COGNEX®

OmniView Application Getting Started

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VisionPro

5481712, 5495537, 5548326, 5583954, 5602937, 5640200, 5751853, 5768443, 5825913, 5850466, 5872870, 5901241, 5943441, 5978080, 5978521, 5987172, 6005978, 6039254, 6064388, 6075881, 6137893, 6141033, 6167150, 6215915, 6240208, 6324299, 6381366, 6381375, 6411734, 6421458, 6459820, 6490375, 6516092, 6563324, 6658145, 6687402, 6690842, 6697535, 6718074, 6748110, 6771808, 6804416, 6836567, 6850646, 6856698, 6920241, 6959112, 6963338, 6973207, 6975764, 6985625, 6993177, 6993192, 7006712, 7016539, 7043081, 7058225, 7065262, 7088862, 7164796, 7190834, 7242801, 7251366, 7313761, EP0713593, JP3522280, JP3927239

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CVL

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SMD 4

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Preface

OmniView is a machine vision, cylindrical product verification system that can accurately inspect randomly oriented cylindrical surfaces.

Audience

This document is written for engineers who have been trained to use OmniView software, such as Original Equipment Manufacturers (OEMs) and Partner System Integrators (PSIs). The guide can also serve as a checklist for engineers who have previously performed these steps in a training environment. The *OmniView User's Guide* contains information on creating an OmniView vision application.

Organization

This document lists the prerequisites to using OmniView, how to install the OmniView software, and the basic features OmniView provides in this release.

Conventions Used in This Guide

This document uses the following style conventions:

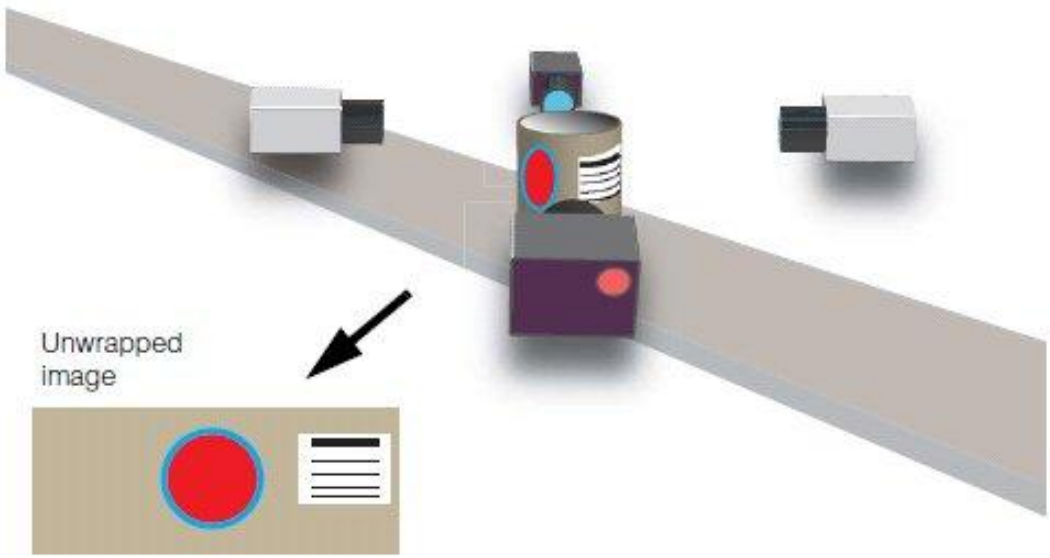
boldface	**Indicates a specific component of the OmniView graphics user interface.**
italic	Used for variables, arguments, file names, program names, book section names, and for emphasis.
`Courier`	Used for program output.
`bold courier`	Used in illustrations to show what you would type on a keyboard.
<*italic*>	When enclosed in brackets, used to indicate keyboard keys such as <Tab> or <Enter>.

Introduction

This document provides an ordered list of the steps you should follow to setup and configure your OmniView system, including:

- Ensuring you have an adequate PC platform as described in the section *PC Requirements* on page 11
- Installing the OmniView hardware purchased from Cognex
- Installing the customer-provided hardware specific to this application
- Installing the OmniView software
- Launching a setup wizard to set most of the configuration parameters your OmniView application will need
- Launching OmniView

What is OmniView?



A conveyer carries containers to be inspected as they move horizontally through the verification station, using four cameras to capture simultaneous images from all sides. OmniView blends the four images together to create a single unwrapped image containing an entire 360 degree view of the container, then registers the unwrapped image to a common starting point so that verification can be defined for relatively fixed regions of interest. This new aligned unwrapped image along with the four original images can be analyzed with Cognex vision tools to verify any logos, dates, and product codes to ensure the container has been manufactured and labeled correctly.

An optional fifth camera can be used to capture an image directly above the container for an independent verification of the top.

OmniView is designed to operate on sufficiently rigid containers. Parts that suffer geometric deformation compared to the trained shape, or parts that have embossing, protrusions, or intrusions on the surface to be verified will show noticeable irregularities in the unwrapped

image, especially in the horizontal direction. Moreover, labels with lumps, texture, or rough surface features will be unwrapped at noticeably lower fidelity than labels with smooth surfaces, even if the container itself is sufficiently rigid. This will adversely affect the ability for vision tools to run on the images.

Make sure that OmniView is suitable for your application before getting started.

