EN

DNNP011

VisionApp 360 Plugin

Operating Instructions

Subject to change without notice
Available as PDF file only
Version 1.3.0
Revision level: 25.05.2023
www.wenglor.com

Table of Contents

1. General

1.1 Information Concerning these Instructions

- These instructions apply to the VisionApp 360 plugin product (item number DNNP011).
- They enable the safe and efficient use of the product.
- These instructions are an integral part of the product and must be kept safe for the entire duration of the product's service life.
- Local accident prevention regulations and national work safety regulations must be observed before, during and after initial startup.
- The product is subject to further technical development, and thus the information contained in these operating instructions may also be subject to change. The current version can be found at www.wenglor.com in the product's separate download area.

NOTE!
The operating instructions must be read carefully before using the product and must be kept safe for later reference.

1.2 Explanations of Symbols

- Safety precautions and warnings are emphasized by means of symbols and signal words.
- Safe use of the product is only possible if these safety precautions and warnings are adhered to.

The safety precautions and warnings are laid out in accordance with the following principle:

SIGNAL WORD
Type and source of danger!
Possible consequences in the event that the hazard is disregarded.
- Measures for averting the hazard.

The meanings of the signal words, as well as the scope of the associated hazards, are listed below:

DANGER!
This signal word indicates a hazard with a high degree of risk which, if not avoided, results in death or severe injury.

WARNING!
This signal word indicates a hazard with a medium degree of risk which, if not avoided, may result in death or severe injury.

CAUTION!
This word indicates a hazard with a low degree of risk which, if not avoided, may result in minor or moderate injury.

ATTENTION!
This signal word draws attention to a potentially hazardous situation which, if not avoided, may result in property damage.

NOTE!
A note draws attention to useful tips and suggestions, as well as information regarding efficient, error-free use.

1.3 Limitation of Liability

- The product has been developed taking into account the state of the art as well as the applicable standards and guidelines.
- We reserve the right to make technical changes.
- A valid declaration of conformity can be found at www.wenglor.com in the download area of the product.
- wenglor sensoric elektronische Geräte GmbH (hereinafter "wenglor") accepts no liability for:
  - » Failure to observe the operating manual,
  - » Unsuitable or improper use of the product,
  - » Excessive use, incorrect or negligent treatment of the product,
  - » Incorrect installation or commissioning,
  - » Use of untrained personnel,
  - » Use of unauthorized spare parts or
  - » Improper or unauthorized changes, modifications or repair work to the products.
- This operating manual does not contain any guarantees/warrantees from wenglor with regard to the processes described or certain product properties.
- wenglor assumes no liability with regard to printing errors or other inaccuracies contained in this operating manual, unless it can be proven that wenglor was aware of the errors at the time the operating manual was created.

1.4 Copyrights

- The contents of these instructions are protected by copyright law.
- All rights are reserved by wenglor.
- Commercial reproduction or any other commercial use of the provided content and information, in particular graphics and images, is not permitted without previous written consent from wenglor.

2. For Your Safety

2.1 Use for Intended Purpose

The VisionApp 360 plugin only runs on the wenglor control units with the order number BB1C (only control units with an i7 processor are recommended). There are control units available with pre-installed VisionApp 360 software and a valid license. The software and its license can also be installed or ordered retrospectively, however.
The VisionApp 360 plugin combines the height profiles of up to 16 (model-independent) 2D/3D profile sensors. Calibration is done via any calibration object. The 2D/3D profile sensors can be arranged in a circle, for example, or next to each other. The combined height profile is then transferred to the parameterizable uniVision software and can be evaluated there as required.

NOTE!
Details on the uniVision software or the precise functioning of the 2D/3D profile sensors can be found in the relevant operating instructions. These instructions only describe the function of the VisionApp 360 plugin – as an interface between multiple 2D/3D profile sensors and the uniVision software.

This product can be used in the following industry sectors:

- Special-purpose mechanical engineering
- Heavy mechanical engineering
- Logistics
- Automotive industry
- Food industry
- Packaging industry
- Pharmaceuticals industry
- Plastics industry
- Woodworking industry
- Consumer goods industry
- Paper industry
- Electronics industry
- Glass industry
- Steel industry
- Aviation industry
- Chemicals industry
- Alternative energy
- Raw materials extraction

2.2 Use for Other than the Intended Purpose

- No safety components in accordance with 2006/42/EC (Machinery Directive).
- The product is not suitable for use in potentially explosive atmospheres.
- The product may only be used with accessories supplied or approved by wenglor, or in combination with approved products. A list of approved accessories and products which have been approved for use in combination with the software is available on the product detail page at www.wenglor.com.

DANGER!
Risk of personal injury or property damage in case of use for other than the intended purpose!
Use for other than the intended purpose may lead to hazardous situations.
- Instructions regarding use for the intended purpose must be observed.

2.3 Personnel Qualifications

- Suitable technical training is a prerequisite for use.
- In-house electronics training is required.
- Trained personnel who use the product must have uninterrupted access to the operating instructions.

DANGER!
Risk of personal injury or property damage in case of incorrect initial start-up and maintenance!
Personal injury and damage to equipment may occur.
- Adequate training and qualification of personnel.

2.4 General Safety Precautions

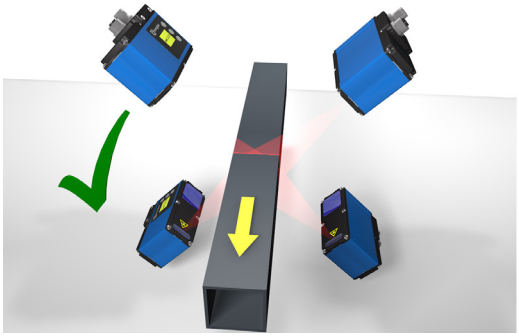
NOTE!
- These instructions are an integral part of the product and must be kept on hand for the entire duration of the product's service life.
- In the event of possible changes, the respectively current version of the operating instructions can be accessed at www.wenglor.com in the product's separate download area.

