

MANUAL

ICDM-RX/TCP (DeviceMaster) and ICRPC (RocketPort EXPRESS) Windows Driver Installation



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1. Overview

The ICDM-RX/TCP (DeviceMaster) and ICRPC (RocketPort EXPRESS) Windows Driver Console manual provides support for the following products:

- ICRPC (RocketPort EXPRESS), including the RocketPort INFINITY, which is referred to as RocketPort in the manual.
- DeviceMaster (ICDM-RX/TCP), which is referred to as DeviceMaster in the manual.

Install the DeviceMaster NS-Link device driver to use the 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 *NS-Link Device Driver Configuration Considerations* on Page 29 for detailed information about the NS-Link device driver.

Refer to *PortVision DX Overview - DeviceMaster* on Page 7 for information about an application to assist configuring network settings.

1.1. Windows Driver Management Console

This manual discusses how to install and configure Pepperl+Fuchs Windows device drivers using the Windows Driver Management Console.

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

You can refer to *Using the Windows Driver Management Console* on Page 30 for general information.

1.2. Supported Operating Systems

The *Windows Driver Management Console* supports the following operating systems:

- Windows 7, Windows 8/8.1, Windows 10, and Windows 11
- Windows Server 2012R2, Windows Server 2016, Windows Server 2019, and Windows Server 2022

1.3. Products Supported

These are the products supported by the *Windows Driver Management Console*:

- All DeviceMaster models
- All RocketPort EXPRESS models
- All RocketPort INFINITY models



1.4. PortVision DX Overview - DeviceMaster

PortVision DX automatically detects the following 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 models
- ICDM-RX/EN and ICDM-RX/EN1 (DeviceMaster EtherNet/IP) models
- ICDM-RX/MOD (DeviceMaster Modbus Router/Server/TCP) models
- ICDM-RX/PN and ICDM-RX/PN1 (DeviceMaster PROFINET IO) models
- IO-Link master (ICE2x and ICE3x) models
- RocketLinx managed switches

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

In addition to identifying the following 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-Pepperl+Fuchs 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.

1.5. Download the Latest Software and Documentation

Go to <https://www.pepperl-fuchs.com> to locate the latest Windows device driver for your product.



2. Before Installing the DeviceMaster Driver

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

This section contains the following discussions:

- *Initial Installation Overview* on Page 8
- *Install the Hardware* on Page 8
- *Install PortVision DX* on Page 9
- *Program the IPv4 Address (Network Information)* on Page 12
- *Program the IPv6 Address (Network Information)* on Page 14
- *Check the SocketServer Version* on Page 15
- *Uploading SocketServer* on Page 16

2.1. Initial Installation Overview

If you have already performed the following procedures, you can skip to the next section, *Device Driver Installation* on Page 17.

You may also refer to the *ICDM-RX/TCP Installation and Configuration Manual*, which provides detailed information about the following procedures:

1. Install the hardware.
2. Install PortVision DX.
3. Program the network information using PortVision DX (Page 12).
4. Check the SocketServer version and determine whether you need to download an updated version (Page 15).
5. If necessary, check with Technical support to get the latest version of SocketServer.

2.2. Install the Hardware

If you have not done so, install the DeviceMaster:

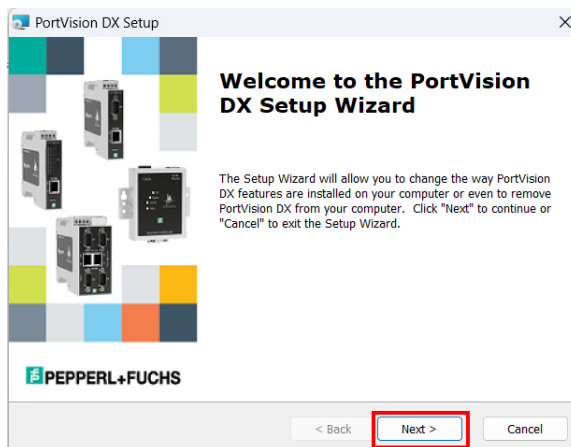
1. Connect an Ethernet cable between the DeviceMaster and a host PC NIC or to the same Ethernet network segment using a standard Ethernet cable. Refer to *DeviceMaster Connectivity Requirements* on Page 72 for cabling information.
2. Connect the power supply or cable to the DeviceMaster and apply power.
3. Check the DeviceMaster LEDs to verify that it is ready. Refer to *DeviceMaster LEDs* on Page 72 to determine the LED status.



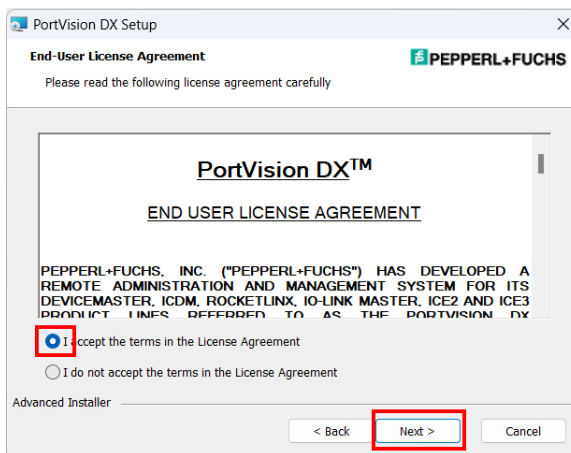
2.3. Install PortVision DX

Use the following procedure to install PortVision DX.

1. Download PortVision DX from <https://www.pepperl-fuchs.com>.
2. Execute the **PortVision_DX_[version].msi** file and click **Next**.

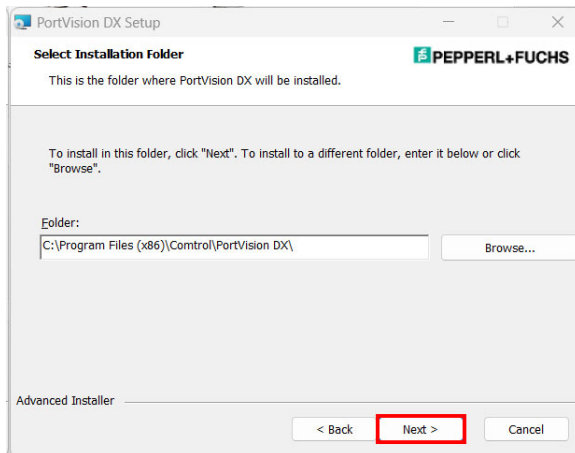


3. Select *I accept the terms in the License Agreement* and **Next** to install.

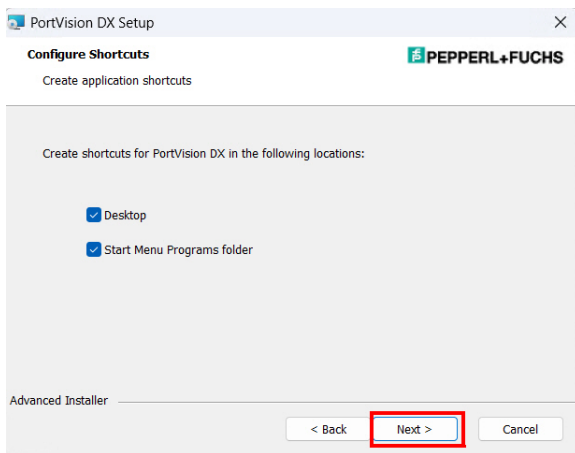




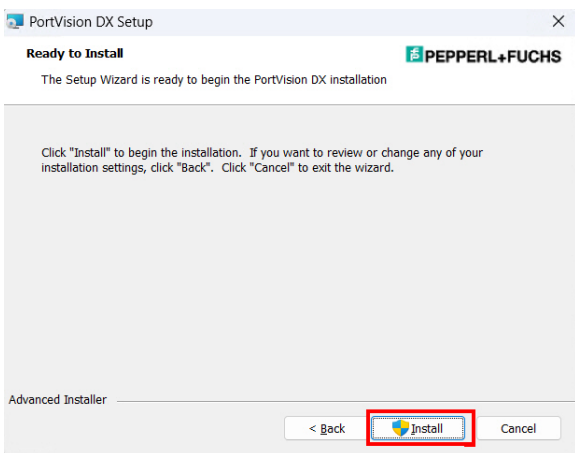
4. Click **Next**.



5. Click **Next**.



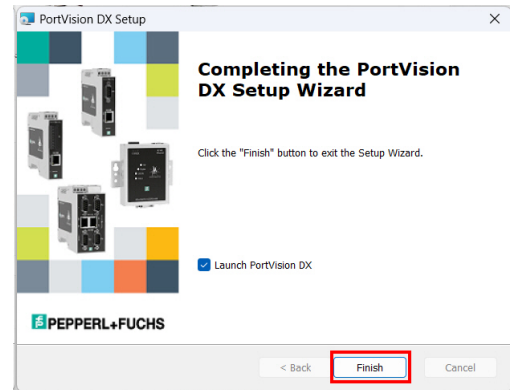
6. Click **Install**.



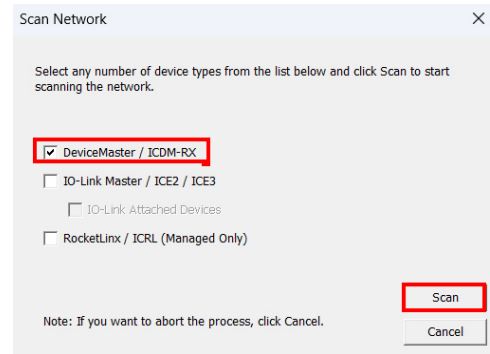
7. Select **Yes** to the *User Account Control Do you want to allow this app to make changes to your device* message.

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- Click **Launch PortVision DX** and **Finish** in the last installation screen.
- Click **Yes** to the *Do you want to allow this app to make changes to your device?* message.



- Click **Scan** so that PortVision DX locates the DeviceMaster. PortVision DX displays the the following 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.
- Go to the next discussion to program the network information into the DeviceMaster.



The contents of this folder are displayed in the *Device List* pane (below).

See the PortVision DX help system for procedures on organizing your devices and customizing your view or views in PortVision DX.

Device Tree Pane

Device Name	Model	IP Address	MAC Address	Software Version	Status
EtherNet/IP System	UP-1P (5-30V)	192.168.11.55	00:C0:4E:21:05:CD	EtherNet/IP 4.10	ON-LINE
Modbus/TCP	UP-1P (5V)	192.168.11.53	00:C0:4E:15:04:7A	EtherNet/IP 4.10	ON-LINE
Modbus Router System	UP-4P (DB9)	192.168.11.54	00:C0:4E:07:43:84	Modbus Router 5.10	ON-LINE
SH8 Console Port COM Ports	SH-8P (DB9)	192.168.11.14	00:C0:4E:1C:FF:FD	NS-Link 9.18	ON-LINE
PRO8 Console Port COM Ports	PRO-8P (DB9)	192.168.11.20	00:C0:4E:17:FF:FB	NS-Link 9.18	ON-LINE
LT16 #2	DM-LT16	192.168.11.61	00:C0:4E:40:FF:F0	NS-Link 9.23.1	ON-LINE
RTS4 Spare COM Ports	RTS-4P (DB9)	192.168.11.23	00:C0:4E:07:FF:FC	SocketServer 9.18	ON-LINE
RTS 2-Port	RTS-2P (ZE)	192.168.11.52	00:C0:4E:29:FF:F5	SocketServer 9.18	ON-LINE (TCP) Remote Device
ES9528-XT	ES9528-XT	192.168.11.105	00:C0:4E:36:00:02	v1.4 (b1.1.0.4)	ON-LINE

Device List Pane

2.4. 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 *ICDM-RX/TCP Installation and Configuration Manual*.

Default Network Settings

- IPv4 address: 192.168.250.250
- IPv4 Subnet mask: 255.255.0.0
- IPv4 Gateway address: 192.168.250.1

1. If necessary, start PortVision DX, **Start > Pepperl+Fuchs > 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**.

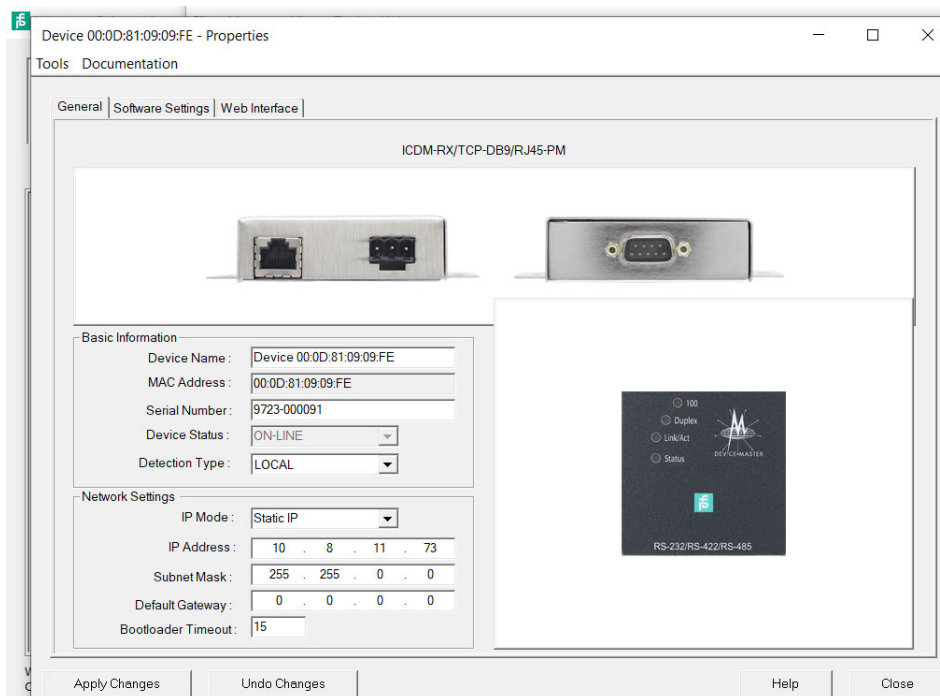
Note: *Optionally, you can double-click the DeviceMaster and PortVision DX opens the Properties page.*

The screenshot shows the PortVision DX application window. The interface includes a menu bar (File, Manage, View, Tools, Help), a toolbar with icons for Scan, Refresh All, Properties, Save, Load, Upload, Reboot, Webpage, Notes, Help, About, and Exit. The main area is divided into a left sidebar with the 'IPV' logo and a 'Name: Scan Results' field, and a central pane showing a tree view of scan results. The tree view includes folders for 'support' and 'testlab', and a list of devices with their MAC addresses. A table at the bottom displays the following data:

Device Name	Model	IP Address	MAC Address	Software Version	Status
Device 00...	PN-ST/RJ45-DIN	10.8.11.72	00:0D:81:09:08:CC	PROFINET IO V 3.4.2	ON-LINE
Device 00...	TCP-DB9/RJ45-PM	10.8.11.73	00:0D:81:09:09:FE	NS-Link 11.37	ON-LINE
Device 00...	PN-DB9/RJ45-DIN	10.8.41.8		PROFINET IO V 3.4.9	ON-LINE
Device 00...	TCP-2DB9/RJ45-DIN	192.168.250.250		NS-Link 11.43	ON-LINE
Device 00...	yyyyyyyyyyyyyyyyyyyy	10.8.41.24		MQTT-Modbus-Rtu 0.55	ON-LINE
Device 00...	RTS-8P (DB9)	10.8.40.209		NS-Link 10.13	ON-LINE
Device 00...	RTS-16P (1E)	10.8.14.162		SocketServer 11.34	ON-LINE
Device 00...	UP-1P (5V)	10.8.14.112		Modbus Router 7.01	ON-LINE
Device 00...	RTS-1P (5V)	10.8.14.30		SocketServer 11.40	ON-LINE
Device 00...	PRO-8P (DB9)	10.8.13.67		NS-Link 11.58	OFF-LINE
Device 00...	SH-16P (DB9)	10.8.14.165		SocketServer 11.23	ON-LINE
Device 00...	AIR-1P	10.8.41.3		SocketServer 11.37	ON-LINE
Device 00...	RTS-1P (5-30V)	10.8.14.15		SocketServer 11.30	ON-LINE
Device 00...	UP-1P (5-30V)	10.8.14.16		EtherNet/IP 7.10	ON-LINE
Device 00...	UP-2P (2E)	10.8.41.23		Modbus Router 7.07	ON-LINE
Device 00...	UP-2P (DB9/2E)	10.8.14.24		SocketServer 11.23	ON-LINE
Device 00...	DM 3103	10.8.14.23		SocketServer 11.23	ON-LINE

A context menu is open over the selected device 'Device 00... TCP-DB9/RJ45-PM', showing options: Refresh Device, Properties, Edit Notes, Webpage, Telnet / SSH Session, Advanced, Configuration, Tracker, Rename, Move, Delete, and Help...

- 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.



- Optionally, enter the DeviceMaster serial number in the event you need to contact Pepperl+Fuchs.

Note: The device status from the main screen displays in the Device Status list box.
- 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.
- 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.
- Leave the **Bootloader Timeout** set to the default 15.
- Click **Apply Changes** and **Close**.
- Go to *Check the SocketServer Version* on Page 15 to verify that you have the latest SocketServer version.

2.5. Program the IPv6 Address (Network Information)

You must use DeviceMaster web page to program an IPv6 address. You can refer to www.ipv6.com 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.

The screenshot shows the 'Network Configuration' page in a browser. The URL is 10.8.3.100/network-config.asp. The page has a navigation bar with 'Home', 'Port', 'Network', 'Diagnostics', 'System', and 'Help'. Below the navigation bar, there are tabs for 'Configuration', 'Password', 'Security', 'Keys/Certs', 'Email', and 'RFC1006'. The main content area is titled 'Network Configuration' and contains three panels: 'General', 'IPv4', and 'IPv6'. The 'IPv6' panel is active, showing radio buttons for 'Use DHCPv6', 'Disable IPv6 networking', and 'Use static config below'. The 'Use static config below' option is selected. Below this, there are input fields for 'Address' (2013:dc9::192:168:e), 'Prefix Length' (64), and 'Gateway' (::). There is also a 'Link-Local' field with the value fe80::20d:81ff:fe09:a0c. A green 'Save' button is located at the bottom right of the configuration area.

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

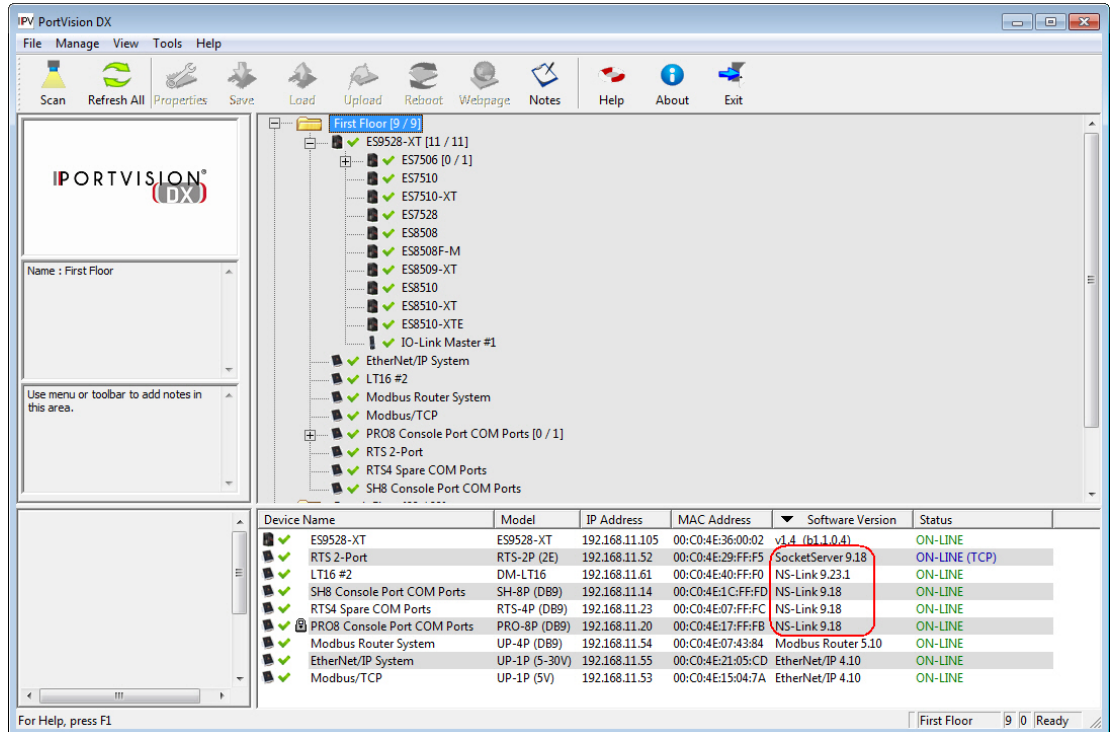
7. Click the **System** tab and then click the **Reboot** option.
8. Optionally, click the **Reboot Now** button or let the web page reboot using the timer.
9. Go to *Check the SocketServer Version* on Page 15 to verify that you have the latest SocketServer version.

2.6. Check the SocketServer Version

Check the SocketServer version installed on the DeviceMaster against the latest SocketServer version available through Technical Support.

1. If necessary, start PortVision DX: **Start > Pepperl+Fuchs > PortVision DX.**

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



2. If desired, check with Technical Support for the latest SocketServer version.
3. If necessary, 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 *Device Driver Installation* on Page 17.

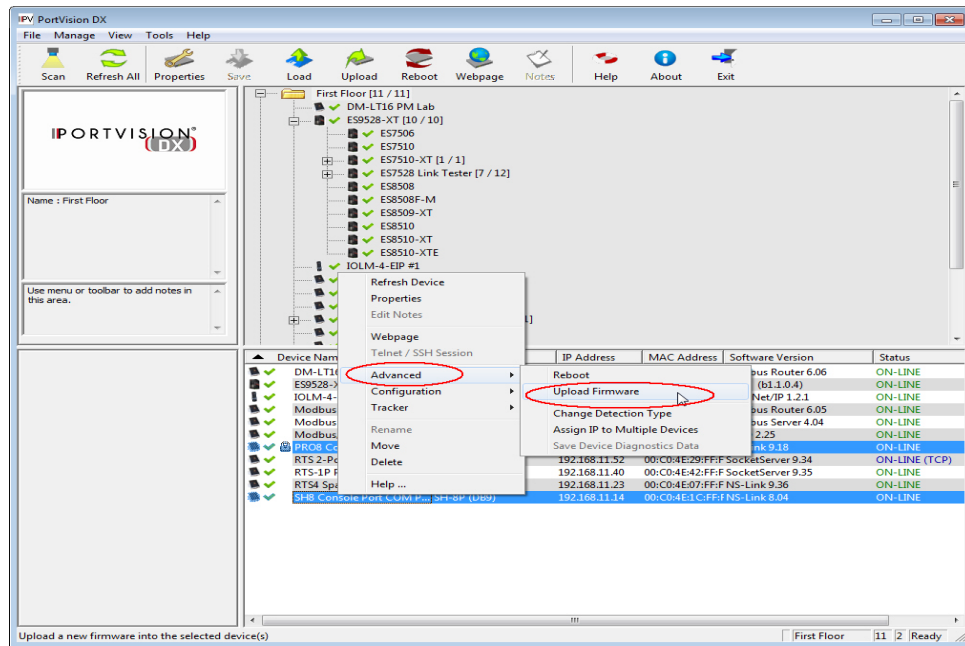
2.7. Uploading SocketServer

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.

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.

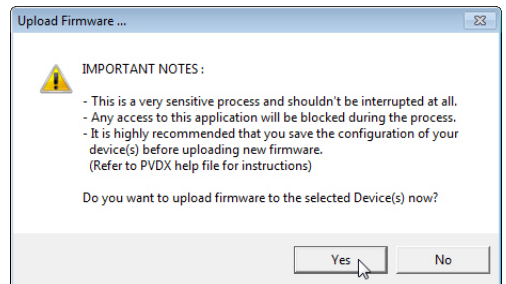
1. Start PortVision DX, click: **Start > Pepperl+Fuchs > PortVision DX**.
2. Right-click the DeviceMaster or DeviceMasters of which you want to upload the latest version of SocketServer and then click **Advanced > Upload Firmware**.



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

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

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





3. Device Driver Installation

This section discusses the following topics:

- *Installation Setup Wizard* on Page 18 for initial installation procedures
- *Checking the Device Driver Version* on Page 23
- *Updating the Device Driver* on Page 23
- *Adding to an Existing Installation* on Page 27

3.1. Installation Overview

Windows Driver Management Console specific installation instructions for the DeviceMaster and RocketPort are discussed below.

3.1.1. DeviceMaster

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

- *Updating the Device Driver* on Page 23 if you want to update the existing driver.
- *Adding to an Existing Installation* 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 *Before Installing the DeviceMaster Driver* on Page 8 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.

