Getting Started with the NI EVS-1463RT

The NI EVS-1463RT is a real-time, fanless embedded vision system designed for rugged industrial applications. The NI EVS-1463RT features a dual core processor, a solid-state drive, and a variety of industrial communication connectors. The NI EVS-1463RT supports Base configuration Camera Link-compatible cameras and GigE Vision cameras, and features a 15-pin D-SUB I/O connector that has four external TTL I/O lines, two optically isolated inputs, and two RS-422 inputs.

This document describes how to install the NI EVS-1463RT hardware, configure a development computer, configure an IP address, and acquire an initial image.

Refer to the *NI EVS-1463 Series User Manual* for device and I/O specifications, mounting requirements, and answers to common questions about network, firewall, hardware, software, and power issues. To access the *NI EVS-1463 Series User Manual*, select **Start»All Programs»National Instruments» Vision»Documentation»NI-IMAQ**.

What You Need to Get Started

The following components are included in the NI EVS-1463RT kit:

❑ NI EVS-1463RT

❑ DVI splitter cable

❑ Three-position power connector

❑ NI Vision Acquisition Software DVD

Required Hardware

In addition to the items included in the NI EVS-1463RT kit, the following components are necessary to set up and configure the NI EVS-1463RT.

❑ One of the following power supply options:

⚠ **Caution** Use the NI EVS-1463RT only with a 24 VDC, UL listed, limited power source (LPS) supply. The power supply will bear the UL listed mark, LPS. The power supply must also meet any safety and compliance requirements for the country of use.

   – PS-5 Power Supply, 24 VDC, 5 A, Universal Power Input (part number 778805-90)

   – Any 24 VDC ±10%, 70 W or greater power supply

❑ Development computer running Windows Vista/XP/2000

❑ One or two CAT 5 10/100Base-TX or CAT 5e or CAT 6 1000Base-T Ethernet cables. One Ethernet cable is required to connect the device directly to the development computer. A second Ethernet cable is required to connect the device to the development computer through a network.

📝 **Note** A CAT 5e or CAT 6 1000Base-T Ethernet cable is required to achieve maximum 1,000 Mbps (Gigabit) Ethernet performance. CAT 5e and CAT 6 Ethernet cables adhere to higher electrical standards required for Gigabit Ethernet communication. CAT 5 cables are not guaranteed to meet the necessary electrical requirements. While CAT 5 cables may appear to work at 1,000 Mbps in some

installations, CAT 5 cables are likely to cause increased bit errors resulting in degraded or unreliable network performance.

❑ One of the following types of cameras:
- Base configuration Camera Link-compatible camera
- GigE Vision camera

❑ One of the following cables, corresponding to your camera type:
- MDR 26-pin Camera Link cable for connecting to Base configuration Camera Link-compatible camera
- CAT 5e or CAT 6 1000Base-T Ethernet cable for connecting to GigE Vision cameras

Required Software

Use one of the following application development environments to develop NI EVS-1463RT applications:

❑ LabVIEW 8.6 or later and the following add-on modules:
- LabVIEW Real-Time Module 8.6 or later
- NI Vision Development Module 8.6 or later
- NI Vision Acquisition Software 8.6.1 or later (included with the NI EVS-1463RT)

❑ NI Vision Builder for Automated Inspection 3.6.1 or later

Safety Information

The following section contains important safety information that you must follow when installing and using the hardware.

Do not operate the hardware in a manner not specified in this document and in the user documentation. Misuse of the hardware can result in a hazard. You can compromise the safety protection if the hardware is damaged in any way. If the hardware is damaged, return it to National Instruments for repair.

Clean the hardware with a soft, nonmetallic brush. Make sure that the hardware is completely dry and free from contaminants before returning it to service.

Do not substitute parts or modify the hardware except as described in this document. Use the hardware only with the chassis, modules, accessories, and cables specified in the installation instructions or specifications. You must have all covers and filler panels installed during operation of the hardware.

Do not operate the hardware in an explosive atmosphere or where there may be flammable gases or fumes unless the hardware is UL (U.S.) or Ex (EU) Certified and marked for hazardous locations. The hardware must be in a suitably rated IP 54 minimum enclosure for hazardous locations. Refer to the hardware's user documentation for more information.

You must insulate signal connections for the maximum voltage for which the hardware is rated. Do not exceed the maximum ratings for the hardware. Do not install wiring while the hardware is live with electrical signals. Do not remove or add connector blocks when power is connected to the system. Avoid contact between your body and the connector block signal when hot swapping hardware. Remove power from signal lines before connecting them to or disconnecting them from the hardware.

Operate the hardware only at or below Pollution Degree 2. Pollution is foreign matter in a solid, liquid, or gaseous state that can reduce dielectric strength or surface resistivity. The following is a description of pollution degrees:

- Pollution Degree 1 means no pollution or only dry, nonconductive pollution occurs. The pollution has no influence. Typical level for sealed components or coated PCBs.

- Pollution Degree 2 means that only nonconductive pollution occurs in most cases. Occasionally, however, a temporary conductivity caused by condensation must be expected. Typical level for most products.

- Pollution Degree 3 means that conductive pollution occurs, or dry, nonconductive pollution occurs that becomes conductive due to condensation.

Operate the hardware at or below the measurement category[1] marked on the hardware label. Measurement circuits are subjected to working voltages[2] and transient stresses (overvoltage) from the circuit to which they are connected during measurement or test. Measurement categories establish standard impulse withstand voltage levels that commonly occur in electrical distribution systems. The following is a description of measurement categories:

- Measurement Category I is for measurements performed on circuits not directly connected to the electrical distribution system referred to as MAINS[3] voltage. This category is for measurements of voltages from specially protected secondary circuits. Such voltage measurements include signal levels, special hardware, limited-energy parts of hardware, circuits powered by regulated low-voltage sources, and electronics.

