

Software for Industrial Endoscope

3DAssist
Operation Manual

Version 1.0.1

Table of Contents

For proper use.....	1
Purpose of the software	1
About the manuals	1
Video formats supported by the software	1
Limitation conditions	2
About safety	6
Precautions regarding cyber security	6
1 Starting up and initializing the product.....	7
1 Start up	7
2 Activate the device (at first startup only)	7
2 Video viewing screen.....	10
2-1 Loading video files and generating 3D data	10
2-2 Loading 3D data	15
2-3 Settings	17
3 3D data viewing screen.....	21
3-1 Common functions	22
3-2 Measuring functions	24
3-3 Analyzing	35
3-4 Viewing functions	40
3-5 End operations	46
4 Updating/uninstalling software.....	47
4-1 Updating software	47
4-2 Uninstalling software	49
5 Troubleshooting.....	50
6 Specifications.....	51

The following symbol is used in this instruction manual.

TIP

: Indicates content, such as practical knowledge and information, that you can use.

For proper use

Purpose of the software

With this software, you can generate 3D data from video files captured by our industrial endoscopes, and you can display and analyze that 3D data. The purpose of this software is to effectively improve the quality of your inspection reports by allowing you to determine the location and severity of defects and other problems inside machinery, equipment, buildings, and other objects when direct observation is not possible.

About the manuals

Before using the software, you must fully understand the content and follow the instructions in this instruction manual, the software license agreement, the instruction manuals of our industrial endoscope to be used, and the instruction manuals of the computer and OS to be used.

If anything in this instruction manual is unclear, contact the dealer where you purchased the product, or our branch or sales office.

Video formats supported by the software

The software supports videos recorded by the following industrial endoscopes.

- IPLEX NX (4mm/6mm) *6.2mm is not supported
- IPLEX GX/GT (4mm/6mm)
- IPLEX G Lite (4mm/6mm) *IPLEX G Lite-W is not supported
- IPLEX GAir (8.5mm)

The video files that are guaranteed to work with the software are limited. See "6.Specifications" for compatible IPLEX industrial endoscopes, scopes, and optical adapter combinations.

Limitation conditions

Guaranteed operating conditions

About license types

The software has the following license types, each of which has limits on operations. Also, for Single Edition and 5-Multiple Edition, multiple licenses cannot be issued for the same IPLEX serial number.

- Single Edition
 - The software can only activate 1 IPLEX device.
 - There are no restrictions on the time that the software can be used.
- 5-Multiple Edition
 - The software can activate up to 5 IPLEX devices.
 - There are no restrictions on the time that the software can be used.
- Time limited Edition
 - The software can only activate 1 IPLEX device.
 - The software can be used for a period of 3 months from the date the license becomes effective.
- Trial Edition
 - The software can only activate 1 IPLEX device.
 - The software can be used for a period of 1 month from the date the license becomes effective.

TIP

Store your license serial number in a safe place

Store your license serial number, which is on the key code issuance request form, in a safe place. If the number is lost due to your negligence, in principle, we cannot reissue that number.

About device activation

Only videos shot with devices activated by this software can be played back and processed into 3D data. Refer to "1-2. Activate the device (at first startup only)" for how to activate devices.

About video recording conditions

[Common to all models]

Operation with videos shot at a zoom setting (other than 1×) is not guaranteed.

[IPLEX NX]

Operation with videos shot using analog input is not guaranteed.

[IPLEX GX/GT]

Operation with videos shot using constant video recording is not guaranteed.

[IPLEX GLite]

Operation with videos shot using constant video recording is not guaranteed.

[IPLEX GAir]

- Operation with videos shot using constant video recording is not guaranteed.
- Operation with videos shot with auto image rotate set to something other than "OFF" is not guaranteed.
- Operation with videos shot with real-time distortion correction set to something other than "OFF" is not guaranteed.

When a video file has been processed

Operation with video files processed independently, as in the examples shown below, is not guaranteed.

- Clipping
- Annotation
- Changing of the frame rate
- Changing of the codec, etc.

When video recording conditions have been changed

Operation cannot be guaranteed if the following conditions are changed during video recording and then the 3D data is generated by specifying frames close to the timing of the change.

- BRT
- WIDER
- Sharpness
- Noise reduction
- Addition of video (IPLEX NX, GX/GT, G Lite, G Air)
- Videos that are flipped left to right, flipped top to bottom, or rotated (IPLEX GX/GT, G Lite, G Air)

Recommended conditions

Recommended PC specifications

Refer to page 32 for the PC requirements recommended for the software.

About the graphics information display function (title, logo, date and time, etc.)

Turn off the graphics information display function when shooting videos (the area of 3D data generation is wider than when the graphics information display function is turned on).

The graphics information appears as [PRINT SCREEN] in the NX series and [DISPLAY] in the G series.

Precautions

About conditions for video equipment

Depending on the combination, the differences in optical conditions such as illumination intensity, light distribution, and angle of view may degrade the quality of the 3D data.

About the shape of 3D data

- Depending on the tip, the positional relation with the subject, and how the tip is moved while shooting, the shape of the 3D data may be inaccurate.
- The shape of the 3D data may be inaccurate depending on the values set for the video recording conditions (BRT, WiDER, sharpness, and noise reduction).

About still images recorded while shooting video

- The 3D data cannot be generated if a still image file stored with a video file is deleted or lost.
- The 3D data cannot be generated if the file name of the still image saved with the video file has a different name than the video file.
- Still image files must be saved in the same folder as video files. The 3D data cannot be generated if a still image file is stored in a different folder than the video file.

About the process to generate 3D data

Differences in the video file and differences in the starting frame position may lower the quality of the 3D data. The waiting time for 3D data to be displayed may also change.

About PCs

The waiting time for 3D data to be displayed may change due to the specifications of the PC.

About safety

Precautions regarding cyber security

- **Configure security settings if the PC on which the software is being can be accessed via a network**

Install firewalls and intrusion detection/prevention systems to prevent unauthorized access from outside. Note that we are not responsible for any damage suffered by customers as a result of unauthorized access from outside.

- **You must manage how files are handled**

Files should be handled with care, even though the software does not handle image files containing personal or medical information.

- **Follow the manual of the PC on which the software is installed for how to configure that PC**

We cannot provide support for setup work or problems related to the actual PC on which the software is installed. Check the manual for the actual PC, and follow the instructions in it.

- **We cannot provide support for the work or problems when connecting the PC to the internet, which is needed to download the software.**

1 Starting up and initializing the product

1 Start up

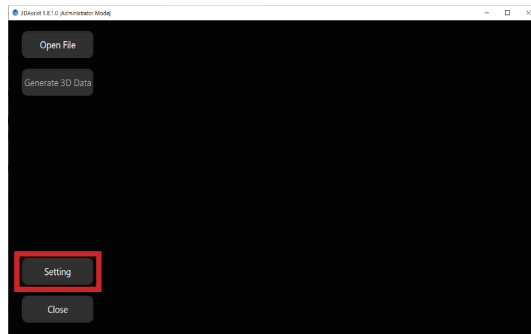
Double-click 3DAssist.exe to start up the software.



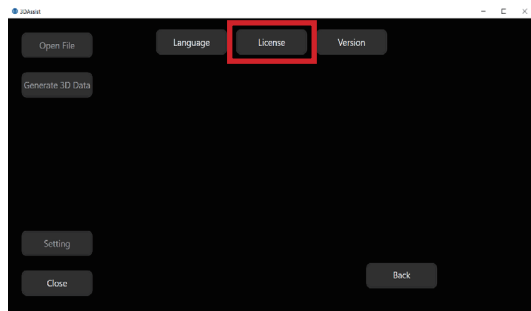
3DAssist.exe

2 Activate the device (at first startup only)

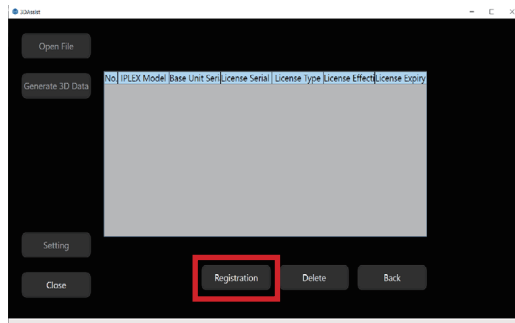
When the video viewing screen appears by starting this software, press the [Setting] button.



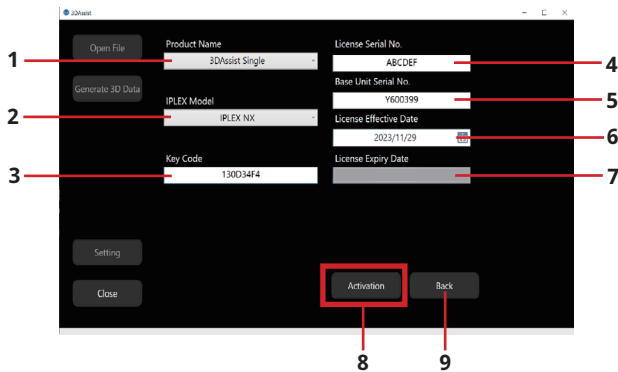
Press the [License] button.



