

ComPort Redirector User Guide

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11/23/04	A	GR	Preliminary Release
11/14/05	B	GR	Add TCP Port offset. Notes for RAW Mode. Notes for Redirector 3.0.0.2.
04/11/07	C	GR	New version of Redirector. Release version 4.0.0.1 All new interface and setup.
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1. ComPort Redirector

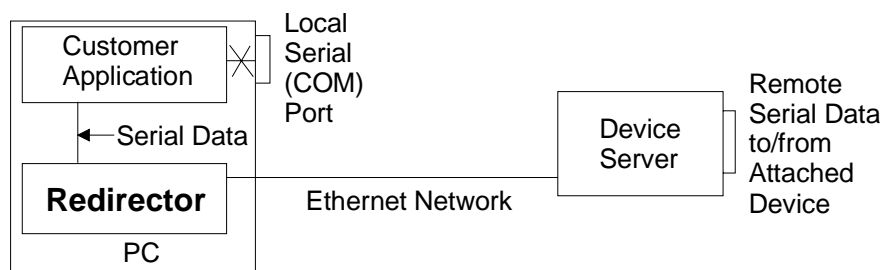
Com Port Redirector v.4.3.0.0, is a software utility for network-enabling software applications that do not have network support. If you software currently uses a COM port for communication, CPR can redirect the communication path to an Ethernet connection.

Com Port Redirector installs virtual communication ports; these communication (com) ports are redirected over a network to the serial port of a device server.

Com Port Redirector consists of the following modules:

CPR Manager enables you to map com ports to device servers.

CPR Monitor enables you to identify and troubleshoot problems.



In most cases, legacy software that uses the virtual com ports created with Com Port Redirector encounters no problems and acts as if it were communicating with a physical com port. Not all software applications, however, are suited for use with Com Port Redirector.

Serial port software applications are designed for direct communication with the serial device being managed. However, when device servers are used across a network, latency can occur with the connection from the software to the managed serial device. Some software applications have timing constraints for data transmitted and received on com ports. In some cases, a software application will not wait long enough to receive a response from the serial device being managed. As a result, the software assumes the serial device is not responding and times out.

1.1 Non-Redirected Connections vs. Redirected Connections

Most software applications that need to use the Com Port Redirector have been designed to connect directly to the serial device being managed. This connection is achieved using a direct cable connection from a com port on the personal computer (PC) running the software utility to the serial port of the serial device being managed. With this configuration, the PC and the managed serial device reside on an isolated serial network. The traffic passed on the physical media between them is intended for either the PC or the serial device. Latency is not an issue in this scenario.

When the same software applications are used with the Com Port Redirector, the applications are no longer directly attached to the serial device being managed. Instead, all traffic between the software application and the serial device is routed as follows:

1. From a virtual com port, the data is stripped out of a serial packet and placed into an IP packet.
2. The serial packet is sent from the virtual com port to a network interface on the PC.
3. Data is transmitted over the network, through switches or routers, to the network interface on a device server.
4. From the network interface on the device server, the data converts from an IP packet back to a serial packet.
5. Once in a serial packet, data is transmitted down the physical media to the serial device.

This process introduces latency. The amount of latency associated with this type of connection is determined by the amount of network latency. The more traffic on the network, the greater the latency between the PC running the software application and the device server.

To address latency, Com Port Redirector provides a **No Net Close** option in the Port Settings dialog box (click **Port Settings** from the COM Port Redirector Configuration window). This option keeps the TCP/IP connection open when the com port is closed, reducing latency.

1.2 Direct Cable vs. Virtual Connections

A direct cable connection from a com port on a personal computer (PC) to a serial device may use some signals that are not available on a virtual connection. Some direct cable connections require the use of modem control signals such as Data Terminal Ready (DTR), Data Set Ready (DSR) and Carrier Detect (CD). These signals are generally not available on a virtual com port connection. In many applications, these signals can be connected together to simulate a hardware connection.

Many Serial-to-Ethernet adapters, like the NET232, have only the Transmit Data (TX), Receive Data (RX), Ready to Send (RTS) and Clear to Send (CTS) signals available for the serial device. This may require some changes to the cable connections or changes to the serial port protocol for the serial device in order to use Com Port Redirector.

2. Requirements

The following items are required to run CPR version 4.2.1.1:

1. x86 (32bit): Windows XP, 2003 Server, Vista, 7, and 2008 Server
x64 (64bit): Windows Vista, 7, and 2008 Server
2. Microsoft .NET Framework v4.0 for CprManager.exe and CprMonitor.exe only.
3. 30MB free hard drive space.
4. Device Servers must have firmware version 6.5.0.6 or greater to use RFC2217 (TruPort) capability.

Microsoft .NET Framework v4.0 is included on the distribution CD.

See the Release.txt file in the Redirector folder for more information.

The application installation directory defaults to C:\Program Files\CPR, unless another folder is selected during the installation process.

A shortcut to this application is created on the Start/Programs menu for CprManager and CprMonitor.

3. Installing Com Port Redirector

3.1 Install Redirector

1. Insert the product CD into your CD-ROM drive. The CD will automatically start and display the main window. In the following examples, the NET232 Serial to Ethernet Adapter CD is used.

If the CD does not launch automatically:

- a) Locate your CD Drive. Example: CD-RW Drive (D:)
- b) Double-click on **autorun.exe** to start the CD browser.