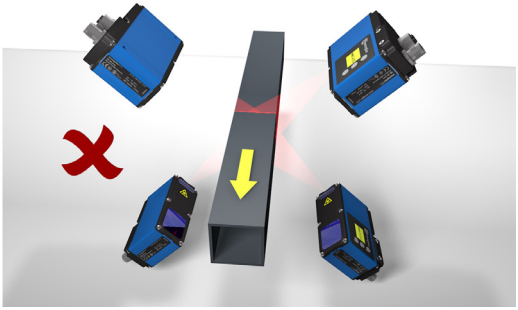
3. Technical Data

Order number / Technical data	DNNP011
Function	
Display software	Yes
Evaluation software	Yes
Operating system	
Linux	Yes
General data	
Use	For 2D/3D profile sensors as of firmware version 1.1.0 For control unit
Languages	English
Licensing model	License key
Minimum resolution	1280 × 1024 pixels

4. Installation

Various solutions are available for mounting the 2D/3D profile sensors. Details are available in the download area of the product detail pages at www.wenglor.com.
The 2D/3D profile sensors must be positioned so that the visual fields of all sensors are at the same level. For this purpose, the laser lines of all sensors must be at the same level. All 2D/3D profile sensors must also be oriented so that an object to be measured moves in the direction in which the laser beam is emitted.





NOTE!
If this alignment is not possible, the sensors have to be inverted with the software (see section “9. VisionApp 360 Plugin” on page 16). Software-inverted sensors are displayed in the VisionApp 360 plugin without a logo.

5. Connection

5.1 Network

Up to 16 2D/3D profile sensors (port 2) can be connected directly to one of the LAN interfaces of the control unit. The network must support 1 gigabit throughout.

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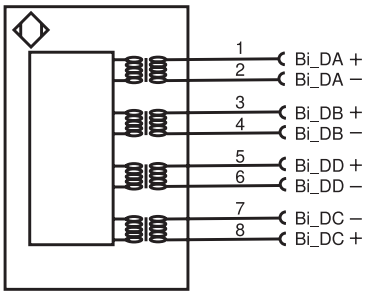

Connection diagram: port 2 of the 2D/3D profile sensor

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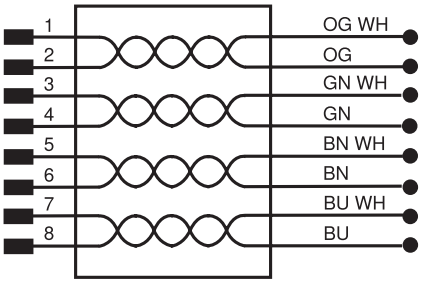
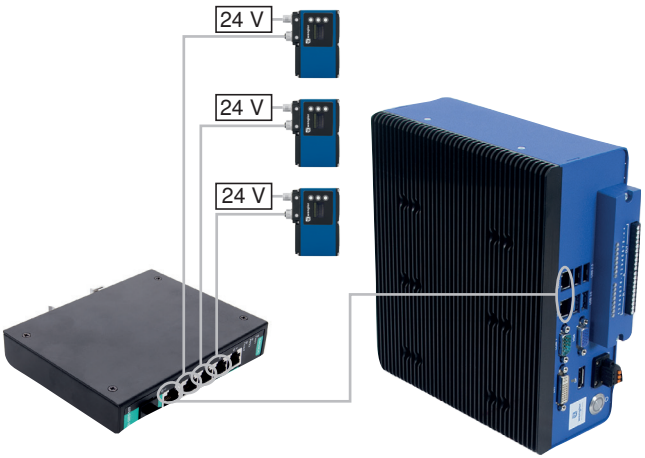


Suitable wenglor connection equipment

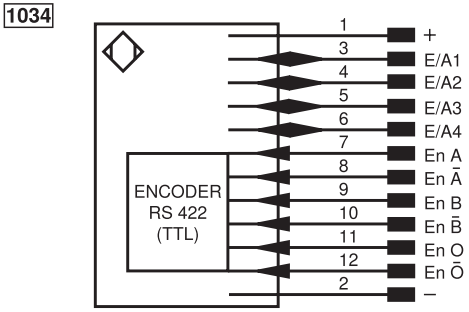
NOTE!
Suitable network cables can be found in the download area on the product detail page of the 2D/3D profile sensors at www.wenglor.com.



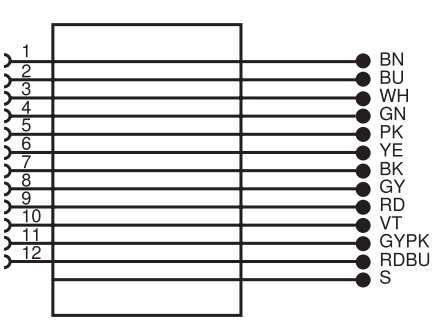
5.2 Power Supply

Connect port 1 of the 2D/3D profile sensor to 18…30 V DC.

- Pin 1: + (brown with suitable wenglor connection equipment)
- Pin 2: – (blue with suitable wenglor connection equipment)



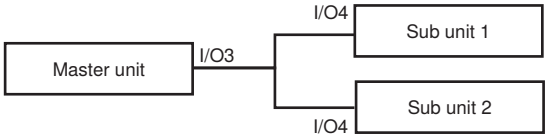
Connection diagram: port 1 of the 2D/3D profile sensor



Suitable wenglor connection equipment

5.3 Synchronization

The 2D/3D profile sensors must be synchronized to enable the VisionApp 360 plugin to be used. This is necessary to record the height profiles synchronously and to prevent mutual interferences between the sensors. For this purpose, one 2D/3D profile sensor must be used as the master unit and all other 2D/3D profile sensors as sub units. The master unit can be triggered as desired and forwards the trigger signal to all sub units via a synchronization pin.
For synchronization, I/O 3 of the master unit is connected to all I/O 4 of the sub units as standard.



The following color coding is used for wenglor's standard cables:

- Master unit: I/O 3 (pin 5) → Pink
- Sub unit: I/O 4 (pin 6) → Yellow

6. Installation of the Plugin

NOTE!
The VisionApp 360 plugin is supported from control unit firmware 2.2.0.

