

About This Release

Cognex ViDi 3.4.1 introduces the following new features and enhancements:

- Blue Locate tool

The Blue Locate tool has undergone significant overhaul, including the following:

- Create a Layout Model, which provides presence/absence verification of features in areas of an image.
- New label, marking and model graphics to both increase visibility and usability by making labeled and marked features clearer, and handles to enhance graphic interaction when moving and resizing labels.
- Feature identifiers can now be up to 140 characters.
- Improved capabilities for oriented and scaled features.
- Improved workflow when labeling images/views, with the tool remembering the previously labeled feature, allowing you to start with one image, create a label, and then apply that label to remainder of your images.
- Improved performance of node models, along with a new Model Editor GUI.
- The tool can now create a region of interest for downstream tools based on a feature, a match, or a node or layout model.

- Training workflow

- There is a new paradigm for defining the images/views that will be used to train tools, allowing the process to be more transparent and controllable through integration with the new image sample sets.

- Image sample sets

- The ability to create and manage images/views as training and testing sample sets has been added, which allows for better management of the images/views used to train and test tools.

- Database Overview filtering

- While in Expert Mode, it is now possible to filter results and statistics in the Database Overview, using the syntax of the Display filters.

- Blue Read tool

- Capability to identify and read rotated characters.

- Red Analyze tool

- An eraser tool has been added which allows you to remove areas of defect regions and masks.

- In addition to the above new features, there have been numerous performance and stability improvements

Note:

- The VisionPro, Designer and ViDi software require that a valid Cognex Security Dongle be installed during all phases of operation. Any attempts to temporarily remove, substitute, or share a Cognex Security Dongle may cause your system to operate incorrectly, and may result in the loss of data.

When ViDi is configured for the Client/Server functionality, and a computer has been configured as a server, the Cognex Security Dongle must be attached to the server, but the client(s) does not need a Cognex Security Dongle.



- Sample code is included with the ViDi 3.4.1 installer. The resources for the sample code (*ViDi 3.4 Sample Code Resource.msi*), which include images and workspaces, are available for download from the [Cognex Support Site](#).
- For more information about new API functionality in this release, see the *Cognex ViDi Suite .NET Library* and *Cognex ViDi Suite C API* help files.
- The ViDi Client/Server functionality is not supported by the ViDi Sub Task Designer plugin.
- The ViDi Sub Task Designer plugin GUI and Help have not been translated into Simplified Chinese.

Resolved Issues

This section describes changes and resolved issues in ViDi 3.4.1.

- Resolved an issue where exporting or cloning a large workspace could cause the ViDi Suite GUI to become unresponsive or unexpectedly quit.
- Resolved an issue where a Blue Locate or Blue Read tool's graphical display of markings could be offset from its actual location due to the language settings of the user's PC.
- Resolved an issue with the Blue Read tool's Label Views dialog not displaying the names of Regex models that had been created.
- Resolved an issue with the Red Analyze tool's generated reports not displaying the markings in the report.

Migrating to This Release

This topic contains information about changes that may affect existing ViDi projects when migrating projects from previous releases to the current release.

Changes to the Viewing of Overlay Graphics

In the 3.4.0 and 3.4.1 releases, the keyboard shortcuts used to show and hide overlay graphics in the Image Display Area have been changed. The new keystrokes are the following:

- The *Alt* key plus the *Right Arrow* key or the *Alt* key plus the *Left Arrow* key

These are used to cycle through the available combinations of display graphics (labels, markings, labels and markings, or no overlay graphics).

In previous releases, the space bar could be used to show or hide all overlay graphics, but that is no longer supported.

Changes to Tool Training Workflow

In the 3.4.0 release, there is a new method for specifying the images/views that will be used to train a tool. If you will be re-training a tool that was trained in a previous release, you will need to configure the tool to use the new training set paradigm, via the Select Training Set dialog. Please refer to the Training Set and Use the Select Training Set Dialog topics.

C Library Overlay Function Deprecation

ViDi provides two mechanisms, the C API and the .NET API, to display result graphics. However, the following C library overlay graphics functions are being deprecated in this release, and will be removed in the following release:

- `vidi_training_tool_get_overlay ()`;
- `vidi_runtime_sample_get_overlay ()`;
- `vidi_runtime_get_overlay ()`;
- `vidi_training_sample_get_overlay ()`;

To access the overlay graphics in the future, you will need to use either Cognex Designer, the .NET API or In-Sight ViDi.