3.1.2. RocketPort

If there is a device driver already installed on your system for the RocketPort, see *Updating the Device Driver* on Page 23 or *Adding to an Existing Installation* on Page 27.



3.2. Installation Setup Wizard

You can use the following procedure to install the device driver for DeviceMaster or RocketPort, which is used to configure the driver.

Note: Most installation steps are the same for the DeviceMaster and RocketPort. Some procedures are specific to the products and are identified accordingly.

1. Download the appropriate device driver from <https://www.pepperl-fuchs.com> 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.

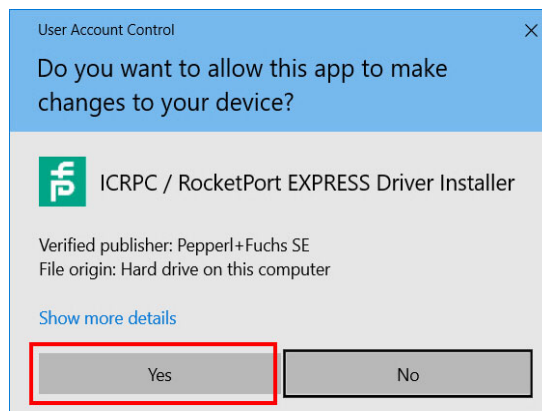
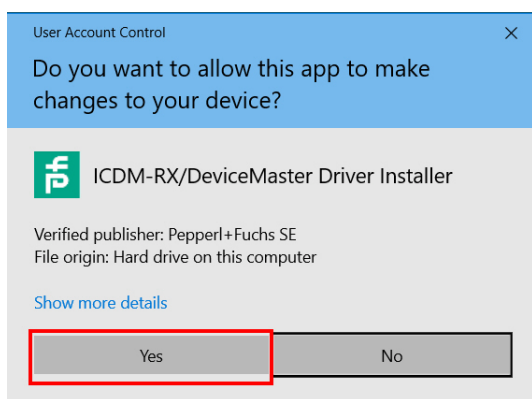
3. **RocketPort:**

- a. Install the adapter and connect the interface (Quad cable, Octacable, or breakout box). If you need hardware installation procedures, you can download the *ICRPC and ICRPB (RocketPort EXPRESS) Hardware Installation Manual*.

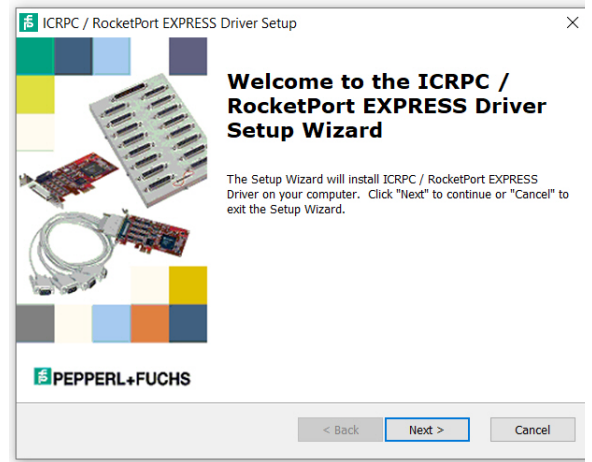
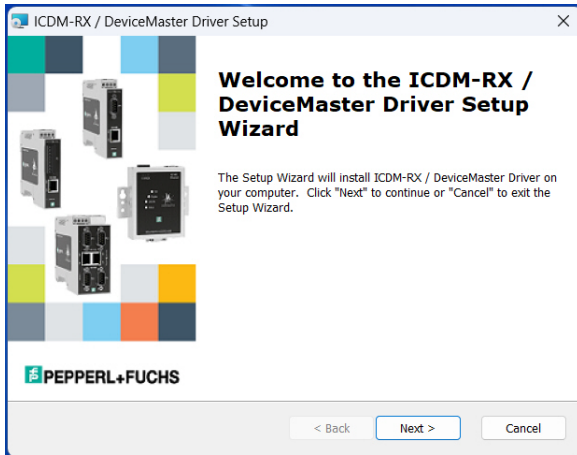


Do not connect RS-422/485 devices until the appropriate port interface type has been configured in the device driver.

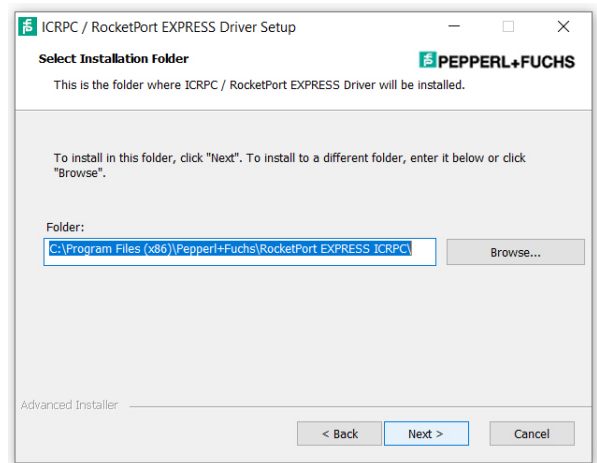
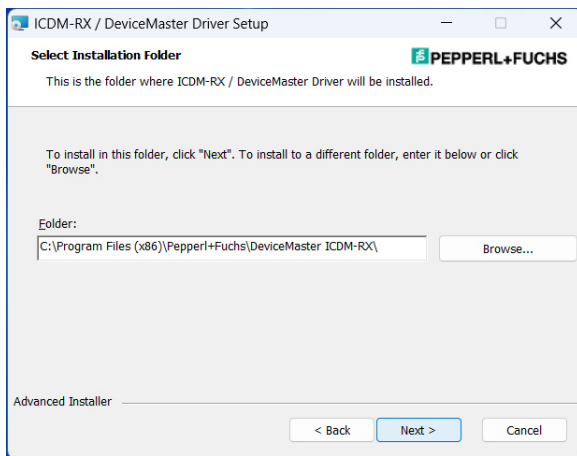
- b. Click **Cancel** if a *Found New Hardware* message appears.
4. Start the installation by executing the **.exe** file for your device.
 5. If necessary, click the **Yes** button to the *Do you want to allow this app to make changes to your device* message.



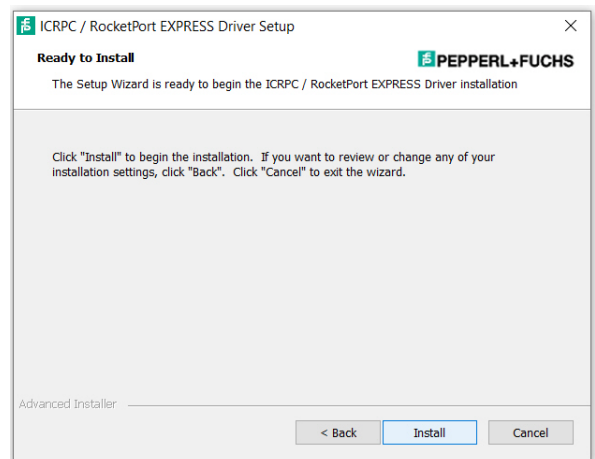
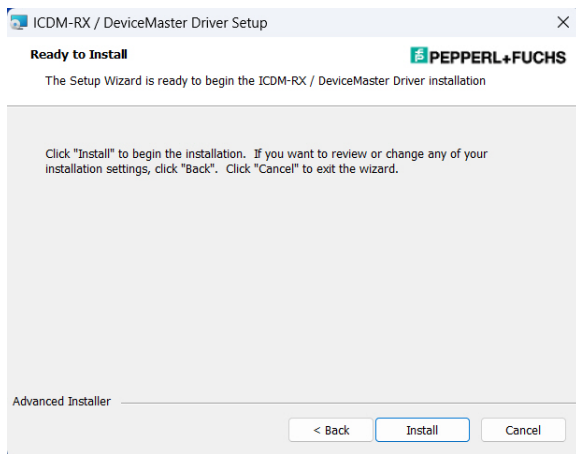
6. Click **Next** to start the installation.



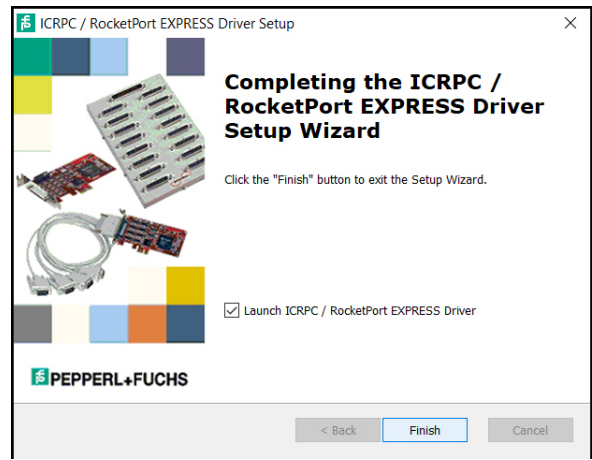
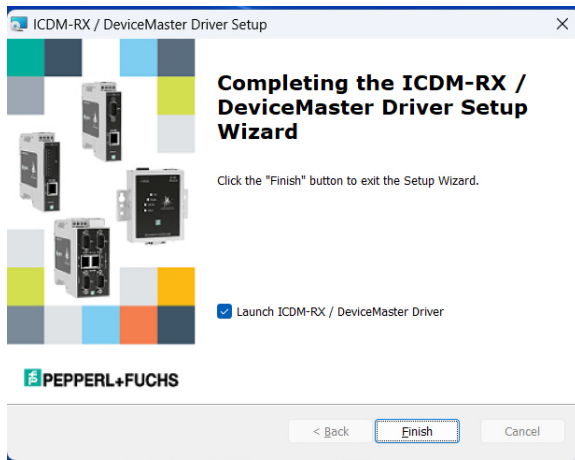
7. Optionally, enter a different location to install the driver files.



8. Click **Install**.

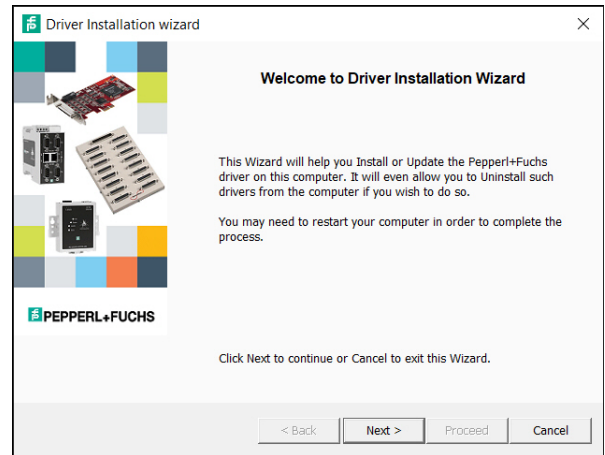
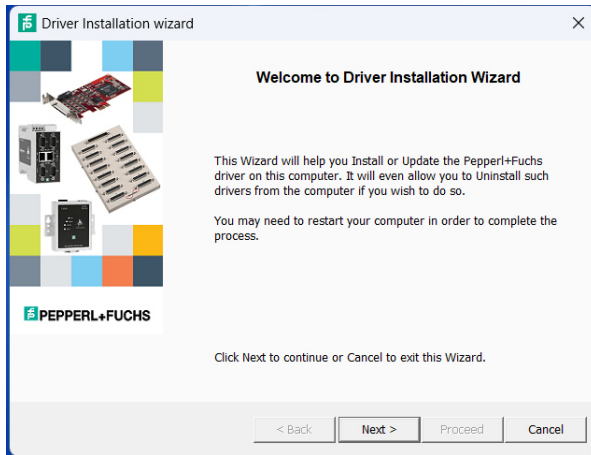


9. Leave the *Launch* option checked and click **Finish**.

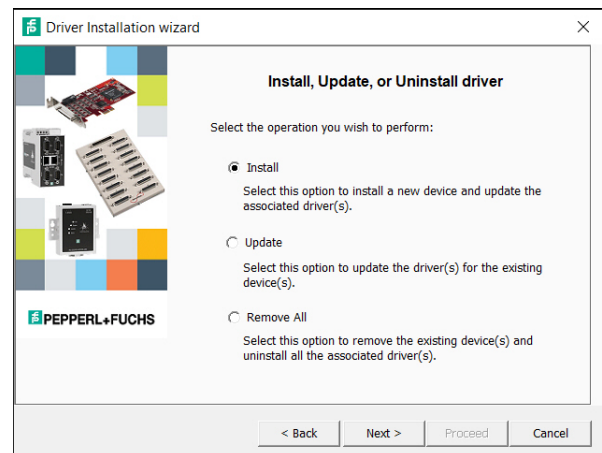
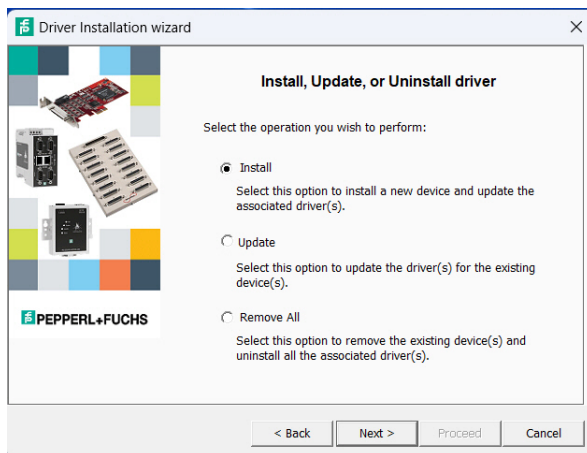


Note: Additionally, a shortcut is available under Pepperl+Fuchs in the Start menu.

10. Click **Next** to install the driver.

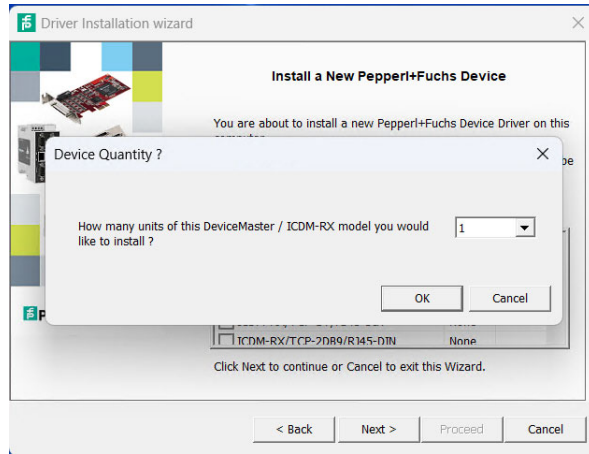


11. Click **Install** and **Next**.

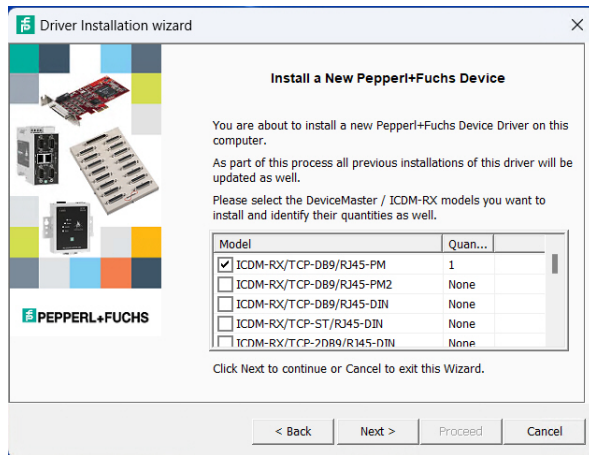


12. **DeviceMaster:**

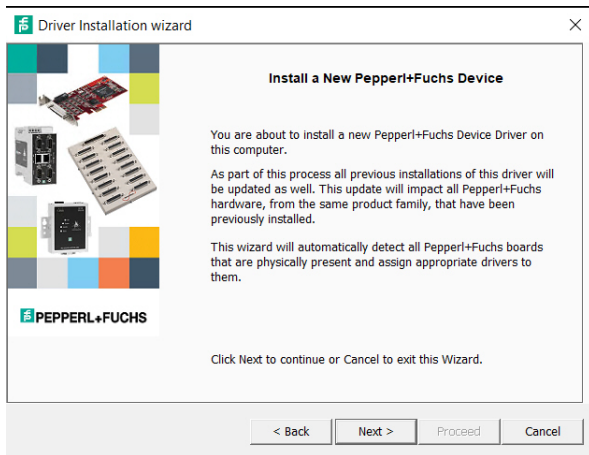
- a. Select the model that you want to install and enter the number of this DeviceMaster model that you want to install and click **Ok**.



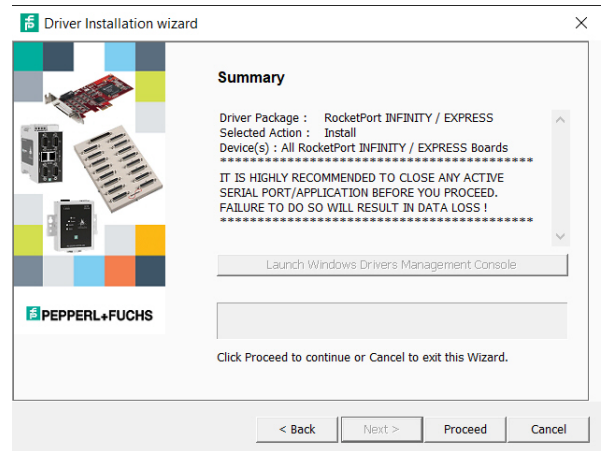
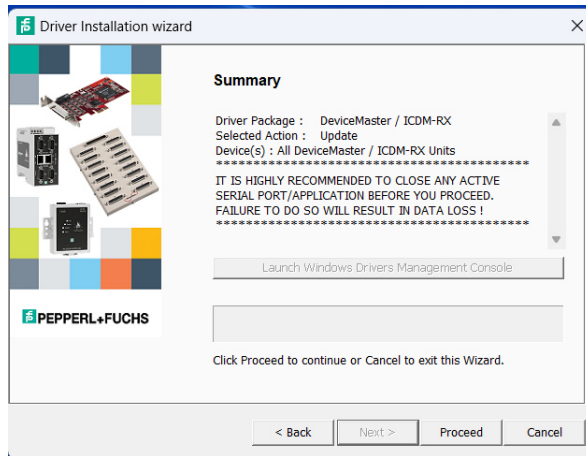
- b. Click **Next**.



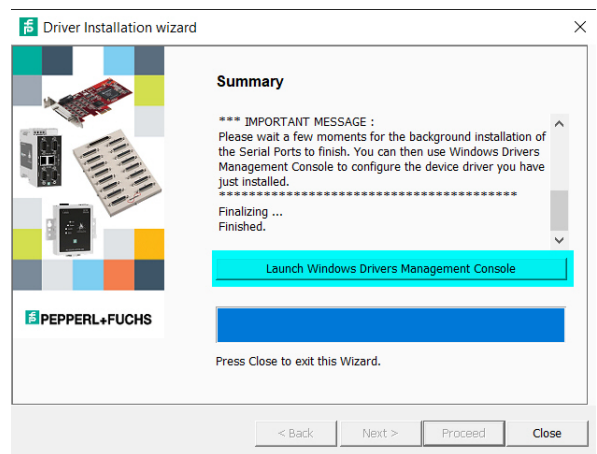
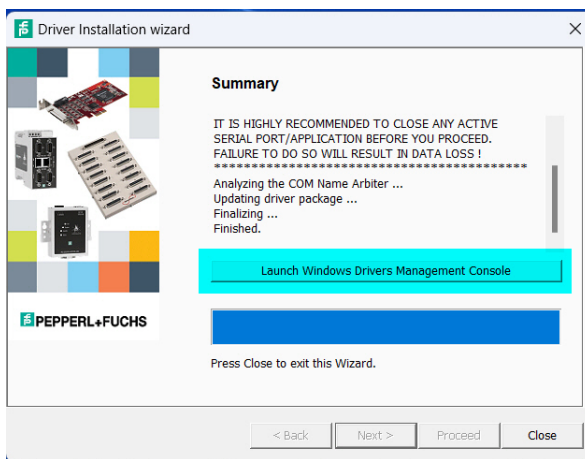
- c. Repeat Step 12 for each DeviceMaster that you want to install and click **Next**.
13. **RocketPort:** click **Next**.



14. Click **Proceed**.



15. Click the **Launch DeviceMaster** or **RocketPort** button.



Note: You can close the Driver Installation Wizard after launching the Windows Driver Management Console.

16. **DeviceMaster:**

- Go to *Device Driver Configuration* on Page 28 to start NS-Link device driver configuration.
- The device driver installation is not complete until you have configured the DeviceMaster using procedures discussed in *DeviceMaster Associating the MAC Address* on Page 36.
- After associating the MAC address, go to *Configuring Device Settings* on Page 43 to set up device properties (device name and starting COM port number).
- Go to *Configuring COM Port Properties* on Page 47 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 *ICDM-RX/TCP Installation and Configuration Manual*

17. **RocketPort:**

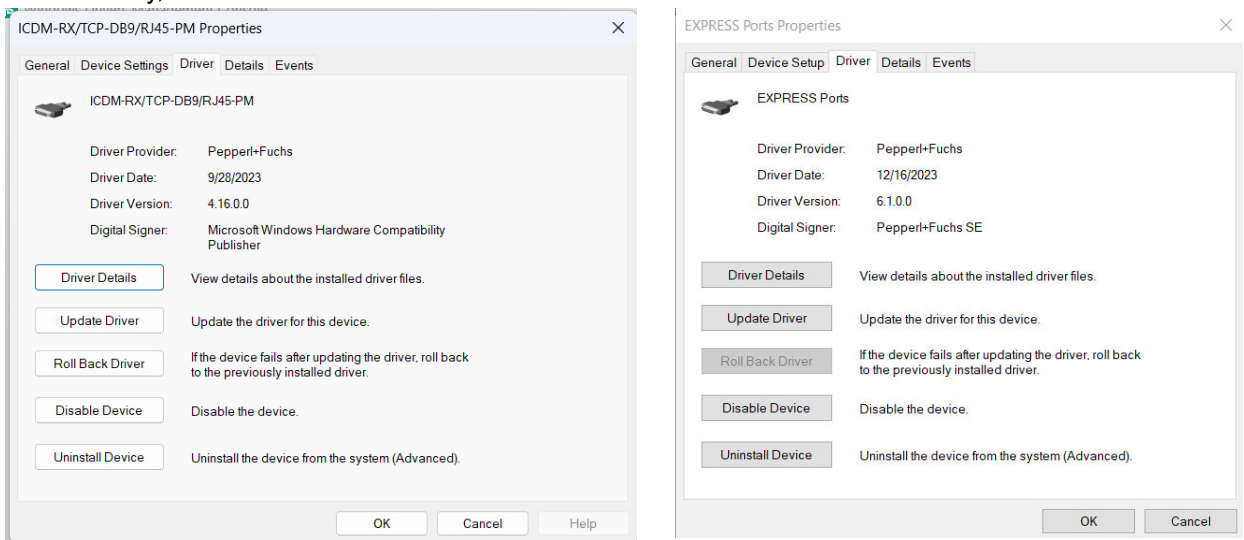
- Go to *Configuring COM Port Properties* on Page 47 to configure the COM port properties for RocketPort adapters
- If desired, go to *Configuring Device Settings* on Page 43 to set up advanced device properties (device name and starting COM port number).

After driver installation and configuration, connect the serial devices to the ports. For information about the RocketPort connectors, refer to the *ICRPC and ICRPB (RocketPort EXPRESS) Hardware Installation Manual*.

3.3. Checking the Device Driver Version

You can check the driver version using the following procedure.

1. In the *Windows Driver Management Console* for your product, right-click your product and click **Properties**.
2. If necessary, click the **Driver** tab to view the device driver version.



Note: Please note that Microsoft truncates leading zeros in the versions number.

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

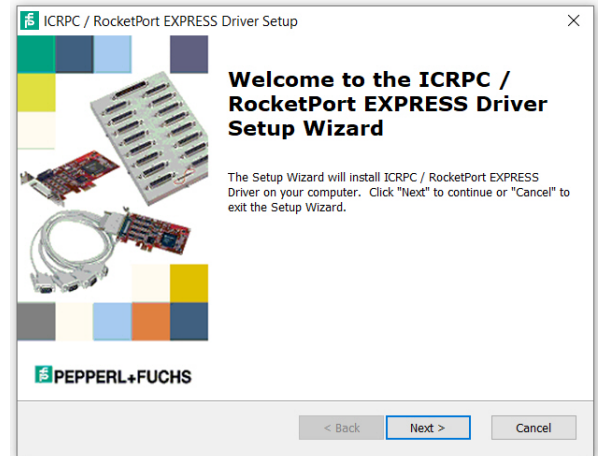
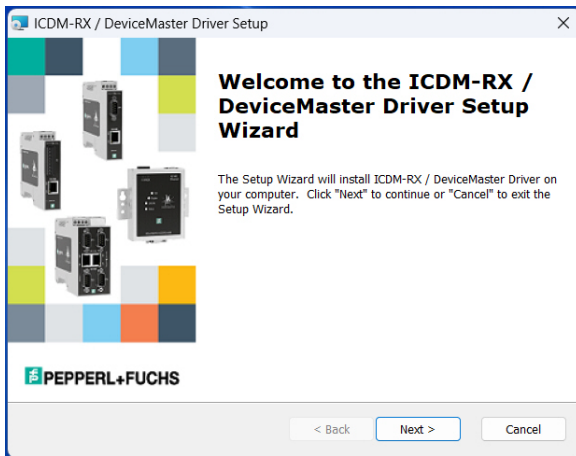
3.4. Updating the Device Driver

Use the following procedure to update the device driver after initial installation.

