

NS-Link

Device Driver User Guide

Windows 10 Windows Server 2016 Windows 8/8.1 Windows Server 2012R2 Windows 7



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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 29 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 User Guide for Windows for adapter specific information.

You can refer to <u>Using the Comtrol Drivers Management Console</u> on Page 31 for general information about the Comtrol Drivers Management Console.

Supported Operating Systems

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

- Windows 10, Windows 8.1, Windows 8, and Windows 7
- Windows Server 2016 and Windows Server 2012R2

Note: You can refer to <u>downloads.comtrol.com</u> for older operating system support.

Products Supported

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

- DeviceMaster LT
- DeviceMaster DM-models, DeviceMaster PRO, DeviceMaster RTS, and DeviceMaster Serial Hub
- RocketPort EXPRESS
- RocketPort EXPRESS SMPTE
- RocketPort INFINITY

Conventions

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

- **Comtrol device** unless there is model-specific information
- **DeviceMaster** means all DeviceMaster models listed in the previous subsection, unless there is model specific information
- **RocketPort** means any RocketPort model
- **RocketPort EXPRESS/INFINITY** means RocketPort EXPRESS, RocketPort EXPRESS SMPTE, and RocketPort INFINITY

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

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 DM-models, DeviceMaster PRO, DeviceMaster RTS, and DeviceMaster Serial Hub
 - DeviceMaster UP
- IO-Link Master
- RocketLinx

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

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.

-

Downloading the Latest Software and User Guides

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

	Software	ware Description Document	
Configuration Application	PortVision DX	Install on a Windows host to program the IP address and manage your DeviceMaster. Refer to on Page 7 for more information.	DeviceMaster Installation and Configuration Guide
	Bootloader	Bootloader is the operating system that runs on the DeviceMaster hardware during the power on phase, which then loads NS-Link/ SocketServer.	
/are		Update the Bootloader on your DeviceMaster, if advised by Technical Support.	
Firmw	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.	
	2	Note: Make sure you upload the latest version of SocketServer before configuring the device driver.	
Device Driver	Windows 7/8/8.1 Windows Server 2016	Install if you want COM ports (native or secure).	(This Guide)

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:

- <u>Initial Installation Overview</u> on Page 9
- Install the Hardware on Page 9
- Install PortVision DX on Page 10
- <u>Program the IPv4 Address (Network Information)</u> on Page 11
- <u>Program the IPv6 Address (Network Information)</u> on Page 13
- <u>Check the SocketServer Version</u> on Page 14
- <u>Uploading SocketServer</u> on Page 15

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 17.

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 14).
- 5. If necessary, <u>upload</u> the latest version of SocketServer (Page 15).

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 68 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 70 to determine the LED status.

Install PortVision DX

Use the following procedure to install PortVision DX.

- 1. Download PortVision DX from <u>http://downloads.comtrol.com/dev_mstr/</u> 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.

 Scan Network

 Select any number of device types from the list below and click Scan to start scanning the network.

 If
 DeviceMaster 500 / AIR / LT / PRO / RTS / Serial Hub / UP

 If
 IO-Link Master

 If
 RocketLinx (Managed Only)

 Note: If you want to abort the process, click Cancel.
 Scan Cancel

You can save time if you only scan for

DeviceMasters.

IPV PortVision DX				
File Manage View Tools Help				
Scan Refresh All Properties Save	Load Upload Reboot Webp	age Notes Help A	b out Exit	
IPORTVISION®	First Floor (9 / 9) Image: Floor (9 / 9)	The contents o (below). See the PortVi your devices a 41 M Ports [0 / 1]	of this folder are displayed in t sion DX help system for proce nd customizing your view or vi <i>Device Tree Pane</i>	the <i>Device List</i> pane
	SH8 Console Port COM	1 Ports		-
A	Device Name	Model IP Address	MAC Address A Software Version	Status
E	EtherNet/P System Modbus/TCP Modbus/Router System SH8 Console Port COM Ports EPR08 Console Port COM Ports LTI6 #2 RTS4 Spare COM Ports RTS4 Spare COM Ports ES9528-XT	UP-1P (5-30V) 192.168.11.55 UP-4P (DS) 192.168.11.54 UP-4P (DB) 192.168.11.54 SH-8P (DB) 192.168.11.20 DM-1T16 192.168.11.20 DM-1T16 192.168.11.23 RTS-4P (DB) 192.168.11.22 RTS-4P (2B) 192.168.11.22 ES928-XT 192.168.11.52	00:C04E3205:CD EtherNet/IP 4.10 00:C04E125047A EtherNet/IP 4.10 00:C04E074384 Modbus Router 5.10 00:C04E074384 Modbus Router 5.10 00:C04E12:FF:FD NS-Link 9.18 00:C04E12:FF:FD NS-Link 9.13 00:C04E12:FF:FD SocketServer 9.18 00:C04E329:FF:F5 SocketServer 9.18 00:C04E360:002 v1.4 (b1.1.0.4)	ON-LINE ON-LINE ON-LINE ON-LINE ON-LINE ON-LINE ON-LINE ON-LINE ON-LINE
For Help, prore F1	1	Device Li	ST Pane	First Floor 0 0 Poody
For Help, press F1				First Floor 9 0 Ready //

Program the IPv4 Address (Network Information)

If you have not done so, program the IPv4 address for your network. The following procedure is to program a single DeviceMaster, if you want to program IPv4 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 > Comtrol > 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**.
 - *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 :	
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 <u>Check the SocketServer Version</u> on Page 14 to verify that you have the latest SocketServer version.

Program the IPv6 Address (Network Information)

You must use NS-Link/SocketServer (DeviceMaster web page) to program an IPv6 address. You can refer to <u>www.ipv6.com</u> for information about IPv6.

Default Network Settings IPv4 address: 192.168.250.250

IPv4 Subnet mask: 255.255.0.0

IPv4 Gateway address: 192.168.250.1

You may want to use PortVision DX to program an IPv4 address so that you can open the DeviceMaster web page without changing your system IP settings to communicate with DeviceMaster.

Use the following procedure to program an IPv6 address.

- 1. Open your browser and enter the DeviceMaster's IP address.
- 2. Click the Network tab.
- 3. Optionally, configure a Host Name or change any of the General options.
- 4. Under IPv6, either select Use DHCPv6 or User static config below option.
- 5. If you selected a static address, enter the IPv6 address, Prefix Length, and if necessary, the Gateway.
- 6. Click the **Save** button.

← (⇒) ♦ http://10.0.0.52/network-config.asp	P → C ♦ DeviceMaster	- □ × * 命☆戀 ⁽¹⁾
COMTROL' Home Port Network	Diagnostics System Help	DeviceMaster 2-port Logout
Configuration Password Security K	eys/Certs Email RFC1006	
Network Configuration		
General Host Name: Rx Polling: 50 ms TCP Keepalive: 60 s Boot Timeout: 15 s	IPv4 O Use DHCP Disable IPv4 networking Use static config below: Address: 10.0.0.52 Subnet Mask: 255.255.0.0 Gateway:	IPv6 Use DHCPv6 Disable IPv6 networking Use static config below: Address: ff22::29:ff:f5 Prefix Length: 64 Gateway: ::
		© Copyright Comtrol Corp

Note: You must reboot for changes on this page to take affect.

- 7. Click the System tab and then click the Reboot option.
- 8. Optionally, click the **Reboot Now** button or let the web page reboot using the timer.
- 9. Go to <u>Check the SocketServer Version</u> on Page 14 to verify that you have the latest 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 > Comtrol > PortVision DX.

