

NS-Link Device Driver User Guide

Windows 8/8.1 Windows Server 2012 Windows 7 Windows Server 2008 Windows Vista Windows Server 2003 Windows XP



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Overview

This section discusses the following topics:

- <u>When to Use the DeviceMaster NS-Link Device Driver</u>
- <u>Comtrol Drivers Management Console</u>
- <u>Supported Operating Systems</u>
- <u>Products Supported</u>
- <u>Conventions</u> on Page 6
- <u>Downloading the Latest Software and User Guides</u> on Page 7

When to Use the DeviceMaster NS-Link Device Driver

Install the DeviceMaster NS-Link device driver to use DeviceMaster serial ports as native COM ports and to set up secure COM ports. If you install the device driver, you can also configure the ports for socket mode or serial tunneling. See <u>NS-Link Device Driver Configuration Considerations</u> on Page 27 for detailed information about the NS-Link device driver.

Comtrol Drivers Management Console

This User Guide discusses how to install and configure Comtrol device drivers using the Installation Setup Wizard and the Comtrol Drivers Management Console for the NS-Link device driver.

The *Comtrol Drivers Management Console* is accessible through the Windows *Control Panel* using a dedicated shortcut created during the initial device driver installation process. The *Comtrol Drivers Management Console* allows you to browse all installed and supported Comtrol products in one place and apply any changes quickly.

Note: This User Guide discusses the DeviceMaster, see the RocketPort EXPRESS/ INFINITY, RocketPort and RocketModem (Universal PCI) Series User Guide for Windows for adapter specific information.

You can refer to <u>Using the Comtrol Drivers Management Console</u> on Page 29 for general information about the Comtrol Drivers Management Console.

Supported Operating Systems

The *Comtrol Drivers Management Console* supports the following operating systems:

- Windows 7, Windows 8, and Windows 8.1
- Windows Server 2012, Windows Server 2008, and Windows Server 2003
- Windows Vista
- Windows XP

Products Supported

These are the products supported by the *Comtrol Drivers Management Console*:

- DeviceMaster LT
- DeviceMaster PRO
- DeviceMaster RTS
- DeviceMaster Serial Hub
- DeviceMaster 500
- RocketModem IV
- RocketPort EXPRESS
- RocketPort EXPRESS SMPTE
- RocketPort INFINITY
- RocketPort Plus Universal PCI
- RocketPort Plus/422 Universal PCI
- RocketPort Universal PCI
- RocketPort Universal PCI SMPTE

Conventions

In the remainder of this *User Guide*, the products are referred to accordingly:

- Comtrol device unless there is model-specific information
- **DeviceMaster** means the DeviceMaster models listed in the previous subsection
- **RocketPort** means any RocketPort model
- **RocketPort EXPRESS/INFINITY** means RocketPort EXPRESS, RocketPort EXPRESS SMPTE, and RocketPort INFINITY
- RocketPort and RocketModem (Universal PCI) means RocketModem IV, RocketPort Universal PCI, RocketPort Plus Universal PCI, RocketPort Plus/ 422 Universal PCI, and RocketPort Universal PCI SMPTE

The paths in this Guide to locate DeviceMaster software and documentation point to the DeviceMaster RTS paths on the ftp site. All supported DeviceMasters (*Products Supported*) models use the same software and documentation.

Downloading the Latest Software and User Guides

You can use the CD or the following table to locate the latest version of the	
software and documentation.	

	Software	Description	Document
Configuration Application	PortVision DX	Install on a Windows host to program the IP address and manage your DeviceMaster. Refer to <u>PortVision DX Overview</u> on Page 7 for more information.	
	Bootloader	Bootloader is the operating system that runs on the DeviceMaster hardware during the power on phase, which then loads SocketServer.	es DeviceMaster Installation
/are		Update the Bootloader on your DeviceMaster, if advised by Technical Support.	Configuration
Firmware	SocketServer	SocketServer is the name of the TCP/IP socket web page that is integrated in the firmware that comes pre-installed on your DeviceMaster.	Guide
		Note: Make sure you upload the latest version of SocketServer before configuring the device driver.	
Device Driver	Windows 7/8/8.1 Windows Server 2012/2008/2003 Windows Vista Windows XP	Install if you want COM ports (native or secure).	(This Guide)

PortVision DX Overview

PortVision DX automatically detects Comtrol Ethernet attached products physically attached to the local network segment so that you can configure the network address, upload firmware, and manage the following products:

- DeviceMaster family, including:
 - DeviceMaster LT
 - DeviceMaster PRO
 - DeviceMaster RTS
 - DeviceMaster Serial Hub
 - DeviceMaster UP
 - DeviceMaster 500
- IO-Link Master
- RocketLinx

PortVision DX replaces PortVision Plus. PortVision Plus does not support operating systems above Windows 7 and SocketServer versions above v9.00 or NS-Link device driver v10.xx.

PortVision DX may require that you have the latest Microsoft Service pack for your operating system:

- Windows 8/8.1
- Windows Server 2012
- Windows 7
- Windows Server 2008
- Windows Vista
- Windows Server 2003
- Windows XP

In addition to identifying Comtrol Ethernet attached products, you can use PortVision DX to display any third-party switch and hardware that may be connected directly to those devices. All non-Comtrol products and unmanaged RocketLinx devices are treated as non-intelligent devices and have limited feature support. For example, you cannot configure or update firmware on a third-party switch.

Before Installing the Comtrol Drivers Management Console

This section provides an overview for the procedures that you may need to perform before installing the *Comtrol Drivers Management Console* for the device driver.

This section contains the following discussions:

- Initial Installation Overview on Page 9
- Install the Hardware on Page 9
- Install PortVision DX on Page 10
- <u>Program the IP Address (Network Information)</u> on Page 11
- <u>Uploading SocketServer</u> on Page 14

Initial Installation Overview

If you have already performed the following procedures, you can skip to the next section, <u>NS-Link Device Driver Installation</u> on Page 15.

You may also refer to the *DeviceMaster Installation and Configuration Guide*, which provides detailed information about the following procedures:

- 1. Install the hardware (below).
- 2. Install PortVision DX (below).
- 3. <u>Program</u> the network information using PortVision DX (Page 11).
- 4. <u>*Check*</u> the SocketServer version and determine whether you need to download an updated version (Page 13).
- 5. If necessary, <u>upload</u> the latest version of SocketServer (Page 14).

Install the Hardware

If you have not done so, install the DeviceMaster:

- 1. Connect an Ethernet cable between the DeviceMaster and a host PC NIC or to the same Ethernet network segment using a standard Ethernet cable. Refer to <u>Connectivity Requirements</u> on Page 66 for cabling information.
- 2. Connect the power supply or cable to the DeviceMaster and apply power.
- 3. Check the DeviceMaster LEDs to verify that it is ready. Refer to <u>DeviceMaster</u> <u>LEDs</u> on Page 68 to determine the LED status.

Install PortVision DX

Use the following procedure to install PortVision DX.

- 1. Download PortVision DX from http://ftp.comtrol.com/dev_mstr/portvision_dx.
- 2. Execute the **PortVision_DX_**[version]**.msi** file and follow the *Installation* wizard.
- 3. Click Launch PortVision DX and Finish in the last installation screen.
- 4. Click Scan so that PortVision DX locates the DeviceMaster.

PortVision DX displays the Comtrol Ethernet attached products for which you chose to scan. See the PortVision DX help system detailed information about how to use it to tailor your view.

5. Go to the next discussion to program the network information into the DeviceMaster.

You can save time if you only scan for DeviceMasters.

Scan Network	×
Select any number of device types from the list below and clic scanning the network.	k Scan to start
DeviceMaster 500 / AIR / LT / PRO / RTS / Serial Hub / U I T IO-Link Master	
RocketLinx (Managed Only)	
Note: If you want to abort the process, dick Cancel.	Scan Cancel

ile Manage View Tools He	lp											
Scan Refresh All Properties	Save.	A Load	Upload	Reboot	Q Webpage	₩ Notes	🥌 Help	() About	exit			
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Program the IP Address (Network Information)

If you have not done so, program the IP address for your network. The following procedure is to program a single DeviceMaster, if you want to program IP addresses into multiple DeviceMasters, refer to the PortVision DX help system or the <u>DeviceMaster Installation and Configuration Guide</u>.

- 1. If necessary, start PortVision DX, Start > Programs > Comtrol > PortVision DX > PortVision DX.
- 2. If the DeviceMaster that you want to program is not displayed, click Scan.
- 3. Right-click the DeviceMaster in the *Device Tree* or *Device List* pane for which you want to program network information and click **Properties**.

- • • PV PortVision DX File Ma nage Vi Tools Help . 8 -3 Ľ • 0 Save Refresh All Properties Load Upload Reboot Help Exit Webpage Notes About First Floor [9 / 9] ES9528-XT [11 / 11] B 🗸 ES7506 [0 / 1] ES7510 ES7510-XT ES7528 ÷ PORTVISION ES8508 ES8508F-M ES8509-XT ne : First Floo B 🖌 ES8510 ES8510-XT ES8510-XTE I V IO-Link Ma Refresh Device Properties EtherNet/IP System Edit Notes LT16 #2 Jse menu or his area. Modbus Router S Webpage Modbus/TCP Telnet / SSH Session PRO8 Console Po RTS 2-Port Device Tree Pane Advanced RTS4 Spare COM . Configuration 🐞 🛹 SH8 Console Port Tracker
 MAC Address
 Software Version
 Status

 00:C0:4E:21:05:CD
 EtherNet/IP 4.10
 ON-LIN

 00:C0:4E:15:04:7A
 EtherNet/IP 4.10
 ON-LIN
 Device Name Rename EtherNet/IP System Modbus/TCP ON-LIN Move ON-LINE Modbus Router System Delete 00:C0:4E:07:43:84 Modbus Router 5.10 ON-LIN SH8 Console Port COM Port 00:C0:4E:1C:FF:FD NS-Link 9.18 ON-LINE 🗸 🖹 PRO8 Console Port COM Po Help .. 00:C0:4E:17:FF:FB NS-Link 9.18 DN-LIN RTS4 Spare COM Ports RTS 2-Port RTS-4P (DB9) 192.168.11.23 00:C0:4E:07:FF:FC SocketServer 9.18 192.168.11.52 00:C0:4E:29:FF:F5 SocketServer 9.18 ON-LINE ON-LINE (TCP) RTS-2P (2E) lse menu or ES9528-XT ES9528-XT 192.168.11.105 00:C0:4E:36:00:02 v1.4 (b1.1.0.4) ON-LINE Device List Pane First Floor 9 1 Ready View & Edit the existing properties of the device

Note: Optionally, you can double-click the DeviceMaster and PortVision DX opens the **Properties** page.

4. Optionally, enter a friendly device name in the **Device Name** list box. The default name is **Device** and the last three pairs of digits from the MAC address.

RTS_2E - 29:FF:F5 - Properties Tools Documentation	
General Software Settings Web Interface	1
DeviceMaster	RTS 2-Port (2E)
DEV CE-MASTER*	
Basic Information Device Name : RTS_2E - 29:FF:F5 MAC Address : 00:C0:4E:29:FF:F5 Serial Number : Device Status : Device Status : Detection Type : LOCAL Network Settings IP Mode : Static IP IP Address : 192 . 168 . 11 . 52 Subnet Mask : 255 . 255 . 0 . 0 Default Gateway : 192 . 168 . 1 . 254 Bootloader Timeout :	
Apply Changes Undo Changes	Help Close

5. Optionally, enter the DeviceMaster serial number in the event you need to contact Comtrol.

Note: The device status from the main screen displays in the Device Status list box.

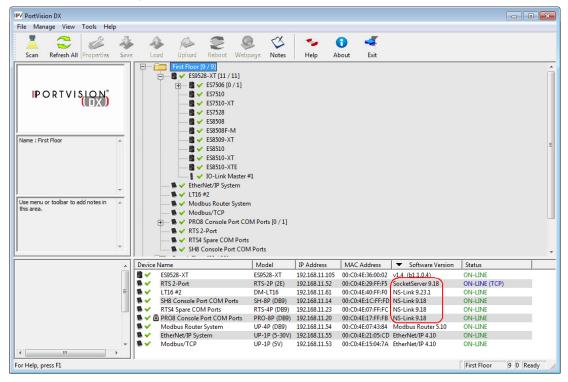
- 6. Select the appropriate Detection Type for this DeviceMaster.
 - **REMOTE** means that IP communications are used instead of MAC communications. This is generally an indication the DeviceMaster is not on the local Ethernet segment
 - LOCAL means that the MAC communications level is used and the DeviceMaster must be on the local segment for MAC mode to be used. An IP address is not required but Technical support recommends using an IP address.
- 7. Select the appropriate **IP Mode** for your installation:
 - If you want to disable IP communications on the DeviceMaster, click Disable IP.
 - To use the DeviceMaster with DHCP, click **DHCP IP**, and make sure that you provide the MAC address of the device to the network administrator. Make sure that the administrator reserves the IP address, subnet mask and gateway address of the DeviceMaster in the DHCP server.
 - To program a static IP address, click **Static IP** and enter the appropriate values for your site.
- 8. Leave the **Bootloader Timeout** set to the default 15.
- 9. Click Apply Changes and Close.
- 10. Go to the next subsection to check the SocketServer version.

Check the SocketServer Version

Check the SocketServer version installed on the DeviceMaster against the latest SocketServer version on the ftp site.

1. If necessary, start PortVision DX: Start > Programs > Comtrol > PortVision DX > PortVision DX.

Note: The SocketServer version displays for the DeviceMaster under the Software Version column.



- 2. Check for the latest SocketServer version.
 - **Note:** Although these paths point to the DeviceMaster RTS subdirectory, the software (applications, firmware, and drivers) and documentation works on the DeviceMaster LT, DeviceMaster PRO and DeviceMaster Serial Hub.

FTP subdirectory: ftp://ftp.comtrol.com/dev_mstr/rts/software/socketserver.

FTP directory /dev mstr/rts/software/socketserver at ftp.comtrol.com

To view this FTP site in File Explorer: press Alt, click View, and then click Open FTP Site in File Explorer.

Up to higher level directory

 05/28/2014
 05:00PM
 132,373
 socketserver history.pdf

 02/08/2013
 10:42AM
 Directory help

 05/28/2014
 02:10PM
 1,179,301
 socketserver-9.36.cmtl

3. If necessary, download SocketServer, and then use the next subsection to upload SocketServer. If you do not need to upload the latest version of SocketServer, you are ready to install the device NS-Link device driver using <u>NS-Link Device Driver Installation</u> on Page 15.

Uploading SocketServer

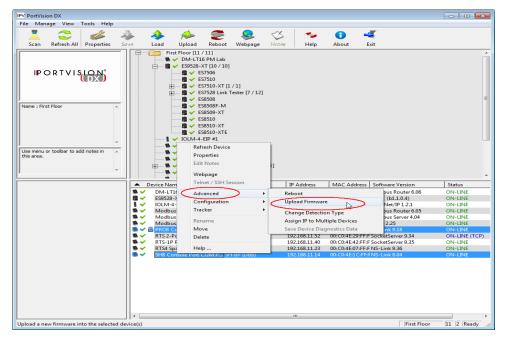
The NS-Link device driver loads the current firmware but not until the DeviceMaster has shown that an old version of the SocketServer (older than 8.00) or any firmware other than NS-Link Updater is running. The driver does not upload anything unless it first connects to the default application (SocketServer) on the DeviceMaster.

Note: If you are familiar with the NS-Link driver, you may want to review information for <u>existing customers</u>.

Optionally, you can upload the appropriate version of SocketServer after running the NS-Link device driver *Installation Setup Wizard*.

Use the following procedure to upload the latest SocketServer version using PortVision DX.

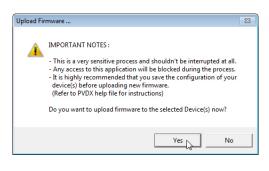
- 1. Start PortVision DX, click: Start > Programs > Comtrol > PortVision DX > PortVision DX.
- 2. Right-click the DeviceMaster or DeviceMasters of which you want to upload the latest version of SocketServer and then click Advanced > Upload Firmware.



- 3. Browse to the location where you downloaded SocketServer, highlight the file, and click **Open**.
- 4. Click **Yes** to the *Upload Firmware* popup.
- 5. Click Yes to the second Upload *Firmware* popup.

You can click **Refresh** to verify that the upload has been successfully completed.

If the upload fails, use the PortVision DX General tab on the *Properties* screen to change the Bootloader Timeout to 45 seconds and then repeat Steps 2 through 5.



NS-Link Device Driver Installation

This section discusses the following topics:

- Overview of the driver installation procedures
- Installation Setup Wizard on Page 15 for initial installation procedures
- <u>Checking the Device Driver Version</u> on Page 20
- <u>Updating the Driver</u> on Page 21
- <u>Adding a DeviceMaster (Existing Installation)</u> on Page 25

Overview

If there is an NS-Link device driver already installed on your system for the DeviceMaster, use the following discussions:

- <u>Updating the Driver</u> on Page 21 if you want to update the existing driver.
- <u>Adding a DeviceMaster (Existing Installation)</u> on Page 25 to add more DeviceMasters to the existing installation.

If you have performed the following procedures, you can skip to *Installation Setup Wizard* to start NS-Link device driver installation.