The VisionApp 360 plugin can be installed or updated as follows:
1. Download the latest version of the VisionApp 360 plugin from the wenglor website (www.wenglor.com/product/DNNP011).
2. Copy the plugin (tgz file) to the firmware folder on the control unit.
   2a. Transfer to the control unit via a USB stick and copy the firmware file to the folder /media/card/firmware.
   2b. Copy to the firmware folder on the control unit via FTP.

NOTE!
A network connection from the Windows PC to the control unit is required for this.
Enter ftp:// + the control unit's IP address into the file manager.

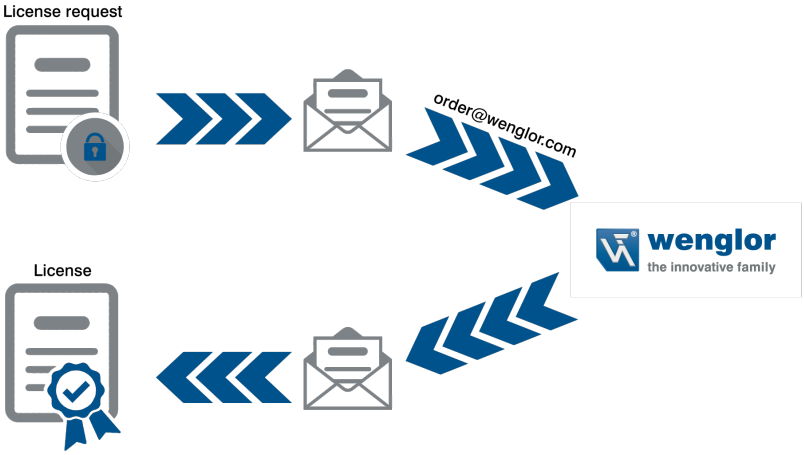
Example with the control unit's standard IP address: ftp://192.168.100.252
User data:
- User name: ftpuser
- Password: ftpvision

3. Reboot the control unit (via uniVision Software -> Device List, via VNC or directly on the control unit via the menu -> Reboot).

NOTE!
- The VisionApp 360 plugin starts automatically after the control unit reboot.
- All installed plugins can be uninstalled with a firmware update for the control unit.

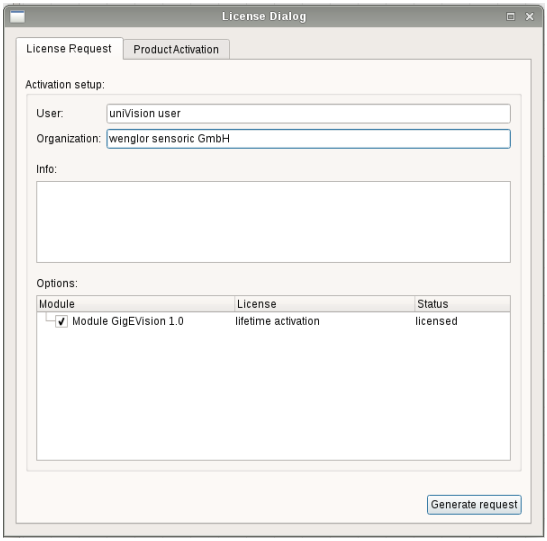
7. Licensing

There are control units available with pre-installed VisionApp 360 software and a valid license. The software and its license can also be installed or ordered retrospectively, however.
The plugin can be installed free of charge. The combined height profile can only be output with a suitable license for the “GigE Vision” module for the relevant control unit.



The license for using the VisionApp 360 plugin can be ordered for a control unit as follows.

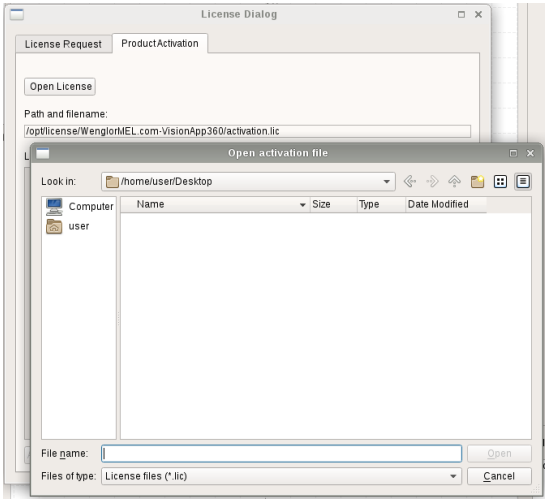
1. Open the VisionApp 360 plugin on the control unit.
2. Select “Help” → “Licensing”.
3. Enter the user name, organization and any other information.
4. Generate the license request file for the “GigEVision 1.0 module”.



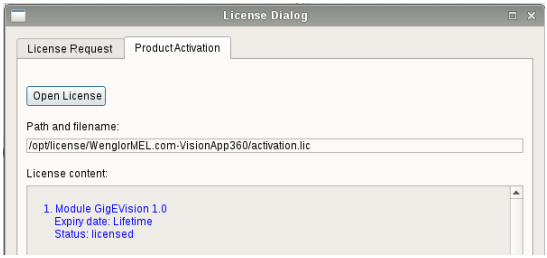
5. Send the *.req file, together with the order for product DNNP011 (VisionApp 360 plugin), by e-mail to wenglor customer service (order@wenglor.com).

NOTE!
It can take 2–3 working days to process the license file. The licensed file will be returned to you by e-mail.

6. Following receipt of the *.lic file, open the license management in the VisionApp 360 plugin again.
7. Click on “Product Activation” and select the license file.