Press the [Registration] button.

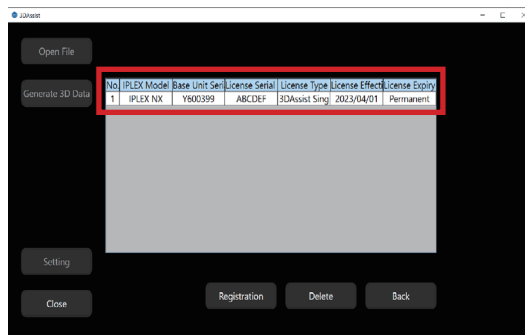


When a screen similar to the one below appears, input items 1 to 7. (All the information for items 1 to 7 can be found on the key code issuance certificate.)
After you have input items 1 to 7, Press the [Activation] button.



No.	Name	Explanation of functions
1	Product Name	Select a type of license. You can press the button to display the following list and make a selection. <ul style="list-style-type: none"> • 3DAssist Trial • 3DAssist Time limited • 3DAssist Single • 3DAssist 5-Multiple
2	IPLEX Model	Select an IPLEX model. You can press the button to display the following list and make a selection. <ul style="list-style-type: none"> • IPLEX NX • IPLEX GX/GT • IPLEX GLite • IPLEX GAir
3	Key Code	The key code when the license is issued.
4	License Serial No.	The serial number issued when you purchase 3DAssist.
5	Base Unit Serial No.	The serial number of the device that took the video.
6	License Effective Date	The date that the license becomes effective.
7	License Expiry Date	The date that the license expires.
8	Activation	Devices are activated based on the information in 1 to 7 above.
9	Back	Return to the previous screen.

If the activation is successful, the activated device appears in the device registration information list.



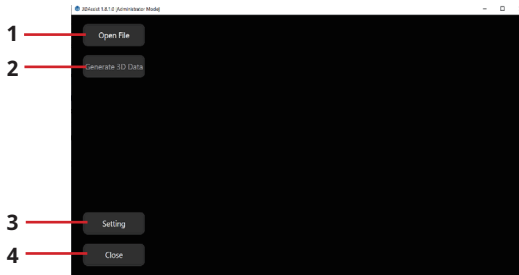
TIP

- One license can be used to activate devices by multiple PCs.
- To register multiple devices, repeat the above procedure.

2 Video viewing screen

This product consists of a screen to display a specified video and to select frames for generating 3D data (video viewing screen), and a screen for checking and measuring 3D data (3D data viewing screen). When the 3DAssist executable file is started up, the video viewing screen appears.

The main screen has the following buttons.



No.	Name	Explanation of functions
1	Open File	Opens a file selection dialog and you can select a file. Select a video file (AVI or MP4 file) or 3D data file (e3m file).
2	Generate 3D Data	Generates 3D data. It is enabled after a video file has been loaded. If no video file is loaded, it is disabled.
3	Settings	Moves to the mode for selecting a language, activating the license, displaying versions, and toggling between having or not having graphics information. Refer to 2-3 Settings for details.
4	Close	Closes the application.

2-1 Loading video files and generating 3D data

This section describes the procedures for loading video files and generating 3D data.

2-1-1. Load a video file

There are two ways to load video files, you can use the [Open File] button or drag and drop an AVI or MP4 file.

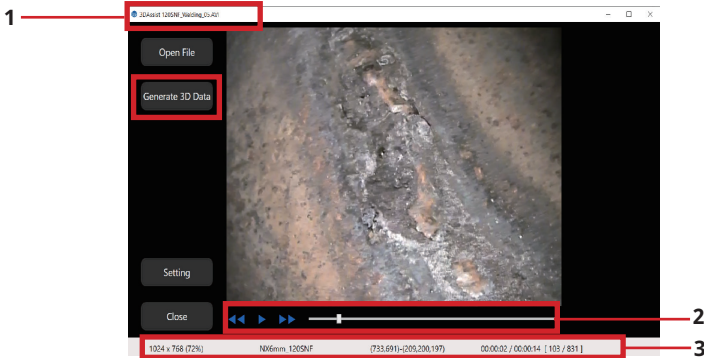
This section describes the procedures for loading by using the [Open File] button.

1 Press the [Open File] button on the video viewing screen to open the file selection dialog.

2 In the file selection dialog, select an AVI or MP4 file.

When performing this operation, the JPG file recorded at the same time as the AVI or MP4 file must be in the same folder and have the same file name as the video file.

- 3** If the video is loaded correctly, the following screen appears and the [Generate 3D Data] button is enabled.



TIP

- You can move 1 frame at a time by using the mouse wheel on the slider bar or by pressing the ←/→ or ↑/↓ keys on the keyboard.
- If the loaded video file is recorded with graphics information such as date and optical adapter name, you can prevent artifacts caused by graphics information from being introduced into the 3D data by selecting [Graphics] > [Yes] from the [Settings] button. Refer to 2-1-3. Select whether or not there is graphics information, for details.

No.	Name	Explanation of functions
1	Title bar	Displays the name and version information of the software. When a video file is loaded, the name of that video file is also displayed.
2	Video control panel	This appears when the video has been loaded successfully. ▶ to play, ◀◀ to step back, and ▶▶ to step forward The slider bar can be used to change the frame position.
3	Information area	Information about the opened video file is displayed. The following information is displayed from left to right. <ul style="list-style-type: none"> • Video resolution and zoom factor [%] • IPLEX series name and optical adapter name • Coordinates (X, Y) and color (red, green, blue) of mouse cursor position • Current played time/total time • Current frame count/total frame count

TIP

Activate the license before you open the video file. Video files recorded on non-activated devices cannot be loaded successfully. License activation is explained in 2-3-2. Licenses.

2-1-2. Procedure to generate 3D Data

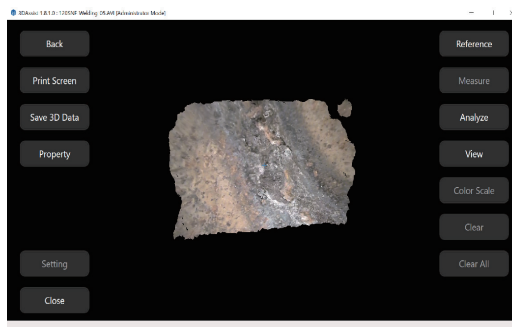
After loading a video file, you can generate 3D data. Use the following procedure to generate 3D data.

- 1** Use the slider bar to select the frame that displays the position where you want to generate 3D data. When doing this, do not select a frame within 9 frames from the beginning or 9 frames from the end. It may not be processed correctly.
- 2** Press the [Generate 3D Data] button. The following progress bar appears.

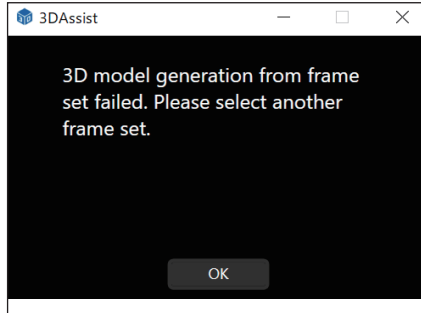


Wait about 1 minute for the calculation to complete. However, processing times may vary depending on the specifications (performance of the CPU, memory, etc.) of the PC you are using, the frame you have selected, the video shooting conditions, etc.

- 3** When the 3D data has finished generating, the screen moves to the 3D data viewing screen.



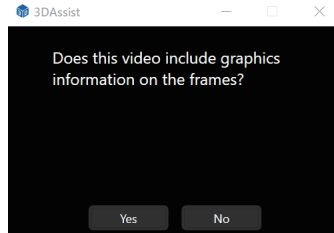
If the following error message appears after generating 3D data, change the starting frame and then try generating 3D data again.



2-1-3. Select whether or not there is graphics information

After the video file is loaded, when a dialog similar to the one shown below appears, press the appropriate button.

However, for video files shot with the IPLEX NX, the existence of graphics information can be determined automatically, so the dialog shown in the figure below does not appear.



The 3D data that is generated may be affected by the selection in the above dialog and the existence of graphics information. For details, refer to the following table [List of Graphics Information Selection Results].

[List of Graphics Information Selection Results]

Existence of graphics information	Selections in dialog	Effect on 3D data
Graphics information does not exist	"Yes" is selected	<ul style="list-style-type: none">• [Graphics] appears in the status bar• 3D display area is narrowed
	"No" is selected	3D display area is not narrowed (recommended)
Graphics information exists	"Yes" is selected	<ul style="list-style-type: none">• [Graphics] appears in the status bar• 3D display area is narrowed
	"No" is selected	<ul style="list-style-type: none">• 3D display area is not narrowed• 3D data generation may fail• Graphics information may be included in the 3D data when it is generated

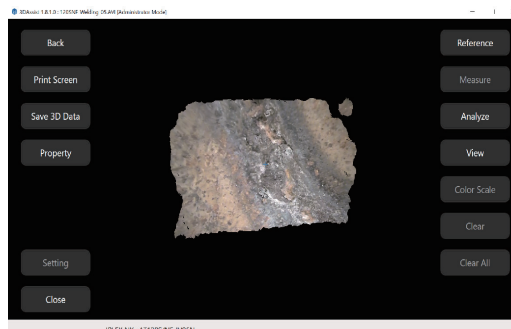
TIP

- Graphics information refers to data superimposed on image data, such as title, logo, date, and optical adapter type name.
- To have the IPLEX NX automatically determine that there is no graphics information in the video captured by the IPLEX NX, turn off the Print Screen setting rather than turning off each graphics setting individually in the screen display settings of the IPLEX NX menu.

