Overview

This document describes Release 4.3.0 of In-Sight Explorer, including the following topics:

- System Requirements
- New Features
- Changes & Fixes
- Known Issues
- Release History

For updated release notes, documentation and more, visit the In-Sight Online Support Center.

System Requirements

Supported In-Sight Vision Systems

In this release, new firmware is available for the following systems:

- In-Sight 5000 Series Vision Systems
- In-Sight Micro Vision Systems

Note: Support has been removed for the In-Sight 1000 series, 3000, 4000 series sensors, In-Sight 3400 vision sensor, In-Sight 5000 vision sensor and the 1700/1701 wafer readers. In-Sight Explorer 4.3.0 does not support vision systems with less than 32MB Flash memory.

Hardware Requirements

- Intel® Pentium®4 processor running at 2 GHz (or equivalent)
- 256MB of available RAM
- 2GB of available hard-disk space
- Video card capable of displaying 1024x768 resolution at 16-bit color depth. The DPI Display setting must be set to 96 DPI.
- Network Interface Card (at least 100Mbps) for connecting to In-Sight sensors

Operating System Requirements

In-Sight Explorer has been tested on the following 32-bit operating systems:

For updated release notes, documentation and more, visit the In-Sight Online Support Center.
Microsoft® Windows Server® 2003, Service Pack 2
Microsoft Windows XP Professional, Service Pack 3
Microsoft Windows Vista Business, Service Pack 1

Although In-Sight Explorer may function on other operating systems, systems not meeting the preceding requirements are not supported.

Supported Languages

- English
- Japanese
- French
- German
- Spanish (European)
- Korean
- Chinese (Simplified)

Old Firmware Version Support

In-Sight vision systems with older firmware may work properly with In-Sight Explorer 4.3.0; however, firmware versions prior to 3.1.0 are not fully tested.

Licensing

In-Sight Explorer 4.3.0 is distributed in two different packages: a full version and a trial version. The full version is completely functional and does not expire. The trial version runs for 30 days and then ceases to function. An Offline Programming Key is required for the full version to use In-Sight Explorer in emulator mode if no In-Sight sensors are present on your network.

New Features

Note: The following features are only available when using In-Sight Explorer 4.3.0 with sensors that have been upgraded to firmware version 4.3.0. Cognex strongly recommends upgrading sensors to firmware version 4.3.0 so that all of the new features are available.

In-Sight Explorer Enhancements

This release of In-Sight Explorer provides new functionality for both the EasyBuilder and Spreadsheet development environments, while also providing new functionality shared by both, including the following:

- Support for the new In-Sight CIO-Micro-CC I/O Module, with CC-Link Certification.
- Support for the new In-Sight Micro Color Vision Systems, standard resolution (1100C and 1400C) and high resolution (1403C) models.

EasyBuilder®

- The Math & Logic Tools category has been added to the Inspect Part step. The Math & Logic Tools are used to conditionally link tools together based on Pass/Fail results, perform mathematical operations on tool outputs, process statistics of tools, group tools together and create steps for the order of operation.
- The Image Filters Tools category has been added to the Inspect Part step. The Image Filter Tools are used to enhance an image or area of the image for image analysis.
Support for the Mitsubishi communication protocols, CC-Link and MC Protocol, has been added to the Communications step.

The ability to export images to an FTP server has been added to the Communications step.

The Trigger Interval parameter has been added to the Edit Acquisition Settings group box in the Set Up Image step. This parameter allows you to control the delay between triggers when the Trigger parameter is set to Continuous.

The Start Row and Number of Rows parameters have been added to the Edit Acquisition Settings group box in the Set Up Image step. These parameters allow you to define at what row of the CCD the image will begin to be transferred, and how many rows of the CCD will be used to construct the image.

The Focus Metric has been added to the Live Video button in the Set Up Image step. The Focus Metric returns a relative score of the focus of a region of the image.

The Focus Region button has been added to the Edit Acquisition Settings group box in the Set Up Image step. This parameter allows you to specify the region used to measure the focus score of the image.

For In-Sight color vision systems, the White Balance button has been added to the Edit Acquisition Settings group box in the Set Up Image step. This parameter allows you to specify the region used to measure the white balance when connected to an In-Sight color vision system.