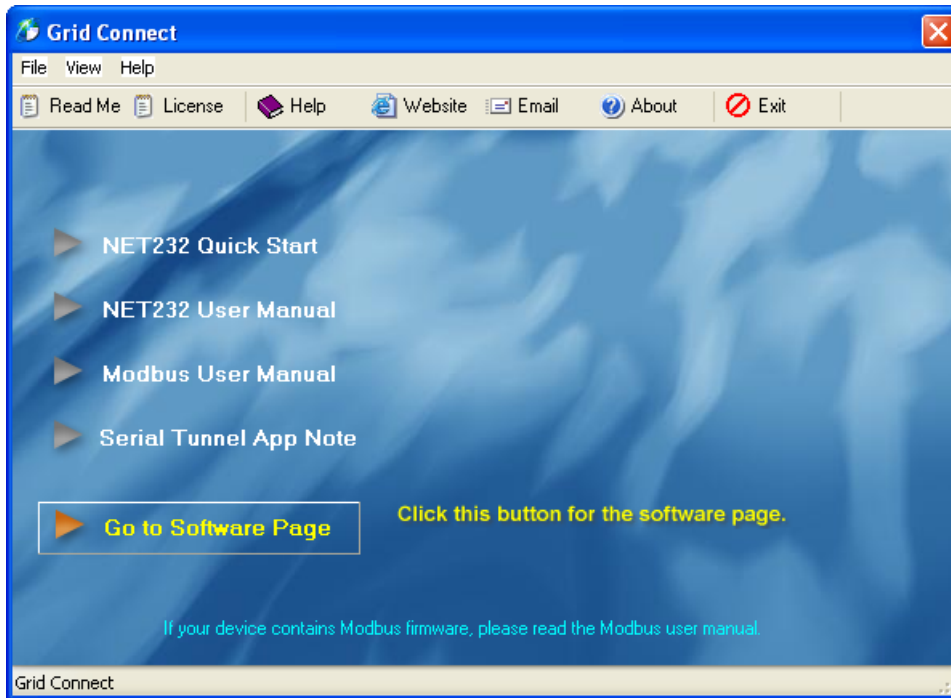
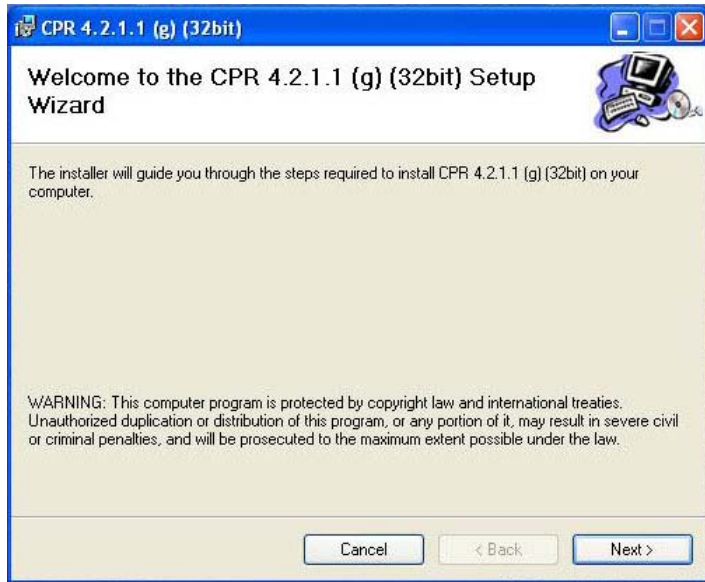


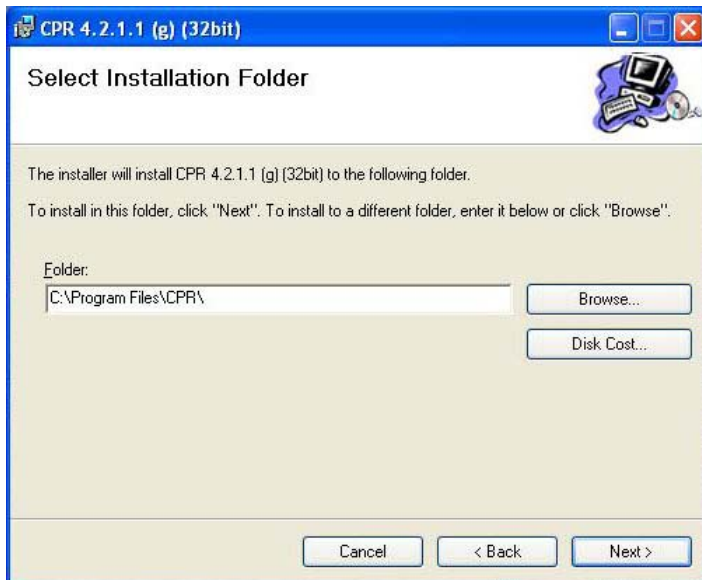
Figure 1 – CD Browser Main Window

2. Click the **Go to Software Page** button.

3. Click the **Comm Port Redirector** button. The Setup Wizard window appears. The setup uses a web browser to download the file. If you do not have web access, use the standalone install file found in the Redirector_4300 folder.