You can use <u>Before Installing the Comtrol Drivers Management Console</u> on Page 9 for procedures for these steps.

- 1. Install the DeviceMaster.
- 2. Install PortVision DX.
- 3. Program the network information (IP address) using PortVision DX.
- 4. Upload the appropriate version of SocketServer firmware.

Installation Setup Wizard

You can use the following procedure to install the device driver and the *Comtrol Drivers Management Console*, which is used to configure the driver.

- 1. Locate the latest driver assembly (.exe) for your product and copy it to a location that is available to the host.
 - <u>Download the latest device driver</u> for the DeviceMaster.
 - The *Software and Documentation* CD contains all of the files for installation, configuration, and troubleshooting. The CD also provides download links to the Comtrol ftp site to locate the latest files.

Note: Administrative privileges are required to install device drivers on Windows operating systems newer than Windows Server 2003.

Do not connect RS-422/485 devices until the appropriate port interface type has been configured in the device driver. The DeviceMaster default port setting is RS-232, except for the DeviceMaster Serial Hub.

aution

2. Execute the NS-Link device driver assembly (DeviceMaster_Windows_x.xx.exe) and click Next to start the installation.



3. Optionally, enter a different location to install the driver files.

😼 DeviceMaster Driver Installation Setup	- • •
Select Installation Folder	A
This is the folder where DeviceMaster Driver Installation will be installed.	T
To install in this folder, click "Next". To install to a different folder, enter it "Browse".	below or click
<u>F</u> older:	
C: \Program Files (x86) \Comtrol \DeviceMaster \	Browse
Advanced Installer	Cancel

4. Click Install.

😸 DeviceMaster Driver Installation Setup	×
Ready to Install The Setup Wizard is ready to begin the DeviceMaster Driver Installation installation	ŧ
Click "Install" to begin the installation. If you want to review or change any of your installation settings, click "Back". Click "Cancel" to exit the wizard.	
Advanced Installer	
< Back Install Can	:el

5. Leave the Launch DeviceMaster Driver Installation box checked and click Finish.

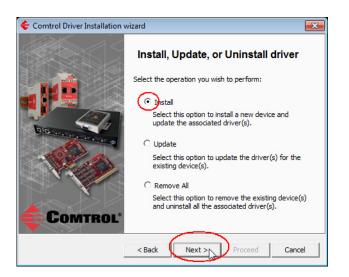


If you do not check this box, you can use the shortcut under the **Start** button at **Programs > Comtrol > DeviceMaster > DeviceMaster Driver Installation Wizard** to install the device driver.

6. Click Next to install the driver.



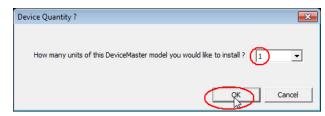
7. Click Install and Next.



8. Select the DeviceMaster model that you want to install.

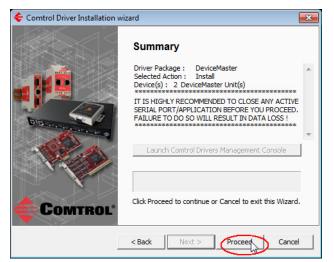
E Comtrol Driver Installation wizard					
	Install a New Comtrol E)evice			
	You are about to install a new Comtrol I on this computer.	Device Drive	er		
	As part of this process all previous insta driver will be updated as well.	allations of t	his		
Distance of the second	Please select the DeviceMaster models install and identify their quantities as we				
	DeviceMaster Model	Quantity	*		
	eviceMaster PRO, 8 Port	1			
	DeviceMaster PRO, 16 Port	None			
	🗩 eviceMaster Serial Hub, 8 Port	1			
	DeviceMaster Serial Hub, 16 Port	None	-		
	DouisoMaster E00_1 Dart	Mana	·		
COMTROL	Click Next to continue or Cancel to exit	this Wizard.			
	< Back Next Proceed	Car	ncel		

9. Enter the number of this DeviceMaster model that you want to install and click Ok.

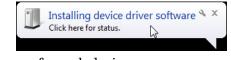


10. Repeat Steps $\underline{8}$ and and 9 for each DeviceMaster that you want to install and click \underline{Next}

11. Click Proceed.



You may see the following popup for each port.



You may see this popup for each device.



12. Verify that all your selections installed and then click the Close button.

Driver Software Installation		X
Your device is ready to use		
DeviceMaster Port 01 (COM4) DeviceMaster Port 02 (COM5) DeviceMaster Port 03 (COM6) DeviceMaster Port 05 (COM1) DeviceMaster Port 05 (COM11) DeviceMaster Port 06 (COM12) DeviceMaster Port 08 (COM18) DeviceMaster Port 01 (COM19) DeviceMaster Port 02 (COM20)	Ready to use Ready to use	× ·
		Close

13. Click the Launch Comtrol Drivers Management Console button.

14. Return to the Installation wizard and 🗲 Comtrol Driver Installation wizard click Close to exit the wizard. Summary 15. Go to <u>NS-Link Device</u> *** IMPORTANT MESSAGE : Please wait a few moments for the background **Driver Configuration** installation of the Serial Ports to finish. You can ther use Comtrol Drivers Management Console to on Page 27 to start NSconfigure the device driver you have just installed. Link device driver Finalizing ... configuration. Finished The device driver Launch Comtrol Drivers Management Console installation is not complete until you have associated the MAC address to the Press Close to exit this Wizard. DeviceMaster. Comtroi 16. After associating the MAC address, go to Next > Close Configuring Device **Properties** on Page 38

to set up device properties (device name and starting COM port number).

17. Go to <u>Configuring COM Port Properties</u> on Page 41 to configure any necessary COM port characteristics.

After driver installation and configuration, connect the serial devices to the ports. For information about the DeviceMaster connectors, refer to the <u>DeviceMaster</u> <u>Installation and Configuration User Guide</u> (Page 7).

Checking the Device Driver Version

Use the appropriate procedure for your operating system to check the Comtrol device driver version using the *Device Manager*.

1. In the Comtrol Drivers Management Console, right-click the DeviceMaster and click **Properties**.

2. If necessary, click the Driver tab to view the NS-Link device driver version.

You can check this driver version against the *latest driver* for your product.

If necessary, you can update the device driver using the next subsection.

Updating the Driver

Use the following procedure to update the <u>DeviceMaster</u>NS-Link device driver after initial installation.

If you are unsure what driver version is running, see <u>Checking the Device Driver</u> <u>Version</u> on Page 20.

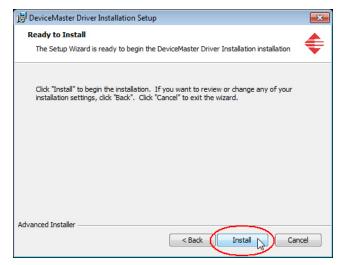
- 1. Locate the latest NS-Link device driver assembly (Page 7) and copy it to a location that is available to the host.
- 2. Close any applications that are using serial ports before the NS-Link device driver installation.
- 3. Start the update by executing the .exe file.
- 4. Click Next to start the Installation Setup Wizard.



5. Optionally, enter a different location to install the latest NS-Link device driver files.

📅 DeviceMaster Driver Installation Setup	- • ×
Select Installation Folder This is the folder where DeviceMaster Driver Installation will be installed.	ŧ
To install in this folder, click "Next". To install to a different folder, enter it "Browse".	below or click
Eolder: C:\Program Files (x86)\Comtrol\DeviceMaster\	Browse
Advanced Installer	Cancel

6. Click Install.



7. Leave the Launch DeviceMaster Driver Installation box checked and click Finish.



If you do not check this box, you can use the shortcut under the **Start** button at: **Programs > Comtrol > DeviceMaster > DeviceMaster Driver Installation Wizard**. 8. Click Next to update the driver.



9. Click Update and Next.



10. Click Next to update the driver.



11. Click Proceed.



- 12. Click the Launch Comtrol Drivers Management Console button to configure the ports or device properties.
- 13. Return to the Installation wizard and click Close.

🗲 Comtrol Driver Installation	n wizard	x
	Summary *** IMPORTANT MESSAGE : Press Close to exit this Wizard.	•
I	< Back Next > Proceed Close	

14. If necessary, go to <u>Configuring COM Port Properties</u> on Page 41 to configure the NS-Link COM port properties

Adding a DeviceMaster (Existing Installation)

Use the following procedure to add aDeviceMaster to an existing <u>DeviceMaster</u> installation.

- 1. Close any applications that are using serial ports before the device driver installation.
- 2. Connect the DeviceMaster to your network and use PortVision DX to program the IP address.

If you need hardware installation procedures, see <u>Downloading the Latest</u> <u>Software and User Guides</u> on Page 7).

Do not connect RS-422/485 devices until the appropriate port interface type has been configured in the device driver. The default port setting is RS-232.

- 3. From the Start button, click Program> Comtrol> DeviceMaster> DeviceMaster Driver Installation Wizard.
- 4. Click Next to start the Comtrol Driver Installation Wizard.



5. Click Install and Next.



6. Click Next and follow the *Installation Wizard*. Refer to Step 8 on Page 18, for the remainder of the installation steps if needed.



NS-Link Device Driver Configuration

If you programmed an IP address into the <u>DeviceMaster</u> for your network using PortVision DX before installing the NS-Link device driver; first associate the MAC address to the DeviceMaster and then configure the driver with the IP address that you programming into the DeviceMaster using PortVision DX.

This section discusses the following topics:

- <u>NS-Link Device Driver Configuration Considerations</u>
- <u>Using the Comtrol Drivers Management Console</u> on Page 29
- Associating the MAC Address on Page 34
- <u>Using IP Mode and Enabling SSL</u> on Page 36
- <u>Configuring Device Properties</u> on Page 38
- <u>Configuring COM Port Properties</u> on Page 41
- <u>Network Configuration in Comtrol Drivers Management Console</u> on Page 46
 - <u>Disabling IP Mode</u> on Page 46
 - Changing a Static IP Address on Page 47
 - <u>Setting Up DHCP</u> on Page 49
- <u>Configuring DeviceMaster Ports as Sockets</u> on Page 50
- <u>Enabling Secure Data Mode</u> on Page 51

NS-Link Device Driver Configuration Considerations

The following subsections discuss the NS-Link device driver features and topics that you may want to review before driver configuration.

IP or MAC Addressing Issues	This is an overview of IP and MAC addressing issues that may affect how you configure the DeviceMaster with a brief discussion of advantages of each method.
	Note: The default IP address for the DeviceMaster is 192.168.250.250.
	The IP addressing scheme (IP mode) has the following advantages:
	• Uses an IEEE industry standard protocol.
	• Allows you to configure systems to use ports on the DeviceMaster that are outside of the host system's local 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 (MAC mode) has the following advantages:
	• Simplifies implementation and ongoing support by eliminating the address administration issues inherent in network protocols. MAC addresses are predefined by DeviceMaster and there is no potential for an <i>address conflict</i> at setup.
	• It is isolated from foreign LAN segments minimizing potential security issues.
	Maximizes throughput of serial data.

NS-Link Device Driver Features

Using the Port

Sharing Feature

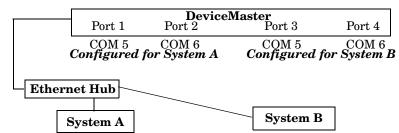
During initial installation and configuration of the NS-Link device driver, Comtrol recommends that you associate the MAC address to the DeviceMaster. If you do not do so, you will not be able to use the following device driver features:

- Access the *Advanced* tab to review PC network or device network interface statistics
- Program or change an IP address using through the Network Settings button
- Reboot the DeviceMaster from the Comtrol Drivers Management Console

After associating the MAC address, you can then program the DeviceMaster for IP or DHCP usage.

You can refer to IP or MAC Addressing Issues on Page 27 for information about MAC addressing and IP addressing issues.

DeviceMaster ports can be shared by installing the NS-Link device driver on multiple systems or through socket mode, or combination of both. To do so, install the NS-Link driver on each system that you want to permit access to the serial ports. You can share the same port with multiple systems (only one system can have an open connection to a port at any given time) or you can set up multiple systems to share specific ports on the device driver.



Multiple systems can use the same COM port names.

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

- 1. When installing the device driver on System A, click "Not Configured" for the COM port names for Ports 3 and 4.
- 2. When installing the device driver on System B, click "Not Configured" for the COM port names for Ports 1 and 2.

Use port sharing to configure redundant PCs or fail-over protection.

Port	System A	System B
1	COM5	Not Configured
2	COM6	Not Configured
3	Not Configured	COM5
4	Not Configured	COM6

Note: Most applications do not release ports, so you may not be able to use port sharing across multiple systems 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.

Using the Comtrol Drivers Management Console

This subsection discusses basic *Comtrol Drivers Management Console* operations, such as:

- Accessing the Comtrol Drivers Management Console
- **Displaying All Installed Devices** on Page 29
- <u>Collapsing the View</u> on Page 30
- <u>How to Configure Device Properties</u> on Page 30
- <u>Customizing the Device Name</u> on Page 31
- <u>Customizing the COM Port Name</u> on Page 31
- <u>How to Configure COM Port Properties</u> on Page 32
- <u>How to Save Changes</u> on Page 33

See <u>Associating the MAC Address</u> on Page 34 to start DeviceMaster configuration procedures.

Accessing the *Comtrol Drivers Management Console* can be done using one of the following methods:

- Windows Control Panel; go to your Control Panel and click on the Comtrol Drivers Management Console.
- Shortcut; located under Start > Program Files > Comtrol > DeviceMaster > Comtrol Drivers Management Console.

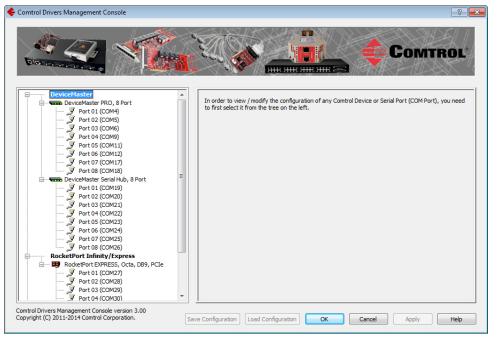
Displaying All Installed Devices

Accessing the Comtrol Drivers

Management

Console

The *Comtrol Drivers Management Console* opens and displays all products for which a device driver was installed.



Collapsing the View

To collapse the view, click - in the *Tree View* pane to close the selected family. To view a family or device, click the + to open the selected family.

🗲 Comtrol Drivers Management Console		? ×
No.		
RocketPort Infinity/Express	In order to view / modify the configuration of any Comtrol Device or Serial Port (COM Port), you to first select it from the tree on the left.	reed
Comtrol Drivers Management Console version 3.00 Copyright (C) 2011-2014 Comtrol Corporation.	Save Configuration Load Configuration OK Cancel Apply	ielp

How to Configure Device Properties

This overview discusses changing device properties for a product. Highlight the device name of the product that you want to configure in the *Tree View* pane. Make any necessary changes.

- Click **Apply** to save the changes, which saves the changes and leaves the *Comtrol Drivers Management Console* open.
- Click **Ok** to save the changes and close the *Comtrol Drivers Management Console*.
- Click **Cancel** to close the *Comtrol Drivers Management Console* without saving the changes.

If you click a port or device name without saving the changes, the *Comtrol Drivers Management Console* will prompt you to **Apply**, **Ignore**, or **Cancel** the changes.

For more information, see *Configuring Device Properties* on Page 38.

Comtrol Drivers Management Console	
A Constant of the second secon	
DeviceMaster	General Advanced
PerceNaster PRO. 5Port V ESSOPAT-WES (COM102) V ESSOPAT-WES (COM103) V ESSOPAT-WES (COM103) V ESSOPAT-WE (COM107) V ESSOPAT-WE (COM109) V ESSOPAT-WE (COM100) V ESSOPAT-WE (COM100) V ESSOPAT-WE (COM100) V ESSOPATO (COM107) V ESSOPAT (COM105)	Network Connection Mode MAC Mode O C0 < 17 FF FB O C0 < 12 FF FB O C0 < 192.168.11.20 C nable SSL Mode Server Certificate Client Certificate Client Certificate Device Settings Device Name: DeviceMaster PRO, 8 Port User -Friendly Device Name: DeviceMaster PRO, 8 Port Keep Allve Timeout (seconds): 120 (Default: 120)
Comtrol Drivers Management Console version 3.00 Coopyright (C) 2011-2014 Comtrol Corporation.	TCP Timeout Multiplier: 1 (Default: 1) Scan Rate (ms): 10 (Default: 10) Verbose Event Log (Troubleshooting Only)

Customizing the Device Name

Change the default *Device Name* on the **Device General** tab by changing the name in the **User-Friendly Device Name** field and saving the change.

		Сомт я
DeviceMaster	General Advanced	
DeviceMaster PRO, 8 Port SS509-XT=YES (COM102) SS508 (COM108)	Network Connection Mode	
 Port 03 (COM12) ES8510-XTE (COM110) 	IP Mode 192.168.11.20	Network Settings
Session (COM103) Session (COM103) Session (COM104) Port 07 (COM17) Session (COM109)	Enable SSL Mode	Reboot Device
	Device Settings Device Name: Devi	ceMaster PRO, 8 Port
ES7510-XT (COM107) ES7528 (COM101)	User-Friendly Device Name: PRO	- RocketLinx Console Ports
🖉 Port 05 (COM25)	Keep Alive Timeout (seconds): 120	(Default: 120)
ES9528-XT (COM105) S8510-XTE (COM106) Port 08 (COM26) RocketPort Infinity/Express	TCP Timeout Multiplier: 1	(Default: 1)
	Scan Rate (ms): 10	 (Default: 10)
RocketPort/RocketModem	Verbose Event Log 🔲 🕅	Troubleshooting Only)
		Defaults

Customizing the COM Port Name

Change the default *Port Name* on the **Port Settings General** tab by changing the name in the **User-Friendly Port Name** field and saving the change.