2-2 Loading 3D data

There are two ways to load 3D data (e3m) files, you can use the [Open File] button or drag and drop an e3m file. This section describes the procedures for loading by using the [Open File] button.

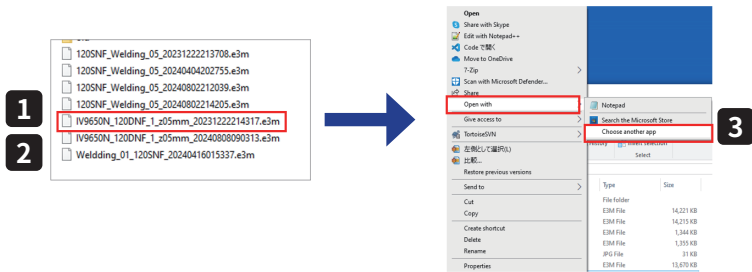
- 1** Press the [Open File] button on the video viewing screen to open the file selection dialog.
- 2** In the file selection dialog, select an e3m file.
- 3** When the file has successfully loaded, the screen moves to the 3D data viewing screen. (See 3. 3D data viewing screen, for details)



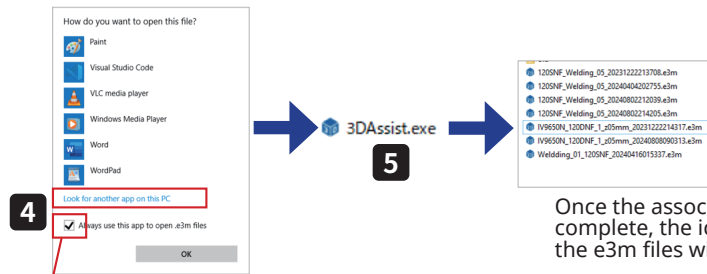
How to associate e3m files with the software

This section describes how to associate the 3D data stored in the e3m files with the software. By completing this operation after saving the e3m file, the 3D data can be displayed directly on the software by double-clicking on it.

- 1 Open the folder where the e3m files are stored.
- 2 After selecting the e3m file you want to associate with the software, press the right mouse button.
- 3 In the menu, click [Open with] and select [Choose another app].



- 4 Select the box for [Always use this app to open] and then select [Look for another app on this PC].
- 5 From the Windows dialog, select [3DAssist.exe].



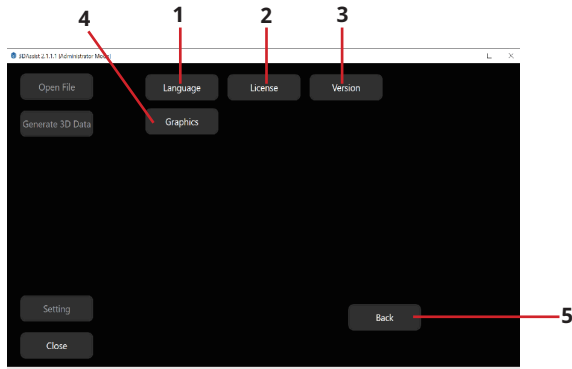
Select this.

Once the association is complete, the icons for the e3m files will change.

2-3 Settings

This section describes the various settings.

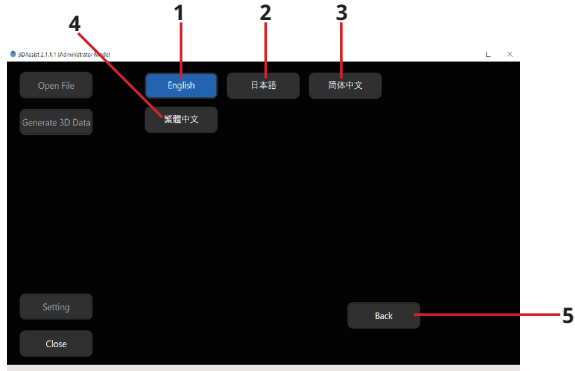
Press the [Setting] button to display the following screen.



No.	Name	Explanation of functions
1	Language	Opens the selection screen for English, Japanese, Simplified Chinese, or Traditional Chinese.
2	License	Opens the license Activation screen.
3	Version	Opens a screen with the application's version information.
4	Graphics	Opens a screen to select whether the video is recorded with graphics information such as date and logo displayed on the video.
5	Back	Returns to the video viewing screen.

2-3-1. Language settings

Set the display language for the application.
The currently set language is highlighted.

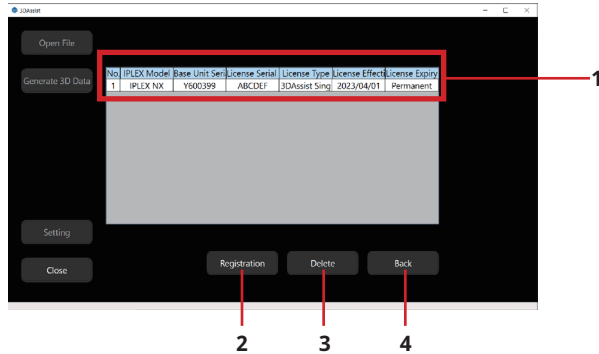


No.	Name	Explanation of functions
1	English	Sets English
2	日本語	Sets Japanese
3	簡體中文	Sets Simplified Chinese
4	繁體中文	Sets Traditional Chinese
5	Back	Returns to the video viewing screen

2-3-2. Licenses

The license Activation screen displays a list of currently registered licenses.

The [Registration] button registers license and the [Delete] button deletes selected licenses.



No.	Name	Explanation of functions
1	List of licenses	Displays a list of information about registered licenses.
2	Registration	Moves to the license Registration screen.
3	Delete	Deletes the information about the selected licenses.
4	Back	Returns to the video viewing screen.

How to register license information

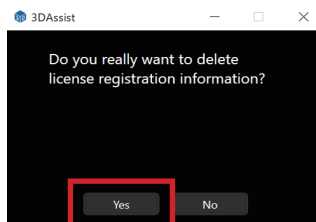
Press the [Registration] button on the screen shown above to move to the license registration screen.

After that, register the license in the same way as in 1-2 Activate the device (at first startup only).

How to delete registered license information

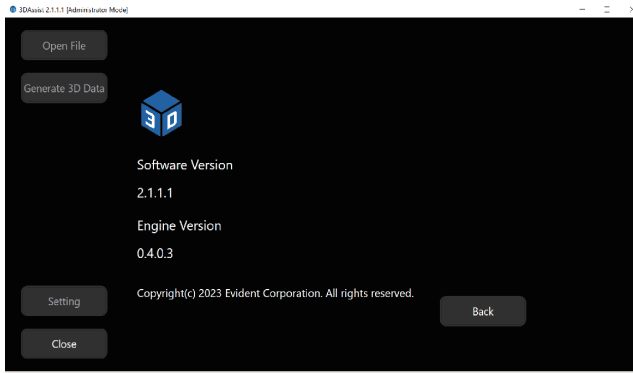
From the list of licenses displayed, select the line you want to delete and press the [Delete] button.

When a message similar to the one below appears, press the [Yes] button.



2-3-3. Version screen

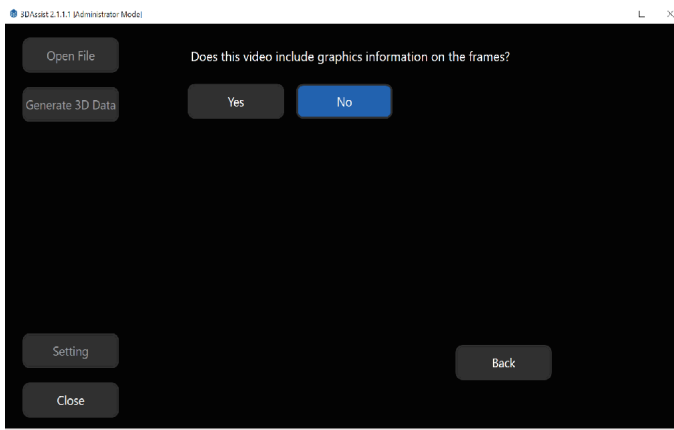
In the Version screen, you can check the version information for the application.



2-3-4. Graphics screen

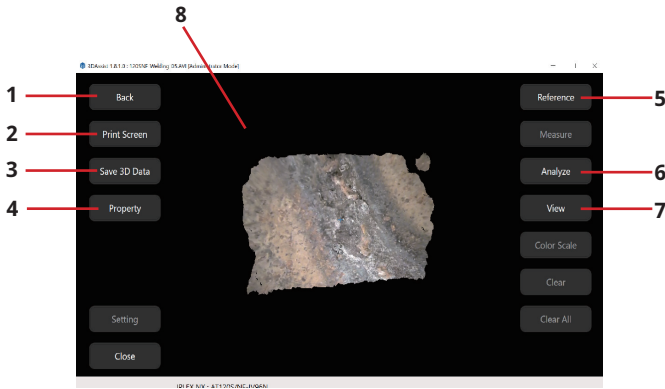
In the graphics screen, you can set whether to include graphics information in the video.