OmniView Application and OmniView SDK

The OmniView software can be used in either discrete form:

- The *OmniView Application*, an interactive user interface for setup, management and operation of a vision application.
- The *OmniView Software Development Kit* (SDK) provides a sophisticated .NET programming interface that provides access to camera calibration, acquisition, training, fixturing and unwrapping capabilities.

The OmniView kit ships with all the software for both OmniView Application and OmniView SDK. The two forms, however, cannot be used together to produce a single inspection application. You must choose between the interactive interface or the SDK before you start development.

For more information on the OmniView SDK, see the *Cognex OmniView SDK Programmer's Guide*.

OmniView Requirements

A complete verification station requires a mix of components supplied by both Cognex and the station manufacturer.

Supplied Hardware and Software Components

Cognex can supply some or all of the following components for each OmniView kit:

Cognex Component	Description
GigE Vision Cameras	GigE Vision cameras with a minimum resolution of 1628 x 1236. See the section *Supported Cameras* on page 11 for a list of supported cameras and camera combinations.
GigE Vision Network Adapters	CGE-NIC4 quad-port adapters and CGE-NIC1-1 single port adapters; one quad-port adapter and one single port adapter for a 5-camera station
I/O board	Cognex 8501 PCI Opto-isolated Board for a PCI or PCI-X slot (8 ins, 8 outs) with supported software security mechanism
OmniView installation DVD	All OmniView software, including VisionPro with its wide array of vision tools.
Calibration plates	Three sizes of aluminum calibration plates laminated with a checkerboard pattern. Calibration plates need to be purchased separately based on the requirements of the application.
Security key	A security key to install on the PC that contains the security mechanism necessary to run Cognex software.

Other Necessary Hardware Components

Cognex does not provide the following necessary components for each verification station:

Component	Description
Control Enclosure	The enclosure must house the PC running OmniView software and provide adequate cooling. Based on the user's preference, the display, keyboard, pointer device, and other peripheral equipment can also be integrated into the enclosure.
Display	17¨ minimum size, 1024x768 resolution. A second monitor is necessary when using the 3D animated OmniView Model Viewer feature for demonstration purposes.
Imaging Enclosure Exterior	Cubic enclosure with dimensions based on the range of valid containers, made from stainless steel or engineered plastic such as polycarbonate. It is critical that the side-view cameras remain rigidly mounted relative to each other during the operation of OmniView.

Imaging Enclosure Interior	Users are responsible for rigid mounting of lighting and cameras. Cognex encourages users to review their designs and plans with Cognex before implementation.
Junction Box Houses	+24VDC and +5VDC power supplies and terminal strips, recommend use of fuses on both DC power supplies Stainless steel type recommended (24” x 20” x 12” minimum size)
Keyboard	Standard English keyboard, PS/2 or USB connector
Lighting	Users are responsible for lighting and any custom diffuser elements. Cognex encourages users to review their designs and plans with Cognex before implementation. A “cloudy day” lighting on the surface of the containers being verified is required for best performance.
Part Presence Sensor	A +24VDC device with single-ended signal interface and selectable signal polarity. You must select the sensor appropriate to container size, with a maximum response time of 2ms.
Pointer Device	Minimum 2-button mouse, PS/2 or USB connector
Power Cables	A power cable is required for the light source and the PC. To ensure clean electrical power signaling and orderly shutdown of Windows in the event of electrical power outage, the use of an Uninterruptible Power Supply (UPS) is strongly recommended. Normally OmniView systems deploy with a UPS rated for a minimum of 400 Watts (450VA) to safely cover the PC, monitor, lights, cameras, and DC power supplies.
Power Supplies	A +5VDC @ 1A, +24VDC @ 2A (fused)
Reject Actuator	A +24VDC controllable device (pneumatic valve type is most common)
Shaft Encoder	A +24VDC device with single-ended signal interface; select the proper number of pulses per revolution to achieve a pulse frequency of at least 350 Hz, not to exceed 950 Hz at the peak conveyor speed.
Terminal Block	Cage-clamp style wiring blocks where power supply and trigger connections are terminated
Lenses	Industrial optics such as those available from the Cognex standard product catalog, with locking aperture and focus, matched to the part size and working distance for each particular deployed system
PC	Validated OmniView processing platform from Dell Computer. See the section *PC Requirements* on page 11 for platform requirements.

PC Requirements

Cognex has tested OmniView on the Dell Precision T5500 in each of the following configurations:

- Intel dual processor Xeon Six Core, 2.66 GHz, 12GB physical memory
- Intel Xeon Quad Core, 2.66 GHz, 6GB physical memory

In addition, your PC must meet the following minimum requirements:

- Windows 7 Professional 64-bit.

  This release does not support Microsoft Windows Vista or Windows XP.
- Administrator privileges to install OmniView.
- One full height PCI or PCI-X slot for the I/O board
- For 4-camera stations, one open PCI-Express slot for the GigE Vision network adapters.
- For 5-camera stations, an additional open PCI-Express slot for a 2nd GigE Vision network adapter.

Check with your Cognex sales representative before using a non-validated platform.

Supported Cameras

Cognex has tested OmniView with a specific set of Basler GigE Vision cameras.

Side-View Cameras

Choose a single camera-type for all four of your side-view cameras:

Camera Model	Resolution	Mono/Color
Basler Scout scA1600-14gm	1628x1236	Mono
Basler Scout scA1600-14gc	1628x1236	Color
Basler Pilot piA2400-17gm	2448x2050	Mono
Basler Pilot piA2400-17gc	2448x2050	Color

Optional 5th Camera

Regardless of which camera type you are using for your four side-view cameras, you can choose a different type of camera for an optional top-view. Specifically, you can choose either of the following cameras for the top-view:

- Basler Scout scA1600-14gm mono
- Basler Scout scA1600-14gc color
- Basler Pilot piA2400-17gc color

You cannot use the Basler Pilot piA2400-17gm mono camera as the optional 5th camera.

