IO-Link Master

Initial Installation and Configuration

Application Note

This document provides the following information:

- ***Connecting the IOLM (power and network)***
- ***Using PortVision DX to program the IP address***
- ***Verifying the latest firmware is loaded***

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Connecting the IOLM (Power and Network)

For detailed procedures, refer to the appropriate guide for your model:

- IO-Link Master 4-EIP User Guide
- IO-Link DR-8-EIP User Guide.

The IO-Link Master is referred to simply as the IOLM in this document unless there is specific information about a specific model.

Use the appropriate discussion for you IOLM model.

- DR-8-EIP (IP20 DIN rail)
- 4-EIP (IP67 with rotary switches)

DR-8-EIP (IP20 DIN Rail)

The following procedures discuss connecting the IOLM DR-8-EIP power and network.

Connecting to the Network

The IOLM DR-8-EIP provides two Fast Ethernet (10/100BASE-TX) RJ45 connections.

1. Securely connect one end of the RJ45 Ethernet cable to either Ethernet port.
2. Connect the other end to the network.
3. Optionally, you can use the other Ethernet port to daisy-chain to another Ethernet device.

Connecting the Power

Use either power terminal (top or bottom) but do not use both to supply power to the DR-8-EIP.

Signal	Description
V-	24VDC Power Supply Return
V-	24VDC Power Supply Return
V+	Primary +24VDC Supply
V+	Secondary +24VDC Supply

Power Requirements	Values
Voltage Input Range	18 to 30VDC
Input Power	24VDC @4A
Output power	24VDC @ 200mA†
†The total supply of current for all connected IO-Link devices.	

You can use this procedure to connect the DR-8-EIP to a power supply.

Note: *Disconnect the power from the power supply before connecting it to the DR-8-EIP. Otherwise, your screw driver blade can inadvertently short your terminal connections to the grounded enclosure.*

1. Insert positive and negative wires (12-24AWG) into the V+ and V- contacts.
2. Tighten the wire-clamp screws to prevent the wires from coming loose.

3. Apply the power and verify that the following LEDs are lit indicating that you are ready to attach your IO-Link or digital I/O devices.

    *   **PWR** – a green lit LED indicates the DR-8-EIP is receiving power.

    *   **MS**, first the flashing green and red LEDs displays that it is in self-test mode. After the self-test, depending on whether you set the IP address with the rotary switch one of the following occurs:

        o   The green LED is flashing to indicate that the DR-8-EIP is in standby mode.

        o   The green LED is lit to indicate that the DR-8-EIP is operational.

    *   **NS**, first it flashes green and red indicating that it is in self-test mode. After the self-test, depending on whether you set the IP address with the rotary switch one of the following occurs:

        o   Off indicates there is no IP address

        o   Steady red indicates a duplicate IP address on the network

    *   **LINK** should be lit (green) to indicate a valid network connection.

    *   **ACT** blinks if there is network traffic between the DR-8-EIP and the network.

    *   Port LEDs should display in this manner if there is no device attached:

        o   The IO-Link port LED should be flashing green indicating that it is searching for an IO-Link device.

        o   DI (Digital input) should be off to indicate that there is no device attached to the port.
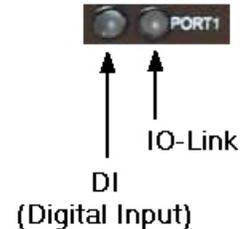
If the LEDs indicate that you are ready to attach devices, go the *Using PortVision DX to Program the IP Address* subsection.

If the LEDs do not meet the above conditions, you can refer to the *IO-Link DR-8-EIP User Guide*.

IOLM 4-EIP (IP67)

The following procedures discuss connecting the IOLM 4-EIP power and network.

Setting the Rotary Switch

You can use the rotary switches under the configuration window on the IOLM 4-EIP to set the lower 3-digits (8 bits) of the static IP address.

If the rotary switches are set to a non-default position, the upper 9-digits (24 bits) of the IP address are then taken from the static network address and DHCP maybe disabled.

The switches only take effect during startup. The current position displays in the **Help | SUPPORT** web page.

