



Figure 24 The Search Setup Window

Step 5: Enter the **IP Address** assigned to the desired IPS or click **Search all reachable servers**, then **OK**. The IP Address is used to find IPS units that are not on the same subnet. (Routers on the network will block the standard broadcast used to find servers if **Search all reachable servers** is selected.) The user must set an IP address that conforms to the LAN addressing scheme.

The Searching window is shown until all active IPSs on the LAN are listed in the **IPS List** window.

4.5 Setting the Configurations

The **Configurations** window displays the current configurations for the currently selected server.

Step 6: To open the **Configurations** window, highlight the IPS in the **IPS List** window, double-click to open.

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

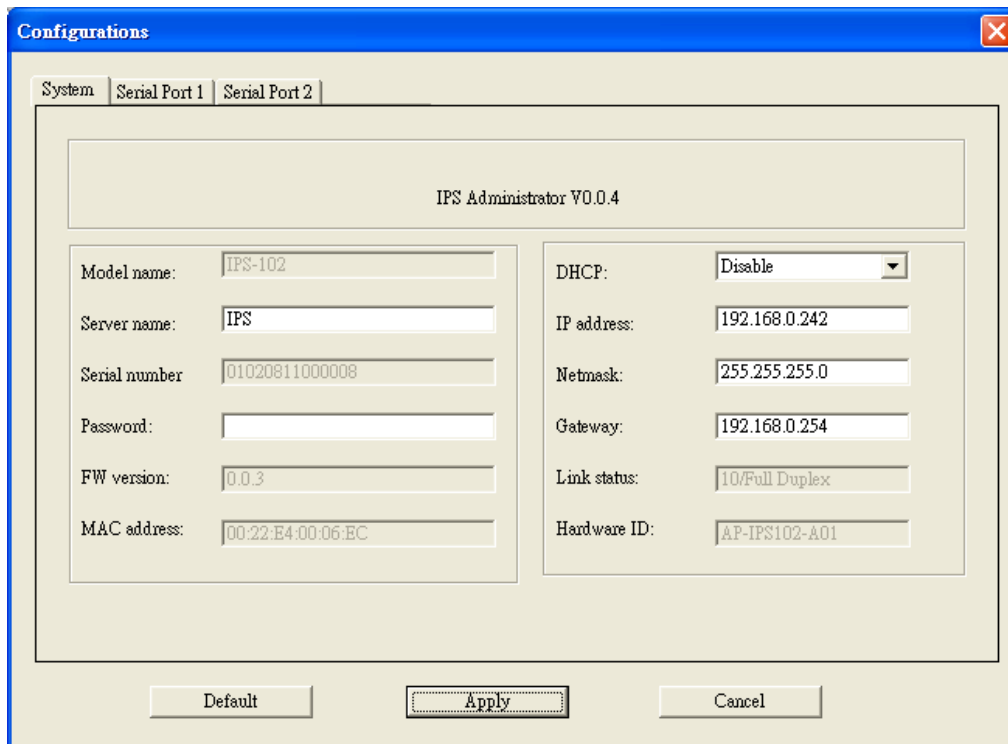


Figure 25 The Configurations Window

Note: IPS Administrator Navigation:

- Use the mouse to select the property and parameters or
- Tab to move to the next property
- Tab+Shift to move back to previous property
- Arrows to move between configurations or change values or contents of the current configuration
- Enter to select Apply or Cancel

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

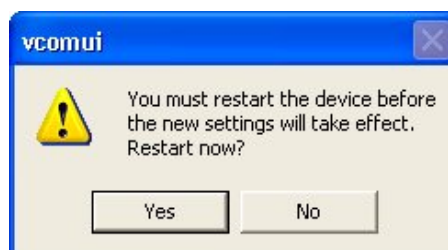


Figure 26 The Restart Dialogue Box

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

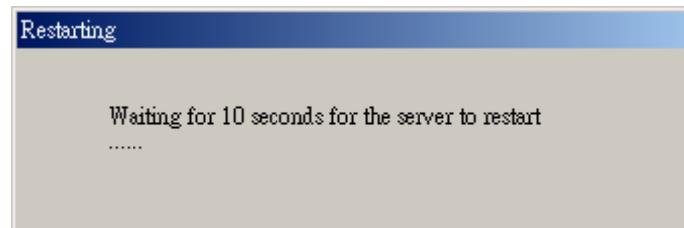


Figure 27 The Restarting Dialogue Box

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

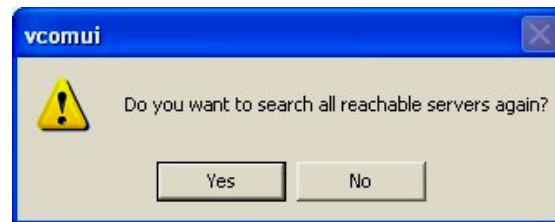


Figure 28 The Search Server Dialogue Box

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

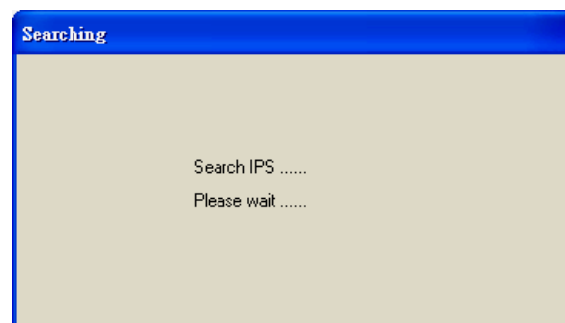


Figure 29 The Searching Dialogue Box

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

5. Configuring the IP Serial Server

The IPS can be configured using any of four different user interfaces: the **IPS Administrator** software, **Console Mode**, **Telnet** or the **Web Server**. The **Configurations** described in this chapter can be changed from any of these user interfaces.

5.1 Description of Configuration - System

The screenshot shows the 'Configurations' window of the IPS Administrator V0.0.4 software. The window has three tabs: 'System', 'Serial Port 1', and 'Serial Port 2'. The 'System' tab is selected. The main area is divided into two columns of configuration fields. The left column contains: 'Model name' (IPS-102), 'Server name' (IPS), 'Serial number' (01020811000008), 'Password' (empty), 'FW version' (0.0.3), and 'MAC address' (00:22:E4:00:06:EC). The right column contains: 'DHCP' (Disable), 'IP address' (192.168.0.242), 'Netmask' (255.255.255.0), 'Gateway' (192.168.0.254), 'Link status' (10/Full Duplex), and 'Hardware ID' (AP-IPS102-A01). At the bottom of the window are three buttons: 'Default', 'Apply', and 'Cancel'.

Figure 30 The Server Configurations Window of IPS Administrator

5.1.1 Model Name

The model highlighted to open for configuration.

5.1.2 Server Name

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

5.1.3 Serial Number

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

5.1.4 Password

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

5.1.5 FW Version

It shows the currently loaded firmware version.

5.1.6 MAC Address

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

5.1.7 DHCP

DHCP servers are a part of numerous LAN management systems. The DHCP field provides two choices: **Disable** and **Enable**. Disable is the normal, or default, setting. When enabled, the IPS will send a DHCP request to the DHCP server, which will assign a dynamic IP address, net mask, and gateway to the IPS. If a DHCP server is not available on the network the IPS will time out after 10 seconds and the default values will remain. When DHCP is enabled, the IP Address, Netmask and Gateway fields become inaccessible and cannot be changed by the user.

Note:

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

5.1.8 IP Address

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

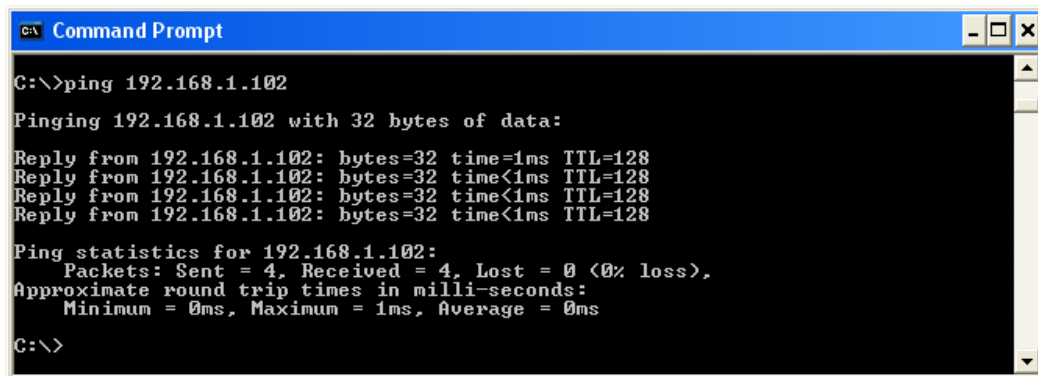
The IP Address of the IPS can be confirmed using the DOS Ping command.