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

IPV PortVision DX								
File Manage View Tools Help								
Scan Refresh All Properties Save	Load	Upload Reboot	Webpage Note	s Help A	🚹 🚅			
IPORTVISION®		First Floor 9 / 9 ● ES9528-XT [14] ● ●	/11] 0 / 1] cr cr cr cr cr cr cr cr					E
Use menu or toolbar to add notes in this area.		Chink I C	Master #1 r System Port COM Ports [0 / 1 M Ports ort COM Ports	1				•
E	Device Nam	ie 1528-XT 52-Port 6.6 #2 8 Console Port COM Ports 98 Spare COM Ports 08 Console Port COM idbus Router System idbus/TCP	Model ES9528-XT RT5-2P (2) DM-LT16 orts SH-8P (DB8 RTS-4P (DB POrts PRO-8P (DD UP-4P (DB9 UP-1P (5-3) UP-1P (5V)	IP Address 192.168.11.05 192.168.11.52 192.168.11.61 192.168.11.61 192.168.11.23 99 192.168.11.23 99 192.168.11.54 192.168.11.55 192.168.11.53	MAC Address 00:C0:4E:36:00:02 00:C0:4E:29:FF:F0 00:C0:4E:40:FF:F0 00:C0:4E:12:FF:F0 00:C0:4E:12:FF:F0 00:C0:4E:12:FF:F0 00:C0:4E:12:43:84 00:C0:4E:21:05:CD 00:C0:4E:15:04:7A	▼ Software Version v1.4 (b1.1.0.4) SocketServer 9.18 NS-Link 9.23.1 NS-Link 9.28 NS-Link 9.18 NS-Link 9.18 NS-Link 9.18 Modbus Router 5.10 EtherNet/IP 4.10 EtherNet/IP 4.10	Status ON-LINE ON-LINE (TCP) ON-LINE ON-LINE	
For Help, press F1							First Floor 9 0 Rea	idy //

- 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.

Downloads subdirectory: <u>http://downloads.comtrol.com/dev_mstr/rts/software/</u>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

This images shows the ftp path, which is the same as the downloads site.

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 17.

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 > Comtrol > 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 <u>Steps 2</u> through 5.

Upload Fi	mware	83
<u>^</u>	IMPORTANT NOTES : - This is a very sensitive process and shouldn't be interrupted at all. - Any access to this application will be blocked during the process. - It is highly recommended that you save the configuration of your device(s) before uploading new firmware. (Refer to PVDX help file for instructions) Do you want to upload firmware to the selected Device(s) now?	
	Ves No	

NS-Link Device Driver Installation

This section discusses the following topics:

- Overview of the driver installation procedures
- Installation Setup Wizard on Page 17 for initial installation procedures
- <u>Checking the Device Driver Version</u> on Page 22
- <u>Updating the Driver</u> on Page 23
- <u>Adding a DeviceMaster (Existing Installation)</u> on Page 27

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 23 if you want to update the existing driver.
- <u>Adding a DeviceMaster (Existing Installation)</u> on Page 27 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 <u>latest driver assembly</u> (.exe) for your product and copy it to a location that is available to the host.

Note: Administrative privileges are required to install device drivers on Windows operating systems.

2. Close any applications that are using serial ports before the device driver installation.

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.

3. Start the installation by executing the .exe file for your device.

Driver assembly file names include the driver version number. For example, **DeviceMaster_Windows_***x***.***xx***.***exe*, where *x***.***xx* is the driver assembly version.

4. If necessary, click the Yes button to the *Do you want to allow this app to make changes to your device* message.



5. Read the *Caution* and then click Next.

🛃 DeviceMaster Driver Installation Setup	>
Read me file Please read the following text carefully	ŧ
CAUT	<u>10N</u>
In order to provide additional function recovery and initialization, the Device longer be compatible with any version older than version 8.00.	onality and improve device eMaster Windows driver will no on of the SocketServer firmware
Please use PortVision DX to verify	that your device is using a newer 🗸
, Advanced Installer	< Back Next > Cancel

6. Click Next to start the installation.



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

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

8. Click Install.



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



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

10. Click Next to install the driver.



11. Click Install and Next.



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

Comtrol Driver Installation v	vizard		>	
	Install a New Comtrol Dev	ice		
	You are about to install a new Comtrol Device Driver on this computer.			
	As part of this process all previous installations of undated as well.	this driver will	be	
DIS	Please select the DeviceMaster models you want to identify their quantities as well.	o install and		
1000	DeviceMaster Model	Quantity		
and the second	DeviceMaster RTS, 1 Port, DB9, 1E, DIN rail	None		
	DeviceMaster RTS 2 Port, IE, DIN rail	None		
	SeviceMaster RTS, 2 Port, 2E, DIN rail	1		
	DouisoMaster DTC 2 Dert DR0 2E DTN rail	Nono	~	
COMTROL	Click Next to continue or Cancel to exit this Wizard	l.		
	< Back Next > Procee	d Car	ncel	

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

Device Quantity ?	×
How many units of this DeviceMaster model you would like to install ?	1
ОК	Cancel

14. Repeat Steps <u>12</u> and and 13 for each DeviceMaster that you want to install and click Next

15. Click Proceed.

< Comtrol Driver Installatio	n wizard
	Summary
	Driver Package : DeviceMaster Selected Action : Install Device(s) : 1 DeviceMaster Unit(s)
	IT IS HIGHLY RECOMMENDED TO CLOSE ANY ACTIVE SERIAL PORT/APPLICATION BEFORE YOU PROCEED. FAILURE TO DO SO WILL RESULT IN DATA LOSS !
	Launch Comtrol Drivers Management Console
COMTROL	Click Proceed to continue or Cancel to exit this Wizard.
	< Back Next > Project Cancel

16. Click the Launch Comtrol Drivers Management Console button.

Comtrol Driver Installation v	vizard	×
	Summary *** IMPORTANT MESSAGE : Please wait a few moments for the background installation of the Serial Ports to finish. You can then use Comfour the device driver you have just installed. Finalizing Finalizing Launch Comtrol Drivers Management Console Press Close to exit this Wizard.	^
	< Back Next > Proceed Close	

17. Return to the Installation wizard and click Close to exit the wizard.

Comtrol Driver Installation with the second seco	zard	×
	Summary **** IMPORTANT MESSAGE : Please wait a few moments for the background installation of the Serial Ports to finish. You can then use Comtrol Drivers Management Console to configure the device driver you have just installed. ************************************	^ ~
Comtrol	Press Close to exit this Wizard.	

18. Go to <u>NS-Link Device Driver Configuration</u> on Page 29 to start NS-Link device driver configuration.

The device driver installation is not complete until you have <u>associated the</u> <u>MAC address to the DeviceMaster</u>.

- 19. After associating the MAC address, go to <u>*Configuring Device Settings*</u> on Page 42 to set up device properties (device name and starting COM port number).
- 20. Go to <u>Configuring COM Port Properties</u> on Page 45 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

You can check the driver version using the following procedure.

- 1. In the Comtrol Drivers Management Console, right-click the Comtrol device and click Properties.
- 2. If necessary, click the Driver tab to view the NS-Link device driver version.

RocketPor	t EXPRESS, Oct	a, DB9/DB	25, PC	le Prope	rties			\times
0	D : C :	Driver						
General	Device Setup	Diver	etails	Events				
	RocketPort EX	(PRESS, O	cta, DI	B9/DB25	, PCle			
	Driver Provide	r: Comtr	ol Corp	oration				
	Driver Date:	3/17/	2016					
	Driver Version:	5.6.0.	0					
	Digital Signer:	Micro: Publis	soft Wi her	indows Hi	ardware C	ompatibility		
Dri	ver Details	To view	details	about the	e driver file	es.		
Upd	ate Driver	To updat	te the	driver soft	ware for t	nis device.		
Roll E	Back Driver	If the der back to t	vice fai he pre	ils after up viously in	odating th stalled driv	e driver, roll ver.		
	Disable	Disables	the se	lected de	vice.			
	Jninstall	To unins	tall the	driver (A	dvanced).			
						<u>ck</u>	Cance	ł

Note: Please note that Microsoft truncates leading zeros in the versions number. The above driver version is 5.06.

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 22.

- 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 the Yes button to the *Do you want to allow this app to make changes to your device* message.
- 5. Click Next to start the Installation Setup Wizard.



6. Read the Caution and click Next.

🛃 DeviceMaster Driver Installation Setup	×
Read me file Please read the following text carefully	ŧ
CAUTION	^
In order to provide additional functionality and improve device	
longer be compatible with any version of the SocketServer firmwa	re
older than version 8.00.	
Please use PortVision DX to verify that your device is using a new	er 🗸
Advanced Installer	
< Back Next	Cancel

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

🛃 DeviceMaster Driver Installation Setup	-		Х
Select Installation Folder			
This is the folder where DeviceMaster Driver Installation will be installed	d.		-
To install in this folder, click "Next". To install to a different folder, ente "Browse".	r it be	low or clic	k
<u>F</u> older:			
C:\Program Files (x86)\Comtrol\DeviceMaster\		Browse	•
Idvanced Installer	_		
< Back Next >		Can	rel

8. 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 Can	cel

9. Leave the Launch DeviceMasterDriver Installation box checked and click Finish.



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



11. Click Update and Next.

Comtrol Driver Installation	wizard X
	Install, Update, or Uninstall driver
	Select the operation you wish to perform: C Install Select this option to install a new device and update the associated driver(s).
	 Update Select this option to update the driver(s) for the existing device(s).
Comtrol'	\bar{C} Remove All Select this option to remove the existing device(s) and uninstall all the associated driver(s).
	< Back Next > Proceed Cancel

12. Click **Next** to update the driver.

< Comtrol Driver Installation w	vizard X
	Update Existing Driver(s)
	You have chosen to replace your existing driver(s) with the driver included in this package. This update will impact all Comtrol hardware, from the following product family, that reside on this PC and use any version of this driver assembly. Product Family: DeviceMaster
COMTROL'	Click Next to continue or Cancel to exit this Wizard.