The button with the currently set status is highlighted.



3 3D data viewing screen

After generating 3D data, drag and drop the e3m file or press the [Open File] button to load the data, and the following screen (3D data viewing screen) will appear.



No.	Name	Explanation of functions
1	Back	Returns to the video viewing screen.
2	Print Screen	Save the screenshot of the 3D view area as image data by specifying the name of the file and where to save it in the file dialog that opens.
3	Save 3D Data	Saves the generated 3D data as an e3m file.
4	Property	Shows the path and start frame information of the video used to generate the 3D data.
5	Reference	Moves to the mode for setting a reference position and dimensions for comparative measurements. (Refer to 3-2 Measuring functions for details.)
6	Analyze	Moves to the mode to show a profile or the deepest and highest values in a specified range. (Refer to 3-3 Analyzing for details.)
7	View	Moves to the screen for changing the settings for the rendering conditions in the 3D view area. (Refer to 3-4 Viewing functions for details.)
8	3D View Area	Displays 3D data.

3-1 Common functions

The following functions are common, regardless of the status of the 3D data viewing screen.

3-1-1. Back

Returns to the video generating screen.

3-1-2. Print Screen

You can save a screenshot of the 3D view area by using the following procedure.

- 1 Press the [Print Screen] button to open the file dialog and specify where to save the file.**
- 2 Press the [Save] button to output the file.**

You can also copy a screenshot to the clipboard by right double-clicking or long-tapping on the 3D view area.

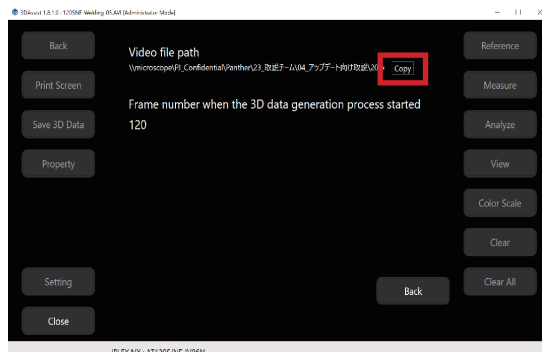
3-1-3. Save 3D data

Save the generated 3D data as an e3m file in the same way as described in 3-1-2 Print Screen, above.

3-1-4. Property

Shows the path and start frame number information of the video used to generate the 3D data.

Press the [Copy] button to copy the path of the video to the clipboard.



3-1-5. 3D view area

The 3D view area shows 3D images.

Various operations within the 3D view area are done with a mouse or touch screen. The common operations are described below.

Mouse operation	Explanation of functions
Left button drag	Rotate the 3D data.
Right button drag	Shift the 3D data.
Rotate wheel	Rotate wheel forward: Zoom out the 3D data Rotate wheel backward: Zoom in the 3D data
Left button double-click	Initialize the position, orientation, magnification, and center of rotation coordinates of the 3D data.
Right button double-click	Copy a screenshot of the 3D view area to the clipboard.
Ctrl + Left button click	Change the coordinates of the center of rotation of the 3D data.

Touch screen operation	Explanation of functions
Drag with one finger (slide while pressing)	Rotate the 3D data.
Drag with two fingers (slide while pressing)	Shift the 3D data.
Pinch in	Zoom out the 3D data.
Pinch out	Zoom in the 3D data.
Double tap	Initialize the position, orientation, magnification, and center of rotation coordinates of the 3D data.
Long tap	Copy a screenshot of the 3D view area to the clipboard.
Ctrl + single tap (*Do not drag)	Change the coordinates of the center of rotation of the 3D data.

3-2 Measuring functions

This section describes the procedures for measurements.

The measurement function of this software can do comparative measurement using 3D data generated on videos. By using comparative measurement, the dimensions of a specified position are measured by comparison with the dimensions corresponding to a pre-specified reference location. The measurement results obtained in this way are affected by the surface condition of the area being measured and the shooting conditions during video recording, such as the brightness and the way the endoscope tip is moved. Because of this, we cannot guarantee the accuracy of the measured results. You should check the uncertainty of the measurement results under your own shooting conditions by conducting your own experiments.

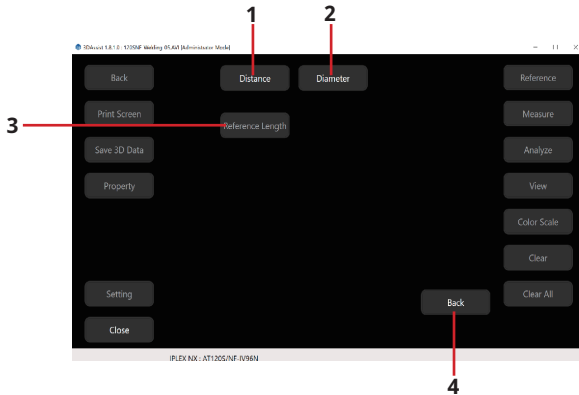
The major steps are described below.

1. Setting a reference
2. Deciding measurement method
3. Measuring

3-2-1. Setting a reference

Press the [Reference] button to move to the following screen.

To set the reference, select [Distance] or [Diameter] and set the reference length.



No.	Name	Explanation of functions
1	Distance	Set a reference for comparison by specifying the location of two points on the 3D data and entering the length between the two points.
2	Diameter	Estimate a cylindrical surface by specifying three or more positions on the 3D data, and enter the diameter of the cylinder to set the reference for comparison.
3	Reference Length	Change the reference length. You cannot press it unless you have set the reference.
4	Back	Returns to the 3D data viewing screen.

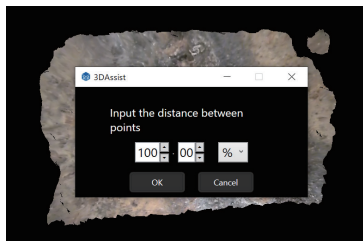
3-2-1-1. Setting a reference distance

This section describes how to set a reference distance.

- 1** Press the [Distance] button to move to the 3D data viewing screen.
- 2** Set the first point in the 3D data viewing area. Left-click or tap the position you want to set. When doing this, if you cannot select a point, shift the position a little, and then set it.
- 3** An × mark appears, as shown in the following image.



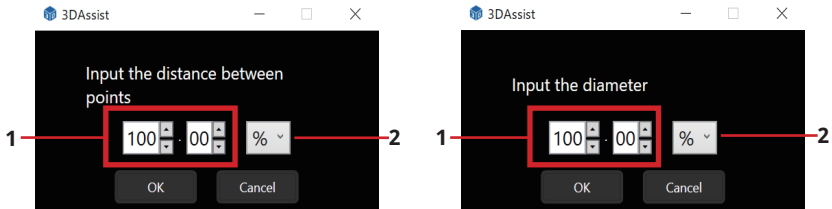
- 4** Next, set the second point. Left-click or tap the position you want to set. When you have completed the settings, the screen for setting the reference length opens.



3-2-1-2. Setting a reference length

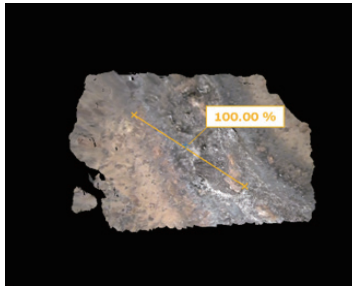
This section describes how to set a reference length.

- 1 Set a reference or press the [Reference Length] -> [Reference Length] buttons to display the following dialog. (Left image below: Distance Reference; Right image below: Diameter Reference)



- 2 Set the value and units, then press the [OK] button to set the reference length.

No.	Name	Explanation of functions
1	Reference Length	Input the reference length.
2	Unit	Select a unit of length (% , mm , inch).



- 3 If a reference length is set, a label appears, as shown above. If it has not been set, the label does not appear.

This completes the setting of the reference distance.

To cancel the setting

If you want to cancel the settings while setting the second point, you can do so by pressing the [Clear All] button or by resetting the reference by pressing the [Reference] button. If the setting is canceled, the measurement function cannot be used.

TIP

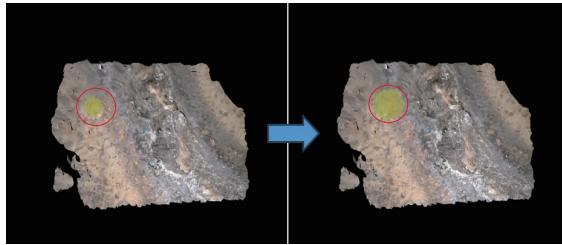
- Regarding the [Clear All] button, refer to 3-3-3. Clear All.
- If you want to clear the information after completing the reference input, select [Distance] or [Diameter] under [Reference], and then select [OK] in the dialog that appears. However, all measurement results performed up to that point will also be cleared.