Optionally, you can leave the rotary switch set to the default and use the web interface or PortVision DX to set the network address.

Note: *If you set the network address using the rotary switches, the Rotary Switch setting overrides the network settings in the web interface.*

Switch Setting	Node Address
000 (Default setting)	Use the network configuration stored in the flash. The default network values are: • IP address = 192.168.1.250 • Subnet mask = 255.255.255.0 • IP gateway = 0.0.0.0
001-254	This is the last three digits in the IP address. This uses the first three numbers from the configured static address, which defaults to 192.168.1.xxx.
255-887	Reserved.
888	Reset to factory defaults.
889-997	Use the network configuration values stored in the flash (reserved).
998	Use DHCP addressing.
999	Use the default IP address.

Use the following steps if you want to change the default rotary switch settings.

1. Remove the two Phillips screws securing the switch window.

2. Gently swing open the switch window from the left to the right, allowing it to pivot on the hinge on the right side.

3. Turn each dial to the appropriate position using a small flathead screwdriver.

    The default setting is 000 as shown.

    The arrow points to the switch location. 0 is located at the 3:00 position. Turn the dial clockwise to the appropriate setting.
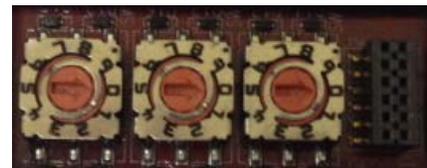
4. Carefully close the window making sure that it is properly aligned.

5. Reinsert and hand tighten the two screws making sure that the window is securely sealed.

Note: *Failure to reassemble the configuration window properly may compromise IP67 integrity.*

Mounting the IOLM 4-EIP

Use the following procedure to mount the IOLM 4-EIP. Install the IOLM 4-EIP on a mounting panel or a machine.

1. Verify that the mounting surface is level (flat) to prevent mechanical stress to the IOLM 4-EIP.

2. Attach the IOLM 4-EIP to the surface with two 6mm screws and washers.

   a. Attach the grounding strap to chassis or earth ground.

   b. Torque down to 8Nm.

Note: *Make sure that you connect the FE terminal at low impedance to function ground to meet EMC standards.*

Connecting to the Network

The IOLM 4-EIP provides two Fast Ethernet (10/100BASE-TX) M12 connections (4-pin female /D-coded). You can use this procedure to connect the IOLM 4-EIP to the network.

1. Securely connect one end of the M12 Ethernet cable to EIP 1 or EIP 2 Ethernet port.

2. Connect the other end to the network.

3. Optionally, you can use the other Ethernet port to daisy-chain to another Ethernet device.

4. If you did not connect both Ethernet ports, make sure that the port is covered with a connector cap, which was shipped with the IOLM 4-EIP to keep dust and liquids from getting in the connector.
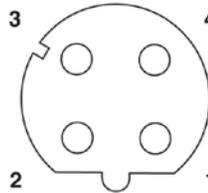
Pin	Signal
1	Tx+
2	Rx+
3	Tx-
4	Rx-

Note: *Ethernet ports must have an approved cable or protective cover attached to the port to guarantee IP67 compliance.*

Connecting the Power

The IOLM 4-EIP provides dual M12 (A-coded) power connectors.

Note: *Power connectors must have an approved cable or protective cover attached to the port guarantee to IP67 compliance.*
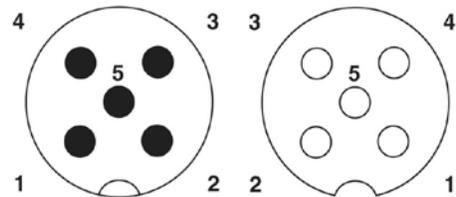
Pin	Input - Male	Output - Female
1	L+	L+
2	L2+	L2+
3	L-	L-
4	L2-	L2-
5	Not connected	

Power Supply Voltage/Current	Values
Voltage Input Range	20 to 30VDC
Current (for the IOLM 4-EIP)	100mA
Maximum Output Current	1.9A†

Note: *The total supply of current for all connected IO-Link devices.*

The IOLM 4-EIP requires a UL listed power supply with an output rating of 24VDC.