Comtrol Drivers Management Console	
DeviceMaster DeviceMaster Serial Hub, 8 Port Session Text Console Ports DeviceMaster Serial Hub, 8 Port Session Text Console Ports DeviceMaster Serial Hub, 8 Port Session Text Console Ports DeviceMaster Serial Hub, 8 Port Session Text Console Ports DeviceMaster Serial Hub, 8 Port Session Text Console Ports Session Text Console DeviceMaster Serial Hub, 8 Port Session Text Console DeviceMaster Serial Hub, 8 Port Session Text Console Session Text Console DeviceMaster Serial Hub, 8 Port Session Text Console DeviceMaster Serial Hub, 8 Port Session Text Console DeviceMaster Serial Hub, 8 Port Session Text Console Session Text Console DeviceMaster Serial Hub, 8 Port Session Text Console Session Text Console Session Text Console Session Text Console DeviceMaster Serial Hub, 8 Port Session Text Console Session	General Port Settings RS Mode: 232 Override and Lock Baud Rate to: None Transmit Data Timeout on Port Close: Applies to 1 Wat on Physical Transmission before Completing Write Emulate Moder Mardware RING Signal Allow Parity Conflict (DeviceMaster 1 Port only) Block Plug-N-Play Search for Attached Serial Device Defaults
	Clone
	Port Name User-Friendly Port Name: Port 03 = Spare Port COM Name: COM 12 Renumber All Subsequent Ports Relative to This Port
Comtrol Drivers Management Console version 3.00 Copyright (C) 2011-2014 Comtrol Corporation.	

How to Configure COM Port Properties To change a port's properties for a product, highlight the port of the product that you want to configure in the *Tree View* pane. Make any necessary changes:

- Click Apply to save the changes, which saves the changes and leaves the *Comtrol Drivers Management Console* open.
- Click **Ok** to save the changes and close the *Comtrol Drivers Management Console*.
- Click **Cancel** to undo the changes and close the *Comtrol Drivers Management Console*.

If you click another port or device name without saving the changes, the *Comtrol Drivers Management Console* will prompt you to **Apply**, **Ignore**, or **Cancel** the changes.

For more information, see <u>Configuring COM Port Properties</u> on Page 41.

After saving the port changes, if desired, you can click **Apply These Settings to All Ports** to populate the remaining ports with these NS-Link COM properties.

Comtrol Drivers Management Console	
DeviceMaster DeviceMaster Serial Hub, 8 Port J S7506 (COM 100)	General Port Settings
🥑 Port 02 (COM20)	RS Mode: 232 RTS Toggle
ES7510-XT (COM107)	Override and Lock Baud Rate to: None
Port 05 (COM101)	Transmit Data Timeout on Port Close: 0
🖉 ES9528-XT (COM105)	Map 2 Stop Bits to 1
ES8510-XTE (COM106)	Wait on Physical Transmission before Completing Write
PRO - RocketLinx Console Ports	Emulate Modem Hardware RING Signal
Z ES8509-XT (COM102)	Allow Parity Conflict (DeviceMaster 1 Port only)
ES8508 (COM108) Port 03 = Spare Port (COM12)	Block Plug-N-Play Search for Attached Serial Device
J ES8510-XTE (COM110)	Clone
 	Apply These Settings to All Ports
ES8508F-MM (COM109)	Port Name
RocketPort Infinity/Express RocketPort/RocketModem	User-Friendly Port Name: ES8509-XT
RocketPort/RocketModem	COM Name: COM102 -
	Renumber All Subsequent Ports Relative to This Port
omtrol Drivers Management Console version 3.00 opyright (C) 2011-2014 Comtrol Corporation.	Save Configuration OK Cancel Apply Help

How to Save Changes

The *Comtrol Drivers Management Console* indicates that changes have been made on this screen with a red frame that identifies which device's **General** tab you are editing.

- Clicking the Apply button saves the changes on the tab and leaves the *Comtrol Drivers Management Console* open for further configuration.
- Clicking the **Ok** button saves the changes on that tab and closes the *Comtrol Drivers Management Console*.
- Clicking the **Cancel** button cancels the changes on that tab and closes the *Comtrol Drivers Management Console*.

A CO				Cor	итро
DeviceMaster DeviceMaster Serial Hub. 8 Port	General	Advanced			
s frame indicates that changes	Network Connection	on Mode			
ve been made but not applied.	MAC Mode	00 C0 4E 1C FF FD	•		
S7528 (COM101)	IP Mode	192.168.11.14		Network Se	ttings
Port 05 (COM25) SESS28 XT (COM105) SESS10 XTE (COM106) Port 08 (COM26) PRO - RocketLinx Console Ports SESS09 XT (COM102) SESS09 XT (COM102) Prot 03 = Spare Port (COM12)	Enable SSL N	ertificate		Reboot De	evice
	Device Settings User-F	Device Name:	DeviceMaster Seri Serial Hub - Rocke		
		ve Timeout (seconds): CP Timeout Multiplier:	120	(Default: 120) (Default: 1)	
ES8508F-MM (COM 109)		Scan Rate (ms):	10 👻	(Default: 10)	
RocketPort/RocketModem		Verbose Event Log	(Troubleshooti		Defaults

Associating the MAC Address

The first step to configuring the NS-Link device driver is to associate the MAC address of the DeviceMaster to the device driver.

You can use the method that is appropriate to your installation:

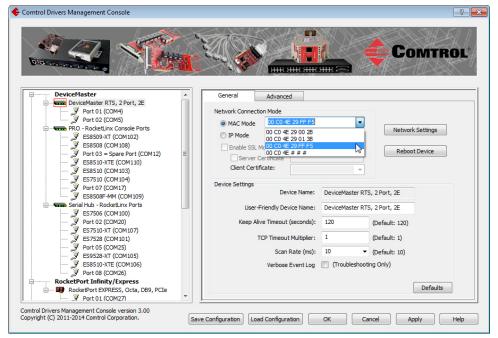
- Same Network Segment (below)
- <u>Different Physical Segment</u> on Page 35

Although you can and should associate a MAC address on a different physical segment, the DeviceMaster must be connected to the local network segment or directly to a NIC on the host system for the NS-Link driver to **<u>operate</u>** in <u>MAC</u> <u>Mode</u>.

Same Network Segment The DeviceMaster must be connected to the local network segment or directly to a NIC on the host system to operate in MAC mode and in order for PortVision DX to detect the MAC address, otherwise you must enter the MAC address manually.

Use the following procedure to associate a MAC address to a DeviceMaster.

- 1. If necessary, access the *Comtrol Drivers Management Console*, click **Start** > **Control Panel** > **Comtrol Drivers Management Console**.
- 2. Highlight the Device Name of the DeviceMaster that you want to configure.



3. Select the MAC address from the drop-down list or enter the address from the MAC address label on the DeviceMaster.

If the appropriate MAC address is not displayed in the drop-down list, then it can be one of the following reasons:

- The DeviceMaster is not on the same network segment
- The DeviceMaster not powered on or connected to the network
- The DeviceMaster wrong model was selected during the driver installation
- Device failure
- Note: If you enter the MAC address, make sure that you use the correct format: 00 C0 4E xx xx xx. A space must separate each pair of digits. The MAC address is located on a label on the DeviceMaster.

If you programmed the IP address using PortVision DX, the IP address displays in the $I\!P$ Mode text box.

- 4. Click **Apply** to program the driver with the MAC address of the DeviceMaster. If you do not **Apply** the changes before leaving this screen, you will be prompted to **Apply**, **Ignore**, or **Cancel** the changes.
- 5. Optionally, you can click the <u>Advanced</u> tab and verify that the <u>Device</u> Status message indicates that the DeviceMaster is active and Ok.
- 6. You may need to perform some of the following tasks to complete the driver configuration process.
 - Configure the DeviceMaster for IP Mode, see <u>Using IP Mode and Enabling</u> <u>SSL</u> on Page 36
 - Configure device properties, see <u>Configuring Device Properties</u> on Page 38.
 - Configure COM port properties, see <u>Configuring COM Port Properties</u> on Page 41.
 - Configure any of the DeviceMaster ports as sockets, see <u>Configuring</u> <u>DeviceMaster Ports as Sockets</u> on Page 50.

Different Physical Segment

Use the following procedure to associate a MAC address to a DeviceMaster that is not on the same physical network segment or not connected directly to the NIC.

- 1. If necessary, start the Comtrol Drivers Management Console.
- 2. Highlight the *Device Name* of the DeviceMaster that you want to configure.
- 3. Enter the MAC address in the MAC Mode text box.

Comtrol Drivers Management Console		
DeviceMaster		General Advanced
	ш	Network Connection Mode MAC Mode MAC Mode IP Mode Explore Certificate Client Certificate:
Perto (COM104) Perto 7 (COM17) ESS508F-MM (COM109) Perto 7 (COM17) Perto 2 (COM20) Perto 2 (COM20) Perto 2 (COM107) Perto 2 (COM107) Perto 2 (COM107) Perto 2 (COM107) Perto 2 (COM20) Perto 5 (COM100) Perto 5 (COM105) Perto 8 (COM25) Perto 8 (COM26) RocketPort Infinity/Express Perto 10 (COM27) Perto 10 (COM27) Perto 10 (COM20) Perto 10 (COM20) Perto 10 (COM20) Perto 10 (COM20) Perto 10 (COM21) Perto 10 (COM20) Perto 10 (COM20) Perto 10 (COM20) Perto 10 (COM27) Perto 10 (COM27) Perto 10 (COM27) Perto 10 (COM27) Perto 10 (COM27)	-	Device Settings Device Name: User-Friendly Device Name: Keep Alive Timeout (seconds): TCP Timeout Multiplier: Scan Rate (ms): Verbose Event Log (Troubleshooting Only) Defaults DeviceMaster RTS, 2 Port, 2E (Default: 120) (Default: 10) Verbose Event Log (Troubleshooting Only)
Comtrol Drivers Management Console version 3.00 Copyright (C) 2011-2014 Comtrol Corporation.	Save	e Configuration Load Configuration OK Cancel Apply Help

Note: When you enter the MAC address, make sure that you use the correct format: 00 C0 4E xx xx xx. A space must separate each pair of digits.

A MAC address is located on a label on the DeviceMaster or use PortVision DX to scan the network, which will display the MAC address.

4. Click Apply to program the driver with the MAC address of the DeviceMaster or Ok to save the change and close the *Comtrol Drivers Management Console*.

If you do not Apply the changes, you will be prompted to Apply, Ignore, or Cancel the changes.

- 5. You may need to perform some of the following tasks to complete the driver configuration process.
 - You can now configure the DeviceMaster to operate in IP Mode using the next subsection.
 - Configure device properties, see <u>Configuring Device Properties</u> on Page 38.
 - Configure COM port properties, see <u>Configuring COM Port Properties</u> on Page 41.
 - Configure any of the DeviceMaster ports as sockets, see <u>Configuring</u> <u>DeviceMaster Ports as Sockets</u> on Page 50.

Using IP Mode and Enabling SSL

After associating the DeviceMaster with the MAC address you can set the DeviceMaster to run in IP Mode.

- 1. First associate a MAC address (Page 34) to the DeviceMaster.
- 2. Highlight the DeviceMaster.
- 3. If the DeviceMaster is not on the same network segment, enter the IP address of the DeviceMaster in the **IP Mode** text box.

If the DeviceMaster is on the same network segment, the driver populates the **IP Mode** text box with the DeviceMaster IP address.

4. Click the **IP Mode** radio button.

DeviceMaster		General Advanced
DeviceMaster PRO, 8 Port		
		Network Connection Mode
Port 02 (CON107)		O MAC Mode O C0 4E 1C FF FD ✓ Network Settings
— 💯 Port 04 (COM101)		Mode 192.168.11.14
— 🍠 Port 05 (COM100)		Enable SSL Mode Reboot Device
	=	Server Certificate
Port 07 (COM106)		Client Certificate:
DeviceMaster Serial Hub, 8 Port		
— 🍠 Port 01 (COM19)		Device Settings Device Name: DeviceMaster Serial Hub, 8 Port
 Port 02 (COM20) Port 03 (COM21) 		
- Port 03 (COM21)		User-Friendly Device Name: DeviceMaster Serial Hub, 8 Port
- 9 Port 05 (COM23)		Keep Alive Timeout (seconds): 120 (Default: 120)
— 🍠 Port 06 (COM24)		
 Port 07 (COM25) Port 08 (COM26) 		TCP Timeout Multiplier: 1 (Default: 1)
RocketPort Infinity/Express		Scan Rate (ms): 10 (Default: 10)
RocketPort EXPRESS, Octa, DB9, PCIe		Verbose Event Log 🦳 (Troubleshooting Only)
— 🗾 Port 01 (COM27)		
		Defaults
Port 03 (COM29)	-	
. Dr Torco Roombor		,,,,,,,

5. Optionally, click Enable SSL Mode or go to <u>Step 8</u>.

The DeviceMaster must be configured using IP Mode before you can **Enable SSL Mode**. If SSL Mode is enabled, TCP connections that carry data to/from the serial ports are encrypted using SSL or TLS security protocols. This includes the following:

• TCP connections to the per-serial-port TCP ports (default is 8000, 8001, 8002, ...) are encrypted using SSL/TLS.

- TCP connections to TCP port 4606 on which the DeviceMaster implements the Comtrol proprietary serial driver protocol are encrypted using SSL/TLS.
- Since SSL/TLS can not be used for either UDP data streams or for the Comtrol proprietary MAC mode Ethernet driver protocol, both UDP and MAC mode serial data transport features are disabled.

In addition to encrypting the data streams, it is possible to configure the DeviceMaster so that only authorized client applications can connect using SSL/TLS.

For this option to function, you must also <u>Enable Secure Data Mode</u> in the NS-Link web page.

6. If you are using a server certificate, click the Server Certificate check box and enter the name in the Server Certificate text box.

This is the RSA identity certificate that the DeviceMaster uses during SSL/ TLS handshaking to identify itself. It is used most frequently by SSL server code in the DeviceMaster when clients open connections to the DeviceMaster's secure web server or other secure TCP ports.

If a DeviceMaster serial port configuration is set up to open (as a client) a TCP connection to another server device, the DeviceMaster also uses this certificate to identify itself as an SSL client, if requested by the server.

7. If you are using a client certificate, click the drop list and browse to the appropriate client certificate file.

When configured with a CA certificate, the DeviceMaster requires all SSL/TLS clients to present an RSA identity certificate that has been signed by the configured CA certificate. As shipped, the DeviceMaster is not configured with a CA certificate and all SSL/TLS clients are allowed.

If desired, controlled access to SSL/TLS protected features can be configured by uploading a client authentication certificate to the DeviceMaster.

When a CA certificate is uploaded, the DeviceMaster only allows SSL/TLS connections from client applications that provide to the DeviceMaster an identity certificate that has been signed by the CA certificate that was uploaded to the DeviceMaster.

This uploaded CA certificate that is used to validate a client's identity is sometimes referred to as a *trusted root certificate*, a trusted *authority certificate*, or a *trusted CA certificate*. This CA certificate might be that of a trusted commercial certificate authority or it may be a privately generated certificate that an organization creates internally to provide a mechanism to control access to resources that are protected by the SSL/TLS protocols.

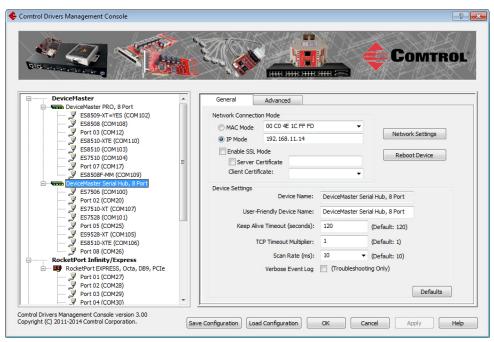
To control access to the DeviceMaster's SSL/TLS protected resources you should create your own custom CA certificate and then configure authorized client applications with identity certificates signed by the custom CA certificate.

- 8. Click Apply or Ok to save the change and close the *Comtrol Drivers* Management Console
- 9. You may need to perform some of the following tasks to complete the configuration process.
 - Configure device properties, see <u>Configuring Device Properties</u> on Page 38.
 - Configure COM port properties, see <u>Configuring COM Port Properties</u> on Page 41.
 - Configure any of the DeviceMaster ports as sockets, see <u>Configuring</u> <u>DeviceMaster Ports as Sockets</u> on Page 50.
 - Enable Secure Data Mode in the NS-Link web page, see <u>Enabling Secure</u> <u>Data Mode</u> on Page 51.

Configuring Device Properties

Use the following procedure to change device settings on a *DeviceMaster*.

