



NS-Link™ Installation for Windows NT®

How to Use this Document

You can use the interactive [Table of Contents](#) to locate the information you need. There is also an [Installation Quick Start](#) discussion for more experienced users.

Red, underscored items are links to URLs. **Blue**, underscored items are links within this document or to another document on the media.

Note: *If you copy this document from the ftp/web or CD and do not use the procedure discussed on the CD, you will get an error message when selecting hyperlinks outside of this document.*

NS-Link Requirements

This document discusses installing and configuring the NS-Link driver for the following hardware platforms in the Windows NT 4.0 operating system:

- DeviceMaster™

Note: *Use NS-Link if you want to use the ports as native COM ports. If you want to use serial tunneling or socket mode, use the [DeviceMaster RTS User Guide](#) for configuration.*

- RocketPort® Serial Hub *ia*
- RocketPort Serial Hub *Si*

The Control device requires at least one host server running one of the following operating systems to install NS-Link:

- Microsoft® Windows® NT 4.0, RAS or RRAS is required to support Remote Access Service and Microsoft supports up to 256 RAS ports.
- Windows Terminal Server and Citrix® MetaFrame®

Note: *The driver for the **RocketPort Serial Hub Si** is different than the driver for the **RocketPort Serial Hub** and they are **NOT** interchangeable.*

For hardware specific information or product information, see the hardware installation documentation that is available on the Control media (diskette or CD) shipped with your product or download the current version from the [ftp/web](#) site.

- [DeviceMaster 4/8-port](#)
- [DeviceMaster 16-port](#)
- [RocketPort Serial Hub *ia*](#)
- [RocketPort Serial Hub *Si* 2-port](#)
- [RocketPort Serial Hub *Si* 4/8-port](#)

Driver updates can be downloaded at no charge from the Control ftp/web site. Always check the web or ftp sites to make sure that you have the current driver and documentation. Software downloaded from the ftp/web site are self-extracting zipped files that you must extract before installing.

Connectivity Requirements

An ethernet connection, either to an Ethernet hub or to a network interface card (NIC) in the host server. See the hardware installation documentation (above) for information regarding hardware installation.

If you are connecting a RocketPort Serial Hub *Si* or RocketPort Serial Hub *ia* directly to the server NIC card, an ethernet crossover cable is required (see the *Hardware Installation* documentation).

If you are connecting a DeviceMaster directly to the server NIC card, connect an ethernet cable to the port labeled DOWN. If connecting a DeviceMaster to an ethernet hub, connect an ethernet cable to the port labeled UP.

IP or MAC Addressing Issues

This is an overview of IP and MAC addressing issues that may affect how you configure the Control device with a brief discussion of advantages of either method.

The IP addressing scheme has the following advantages:

- Uses an industry standard protocol.
- Allows you to configure servers to use ports on the Control device that are outside of the host server's Ethernet segment.

Note: This IP address must be a unique reserved IP address, do not use an address from a dynamic address pool. If necessary, see the system administrator for an IP address.

The MAC addressing method has the following advantages:

- Simplifies implementation and ongoing support by eliminating the address administration issues inherent in network protocols. MAC addresses are predefined by Control and there is no potential for an "address conflict" at setup.
- It is isolated from foreign LAN segments, which minimizes potential security issues.

Using SNMP (RPSH-Si 4/8-Port, Only)

To configure SNMP for the RocketPort Serial Hub Si 4/8-port, use the *Diagnostic and IP Configurator* utility. This utility is delivered on the Control media shipped with your product or available on the ftp/web sites.

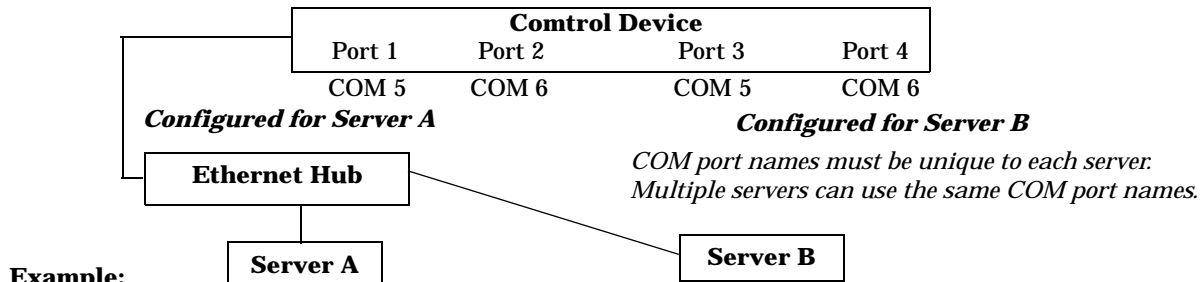
The [Hardware Installation](#) documentation (also on the Control media) provides you with information about how to use the *Diagnostic and IP Configurator* utility.

Note: For SNMP configuration on other models, see the ftp/web site for availability.

Using the Port Sharing Feature

The Control device can be shared with multiple servers on a network. To do so, follow the [Installing NS-Link](#) discussion for each server that you want to permit access to the serial ports.

You can implement the port sharing feature in several ways. You can share the same port with multiple servers or you can set up multiple servers to share specific ports on the Control device.



Example:

To configure two ports for Server A and two ports for Server B, you could configure the drivers like this:

1. When installing NS-Link on Server A, select "Not Configured" for the COM port names for Ports 3 and 4.
2. When installing NS-Link on Server B, select "Not Configured" for the COM port names for Ports 1 and 2.

Note: Most applications do not release ports, so you may not be able to use port sharing across multiple servers with the same port. Also, if using port sharing, make sure that two computers do not try to access the same port at the same time. Only one computer can control a given port at a given time.

NS-Link Installation - Quick Reference

If you are familiar with installing Control software, you can use the following procedure as a quick reference:

1. Install the hardware.
2. If necessary, unzip the self-extracting NS-Link files.
3. If necessary, remove the existing NS-Link driver.
4. [Install](#) NS-Link and the configure the [port characteristics](#) in NS-Link setup.
5. Shut down, restart the server and [program the IP address](#) into the device.
6. Connect your serial devices.

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NS-Link Installation and Configuration

This subsection discusses the following installation and configuration issues:

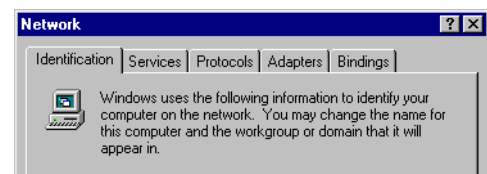
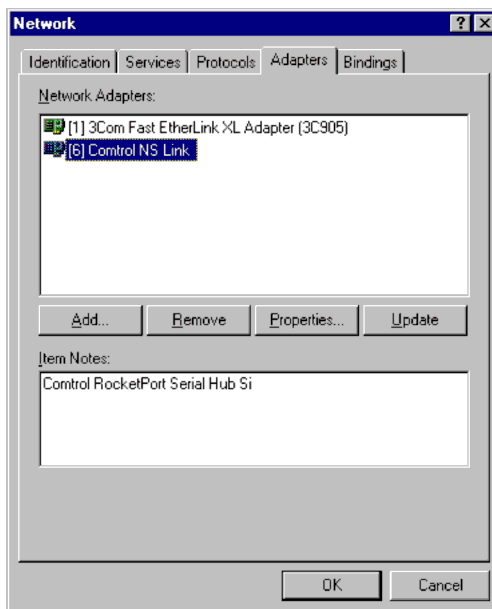
- Removing an existing driver
- [Installing](#) the software
- [Verifying](#) the installation
- [Program](#) the IP addresses
- [Changing](#) configuration parameters
- [Adding](#) additional Control devices to an existing configuration
- [Replacing](#) devices

Removing an Existing Driver

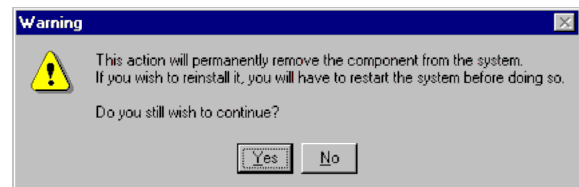
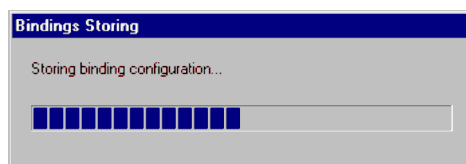
Use the following procedure to remove the existing driver. If updating (not reconfiguring) NS-Link, make sure that you remove the existing version before installing an updated driver.

Note: Using the **Remove** button on the *Control Main Setup* sheet only discards the software configuration, it does not remove the software.

1. Right-click on the **Network Neighborhood**, and select **Properties**.
2. Select the **Adapters** tab.
3. Highlight **Control NS-Link** and select the **Remove** button.



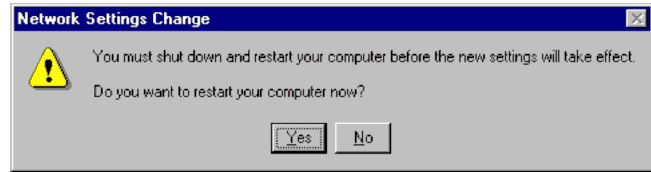
4. Click **Yes** to the delete this item query.
5. Click **Close**. Several screens display as the system updates.



When the updates are complete, this message displays:

6. Click **Yes** to shut down and restart the server, so that your changes take effect.

After removing the existing driver, use the following subsection to install a new version.



Installing NS-Link

Use the following procedures to install NS-Link for Windows NT 4.0 operating systems.

Note: If updating NS-Link, first [remove](#) the existing version of NS-Link. Do **not** use the *Update* option.

The following procedures assume that you have already:

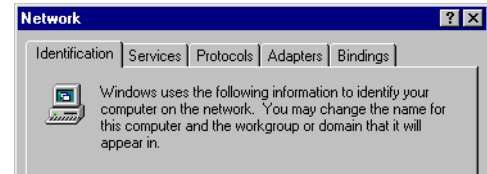
1. Installed the hardware.
2. Determined that the hardware is working properly.

Model	Status
DeviceMaster	<ol style="list-style-type: none"> 1. The PWR LED on the front of the unit is lit, indicating you have power and it has completed the boot cycle. 2. The red LNK/ACT LED is lit, indicating that you have a working Ethernet connection. 3. The red 100 LED is lit, indicating a working 100 MB Ethernet. 4. After connecting the serial devices, the yellow Rx LED shows that the data receiver is connected to another RS-232 device or receiving data in RS-422/485 mode. The green Tx LED shows that the data is transmitting.
RocketPort Serial Hub ia	<ol style="list-style-type: none"> 1. The yellow PWR LED is lit, indicating you have power and that the device driver has been downloaded to the device. Note: If the PWR LED is still flashing, this means that the driver has not downloaded to the device. 2. The green LNK LED is lit, indicating that you have a working Ethernet connection. 3. The yellow ACT LED flashes, indicating Ethernet activity on the network.
RocketPort Serial Hub Si 2-port	<ol style="list-style-type: none"> 1. Both 10/100BASE-T LEDs should be lit. 2. The Power LED in the front of the unit should lit. Note: If the Power LED is still blinking on the RPSH-Si, this indicates that NS-Link did not download.
RocketPort Serial Hub Si 4/8-port	<ol style="list-style-type: none"> 1. The lower 10BASE-T LED should be lit (if using a 10Base-T Ethernet connection). 2. The Port LEDs on the front of the unit should be cycling their lights approximately every 30 seconds (instead of the Port 1 LED flashing, which indicates that the RPSH-Si is waiting for NS-Link to be downloaded).

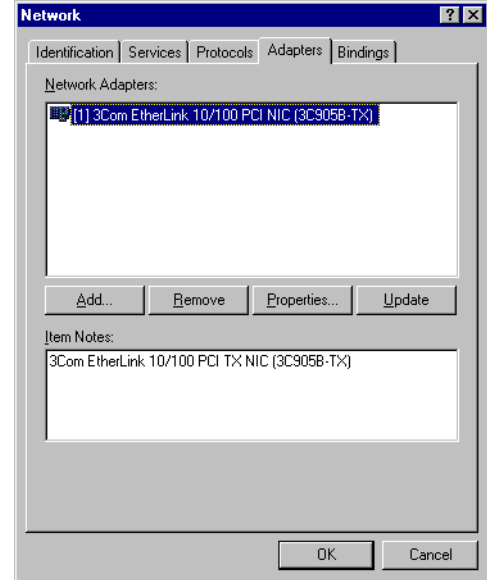
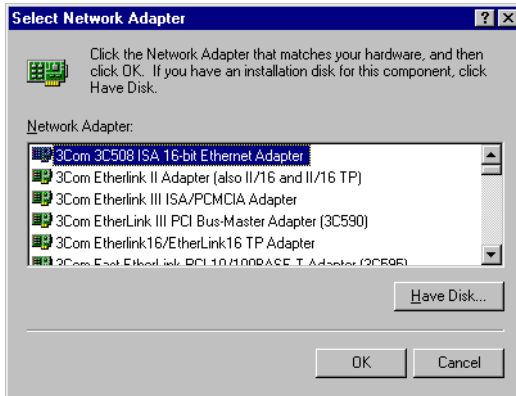
3. If necessary, unzip the self-extracting files from the Control media or ftp/web site.

Note: The self-extracting zip file name has this format: 180####.exe. Double-click on the file name and follow the Winzip wizard. Extract NS-Link files to a diskette or create a subdirectory on your hard drive and extract the files.

- Right-click on the Network Neighborhood, and select Properties. The following screen appears.



- Select the Adapters tab and click on the Add button.
- Select the Have Disk button.



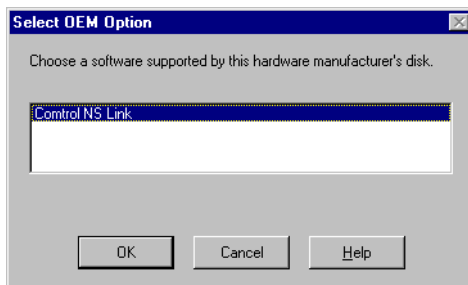
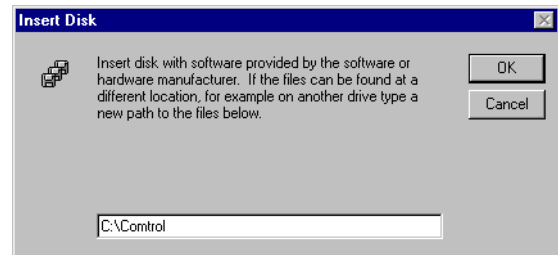
If installing NS-Link from a diskette, insert the diskette.

- Enter the drive and directory path to the installation files and click on the OK button. For example, if you extracted NS-Link to a subdirectory named control, enter:

`c:\control`

Note: This screen shot illustrates installing NS-Link from the default installation directory.