13. Click Proceed.

Comtrol Driver Installation	wizard	L×
	Summary Driver Package : DeviceMaster Selected Action : Update Device(s) : All DeviceMaster Units TT IS HIGHLY RECOMMENDED TO CLOSE ANY ACTIVE SERIAL PORT/APPLICATION BEFORE YOU PROCEED.	>
	FAILURE TO DO SO WILL RESULT IN DATA LOSS !	<
Comtrol'	Click Proceed to continue or Cancel to exit this Wizard.	
	< Back Next > Proceed Cancel	

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

Comtrol Driver Installation v	vizard	×
	Summary	
	*** IMPORTANT MESSAGE : At the end of this process you need to REBOOT this computer. Finalizing Finalizing	^
	REMINDER: < SYSTEM REBOOT IS REQUIRED >	~
2	Launch Comtrol Drivers Management Console	
	Reboot My Computer	-
COMTROL	Press Close to exit this Wizard.	
	< Back Next > Proceed Close	

16. If necessary, go to <u>Configuring COM Port Properties</u> on Page 45 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 Comtrol> DeviceMaster Driver Installation Wizard.
- 4. Click the Yes button to the *Do you want to allow this app to make changes to your device* message.
- 5. Click Next to start the Comtrol Driver Installation Wizard.



6. Click Install and Next.





7. Click Next and follow the *Installation Wizard*. Refer to Step 12 on Page 20, for the remainder of the installation steps if needed.

NS-Link Device Driver Configuration

If you programmed an IPv4 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 IPv4 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 31
- <u>Associating the MAC Address</u> on Page 36
- <u>Using the Driver in IPv4 Mode</u> on Page 38
- <u>Using the Driver in IPv6 Mode</u> on Page 40
- <u>Enabling SSL</u> on Page 41
- <u>Configuring Device Settings</u> on Page 42
- <u>Configuring COM Port Properties</u> on Page 45
- <u>Network Configuration in Comtrol Drivers Management Console</u> on Page 50
 - Disabling IPv4 Mode on Page 50
 - <u>Changing a Static IPv4 Address</u> on Page 51
 - <u>Setting Up DHCP (IPv4)</u> on Page 52
- <u>Configuring DeviceMaster Ports as Sockets</u> on Page 54
- <u>Enabling Secure Data Mode</u> on Page 55

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 IPv4 address for the DeviceMaster is 192.168.250.250.
	The IPv4 and IPv6 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 29 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 31
- <u>Collapsing the View</u> on Page 32
- <u>How to Configure Device Properties</u> on Page 32
- <u>Customizing the Device Name</u> on Page 33
- <u>Customizing the COM Port Name</u> on Page 33
- <u>How to Configure COM Port Properties</u> on Page 34
- <u>How to Save Changes</u> on Page 35

Comtrol Drivers Management Console

See <u>Associating the MAC Address</u> on Page 36 to start Device Master 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 > Comtrol > DeviceMaster Driver Management Console.

Displaying All Installed Devices

Accessing the

Management

Console

Comtrol Drivers

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

control privers management console		
		Comtrol
DeviceMaster Image: Sepsize and the	In order to view / modify the configuration of any Comt to first select it from the tree on the left.	rol Device or Serial Port (COM Port), you need
Comtrol Drivers Management Console version 4.05 Copyright © Comtrol Corporation. All rights reserved.	Save Configuration Load Configuration OK	Cancel Apply Help

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		?	×
	Сомт	ROL	1 H
DeviceHaster Tom 10.0.0.14 5H8 Tom 10.0.0.20 PR0 Tom 10.0.0.23 PR0 DWRTS IP Panel DWRTS DRESS, Octo, DB9/D825, PCLe	In order to view / modify the configuration of any Comtrol Device or Senal Port (COM Port), to first select it from the tree on the left.	you need	
Comtrol Drivers Management Console version 4.05 Copyright © Comtrol Corporation. All rights reserved.	Save Configuration Load Configuration OK Cancel Apply	Help	

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* prompts you to **Apply, Ignore**, or **Cancel** the changes.

For more information, see <u>Configuring Device Settings</u> on Page 42.

		ITRO
DeviceHaster Es9528/TV 2 (COM112) Dead Port (COM500) ES7510/COM107) ES7510/COM107) ES5510/T (COM107) ES5510/T (COM107) ES5510/T (COM107) ES5510/T (COM107) ES5510/T (COM107) ES5510/T (COM107) ES510/T (COM107) ES510/T (COM107) ES510/T (COM107) ES510/T (COM108) Port 08 (COM7) ES510/T (COM106) Port 08 (COM7) ES510/T (COM106) Port 01 (Not Configured) RocketPort EXPRESS, Octa, DB9/DB25, PCIe	General Advanced Network Connection Mode OR Confection Mode MAC Mode 00 C0 4E 1C FF FD Image: State of the state	ess Igs I
rol Drivers Management Console version 4.05		efaults

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.

DeviceMaster 10.0.0.14_SH8 Sep528-XT V2 (COM112) Dead Port (COM500) ES7510-XT #1 (COM107) ES7528 (COM101) ES7528 (COM101) ES7528-XT (COM105) ES8510-XTE (COM106) Port 08 (COM7) I0.0.0.2_PRO I0.0.0.2_PRO Port 01 (Not Configured) RocketPort Infinity/Express RocketPort EXPRESS, Octa, DB9/DB25, PCIe	General Advanced Network Connection Mode O C0 4E 1C FF FD MAC Mode 00 C0 4E 1C FF FD IPv6 Mode 10.0.0.14 IPv6 Mode FE80::2C0:4EFF:FE1C:FFFD Enable SSL Mode Reboot Device Device Settings Certificates Device Settings Device Name: Device Settings Device Name: Device Name: 10.0.0.14_SH-8 Keep Alive Timeout (seconds): 120 TCP Timeout Multiplier: 1 Scan Rate (ms): 10 Verbose Event Log (Troubleshooting Only)

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.



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 45.

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.



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*.

Comtrol Drivers Management Console					?
ACC STREET				Сомт	ROL
	General	Advanced			
Port 01 (COM6)	1201010120000				
ES8520-XT (COM116)	Network Connec	tion Mode			
ES8814-XT (COM117)	O MAC Mode	00 C0 4E 29 FF F5	~	Fetch IP Address	
DeviceMaster RTS, 2 Port, 2E, DIN rail	IPv4 Mode	10.0.0.52		Network Settings	
This frame indicates that changes have	O IPv6 Mode	FE80::2C0:4EFF:FE2	9:FFF5	nethone becango	
heen made but not vet annlied		Mada		Reboot Device	
		Hode		Certificates	
ES9528-XT_v2 #2 (COM212)	Device Cotting			Ceruicates	
Port 03 (COM10)	Device Settings	Device Name:	DeviceMaster RTS, 2	Port. 2E. DIN	
Port 04 (COM11)			beneen abate reroy a		
ROCKETPORT Infinity/Express	User	-Friendly Device Name:	DeviceMaster RTS, 2	Port, 2E, DIN	
Port 01 (COM300)	Keep A	live Timeout (seconds):	120 (0	efault: 120)	
Port 02 (COM301)					
Port 03 (COM302)		TCP Timeout Multiplier:	1 (C)efault: 1)	
Port 04 (COM303)		Scan Rate (ms):	10 ~ (D	efault: 10)	
Port 05 (COM304)		Verbose Event Log	(Troubleshooting	Only)	
Port 07 (COM306)					
Port 08 (COM307)				Default	
				Derault	,
Combal Drivers Management Consults warring 4.05					
Copyright © Comtrol Corporation. All rights reserved.	Configuration	ad Configuration	OK Cance		Help
			Curre	- 12 - 12 - 12 - 12 - 12 - 12 - 12 - 12	

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 37

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** > **Comtrol** > **DeviceMaster Driver 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 IPv4 address using PortVision DX, the IPv4 address displays in the ${\bf IPv4}$ 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 the appropriate discussion:
 - <u>Using the Driver in IPv4 Mode</u> on Page 38
 - <u>Using the Driver in IPv6 Mode</u> on Page 40
 - Enable SSL, see <u>Enabling SSL</u> on Page 41
 - Configure device properties, see <u>Configuring Device Settings</u> on Page 42.
 - Configure COM port properties, see <u>Configuring COM Port Properties</u> on Page 45.
 - Configure any of the DeviceMaster ports as sockets, see <u>Configuring</u> <u>DeviceMaster Ports as Sockets</u> on Page 54.