ViDi Sub Task Designer Plugin

When you open previously created Designer projects that contain the ViDi Sub Task Designer plugin, they will continue to use the previous version of the ViDi plugin unless the plugin is updated in Designer. If you attempt to load a project that contains the older plugin version, you will be prompted to update the plugin to the latest version.

All newly created projects after ViDi3.4.1 has been installed will use that version of the plugin, even if the previous version is still installed.

To manually update the Designer project's plugin version to version 3.4.1 of ViDi, you will need to perform the following steps:

1. Launch Designer.
2. From the Designer Launch Page, select the project containing the VisionPro ViDi components.
3. Open the **Utilities** and launch the **Project Plugin Configurator** utility.
4. The Select a project dialog will be launched, where you can select the project.
5. Check the check box of the 3.4.1 version, and un-check the previous version.
6. Press the **OK** button.


Past Releases - ViDi 3.2 to 3.3

- Importing workspace archives created with version 2.1 and older is not supported. If you are migrating from ViDi Suite version 2.1 or older, you must first import and then export your workspaces using version 3.0, 3.1, 3.2, or 3.2.1 before you can import them into ViDi 3.3.0.
- ViDi 3.3.0 requires the use of an NVIDIA driver version greater than or equal to 411.31.

To obtain the updated NVIDIA drivers, visit: <https://www.nvidia.com/download/find.aspx>

For more information on ViDi driver compatibility, visit: <https://support.cognex.com/en/downloads/detail/deep-learning/3763/1033>

- The Client/Server functionality in ViDi 3.3.0 has been updated to use the HTTP communication protocol, and no longer supports the TCP protocol. To use the new HTTP protocol in your client/server application, you must upgrade both the client and server to ViDi 3.3.0. There is no cross-version client/server compatibility (e.g. clients running 3.2.1 can *only* connect to servers running 3.2.1, and clients running 3.3.0 can *only* connect to servers running 3.3.0).

Note: HTTP communications generally provide better throughput for run-time image processing. However,  for high-latency network topologies, HTTP communications may increase interface latency during training and development.

Past Releases - ViDi 3.1 to 3.2

C Library Function Deprecation

A number of C library functions were deprecated, as follows:

- Runtime functions

Note: The deprecated functions are located in a new `vidi_runtime_legacy.h` header file.

Previous Version	New Version
<code>vidi_runtime_get_overlay</code>	Not available
<code>vidi_runtime_process_sample</code>	<code>vidi_runtime_sample_process</code>
<code>vidi_runtime_get_image</code>	<code>vidi_runtime_sample_get_image</code>

- Training functions

Note: The deprecated functions are located in a new `vidi_training_legacy.h` header file.

Previous Version	New Version
<code>vidi_training_stream_process_sample</code>	<code>vidi_training_sample_process</code>
<code>vidi_training_blue_add_feature</code>	<code>vidi_training_blue_set_feature</code>
<code>vidi_training_blue_add_model</code>	<code>vidi_training_blue_create_model</code>
<code>vidi_training_tool_set_mask</code>	<code>vidi_training_roi_set_mask</code>
<code>vidi_training_tool_get_mask</code>	<code>vidi_training_roi_get_mask</code>
<code>vidi_training_ini_sample</code>	<code>vidi_training_add_sample</code>
<code>vidi_training_process_sample</code>	<code>vidi_training_sample_process</code>

NuGet Package Deprecation

The use of NuGet packages have been deprecated, and are no longer included in the ViDi installer. If you have runtime and/or training applications that reference the NuGet packages from an earlier ViDi release, you will need to remove those references, and replace them with references to the .NET .dll libraries, instead.

To remove NuGet packages in Visual Studio, select Tools -> NuGet Package Manager -> Manage NuGet Packages for Solution...

To add the .NET .dlls, in your project, right-click and select Add -> Reference.

Past Releases - ViDi 3.0 to 3.1

- For the Blue Locate Tool, a change was made in the behavior of X and Y position clamping when using model matching. In version 2.1, these constraints were interpreted to apply to the position of the origin of the model coordinates. In version 3.0, they are interpreted as constraints on the position of the centroid of the nodes in the model.