- Click on the OK button when the selection box appears with Control NS-Link highlighted.

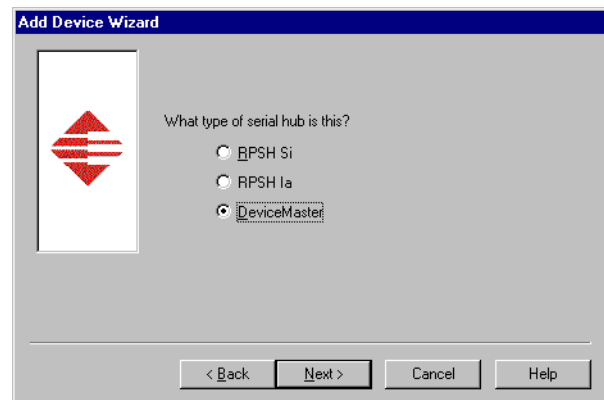
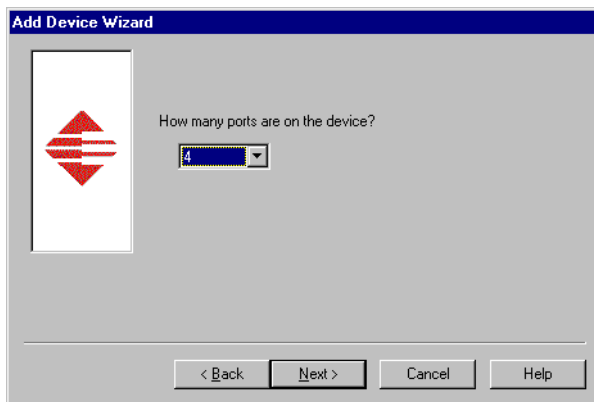


9. Select the Next button when the Add Device Wizard appears:

Note: The Add Device Wizard also contains help for each screen.



10. Select the Control device you are installing.
11. If queried, select the number of ports on this Control device.



12. Select the starting COM port number for each port you plan to use on this server, if you do not want to allow access to a specific port for this server, scroll up to **Not configured**. When configuring ports among several servers, they can [share the same COM port name or be assigned a unique COM port name](#) on each server.

Note: This screen is dependent on the number of ports on the device.

13. If this is the initial NS-Link installation and you have not programmed an IP address into the device, select MAC. If the device has been **previously** programmed with an IP address, you can select IP.



Note: If you want to use the device in an IP networking environment, you must first install NS-Link with a MAC address and then configure the IP address using the [IP Programming](#) tab in the NS-Link Device Properties screen.

- a. If you selected MAC, enter the MAC Address of the device that you are installing and click on the Next button.

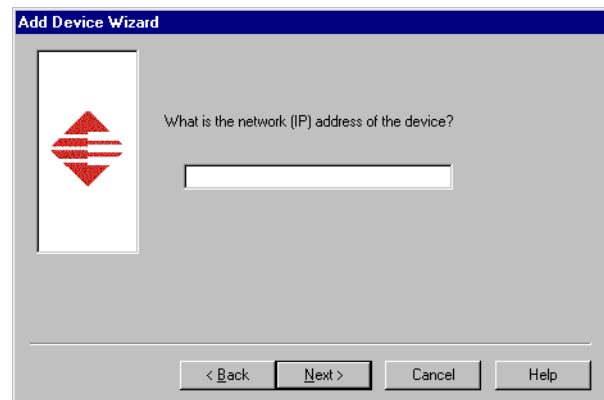
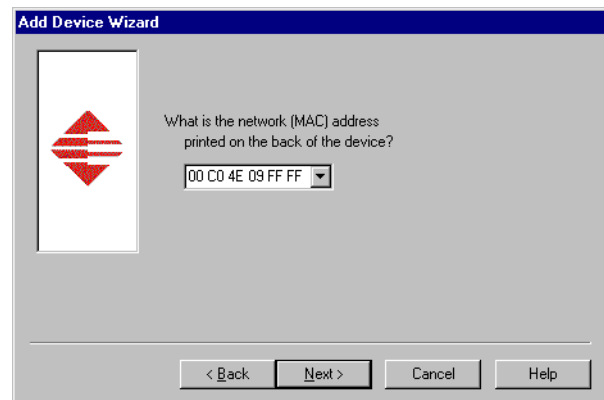
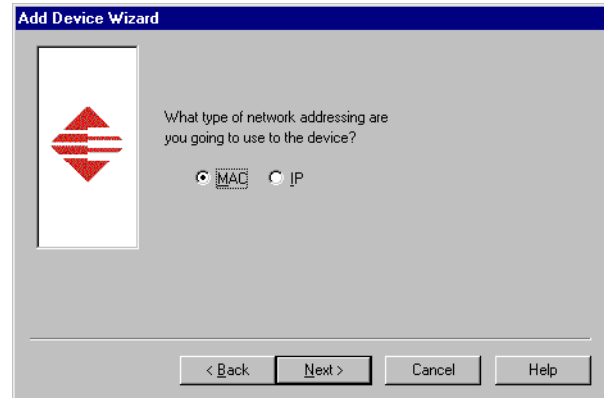
Note: The MAC address label is on the device and the format is: 00 c0 4E xx xx xx. A space must separate each two digits, as illustrated in the following screen shot.

If your site has other Control network devices on the network, their MAC addresses will display in the droplist after initial installation.

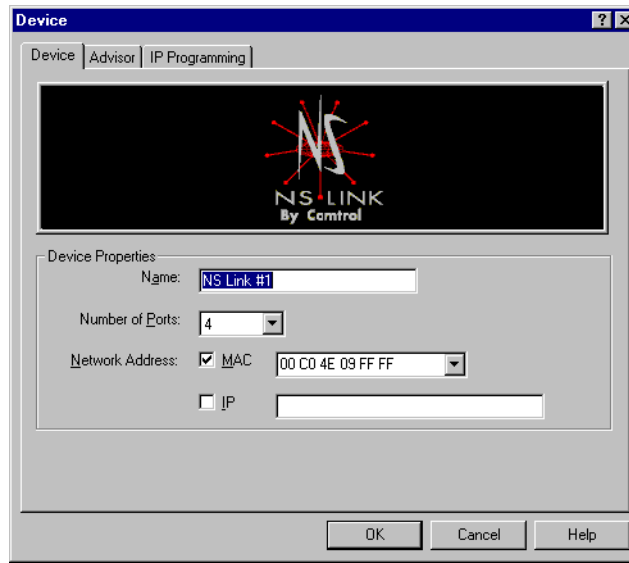
- b. If you selected IP, enter a unique reserved IP address or a qualified domain name (DNS) and select the Next button.

Note: If using DHCP or ARP, the administrator must reserve the MAC address of the Control device to the IP address assigned to the device. If necessary, see your system administrator for a unique reserved IP address or qualified domain name.

14. Click on the Finish button when the following screen appears:

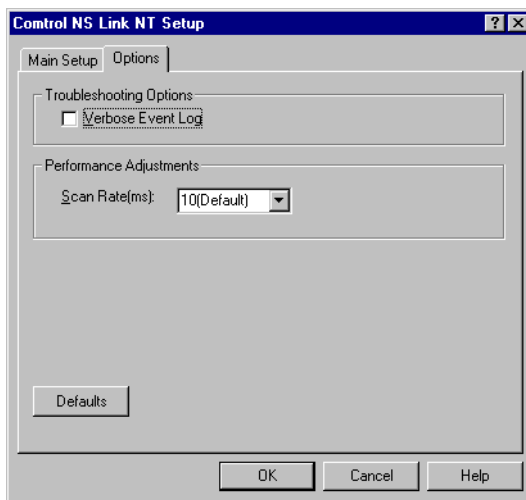


The Device Properties screen appears after selecting the Finish button.



Note: If you select IP address in the previous screen, the screen is similar to the MAC version displayed.

15. Optionally, rename the NS-Link default name.
16. Verify the Number of Ports on the device.
17. Verify the Network Address.
18. Select the OK button. The NS-Link Setup screen appears.
19. If you want to enable Verbose mode for Windows NT error messages or select a scan rate, click on the Options tab. The Device Options screen appears.



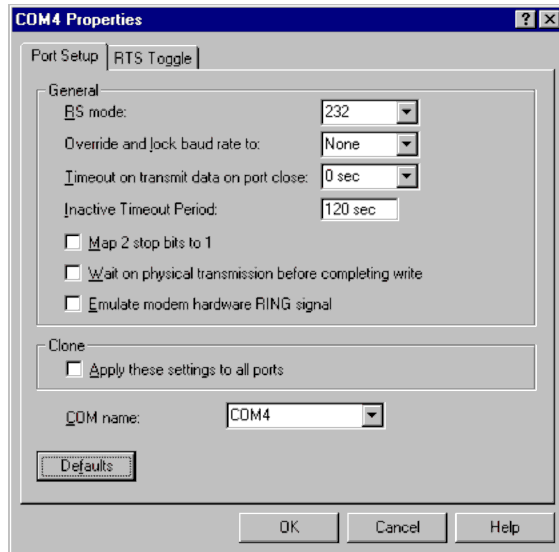
- a. Select the options you want to implement.

Note: Typically, you should leave the scan rate set to the default value (10 ms) for most applications. To adjust latency for time-critical applications, select a longer or shorter interval from the droplist, or type in the rate. Changes to Scan Rate do not take effect until you restart the server.

- b. Click on the Main Setup tab.

20. Highlight the COM port that you want to configure and select the Properties button.

The COM Properties screen appears:



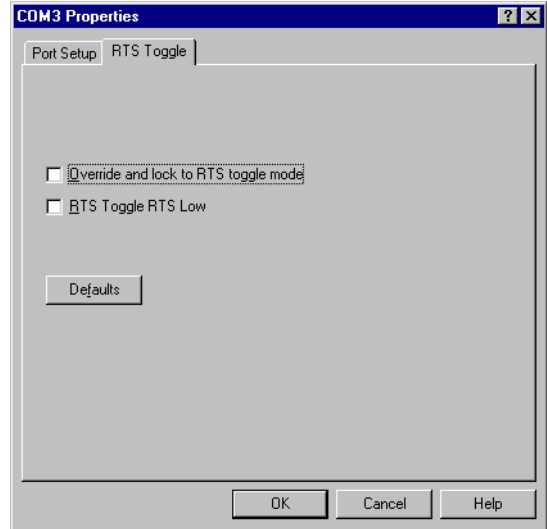
21. Select the appropriate mode to match the peripheral that you are connecting to that particular COM port.
22. Optionally, make any necessary changes to fit your environment:

- a. Lock the baud rate to access higher or lower rates than are normally permitted by your Windows NT applications.
- b. Set a time delay on the transmit data before a port closes.
Note: You can select the length of time to wait for data to clear the transmit buffer, before a host application closes the port. If data is still in the transmit buffer, you can set a delay time to allow the buffer to empty. This is typically used with slower peripheral devices such as printers, to give the data sufficient time to flush through the system.
- c. Set an inactive timeout period for the device.
Note: Specifies the amount of time (seconds) that interface to the server can have no activity before the device releases the lock and allows another host server to acquire the port. If you enter fractional seconds, the timeout value re-sets to zero. Zero means that the port never times out.
- d. Map 2 stop bits to 1.
Note: You can use this option to map 2 stop bits to 1 bit. If the application you are using is hard coded to use two stop bits and you are receiving framing errors, you can implement this option. Leave this box unchecked to enable stop bits to pass through unchanged.
- e. Wait for physical transmission before completing write.
Note: Use this option to force all write packets to wait until the transmit data has physically completed the transmission before returning completion to the host application. The default mode (box not checked) is to buffer the data in the transmit hardware buffer and return completion as soon as the packet is in the buffer.
- f. Emulate modem hardware ring signal.
Note: This emulates a hardware RI (ring indicator) signal.
- g. Clone port settings.
Note: If this box is checked, the changes you make in the COM Properties screen are applied to **all NS-Link ports in the system**. If this box is not checked, the changes you make to the Port Setup options apply to the selected port only.

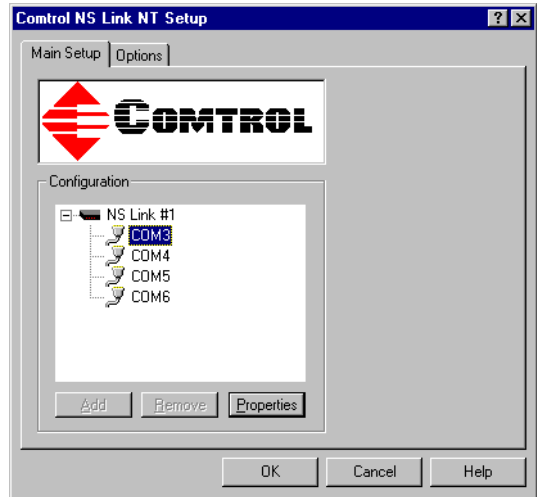
- h. If you need to configure RTS options, click on the **RTS Toggle** tab.
- i. Configure the port and select **OK** after making the appropriate selections.

The **Override and lock to RTS toggle mode** option allows you to lock the port in RTS toggle mode, then set the mode (low or high) as desired.

The **RTS Toggle RTS Low** option allows you to toggle the RTS output signal low during data transmission. If the option box is not checked, RTS is toggled high (asserted) during data transmission.



- 23. After configuring your port (COM) properties, click on the **OK** button. The Main Setup screen returns.
- 24. If you did not clone all the COM ports, repeat [Steps 20](#) through 23 until all of the COM ports that you want to use are configured.
- 25. Click on the **Ok** button after you have configured each port.
- 26. To add another NS-Link device, highlight the first device and click the **Add** button. Follow [Steps 9](#) through 25 to complete installation.
- 27. Select **Yes** to the following query.

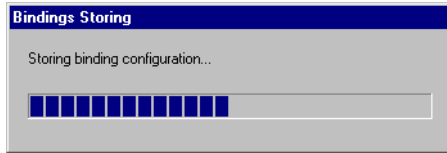


- 28. Click on the **OK** button.



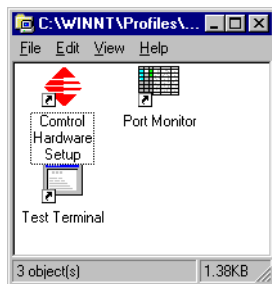
29. Select the **Add** button if you want to add a device (from another manufacturer) at this time or the **Close** button in the Network window. See [Adding Devices After the Initial Installation](#) to install multiple Control devices.

Note: You must configure at least one valid NS-Link Device. The Windows NT system updates the bindings.



Another advisory message displays and the Control Program Group appears.

30. Close the Control Program Group.



31. Select **Yes** to shut down and restart the server.

Note: Initial installation is not complete until you have rebooted the server.