- Measurement Category II is for measurements performed on circuits directly connected to the electrical distribution system (MAINS[3]). This category refers to local-level electrical distribution, such as that provided by a standard wall outlet (for example, 115 AC voltage for U.S. or 230 AC voltage for Europe). Examples of Measurement Category II are measurements performed on household appliances, portable tools, and similar hardware.

- Measurement Category III is for measurements performed in the building installation at the distribution level. This category refers to measurements on hard-wired hardware such as hardware in fixed installations, distribution boards, and circuit breakers. Other examples are wiring, including cables, bus bars, junction boxes, switches, socket outlets in the fixed installation, and stationary motors with permanent connections to fixed installations.

- Measurement Category IV is for measurements performed at the primary electrical supply installation typically outside buildings. Examples include electricity meters and measurements on primary overcurrent protection devices and on ripple control units.

To obtain the safety certification(s) for this product, visit ni.com/certification, search by model number or product line, and click the appropriate link in the Certification column.

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[1] Measurement categories, also referred to as overvoltage or installation categories, are defined in electrical safety standard IEC 61010-1 and IEC 60664-1.

[2] Working voltage is the highest rms value of an AC or DC voltage that can occur across any particular insulation.

[3] MAINS is defined as a hazardous live electrical supply system that powers hardware. Suitably rated measuring circuits may be connected to the MAINS for measuring purposes.

Electromagnetic Compatibility Information

This hardware has been tested and found to comply with the applicable regulatory requirements and limits for electromagnetic compatibility (EMC) as indicated in the hardware's Declaration of Conformity (DoC)[1]. These requirements and limits are designed to provide reasonable protection against harmful interference when the hardware is operated in the intended electromagnetic environment. In special cases, for example when either highly sensitive or noisy hardware is being used in close proximity, additional mitigation measures may have to be employed to minimize the potential for electromagnetic interference.

While this hardware is compliant with the applicable regulatory EMC requirements, there is no guarantee that interference will not occur in a particular installation. To minimize the potential for the hardware to cause interference to radio and television reception or to experience unacceptable performance degradation, install and use this hardware in strict accordance with the instructions in the hardware documentation and the DoC[1].

If this hardware does cause interference with licensed radio communications services or other nearby electronics, which can be determined by turning the hardware off and on, you are encouraged to try to correct the interference by one or more of the following measures:

- Reorient the antenna of the receiver (the device suffering interference).
- Relocate the transmitter (the device generating interference) with respect to the receiver.
- Plug the transmitter into a different outlet so that the transmitter and the receiver are on different branch circuits.

Some hardware may require the use of a metal, shielded enclosure (windowless version) to meet the EMC requirements for special EMC environments such as, for marine use or in heavy industrial areas. Refer to the hardware's user documentation and the DoC[1] for product installation requirements.

When the hardware is connected to a test object or to test leads, the system may become more sensitive to disturbances or may cause interference in the local electromagnetic environment.

Operation of this hardware in a residential area is likely to cause harmful interference. Users are required to correct the interference at their own expense or cease operation of the hardware.

Changes or modifications not expressly approved by National Instruments could void the user's right to operate the hardware under the local regulatory rules.

Thermal Considerations and Mounting

To maximize the cooling efficiency of the NI EVS-1463RT, observe the following recommendations:

- Mount the NI EVS-1463RT on a thermally conductive surface.
- Avoid static air environments.
- Mount the NI EVS-1463RT with the heatsink facing upward. If you mount the NI EVS-1463RT on a wall or other vertical surface, mount the device so that the heat sink fins are vertical.

Note The NI EVS-1463 Camera Link hardware is equipped with a temperature monitor. The Camera Link hardware will stop acquiring images if it reaches its maximum allowable temperature. An error will occur, reporting that the maximum temperature has been reached.

Refer to the *NI EVS-1463 Series User Manual* for dimensional drawings, additional mounting information, and detailed device specifications.

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[1] The Declaration of Conformity (DoC) contains important EMC compliance information and instructions for the user or installer. To obtain the DoC for this product, visit ni.com/certification, search by model number or product line, and click the appropriate link in the Certification column.

Unpacking and Verifying Components

Remove the NI EVS-1463RT from the package and inspect the system for any sign of damage. Notify National Instruments if the system appears damaged in any way. Do not use a damaged system.

Installing Hardware

Ensure that the AC input to the external power supply is disconnected before plugging in or unplugging any connector. Ground the unit to minimize the possibility of static electricity damage.