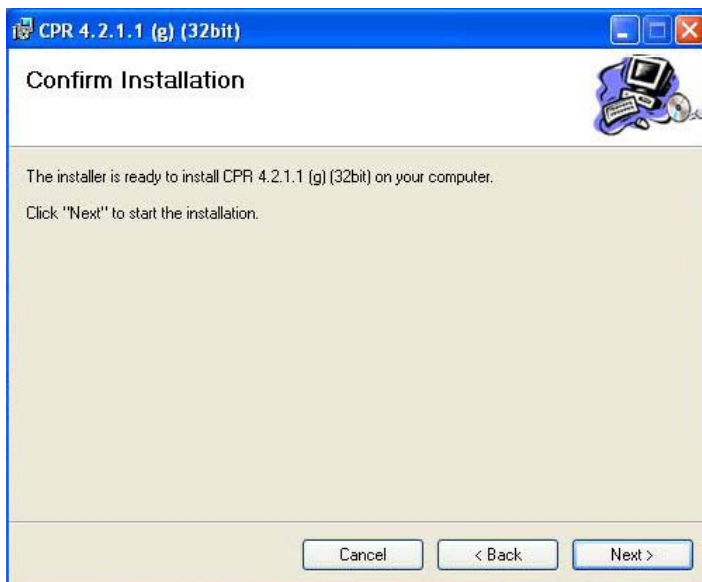


4. Click **Next** to continue. The **Select Installation Folder** dialog box appears.



The path under **Folder** shows where the Com Port Redirector software will be installed. We recommend the default location. To change this location, click the **Browse** button and select a different location.

5. Click the **Next** button and the Confirm Installation dialog appears.

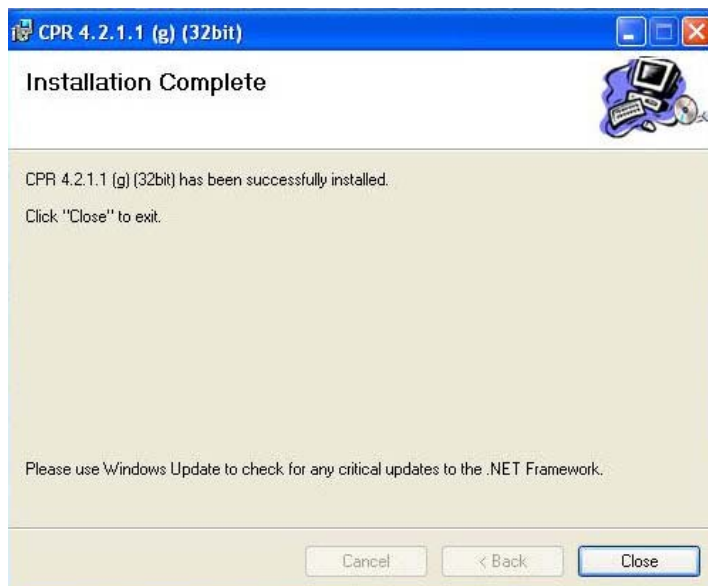


6. Click **Next** to begin the installation.

*Note: You may see the following warning:
Click the **Continue Anyway** button to proceed with the installation.*



7. When the setup is complete, the following message appears.



8. Click **Close** to complete the installation and reboot your computer.

Note: Before you can use the program, you must restart your computer.

3.2 RUN ComPort Redirector

Click the **Start** button in the Windows Taskbar, point to **Programs, Lantronix, CPR 4.3** , and select **CPR Manager**

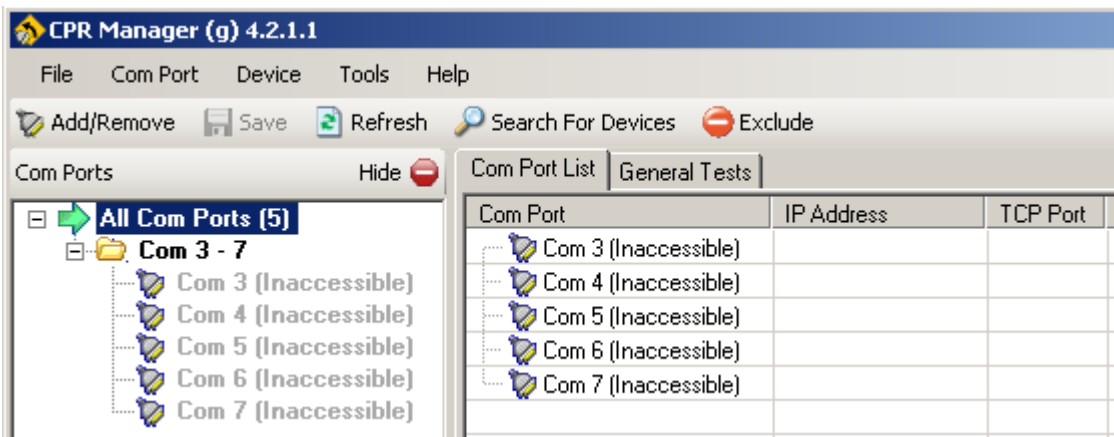
The CPR Manager Configuration window appears.

CPR enables you to create up to 255 com ports. The tree structure in the left pane of the window displays existing com ports, and the Com Port List tabbed page lists them on the right, along with additional information, if available.

To view com port information:

1. Click on **All Com Ports** in the left pane or press **F5**.

Note: The following screen is for an earlier version. The screen for CPR Manager 4.3 is the same.




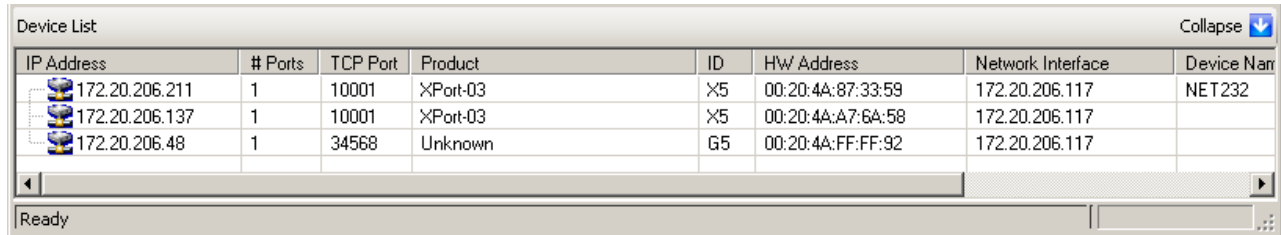
You can view the following information for each assigned com port in the right pane.