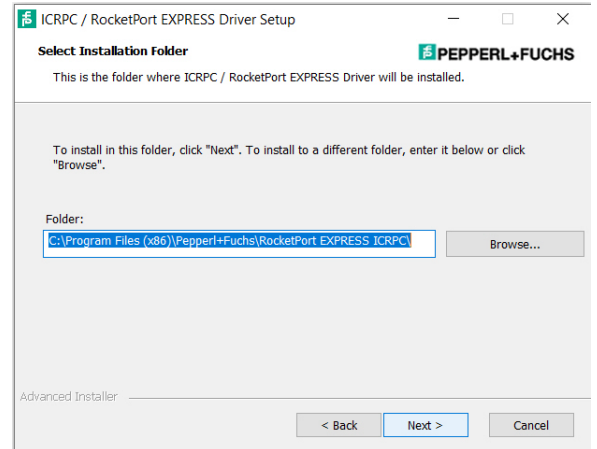
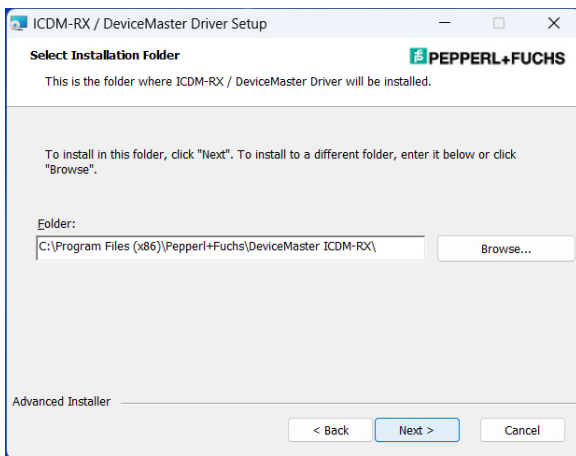
If you are unsure what driver version is running, see *Checking the Device Driver Version* on Page 23.

1. Locate the *latest driver assembly* and copy it to a location that is available to the host.
2. Close any applications that are using serial ports before the 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.

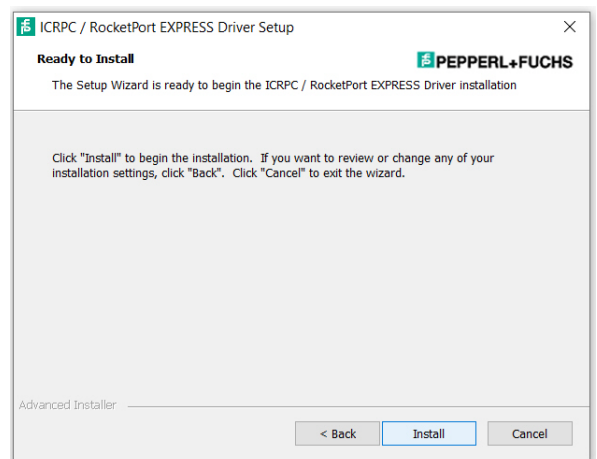
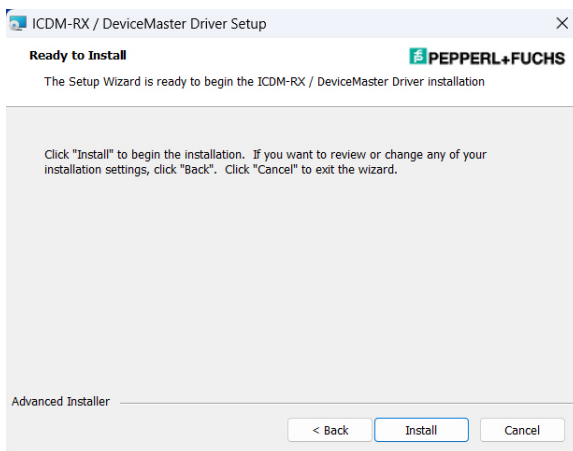
5. Click **Next** to start the *Installation Setup Wizard*.



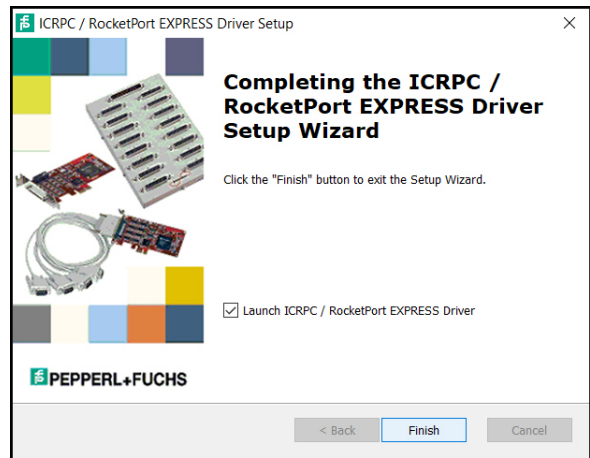
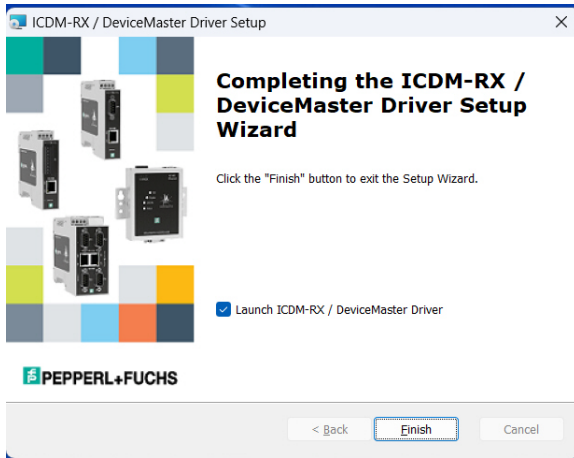
6. Optionally, enter a different location to install the latest device driver files.



7. Click **Install**.

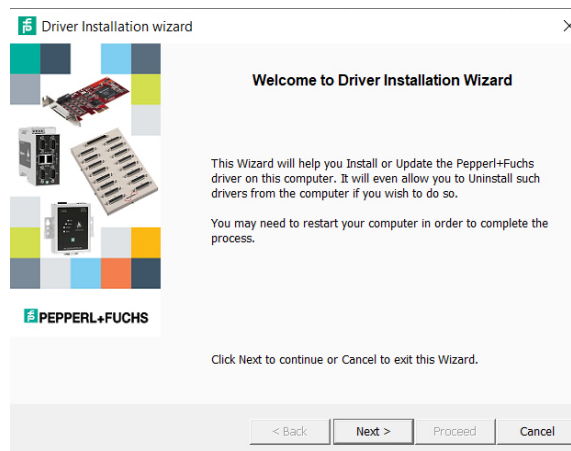


8. Leave the **Launch DeviceMaster or RocketPort Driver Installation** box checked and click **Finish**.

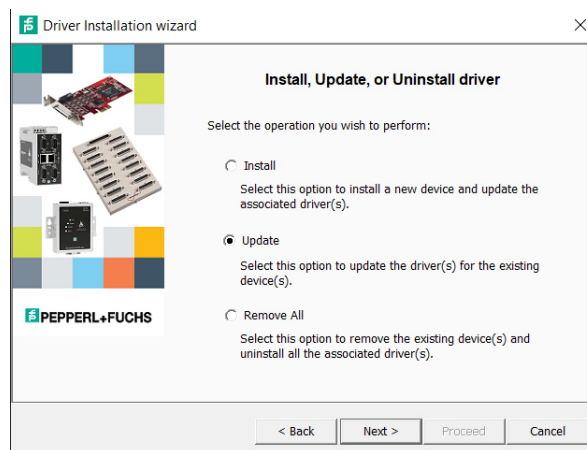


If you do not check this box, you can use the shortcut under the **Start** button at: **Pepperl+Fuchs > Product Driver Installation Wizard**.

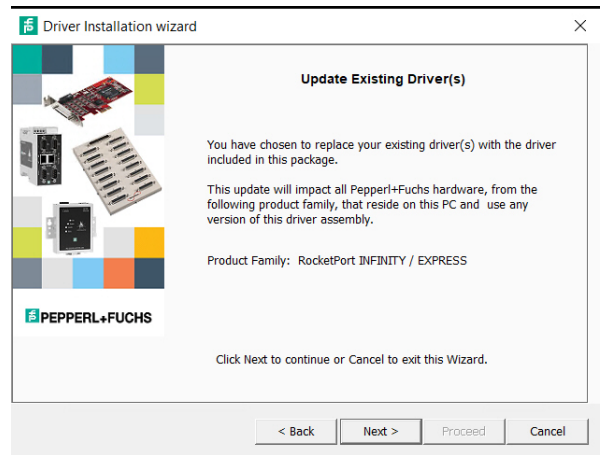
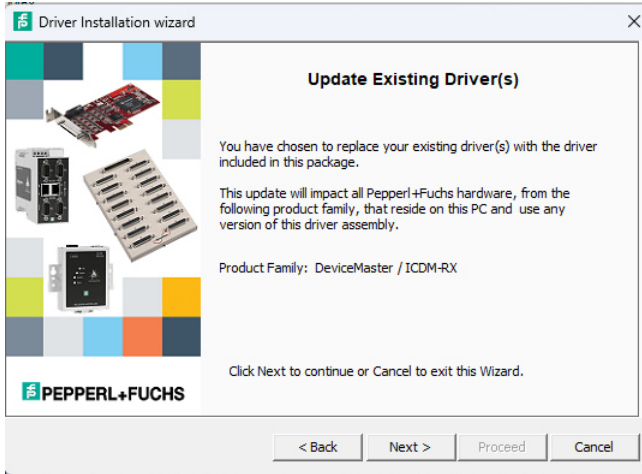
9. Click **Next** to update the driver.



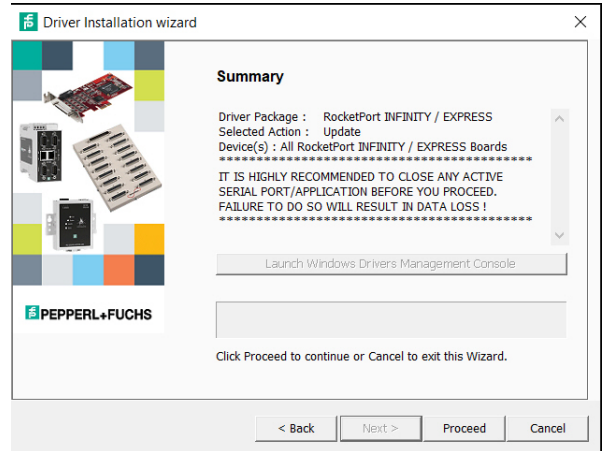
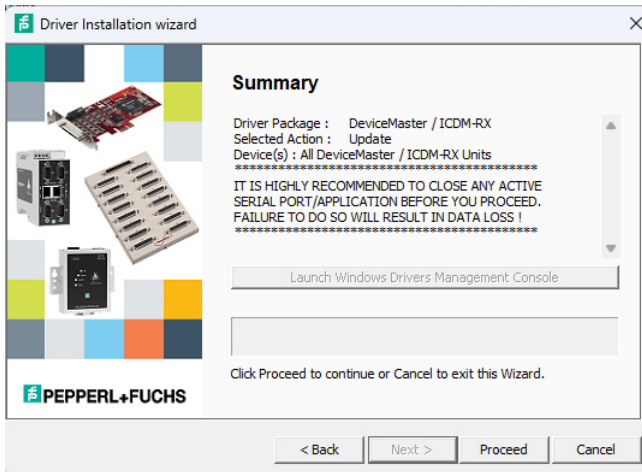
10. Click **Update** and **Next**.



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

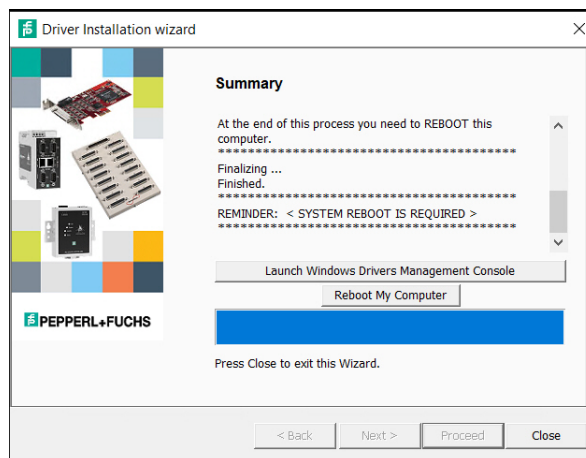


12. Click **Proceed**.

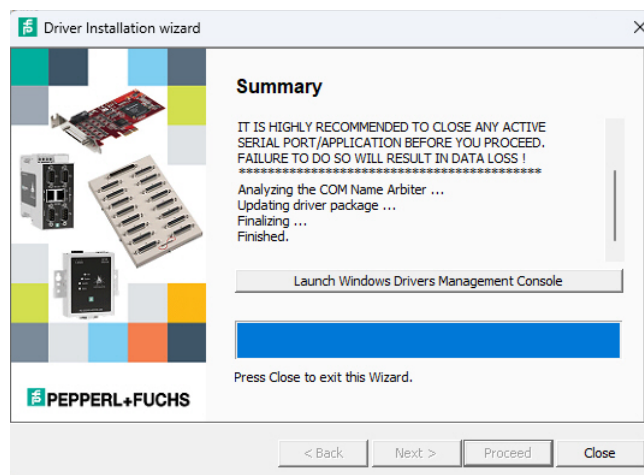


Note: This may take several minutes depending upon the number of ports involved in the update.

13. **RocketPort:** click **Reboot My Computer** for the update to complete.



- Click the **Launch Windows Driver Management Console** button to configure the ports or device properties.



- Return to the *Installation wizard* and click **Close**.
- If necessary, go to *Configuring COM Port Properties* on Page 47 to configure the COM port properties.
- If desired, go to *Configuring Device Settings* on Page 43 to set up advanced device properties (device name and starting COM port number).

3.5. Adding to an Existing Installation

Use the following procedure to add a DeviceMaster or RocketPort to an existing installation.

- Close any applications that are using serial ports before the device driver installation.
- RocketPort:** Install the adapter and connect the interface (Quadcable, Octacable, or interface box).
DeviceMaster: Connect the DeviceMaster to your network and use PortVision DX to program the IP address.

If you need hardware installation procedures, see <https://www.pepperl-fuchs.com>.



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.

- RocketPort:** Click **Cancel** if a *Found New Hardware* message appears.
- From the **Start** button, click **Pepperl+Fuchs > Product Driver Installation Wizard**.
- Click the **Yes** button to the *Do you want to allow this app to make changes to your device* message.
- Click **Next** to start the *Windows Driver Management Console*.
- Click **Install** and **Next**.
- Click **Next** and follow the *Installation Wizard* for the remainder of the installation steps if needed.
 - RocketPort:** Refer to Step 11 on Page 20
 - DeviceMaster:** Refer to Step 12 on Page 21,



4. Device Driver Configuration

4.1. Overview

This chapter discusses driver configuration for the Windows Driver Management Console.

4.1.1. DeviceMaster

If you programmed an IPv4 address into the DeviceMaster 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.

DeviceMaster Driver Configuration Overview on Page 28 provides configuration procedures.

4.1.2. RocketPort

The RocketPort driver configuration discussions are available.

- *Using the Windows Driver Management Console* on Page 30
- *Configuring Device Settings* on Page 43
- *Configuring COM Port Properties* on Page 47

4.2. DeviceMaster Driver Configuration Overview

This subsection provides information for the DeviceMaster driver configuration.

- *NS-Link Device Driver Configuration Considerations*
- *Using the Windows Driver Management Console* on Page 30
- *DeviceMaster Associating the MAC Address* on Page 36
- *Using the Driver in IPv4 Mode* on Page 39
- *Using the Driver in IPv6 Mode* on Page 40
- *Enabling SSL* on Page 41
- *Configuring Device Settings* on Page 43
- *Configuring COM Port Properties* on Page 47
- *DeviceMaster Network Configuration* on Page 52
 - *Disabling IPv4 Mode* on Page 52
 - *Changing a Static IPv4 Address* on Page 53
 - *Setting Up DHCP (IPv4)* on Page 54
- *Configuring DeviceMaster Ports as Sockets* on Page 56
- *Enabling Secure Data Mode* on Page 58

4.2.1. 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.

4.2.2. 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 *address conflict* at setup.
- It is isolated from foreign LAN segments minimizing potential security issues.
- Maximizes throughput of serial data.

4.2.3. NS-Link Device Driver Features

During initial installation and configuration of the NS-Link device driver, Pepperl+Fuchs 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:

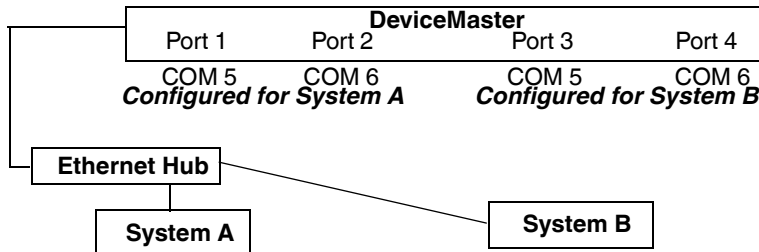
- Access the *Advanced* tab to review PC network or device network interface statistics
- Program or change an IP address using through the **Network Settings** button
- Reboot the DeviceMaster from the *Windows Driver Management Console*

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.

4.2.4. Using the Port Sharing Feature

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..



Example: Multiple systems can use the same COM port names.

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.

4.3. Using the Windows Driver Management Console

This subsection discusses basic *Windows Driver Management Console* operations, such as:

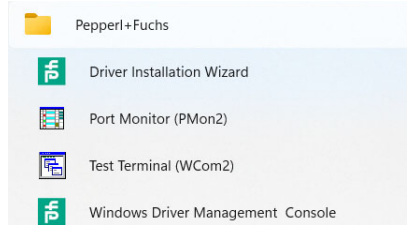
- *Accessing the Windows Driver Management Console*
- *Displaying All Installed Devices on Page 31*
- *How to Configure Device Properties on Page 32*
- *Customizing the Device Name on Page 33*
- *Customizing the COM Port Name on Page 34*
- *How to Configure COM Port Properties on Page 35*
- *How to Save Changes on Page 35*

DeviceMaster: See *DeviceMaster Associating the MAC Address on Page 36* to start DeviceMaster configuration procedures.

RocketPort: See *Configuring Device Settings on Page 43* to start configuration procedures for your adapter.

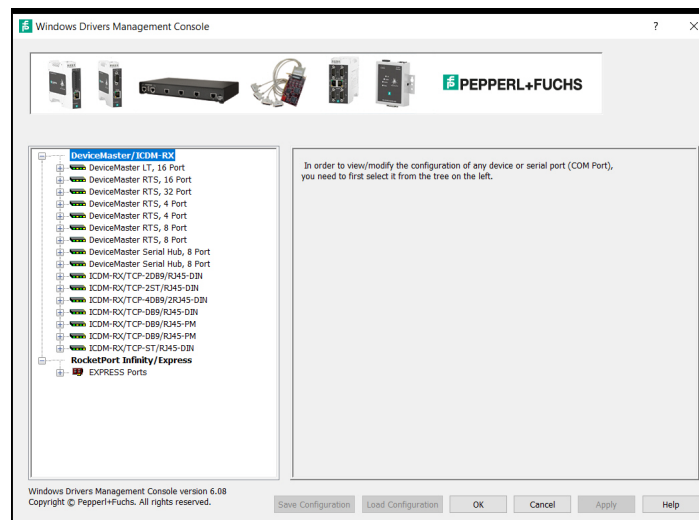
4.3.1. Accessing the Windows Driver Management Console

Access the *Windows Driver Management Console* located under **Start > Pepperl+Fuchs > Product > Windows Driver Management Console**.



4.3.2. Displaying All Installed Devices

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



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.

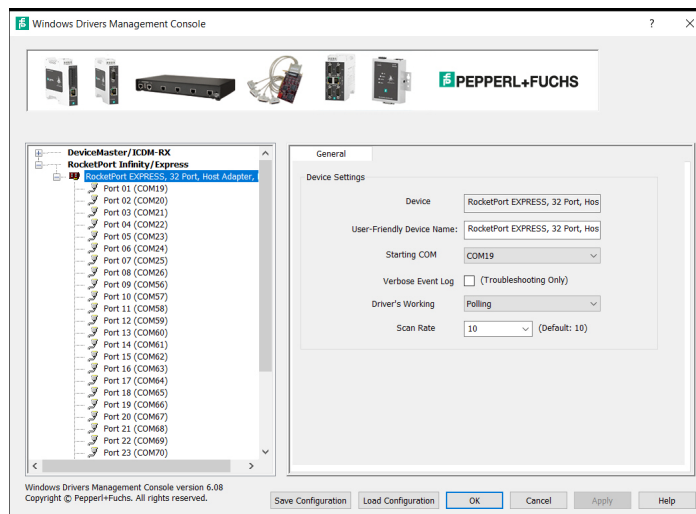
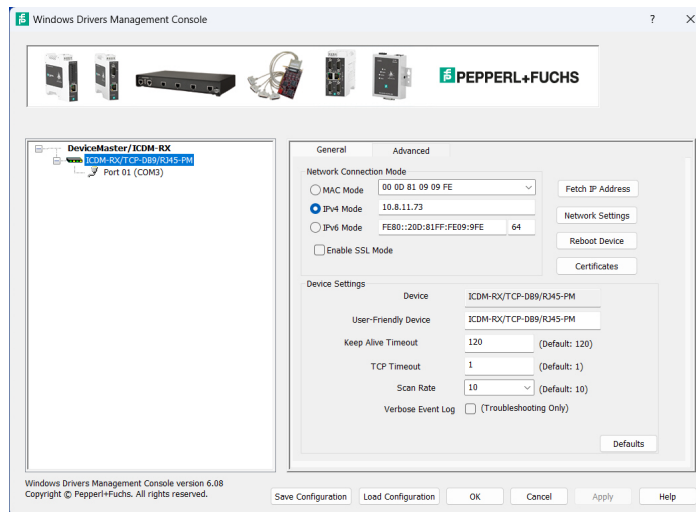
4.3.3. How to Configure Device Properties

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 *Windows Driver Management Console* open.
- Click **OK** to save the changes and close the *Windows Driver Management Console*.
- Click **Cancel** to close the *Windows Driver Management Console* without saving the changes.

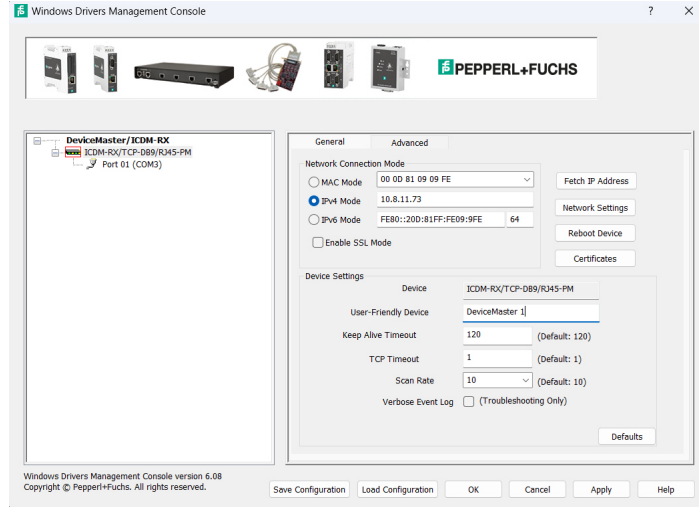
If you click a port or device name without saving the changes, the *Windows Driver Management Console* prompts you to **Apply**, **Ignore**, or **Cancel** the changes.

For more information, see *Configuring Device Settings* on Page 43.