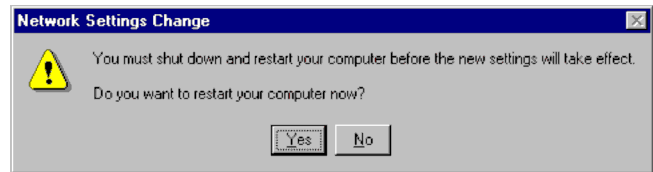
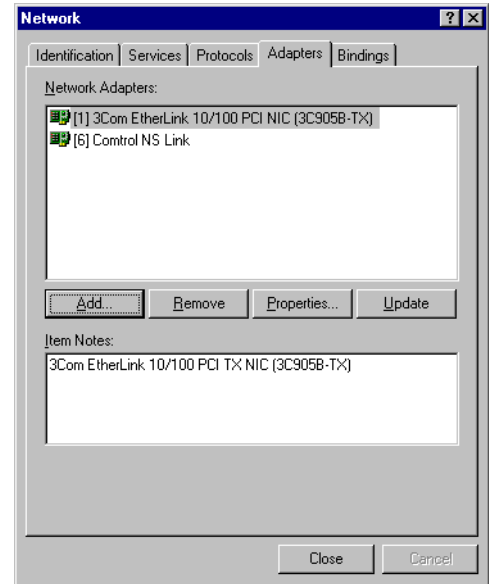
32. After rebooting, perform the appropriate procedure for your installation:

MAC Addressing

- Verify that the installation was successful using [Verifying the Installation](#) (Page 18).
- Connect your serial devices to the Control device. If you need information about connecting your serial devices, see the appropriate hardware installation documentation for your product.
 - [DeviceMaster 4/8-port](#)
 - [DeviceMaster 16-port](#)
 - [RocketPort Serial Hub ia](#)
 - [RocketPort Serial Hub Si 2-port](#)
 - [RocketPort Serial Hub Si 4/8-port](#)
- Set up [modems](#), [RAS](#), or [printers](#).

IP Address

Go to the *Programming the IP Address* discussion to program the IP address into the Control device.



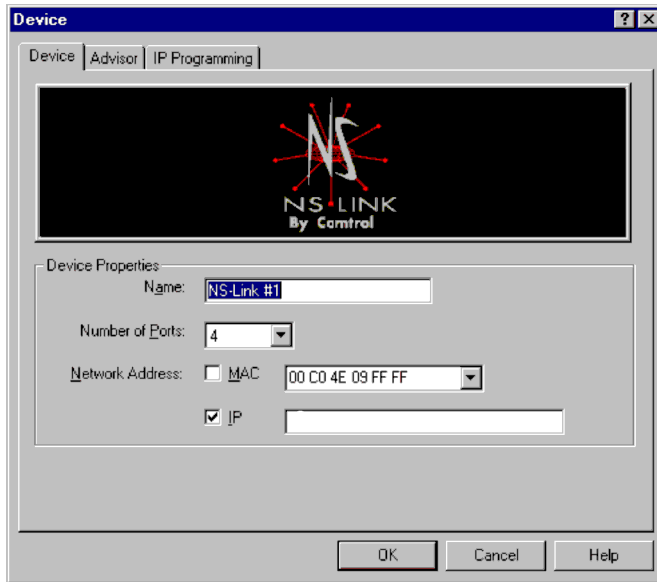
Programming the IP Address

After installing NS-Link and restarting the system, use the following procedure to program the IP address in the Control device.

Note: To perform the following procedure, you must have previously entered the MAC address in the Device Setup tab and rebooted your system.

See your System Administrator to acquire a unique reserved IP address if you are using DHCP. They will need the MAC address of the unit to provide you with an IP address.

1. Go to the Start button and select Programs/Control NS-Link/Control Hardware Setup. The Setup screen appears:
2. Highlight the device name of the unit you want to program and select Properties.
3. Uncheck the MAC box and then check the IP checkbox.



4. Select the IP Programming tab.
5. Select the Retrieve button to check to see if the Control device has been programmed with an IP address, gateway, and subnet mask.
6. Select the Ok button to retrieve the values.



7. If NS-Link **retrieves the values** assigned by the System Administrator, this means that the hardware has been previously configured and go to [Step 16](#).

Note: The default address for the DeviceMaster is 192.168.250.250.

If NS-Link returns **all zeros**, go directly to [Step 8](#).

If NS-Link **did not retrieve the correct values** (not zeros), select the Clear button.

- a. Select the Ok button when this message displays:

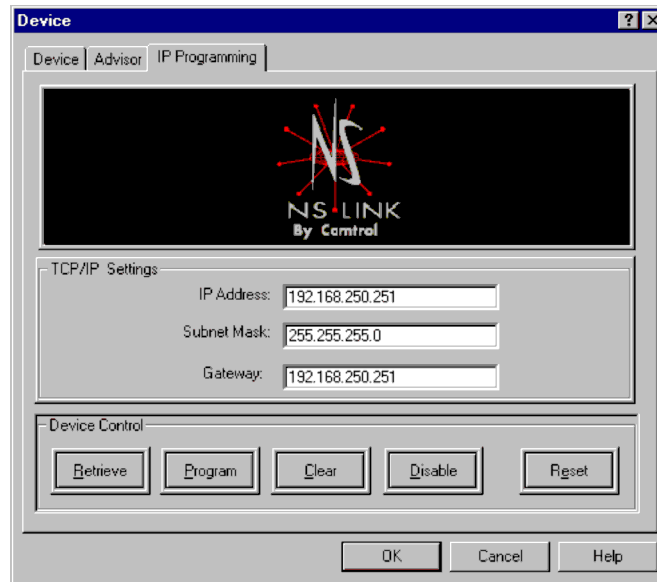
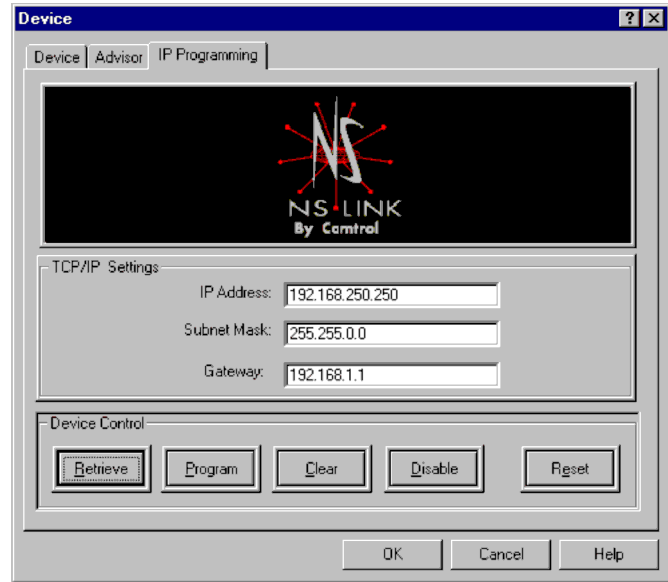


- b. Select the Ok button when this message displays:



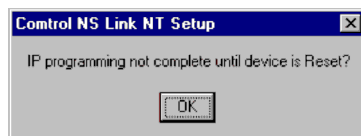
- c. Select the Reset button and wait until the device reloads.

8. Enter the IP address, subnet mask, and gateway values in the IP Settings area.

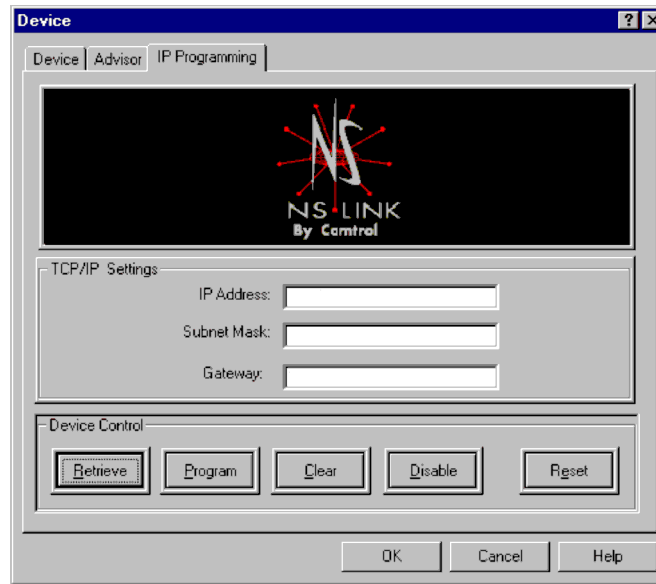


9. Select the Program button and then the Ok button when this message displays:

10. Select the Ok button when this message displays:



11. Delete the contents of the IP Address, Gateway, and Subnet Mask fields.



12. Select the Retrieve button.



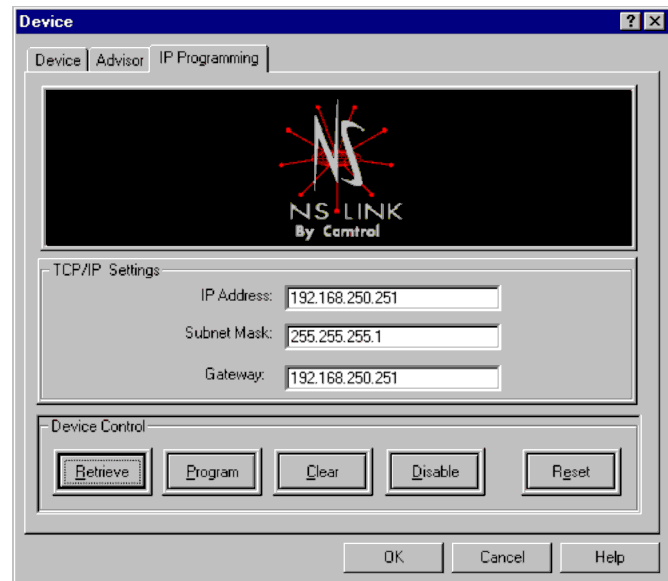
13. Verify that the information that loads into the IP Address, Gateway, and Subnet Mask fields matches the information that you previously entered. If not, re-enter the IP Address, Gateway, and Subnet mask information and repeat Steps 9 through 12.

14. Perform the appropriate procedure:

- If you are operating this device in a **DHCP or ARP environment**, select the **Clear** button.
- If you are operating this device in **MAC mode**, select the **Disable** button.

15. Select the **Reset** button to soft boot the device.

Note: The Control device cycles its LEDs.

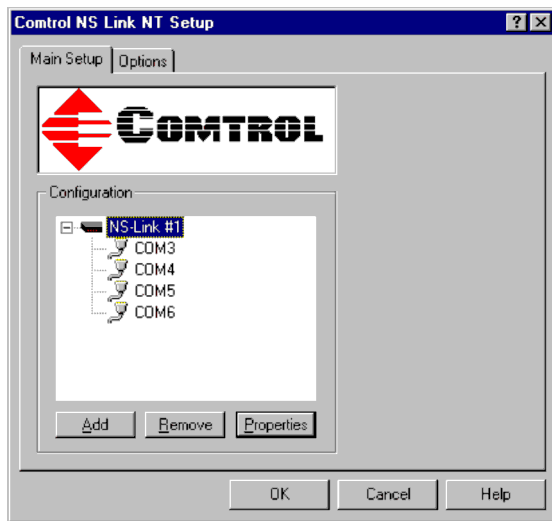


16. Select the OK button to this message.

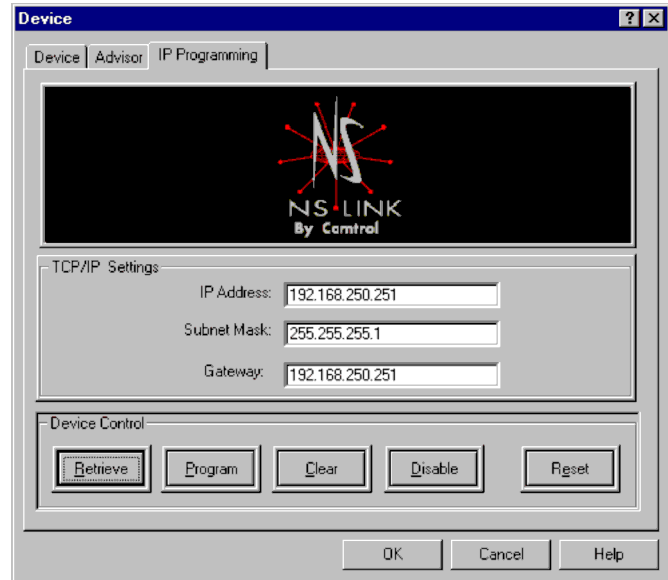


Select the Ok button to close the Device screen.

17. Select the Ok button:



18. Reboot the server.



Verifying the Installation

After rebooting the system, NS-Link downloads to the Control device. The following provides you with LED conditions that indicate whether NS-Link has downloaded to the device.

Model	Status
DeviceMaster	<ol style="list-style-type: none"> 1. The PWR LED on the front of the unit is lit, indicating you have power and it has completed the boot cycle. 2. The red LNK/ACT LED is lit, indicating that you have a working Ethernet connection. 3. The red 100 LED is lit, indicating a working 100 MB Ethernet. 4. After connecting the serial devices, the yellow Rx LED shows that the data receiver is connected to another RS-232 device or receiving data in RS-422/485 mode. The green Tx LED shows that the data is transmitting.
RocketPort Serial Hub ia	<ol style="list-style-type: none"> 1. The yellow PWR LED is lit, indicating you have power and that the device driver has been downloaded to the device. <i>Note: If the PWR LED is still flashing, this means that the driver has not downloaded to the device.</i> 2. The green LNK LED is lit, indicating that you have a working Ethernet connection. 3. The yellow ACT LED flashes, indicating Ethernet activity on the network.
RocketPort Serial Hub Si 2-port	<ol style="list-style-type: none"> 1. Both 10/100BASE-T LEDs should be lit. 2. The Power LED in the front of the unit should lit. <i>Note: If the Power LED is still blinking on the RPSH-Si, this indicates that NS-Link did not download.</i>
RocketPort Serial Hub Si 4/8-port	<ol style="list-style-type: none"> 1. The lower 10BASE-T LED should be lit (if using a 10Base-T Ethernet connection). 2. The Port LEDs on the front of the unit should be cycling their lights approximately every 30 seconds (instead of the Port 1 LED flashing, which indicates that the RPSH-Si is waiting for NS-Link to be downloaded).

You can also use the following procedure to verify NS-Link installation.

1. Open the Event Viewer.
2. Review the messages in the log.

If the installation was successful, there is a log entry for the device stating that NS-Link was successfully initialized.

Note: This message is only meaningful if the hardware LED diagnostics pass.

If the installation fails, a Stop Event Log entry for the device states that there was a problem and NS-Link did not load.