Notes:

To use Ping to check for communications:

- Access a DOS window (in Win-XP click **Start**, then **Run**)

- At run prompt enter: CMD
- In the DOS window enter: Ping xxx.xxx.xxx.xxx (IP address for the server to be confirmed)
- The command will return the Ping results indicating 4 replies



```
C:\> Command Prompt
C:\>ping 192.168.1.102
Pinging 192.168.1.102 with 32 bytes of data:
Reply from 192.168.1.102: bytes=32 time=1ms TTL=128
Reply from 192.168.1.102: bytes=32 time<1ms TTL=128
Reply from 192.168.1.102: bytes=32 time<1ms TTL=128
Reply from 192.168.1.102: bytes=32 time<1ms TTL=128
Ping statistics for 192.168.1.102:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms
C:\>
```

Figure 31 Pinging using the DOS command window

5.1.9 Netmask

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

5.1.10 Gateway

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

5.1.11 Link Status

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

5.1.12 Default

Click on **Default** will force all the configuration settings (except the password) return to their default values.

5.2 Description of Configuration – Serial Port

Each serial port has one configuration page for easy configuration settings. Click to port number interested to open the configuration page.

Note: any changes to Configurations must be **Applied** (Saved) or the IPS will not retain them.

Configurations

System | **Serial Port 1** | Serial Port 2

Basic Settings

Serial type: RS-232 Flow control: None

Baud rate: 115200 TCP/UDP: TCP

Data/Stop bits: 8-1 TCP/UDP port: 4000

Parity: None

Advance Settings

Delimiter 1: 00 Hex (00-FF, 00=disable) Inter-character gap: 0 x100ms (0-65535, 0=disable)

Delimiter 2: 00 Hex (00-FF, 00=disable) Connection status: Not Connected

Force transmit: 0 x100ms (0-65535, 0=disable)

Serial timeout: 0 (0-65535 sec) Max TCP connection: 1

TCP alive: 0 (0-255 min) Connection at: Power up

TCP mode: Server Remote IP address: 255.255.255.255

Default Apply Cancel

5.2.1 Serial Type

Each Serial Port allows configuration to one of the following operation modes:

5.2.1.1 Console (Serial Port 1 only)

The **Serial Port 1** is default set to **Console** mode.

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

In Console Mode the default serial port settings are: **115200** baud, **8** data bits, **1** stop bit, and **No** parity, From Windows, HyperTerminal with VT100 terminal emulation can be used for Console Mode configuration.

5.2.1.2 RS-232

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

5.2.1.3 RS-422

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

5.2.1.4 RS-485(2-wire)

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

5.2.1.5 RS-485(4-wire)

In RS-485(4-wire) mode the currently selected port is configured as a four-wire RS-485 interface supporting transmit lines TXDB(+) and TXDA(-) and receive lines RXDB(+) and RXDA(-) for full duplex operation. The lines are differential with the B line positive relative to A in the idle (mark) state. Ground provides a common mode reference.

5.2.1.6 Upgrade Mode

In Upgrade Mode firmware can be uploaded from a PC via its serial port to the IPS **serial port 1**. Upgrading also can be accomplished via the network connection, using the IPS Administrator software and a virtual COM port.

In Upgrade Mode the default serial port settings are: 9600 baud, 8 data bits, No parity, and 1 stop bit. However, usually the baud rate typically is reconfigured to **115200** kbps to facilitate a faster upload speed.

5.2.2 Baud Rate

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

5.2.3 Data/Stop bits

Set this to match the data format used by the serial device connected.

5.2.4 Parity

Set this to match the data format used by the serial device connected.

5.2.5 Flow Control

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

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

5.2.6 TCP/UDP Protocol

Select **TCP** (Transmission Control Protocol) or **UDP** (User Datagram Protocol) protocol.

TCP Mode

If the application does not require a UDP connection, select TCP. TCP guarantees reliable communication with error checking whereas UDP provides faster transmission.

UDP Mode

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

Configurations

System | **Serial Port 1** | Serial Port 2

Basic Settings

Serial type: RS-232 Flow control: None

Baud rate: 9600 TCP/UDP: UDP

Data/Stop bits: 8-1 TCP/UDP port: 4001

Parity: None

Advance Settings

Delimiter 1: 00 Hex (00-FF, 00=disable) Inter-character gap: 0 x100ms (0-65535, 0=disable)

Delimiter 2: 00 Hex (00-FF, 00=disable) Connection status: Not Connected

Force transmit: 0 x100ms (0-65535, 0=disable)

Destination UDP/IP addresses :		UDP Port :	Source UDP/IP addresses :	
0.0.0.0	to 0.0.0.0	4001	0.0.0.0	to 0.0.0.0
0.0.0.0	to 0.0.0.0	4001	0.0.0.0	to 0.0.0.0
0.0.0.0	to 0.0.0.0	4001	0.0.0.0	to 0.0.0.0
0.0.0.0	to 0.0.0.0	4001	0.0.0.0	to 0.0.0.0

Default Apply Cancel

Figure 32 The Server UDP Configuration Screen

Notes:

1. **Destination UDP/IP addresses:** In order not to over-flood the UDP traffic, we should keep the **Destination UDP/IP addresses** (broadcast range) as small as possible.
2. **Source UDP/IP addresses:** to filter the incoming IP/Port, i.e., only accept UDP packets that come from the assigned source addresses.

5.2.7 TCP/UDP Port

This sets the port number for connection. The default port number for the IPS is **4000** for serial **port 1**. In all modes of operation, **Straight IP** or **Virtual COM**, the port number set in the **Server Configurations** menu must match the **Virtual COM** or socket software port settings.

Note:

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

5.2.8 Connector Type

This is field is for one port model only. There are two connectors to choose from, DB9 or Terminal Block, depends on which connector you will connect to.

5.2.9 Delimiter Hex 1 and Delimiter Hex 2

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

5.2.10 Force Transmit

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

5.2.11 Inter-character Gap

The Inter-byte timer defines the maximum time allowed to elapse since last data byte was received, without being sent.

When inter-byte timer maximum is reached, the TCP/IP protocol packs the data currently in the serial buffer into a packet and sends it out through the Ethernet port.

5.2.12 Connection Status

This field indicates whether a serial port is connected via the IPS to a virtual COM port of a device on the network.

5.2.13 Serial Timeout

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

5.2.14 TCP Alive Timeout

This is "TCP keep-alive" function replacing "TCP alive timeout" function. This feature is effective in server mode only. This field can be set to any value between 0 and 255 minutes. Value 0 disables the function.

If enable, the unit will query the client regularly, if the client fail to respond in the period set in the "TCP alive timeout" the IPS will close the TCP session. So it can prevent TCP connection lockup. This function is especially useful for WINSOCK application, so the IPS won't be deadlocked when

user's application closed improperly or the network link interrupt.

Note: The TCP **Probe** function is for VCOM application, not for WINSOCK application.

5.2.15 TCP Mode

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

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

5.2.16 Max Connection

This field allows the user to configure the IPS to have up to **eight** TCP connections.

5.2.17 Connection At

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

5.2.18 Remote IP Address

This is a security feature activated by entering the IP address of the desired client. The IPS will only communicate with the listed IP address and reject all others.

The default setting is **255.255.255.255.**, which will disable the filter function and will pass all TCP packets.

5.2.19 Apply

Server Configurations must be applied (saved) separately for each serial port.

5.2.19.1 Saving Configuration Data in IPS Administrator

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

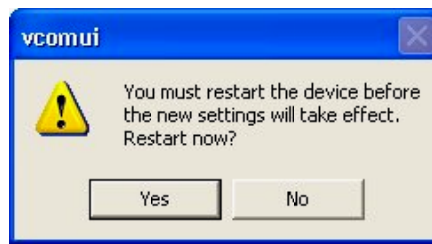


Figure 33 The Restart Dialogue Box

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

5.2.19.2 Saving Configuration Data in Console Mode or Telnet

Saving Server Configurations is done from the **Properties** screen. Access the **Properties** screen by tabbing through the **Page list** of screens on the left side of the window and highlighting **Apply**. There are four options shown on the right side of the **Properties** screen: **Apply**, **Default**, **Reload** and **Restart**. Use **Tab**, **Backspace**, or **arrow** keys to move the cursor to the option position, and then press **Enter**.