Note: *Maximum EMC protection is provided by a low impedance connection between functional earth, the grounding tabs, and protective earth.*

5. Securely attach the power cable between the male power connector (Pwr In) and the power supply.

6. Either attach a power cable between the female power connector and another device to which you want to provide power or securely attach a connector cap to prevent dust or liquids from getting into the connector. Connector caps are shipped with the IOLM.

7. Apply the power and verify that the following LEDs are lit indicating that you are ready to attach your IO-Link or digital I/O devices.

   - **PWR** – a green lit LED indicates the IOLM 4-EIP is receiving power.

   - **MS**, first the flashing green and red LEDs displays that it is in self-test mode. After the self-test, depending on whether you set the IP address with the rotary switch one of the following occurs:

     o The green LED is flashing to indicate that the IOLM 4-EIP is in standby mode.

     o The green LED is lit to indicate that the IOLM 4-EIP is operational.

   - **NET**, first it flashes green and red indicating that it is in self-test mode. After the self-test, depending on whether you set the IP address with the rotary switch one of the following occurs:
     o Off indicates there is no IP address

     o Steady red indicates a duplicate IP address on the network

   - **LINK** should be lit (green) to indicate a valid network connection.

   - **ACT** blinks if there is network traffic between the IOLM 4-EIP and the network.

   - **EIP 1/2** should be lit (green) indicating that the link is up if both connectors are connected.

   - Port LEDs should display in this manner if there is no device attached:

     o IO-Link port   LED should be flashing green indicating that it is searching for an IO-Link device.

     o **DI** should be off to indicate that there is no device attached to the port.
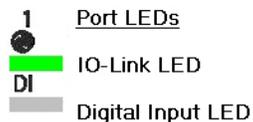
If the LEDs indicate that you are ready to attach devices, go the *Using PortVision DX to Program the IP Address* subsection.

If the LEDs do not meet the above conditions, you can refer to the *IO-Link Master 4-EIP User Guide*.

Using PortVision DX to Program the IP Address

PortVision DX automatically detects Comtrol Ethernet attached products physically attached to the local network segment so that you can quickly configure the network address, upload firmware, access IOLM embedded web pages, download the latest product documentation, and manage the following products:

- DeviceMaster family
- IO-Link Master
- RocketLinx managed switches

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

PortVision DX also provides these features:

- Telnet/SSH interface
- PuTTY
- Ability to save and load IOLM configuration files
- Save Device Diagnostics Data, which can be sent to Comtrol in the event you have a support issue
- LED Tracker feature

Use the **Advanced | Network** embedded web page, if you want to configure the following:

- Host name
- DNS servers
- Syslog Server IP/Host name
- Syslog Port
- SSH Server Enable

Note: *You can use PortVision DX to configure the IP address information and then use the web interface to configure the options not configurable in PortVision DX.*

This subsection provides the following procedures:

- Download and install PortVision DX
- Scan the network and locate the IOLM
- Program the IOLM IP address to operate on your network

For more information about PortVision DX features and procedures, refer to the help system or the *PortVision DX User Guide*.

Download and Install PortVision DX

You can use this procedure to download and install PortVision DX.

1. Download PortVision DX.

2. Execute the **PortVision_DX_x.xx.msi** file, where x.xx is the version number.

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

4. Click **I accept the terms in the License Agreement** and **Next**.

5. Click **Next** to install in the default location or browse to another location and then click **Next**.

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

7. Click **Install**. Depending on your operating system, you may need to click **Yes** to the *Do you want to allow the following program to install software on this computer User Account Control* popup message.

8. Click **Finish**.

PortVision DX is installed and you can use the next subsection to program the IP address into the IOLM.

Programming the IP Address

Use the following procedure to program the IP address into the IOLM using PortVision DX.

Note: Connect a single IOLM at a time because they all have the same default IP address. PortVision DX cannot program an IP address in cases where there are multiple IOLMs with the same IP address.