The PatMax Location and Inspection Tools have added the Find Mode parameter to their Settings tab. This parameter allows you to specify either the PatMax or PatQuick detection method.

The PatMax Patterns Location Tool has added the Sort By parameter to the Settings tab. This parameter allows you to specify how the results are sorted; either by the score or the X or Y coordinates of the found pattern.

The Edge Presence/Absence Tool has added the Show Mid-Point parameter to the Settings tab. This parameter allows you to display the mid-point of the found edge, which can then be used as an input for another tool or output to an external device.

The Distance Measurement Tool now displays a line with arrowheads to better differentiate the result of a Distance Measurement Tool and edges or lines from Geometry Tools.

**Spreadsheet**

**Added Functions**

*Note: The following functions are only available when using the In-Sight Explorer Spreadsheet View.*

- The ExtractColor and the TrainExtractColor functions, and their associated Vision Data Access functions, have been added (Vision Tools --> Color). The ExtractColor algorithm uses color groups to form complex color definitions, comparing a color group against trained color groups, outputting pixel counts, match scores and images, while providing 16 resolution.
- The MatchColor and the TrainMatchColor functions, and their associated Vision Data Access functions, have been added (Vision Tools --> Color). The MatchColor algorithm finds a single model in color space, outputting the average color found in the region and a match score between the found and trained color, while providing 24 bit resolution and higher speed.
- The WriteImageSFTP function has been added (Input/Output --> Network) to support the exporting of images to secure FTP servers.
- The WriteMC and ReadMC functions have been added (Input/Output --> Network) to support the MC Protocol communications between Mitsubishi PLCs and In-Sight vision systems.
- The ReadCCLinkBitBuffer, ReadCCLinkWordBuffer, WriteCCLinkBitBuffer and WriteCCLinkWordBuffer functions have been added (Input/Output --> Network) to support CC-Link communications between Mitsubishi PLCs and In-Sight vision systems.
- The CombineOutputBuffers function has been added (Input/Output), which allows multiple FormatOutputBuffer functions to be combined into a single output buffer.

**Function Enhancements**

- The Delay parameter in the AcquireImage property sheet has been modified to now include a control for the delay between triggers when the Trigger parameter is set to Continuous.
- The Focus Metric Region parameter has been added to the AcquireImage property sheet, allowing you to specify the region used to measure the focus score of the image.
• The White Balance Region parameter has been added to the AcquireImage property sheet, which allows you to specify the region used to measure the white balance when connected to an In-Sight color vision system.

• The Trigger Debounce parameter has been added to the AcquireImage property sheet for In-Sight Micro vision systems, which allows you to specify an amount of time, in micro seconds, that the input trigger must remain active to be recognized as a valid trigger.

• Support for decoding QR Codes with perspective distortion has been added to the ReadIDCode function (Vision Tools -->ID).

• The PlotLine function (Graphics --> Image) has been modified to include two new parameters, Start Point Adornment and End Point Adornment, to draw arrowheads at the ends of the line.

Spreadsheet View Enhancements

• While in Live Video, a Focus Metric score has been added and returns a relative score of the focus of a region of the image.

• The FormatInputBuffer and FormatOutputBuffer dialogs have been updated to include a bit data type option, for communications over CC-Link and MC Protocol.

• The Color category, containing the ExtractColor, MatchColor, TrainExtractColor and TrainMatchColor functions, has been added to the Vision Tools function category, when connected to an In-Sight Color vision system or emulator.

Changes & Fixes

NOTE: Change Request numbers ( CR# ) have been included (where applicable) to improve tracking of Known Issues reported via Cognex Technical Support.