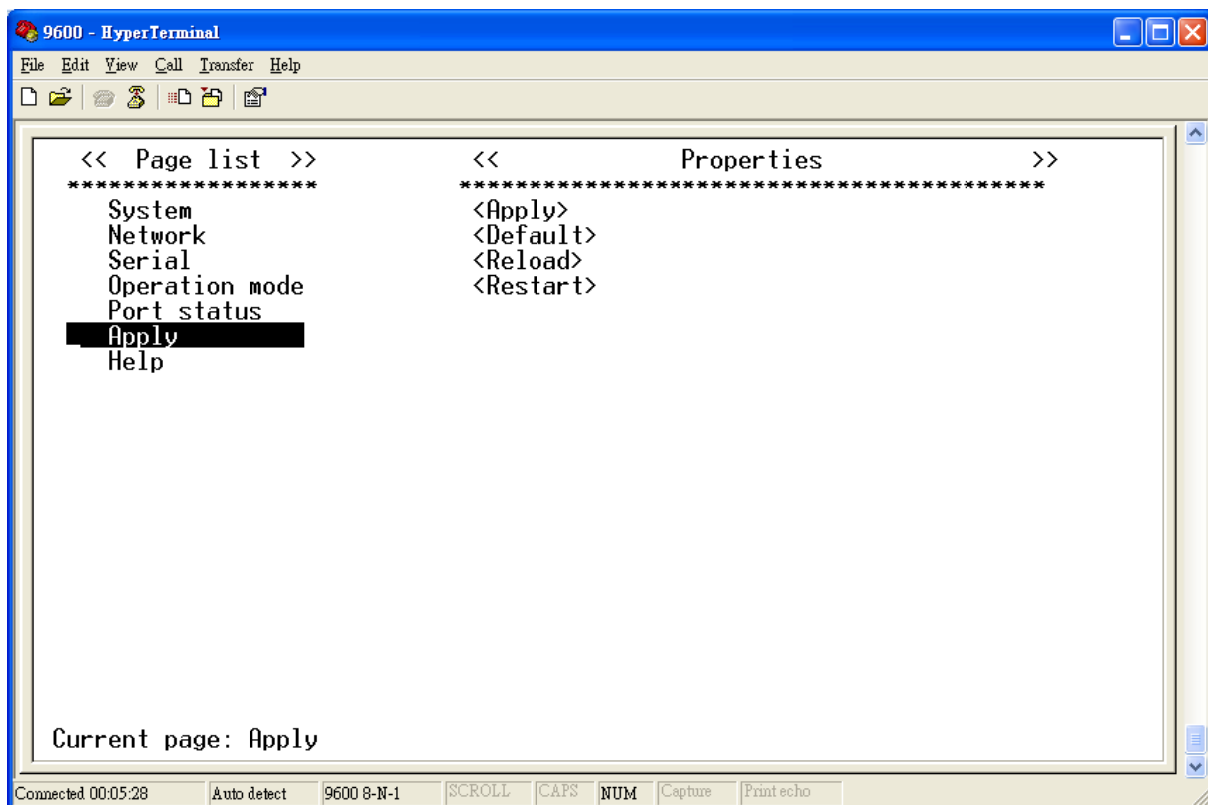


Figure 34 The Console Configuration

- **Apply** -- stores the configuration data to the IPS flash memory and resets it.
- **Default** -- restores the configuration data to factory default settings.
- **Reload** -- restores the configuration data to the last values stored in the flash memory.

- **Restart** -- re-boots the IPS, making it available for a client connection.

5.2.19.3 Saving Configuration Data in Web Server Interface

The Web Server interface provides the same configuration options as IP Administrator or Console does. If a field is changed, you must click **Apply** before leaving that page or the changes will be ignored.

The screenshot shows the 'IP Serial Server' web interface. On the left is a blue sidebar with three menu items: 'System', 'Serial port', and 'Operation mode'. The main content area has a blue header with the text 'IP Serial Server'. Below the header, there are several configuration fields with labels and input boxes. At the bottom of the configuration fields are three buttons: 'Apply', 'Default', and 'Reboot'.

Label	Value
Server name:	IPS
User password:	
DHCP :	Disable
IP address:	192.168.0.242
Network mask:	255.255.255.0
Gateway:	192.168.0.254
MAC address:	00:22:E4:00:06:EC
Link status:	10/Full Duplex
Serial number:	01020811000008
Firmware version :	0.0.3
Server hardware ID:	AP-IPS102-A01

Buttons: Apply, Default, Reboot

Figure 35 The Web Server Configuration

6. Installing Virtual COM Ports

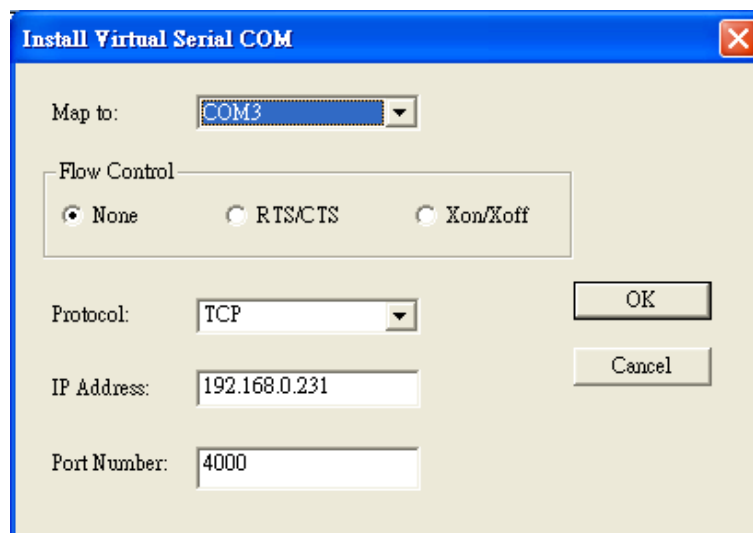
The **Virtual COM Port** feature allows Windows platform software, using standard API calls, to be used in an Ethernet application.

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

6.1 Installing Virtual COM Port

Step 1: From the IPS Administrator, double click on the **Install Virtual COM** icon.

Step 2: Select a port and map it to an unused COM port (e.g. Port 3). Configure it for TCP protocol and the appropriate IP address (determined in the last section).



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

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

6.2 Matching the IPS and Virtual COM Port Settings

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

Step 1: Use Device Manager to view new ports. Confirm the virtual COM ports in the Device Manager.

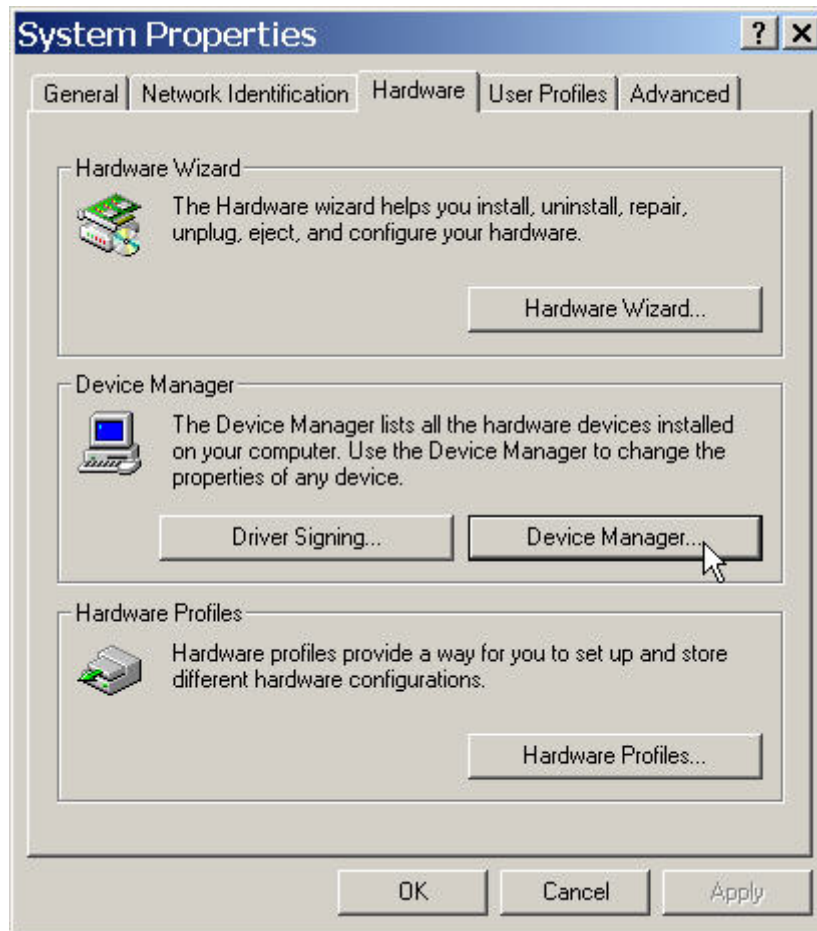


Figure 36 The System Properties Window

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

The installed Virtual COM port will be displayed as IPS (**COM #**).