1. **4-EIP**: Optionally, you can use the web interface to configure or Rotary switch to configure the IP address. The Rotary switch settings override the lower 3 digits (8 bits) of the static IP address configured in PortVision DX or the **Configuration | Network** page.

2. Start PortVision DX by using the desktop icon or click PortVision DX in the **Start** menu.

3. Depending on the operating system, you may need to click **Yes** to the *Do you want to allow the following program to make changes on this computer User Account Control* popup message.

4. Click the **Scan** button to locate your IOLM or IOLMs on the network.

5. Click the hardware types that you want to locate and click **Scan**.
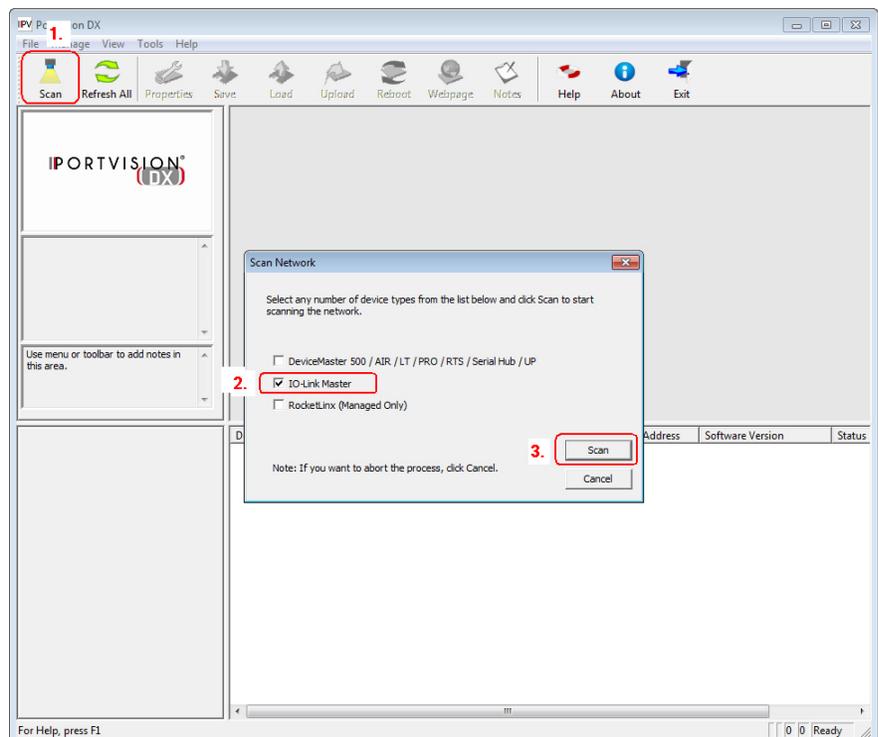
6. Right-click the IOLM that you want to program in the *Device List* pane (lower) and then click **Properties**.