System Requirements

These topics cover the computer operating system and hardware requirements to use VisionPro ViDi and/or the ViDi Sub Task Designer plugin in your application.

Operating System Requirements

Microsoft® Windows® Operating System	English	Chinese
Windows 10 Professional (64-bit)	✓	✓
Windows 7 Professional (64-bit), Service Pack 1	✓	✓
Windows Server 2016	✓	✓

Note:



- Windows Server 2016 is only supported for servers configured to use the ViDi client/server functionality. Configuring clients on the Windows Server 2016 OS is not supported.
- The use of the ViDi software or the ViDi Suite Service on a virtual machine (VM) is not supported.

Computer Hardware Requirements

- CPU = Intel® Core™ i5 or i7, or Intel® Xeon® processor
- Memory = 4-8GB of available RAM (4GB for runtime and 8GB for training)
- Graphics Card = NVIDIA® CUDA® enabled GPU

Note: CUDA compute capability 3.0 or higher is required to use the core ViDi functionality. The Low Precision parameter requires CUDA compute capability 6.1 or higher (for more information, visit the [NVIDIA website](#)).

- USB 2.0 port to connect the Cognex Security Dongle

Note:

The VisionPro, Designer and ViDi software require that a valid Cognex Security Dongle be installed during all phases of operation. Any attempts to temporarily remove, substitute, or share a Cognex Security Dongle may cause your system to operate incorrectly, and may result in the loss of data.



When ViDi is configured for the Client/Server functionality, and a computer has been configured as a server, the Cognex Security Dongle must be attached to the server, but the client(s) does not need a Cognex Security Dongle.

GPU Requirements

NVIDIA® Driver Support

- NVIDIA GeForce® driver greater than or equal to 419.67 (Creator Ready)
- NVIDIA Quadro® driver greater than or equal to 430.64 (Optimal Driver for Enterprise)




Note: For more information about supported drivers, please visit the [Cognex Support Site](#).

Supported NVIDIA GPUs

GPU	Model	Performance Level	System Power Supply
NVIDIA GeForce®	GTX 1060	Low to Medium	≥ 500W
	GTX 1070	Medium	≥ 600W
	GTX 1080 Ti	High	≥ 600W
	RTX™ 2070	Medium	≥ 550W
	RTX 2080	Medium to High	≥ 650W
	RTX 2080 Ti	High	≥ 650W
NVIDIA Quadro®	P2000	Low	≥ 500W
	P4000	Medium to High	≥ 600W
	GV100*	High	≥ 600W
	RTX 4000	Medium	≥ 550W
	RTX 5000	Medium to High	≥ 650W
	RTX 6000	High	≥ 650W
	RTX 8000	High	≥ 650W
	Titan V*	High	≥ 600W
	Titan RTX	High	≥ 650W
NVIDIA Tesla®	P5000	High	≥ 600W
	V100*	High	≥ 600W


Note:

- Cognex strongly recommends the use of NVIDIA Quadro and Tesla GPUs for the following reasons:
 - These GPUs support the compute-optimized Tesla Compute Cluster (TCC) mode.
 - These GPUs are designed and tested for continuous duty-cycle operation.
 - These GPUs undergo rigorous testing and qualification by NVIDIA.
- ViDi3.4.1 supports the use of any NVIDIA CUDA® enabled GPU that provides a compute capability of 3.0 and higher, and requires a driver version greater than or equal to 419.67.
-  CUDA compute capability 3.0 or higher is required to use the core ViDi functionality. The Low Precision parameter requires CUDA compute capability 6.1 or higher (for more information, visit the [NVIDIA](https://www.nvidia.com) website).
- A minimum of 4 GB of GPU memory is required for runtime operation, and a minimum of 8 GB of GPU memory is required for training.
- The NVIDIA GeForce Titan V, Quadro GV100 and Tesla V100 include NVIDIA Tensor Cores. ViDi 3.4.1 will automatically utilize Tensor Cores if they are present, provided you have a [Standard or Advanced security license](#). Please contact your Cognex Sales Representative for information about enabling the functionality on your Cognex Security Dongle.