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.

		Сомт	ROL
DeviceMaster	^	General Advanced	
		Network Connection Mode	
ES7510-XT #1 (COM107)		O TPv4 Mode 10.0.0.52	
ES7510-XT (COM101)		O IPv6 Mode FE80::2C0:4EFF:FE29:FFF5	
ES9528-XT (COM105) ES8510-XTE (COM106)		Enable SSL Mode	
		Certificates	
Port 01 (COM3)		Device Settings Device Name: DeviceMaster RTS, 2 Port, 2E, DIN	
Port 03 - Spare port (COM4)		User-Friendly Device Name: DeviceMaster RTS, 2 Port, 2E, DIN	
S8510 (COM103)		Keep Alive Timeout (seconds): 120 (Default: 120)	
Open (COM98) NXP-1P (COM17)		TCP Timeout Multiplier: 1 (Default: 1)	
S8508F-MM (COM115)		Scan Rate (ms); 10 V (Default: 10)	
		Verbose Event Log (Troubleshooting Only)	
ES8520-XT (COM116)	~	Defaults	
C # E27610-X1 (COM118)	>		

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.
 - Configure the DeviceMaster to operate in IPv4 Mode using the next subsection.
 - Configure the DeviceMaster to operate in IPv6 mode using <u>Using the Driver</u> <u>in IPv6 Mode</u> on Page 40.
 - Configure a DHCP addressing, refer to <u>Network Configuration in Comtrol</u> <u>Drivers Management Console</u> on Page 50
 - Configure device properties, see <u>Configuring Device Settings</u> on Page 42.
 - Configure COM port properties, see <u>Configuring COM Port Properties</u> on Page 45.
 - Configure any of the DeviceMaster ports as sockets, see <u>Configuring</u> <u>DeviceMaster Ports as Sockets</u> on Page 54.

Using the Driver in IPv4 Mode

After associating the DeviceMaster with the MAC address you can set the DeviceMaster to run in IPv4 Mode.

- 1. First associate a MAC address (Page 36) 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 \mathbf{IP} Mode text box with the DeviceMaster IP address.

4. Click the IPv4 Mode radio button.

DeviceHaster Image: Device Haster Image: Dev	Control Drivers Management Console	Сомтро	
Image: Second	DeviceMaster Image: Double of the set of	General Advanced Network Connection Mode OB C0 4E 29 FF F5 Image: State of the state of	
	Port 02 (COM8) Port 01 (COM15) Port 01 (COM15) Port 01 (COM15) Port 03 (COM10) Port 04 (COM11) RocketPort Infinity/Express Port 04 (COM11) Port 04 (CO	Device Settings Device Name: DeviceMaster RTS, 2 Port, 2E, DIN User-Friendly Device Name: DeviceMaster RTS, 2 Port, 2E, DIN Keep Alive Timeout (seconds): 120 (Default: 120) TCP Timeout Multiplier: 1 (Default: 1) Scan Rate (ms): 10 (Default: 10) Verbose Event Log (Troubleshooting Only) Defaults	

- 5. If you do not have any other configuration changes, click **Apply**. If you have other configuration changes, refer to the appropriate subsection:
 - <u>Enabling SSL</u> on Page 41
 - <u>Configuring Device Settings</u> on Page 42

Using the Driver in IPv6 Mode

After associating the DeviceMaster with the MAC address you can configure the DeviceMaster to run in IPv6 Mode.

Note: You must first program the IPv6 address in the DeviceMaster. Refer to <u>Program the IPv6 Address (Network Information)</u> on Page 13 for IPv6 programming procedures.

You can refer to <u>www.ipv6.com</u> for information about IPv6.

- 1. First associate a MAC address (Page 36) to the DeviceMaster.
- 2. Highlight the DeviceMaster.
- 3. Click the IPv6 Mode radio button.
- 4. Enter the IPv6 address and the subnet mask prefix length.
 - After driver installation, the Comtrol Drivers Management Console may display the *link-local address* for the DeviceMaster in the **IPv6 Mode** field.

You can identify the link-local address by the prefix: **FE80**. The link-local address is a network address that is valid only for communications within the network segment or the broadcast domain to which the host is connected. Link-local addresses are usually not guaranteed to be unique beyond a single network segment. Routers do not forward packets with link-local addresses.

• The subnet mask prefix length is 1 - 128. The smallest recommended subnet is 64.

Comtrol Drivers Management Console	Сомт	? ×
DeviceMaster ID.0.0.14_SH-8 ID.0.0.23_RTS ID.0.0.20_RTS ID.0.0.20_RTS ID.0.0.20_RTS ID.0.0.21_RTS	General Advanced MAC Mode 00 C0 4E 29 FF F5 DPv4 Mode 10.0.0.52 PIv4 Mode 10.0.0.52 Performed Figure 10.0.0.52 64 Enable SSL Mode Certificates Device Settings Certificates	
Portol (COM15) Portol (COM15) Portol (COM15) Portol (COM16) Portol (COM10) Portol (Device Name: Device Name: DeviceMaster RTS, 2 Port, 2E, DIN User-Friendly Device Name: DeviceMaster RTS, 2 Port, 2E, DIN Keep Alive Timeout (seconds): 120 (Default: 120) TCP Timeout Multiplier: 1 (Default: 1) Scan Rate (ms): 10 (Default: 10) Verbose Event Log (Troubleshooting Only)	5
Comtrol Drivers Management Console version 4.05 Copyright © Comtrol Corporation. All rights reserved.	ve Configuration OK Cancel Apply	Help

- 5. If you do not have any other configuration changes, click **Apply**. If you have other configuration changes, refer to the appropriate subsection:
 - <u>Enabling SSL</u> on Page 41
 - <u>Configuring Device Settings</u> on Page 42

Enabling SSL

After associating the DeviceMaster with the MAC address and configuring it to run in IP Mode, you can configure SSL Mode.

1. Click Enable SSL Mode or go to <u>Step 4</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.

2. 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.

3. 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.

- 4. Click Apply or Ok to save the change and close the *Comtrol Drivers* Management Console
- 5. You may need to perform some of the following tasks to complete the configuration process.
 - Configure device properties, see <u>*Configuring Device Settings*</u> on Page 42.
 - Configure COM port properties, see <u>Configuring COM Port Properties</u> on Page 45.
 - Configure any of the DeviceMaster ports as sockets, see <u>Configuring</u> <u>DeviceMaster Ports as Sockets</u> on Page 54.
 - Enable Secure Data Mode in the NS-Link web page, see <u>Enabling Secure</u> <u>Data Mode</u> on Page 55.

Configuring Device Settings

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 31).
- 2. Highlight the *DeviceMaster* device name that you want to configure.

Breasterner, Maria	
DeviceMaster DeviceMaster DeviceMaster DeviceMaster DeviceMaster DeviceMaster DeviceMaster Port 01 (COM) DeviceMaster RTS, 2 Port, 2E, DIN rail Port 01 (COM) DeviceMaster RTS, 4 Port, DE9, 2E, DIN rail DeviceMaster RTS, 4 Port, DE9, 2E, DIN rail DeviceMaster RTS, 4 Port, 2E, 2 (COM212) Port 03 (COM10)	General Advanced Network Connection Mode MAC Mode MAC Mode 00 C0 45 SC 00 08 © IPv4 Mode 10.0.22 IPv6 Mode FE80::2C0:4EFF:FESC:8 Enable SSL Mode Reboot Device Device Settings Device Name: Device Settings Device Name: User-Friendly Device Name: DeviceMaster RTS, 4 Port, D89, 2E
RocketPort Infinity/Express	Keep Alive Timeout (seconds): 120 (Default: 120) TCP Timeout Multiplier: 1 (Default: 1) Scan Rate (ms): 10 V Verbose Event Log (Troubleshooting Only)

- 3. If desired, change the User-Friendly Device Name.
- 4. Optionally, set a different *Keep Alive Timeout* (Page 43) 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 44) 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 44).
- 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.
	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.
Keep Alive Timeout (seconds) Default = 120 seconds	• 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.

