

# **VisionPro<sup>®</sup> Trevista CI Dome Area Scan Getting Started**

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# Precautions

To reduce the risk of injury or equipment damage, observe the following precautions when you install the Cognex product:

- Trevista Controller requires power supply connection from a supply network that meets the following requirements:  
100-240 V AC +/- 1-%, 50-60 Hz, 550 VA
- This product is intended for industrial use in automated manufacturing or similar applications.
- The safety of any system incorporating this product is the responsibility of the assembler of the system.
- Do not install Cognex products where they are exposed to environmental hazards such as excessive heat, dust, moisture, humidity, impact, vibration, corrosive substances, flammable substances, or static electricity.
- Route cables and wires away from high-current wiring or high-voltage power sources to reduce the risk of damage or malfunction from the following causes: over-voltage, line noise, electrostatic discharge (ESD), power surges, or other irregularities in the power supply.
- Do not expose the image sensor to laser light. Image sensors can be damaged by direct, or reflected, laser light. If your application requires laser light that might strike the image sensor, use a lens filter at the corresponding laser wavelength. For suggestions, contact your local integrator or application engineer.
- This product does not contain user-serviceable parts. Do not make electrical or mechanical modifications to product components. Unauthorized modifications can void your warranty.
- Changes or modifications not expressly approved by the party responsible for regulatory compliance could void the user's authority to operate the equipment.
- Include service loops with cable connections.
- Ensure that the cable bend radius begins at least six inches from the connector. Cable shielding can be degraded or cables can be damaged or wear out faster if a service loop or bend radius is tighter than 10X the cable diameter.
- This device should be used in accordance with the instructions in this manual.
- All specifications are for reference purposes only and can change without notice.

# Symbols


The following symbols indicate safety precautions and supplemental information:

---

 **WARNING:** This symbol indicates a hazard that could cause death, serious personal injury or electrical shock.

---

---

 **CAUTION:** This symbol indicates a hazard that could result in property damage.

---

---

 **Note:** This symbol indicates additional information about a subject.

---

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 **Tip:** This symbol indicates suggestions and shortcuts that might not otherwise be apparent.

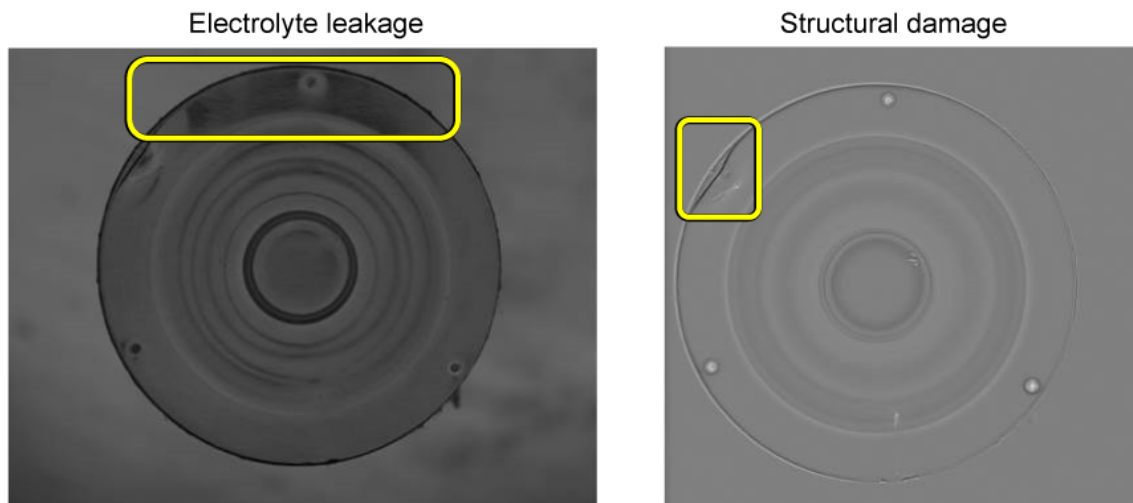
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# Introduction

Cognex "shape from shading" technology determines topographical surface information of materials that range from a matte appearance to shining reflectance.

A VisionPro application using a Trevista Computational Imaging (CI) Dome captures multiple images of a stationary object as it passes under patented dome illumination. Your vision application accepts the output images and allows you to choose one or more for additional analysis by other vision tools in your application.

For example, the following figure shows different output images generated by the same object and highlights how they enhance different defect information:



This document describes the use of a Trevista CI Dome with an area-scan camera and supported VisionPro software to capture an image and make output images available for additional analysis.

**i Note:** Refer to the Trevista CI Dome Line Scan Getting Started for an introduction to using the Trevista Dome Light with a line-scan camera.

# Trevista Kits

The following table lists components of full kits and light-only kits:

| Component  | Full Kit | Light-only Kit | Notes  |
|--|----------|----------------|--|
| Dome light (Configuration)                       | x        | x              |  |
| Camera flat mounting plate                       | x        | x              |  |
| GigE or 10GigE area scan camera                  | x        |                |  |
| Lens toolkit                                     | x        |                |  |
| Controller unit (Configuration)                  | x        | x              |  |
| Security license key for VisionPro software      | x        | x              |  |
| Camera Ethernet cable (5m)                       | x        |                | Power supply/data cable for area scan cameras  |
| Controller To Camera I/O cable                   | x        | x              | Cable without camera connector/flying leads<br>Camera trigger, exposure active signals and power supply for non-PoE cameras. |
| Controller To camera I/O cable with flying leads |          |                |  |
| Controller to PC Ethernet cable                  | x        |                |  |

# Module Components

A Trevista CI Dome consists of the following hardware components:

