

# Cognex MVS-8000 Series

## Getting Started

CVL 8.0

June 2016

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#### **CVL**

5495537, 5548326, 5583954, 5602937, 5640200, 5717785, 5751853, 5768443, 5825483, 5825913, 5850466, 5859923, 5872870, 5901241, 5943441, 5949905, 5978080, 5987172, 5995648, 6002793, 6005978, 6064388, 6067379, 6075881, 6137893, 6141033, 6157732, 6167150, 6215915, 6240208, 6240218, 6324299, 6381366, 6381375, 6408109, 6411734, 6421458, 6457032, 6459820, 6490375, 6516092, 6563324, 6658145, 6687402, 6690842, 6718074, 6748110, 6751361, 6771808, 6798925, 6804416, 6836567, 6850646, 6856698, 6920241, 6959112, 6975764, 6985625, 6993177, 6993192, 7006712, 7016539, 7043081, 7058225, 7065262, 7088862, 7164796, 7190834, 7242801, 7251366, EP0713593, JP3522280, JP3927239

#### **VGR**

5495537, 5602937, 5640200, 5768443, 5825483, 5850466, 5859923, 5949905, 5978080, 5995648, 6002793, 6005978, 6075881, 6137893, 6141033, 6157732, 6167150, 6215915, 6240208, 6240218, 6324299, 6381375, 6408109, 6411734, 6421458, 6457032, 6459820, 6490375, 6516092, 6563324, 6658145, 6690842, 6748110, 6751361, 6771808, 6804416, 6836567, 6850646, 6856698, 6959112, 6975764, 6985625, 6993192, 7006712, 7016539, 7043081, 7058225, 7065262, 7088862, 7164796, 7190834, 7242801, 7251366

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# Contents

■ <b>CVL 8.0 Notes</b> .....	5
About This Release .....	6
New Features in This Release .....	6
Support for Visual Studio 2013 and 2015, and Removal of Support for Visual Studio 2008 and 2010 .....	6
Support for Windows 8.1 and Windows 10, and Removal of Support for Windows XP and Windows 8 .....	6
Support for the Cognex MVS-8704e GigE card, Removal of Support for: MVS-8100, MVS-850X/850Xe, MVS-860X (while Retaining Support for MVS-8602e), MVS-8200 and MVS-82400, and FireWire Cameras (IEEE 1394 DCAM) .....	6
Support for New Sentinel HL Dongles, and Removal of Support for Previous Dongle Types and Software Licensing .....	7
Support for Camera Calibration Using Checkerboard Calibration Plates with Data Matrix Codes as Fiducials .....	7
Support for Persistent Camera Enumeration .....	7
Documentation Supplied With This Release .....	7
Sample Code Installed with This Release .....	9
Single-File Sample Code Examples .....	9
Acquisition Sample Projects .....	15
Display Sample Projects .....	15
3D-Locate Sample Projects .....	15
3D-Locate Sample Application .....	16
OCR Tool Demo Application .....	16
Supported Hardware .....	17
Image Acquisition Devices .....	17
Multiple CPU Systems and Multi-core processors .....	17
Dual-Board Configurations .....	18
System Information .....	20
System Requirements .....	21
Video Card Requirements .....	22
Operating System Requirements .....	24
DirectX Support .....	24
DEP Support .....	24
Locale Support .....	25
Development Environment Requirements .....	25
Visual C++ Requirements .....	26
Installation Information .....	27
Before You Install .....	27
Using a Dongle .....	27
Extension of Time-Limited Dongles Not Supported, Annual Repurchase Is Required .....	27

## ■ Contents

---

Installing CVL 8.0 Software .....	28
Uninstalling CVL Software .....	29
Installing CVL Silently .....	29
Uninstalling CVL 8.0 Silently .....	32
Installing 32-bit Device Drivers .....	32
Running the 32-bit Cognex Drivers Installer .....	33
Installing the 32-bit Cognex Drivers Manually .....	33
Uninstalling the 32-bit Cognex Drivers .....	34
Installing 32-bit Device Drivers Silently .....	34
Uninstalling the 32-bit Device Drivers Silently .....	35
Installing 64-bit Device Drivers .....	35
Running the 64-bit Cognex Drivers Installer .....	36
Installing the 64-bit Cognex Drivers Manually .....	36
Uninstalling the 64-bit Cognex Drivers .....	37
Installing 64-bit Device Drivers Silently .....	37
Uninstalling the 64-bit Device Drivers Silently .....	38
Modifying an Existing CVL Installation .....	38
Compatibility Notes .....	40
64-bit Operating System Compatibility Issues .....	40
Microsoft Windows 7 Compatibility Issues .....	40
Large Image Compatibility Issues .....	40
Affine Sampling Tool Interface Changed .....	40
Not all Affine Sampling Modes Supported for Large Images .....	41
Edge Tool Interface Changed to Support Large Images .....	41
CDB Files Created by Certain CVL and VisionPro Versions are Invalid .....	42
CDB Files with Large Images are Not Compatible with Earlier CVL Releases .....	42
Development Environment Compatibility Issues .....	42
Device Driver Backward Compatibility .....	43
MVS-8510 Series Frame Grabber Compatibility Issues .....	43
Contrast and Brightness on MVS-8510 Series Frame Grabbers .....	44
Software Addresses with Cable 300-0406 .....	44
Strobe Polarity Reversed When Using TTL-Only Cable Option .....	44

# CVL 8.0 Notes

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This document describes release 8.0 of the Cognex Vision Library (CVL).

This document contains the following sections:

- *About This Release* provides an overview of the features of the current release.
- *Supported Hardware* describes the Cognex hardware supported by this release.
- *System Information* describes system requirements for this release.
- *Installation Information* describes how to install and uninstall the software.
- *Compatibility Notes* describes compatibility issues related to the use of this software release and Cognex hardware.

## About This Release

This section provides an overview of CVL 8.0.

### New Features in This Release

CVL 8.0 is a general availability release. The main new features it includes are listed in this section.

#### **Support for Visual Studio 2013 and 2015, and Removal of Support for Visual Studio 2008 and 2010**

CVL 8.0 adds support for Visual Studio 2013 Update 5 and Visual Studio 2015 Update 2. It removes support for Visual Studio 2008 and 2010.

#### **Support for Windows 8.1 and Windows 10, and Removal of Support for Windows XP and Windows 8**

CVL 8.0 adds support for Windows 8.1 Update 1 (32-bit and 64-bit) and Windows 10 (64-bit only). It removes support for Windows XP and Windows 8.

#### **Support for the Cognex MVS-8704e GigE card, Removal of Support for: MVS-8100, MVS-850X/850Xe, MVS-860X (while Retaining Support for MVS-8602e), MVS-8200 and MVS-82400, and FireWire Cameras (IEEE 1394 DCAM)**

CVL 8.0 adds support for the Cognex MVS-8704e GigE card. It removes support for the following hardware: MVS-8100, MVS-850X/850Xe, and MVS-860X frame grabbers (while retaining support for MVS-8602e); MVS-8200 and MVS-82400 vision processors; and FireWire Cameras (IEEE 1394 DCAM).

## Support for New Sentinel HL Dongles, and Removal of Support for Previous Dongle Types and Software Licensing

CVL 8.0 adds support for new Sentinel HL USB dongles (used to be called HASP USB dongles) while removing support for previous dongle types. It removes support for software licensing.

## Support for Camera Calibration Using Checkerboard Calibration Plates with Data Matrix Codes as Fiducials

CVL 8.0 adds support for camera calibration using checkerboard calibration plates with Data Matrix codes as fiducials.

## Support for Persistent Camera Enumeration

CVL 8.0 adds support for Persistent Camera Enumeration (PCE), which prevents unexpected changes in camera enumeration. For example, if your application uses **ccGigEVisionCamera::get(0)** to get a reference to a particular camera, it likely expects to always get a reference to the same camera whenever the application is run. Without PCE in a multi-camera system, if the power supply for that camera fails, then **ccGigEVisionCamera::get(0)** will return a reference to a different camera. With PCE, cameras will always be enumerated at the same index regardless of the state of other cameras in the system.

## Documentation Supplied With This Release

The documentation included with this release is available online once you install CVL, and can also be found in the *Doc* directory of the CVL installation file set. To access the online documentation, from the Windows Start menu, select **Programs -> Cognex -> CVL -> Documentation**.