3-2-1-3. Setting a reference curved surface

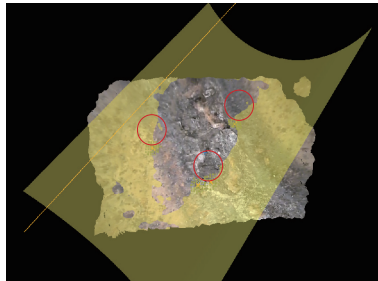
This section describes how to set a reference curved surface.

- 1** Press the [Diameter] button to move to the 3D data viewing screen. For a reference curved surface, you must set at least 3 positions to determine a cylindrical surface.
- 2** The 3D data selection area appears centered on the position where the cursor is set. A position corresponding to the cylindrical surface in the 3D data is selected to allow accurate estimation of the cylindrical surface. Before specifying the position, you can change the size of the 3D data selection area by holding down the Ctrl key and turning the mouse wheel.

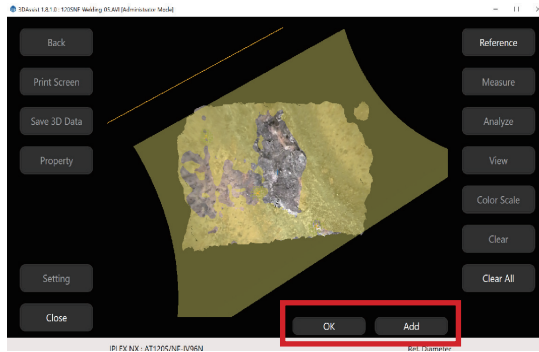
The image below shows the 3D data selection area at a different size.



- 3** Set the second position in the same way.
- 4** The cylindrical surface is calculated and rendered based on the cursor position before setting the third position and the 3D data selection area selected for the first and second positions. Set the third position by adjusting the position so that the cylindrical surface rendered over the 3D data is as close as possible to the cylindrical part in the 3D data.



- 5** If the cylindrical surface that is rendered is almost the same as the cylindrical part in the 3D data when the third position is set, press the [OK] button to confirm. By selecting the fourth and subsequent positions with the [Add] button, you can add 3D data areas so that the cylindrical surface that is rendered approaches the shape of the cylindrical part in the 3D data.

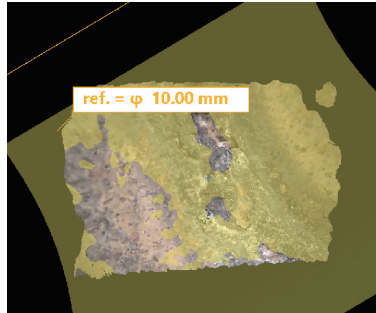


- 6** For the fourth and subsequent positions, determine the points in the same manner as for the third position, and then press the [OK] button to open the dialog for setting the reference length of the reference curved surface, as shown in the image below. For how to set a reference length, refer to 3-2-1-2. Setting a reference length.



- 7** If a reference length is set, a label appears, as shown below. If it has not been set, the label does not appear.

This completes the setting of the reference curved surface.



To cancel the setting

If you want to cancel the reference curved surface setting, you can do so by pressing the [Clear All] button or by resetting the reference by pressing the [Reference] button. If the setting is canceled, the measurement function cannot be used.

TIP

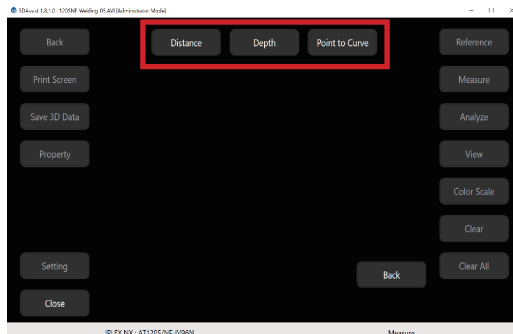
- Regarding the [Clear All] button, refer to 3-3-3. Clear All.
- If you want to clear the information after completing the reference input, select [Distance] or [Diameter] under [Reference], and then select [OK] in the dialog that appears. However, all measurement results performed up to that point will also be cleared.

3-2-2. Measurement methods

This section describes various methods.

When reference settings are complete, the [Measure] button can be pressed. Pressing the [Measure] button enables the buttons for the following three measurement methods.

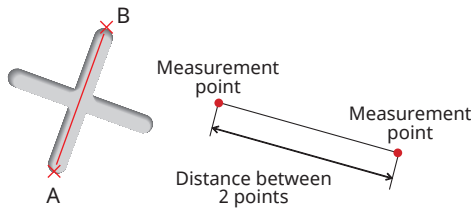
- [Distance]
Specify 2 points to measure the distance between them
- [Depth]
Set a reference plane and measure the depth and height from that reference plane
- [Point to Curve]
Set a reference curved surface and measure the depth and height from that reference plane (this is only enabled when a reference plane is set in Diameter)



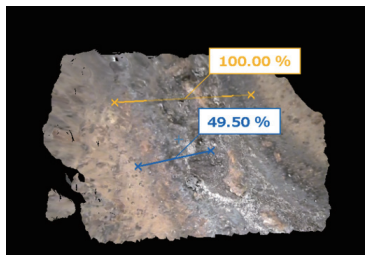
3-2-2-1. Distance

This measurement method is to specify 2 points to measure the distance between them.

- 1** Press the [Distance] button.
- 2** In the 3D data viewing area, specify point A by left-clicking or tapping one end of the line segment you want to measure.
When doing this, if you cannot select a point, shift the position a little, and then set it.
- 3** Specify point B as the other end in the same way as when you specified point A, by left-clicking or tapping.



- 4** When you have finished setting the 2 points, the measured result of the length of line segment AB appears in blue.



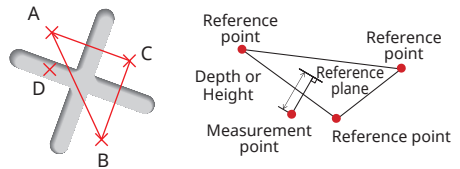
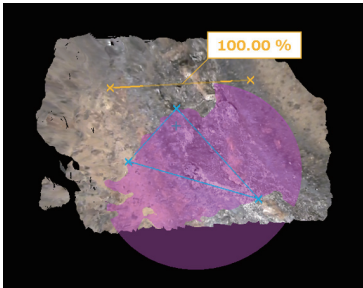
3-2-2-2. Depth

This is a measurement method in which a reference plane is set and the depth and height of the measurement points are determined.

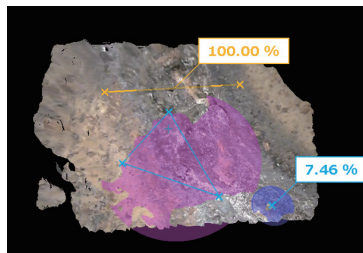
3-2-2-2-1. Setting a reference plane and measurement points

This section describes the procedures for setting a reference plane and measurement points.

- 1 Press the [Depth] button.
- 2 Left-click or tap the 3 points A, B, and C respectively, that you want to specify as the reference plane. The reference plane ABC appears.



- 3 Left-click or tap the position where you want to find the distance from the reference plane ABC, and then specify the measurement point D. When using the mouse, the measurement results for a point are displayed in light blue while the cursor is hovering over the point until you click the mouse.



- 4 The measurement result showing the distance from the reference plane ABC to the measurement point D is displayed in light blue.

This measurement method automatically proceeds to the next measurement point setting after each measurement point is set.

A positive value measurement result indicates that the measurement point is higher than the reference plane, while a negative value indicates that it is deeper than the reference plane.

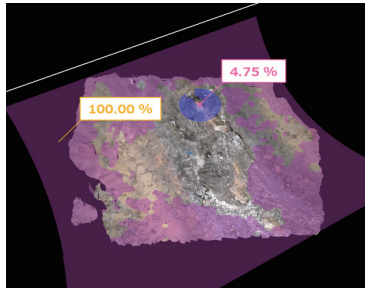
3-2-2-3 . Point to Curve

This is a measurement method in which a reference curved surface is set and the depth and height of the measurement points are determined.

3-2-2-3-1. Setting a reference curved surface and measurement points

This section describes the procedures for setting a reference curved surface and measurement points.

- 1 Press the [Point to Curve] button.
- 2 Left-click or tap the position you want to set a measurement point. When using the mouse, the measurement results for a point are displayed in pink while the cursor is hovering over the point until you click the mouse.

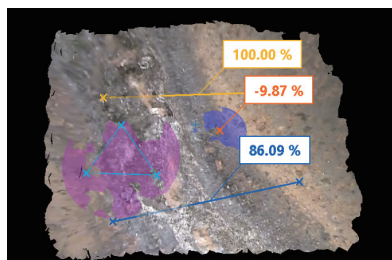


A positive value measurement result indicates that the measurement point is higher than the reference surface, while a negative value indicates that it is deeper than the reference surface.