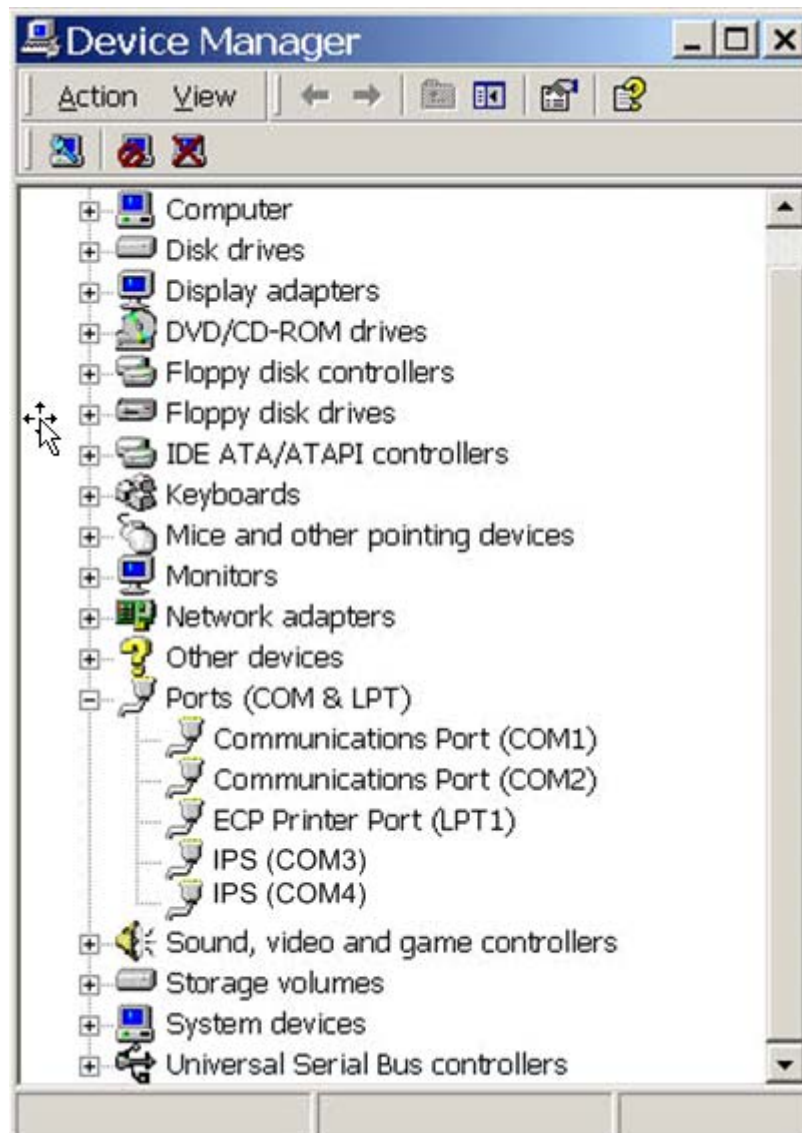


Figure 37 The Device Manager Window

Step 3: In the Device Manager select the **IPS (COM #)**. Double-click it to bring up the **Properties** window.

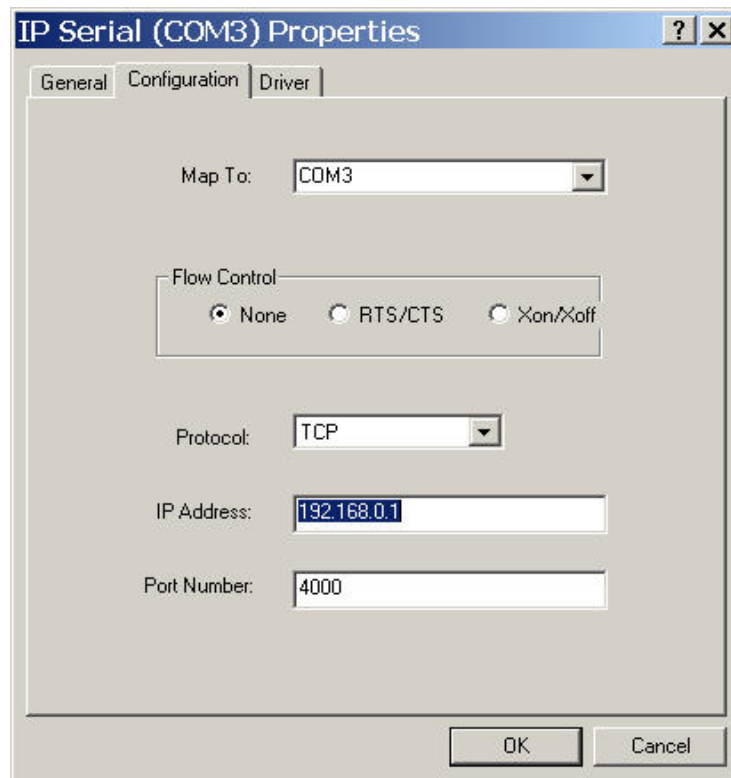


Figure 38 Virtual COM Port Configuration Window

- Step 4:** Click the **Configuration** or **Port Settings** tab. This screen allows the settings to be changed if necessary. Click **Cancel** to keep the existing settings.
- Step 5:** Click **OK** to change the settings. Use **Refresh** in the Device Manager if Windows does not auto refresh.

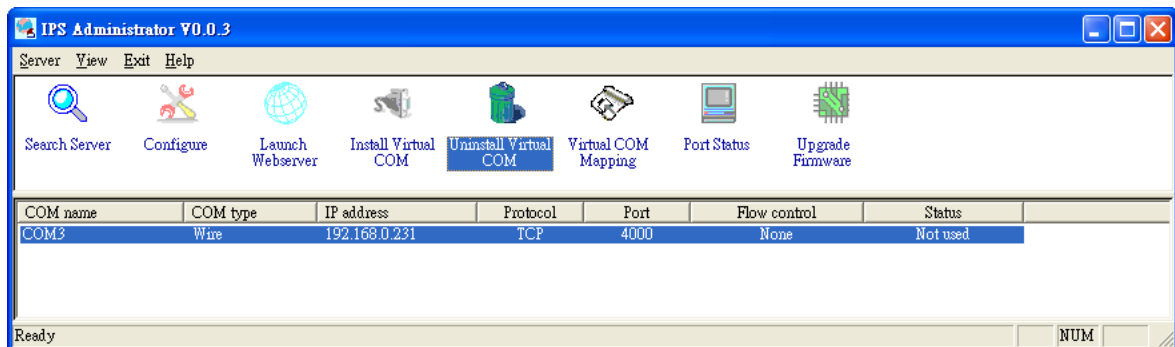
7. Removing Virtual COM Ports

The **IPS Administrator** software **Uninstall Virtual COM Port** feature will remove a mapped COM port in the Device Manager of Windows 2000/2300/ XP/Vista operating systems.

7.1 Removing the Virtual COM port using IPS Administrator

Step 1: Double Click on **Virtual COM Mapping** icon to display the Virtual COM list.

Step 2: Highlight the server in the Virtual COM list of the IPS Administrator, double click on the **Uninstall Virtual COM** icon.



Step 3: The Administrator will ask for conformation. Click **OK** to complete the uninstall procedure.

7.2 Removing the Virtual COM Port using Device Manager

Step 1: From the Windows **Desktop** click:

Start > Settings > Control Panel

Step 2: Click the **System** icon.

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

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

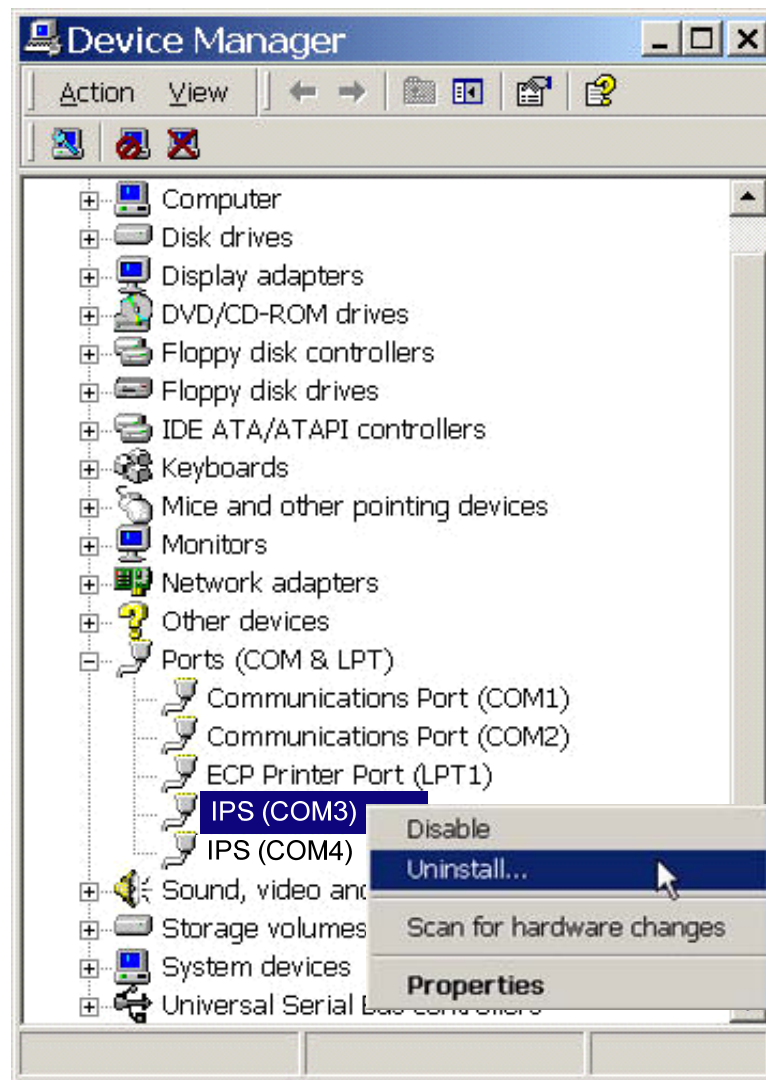


Figure 39 Confirm Device Removal

Step 5: click **OK** to proceed.