- 1. Open Comtrol Drivers Management Console (<u>Accessing the Comtrol Drivers</u> <u>Management Console</u> on Page 29).
- 2. Highlight the *DeviceMaster* device name that you want to configure.



- 3. If desired, change the User-Friendly Device Name.
- 4. Optionally, set a different *Keep Alive Timeout* (Page 39) period. You can set the amount of time in seconds that this DeviceMaster waits until it closes this connection and frees all the ports associated with it.
 - Note: This value may be set to less than 5 seconds, however the DeviceMaster may not operate at any value less than 5. A recommended value to begin experimentation with is 10.
- 5. Optionally, set the <u>TCP Timeout Multiplier</u> (Page 40) value.
 - Note: This value should not be modified unless the network connection to the DeviceMaster is very slow, such as, if a satellite uplink connection is involved. It is recommended that a value over 3 never be used.
- 6. Optionally, click a different <u>Scan Rate (ms)</u> (Page 40).
- 7. Optionally, click Verbose Event Log if you want to log additional DeviceMaster information into the event log.
- 8. After making your changes, click **Apply** if you have additional configuration procedures or click **Ok** if you have completed configuring your Comtrol devices.

Note: If you do not *Apply* the changes, you will be prompted to *Apply*, *Ignore*, or *Cancel* the changes.

The following table provides detailed information about **Device General** tab options for the DeviceMaster.

Device General Tab	Description	
Device Name	This is the default name assigned by the driver and it cannot be changed. You can use the User-Friendly Device Name field to provide custom device names for your installation.	
User-Friendly Device Name	Use this field to enter a more descriptive name. The name that you assign is not saved until you click Apply or OK .	
	Use this option to set the amount of time in seconds that this DeviceMaster waits until it closed this connection and frees all the ports associated with it. The <i>Keep Alive feature</i> works in the following way.	
Keep Alive Timeout (seconds) Default = 120 seconds	During normal operation the driver periodically sends a connection check to the DeviceMaster, and the DeviceMaster then returns a response. There are two timers: one in the driver, and one in the DeviceMaster. These timers are reset when a connection check signal is received. If a connection is broken, that is, a check is not received, the data is stored in the computer and/or the DeviceMaster. Depending on the amount of time that has expired since the connection was lost, the following happens:	
	• When the computer loses its connection to the DeviceMaster but re-establishes it before the time-out period expires, any data transmitted during this period is queued and sent when the connection resumes.	
	• When the computer loses its connection to the DeviceMaster and does not re-establish it before the time-out period expires; the driver then purges any pending I/O data for ports on that connection and returns all pending, and future I/O commands, with the exception of the Close command, to the application with an error indicating the disconnected status.	
	This is similar to the processing which occurs when the computer receives a notification from the DeviceMaster that a port release request was processed on a port it owns with the exception that a different status is returned. When the connection is re-established, the computer will attempt to re- acquire the ports that were open when the connection was lost. If the attempt is successful, normal operations resume for the port. If any port fails to be acquired, then the computer will continue to fail all further I/O operations, with the exception of a Close request. When the Close request is received, the port can then be re-opened.	
	• If the computer loses its connection and the time period expires, the DeviceMaster places the port into a state that another computer can establish a connection, locking out the original driver when a connection is made. The driver will respond to all I/O commands, with the exception of the Close command, with an error indicating the disconnected status. If the port is still available when the driver re-establishes a connection, then it will claim the port and allow I/O to resume.	

Description	
Use the TCP Timeout Multiplier option to modify two timers used in TCP/IP socket communications.	
The first identifies how long the TCP protocol should wait before timing out an attempt to open a TCP channel. The TCP Timeout Multiplier default is 1 and the timer defaults to 500 ms when the TCP/IP address method is used to communicate with a device.	
If the TCP Timeout Multiplier is set to 2, the timer would now be 1000 ms, or 1 sec. If the multiplier is 4, the new time-out period would be 2000 ms, or 2 sec.	
The second timer defines how long the driver will wait for a response from the DeviceMaster when a forced release of a port is requested. This timer defaults to 8 seconds.	
If the TCP Timeout Multiplier is changed to 2, the timer would now be 16 seconds. If the multiplier is 4, the new time-out period would be 32 seconds.	
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 (2 to 50). If a value larger than 50 is entered, the maximum of 50 is implemented.	
Note: The faster the scan rate (lower number), the higher the load on the system processor.	
Selecting this option causes detailed messages to be sent to the operating system <i>Event Log</i> . This added information can be useful when debugging communications and configuration problems	
Click <u>Save Configuration</u> to save the <i>Device Settings</i> for use on another similar Comtrol device or to archive a copy of your environments settings.	
Click to <u>Load Configuration</u> to load the <u>Device Settings</u> previously saved using the Save Configuration feature.	
Note: Configuration files must be for the same model with the same port density. For example, you cannot load a DeviceMaster PRO configuration file onto a DeviceMaster RTS or a configuration file for a 32-port DeviceMaster RTS onto a 4- port DeviceMaster RTS.	
Click Ok to save the changes made on this page and close the <i>Comtrol Drivers Management Console</i> .	
Cancels any changes made on this page.	
Click Apply to save the settings on this page. If you do not click Apply before leaving this page, you will be prompted to Apply or Cancel the changes.	

Configuring COM Port Properties

This section discusses COM port configuration procedures for <u>DeviceMaster</u> NS-Link ports. If you want to change the starting NS-Link COM port number on the DeviceMaster, see <u>Configuring Device Properties</u> on Page 38.

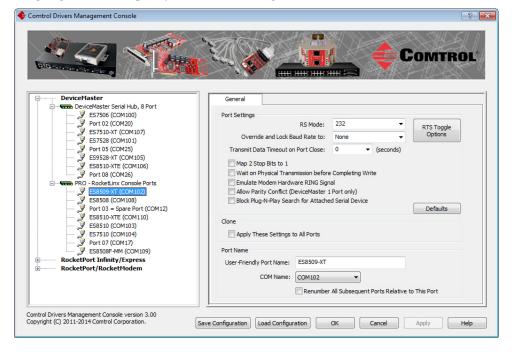
If your application does not set COM port properties, use the *Device Manager* to access Ports (COM & LPT) to change the port parameters. If the application sets COM port properties, those settings take precedence over Windows COM port settings. The exception to this guideline is if you use the **Override and Lock Baud Rate** to option.

Use the following procedure to change NS-Link COM port settings on a *DeviceMaster* port or ports.



Do not connect RS-422/485 devices until the appropriate port interface type has been configured in the driver. The driver default port setting is RS-232.

- 1. Open Comtrol Drivers Management Console (Page 29).
- 2. Highlight the appropriate DeviceMaster.
- 3. Highlight the first port you want to configure.



- 4. Select the appropriate communications mode.
 - **Note:** The DeviceMaster Serial Hub only supports RS-232. If you select RS-422 or RS-485 on the DeviceMaster LT, you may want to configure Terminator Resistor options. If so, click the <u>Terminator Resistor Options</u> button.

븆 Comtrol Drivers Management Console	
DeviceMaster DeviceMaster LT 16 Port	General
	Port Settings RS Mode: 232 Override and Lock Baud Rate to: 495 (2-wire) 495 (4-wire, Slave) 495 (4-wire, Slave) 495 (4-wire, Slave) 495 (4-wire, Slave) Terminator 495 (4-wire, Master) Termin
	Clone
Port 15 (COM42)	Apply These Settings to All Ports
	Port Name User-Friendly Port Name: Port 01 COM Name: COM 11 Renumber All Subsequent Ports Relative to This Port
RocketPort Infinity/Express RocketPort/RocketHodem Comtrol Drivers Management Console version 2.11	COM Name: COM11

Make the appropriate selections to reflect your configuration.

Terminator Resistor Options		
NOTE		
You may use one or both of these two options to improve the integrity of the signal on a long distance high-speed RS-422 or RS-485 network.		
Using these options you can place a 120 O termination resistor between each of the transmit differential pair or receive differential pair on every port in RS-422 or RS-485 mode.		
If enabled, termination resistors will be placed between the signals shown below:		
* RS-422 mode: - Between TxD+ and TxD- - Between RxD+ and RxD-		
* RS-485 mode (4-wire): - Between TxD+ and TxD- - Between RxD+ and RxD-		
*RS-485 mode (2-wire): - Between TxD+ and TxD-		
*RS-232 mode: DeviceMaster LT, Only - It does NOT apply.		
Tx Terminator Resistor		
Rx Terminator Resistor		
Defaults OK Cancel		

- 5. Enable the features that you require for your environment.
 - *Note:* You can use the help system or refer to the <u>following table</u> for information about each option.

- 6. Optionally, click the <u>*RTS Toggle Options*</u> button:
 - If your communications application does not toggle FTS when transmitting in RS-485 mode.

If you are using an external RS-232 to	RTS Toggle Options
RS-485 converter, which is attached to a port that is configured for RS- 232.	NOTE: You may need to use one or more of the settings below in any of the following cases: If your communications application doesn't toggle RTS when transmitting in RS-485 mode. If you are using an external RS-232 to RS-485 converter attached to a port
Click the appropriate options for your environment.	 If you are using an external KS-232 to KS-465 converter attached to a port configured in RS-232 mode. Override and Lock to RS-485 Toggle Mode RS-485 Toggle RTS Low
Click OK to save the changes and return to the port General tab.	Defaults OK Cancel

- 7. If desired, click the **Clone** check box to set all of the ports on this Comtrol device to these characteristics.
- 8. Optionally, change the User-Friendly Port Name.
- 9. If desired, select a different **COM Name** (NS-Link COM port number). The drop-down list displays (in use) next to COM port numbers that are already in use in this system. Do not duplicate COM port numbers as this will cause the ports to not function.
- 10. Click Apply to save these changes.

a.

b.

Note: If you selected RS-422 mode, make sure that there is not a device attached to the port and click **Ok**.

11. Highlight the next port that you want to configure and perform $\underline{\text{Steps 4}}$ through 10.

Port Settings General Tab	Description		
	Use this drop-down list to select the communications mode for the serial device that you will be connecting to this port.		
	• RS-232		
	• RS-422		
	• RS-485 Mode provides these choices, depending on the model.		
	Note: The DeviceMaster LT and DeviceMaster RTS 2-port models support RS-485 4-wire, Slave or Master. The DeviceMaster PRO and other DeviceMaster RTS models only support RS-485 2-wire.		
RS Mode	- RS-485 2-wire (half-duplex) supports transmit and receive data. When data is transmitted, the Transmit Enable signal is activated, and the transmit receive device switches from receive to transmit automatically.		
Default = RS-232	 RS-485 4-wire Master (full-duplex master) supports transmit and receive data, which means both signals are always active. The DeviceMaster is enabled by the Transmit Enable signal. This mode the same as RS-422. 		
	- RS-485 4-wire Slave (full-duplex slave) supports transmit and receive data. When data is transmitted, the Transmit Enable signal is activated, the transmit device goes active and starts sending data. When the data is not being sent, the transmit device is inactive. The receive device is always active. If you click RS-485, you may need to change settings in the <u>RTS Toggle Options</u> screen.		
	Note: The DeviceMaster Serial Hub default value is RS-422, the default value is RS-232 for other DeviceMasters.		
	This option allows you to lock selected ports.		
Override and Lock Baud Rate to	You can select a value from the drop-down list or enter an appropriate value from the following standard baud rates: 300, 600, 1200, 1800, 2400, 3600, 4800, 7200, 9600, 14400, 19200, 38400, 57600, 115200, 230400, 460800, or		
Default = None	921600. After locking a baud rate, no matter what baud rate is selected in a host application, the <i>actual</i> rate used is the rate specified here.		
	This button opens the RTS Toggle Options popup, which provides the following features:		
	Override and Lock to RS-485 Toggle Mode		
	Use the Override and Lock to RTS Toggle Mode option to lock the port in RTS (Request to Send) toggle mode, then set the mode (low or high) as desired for RS-485 mode.		
	RS-485 Toggle RTS Low		
RTS Toggle Options	Use the RTS Toggle RTS Low option to toggle the RTS output signal low during data transmission, which may be needed for relay devices for RS-485.		
	If the option box is not checked, RTS is toggled high (asserted) during data transmission for RS-485 mode.		
	• Defaults		
	Clicking the Defaults button returns all the values in the RTS Toggle Options popup to their default state:		
	 Override and Lock to RTS Toggle Mode = Disabled RTS Toggle RTS Low = Disabled 		

The following table provides information about the options on the port General tab.

Port Settings General Tab	Description	
	Optionally, click the Terminator Resistor button to enable termination resistors.	
	To ensure the best signal integrity on a long distance high-speed RS-422 or RS-485 network, sometimes it is required to place a 120Ω termination resistor between each of the transmit differential pair or receive differential pair.	
Terminator Resistor Options (DeviceMaster LT, Only)	Signal reflection is reduced and a reliable communication is ensured by placing the 120Ω termination resistor. The DeviceMaster LT provides software controllable 120Ω termination resistor for each differential pair on every port in RS-422 and RS-485 mode. Use the Termination Resistor Options popup to place 120Ω termination resistors between the signals shown below:	
	• RS-422 Mode	
	- Between TxD+ and TxD- (Pins 5 and 7)	
	- Between RxD+ and RxD- (Pins 4 and 2)	
	• RS-485 Mode – Between TxD/RxD+ and TxD/RxD- (Pins 5 and 7)	
Transmit Data Timeout Port Close	This option allows you to select the length of time to wait for data to clear the transmit buffer after a host application has closed the port. This is typically used with serial devices such as printers, to give the data sufficient time to	
Default = 0	used with serial devices such as printers, to give the data sufficient time to flush through the system.	
Map 2 Stop Bits to 1	If your application is hard-coded to use two stop bits and you receive framing errors, click this check box to map 2 stop bits to 1 bit.	
Default = Disabled	Leave this check box blank to enable stop bits to pass through unchanged.	
Wait on Physical Transmission before Completing Write		
Default = Disabled	The default mode (check box not clicked) is to buffer the data in the transmit hardware buffer, and return completion as soon as the packet is in the buffer.	
Emulate Modem	nulate Modem Click this check box to emulate the ring indicator signal.	
Hardware RING Signal Hardware RING Signal Default = Disabled If this box is checked and the port receives a <i>RING</i> signal (or a code, as defined in the AT command set for the modem), it send to the communications application.		
Block PnP search for attached serial device	This option disables plug and play from searching for a device attached to the serial port.	
Default = Disabled	For example, data received during device discovery on a device is assumed to be a mouse to plug and play.	
Allow Parity Conflict (DeviceMaster 1-Port only)	Use this option to allow a parity conflict on a DeviceMaster 1-port. It may be necessary to use this option after you have determined that the cabling is	
Default = Disabled	correct and you are able to transmit data but not receive proper data.	
Clone: Apply all the	If this check box is <i>not</i> clicked, changes apply to the selected port only.	
settings to all ports Default = Disabled	If this check box <i>is</i> clicked, changes apply to all ports on this board.	
User-Friendly Port Name	You can enter a custom COM port name to identify this DeviceMaster in the Comtrol Drivers Management Console.	

Port Settings General Tab	Description	
	The COM Name drop list allows you to renumber this COM port. If you see a COM port number followed by (in use), this means that Plug and Play sees those COM port numbers in use by another device.	
COM Name	If you renumber this COM port and click the Renumber All Subsequent Ports Relative to The Port option, the device driver will renumber all of the ports on the DeviceMaster, starting with the number you select in this drop list.	
	If you rename the port to a COM name used by another port, a dialog appears indicating that the port is already in use.	
Renumber All Subsequent Ports Relative to the Port	Use the Renumber All Subsequent Ports Relative to This Port option to renumber all subsequent ports on the DeviceMaster relative to the port displayed in the COM name drop list.	
Default = Disabled	-	
Defaults	Click the Defaults button to return to the driver default values.	
Default = Disabled		

Network Configuration in Comtrol Drivers Management Console

		· · · · · · · · · · · · · · · · · · ·	
	Comtrol recommends using PortVision DX t		
	Optionally, you can use the <i>Comtrol Drivers Mana</i>		
	Disable IP communications.		
	Change the IP address (if the MAC address (if the MAC address), see <u>Changing a Static IP</u>	ess has been associated to the <u>Address</u> on Page 47.	
	• Configure the DeviceMaster for use with 49.	DHCP, see <u>Setting Up DHCP</u> on Page	
Disabling IP Mode	Use this procedure if you want to disable IP	communications.	
	1. If necessary, access the Comtrol Drivers Management Console.		
	Note: The DeviceMaster must be operational in MAC n segment or connected directly to the PC (<u>Associan</u> on Page 34).		
	2. Make sure that the MAC Mode radio button has been selected.		
	3. Highlight the <i>Device Name</i> of the DeviceMaster that you want to configure.	Network Settings	
	4. Click the Network Settings button.	C Disable IP	
	5. Click the Modify button.	C DHCP IP C Static IP	
	6. Click Disable IP.		
		IP Address: 192.168.11.20	
		Subnet Mask: 255.255.0.0	
	Gateway: 192.168.11.1		
		Modify Apply Changes Close	
		Modif Apply Changes Close	

You can use the **Disable IP** option if you are not using IP addressing (DHCP or static) and operating the DeviceMaster in MAC mode.