- IP address of the device server to which the com port is connected.
- IP port on the device server to which the com port is connected. For example, 10001 if using channel 1.
- Status of the connection between the com port and the device server.

3.2.1 Search Devices

Use the search feature to list the device servers currently on the network. You can name a device server and its TCP port and hide or display the list of devices servers.

Click the search icon  located on the toolbar. A list of device servers on the local network displays in the **bottom pane** of the window.



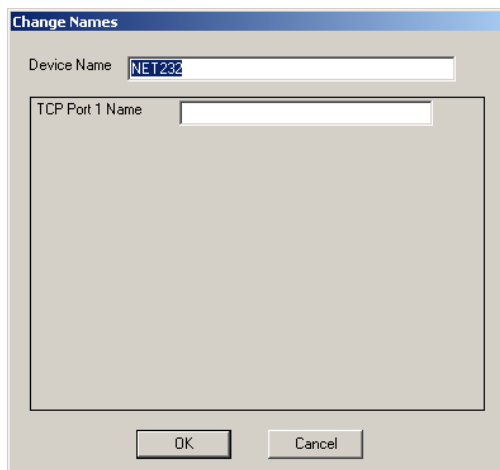
IP Address	# Ports	TCP Port	Product	ID	HW Address	Network Interface	Device Name
172.20.206.211	1	10001	XPort-03	X5	00:20:4A:87:33:59	172.20.206.117	NET232
172.20.206.137	1	10001	XPort-03	X5	00:20:4A:A7:6A:58	172.20.206.117	
172.20.206.48	1	34568	Unknown	G5	00:20:4A:FF:FF:92	172.20.206.117	

You can view the following information about found device servers:

- IP address of the device server to which the com port is connected.
- Number of Ports available on the device
- TCP Port (Local Port setting) on the device server to which the com port is connected. Default setting for most XPort-03 devices is 10001.
- Product name, for example, XPort-03.
- ID: The device server type identifier (ID of the product).
- HW Address or Hardware address (also called MAC or Ethernet address) that identifies the unit. It is on the product label, in the format: 00-20-4a-XX-XX-XX, where the XXs are unique numbers assigned to the product.
- IP address of the Network Interface
- Device Name is a user-supplied name that identifies the device server.
- Port Name is a user-supplied name to identify the port.

To name a device server and port:

1. In the Devices pane, right-click in the device's row. A pop-up menu displays.
2. Select **Change the Device and Port Names**. The Change Names dialog box displays.



Change Names

Device Name:

TCP Port 1 Name:

OK Cancel

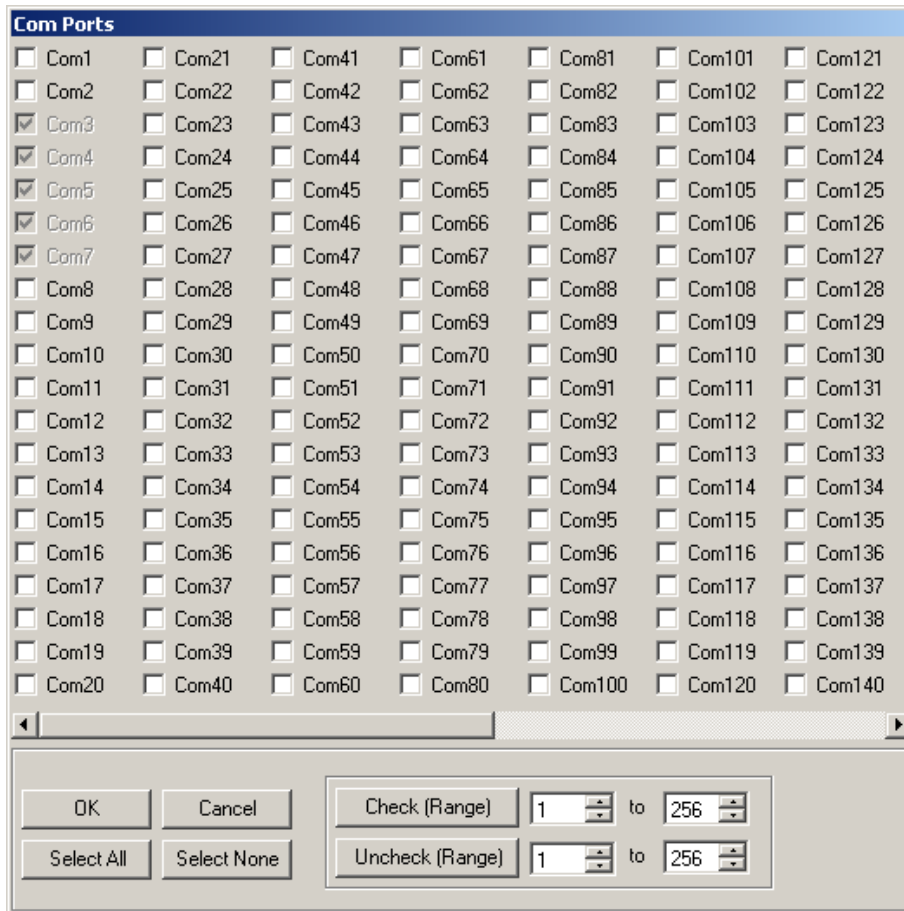
3. Enter the Device Name and TCP Port Name and click OK.