The **IPS (COM #)** will be removed and the Device Manager window will refresh and display the remaining COM ports

8. Upgrading the IPS Firmware

New IPS firmware updates may become available through the website for installation into the server. The firmware can be uploaded using either a virtual COM port connection or hardware COM port connection.

The **IPS Administrator** software can upload new firmware to the server using a direct PC connection via the IPS serial port or remotely using a virtual COM port.

Notes:

1. Have a folder to hold the firmware file that will be uploaded to the IPS.
2. If connecting directly to a computer serial port, use a null modem cable between the Computer RS-232 port and the IPS serial **port 1**.

8.1.1 Change to Upgrade Mode

Step 1: In the **IPS Administrator, IP Serial Server List** window, double click the server to be upgraded. The **Configurations** window will appear.

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

Step 3: Set the **Serial type** field to **Upgrade** and click the **Apply** button.

Step 4: Click **Yes** on the **vcomui** dialogue to restart the IPS.

8.1.2 Upgrading the Firmware

Step 5: Double-click the **Upgrade Firmware** icon.

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

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

Note: If connected directly from the PC to an IPS port 1 it will typically be COM1 or COM2. If using a virtual COM port to upgrade via the network, identify the virtual COM number and address mapped to Port 1 on the IPS.

Step 8: Click **Upgrade**

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



Figure 40 Te Port Settings Window

Step 10: Upgrade progress will be shown until the message **Upgrade finished!** is shown.
Click **OK**.

9. Using the Console Mode

Before the IPS is installed on a LAN the **Console** mode can be used to change the settings from the defaults. The IPS is shipped with **Serial type** in **Console** mode. Connect a crossover (null modem) cable between the COM port on the computer and the **serial port 1** on the IPS.

9.1 Entering Console Mode

Enter Console mode via IPS Administrator:

1. Enter the **IPS Administrator**, open the Server Configurations, and set the serial **port 1** to **115200** baud and 8-N-1. Set the **Serial type** to **Console**.
2. Click **Apply** to take effect the settings.

Enter Console mode via Web Page:

1. Use Internet Browser to log in Web server.
2. Enter the **Serial port** page, set the **Serial type** to **Console**.
3. Click **Apply**, and then **Reboot**

9.2 Console Mode Setup

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

Step 2: Using a VT100 Terminal emulation program (such **HyperTerminal** or **PuTTY**) open the computer COM port connected to the IPS (via an RS-232 crossover / null modem cable).

Step 3: Configure a terminal emulation program with the following settings:

- Baudrate = 115200
- Data/stop bits = 8-1
- Parity = none
- Flow control = none

Click **OK**

Step 4: Enter the Console mode via IPS Administrator or Web page.

Step 5: To view the **Configuration Menu**, press the **space bar**. The menu will appear in a second.

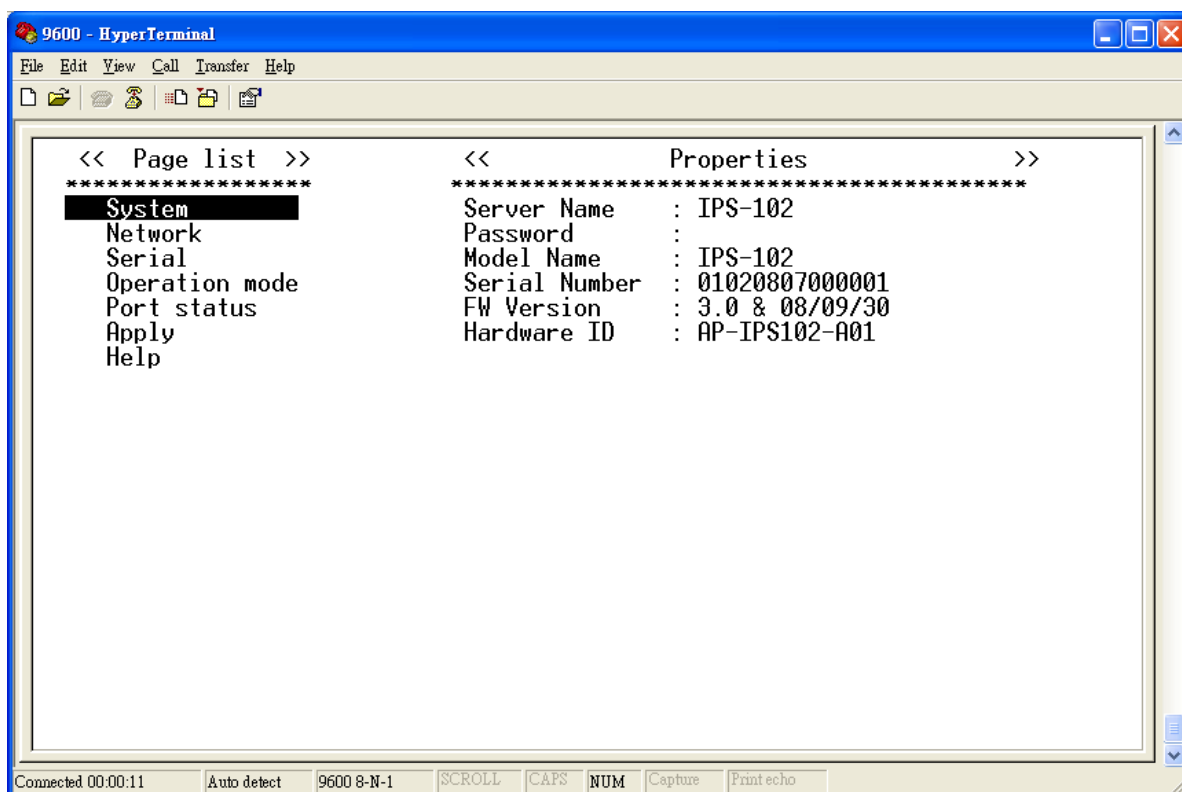


Figure 41 The Console Mode Screen in the HyperTerminal Window

Note !!!

Please set the Emulation type to VT100 mode in your Terminal Emulation Program (e.g., HyperTerminal) or simply use PuTTY (select serial mode), so the left-arrow & right-arrow keys can be functioning.

9.2.1 Navigating the Configuration Menus

There are six **Console Mode** pages: **System**, **Network**, **Serial**, **Operation mode**, **Port status**, and **Apply**, and **Help**. **Tab**, **Back Space** and **arrow** keys can be used to highlight the desired item on the screen list. Pressing **Enter** moves the cursor to the first field of the current screen. The configuration fields can be changed by pressing **Enter** and selecting from the list that appears. The **Esc** key moves the cursor back to the screen list. Pressing the **Space Bar** refreshes the page.

Step 6: Once all the changes have been made move to the **Apply** page and **Enter**, select **Apply** and press **Enter**.

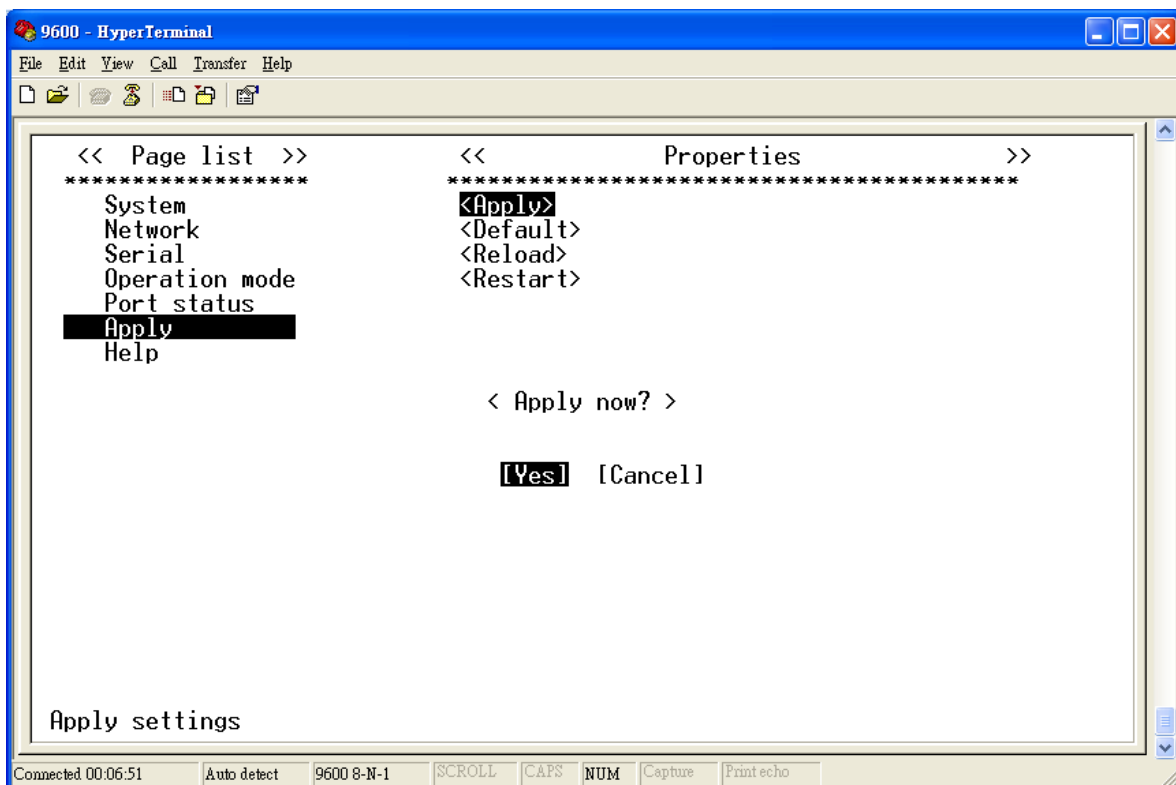


Figure 42 Saving and Restarting the Configuration in Console mode

The restart message will appear.