## ■ CVL 8.0 Notes

Table 1 lists the online documentation supplied with CVL 8.0 release.

<b>Document</b>	<b>Format</b>	<b>Contains</b>
<i>Getting Started</i> (this manual)	PDF	New features, system requirements, supported hardware, and software installation information
<i>CVL 8.0 Release Notes</i>	HTML	Lists fixed bugs, open bugs, and known limitations.  The version supplied on the CVL installation CD is current as of the release date of the product. Check the Online Support area of <a href="http://www.cognex.com">www.cognex.com</a> for the most current information.
<i>CVL 8.0 Supported Cameras</i>	HTML	Cameras and video formats supported in this release.
<i>CVL User's Guide</i>	PDF	Overview of CVL programming, working with the sample code, acquiring and displaying images and graphics, and an introduction to vision tools and concepts.
<i>CVL Vision Tools Guide</i>	PDF	Descriptions of how each vision tool works; describes algorithms, parameters, and results.
<i>CVL Class Reference</i>	PDF	Class-by-class reference manual for the CVL C++ class library.
<i>PC Vision Wiring Guide</i>	PDF	Illustrated guide showing how to wire common I/O configurations.
<i>PC Configuration Guide</i>	PDF	Summary document listing PC system requirements and recommendations.
<p>The following hardware manuals are accessible from the <b>Cognex MVS-8000 Hardware Manuals</b> submenu of the <b>Cognex Documentation and Tutorial</b> menu:</p>		
<i>MVS-8500 Hardware Manual</i> <i>MVS-8600/8600e Hardware Manual</i> <i>GigE Vision Cameras User's Guide</i>	PDF	Electrical, mechanical, installation, and configuration information for Cognex MVS-8000 series hardware and GigE Vision cameras.

Table 1. CVL 8.0 Documentation

## Sample Code Installed with This Release

CVL 8.0 is shipped with four sets of sample code. Each set of code is described briefly here, and in more detail in the section *Programming Examples* in chapter 1 of the *CVL User's Guide*.

**Note** The provided solution files default to building for 32 bits. Therefore, for 64-bit environments, you must change the solution platform to 64 bits.

### Single-File Sample Code Examples

Each of the single-file sample code examples, which are listed in Table 2, shows how to use a specific CVL tool or how to perform a specific function. These sample code files are installed in `%VISION_ROOT%\sample\cvl`.

To use one of these examples, you add it to the framework provided by `%VISION_ROOT%\sample\cvl\cvlmain.cpp`. In addition, if you are using a Cognex-provided project file, remove the `disp.cpp` sample file from the project file (added to it by default) if you want to build and run other samples. For detailed instructions on using these sample files, see *Using the Single Code File Samples* in chapter 1 of the *CVL User's Guide*.

Sample Code File	Description
<code>acq8600.cpp</code>	Shows how to acquire images using the MVS-8600 frame grabber and a Camera Link area scan camera
<code>acq8600linescan.cpp</code>	Shows how to acquire continuous line scan images using the MVS-8600 frame grabber and a Camera Link line scan camera
<code>acq8600elinescan.cpp</code>	Shows how to use two MVS-8600e-specific line scan acquisition features: starting acquisition at a specific encoder count and specifying encoder count resolution.
<code>acqbasic.cpp</code>	Shows the textbook way to perform image acquisition in CVL.
<code>acq_custom.cpp</code>	Shows how to examine and modify custom properties implemented by GigE Vision cameras and Cognex Imaging Devices.
<code>acubar.cpp</code>	Shows how to use the barcode classes.

Table 2. CVL single file code samples for this release

## ■ CVL 8.0 Notes

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<b>Sample Code File</b>	<b>Description</b>
<i>acuread.cpp</i>	Shows how to use the OCR class <b>ccAcuRead</b> .
<i>acureadud.cpp</i>	Shows how to use user-defined fonts with the OCR class <b>ccAcuRead</b> .
<i>acusymb2.cpp</i>	Shows how to use of the 2D Symbology tools for decoding QR Code symbols encoding Shift JIS characters.
<i>acusymb1.cpp</i>	Shows how to use the 2D symbol classes.
<i>afftrans.cpp</i>	Shows how to create a synthetic image and transforms an affine rectangular region of it into a separate destination image.
<i>archive.cpp</i>	Shows how to write a persistent class.
<i>atslenh.cpp</i>	Demonstrates enhanced functionality of the Auto-select tool: query mode, masking, and overlap constraints
<i>atslsmpl.cpp</i>	Shows how to use the Auto-select tool.
<i>blend.cpp</i>	Demonstrates the blending of two images during live display.
<i>blob.cpp</i>	Shows how to use the Blob tool.
<i>bndtrckr.cpp</i>	Shows how to use the Boundary Tracker tool in its major modes and how to read the results.
<i>boards.cpp</i>	Displays the Cognex frame grabber boards installed on your system and their capabilities.
<i>boundaryinspector1.cpp</i>	Demonstrates the Boundary Inspection Tool with a global tolerance.
<i>boundaryinspector2.cpp</i>	Demonstrates the Boundary Inspection Tool with a local shape tolerance.
<i>boundaryinspector3.cpp</i>	Demonstrates the Boundary Inspection Tool with statistically learned boundary tolerances.
<i>boundaryinspector4.cpp</i>	Demonstrates the Boundary Inspection Tool with shape masking, shape clipping, and featurelet filtering.

*Table 2. CVL single file code samples for this release*

Sample Code File	Description
<i>boundaryinspector5.cpp</i>	Demonstrates the local contour comparison mode of the Boundary Inspection Tool
<i>bpa.cpp</i>	Shows how to use the Ball Pattern Align tool.
<i>calib.cpp</i>	Shows how to use the <b>cc2XformLinear/cc2XformPoly</b> Calibration tool.
<i>calib2.cpp</i>	Shows how to use the <b>cc2XformCalib2</b> Calibration tool.
<i>calibls.cpp</i>	Shows how to use the Line Scan Calibration tool.
<i>caliper.cpp</i>	Shows how to use the Caliper tool.
<i>cdb.cpp</i>	Shows how to use the image database.
<i>circfit.cpp</i>	Shows how to use the Circle Finder tool to find a circle.
<i>clipsket.cpp</i>	Demonstrates rectangular region clipping of displayed images.
<i>clssfier.cpp</i>	Shows how to classify numbers in one of the four quadrants and initialize the scoring functions.
<i>cnlsrch.cpp</i>	Show how to use CNLSearch.
<i>colmtchc.cpp</i>	Show how to use the Composite Color Match tool.
<i>colmtchs.cpp</i>	Shows how to use the Color Match tool.
<i>colsegm.cpp</i>	Shows how to use the Color Segmenter tool.
<i>constrea.cpp</i>	Shows how to use console streams including <i>cogOut</i> , the Cognex standard output stream
<i>convolve.cpp</i>	Shows how to use the Discrete Convolution tool.
<i>cvlmain.cpp</i>	Main program for most sample projects. Use this file when building host-based projects, except enhanced acquisition samples in <i>%VISION_ROOT%\sample\cvlacquire</i> .
<i>diag.cpp</i>	Shows how to use the diagnostic recording classes with CNLSearch.

Table 2. CVL single file code samples for this release

## ■ CVL 8.0 Notes

Sample Code File	Description
<i>disp.cpp</i>	Shows how to use <b>ccDisplayConsole</b> windows to draw graphics in an MFC application.  See <i>Using the Display Classes</i> in the <i>Displaying Images</i> chapter for more information on <b>ccDisplayConsole</b> .
<i>dispprop.cpp</i>	Shows how to use the <b>ccGraphicsProps</b> class.
<i>disppump.cpp</i>	Shows how to create a Windows message handler thread for a <b>ccDisplayConsole</b> .
<i>dxc390_8504.cpp</i>	Shows how to acquire color images from a 3-tap color camera (Sony DXC-390) using the MVS-8504.
<i>edge.cpp</i>	Shows how to use the Edge tool.
<i>edgefilt.cpp</i>	Demonstrates edgelet chain filtering.
<i>except.cpp</i>	Shows how to use CVL exceptions.
<i>featureletfilter.cpp</i>	Shows how to use the Featurelet Filtering tool.
<i>featurelt.cpp</i>	Shows how to use featurelets and featurelet chains.
<i>fit.cpp</i>	Shows how to use the Fitting tool.
<i>flxunwrp.cpp</i>	Shows how to use the results of a PatFlex tool to unwarped an image.
<i>gausmpl.cpp</i>	Shows how to use the Gaussian Sampling tool.
<i>gige_basler_as.cpp</i> <i>gige_jai.cpp</i> <i>gige_prosilica.cpp</i>	Shows how to access camera-specific features of several GigE Vision cameras.
<i>gige_basler_ls.cpp</i>	Shows how to configure a Basler GigE line scan camera.
<i>gige_timestamp.cpp</i>	Shows how to use the timestamp function of GigE Vision cameras.
<i>gmrph.cpp</i>	Shows how to use the Grey-scale Morphology tools.
<i>handle.cpp</i>	Shows how to use the Cognex handle classes.
<i>histo.cpp</i>	Shows how to use the Histogram tool.