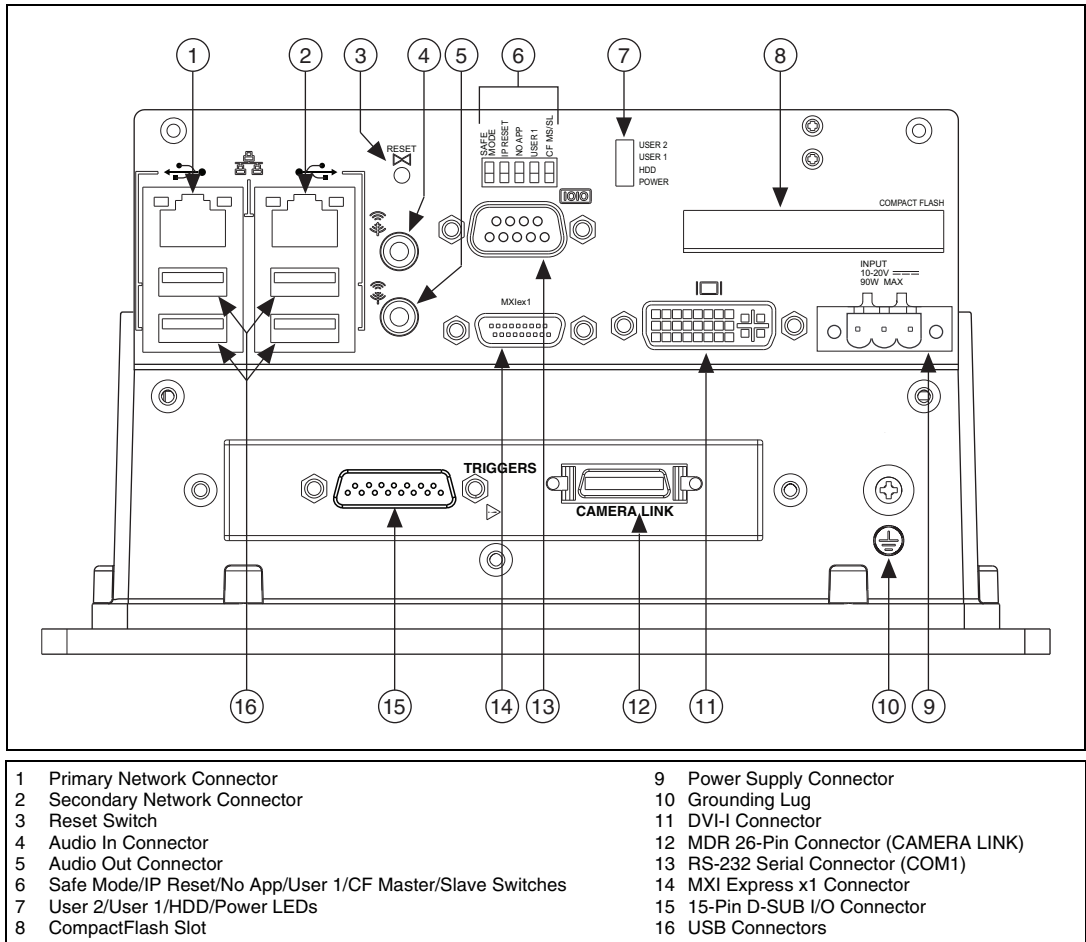Refer to Figure 1 while completing the following steps to install the NI EVS-1463RT.

1	Primary Network Connector	9	Power Supply Connector
2	Secondary Network Connector	10	Grounding Lug
3	Reset Switch	11	DVI-I Connector
4	Audio In Connector	12	MDR 26-Pin Connector (CAMERA LINK)
5	Audio Out Connector	13	RS-232 Serial Connector (COM1)
6	Safe Mode/IP Reset/No App/User 1/CF Master/Slave Switches	14	MXI Express x1 Connector
7	User 2/User 1/HDD/Power LEDs	15	15-Pin D-SUB I/O Connector
8	CompactFlash Slot	16	USB Connectors

Figure 1. NI EVS-1463RT Connectors

1. Connect a DVI monitor to the DVI connector, or use the DVI splitter cable (supplied) to connect dual monitors.

Note Connect all monitors before you supply power to the NI EVS-1463RT.

2. Connect devices to other connectors as required by your system configuration.

Connecting a Camera

To connect a camera to the NI EVS-1463RT, complete the following steps:

1. Connect the appropriate cable to your camera. Refer to your camera manufacturer documentation for specific instructions about how to connect the cable to your camera.

2. Complete the following step for your camera type to connect the camera to the NI EVS-1463RT:

    - **Base configuration Camera Link Compatible Cameras**—Connect the camera MDR 26-pin Camera Link cable to the MDR 26-pin connector on the NI EVS-1463RT front panel.

    - **GigE Vision Cameras**—Connect the camera Ethernet cable to the secondary network connector on the NI EVS-1463RT front panel.

The camera is now attached to the NI EVS-1463RT.

Connecting the Power Supply

To connect a power supply to the NI EVS-1463RT, complete the following steps:

1. Connect the power supply to the 3-position power connector.

2. Connect the 3-position power connector to the power supply connector on the NI EVS-1463RT.

3. Plug the power supply cord into an outlet.

The power LED will illuminate and the NI EVS-1463RT will boot when the power supply is properly connected.

Configuring the Development Computer

You must use a development computer to develop machine vision applications and configure the NI EVS-1463RT. The following sections describe the software required to develop applications or configure the NI EVS-1463RT.

Installing Application Development Software

To develop machine vision applications for the NI EVS-1463RT, you must install application development software on the development computer. National Instruments provides two options for developing applications for the NI EVS-1463RT.

Visit ni.com/vision for additional information about application development software. Refer to the software documentation for specific installation instructions.

Vision Builder
for
Automated Inspection

or

LabVIEW
LabVIEW Real-Time Module
NI Vision Development Module
NI Vision Acquisition Software

- **NI Vision Builder for Automated Inspection** (Vision Builder AI)—Interactive, menu-driven configuration software for developing, benchmarking, and deploying machine vision applications.

    To use Vision Builder AI to configure the NI EVS-1463RT and develop your application, complete the instructions in the *Configuring the NI EVS-1463RT with Vision Builder AI* section of this document.

- **NI LabVIEW**—Graphical programming environment for developing flexible and scalable applications. The following add-on modules are required to develop machine vision applications for the NI EVS-1463RT:

  – **NI LabVIEW Real-Time Module**—Programming library for developing distributed, deterministic applications.

  – **NI Vision Development Module**—Programming library for developing machine vision and scientific imaging applications.

  – **NI Vision Acquisition Software**—Includes programming libraries for acquiring images and controlling I/O using the NI EVS-1463RT.

To use LabVIEW to develop your application, you must use Measurement & Automation Explorer (MAX)—the National Instruments configuration utility—to configure the NI EVS-1463RT. To use MAX to configure the NI EVS-1463RT, complete the instructions in the *Configuring the NI EVS-1463RT with MAX* section of this document.