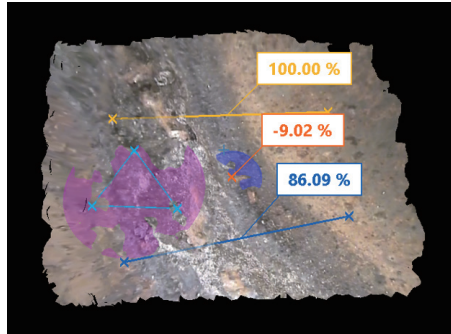
3-2-2-4. Editing measurement points

This section describes the procedures for editing pre-defined measurement points. The editable measurement points are [Distance], [Depth], and [Point to Curve] measurement points.

- 1 Left-click or tap the × mark of the position you want to edit. The selected point turns orange. For mouse operations, when the mouse cursor changes from an arrow cursor to a pointing finger cursor, you can select the point you want to edit.



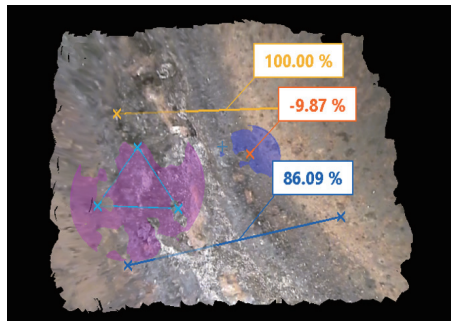
- 2** In this state, you can drag the × mark or use the arrow keys on the keyboard (the image below is after being moved).



3-2-2-5. Deleting measurement points

The procedure for if you want to delete pre-defined measurement points is as follows.

- 1** Left-click or tap the × mark of the position you want to delete. The selected point turns orange.



- 2** In this state, pressing the [Delete] button or the Delete key will delete the measurement point.

TIP

- Note that measurement points may be removed in batches.
- When you delete a reference, all the measurement information is deleted.
- If you delete a reference point that makes up a reference plane in a surface reference, all measurement information related to the surface reference is deleted. However, cross-section information will remain. (When [Delete All] is used, cross-section information is also deleted.)

3-3 Analyzing

The following two functions are available for doing analysis.

1. Profile

The 3D data is divided to show a profile that intersects the 3D data at a plane that passes through 2 specified points and the origin of the 3D viewing area.

2. Deepest/Highest

The deepest and highest values in the selection area specified by 2 points, and their locations, are shown.

3-3-1. Showing a profile

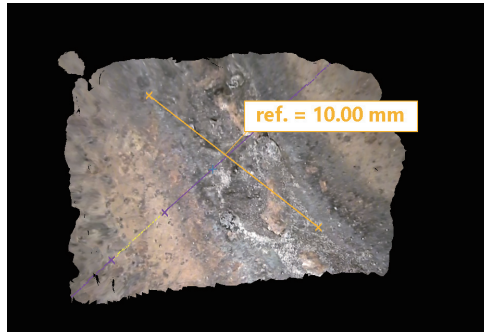
- 1 Press the [Analyze] button to display the following selection screen.
- 2 Pressing the [Profile] button switches to the profile display mode.



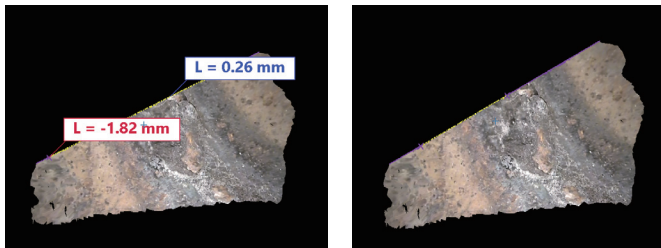
- 3 "Profile" appears in the lower right and you enter profile viewing mode.



- 4** In this state, left-click or tap the position you want to set as the starting point of the profile. Once the starting point has been set, a purple × mark will appear, and you can draw a straight line through the starting point and the cursor.



- 5** Left-click or tap the position you want to set as the end point of the profile, then an image of the profile at the specified position will appear. In addition, if a reference plane or reference curved surface has been set, the maximum and minimum values will be displayed as labels (left image below), but if no reference plane or reference curved surface has been set, only the profile will appear (right image below).

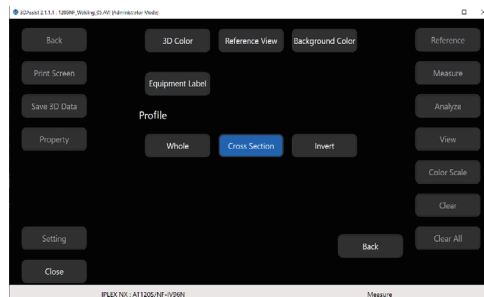


- 6** If you want to end profile viewing mode before determining the end point of the profile, you can do so by pressing the [Clear] button.

3-3-1-1. Switching the profile display

This section describes how to switch the profile display.

- 1 After determining the profile, press the [View] button.
- 2 The view function screen shown below appears and the [Cross Section] button is enabled.



- [Whole] Shows all the 3D data.
- [Cross Section] Shows a cross section of the 3D data.
- [Invert] Hides the currently displayed 3D data and displays the currently hidden 3D data. This mode is enabled when [Cross Section] is selected.

Since [Whole] and [Cross Section] are switched alternately, only one of the modes is always enabled.

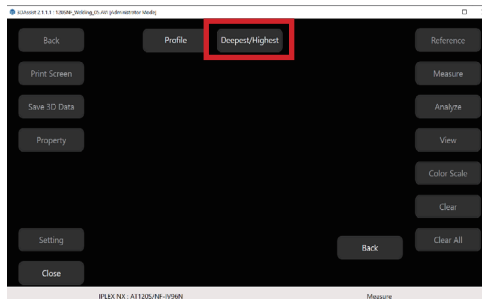
The enabled mode is highlighted.

3-3-2. Deepest/Highest

Press the [Analyze] button in the 3D viewing area screen to display the following selection screen.

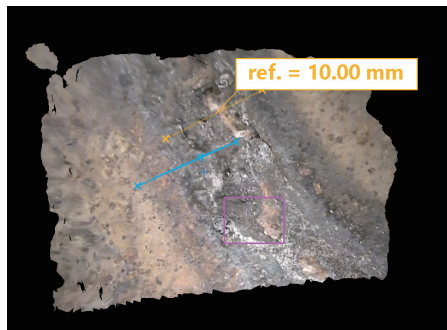
Pressing the [Deepest/Highest] button switches to the deepest/highest display mode.

If no reference plane or reference curved surface has been set, then you cannot move to deepest/highest mode.



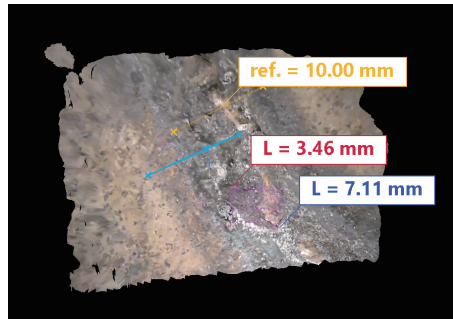
- 1 After switching to the deepest/highest mode, drag to create a rectangle around the area you want to analyze.
- 2 A rectangle will appear as you drag, so enclose the area you want to analyze in the rectangle and drop it to confirm.

The image below shows an area selected by a rectangle.



After determining the deepest and highest analysis areas, the image is as shown below.

The maximum (light blue label) and minimum (red label) analytical values are displayed.



3-3-3. Clear All

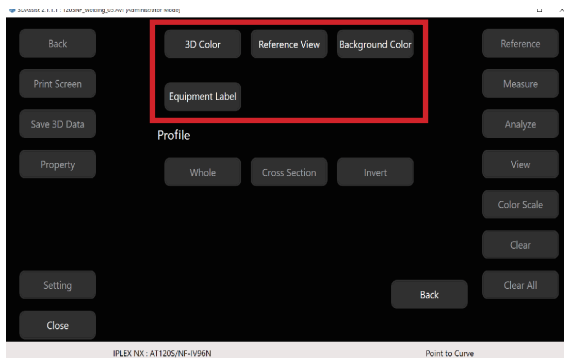
Pressing the [Clear All] button deletes all information set on the 3D data and returns the 3D data to the state immediately after it was shown.

3-4 Viewing functions

The viewing functions allow you to change the settings for the rendering conditions in the 3D view area.

Press the [View] button to display the following screen with the viewing functions.

- [3D View]
- [Reference View]
- [Background Color]
- [Equipment Label]



3-4-1. 3D View

Pressing the [3D View] button on the view function screen enables the following buttons. The [Contour for Plane] and [Contour for Curve] buttons are only enabled when a reference plane or reference curved surface has been set.

- [Real View]
- [Range]
- [Contour for Plane]
- [Contour for Curve]

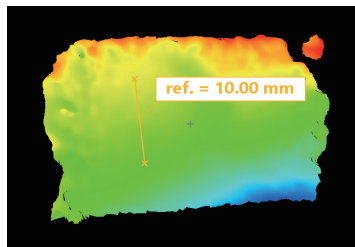
[Real View]

Pressing the [Real View] button switches to a display format that pastes the colors and patterns of the subject into a still image, as shown in the image below.



[Range]

Pressing the [Range] button makes things appear bluer the closer they are to the endoscope, and makes things appear redder the farther they are from the endoscope.