Table 2. CVL single file code samples for this release

<b>Sample Code File</b>	<b>Description</b>
<i>idtool.cpp</i>	Shows how to use the ID tool.
<i>lablproj.cpp</i>	Shows how to use the Label Projection tool.
<i>linefit.cpp</i>	Shows how to use the Line-fitting tools.
<i>matrix.cpp</i>	Shows how to work with the matrix classes.
<i>ocr.cpp</i>	Shows how to use the OCR tool.
<i>ocv1.cpp</i>	Shows how to use the OCV tool.
<i>ocvmax.cpp</i>	Shows how to use the OCVMax tool.
<i>pdf417.cpp</i>	Shows how to use the PDF417 OCR tool.
<i>pelbuf.cpp</i>	Shows how to work with images (pel buffers).
<i>pelfunc.cpp</i>	Shows how to use pixel processing functions (pelfuncs).
<i>pelrect.cpp</i>	Shows how to use the rectangle classes.
<i>persist.cpp</i>	Shows how to write a complex-persistent class.
<i>pio.cpp</i>	Shows how to use parallel I/O.
<i>pmalign1.cpp</i>	Shows how to use the PatMax/Align tool.
<i>pmalign2.cpp</i>	Shows how to use the PatMax/Align tool with synthetic training.
<i>pmalign3.cpp</i>	Shows how to use interactive mouse-manipulable shapes to define a model for PatMax.
<i>pmalign4.cpp</i>	Shows how to import synthetic models from DXF-format CAD files for use with PatMax.
<i>pmalign5.cpp</i>	Shows how to use CVL shapes code to draw a synthetic model for use with PatMax.
<i>pmalignf.cpp</i>	Demonstrates outside region threshold PatMax, with full scene usage
<i>pmalignh.cpp</i>	Shows how to use High Sensitivity PatMax
<i>pmaligno.cpp</i>	Demonstrates outside region threshold PatMax

Table 2. CVL single file code samples for this release

## ■ CVL 8.0 Notes

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<b>Sample Code File</b>	<b>Description</b>
<i>pmcompmodel.cpp</i>	Shows how to train a PatMax Composite Model.
<i>pmisimpl.cpp</i>	Shows how to use the PatInspect tool to train a pattern and do image difference calculations.
<i>pmmultimodel.cpp</i>	Shows how to use the PatMax Multi-Model tool.
<i>png.cpp</i>	Demonstrates reading a PNG file.
<i>polar.cpp</i>	Demonstrates polar transformations.
<i>prealign.cpp</i>	Shows how to use the Wafer Pre-Align tool
<i>ptmatch.cpp</i>	Shows how to use the Point Matcher tool to train and match sets of 2-dimensional points.
<i>rgbplane.cpp</i>	Shows how to extract separate red, green, and blue images from a single color image, and create a grey-scale image from a color image. Requires a color-capable frame grabber and color camera.
<i>rsi.cpp</i>	Shows how to use the RSI Search tool.
<i>rsltgrph.cpp</i>	Shows how to use the result graphic classes with CNLSearch.
<i>sanglef.cpp</i>	Shows how to use the Scene Angle Finder tool.
<i>serialio.cpp</i>	Demonstrates the CVL interface for serial I/O.
<i>thresh.cpp</i>	Shows how to use the Threshold tool.
<i>timer.cpp</i>	Shows how to use timers.
<i>units.cpp</i>	Shows how to use units classes to convert between degrees and radians.
<i>userbuf.cpp</i>	Shows how to display the contents of a user-defined block of data in a pel buffer.
<i>userstor.cpp</i>	Shows how to persist the contents of a user-defined block of data to a file.
<i>vector.cpp</i>	Shows how to use the vector classes.

Table 2. CVL single file code samples for this release

Sample Code File	Description
<i>version.cpp</i>	Shows how to retrieve CVL product version information.
<i>xform.cpp</i>	Shows how to use the transformation object classes.

Table 2. CVL single file code samples for this release

## Acquisition Sample Projects

The CVL sample code includes five Visual Studio projects that build stand-alone CVL applications that acquire images. The sample projects show how to

- Acquire images from an externally triggered camera
- Acquire RGB images from a color camera
- Perform master-slave acquisition using multiple analog cameras
- Create a live-display loop application

These sample programs are found in the `%VISION_ROOT%\sample\cv\acquire` directory. For detailed instructions on using these sample files, see *Image Acquisition Sample Projects* in chapter 1 of the *CVL User's Guide*.

## Display Sample Projects

The CVL sample code includes three Visual Studio projects that build stand-alone CVL applications that display images. The sample projects show how to

- Perform live display of both color and grey-scale images.
- Use the display console to display images and vision tool results.
- Use the Win32 display code to display images in an MFC application.

These sample programs are found in the `%VISION_ROOT%\sample\cv\display` directory. For detailed instructions on using these sample files, see the section *Display Sample Projects* in chapter 1 of the *CVL User's Guide*.

## 3D-Locate Sample Projects

The CVL sample code includes three Visual Studio projects: one for Visual Studio 2012, one for Visual Studio 2013, and one for Visual Studio 2015 that build an application that demonstrates 3D-Locate. The sample projects show how to

- Use viewsets to perform 3D camera calibration.
- Use a set of images and poses to perform hand-eye calibration.

## ■ CVL 8.0 Notes

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- Use triangulation and pose estimation to solve 3D applications.

These sample programs are found in the `%VISION_ROOT%\sample\cv\lc3d` directory. For additional instructions on using these sample files, see the *3D-Locate Developer's Guide*.

### **3D-Locate Sample Application**

The CVL sample code for 3D-Locate includes a fully functional sample application that shows how to use 3D-Locate and PatMax to determine the pose of objects in 3D space.

The sample application can be found in `%VISION_ROOT%\sample\cv\lc3d\apps\fixedmulticam`. For information on the sample application, see the file `%VISION_ROOT%\sample\cv\lc3d\apps\fixedmulticam\fixedmulticamera3dlocate.doc`.

### **OCR Tool Demo Application**

The demo application for the OCR tool includes three Visual Studio projects: one for Visual Studio 2012, one for Visual Studio 2013, and one for Visual Studio 2015 that build an application that demonstrates how to use the OCR tool.

The demo application for the OCR tool can be found in `%VISION_ROOT%\sample\cv\ocr\demo`.

# Supported Hardware

This section describes the Cognex hardware configurations that CVL 8.0 supports.

## Image Acquisition Devices

CVL 8.0 supports the following image acquisition devices:

- Cognex MVS-8511 (32-bit and 64-bit OS)
- Cognex MVS-8511e (32-bit and 64-bit OS)
- Cognex MVS-8514 (32-bit and 64-bit OS)
- Cognex MVS-8514e (32-bit and 64-bit OS)
- Cognex MVS-8602e (32-bit; 64-bit OS for board firmware versions 3.56 or later, the use of the board is blocked by the software for other board firmware versions)
- GigE Vision Cameras as listed in the *Supported Cameras* table for this release (32-bit and 64-bit OS)
- Cognex MVS-8704e GigE card (32-bit and 64-bit OS)
- Third-party Imaging Devices that conform to the Imaging Device Interface, described in Chapter 3 of the *CVL User's Guide*. The Acquisition Integration Kit (AIK) for third-party image acquisition supports 32-bit and 64-bit OS.

In addition to frame grabber-based security, CVL 8.0 supports the use of a Cognex-supplied dongle (security key) for licensing, as described in the section *Using a Dongle* on page 27.