See the section *Install the GigE Vision Cameras* on page 13 for details on installing the GigE Vision cameras you will use.

System Interconnects

A field wiring diagram is available from the Start menu with **Start->Cognex->OmniView->Wiring Reference**, or as the file *800-5712-3R.pdf* in your Cognex\OmniView\doc installation directory.

Default Discrete Inputs

The following default inputs are required to run an OmniView vision application:

- Part Presence Sensor (+24VDC single-ended signal, default falling-edge polarity).
- Shaft Encoder (+24VDC single-ended signal, range 350 -2500Hz).

Default Discrete Outputs

The following default outputs are produced by an OmniView vision application:

- Camera Trigger Output (+5VDC single-ended signal, falling-edge polarity).
- Light Trigger Output (+5VDC single-ended signal, rising-edge polarity).
- Reject Control Output (+24VDC, single-ended signal, rising-edge polarity).

To use non-default polarities, refer to *OmniView User's Guide* for details.

OmniView Application Installation

Perform the following steps to install the OmniView Application software.

Save Existing OmniView Jobs

Back up the directory *%omniview_data%* if it exists. Installing this release will overwrite files in this directory. The backup file will allow you to revert to a previous OmniView release if needed.

You may be asked to send a copy of the contents of your *%omniview_data%* directory to Cognex when reporting an issue to Cognex customer support.

Prepare the PC

Turn off the PC and install the Cognex hardware necessary for your vision application:

- Install the Cognex MVS-8501 into an empty PCI or PCI-X slot and attach the I/O breakout module.

  Refer to the Cognex 8500 Hardware Reference documentation in the *\doc* directory of the OmniView installation DVD for installation instructions.
- Remove any Cognex security key device if one is installed on your PC, and install the Cognex security key that arrives with the OmniView kit.
- Turn on the PC and download the latest video driver for your video card.

  Downloading the latest driver fixes a known display card driver problem. Refer to the manufacturer's web site for details.
- Disable Windows 7 power saving schemes and any C-state settings in the BIOS that allow an idle processor to turn off unused components to save power.

  OmniView will not run properly after exiting standby or hibernation since it is a high performance application requiring constant access to its high speed hardware components.
- Disable any virus checking software, any screen savers, and any scheduled tasks on the PC.

Install the GigE Vision Cameras

The *\doc* directory of the OmniView installation DVD contains the *GigE Vision Cameras User's Guide*, with specific instructions on installing and using GigE Vision cameras with Cognex software. Perform the following steps to install the GigE Vision hardware:

1. Turn off the PC and install the GigE Vision network adapters.

   Refer to the installation instructions for the network adapter for specific installation instructions. Install 1 GigE Vision network adapter for a 4-camera verification station or 2 adapters for a 5-camera verification station.
2. Connect the GigE Vision cameras.

   Refer to your camera manufacturer's instructions for details on attaching each camera to a network adapter.
3. Restart the PC.

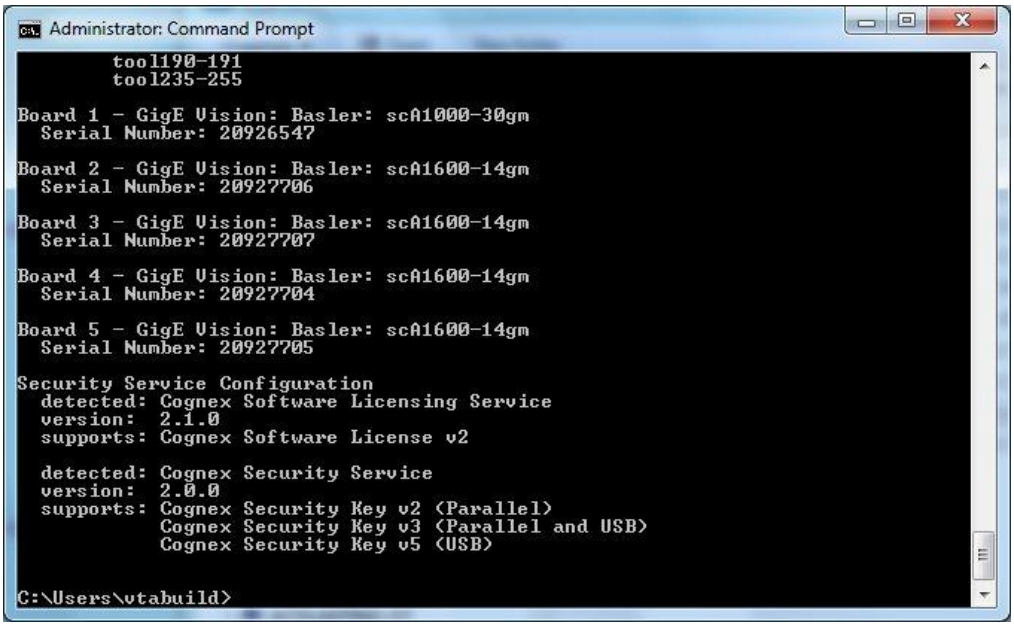
The **Found New Hardware** wizard should launch and allow you to install the drivers for the GigE Vision network adapters automatically. If it does not then install the drivers from the manufacturer's installation media.