Read over the system log in the Event Viewer. If the event log states it could not connect with the device, check the device as outlined in [Troubleshooting](#). In addition, you can use the following applications to help diagnose the problem in Windows NT:

- [Using Test Terminal](#)
- [Using Port Monitor](#)
- [Using Peer Tracer](#)
- [Using the Device Advisor](#)

You can also select the Verbose EventLog option under the Main Setup Options tab in NS-Link, which may help you determine the problem. See [Step 19](#) (Page 10) in the Installing NS-Link discussion for more information.

Changing Configuration Parameters

Use the following procedure to change the:

- NS-Link properties, such as:
 - Name of the Control device
 - Number of ports being used by this host server
 - Network address

Note: You can change the network address type by clicking on the current checkbox type, followed by placing a check in the other network type and entering the appropriate address. If replacing hardware, you have to change the MAC address. If necessary, see [Programming the IP Address](#).

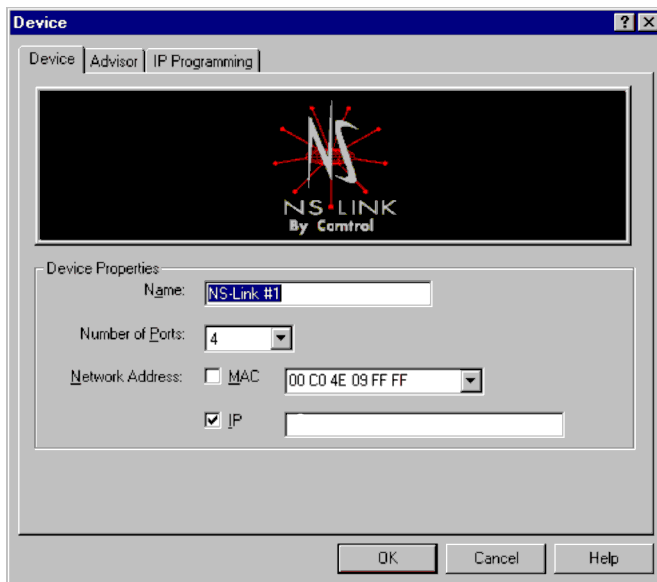
 - Device options, for example, [Verbose mode](#) or using a [scan rate](#).
- COM port properties, such as the port mode (RS-232, RS-422, or RS-485) and application-related options discussed in [Step 22](#) of the installation process.



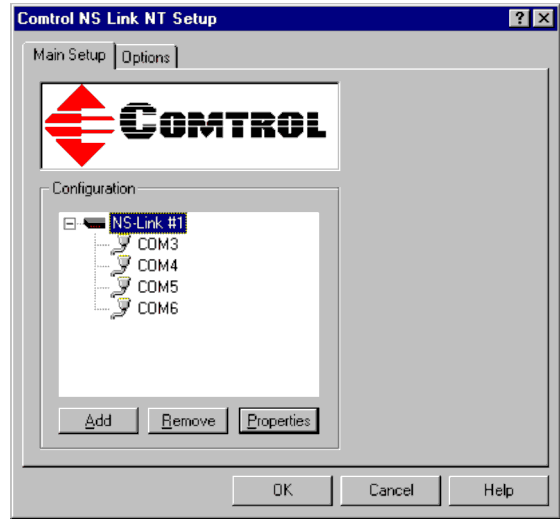
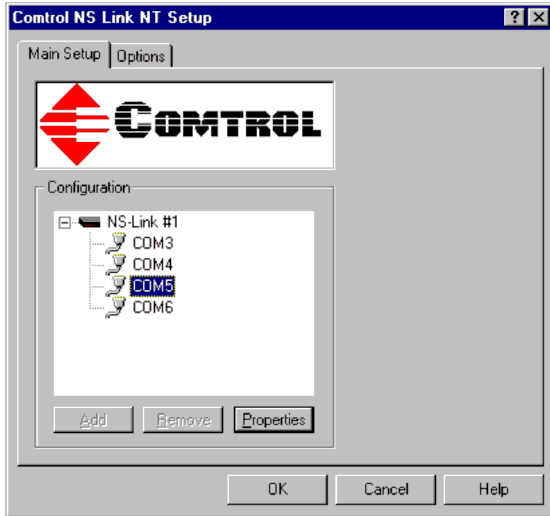
Before changing the communications mode in NS-Link for an existing port, make sure that you disconnect the peripheral device from the port.

Use the following procedure to change configuration parameters.

1. Click **Start/Programs/Control NS-Link/Control Hardware Setup**.
2. To change the NS-Link properties for the device (name, number of ports, or network address) **highlight** the device name and select the **Properties** button.
3. Make the desired changes and select the **OK** button.



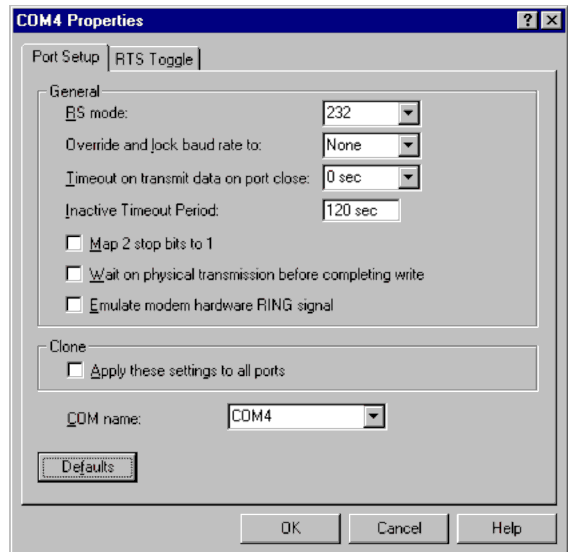
- To change device options (Verbose mode or scan rate), click on the **Options** tab, make the changes, and toggle back to the **Main Setup** tab.
- To change port configuration, **highlight the COM port** that you want to change and select **Properties**.



- Make the port configuration changes and select the **Ok** button.

Note: Before changing the communications mode in NS-Link for an existing port, make sure that you disconnect the peripheral device from the port.

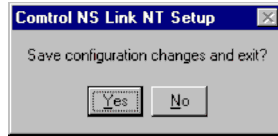
If you change the mode of the port, the following query appears:



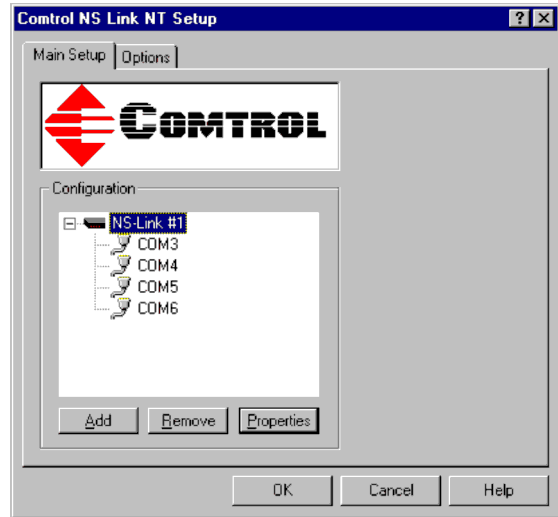
7. Click **OK** to save your configuration changes.

Note: Depending upon the type of configuration changes you made, you may or may not need to reboot your system. The driver will prompt you to save the changes, if necessary.

8. Select **Yes** to complete NS-Link installation.



9. Click on the **OK** button to the following query.



Adding Devices After the Initial Installation

Use the following procedure to add more NS-Link Control devices to an existing installation.

1. Connect the new device to the network and power it up.
2. Make sure that the device passes the power-on LED diagnostics.
3. Click **Start/Programs/Control NS-Link/Control Hardware Setup**.
4. Click on the **Add** button.

The Add Device Wizard appears.



5. For help with the remainder of the setup, use *Installing NS-Link* and start with [Step 9](#).
6. Reboot the system so that the new device initializes.

Replacing NS-Link Devices

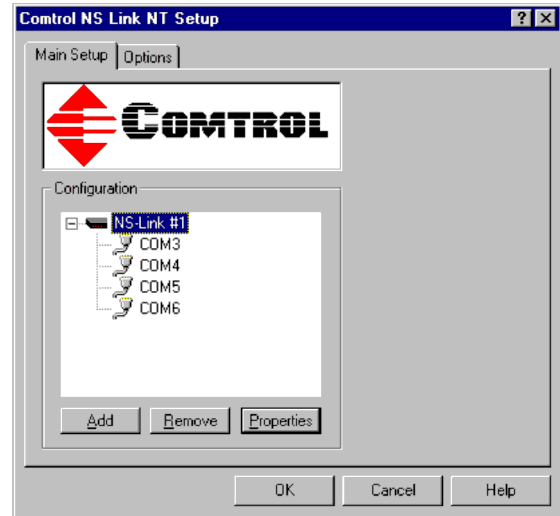
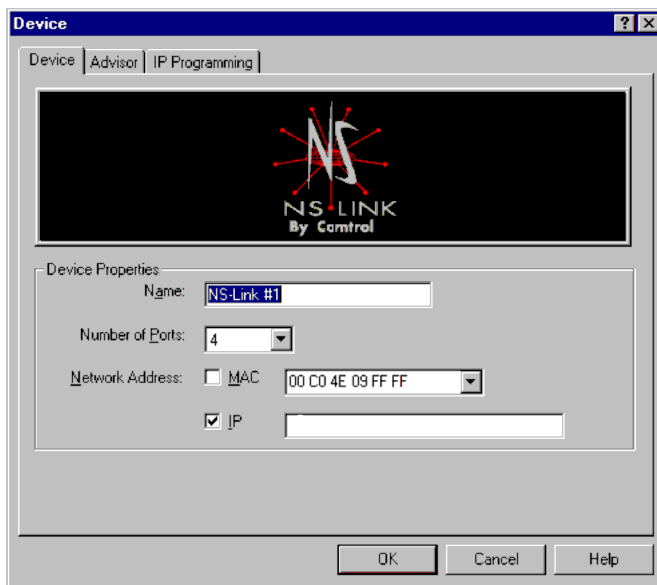
On occasion, it may be necessary to replace an existing and configured Control device with an identical device, without downing the server or reconfiguring ports. To do so, follow these steps:

1. Shut off the old device, connect all cables to the corresponding ports on the spare device, and power up the new device.



Make sure that you re-cable the spare exactly like the original. A remote chance exists that you could damage a peripheral if it is incorrectly connected to a port configured for the wrong communications mode.

2. Write down the Network (MAC) Address of the spare device on the customer service label provided.
3. Click **Start/Programs/Control NS-Link/Control Hardware Setup**.
4. Highlight the name of the NS-Link device that you want to swap out and click the **Properties** button.
5. Enter the new network (MAC or IP) address of the new Control device.



Note: Leave all other properties the same.

6. If necessary, [program the IP address](#).
7. Click **OK** to exit the Device window and click **OK** to exit NS-Link Setup screen.
8. Click **OK** to save the new configuration.

The new device immediately replaces the old one under the old device's device name.

Note: Restarting the system is not needed.

NT Configuration Overview

Configuring Modems

After installing the hardware and driver for Windows NT, you can use this discussion to configure modem COM ports.

The Control device can support any asynchronous serial modem for use by any application that uses TAPI. For information regarding port pinouts and signals, see the *Hardware Installation* documentation:

- [DeviceMaster 4/8-port](#)
- [DeviceMaster 16-port](#)
- [RocketPort Serial Hub *ia*](#)
- [RocketPort Serial Hub *Si* 2-port](#)
- [RocketPort Serial Hub *Si* 4/8-port](#)

Working with NT RAS

Control products are frequently used to provide Dial-Up Networking access with NT RAS (Remote Access Service).

- If RAS is *not* installed, note that you must install at least one RAS-capable device (for example, modem) before installing and configuring RAS.
- If RAS *is* installed, note that the modem installation process automatically launches RAS Setup after modem installation is complete.

Installing Modems

The following instructions were developed using Control modem products. If you are using another brand of modem, note that some prompts and screen descriptions may differ from those shown.

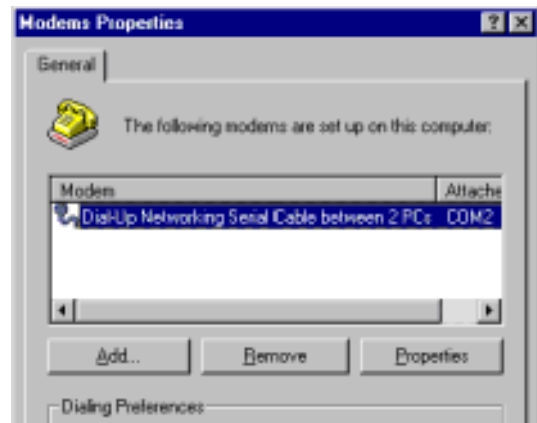
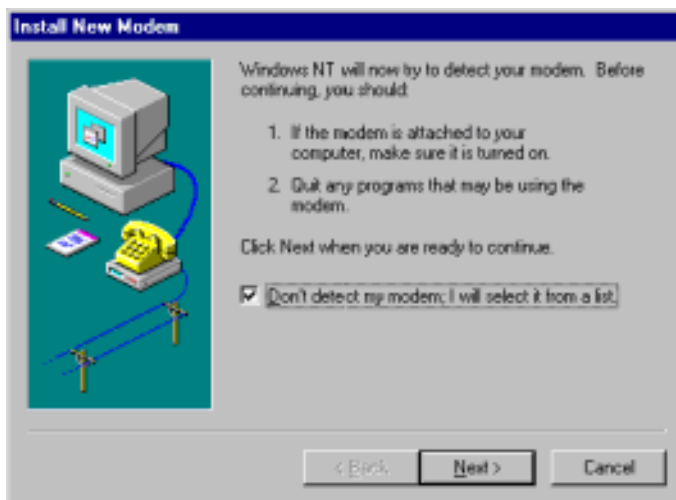
Follow these steps:

1. Connect the modem to the desired port.
2. Power up the modem.
3. Open the Control Panel window.
4. Double-click the Modems icon.

If you have no other modems installed, skip to [Step 5](#).

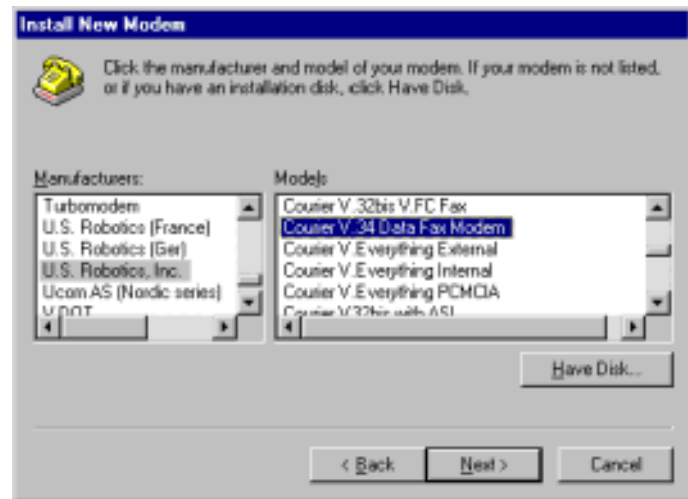
If you have already installed another modem, the Modems Properties window displays. Click the Add button.