## Trevista Dome

The Trevista Dome provides structured and diffuse illumination across the field of view:

|  | Small   | Medium   | Large   |
|--|---|--|---|
|  |  |  |  |
| <b>Diameter of measuring field/scan width *</b>                            | Up to 30 mm (1.18")<br>* (application-specific)                                   | Up to 75 mm (2.95") *<br>(application-specific)                                    | Up to 300 mm (11.81") *<br>(application-specific)                                   |
| <b>Working distance between lens and inspection plane</b>                  | Typ. 72 mm (2.83")  | Typ. 158 mm (6.22")  | Typ. 300 mm (11.81")  |
| <b>Working distance between bottom edge and inspection plane</b>           | Typ. 2 mm (0.08")   | Typ. 10 mm (0.39")   | Typ. 47 mm (1.85")  |
| <b>Dimensions (W x D x H)</b>  | 246 x 160 x typ. 259 mm (9.69" x 6.30" x typ. 10.20")                             | 388 x 330 x typ. 348 mm (15.28" x 12.99" x typ. 13.70")                            | 669 x 610 x typ. 453 mm (26.34" x 24.02" x typ. 17.83")                             |
| <b>Weight (Without cable)</b>  | 4.1 kg (9.04 lb)  | 6.9 kg (15.21 lb)  | 16.2 kg (35.71 lb)  |
| <b>Material</b>  | Aluminum  | Aluminum/Plastic   | Aluminum/Plastic  |
| * Depending on the camera, optics, and surface properties of the test part |   |  |   |

**Note:** Trevista Dome hardware shown with cameras and additional camera-mounting hardware.

## Controller

The Trevista Controller acts as the interface between the Trevista Dome and the PC running the VisionPro application:

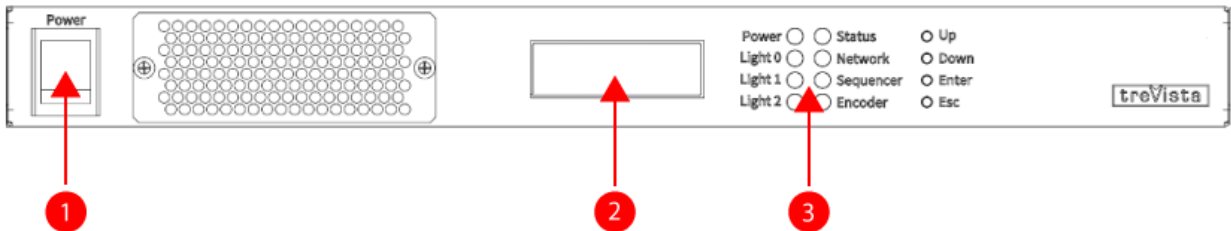


|                                |   |
|--------------------------------|---|
| <b>Dimensions (W x D x H)</b>  | 484 x 370 x 44 mm (19.06" x 14.57" x 1.73") |
| <b>Weight</b>                  | 6.4 kg (14.11 lbs.)                         |
| <b>Material</b>                | Aluminum-zinc                               |
| <b>Electrical Power Supply</b> | 100-240 V AC +/-10%, 50-60 Hz, 550 VA       |

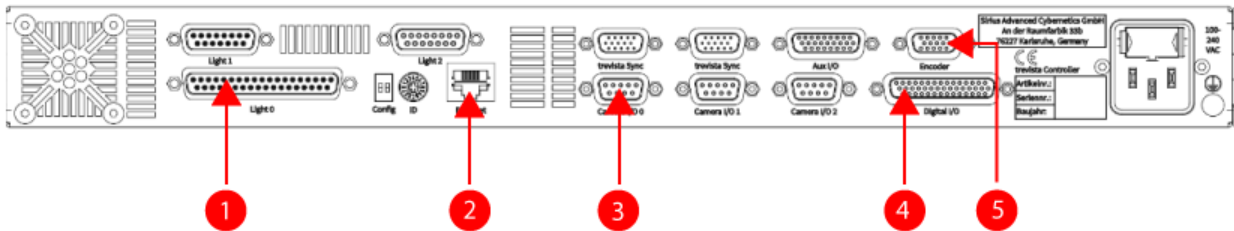
As your VisionPro application executes, the Trevista Controller:

- Accepts the signal from a hardware trigger used to cue the start of an image acquisition
- Triggers the connected camera for image acquisition
- Manages the lighting sequence of the Trevista Dome
- Interprets an incoming encoder signal (for line-scan configurations only)

In addition to all hardware connections, the controller supports an LCD display for visual feedback on all channels to check electrical signal status.



| Feature | Description       |
|---------|-------------------|
| 1       | Power switch      |
| 2       | LCD Display       |
| 3       | Status Indicators |



| Feature | Description                 |
|---------|-----------------------------|
| 1       | Connection to Trevista Dome |
| 2       | Ethernet port               |
| 3       | Camera I/O                  |
| 4       | Digital I/O                 |
| 5       | Encoder                     |

## Frame Grabbers and Cameras

Cognex recommends you use the frame grabber and camera that arrives with your Trevista CI Dome kit. For additional supported cameras, Cognex maintain the [VisionPro Camera Support](#) page.

Refer to the following table on minimum and recommended specifications for area-scan acquisition:

| Area-Scan Acquisition                            | Minimum  | Recommended                        |
|--|--|------------------------------------|
| GigE frame grabber (1x Gigabit-Ethernet adapter) | GigE Vision interface with 4GB RAM                               | GigE Vision interface with 8GB RAM |
| 10 GigE frame grabber                            | Intel® Ethernet Controller X550<br>(Host interface: PCIe 3.0 x4) |                                    |

Refer to the following table on minimum and recommended specifications for line-scan acquisition:

| Line-Scan Acquisition    | Specs     | Minimum                  | Recommended                       |
|--------------------------|-----------|--------------------------|-----------------------------------|
| CameraLink frame grabber | Model     | Basler microEnable 5     | Basler microEnable 5 marathon ACL |
|                          | Interface | PCIe x4 (Gen 2.0)        | PCIe x4 (Gen 2.0)                 |
|                          | RAM       | 8 GB                     | 16 GB                             |
| Trigger extension board  | Model     | Basler TTL Trigger board | Basler TTL Trigger board          |

Refer to your installed VisionPro documentation for supported frame grabbers.