4. Turn on the GigE Vision cameras.

   Ensure the cameras are available by using the *cogtool* utility. Open a command window and enter the following command:

```
cogtool --print
```

   The camera type and serial numbers appear as shown in the following example:



5. (Optional) Change the User Account Control (UAC) setting to **Never Notify**.

   Access the Control Panel from the Start menu. See your Windows documentation for details. Reboot the PC for the UAC to take effect.

Uninstall existing Cognex software

Uninstall any existing Cognex software. Use the **Add or Remove Programs** feature of the Windows Control Panel to remove any of the following programs if they are present:

- **Cognex OmniView**
- **Cognex Drivers**
- **Cognex VisionPro**

Restart your PC if prompted.

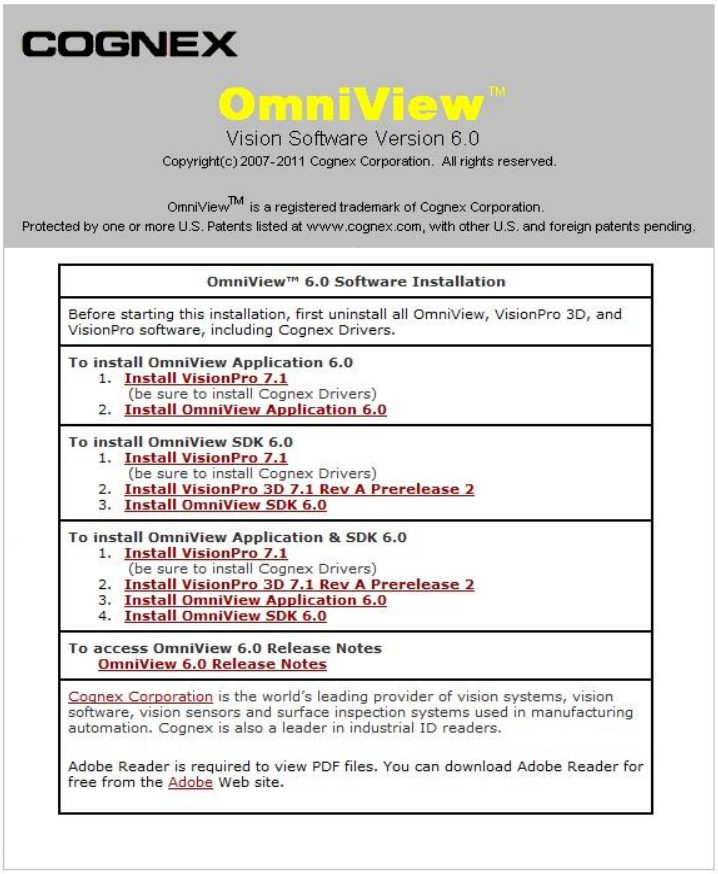
Install the OmniView Application Software

Administrative privileges are required in order to install and run OmniView.

1. Exit all applications and insert the OmniView DVD.

   If the installation utility does not start automatically, double-click *setup.html* on the installation DVD.

The installation utility appears as shown in the following figure:



If this screen does not appear, double-click on the file *setup.html* in the root directory of the DVD.

2. Click on **Install VisionPro 7.1** and follow the on-screen prompts.

   You must install VisionPro in order to use OmniView.

   Install the Cognex drivers when prompted to do so.

3. Click on **Install OmniView Application 6.0** and follow the on-screen prompts.

%OMNIVIEW_ROOT% refers to where OmniView Application is installed and *%OMNIVIEW_DATA%* refers to where it saves and loads data. By default *%OMNIVIEW_ROOT%* is C:\Program Files\Cognex\OmniView; *%OMNIVIEW_DATA%* is C:\Program Files\Cognex\OmniView\data.