8. The license for the “GigEVision 1.0 module” is activated.



8. Network Settings

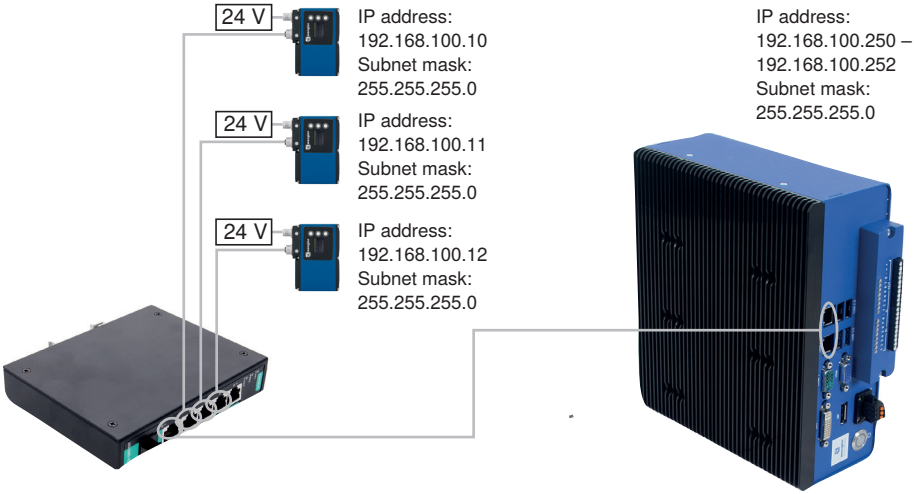
To use the VisionApp 360 plugin, the control unit and the 2D/3D profile sensors must be in the same network. The network part of the IP addresses of the control unit and 2D/3D profile sensors must be identical. The device part of the IP addresses must be different for all devices.

	Network part	**Device part** (host part)
IP address	192.168.100.	001
Subnet mask	255.255.255.	000

Standard network settings:

- Control unit
  - Bridge: LAN1 + LAN2
  - Bridge IP address range: 192.168.100.250 – 192.168.100.252
  - Bridge subnet mask: 255.255.255.0
- 2D/3D profile sensors
  - IP address: 192.168.100.1
  - Subnet mask: 255.255.255.0

An example network configuration for a control unit with VisionApp 360 plugin and three 2D/3D profile sensors.



NOTE!

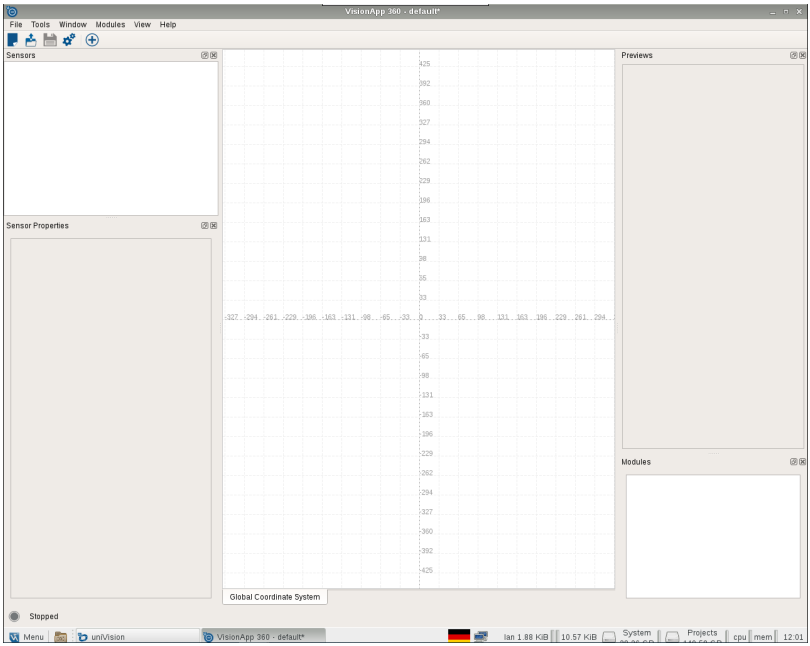
- The network settings of the control unit can be changed via the uniVision software. Details can be found in the uniVision software operating instructions.
- The network settings for the 2D/3D profile sensors can be changed on the OLED display on the device or via the sensor website. Details can be found in the operating instructions for the 2D/3D profile sensors.
- The individual 2D/3D profile sensors may not be added to the control unit via the device list in the uniVision software for use via the VisionApp 360 plugin, as otherwise the sensors can not be accessed by the VisionApp 360 plugin.

9. VisionApp 360 Plugin

9.1 Creating a Couple

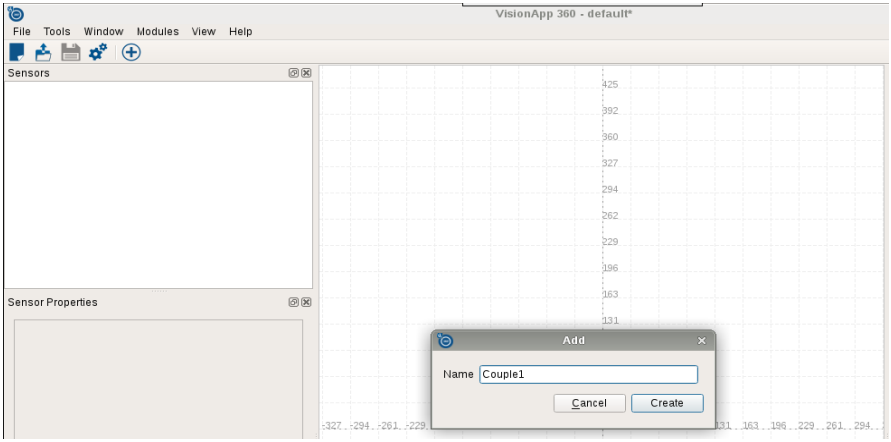
A couple must first be created in the VisionApp 360 plugin.

NOTE!
A maximum of one couple can be created in the VisionApp 360 plugin.



To do this, select “Add new couple” in the menu bar and enter a name.