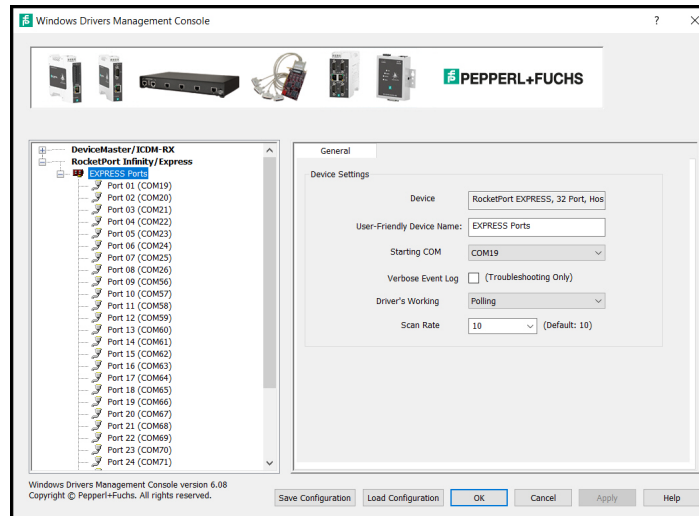


4.3.4. Customizing the Device Name

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.



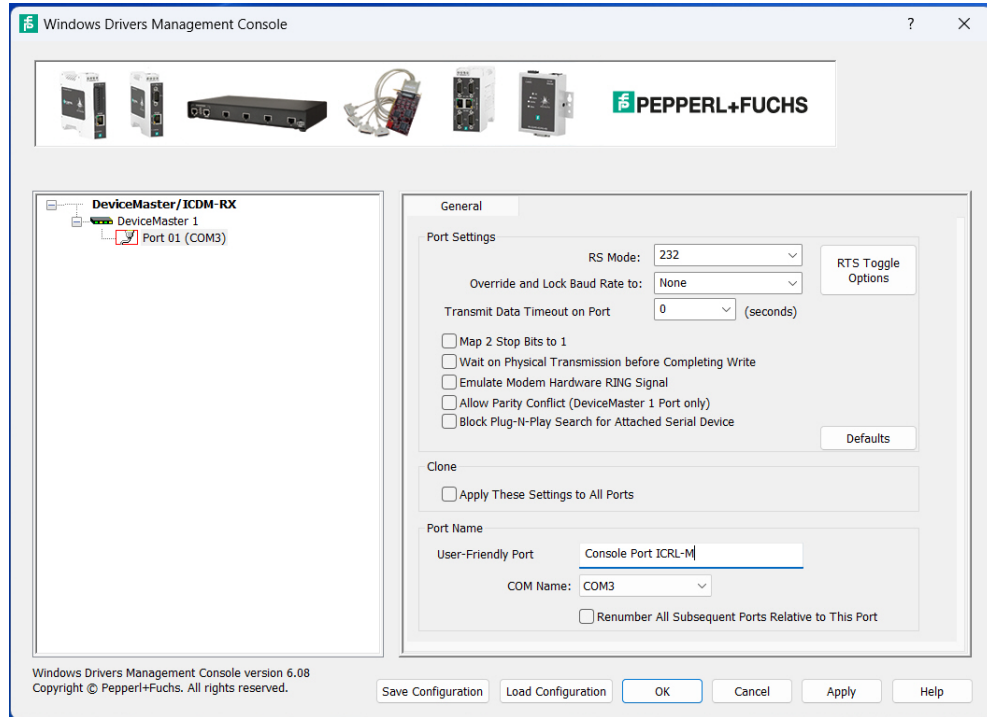
Note: The Device Name will display the next time you open the Windows Driver Management Console.



4.3.5. 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.

Note: This displays a DeviceMaster, the RocketPort Port pages are the same.



4.3.6. 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:

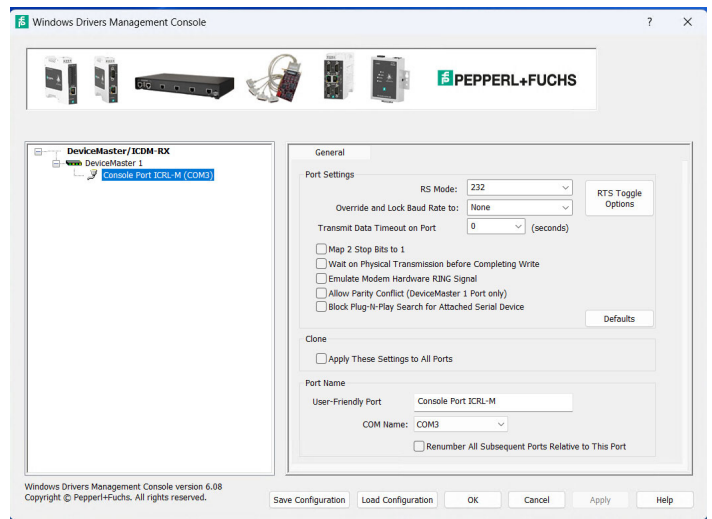
- Click **Apply** to save the changes, which saves the changes and leaves the *Windows Driver Management Console* open.
- Click **OK** to save the changes and close the *Windows Driver Management Console*.
- Click **Cancel** to undo the changes and close the *Windows Driver Management Console*.

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

For more information, see *Configuring COM Port Properties* on Page 47.

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

Note: *Not all products support the Terminate Resistor Options feature.*

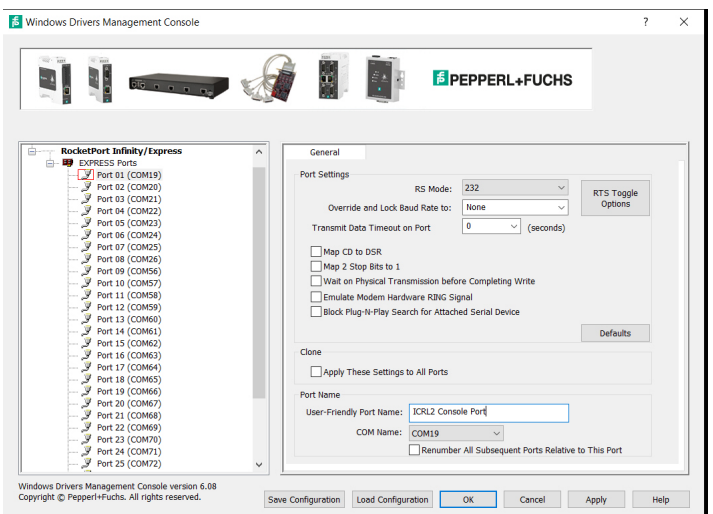


4.3.7. How to Save Changes

The *Windows Driver 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 *Windows Driver Management Console* open for further configuration.
- Clicking the **Ok** button saves the changes on that tab and closes the *Windows Driver Management Console*.
- Clicking the **Cancel** button cancels the changes on that tab and closes the *Windows Driver Management Console*.

Note: *The red frame around Port indicates that the change has not been saved.*



4.4. DeviceMaster Driver Configuration

4.4.1. DeviceMaster 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)
- *Different Physical Segment* on Page 38

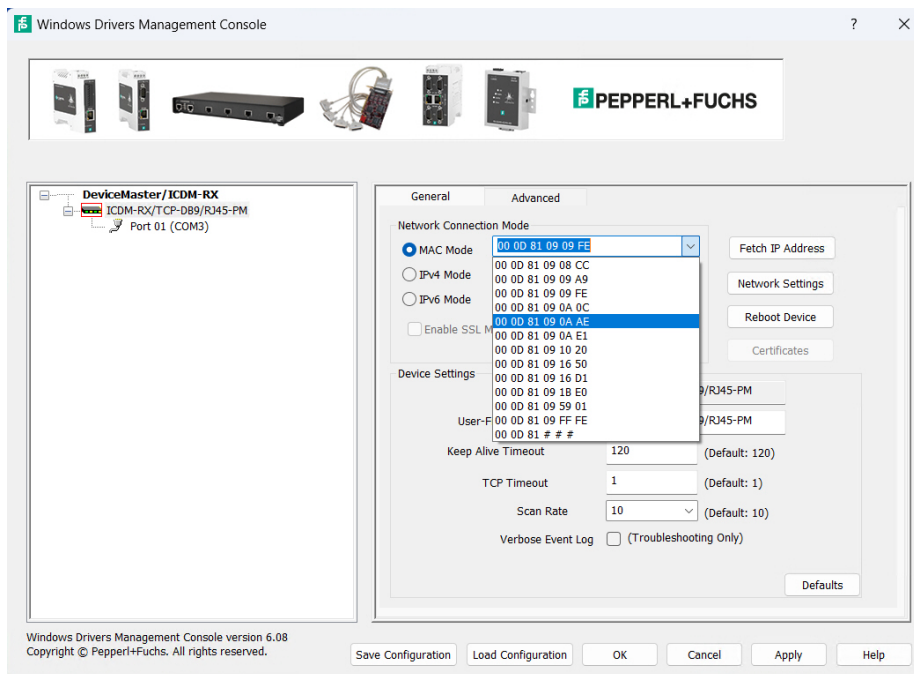
Although you can and should associate a MAC address on a different physical segment, the DeviceMaster must be connected to the local network segment or directly to a NIC on the host system for the NS-Link driver to **operate** in *MAC Mode*.

4.4.2. 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 *Windows Driver Management Console*, click **Start > Pepperl+Fuchs > Windows 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 0D 81** or **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.

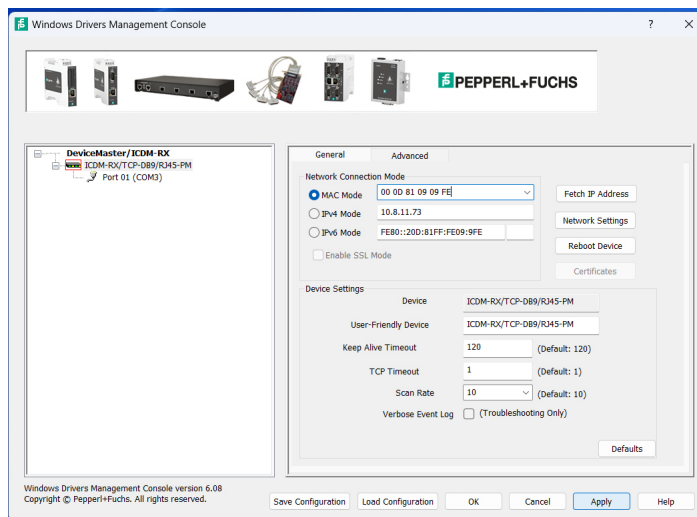
If you programmed the IPv4 address using PortVision DX, the IPv4 address displays in the **IPv4 Mode** text box.

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 *Advanced* tab and verify that the *Device 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:
 - *Using the Driver in IPv4 Mode* on Page 39
 - *Using the Driver in IPv6 Mode* on Page 40
 - Enable SSL, see *Enabling SSL* on Page 41
 - Configure device properties, see *Configuring Device Settings* on Page 43.
 - Configure COM port properties, see *Configuring COM Port Properties* on Page 47.
 - Configure any of the DeviceMaster ports as sockets, see *Configuring DeviceMaster Ports as Sockets* on Page 56.

4.4.3. 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 *Windows Driver 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.



Note: When you enter the MAC address, make sure that you use the correct format: 00 0D 81 or 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 *Windows Driver 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 *Using the Driver in IPv6 Mode* on Page 40.
 - Configure a DHCP addressing, refer to *DeviceMaster Network Configuration* on Page 52
 - Configure device properties, see *Configuring Device Settings* on Page 43.
 - Configure COM port properties, see *Configuring COM Port Properties* on Page 47.
 - Configure any of the DeviceMaster ports as sockets, see *Configuring DeviceMaster Ports as Sockets* on Page 56.

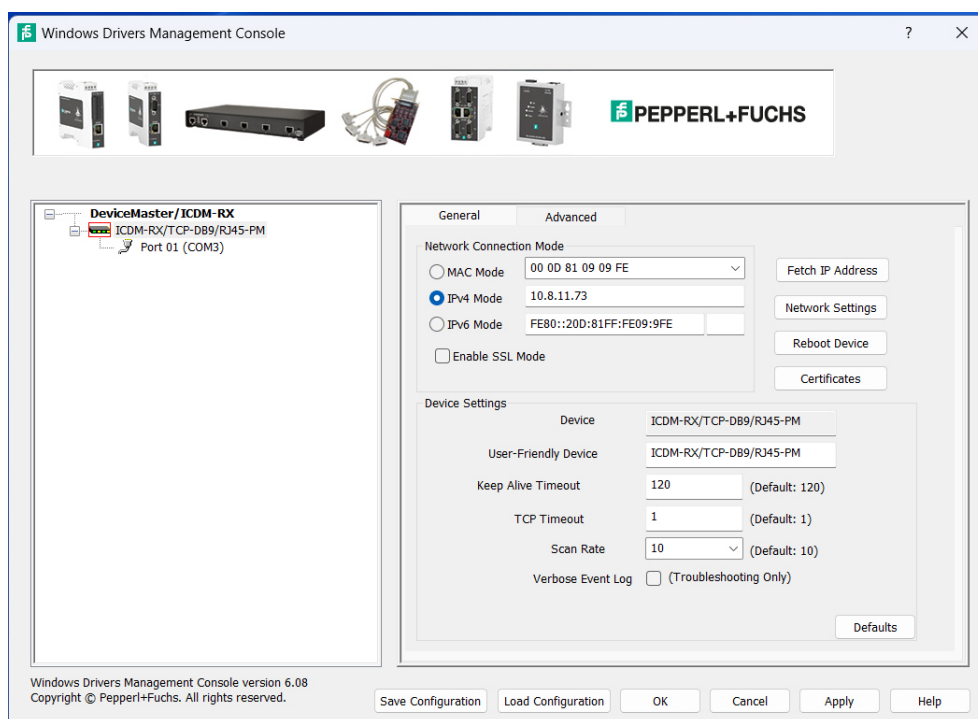
4.4.4. Using the Driver in IPv4 Mode

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 **IP Mode** text box with the DeviceMaster IP address.

4. Click the **IPv4 Mode** radio button.



5. If you do not have any other configuration changes, click **Apply**. If you have other configuration changes, refer to the appropriate subsection:

- *Enabling SSL* on Page 41
- *Configuring Device Settings* on Page 43

4.4.5. Using the Driver in IPv6 Mode

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

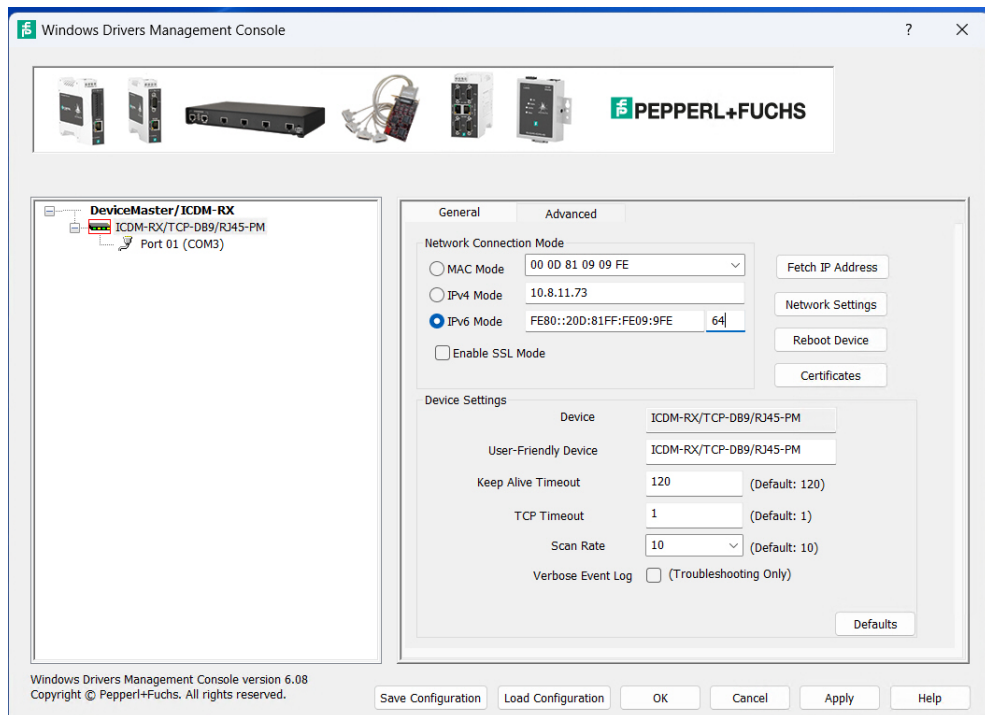
Note: You must first program the IPv6 address in the DeviceMaster. Refer to *Program the IPv6 Address (Network Information)* on Page 14 for IPv6 programming procedures.

You can refer to www.ipv6.com 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 Windows Driver 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, an entry is required.



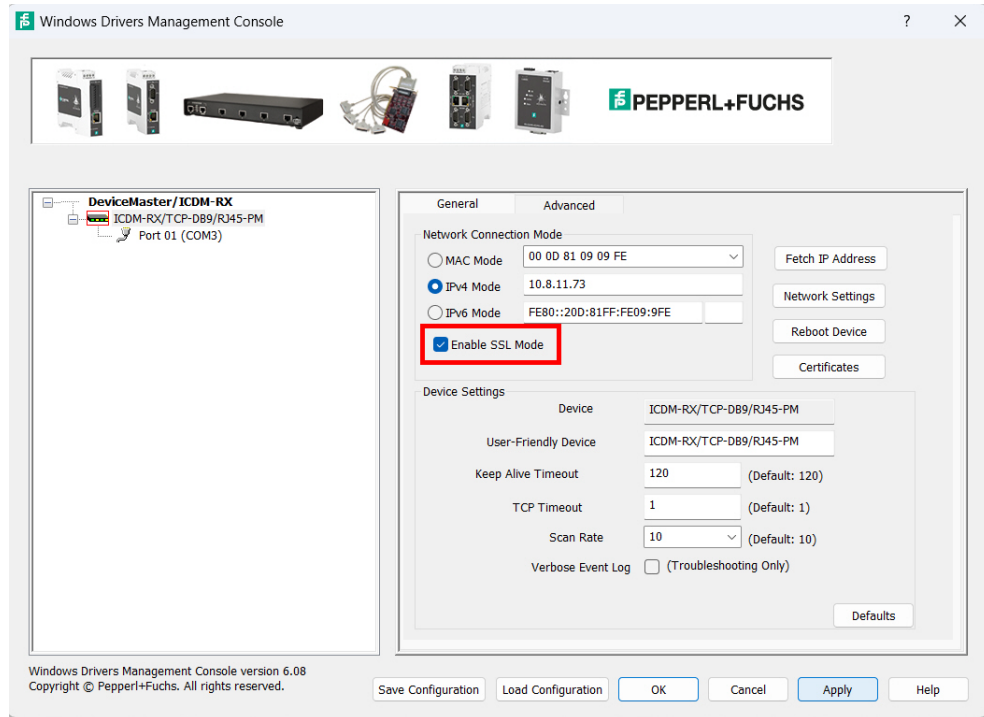
5. If you do not have any other configuration changes, click **Apply**. If you have other configuration changes, refer to the appropriate subsection:
 - *Enabling SSL* on Page 41
 - *Configuring Device Settings* on Page 43

4.4.6. Enabling SSL

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

Note: After configuring SSL Mode in the driver, remember that you will need to configure SSL Mode in the web interface (*Enabling Secure Data Mode on Page 58*).

1. Click **Enable SSL Mode** or go to Step 4.



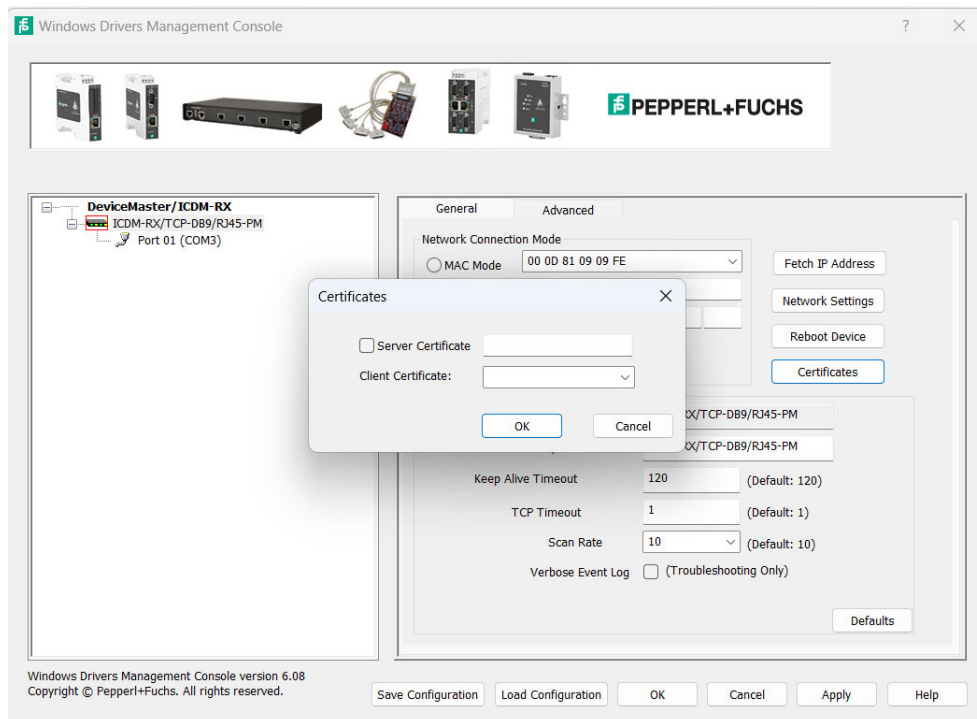
The DeviceMaster must be configured using IP Mode before you can **Enable SSL Mode**. If SSL Mode is enabled, TCP connections that carry data to/from the serial ports are encrypted using SSL or TLS security protocols. This includes the following:

- 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 Pepperl+Fuchs proprietary serial driver protocol are encrypted using SSL/TLS.
- Since SSL/TLS can not be used for either UDP data streams or for the Pepperl+Fuchs 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 Enable Secure Data Mode in the NS-Link web page.

- 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.

- 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.

- Click **Apply** or **Ok** to save the change and close the *Windows Driver Management Console*.
- You may need to perform some of the following tasks to complete the configuration process.

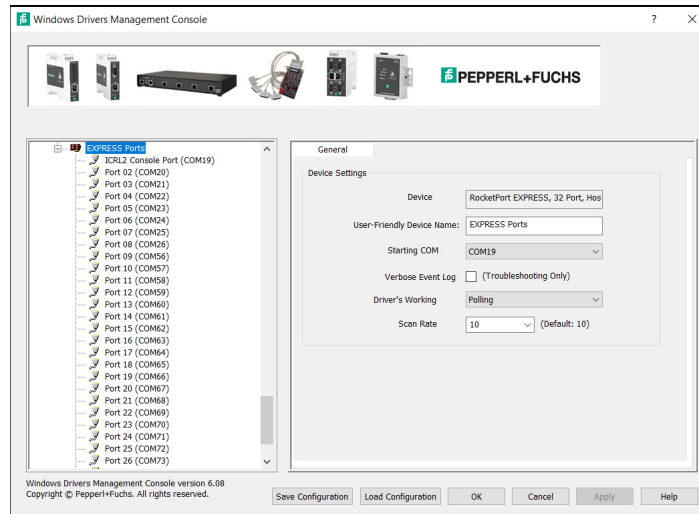
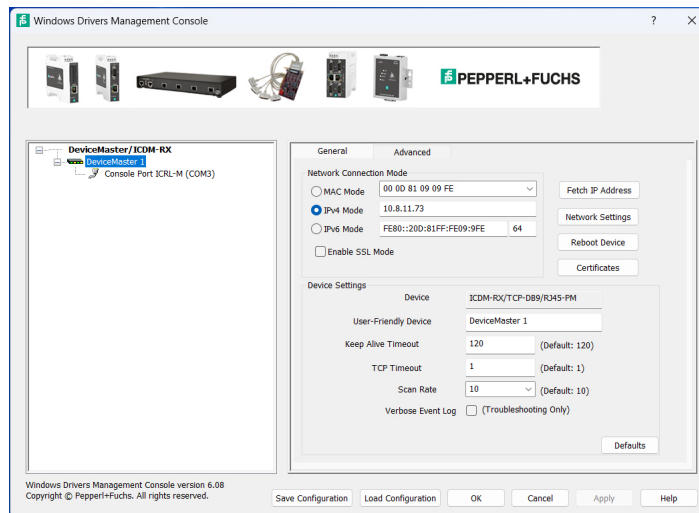
- Configure device properties, see *Configuring Device Settings* on Page 43.
- Configure COM port properties, see *Configuring COM Port Properties* on Page 47.

- Configure any of the DeviceMaster ports as sockets, see *Configuring DeviceMaster Ports as Sockets* on Page 56.
- Enable **Secure Data Mode** in the NS-Link web page, see *Enabling Secure Data Mode* on Page 58.

4.5. Configuring Device Settings

Use the following procedure to change device settings using the Windows Driver Management Console

1. Open *Windows Driver Management Console*.
2. Highlight the DeviceMaster or RocketPort device name that you want to configure.