3.3 Add Com Ports

Com Port Redirector allows up to 255 com ports.

Note: Any com ports on the system that are not CPR virtual com ports are inaccessible.

To select and configure a com port, click the **Add and Remove Com Ports** icon  located on the toolbar or select **Add and Remove** from the Com Port menu.



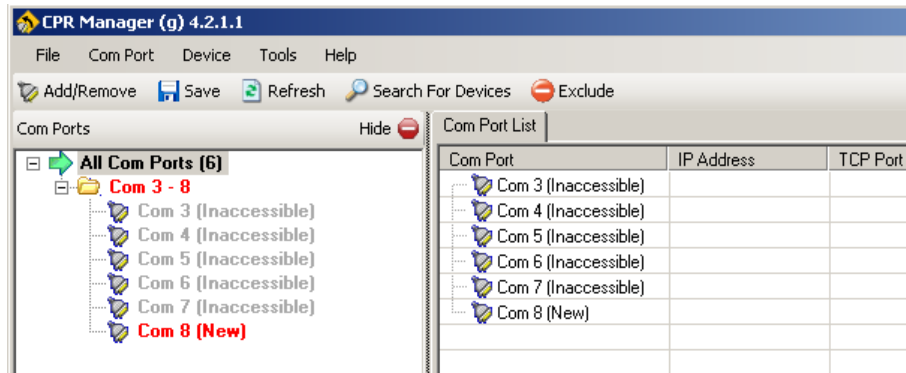
Select an unused com port. The physical communication ports on the computer are displayed as gray and unavailable. The unavailable ports will vary depending on the make and model of your computer.


Do one of the following:

- To select com ports individually, select the appropriate checkboxes.
- To select a range of com ports, enter the beginning and end of the range to the right of the Check (Range) button and click the button.
- To select all of the com ports, click the Select All button.
- To clear all checkboxes, click the Select None button.

Click the OK button. The dialog box closes. The added com ports display in red and are identified as new. The word "Modified" displays at the bottom of the window.


Note: The following screen is for an earlier version. The screen for CPR Manager 4.3 is the same.



To save the settings, click the Save icon .

3.3.1 Remove Com Ports

To remove a com port:

Click the Add or Remove icon , or select Add and Remove from the Com Port menu.

Do one of the following:

- To remove com ports individually, clear the appropriate checkboxes.
- To remove a range of com ports, enter the beginning and end of the range to the right of the Uncheck (Range) button and click the button.
- To select no checkboxes, click the Select None button.

Click the OK button. The dialog box closes. Removed com ports that were never saved no longer display. Removed com ports that were saved previously have "marked for deletion." beside their names.

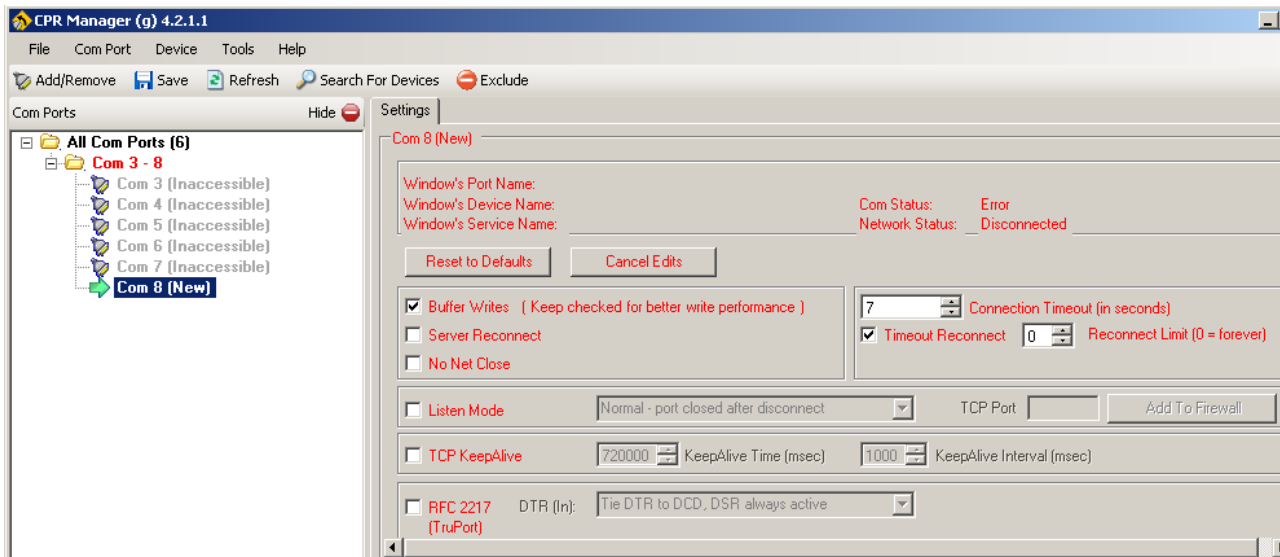
To save the changes, click the Save icon. The removed com ports no longer display.