    Optionally, you can double-click on the IOLM to open the **Properties** tabs. It may take a few moments for the next screen to open.
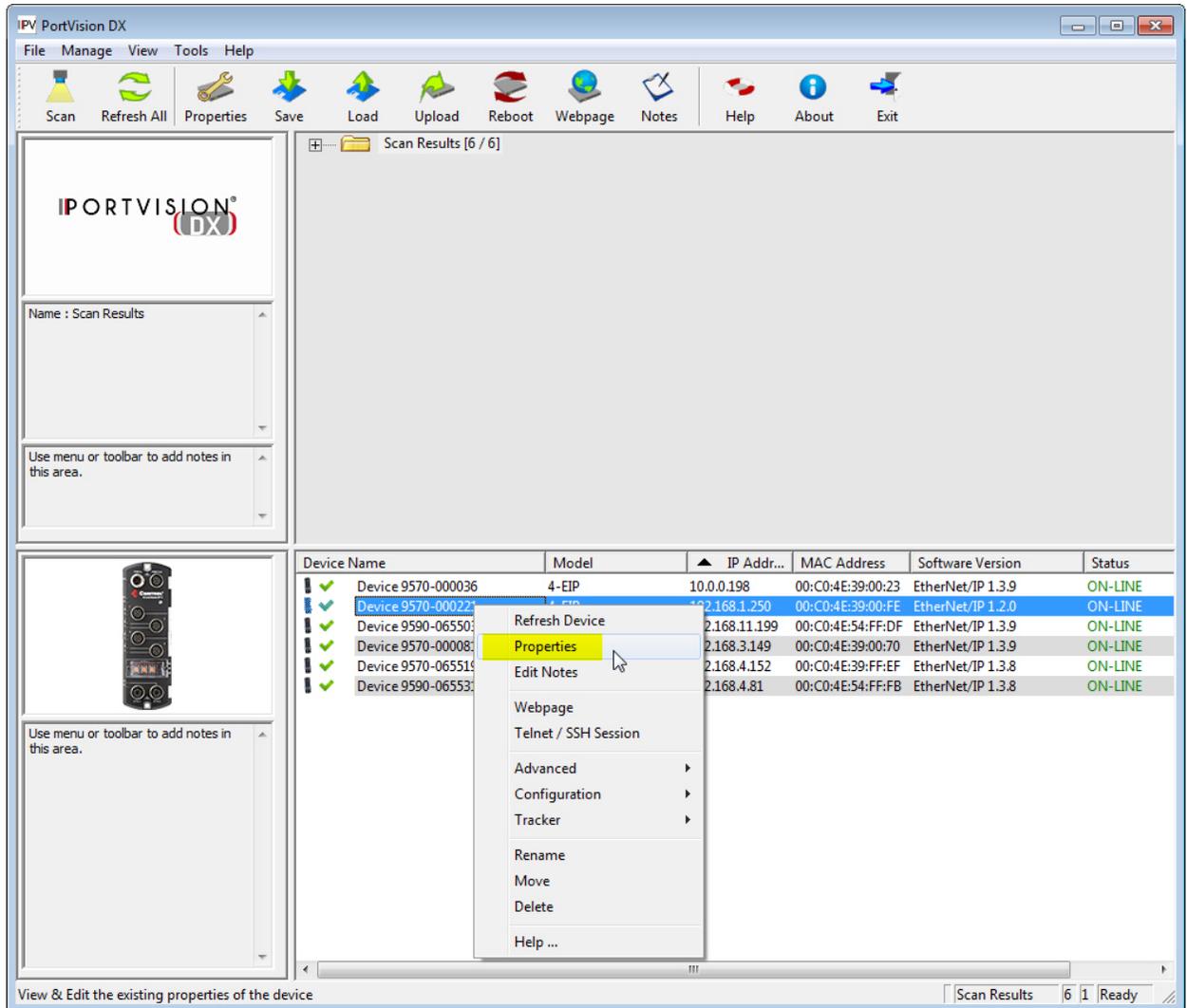
7. Optionally, enter a device name, which displays in PortVision DX on the **Main** screen.

   The MAC address, Serial Number, and Device Status fields are automatically completed and are status-only fields. This image may not reflect your model.

8. Enter the appropriate network information on the **General** tab. You can configure the IOLM for a static IP address or set it to DHCP.

   - If you select **Static** for the IP Type:

     a. Enter a valid IPv4 address. If necessary, see your Network Administrator for a valid IP address for this IOLM. The default IP address is: 192.168.1.250.

     b. Enter a valid subnet mask for your network. The default Subnet Mask is: 255.255.255.0.

     c. Enter a valid IP gateway address for your network. The default Gateway Address is: 0.0.0.0.

   - If you select **DHCP**, this field displays the last IP address programmed into the IOLM.