3. If desired, change the **User-Friendly Device Name**.
4. **RocketPort:**
 - a. If desired, set a Starting COM Port number value.
 - b. Select the Driver's Working Mode.
 - c. Optionally, select a different Scan Rate (ms) (Page 44).

5. **DeviceMaster:**

- a. Optionally, set a different *Keep Alive Timeout* (Page 45) 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.

- b. Optionally, set the *TCP Timeout Multiplier* (Page 46) 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. Setting to 0 will inhibit the DeviceMaster from fully booting and will remain at a Redboot prompt.

- c. Optionally, click a different *Scan Rate (ms)* (Page 44).

6. Optionally, click **Verbose Event Log** if you want to log additional device information into the event log.

7. After making your changes, click **Apply** if you have additional configuration procedures or click **Ok** if you have completed configuring your Pepperl+Fuchs 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 Windows Driver Management Console.

Device General Tab	Descriptions
Common Options (DeviceMaster and RocketPort)	
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 .
Verbose Event Log Default = Disabled	Selecting this option causes detailed messages to be sent to the operating system <i>Event Log</i> . This added information can be useful when debugging communications and configuration problems
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. Note: The faster the scan rate (lower number), the higher the load on the system processor.
Save Configuration	Click <i>Save Configuration</i> to save the <i>Device Settings</i> for use on another similar Pepperl+Fuchs device or to archive a copy of your environments settings.
Load Configuration	Click to <i>Load Configuration</i> to load the <i>Device Settings</i> previously saved using the Save Configuration feature. <ul style="list-style-type: none"> DeviceMaster: Configuration files must be for the same model with the same port density. For example, you cannot load a configuration file onto a DeviceMaster or a configuration file for a 32-port DeviceMaster onto a 4-port DeviceMaster. RocketPort: You cannot a load configuration file from different models. For example, you cannot load a configuration file for a RocketPort INFINITY on a RocketPort.
Ok	Click Ok to save the changes made on this page and close the <i>Windows Driver Management Console</i> .
Cancel	Cancels any changes made on this page.

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Device General Tab	Descriptions (Continued)
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.
DeviceMaster Device Options	
<p>DeviceMaster Keep Alive Timeout (seconds) Default = 120 seconds</p>	<p>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.</p> <p>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:</p> <ul style="list-style-type: none"> • When the computer loses its connection to the DeviceMaster but re-establishes it before the time-out period expires, any data transmitted during this period is queued and sent when the connection resumes. • When the computer loses its connection to the DeviceMaster and does not re-establish it before the time-out period expires; the driver then purges any pending I/O data for ports on that connection and returns all pending, and future I/O commands, with the exception of the Close command, to the application with an error indicating the disconnected status. <p>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.</p> <ul style="list-style-type: none"> • 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	Descriptions (Continued)
<p>DeviceMaster TCP Timeout Multiplier Default = 1ms</p>	<p>Use the TCP Timeout Multiplier option to modify two timers used in TCP/IP socket communications.</p> <p>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.</p> <p>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.</p> <p>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.</p> <p>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.</p>
<p>Defaults</p>	<p>Resets this screen to its default values.</p>
<p>RocketPort Device Options</p>	
<p>RocketPort Starting COM Port Number</p>	<p>You can change the starting COM port number in the drop list for this adapter.</p> <p>In addition, you can use Starting COM Port to set nonsequential starting COM port numbers for each adapter, thus leaving gaps in the COM port numbering sequence.</p> <p>When you change the starting COM port number, the driver assigns that COM port to the first port on this adapter and all other port numbers follow in sequence.</p> <p>Do not overlap COM port numbers between devices or other adapters because if you do so, the overlapping ports are disabled.</p>
<p>RocketPort Driver's Working Mode</p>	<p>Select the mode that meets your application requirements.</p> <p>Polling (default)</p> <ul style="list-style-type: none"> • Smaller packets • Lower volume • Faster I/O (Low Latency) • Predictability (Based on Scan rate) • Perfect for low baud rates or low volume transfer where the operation is time critical. <p>Interrupts</p> <ul style="list-style-type: none"> • Larger packets • Higher volume • The speed of I/O depends on the volume of data • Unpredictable • Perfect for high baud rate, high volume data transfer.

4.6. Configuring COM Port Properties

This section discusses COM port configuration procedures for Windows Driver Management Console ports. If you want to change the starting COM port number on the device, see *Configuring Device Settings* on Page 43.

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 COM port settings on the device port or ports.

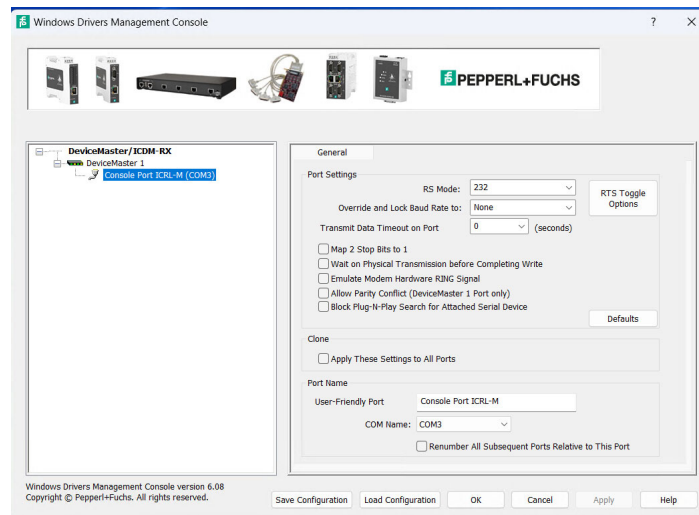


Caution

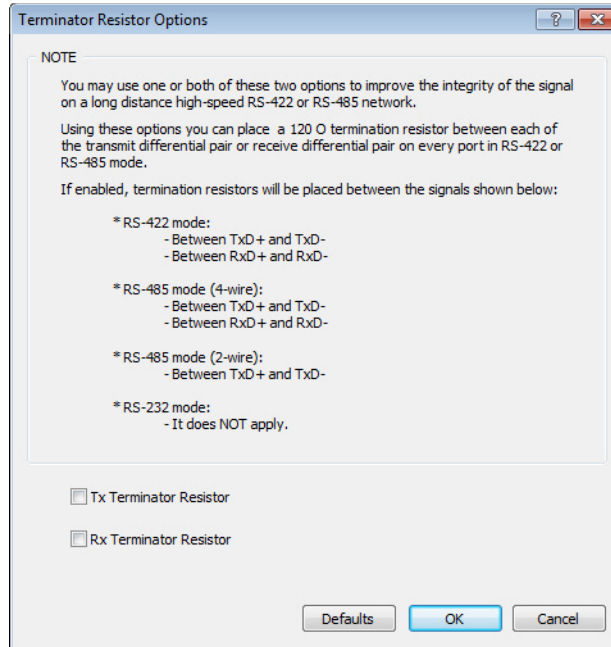
Do not connect RS-422/485 devices until the appropriate port interface type has been configured in the driver. The driver default port setting is RS-232.

1. Open the *Windows Driver Management Console* ([Page 31](#)).
2. Highlight the appropriate device.
3. Highlight the first port you want to configure.
4. Select the appropriate communications mode.

Note: *The COM port configuration page for DeviceMaster and RocketPort provide the most of the same options.*



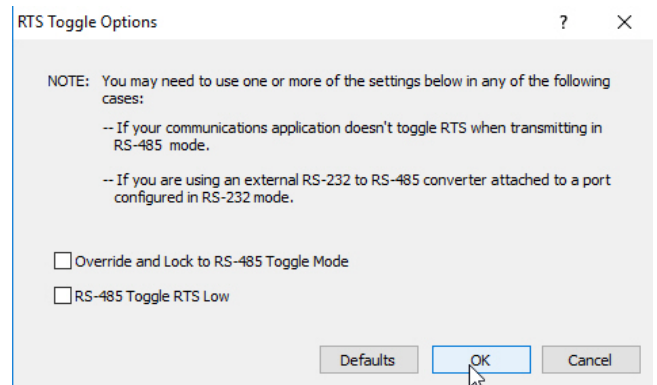
5. **DeviceMaster:** If your model supports Terminator Resistor Options, and you select RS-422 or RS-485, you may want to configure **Terminator Resistor** options. If so, click the *Terminator Resistor Options* button.
 - a. Make the appropriate selections to reflect your configuration.
 - b. Click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



6. Enable the features that you require for your environment.

Note: You can use the help system or refer to the following table for information about each option.
7. **RocketPort:** Select the **Use Fast (Low Latency) Data Transfer** option when receiving or sending small blocks of data.
8. Optionally, click the *RTS Toggle Options* button:
 - If your communications application does not toggle FTS when transmitting in RS-485 mode.
 - If you are using an external RS-232 to RS-485 converter, which is attached to a port that is configured for RS-232.
 - a. Click the appropriate options for your environment.
 - b. Click **OK** to save the changes and return to the port **General** tab.
9. If desired, click the **Clone** check box to set all of the ports on this device to these characteristics.
10. Optionally, change the **User-Friendly Port Name**.
11. If desired, select a different **COM Name** (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.
12. 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**.
13. Highlight the next port that you want to configure and perform *Steps 4* through 12.



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

Port Settings General Tab	Descriptions
<p>RS Mode Default = RS-232</p>	<p>Use this drop-down list to select the communications mode for the serial device that you will be connecting to this port.</p> <ul style="list-style-type: none"> • RS-232 (default) • RS-422 • RS-485 Mode provides these choices. <p>Note: <i>The DeviceMaster DIN rail models support RS-485 4-wire, Slave or Master but this feature is not supported in panel and rack mount models.</i></p> <ul style="list-style-type: none"> - 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. - RS-485 4-wire Master (full-duplex master) supports transmit and receive data, which means both signals are always active. The device 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 <i>RTS Toggle Options</i> screen.
<p>Override and Lock Baud Rate to Default = None</p>	<p>This option allows you to lock selected ports.</p> <p>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.</p> <p>RocketPort: The Quad/Octacable models support up to 921.6Kbps and the 8/16/32-port models with an interface box support up to 460.8Kbps.</p> <p>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.</p>
<p>Transmit Data Timeout Port Close Default = 0</p>	<p>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 flush through the system.</p>

Port Settings General Tab	Descriptions (Continued)
RTS Toggle Options	<p>This button opens the RTS Toggle Options popup, which provides the following features:</p> <ul style="list-style-type: none"> 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 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: <ul style="list-style-type: none"> - Override and Lock to RTS Toggle Mode = Disabled - RTS Toggle RTS Low = Disabled
DeviceMaster Terminator Resistor Options (Specific Models, Only)	<p>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. 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:</p> <ul style="list-style-type: none"> RS-422 Mode <ul style="list-style-type: none"> - Between TxD+ and TxD- (Pins 5 and 7) - Between RxD+ and RxD- (Pins 4 and 2) RS-485 Mode – Between TxD/RxD+ and TxD/RxD- (Pins 5 and 7)
RocketPort Map CD to DSR Default = Disabled	<p>This option is used in installations where there is no connection to the port's DSR input. Click this check box to cause the CD input to appear as DSR to the host application, and to perform hardware handshaking with CD rather than DSR.</p>
Map 2 Stop Bits to 1 Default = Disabled	<p>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. Leave this check box blank to enable stop bits to pass through unchanged.</p>
Wait on Physical Transmission before Completing Write Default = Disabled	<p>This option forces all write packets to wait until the transmit data has physically completed the transmission before returning completion to the host application. 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.</p>
Emulate Modem Hardware RING Signal Default = Disabled	<p>Click this check box to emulate the ring indicator signal. If this box is checked and the port receives a <i>RING</i> signal (or an alternate code, as defined in the AT command set for the modem), it sends an <i>RI</i> signal to the communications application.</p>

Port Settings General Tab	Descriptions (Continued)
(DeviceMaster 1-Port only) Allow Parity Conflict 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.
Block PnP search for attached serial device Default = Disabled	This option disables plug and play from searching for a device attached to the serial port. 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 Default = Disabled	If this check box is <i>not</i> clicked, changes apply to the selected port only. If this check box <i>is</i> clicked, changes apply to all ports on this board.
RocketPort Use Fast (Low Latency) Data Transfer Default = Disabled	Use this option when you need to send or receive a small block of data on RocketPort adapters.
User-Friendly Port Name	You can enter a custom COM port name to identify this device in the <i>Windows Driver Management Console</i> .
COM Name	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. DeviceMaster: 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 product 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.

4.7. DeviceMaster Network Configuration

Pepperl+Fuchs recommends using PortVision DX to configure network settings.

Note: Use NS-Link/SocketServer (DeviceMaster web page) to configure IPv6 network settings.

Optionally, you can use the Windows Driver Management Console to:

- 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 53.
- Configure the DeviceMaster for use with DHCP, see *Setting Up DHCP (IPv4)* on Page 54.

4.7.1. Disabling IPv4 Mode

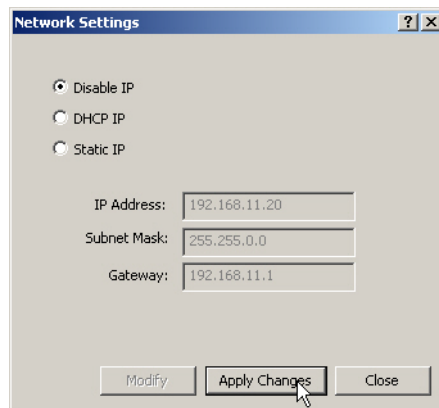
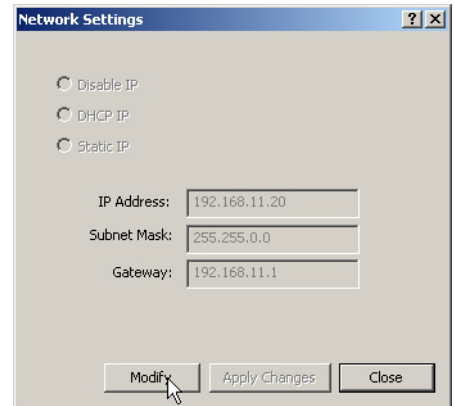
Use this procedure if you want to disable IP communications.

1. If necessary, access the *Windows Driver Management Console*.

Note: The DeviceMaster must be operational in MAC mode on a local network segment or connected directly to the PC (DeviceMaster Associating the MAC Address on Page 36).

2. Make sure that the **MAC Mode** radio button has been selected.
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**.

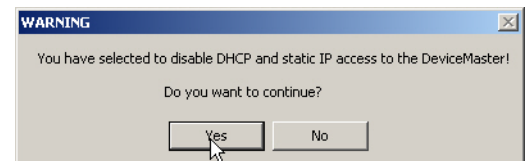
You can use the **Disable IP** option if you are not using IP addressing (DHCP or static) and operating the DeviceMaster in MAC mode.



7. Click the **Apply Changes** button.
8. Click **Yes** to the *Warning* popup.

After the DeviceMaster is rebooted, the following occurs:

- In PortVision DX, the IP address displays as 0.0.0.0.
- In the *Windows Driver 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.

- Click **Close** to return to the *Windows Driver Management Console*.

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

- Configure device properties, see *Configuring Device Settings* on Page 43.
- Configure COM port properties, see *Configuring COM Port Properties* on Page 47.
- Configure any of the DeviceMaster ports as sockets, see *Configuring DeviceMaster Ports as Sockets* on Page 56.

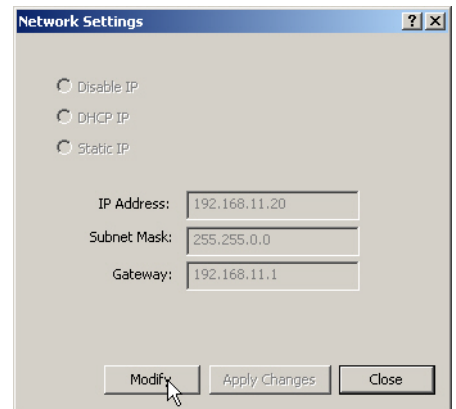
4.7.2. Changing a Static IPv4 Address

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 *Windows Driver Management Console*.

- 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 (*DeviceMaster Associating the MAC Address* on Page 36).

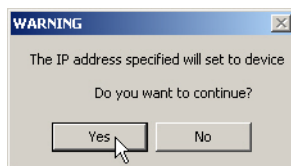
Note: If the DeviceMaster is NOT operational, do NOT attempt to program or use an IP address with the DeviceMaster.

- Highlight the *Device Name* of the DeviceMaster that you want to configure.
- Click the **Network Settings** button.
- Click the **Modify** button.
- Click **Static IP**.
- Enter static IP address information in the fields below.

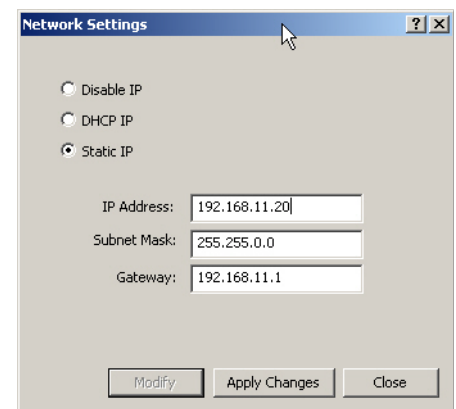
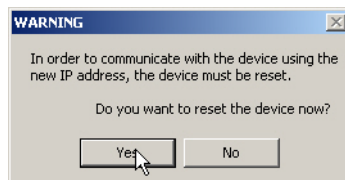


- IP Address:** Enter a valid IP address for your network. The IP Address field is the IP address programmed into the DeviceMaster after applying the changes and rebooting the DeviceMaster. See your network administrator for a valid IP address.
- Mask:** The subnet mask is a 32-bit value (255.x.x.x) that enables IP packets to distinguish the network ID and host ID portions of the IP address that filters traffic.
- Gateway:** The default gateway is a TCP/IP configuration item that is the IP address of a directly reachable IP router.

- Click **Apply Changes** to begin programming the DeviceMaster.
- Click **Yes** to the **WARNING** popup message.



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



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. Pepperl+Fuchs support recommends rebooting the DeviceMaster at this point.

10. Click **Close** to return to the **Device General** tab.
11. Optionally, you can click the *Advanced* 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 *Configuring Device Settings* on Page 43.
 - Configure COM port properties, see *Configuring COM Port Properties* on Page 47.
 - Configure any of the DeviceMaster ports as sockets, see *Configuring DeviceMaster Ports as Sockets* on Page 56.

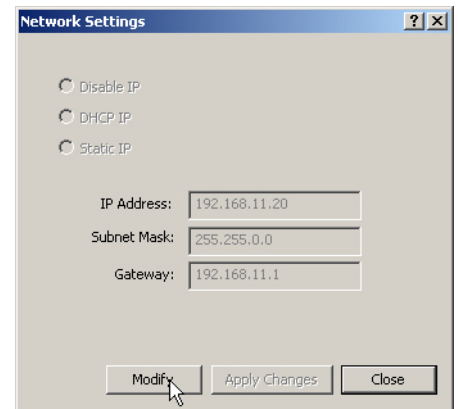
4.7.3. Setting Up DHCP (IPv4)

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

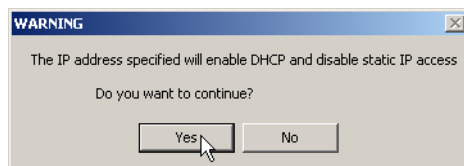
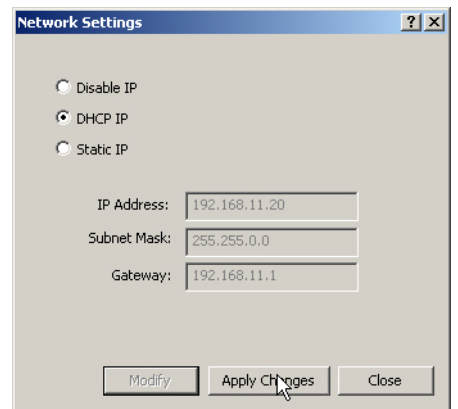
1. Before programming an IP address it is critical that the DeviceMaster be *operational* (the PWR or Status LED is lit) when configured for the MAC address (*DeviceMaster Associating the MAC Address* on Page 36).

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.



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.



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. Pepperl+Fuchs support recommends resetting the DeviceMaster.

After the DeviceMaster reboots, the following occurs:

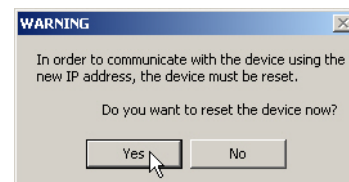
- The *Windows Driver Management Console* displays the IP address (0.0.0.0) and subnet mask (255.255.0.0) values in the *Network Settings* popup.
- PortVision DX will display the IP address assigned by DHCP.

10. Click **Close** to return to the **Device General** tab.

11. Optionally, you can click the *Advanced* 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 *Configuring Device Settings* on Page 43.
- Configure COM port properties, see *Configuring COM Port Properties* on Page 47.
- Configure any of the DeviceMaster ports as sockets, see *Configuring DeviceMaster Ports as Sockets* on Page 56.



4.8. 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 **Web page**.
 - 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.

The screenshot shows the web interface for PEPPERL+FUCHS. The top navigation bar includes 'Home', 'Port', 'Network', 'Diagnostics', 'System', 'Help', 'ICDM-RX/TCP-DB9/RJ45-PM', and 'Logout'. The 'Port' tab is active, and 'Port 1' is selected in the sub-menu. The main content area is titled 'Port Overview' and displays the following configuration details for 'Port 1':

Port 1	
Port Name:	
NS-Link Connections	
	[10.8.11.10]:49847
Socket Connections	
Remote IP:	
Rx Count:	0
Tx Count:	0
Port Configuration (serial)	
Port Mode:	RS-232
Baud Rate:	9600
Parity:	none
Data Bits:	8
Stop Bits:	1
Flow Control:	none
Default Xon/Xoff:	
DTR Mode:	off
RTS Mode:	off
Pre/Post RTS hold time:	0/0
End of line character(s):	none
Serial RX buffer timeout:	0
Send buffered data after close:	no
Rx FIFO Disable:	no
Port Configuration (network)	
TCP Enabled:	no
Listen Enabled:	yes
Max Connections:	1

© Pepperl+Fuchs

3. Configure as a socket in the *Port* page.

Port 1 Configuration

Serial

Port Name:

Port Mode:

Baud Rate:

Parity:

Data Bits:

Stop Bits:

Flow Control:

Default Xon/Xoff:

Advanced

DTR Mode:

RTS Mode:

Pre/Post RTS Hold Time: / ms

Detect End of Line:

End of Line Characters: (dec)

Serial Rx Buffer Timeout: ms

Rx FIFO Disable:

Send Buffered Data After Close:

TCP Connection Enabled:

Listen:

On Port:

Max Connections:

Connect to IP Address:

Target Port:

Source Port:

Connect: Always
 Data
 DSR
 CD

Disconnect: Idle
 No DSR
 No CD

Idle Timeout: s

Telnet Protocol Enable (RFC2217):

UDP Connection

Enable serial to Ethernet:

Enable Ethernet to serial:

Allow Ethernet data from any IP address:

Serial data to last host that sent UDP data:

Target IP Address	Target Port	Source Port
<input type="text"/>	<input type="text" value="0"/>	<input type="text" value="0"/>
<input type="text"/>	<input type="text" value="0"/>	<input type="text" value="0"/>
<input type="text"/>	<input type="text" value="0"/>	<input type="text" value="0"/>
<input type="text"/>	<input type="text" value="0"/>	<input type="text" value="0"/>
<input type="text"/>	<input type="text" value="0"/>	<input type="text" value="0"/>
<input type="text"/>	<input type="text" value="0"/>	<input type="text" value="0"/>
<input type="text"/>	<input type="text" value="0"/>	<input type="text" value="0"/>
<input type="text"/>	<input type="text" value="0"/>	<input type="text" value="0"/>
<input type="text"/>	<input type="text" value="0"/>	<input type="text" value="0"/>

UDP Listen Port:

Clone Settings to All Serial Ports

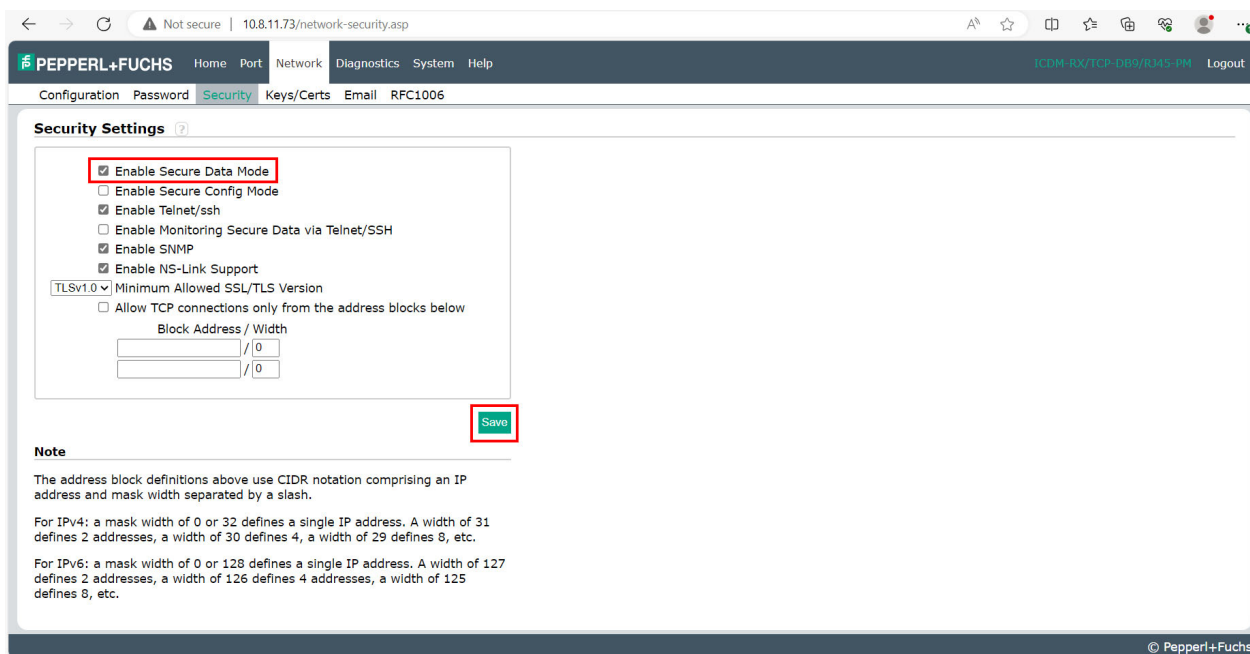
© Pepperl+Fuchs

See the web page help system, if you need information about configuring sockets or serial tunneling. Optionally, you can refer to the *ICDM-RX/TCP Installation and Configuration Manual*.