## Multiple CPU Systems and Multi-core processors

CVL 8.0 supports multi-CPU systems and multi-core processors for all supported operating systems and hardware configurations. (See *Operating System Requirements* on page 24).

## Dual-Board Configurations

CVL 8.0 supports the dual-board combinations marked in Table 3 for 32-bit operating systems.

	8511	8511e	8514	8514e	GigE Vision	8602e	8704e	Imaging Device
8511	Y	Y	Y	Y	Y	Y	Y	Y
8511e		Y	Y	Y	Y	Y	Y	Y
8514			Y	Y	Y	Y	Y	Y
8514e				Y	Y	Y	Y	Y
GigE Vision					Y	Y	Y	Y
8602e						Y	Y	Y
8704e							Y	Y
Imaging Device								Y

Table 3. Dual-board frame grabber combinations supported (32-bit OS)

CVL 8.0 supports the dual-board combinations marked in Table 4 for 64-bit operating systems.

	GigE Vision	Imaging Device	8602e	8704e	8510
GigE Vision	Y	Y	Y	Y	Y
Imaging Device		Y	Y	Y	Y
8602e			Y	Y	Y
8704e				Y	Y
8510					Y

Table 4. Dual-board frame grabber combinations supported (64-bit OS)



## **System Information**

This section describes system level information, such as the operating system, service pack levels, hardware platforms, and video card required to run CVL software.

## System Requirements

To install and use CVL, the host PC must meet the following minimum requirements:

- If you are using a Cognex board, the PC must be equipped with the expansion slots and ports listed in the *PC Configuration Guide* and shown in the following table

<b>Frame Grabber</b>	<b>Supported Expansion Slots</b>	<b>Recommended</b>
<b>8511</b>	PCI (3.3 or 5 volts; 32 or 64-bit) that provides 3.3V power, PCI-X (3.3 or 5 volts; 32 or 64-bit) that provides 3.3V power	PCI or PCI-X slot 33 MHz or higher that provides 3.3V power.
<b>8514</b>	PCI (3.3 or 5 volts; 32 or 64-bit) that provides 3.3V power, PCI-X (3.3 or 5 volts; 32 or 64-bit) that provides 3.3V power	PCI or PCI-X slot 66 MHz or higher that provides 3.3V power.
<b>8511e/ 8514e</b>	PCIe x1, x4, x8, x16	PCIe x1
<b>8602e</b>	PCIe x4, x8, x16	PCIe x4
<b>8704e</b>	PCIe x4	PCIe x4

- If you are using a direct-connect camera, the PC must be equipped with an appropriate port (Gigabit-Ethernet for GigE Vision).
- The host must have a 1 GHz or faster Intel Pentium (or compatible) CPU with MMX/SSE2 instruction set support. See the *PC Configuration Guide* for additional recommendations.
- The host PC must run a Windows operating system listed in the section *Operating System Requirements* on page 24.
- The PC must have a PCI, AGP, or PCI Express video card.
  - The minimum supported video card memory configuration is 8 megabytes, which provides limited functionality.
  - A standalone video card that plugs into a motherboard slot is strongly preferred over a chip-based video system integrated with the motherboard.
  - An AGP or PCI Express x16 standalone video card with at least 16 megabytes of memory is strongly recommended as the practical minimum configuration with acceptable performance.
  - The video card's device driver must support DirectX 8.1 or later.

## ■ CVL 8.0 Notes

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- Video card recommendations are discussed in *Video Card Requirements* on page 22.

To use CVL at its maximum potential, the host PC should meet the following additional requirements:

- The host system should have more RAM than is specified for the version of Windows in use. The amount required is application dependent. Generally, the host system should have enough RAM that your CVL application does not need to page to disk.
- The Windows desktop must be in 8-, 16-, or 32-bit color mode. The desktop must be in 16- or 32-bit mode to display color images.
- Video card memory requirements depend on several factors, including the number of cameras in use, the number of live display windows open, the desktop color depth selected, and whether overlay graphics are used. More video memory than 16 megabytes may be required to assure maximum performance for some frame grabbers and configurations, as discussed in Table 5 on page 23.
- To use CVL manipulable graphics, the host PC must have a mouse or other pointing device supported by your Windows version.
- Set the PC's BIOS to support a non plug-and-play operating system.
- The system should use bus-mastered DMA disk drivers, as opposed to PIO drivers for IDE (ATA) hard disks. Bus-mastered drivers improve system performance, because the CPU is less heavily used during disk I/O. Windows defaults to auto detection and uses DMA mode if the disk device supports it. Check with your motherboard vendor to determine if it provides bus-mastered IDE drivers.
- By default, Windows allows the kernel and some device drivers to be paged from memory. If your PC has 64 MB of RAM or more, you can disable the paging of the kernel and drivers, which keeps them in memory for faster access. To do this, use your registry editor of choice and navigate to *HKLM/SYSTEM/CurrentControlSet/Control/Session Manager/Memory Management*. In this folder, the key *DisablePagingExecutive* controls kernel paging behavior and is set to 0 (false) by default. To disallow kernel and driver paging, set this key's value to 1 (true). Once changed, the setting does not take effect until after you reboot the computer. Always back up your registry before making edits.

## Video Card Requirements

### Note

Cognex provides video card recommendations in this section as a guideline. If your video card meets all of the requirements described in Table 5 on page 23, you may still experience less than optimal performance depending on the video card manufacturer, the video card driver installed, and the PC hardware in use.

The minimum requirements for video cards used with this CVL release are listed in *System Requirements* on page 21. If your application requires extensive use of live display for multiple cameras, or uses overlay graphics, more video memory is strongly recommended.

Table 5 provides general recommendations for video card capabilities.

<b>Video Card Feature</b>	<b>Recommendations</b>
PCI video cards	<p>Adequate when using 8-bit acquisition FIFOs and 8-bit desktop depth when maximum acquisition frame rate is not required.</p> <p>Because PCI-type video cards cause more bus traffic to occur when performing live display of images, the CPU usage will be higher with a PCI video card than with an AGP video card. This is true for all frame grabbers.</p>
AGP video cards	<p>Cognex strongly recommends 2X cards or faster.</p> <p>AGP video cards that support the AGP Fast Write feature may show reduced CPU usage during live display. Check with the video card manufacturer to determine whether your card and its driver support this feature.</p>
PCI Express video cards	Cognex supports x16 PCI Express video cards.
8 MB of video memory	Adequate when using 8-bit acquisition FIFOs and 8-bit desktop depth.
16 MB of video memory	<ul style="list-style-type: none"> <li>• Recommended when using 16- or 32-bit desktop depths.</li> <li>• Required when using the overlay layer with 8-bit acquisition FIFOs and 8-bit desktop depth, or 16-bit acquisition FIFOs and 16-bit desktop depth.</li> </ul>

*Table 5. Video card general recommendations*

## ■ CVL 8.0 Notes

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<b>Video Card Feature</b>	<b>Recommendations</b>
32 MB of video memory	<ul style="list-style-type: none"><li>• Recommended when using 32-bit desktop depth.</li><li>• Required when using the overlay plane with 32-bit acquisition FIFOs and 32-bit desktop depth (if supported by your hardware).</li></ul>
64 MB of video memory	<ul style="list-style-type: none"><li>• Recommended when using 32-bit desktop depth, large desktop width x height resolutions, or displaying live images from multiple cameras with large video formats.</li><li>• Recommended when using the overlay layer with 8-, 16-, or 32-bit acquisition FIFOs and 32-bit desktop depth in a multicamera configuration and/or with multiple display windows.</li></ul>

*Table 5. Video card general recommendations*

## Operating System Requirements

CVL 8.0 requires one of the Microsoft operating systems listed below to be installed on the host system. Cognex supports the US English and Japanese localized editions of the following Windows variants:

- Windows 7 SP1  
(32-bit editions for Premium, Professional, and Ultimate)
- Windows 7 SP1  
(64-bit editions for Premium, Professional, and Ultimate)
- Windows 8.1 Update 1  
(32-bit and 64-bit editions)
- Windows 10 (64-bit edition only)

## DirectX Support

For all supported operating systems, CVL 8.0 supports the version of DirectX associated with that operating system (DirectX 11.0 for Windows 7, and DirectX 11.1 for Windows 7 SP1, DirectX 11.2 for Windows 8.1, and DirectX 11.3 and 12.0 for Windows 10).