## Industrial PC

Refer to the following table for minimum and recommended specifications for a PC that meets the prerequisites for using a Trevista CI Dome and VisionPro software.

| Spec               | Minimum                               | Recommended                          |
|--------------------|---------------------------------------|--------------------------------------|
| Operating System   | Windows 10 (64 bit)                   | Windows 10 (64 bit)                  |
| CPU                | 64-bit processor with SSE3 technology | Intel Core i7 (13. Gen)              |
| RAM                | 4 GB                                  | 8 GB (Area scan) / 16 GB (Line scan) |
| Hard drive         | 200 MB free space                     | SSD drive with 2 GB free space       |
| Controller Adapter | 1x 100-Mbit/s-Ethernet                | 1x Gigabit-Ethernet                  |
| NVIDIA GPU         | Turing (NVIDIA T1000 with 4GB memory) | RTX-3080 and A4000 with 12GB memory  |

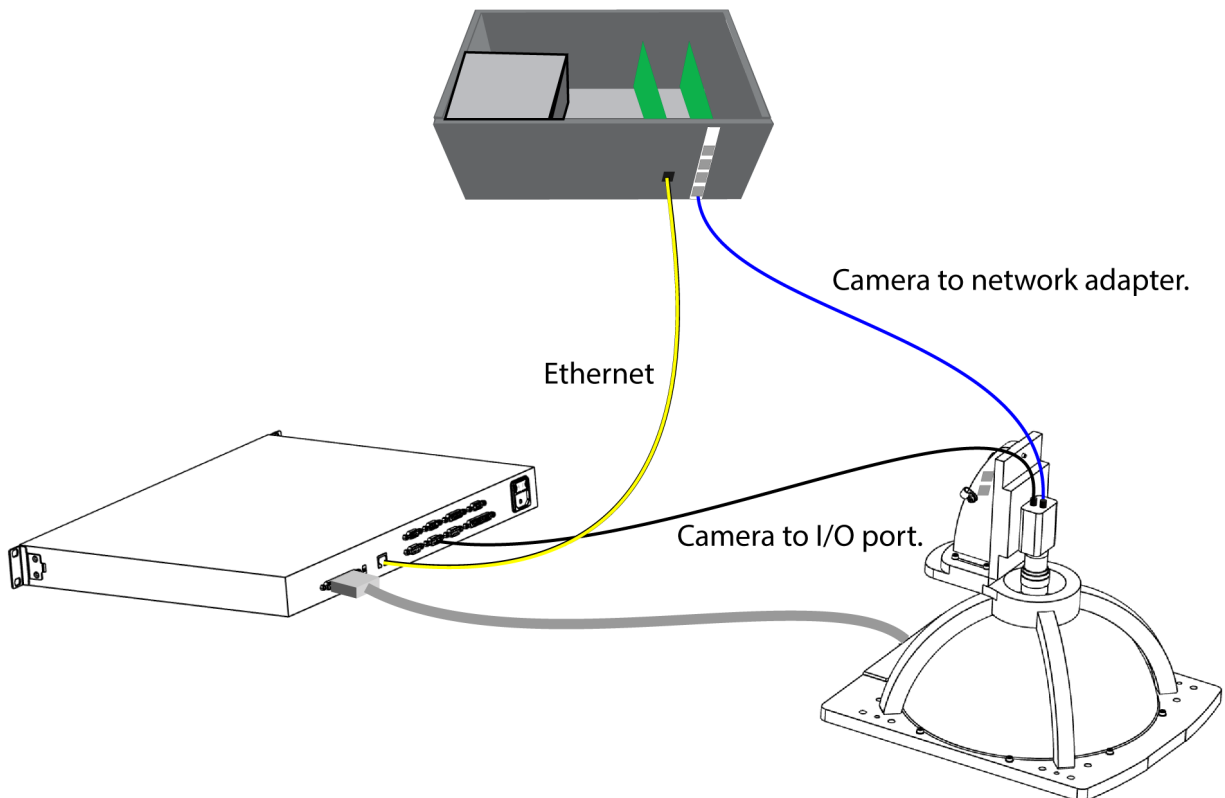
# Hardware Connections

In many cases your Trevista Dome Light arrives with the GigE Vision camera already mounted. Perform the following steps to connect the Dome Light to the Trevista controller and your PC:

- Connect the Trevista Dome Light to the **Light0** connection on the Trevista controller.  
The Trevista Dome Light supports a permanent cable connection.
- Connect the Trevista controller to an Ethernet adapter on the PC.
- Connect the GigE Vision camera to a GigE Vision adapter on the PC.
- Connect the GigE Vision camera to the **Camera I/O** port on the Trevista controller.
- Connect your PC and the Trevista controller to respective power supplies.

The following figure represents the connections between PC, GigE Vision camera and Trevista controller:

**Note:** The following figure represents the connections using a Medium Trevista Dome Light.



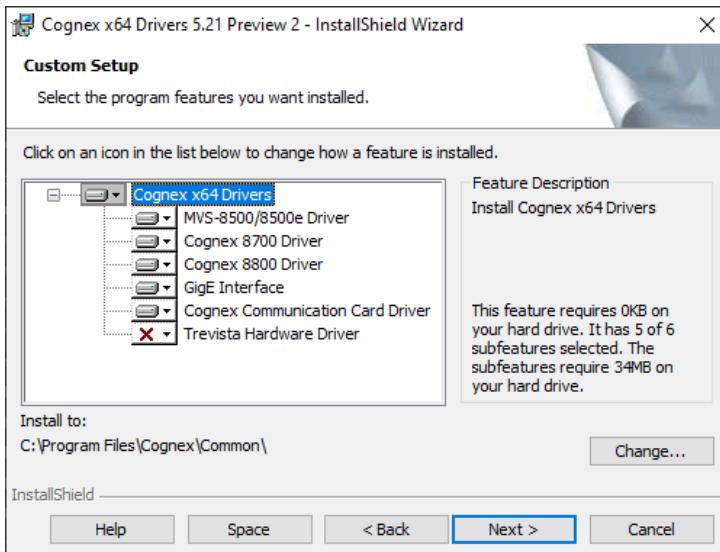
# Software Installation

With your Trevista CI Dome hardware connected, install and configure your VisionPro software.