“Add new couple”

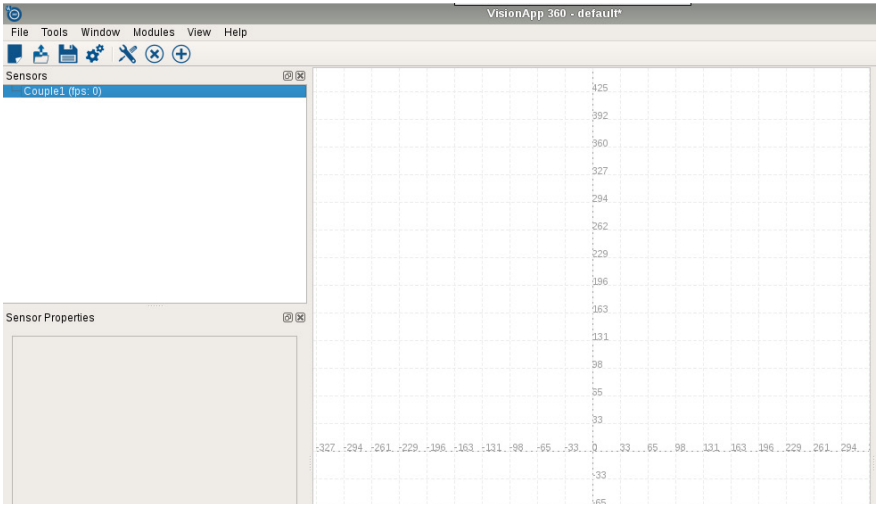


9.2 Setting Up the Master Unit

Select the newly created couple and add a sensor to the couple.

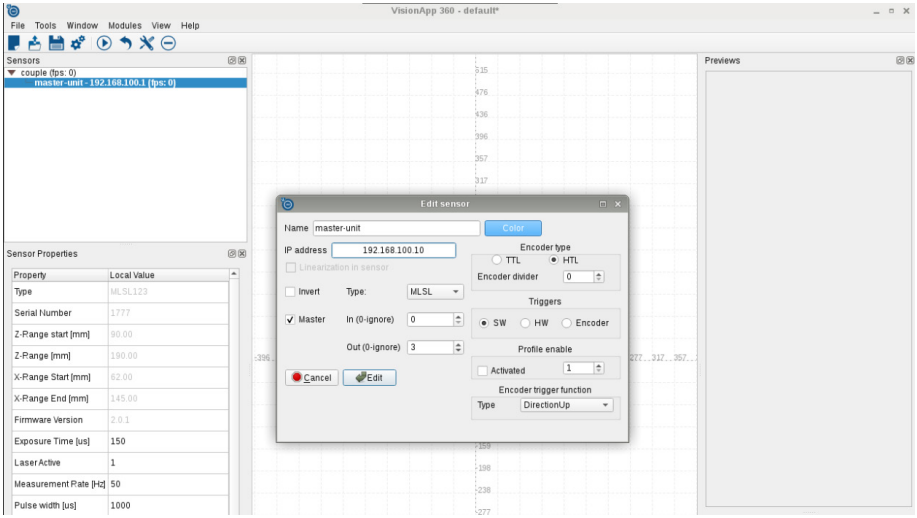
NOTE!
A maximum of 16 model-independent 2D/3D profile sensors can be added to a couple.

“Add new sensor”



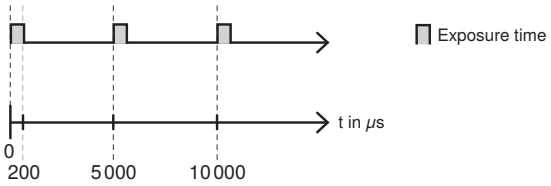
Define the first 2D/3D profile sensor as the master unit for the couple:

- Assign a name
- Enter an IP address for the device
- Select the device type (MLSL or MLWL)
- Select the triggering
- Invert the sensor if the object to be measured is not moving in the direction in which the laser beam is emitted (see section “4. Installation” on page 8)

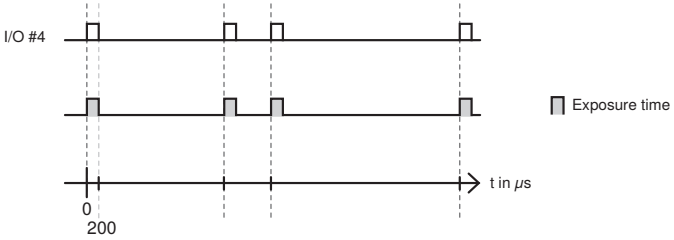


NOTE!
The following trigger settings are possible on the master unit:

- Software (SW): The master unit records height profiles with a fixed frequency (e.g. 200 Hz)



- Hardware (HW): Define an input pin on the 2D/3D profile sensor as the trigger input so that a height profile is recorded with a rising edge.

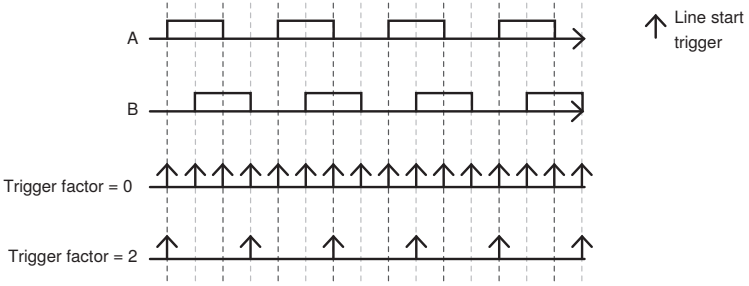


- Encoder: Use a HTL or TTL encoder for triggering the master unit so that height profiles are only recorded if changes in movement occur.

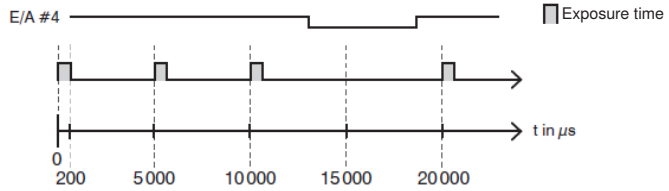
NOTE!

The encoder trigger function can be defined:

- Higher position: The sensor is only triggered when the encoder value is higher than before.
- Lower position: The sensor is only triggered when the encoder value is lower than before.
- Higher position: Any increase in the encoder value triggers the sensor.
- Lower position: Any decrease in the encoder value triggers the sensor.
- Movement: Any change to the encoder value triggers the sensor.