• In-Sight Emulators will now correctly display images acquired utilizing the partial acquisition parameters, provided that the In-Sight Emulator's Start Row and Number of Lines parameters in the AcquireImage property sheet are configured to the same settings as those used by the In-Sight vision system that acquired the image. Previously, if an In-Sight Emulator utilized an image that was acquired utilizing the partial acquisition parameters, the image orientation would be incorrect. (CR# 58563)

• When an In-Sight Micro vision system is connected to an In-Sight CIO-Micro I/O Module, and the Set Job Native Mode command is issued via serial communications, the command will now correctly issue the signal and maintain communications. Previously, when the In-Sight Micro vision system was connected to the In-Sight CIO-Micro I/O Module, and the Set Job Native Mode command was sent over serial, communications between the two devices could be dropped. (CR# 58575)

• The ExtractColorHistogram function now returns #ERR when the function references an 8-bit greyscale image. Previously, the ExtractColorHistogram would return incorrect values for the RGB and HSI values. (CR# 59862)

• The Line Intersection Geometry Tool now displays the X,Y coordinates of the found intersection as an output symbol that may be referenced by other tools or communicated to external devices in the Communications Application Step. Previously, this output symbol was unavailable in EasyBuilder and was only accessible through the Spreadsheet. (CR# 60165)

• The BoundingRectangle function has been modified, preventing the tool from entering into a state that could result in the In-Sight vision system running the function to become unresponsive and necessitate a power cycle. Previously, if an In-Sight vision system was utilizing an ExtractBlobs function on a complex blob, in conjunction with a BoundingRectangle function, in the process of calculating the boundary, the tool would not correctly identify the origin and then repeatedly re-draw the boundary. (CR# 57400)

• When an In-Sight Micro vision system is connected to a CIO-WENET (750-341) Ethernet I/O Expansion Module, and the connection is interrupted while the In-Sight Micro is Online, the Inputs in the ReadDiscrete functions now retain the last read value before the connection was interrupted. Previously, the ReadDiscrete functions would retain random values. (CR# 58601)

• Communication between In-Sight vision systems configured to utilize ReadResult and WriteResult functions in a master/slave configuration will now be correctly restored if the slave In-Sight vision system is power cycled (note that the first result after the power cycle will be missed; all subsequent results will be transmitted successfully)). Previously, in this situation, if the slave vision system was configured to use a network trigger and was then power cycled, after the slave vision system had the job reloaded and placed back Online, communication between the two systems would not be restored. (CR# 59322)

• The ComputeImageSharpness function's Smoothness parameter has been fixed, and now operates correctly. Previously, all three settings of the parameter worked in the same manner. (CR# 58033)
The Add Sensor/Device to Network dialog has been updated to better recognize In-Sight vision systems on the network. Previously, when attempting to add In-Sight vision systems running In-Sight 3.x.x and older firmware to the In-Sight Network, the In-Sight vision system's MAC address would appear, but an error message would be displayed and the vision system could not be added. (CR# 58633)

The Add Sensor/Device to Network dialog has been updated to allow for In-Sight vision systems to be reset to factory defaults and their IP addresses re-assigned in one step. Previously, this process involved resetting the vision system to the factory defaults, power cycling the system, and then re-opening the dialog to assign the IP address. (CR# 58105)

The PatMax Patterns Inspection Tools now provide items in the Select EasyView Items dialog for activating the Model Region and Train buttons on a VisionView® Operator Interface Panel. Previously, these items had to be symbolically tagged in the Spreadsheet prior to being a selection in the Select EasyView Items dialog. (CR# 57507)

The performance of the ReadText function's Speed Reading Mode parameter has been optimized to better recognize valid timeouts. Previously, when the ReadText function was used in conjunction with images that were composed of mostly white space and/or high noise, the tool would fail to timeout, even when it had exceeded the value specified in the Timeout parameter. (CR# 58660)

The ReadEIP function now correctly receives explicit messages from ControlLogix. Previously, the ReadEIP function would not work with explicit messages. (CR# 57213)

EtherNet/IP implicit connectivity between ControlLogix ENET/B modules and In-Sight vision systems has been corrected. Previously, EIP connections initiated from a ControlLogix ENET/B module to an In-Sight vision system would fail to connect. (CR# 59765)

The process of saving a bitmap (BMP) image from an In-Sight Color vision system has been changed. Previously, when a BMP image file was loaded on a Color vision system, the image would be internally converted to a Bayer Pattern. The conversion from BMP to the Bayer Pattern would result in a loss of data precision. If the loaded BMP image file was then later saved, the internally converted Bayer Pattern image was then converted back to BMP format, thus changing the data of the originally loaded image. (CR# 60569)

Consult the Release History for changes and fixes in previous releases.