Network Settings		<u>? ×</u>
Oisable IP		
C DHCP IP		
C Static IP		
IP Address:	192.168.11.20	
Subnet Mask:	255.255.0.0	_
Gateway:	192.168.11.1	-
Modify	Apply Changes	Close

7. Click the Apply Changes button.

8. Click **Yes** to the *Warning* popup. After the DeviceMaster is rebooted, the following occurs:

- In PortVision DX, the IP address displays as 0.0.0.0.
- In the Comtrol Drivers Management Console:

WARNING
You have selected to disable DHCP and static IP access to the DeviceMaster!
Do you want to continue?
Ves No

- The IP address in the *Network Settings* popup displays 255.255.255.255.
- If the DeviceMaster had been set to *IP Mode*, the previously programmed IP address will appear in the **IP Mode** text box. You can delete the IP address from the **IP Mode** text box and click **Apply** to clear the IP address from the text box.
- 9. Click Close to return to the Comtrol Drivers Management Console.

After disabling IP communications, you may need to do the following:

- Configure device properties, see <u>Configuring Device Properties</u> on Page 38.
- Configure COM port properties, see <u>Configuring COM Port Properties</u> on Page 41.
- Configure any of the DeviceMaster ports as sockets, see <u>Configuring</u> <u>DeviceMaster Ports as Sockets</u> on Page 50.

Changing a Static IP
AddressTypically, PortVision DX is used to program the IP address into the DeviceMaster
during initial configuration. After associating the DeviceMaster with the MAC
address you can change the IP address using the Comtrol Drivers Management
Console.

1. Before programming an IP address it is critical that the DeviceMaster be <u>operational</u> (the PWR or Status LED is lit) when configured for the MAC address (<u>Associating the MAC Address</u> on Page 34).

Note: If the DeviceMaster is NOT operational, do NOT attempt to program or use an IP address with the DeviceMaster.

- 2. Highlight the *Device Name* of the DeviceMaster that you want to configure.
- 3. Click the Network Settings button.
- 4. Click the Modify button.
- 5. Click Static IP.
- 6. Enter static IP address information in the fields below.
 - a. **IP Address**: Enter a valid IP address for your network. The IP Address field is the IP address programmed into the DeviceMaster after applying the changes and rebooting the DeviceMaster. See your network administrator for a valid IP address.

Network Settings		<u>?</u> ×
C Disable IP C DHCP IP C Static IP		
IP Address: Subnet Mask:	192.168.11.20	
Gateway:	192.168.11.1	
Modify	Apply Changes	Close

- b. Mask: The subnet mask is a 32-bit value (255.x.x.x) that enables IP packets to distinguish the network ID and host ID portions of the IP address that filters traffic.
- c. Gateway: The default gateway is a TCP/IP configuration item that is the IP address of a directly reachable IP router.
- 7. Click Apply Changes to begin programming the DeviceMaster.
- 8. Click **Yes** to the *WARNING* popup message.

WARNING	X
The IP address specific	ed will set to device
Do you wan	nt to continue?
Yes	No

- 9. Click **Yes** to the next *WARNING* popup message about rebooting the DeviceMaster.

WARNING	X
In order to communicate new IP address, the devi	
Do you want t	o reset the device now?
Yes	No

If you do not reboot the DeviceMaster at this time, the IP address is not implemented on the DeviceMaster. Failure to reboot at this time can cause network communication problems later, if the IP address is not programmed into the DeviceMaster. Comtrol support recommends rebooting the DeviceMaster at this point.

- 10. Click Close to return to the Device General tab.
- 11. Optionally, you can click the <u>Advanced</u> tab and verify that the <u>Device Status</u> message indicates that the Device is active and Ok.
- 12. After programming the IP address, you may need to do the following:
 - Configure device properties, see <u>Configuring Device Properties</u> on Page 38.
 - Configure COM port properties, see <u>Configuring COM Port Properties</u> on Page 41.
 - Configure any of the DeviceMaster ports as sockets, see <u>Configuring</u> <u>DeviceMaster Ports as Sockets</u> on Page 50.

Setting Up DHCP After associating the DeviceMaster with the MAC address you can configure the driver to work using DHCP.

1. Before programming an IP address it is critical that the DeviceMaster be <u>operational</u> (the PWR or Status LED is lit) when configured for the MAC address (<u>Associating the MAC Address</u> on Page 34).

Note: If the DeviceMaster is NOT operational, do NOT attempt to program or use an IP address with the DeviceMaster.

- 2. Highlight the Device Name of the DeviceMaster that you want to configure.
- 3. Click the IP Mode radio button.
- 4. Click the Network Settings button.
- 5. Click the **Modify** button.

Network Settings	<u>?</u> ×
C Disable IP	
C DHCP IP	
C Static IP	
IP Address:	192.168.11.20
Subnet Mask:	255.255.0.0
Gateway:	192.168.11.1
Modify	Apply Changes Close

etwork Settings

🔿 Disable IP

OHCP TP

C Static IP

IP Address:

Subnet Mask:

192.168.11.1

Apply Chingges

- 6. Click **DHCP IP**. This option allows DHCP to assign the IP address. Make sure that you provide the MAC address of the DeviceMaster for the network administrator to assign a static IP address from the pool. The DHCP server should assign the IP address, mask, and IP gateway.
- 7. Click Apply Changes.
- 8. Click **Yes** to the *WARNING* popup message.

WARNING
The IP address specified will enable DHCP and disable static IP access
Do you want to continue?
Yes No

9. Click **Yes** to the next *WARNING* popup message.

If you do not reboot the DeviceMaster at this time, the IP address is not implemented on the DeviceMaster. Failure to reboot at this time can cause network communication problems. Comtrol support recommends resetting the DeviceMaster.

WARNING	X
In order to communicate new IP address, the dev	with the device using the ice must be reset.
Do you want t	to reset the device now?
Yes	No

? X

Close

After the DeviceMaster reboots, the following occurs:

- The *Comtrol Drivers Management Console* displays the IP address (0.0.0.0) and subnet mask (255.255.0.0) values in the *Network Settings* popup.
- PortVision DX will display the IP address assigned by DHCP.

- 10. Click Close to return to the Device General tab.
- 11. Optionally, you can click the <u>Advanced</u> tab and verify that the Device Status message indicates that the Device is active and Ok.
- 12. After programming the IP address, you may need to do the following:
 - Configure device properties, see <u>Configuring Device Properties</u> on Page 38.
 - Configure COM port properties, see <u>Configuring COM Port Properties</u> on Page 41.
 - Configure any of the DeviceMaster ports as sockets, see <u>Configuring</u> <u>DeviceMaster Ports as Sockets</u> on Page 50.

Configuring DeviceMaster Ports as Sockets

DeviceMaster ports can also be configured as sockets. To configure sockets, use the following procedure:

- 1. Use one of these methods to open the socket configuration web interface (SocketServer).
 - In PortVision DX, right-click the DeviceMaster and click Webpage.
 - Enter the IP address of the DeviceMaster in your web browser URL field or highlight the DeviceMaster in PortVision DX and click Web Manager.
- 2. Click the port number that you want to configure as a socket.

					x
🕞 🕞 🥖 http://192.168.11.23/home.asp	D + C	Comtrol Corporation - Dev	×	ŵ ☆	£33
Comtrol			DEVICE	MASTER	^
Server Status Network Secur	ity EMail Ri	FC1006			J
Server Status 🛛					
Software: NS-Link 9.36	IPv4 Config:	Static	IPv6 Cor	fig: Disabled	
Host Name:	Address:	192.168.11.23	Addr	ess: ::/0	
	Netmask:	255.255.0.0	Gatev	vay: ::	
	Gateway:	192.168.11.1			
Connection Status					_
	Port 1	Port 2	Port 3	Port 4	
Port Name:	Serial Printer	Bar code reader	Scanner		
NSLink Connection Status					
00:1a:a0:3d:63:44					~

See the web page help system, if you need information about configuring sockets or serial tunneling. Optionally, you can refer to the <u>DeviceMaster Installation and</u> <u>Configuration Guide</u>.

The web page help is also available separately if you want a local copy on your host system. The help files are on the *Software and Documentation* CD and the latest version can be downloaded at: <u>ftp://ftp.comtrol.com/dev_mstr/rts/software/SocketServer/help/ssvr_help.zip</u>.

Enabling Secure Data Mode

In addition to enabling SSL mode in the driver, you must **Enable Secure Data Mode** in the NS-Link web page. Use the following procedure to implement the **Enable Secure Data Mode** option.

- 1. Access the NS-Link web page using one of these methods:
 - Open your web browser, enter the IP address, and click enter.
 - Right-click the DeviceMaster in the *Device Tree* or *Device List* pane in PortVision DX and click Webpage.
- 2. Click the Security tab.
- 3. Click Enable Secure Data Mode and Save.

ح 🕞 🥖 http://192.168.11.23/securityCfg ۵ - ۲	🥭 Comtrol C	Corporation - Dev	 A ☆	×
Comtrol		DEVI	CE MASTER	^
Server Status Network Security	EMail	RFC1006		
Security Configuration				-
Enable Secure Data Mode				
Enable Secure Config Mode				
Enable Telnet/ssh	\checkmark			
Enable Monitoring Secure Data via Telnet				
Enable SNMP				
Undo Changes Save				~
<			>	

4. Configure your security key and certificate and click Set.

Key and Certificate Management

RSA Key pair used by SSL and SSH servers	factory	Set	Delete
RSA Server Certificate used by SSL servers	factory	Set	Delete
DH Key pair used by SSL servers	factory	Set	Delete
Client Authentication Certificate used by SSL servers	none	Set	Delete

 \mbox{Click} the \mbox{Help} button if you need information about key and certificate management.

Using Driver Configuration Files

The *Comtrol Drivers Management Console* supports saving device driver configuration files, which provides:

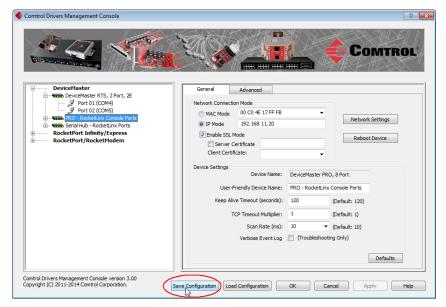
- Back-up for existing driver configuration settings
- Ability to configure multiple of the same devices with the same configuration parameters
- Save the driver configuration settings because you need to remove a driver version to install a new driver version and you want to reload the driver configuration settings into the new driver
- Note: Configuration files must be for the same model with the same port density. For example, you cannot load a DeviceMaster PRO configuration file onto a DeviceMaster RTS or a configuration file for a 32-port DeviceMaster RTS onto a 4-port DeviceMaster RTS.

Configuration files are saved with a .DCF extension.

Saving Driver Configuration Files

Use the following procedure to create and save a configuration file.

1. After configuring the device and ports, click Save Configuration.



Organize 🔻 Nev	v folde	r	800	- (
鷆 Downloads	*	Name	Date modified	Туре
🔠 Recent Places		DeviceMaster LT, 16 Port.DCF	10/21/2013 3:03 PM	DCF File
		DeviceMaster Serial Hub, 8 Port.DCF	3/21/2013 12:41 PM	DCF File
	📜 Libraries	PRO_P1_Com103.DCF	10/21/2013 9:10 AM	DCF File
Documents	PRO_P2_Com108.DCF	10/21/2013 9:10 AM	DCF File	
	PRO-Console Ports.DCF	3/13/2013 10:02 AM	DCF File	
	SH_P3_Com107.DCF	10/21/2013 9:08 AM	DCF File	
🛃 Videos 💷		SH_P4_Com101.DCF	10/21/2013 9:09 AM	DCF File
💻 Computer		SH_P5_Com100.DCF	10/21/2013 9:09 AM	DCF File
Local Disk (C:)		SH_P6_Com105.DCF	10/21/2013 9:09 AM	DCF File
Gallery (\\SIDE	M	SH_P7_Com106.DCF	10/21/2013 9:10 AM	DCF File
	-	<		
File name:	PRO -	RocketLinx Console Ports.DCF		
Save as type:	Driver	Configuration File (*.DCF)		

2. Optionally, change the default file name and click Save.

Loading a Driver Configuration File

Loading Device

Configuration

You must have previously saved a configuration file before you can load a configuration file.
The driver configuration file uploads in portions:
If you highlight a device and click Load Configuration and Apply for the <u>device-level</u> configuration parameters to reload on the device.

• To load *port-level* configuration parameters, you must highlight a single port and click **Load Configuration** and **Apply**. You must upload each port's configuration parameters separately.

Use the following procedure to load the configuration file for device-level information for your device.

- 1. If necessary, open the *Comtrol Drivers Management Console* using one of these methods:
 - Windows Control Panel; go to your Control Panel and click on the Comtrol Drivers Management Console.
 - *Shortcut*; located under Start > Program Files > Comtrol > *Product_Name* > Comtrol Drivers Management Console.
- 2. Depending on your operating system, you may need to click **Yes** to the *Do you* want to allow the following program to make changes to this computer? User Account Control message.

3. In the left pane, highlight the device for which you want to load the devicelevel settings from the configuration file.

E Comtrol Drivers Management Console		?
		Comtrol
DeviceMaster	General Advanced	
DeviceMaster RTS, 2 Port, 2E PRO - RocketLinx Console Ports	Network Connection Mode	
Senarthub Rockettinx Ports RocketPort Infinity/Express	O MAC Mode 00 C0 4E 17 FF FB	 Network Settings
RocketPort/RocketModem	IP Mode 192.168.11.20 If Mode SSL Mode	Reboot Device
	Client Certificate	•
	Device Settings Device Name: DeviceMa	ster PRO, 8 Port
	User-Friendly Device Name: PRO - Ro	cketLinx Console Ports
	Keep Alive Timeout (seconds): 120	(Default: 120)
	TCP Timeout Multiplier: 1	(Default: 1)
	Scan Rate (ms): 10	▼ (Default: 10)
	Verbose Event Log 🔲 (Troub	leshooting Only)
		Defaults
Comtrol Drivers Management Console version 3.00 Copyright (C) 2011-2014 Comtrol Corporation.	ve Configuration Load Configuration OK	Cancel Apply Help

- 4. Click Load Configuration.
- 5. Browse to the location of the configuration file that you want to load.
- 6. Highlight the configuration file and click **Open**. The configuration file loads in a few moments.
- 7. Make the appropriate choice for your situation:
 - Click No to the *ComtrolApplet* message, if you are using the file to set up multiple devices with the same device-level settings.
 - Click Yes to the *ComtrolApplet* message, if you are using the file to restore a specific device. For example, you needed to remove an

🔾 🗸 📕 « Backup_Config_	Files 🕨	• DN	I_2014_April	▼ 49	Search DM	_2014_Apr	il	م
Organize 🔻 New folder								0
🔆 Favorites	-	ľ	lame	^		Date	modified	
🧮 Desktop			🗈 PRO - Rocket	Linx Console	Ports.DCF	4/2/2	014 3:03 F	M
鷆 Downloads			🖹 Serial Hub - F	ocketLinx Po	rts.DCF	4/2/2	014 3:04 F	M
🔛 Recent Places								
	E							
📜 Libraries								
Documents								
👌 Music								
Pictures								
🛃 Videos								
🖳 Computer								
Local Disk (C:)								
Gallery (\\SIDEWINDER) (G:	-	•						
File name:	PRO - F	Rocke	tLinx Console Po	rts.DCF 🔻	Driver Confi	guration F	ile (*.DCF	-
								5
					Open		Cancel	

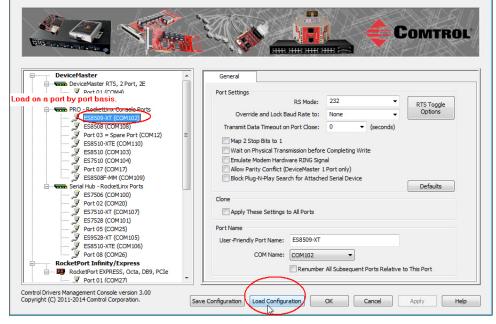
you needed to remove and then re-install the DeviceMaster NS-Link device driver.

ComtrolA	oplet	23
?	"MAC address", "IP address", "User-Friendly Device Name" may conflict with your current settings. Do you want to load these settings?	
	Yes No	6

- 8. Click Apply so that the configuration is saved on the device.
- 9. Go to the next procedure if you want to restore port settings from a configuration file.

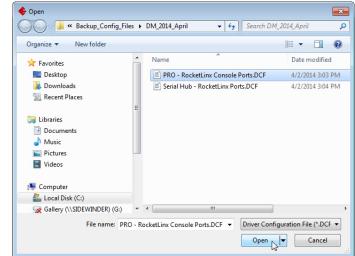
Loading Port Configuration Use the following procedure to load the configuration file for port-level settings for your device.

- Note: Device driver configuration files must be for the same model with the same port density. For example, you cannot load a DeviceMaster PRO configuration file onto a DeviceMaster RTS or a configuration file for a 32port DeviceMaster RTS onto a 4-port DeviceMaster RTS.
- 1. If necessary, open the *Comtrol Drivers Management Console* using one of these methods:
 - Windows Control Panel; go to your Control Panel and click on the Comtrol Drivers Management Console.
 - Shortcut; located under Start > Program Files > Comtrol > Product_Name > Comtrol Drivers Management Console.
- 2. Depending on your operating system, you may need to click **Yes** to the *Do you* want to allow the following program to make changes to this computer? User Account Control message.
- 3. In the left pane, highlight the port for which you want to load the port-level settings from the configuration file.