Installing NI Vision Acquisition Software

The latest version of NI Vision Acquisition software is included with the NI EVS-1463RT. NI Vision Acquisition Software includes driver software and MAX—the National Instruments configuration utility—which you can use to configure the NI EVS-1463RT.

Complete the following instructions to install NI Vision Acquisition Software:

1. Insert the NI Vision Acquisition Software DVD.
2. When the installation screen appears, click **Install NI Vision Acquisition Software**, and follow the setup instructions.

To use MAX to configure the NI EVS-1463RT, complete the instructions in the *Configuring the NI EVS-1463RT with MAX* section of this document.

Note If you plan to use LabVIEW to develop applications, install LabVIEW before installing NI Vision Acquisition Software.

Connecting the NI EVS-1463RT to the Development Computer

To configure the NI EVS-1463RT, you must connect the NI EVS-1463RT to a development computer. The NI EVS-1463RT can connect to the development computer directly or through a network using an Ethernet cable.

Caution To prevent data loss and to maintain the integrity of your Ethernet installation, do not use a cable longer than 100 m. Use a shielded twisted pair Ethernet cable for maximum signal integrity. If you are using 1,000 Mbps Ethernet, use a CAT 5e or CAT 6 shielded twisted-pair Ethernet cable.

After configuration, the NI EVS-1463RT device can run an inspection autonomously, without any connection to a development computer.

Connecting Directly to the Development Computer

To connect the NI EVS-1463RT device to the development computer, complete the following steps:

1. Use a standard Ethernet cable to connect the Ethernet port on the development computer to the primary network connector on the NI EVS-1463RT front panel, as shown in Figure 2.
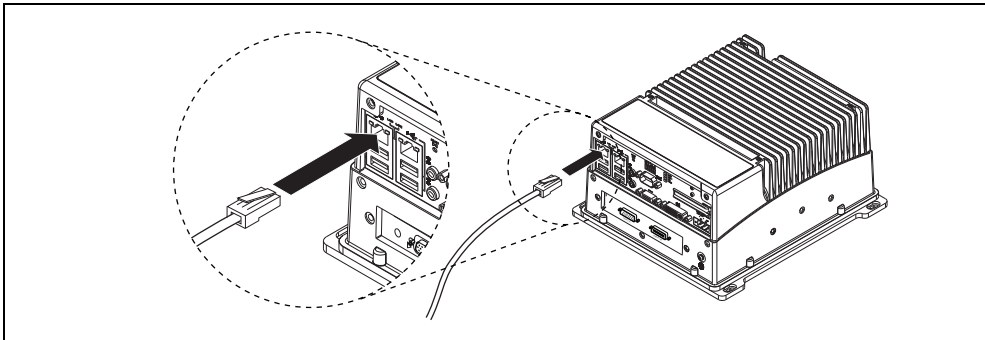
Figure 2. Connecting to the Primary Ethernet Connector on the NI EVS-1463RT

2. Power on the NI EVS-1463RT. The NI EVS-1463RT automatically attempts to detect the presence of a network. If a DHCP server is not available, the NI EVS-1463RT uses a link-local address to connect directly to the development computer.

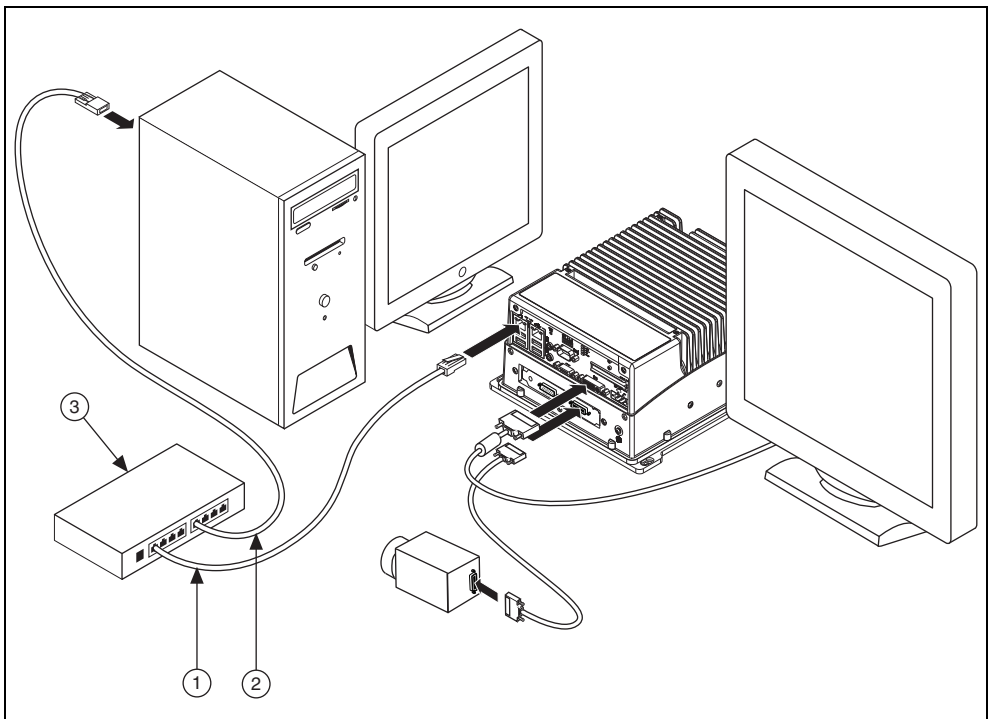The NI EVS-1463RT is now connected directly to the development computer.

Connecting to the Development Computer Through a Network

To connect the NI EVS-1463RT to the development computer through a network, refer to Figure 3 and complete the following steps.