Device General Tab	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.
TCP Timeout Multiplier Default = 1ms	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.
Verbose Event Log	Selecting this option causes detailed messages to be sent to the
Default = Disabled	when debugging communications and configuration problems
Scan Rate (ms)] Default = 10ms	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.
	<i>Note:</i> The faster the scan rate (lower number), the higher the load on the system processor.
Save Configuration	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.
Load Configuration	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.
Ok	Click Ok to save the changes made on this page and close the <i>Comtrol Drivers Management Console</i> .
Cancel	Cancels any changes made on this page.
Apply	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.
Defaults	Resets this screen to its default values.

? X

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 Settings</u> on Page 42.

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 31).
- 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.

COMTROL Port 8 (COM97) ^ General 10.0.0.20_PRO Port 01 (COM3) ES8508 (COM108) Port 03 - Spare por Port 04 (COM5) 10.0.0.20 PRO Port Settings RS Mode: RTS Toggle Options Port 03 - Spare port (COM4) Port 04 (COM5) 232 Override and Lock Baud Rate to: 422 485 (2-wire) 485 (4-wire, Slave) 485 (4-wire, Master ES8510 (COM103) Open (COM98) Transmit Data Timeout on Port Close: Terminator Map 2 Stop Bits to 1 Resistor Options NXP-1P (COM17) ES8508F-MM (COM115) Wait on Physical Transmission before Completing Write Emulate Modem Hardware RING Signal 10.0.0.22
 Into.0.22

 Image: The second Allow Parity Conflict (DeviceMaster 1 Port only) Block Plug-N-Play Search for Attached Serial Device Defaults Clone 10.0.0.23 RTS JU.U. 23_KTS Port 01 (COM6) ES8520-XT (COM116) ES8814-XT (COM117) ES7810-XT (COM118) Apply These Settings to All Ports Port Name User-Friendly Port Name: Port 04 DeviceMaster RTS, 2 Port, 2E, DIN rail Port 01 (COM7) Port 02 (COM8) COM Name: COM11 \sim Renumber All Subsequent Ports Relative to This Port etPort Infinity/Express RP EXPRESS, Octa Comtrol Drivers Management Console version 4.05 Copyright © Comtrol Corporation. All rights reserved. Save Configuration Load Configuration OK Cancel Apply Help

🗲 Comtrol Drivers Management Console

- 5. If your model supports Terminator Resistor Options, and you select RS-422 or RS-485, you may want to configure **Terminator Resistor** options. If so, click the <u>Terminator Resistor Options</u> button.
 - a. Make the appropriate selections to reflect your configuration.
 - b. Click Ok.

erminator 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: - It does NOT apply.
Tx Terminator Resistor
Rx Terminator Resistor
Defaults OK Cancel

6. 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.

- 7. 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	?	\times
	RS-485 converter, which is attached to a port that is configured for RS-	NOTE: You may need to use one or more of the settings below in any of the cases: If your communications application doesn't toggle RTS when trans RS-485 mode.	followin nitting in	g
a.	232. Click the appropriate options for your environment.	If you are using an external RS-232 to RS-485 converter attached configured in RS-232 mode. Override and Lock to RS-485 Toggle Mode RS-485 Toggle RTS Low	to a por	t
b.	Click OK to save the changes and return to the port	Defaults OK	Cance	el

- 8. If desired, click the **Clone** check box to set all of the ports on this Comtrol device to these characteristics.
- 9. Optionally, change the User-Friendly Port Name.

General tab.

10. 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.

- 11. Click **Apply** to save these changes.
 - *Note:* If you selected RS-422 mode, make sure that there is not a device attached to the port and click **Ok**.
- 12. Highlight the next port that you want to configure and perform <u>Steps 4</u> through 11.

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

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 DIN rail 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 = K5-252	- 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 is 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 only supports RS-232, the default value is RS-232 for other DeviceMasters.
	This option allows you to lock selected ports.
Override and Lock Baud Rate to Default = None	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 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.
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	flush through the system.

Port Settings General Tab	Description
	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
	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 (Specific Models, Only)	Signal reflection is reduced and a reliable communication is ensured by placing the 120Ω termination resistor. The DeviceMaster 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 Retween TyD, and TyD, (Ping 5 and 7)
	- Between RxD+ and RxD- (Pins 4 and 2)
	• RS-485 Mode – Between TxD/RxD+ and TxD/RxD- (Pins 5 and 7)
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	This option forces all write packets to wait until the transmit data has physically completed the transmission before returning completion to the host application.
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	Click this check box to emulate the ring indicator signal.
Hardware RING Signal	If this box is checked and the port receives a <i>RING</i> signal (or an alternate
Default = Disabled	to the communications application.
Allow Parity Conflict (DeviceMaster 1-Port only) Default = Disabled	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 correct and you are able to transmit data but not receive proper data.

Port Settings General Tab	Description
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.
Clone: Apply all the settings to all ports	If this check box is <i>not</i> clicked, changes apply to the selected port only.
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 <i>Comtrol Drivers Management Console</i> .
	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 Default = Disabled	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.
Defaults Default = Disabled	Click the Defaults button to return to the driver default values.