5. Check the "Don't detect my modem..." box and click Next.



Note: While Windows NT can automatically detect modems, we advise against using this option as auto-detect feature may cause some multiprocessor systems to lock up, and the modems may be installed in reverse order.

6. Select the appropriate manufacturer and model and click **OK**. If the correct manufacturer and model do not appear on the list, click **Have Disk** to install software from a manufacturer-supplied installation diskette.



7. Select **Finish**. The modem software is installed on the selected ports.



Depending on prior configuration, you may be asked to enter your country of use, area code, the number you dial to get an outside line, and whether you have tone or pulse dialing at this time.

8. If you need to configure modem properties (maximum baud rate, data bits, parity, and so on), click the **Properties** button, make the needed changes, then click **OK** to return to this window.

Note: For help configuring modem properties, see the *Windows Help System*.

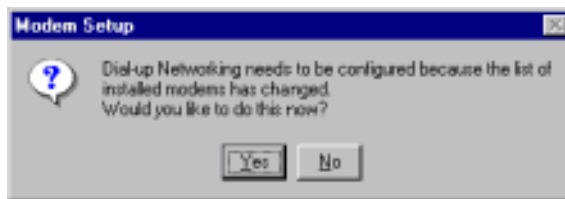
9. If you need to configure dialing properties (country, area code, calling card number, and so on), click the **Dialing Properties** button, make the needed changes, then click **OK** to return to this window.

10. Click **Close**.

Further Modem Configuration

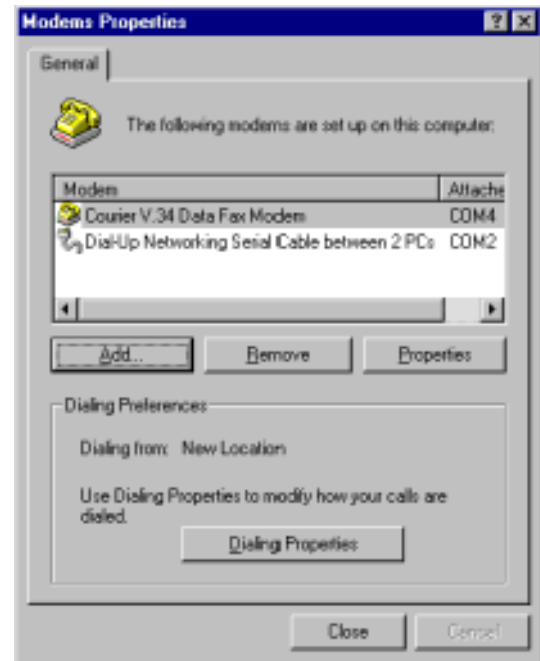
At this point:

- If you are not using RAS, you are now finished. Reboot the server so that your changes take effect and resume normal operations.
- If you plan to use RAS but do not have it installed yet, reboot your system, then go to [Installing RAS Initially](#).
- If you already have RAS installed and configured, this dialog box displays.



If you do *not* want to configure this modem for use with RAS at this time, click **No**, then reboot and resume normal operations.

If you *do* want to configure this modem for use with RAS, do *not* reboot. Instead, click **Yes**, then go directly to [Adding or Reconfiguring a RAS Device](#)



Installing and Configuring RAS

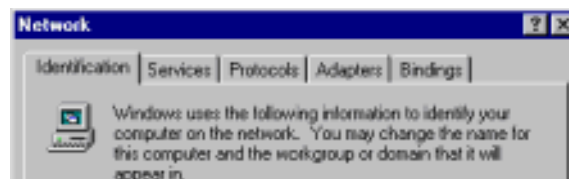
After installing the hardware and driver, and installing and configuring at least one RAS device (for example, a modem), use this section to install and configure Remote Access Service (RAS).

Installing RAS Initially

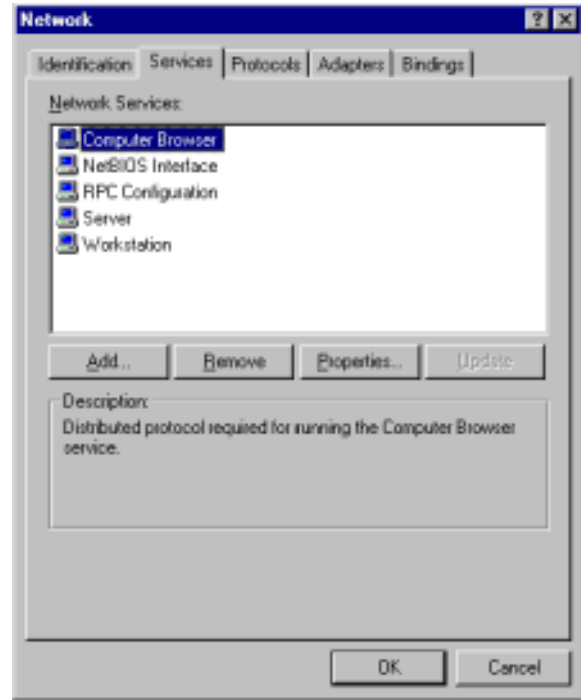
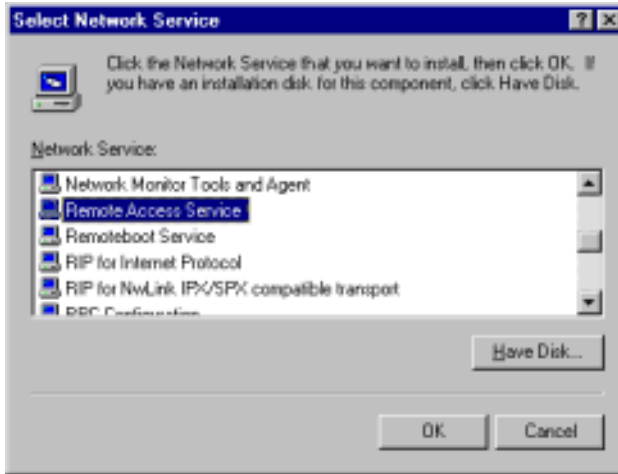
If you have not previously installed RAS in your Windows NT server, log into the server with Administrative rights and follow these steps:

Note: This example shows how to install and configure RAS for use with modems, but you can use it as a guide to setting up other serial devices.

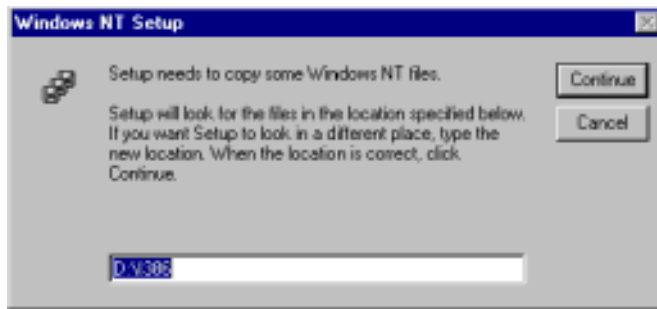
1. Open the Control Panel and start the Network applet, or right-click on the Network Neighborhood and select **Properties**. The following screen displays:



2. Select the Services tab and click the Add button.
3. Highlight Remote Access Service and click the OK button.



4. Enter the location of the Windows NT files (for example, d:\i386) and press the Continue button.



The appropriate files are copied onto your hard drive.

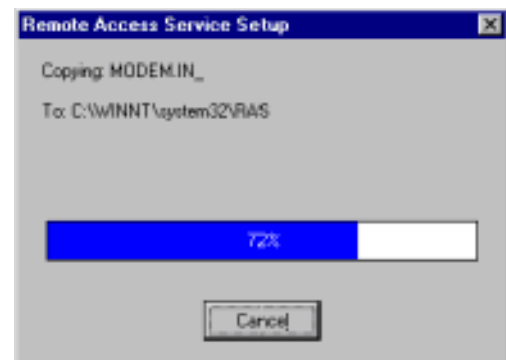
The RAS installation process automatically launches the Add RAS Device process. Go to [Adding or Reconfiguring a RAS Device, Step 5](#).

Note: If you install or reinstall RAS from your original Windows NT 4.0 distribution media, you must install or reinstall the latest Windows NT Service Pack **after** installing/reinstalling RAS. This is necessary because most Service Packs include RAS-related files that are newer than the files on the NT distribution media.

Adding or Reconfiguring a RAS Device

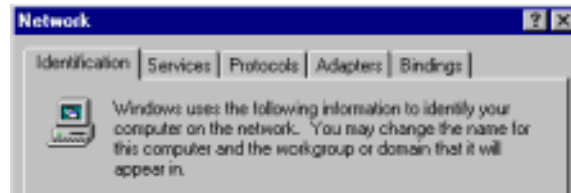
There are several different ways to start this procedure:

- If you have previously installed RAS and configured at least one RAS device, and are now adding or reconfiguring RAS devices, begin with [Step 1](#).
- If you have previously installed RAS and were in the process of installing a modem when this process started automatically, begin with [Step 3](#).
- If you were in the process of installing RAS when this process started automatically, begin with [Step 5](#).

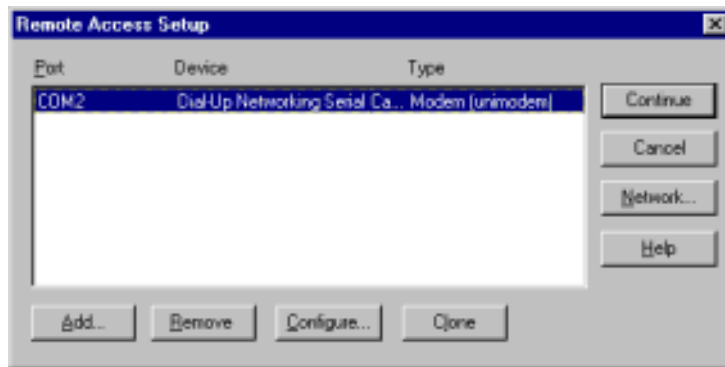


Follow these steps:

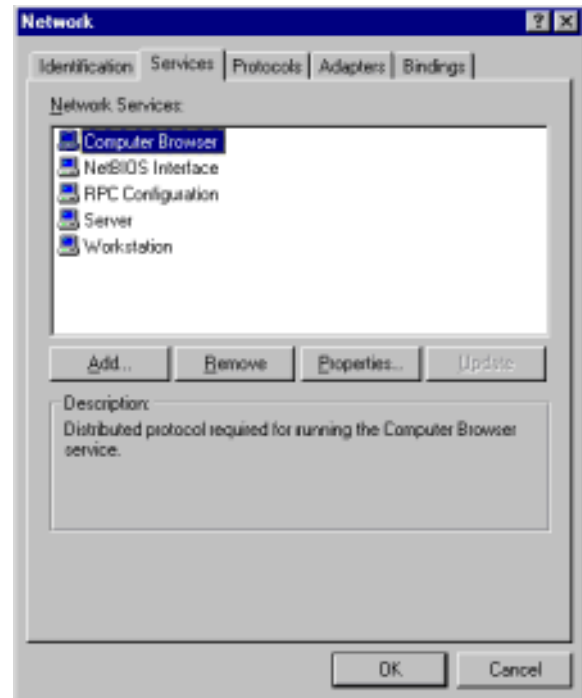
1. Open the Control Panel and start the Network applet, or right-click on the Network Neighborhood and select Properties. The Network window displays.



2. Select the Services tab.
3. Highlight Remote Access Service and click the Properties button. The Remote Access Setup window displays:



4. To reconfigure an existing RAS port, highlight the port/device and click the Configure button. Then go to [Step 7](#).

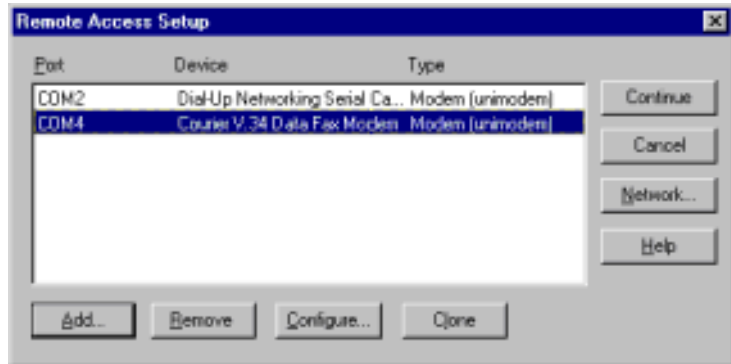


5. To add a new RAS device—for example, if you are configuring a new modem—click the Add button. The Add RAS Device window displays:
6. Use the droplist to select the COM port (modem) that you want to configure and click the OK button.

Note: If no modems appear on this list, you need to install a modem, see [Installing Modems](#).



The Remote Access Setup window displays again.



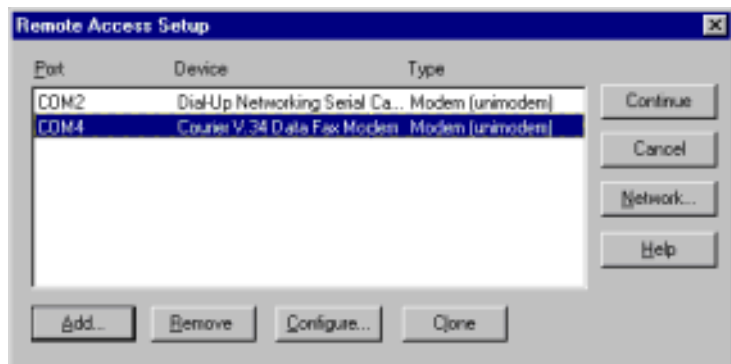
7. Highlight the desired COM port (Modem) and click the **Configure** button. The Configure Port Usage window displays.
8. Select the appropriate radio button, based on the role the modem will perform, and click the **OK** button.

Note: When configuring multiple simultaneous RAS dial-in ports, configure the ports to “Receive calls only” not “Dial out and Receive.” Configuring a port to dial-out requires a separate memory pool for each dial-out port, while all ports configured for receive-only share the same memory pool.



If you configure too many ports for dial-out unnecessarily, resources can become an issue. If you require dial-out on the RAS server, configure one port to “Dial out and Receive” and all the other ports to “Receive calls only.”

The Remote Access Setup window displays again.



- Highlight the COM port (modem) again and click the Network button.
- Select the appropriate dial out protocols, dial in protocols, logon security levels, enable multilink (if required) and click OK.