Note To configure the NI EVS-1463RT device, it must reside on the same subnet as the development computer. If you want to deploy the NI EVS-1463RT on a different subnet, first connect and configure the NI EVS-1463RT on the same subnet as the host computer. If you want to assign a static IP address for a different subnet, do so while the NI EVS-1463RT is connected to the development computer. After installing software on the NI EVS-1463RT physically move the NI EVS-1463RT to the correct subnet. Refer to Appendix D, *Common Questions*, of the *NI EVS-1463 Series User Manual* to troubleshoot network configuration issues.

1	Connecting to the Primary Ethernet Connector on the NI EVS-1463RT
2	Connecting to an Ethernet Connector on the Development Computer
3	Ethernet Hub or Other Network Port

Figure 3. Connecting the NI EVS-1463RT to the Development Computer Through a Network

1. Use an Ethernet cable to connect the Ethernet hub to the primary network connector on the NI EVS-1463RT, as show in Figure 2.

2. Power on the NI EVS-1463RT.

Note You must connect the NI EVS-1463RT to the network before the NI EVS-1463RT boots. The NI EVS-1463RT does not have an on or off switch, and boots when power is supplied to it.

The NI EVS-1463RT is now connected to the development computer through a network.

Configuring the NI EVS-1463RT for Deployment

The following sections describe how to use the application development environment installed on the development computer to configure the NI EVS-1463RT. The configuration instructions differ for each application development environment. Complete *only* the instructions for your chosen development environment.
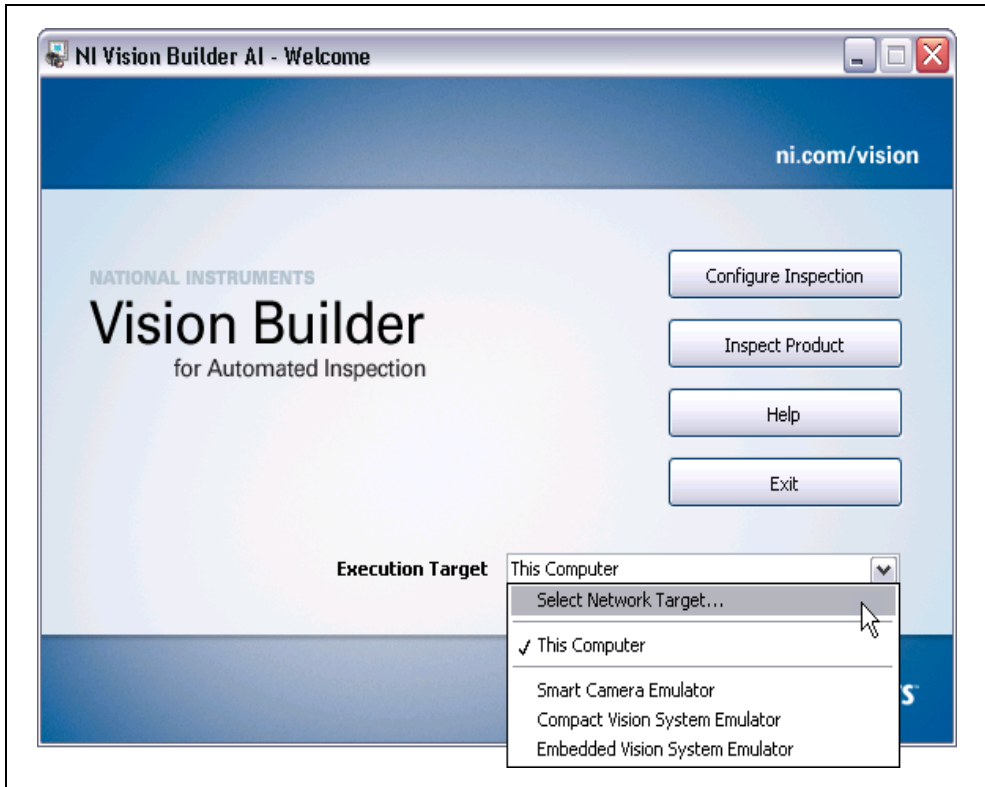
Configuring the NI EVS-1463RT with Vision Builder AI

Complete the steps in the following sections to configure the NI EVS-1463RT in Vision Builder AI.

Configure the IP Address

Complete the following steps to configure an IP address for the NI EVS-1463RT:

1. Launch Vision Builder AI.

2. On the Vision Builder AI startup screen, expand the **Execution Target** list, and click **Select Network Target**.

Figure 4. Vision Builder AI Welcome Screen

3. In the **Select Remote Target** dialog box, select the NI EVS-1463RT with a MAC address that corresponds to the MAC address on the bottom label of the NI EVS-1463RT you want to configure.

   Refer to Appendix D, *Common Questions*, of the *NI EVS-1463 Series User Manual* to troubleshoot network configuration issues.

4. Click **Configure**. The Remote Target Configuration Wizard launches in a new window.

5. In the **Name** field, enter a name for the device. Device names are limited to 31 characters with no spaces or special characters, except hyphens. The first and last characters must be alphanumeric.

6. Click **Next**.

7. Verify the IP address configuration. The IP address is either a network address, an automatic private IP address (169.254.x.x), or 0.0.0.0, depending on how the network is configured to issue network addresses.

📝 **Note** If the IP address is 169.254.x.x or 0.0.0.0, the NI EVS-1463RT is only accessible from the local subnet. To access the NI EVS-1463RT from a remote subnet, configure the device to obtain an IP address from a DHCP server or manually assign a static IP address.

- If the network is configured to issue IP addresses using DHCP, select **Obtain IP address from DHCP server**.
- Otherwise, configure the IP address manually. Select **Edit the IP settings**, click **Suggest Values**, and click **OK**.