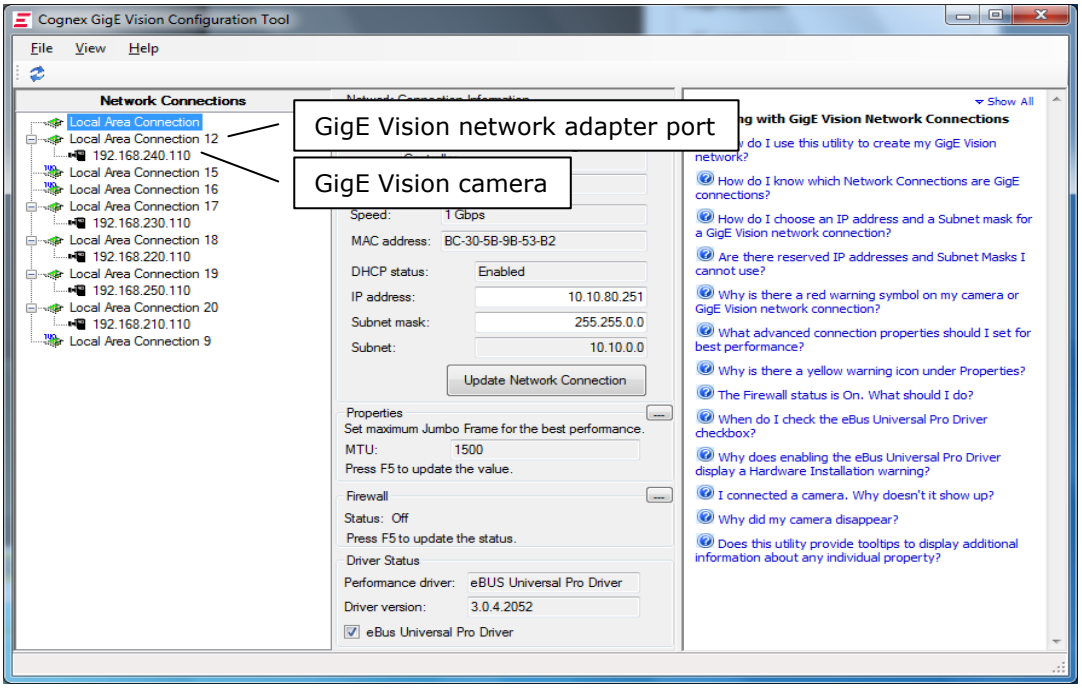
Configure the GigE Vision Equipment

Each GigE Vision network adapter (or each port of a multi-port adapter) must have its own IP address on its own subnet and each camera must have an IP address in the same subnet as its network adapter.

Choose **Cognex->VisionPro->Utilities->GigE Vision Configuration Tool** to launch the GigE Vision Configuration Tool and assign all the IP addresses your GigE Vision equipment requires.

The GigE Vision Configuration Tool displays all the network connections installed on your PC, including GigE Vision network adapters and the GigE Vision cameras attached to them.

For example, the following figure shows a PC where a quad port adapter and a single port adapter have been installed and five cameras have been attached:



An interactive list of Questions and Answers appears on the right side of the utility to guide you in setting IP addresses and configuring other system properties.

If you are not familiar with TCP/IP networking, Cognex recommends you use the following IP addresses:

Adapter	IP Address	Camera IP Address	Subnet Mask
1	192.168.21.200	192.168.21.210	255.255.255.0
2	192.168.22.200	192.168.22.210	255.255.255.0
3	192.168.23.200	192.168.23.210	255.255.255.0
4	192.168.24.200	192.168.24.210	255.255.255.0
5	192.168.25.200	192.168.25.210	255.255.255.0

For each GigE Vision network connection and camera, perform the following steps to configure their IP addresses:

1. Select a **Network Connection** listing corresponding to a GigE Vision network adapter, a single port on a multi-port adapter, or a network switch.
2. Assign an **IP Address** and **Subnet mask** and click **Update Network Connection**.
3. Verify that the **Properties** section does not display a yellow warning icon indicating that you need to modify one or more system properties.
4. Verify that your **Firewall** status is **Off** or that the group policy set by your network administrator disables the Windows Firewall regardless of the local status detected by the utility.

5. Verify that the **eBus Universal Pro Driver** checkbox is checked.
6. Select the GigE Vision camera listed under the GigE Vision network connection.
7. Assign an **IP Address** and **Subnet mask** and click **Update Camera Address**.
8. Close this utility.
9. Attach the trigger cables from the I/O breakout module to the GigE cameras.

Consult the *GigE Vision Cameras User's Guide* for other helpful information as well as troubleshooting tips.

Prepare the Verification Station

Ensure the following equipment has been installed for the verification station:

- All enclosures, equipment, and cabling
- A complete imaging enclosure with lights and cameras rigidly mounted

  If not fully wired already, ensure the system is at least ready for connection.
- A part presence detector

  Be aware that OmniView will trigger an acquisition on the rising edge of the signal.
- A shaft encoder connected to the local conveyer belt motor or to its drive gearbox

The mounting hardware for the cameras should be rigid enough so that the relative position among the cameras does not change over time. A common practice is to mount side view cameras on a single aluminum base plate.

Strobe Lights for 5 Camera Stations

Refer to the manufacturer's documentation for your strobe light for information on how to connect it to the cameras in your verification station. If you are using a 5-camera station and all cameras are the same type, the strobe light can be connected to any camera.

Some verification stations use a 5th camera with a different format from the 4 side-view cameras. In these stations the delay between the image acquisition trigger and the start of image integration must be considered so that the strobe light adequately illuminates the container under inspection.

If you are using cameras supported in this release and your verification station uses a different 5th camera than the side-view cameras, perform the following steps:

1. Refer to the following table for the exposure start delay for each supported camera type:

Camera	Exposure Start Delay
Basler Scout scA1600-14gm	58.92 µs
Basler Pilot piA2400-17gm	32.06 µs
Basler Scout scA1600-14gc	58.92 µs
Basler Pilot piA2400-17gc	32.06 µs

2. Connect the trigger signal for the strobe light to one of the cameras with the largest exposure start delay.

If you are using unsupported cameras and your verification station uses a different 5th camera than the side-view cameras, consult your camera specifications and connect the trigger signal for the strobe to the camera with the largest exposure start delay.

Part Tracking and Rejections

Cognex recommends you be aware of the following concerning part tracking and rejection:

- Locate the reject mechanism no closer than 8 diameters (4 containers plus the spacing between them) from the center of the field of view, but no farther than 64 diameters (32 containers plus the spacing between them).
- OmniView will reject parts while the software application is starting up, or while it is switching from offline to online. The number of parts rejected in these cases depends on the speed of the production line and frequency of part presentation.
- An acquisition overrun occurs any time the software receives another part present trigger before the current image is fully transferred into host memory. The acquisition cycle restarts, and the initial part is rejected since its images were never received. The tracking graphics at the bottom of the OmniView interface will show the part as remaining 'grey' in color and not changing to green or red since the part images were never fully acquired and processed. Besides upgrading the PC, the only fix is to increase the time interval between part present trigger events, normally by ensuring that parts are always separated by at least one diameter as they pass through the OmniView station.
- A processing overrun occurs any time the system is unable to process fully acquired images quickly enough to keep up with the production line. You will notice that updates to the display slow down, since they are managed as a lower priority than the image analysis. As with acquisition overruns, the tracking graphics at the bottom of the OmniView screen will show the part as remaining 'grey' in color and not changing to green or red since the part image was acquired but never inspected. Besides upgrading the PC to a faster processor and chipset, you can start by removing tools and defining a narrower unwrap region in order to save time on each part processing cycle.