Note: Only previously configured protocols are selectable. If you want to set up a protocol that is grayed out, you must first add it using the Network Protocols tab.

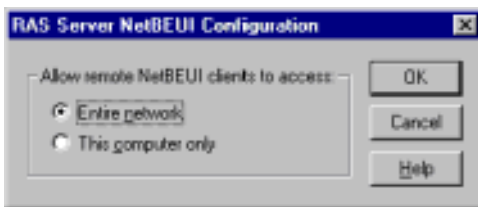
If you selected "Receive calls only" on all ports while configuring the port usage, the "Dial out Protocols" area will be shaded.

If you want to use Multilink PPP (bonding), make sure that you click the **Enable Multilink** checkbox.

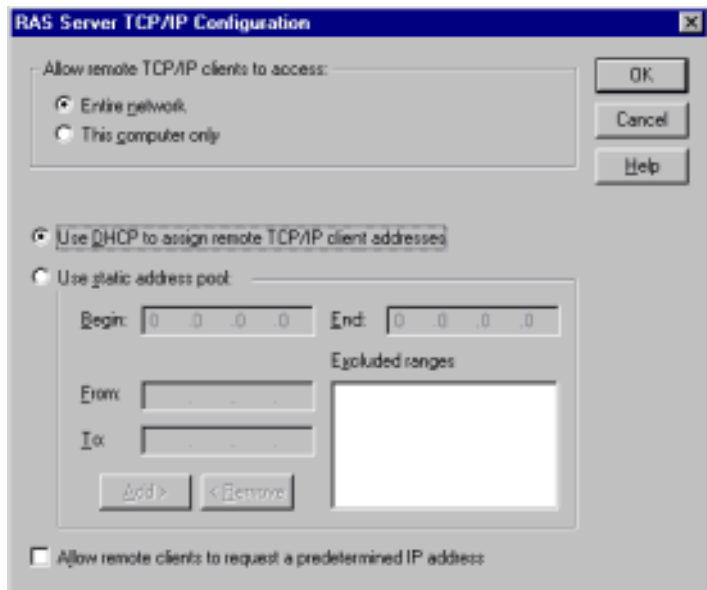
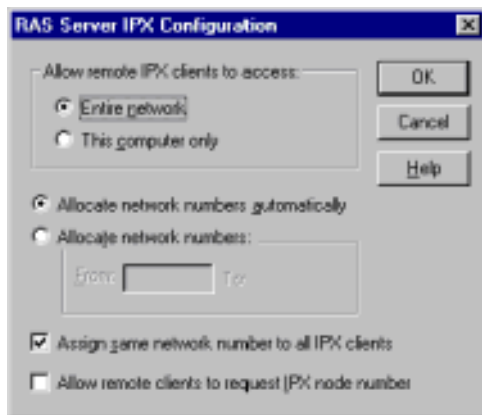
For detailed information about the configuration screens, use the Help button or the Windows NT CD-ROM (**Support/books/server.hlp** file to locate information).

Note: The following steps are dependent upon the protocol selections made in this screen.

- If you select NetBEUI on the Network Configuration screen, the following window displays. Make the appropriate selection for your environment and click OK.



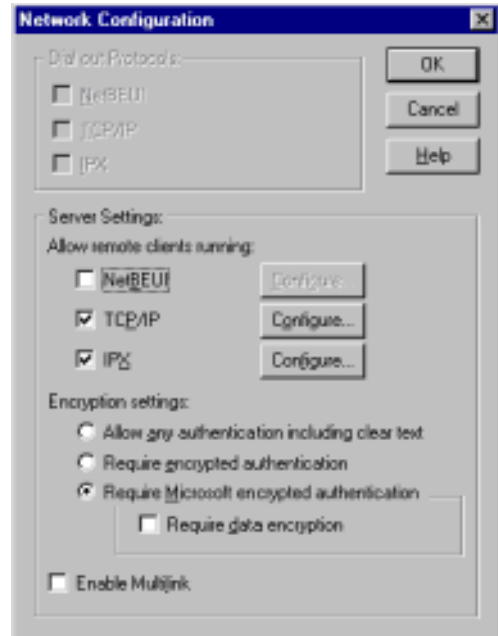
- If you select TCP/IP, the following window displays. Make the appropriate selections for your environment and press OK.
- If you select IPX, the following window displays. Make the appropriate selection for your environment and press OK.



- Click **OK** to exit the Network Configuration screen and return to the Remote Access Setup screen.

Note: Choices made during network configuration will effect the entire system.

- If you want to duplicate the configuration you just created on any other COM port (modem), highlight the COM port number and click Clone. Otherwise, repeat [Steps 7](#) through 14 for each COM port (modem) you want to set up.



16. After setting up all the COM ports, click the **Continue** button.
17. Click the **Close** button at the Network/Services tab to complete the RAS installation.
18. Click **Yes** when asked to reboot the computer.
Windows NT RAS installation is complete.
19. If necessary, install the latest NT Service Pack or Packs from Microsoft.

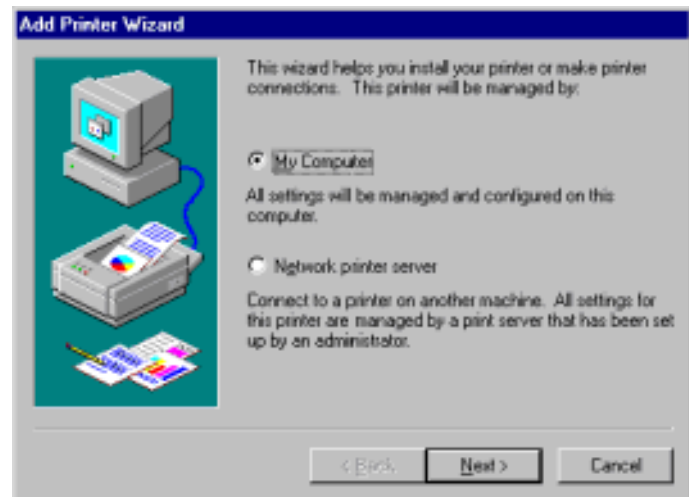
Configuring Printers

Use this subsection to configure printers for the Control device after installing the hardware and NS-Link.

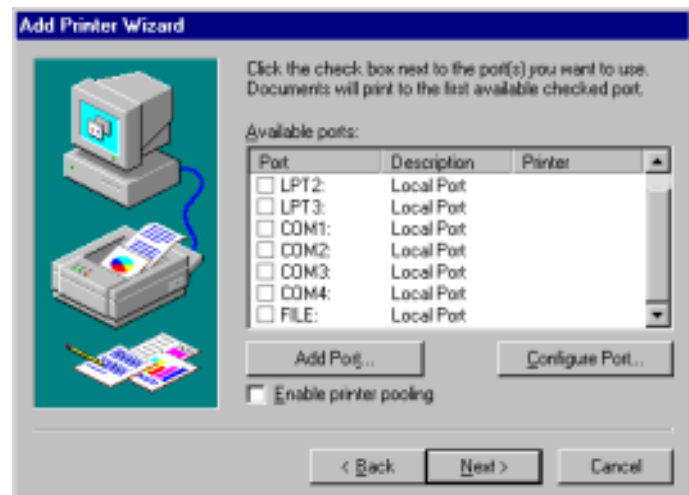
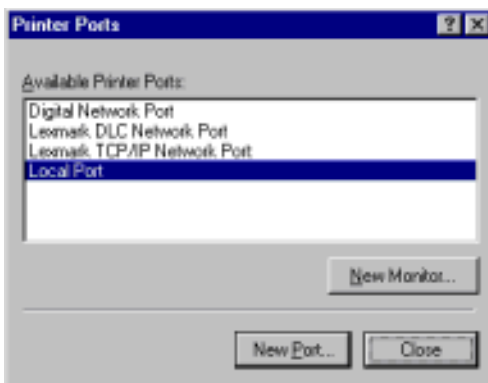
Adding Serial Printers

Follow these steps to configure a serial printer in Windows NT:

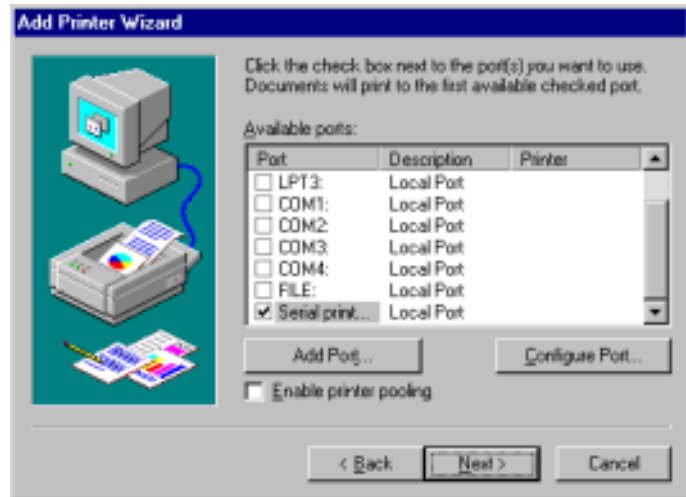
1. Connect the printer to the desired port. Use a DTE-to-DTE null modem cable unless the printer maker specifies otherwise.
2. Open the Printers control panel and double-click on the **Add Printer** icon.
3. Click the **My Computer** checkbox, then the **Next** button.



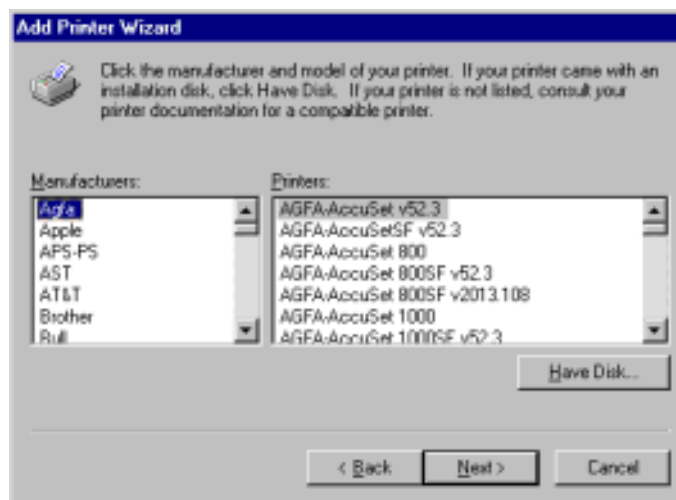
4. If the desired COM port is on this screen, select it, click on the **Next** button, and skip to [Step 6](#).
5. If the desired COM port is not on this list, click the **Add Port** button and follow these steps:
 - a. A list of printer ports is displayed. Click **Local Port**.



- b. Click **New Port**.
- c. Type in the name of the port.
- Note:** Port names above COM9 require the \\.\ prefix. For example, to reference COM12, enter \\.\COM12: (make sure that you add the colon)
- d. Click the **OK** button.
- e. Click the **Close** button to return to the Add Printer Wizard.
- f. Click the **Next** button.



- 6. Select the printer make and model and click the **Next** button.



If your printer is not on the make and model lists, but you have a manufacturer-supplied printer diskette, click the **Have Disk** button.

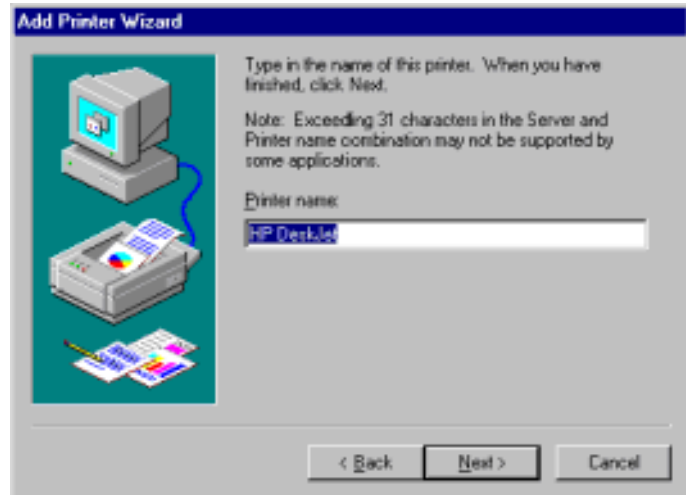
If you have already installed another printer using this driver, you are asked if you want to keep the existing driver.

- 7. To keep NS-Link: check **Keep existing driver**, click **Next**, and go to [Step 8](#).

If you choose **Replace existing driver**, or if you have not previously installed this driver, you are prompted to insert either the Windows NT CD-ROM or the manufacturer's printer diskette. Do so and click **Next**.

8. Select whether you want this printer to be the Windows NT default printer, and click on the Next button.
9. Select whether or not you want to share this printer with other computers on the network. If you select **Shared**, you are asked to indicate the operating systems of all the computers that will be sharing this printer. (You may also be required to insert the operating system media so that Windows NT can extract the necessary driver files.)
10. Select whether to print a test page and click on the **Finish** button.

You are now ready to begin using the printer. No reboot is needed.



Changing Printer Port Configuration

If the printer does not successfully print the test page, it may be necessary to change the port baud rate, parity, and so on. If the Ports applet does not configure the port properly, you may have to use the `mode` command from a DOS prompt. Also, check the printer for DIP switches or other hardware configuration options.

Changing Printer Port Assignment

To change the port assigned to a printer, follow these steps:

1. Open the Printers control panel.
2. Right-click on the icon for the printer you want to change.
3. Select the **Properties** option from the menu. The Properties window is displayed.
4. Click the **Ports** tab.

Note: *The Properties window also gives you access to printer test and setup options that can be very helpful when debugging a serial printer installation.*

5. Check the port you want to switch to. Remember to change your cabling accordingly.

Note: *The Configure button on the Ports tab does not recognize Control ports. This is a limitation of Windows NT. If you need to reconfigure the port, use the Ports option on the Control Panel.*

6. Click on the **OK** button. Any changes you make take effect immediately. No reboot is needed.

Troubleshooting and Using Control Tools

The first subsection discusses troubleshooting. The following subsections discuss the following utilities that are shipped with Control drivers for Microsoft operating systems:

- [Test Terminal](#) (WCOM32.EXE)
- [Port Monitor](#) (PORTMON.EXE)
- [Peer Tracer](#) (PEER.EXE)
- [Device Advisor](#)

Troubleshooting

If you are having trouble with a Control device, try the following.

Note: Most customer problems reported to [Technical Support](#) are traced to cabling or network problems.