- 4. Click Load Configuration.
- 5. Browse to the location of the configuration file that you want to load.

6. Highlight the configuration file and click **Open**. The configuration file loads in a few moments.



- 7. Make the appropriate choice for your situation:
 - Click No to the *ComtrolApplet* message, if you are using the file to set up multiple devices with the same port-level settings.
 - Click **Yes** to the *ComtrolApplet* message, if you are using the file to restore a specific device. For example, you needed to remove and then re-install the DeviceMaster NS-Link device driver.

ComtrolA	pplet 🛛
?	"User-Friendly Port Name", "COM Name" may conflict with your current settings. Do you want to load these settings?
	Yes No No

- 8. Click Apply so that the configuration is saved on the device.
- 9. Repeat <u>Steps 3</u> through 8 for each port that you want to restore.

Removing the DeviceMaster and Driver

This section discusses:

- Removing a DeviceMaster from an installation without removing the NS-Link device driver from your system
- <u>Removing the NS-Link Device Driver</u> from your system

Removing a DeviceMaster

Use the following procedure to uninstall the device driver.

Note: Administrative privileges are required to remove device drivers on Windows operating systems newer than Windows Server 2003.

- 1. Right-click the DeviceMaster that you want to uninstall in the Tree View pane.
- 2. Click Uninstall.

Mattern					HEAN .	
					Col	MTRO
DeviceMaster		General Adva	nced			
DeviceMaster LT, 16 Port DeviceMaster RTS, 4	Disable	Network Connection Mode				
DeviceMaster Serial H PRO - Rockett inx Cor	Uninstall	MAC Mode 00 C	0 4E 40 FF F0	•		
PRO - RocketLinx Cor RocketPort Infinity/Ex	Properties	IP Mode 192.	168.11.61		Network S	ettings
RocketPort/RocketMousa		Enable SSL Mode			Reboot	evice
		Server Certificat	e			
		Client Certificate:		-		
		Device Settings				
			Device Name:	DeviceMaster LT,	, 16 Port	
		User-Friendly	Device Name:	DeviceMaster LT,	, 16 Port	
		Keep Alive Time	out (seconds):	120	(Default: 120)	
		TCP Time	out Multiplier:	1	(Default: 1)	
			an Rate (ms):	10 -		
		Number of Devices to		20	(Default: 20)	
		Do NOT Load Firmy			(Derduit: 20)	
			are to Device ose Event Log	(Troubleshoot	ting Only)	Defaults
		Verbe	and arrent bog			
ol Drivers Management Console versio	n 2.11					
ight (C) 2011-2013 Comtrol Corporatio	n. Sa	e Configuration Load Config	uration	ОК Са	ancel Appl	y Help

Removing the NS-Link Device Driver

Use the following procedure to remove the DeviceMaster device driver.

- 1. From the Start button, click the shortcut for your DeviceMaster: Programs > Comtrol > DeviceMaster > Driver Installation Wizard.
- 2. Click Next to start the Comtrol Driver Installation Wizard.
- 3. Click Remove All and Next.



4. Click **Next** to remove the driver.



5. Click **Proceed** to continue the driver removal process.



6. Click the Reboot My Computer button or Close.



- If you click **Close**, make sure that you reboot the system and remove the adapter to complete the driver removal.
- If you click Reboot My Computer, click Ok.



- 7. Shutdown the system and disconnect the DeviceMaster from your network.
- 8. If you want to totally remove the .exe driver assembly:
 - a. Delete any copies of the .exe driver assembly file residing on the system.
 - b. Delete the driver and devices using the Add > Remove Programs Control Panel.

Troubleshooting and Technical Support

This section contains troubleshooting information for your DeviceMaster and the NS-Link device driver. You should review the following subsections before calling Technical Support because they will request that you perform many of the procedures or verifications before they will be able to help you diagnose a problem.

- <u>How to Find Diagnostic Tools and Utilities</u>
- <u>Troubleshooting Checklist</u> on Page 64
- <u>General Troubleshooting</u> on Page 65
- <u>Connectivity Requirements</u> on Page 66
- <u>DeviceMaster LEDs</u> on Page 68
- <u>Using the Advanced Tab</u> on Page 70
- <u>NS-Link Driver Troubleshooting</u> on Page 75
- <u>Using Port Monitor to Test Ports</u> on Page 76
- <u>Using Test Terminal</u> on Page 79
- <u>How Disable / Enable the Device Driver</u> on Page 85
- <u>Technical Support</u> on Page 85

If you cannot diagnose the problem, you can contact <u>*Technical Support*</u> on Page 85.

How to Find Diagnostic Tools and Utilities

There are several tools and utilities that Comtrol provides to diagnose serial port problems or to monitor data.

- The Advanced tab in the *Comtrol Drivers Management Console* (<u>Using the</u> <u>Advanced Tab</u> on Page 70), which may provide valuable information about the DeviceMaster and your network, in the event that you are having problems.
- PortVision DX (Page 7) that provides the following features:
 - Auto-discover and organize Comtrol Ethernet attached products on your network.
 - Remotely access, manage, and configure Comtrol Ethernet attached products from a central console.
 - Load network configuration settings onto multiple Comtrol Ethernet attached products quickly and easily.
 - Instantly view connection status, firmware revision, and network settings of all servers.
 - Configure serial ports using TCP sockets, port communication, and interface settings.
 - Visualize each server and port with instant links to connector, power, and serial pinout information.
 - Conveniently customize and save your network view and commands for replication across all servers.
 - Includes the **Test Terminal** (WCom2) and **Port Monitor** (PMon2) programs for easy access.
 - Test Terminal can be used to troubleshoot communications on a port-byport basis.
 - Port Monitor can check for errors, modem control, and status signals. In

addition, it provides you with raw byte input and output counts

Test Terminal and Port Monitor are installed and available if you install PortVision DX. You can refer to the <u>Port Monitor and Test Terminal User</u> <u>Guide</u> for testing procedures.

Troubleshooting Checklist

Most customer problems reported to Comtrol Technical Support are eventually traced to cabling or network problems.

Reboot the system and reset the power on the DeviceMaster, watch the **PWR** or **Status** light activity. See <u>DeviceMaster LEDs</u> on Page 68 for information about the diagnostic LEDs.

- If the DeviceMaster has a power switch, turn the DeviceMaster power switch off and on.
- If the DeviceMaster does not have a power switch, disconnect and reconnect the power cord.

PWR or Status LED	Description
5 sec off, 3 flashes, 5 sec off, 3 flashes	Redboot checksum failure.
5 sec off, 4 flashes, 5 sec off, 4 flashes	SREC load failure.
5 quick flashes	The default application is starting up.
10 sec on, .1 sec off, 10 sec on .1 sec off	The default application is running.

The following table may help you diagnose your problem:

Issue	Check	
Cabling?	Verify that you are using the correct types of cables on the correct connectors and that all cables are connected securely using the <i>DeviceMaster Installation and Configuration Guide</i> (Page 7).	
	• Isolate the DeviceMaster from the network by connecting the DeviceMaster directly to a NIC in a host system.	
	• See <u>Connectivity Requirements</u> on Page 66 for network cabling information.	
Network?	• Reduce network traffic by installing a second NIC in the host and connect directly to the DeviceMaster.	
	• Verify that the Ethernet hub, switch, or router and any other network devices between the system and the DeviceMaster are powered up and operating.	
Correct MAC address?	Verify that the hardware MAC address in NS-Link matches the address on the DeviceMaster label. You can also use PortVision DX to verify the MAC and IP addresses.	
Correct IP	• Verify that the network IP address is correct. If IP addressing is being used, the system should be able to ping the DeviceMaster.	
address?	• Verify that the IP address programmed into the DeviceMaster matches the unique reserved IP configured address assigned by the system administrator.	

Issue	Check
Correct port addressing?	If using the NS-Link device driver with an in-house application, 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.
Is this the Latest Driver?	See <u>Checking the Device Driver Version</u> on Page 20.
Test the Port or Ports?	Install PortVision DX (Page 10) and use Test Terminal (Page 79).
Comtrol Drivers Management Console?	Verify that the DeviceMaster has installed using the Comtrol Drivers Management Console to confirm that the DeviceMaster displays. Install the device driver, if the DeviceMaster is not displayed.
Enable Verbose mode	Enable the Verbose Event Log feature on the Device General and then reboot the system.

Note: If you have a spare DeviceMaster, try replacing the DeviceMaster.

General Troubleshooting

This table illustrates some general troubleshooting tips.

Note: Make sure that you have reviewed the <u>Troubleshooting Checklist</u> on Page 64.

General Condition	Explanation/Action		
	Indicates that boot program has not downloaded to the DeviceMaster.		
	1. If applicable, remove the NS-Link driver.		
PWR or Status LED	2. Make sure that you have downloaded the most current driver from <u>ftp://ftp.comtrol.com/dev_mstr/</u> <u>rts/drivers/win7</u> .		
flashing	3. Install the driver and configure the DeviceMaster using the MAC address. Make sure that you reboot the system. Refer to <u>NS-Link Device Driver</u> <u>Installation</u> on Page 15 for installation information.		
	Note: If the PWR or Status LED is still flashing, contact Technical Support.		
PWR or Status LED not lit	Indicates that power has not been applied or there is a hardware failure. Contact Technical Support.		

General Condition	Explanation/Action
	The NS-Link driver uses Port 4606 (11FE h) to communicate with the DeviceMaster.
Can ping the Comtrol device, but cannot open the ports from a remote location. (You must have	When using a <i>sniffer</i> to track NS-Link packets, filtering for Port 4606 will easily track the packet. The packet should also contain the MAC address of the DeviceMaster and the originating PC so that it can be determined if the packet is able to travel the full distance one way or not.
previously programmed the IP address, subnet mask, and IP gateway.)	If the 4606 packet is found on one side of a firewall or router, using sniffer, and not on the other side, then that port needs to be opened up to allow the 4606 to pass.
	This will most often be seen with firewalls, but is also seen in some routers.
Cannot ping the device through Ethernet hub, switch, or router	Isolate the DeviceMaster from the network. Connect the DeviceMaster directly to the NIC in the host system (see <u>Connectivity Requirements</u> on Page 66).
	The DeviceMaster family default IP address is often not accessible due to the subnet masking from another network unless 192.168 is used in the network.
Connot ning on connoct	In most cases, it will be necessary to program in an address that conforms to your network.
Cannot ping or connect to the DeviceMaster	If you do not use the NS-Link driver to program the IP address, you only have 10 seconds to disable the bootloader with Redboot to get into the setup utility.
	See the <i>DeviceMaster Installation and Configuration</i> <i>Guide</i> (Page 7) for the Redboot method of programming an IP address.

Connectivity Requirements

An Ethernet connection: either to an Ethernet hub, switch, or router; or to a Network Interface Card (NIC) in the host system using a standard Ethernet cable. See the *DeviceMaster Installation and Configuration Guide* (Page 7) for information regarding hardware installation.

Product Type	Connected to	Connector Name
DeviceMaster RTS 1-port	Hub, switch, router, or NIC	10/100 ETHERNET
DeviceMaster RTS Embedded	Hub, switch, router, or NIC	RJ45 port (not labeled)
DeviceMaster RTS 2-port 1E	NIC Hub, switch, or router	10/100
DeviceMaster RTS 2-port 2E	NIC Hub, switch, or router	10/100 1E/2E

Product Type	Connected to	Connector Name
DeviceMaster RTS 4/8/16-port	NIC	DOWN
(external power supply)	Hub, switch, or router	UP
DeviceMaster RTS 16/32RM (<i>internal</i> power supply)	Hub, switch, router, or NIC	10/100 NETWORK
	NIC	DOWN
DeviceMaster PRO 8/16-port	Hub, switch, or router	UP
	NIC	DOWN
DeviceMaster Serial Hub 8-port	Hub, switch, or router	UP
DeviceMaster Serial Hub 16-port	Hub, switch, router, or NIC	10/100 NETWORK

DeviceMaster LEDs

The DeviceMaster has network and port LEDs to indicate status.

Port LEDsPort LEDs are amber and green on 4, 8, 16, and 32-port. The 1-port and 2-port
models do not have port LEDS. After a port has been opened in RS-232 mode, an
amber LED means that there is link between the port and the serial device. After
a port has been opened in RS-422 or RS-485 mode, an amber LED means that data
is receiving data. A green port LED indicates transmit activity.

Network	and Device
LEDs	

The LEDs indicate that the default DeviceMaster application, SocketServer is running or after driver installation, that the NS-Link driver loads. If you have loaded PortVision DX, you can check the DeviceMaster status on-line.

Ports	Model	Network LEDs		
1	DeviceMaster RTS	• The Status LED on the front of the unit is lit, which indicates that it has power and has completed the boot cycle.		
		Note: The Status LED flashes while booting and it takes approximately 15 seconds for the bootloader to complete the cycle. When the Bootloader completes the cycle, the LED has a solid, steady light that blinks approximately every 10 seconds.		
		• The red Link Act LED is lit, which indicates a working Ethernet connection.		
		• If the red Duplex LED is lit, it indicates full-duplex activity.		
		• If the red 100 LED is lit, it indicates a working 100 MB Ethernet connection (100 MB network, only).		
	DeviceMaster RTS Embedded	The LEDs are located between the RJ45 connector and the power terminal block.		
		• The amber Status LED (D1) on the adapter is lit, which indicates that it has power and has completed the boot cycle.		
1		Note: The Status LED flashes while booting and it takes approximately 15 seconds for the bootloader to complete the cycle. When the Bootloader completes the cycle, the LED has a solid, steady light that blinks approximately every 10 seconds.		
		• The red Link Act LED (D2) is lit, which indicates a working Ethernet connection.		
		• If the red Duplex LED (D3) is lit, it indicates full-duplex activity.		
		• If the red 100 LED (D4) is lit, it indicates a working 100 MB Ethernet connection (100 MB network, only).		
	DeviceMaster RTS	• The STATUS LED on the device is lit, indicating you have power and it has completed the boot cycle.		
2		Note: The STATUS LED flashes while booting and it takes approximately 15 seconds for the Bootloader to complete the cycle. When the Bootloader completes the cycle, the LED has a solid, steady light that blinks approximately every 10 seconds.		
		• If the LINK (green) LED is lit, it indicates a working Ethernet connection.		
		• If the ACT (yellow) LED flashes, it indicates network activity.		

Ports	Model	Network LEDs		
		• The PWR LED on the front of the unit is lit, which indicates it has power and has completed the boot cycle.		
4 8	DeviceMaster PRO (8) DeviceMaster RTS†	Note: The PWR LED flashes while booting and it takes approximately 15 seconds for the bootloader to complete the cycle. When the Bootloader completes the cycle, the LED has a solid, steady light that blinks approximately every 10 seconds.		
16	DeviceMaster	• The red LNK/ACT LED is lit, which indicates a working Ethernet connection.		
	Serial Hub (8)	• If the red 100 LED is lit, it indicates a working 100 MB Ethernet connection (100 MB network, only).		
		• The Status LED on the front of the unit is lit, which indicates it has power and has completed the boot cycle.		
16	DeviceMaster PRO (16)	Note: The Status LED flashes while booting and it takes approximately 15 seconds for the bootloader to complete the cycle. When the Bootloader completes the cycle, the		
	DeviceMaster RTS††	LED has a solid, steady light that blinks approximately every 10 seconds.		
32	DeviceMaster Serial Hub	• The red LNK/ACT LED is lit, which indicates a working Ethernet connection.		
	(16)	• If the red Duplex LED is lit, it indicates full-duplex activity.		
		• If the red 100 LED is lit, it indicates a working 100 MB Ethernet connection (100 MB network, only).		
† Exte	† External power supply.			
†† Inte	† Internal power supply.			

Using the Advanced Tab

You can use the **Advanced** tab to get a summary of the DeviceMaster status. The **Advanced** tab can be useful for troubleshooting network problems with your DeviceMaster.

Note: To use the Advanced tab, you must associate a MAC address to the DeviceMaster before programming an IP address (Page 34).

Use the following procedure to access the Advanced tab.

- 1. If necessary, access the Comtrol Drivers Management Console.
- 2. Highlight the DeviceMaster.
- 3. Click the **Advanced** tab.

omtrol Drivers Management Console	<u>?</u> ×
DeviceMaster	General Advanced
DeviceMaster PRO 8 Port (DeviceMaster PRO Port 01 (COM11) Port 02 (COM12)	Device Status
🖉 Port 03 (COM13)	Device is active and OK. Refresh
	History
🔊 Port 06 (COM16)	
Port 08 (COM18) DeviceMaster RTS 4 Port (DeviceMaster RTS	
	Network Statistics
Port 03 (COM21)	PC Network Interface Details
RocketPort Infinity/Express	
🖃 📟 RocketPort Express 8 Port, PCIe-BUS (Rock	Device Network Interface Details
🍠 Port 01 (COM3)	
🖉 Port 02 (COM4)	
🖉 Port 03 (COM5)	
Port 07 (COM9)	
omtrol Drivers Management Console version 1.01	
	re Configuration Load Configuration OK Cancel Apply Help

Note: You must have previously associated a MAC address to the DeviceMaster (<u>Associating the MAC Address</u> on Page 34).