API Development Requirements

The following software and components are necessary for developing ViDi custom applications through the ViDi API:

- Microsoft® Visual Studio® 2015, 2017 or 2019
- Microsoft .NET Framework 4.7.1 or higher

 **Note:** For more information about the ViDi API, please refer to the *Cognex ViDi Suite .NET Documentation* and the *Cognex ViDi Suite C Documentation* help files.

Cognex Designer and VisionPro Support

ViDi is qualified to support the following Cognex Designer and VisionPro releases:

- Designer 4.1 PR2
- VisionPro 9.5 SR1

Image File and Format Requirements

Image File Formats

- PNG
- BMP
- TIFF
- JPEG

Image Channels

- 1 to 4

Bit Depth

- 8-bit
- 16-bit

Software Installation

VisionPro ViDi Installation

To successfully install ViDi, perform the following:

1. Attach the Cognex Security Dongle to a USB port on the computer that will be used to develop the vision application.
2. Download the ViDi installer from the [Cognex support page](#).
3. Run the ViDi installer and follow the prompts.

ViDi Sub Task Designer Plugin Installation

To utilize the Cognex ViDi Sub Task block and ViDi devices in a Designer application, follow these steps:

1. Attach the Cognex Security Dongle to a USB port on the computer that will be used to develop the vision application.
2. Download the VisionPro 9.5 SR1 installer from the [Cognex support page](#).
3. Download the Designer 4.1 PR2 installer from the [Cognex support page](#).
4. Download the ViDi 3.4.1 installer from the [Cognex support page](#).
5. Install VisionPro software, release 9.5 SR1.
6. Install Designer software, release 4.1 PR2.
7. Install ViDi software, release 3.4.1.

Note:

Choosing the Custom option will allow you to install selected features:

- The Wibu Runtime Server, which is needed to connect to the USB Cognex Security Dongle.
- The main ViDi application (this is required).
- The ViDi Developer API.
- The VisionPro, Designer and ViDi software require that a valid Cognex Security Dongle be installed during all phases of operation. Any attempts to temporarily remove, substitute, or share a Cognex Security Dongle may cause your system to operate incorrectly, and may result in the loss of data.



When ViDi is configured for the Client/Server functionality, and a computer has been configured as a server, the Cognex Security Dongle must be attached to the server, but the client(s) does not need a Cognex Security Dongle.

Release History

This topic lists the features and resolved issues in previous releases of ViDi.

ViDi 3.3.0

- General stability and performance improvements.
- Improved support for NVIDIA® Turing™ Tensor Cores for the Red Analyze and Green Classify tools with the Low Precision parameter enabled.
- Two new model types have been added for the Blue Read tool.
 - A regular expression model, which allows you to specify string matches based on regular expressions. This type of model offers faster, more flexible model matching for applications with linear arrangements of text than the existing node model.
 - A string model, which allows you to match linear strings based on the length of the text string.
- Improved performance for image displays that include a large number (500+) of feature graphics.
- Improved readability of the Green Classify tool's class labels when creating reports for the tool.
- Simplified controls for rotating a tool's Region of Interest (ROI).
- Support for Cognex VisionPro version 9.5 has been added.

Resolved Issues 3.3.0

Issue	Description
AIC-1861	Corrected an issue with NVIDIA drivers 411.31 and newer. For more information, please visit the Cognex Support Site VisionPro ViDi Software Drive Support page.
AIC-1801	The Set Group option has been restored to the Action for N Views menu in the View List, which allows you to create a group of images when using the Red Analyze tool in Unsupervised Mode.
AIC-1201	Corrected an issue where a workspace would not function correctly if a stream contained a single quote in the name.
AIC-1223	Corrected an issue where the ViDi Suite GUI would become unresponsive when applying a region for a Red Analyze tool with numerous views.
AIC-1387	Corrected an issue where the ViDi Suite GUI would not terminate properly after attempting to connect to a runtime-only service.
AIC-1293	Corrected an issue with interactions of different VisionPro components in the Designer IDE when the ViDi Sub Task Designer plugin was installed.

ViDi 3.2.1

- This release introduces the **ViDi Client/Server** functionality, allows you to use the training and runtime implementations of the ViDi software on multiple PCs, through the use of a server/client model. This functionality gives you the option of using a remote service for runtime inference and/or training, instead of using the GPU on your local PC. This can be useful if you have a more powerful GPU on the server, or perhaps you do not have a GPU installed locally.