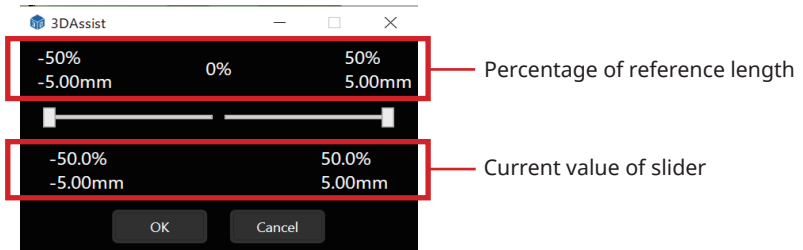


[Contour for Plane]

Pressing the [Contour for Plane] button makes things appear bluer as the surface becomes higher, and makes things appear redder as the surface becomes deeper relative to the reference surface.

Also, when this button is pressed, the [Color Scale] button is enabled. The [Color Scale] button changes the color according to the depth and height from the surface reference and curved surface reference.

- 1 Press the [Color Scale] button to display the following dialog.



1. Left slider

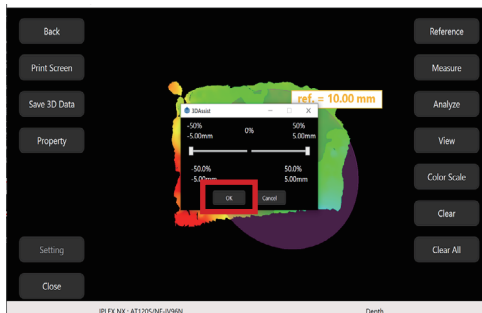
Sets the depth below the reference plane to which the darkest red is assigned. If you change the value with the slider, all areas deeper than that value will be red.

2. Right slider

Sets the height above the reference plane to which the darkest blue is assigned. If you change the value with the slider, all areas higher than that value will be blue.

- 2 The color of the 3D view area changes as the slider is adjusted. (see the image below)

However, the settings are not finalized until you press on the [OK] button, so you can return to the original settings by pressing on the [Cancel] button. To finalize, pressing the [OK] button.



[Contour for Curve]

Pressing the [Contour for Curve] button makes things appear bluer as the surface becomes higher, and makes things appear redder as the surface becomes deeper relative to the reference surface.

Also, when this button is pressed, the [Color Scale] button is enabled.

Operation of the [Color Scale] button is the same as for [Contour for Plane] above.

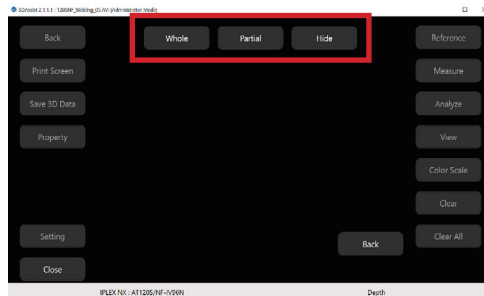
TIP

The conditions under which the [Color Scale] button is enabled are only when the display settings of the 3D view area are [Contour for Plane] or [Contour for Curve].

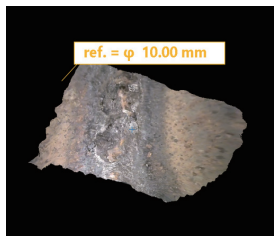
3-4-2. Reference View

By pressing the [Reference View] button on the view function screen, you can set whether to display the cylinder of the reference curved surface or the flat circle of the reference plane.

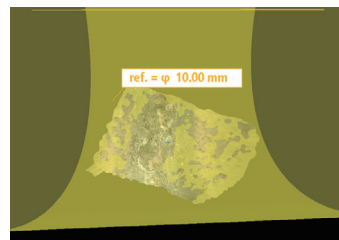
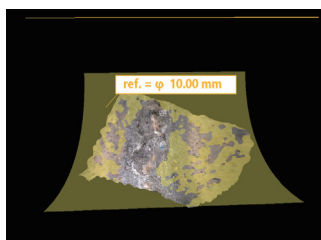
Display settings	Reference cylinder plane	Reference plane
Whole	Displays the whole circumference of the cylinder reference plane	Displays the reference plane
Partial	Displays a part of the circumference of the cylinder reference plane (area with 3D data)	The same as Whole
Hide	Not displayed	Not displayed



If hidden, a circle is not displayed on the reference plane. (see the image below)



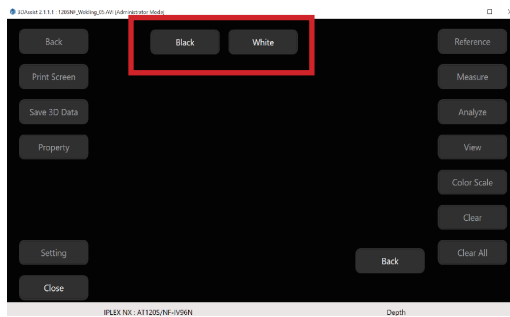
The image on the left shows the partial display and the image on the right shows the whole display.



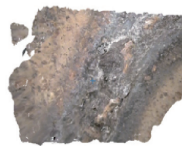
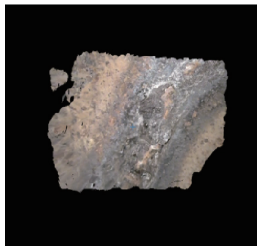
3-4-3. Background Color

Pressing the [Background Color] button on the view function screen allows you to set the background color of the 3D data viewing area.

Pressing the [Black] button sets the background color to black and pressing the [White] button sets the background color to white.



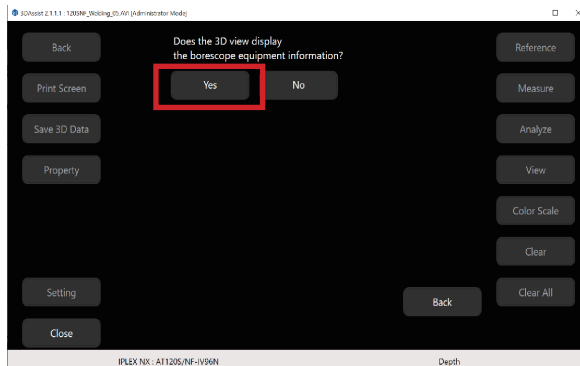
The left and right images below show the background set to black and white, respectively.



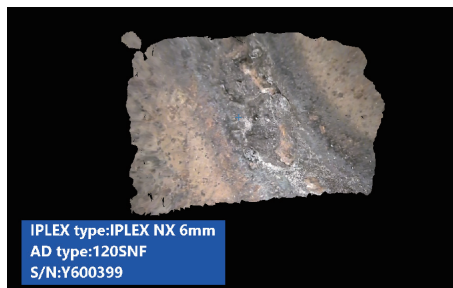
3-4-4. Equipment Label

Pressing the [Equipment Label] button on the view function screen allows you to display information, in the 3D view area, about the device that recorded the video.


- 1 Press the [Equipment Label] button to display the following screen, and then press [Yes].



- 2 As shown in the image below, information about the device that recorded the video is displayed in the 3D view.



3-5 End operations

To close the software, press the [Close] button in the lower left of the screen or  in the upper right of the screen.



When a message similar to the one below appears, press [OK] button to close the software.



4 Updating/uninstalling software

4-1 Updating software

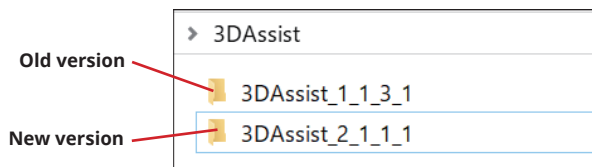
Use the following procedure to update the software.

Do not uninstall the previous version of the software until the software update is complete.

1 Download all of the new version of the software

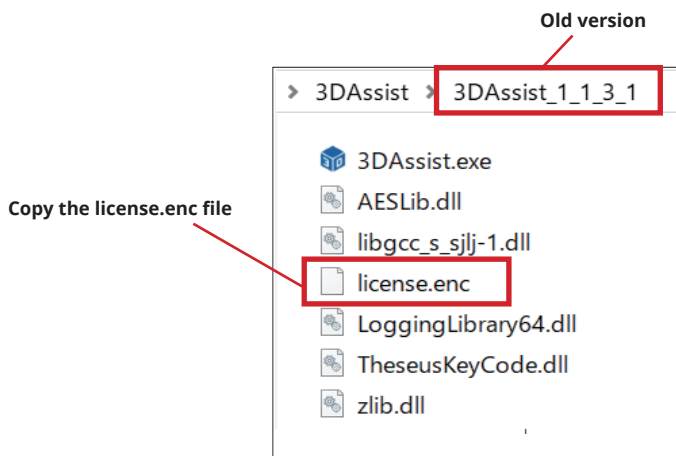
Download the new version of the 3DAssist software from the following site.