Choose a Calibration Plate

Contact your Cognex sales representative for calibration plates, and choose one based on the size of the containers you are inspecting:

Plate Size	Diameter of Container	Description
Small	1¨ or less	1/16¨ grid square size (1/16¨ = 0.0625 inches = 1.5875 millimeters)
Medium	1¨ to 3¨	1/8¨ grid square size (1/8¨ = 0.125 inches = 3.175 millimeters)
Large	3¨ or greater	1/4¨ grid square size (1/4¨ = 0.250 inches = 6.35 millimeters)

The *OmniView User's Guide* describes the calibration process in detail.

Uninstalling OmniView

Use the Windows Control Panel to uninstall OmniView.

OmniView retains the environment variable *%OMNIVIEW_DATA%*, which points to the directory holding archived configuration files such as all job files and the file *config.xml*. In most cases, you may want to retain the existing data when reinstalling or upgrading OmniView. In these cases, Cognex recommends you make a backup of the %OMNIVIEW_DATA% directory before reinstalling or upgrading.

To completely delete the OmniView installation, delete the directory referenced by %OMNIVIEW_DATA% and then delete the environment variable itself.

Changing or Removing GigE Vision Equipment

Any time you replace a GigE Vision camera, you must use the GigE Vision Configuration Tool to set the camera's IP address. See the *GigE Vision Cameras User's Guide* for more information.

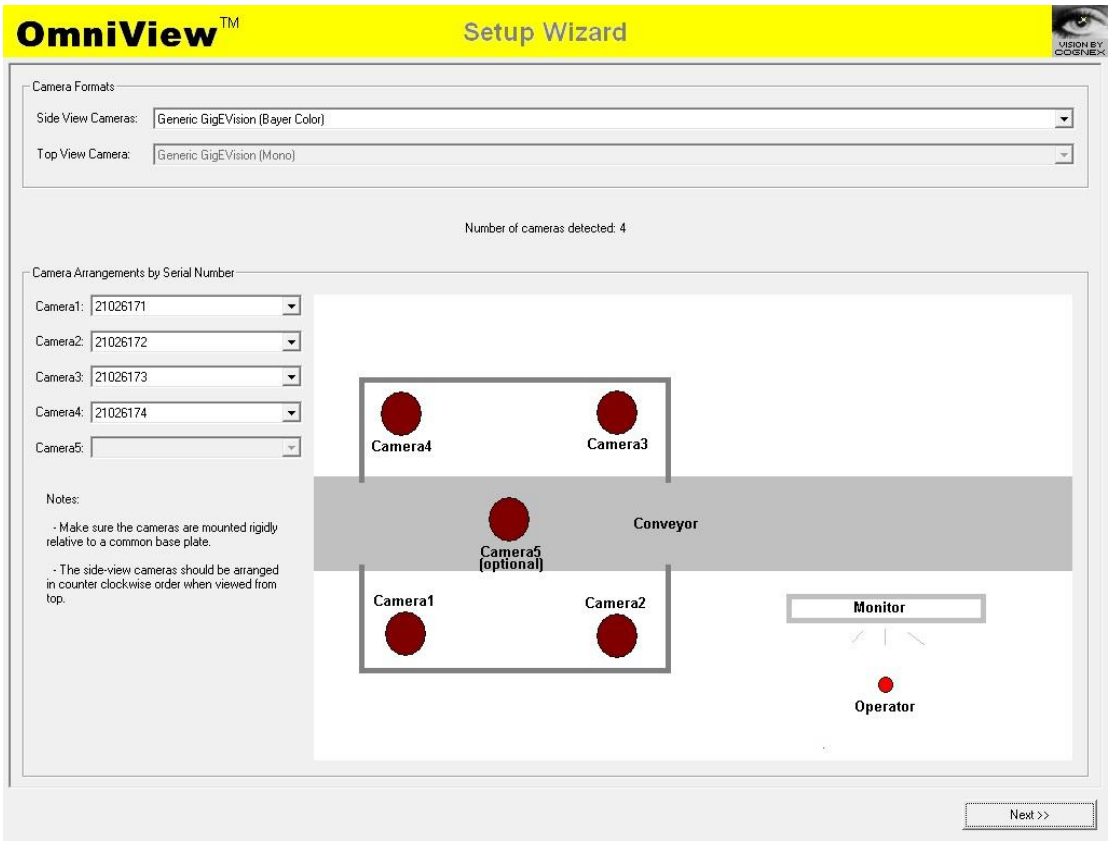
Any time you replace or add a GigE Vision network adapter, you must configure the network connections with the correct IP address and subnet mask.

OmniView Setup Wizard

Before you launch OmniView for the first time, you must run the OmniView Setup Wizard. The Setup Wizard modifies the parameters in a configuration file that OmniView uses to store initialization parameters for your vision application. This configuration file stores information such as the make and serial numbers of the GigE Vision cameras you are using and the size of calibration plate you will use to convert the results generated by the vision tools you use into real-world measurements.