1. Verify that the unit is powered on.
 - If the unit has a power switch, turn the unit's power switch off and on, while watching the LED diagnostics. If it is a RocketPort Serial Hub *Si 4/8-port* unit, run the diagnostics program.
 - If the unit does not have a power switch, disconnect and reconnect the power cord.
2. Verify that the port polarity is correct, see the appropriate documentation:
 - [DeviceMaster 4/8-port](#)
 - [DeviceMaster 16-port](#)
 - [RocketPort Serial Hub *ia*](#)
 - [RocketPort Serial Hub *Si 2-port*](#)
 - [RocketPort Serial Hub *Si 4/8-port*](#)
3. Verify that you are using the correct types of cables in the correct places and that all cables are tightly connected.
4. If you are using a 10/100mb NIC card with a RocketPort Serial Hub *Si (4/8-port)*, try locking the card to 10mb/s.
5. Verify that the Ethernet hub and any other network devices between the server and unit are powered up and operating.

Note: To isolate the unit from the network:

DeviceMaster: move the cable from the port labeled *UP* to the port labeled *DOWN* and connect the other end directly to the PC network interface card.

RPSH-*ia* and RPSH-Si: use an Ethernet crossover cable to connect the unit directly to the server NIC.

6. Verify which servers are having problems controlling the device.
7. Verify that the network (MAC) address in NS-Link matches the address on the Control device. See [Changing Configuration Parameters](#) to see how to do this.
8. Verify that the network IP address is correct. If IP addressing is being used, the server should be able to ping the Control device.
9. Enable the Verbose Event Log feature under the [Setup Options tab](#) and then reboot the server.
10. Verify that you are addressing the port correctly. In many applications, device names above COM9 require the prefix \\.\ in order to be recognized. For example, to reference COM20, use \\.\COM20 as the file or port name.
11. Use the [Test Terminal](#) program (wcom32.exe) to troubleshoot communications on a port-by-port basis.
12. Use the [Port Monitor](#) program (portmon.exe) to check for errors, modem control, and status signals. In addition, it provides you with raw byte input and output counts.
13. Use the [Peer Tracer](#) program (peer.exe) to trace driver events.
14. Use the [Device Advisor](#) to help identify the problem.

- If you have a spare Control device try [replacing](#) units. If this corrects the problem, the Control device you have removed from service may be in need of repair.
- Remove and reinstall NS-Link.

Using Test Terminal

WCOM32 is a terminal program that enables you to open a port, send characters and commands to the port, and toggle the control signals.

Note: WCOM32 will **not** work on ports used by RAS if **Remote Access Service is running** or any other application is using the port. If you are using RAS, you must stop the service before starting WCOM32 to test RAS COM ports. To test ports that are not used by RAS, you do not need to stop RAS.

Follow these steps:

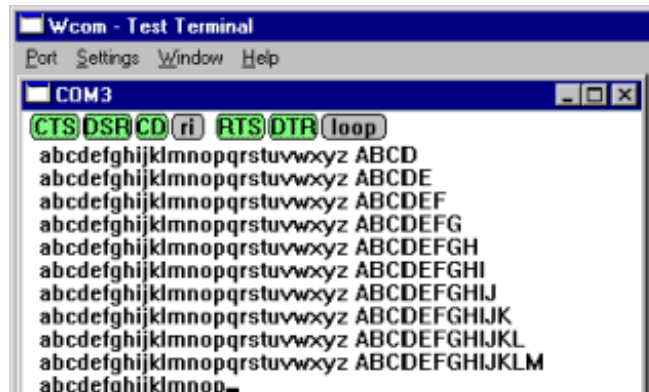
- To start WCOM32, select **Test Terminal** from the Control program group. The program window displays:
- Select **Open Port** from the **Port** menu. A list of possible COM port numbers displays.
- Select the COM port you want to test.



If the COM port does not exist or if it is currently being used by another program, a *Create File Error* message displays.

If the COM port is available, a terminal window pops up:

Note: Notice the <loop> button in the terminal window. If this option is activated, it is green and uppercase (**LOOP**), the COM port internal loopback feature is activated, and the data is returned by the COM port hardware. If this option is deactivated, it is gray and lowercase (**loop**), the internal loopback is deactivated, and the data is sent out the COM port.



Testing a Control Device

- Place a loopback plug on the COM port you are testing. Make sure all connectors are seated firmly and that the loop button is off.

RocketPort Serial Hub Si (4/8-ports only): this works only for RS-232 and RS-422 mode. Use the [diagnostics](#) for RS-485 mode.

RocketPort Serial Hub Si (2-port) and RocketPort Serial Hub ia: This works only for RS-232 mode.

To build loopback plugs, see the appropriate hardware documentation:

- [DeviceMaster 4/8-port](#)
- [DeviceMaster 16-port](#)
- [RocketPort Serial Hub ia](#)
- [RocketPort Serial Hub Si 2-port](#)
- [RocketPort Serial Hub Si 4/8-port](#)

- From the Port menu, select **Send Test Data**. The program sends out a repeating data stream.

Note: To stop the data stream, select **Send Test Data** again.

- If the loopback plug is in place and the port is working correctly, the test data should be echoed back to the screen.
- If the loopback plug is **not** in place or the port is not working correctly, no data or garbled data is echoed back to the screen.

Note: If no characters appear, try putting the loopback plug on an adjacent port. It may be that you have the ports mixed up.

3. If further testing is required, select **Loopback Test** from the Port menu.

If the loopback plug is in place and the port is working correctly, the system should return the message “Passed.”

If the loopback plug is not in place or the port is not working correctly, the system will return the message “Failed.”



Testing a Control Device (RS-485)

Perform the following procedure to determine if a port or ports are functioning properly.

1. Connect a straight-through cable from Port 1 to Port 2.

Note: See the appropriate Hardware Installation documentation if you need to build a cable:

- [DeviceMaster 4/8-port](#)
- [DeviceMaster 16-port](#)
- [RocketPort Serial Hub ia](#)
- [RocketPort Serial Hub Si 2-port](#)
- [RocketPort Serial Hub Si 4/8-port](#)

If testing ports other than Ports 1 and 2, simply connect the cable between any two ports.

2. Open a session for each port.
3. Enter data into the Port 1 session, the data should appear in the Port 2 window.
4. Enter data into the Port 2 session, the data should appear in the Port 1 window.

Note: If the data appears as described in Steps 3 and 4, the hardware is functioning properly.

Test Terminal Modem Control Signals

The terminal window displays the modem control signals as gray or green lights at the top of the window. The first four are inputs:



The lights are green if they are turned on, or gray if off. The text on the light also changes from uppercase (CTS), which is on, to lowercase (cts), which is off.

The next two lights are outputs: **RTS DTR**

Note: If you have a loopback plug connected and you click on one of the outputs, the corresponding signal is sent to the input and the input lights should toggle accordingly.

The rightmost light is the loop indicator: **loop**

If this is on, the COM port internal loopback feature is activated and any information or code entered in the terminal window loops back through the COM port circuitry. If this is off, the COM port internal loopback is deactivated, and any information or code entered in the terminal window is sent out of the port.

Using Port Monitor

The Port Monitor program (**portmon.exe**) offers a summary of all Control device statistics in one spreadsheet view. It also enables you to verify operation of all Control device ports from a single window.

The Port Monitor display follows the familiar spreadsheet model: each COM port is a horizontal row, and each vertical column displays a variable or value for the respective COM port. For definitions of the abbreviations used, see the [Port Monitor Variable List](#).

Port Monitor can also produce statistics and reports that can help you verify the operation of the COM ports and connected peripherals. Some immediate feedback includes:

- The state of the modem control and status signals
- Open ports
- Raw byte input and output counts obtained from NS-Link
- Port errors

The available statistics include:

- Instantaneous characters per second (CPS) calculations
- Minute, hour, and day CPS averages and peaks
- Carrier detect (CD) signal runtime and transition count

Reports can be automatically generated on an hourly and/or daily basis, and can cover all ports collectively or a separate report for each port. You can also set how often the values are recalculated, fine-tuning thoroughness against system efficiency, and automatically run external batch files to perform additional processing and analysis.

Starting Port Monitor

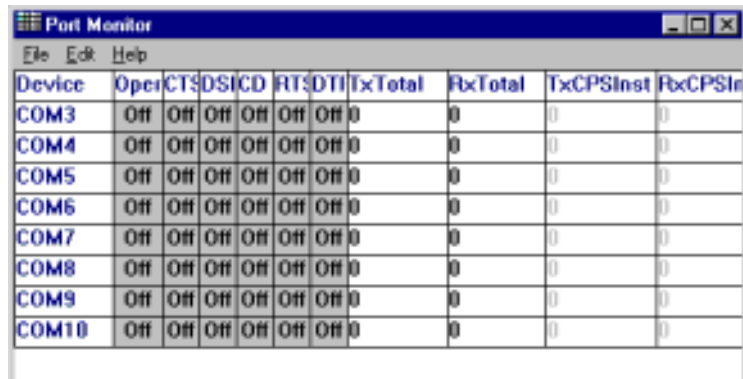
To run Port Monitor, select **Port Monitor** from the Control program group.

The monitor window displays:

Note: To change the appearance of the screen, see the following discussion.

Once the monitor window displays, Port Monitor is active and collecting data. If any cumulative data has been saved from previous sessions, it is automatically brought in and used.

Port Monitor continues to run and collect data until you terminate it, at which point all accumulated data is automatically saved for use in the next session.



Changing Screen Appearance

While Port Monitor is running, there are a number of commands and controls that change the appearance of the screen.

Port Monitor Screen Commands

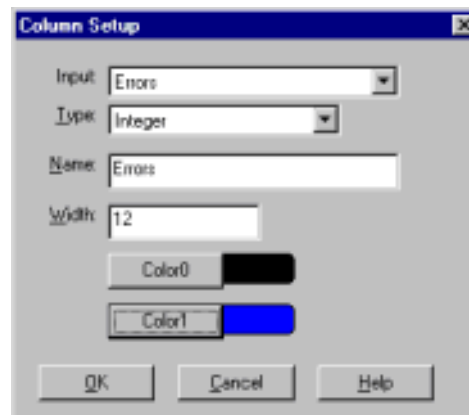
Desired Change	Procedure
Change the monitor window font.	Select Font from the Edit menu.
Change width of a single column.	Left-click on the column separator (vertical) line and drag it to the desired width.
Change column placement.	Left-click in the middle of the column you want to move and drag it to the desired location.
Remove a column.	Right-click on the column you want to remove and select Remove from the pop-up menu.
Clear all fields and reset them to null values.	Right-click on the upper left cell in the table and select Reset from the pop-up menu.*
Clear any single field <i>except</i> the upper left cell.	Right-click on the field to be cleared and select Reset from the pop-up menu.*
Add a column.	Right-click on the column now occupying the desired location and select Add from the pop-up menu. You are prompted to name the variable you want to display, as well as other information. (See <i>Column Setup</i> , below.) After you click OK , the column is inserted in the selected location and the existing column is moved to the right.
Change other properties of a column.	Right-click on the column and select Properties from the pop-up menu. (See <i>Column Setup</i> , below.)

* The **Reset** command does not clear raw data from the *calcs.dat* file. It simply resets the selected display fields to their null values. For more information regarding *calcs.dat* see [Page 38](#).

Column Setup

When you select **Add** or **Properties** from the column pop-up menu, the Column Setup window displays:

- Use the **Input** droplist to select the variable displayed in the column.
- Use the **Type** droplist to select the way in which the value displays: either as an integer, as an on/off state, as an integer with a kilo, mega, or giga suffix, or as an hh:mm:ss time stamp. This defaults to the appropriate type for the selected Input variable.
- Use the **Name** variable to change the column heading name.
- Use the **Width** variable to specify the column width in characters.
- Use **Color0** to set the column character color when the value is zero.
- Use **Color1** to set the column character color when the value is not zero.
- When done, click **OK** to save your changes and return to Port Monitor.



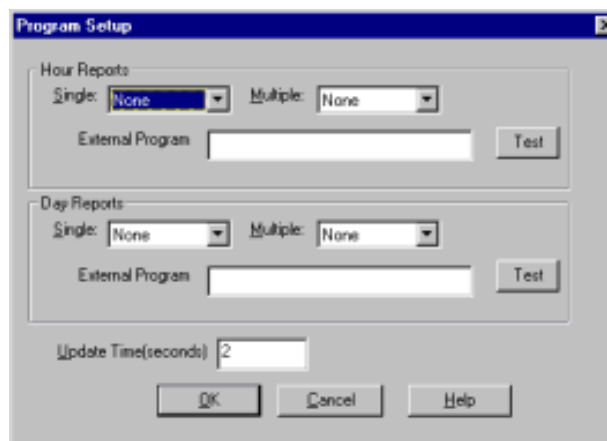
Report Configuration

To configure reports, select **Config** from the Edit menu.

The **Single** report options cover all ports and are overwritten each time the reports are generated. The **Multiple** report options generate a separate report for each port, and each report file is appended each time the report is generated.

For **Hour** reports, use the **Single** and **Multiple** droplists to select whether you are generating single or multiple reports, or both. For each report type, select from the following types of data to include:

- **None**: no report is generated.
- **Hour Data**: only variables with “Hour” in the name are included.
- **All Data**: all variables are included.
- **View Data**: only variables that appear on-screen are included.



The **External Program** field is used to enter a command line to run another program after the hourly reports have been generated. For example, you can use this to run a batch file that performs custom report processing. The **Test** button causes the command line to be executed immediately.

For **Day** reports, the single and multiple droplists behave the same, but your choices are:

- **None**: no report is generated.
- **Day Data**: only variables with the words “Day” or “Raw” in the names are included.
- **All Data**: all variables are included.
- **View Data**: only the variables that appear in the Port Monitor window are included.

Likewise, the **External Program** field is used to enter a command line to be executed after the daily reports have been generated.

The **Update Time** option allows you to set the rate at which the port information is obtained and the calculations performed. There is a trade-off between Port Monitor efficiency and response time. If you are using Port Monitor to view the port activity on the screen, you may want to set the update time to 1 or 2 seconds, so that the screen is updated frequently. If you are concerned about the monitor program using CPU resources, set this to a higher value, (6 to 20 seconds) in order to decrease the time required by the program to perform the calculations and update the screen.

If Port Monitor is left active to generate reports, minimizing or reducing the display area of the program will help reduce the CPU overhead of updating the screen.

Port Monitor Files

Port Monitor creates and uses the following files:

- portmon.view
- calcs.dat

The default column layout is saved in portmon.view. If you have been experimenting with the appearance of the monitor screen, you can use the File menu Save option to save your customized layout in another.view file. You can retrieve this file later by using the File menu Open option, or you can use the Edit menu View Default option to retrieve portmon.view and restore the default view.

All Port Monitor calculations are saved at program exit and on the hour in a binary file named calcs.dat. This enables you to halt Port Monitor execution without losing accumulated data.