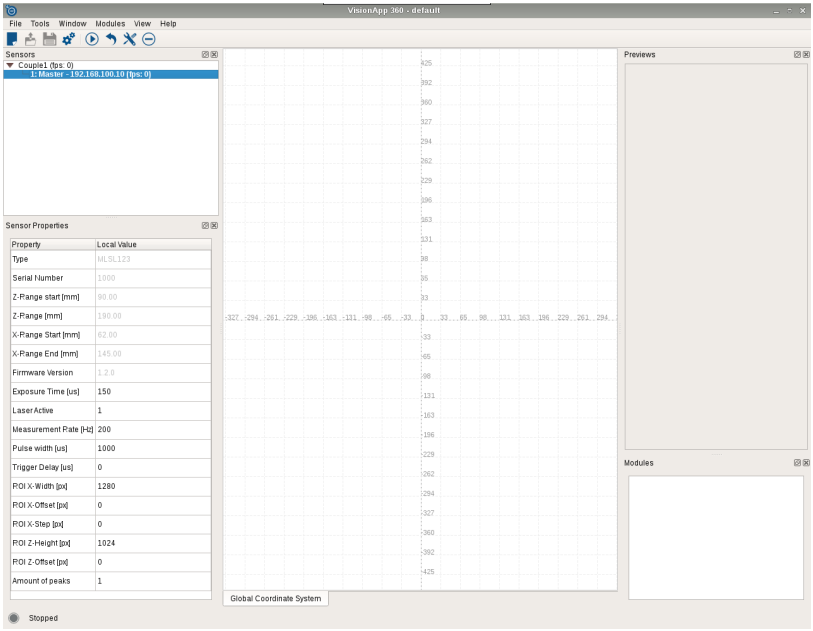
- Profile enable: If the “Profile enable” trigger function is activated, height profiles are only recorded if a signal (24 V) is applied to a definable input pin (e.g. I/O 4).



All sub unit devices are triggered via the synchronization signal from the master unit (Out: I/O 3 as standard).

Make any further settings on the master unit in the sensor settings.

- Exposure time
- Recording frequency
- Measuring range (ROI)
- Number of signals
  - 1 = First signal
  - 2 = Second signal
  - 3 = First and second signal
- Signal selection
  - 0 = First signal in camera column
  - 1 = Strongest signal in the camera column
  - 2 = Widest signal in the camera column
  - 3 = Last signal in camera column



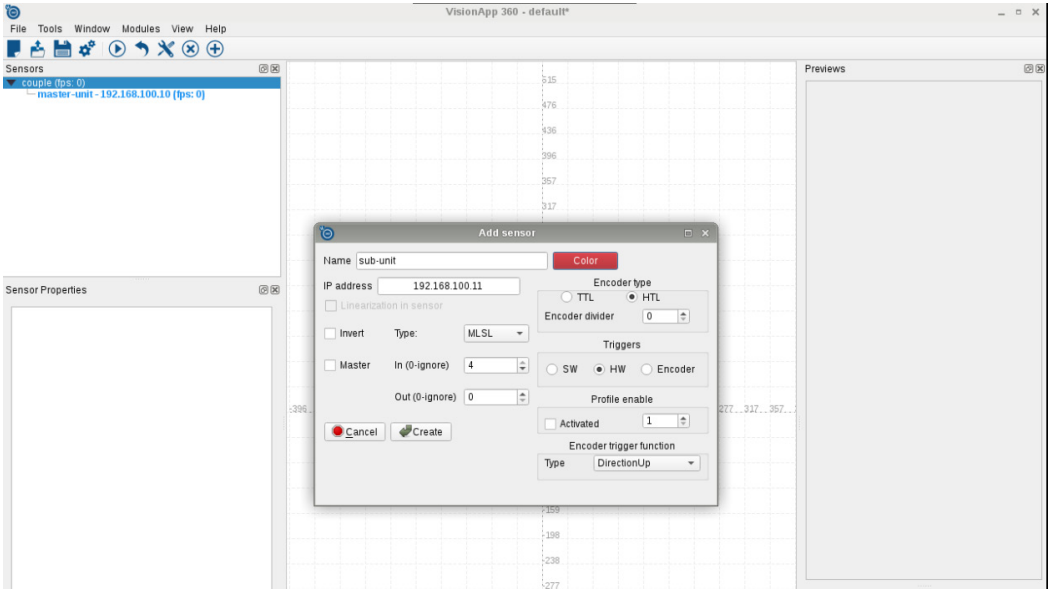
9.3 Setting Up the Sub Units

Add the slaves to the couple one after the other. For this, the couple must be selected first so that the “Add new sensor” button appears in the menu bar.

“Add new sensor”