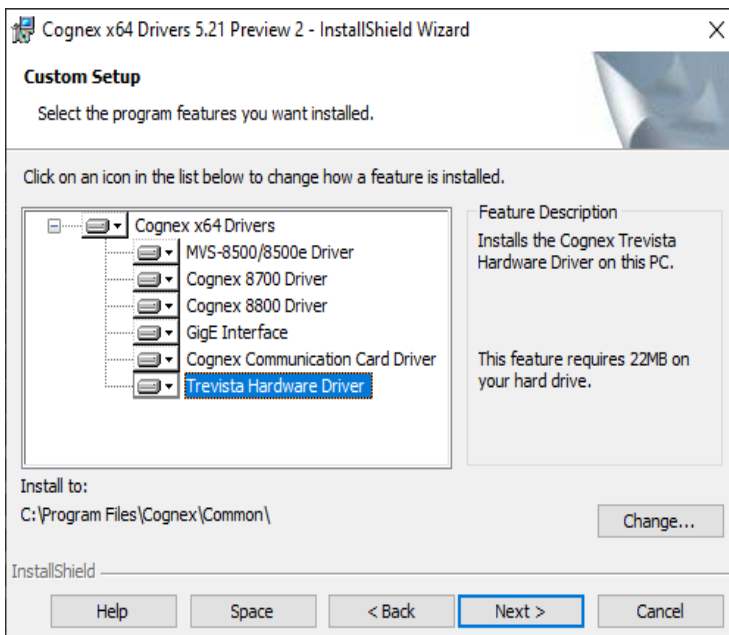
## Install VisionPro

Turn on your PC and install the latest VisionPro software release. Visit the [VisionPro Support site](#) to find VisionPro downloads.

Follow the on-screen prompts. Be aware that the driver installer disables the installation of the **Trevista Hardware Driver** by default:



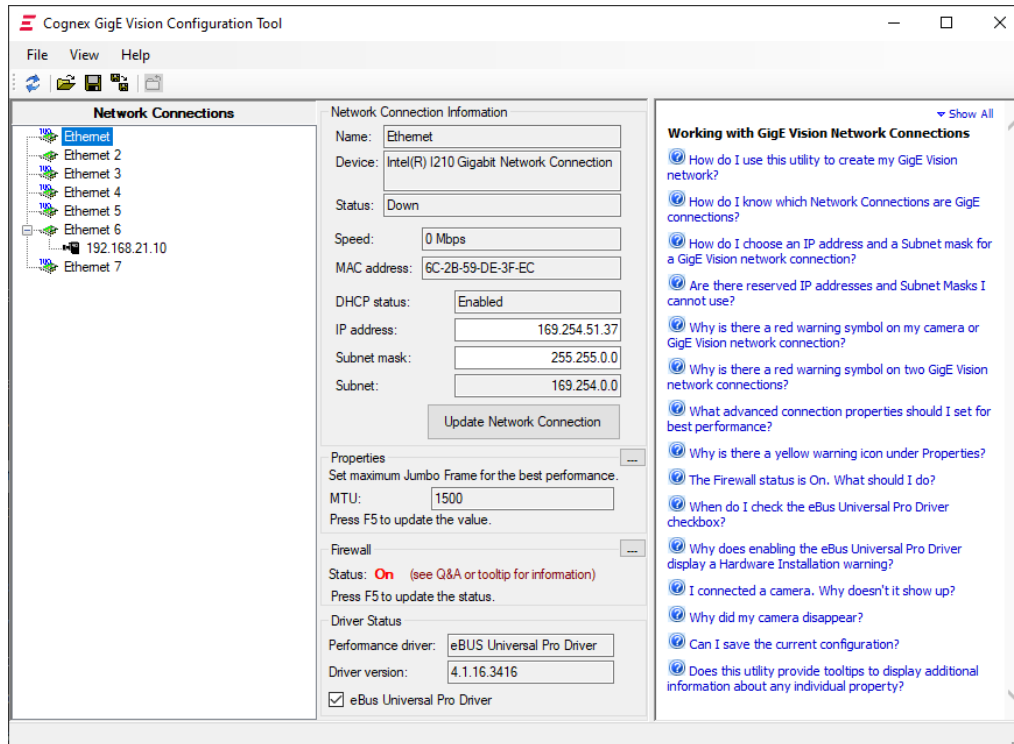
Enable the **Trevista Hardware Driver** before you click **Next**:



Complete the software installation and attach your VisionPro security key to a USB port on your PC.

# Configure Your GigE Vision Camera

After installing VisionPro, launch the Cognex GigE Vision Configuration Tool from the Windows Start menu to assign IP addresses to each GigE Vision network adapter port and the camera connected to it.



Refer to the Q&A in the far-right panel for user assistance. In addition, refer to the GigE Vision Cameras User's Guide, installed with VisionPro in the %VPRO\_ROOT%\Doc\en\HardwareManuals\GigEGuide.pdf.

## Set IP Address for Controller Adapter

The topic [Hardware Connections on page 12](#) describes the physical connections between components of your Trevista CI Dome setup.

You must allow communications between your Trevista controller and your PC using an Ethernet cable connection, and configure the connected PC Ethernet adapter to use the same IP subnet as the controller.

Your Trevista controller arrives with an IP address of "10.1.1.1". Use the Windows **Network & Internet** settings to assign your PC Ethernet adapter with a compatible address, such as "10.1.1.5", and with a subnet mask of "255.255.0.0".