## DEP Support

CVL 8.0 supports PCs with hardware enabled DEP using Intel chipsets.

## Locale Support

CVL 8.0 was tested on all supported operating systems (listed in the section *Operating System Requirements* on page 24) with the following locales:

- US English
- Japanese

## Development Environment Requirements

CVL 8.0 has been tested against the service pack or release levels of the Microsoft development environment products shown in Table 6. Later service packs or release levels may work, but have not been tested and are not supported by Cognex for use with this version of the software.

Development Environment	Compiler Version	Service Pack Requirement
Visual Studio 2012	Visual C++ v11.0	Update 5
Visual Studio 2013	Visual C++ v12.0	Update 5
Visual Studio 2015	Visual C++ v14.0	Update 2

<sup>1</sup> Unicode versions of the MFC libraries may be required to run some CVL samples in the default mode, as described in the next section.

Table 6. *Development environment, framework, and operating system service pack release levels supported by CVL 8.0*

### Notes+

Because CVL 8.0 is an unmanaged SDK, it only supports applications built with MSVC 2012, MSVC 2013, or MSVC 2015 in unmanaged applications. CVL 8.0 does not support applications built with managed .NET (using the `/clr` compiler switch); also known as *mixed mode*.

For more information regarding Microsoft Security Bulletin MS11-025, see the following link:

<http://www.microsoft.com/technet/security/bulletin/MS11-025.msp>

## Visual C++ Requirements

The sample code provided with CVL (in `%VISION_ROOT%\sample\cvl`) has four build modes: Win32 Debug, x64 Debug, Win32 Release, and x64 Release. For all sample projects, Debug configuration will build using multibyte character set, while Release configuration will build using Unicode character set. To be able to build these sample projects, Microsoft Visual C++ must be installed. To build Debug configuration using Visual Studio 2013, the Visual C++ “MFC” multibyte character set support must be installed.

If “MFC” multibyte support is not present, you can build the samples in one of the Unicode modes (Win32 Release or x64 Release). To change the build mode of the solution, use the Configuration Manager.

# Installation Information

This section describes the procedures and limitations for installing CVL 8.0 software. For information about installing hardware, refer to the hardware manual for your Cognex frame grabber or adapter.

## Before You Install

Please take a moment to familiarize yourself with the information in this section before installing CVL.

- Verify that the system on which you are installing CVL software meets all hardware and software requirements described in *System Information* on page 20.
- When installing CVL, you must have Administrator privileges for the system.
- Fully uninstall any earlier version of CVL and the Cognex Drivers before installing the current version. You uninstall the software using the **Programs and Features** control panel, as described further in *Uninstalling CVL Software* on page 29 and *Uninstalling the 32-bit Cognex Drivers* on page 34.

## Using a Dongle

A dongle (sometimes called a security key) is a hardware device that you attach to your PC's USB port. A CVL-based application can then verify the licensing of CVL vision tools by checking the licensing data programmed into the dongle, as an alternative to checking the security information in a Cognex frame grabber.

Time-limited dongles expire after a set period of time programmed into the dongle. CVL provides the Cognex (Dongle) Expiration Reminder that warns you of an impending expiration date. It is part of CVL. The Expiration Reminder will appear once a day if the development dongle has 30 or fewer days remaining. It will also warn whenever a CVL application is launched if the dongle has expired (0 days remaining). After the dongle has expired, you will need to repurchase one.

Dongle security is managed by the *Cognex Security Service*, a Windows service that is automatically installed when you install CVL. The CVL installer also installs all of the files required by all supported dongle types.

## Extension of Time-Limited Dongles Not Supported, Annual Repurchase Is Required

Time-limited dongles are programmed to expire after a specified time limit, usually one year. The expiration date of a time-limited dongle cannot be extended. Contact Cognex Technical Support to repurchase a dongle (on an annual basis).

## ■ CVL 8.0 Notes

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You can display the time remaining with the *Cogtool* utility. In a DOS command prompt window, type the following command:

```
cogtool --print | more
```

The dongle responds with information like the following:

```
Board 0 - Cognex Security Key v7 (USB)
Serial Number: nnnnnnnn
Upgrade Code: ABC
Device: Sentinel HL Time USB
State: Active
Time Remaining: 363 days 0 hours
Battery: ok
Host Tools Enabled:
...
```

## Installing CVL 8.0 Software

This section describes how to install CVL 8.0 software.

### Notes

You can download the CVL installer from [www.cognex.com](http://www.cognex.com) for both 32-bit operating systems and 64-bit operating systems.

If the installer detects an older installed CVL version it displays a message instructing you to uninstall CVL before attempting this installation. Remove the existing version of CVL and try again.

If the installer detects that the CVL version you are now installing is already installed, the InstallShield Wizard displays a screen with the choices **Modify**, **Repair** and **Remove**. Follow the on-screen instructions.

1. Extract the CVL installation files and run *setup.exe*
2. Follow the on-screen prompts through the **Preparing...**, **Welcome...** and **License Agreement** screens.

3. On the **Setup Type** screen, select one of the following:
  - Select **Complete** to install all files required to develop CVL applications with the supported Microsoft Visual C++ versions, all Cognex online documentation and CVL sample code.
  - Select **Custom** to choose MSVS C++ .NET 2012, MSVS C++ 2013, or MSVS C++ 2015 as your CVL development environment, and whether to include or exclude Cognex online documentation, CVL sample code and CVL deployment-only files.

Choosing Custom leads to the **Custom Setup** dialog where you can choose the features you wish to install. Browse through the displayed tree and choose the features you wish to install. Note that an **X** next to a feature indicates it will NOT be installed.
4. The **Ready to Install the Program** dialog gives you a chance to review what will be installed. Click **Back** to review or change your selections, or click **Install** to install CVL.
5. The **Installing Cognex CVL 8.0** screen displays while the software is being installed.
6. When the installation is complete the **InstallShield Wizard Complete** screen appears. By default, the box in this screen is checked to launch the Cognex driver installer. (See *Installing 32-bit Device Drivers* on page 32). Uncheck the box(es) if you do not wish to install the drivers or the CSLC. Click **Finish** to proceed.

## Uninstalling CVL Software

To uninstall CVL use the **Programs and Features** control panel. Find the CVL version to remove in the program list and click on it to highlight and expand it. Click on **Remove** to uninstall it. You must uninstall the Cognex Drivers separately.

## Installing CVL Silently

It is possible to install CVL unattended, without the need for operator intervention to click on screen dialog buttons. This is known as *silent* operation. Note that when you install CVL silently, if you wish to also install Cognex device drivers silently a separate operation is required. For information on installing Cognex device drivers silently, see *Installing 32-bit Device Drivers Silently* on page 34.

## ■ CVL 8.0 Notes

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The CVL silent install is run from a DOS prompt command line. Arguments you include on the command line name CVL features you wish to install. These are the same features you see in the screen dialog of an interactive Custom install. See **Setup Type** on page 29. These features are summarized in Table 7 (for the 32-bit installer) and Table 8 on page 31 (for the 64-bit installer).