Known Issues

This section describes known issues with the In-Sight Explorer 4.3.0 software, including any known workarounds. Change Request numbers (CR#) have been included to improve tracking of Known Issues reported via Cognex Technical Support.

Displayed Color Models do not update correctly when the Output Image is set to Color or Binary Image

Issue: When using an ExtractColor function with multiple Color Models and the Output Image parameter is set to either Color Image or Binary Image, when you activate or de-activate the Color Models in the Color Models tab, the image being displayed will not be updated to reflect the change until the ExtractColor property sheet is closed. (CR# 61192)

Workaround: If applicable, set the Output Image parameter to Marked Image, or activate/de-activate the desired Color Models and close the ExtractColor property sheet to see the image updated correctly.

Uninstalling In-Sight Explorer 4.x.x results in unhandled exception errors for other installed versions of In-Sight Explorer 4.x.x

Issue: If there are multiple versions of In-Sight Explorer 4.x.x (e.g. 4.1.0, 4.1.1, 4.2.0, 4.3.0) installed on a PC and a version of In-Sight Explorer 4.x.x is un-installed, other versions of In-Sight Explorer 4.x.x may generate an unhandled exception error after opening. (CR 61127)

Workaround: From the Windows Control Panel, run a repair on the version of In-Sight Explorer 4.x.x that is generating the error. To correct this issue, follow these steps:

For Windows XP:

1. Open the Windows Control Panel and select Add/Remove Programs.
2. From the list, select the version of In-Sight Explorer 4.x.x that is generating the error.
3. Below the Cognex In-Sight Explorer 4.x.x label, click on the link: "Click here for support information." This launches the
Support Info dialog.

4. Press the Repair button in the Support Info dialog.

For Windows Vista:

1. Open the Windows Control Panel and select Programs and Features.
2. From the list, right-click on the version of In-Sight Explorer 4.x.x that is generating the error.
3. From the right-click menu, select Repair.

**PatMax Patterns and Patterns Location and Inspection Tools may not properly display bent Model Regions**

*Issue:* If a PatMax Patterns or Patterns Location or Inspection Tool is added to a job, and the Model Region is bent into a large annular shape, the thumbnail image of the Model may not appear in the Trained Image tab of the tool. (CR# 60798)

*Workaround:* Although the Model is not displayed as a thumbnail, the Model is still a valid, usable Model. If you need to display the Model as a thumbnail, attempt to utilize a smaller Model Region, or decrease the size of the inner radius of the annulus.

**ImageMath will display the incorrect image when referencing an ExtractColor output image**

*Issue:* If the ImageMath function references the output of an ExtractColor function in its Image parameter, the origin of the ImageMath output image will be shifted inaccurately, and the resulting operation of the ImageMath function is invalid. The image generated by the ExtractColor function does not work as an Image parameter input for the ImageMath function. (CR# 60224)

**In-Sight Color Vision Systems do not support recording quarter image resolution images**

*Issue:* If an In-Sight Color vision system is configured to record images at quarter resolution in the Record/Playback Options dialog, the image that is recorded will actually be recorded at half resolution. (CR# 60452)

**SNTP synchronization sends an erroneous "Job Complete" signal**

*Issue:* If an In-Sight vision system is configured to utilize the Simple Network Time Protocol (SNTP) and a Discrete Output Line is configured to Job Complete, while the vision system is Online, the Job Complete signal will be sent when the SNTP synchronization occurs. (CR# 60177)

*Workaround:* Disable the SNTP synchronization.

**Updating In-Sight sensor firmware while directly connected to a PC**

*Issue:* If an In-Sight sensor's network cable is connected directly to an Ethernet port on a local PC, and an attempt is made to update the firmware of that sensor, an error message may result and the sensor may become unresponsive and require the sensor to be power cycled. (CR# 56735)

*Workaround:* The In-Sight.exe program may be blocked from performing network operations by the Windows Firewall settings. To correct this issue, the In-Sight.exe program must be set as an exception in the Windows Firewall utility (note that these steps should only be performed *after* the In-Sight sensor has been directly connected to the local PC):