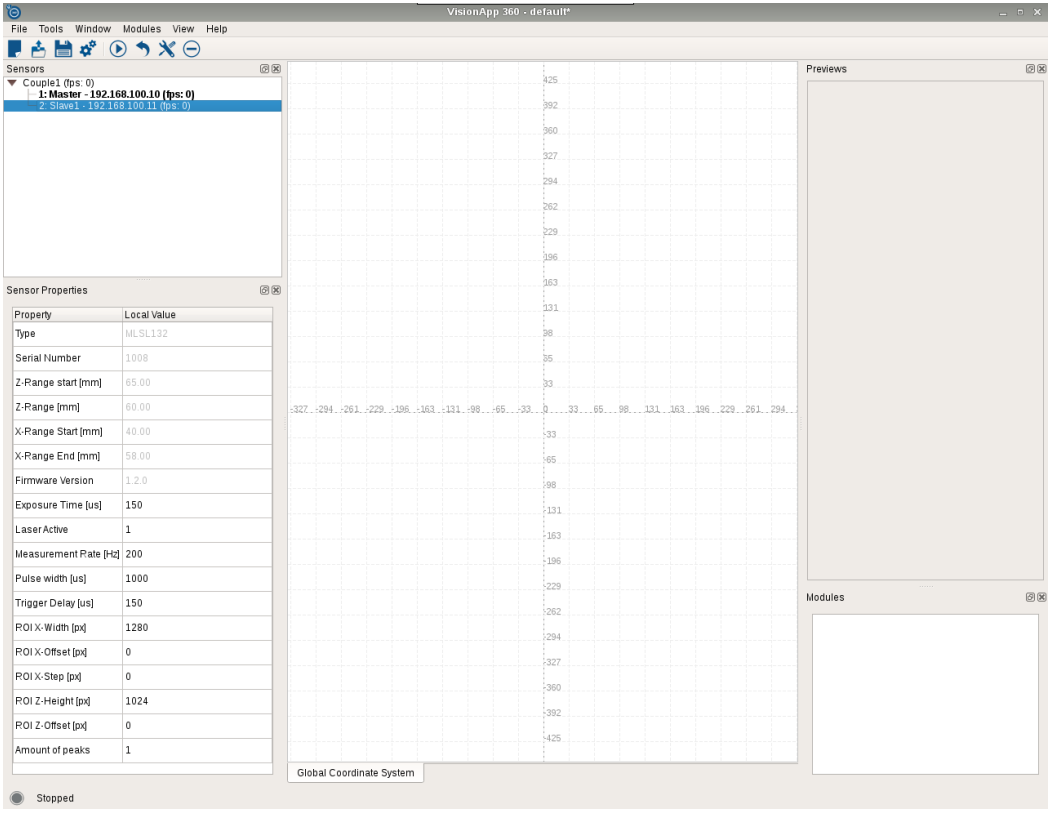
Make the following settings for all slaves:

- Assign a name
- Enter an IP address for the device
- Select the device type (MLSL or MLWL)
- The triggering of all slaves must remain set on the hardware (HW) so that the synchronization signal of the master unit triggers the sub unit. The trigger input for the sub units is set to I/O 4 as standard.
- Invert the sensor if the object to be measured is not moving in the direction in which the laser beam is emitted (see section “4. Installation” on page 8)



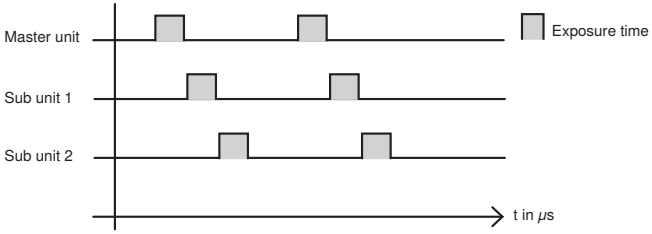
Make further settings for the sub units:

- Exposure time
- Trigger delay: Set the trigger delay so that the exposure of the sensors does not take place at the same time, but with a time delay in order to avoid interferences between several 2D/3D Profile Sensors.
- Measuring range (ROI)
- Number of signals
  - 1 = First signal
  - 2 = Second signal
  - 3 = First and second signal
- Signal selection
  - 0 = First signal in the camera column
  - 1 = Strongest signal in the camera column
  - 2 = Widest signal in the camera column
  - 3 = Last signal in the camera column



NOTE!
The following settings for exposure times and trigger delays are possible, for example:

- Master unit:
– Exposure time: 150 µs
- Sub unit 1:
– Trigger delay: 150 µs
– Exposure time: 200 µs
- Sub unit 2:
– Trigger delay: 350 µs
– Exposure time: 200 µs



NOTE!
2D/3D Profile Sensors with red and blue laser light do not interfere each other and can capture profiles at the same time. If red and blue 2D/3D Profile Sensors are mounted next to each other, it is possible to capture height profiles of all sensors at the same time.

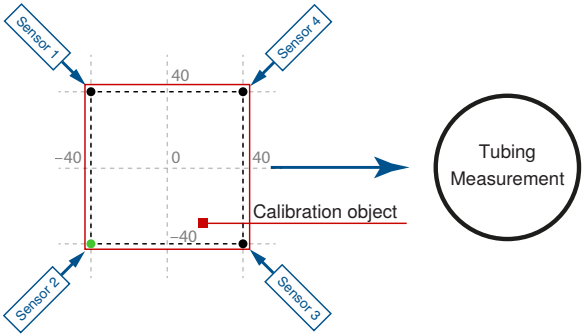
9.4 Calibration

In order to combine the height profiles of multiple 2D/3D profile sensors to a shared height profile, the sensors must be calibrated to each other. A precise, firm calibration object that has an angular cross section and is as temperature-independent as possible is required for this purpose. The calibration object is positioned such that each sensor is aligned to one corner of the calibration object. The sensors' laser lines must all be at the same level for this.

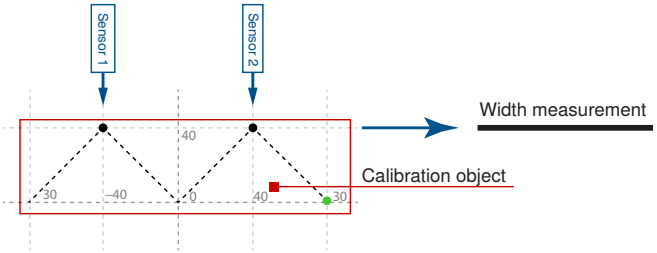
NOTE!
The accuracy of the calibration object is crucial to the accuracy of the calibration results. A calibration object that is as precise as possible should therefore be selected. The calibration object can be marked with a line to make the coplanar sensor arrangement easy to set up. Before starting the calibration, it is also necessary to wait until the warm-up phase of the 2D/3D profile sensors is completed.

9.4.1 Calibration Object

For a 360° height profile (e.g. pipe measurement), the following calibration object is required, for example.