<b>Command line argument</b>	<b>Defaults</b>	<b>Screen dialog names</b>
<b>devvc110</b>	✓	Visual Studio C++ 2012 Development Files
<b>devvc120</b>	✓	Visual Studio C++ 2013 Development Files
<b>devvc140</b>	✓	Visual Studio C++ 2015 Development Files
<b>docsw</b>	✓	CVL Developer Manuals
<b>dochw</b>	✓	Acquisition Hardware Manuals
<b>sample</b>	✓	Sample Code
<b>gigecfg</b>	✓	GigE Vision Configuration Tool
<b>dplvc110a</b>		Visual Studio C++ 2012 ANSI <sup>1</sup>
<b>dplvc110u</b>		Visual Studio C++ 2012 UNICODE <sup>1</sup>
<b>dplvc120a</b>		Visual Studio C++ 2013 ANSI <sup>1</sup>
<b>dplvc120u</b>		Visual Studio C++ 2013 UNICODE <sup>1</sup>
<b>dplvc140a</b>		Visual Studio C++ 2015 ANSI <sup>1</sup>
<b>dplvc140u</b>		Visual Studio C++ 2015 UNICODE <sup>1</sup>

**Note 1:** Deployment-only files

Table 7. CVL installation Features (32-bit installer)

Command line argument	Defaults	Screen dialog names
<b>dev110x64</b>	✓	Visual Studio C++ 2012 x64 Development Files
<b>dev120x64</b>	✓	Visual Studio C++ 2013 x64 Development Files
<b>dev140x64</b>	✓	Visual Studio C++ 2015 x64 Development Files
<b>docsw</b>	✓	CVL Developer Manuals
<b>dochw</b>	✓	Acquisition Hardware Manuals
<b>sample</b>	✓	Sample Code
<b>gigecfg</b>	✓	GigE Vision Configuration Tool
<b>dpl110a64</b>		Visual Studio C++ 2012 x64 ANSI <sup>1</sup>
<b>dpl110u64</b>		Visual Studio C++ 2012 x64 UNICODE <sup>1</sup>
<b>dpl120a64</b>		Visual Studio C++ 2013 x64 ANSI <sup>1</sup>
<b>dpl120u64</b>		Visual Studio C++ 2013 x64 UNICODE <sup>1</sup>
<b>dpl140a64</b>		Visual Studio C++ 2015 x64 ANSI <sup>1</sup>
<b>dpl140u64</b>		Visual Studio C++ 2015 x64 UNICODE <sup>1</sup>

**Note 1:** Deployment-only files

Table 8. CVL installation Features (64-bit installer)

To run a silent install, execute *setup.exe* located in the root directory of your CVL release installer. For example:

```
setup /s /v"/qn ADDLOCAL=dpl180a64,dpl180u64
        INSTALLDIR="c:\Program Files\Cognex\CVL\" "
```

This command installs CVL into the `c:\Program Files\Cognex\CVL` directory. You can install it in another directory if you wish by changing the Path in the above command line.

## ■ CVL 8.0 Notes

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Following `ADDLOCAL=` is a comma-separated list (with no spaces) of the features you wish to install. These must be names from the left-hand column of Table 7 (32-bit) and Table 8 (64-bit). If you omit `ADDLOCAL=` the installer installs the defaults which are the same as the defaults used in the interactive installation when you choose a **Complete** install. These defaults are shown in Table 7 and Table 8.

To install all features, use `ADDLOCAL=ALL`.

Note that the path you specify following `INSTALLDIR` must be enclosed with quotes if there are any spaces in the path name.

## Uninstalling CVL 8.0 Silently

To uninstall CVL 8.0 silently run the following command from a DOS command line prompt.

```
setup/s /v"/qn REMOVE=ALL"
```

CVL installs into `%VISION_ROOT%` a text file named "cvl\_installed\_productcode.txt" for 32-bit and "cvlx64\_installed\_productcode.txt" for 64-bit. This file contains a command you can use to uninstall CVL silently. For example, CVL 64-bit installs "`%VISION_ROOT%\cvlx64_installed_productcode.txt`" with the content:

To silently uninstall cvlx64, you can run the following command:

```
msiexec /qn /X{A5DE62D6-8961-4176-AB2C-3297B91A7A5A}
```

So, to uninstall CVL 64-bit silently, open an Administrator cmd shell and execute:

```
msiexec /qn /X{A5DE62D6-8961-4176-AB2C-3297B91A7A5A}
```

The CVL 32-bit file "cvl\_installed\_productcode.txt" has a different argument for its command, so use the argument in that file for uninstalling 32-bit.

**Note** If you start this command in a non-Administrator cmd shell, the `msiexec` command will exit silently without uninstalling CVL, so make sure you are running in an Administrator cmd shell.

## Installing 32-bit Device Drivers

This section describes installing the 32-bit *Cognex Drivers 5.9* package for CVL 8.0. After installing CVL the installer dialog gives you the option to run the drivers installer. If you install both VisionPro and CVL on the same PC you need run the drivers installer only once. Note that on PCs with both CVL and VisionPro installed, you should not uninstall the drivers unless you are uninstalling *both* CVL and VisionPro.

## Running the 32-bit Cognex Drivers Installer

The final dialog screen of the CVL 8.0 install includes a check box labeled **Launch Cognex Driver Installer** which is checked by default. The recommended procedure is to leave the box checked which will then automatically start the *Cognex Drivers* installer which installs device drivers.

When you run the *Cognex Drivers* installer, follow these steps:

1. The **Welcome** screen displays. Click **Next**, click **I accept...**, and **Next** again to display the **Setup Type** screen.
2. If while starting, Windows detects new hardware (your frame grabber or adapter) it displays the **Files Needed** dialog. Click **Cancel** to skip this dialog. Do not use this method to install the drivers.
3. On the **Setup Type** screen, select **Complete** to install the device drivers.
4. The **Installing Cognex Drivers** screen displays while the drivers are being installed.
5. When the installation is complete the **InstallShield Wizard Complete** screen appears. Click **Finish** to proceed.

You must reboot your PC if the drivers installer prompts for it.

## Installing the 32-bit Cognex Drivers Manually

If you did not launch the drivers installer after installing CVL 8.0, or if you later add hardware, you will need to run the driver installer manually. To do this, double click on the file *setup.exe* in the *drivers* subfolder of your CVL release installer.

Running the Cognex Drivers installer will cause one of the following to happen:

1. If an older set of drivers is installed a display asks you to uninstall them. Uninstall the drivers and try again. (Also, see *Uninstalling the 32-bit Cognex Drivers* below).
2. If the installer detects that the driver version you are now installing is already installed, the InstallShield Wizard displays a screen with the choices **Modify**, **Repair** and **Remove**. Follow the on-screen instructions. Also, see the following paragraphs for more about these options.

If you know that the drivers are currently installed and you wish to only make some driver changes or reinstall drivers, you do not need to uninstall the drivers. In this case go to the **Programs and Features** control panel, select **Cognex Drivers**, and click on **Change**. The installer starts and leads to a screen with the choices **Modify**, **Repair** and **Remove**. **Repair** causes the previously installed driver set to be reinstalled. This is most often used if you suspect a driver problem and want to reinstall the drivers. The Repair option proceeds with no intervention since there are no choices to make.

**Remove** will uninstall all of the Cognex drivers.

## Uninstalling the 32-bit Cognex Drivers

To uninstall device drivers, use the **Programs and Features** control panel. Find *Cognex Drivers* in the program list and click on it to highlight and expand it. Click on **Remove** to cause the device drivers to be uninstalled. The installer will then ask you to reboot, which is required.

## Installing 32-bit Device Drivers Silently

It is possible to install device drivers unattended, without the need for operator intervention to click on screen dialog buttons. This is known as *silent* operation. You initiate a silent install from a DOS prompt command.

The silent *Cognex Drivers* installer runs from a DOS prompt command line. Arguments you include on the command line name device drivers you wish to install. These are the same drivers you see in the screen dialog of an interactive Custom install. See **Setup Type** on page 33.

The *Cognex Drivers* installer can install any or all of the drivers. Each driver has an internal name that you must use in the command line when installing silently. These drivers are listed in the following table.

Command line argument <sup>1</sup>	Screen dialog names
<b>_8504</b>	MVS-8500/8500e Driver
<b>_8600</b>	MVS-8600 Driver
<b>_gige</b>	GigE Interface and CFG-8700 Driver

**Note 1:** Command line arguments are case sensitive.

**Note** The Cognex driver package also includes a driver for the Cognex Communication Card, however, CVL does not support the Cognex Communication Card.

To install the drivers silently, run the file *setup.exe* from the *drivers* subfolder of the CVL release installer. The ADDLOCAL command line option lets you specify the specific drivers to install. Specify ADDLOCAL=ALL to install all drivers.

```
setup /s /v" /qn ADDLOCAL= driver,driver,driver  
                    INSTALLDIR=directory "
```

Note that the path you specify following `INSTALLDIR` must be enclosed with quotes if there are any spaces in the path name.