8. If you want to prevent other users from configuring the device, select **Enable Password** and click **Set Password** to set up password protection.

9. Click **Next**.

Install Software on the NI EVS-1463RT

Complete the following steps to install software from the development computer to the NI EVS-1463RT:

1. In the Remote Target Configuration Wizard, enable the **Update Target Software** checkbox.

2. Click the **Browse** button next to the **Software Image to Install on the Target** control.

3. Navigate to the Vision Builder AI software image for the NI embedded vision system and click **OK**. Software images provided by National Instruments are installed to the <Vision Builder AI>\RT Images directory, where <Vision Builder AI> is the location where Vision Builder AI is installed.

4. Click **OK** to apply the IP configuration settings and download software to the NI EVS-1463RT.

5. Click **OK** to close the **Remote Target Configuration Successful** dialog box.

6. In the **Select Remote Target** dialog box, select the configured NI EVS-1463RT, and click **OK**. The configured NI EVS-1463RT appears in the Execution Target list on the Vision Builder AI Welcome screen.

Interfacing with GigE Vision Cameras through the Secondary Ethernet Connector

To interface with a GigE Vision camera connected to the secondary Ethernet connector, you must manually configure the connector. Complete the following instructions to manually configure the secondary Ethernet connector:

1. On the Vision Builder AI Welcome screen, click **Configure Inspection** to open the Vision Builder AI Configuration Interface.

2. Select **Target»Target Options** to open the **Remote Target Options** dialog box.

3. Select **Secondary Ethernet** from the **Category** list to display the secondary Ethernet connector settings.

4. Select **Use Link-Local IP Address**.

5. Manually specify an **IP address** for the secondary Ethernet connector.

6. Click **OK** to close the **Remote Target Options** dialog box.

7. Select **Target»Reboot Target** to reboot the NI EVS-1463RT and close the Vision Builder AI Configuration Interface.

Interfacing with Camera Link Cameras

To interface with a Camera Link camera connected to the NI EVS-1463RT, you must associate the camera with the appropriate camera file. For information about how to associate a camera file with a Camera Link camera connected to a remote target, visit ni.com/info and enter the info code rtcamerafile. For more information about camera files, refer to the *Camera Files* section of Chapter 1, *NI EVS-1463 Series Overview*, in the *NI EVS-1463 Series User Manual*.

Acquire an Image

Complete the following steps to acquire an image using Vision Builder AI:

1. On the Vision Builder AI Welcome screen select the NI EVS-1463RT in the **Execution Target** list.

2. Click **Configure Inspection** to open the Vision Builder AI Configuration Interface.

3. In the Inspection Steps palette, select the **Acquire Images** tab.

4. Click the image acquisition step for your camera type:

   • **Base Configuration Camera Link compatible cameras**—Use the **Acquire Image** step.

   • **GigE Vision cameras**—Use the **Acquire Image (1394, GigE, or USB)** step.

   The property page for the step opens.

5. Click **Acquire Single Image** to acquire an image from the NI EVS-1463RT.

6. Click **OK** to add the step to the inspection.

The device is now configured and acquiring images. Use Vision Builder AI to add and configure additional inspection steps to create your application. Refer to the *Where to Go from Here* section for a list of resources to help you set up and use the NI EVS-1463RT in an application.

Configuring the NI EVS-1463RT with MAX

If you choose LabVIEW as your application development environment, you must use MAX to configure the NI EVS-1463RT. Complete the steps in the following sections to configure the NI EVS-1463RT in MAX.

Configure the IP Address

Complete the following steps to configure an IP address for the NI EVS-1463RT:

1. Launch MAX by double-clicking the Measurement & Automation icon on the desktop, or selecting **Start»All Programs»National Instruments»Measurement & Automation**.

2. Expand the **Remote Systems** branch of the configuration tree, and select the device you want to configure.

   Refer to Appendix D, *Common Questions*, of the *NI EVS-1463 Series User Manual* to troubleshoot network configuration issues.

3. In the **Name** field, enter a name for the device. Device names are limited to 31 characters with no spaces or special characters, except hyphens. The first and last characters must be alphanumeric.

4. Verify the IP address configuration. The IP address is either a network address, an automatic private IP address (169.254.x.x), or 0.0.0.0, depending on how the network is configured to issue network addresses.

   Note If the IP address is 169.254.x.x or 0.0.0.0, the NI EVS-1463RT is only accessible from the local subnet. To access the NI EVS-1463RT from a remote subnet, configure the device to obtain an IP address from a DHCP server or manually assign a static IP address.

   • If the network is configured to issue IP addresses using DHCP, select **Obtain IP address from DHCP server**.

- Otherwise, configure the IP address manually. Select **Edit the IP settings**, click **Suggest Values**, and click **OK**.

5. If you want to prevent other users from resetting the device, click the **Lock** button on the MAX toolbar to set up password protection. To require users to enter the password before restarting the device, enable the **Password-protect Resets** checkbox.

6. Click **Apply** on the MAX toolbar.

7. When prompted, click **Yes** to restart the device. The initialization process may take several minutes.

Install Software on the NI EVS-1463RT

Complete the following steps to install software from the development computer to the NI EVS-1463RT:

1. In the Remote Systems branch of the MAX configuration tree, expand the folder for the NI EVS-1463RT and select **Software**.

2. Click **Add/Remove Software** on the MAX toolbar to launch the LabVIEW Real-Time Software Wizard.

3. Select **LabVIEW Real-Time**, **RT Extension for SMP (Multicore Support)**, **NI Vision RT**, **NI-IMAQ RT**, **NI-IMAQ Server**, **NI-IMAQdx RT** and any necessary additional software.