Assigning Cameras to Camera Positions

To launch the Setup Wizard, choose **Start->Programs->Cognex->OmniView->OmniView Setup Wizard**. The Setup Wizard launches as shown in the following example:



As the graphics in the Setup Wizard illustrate, configure the cameras around the verification station in a counterclockwise direction, as viewed from above. The Setup Wizard reads the serial numbers of all the cameras currently connected to the PC. Use this panel to specify the following:

- The type and resolution of all the cameras you are using
- The assignment of cameras, based on their serial numbers, to camera positions inside the verification station

  Refer to the diagram shown in the Setup Wizard to assign the correct camera to each position.

Click **Next** when you are done.

Providing Calibration Information

Use the second panel of the Setup Wizard to provide calibration and image-conversion information:

Calibration

For **Calibration Units** and **Calibration Square Size**, specify the units of calibration you want to use and the size of the squares in the calibration plate you are using.

Bayer Color Conversion

In past releases, OmniView would convert each acquired color image into three separate red, green and blue images of the same size as the acquired image for processing by the VisionPro color tools. For example, when a 2 Megapixel color image was acquired, OmniView would create a 2 Megapixel red image, a 2 Megapixel green image, and a 2 Megapixel blue image.

In this release, the default behavior for new applications is to create half-resolution red, green, and blue images from the acquired color image, which can greatly improve the performance of each inspection. For example, when a 2 Megapixel color image is acquired, the conversion now creates three 0.5 Megapixel images; when a 5 Megapixel color image is acquired, the conversion creates three 1.25 Megapixel images.

> **Note:** The new default behavior does not cause the loss of any information from the acquired image. Because of the encoding method used for Bayer-format color images

(where alternating pixels contain red, blue, and green information), the half-resolution color plane images actually contain all of the pixel data for the given color.

If you are creating a new application that acquires color images, the Wizard automatically selects the option **Retain Bayer image size**. Cognex recommends you keep this option.

If you are migrating an existing application to this release, the Wizard defaults to **Retain image size** and continues to generate full-resolution red, green, and blue images. Cognex recommends you choose the option **Retain Bayer image size** and reduce the size of the RGB images available for processing. This will require you to re-calibrate your cameras and update your inspection, but will improve your inspection time. For details on how to calibrate your OmniView application, see the *OmniView User's Guide*, available by choosing **Start->Programs->Cognex->OmniView->User's Guide**.

Multi-Core Processing

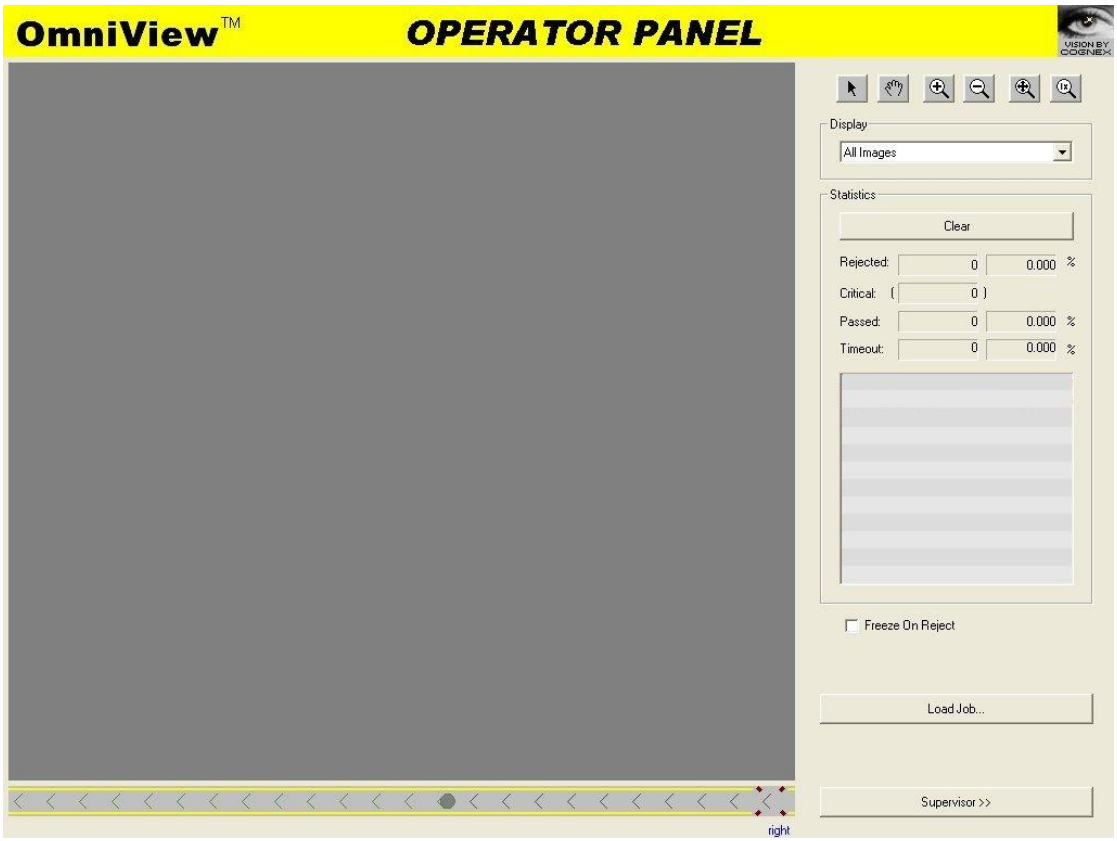
By default, **Allow tools to run in multi-core** is disabled for compatibility with previous versions of the application, but Cognex recommends you check this option to allow vision tools to take advantage of multi-core PCs.