1. From the Control Panel, open the Windows Firewall utility.
2. Select the Exceptions tab.
3. Press the Add Program button.
4. Press the Browse button and navigate to the Emulator directory of In-Sight Explorer (i.e. Program Files > Cognex > In-Sight > In-Sight Explorer x.x.x > Emulator).
5. Select In-Sight.exe and press the Open button.
6. In-Sight.exe should now be displayed in the Add a Program dialog; press the OK button to continue.
7. In-Sight.exe should now be displayed, with a checkmark beside it, in the list of Programs and Services in the Exceptions tab of the Windows Firewall dialog. Press the OK button to continue. If the checkmark is not present, check the box and then...
Updating In-Sight sensor firmware in EasyBuilder while connected to a VisionView

Issue: If an In-Sight sensor is in Run Mode within VisionView, then the sensor is logged on to from EasyBuilder and the sensor's firmware is updated, after the firmware update is complete, both VisionView and EasyBuilder may be unable to reestablish a connection to the sensor and may need to be power cycled or restarted, respectively. (CR# 54251)

Workaround: From the VisionView Network Settings screen, configure the Subnet Mask to an invalid value (ex. 255.255.255.252). Next, update the sensor's firmware. After the sensor's firmware has been updated, restore the correct VisionView Subnet Mask value.

The In-Sight Modbus TCP Server implementation only supports one connection at a time

Issue: The current In-Sight Modbus TCP Server implementation only supports one connection between the Modbus TCP Server (the In-Sight sensor) and one client device at a time, and does not support TCP-Keepalive or another similar mechanism to close a socket when the network is disconnected. (CR# 56136)

Workaround: If an In-Sight sensor is configured as a Modbus TCP Server, and the Modbus TCP client does not properly close its connection to the In-Sight sensor Modbus TCP Server, the sensor must be power-cycled to re-establish communications.

Rockwell RSLogix 5000 Add-On Profile support for In-Sight Vision Sensors

Issue: The Rockwell RSLogix 5000 Add-On Profile has not been updated to properly handle In-Sight 3400, 5000 series sensors or Micro vision systems running 4.2.0 firmware. (CR# 52947)

Workaround: The In-Sight 3400, 5000 series sensors or Micro vision systems may still be used with the existing Add-On Profile, however it requires disabling keying from within RSLogix 5000. For In-Sight 3400 and 5000 series sensors, disable keying when configuring the profile within RSLogix 5000. For In-Sight Micro vision systems, when establishing the connection, select an In-Sight 5000 series sensor as the module type and also disable keying.

Using the Add Sensor/Device to Network dialog with firmware 3.4.x or earlier may launch an error message

Issue: If the Add Sensor/Device to Network dialog is used to change the network settings of a sensor running firmware 3.4.x or earlier, you will be prompted to power cycle the sensor. In some cases, an error message will appear afterward, indicating that the sensor did not reboot properly. (CR# 53425)

Workaround: Click OK in the error message to dismiss it. No further action is needed.

Cut cell contents may be lost if error occurs

Issue: During cut-and-paste, the contents of the cut cell may be lost if an error occurs, even if you select Cancel to stop the operation. (CR# 40584)

Workaround: Use Undo (CTRL+Z) to restore the contents of the cut cell.

Get Job only returns status data with Motoman mode

Issue: When a Get Job (GJ) command is issued using Motoman mode, the status data is returned but the result data is not returned. (CR# 40160)

Workaround: Use the Get File (GF) command instead of the Get Job command, or place the job ID number in another cell in the spreadsheet and use the Get Value (GV) command.

Using the Cancel button to exit the AcquireImage property sheet causes unexpected behavior

Issue: With an image currently displayed on an In-Sight 5000 series sensor, and the AcquireImage property sheet is opened, closing the property sheet by clicking the Cancel button will not restore the displayed image or property sheet to its status prior to being opened. Opening the AcquireImage property sheet will cause the sensor to display a new image, and regardless of whether the Cancel button is used to exit the property sheet, the new image and any changes made in the property sheet will be retained in both the displayed image and the property sheet. (CR# 38201, 38242)

Workaround: If you need the currently displayed image, save the image before opening the AcquireImage property sheet, and then
In-Sight® Explorer Release Notes

In-Sight CIO-Micro I/O Module Environmental Operating Temperature Rating

**Issue:** Due to the limitations of the current plastic housing design, the environmental operating temperature rating of the In-Sight CIO-Micro I/O Module is 0°C (0° F) to 40°C (104° F).