4. Click **Next**.

5. Verify your software installation choices, and click **Next**.

6. When the installation is complete, click **Finish**.

Interfacing with GigE Vision Cameras through the Secondary Ethernet Connector

To interface with a GigE Vision camera connected to the secondary Ethernet connector, you must manually configure the connector. Complete the following instructions to manually configure the secondary Ethernet connector:

1. In the Remote Systems branch of the MAX configuration tree, select the NI EVS-1463RT.

2. Select the **Network Settings** tab.

3. Click **Advanced Ethernet Settings** to open the Advanced Ethernet Settings dialog box.

4. Select the MAC address for the secondary Ethernet connector from the **Ethernet Devices** list.

5. Select **TCP/IP Network** in the **Mode** list.

6. Manually specify an **IP address** for the secondary Ethernet connector. National Instruments recommends that you configure the secondary Ethernet connector with an **IP address** of 169.254.0.*x*, where *x* is the range 1–255, and a **Subnet Mask** of 255.255.0.0. This configuration allows the NI EVS-1463RT to communicate with GigE Vision cameras using a link-local address.

7. Click **OK** to close the Advanced Ethernet Settings dialog box.

8. Click **Reboot** to reboot the NI EVS-1463RT.

Interfacing with Camera Link Cameras

To interface with a Camera Link camera connected to the NI EVS-1463RT, you must associate the camera with the appropriate camera file. For information about how to associate a camera file with a Camera Link camera connected to a remote target, visit ni.com/info and enter the info code rtcamerafile. For more information about camera files, refer to the *Camera Files* section of Chapter 1, *NI EVS-1463 Series Overview*, in the *NI EVS-1463 Series User Manual*.

Acquire an Image

Complete the following steps to acquire an image using MAX:

1. In the Remote Systems branch of the MAX configuration tree, expand the branch for your device.

2. Expand the Devices and Interfaces branch.

3. Expand the **NI-IMAQdx Devices** branch and the **NI-IMAQ Devices** branch to view all cameras connected to the NI EVS-1463RT.

4. Select a camera.

5. Click **Snap** to acquire a single image, or click **Grab** to acquire continuous images. Click **Grab** again to stop a continuous acquisition.

The NI EVS-1463RT is now configured and acquiring images. Use LabVIEW to create your application. Refer to the *Where to Go from Here* section for a list of documentation and other resources to help you set up and use the NI EVS-1463RT in an application.

Accessing the Camera Link Serial Interface

Use the Camera Link Serial Remote System Selector to make the Camera Link serial interface on the NI EVS-1463RT available to Camera Link serial utilities installed on the development computer.

> **Note** NI Vision Acquisition Software 2009 or later is required to configure the NI EVS-1463RT with the Camera Link Serial Remote System Selector.

Complete the following steps to configure the NI EVS-1463RT with the Camera Link Serial Remote System Selector:

1. Launch MAX by double-clicking the Measurement & Automation icon on the desktop, or selecting **Start»All Programs»National Instruments»Measurement & Automation**.

2. Launch the Camera Link Serial Remote System Selector by selecting **Tools»NI Vision»Select CLSerNat Systems**.

3. Select any NI EVS-1463RT system with a serial interface that you want to make available to the development computer.

4. Click **OK**.

The Camera Link serial interface is now available to Camera Link serial utilities installed on the development computer. For more information about Camera Link serial utilities, refer to the *Serial Interface* section of Chapter 3, *Camera Link Hardware Overview*, of the *NI EVS-1463 Series User Manual*.

Deploying Multiple NI EVS-1463RT Devices

As with all Ethernet devices, you can connect multiple NI EVS-1463RT devices to the same network. This feature allows remote configuration, programming, and monitoring of any NI EVS-1463RT device not protected by a firewall or user password.

Use the serial number and media access control (MAC) address printed on the bottom of each NI EVS-1463RT device to identify individual devices in the configuration environment on the development machine. You can also assign each NI EVS-1463RT device a descriptive name in the configuration environment.

Specifications

For detailed device and I/O specifications, refer to Appendix A, *Specifications*, in the *NI EVS-1463 Series User Manual*.

Environment

NI EVS-1463RT systems are intended for indoor use only.

Maximum altitude...2,000 m

Pollution Degree (IEC 60664) 2

Operating Environment

Ambient temperature range ....0 °C to 45 °C
(IEC 60068-2-1 and IEC 60068-2-2)

Relative humidity range (IEC 60068-2-56) ....10% to 90% noncondensing

⚠ **Caution** Clean the NI EVS-1463RT with a soft nonmetallic brush. Make sure that the system is completely dry and free from contaminants before powering-on the controller again.

Storage Environment

Ambient temperature range ....−40 °C to 70 °C
(IEC 60068-2-1 and IEC 60068-2-2)

Relative humidity range (IEC 60068-2-56) ....5% to 95% noncondensing

Shock and Vibration

Operational shock ....30 g peak, half-sine, 11 ms pulse
(Tested in accordance with IEC-60068-2-27.
Test profile developed in accordance with
MIL-PRF-28800F.)

Random vibration
  Operating ....5 to 500 Hz, 0.3 g_{rms} (with solid-state hard drive)
  Nonoperating ....5 to 500 Hz, 2.4 g_{rms}
(Tested in accordance with IEC-60068-2-64.
Nonoperating test profile exceeds the requirements
of MIL-PRF-28800F, Class 3.)

Safety

This product is designed to meet the requirements of the following standards of safety for electrical equipment for measurement, control, and laboratory use:

• IEC 61010-1, EN 61010-1
• UL 61010-1, CSA 61010-1

✎ **Note** For UL and other safety certifications, refer to product label or the *Online Product Certification* section.