Step 7: Select **Yes** to save changes.

10. Using the Web Server

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

10.1 Setting Server Configurations

In Internet Explorer type the IP Address of the IPS into the address field near the top of the window and press the **Enter** key. The **General Setting** window will appear:

The screenshot shows the 'IP Serial Server' web interface. On the left is a blue sidebar with three menu items: 'System' (selected), 'Serial port', and 'Operation mode'. The main content area has a green header 'Serial over IP' and a blue title bar 'IP Serial Server'. Below the title bar, there are several configuration fields for the system: 'Server name' (text box with 'IPS'), 'User password' (text box), 'DHCP' (dropdown menu with 'Disable' selected), 'IP address' (text box with '192.168.0.242'), 'Network mask' (text box with '255.255.255.0'), 'Gateway' (text box with '192.168.0.254'), 'MAC address' (text box with '00:22:E4:00:06:EC'), 'Link status' (text box with '10/Full Duplex'), 'Serial number' (text box with '01020811000008'), 'Firmware version' (text box with '0.0.3'), and 'Server hardware ID' (text box with 'AP-IPS102-A01'). At the bottom of the configuration fields are three buttons: 'Apply', 'Default', and 'Reboot'.

Figure 43 The Web Page - System

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

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

The screenshot shows the 'IP Serial Server' web interface with the 'Serial port' configuration page selected in the sidebar. The main content area has a green header 'Serial over IP' and a blue title bar 'IP Serial Server'. Below the title bar, there are two sections of configuration fields. The first section, 'Basic Settings', includes: 'Serial port' (dropdown menu with '1' selected), 'Serial type' (dropdown menu with 'RS-232' selected), 'Baud rate' (dropdown menu with '115200' selected), 'Data/Stop bits' (dropdown menu with '8-1' selected), 'Parity' (dropdown menu with 'None' selected), and 'Flow control' (dropdown menu with 'None' selected). The second section, 'Advance Settings', includes: 'Delimiter 1' (text box with '00' and 'Hex (00-ff, 00=disable)' label), 'Delimiter 2' (text box with '00' and 'Hex (00-ff, 00=disable)' label), 'Force transmit' (text box with '0' and 'x100ms (0-65535, 0=disable)' label), 'Inter-character gap' (text box with '0' and 'x100ms (0-65535, 0=disable)' label), and 'Connection status' (text box with 'Not connected'). At the bottom of the configuration fields are two buttons: 'Apply' and 'Reboot'.

Figure 44 The Web Page - Serial port

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

Serial over IP **IP Serial Server**

System
Serial port
Operation mode

Serial port: 1
TCP/UDP port: 4000
☒ TCP
Serial timeout: 0 (0.65535 sec)
TCP alive timeout: 0 (0.255 min)
TCP mode: Server
Connection at: Power up
Max TCP connection: 1
Remote IP address: 255.255.255.255

☐ UDP

	Destination UDP IP addresses:	Port:	Source UDP IP addresses:
1.	0.0.0.0 to 0.0.0.0	4000	0.0.0.0 to 0.0.0.0
2.	0.0.0.0 to 0.0.0.0	4000	0.0.0.0 to 0.0.0.0
3.	0.0.0.0 to 0.0.0.0	4000	0.0.0.0 to 0.0.0.0
4.	0.0.0.0 to 0.0.0.0	4000	0.0.0.0 to 0.0.0.0

Apply **Reboot**

Figure 45 The Web Page - Operation mode

Click **Apply** to store changes to the IPS. Settings for each Port must be saved separately.

Note:

If you leave any Web Server page without **Apply** (saving), any changes you have made in this page will be ignored.

11. Using the Telnet

A Telnet client can be used to configure the IPS from the LAN. The Telnet window displays the same configuration information shown in Console Mode and allows Server Configurations to be configured. Basically, the configuration interface of Console mode and Telnet are the same. Except that Telnet is remote login to operate.

11.1 Telnet Login

Step 1: Ensure the PC and the IPS are connected to the LAN.

Step 2: Apply power to the IPS. The power and ready LED will light.

Step 3: From the **Desktop**, click **Start**, and then **Run**. The Run dialogue box will open.

Step 4: Type in **Telnet** and the IP address of the IPS to be configured, and then click **OK**.

Step 5: The **Telnet** window will open and the **Server** screen will appear. (Note: the server must **not** in **Console** mode)

Note:

The IPS must be in RS-232, RS-422 or RS-485 mode, **shall not in Console mode**, before you can Telnet to it and access the configuration screens.

11.2 Navigating the Configuration Menu

There are six **Console Mode** pages: **System**, **Network**, **Serial**, **Operation mode**, **Port status**, and **Apply**, and **Help**. **Tab**, **Back Space** and **arrow** keys can be used to highlight the desired item on the screen list. Pressing **Enter** moves the cursor to the first field of the current screen. The configuration fields can be changed by pressing **Enter** and selecting from the list that appears. The **Esc** key moves the cursor back to the screen list. Pressing the **Space Bar** refreshes the page.

Step 6: Once all the changes have been made move to the **Apply** page and **Enter**, select **Apply** and press **Enter**.

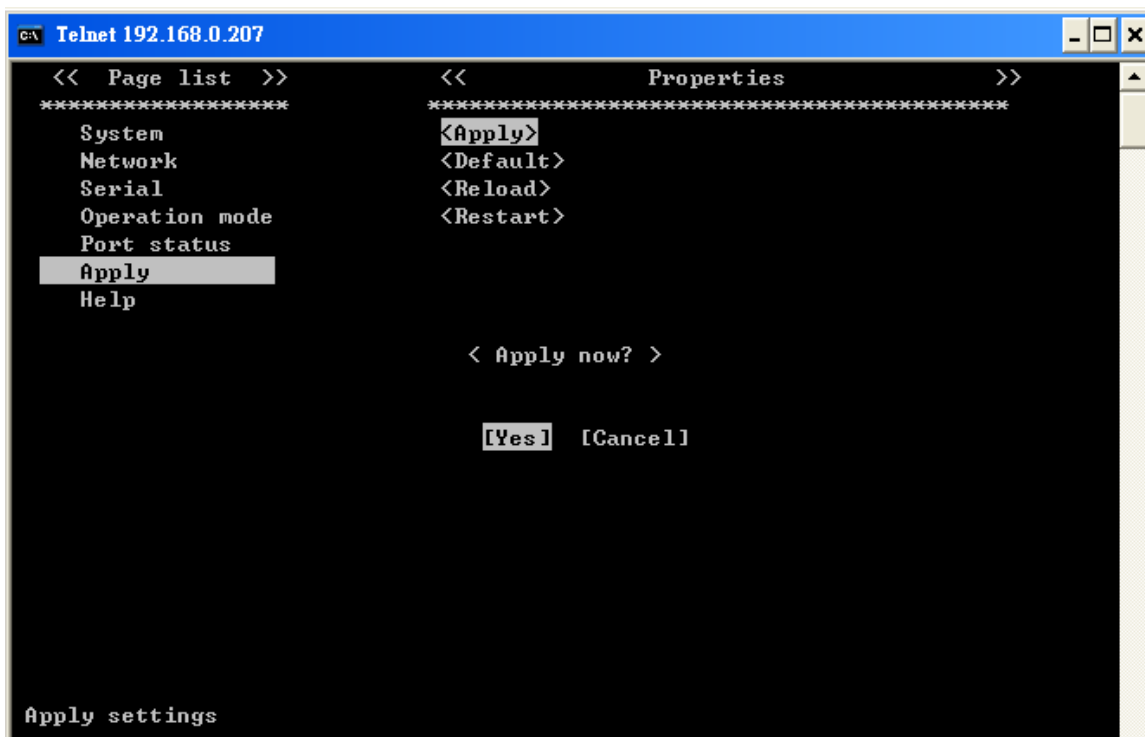


Figure 46 Saving and Restarting the Configuration

The restart message will appear.

Step 7: Select **Yes** to save changes.