Refer to the *Device Status* table (Page 73) for a list of messages and explanations.

4. You can click the **History** button to review the last ten actions on the DeviceMaster.

Hi	History X		
	2012-01-04 16:05:09	Code upload has completed.	
	2012-01-04 16:05:11	Device detected, initializing	
	2012-01-04 16:05:18	Initialization complete. Waiting on response from device	
	2012-01-04 16:05:18	Device is active and OK.	
	2012-01-04 16:17:19	Device detected, initializing	
	2012-01-04 16:17:50	Device detected, microcode upload in progress.	
	2012-01-04 16:17:59	Code upload has completed.	
		ОК	

5. Click PC Network Interface Details for the following information.

PC Network Interface		<u>?</u> ×
Statistics MAC Address :	00 1A A0 3D 63 44	
Frames Out :	249973	
Frames Accepted :	11858767	
Frames Passed On :	422747	
Adapter 1 ID String :	DEVICE\{7C067D6D-3272-4F13-AF36-80B5521E0CBE}	
	Help Reset Clo	Ę1

Field	Description
MAC Address	MAC Address is the reported MAC address of the Ethernet network interface card (NIC) card in the server. Since a server may contain more than one NIC, identifying exactly which NIC is being used by the device driver may help you to identify and resolve problems.
Frames Out	Frames Out is the count of the number of frames output by the device driver through the identified network interface. This includes all administrative, data, and control frames, and should be incriminated whenever the DeviceMaster and the device driver are operating, even if the DeviceMaster is idle.
Frames Accepted	Frames Accepted is the count of the number of received frames accepted by the device driver for further processing. These must be well-formed packets with the correct protocol identifiers for the device driver.
Frames Passed On	Frames Passed On is when a NIC receives a packet, it passes the packet around to each driver or application that is bound to the NIC until one of them recognizes and accepts the packet.
Adapter 1 ID String	Adapter 1 ID String is the NIC binding string. Every network entity that needs to be uniquely identified has a Globally Unique Identifier (GUID), which is used to form unique binding strings. The presence of this string indicates that the device driver has been bound to a specific NIC.
Reset	This button resets the statistics in the PC Network Interface window.

6. Click Close to return to the Advanced tab.

Statistics	· · · · · · · · · · · · · · · · · · ·
MAC Address :	00 C0 4E 17 FF FB
Packets to :	p
Packets from :	ρ
Retransmitted / % of All Sent :	0/0%
Reported State :	Active
Devices Detected / Available :	63 / 0
Out Of Sequence / % of All Received :	0/0%
Maximum - Average Buffer Usage :	12% - 0%
Buffer Allocation Failures :	p
Starving Port(s) :	None

7. Click the Device Network Interface Details button to review the following

information.

Fields	Description
MAC Address	MAC Address is the network (MAC) address of the DeviceMaster that is currently selected. It should match both the MAC address on the General tab and the MAC address on the physical DeviceMaster.
Packets To	Packets To is the count of information frames sent to a layer in the device driver and indicates actual data traffic sent.
Packets From	Packets From is the count of information frames received by a layer in the device driver, and indicates actual data traffic received.
Retransmitted/% All Sent	Retransmitted/% All Sent is the percentage of information frames requiring retransmission due to network errors. If this value is not zero, you may have network problems.
Reported State	Reported State contains a message showing the status of the device driver to the selected DeviceMaster.
Devices Detected/ Available	Devices Detected/Available is the number of DeviceMasters found on the network and how many of the DeviceMasters are available.
Out of Sequence/ % of All Received	Out of Sequence/ % of All Received is the percentage of information frames received out of order, possibly due to network errors. If this value is not zero, you may have network problems.
Maximum Average Buffer Usage	Maximum and Average Buffer Usage is the percentage of the network buffer used since the driver was loaded.
Buffer Allocation Failures	Buffer Allocation Failures displays how many times the driver failed to allocate network buffers to the process because there were not enough buffers.
Starving Port(s)	If any Buffer Allocation Failure happens, the Starving Port(s) list will include the name of the COM port that could not be serviced (immediately) because of it.
Reset	Reset clears the data values from the fields. and updates the data displayed in the event that you want review data before the automatic refresh cycle occurs.

Click Close to return to the Advanced tab.

	ides a list of <i>Device Status</i> messages.
Device Status Message	Description
A MAC address has not yet been specified for this device. Return to the General tab, configure the device, and apply the changes.	The driver may have only been configured with an IP address. The appropriate MAC address must be input in the MAC field in the General tab so that the Advanced tab can report DeviceMaster status.
Can't detect any Comtrol devices. Check Ethernet connectors and ensure the device is powered on.	Network traffic is being received, but not from a DeviceMaster. Check the network connections and verify that the DeviceMaster is powered up.
Can't detect the device with specified the MAC address on any network. Verify the MAC address of the unit, check the Ethernet connectors and ensure the device is powered on.	Network traffic is being received from a DeviceMaster, but not the one specified on the General tab. Check the DeviceMaster to make sure that you are using the correct MAC address.
Code upload failed due to a timeout and the driver is attempting to re- synchronize with the device.	The device driver has not successfully uploaded the firmware to the assigned DeviceMaster.
Code upload has completed.	The driver has completed uploading the firmware to the DeviceMaster.
Code upload was restarted after a timeout.	The firmware upload process failed due to a time- out. The upload process has been restarted.
Device detected, initializing.	The server has acquired the DeviceMaster and is downloading the control program. The DeviceMaster will be available shortly.
Device detected, microcode upload in progress.	The device driver is attempting to upload the microcode to the DeviceMaster. This should complete momentarily.
Device is active and OK, no data traffic was exchanged since last inquiry.	The DeviceMaster and ports are operational. There is currently no active serial traffic.
Device is active and OK.	The DeviceMaster is okay and ready to use.
Device is detected and configured in the driver, but is not yet assigned to this server/PC.	Either the DeviceMaster is currently being controlled by another server or the DeviceMaster power has been cycled and the DeviceMaster is waiting for a server to acquire it.
Excess out-of-sequence packets received. Check for indications of	Click the PC Network Interface Details button to review the statistics, which may indicate that DeviceMaster is functioning properly.
high network traffic.	This message typically goes away on it's own but you can reboot the PC so that the network traffic is re- synchronized.
Excess packet retransmissions detected. Check for indications of high network traffic.	Click the PC Network Interface Details button to review the statistics, which may indicate that DeviceMaster is functioning properly. This message typically goes away on it's own but you can reboot the PC so that the network traffic is re- synchronized.
Initialization complete. Waiting on response from the device before making the connection active.	Waiting for a response from the DeviceMaster.
Statistical data was reset.	This indicates the number of times that the statistics in the PC Network Interface and Device Network Interface have been reset.

The following table provides a list of *Device Status* messages.

Device Status Message	Description
The driver is not running. If you just installed the driver you will need to exit the program before the driver starts.	Close and then re-open the Comtrol Drivers Management Console.
The communications between the driver and the device has been disrupted. Check connectors, cabling, and look for indications of high network traffic.	The DeviceMaster is off-line in this state. The MAC or IP address for the DeviceMaster is known (assigned) but communications have been interrupted.
The device has failed to respond for an extended period of time. The device may have lost power or is in an unresponsive state.	The device driver is no longer able to communicate with the DeviceMaster. Check the <u>LED status</u> (Page 68).
The driver is not running. Make sure the driver is installed correctly and restart the PC to correct the problem.	Make sure the driver is installed correctly and restart the PC to correct the problem. The driver is most likely disabled. Enable the driver and reboot the PC.
	There may be network traffic problems, an unresponsive DeviceMaster, or a problem with the server sending out network data.
Timeout occurred while the driver was waiting for an ADMIN command reply from the device.	The device driver is trying to locate the DeviceMaster on the network by sending out the ID request and not receiving a response from the DeviceMaster, which may indicate that the DeviceMaster is either not on the network, on a different segment (if using MAC mode of addressing), or the bandwidth of the network (or server) is so saturated that the DeviceMaster response is not received in time.
Timeout occurred while the driver was waiting for an Assign Reply response from the device prior to making the connection active.	There may be network traffic problems, an unresponsive DeviceMaster, or a problem with the server sending out network data. A handshake that occurs after an ID response is received and the device driver is trying to establish a communication channel with the DeviceMaster.
Unable to find a Network Interface Controller (NIC) card.	Install a NIC in that PC or check that the NIC is operational.
Uninitialized.	The firmware has not uploaded to the DeviceMaster. If this message is displayed in the History file, it often means that the DeviceMaster is in the process of being rebooted.

NS-Link Driver Troubleshooting

NS-Link Condition	Explanation/Action
	Before programming an IP address it is critical that the DeviceMaster be operational and passes the power on tests when configured for the MAC address.
Need to program IP address into the device.	Note: If the DeviceMaster is NOT operational, do NOT attempt to program or use an IP address with the DeviceMaster.
	See <u>Program the IP Address (Network Information)</u> on Page 11 for more information.
	1. Verify that MAC address in the NS-Link driver matches the address on the DeviceMaster.
Cannot open port	2. Verify that you are using the correct NS-Link driver. If necessary, remove and reinstall a new driver.
	3. Isolate the DeviceMaster from the network (see Page 65).
	4. Check to see if another program or computer is active on this port.
The Comtrol device has a	At this speed the entire available bandwidth is required for the purpose of uploading the firmware from the driver to the DeviceMaster. At lower speeds, timing issues will prevent the firmware from being successfully installed to the DeviceMaster, thus preventing the DeviceMaster from normal operation.
lower limitation of network bandwidth requirement of 64 Kbps.	When using the DeviceMaster over a WAN link that is less than the recommended 64 Kbps, a timing modification may be made that will allow uploading of the firmware.
	Load the driver locally to the DeviceMaster for the purpose of getting the firmware installed. The PC on the other side of the slow link can then "share" the port. The sharing may be exclusive as the firmware loader PC may not need to access the ports.

This table includes some tips related to NS-Link drivers.

Using Port Monitor to Test Ports

This procedure will check whether the DeviceMaster can:

- Communicate through the NS-Link device driver
- Determine if a port is open with an application

If necessary, install PortVision DX (<u>Before Installing the Comtrol Drivers</u> <u>Management Console</u> on Page 9, Page 10).

- 1. Open PortVision DX using the desktop shortcut.
- 2. Start Port Monitor by clicking Tools > Applications > Port Monitor (PMon2).

PV PortVision DX						
File Manage View Tools Help						
Scan Refresh All Scan Refresh All Check for Upd	Jpload Reboot	Webpage Notes		Dout Exit		
IPORTVI Options		(PMon2)				
Name : First Floor	Drivers → ESS10 → ESS10 → ESS10 → ESS10 → ESS10 → ESS10 → ESS10 → FFF → RTS_ZE - 29:FFF → RTS_2E - 29:FFFF → RTS_2E - 29:FFFF → RTS_2E - 29:FFFF → RTS_2E - 29:FFFF → RTS	#1 -5				
	Device Name	Model	IP Address	MAC Address	Software Version	Status
- I I I I I I I I I I I I I I I I I I I	■ ✓ ES9528	E\$9528	192.168.11.105	1	v1.4 beta4 (b1.1.0.3	
	V IO-Link Master #1	IO-Link Master EIP-4	192.168.11.199	00:C0:4E:39:FF:F6		ON-LINE
=	Modbus/TCP	UP-1P (5V)	192.168.11.53		Modbus/TCP 5.07	ON-LINE
	🛢 🗸 🕄 PRO - 17:FF:FB	PRO-8P (DB9)	192.168.11.20	00:C0:4E:17:FF:FB	NS-Link 8.03	ON-LINE
	RTS4 - 07:FF:FC	RTS-4P (DB9)	192.168.11.23	00:C0:4E:07:FF:FC	NS-Link 9.11	ON-LINE
	RTS_2E - 29:FF:F5	RTS-2P (2E)	192.168.11.52	00:C0:4E:29:FF:F5		ON-LINE
	SH8	SH-8P (DB9)	192.168.11.14	00:C0:4E:1C:FF:FD		ON-LINE
+	UP1:5-30VDC	UP-1P (5-30V)	192.168.11.55	00:C0:4E:21:05:CD	Modbus Server 4.04	ON-LINE
<						

3. Click Add Ports using the icon or Tools > Add Ports,

0 🚅 🖬	- /	lelp 💥		[] ?									
Port Name	Status A		_		RTS	DTR	Actual Throughput	TxTotal	RxTotal	Total Errors	OverrunErrors	FramingErrors	ParityError
COM4	CLOSED	OFF	OF/	OFF	OFF	OFF	0	0	0	0	0	0	0
COM5	CLOSED	OFF	OFF	OFF	OFF	OFF	0	41970289	41966658	0	0	0	0
COM6	CLOSED	OFF	OFF	OFF	OFF	OFF	0	0	0	0	0	0	0
COM9	CLOSED	OFF	OFF	OFF	OFF	OFF	0	0	0	0	0	0	0
COM10	CLOSED	OFF	OFF	OFF	OFF	OFF	0	0	0	0	0	0	0
COM11	CLOSED	OFF	OFF	OFF	OFF	OFF	0	0	0	0	0	0	0
COM12	CLOSED	OFF	OFF	OFF	OFF	OFF	0	0	0	0	0	0	0
COM18	CLOSED	OFF	OFF	OFF	OFF	OFF	0	0	0	0	0	0	0
COM25	CLOSED	OFF	OFF	OFF	OFF	OFF	0	0	0	0	0	0	0
COM26	CLOSED	OFF	OFF	OFF	OFF	OFF	0	0	0	0	0	0	0
COM100	CLOSED	OFF	OFF	OFF	OFF	OFF	0	0	0	0	0	0	0
COM101	CLOSED	OFF	OFF	OFF	OFF	OFF	0	0	0	0	0	0	0
COM102	CLOSED		OFF	OFF	OFF	OFF	0	0	0	0	0	0	0
COM103	CLOSED	OFF	OFF	OFF	OFF	OFF	0	0	0	0	0	0	0
COM104	CLOSED	OFF	OFF	OFF	OFF	OFF	0	0	0	0	0	0	0
COM105	CLOSED	OFF	OFF	OFF	OFF	OFF	0	0	0	0	0	0	0
COM106	CLOSED	OFF	OFF	OFF	OFF	OFF	0	0	0	0	0	0	0
COM107	CLOSED	OFF	OFF	OFF	OFF	OFF	0	0	0	0	0	0	0
COM108	CLOSED	OFF	OFF	OFF	OFF	OFF	0	0	0	0	0	0	0
COM109	CLOSED	OFF	OFF	OFF	OFF	OFF	0	0	0	0	0	0	0

4. Click Driver, RPSHSI/NSLINK, and click Ok.

Add Ports	X
C Ports	ОК
COM1 COM2 COM3 COM4 COM5 COM5 COM6 COM7 COM8 COM9	Cancel
ГОМ10	•
C Range For example: 3-15,21,45,	51-56,74
Oriver	
ROCKETPORT INFI	NITY / EXPRESS
DEVICEMASTER / N	ISLINK
ROCKETPORT / RO	ICKETMODEM
C VSLINK	

5. If the DeviceMaster is communicating with the device driver for Windows, Port Monitor should display CLOSED status. If a port is open for an application, it displays as OPEN, and displays Actual Throughput, TxTotal and RxTotal statistics.

🗅 🖻 🖥	🖨 😭	· 💥		(?							
Port Name	Status	CTS	DSR	CD	RTS	DTR	Actual Throughput	TxTotal	RxTotal	Total Errors	OverrunErro
	OPEN	ON	ON	ON	ON	ON	114600	205891	205638	0	0
COM12 kz	CLOSED	OFF	OFF	OFF	OFF	OFF	0	0	0	0	0
COM13	CLOSED	OFF	OFF	OFF	OFF	OFF	0	0	0	0	0
COM14	CLOSED	OFF	OFF	OFF	OFF	OFF	0	0	0	0	0
COM15	CLOSED	OFF	OFF	OFF	OFF	OFF	0	0	0	0	0
COM16	CLOSED	OFF	OFF	OFF	OFF	OFF	0	0	0	0	0
COM17	CLOSED	OFF	OFF	OFF	OFF	OFF	0	0	0	0	0
COM18	CLOSED	OFF	OFF	OFF	OFF	OFF	0	0	0	0	0
•										•	

Normally, there should be no data errors recorded or they should be very small. To find out what the actual errors are, scroll to the right. You will see three columns: **Overrun Errors**, **Framing Errors**, and **Parity Errors**.

If the errors are:

- **Overrun Errors** represent receive buffer overflow errors. If this is the case, you will have to configure either software or hardware handshaking to control the flow of data. The most common errors are Overrun errors.
- Framing Errors indicate that there is an synchronization error between the beginning of a data frame and the end of the data frame. A frame usually consists of a start bit, 8 data bits, and a stop bit or two. The framing error occurs if the stop bit is not detected or it occurs in the wrong time frame. Most causes for framing errors are electrical noise on the data lines, or differences in the data clocks of the DeviceMaster and the connected device.
- **Parity Errors** occur when parity is used and the parity bit is not what is expected. This can also be caused by noise on the data lines.