Network Configuration in Comtrol Drivers Management Console

 Note: Use NS-Link / SocketServer (DeviceMaster web page) to configure IPv6 network settings. Optionally, you can use the Comtrol Drivers Management Console to: Disable IP communications. Change the IP address (if the MAC address has been associated to the DeviceMaster), see <u>Changing a Static IPv4 Address</u> on Page 51. Configure the DeviceMaster for use with DHCP, see <u>Setting Up DHCP (IPve</u> on Page 52. Disabling IPv4 Mode Use this procedure if you want to disable IP communications. If necessary, access the Comtrol Drivers Management Console. Note: The DeviceMaster must be operational in MAC mode on a local networ segment or connected directly to the PC (Associating the MAC Address on Page 36). Make sure that the MAC Mode radio button has been selected. Highlight the Device Name of the DeviceMaster that you want to configure. Click the Notify button. Click the Modify button. Click the Notify button. Click the Modify button. Click the Station (DHCP or static) and operating the DeviceMaster in MAC mode.
 Optionally, you can use the Comtrol Drivers Management Console to: Disable IP communications. Change the IP address (if the MAC address has been associated to the DeviceMaster), see Changing a Static IPed Address on Page 51. Configure the DeviceMaster for use with DHCP, see Setting Up DHCP (IPee on Page 52. Disabling IPv4 Mode Use this procedure if you want to disable IP communications. If necessary, access the Control Drivers Management Console. Note: The DeviceMaster must be operational in MAC mode on a local networe segment or connected directly to the PC (Associating the MAC Address on Page 36). Make sure that the MAC Mode radio button has been selected. Highlight the Device Name of the DeviceMaster that you want to configure. Click the Network Settings button. Click the Network Settings button. Click Disable IP. You can use the Disable IP option if you are not using IP addressing (DHCP or static) and operating the DeviceMaster in MAC mode.
 Disable IP communications. Change the IP address (if the MAC address has been associated to the DeviceMaster), see Changing a Static IPv4 Address on Page 51. Configure the DeviceMaster for use with DHCP, see Setting Up DHCP (IPve on Page 52. Disabling IPv4 Mode Use this procedure if you want to disable IP communications. If necessary, access the Comtrol Drivers Management Console. Note: The DeviceMaster must be operational in MAC mode on a local networs segment or connected directly to the PC (Associating the MAC Address on Page 36). Make sure that the MAC Mode radio button has been selected. Highlight the Device Name of the DeviceMaster that you want to configure. Click the Network Settings button. Click Disable IP. You can use the Disable IP option if you are not using IP addressing (DHCP or static) and operating the DeviceMaster in MAC mode. Wow can use the Disable IP option if you are not using IP addressing (DHCP or static) and operating the DeviceMaster in MAC mode. Wow Setting: DeviceMaster in MAC mode. Wow Setting: DeviceMaster in MAC mode. Webse: DeviceMaster in MAC mode. Disable IP option if you are not using IP addressing (DHCP or static) and operating the DeviceMaster in MAC mode. Disable: DeviceMaster
 Change the IP address (if the MAC address has been associated to the DeviceMaster), see <u>Changing a Static IP-d Address</u> on Page 51. Configure the DeviceMaster for use with DHCP, see <u>Setting Up DHCP (IPveon Page 52</u>. Disabling IPv4 Mode Use this procedure if you want to disable IP communications. If necessary, access the <u>Comtrol Drivers Management Console</u>. Note: The <u>DeviceMaster must be operational in MAC mode on a local networs segment or connected directly to the PC (Associating the MAC Address on Page 36).</u> Make sure that the MAC Mode radio button has been selected. Highlight the <u>Device Name of the DeviceMaster that you want to configure</u>. Click the Modify button. Click the Modify button. Click the Sisable IP option if you are not using IP addressing (DHCP or static) and operating the DeviceMaster in MAC mode. Worder Settings Worder Settings P Address: Worder Settings Worder Settings Word
 Configure the DeviceMaster for use with DHCP, see <u>Setting Up DHCP (IPveon Page 52</u>. Disabling IPv4 Mode Use this procedure if you want to disable IP communications. If necessary, access the Comtrol Drivers Management Console. Note: The DeviceMaster must be operational in MAC mode on a local networe segment or connected directly to the PC (Associating the MAC Address on Page 36). Make sure that the MAC Mode radio button has been selected. Highlight the Device Name of the DeviceMaster that you want to configure. Click the Network Settings button. Click the Nodify button. Click the Modify button. Click Disable IP. You can use the Disable IP option if you are not using IP addressing (DHCP or static) and operating the DeviceMaster in MAC mode. Vetwork Settings Vetwork Settings Vetwork Settings Provide IP Searce Provide IP Searce Provide IP Provide IP Searce Provide IP Provide IP Searce Searce Searce Provide IP Searce Provide IP Searce Searce Provide IP Searce
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 If necessary, access the Comtrol Drivers Management Console. Note: The DeviceMaster must be operational in MAC mode on a local networ segment or connected directly to the PC (Associating the MAC Address on Page 36). Make sure that the MAC Mode radio button has been selected. Highlight the Device Name of the DeviceMaster that you want to configure. Click the Network Settings button. Click the Modify button. Click the Modify button. Click Disable IP. You can use the Disable IP option if you are not using IP addressing (DHCP or static) and operating the DeviceMaster in MAC mode.
 Note: The DeviceMaster must be operational in MAC mode on a local networs segment or connected directly to the PC (Associating the MAC Address on Page 36). Make sure that the MAC Mode radio button has been selected. Highlight the Device Name of the DeviceMaster that you want to configure. Click the Network Settings button. Click the Modify button. Click Disable IP. You can use the Disable IP option if you are not using IP addressing (DHCP or static) and operating the DeviceMaster in MAC mode.
 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. 4. Click the Network Settings button. 5. Click the Modify button. 6. Click Disable IP. You can use the Disable IP option if you are not using IP addressing (DHCP or static) and operating the DeviceMaster in MAC mode.
 3. Highlight the Device Name of the DeviceMaster that you want to configure. 4. Click the Network Settings button. 5. Click the Modify button. 6. Click Disable IP. You can use the Disable IP option if you are not using IP addressing (DHCP or static) and operating the DeviceMaster in MAC mode. Vetwork Settings Disable IP D
 4. Click the Network Settings button. 5. Click the Modify button. 6. Click Disable IP. You can use the Disable IP option if you are not using IP addressing (DHCP or static) and operating the DeviceMaster in MAC mode.
 5. Click the Modify button. 6. Click Disable IP. 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 ?X Disable IP Disable IP Disable IP Static IP IP Address: 192.168.11.20 Subnet Mask: 255.255.0.0 Gateway: 192.168.11.1
6. Click Disable IP. 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 Disable IP DHCP IP Static IP IP Address: 192.168.11.20 Subnet Mask: 255.255.0.0 Gateway: 192.168.11.1 Modify 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 ?X © Disable IP © DHCP IP © Static IP IP Address: 192.168.11.20 Subnet Mask: 255.255.0.0 Gateway: 192.168.11.20 Modify Apply Changes Close
Network Settings ? Disable IP DHCP IP Static IP Modify Apply Changes Close IP Address: 192.168.11.20 Subnet Mask: 255.255.0.0 Community 102.168.11.1
Close Modify Apply Changes Close Close Common Particular Submet Masks Close Clo
Disable IP D
C Static IP IP Address: 192.168.11.20 Subnet Mask: 255.255.0.0
IP Address: 192.168.11.20 Subnet Mask: 255.255.0.0
IP Adaress: 192.168.11.20 Subnet Mask: 255.255.0.0
Galaway: 192.100.11.1
Modify Apply Changes Close
7 Click the Apply Changes button
8 Click Ves to the Warning Dopun
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:

- 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 Settings*</u> on Page 42.
- Configure COM port properties, see <u>Configuring COM Port Properties</u> on Page 45.
- Configure any of the DeviceMaster ports as sockets, see <u>Configuring</u> <u>DeviceMaster Ports as Sockets</u> on Page 54.

Changing a Static IPv4 Address

Typically, 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 36).

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.

etwork 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	
	<i>.</i>	
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.



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

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

etwork Settings	N	? ×
	45	
🔿 Disable IP		
C DHCP IP		
Static IP		
IP Address:	192.168.11.20	
Subnet Mask:	255.255.0.0	-
Gateway:	192.168.11.1	
	,	
Modify	Apply Changes	Close

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 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 Settings</u> on Page 42. •
- Configure COM port properties, see <u>Configuring COM Port Properties</u> on Page 45.
- Configure any of the DeviceMaster ports as sockets, see Configuring DeviceMaster Ports as Sockets on Page 54.

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 operational (the PWR or Status LED is lit) when configured for the MAC address (<u>Associating the MAC Address</u> on Page 36).
 - 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 IPv4 Mode radio button.
- 4. Click the Network Settings button.
- 5. Click the Modify button.

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

(IPv4)

- 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	X
The IP address specified will enabl	e DHCP and disable static IP access
Do you want to continu	e?
Yes	No

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

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		×
In order to communicate w new IP address, the device	ith the device using th e must be reset.	e
Do you want to	reset the device now?	
Yes	No	

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.

N

- 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 <u>Device</u> Status message indicates that the <u>Device</u> is active and Ok.
- 12. After programming the IP address, you may need to do the following:
 - Configure device properties, see <u>*Configuring Device Settings*</u> on Page 42.
 - Configure COM port properties, see <u>Configuring COM Port Properties</u> on Page 45.
 - Configure any of the DeviceMaster ports as sockets, see <u>Configuring</u> <u>DeviceMaster Ports as Sockets</u> on Page 54.

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** tab and click the port number that you want to configure as a socket in the *Port Overview* page.

OMTROL' Home Port Network	Diagnostics	System	Help	
erview Port 1 Port 2				
t Overview				
	Dent 1	Devet D		
Port Name:	Port 1	Port 2		
NG Link Connections				
[10.0.0.202]·49664				
[10.0.0.202].49004				
Socket Connections	[]+0	[].0		
Local. Remote:	[].0	[].0		
Ry Count:	0	0		
Tx Count:	0	0		
Dest Configuration (conicil)	Ū	0		
Port Configuration (Serial)	DC 222	DC 222		
Baud Pate:	9600	9600		
Parity:	pope	none		
Data Bits:	8	8		
Stop Bits:	1	1	11	
Flow Control:	none	none		
DTR Mode:	off	off	1	
RTS Mode:	off	off		
Pre/Post RTS hold time:	0/0	0/0		
End of line character(s):	none	none		
Serial RX buffer timeout:	0	0		
Send buffered data after close:	no	no		
Reset UART After Timeout:	no	no		
Port Configuration (network)				
TCP Enabled:	no	no		
Listen Enabled:	yes	yes		
Listen on port:	8000	8001		
Connect to IP Address:	[]:0	[]:0		
From Source Port:	0	0		
Connect On:	never	never		
Disconnect When:	never	never		
Idle Timeout:	300	300		

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 can be downloaded at: <u>http://downloads.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 Network tab.
- 3. Click the Security tab.
- 4. Click Enable Secure Data Mode.
- 5. Optionally, set other security options and then click Save.