The following is an example, installing the MVS-8602e driver:

```
setup /s /v" /qn ADDLOCAL=_8600
        INSTALLDIR="C:\Program Files\Cognex\Common\" "
```

## Uninstalling the 32-bit Device Drivers Silently

Use the following DOS command to uninstall silently all Cognex frame grabber drivers:

```
setup/s /v"/qn REMOVE=ALL"
```

**Note** Be aware that on completion this command automatically reboots your PC.

The Cognex [x64] Drivers installers, both 32-bit and 64-bit, install a text file named “cognex\_drivers\_installed\_productcode.txt” beside the installed directory “Drivers”. This text file contains a command you can use to uninstall Cognex Drivers silently. For example, the “cognex\_drivers\_installed\_productcode.txt” file installed by Cognex x64 Drivers 5.9 shows:

To silently uninstall cognex\_drivers, you can run the following command:

```
msiexec /qn /X{D0ABF7D5-6EDF-4CDA-B789-1424FD445361}
```

So, to uninstall Cognex x64 Drivers, open an Administrator cmd shell and execute:

```
msiexec /qn /X{D0ABF7D5-6EDF-4CDA-B789-1424FD445361}
```

The “cognex\_drivers\_installed\_productcode.txt” installed by 32-bit Cognex Drivers has a different argument for its command, so use the argument in that file for uninstalling 32-bit.

**Note** If the uninstall process determines it needs to reboot, it will start the reboot immediately after completion, without any interaction with the user.

**Note** If you start this command in a non-Administrator cmd shell, the msiexec command will exit silently without uninstalling CVL, so make sure you are running in an Administrator cmd shell.

## Installing 64-bit Device Drivers

This section describes installing the 64-bit *Cognex x64 Drivers 5.9* package for CVL 8.0. Instructions described in this section are for 64-bit editions of Windows 7 operating systems. After installing CVL, the installer dialog gives you the option to run the drivers installer. If you install both VisionPro and CVL on the same PC you need run the drivers installer only once. Note that on PCs with both CVL and VisionPro installed, you should not uninstall the drivers unless you are uninstalling *both* CVL and VisionPro.

## Running the 64-bit Cognex Drivers Installer

The final dialog screen of the CVL 8.0 install includes a check box labeled **Launch Cognex Driver Installer** which is checked by default. The recommended procedure is to leave the box checked which will then automatically start the *Cognex Drivers* installer which installs device drivers.

When you run the *Cognex Drivers* installer, follow these steps:

1. The **Welcome** screen displays. Click **Next**, click **I accept...**, and **Next** again to display the **Setup Type** screen.
2. On the **Setup Type** screen, select **Complete** to install the device drivers.
3. The **Installing Cognex Drivers** screen displays while the drivers are being installed.
4. When the installation is complete the **InstallShield Wizard Complete** screen appears. Click **Finish** to proceed.

You must reboot your PC if the drivers installer prompts for it.

## Installing the 64-bit Cognex Drivers Manually

If you did not launch the drivers installer after installing CVL 8.0, or if you later add hardware, you will need to run the driver installer manually. To do this, double click on the file *setup.exe* in the *drivers* subfolder of your CVL release installer.

Running the Cognex Drivers installer will cause one of the following to happen:

1. If an older set of drivers is installed a display asks you to uninstall them. Uninstall the drivers and try again. (Also, see *Uninstalling the 32-bit Cognex Drivers* below).
2. If the installer detects that the driver version you are now installing is already installed, the InstallShield Wizard displays a screen with the choices **Modify**, **Repair** and **Remove**. Follow the on-screen instructions. Also, see the following paragraphs for more about these options.

If you know that the drivers are currently installed and you wish to only make some driver changes or reinstall drivers, you do not need to uninstall the drivers. In this case go to the **Programs and Features** control panel, select **Cognex Drivers**, and click on **Change**. The installer starts and leads to a screen with the choices **Modify**, **Repair** and **Remove**. **Repair** causes the previously installed driver set to be reinstalled. This is most often used if you suspect a driver problem and want to reinstall the drivers. The Repair option proceeds with no intervention since there are no choices to make.

**Remove** will uninstall all of the Cognex drivers.

## Uninstalling the 64-bit Cognex Drivers

To uninstall device drivers use the **Programs and Features** control panel. Find *Cognex Drivers* in the program list and click on it to highlight and expand it. Click on **Remove** to cause the device drivers to be uninstalled. The installer will then ask you to reboot, which is required.

## Installing 64-bit Device Drivers Silently

It is possible to install device drivers unattended, without the need for operator intervention to click on screen dialog buttons. This is known as *silent* operation. You initiate a silent install from a DOS prompt command.

The silent *Cognex Drivers* installer runs from a DOS prompt command line. Arguments you include on the command line name device drivers you wish to install. These are the same drivers you see in the screen dialog of an interactive Custom install. See **Setup Type** on page 36.

The *Cognex Drivers* installer can install any or all of the drivers. Each driver has an internal name that you must use in the command line when installing silently. These drivers are listed in the following table.

Command line argument <sup>1</sup>	Screen dialog names
_8504	MVS-8500/8500e Driver
_8600	MVS-8600 Driver
_gige	GigE Interface and CFG-8700 Driver

**Note 1:** Command line arguments are case sensitive.

**Note** The Cognex driver package also includes a driver for the Cognex Communication Card, however, CVL does not support the Cognex Communication Card.

To install the drivers silently, run the file *setup.exe* from the *drivers* subfolder of the CVL release installer. The ADDLOCAL command line option lets you specify the specific drivers to install. Specify ADDLOCAL=ALL to install all drivers.

```
setup /s /v" /qn ADDLOCAL= driver,driver,driver
                    INSTALLDIR=directory "
```

Note that the path you specify following `INSTALLDIR` must be enclosed with quotes if there are any spaces in the path name.

The following is an example, installing the MVS-8602e driver:

## ■ CVL 8.0 Notes

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```
setup /s /v" /qn ADDLOCAL=_8600  
INSTALLDIR="C:\Program Files\Cognex\Common\" "
```

### Uninstalling the 64-bit Device Drivers Silently

Use the following DOS command to uninstall silently all Cognex frame grabber drivers:

```
setup/s /v"/qn REMOVE=ALL"
```

**Note** Be aware that on completion this command automatically reboots your PC.

The Cognex [x64] Drivers installers, both 32-bit and 64-bit, install a text file named "cognex\_drivers\_installed\_productcode.txt" beside the installed directory "Drivers". This text file contains a command you can use to uninstall Cognex Drivers silently. For example, the "cognex\_drivers\_installed\_productcode.txt" file installed by Cognex x64 Drivers 5.9 shows:

To silently uninstall cognex\_drivers, you can run the following command:

```
msiexec /qn /X{D0ABF7D5-6EDF-4CDA-B789-1424FD445361}
```

So, to uninstall Cognex x64 Drivers, open an Administrator cmd shell and execute:

```
msiexec /qn /X{D0ABF7D5-6EDF-4CDA-B789-1424FD445361}
```

The "cognex\_drivers\_installed\_productcode.txt" installed by 32-bit Cognex Drivers has a different argument for its command, so use the argument in that file for uninstalling 32-bit.

**Note** If the uninstall process determines it needs to reboot, it will start the reboot immediately after completion, without any interaction with the user.

**Note** If you start this command in a non-Administrator cmd shell, the msiexec command will exit silently without uninstalling CVL, so make sure you are running in an Administrator cmd shell.

## Modifying an Existing CVL Installation

The CVL 8.0 installation program offers the ability to modify or repair an existing CVL 8.0 installation, or to remove the entire CVL 8.0 installation.

If you start the CVL setup program with CVL software already installed, the Welcome screen offers the following options:

- Select **Modify** to add or remove individual CVL features. The Modify option offers you the same choices as the Custom installation option during a first-time CVL installation.
- Select **Repair** to reinstall all CVL features installed by the previous setup.
- Select **Remove** to remove the entire CVL installation.

## Compatibility Notes

This section describes compatibility issues related to the use of Cognex hardware and CVL 8.0 software.

### 64-bit Operating System Compatibility Issues

The AcuRead tool is not supported on 64-bit operating systems.

### Microsoft Windows 7 Compatibility Issues

This section describes compatibility issues related to Microsoft Windows 7.  
N/A.

### Large Image Compatibility Issues

This section describes compatibility issues related to support for large images.

#### Affine Sampling Tool Interface Changed

In CVL 6.7 CR1 and earlier releases, the members used to specify the number of samples in the X- and Y-direction for the affine sampling tool (**ccAffineSamplingParams::xNumSamples** and **ccAffineSamplingParams::yNumSamples**) were of type **c\_Int16**.

In order to support sampling large images, in releases starting with CVL 6.7 CR3, the number of samples is stored using a **c\_Int32** value.

The setter functions in **ccAffineSamplingParams** are simply changed to take a **c\_Int32** value; this does not cause incompatibility with existing code because the C++ compiler promotes the 16-bit value to a 32-bit value. The getter functions, however, cannot be changed without becoming incompatible with existing code. CVL 6.7 CR3 added two new members to **ccAffineSamplingParams**:

- **ccAffineSamplingParams::xNumSamples32()** returns the number of samples in the X-direction.
- **ccAffineSamplingParams::yNumSamples32()** returns the number of samples in the Y-direction.

The existing getter functions that return 16-bit values are deprecated, and they will now throw an error if the number of samples is greater than or equal to 32768.

## Not all Affine Sampling Modes Supported for Large Images

Only the following sampling modes are supported by the Affine Sampling Tool for input or output images with more than 32768 pixels in either the X- or Y-dimension:

- `ccAffineSamplingParams::eNone`
- `ccAffineSamplingParams::eBilinearAccurate`

The remaining modes (`eBilinearApprox`, `eHighPrecision`, and `eBilinear`) are not supported; if you specify one of the unsupported modes and either the input or output image has an X- or Y-dimension greater than 32768, the tool will throw an error.

## Edge Tool Interface Changed to Support Large Images

CVL 6.7 CR1 and earlier releases, the Edge tool stored the whole-pixel locations of sub-pixel edges (edgelets) using 16-bit values. This meant that any edgelet that had whole pixel positions outside the range -32768 to +32767 could not be represented.

Starting with CVL 6.7 CR3, the Edge tool allows you to specify the storage method for edgelets.

- If you request `ccEdgeletDefs::eRequestContiguous`, the edgelets will be stored in a single contiguous block. If no edgelet has a whole-pixel location with an image X- or Y-coordinate outside the range -32768 through +32767, the edgelets are stored in a vector of **ccEdgelet** and accessed through **ccEdgeletSet::edges()**. If any edgelet has a whole pixel location with an image X- or Y-coordinate that is outside the range -32768 through +32767, the edgelets are stored in a vector of **ccEdgelet2** and accessed through **ccEdgeletSet::edges2()** or through the **ccEdgeletIterator** or **ccEdgeletIterator\_const** classes obtained by calling **ccEdgeletSet::begin()**.
- If you request `ccEdgeletDefs::eRequestEdges2`, the edgelets are stored in a vector of **ccEdgelet2** and accessed through **ccEdgeletSet::edges2()** or through the **ccEdgeletIterator** or **ccEdgeletIterator\_const** classes obtained by calling **ccEdgeletSet::begin()**.
- If you request `ccEdgeletDefs::eRequestEdgesAndOffsets`, the edgelets are stored in one or more separate blocks of memory, where each block contains an array of **ccEdgelet** objects and a pair of 32-bit offset specifiers. Edgelets are accessed using the **ccEdgeletIterator** or **ccEdgeletIterator\_const** classes. You obtain one of these objects by calling **ccEdgeletSet::begin()**.

## ■ CVL 8.0 Notes

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Multiple blocks are only used when at least one edgelet has a whole pixel location with an image X- or Y-coordinate that is outside the range -32768 through +32767. If only a single block is created, you can use both **ccEdgeletSet::edges()** and the **ccEdgeletIterator()** methods for accessing the set's edgelets.

Because the **ccEdgeletIterator** or **ccEdgeletIterator\_const** classes obtained by calling **ccEdgeletSet::begin()** can be used to access edgelets regardless of the storage method, Cognex recommends that you use this interface.

### **CDB Files Created by Certain CVL and VisionPro Versions are Invalid**

Any CDB or IDB files created using the IDBEdit program supplied with CVL 6.8 CR1, CVL 6.8 CR2, or VisionPro 6.0 are unreadable by the IDBEdit program supplied with earlier versions of CVL and VisionPro.

The IDBEdit program supplied with CVL 8.0 (and with VisionPro 6.1 or 6.2) can be used to repair invalid CDB or IDB files. Simply open the affected file using the newer IDBEdit program, then select **File->Save As...** and save it under a different name. The newly saved file is readable by *all* versions of IDBEdit.

### **CDB Files with Large Images are Not Compatible with Earlier CVL Releases**

If you use a CVL application built with CVL 6.8 CR3 to save an image that is larger than 32768 pixels in either the X- or Y-dimension, attempts to load that image into a CVL application built using an CVL releases 6.7 CR1 and earlier will produce a 1x1 pixel image.

## **Development Environment Compatibility Issues**

This section describes compatibility issues related to supported development environments.

N/A.

## Device Driver Backward Compatibility

Device drivers supplied with CVL 8.0 are backward compatible with the versions listed in Table 9. Backward compatibility in this sense implies that the specified older CVL version will continue to operate when using the newer driver from this release.

<b>Frame Grabber or Camera</b>	<b>Earliest CVL Version Compatible with 8.0 Driver (Windows 7)</b>	<b>Earliest CVL Version Compatible with 8.0 Driver (Windows 8.1 and 10)</b>
<b>MVS-8511</b> <b>MVS-8514</b> <b>MVS-8511e</b> <b>MVS-8514e</b>	CVL 6.8 CR3 (32-bit) CVL 7.0 (64-bit)	CVL 8.0 (this release)
<b>MVS-8602e</b>	CVL 7.0 (64-bit)	CVL 8.0 (this release)
<b>GigE Vision Performance Drivers</b>	N/A (32-bit) CVL 7.1 CR2 (64-bit)	CVL 8.0 (this release)

Table 9. Device driver compatibility

## MVS-8510 Series Frame Grabber Compatibility Issues

This section describes compatibility issues that affect the use of the MVS-8510 and MVS-8510e frame grabbers.

## Contrast and Brightness on MVS-8510 Series Frame Grabbers

Contrast and brightness settings are made in CVL with functions of the **ccContrastBrightnessProp** class. Within the commonly used range of 0.05 to 0.95 for contrast and 0.20 to 0.80 for brightness settings, the grey level values in acquired images will vary slightly depending on which board you are using.

- At the same contrast and brightness settings, the MVS-8511, MVS-8511e, MVS-8514, and MVS-8514e frame grabbers produce grey level values that may be up to 10 grey levels higher or 6 grey levels lower than the pixel values produced by the (unsupported) MVS-8501 and MVS-8504 frame grabbers with the same input signal. The median difference in grey values across a typical range of inputs is approximately 0.
- At the same contrast and brightness settings, the MVS-8511, MVS-8511e, MVS-8514, and MVS-8514e frame grabbers produce grey level values that may be up to 4 grey levels higher or 12 grey levels lower than the pixel values produced by the (unsupported) MVS-8500Le and MVS-8504e frame grabbers with the same input signal. The median difference in grey values across a typical range of inputs is approximately -2 (the values produced by the newer frame grabbers are lower).

You may be able to minimize the grey value differences for a particular range of input values by adjusting the brightness and contrast settings.

## Software Addresses with Cable 300-0406

Cognex cable 300-0406 is intended for connecting a Sony DXC-390 color camera plus one monochrome analog camera to the MVS-8514 and MVS-8514e.

When using this cable, the R, G, and B cable branches connecting to the color camera consume camera positions 0, 1, and 2. This means that the monochrome camera connected to the fourth cable branch has a software address of 3. Use this address in your CVL code to control the monochrome camera when using cable 300-0406.

## Strobe Polarity Reversed When Using TTL-Only Cable Option

For two of the three parallel I/O cable options for all MVS-8510 series frame grabbers, the strobe lines are opto-isolated. However, when you use the TTL pass-through cable option (cable 300-0390 and the TTL connection module, 800-5818-1), the four strobe lines have reversed polarity, compared to the same lines when opto-isolated.

Thus, when using strobes on the all-opto (300-0389) or half and half (300-0399) cable options, the information about **ccStrobeProp::strobeHigh()** in the *CVL Class Reference* is accurate as written:

---

```
void strobeHigh(bool polarity);
```

When *polarity* is true, the active pulse is set to high. If false, sets the active pulse to low.

However, when using strobes on the TTL pass-through cable option, 300-0390, the polarity information is reversed:

```
void strobeHigh(bool polarity);
```

When *polarity* is true, the active pulse is set to low. If false, sets the active pulse to high.

## ■ CVL 8.0 Notes

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