12. Technical Data

12.1 Feature List

Feature	Specification	IPS-101 IPS-102 IPS-106	IPS-201 IPS-202 IPS-204
Serial Interface	DB-9M connector	■	■
	Terminal Block Connector	IPS-101	IPS-201
	RS-232 mode	■	■
	RS-422 mode	■	■
	RS-485(2-wire) mode	■	■
	RS-485(4-wire) mode	■	■
	Current Loop	IPS-106	-
	Baudrate (110 to 230.4Kbps, 5787bps, 165250bps)	■	■
	Biasing Resistors on receiving lines	■	■
	Termination resistors & dipswitches	■	■
	Flow Control (None, RTS/CTS, Xon/Xoff)	■	■
	Data Packing Delimiters	■	■
	Forced Transmit , Inter- character Gap	■	■
LAN Interface	Dual LAN port (built-in Ethernet switch), IEEE802.3, 10/100BaseT, Auto-detect	■	■
Communication Types	TCP Server, TCP Client, or UDP	■	■
	Straight IP mode	■	■
	Paired Mode	■	■
	Virtual COM mode (Virtual COM drivers for Windows 2000/2003/XP/Vista)	■	■
	Linux/Unix Virtual TTY driver **	■	■
	WinSock Lib. API	■	■
Protocols	TCP, UDP, IP, ARP, ICMP, HTTP, Telnet, DHCP	■	■
	UDP Multicast	■	■
Protocols Relative Function	Client requests connection at Power up or Data arrival	■	■
	TCP Inactivity Timeout	■	■
	Serial Inactivity Timeout	■	■
	Multiple TCP Client Connections (8 per port)	■	■
	TCP Probe function	■	■
Management	Console, Telnet, Web pages	■	■
	Remote Administrator	■	■
	Firmware upgrade	■	■
	Import/Export Configurations file	■	■
Security	Password Access	■	■
	IP Address Filtering	■	■
Power & Environment	DC Input (Power Jack): 10-48VDC	■	IPS-204
	DC Input (Terminal Block): 10-48VDC	-	■
	Operating Temperature (0 to 55 °C)	■	■
	Wide Operating Temperature (-45 to 75 °C)	("-" version)	("-" version)
Certifications	CE, FCC	■	■
Mechanical	Rugged IP30 Metal Case	■	■
	DIN rail mount, Panel mount, or Desktop	■	■
	Dimensions(mm)	107 x 115 x 23	107 x 115 x 23
		107 x 115 x 23	107 x 115 x 23
		107 x 185 x 29	121 x 185 x 23

12.2 Default Settings

The IPS Default Settings are as follows:

Model Name:	xxxxxxx(the model detected)
Server Name:	IPS
Serial Number:	xxxxxxxxx(printed on bottom of the unit)
Password:	(No Password)
DHCP:	Disable(Static)
IP Address:	192.168.0.1
Net Mask:	255.255.255.0
Gateway:	192.168.0.254
MAC Address:	xx:xx:xx:xx(printed on bottom of the unit)
FW Version:	current firmware version number & date
Baud Rate:	115200
Data/Stop bits:	8-1
Parity:	None
Flow Control:	None
TCP/UDP Protocol:	TCP
Serial timeout:	0 second
TCP alive timeout:	0 minute
TCP Mode:	Server
Delimiter Hex 1:	00
Delimiter Hex 2:	00
Force Transmit:	0 ms
Inter-character Gap:	0 ms
TCP/UDP port:	Port 1: 4000 Port 2: 4001 Port 3: 4002 Port 4: 4003
Serial Type:	Console for Port 1, RS-232 for other ports
Max connection:	1
Remote IP Address:	255.255.255.255

Appendix A: TCP/UDP Port Numbers and Firewall

Port numbers are divided into three ranges: Well Known Ports, Registered Ports, and Dynamic and/or Private Ports. Well Known Ports are those from 0 through 1023. Registered Ports are those from 1024 through 49151. Dynamic and/or Private Ports are those from 49152 through 65535.

Well Known Ports are assigned by IANA, and on most systems, can only be used by system processes or by programs executed by privileged users. Table below shows some of the well-known port numbers. For more details, please visit the IANA website:

<http://www.iana.org/assignments/port-numbers>

Port Number	Protocol	TCP/UDP
21	FTP (File Transfer Protocol)	TCP
22	SSH (Secure Shell)	TCP
23	Telnet	TCP
25	SMTP (Simple Mail Transfer Protocol)	TCP
37	Time	TCP, UCP
39	RLP (Resource Location Protocol)	UDP
49	TACACS, TACACS+	UDP
53	DNS	UDP
67	BOOTP server	UDP
68	BOOTP client	UDP
69	TFTP	UDP
70	Gopher	TCP
79	Finger	TCP
80	HTTP	TCP
110	POP3	TCP
119	NNTP (Network News Transfer Protocol)	TCP
161/162	SNMP	UDP
443	HTTPS	TCP

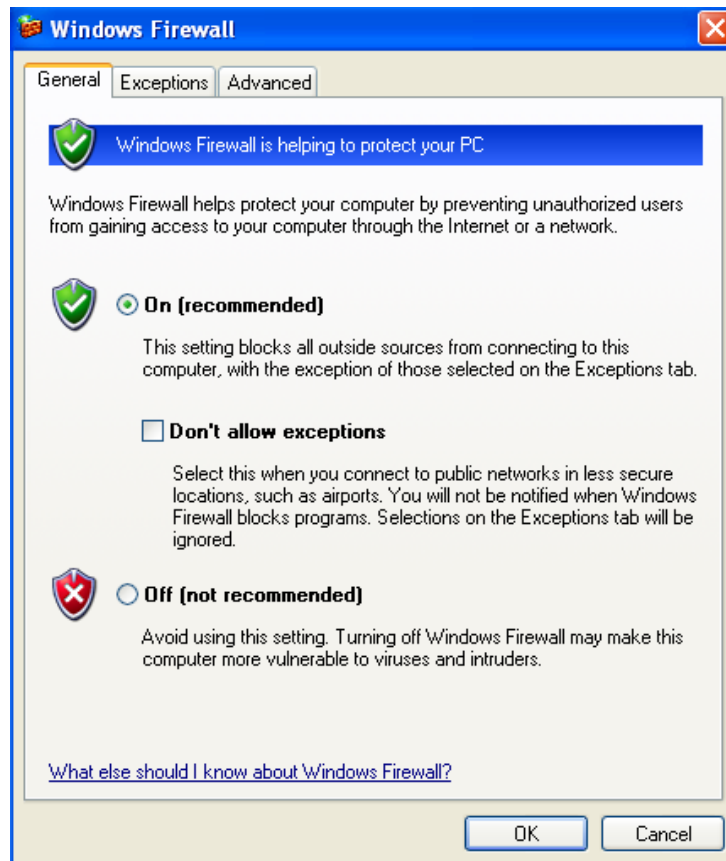
Notice !!!

Please reserve the following port numbers for the IPS operation: **6400** (TCP probe/cmd), **6666**(UDP search all), **6669(UDP cmd)**, and **6690** (UDP search specific).

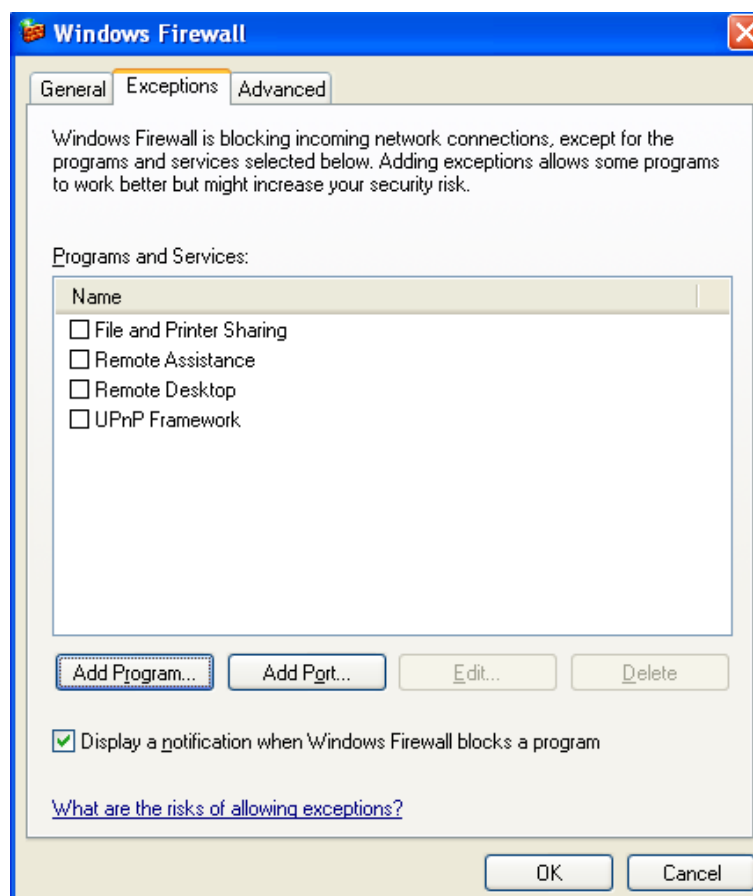
Your attached firewall device shall not block the reserved port numbers mentioned above, the port numbers specified in **TCP/UDP port** in **Configurations** window.

The example below is to configure the Windows Firewall settings, so as to let IP packets of IPS Administrator to pass through the firewall to reach the IP Serial Server unit.