3.3.2 View Com Port Settings

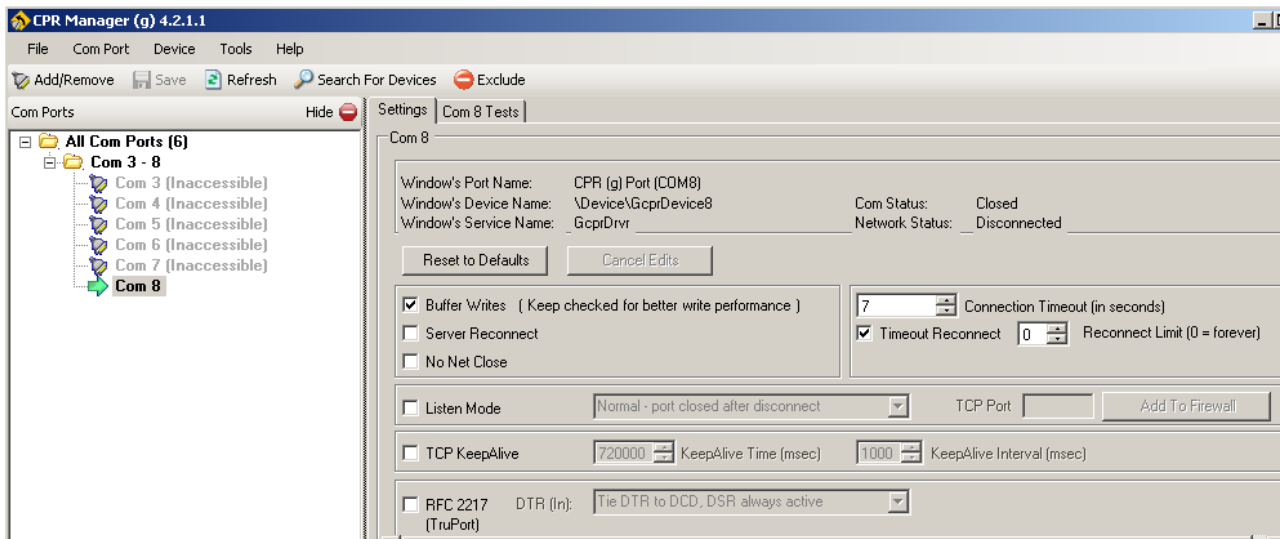
To view the com port settings, click on the selected com port in the left pane.

For the following example, com port 8 has been selected.

Note: The following screen is for an earlier version. The screen for CPR Manager 4.3 is the same.



Note the Settings tab shows the Com 8 settings in RED. Click the save settings icon  on the toolbar to save any new settings.



3.4 Configure the Com Port

You must configure a new com port before it can be used by any communications software.

To configure com port settings click the com port in the tree structure. The Settings dialog box lets you define various settings for redirected com ports. The settings selected from the Settings dialog box are on a per-port basis.

Setting	Description
Buffer Writes	If selected, when an application opens a COM port and starts writing to that port, CPR will buffer those writes and try to send as many as possible in a single TCP packet (speeds processing).
Server Reconnect	If selected, enables the com port to reconnect to the device server after the device server disconnects from CPR.
No Net Close	If selected, when an application closes the com port, CPR does not close the network connection. To disconnect CPR from the device server, right-click the com port in the com port tree view on the left or in the Com Port List on the right, or select Disconnect on the Com Port menu.
Connection Timeout (in seconds)	Number of seconds the com port should wait before attempting to connect to the next device server in the list, or before aborting the connection attempt.
Timeout Reconnect	If selected, CPR re-establishes the connection if the connection times out. When auto-reconnecting, CPR tries to reconnect until the connection succeeds or the number of tries reaches the value in Reconnect Limit .
Reconnect Limit (0 = forever)	The number of times CPR attempts to re-establish the connection. A value of 0 means CPR will continuously attempt to connect.
Listen Mode	If selected, CPR listens on the configured TCP port for incoming connection requests. There are two kinds of Listen Mode. From the drop-down list, select one of the following: Normal - port closed after disconnect: The TCP port will close once the connection to the device server is broken. Auto- back to listen mode after disconnect: CPR goes back into Listen Mode once the connection is broken.
TCP Port	The number of the TCP port you want CPR to listen on. Click the Add to Firewall button to add the TCP port to the firewall's exclusion list if the firewall is turned on. The firewall will then allow traffic on this TCP port.
TCP KeepAlive	CPR uses the TCP protocol to detect when connections are no longer valid. To enable this capability, select the checkbox. (See the device server's user guide for more information.)
KeepAlive Time (msec)	The time, in milliseconds, that TCP will poll the connection with the device server.
KeepAlive Interval (msec)	If TCP detects a connection failure, it will poll for the connection every KeepAlive Interval milliseconds that you specify here. If, after 5 tries, the connection is still invalid, TCP will notify CPR, and CPR will tear down the connection socket. If the CPR port is in Listen Mode - Auto, the CPR port will go back to listening on the appropriate TCP port.
Use RFC 2217	Com port control option protocol that controls: Device server serial port settings (baud rate, data bits, parity, stop bits, flow control) DTR relationships to DCD and DSR serial port signals across the network.
DTR	If you selected Use RFC 2217 , select one of the options to tie the remote DTR with the DCD and DSR of the virtual com port. The default is to tie DTR to DCD and keep DSR always active.
Tx Empty	If you selected Use RFC 2217 , select one of the following options from the drop-down list: CPR Transmit Buffer Empty: CPR notifies the application when the CPR has transmitted data and its buffer is empty. Device Server Transmit Buffer Empty: CPR notifies the application when the device server has transmitted data and its buffer is empty.

3.5 Assign Host IP and Port

Once the com port is configured, you must enter the Host IP address and TCP port. To redirect a com port, double-click a desired device server in the Devices pane. Double clicking a device server in the devices window will transfer the Host IP address and TCP Port setting to the configuration window below.

Service	Host	TCP Port
1	172.20.206.211	10001
2		
3		
4		
5		
6		
7		
8		

WARNING! If the Host is on the other side of a router or a remote firewall, then UDP ports 30718, 43282 and 43283 may need to be added to the firewall's exclusion list. You may experience trouble opening this com port if these UDP ports are not excluded.