Port Monitor also creates a \REPORTS directory. All hourly and daily reports are saved in this directory, under the following names:

- hall.txt — hourly single report
- dall.txt — daily single report
- hcomx.txt — hourly multiple reports, where *x* is the port number
- dcomx.txt — daily multiple reports, where *x* is the port number

Caution: *Since multiple reports append new data each time they are written, the multiple report files grow in size. It is up to you to delete them periodically.*

Some safeguards are built into the program to avoid filling up a hard disk drive due to growing report files. The monitoring program stops writing additional data to the multiple reports if they reach a size of 2 MB. Also, the program will not write out data files to the disk drive if the spare room on the drive is less than 2 MB in size.

To view or edit an hourly or daily report, use the Edit Report option on the File menu, or use a system tool such as NOTEPAD.

For more information, see the Port Monitor Help file.

Port Monitor Variables

The following table lists Port Monitor variables.

Port Monitor Variable List

Variable	Description
Open	Open status, on if open, off if closed.
Cts	Input CTS pin status.
Dsr	Input DSR pin status.
Cd	Input CD (carrier detect) pin status.
Rts	Output RTS pin status.
Dtr	Output DTR pin status.
TxTotal	Total bytes transmitted.
RxTotal	Total bytes received.
TxCPSInst	Instantaneous average of transmit characters per second.
RxCPSInst	Instantaneous average of receive characters per second.
Errors	Total hardware receive errors (parity, framing, and overruns.)
TxMinCPS	Last minute average of transmit characters per second.
RxMinCPS	Last minute average of receive characters per second.
TxCPSMinAvMax	Peak TxCPSInst for the last minute.

Port Monitor Variable List (Continued)

Variable	Description
RxCPSMinAvMax	Peak RxCPSInst for the last minute.
TxCPSHourAvMax	Peak TxMinCPS for the last hour.
RxCPSHourAvMax	Peak RxMinCPS for the last hour.
TxCPSDayAvMax	Peak TxMinCPS for the last day.
RxCPSDayAvMax	Peak RxMinCPS for the last day.
TxTotalRaw	Total number of transmit bytes raw data from NS-Link.
RxTotalRaw	Total number of receive bytes raw data from NS-Link.
TxMinCnt	Count of transmit bytes sent in last minute.
TxHourCnt	Transmit bytes count sent in the last hour.
TxDayCnt	Transmit bytes count sent in the last day.
RxMinCnt	Receive bytes count sent in the last minute.
RxHourCnt	Receive bytes count sent in the last hour.
RxDayCnt	Receive bytes count sent in the last day.
TxMinCntWrk	Transmit bytes count sent in this minute.
TxHourCntWrk	Transmit bytes count sent in this hour.
TxDayCntWrk	Transmit bytes count sent in this day.
RxMinCntWrk	Receive bytes count sent in this minute.
RxHourCntWrk	Receive bytes count sent in this hour.
RxDayCntWrk	Receive bytes count sent in this day.
TxCPSMinAvMaxWrk	Peak TxCPSInst for the current minute.
TxCPSHourAvMaxWrk	Peak TxMinCPS for the current hour.
TxCPSDayAvMaxWrk	Peak TxHourCPS for the current day.
RxCPSMinAvMaxWrk	Peak RxCPSInst for the current minute.
RxCPSHourAvMaxWrk	Peak RxMinCPS for the current hour.
RxCPSDayAvMaxWrk	Peak RxHourCPS for the current day.
CDRuns	Carrier detect turn-on count.
CDDayRuns	Carrier detect turn-on count in the last day.
CDDayRunsWrk	Carrier detect turn-on count in the current day.
CDRunTime	Time in seconds carrier detect has been on.
CDHourRunTime	Time in seconds carrier detect has been on in the last hour.
CDDayRunTime	Time in seconds carrier detect has been on in the last day.
CDHourRunTimeWrk	Time in seconds carrier detect has been on this hour.
CDDayRunTimeWrk	Time in seconds carrier detect has been on this day.
StatusFlags	Bit flags, Open, CTS, DSR, CD, RTS, DTR
TxPkts	Raw count of total transmit packets sent.
RxPkts	Raw count of total receive packets sent.
OverrunErrors	Total count of receive overrun errors.
FramingErrors	Total count of receive framing errors.

Port Monitor Variable List (Continued)

Variable	Description
ParityErrors	Total count of receive parity errors.
OverrunErrorsRaw	Total count of receive overrun errors, from NS-Link.
FramingErrorsRaw	Total count of receive framing errors, from NS-Link.
ParityErrorsRaw	Total count of receive parity errors, from NS-Link.

Using Peer Tracer

The **Peer Tracer** program (**peer.exe**) is specifically designed to view the internal operations of NS-Link for the purpose of troubleshooting communications on Windows NT systems. **Peer** enables you to see:

- Receive and transmit data
- Internal driver event traces
- Advanced configuration and status information

Like **Test Terminal**, **Peer** acts as a simple terminal session, and is used to send and receive text information to and from NS-Link. To use **Peer**, you type in commands, and status and information are sent back.

Unlike **Test Terminal**, **Peer** enables you to keep a continuous log of the commands sent and the results received in a file named **peer.log**.

Control Technical Support may ask you to run **Peer** in order to help diagnose reported problems.

Starting Peer

Peer Tracer does not appear in the Control program group. To use it, you must open **Windows Explorer**, access the **C:\WINNT\system32\rpshSi** directory, and double-click on **peer.exe**. The **Peer Tracer** window displays:



Log Functions

All logging functions are found under the **File** menu. To start keeping a log, select **Log to Disk** from the **File** menu. The other options on this menu are **View Disk Log**, **Clear Disk Log**, **Clear Screen**, and **Exit**.

Using Peer

To use **peer**, simply type in commands at the **:** prompt. (It may be necessary to press **Enter** to make the **:** prompt appear.) For example, to examine **COM5**, type:

```
PORT COM5 <Enter>
```

To gather some information about the port, type:

```
STAT <Enter>
```

This should return details about the port.

To turn on monitoring of any calls into driver (events), type:

```
MON EV <Enter>
```

To send strings and commands to attached peripherals—for example, to send “**ATH0**” to a modem—type:

```
SEND ATH0 <Enter>
```

A return and linefeed are always appended to each string sent.

Other Peer Commands

Enter commands at the **:** prompt and follow each command with **Enter**.

Peer Tracer Commands

Command	Effect
MON TX	Monitor data being transmitted through the selected port.
MON RX	Monitor data being received through the selected port.
M	Turn off all monitoring.
?	Display Peer Tracer command summary.
PORT COM_{xx}	Change port being examined to COM _{xx} .

Keep in mind that all commands are processed in NS-Link, and that **Peer** simply acts as a conduit for this information.

For more information, see the **Peer.hlp** help file.

Using the Device Advisor

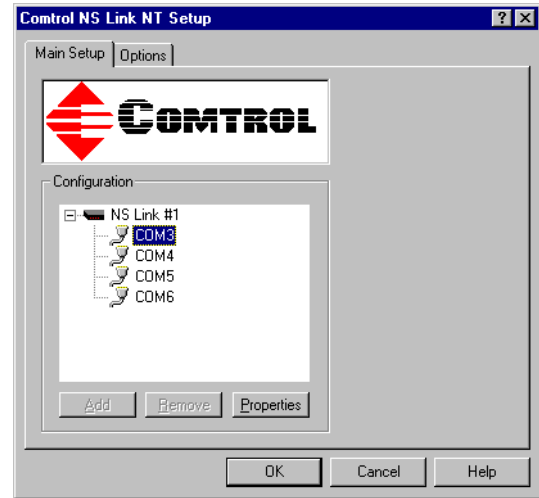
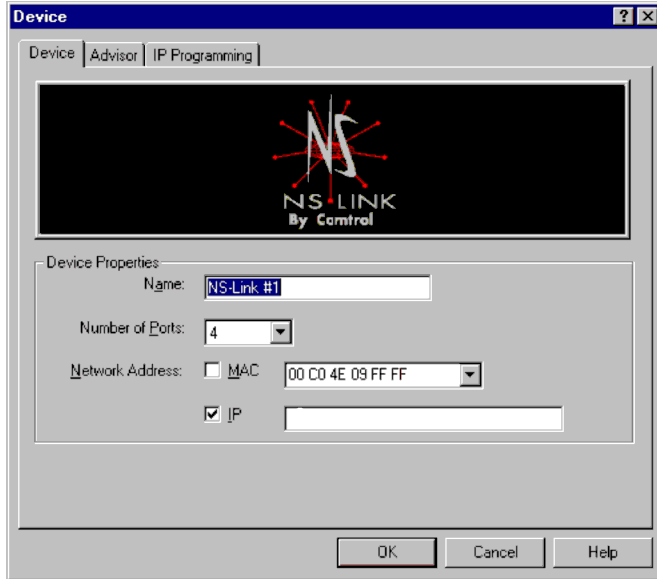
You can use the Device Advisor to determine the following information:

- Summary of the device status
- The MAC address of the network interface card (NIC)
- The Adapter ID string
- The Control device's MAC address
- Detailed state of the Control device
- Total number of successful load attempts
- Total number of devices on the network
- Transmit statistics, such as the number of:
 - Frames out
 - Packets to device
 - Retransmitted frames
- Receive statistics, such as the number of:
 - Frames accepted
 - Frames passed on
 - Packets from device
 - Out of sequence frames

Note: For detailed information about the fields in the Device Advisor, use the on-line help available in the application.

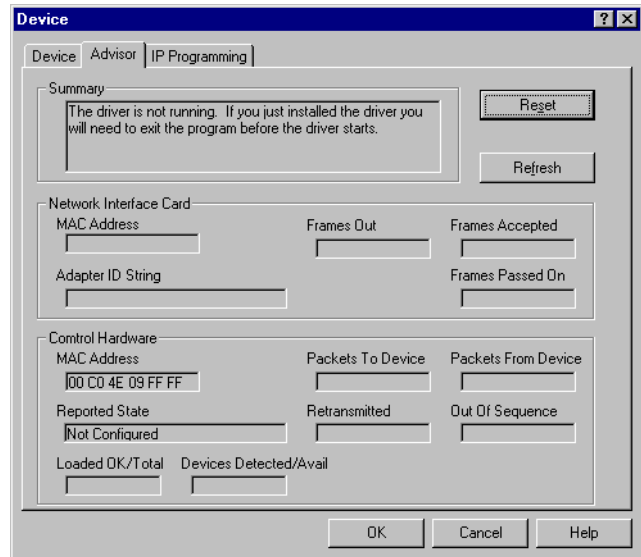
Use the following procedure to access the Device Advisor:

1. Start the NS-Link menus using the **Start** button.
2. Highlight the device that you want to review and select the **Properties** button.
3. Click on the Device Advisor tab.



The Device Advisor screen appears providing you with information that you may find useful.

Note: For information about the fields in the Device Advisor, use the on-line help available in the application.



Device Advisor Driver Messages

The following tables provide information about device driver summary messages and reported state messages.

Driver Summary Messages

Message	Description
Uninitialized	Control device has not been installed correctly.
Unable to contact the RPSH <i>Si</i> NT driver	The Control device NS-Link is not installed or is not responding to Device Advisor requests.
Unable to contact a Network Interface Controller (NIC)	The server NIC card may not be installed, may be malfunctioning, or may not be bound to the Control device.
Cannot detect network	No inbound traffic of any sort Control device may be inoperative or you may have a network cabling problem.
Cannot detect any RPSH- <i>Si</i> .	Network traffic is being received, but not from a Control device. Check the network connections and verify that the Control device is powered up.
Cannot detect RPSH- <i>Si</i> with specified MAC address.	Network traffic is being received from a Control device, but not the one specified in Device Setup. Check the device to make sure that you are using the correct MAC address in Device Setup, and check the Main Setup window to verify that you are working with the correct device.
RPSH- <i>Si</i> device with specified MAC address was detected, but is not configured for this server.	Either the Control device in question is not assigned to this server, or it is not assigned to <i>any</i> server, or it has been configured for this server but the configuration has not been saved. If the latter, return to the Setup window, save and exit, and restart the server
RPSH- <i>Si</i> device detected and configured for this server, but is not yet assigned to this server.	Either the Control device is currently being controlled by another server or the device power has been cycled and the device is waiting for a server to acquire it.
RPSH- <i>Si</i> detected, initializing.	The server has acquired the Control device and is downloading the control program. The device will be available shortly.
RPSH- <i>Si</i> responsive, but no data traffic exchange since last inquiry.	The Control device appears to be installed correctly and active, but no data traffic has been sent or received since the last time you clicked the Refresh button. If there should have been traffic, check the Control device port configuration and external cabling.
RPSH- <i>Si</i> responsive; data traffic received, but nothing sent since last inquiry.	Similar to above, except the Control device has received data successfully.
RPSH- <i>Si</i> responsive; data traffic sent, but nothing received since last inquiry.	Similar to above, except the Control device has sent data successfully.
RPSH- <i>Si</i> active.	Normal state: the Control device is installed correctly and active with data traffic.
Poor connection to RPSH- <i>Si</i> .	This message displays if retransmissions occur, frames arrive out of sequence, or more than 2% of the total packets arrive out of sequence. This generally indicates a cable, connector, or LAN termination problem.
Counts reset.	This message displays immediately after you click the Reset button.

Driver Reported State Messages

Message	Description
Invalid	An illegal Control device state has been detected. Reset the Control device.
Init	This is the normal state for undetected and inactive Control device.
InitOwn	The server has acquired the Control device but has not downloaded the control software.
SendCode	The server has acquired the Control device and is in the process of downloading the control software.
Connect	The server has completed the download and is completing initialization.
Active	The normal state for a Control device that is attached to an NT server and is ready for data traffic.
Not found	The specified MAC address is not configured on this NT server.
Undefined	No Control devices are configured on this NT server.

Technical Support

Control has a staff of support technicians available to help you. You should review [Troubleshooting and Using Control Tools](#) before calling Technical Support.

Control	Headquarters	Europe
Phone	(763) 494-4100	+44 (0)1869 323220
FAX	(763) 494-4199	+44 (0)1869 323211
Email	support@comtrol.com	support@comtrol.co.uk
Web support	Searchable Solution Database and FAQs	
Web site	www.comtrol.com	www.comtrol.co.uk
FTP site	ftp.comtrol.com	

In addition, please have the following information available.

Support Call Information

Item	Information
Hardware Type	
Hardware Serial Number*	
MAC Address* (if using MAC addressing)	00 C0 4E ____ ____ ____
Operating system type	
Driver part number and revision level	
Server computer make, model, and speed	
Other network devices and network (MAC) addresses	
Devices connected to the Control device	

* *The hardware serial number and MAC address can be found on printed tags the unit.*

Control supplies a self-adhesive label with each Control Device, which you can use to record the serial number and network address. If the Control device is not in a readily accessible location, check to see if this label has been filled out and posted elsewhere (for example, near the server console).

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