<https://www.olympus-ims.com/service-and-support/downloads/>



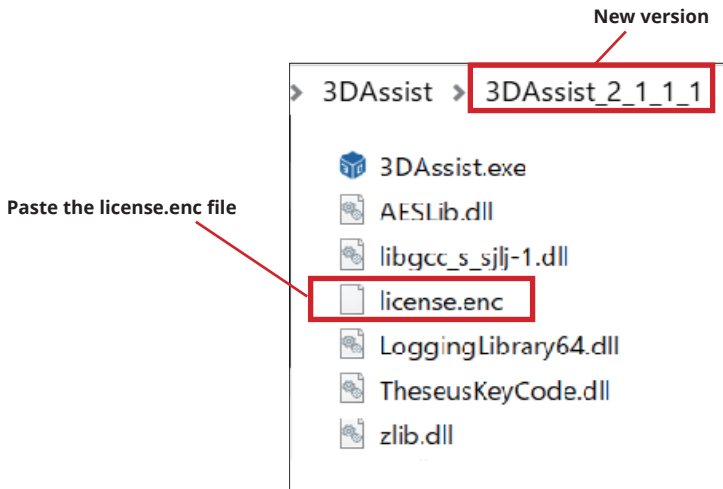
2 Copy the license file of the old version

Open the folder for the old version of the 3DAssist software and copy the license.enc file.



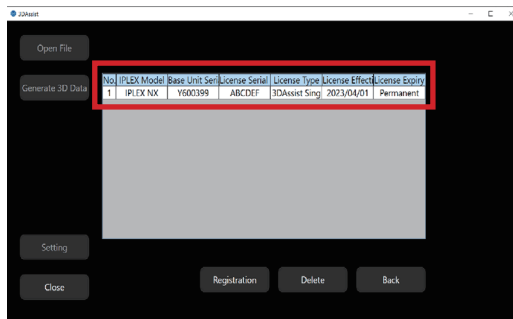
3 Paste the license file into the new version

Open the folder for the new version of the 3DAssist software and paste the license.enc file.



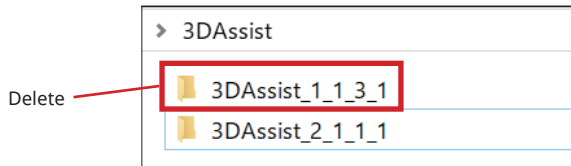
4 Confirm the new version of the device registration information

Start the new version of the 3DAssist software, open the device registration information list, and confirm that the information from the previous version has been carried over. (Refer to page 8 for how to confirm the device registration information list)



5 Delete all the folders for the old version of the software

Open the folder where the old version of the 3DAssist software is stored and delete all the folders for the old version.



TIP

It is possible to keep the old version on the same PC after the software is updated. Delete the old version if necessary.

4-2 Uninstalling software

Refer to page 4-1 **5** for how to uninstall the software.

5 Troubleshooting

If any of the following error messages appear, take the appropriate action by referring to the instructions on countermeasures. If the situation does not improve, contact the Evident distributor where you purchased the product.

Error message	Countermeasure
The selected file format is not supported.	<p>Load an appropriate video file. Confirm that the loaded video file meets the following conditions.</p> <ul style="list-style-type: none"> • The video is an AVI, MP4 or e3m format. • The video was shot using an IPLEX.
IPLEX model that recorded this video is not compatible.	<p>Video files shot with IPLEX equipment not supported by this software cannot be processed properly. Select a video file that was shot with an IPLEX device that is supported by this software. Refer to 6.Specifications for supported devices.</p>
IPLEX license has not been activated on this video.	<ul style="list-style-type: none"> • Activate the license of a device on which a video is taken before importing the video. Refer to 1-2.Activate the device for how to do activation. • Confirm that the still images taken as a set with the video file are in the same folder as the uploaded video file, and that they are saved with the same file name.
The selected recording setting is not supported.	<ul style="list-style-type: none"> • Select a video file that was shot with an optical adapter that is supported. Refer to 6.Specifications for supported optical adapters. • Confirm that you are not shooting video under conditions that are not guaranteed to work, such as zoom, constant video, etc.
3D model generation from frame set failed. Please select another frame set.	<p>Depending on the frame selected, 3D data generation may fail. Select a different frame and regenerate the 3D data.</p>
The IPLEX activation failed. Please try again.	<p>Recheck the setting items and re-enter them.</p>

Countermeasures if the software does not start

You can start operating the software by installing the VC++ Redistributable Packages (see URL below) provided by Microsoft. However, note that we are not responsible for any work performed when this package is applied or for any results from such work.

<https://www.olympus-ims.com/service-and-support/downloads/>

6 Specifications

Applicable models

Series name	Base Unit Model No.	Scope name	Optical adapter name			
IPLEX NX	IV9000N	IV9435N	AT80D/FF-IV94N			
			IV9450N	AT120D/NF-IV94		
				AT120D/FF-IV94		
				AT100S/NF-IV94		
				AT100S/FF-IV94		
		IV9635N		AT80D/FF-IV96N		
			IV9650N	AT120D/NF-IV96		
				IV9675N	AT120D/FF-IV96	
					AT120S/NF-IV96	
					AT120S/FF-IV96	
IPLEX GX/GT	IV9000G	IV9420G	AT80D/FF-IV94G			
			IV9435G	AT120D/NF-IV94		
				AT120D/FF-IV94		
				AT100S/NF-IV94		
				AT100S/FF-IV94		
		IV9620G		AT80D/NF-IV96G		
			IV9635G	AT80D/FF-IV96G		
				IV9675G	AT120D/NF-IV96	
					IV96100G	AT120D/FF-IV96
						AT80S-IV96G
						AT120S/NF-IV96
						AT120S/FF-IV96

Series name	Base Unit Model No.	Scope name	Optical adapter name	
IPLEX G Lite	—	IV9420GL	AT80D/FF-IV94G	
			IV9435GL	AT120D/NF-IV94
				AT120D/FF-IV94
				AT100S/NF-IV94
				AT100S/FF-IV94
		IV9620GL	AT80D/NF-IV96G	
			IV9635GL	AT80D/FF-IV96G
				IV96100GL
			AT120D/FF-IV96	
			AT80S-IV96G	
			AT120S/NF-IV96	
			AT120S/FF-IV96	
			IPLEX GAir	
IV98300GA	AT120D/FF-IV98G			
	AT120S/NF-IV98G			
AT120S/FF-IV98G				

TIP

The license for the software is tied to the serial number of the IPLEX main unit (*1) or base unit. Therefore, when using a base unit for which a license for the software has already been purchased, the system can continue to be used even though the scope unit is replaced. (*1. IPLEX G Lite is called the main unit because it has an integrated scope and is not split into a base unit and a scope unit.)

Recommended PC specifications

Items	Specifications
OS	Windows10 64bit 19H1 (1903) or later Windows11
Processor	8 GB or more
Storage *Space required for software installation	100 GB or more available space
Input device	<ul style="list-style-type: none"> • Mouse • Keyboard • Touch screen
Graphics drivers	Must support OpenGL *1.1 or later
Screen resolution	Width 1200 [pixel] x Height 720 [pixel] or more

Software Functions

Items	Specifications
Display Language	Japanese English Chinese (Simplified) Chinese (Traditional)
Output	Able to save screenshots of 3D data Function to save results for redisplaying 3D Data

About Use of Open Source Software

This product contains open source software licensed under terms and conditions separately stipulated by a third party ("License Terms").

Refer to the following URL for information on the open source software, that is included in this product, and its license conditions. The copyright holders of the open source software included in this product are listed at the following URL. Also, no warranty of any kind is made with respect to the open source software contained in this product, including, but not limited to, the implied warranties of non-infringement of third party rights and warranties of merchantability or fitness for a particular purpose.

Furthermore, For open source software for which the license terms require source code disclosure, the corresponding source code will be provided at the following URL for at least three (3) years after your purchase of the Product. Note that software other than open source software whose license terms require the disclosure of source code is not subject to source code distribution.

<https://www.olympus-ims.com/rvi-products/3dassist/oss-license/>

Note that we cannot respond to inquiries regarding the contents of the source code provided at the above URL.

- © 2023 EVIDENT CORPORATION. All rights reserved.
No part of this publication may be reproduced or distributed in any form or by any means without the prior written consent of Evident Corporation.
- Company names and product names appearing in this document are trademarks or registered trademarks of their respective owners.

Manufactured by

Evident Corporation

6666 Inatomi, Tatsuno-machi, Kamiina-gun, Nagano 399-0495, Japan

Distributed by

Evident Europe GmbH

Caffamacherreihe 8-10, 20355 Hamburg, Germany

Evident Europe GmbH – UK Branch

Part 2nd Floor Part A, Endeavour House, Coopers End Road, Stansted CM24 1AL, UK

Evident Scientific, Inc.

48 Woerd Ave, Waltham, MA 02453, USA

Evident Scientific Singapore PTE. LTD.

#04-04/05, 25 Ubi Rd 4, UBIX Singapore 408621

Evident Australia PTY LTD

Level 4, 97 Waterloo Road Macquarie Park NSW 2113, Australia

Life science solutions

Service Center



<https://www.olympus-lifescience.com/support/service/>

Official website



<https://www.olympus-lifescience.com>

Industrial solutions

Service Center



<https://www.olympus-ims.com/service-and-support/service-centers/>

Official website



<https://www.olympus-ims.com>