This functionality supports up to 4 clients for deployment operation, and up to 8 clients for development.

- This release provides enhancements and speed improvements for the ViDi runtime:
 - Support for NVIDIA® Tensor Cores has been added, and the *GPU Optimization* feature also now supports Tensor Cores.
 - The **Low Precision** parameter has been added to the Red Analyze and Green Classify tools, which optimizes the tools for speed during runtime operation.
- The **Feature Filter** has been added to the Blue Locate and Blue Read tools, which allows you to filter found features by ID, X, Y, size and orientation.
- The ViDi GUI and the ViDi Help file have been translated into Simplified Chinese. To view the GUI and Help in Chinese, the OS language setting must be set to Simplified Chinese.
- Support for up to 32MP images (up to 16k in height or width) has been added.

ViDi 3.1.0

Tool and GUI Changes

- The ViDi Blue Read Tool has been added for Optical Character Recognition (OCR) applications.
- Speed improvements and increased performance for the Blue Locate Tool when matching models.
- The Feature Size parameter is now interactive and can be graphically resized within the GUI.
- Labeling with the Blue tools has been improved to include multi-feature selection and interaction.
- The Blue tools have improved flexibility for model optimization.
- In the results, a Confusion Matrix has been added for the Blue Locate and Blue Read tools.
- A new feature/match and region-focus display mode has been added when using the Database Explorer.
- Checks have been added to provide feedback on wrongly labeled views.
- The examples have been updated, and there is a new example for the Blue Read tool.
- The Green Classify Tool now includes the *Exclusive* parameter, which, when disabled, allows you to label a single image with multiple labels (indicating that the image belongs to multiple classes).
- The Red Analyze Tool – Statistics have been enhanced for better readability.
- There have been numerous issues resolved, and additional enhancements and improvements to the ViDi software.

Processing and Support Changes

- The GPU Memory Optimization is now activated by default (when using either the Windows Display Driver Model or Tesla Compute Cluster drivers). This feature can be activated and/or deactivated via command line arguments and the API.
- Command line arguments have been added to allow you to select the number of GPUs to utilize at startup of ViDi, to specify the GPU mode and to specify the amount of GPU memory to pre-allocate.
- There is a new Cognex VisionPro wrapper assembly, which provides data conversion between VisionPro and ViDi Suite, offering the following:
 - Efficient image conversion
 - Combined graphics
 - Fixturing conversion
 - Calibration conversion

- Support for Cognex Designer 4.0 has been added, with the addition of a ViDi Sub Task block, which contains the ViDi Suite tools and the ability to program the tools within the Cognex Designer IDE.
- Support for Cognex VisionPro 9.3 has been added.
- Support for Microsoft® Windows® 10 Professional (64-bit).
- Support for Microsoft® Windows® 7 Professional (64-bit).
- The performance when loading training Workspaces, utilizing on-demand loading of tools, has been improved.
- A new Workspace archive format, based on ZIP files, has been implemented.

Documentation Updates

You can download the ViDi Sub Task Designer Plugin Help and the ViDi Help on the Cognex Support website, and then replace the existing Help. Updates will be posted as they become available.

VisionPro ViDi Help

To update the ViDi Help file, follow these steps:

1. Go to [Cognex Deep Learning Support](#) and download the most recent version of the Cognex ViDi Suite Documentation, which is available as a ZIP file.
2. Download the file into the following directory: C:\Program Files\Cognex\ViDi Suite\3.4\documentation\ViDiSuite
3. Extract the contents from the ZIP file, and replace the contents and folders with the downloaded versions.
4. When you click the Help link in the ViDi Graphical User Interface (GUI), you see the newly downloaded Help.

ViDi Sub Task Designer Plugin Help

To update the ViDi Sub Task Help file, follow these steps:

1. Go to [Cognex Deep Learning Support](#) and download the most recent version of the Cognex ViDi Plugin Designer Documentation, which is available as a ZIP file.
2. Download the file into the following directory: C:\Program Files\Cognex\ViDi Suite\3.4\documentation\Designer
3. Extract the contents from the ZIP file, and replace the contents and folders with the downloaded versions.
4. When you click the Help link in the Designer Integrated Development Environment (IDE), you see the newly downloaded Help.