	- □ ×
COMTROL Home Port Network Diagnostics System Help Devicable	ster 2-nort Logout
Configuration Password Security Keys/Certs Email REC1006	
configuration Password Security Revisivents Email Richold	
Security Settings	
Enable Secure Data Mode Enable Secure Config Mode Enable Telnet/ssh Enable Monitoring Secure Data via Telnet/SSH Enable SNMP SSLv3.0 V Minimum Allowed SSL/TLS Version Allow TCP connections only from the address blocks below Block Address / Width	
Note)
The address block definitions above use CIDR notation comprising an IP address and mask width separated by a slash.	
For IPv4: a mask width of 0 or 32 defines a single IP address. A width of 31 defines 2 addresses, a width of 30 defines 4, a width of 29 defines 8, etc.	
For IPv6: a mask width of 0 or 128 defines a single IP address. A width of 127 defines 2 addresses, a width of 126 defines 4 addresses, a width of 125 defines 8, etc.	
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- 6. Click Keys/Certs to configure your security key and certificate.
- 7. Use the **Browse** button to locate your key or certificate and when you are done, click **Save**.

→ + http://1	0.0.0.52/network-k	eyscerts.asp 🔎	- ¢ ¢ De	eviceMaster		×	- ŵ	< □< ☆ ☺
Comtrol	Home Port	Network Di	iagnostics	System	Help	DeviceMast	er 2-port	Logout
Configuration	Password S	ecurity Keys	/Certs Er	nail RFC	21006			
Key and Cer	tificate Ma	nagement						
RSA Key pai	r used by SSL	and SSH serv	ers:	Factor	y serve	rRsaKey.der	×	
RSA Server	, Certificate use	d by SSL serv	ers:	Factor	y Brow	se Delete		
DH Key pair	used by SSL s	ervers:		Factor	y Brow	se Delete		
Client auther	ntication certif	icate used by	SSL serve	s: None	Brow	se Delete		
							Save]
Note								
Key and certific	ate changes v	vill take effect	after a reb	oot.				
iles must be ir	n DER format.							
The RSA key ar the identity of t will be unable t the web browse	nd RSA certific the server. If y o authenticate er and other S	ate are used t you update on the server ar SL clients.	ogether by e without u nd you will	r clients to updating t receive w	o authe the oth varning	enticate er, clients s from		
-			-	-		© Copy	right Com	trol Cor

Click the **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.

DeviceMaster	General Advanced
10.0.0.14_SH-8	Network Connection Mode
10.0.22_#PDIN	O MAC Mode 00 C0 4E 1C FF FD V Fetch IP Address
DeviceMaster RTS 2P2E	IPv4 Mode 10.0.0.14 Network Settinge
RocketPort Infinity/Express RocketPort Infinity/Express Portugation of the second secon	O IPv6 Mode FE80::2C0:4EFF:FE1C:FFFD
	Enable SSL Mode Reboot Device
	Certificates
	Device Settings Device Name: DeviceMaster Serial Hub. 8 Port
	Uner Enterfahle Device Names 10.0.0.14 CU.0.
	(Default: 120)
	TCP Timeout Multiplier: 1 (Default: 1)
	Scan Rate (ms): 10 V (Default: 10)
	Verbose Event Log (Troubleshooting Only)
	Defaults
mtrol Drivers Management Console version 4.05	

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

Loading a Driver Configuration File

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.

Loading Device 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.
- 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.
- 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.
 - **Note:** Make sure that if this a configuration from another DeviceMaster, you must either select the correct MAC address from the drop list or enter the correct MAC address. In addition, make sure that the correct IP associated with this DeviceMaster.



- 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.
- 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.



- **Note:** Make sure that you do not duplicate COM port numbers. Simply change the COM port number assignment before applying the changes.
- 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.

Control Drivers Management Console	,	1			? Comtro	
	^	General	Advanced			_
= + 10.0.0.23 RTS			Auvanceu			
Port 01 (COM6)		Network Connect	ion Mode			
J ES8520-XT (COM116)		O MAC Mode	00 C0 4E 5C FF F0	~	Fetch IP Address	
ES8814-XT (COM117)		OniActilidae				
ES7810-XT (COM118)		IPv4 Mode	10.0.0.24		Network Settings	
Disable		O IPv6 Mode	FE80::2C0:4EFF:FE5	C:FFF0		
Port 01 (CON					Reboot Device	
Port 02 (CON Uninstall		Enable SSL N	lode			
Port 03 (CON Properties	_				Certificates	
		Device Settings				
Serial 01 (COM35)			Device Name:	DeviceMaster RTS,	4 Port, DB9, 2E	
Serial 02 (COM36)		11				
RocketPort Infinity/Express		User-	Friendly Device Name:	10.0.0.24_4P DIN-	->2	
RP EXPRESS, Octa		Keep Al	ive Timeout (seconds):	120	(Default: 120)	
Port 01 (COM300)					(,	
Port 02 (COM301)			TCP Timeout Multiplier:	1	(Default: 1)	
Port 03 (COM302)			Scan Pate (mo)	10	(Default: 10)	
🦻 Port 04 (COM303)			Scari Kate (ilis):	10 +	(Default: 10)	
Port 05 (COM304)			Verbose Event Log	(Troubleshootin	g Only)	
Port 06 (COM305)						
Port 07 (COM306)					Defaulte	
Port u8 (COM307)	~				Derduits	
		1				_
omtrol Drivers Management Console version 4.05 opyright © Comtrol Corporation. All rights reserved.	Sav	e Configuration Loa	ad Configuration	OK Can	cel Apply He	lp

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: Comtrol >DeviceMasterDriver Installation Wizard.
- 2. Click **Yes** to the *Do you want to allow this app to make changes to your device?* message.
- 3. Click Next to start the Comtrol Driver Installation Wizard.
- 4. Click **Remove All** and **Next**.



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



6. Click Next to clean up the driver removal.

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



8. 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.

Reboot?		\times
<u> </u>	Please make sure to close your active programs and save your data. Click OK when you are ready to reboot the computer.	
	OK Cancel	1

- 9. Shutdown the system and disconnect the DeviceMaster from your network.
- 10. 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 66
- <u>General Troubleshooting</u> on Page 67
- <u>Connectivity Requirements</u> on Page 68
- <u>DeviceMaster LEDs</u> on Page 70
- <u>Using the Advanced Tab</u> on Page 72
- <u>NS-Link Driver Troubleshooting</u> on Page 77
- <u>Using Port Monitor to Test Ports</u> on Page 78
- <u>Using Test Terminal</u> on Page 81
- <u>How Disable / Enable the Device Driver</u> on Page 87
- <u>Technical Support</u> on Page 87

If you cannot diagnose the problem, you can contact <u>*Technical Support*</u> on Page 87.

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 72), 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 70 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 68 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 22.
Test the Port or Ports?	Install PortVision DX (Page 10) and use Test Terminal (Page 81).
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 66.

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	 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 17 for installation information.
	<i>Note:</i> 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.	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 68).	
	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.	
Connet ning on connect	In most cases, it will be necessary to program in an address that conforms to your network.	
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 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 BTS 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 LEDs** Port 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** The LEDs indicate that the default DeviceMaster application, NS-Link/ 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. LEDs Model **Network LEDs** Ports 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 stady light that blinks approximately

1	DeviceMaster RTS	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).		
		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	DeviceMaster RTS Embedded	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).		
		• The STATUS LED on the device is lit, indicating you have power and it has completed the boot cycle.		
2	DeviceMaster RTS	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	DeviceMaster PRO (8)	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	
8	RTS [†]	every 10 seconds.	
16	DeviceMaster	• The red LNK/ACT LED is lit, which indicates a working Ethernet connection.	
	Serial Hub (6)	• 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).	
† Ext	† External power supply.		
†† Inte	ernal power suppl	y.	

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 36).

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.