Also, some legacy device servers respond on UDP port 43283. If you are unable to connect to a device server, one possible cause is the Firewall on this machine is blocking this port. Press the 'Add Rx Port' button to add this port to the Firewall. If the button caption reads 'Remove Rx Port' then the port has already been added and can be removed by pressing this button.


The Firewall is turned ON

The following information displays for each device server:

Setting	Description
Service	Number of the device server in the list of device ports that the com port can connect to. Note: When a com port is open, it attempts to connect to the first device server in the list. If the com port does not make a successful connection in the time specified in Connection Timeout (above), it tries the next device server. This procedure continues with each device server in turn until the com port makes a successful connection or tries all the listed device servers.
Host	IP address of the device server.
TCP Port	Port on the device server to which the com port will connect.

You can enter up to eight device servers.

Note: Alternatively, right-click the device server in the list of devices and select Add to Settings.

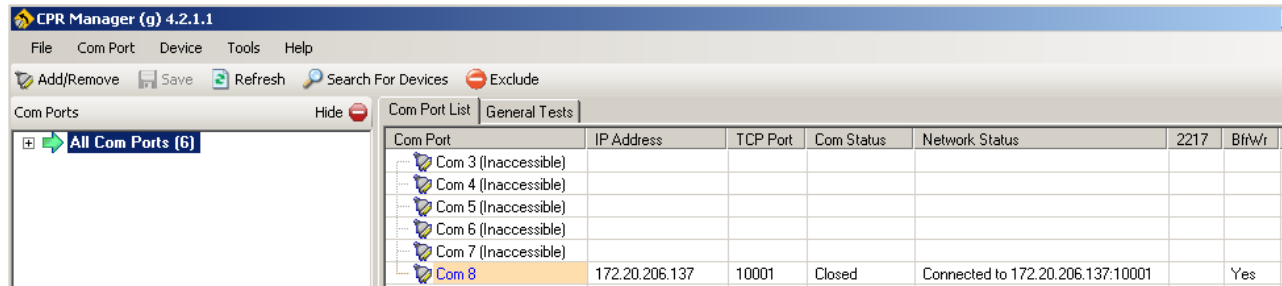
Click the Save Settings icon  to save the new configuration. Com Port 6 is now setup as a virtual port to the assigned Host IP and TCP Port.

3.6 Quick Setup

CPR enables you to create up to 256 com ports. The tree structure in the left pane of the window displays existing com ports, and the Com Port List tab lists them on the right, along with additional information, if available.

To view com port information:

1. Click **All Com Ports** in the left pane and select **Com Port List** tab in the right pane.



Setting	Description
IP Address	IP address of the device server to which the com port is connected.
TCP Port	TCP port on the device server to which the com port is connected (for example, 10001 if using channel 1 or 10002 if using channel 2 on a UDS or XPort device server).
COM Status	Indicates whether the com port is open or closed.
NetworkStatus	Status of the connection between the com port and the device server, e.g., Disconnected.
2217 Yes	indicates RFC 2217 is enabled.
BfrWr Yes	indicates buffer writes is enabled.
SvrRec Yes	indicates CPR will attempt reconnecting to the device server if the device server disconnects from CPR.
NoCls Yes	indicates that when an application closes the com port, CPR will not close the network connection.
CntTO	Number of seconds the com port will wait before attempting to connect to the next device server in the list, or before aborting the connection attempt.
TORec Yes	indicates CPR will re-establish the connection if a connection times out.
KpAlv Yes	indicates TCP KeepAlive is enabled.

4. Configuration

This chapter provides general guidelines for using a device server and ComPort Redirector. It also describes how to set up ComPort Redirector and the device server you will be using with it, and how to verify connectivity between the two.

4.1 General Device Server Configuration Guidelines

Observe the following general guidelines when preparing the NET232 or other device server for use with Com Port Redirector:

- The device server to which Com Port Redirector will connect must have a fixed IP address.
- The PC running Com Port Redirector must have a good network connection to the device server.
- If redirecting over a Wide Area Network (WAN), both the PC and the device server must have a correct gateway address configured in their TCP/IP settings.
- All serial settings on the device server must match the settings of the serial device. Serial settings include:
 - Baud rate - Parity
 - Stop bits
 - Flow control
 - Interface mode (RS-232 or RS-422/485)
- Connect/Disconnect and Access Modes: The way the device server accepts a connection must be configured appropriately to accept a network connection from Com Port Redirector.
 - For NET232: set the connect mode to C0 and the disconnect mode to 00.
- Serial device cabling between the serial device being managed and the device server must be correct. Consult your documentation for the pinouts of your device server. In some cases, you may have to modify your serial device cable.

4.1.1 General Com Port Redirector Usage Guidelines

Observe the following general guidelines when using ComPort Redirector:

- Do not run Com Port Redirector with other software that installs a virtual com port.

4.2 Device Server Configuration

This section describes how to configure ComPort Redirector for use with a NET232 or similar device server.

1. Assign a fixed IP address to the device server before using ComPort Redirector.
2. Telnet into the configuration port **9999** on the device server.
3. When prompted for the Setup Mode, press the Enter key.
4. Select option 1 (Channel 1).
5. Set the serial settings (baud rate, parity, flow control, data bits) to those of the serial device attached to the device server.
6. Set the Port number (Port No) to **10001**. (The default setting is 10001)
7. Set the connect mode for the channel to **C0**.
8. Leave all other settings at the default settings.
9. Select option **9** to Save and Exit.