4.9. 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**.



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**.

The screenshot shows a web interface for 'Key and Certificate Management'. The top navigation bar includes 'PEPPERL+FUCHS', 'Home', 'Port', 'Network', 'Diagnostics', 'System', and 'Help'. The user is logged in as 'ICDM-RX/TCP-DB9/BJ45-PM' and can click 'Logout'. The main menu includes 'Configuration', 'Password', 'Security', 'Keys/Certs', 'Email', and 'RFC1006'. The 'Keys/Certs' section is active, showing a 'Key and Certificate Management' form. The form has three rows of settings: 'RSA Key pair used by SSL and SSH servers' with a 'Factory' dropdown set to 'serverRsaKey.der' and a red 'x' icon; 'RSA Server Certificate used by SSL servers' with 'Factory' and 'Browse' buttons; and 'DH Key pair used by SSL servers' with 'Factory', 'Browse', and 'Delete' buttons. Below these is a row for 'Client authentication certificate used by SSL servers: None' with 'Browse' and 'Delete' buttons. A 'Save' button is at the bottom right of the form. A 'Note' section below the form states: 'Key and certificate changes will take effect after a reboot. Files must be in DER format. The RSA key and RSA certificate are used together by clients to authenticate the identity of the server. They must be loaded together. The RSA server certificate must be x509 v3 with 'Key Encipherment' and 'Digital Signature' usage flags set. The client authentication certificate must be x509 v3 with the 'CA' basic constraint and with the 'Certificate Sign' key usage flag set.' The footer of the page shows '© Pepperl+Fuchs'.

Click the **Help** button if you need information about key and certificate management.



5. Using Driver Configuration Files

5.1. Overview

The *Windows Driver 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

Configuration files are saved with a **.DCF** extension.

5.1.1. DeviceMaster

Configuration files must be for the same DeviceMaster model with the same port density. For example, you cannot load a configuration file for a 32-port DeviceMaster onto a 4-port DeviceMaster.

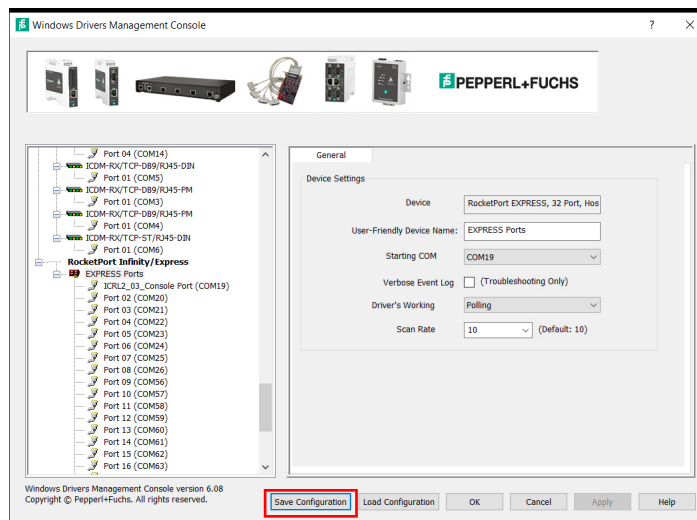
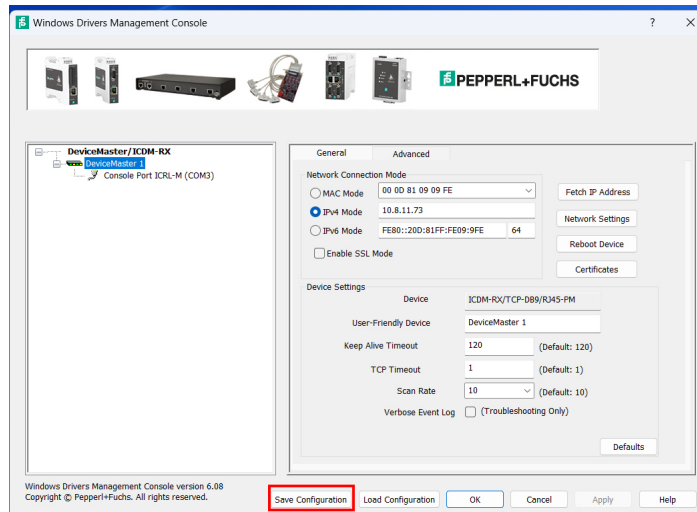
5.1.2. RocketPort

Configuration files must be for the same model with the same port density. For example, you cannot load a RocketPort EXPRESS configuration file onto a RocketPort INFINITY.

5.2. 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**.



Note: Saving the device configuration also saves the port configuration parameters.

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

5.3. Loading a Driver Configuration File

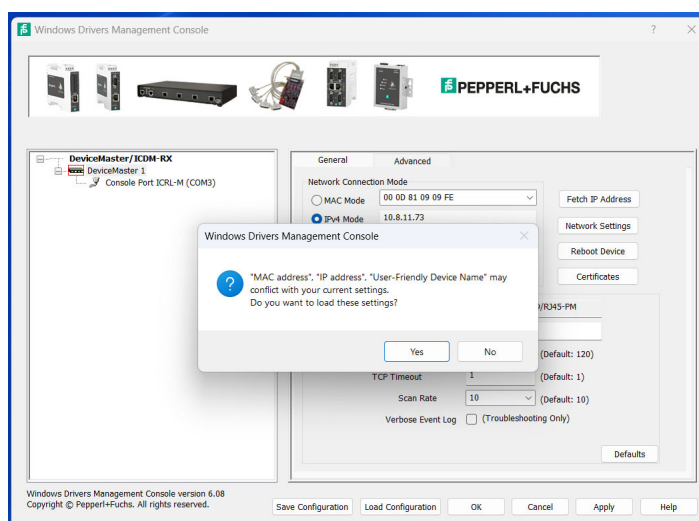
You must have previously saved a configuration file before you can load a configuration file. The driver configuration file uploads in portions:

- If you highlight a device and click **Load Configuration** and **Apply** for the *device-level* 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.

5.3.1. Loading Device Configuration

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

1. If necessary, open the *Windows Driver 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 device-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 message, if you are using the file to set up multiple devices with the same device-level settings.
- Click **Yes** to the message, if you are using the file to restore a specific device.

Note: DeviceMaster: 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.

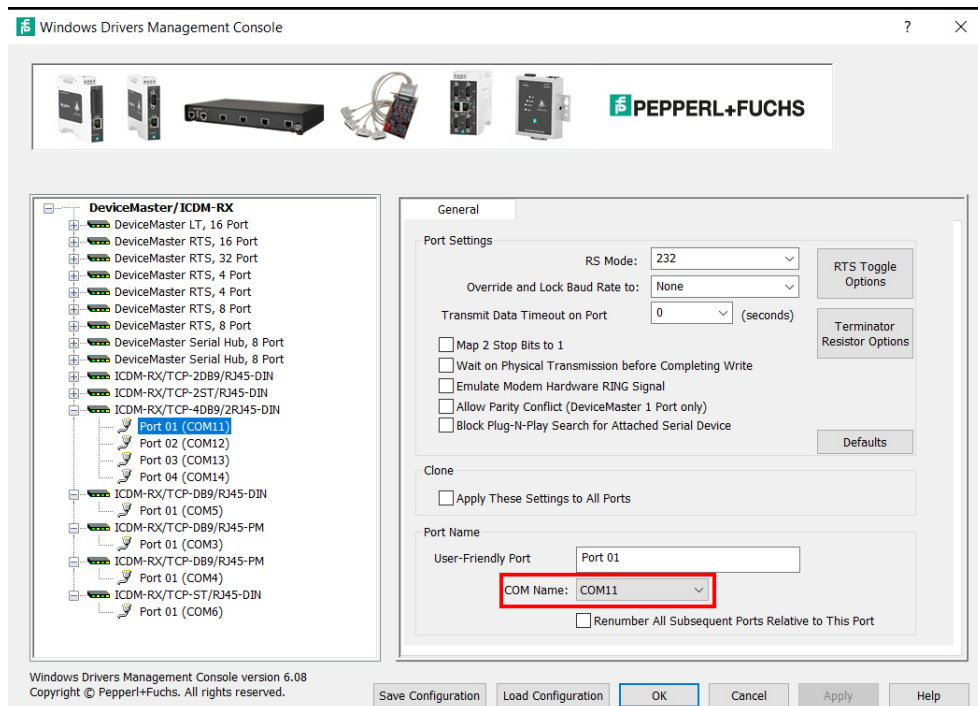
8. Click **Apply** so that the configuration is saved on the device.
9. Go to the next procedure if you want to restore port settings from a configuration file.

5.3.2. 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 configuration file for a 32-port DeviceMaster onto a 4-port or a RocketPort EXPRESS configuration file with the same port density onto a RocketPort INFINITY.

1. If necessary, open the *Windows Driver 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 message, if you are using the file to set up multiple devices with the same port-level settings.
 - Click **Yes** to the 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 [Steps 3](#) through 8 for each port that you want to restore.

6. Removing the Device and Driver

This section discusses:

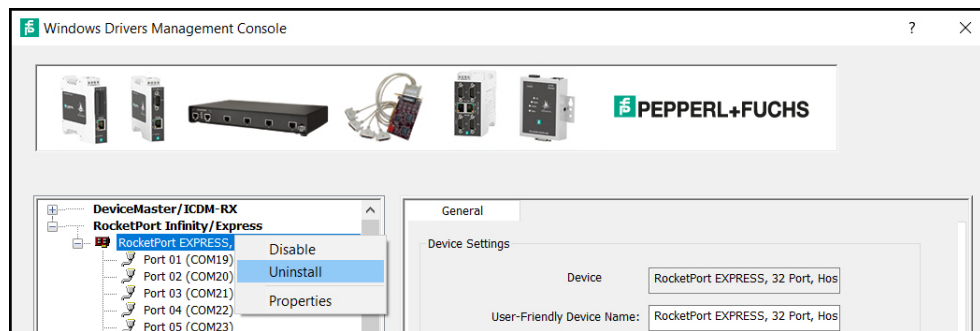
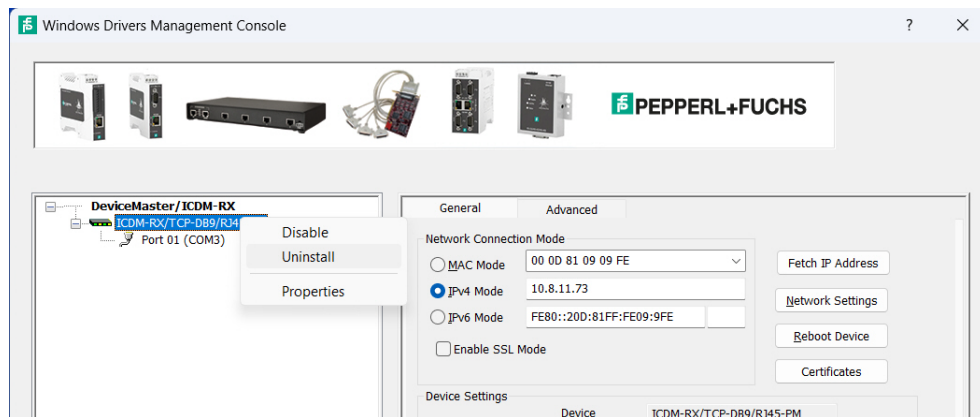
- Removing an RocketPort or DeviceMaster from an installation without removing the device driver from your system
- *Removing the Device Driver and Device* from your system

6.1. Removing a Device from Installation - Keeping the Device Driver

Use the following procedure to uninstall the device driver.

Note: *Administrative privileges are required to remove device drivers.*

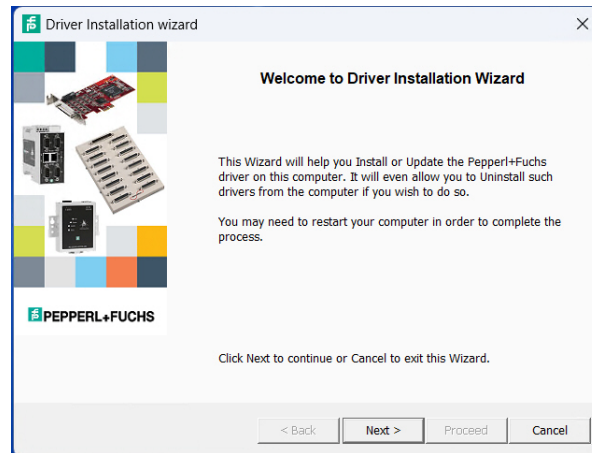
1. Right-click the DeviceMaster or RocketPort that you want to uninstall in the *Tree View* pane of the *Windows Driver Management Console*.
2. Click **Uninstall**.



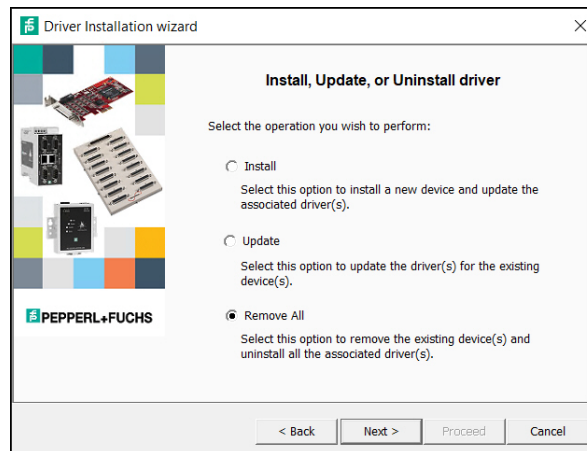
6.2. Removing the Device Driver and Device

Use the following procedure to remove the device driver.

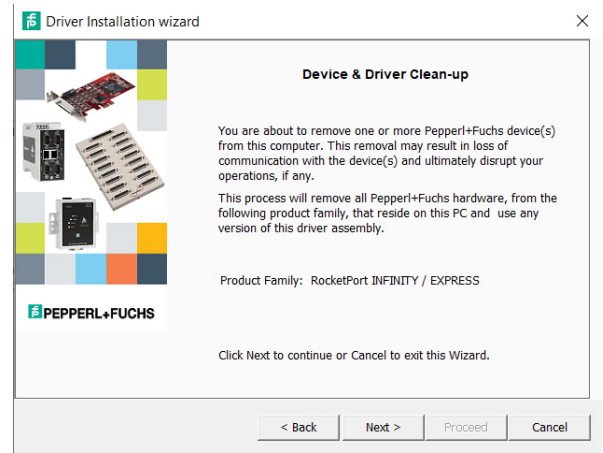
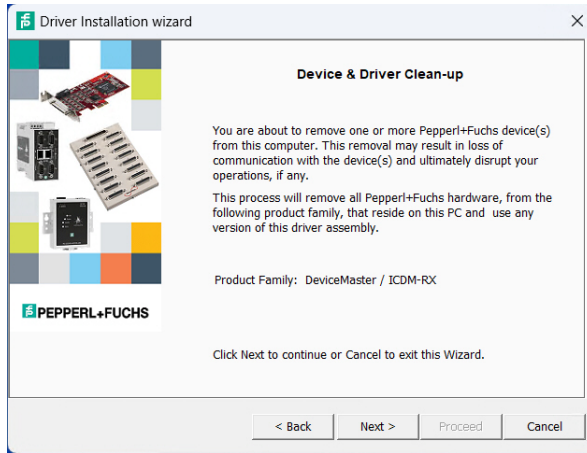
1. From the **Start** button, click the shortcut for your device: **Pepperl+Fuchs > Product > Driver Installation Wizard**.
2. Click **Yes** to the *Do you want to allow this app to make changes to your device?* message.
3. Click **Next** to start the *Pepperl+Fuchs Driver Installation Wizard*.



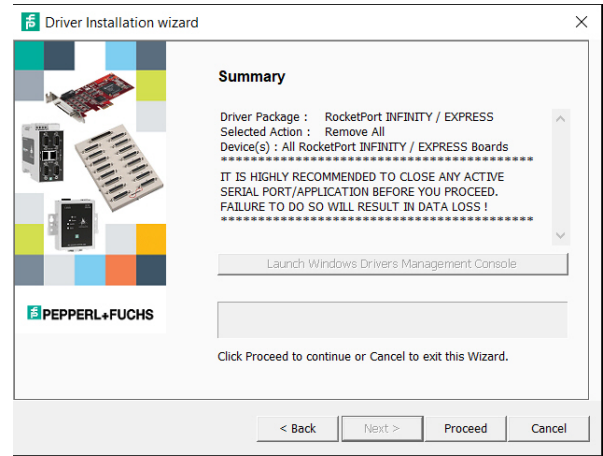
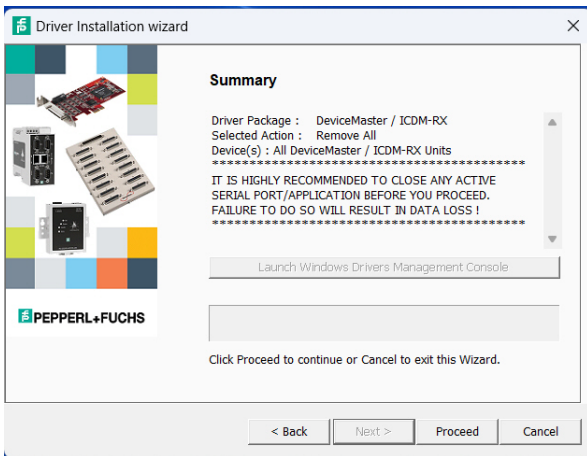
4. Click **Remove All** and **Next**.



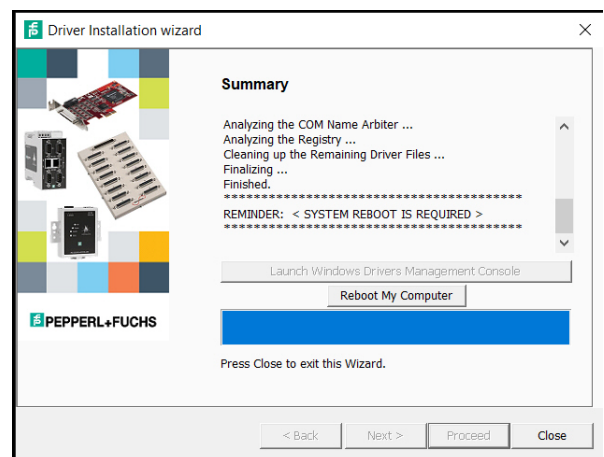
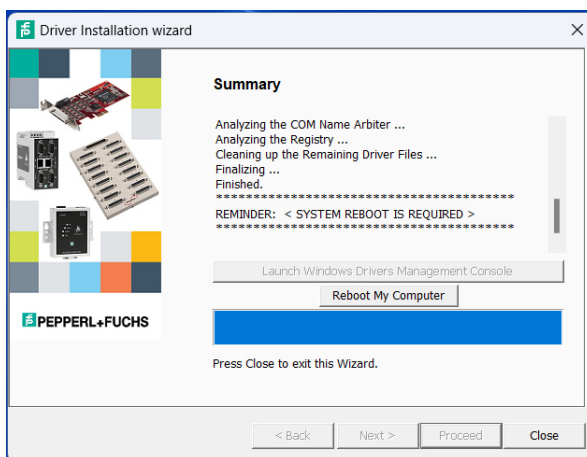
5. Click **Next** to clean up the driver removal.



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

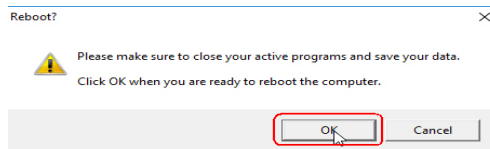


7. Click the **Reboot My Computer** button or **Close**.



- If you click **Close**, make sure that you reboot the system and remove the RocketPort from the system or DeviceMaster from the network to complete the driver removal.

- If you click **Reboot My Computer**, click **Ok**. Remove the RocketPort from the system or DeviceMaster from the network to complete the driver removal.



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

7. Troubleshooting and Technical Support

This section contains troubleshooting information for the DeviceMaster and the RocketPort device driver for Windows. 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.

- *DeviceMaster Troubleshooting* on Page 70
- *Using Test Terminal* on Page 81
- *Using Port Monitor to Test Ports* on Page 92
- *How Disable/Enable the Device Driver* on Page 95

If you cannot diagnose the problem, you can contact *Technical Support* on Page 95.

7.1. Download Diagnostic Applications

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

Go to <https://www.pepperl-fuchs.com> and locate the product and download the applications or utilities.

7.1.1. RocketPort

The RocketPort provides a utility package that includes two diagnostic tools. See *RocketPort Installing Test Terminal and PortMon* on Page 79.

- **Test Terminal** use to troubleshoot communications on a port-by-port basis. See *Using Test Terminal* on Page 81
- **Port Monitor** check for errors, modem control, and status signals. In addition, it provides you with raw byte input and output counts. See *Using Port Monitor to Test Ports* on Page 92

7.1.2. DeviceMaster

The DeviceMaster provides the following diagnostic tools and utilities.

- The **Advanced** tab in the *Windows Driver Management Console* (*Using the Advanced Tab* on Page 73), which may provide valuable information about the DeviceMaster and your network, in the event that you are having problems.
- PortVision DX that provides the following features:
 - Auto-discover and organize the following Ethernet attached products on your network.
 - Remotely access, manage, and configure the following Ethernet attached products from a central console.
 - Load network configuration settings onto multiple the following 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-by-port basis. Refer to *Using Test Terminal* on Page 81 for more information.
 - **Port Monitor** can check for errors, modem control, and status signals. In addition, it provides you with raw byte input and output counts. Refer to *Using Port Monitor to Test Ports* on Page 92 for more information.

7.2. RocketPort Troubleshooting

If you are having trouble with a RocketPort installation, try the following.

Note: Most customer problems reported are traced to cabling or network problems.

Issue	Troubleshooting
Correct cabling?	Verify that you are using the <i>correct types of cables</i> in the correct places and that all cables are tightly connected. Refer to the <i>ICRPC and ICRPB (RocketPort EXPRESS) Hardware Installation Manual</i> to verify cabling.
Correct Port Addressing?	Verify that you are <i>addressing the port correctly</i> . In many applications, device names above COM9 require the prefix \\.\ to be recognized. For example, to reference COM20, use \\.\COM20 as the file or port name.
Windows Driver Management Console?	Verify that the RocketPort has installed using the Windows Driver Management Console to confirm that the adapter displays. Install the device driver, if the adapter is not displayed.
Test the Port or Ports?	Install the Utility (<i>RocketPort Installing Test Terminal and PortMon</i> on Page 79) and use Test Terminal (<i>Using Test Terminal</i> on Page 81).
Is this the Latest Driver?	See <i>Checking the Device Driver Version</i> on Page 23.
Port Does Not Open?	<ol style="list-style-type: none"> 1. Open the <i>Device Manager</i>. 2. Double-click Ports (COM & LPT) to expand the view. Ports are displayed in the <i>Device Manager</i> as RocketPort EXPRESS/INFINITYUnity ports If a yellow exclamation mark represents the port, right-click on the exclamation mark, and click Update Driver . See <i>Updating the Device Driver</i> on Page 23 for detailed procedures.
Monitor Port Activity?	Install the Utility (<i>RocketPort Installing Test Terminal and PortMon</i> on Page 79) and use Port Monitor (<i>Using Port Monitor to Test Ports</i> on Page 92).
Enable Verbose mode	You can optionally enable the Verbose Event Log option on the Device General tab for diagnostic purposes to initiate longer messages to be sent to the <i>Event Log</i> for your operating system. The added information can be useful when debugging communications and configuration problems. Access the event log through the <i>Administrative Tools Event Viewer</i> option.