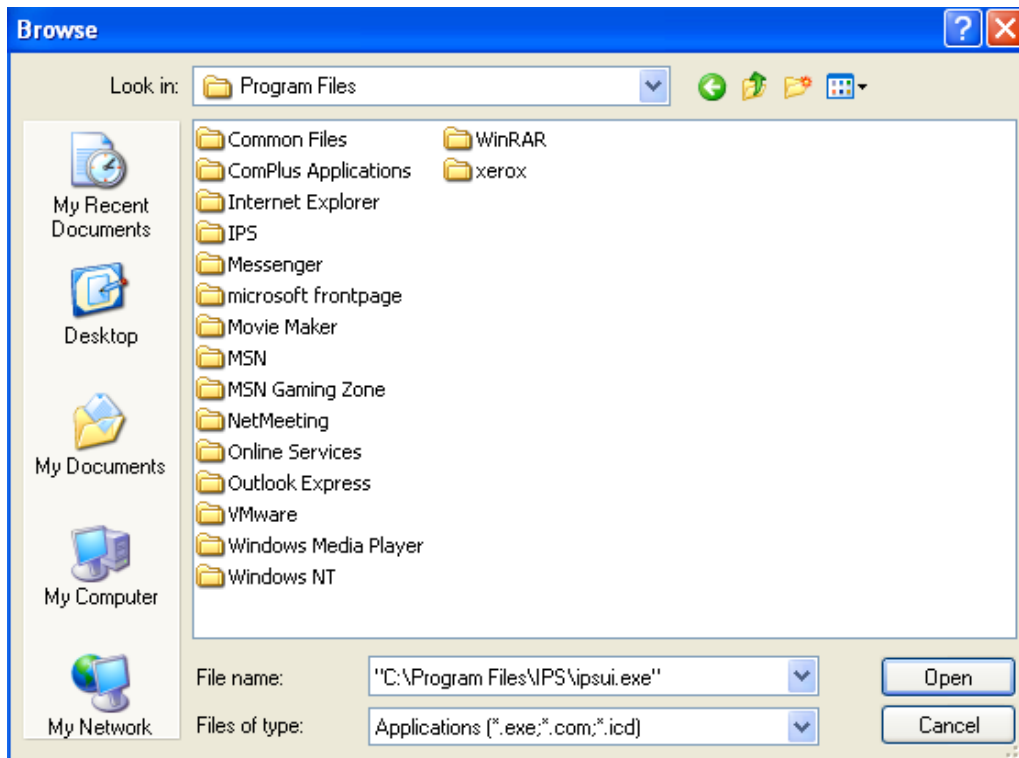
1. Open the Windows Firewall window



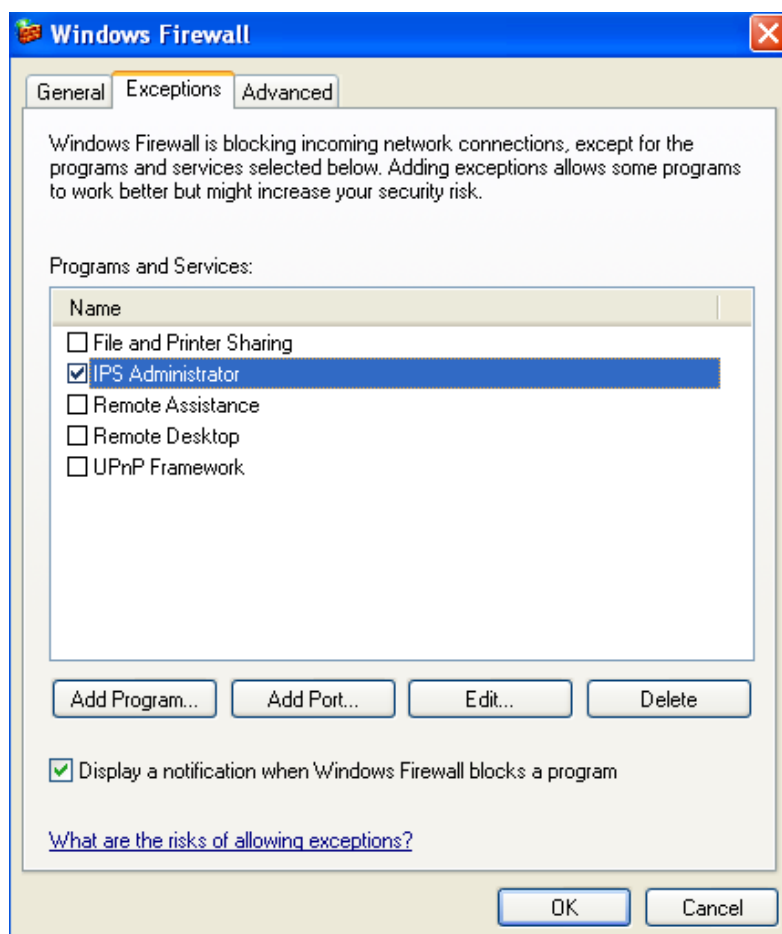
2. Select Exception if Firewall is On, click on **Add Program**



3. Select the **IPS Administrator** program in Program Files, click on **Open**

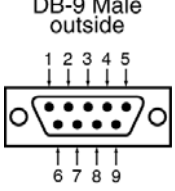


4. You will see the **IPS Administrator**, check it and click **OK**



Appendix B: Serial Port Pin-outs

DB-9M Pin-outs Summary

	Pin	RS-232	RS-422/RS-485 full-duplex (4-wire)	RS-485 half-duplex (2-wire)
	1	DCD	RDA (-)	DATA A (-)
	2	RXD	RDB (+)	DATA B (+)
	3	TXD	TDB (+)	
	4	DTR	TDA (-)	
	5	GND	GND	GND
	6	DSR		
	7	RTS		
	8	CTS		
	9	RI		

Terminal Block Pinouts

	TB Pos	RS-422/485 full-duplex (4-wire)	RS-485 half-duplex (2-wire)
	A	RDA (-)	DATA A (-)
	B	RDB (+)	DATA B (+)
	C	TDB (+)	
	D	TDA (-)	
	E	GND	GND

Note:

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

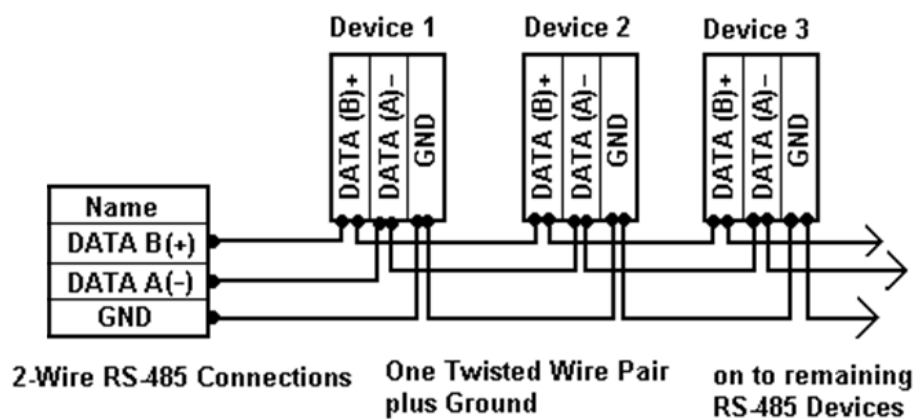


Figure 47 2-wire RS-485 Connection

Appendix C: Ethernet Cable Pin-outs

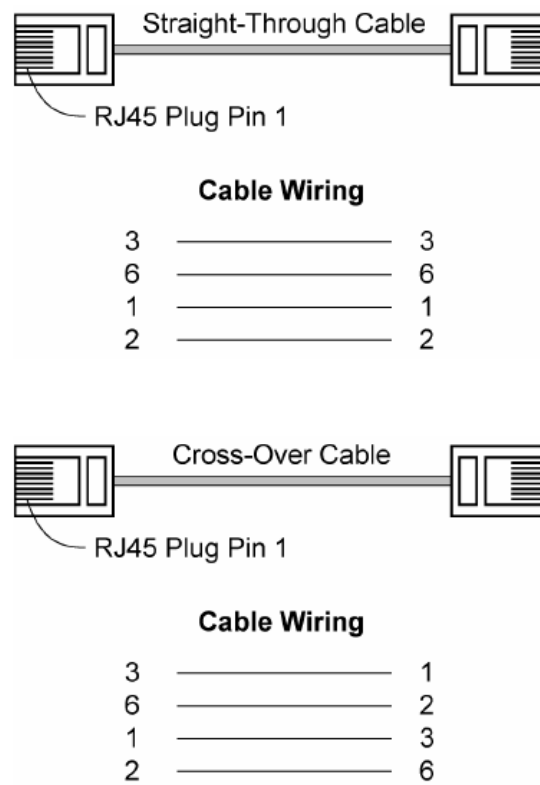


Figure 48 Ethernet Cable Pin-outs

Appendix D: Regulation Information

Regulation Information

FCC

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a commercial installation. This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. Operation of this equipment in a residential environment may cause harmful interference.

CE

This equipment has been tested and found to comply with the CE regulations of Class A.

RoHS

All contents of this package, including products, packing materials and documentation comply with RoHS.