Comtrol Drivers Management Console	<u>? ×</u>
DeviceMaster	General Advanced
Port 01 (COM1) Port 02 (COM12) Port 03 (COM13) Port 03 (COM14) Port 05 (COM15) Port 05 (COM15) Port 05 (COM15) Port 05 (COM16) Port 05 (COM16) Port 05 (COM16) Port 03 (COM17) Port 03 (COM12) Port 03 (COM2) Port 04 (COM2) Port 04 (COM2) Port 04 (COM2) RocketPort Express 8 Port, PCIe-BUS (Rodx Port 01 (COM3) Port 01 (COM3)	Device Status Pevice is active and OK. Refresh History Network Statistics PC Network Interface Details Device Network Interface Details
Port 02 (COM4) Port 03 (COM5) Port 03 (COM5) Port 05 (COM6) Port 05 (COM7) Port 05 (COM8) Port 07 (COM8) Port 07 (COM9)	
Comtrol Drivers Management Console version 1.01 Copyright (C) 2011 Comtrol Corporation.	e 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 36).

Refer to the *Device Status* table (Page 75) for a list of messages and explanations.

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

Hi	istory		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.	
			•
		OK	Ş
5. Click PC Network Interface Details for the following information.

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

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 :	ρ
Packets from :	p
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.

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	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 or reset the counters, which may cause the Advisor to change from Excess Packets to Ok. If this does not cause the DeviceMaster to go Active			
	and Ok, then it is likely that there is a network issue involved that should be corrected.			

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

Device Status Message	Description
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 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 70).
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.
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 IPv4 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 67).
	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 Kefresh All Check for Upc	lates	Webpage Notes	Sector Help Ab	Dout Exit		
IPORTVI Applications Options	ESS28 [9 / 9] ESS28 [9 / 9] Customize Test Terminal Port Monitor HyperTerminal	(WCom2) (PMon2)				
Name : First Floor	Drivers → ESS10- → ESS10- → ESS10-X → ESS10-X → R0-Link Master → R0-2-17:FFE → RT5_2E - 29:FFF → RT5_2E - 29:FFFE → RT5_2E - 29:FFFE	TE #1				
	Device Name	Model	IP Address	MAC Address	Software Version	Status
-	ES0528	E\$0528	102 168 11 105	00-C0-4E-32-00-01	v1.4 hetal (b1.1.0.2)	
	IO-Link Master #1	IO-Link Master EIP-4	192.168.11.199	00:C0:4E:39:FF:F6	EtherNet/IP 0.8-3	ON-LINE
E	Modbus/TCP	UP-1P (5V)	192.168.11.53	00:C0:4E:15:04:7A	Modbus/TCP 5.07	ON-LINE
	Sec. 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	SocketServer 9.11	ON-LINE
	SH8	SH-8P (DB9)	192.168.11.14	00:C0:4E:1C:FF:FD	NS-Link 9.11	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
< Þ					Γ	First Floor 1 Ready

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

📴 Untitled - PMon2													
File Tools	View	Help	>										
i n 🚅 月	A 198	1 Mar 1		1 ?									
Port Name	tatus	dd Do		CD	RTS	DTR	Actual Throughput	TxTotal	RxTotal	Total Errors	OverrunErrors	FramingErrors	ParityErrors
COM4	CLOSED	OFF	07	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	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
•								111					- F
Add one or m	ore port t	o the l	list								Polling tir	mer is ON N	UM //

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
Ісоміо	•
C Range For example: 3-15,21,45,	51-56,74
Oriver	
ROCKETPORT INFI	NITY / EXPRESS
DEVICEMASTER / N	NSLINK
ROCKETPORT / RC	CKETMODEM
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.

🧱 Untitled -	📱 Untitled - PMon2												
File Tools \	File Tools View Help												
Port Name	Status	CTS	DSR	CD	RTS	DTR	Actual Throughput	TxTotal	RxTotal	Total Errors	OverrunErrors		
COM11 N	OPEN	ON	ON	ON	ON	ON	114600	205891	205638	0	0		
COM12 Kg	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		
					-								
•											•		
Ready									Polling	timer is ON			

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.

🔣 U	ntitled - PMon2												
File	Tools View Help												
D	Add Ports												
SI	Remove Ports	Actual Throughput	TxTotal	RxTotal	Total Errors	OverrunErrors	FramingErrors	ParityErrors					
E C	Add Columns	0	64923300	64923300	0	0	0	0					
FC		0	0	0	0	0	0	0					
E C		0	0	0	0	0	0	0					
EC	Reset Values	0	0	0	0	0	0	0					
EC	Default Columns	0	0	0	0	0	0	0					
E C		0	0	0	0	0	0	0					
FC	Settinas	0	0	0	0	0	0	0					
E C		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	
	IxIotalRaw	
	RXI otalRaw	
	Examine Errors Raw	
	ParityErroreBaw	
	TxCPSInst	
	BxCPSInst	
	TxCPSMinute	
	RxCPSMinute	
	42	
	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.

	Unti	itled - P	Mon2							
Fi	le To	ools Vie	ew Help							
	D 🖬	ê 📕 e	🚭 📽 💥 🔳	🛛 🛛 🎖						
Π	RTS	DTR	Actual Throughput	TxTotal	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	0 hz	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
	OFF	OFF	0	0	0	0	0	0	0	0
	OFF	OFF	0	0	0	0	0	0	0	0
•										•
Re	ady								Polling timer is ON	

- 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.

ile Manage View Tools Help								
Refresh A								
Scan Refresh All Check for	ork Updates	Jpload Reboot	Webpage Notes	Help Al	bout Exit			
Les Cite		st Floor [8 / 8]						
Log File	<u> </u>	E29320 [9 / 9]						
	ns i	Customize	·					
Options		C Test Termina	al (WCom2)					
		Port Monitor	r (PMon2)					
		Liker an Tamaia						
		Hyperrennin	Idi					
ame : First Floor		Drivers						
		■ 🗸 ES8510						
		■ ✓ ES8510-	XTE					
	1	V IO-Link Master	r #1					
		Modbus/TCP						
		PRO - 17-FE-FR						
		PTS 2E . 20-EE	.55					
Jse menu or toolbar to add notes in		PTS1 - 07-EE-EC	-					
his area.								
-		OP1:3-50VDC (20)	,					
		ourth Floor [26 / 29]	1					
	Device N	lame	Model	IP Address	MAC Address	Software Version	Status	
	📕 🖌 ES952	28	ES9528	192.168.11.105	00:C0:4E:33:00:01	v1.4 beta4 (b1.1.0.3) ON-LINE	
	I 🗸 IO-Li	nk Master #1	IO-Link Master EIP-4	192.168.11.199	00:C0:4E:39:FF:F6	EtherNet/IP 0.8.3	ON-LINE	
	📕 🗸 🛛 Mod	bus/TCP	UP-1P (5V)	192.168.11.53	00:C0:4E:15:04:7A	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	SocketServer 9.11	ON-LINE	
	🛸 🗸 🛛 SH8		SH-8P (DB9)	192.168.11.14	00:C0:4E:1C:FF:FD	NS-Link 9.11	ON-LINE	
	₩ 🗸 UP1:5	5-30VDC	UP-1P (5-30V)	192.168.11.55	00:C0:4E:21:05:CD	Modbus Server 4.04	ON-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 82
- <u>Sending and Receiving Data</u> (<u>RS-485: 2-Wire</u>) on Page 84



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 81.
- 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 ABCDEFGHIJKLMN0PQRSTUVW Monitor ABCDEFGHIJKLMN0PQRSTUVWX running, it ABCDEFGHIJKLMN0PQRSTUVWXY should show ABCDEFGHIJKLMN0PQRSTUVWXY data sent and A received and AB show the ABCD average data ABCDE throughput on ABCDEFG 4. Select Port > Send and							
	Receive Test Data to stop the scrolling data							
	 You can go to the next procedure to run the <i>Loopback Test</i> on Page 83 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 81, <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 T	erminal	
File Port Settings	View Window Help	
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СОМ40		🔀 🗆 COM41 📃 🗖 🛛
	Toolbar ✔ Status Bar	
	Loopback Open / Close	
	V RTS V DTR	
	Send Receive	Disable Receive.
OPEN RTS DTR	RIN Clear Screen	OPEN TRANS DTR RING Ready
Ready	Change View Port Settings	NUM

📴 WCom2 - Test Terminal	
Elle Bort Settings View Window Help	
D # # # # Ø # = □ ?	
Сом40	🗖 COM41 📃 🗖 🔀
<u>a</u>	
OPEN RTS DTR RING Ready	OPEN RTS DTR RING Ready
Ready	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	http://www.comtrol.com
Phone	763.957.6000 CST: 8AM-6PM (Monday through Friday, excluding major US holidays)