7.3. DeviceMaster Troubleshooting

Most customer problems reported to Pepperl+Fuchs 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 *DeviceMaster LEDs* on Page 72 for information about the diagnostic LEDs.

- If the DeviceMaster has a power switch, turn the 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.

7.3.1. DeviceMaster Checklist

The following table may help you diagnose the problem. If you have a spare, you can replacing it to see if that resolves the issue.

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>ICDM-RX/TCP Installation and Configuration Manual</i> .
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.
Network?	<ul style="list-style-type: none"> • Isolate the DeviceMaster from the network by connecting the DeviceMaster directly to a NIC in a host system. • See <i>DeviceMaster Connectivity Requirements</i> on Page 72 for network cabling information. • 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 IP address?	<ul style="list-style-type: none"> • Verify that the network IP address is correct. If IP addressing is being used, the system should be able to ping the DeviceMaster. • Verify that the IP address programmed into the DeviceMaster matches the unique reserved IP configured address assigned by the system administrator.
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 <i>Checking the Device Driver Version</i> on Page 23.
Test the Port or Ports?	Install PortVision DX (Page 9) and use Test Terminal (Page 81).

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Issue	Check
Windows Driver Management Console?	Verify that the DeviceMaster has installed using the Windows Driver 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.

7.3.2. DeviceMaster General Troubleshooting

This table illustrates some general troubleshooting tips.

General Condition	Explanation/Action
PWR or Status LED flashing	Indicates that boot program has not downloaded to the DeviceMaster. <ol style="list-style-type: none"> If applicable, remove the NS-Link driver. Make sure that you have <i>downloaded the latest driver</i>. Install the driver and configure the DeviceMaster using the MAC address. Make sure that you reboot the system. Refer to <i>Device Driver Installation</i> on Page 17 for installation information. <p>Note: <i>If the PWR or Status LED is still flashing, contact Technical Support.</i></p>
PWR or Status LED not lit	Indicates that power has not been applied or there is a hardware failure. Contact Technical Support.
Can ping the Pepperl+Fuchs device, but cannot open the ports from a remote location. (You must have previously programmed the IP address, subnet mask, and IP gateway.)	The NS-Link driver uses Port 4606 (11FE h) to communicate with the DeviceMaster. 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. 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 <i>DeviceMaster Connectivity Requirements</i> on Page 72).
Cannot ping or connect to the DeviceMaster	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. In most cases, it will be necessary to program in an address that conforms to your network. 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>ICDM-RX/TCP Installation and Configuration Manual Installation and Configuration Guide</i> for the Redboot method of programming an IP address.

7.3.3. DeviceMaster 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 *ICDM-RX/TCP Installation and Configuration Manual Installation and Configuration Guide* for information regarding hardware installation.

DeviceMaster Port Density	Connected to	Connector Name
1-port	Hub, switch, router, or NIC	10/100 ETHERNET
2-port	Hub, switch, router, or NIC	10/100
4/8/16-port (<i>external</i> power supply)	NIC	DOWN
	Hub, switch, or router	UP
16/32RM (<i>internal</i> power supply)	Hub, switch, router, or NIC	10/100 NETWORK

7.3.4. DeviceMaster LEDs

The DeviceMaster has network and port LEDs to indicate status.

7.3.4.1. Port LEDs

The 1-port and 2-port models do not have port LEDs.

4, 8, 16, and 32-port models have port LEDs are amber and green. 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.

7.3.4.2. Network and Device LEDs

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.

Ports	DeviceMaster Network LEDs
1	<ul style="list-style-type: none"> The Status LED on the front of the unit is lit, which indicates that it has power and has completed the boot cycle. <i>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.</i> 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).

Ports	DeviceMaster Network LEDs
2	<ul style="list-style-type: none"> • The STATUS LED on the device is lit, indicating you have power and it has completed the boot cycle. Note: <i>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.</i> • If the LINK (green) LED is lit, it indicates a working Ethernet connection. • If the ACT (yellow) LED flashes, it indicates network activity.
4, 8, 16 External power supply	<ul style="list-style-type: none"> • The PWR LED on the front of the unit is lit, which indicates it has power and has completed the boot cycle. Note: <i>The PWR LED flashes while booting and it takes approximately 15 seconds for the bootloader to complete the cycle. When the Bootloader completes the cycle, the LED has a solid, steady light that blinks approximately every 10 seconds.</i> • The red LNK/ACT LED is lit, which indicates a working Ethernet connection. • If the red 100 LED is lit, it indicates a working 100 MB Ethernet connection (100 MB network, only).
16, 32 Internal power supply	<ul style="list-style-type: none"> • The Status LED on the front of the unit is lit, which indicates it has power and has completed the boot cycle. Note: <i>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.</i> • The red LNK/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).

7.3.5. Using the Advanced Tab

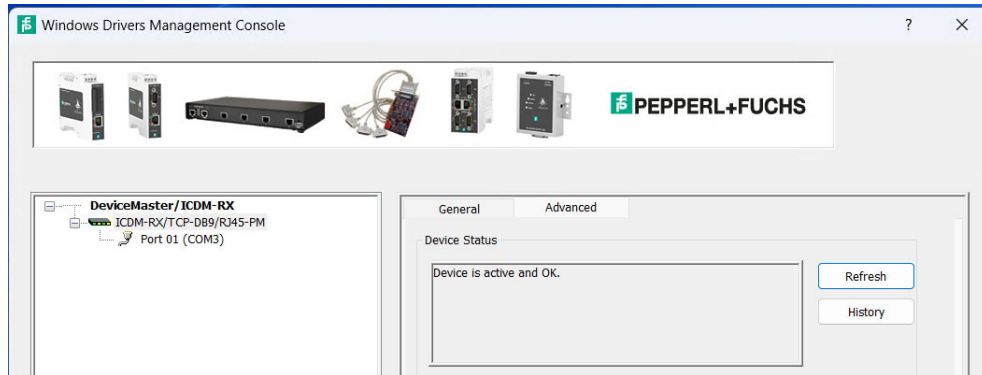
You can use the **Advanced** tab to get a summary of the DeviceMaster status. The **Advanced** tab can be useful for troubleshooting network problems with your DeviceMaster.

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.

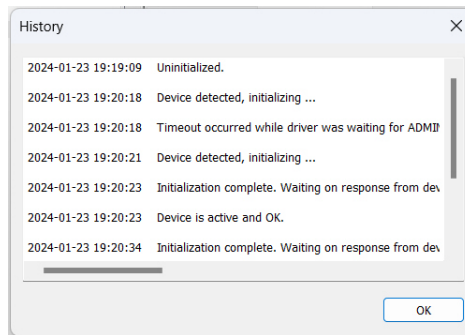
1. If necessary, access the *Windows Driver Management Console*.
2. Highlight the DeviceMaster.

3. Click the **Advanced** tab.

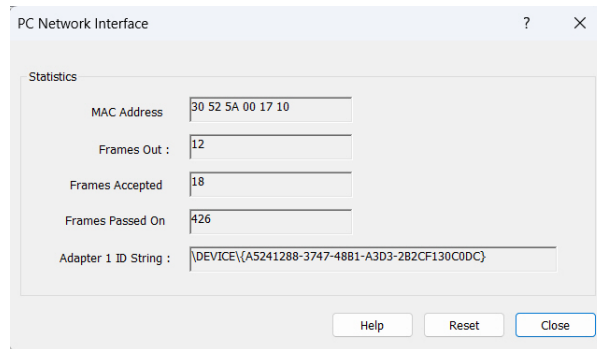


Note: You must have previously associated a MAC address to the DeviceMaster (Page 36). Refer to the *Device Status* table (Page 76) for a list of messages and explanations.

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



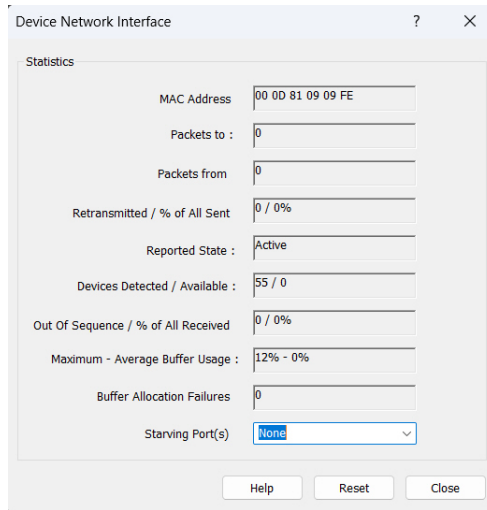
5. Click **PC Network Interface Details** for the following information.



Field	PC Network Interface Details 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.

Field	PC Network Interface Details Description (Continued)
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.

- Click **Close** to return to the **Advanced** tab.
- Click the **Device Network Interface Details** button to review the following information.



Fields	Device Network Interface Details Descriptions
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.

Fields	Device Network Interface Details Descriptions (Continued)
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.

8. Click **Close** to return to the **Advanced** tab.

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

Device Status Message	Descriptions
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 Pepperl+Fuchs 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 device 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.

Device Status Message (Continued)	Descriptions (Continued)
Excess out-of-sequence packets received. 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.
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.
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 Windows Driver 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 LED status (Page 72).
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.
Timeout occurred while the driver was waiting for an ADMIN command reply from the device.	There may be network traffic problems, an unresponsive DeviceMaster, or a problem with the server sending out network data. 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.

Device Status Message (Continued)	Descriptions (Continued)
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.

7.3.6. NS-Link Driver Troubleshooting

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

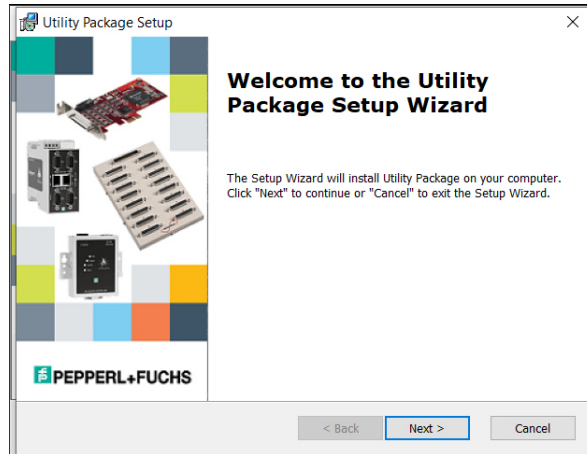
NS-Link Condition	Explanation/Action
Need to program IP address into the device.	<p>Before programming an IP address it is critical that the DeviceMaster be operational and passes the power on tests when configured for the MAC address.</p> <p>Note: <i>If the DeviceMaster is NOT operational, do NOT attempt to program or use an IP address with the DeviceMaster.</i></p> <p>See <i>Program the IPv4 Address (Network Information)</i> on Page 12 for more information.</p>
Cannot open port	<ol style="list-style-type: none"> 1. Verify that MAC address in the NS-Link driver matches the address on the DeviceMaster. 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 71). 4. Check to see if another program or computer is active on this port.
The Pepperl+Fuchs device has a lower limitation of network bandwidth requirement of 64 Kbps.	<p>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.</p> <p>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.</p> <p>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.</p>



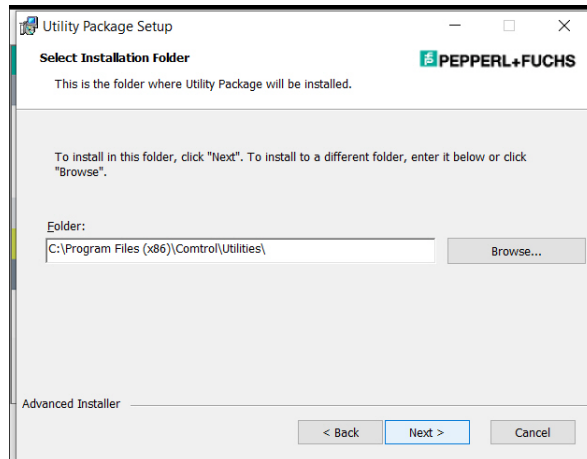
7.4. RocketPort Installing Test Terminal and PortMon

Use this procedure to install Test Terminal and PortMon for RocketPort diagnostic tools.

1. Download from <https://www.pepperl-fuchs.com> by accessing your product page.
2. Extract the .zip file and execute the .msi file.
3. Click Next.

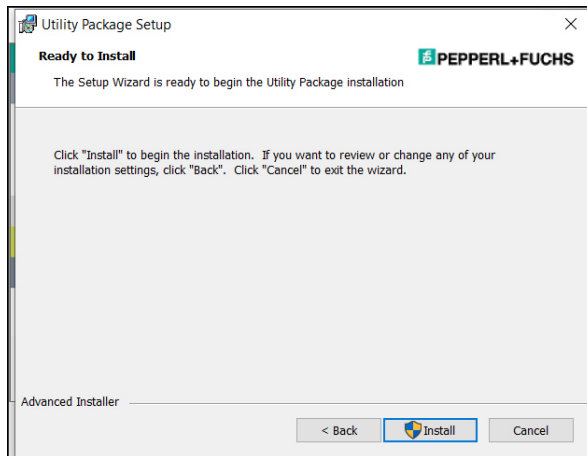


4. Click Next.



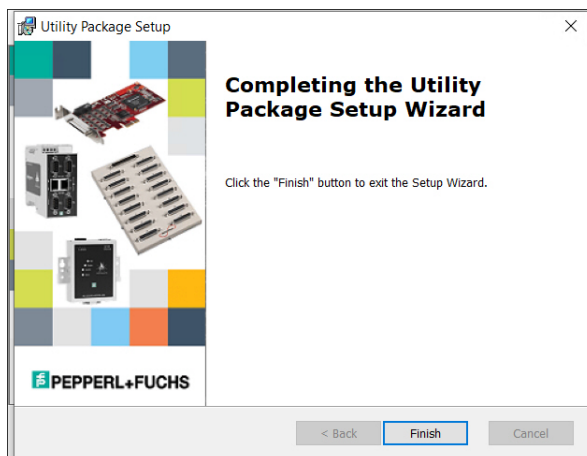


5. Click Install.



6. Click **Yes** to the *Do you want to allow this app to make changes to your device?*

7. Click Finish.



7.5. 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.

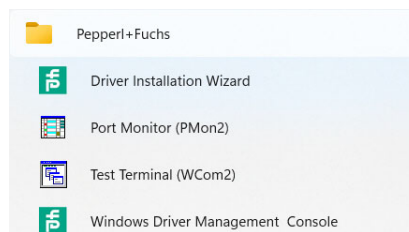
Test Terminal (WCom2) allows you to open a port, send characters and commands to the port, and toggle the control signals. This application can be used to troubleshoot communications on a port-by-port basis.

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 product. If you need to build a replacement or additional loopback plugs refer to the appropriate manual at <https://www.pepperl-fuchs.com>.

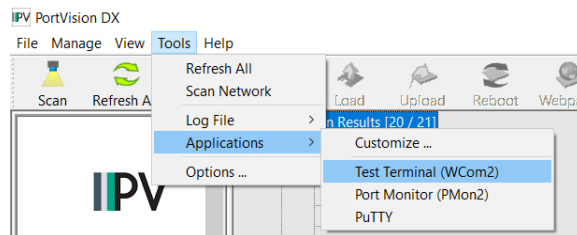
7.5.1. Starting Test Terminal

Use the following information to start Test Terminal.

- **RocketPort:** Test Terminal is included in the Utility package. After installation, start Test Terminal from the Start button.



- **DeviceMaster:** Test Terminal is included with PortVision DX. After PortVision DX is installed, click Tools > Applications > Test Terminal (WCom2).

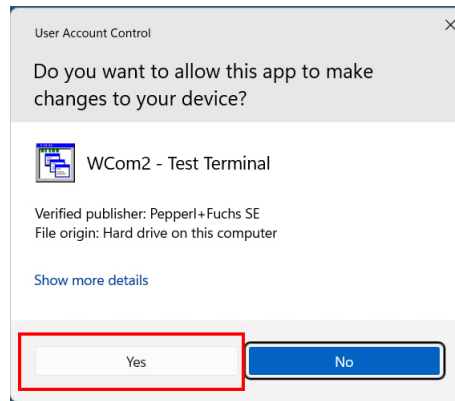




7.5.2. Opening Ports

The following procedure shows how to use **Test Terminal** to send and receive test data to the serial ports.

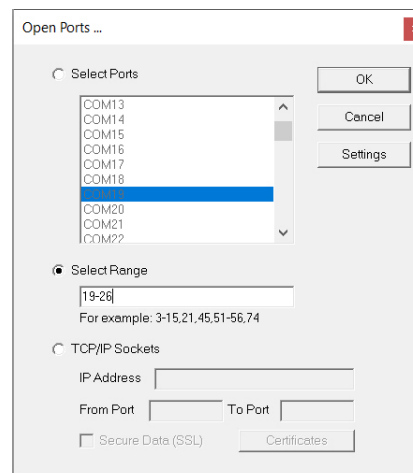
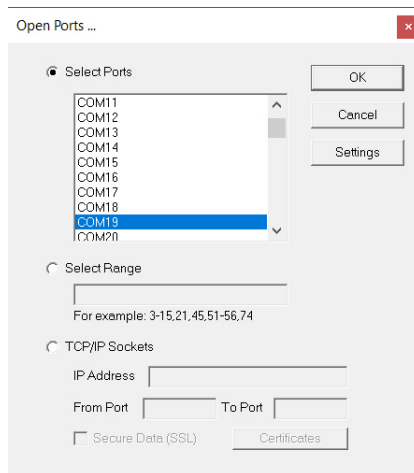
1. Stop all applications that may be accessing the ports such as RRAS or any faxing, or production software. See the appropriate help systems or manuals for instructions on stopping these services or applications.
If another application is controlling the port, then **Test Terminal** will be unable to open the port and an error message will be shown.
2. Start Test Terminal (WCom2) using *Starting Test Terminal on Page 81* .



3. Use the appropriate subsection to open and start testing *RocketPort - Opening Ports on Page 82* or *DeviceMaster - Opening Ports on Page 83*.

7.5.2.1. RocketPort - Opening Ports

1. Select **File > Open Port**, the appropriate port (or ports) from the *Open Ports* drop-down list and **Ok**.

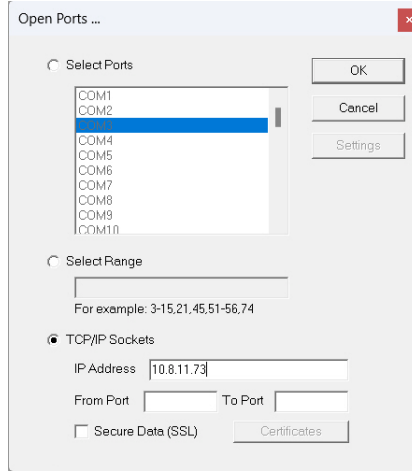


2. Go to the next procedure to send and receive test data.
 - *Sending and Receiving Test Data (RS-232/422 and RS-485: 4-Wire)* on Page 88
 - *Sending and Receiving Data (RS-485: 2-Wire)* on Page 89

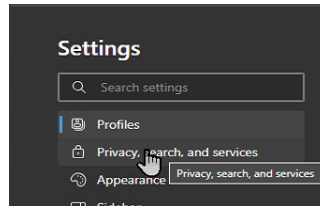


7.5.2.2. DeviceMaster - Opening Ports

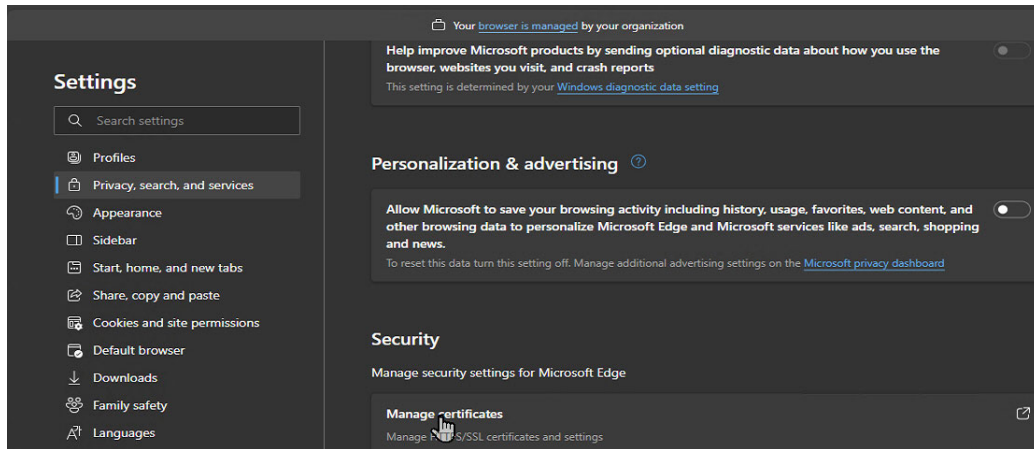
1. Select **File > Open Port**, the appropriate port (or ports) from the *Open Ports* drop-down list, enter the IP address and click **Ok**.



- a. *If necessary to support SSL*, open **Edge > Settings** and select **Privacy, search, and services**.

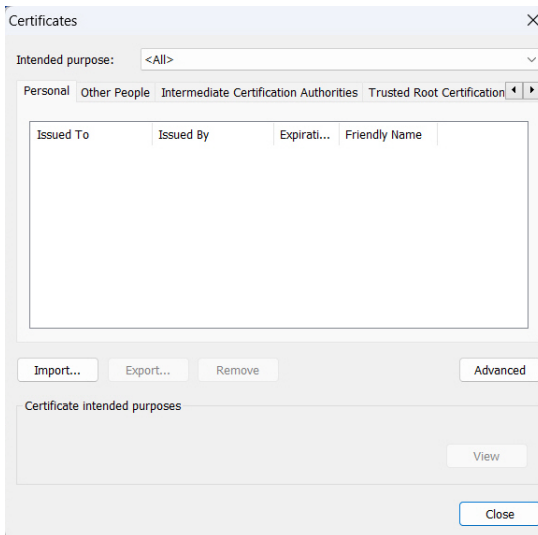


- b. Click **Manage certificates**.

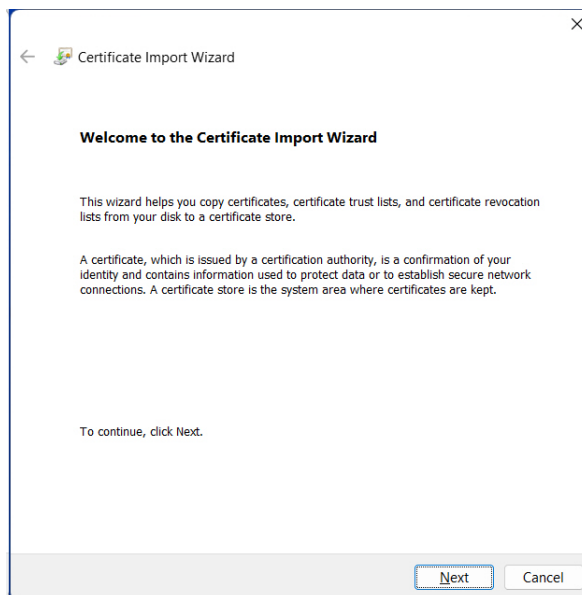




c. Click **Import**.

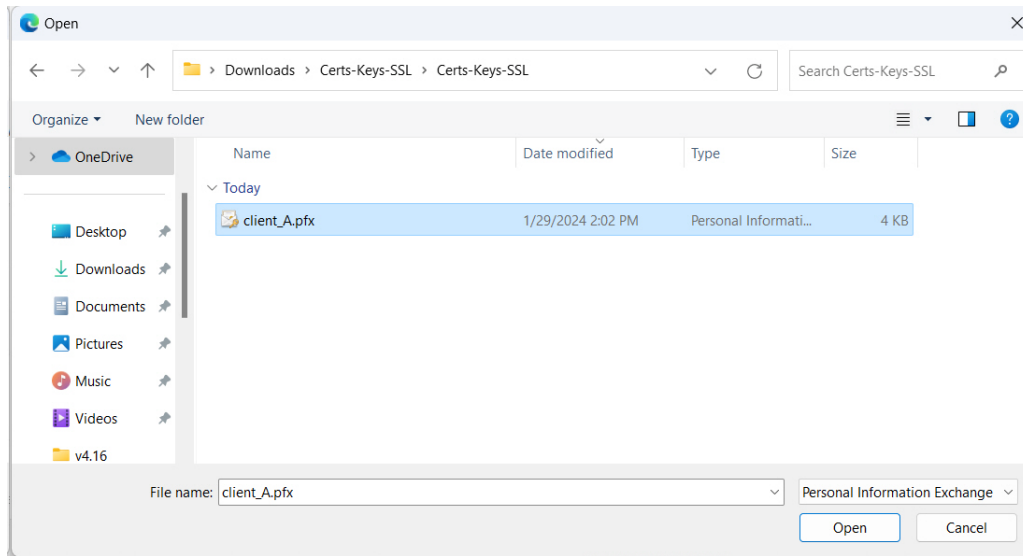


d. Click **Next**.