# Launch QuickBuild

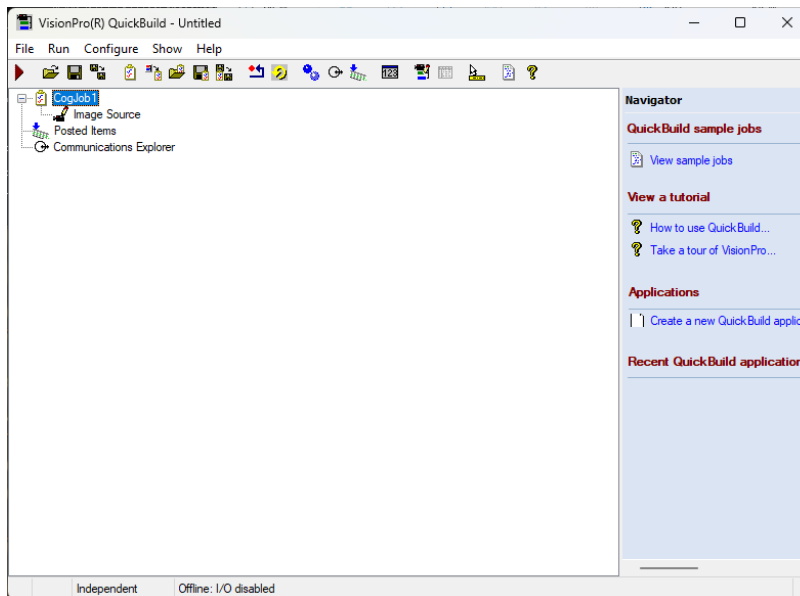
With the physical connections between Trevista CI Dome components described in the topic [Hardware Connections on page 12](#) completed, and your VisionPro software installed as described in the topic [Software Installation on page 13](#), perform the steps outlined in this topic to become familiar with the Trevista Acquisition Wizard and the Trevista tool.

VisionPro includes the QuickBuild utility for prototyping vision applications using a graphical user interface. QuickBuild supports image acquisition from cameras or image databases, adding and configuring all the vision tools VisionPro supports, and configuring attached I/O devices to allow communication with external hardware.

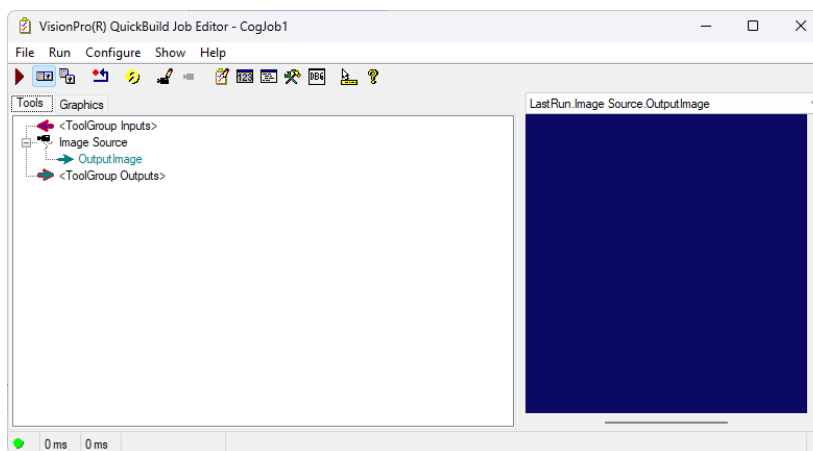
Perform the following steps to launch QuickBuild and acquire an image with your Trevista CI Dome:

1. Launch VisionPro QuickBuild from the Windows Start menu or the icon installed on your desktop.

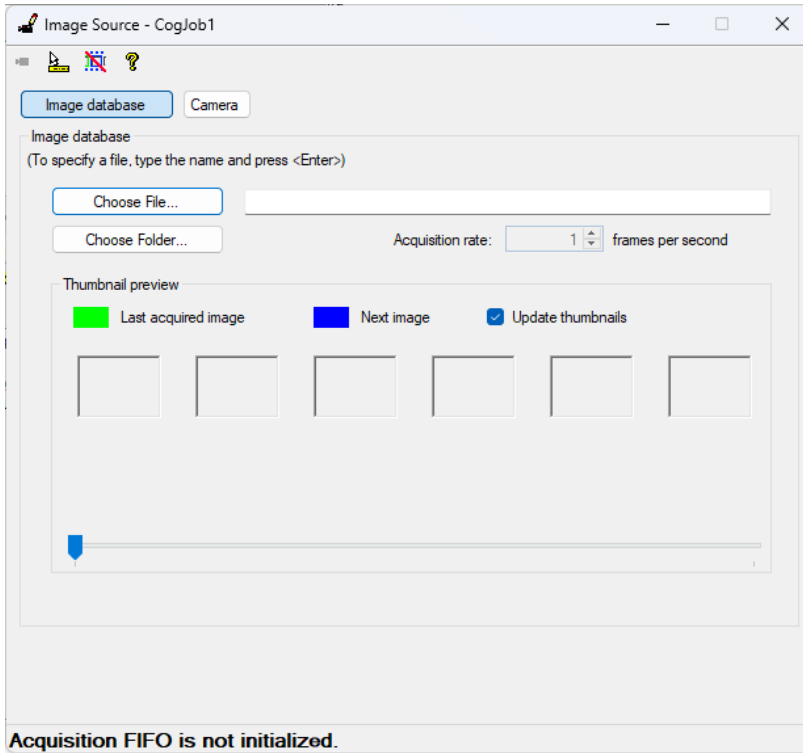
QuickBuild appears as shown:



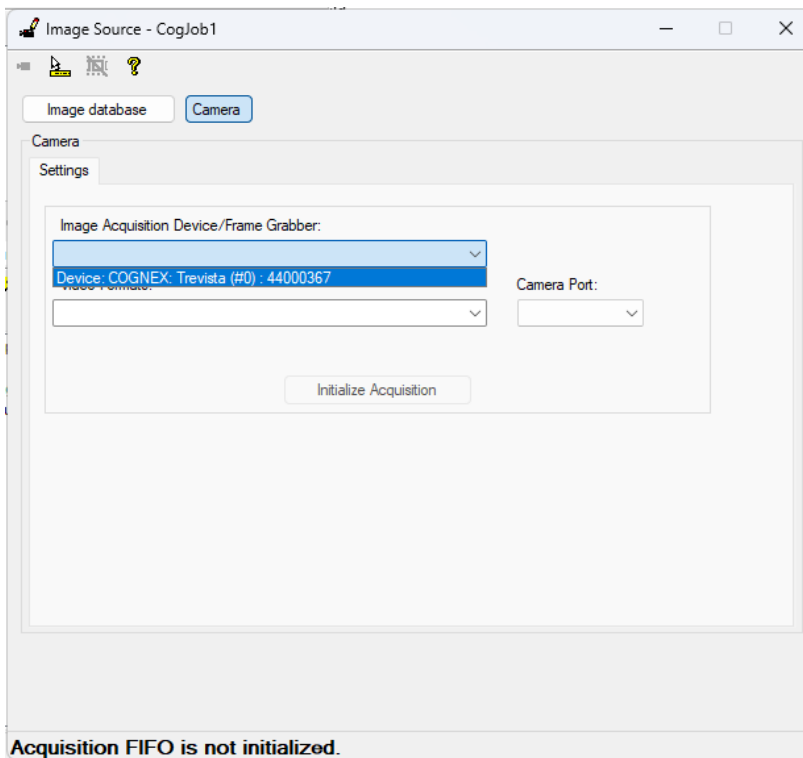
2. Double-click on **CogJob1** to access its image source:



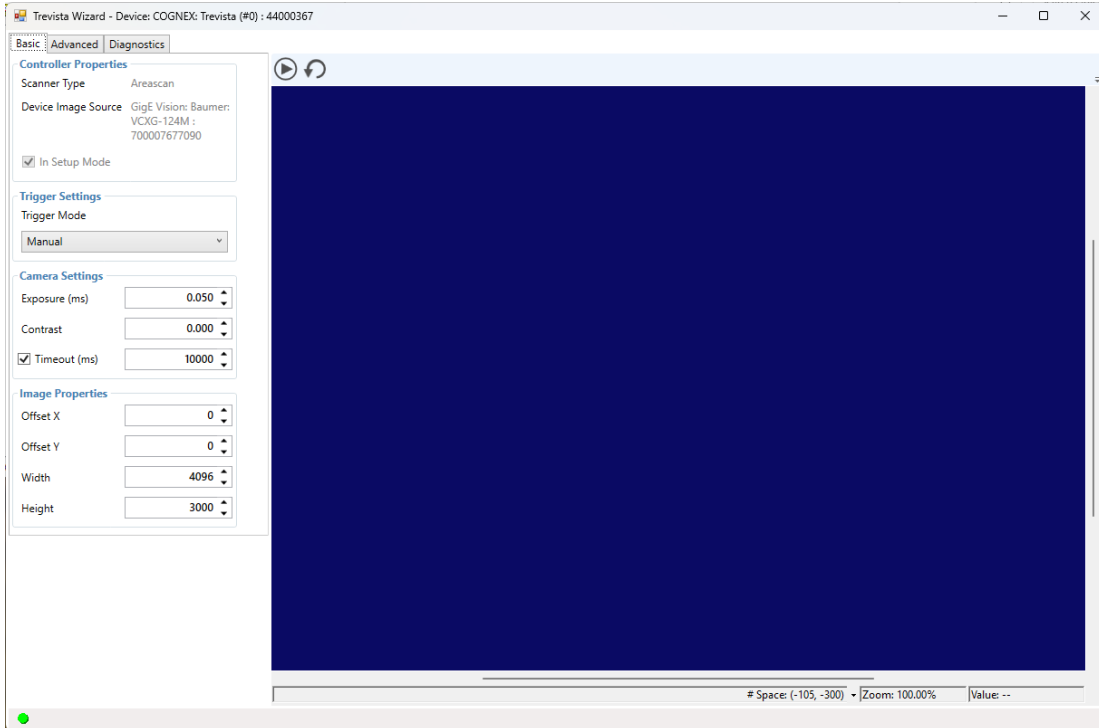
3. Double-click on **Image Source**:



4. Choose **Camera** and select the Trevista CI Dome from the **Image Acquisition** source:



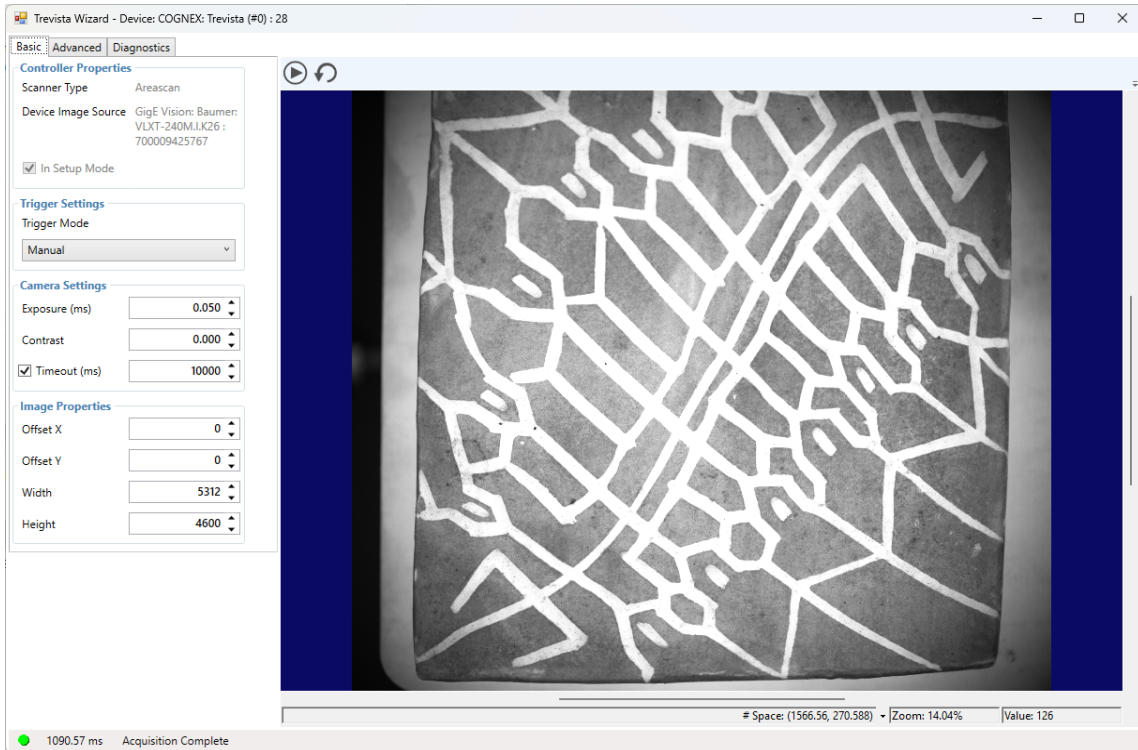
5. Click **Initialize Acquisition** and then click **Trevista Wizard** to launch the wizard, which appears as shown:



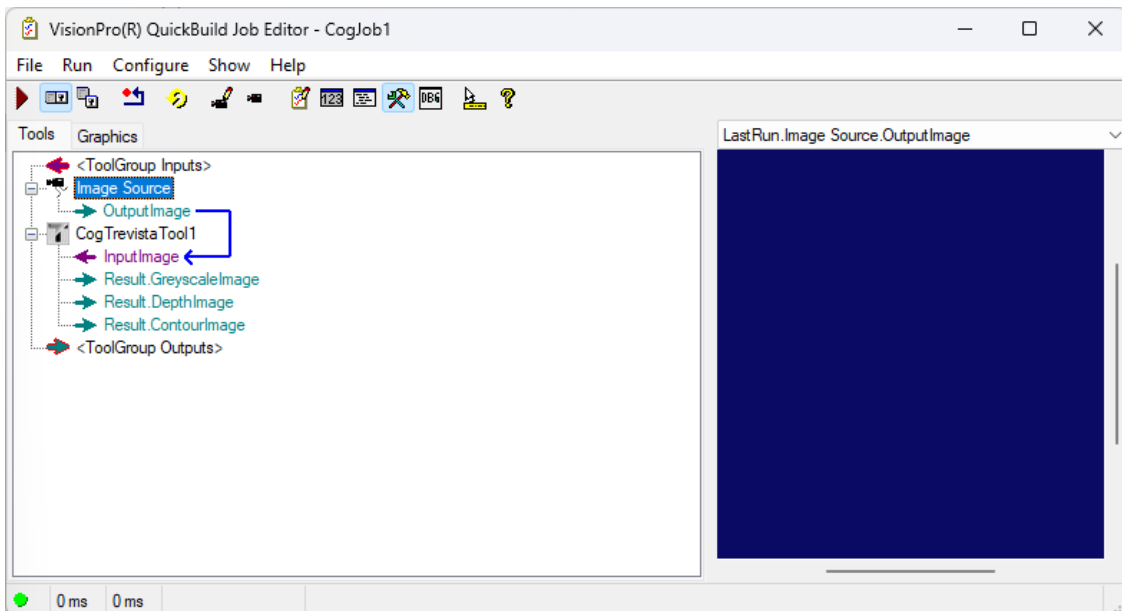
Your VisionPro installation includes documentation on using the wizard. Open the VisionPro Documentation from the Start menu and search for "Trevista Acquisition Wizard" for more information. For this first usage, Cognex recommends you use a **Trigger Mode of Manual**. You can acquire an image by clicking either of these buttons:



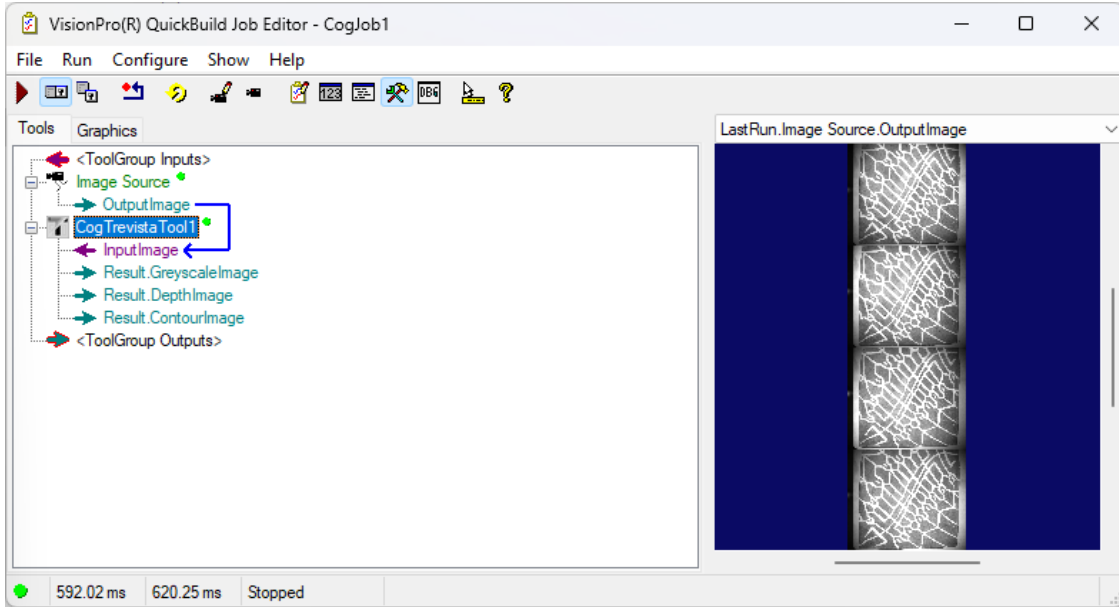
- Place an object in view of the Trevista Dome and click the button for continuous images. Adjust the camera settings and the height of the object relative to the dome until you get a clear image:



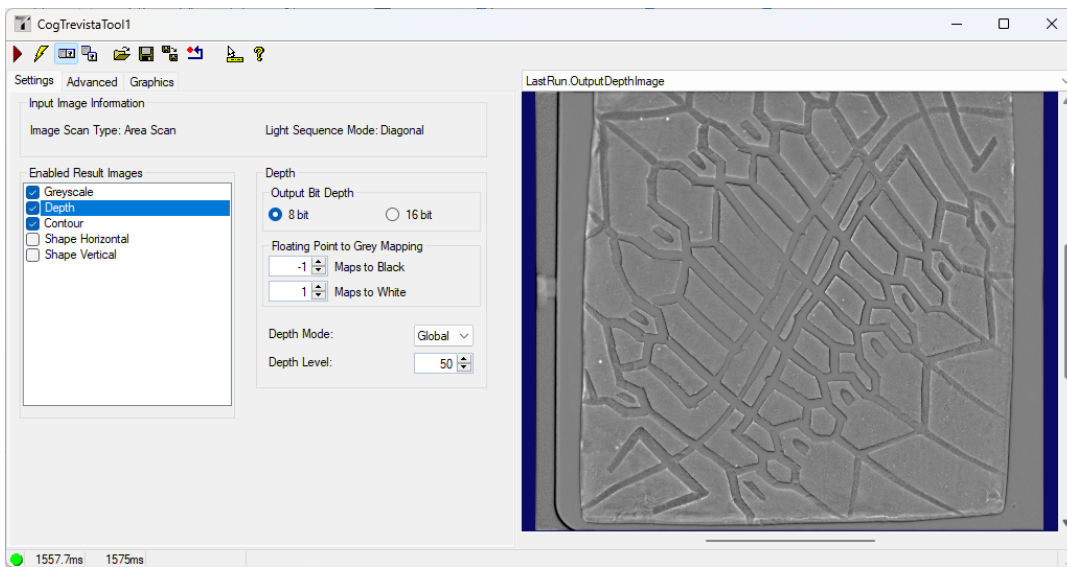
- Close the acquisition wizard and add a Trevista tool to your QuickBuild application. Connect the Image Source to the CogTrevistaTool as shown:



8. Run the Job once. QuickBuild will show the images captured by the Trevista Dome Light:



9. Open the Trevista tool edit control. The following figure shows the edit control viewing the depth image the tool generates:






The Trevista tool edit control offers more documentation by choosing the "?" button in the row of buttons across the top.

# Regulations and Conformity

**Note:** For the most current CE and UKCA declaration and regulatory conformity information, see the Cognex support site: [cognex.com/support](http://cognex.com/support).

The Trevista Controller has a Regulatory Model number 50240 and meets or exceeds the requirements of all applicable standards organizations for safe operation. As with any electrical equipment, however, the best way to ensure safe operation is to operate them according to the agency guidelines that follow. Please read these guidelines carefully before using your device.

| <b>Safety and Regulatory</b>   |   |
|--|---|
| Manufacturer   | Cognex Corporation<br>One Vision Drive<br>Natick, MA 01760 USA  |
|             | Trevista Controller: Regulatory Model 50240<br>This is a class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take immediate measures. This equipment complies with the essential requirements of the EU Directive 2014/30/EU. Declarations are available from your local representative.   |
| EU RoHS  | Compliant to the most recent applicable directive.  |
| FCC  | FCC Part 15, Class A<br>This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense. |
| Korea<br> | Trevista Controller, KC ID : R-R-CGX-TREVISTA2004<br>This device is certified for office use only and if used at home, there can be frequency interference problems.  |
| TÜV  | Trevista Controller: Regulatory Model 50240   |
|  | NRTL: TÜV SÜD SCC/NRTL OSHA Scheme for UL/CAN 61010-1.  |
|  | CB report available upon request. TÜV SÜD, IEC/EN 61010-1.  |
|           | Trevista Controller: Regulatory Model 50240<br>This is a class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take immediate measures. This equipment complies with the essential requirements of the Electromagnetic Compatibility Regulations 2016. Declarations are available from your local representative.  |

# 中国大陆RoHS (Information for China RoHS Compliance)

根据中国大陆《电子信息产品污染控制管理办法》(也称为中国大陆RoHS), 以下部份列出了本产品中可能包含的有毒有害物质或元素的名称和含量。



|                        | Hazardous Substances 有害物质 |                   |                   |                                      |  |  |
|------------------------|---------------------------|-------------------|-------------------|--------------------------------------|--|--|
| Part Name<br>部件名称      | Lead (Pb)<br>铅            | Mercury (Hg)<br>汞 | Cadmium (Cd)<br>镉 | Hexavalent Chromium (Cr (VI))<br>六价铬 | Polybrominated biphenyls (PBB)<br>多溴联苯 | Polybrominated diphenyl ethers (PBDE)<br>多溴二苯醚 |
| Regulatory Model 50240 | X                         | O                 | O                 | O                                    | O                                      | O  |

This table is prepared in accordance with the provisions of SJ/T 11364.  
这个标签是根据SJ/T 11364 的规定准备的。

O: Indicates that said hazardous substance contained in all of the homogeneous materials for this part is below the limit requirement of GB / T26572 - 2011.  
表示本部件所有均质材料中含有的有害物质低于GB / T26572 - 2011 的限量要求。

X: Indicates that said hazardous substance contained in at least one of the homogeneous materials used for this part is above the limit requirement of GB / T26572 - 2011.  
表示用于本部件的至少一种均质材料中所含的危害物质超过GB / T26572 - 2011 的限制要求。

## For European Community Users

Cognex complies with Directive 2012/19/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 4 July 2012 on waste electrical and electronic equipment (WEEE).

This product has required the extraction and use of natural resources for its production. It may contain hazardous substances that could impact health and the environment, if not properly disposed.

In order to avoid the dissemination of those substances in our environment and to diminish the pressure on the natural resources, we encourage you to use the appropriate take-back systems for product disposal. Those systems will reuse or recycle most of the materials of the product you are disposing in a sound way.



The crossed out wheeled bin symbol informs you that the product should not be disposed of along with municipal waste and invites you to use the appropriate separate take-back systems for product disposal.

If you need more information on the collection, reuse, and recycling systems, please contact your local or regional waste administration.

You may also contact your supplier for more information on the environmental performance of this product.