Electromagnetic Compatibility

This product meets the requirements of the following EMC standards for electrical equipment for measurement, control, and laboratory use:

• EN 61326 (IEC 61326): Class A emissions; Basic immunity
• EN 55011 (CISPR 11): Group 1, Class A emissions

- AS/NZS CISPR 11: Group 1, Class A emissions
- FCC 47 CFR Part 15B: Class A emissions
- ICES-001: Class A emissions

Note Note For the standards applied to assess the EMC of this product, refer to product label or the *Online Product Certification* section.

Note Note For EMC compliance, operate this product according to the documentation.

CE Compliance CE

This product meets the essential requirements of applicable European Directives as follows:
- 2006/95/EC; Low-Voltage Directive (safety)
- 2004/108/EC; Electromagnetic Compatibility Directive (EMC)

Online Product Certification

Refer to the product Declaration of Conformity (DoC) for additional regulatory compliance information. To obtain product certifications and the DoC for this product, visit `ni.com/certification`, search by model number or product line, and click the appropriate link in the Certification column.

Environmental Management

National Instruments is committed to designing and manufacturing products in an environmentally responsible manner. NI recognizes that eliminating certain hazardous substances from our products is beneficial not only to the environment but also to NI customers.

For additional environmental information, refer to the *NI and the Environment* Web page at `ni.com/environment`. This page contains the environmental regulations and directives with which NI complies, as well as other environmental information not included in this document.

Waste Electrical and Electronic Equipment (WEEE)

EU Customers At the end of their life cycle, all products *must* be sent to a WEEE recycling center. For more information about WEEE recycling centers and National Instruments WEEE initiatives, visit `ni.com/environment/weee.htm`.

电子信息产品污染控制管理办法 （中国 RoHS）

中国客户 National Instruments 符合中国电子信息产品中限制使用某些有害物质指令 (RoHS)。关于 National Instruments 中国 RoHS 合规性信息，请登录 `ni.com/environment/rohs_china`。(For information about China RoHS compliance, go to `ni.com/environment/rohs_china`.)

Battery Replacement and Disposal

This device contains a long-life coin cell battery. If you need to replace it, use the Return Material Authorization (RMA) process or contact an authorized National Instruments service representative. For more information about compliance with the EU Battery Directive 2006/66/EC about Batteries and Accumulators and Waste Batteries and Accumulators, visit `ni.com/environment/batterydirective`.

Where to Go from Here

The following documents and resources contain information you may find helpful as you set up and use the NI EVS-1463RT in an application.

Refer to the *NI EVS-1463 Series User Manual* for detailed information about:

- Device and I/O specifications
- Mounting requirements
- Answers to common questions about network, firewall, hardware, software, and power issues

Additional Resources for Vision Builder for Automated Inspection Users

Refer to the *NI Vision Builder for Automated Inspection Tutorial* to learn how to perform basic machine vision techniques using Vision Builder AI. You can access the *NI Vision Builder for Automated Inspection Tutorial* and other documentation by selecting **Start»All Programs»National Instruments»Vision Builder AI»Documentation**. You can also access context help within Vision Builder AI by clicking the **Show Context Help** button on the Vision Builder AI toolbar.

Examples of common Vision Builder AI inspections are installed to the `<Vision Builder AI>\Examples` directory.

Visit the NI Developer Zone at `ni.com/zone` for the latest example programs, tutorials, technical presentations, and a community area where you can share ideas, questions, and source code with developers around the world.

Additional Resources for LabVIEW Users

Documentation for LabVIEW and the LabVIEW Real-Time Module is available from the **Help** menu on the LabVIEW toolbar. You can access documentation for the NI Vision Development Module by selecting **Start»All Programs»National Instruments»Vision»Documentation»NI Vision**.

Documentation for the NI-IMAQ driver software is available by selecting **Start»All Programs» National Instruments»Vision»Documentation»NI-IMAQ**.

Documentation for the NI-IMAQdx driver software is available by selecting **Start»All Programs» National Instruments»Vision»Documentation»NI-IMAQdx**.

Documentation for the MAX configuration software is available from the **Help** menu on the MAX toolbar. Specific information about using MAX with NI Vision hardware is available by selecting **Help»Help Topics»NI Vision**.

Examples of image acquisitions and common machine vision inspections are installed to the `<LabVIEW>\Examples\IMAQ` and `<LabVIEW>\Examples\Vision` directories, where `<LabVIEW>` is the location where LabVIEW is installed.

Visit the NI Developer Zone at `ni.com/zone` for the latest example programs, tutorials, technical presentations, and a community area where you can share ideas, questions, and source code with developers around the world.

Where to Go for Support

The National Instruments Web site is your complete resource for technical support. At `ni.com/support` you have access to everything from troubleshooting and application development self-help resources to email and phone assistance from NI Application Engineers.

A Declaration of Conformity (DoC) is our claim of compliance with the Council of the European Communities using the manufacturer's declaration of conformity. This system affords the user protection for electronic compatibility (EMC) and product safety. You can obtain the DoC for your product by visiting `ni.com/certification`. If your product supports calibration, you can obtain the calibration certificate for your product at `ni.com/calibration`.

National Instruments corporate headquarters is located at 11500 North Mopac Expressway, Austin, Texas, 78759-3504. National Instruments also has offices located around the world to help address your support needs. For telephone support in the United States, create your service request at `ni.com/support` and follow the calling instructions or dial 512 795 8248. For telephone support outside the United States, contact your local branch office:

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Brazil 55 11 3262 3599, Canada 800 433 3488, China 86 21 5050 9800,
Czech Republic 420 224 235 774, Denmark 45 45 76 26 00, Finland 358 (0) 9 725 72511,
France 01 57 66 24 24, Germany 49 89 7413130, India 91 80 41190000, Israel 972 3 6393737,
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