4.3 Verifying Connectivity with the Device Server

After configuring the Com Port Redirector and the device server, use a terminal emulation program such as HyperTerminal to verify connectivity between the PC running Com Port Redirector and the device server.

The easiest method is to install a jumper on the device server serial cable between the Transmit and Receive pins. This is generally pins 2 and 3. With the jumper installed, any data received by the device server will be immediately sent back.

A terminal emulation program such as Hyperterminal can be used to send data to the device server. Since the data is going out a virtual com port, it will be received at the device server through the Ethernet connection.

This operation is called Loop Back because data is sent from Hyperterminal, through the redirected com port to the device server. At the device server, the Transmit and Receive connections are tied together so that any data received is immediately transmitted back through the device server. Typing a character in the Hyperterminal window will cause the character to go out the com port, loop back through the device server and display in the Hyperterminal window.

To verify connectivity:

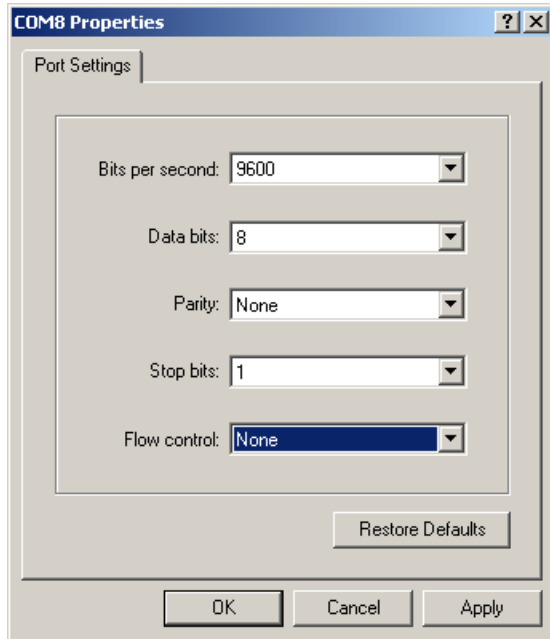
1. Click the Start button in the Windows Taskbar, point to **Programs, Accessories, Communications**, and click **HyperTerminal**.
2. You must enter a name for the new connection. (Anything that is easy to remember).



3. In the **Connect To** dialog box, go to the **Connect using** field and select the virtual com port selected for the device server. Once you select the com port, the other fields will be grayed out. Remember, this is the redirected or virtual com port.



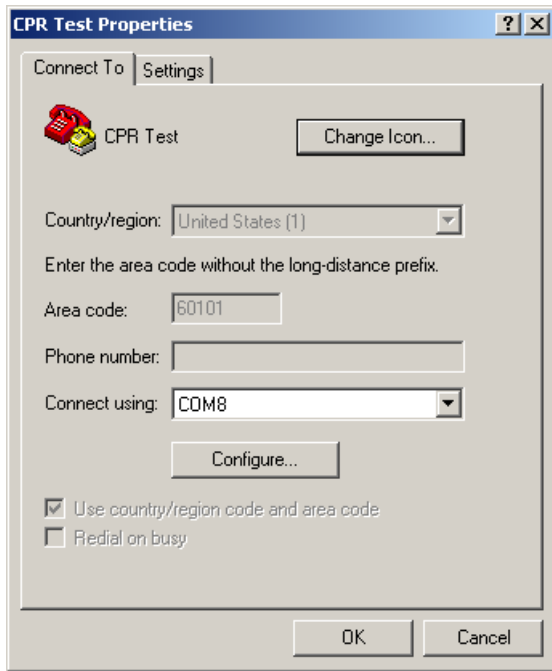
- Click OK. In the **COMx Properties** dialog box, select the communication parameters for the device server.



Click OK and a blank terminal window will appear.

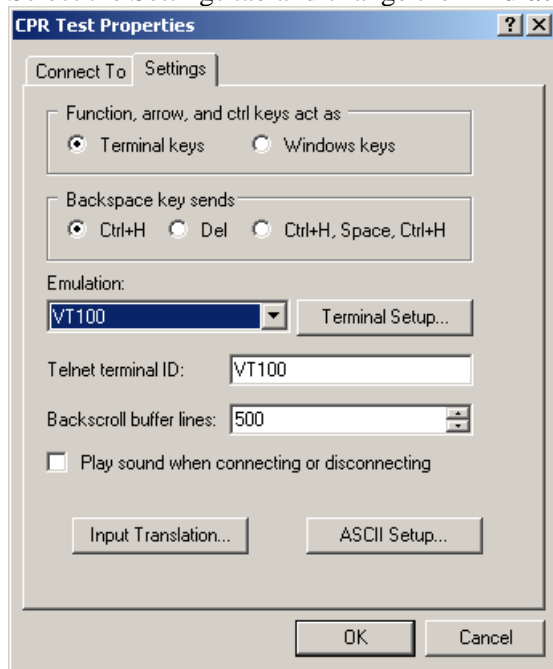
Note the settings in the status window on the bottom of the terminal window. If there is a setting for Auto detect in any field, it **MUST** be changed.

Click the disconnect icon , then click the properties icon . This will display the following dialog box.




Click the Configure button to display the com properties again. Click OK.

Select the Settings tab and change the **Emulation** drop down box to **VT100**.



Click OK. The status line at the bottom of the terminal window should read VT100 and 9600-8-N-1.

Click the call (connect) icon  and the port will be connected with the correct settings.

When you type a character on the terminal keyboard, it will be echoed back and displayed in the terminal window. You can verify it works by removing the jumper between pin 2 and 3. The echo operation will cease.

When you exit Hyperterminal, you can save the test file for another day.