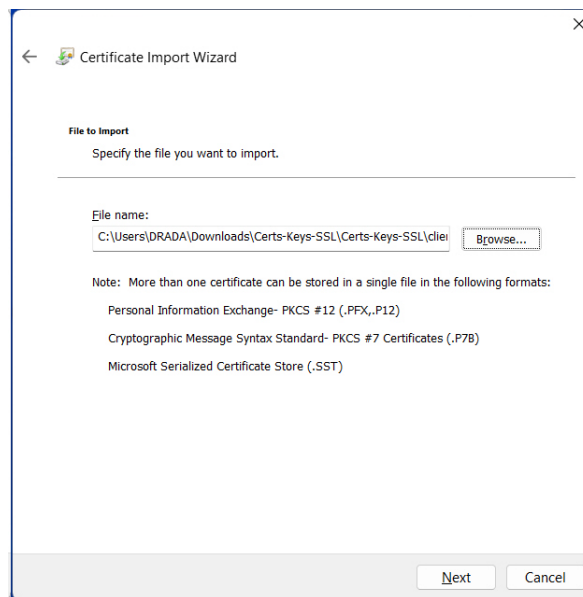




e. Browse to the appropriate certificate.

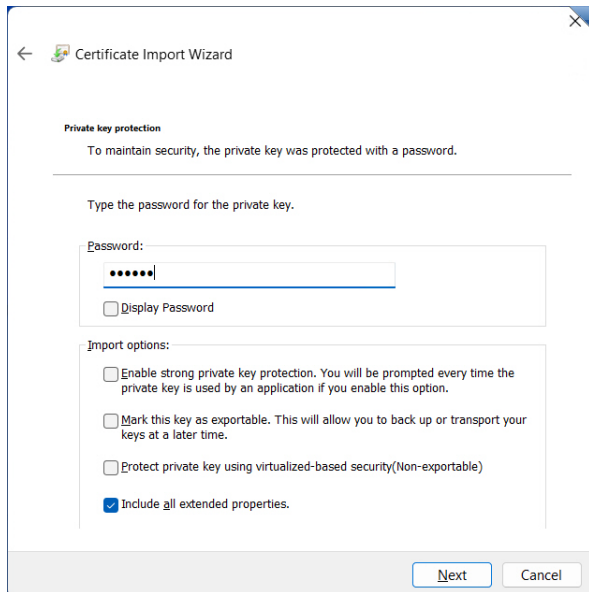


f. Click **Next**.

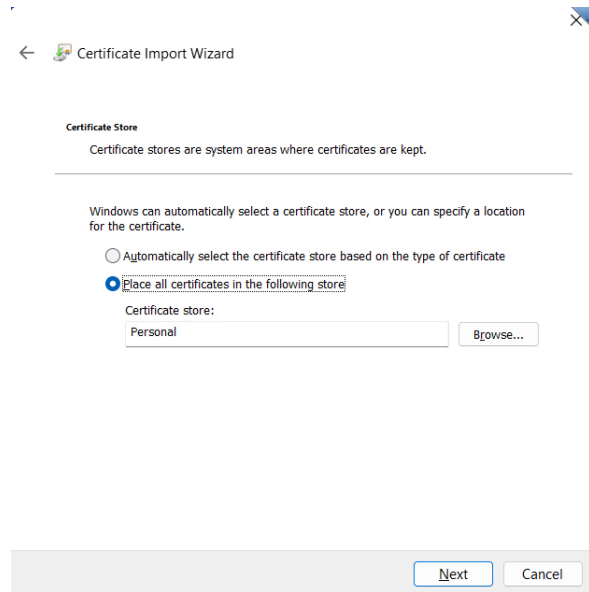




g. Enter the password and click **Next**.

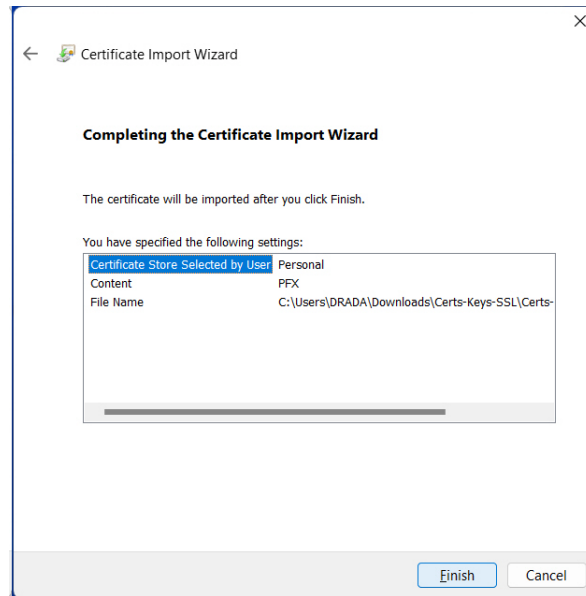


h. Click **Next**.

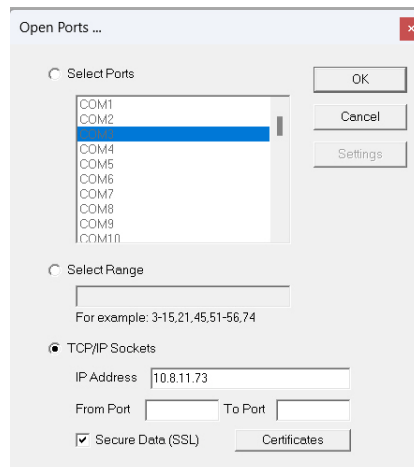




i. Click **Finish**.



j. Click the Secure Data (SSL) option.



2. Go to the next procedure to send and receive test data. Use the appropriate procedure:
 - *Sending and Receiving Test Data (RS-232/422 and RS-485: 4-Wire)* on Page 88
 - *Sending and Receiving Data (RS-485: 2-Wire)* on Page 89

7.5.3. 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, open the port(s) to test.
2. Install the loopback plug onto the port (or ports) that to test.

See the *ICDM-RX/TCP Installation and Configuration Manual* or *ICRPC and ICRPB (RocketPort EXPRESS) Hardware Installation Manual*, if you need to build loopback plugs.

3. Select **Port > Send and Receive Test Data**.

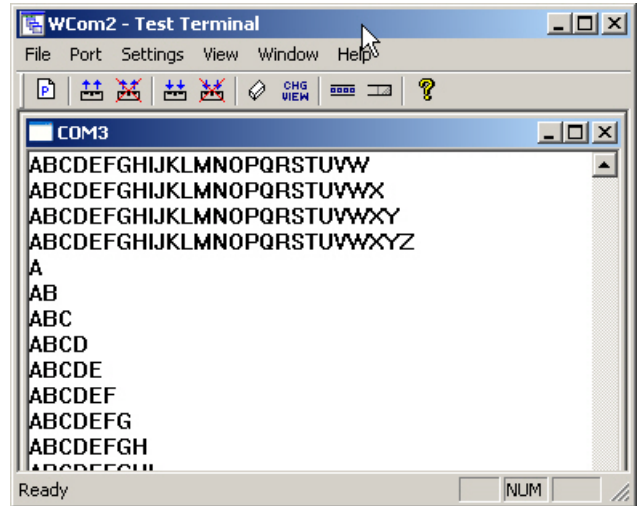
You should see the alphabet scrolling across the port. If so, then the port installed properly and is operational.

Note: *If you left Port Monitor running, it should show data sent and received and show the average data throughput on the port.*

4. Select **Port > Send and Receive Test Data** to stop the scrolling data.
5. You can go to the next procedure to run the *Loopback Test* on Page 88 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.*



7.5.4. 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.
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.

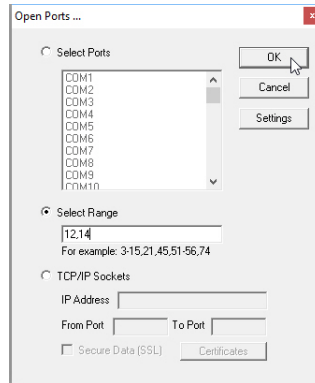
If the Loopback Test and the Send and Receive Test Data tests successfully complete, then the port is operational as expected.



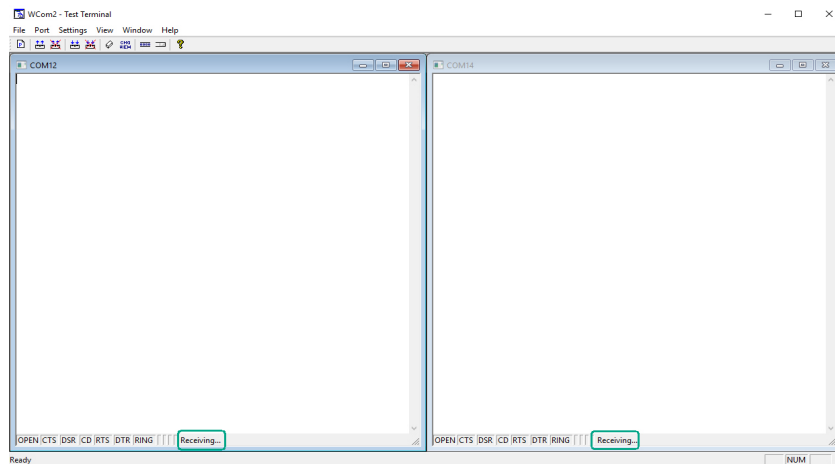
7.5.5. Sending and Receiving Data (RS-485: 2-Wire)

This procedure shows how to use Test Terminal (WCom2) to test two RS-485 (2-wire, half-duplex) ports.

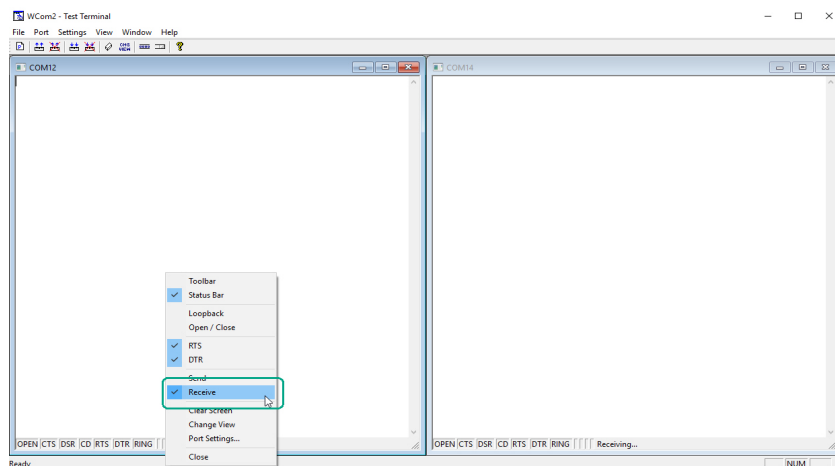
1. Start Test Terminal.
2. Open two ports RS-485 ports. This example uses COM40 and COM41.



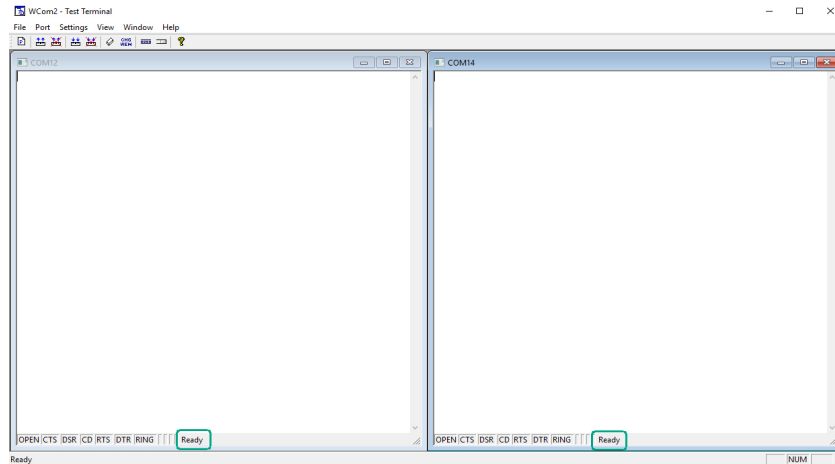
Test Terminal will open two windows, note that both ports show *Receiving* on the status bar.



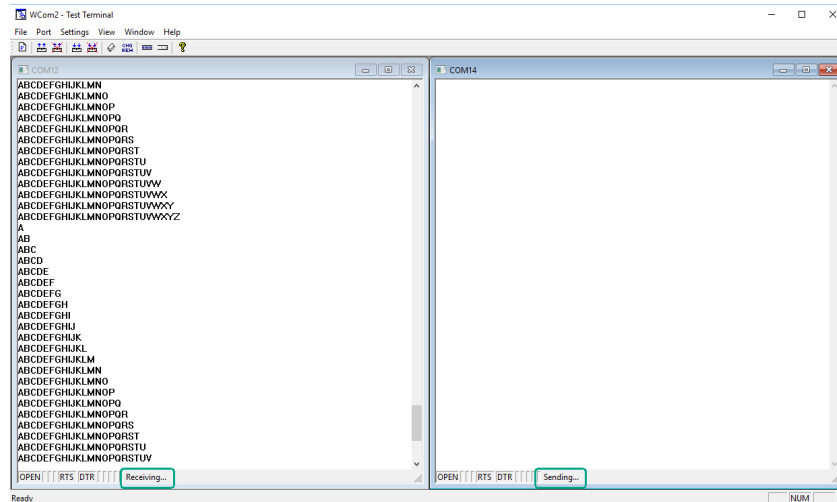
3. Right-click both COM windows and remove the check mark for **Receive**.



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**.



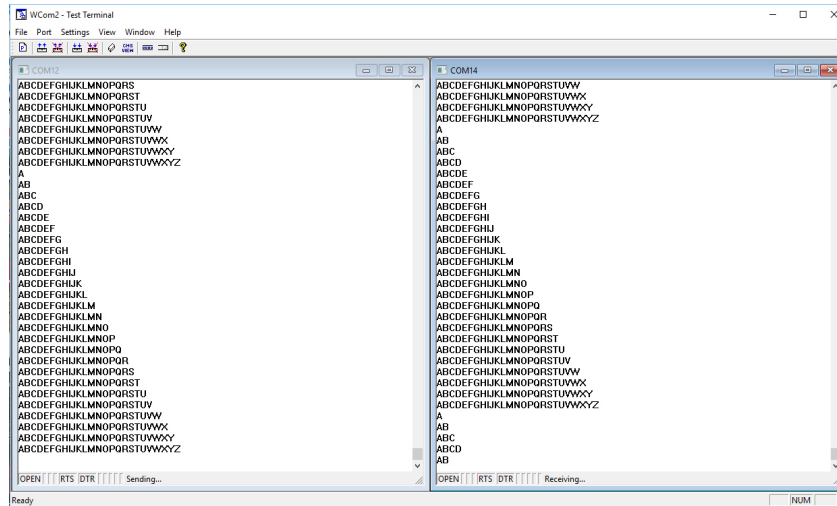
The *Status* line shows *Sending* or *Receiving*.

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.

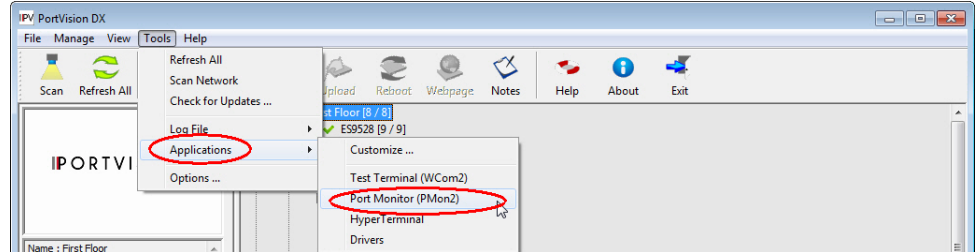
7.6. Using Port Monitor to Test Ports

This procedure will check whether the DeviceMaster or RocketPort can:

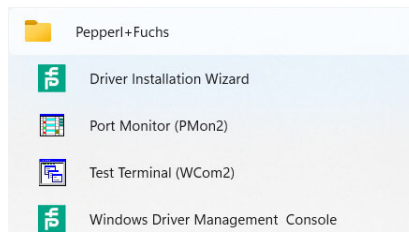
- Communicate through the device driver
- Determine if a port is open with an application

1. Open Port Monitor.

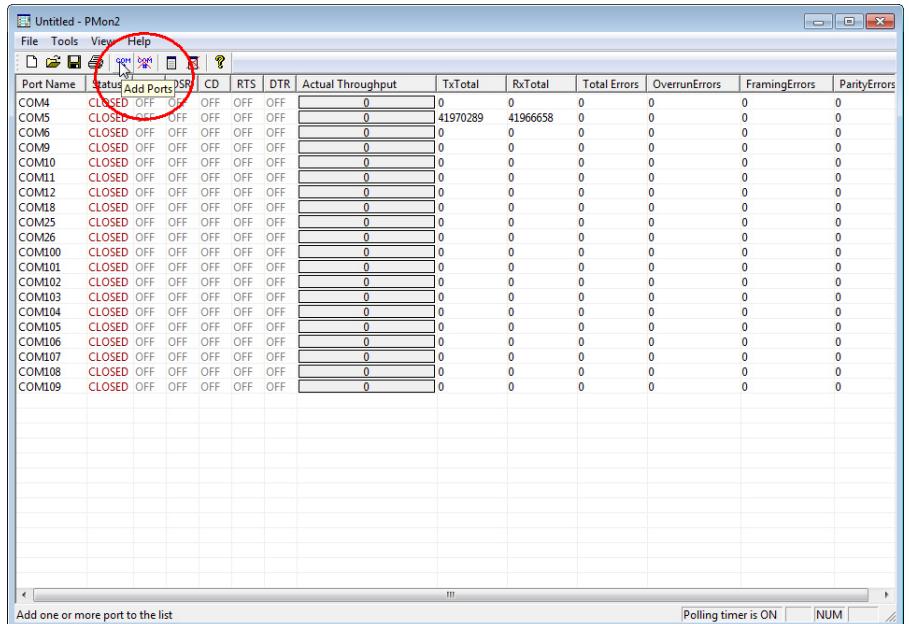
- **DeviceMaster:** Open PortVision DX and start Port Monitor by clicking **Tools > Applications > Port Monitor (PMon2)**.



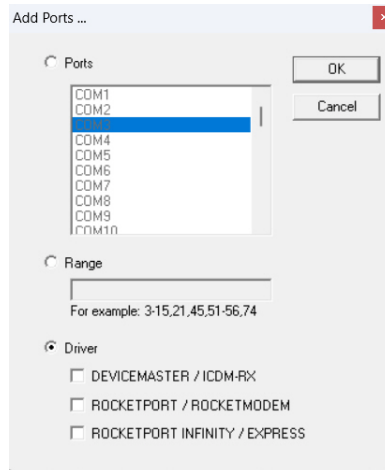
- **RocketPort:** Open Port Monitor under Start.



2. Click **Add Ports** using the icon or **Tools > Add Ports**,



- Click **Driver**, select the appropriate product and click **Ok**.



Note: *RocketPort / RocketModem are legacy products.*

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

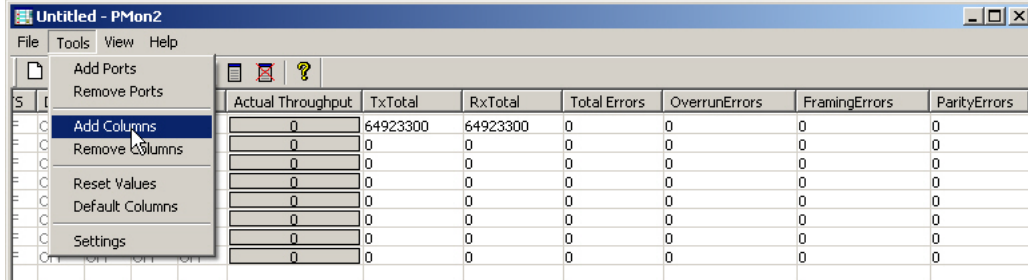
Port Name	Status	CTS	DSR	CD	RTS	DTR	Actual Throughput	TxTotal	RxTotal	Total Errors	OverrunErrors
COM11	OPEN	ON	ON	ON	ON	ON	114600	205891	205638	0	0
COM12	CLOSED	OFF	OFF	OFF	OFF	OFF	0	0	0	0	0
COM13	CLOSED	OFF	OFF	OFF	OFF	OFF	0	0	0	0	0
COM14	CLOSED	OFF	OFF	OFF	OFF	OFF	0	0	0	0	0
COM15	CLOSED	OFF	OFF	OFF	OFF	OFF	0	0	0	0	0
COM16	CLOSED	OFF	OFF	OFF	OFF	OFF	0	0	0	0	0
COM17	CLOSED	OFF	OFF	OFF	OFF	OFF	0	0	0	0	0
COM18	CLOSED	OFF	OFF	OFF	OFF	OFF	0	0	0	0	0

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

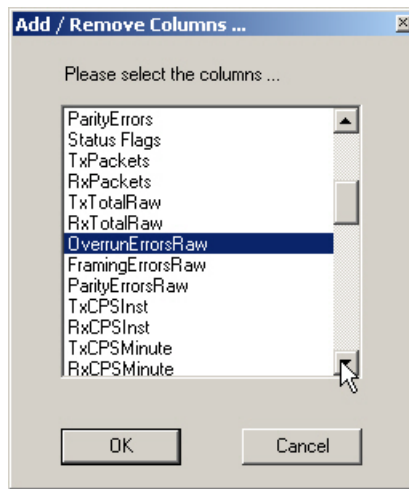
If the errors are:

- Overrun Errors** represent receive buffer overflow errors. If this is the case, you will have to configure either software or hardware handshaking to control the flow of data. The most common errors are Overrun errors.
- Framing Errors** indicate that there is a 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.

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

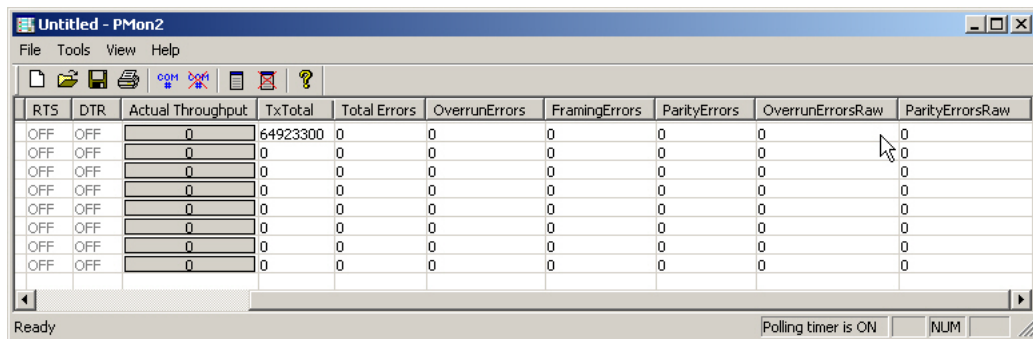


6. Highlight or shift-click to add multiple statistics and click **Ok**.




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


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



8. 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:

- Select File > Open** or the **Open Existing Session**  button. The *Open Session* dialog appears.
- Locate the session (table), you want to open and click the **Open** button.

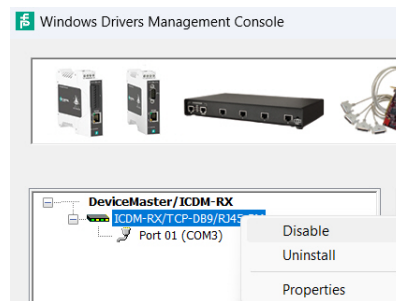
Optionally, if you want to continue monitoring for an existing session, you need to activate the *Polling Interval*.

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

7.7. How Disable/Enable the Device Driver

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

1. Right-click the device that you want to disable (or re-enable) in the Windows Driver Management Console.
2. Click **Disable** (or **Enable**).



7.8. Technical Support

If you need technical support, contact Pepperl+Fuchs.

FACTORY AUTOMATION – SENSING YOUR NEEDS



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