   Note: *Rotary switch settings on the 4-EIP override the lower 3 digits (8 bits) of static IP address.*
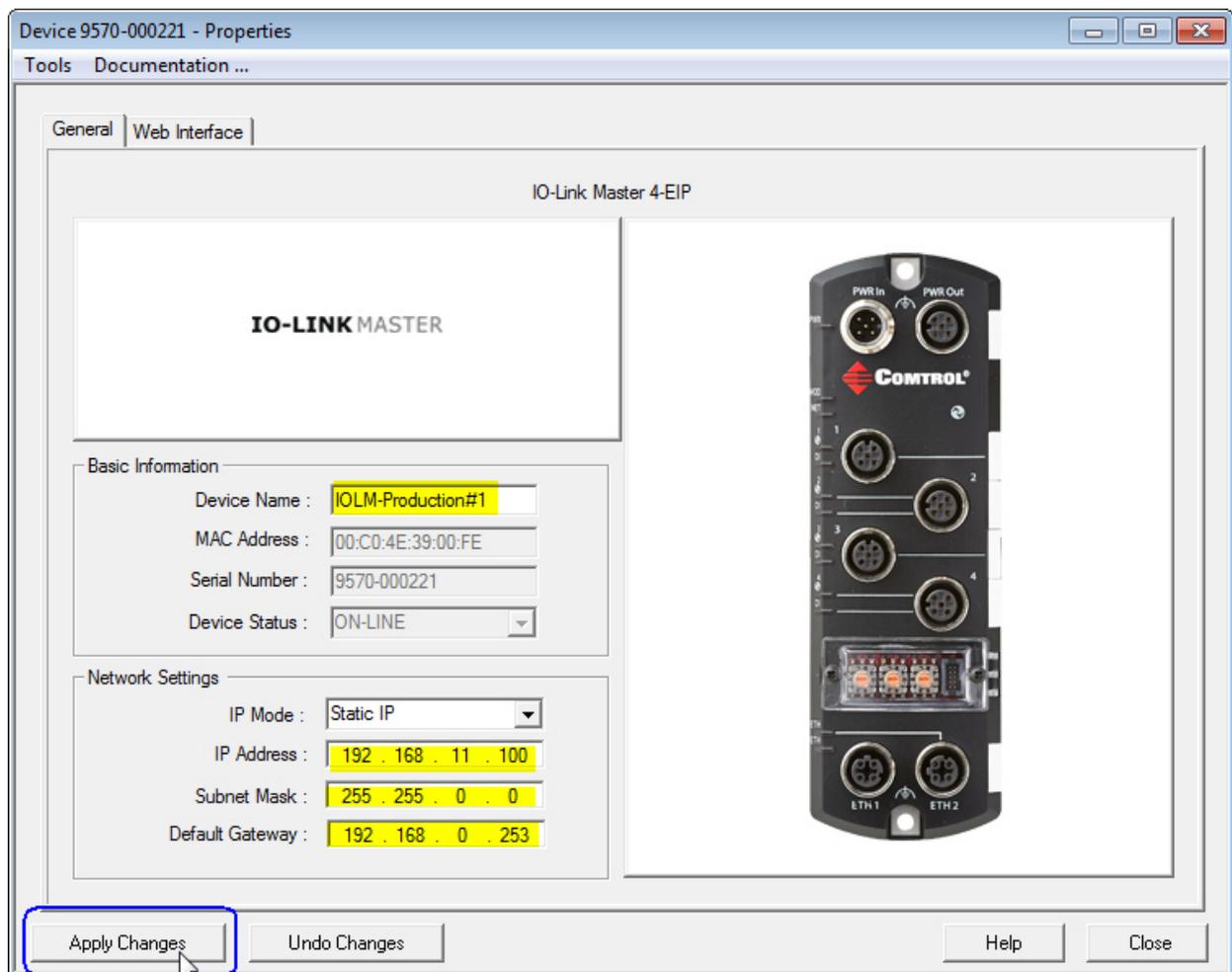
9. Click **Close** to exit the **Properties** tabs.

   Wait until PortVision DX polls to display the updated IOLM IP address or you can click **Refresh** until the new IP address displays in the *Device List* pane.

Verifying the Software (Image Versions)

You can use the following information to determine whether the IOLM contains the latest software.

- Checking the versions on the IOLM
- Checking the Comtrol ftp site for the latest version and downloading the files
- Using PortVision DX to update software

Note: *PortVision DX displays the Application Base image version, for example: EtherNet/IP. The IOLM contains four images.*

Checking the IOLM Software Versions

Use this procedure to check the software on the IOLM.