Release History

**Release 4.2.0**

- Introduced the In-Sight CIO-Micro I/O Module.
- Added EasyView, a convenient and easy way to customize how data is displayed on the VisionView® Operator Interface Panel and to determine if the data is editable by the operator.
- Added the ability to emulate specific In-Sight vision systems.
- The Geometry Tools, to create geometric references and measurements, were added to the Inspection Tools in the Inspect Part step.
- Support for the Modbus TCP Server protocol was added to the Communications Application Step, allowing an In-Sight sensor or vision system to be configured as a server for Modbus TCP communications.
- The Read Text Identification Tool supports up to four custom fonts within a single job, as well as sharing a custom font between multiple Read Text Identification Tools in a job.
- The Read ID Code Identification Tool supports reading 144 x 144 Data Matrix symbols.
- The GetBufferData function (Vision Data Access --> Input/Output) and the ReadModbusBuffer and WriteModbusBuffer functions (Input/Output --> Network) were added to support the Modbus TCP communication protocol.
- A number of enhancements were made to the ReadIDCode function, including the support to read 144 x 144 Data Matrix symbols and enhancements when reading PharmaCode and RSS symbols.
- The GetSymbologyIdentifier function (Vision Data Access --> IDCode) was added, which returns the identity of a symbol using a three-character code, based on AIM-U.S.A. (Automatic Identification Manufacturers) specifications.
- The BGetFloat, BGetInt, BGetString and BStringf functions (Text --> Binary) added optional arguments to support byte-swapping to better support Modbus TCP communication protocols.
- The FormatInputBuffer and FormatOutputBuffer functions (Input/Output) accept byte-swapped strings as a data type to better support Modbus TCP communication protocols.
- Job Protection was added, which allows spreadsheet cells to be protected by hiding cell formulas and limiting cell execution to a single vision sensor.
- The Active Cells Limit dialog, accessible from the Sensor Menu, was added to enable the configuration of the number of programmable spreadsheet cells.
- The MC Protocol snippet was added to the Communication Snippets directory, enabling communication between In-Sight sensors and devices using the MC Protocol.
Release 4.1.0

- Introduced the EasyBuilder development environment to In-Sight Explorer: An image-centric interface that facilitates point-and-click selection of features of interest in the image to configure measurements; a set of Applications Steps to provide a step-by-step template to simplify application set up; a Settings Pane/Results Table in the bottom pane of the interface that updates based on the selected step, and also includes a results table to monitor tool results and troubleshoot applications; and integrated Help and Input/Output Monitoring to guide the user through application set-up and provide useful feedback during application deployment.

- Introduced the In-Sight Micro Vision System.

- Added the Caliper function (Vision Tools --> Edge), which detects the location of edges and edges pairs and distances according to adjustable scoring methods.

- Added the EditCompositeRegion function (Graphics Functions --> Controls), which allows multiple shapes to be used to add to, and subtract (masking), the analyzed area in an image.

- Added the EditPolygon function (Graphics Functions --> Controls), which provides a flexible control that can be manipulated to any shape in an image.

- The Results Queue Settings dialog was renamed to the Sensor Filmstrip Settings dialog, and included functionality enhancements.

- The Job Pass/Fail Cell Setup dialog was added to the Sensor menu, to monitor a cell that determines the job's overall pass/fail status, which can be sent as an output from the sensor to other applications, such as the Cognex VisionView.

- Link-local IP addressing capability was added, enabling an In-Sight sensor to assign itself a temporary IP address if a unique, dynamic or static IP address is not immediately available.

- Support for two-byte character sets (East Asian characters) in OPC tags and cell names was added.

- A CC-Link communication protocol snippet was added to the Snippets tab of the Palette.

- The Trigger Delay parameter was added to the AcquireImage function, to specify a delay between the time the camera trigger is received and the time the sensor begins acquisition.

- The In-Sight 5600 was updated to support the AcquireImage function’s Automatic Exposure parameter.

- The Timeout parameter was added to the FindPatterns function (Vision Tools --> PatFind), to specify the amount of time that the function will search for patterns before execution is halted.

- The number of character models that can be trained using the OCV/OCR Font Training dialog was increased from 64 to 255.