Checking this option may reduce the latency time of your inspections.

Click **Exit** when you are done.

OmniView Start

Launch OmniView by choosing **Start->Programs->Cognex->OmniView->OmniView**. OmniView appears as shown in the following figure:



The first panel OmniView displays is an Operator Panel, which you can use to load a particular saved vision application and view statistics on the job currently running. Other OmniView panels allow access to other functionality such as specifying the vision tools you want to use and configure the I/O subsystem.

Cognex recommends you perform an image acquisition to ensure the verification station is ready to develop your vision application.

1. Click **Supervisor** and then **System** to enter the System Panel.
2. Check the **Triggered Live Video** checkbox.
3. Place a sample container in the middle of the verification station.

   If sizes will vary, use the largest size.
4. Focus all four cameras on the container.

   The focus should be consistent from the edges to the center of the container, even when it is slightly shifted or tilted.
5. Uncheck the **Triggered Live Video** checkbox.
6. Check the Field of View requirements as listed on page 24.

Note If you use Windows Remote Desktop to connect to a PC running OmniView, the OmniView window does not display its title bar. Also, if OmniView is already running on the remote PC when you connect, you will not see images being updated unless you stop and then restart OmniView while you are connected remotely.

Migrating Existing Applications

The OmniView release notes describe how to migrate an existing OmniView application to this release.

Field of View Requirements

Check the following requirements and make any necessary adjustments:

- Ensure that no obstruction to any side camera view exists, and avoid any background features such as product openings that are near geometric matches to the container profile. Keep the background behind the container clean and free of debris.
- Verify that the background does not have saturated pixels.

  As you move the mouse over any image, the X/Y coordinates and grey value are shown in the lower right corner of the display.
- Center the container in each camera's field of view against a uniform non-textured background, leaving at least 1/8 of the available background on either side of the largest container diameter.
- Check each camera for sharp focus, especially at the edges of the part profile.

  Use lens aperture f4 or higher to maximize each side camera's depth of field.

  Check focus across the full range of part sizes to be handled, accounting for any expected container shift and tilt.

  Set the locking screws on the lens focus to prevent any focus change.
- Check that the lighting does not generate hot spots, or reflected light off the container itself.

  Proper lighting for an OmniView application can be described as cloudy day lighting.
- Image intensity between camera views should be similar. There must be at least 20 grey levels of contrast at all points between the container and the background.

  Use the button bar along the top of the Operator Panel to zoom or fit the image in the display.

  Be aware that **Brightness** and **Contrast** settings are only available when viewing live images in the System Panel.

If your images appear correctly, you are ready to perform a system calibration as described in the *OmniView User's Guide*.

Critical Diagnostic Messages

The following table lists the critical diagnostic messages which can appear scrolling in red along the bottom center of each OmniView panel:

Critical Diagnostic Message	Action(s) Required
Check Encoder	• Make sure the conveyor belt is running. • Make sure the shaft encoder is correctly

	coupled to the conveyor motor or gearbox, and that it is spinning smoothly. • Make sure +24VDC power is available to the shaft encoder. • Make sure the encoder output is connected to pins 1 and 20 of the vision I/O board. • Check the OmniView I/O panel to see the encoder status and frequency.(From the **System Panel** click on **System Properties** and then access the **I/O** tab The **IN7: encoder input** displays the encoder frequency).
Encoder Speed Too Slow	Displayed whenever the encoder speed falls below 350 pulses per second. If this minimum frequency is not met, a different encoder device may be required.
Encoder Speed Too Fast	Displayed whenever the encoder speed rises above 2500 pulses per second. If this frequency is exceeded, a different encoder device may be required.
Part Presence Sensor Missing	This message appears when the system is online, but no parts have been detected for more than 120 seconds. If the message persists when containers are present, check the following: • Make sure the conveyor belt is running with containers breaking the beam. • If so, make sure the part presence sensor is powered on with +24V. • Ensure that the sensor's outputs are connected to INPUT0 of the vision I/O board. • Refer to the OmniView I/O panel to see if the part presence input checkbox is changing state when parts move past the sensor. (From the System Panel click **I/O Configurations**. See the **IN0: part presence trigger** check box).
Part Presence Sensor Blocked	Check that the sensor is not blocked by any debris, residue, or fluid.
Other Part Presence Sensor Issues	• From the **System Panel** click on **I/O Configurations**. See if the I**N0: part presence trigger** check box changes from checked to unchecked when the part is breaking the light beam. • Check to see if the sensor has a normally open/normally closed selection available. If it does, try changing it to see if the condition described previous can be established when the part is blocking the light beam.
Camera Not Calibrated	This message will always appear when a valid instance of a calibration data file cannot be

	located in the %OMNIVIEW_DATA% directory. To create a valid camera calibration, follow the calibration procedure detailed in the *OmniView User's Guide*.
Job Not Trained/Ready	This message appears if there are no valid instances of trained part shapes in the OmniView jobs directory. The default location is %OMNIVIEW_DATA%\jobs. The *OmniView User's Guide* describes how to create a trained job.
Job Name Not Defined	This message appears if OmniView does not load an existing job file. The default directory for job files is %OMNIVIEW_DATA%\jobs.