1. Open your web browser and enter the IP address of the IOLM or highlight the IOLM in PortVision DX and click the **Webpage** button.
2. Click **Advanced | Software**.
3. Check the version numbers of the IOLM images.

Checking the Comtrol ftp Site for the Latest Files

Use this procedure to locate the latest software for your IOLM model.

1. Go to the Comtrol ftp Download interface.
2. Select the IOLM model.
3. Download all image versions that are later than the images on the IOLM.

Updating Software

Use one of these methods to update software (images or application subassemblies) on the IOLM:

- PortVision DX
- IOLM web interface

PortVision DX

You can use this procedure to update software on the IOLM using PortVision DX.

1. If necessary, start PortVision DX.
2. Right-click the IO-Link Master that you want to update and click **Advanced** and then **Upload Firmware**.
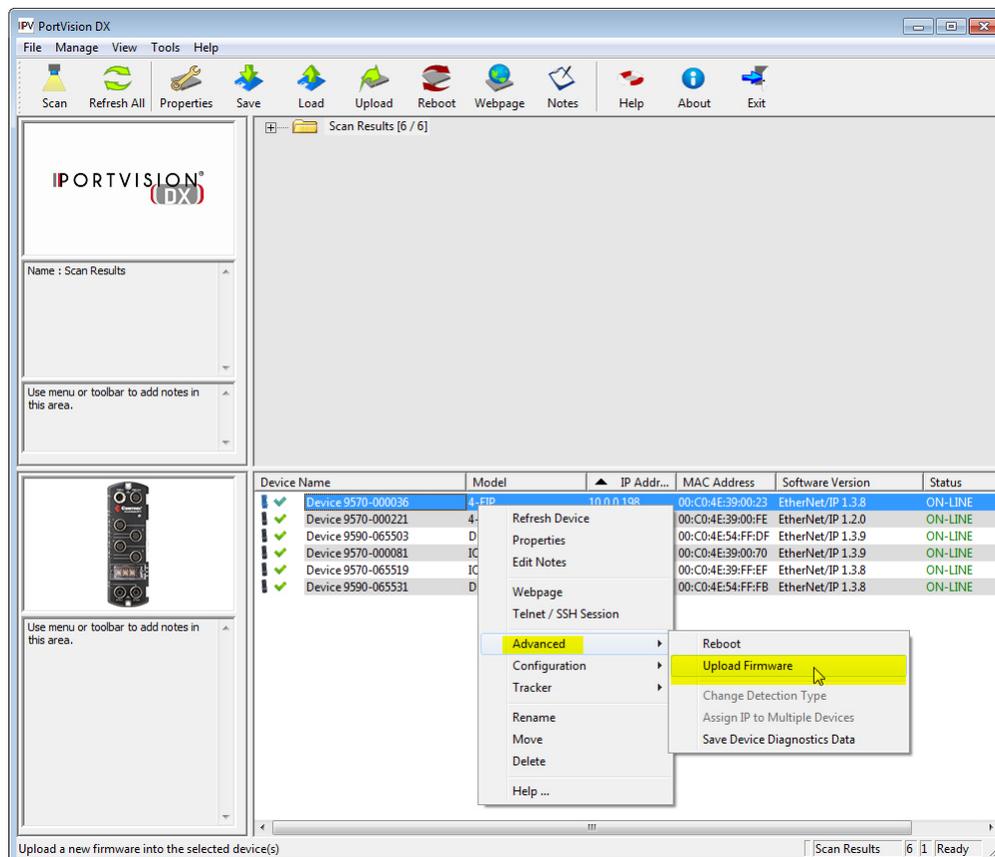
3. Browse to the location you saved the image or images, highlight a file name, and click **Open**.
4. Click **Yes** to the *Upload Firmware... Important Notice*.
5. Click **OK** to the *Upload Firmware... Status* message.

6. You may notice that PortVision DX first displays a Firmware uploaded status message. After the next PortVision DX polling cycle the status message displays ON-LINE.