6. You can view additional statistics to Port Monitor by adding columns. Click Tools and Add Columns.

🌉 Untitled - PMon2	a second second second						_ 🗆 ×
File Tools View Help							
Add Ports	2 🛛 🖉						
S [Remove Ports	Actual Throughput	TxTotal	RxTotal	Total Errors	OverrunErrors	FramingErrors	ParityErrors
E C Add Columns	0	64923300	64923300	0	0	0	0
	0	0	0	0	0	0	0
E C	0	0	0	0	0	0	0
F C Reset Values	0	0	0	0	0	0	0
Default Columns	0	0	0	0	0	0	0
F C	0	0	0	0	0	0	0
E C Settings	0	0	0	0	0	0	0
	0	0	0	0	0	0	0

7. Highlight or shift-click to add multiple statistics and click Ok.

Add /	Remove Columns	×
	Please select the columns	
	ParityErrors	
	Status Flags	
	TxPackets	
	RxPackets	
	TxTotalRaw	
	RxTotalRaw OverrunErrorsRaw	
	FramingErrorsRaw	
	ParityErrorsRaw	
	TxCPSInst	
	RxCPSInst	
	TxCPSMinute	
	RxCPSMinute	
	7	
[OK Cancel	

Note: See the Port Monitor help system if you need an explanation of a column.

8. Scroll to the right to view the new columns.

	ê 🔒	🚭 📽 💥 🔳	X ?						
RTS	DTR	Actual Throughput		Total Errors	OverrunErrors	FramingErrors	ParityErrors	OverrunErrorsRaw	ParityErrorsRaw
OFF	OFF	0	64923300	0	0	0	0	0 .	0
OFF	OFF	0	0	0	0	0	0	õ ka	0
OFF	OFF	0] 0	0	0	0	0	0 Č	0
OFF	OFF	0	0	0	0	0	0	0	0
OFF	OFF	0	0	0	0	0	0	0	0
OFF	OFF	0] 0	0	0	0	0	0	0
OFF	OFF	0] 0	0	0	0	0	0	0
OFF	OFF	0	0	0	0	0	0	0	0

- 9. If you want to capture this session, you can save a current session as a report. To do this, select one of the following save options:
 - File > Save As
 - File > Save if the report already exists in an older format
 - Save Active Session 🖬 button

Reports can be opened, viewed and re-used when needed. To open and view a report:

a. Select File > Open or the Open Existing Session 🖻 button. The Open

Session dialog appears.

b. Locate the session (table), you want to open and click the Open button.

Optionally, if you want to continue monitoring for an existing session, you need to activate the *Polling Interval*.

- Select Tools > Settings to access the PMon2 Settings dialog
- Change the **Polling Interval** field to a value other than zero (0)
- 10. Leave Port Monitor open so that you can review events when using *Test Terminal* to test a port or ports.

Using Test Terminal

Test Terminal (WCom2) allows you to open a port, send characters and commands to the port, and toggle the control signals. This application can be used to troubleshoot communications on a port-by-port basis.

- Send and Receive Test Data: This sends data out the transmit line to the loopback plug, which has the transmit and receive pins connected thus sending the data back through the Rx line to Test Terminal, which then displays the received data in the terminal window for that port. This test is only testing the Tx and Rx signal lines and nothing else. This test works in either RS-232 or RS-422 modes as both modes have transmit and receive capability. A failure in this test will essentially prevent the port from working in any manner.
- Loopback Test: This tests all of the modem control signals such as RTS, DTR, CTS, DSR, CD, and RI along with the Tx and Rx signals. When a signal is made HI in one line the corresponding signal line indicates this. The Loopback Test changes the state of the lines and looks for the corresponding state change. If it successfully recognizes all of these changes, the port passes.

A failure on this test is not necessarily critical as it will depend on what is connected and how many signal lines are in use. For example, if you are using RS-232 in 3-wire mode (Transmit, Receive and Ground) a failure will cause no discernible issue since the other signals are not being used. If the port is configured for use as either RS-422 or RS-485 this test will fail and is expected to fail since RS-422 and RS-485 do not have the modem control signals that are present in RS-232 for which this test is designed.

The following procedures require a loopback plug to be placed on the port or ports that you want to test. A loopback plug was shipped with your DeviceMaster. If you need to build a replacement or additional loopback plugs, refer to the *DeviceMaster Installation and Configuration Guide* (Page 7), if you need to build loopback plugs.

Opening Ports The following procedure shows how to use **Test Terminal** to send and receive test data to the serial ports. If necessary, install PortVision DX (Page 10).

1. Stop all applications that may be accessing the ports such as RRAS or any faxing, or production software. See the appropriate help systems or manuals for instructions on stopping these services or applications.

If another application is controlling the port, then **Test Terminal** will be unable to open the port and an error message will be shown.

2. Open PortVision DX using the desktop shortcut.

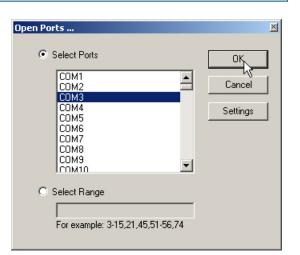
✓ PortVision DX												
ile Manage View To	ools Help											
Scan Refresh All	Refresh All Scan Network Check for Updat	tes	Jpload		Q Webpage	 ✓ Notes 	🦦 Help	() About	exit			
	Log File	•	st Floor (ES952									
	Applications			tomize								
PORTVI	Applications		Cus	atomize								
	Options		Tes	t Termina	l (WCom2)							
			Por	t Monitor	(PMon2)	15						
			Hv	perTermin	al							
			Driv	err								
lame : First Floor	~					_						
				ES8510								
				ES8510-)								
		1	🗸 IO-Lii	nk Master	#1							
			V Mode	ous/TCP								
		🌇	Y PRO -	17:FF:FB								
	÷		V RTS 2	E - 29:FF:	F5							
Use menu or toolbar to add	notes in 🔺		V RTS4	- 07:FF:FC								
this area.			SH8									
			 UP1:5 	-30VDC								
	~	-		r [28 / 29]								
		 Device Na 	ime		Model		IP Address	MA	AC Address	Software Version	Status	
		🛢 🗸 🛛 ES9528	3		ES9528		192.168.11.1	.05 00:0	0:4E:33:00:01	v1.4_beta4 (b1.1.0.3) ON-LINE	
		IO-Lin	k Master i	#1	IO-Link Mas	ster EIP-4	192.168.11.1	.99 00:0	0:4E:39:FF:F6	EtherNet/IP 0.8.3	ON-LINE	
	E 1	📕 🖌 🛛 Modbu	us/TCP		UP-1P (5V)		192.168.11.5	i3 00:0	0:4E:15:04:7A	Modbus/TCP 5.07	ON-LINE	
		🛸 🛩 🕑 PRO - :	17:FF:FB		PRO-8P (DE	9)	192.168.11.2	00:00	0:4E:17:FF:FB	NS-Link 8.03	ON-LINE	
	- 1	📕 🖌 🛛 RTS4 -	07:FF:FC		RTS-4P (DB	9)	192.168.11.2	3 00:0	0:4E:07:FF:FC	NS-Link 9.11	ON-LINE	
		📕 🖌 🚽 RTS_2F	E - 29:FF:F	5	RTS-2P (2E)		192.168.11.5	2 00:0	0:4E:29:FF:F5	SocketServer 9.11	ON-LINE	
		🛸 🖌 🖌 SH8			SH-8P (DB9)	192.168.11.1	4 00:0	0:4E:1C:FF:FD	NS-Link 9.11	ON-LINE	
		-	201/00/0		UP-1P (5-30	10	192.168.11.5	5 00.0	0.4E-21-05-CD	Modbus Server 4.04	ON-LINE	
		UP1:5-	JUVDC								UN-LINE	
	- 1	■ ✓ UP1:5-	SUVDC		01-11 (0-00	••)	192.100.111.5	.5 00.0	.0.40.21.05.00	Woubus Server 4.04	UN-LINE	

3. Start Test Terminal (WCom2) by clicking Tools > Applications > Test Terminal (WCom2).

- 4. Select File > Open Port, the appropriate port (or ports) from the *Open Ports* drop-down list and **Ok**.
 - Note: If you left Port Monitor open from the previous subsection, you should show that the port is open.

Go to the next procedure to send and receive test data. Use the appropriate procedure:

- <u>Sending and Receiving Test</u> <u>Data (RS-232/422 and RS-485: 4-Wire)</u> on Page 80
- <u>Sending and Receiving Data</u> (<u>RS-485: 2-Wire</u>) on Page 82



Sending and Receiving Test Data (RS-232/422 and RS-485: 4-Wire) You can use this procedure to send and receive test data through the RS-232/422/485 (4-wire, full-duplex) port or ports that you want to test.

- 1. If you have not done so, perform <u>Steps 1</u> through <u>3</u> on Page 79.
- 2. Install the loopback plug onto the port (or ports) that you want to test.

See the *DeviceMaster Installation and Configuration Guide* that you can download on Page 7, if you need to build loopback plugs.

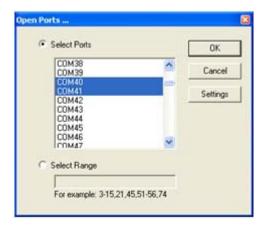
3. Select Port > Send and Receive Test Data.

	You should see the alphabet scrolling across the port. If so, then the port installed properly and is operational.								
	 Note: If you left Port Monitor running, it should show data sent and received and show the average data throughput on the port. ABCDEFGHIJKLMNOPQRSTUVW ABCDEFGHIJKLMNOPQRSTUVWXY ABCDEFGHIJKLMNOPQRSTUVWXY ABCDEFGHIJKLMNOPQRSTUVWXY ABCDEFGHIJKLMNOPQRSTUVWXY ABCDEFGHIJKLMNOPQRSTUVWX ABCDEFGH ABCDEFGH ABCDEFGH ABCDEFGH 								
	the scrolling data.								
	5. You can go to the next procedure to run the <i>Loopback Test</i> on Page 81 if this is an RS-232 port.								
	If this test successfully completed, then the port is operational as expected.								
	Note: Do NOT forget to restart the communications application.								
Loopback Test (RS- 232)	The Loopback Test tests the modem control (hardware handshaking) signals. It only has meaning in RS-232 mode on serial connector interfaces with full RS-232 signals. If performed under the following conditions, the test will always fail because full modem control signals are not present:								
	• RS-422								
	• RS-485								
	RJ11 connectors								
	Use the following steps to run the Loopback Test.								
	1. If necessary, start Test Terminal (Page 79, <u>Steps 1</u> through <u>3</u>).								
	2. Click Port > Loopback Test.								
	This is a pass fail test and will take a second or two to complete. Repeat for each port that needs testing.								

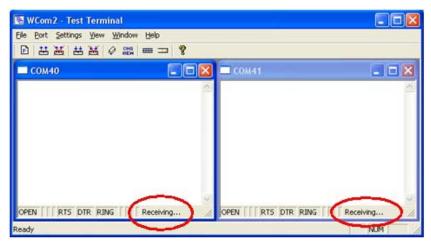
If the Loopback Test and the Send and Receive Test Data tests successfully complete, then the port is operational as expected.

Sending and Receiving Data (RS-485: 2-Wire) This procedure shows how to use Test Terminal (WCom2) to test two RS-485 (2-wire, half-duplex) ports.

- 1. Start Test Terminal.
- 2. Open two ports RS-485 ports. This example uses COM40 and COM41.



Test Terminal will open two windows, note that both ports show ${\it Receiving}$ on the status bar.



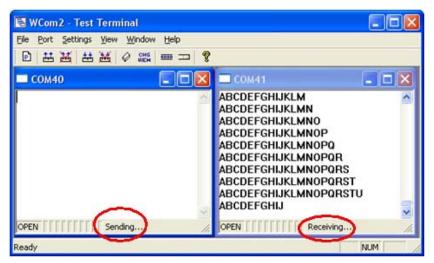
3. Right-click both COM windows and remove the check mark for Receive.

WCom2 - Test 1	Ferminal		
File Port Settings	View Window Help		
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СОМ40		🛛 🗖 СОМ41 📃	
	Toolbar ✔ Status Bar		~
	Loopback Open / Close		
	✓ RTS ✓ DTR		
	Send Receive	Disable <i>Receive</i> .	3
OPEN RTS DTF		OPEN TRING Ready	14
Ready	Change View Port Settings	NUM	

🛾 WCom2 - Test Termin	State of the second state		
jile Port Settings Yew			
COM40		🛛 🗖 СОМ41	2
		a .	
	0	-	0
OPEN RTS DTR RING	Ready	OPEN RTS DTR R	ING [[Ready
sady			NUM

Both COM ports show *Ready* on the status bar.

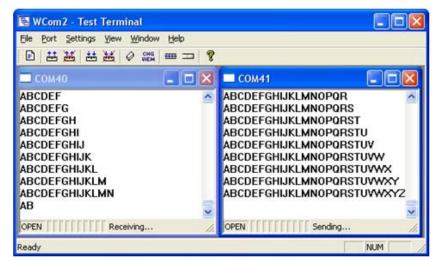
- 4. Right-click in ONE window and select the Receive option from the pop up.
- 5. Right-click the OPPOSITE window and click Send.



The Status line shows Sending or Receiving.

In this case, COM40 is sending data and COM41 is receiving the data which is visually confirmed by the data scrolling across the COM41 window.

- *Note:* If you do not see the data being received it MAY be necessary to also disable the RTS and DTR options from the right-click pop-up menu in each COM port.
- 6. Right-click and remove the check mark on the Sending COM port.



7. Right-click and remove the check mark on the *Receiving* COM port.

Neither COM port is sending or receiving data but shows *Ready* on the *Status* bar.

8. Reverse the sending/receiving windows one at a time. Set the **Receive** option first, then in the opposite window, select the **Send** option.

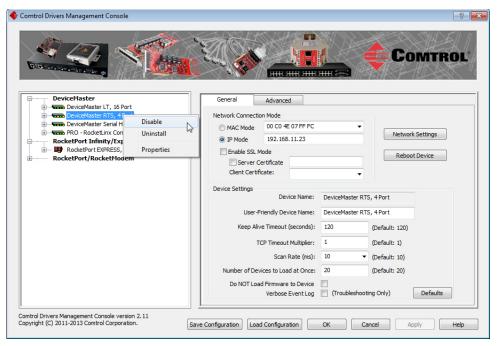
The Status line shows Sending or Receiving in the reverse windows.

Data is now scrolling in the COM40 window. COM41 is static as it is not receiving data but transmitting data.

How Disable/Enable the Device Driver

Use this procedure to disable or enable the driver for a specific DeviceMaster.

- 1. Right-click the DeviceMaster that you want to disable (or re-enable).
- 2. Click Disable (or Enable).



Technical Support

If you need technical support, contact Comtrol using one of the following methods.

Contact Method	Corporate Headquarters
Downloads	http://www.comtrol.com/Support
Web site	<u>http://www.comtrol.com</u>
Phone	763.957.6000 CST: 8AM-6PM (Monday through Friday, excluding major US holidays)

Appendix A. Configuring Non-Plug and Play Devices

After installing the hardware and driver for Windows operating systems, you can use this discussion to configure non-plug and play COM ports.

Installing Non-Plug and Play Devices

	Use the following procedure to install non-plug and play devices.
	1. If you have not so yet, connect the device to a DeviceMaster port and turn on the device.
	2. Open the Control Panel.
	3. Go to the appropriate subsection to install non-plug and play modems or printers:
	• <u>Installing Modems</u> on Page 87
	• <u>Installing Printers</u> on Page 88
Installing Modems	Use the following procedure to install non-plug and play modems.
	1. If you have not done so yet, connect the modem (or modems) to the desired DeviceMaster port (or ports) and turn on the modem (or modems).
	Note: This may take a few minutes, depending upon your system and the number of modems you are installing.
	2. Open the Control Panel and click the Phone and Modem Options icon.
	3. Click the Modems tab.
	4. Click Add.
	5. Click Don't detect my modem. I will select it from a list and then click Next.
	6. Click an appropriate modem model and then click Next.
	Note: If you have a driver from the modem manufacturer, click Have Disk and browse to the location of the driver. If your modem is not listed, go to the modem manufacturer's web site and download the appropriate driver.
	7. Highlight the port or ports on to which you have connected modems.
	8. Click Finish to complete the modem installation.
	9. Configure modem properties as necessary. For assistance, use the Windows help system.
	To use this modem or modems with RRAS, you can refer to the Comtrol <u><i>RRAS</i></u> <u><i>Configuration Overview for Windows XP</i></u> document.

Installing Printers Use the following procedure to install a non-plug and play printer.

- **Note:** If you want to install a plug and play printer, connect the printer to the appropriate serial port and the driver should automatically install. If it does not automatically install, use the following procedure as a guide with the printer manufacturers documentation.
- 1. Open the *Control Panel* and click the **Printers and Faxes** icon.
- 2. Click Next when this screen appears.
- 3. Click the Local printer attached to this computer item.
- 4. Click the COM port that corresponds to the port to which the printer is connected.
- 5. Click the Manufacturer, Printer type, and then click Next.
 - **Note:** If you have a driver from the printer manufacturer, click **Have Disk** and browse to the location of the driver. If your printer is not listed, go to the printer manufacturer's web site and download the appropriate driver.
- 6. Optionally, enter a printer name and then click Next.
- 7. Click Yes if you want to print a test page.
- 8. Click Finish to complete the installation.
- 9. Close the Printer and Faxes Control Panel.