7. Repeat the above steps for each image.

Using the Web Page to Update Software

Use the following procedure to update software on the IOLM using the IOLM web page.

1. Open your web browser and enter the IP address of the IOLM or highlight the IOLM in PortVision DX and click the **Webpage** button.

2. Click **Advanced | Software**.

3. Click the **UPDATE** button that corresponds to the image that you want to upload.

4. Click the **Browse…** button.

5. Locate and highlight the file.

6. Click **Open**.

7. Click the **Install** button.
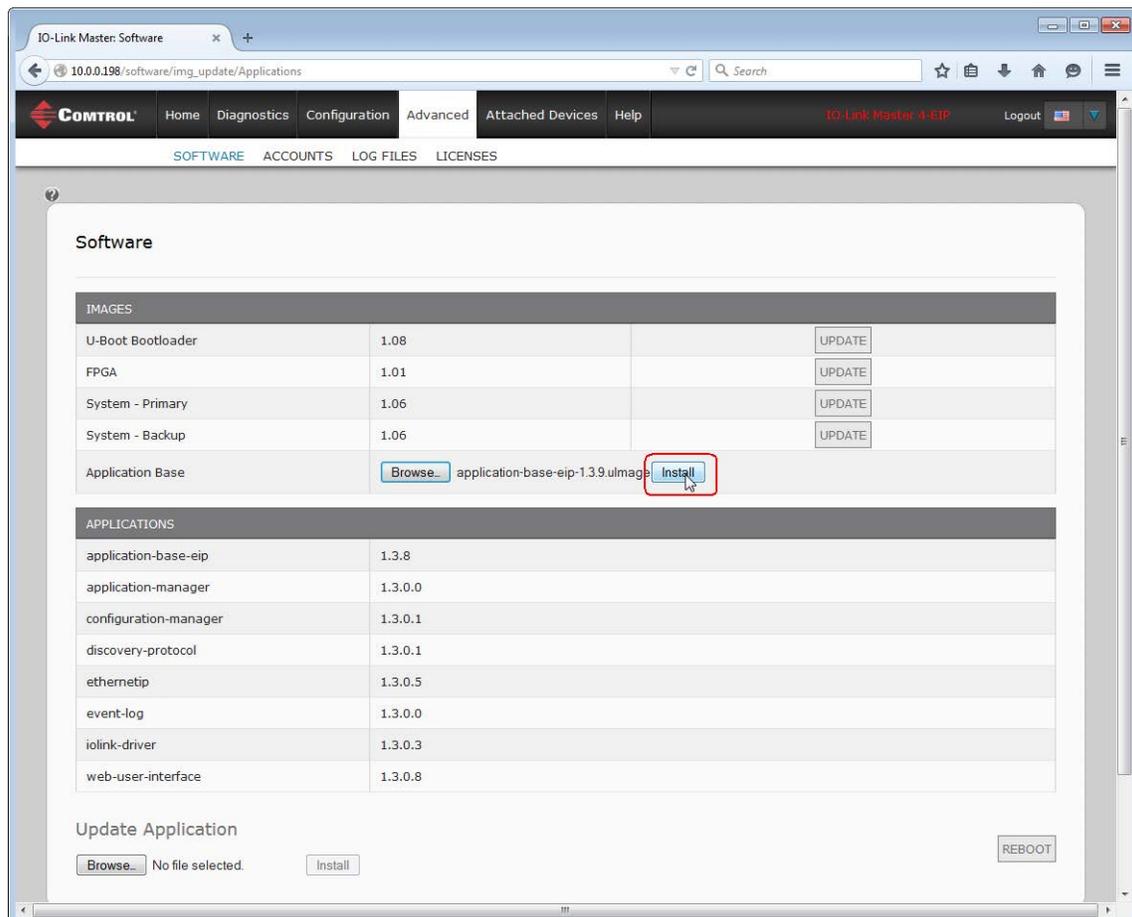
8. Click the **CONTINUE** button to the *Update Image* pop up message.

9. Wait the recommended time period before clicking the **OK** button to the *In Progress* message.

The **Software** page refreshes and displays that the version updated.