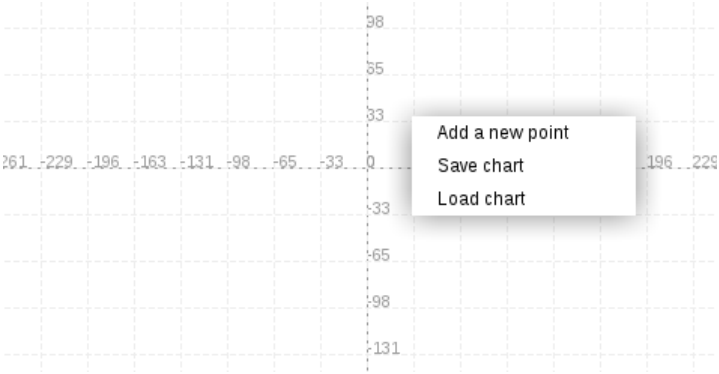


For a measurement in one level (e.g. width measurement), the following calibration object is required, for example.

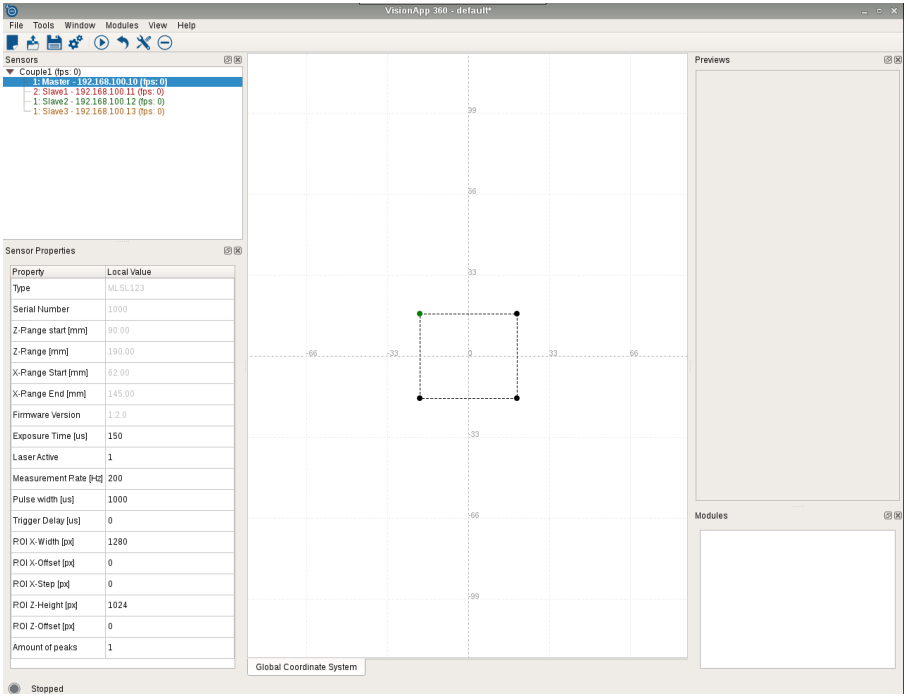


9.4.2 Drawing a Calibration Object

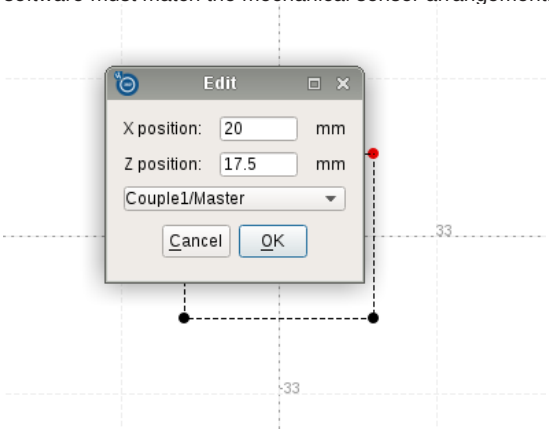
Enter the coordinates of the calibration object in the measuring range of the VisionApp 360 plugin. This is done in the measuring range by double-clicking with the left mouse key or in the “Add new point” context menu. When all coordinates are entered, the calibration object is closed by double-clicking on the start point of the calibration point.



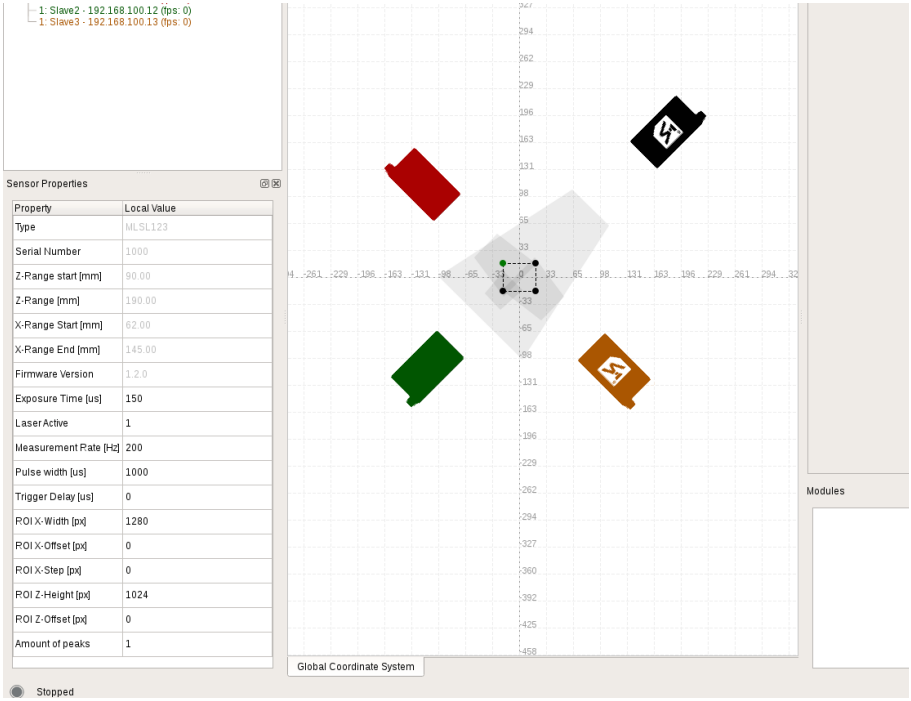
This example uses a calibration object for four sensors arranged in a circle.



Each coordinate of the calibration object must now be assigned to the relevant sensor. The assignment in the software must match the mechanical sensor arrangement.



All sensors are then displayed in the measuring field.

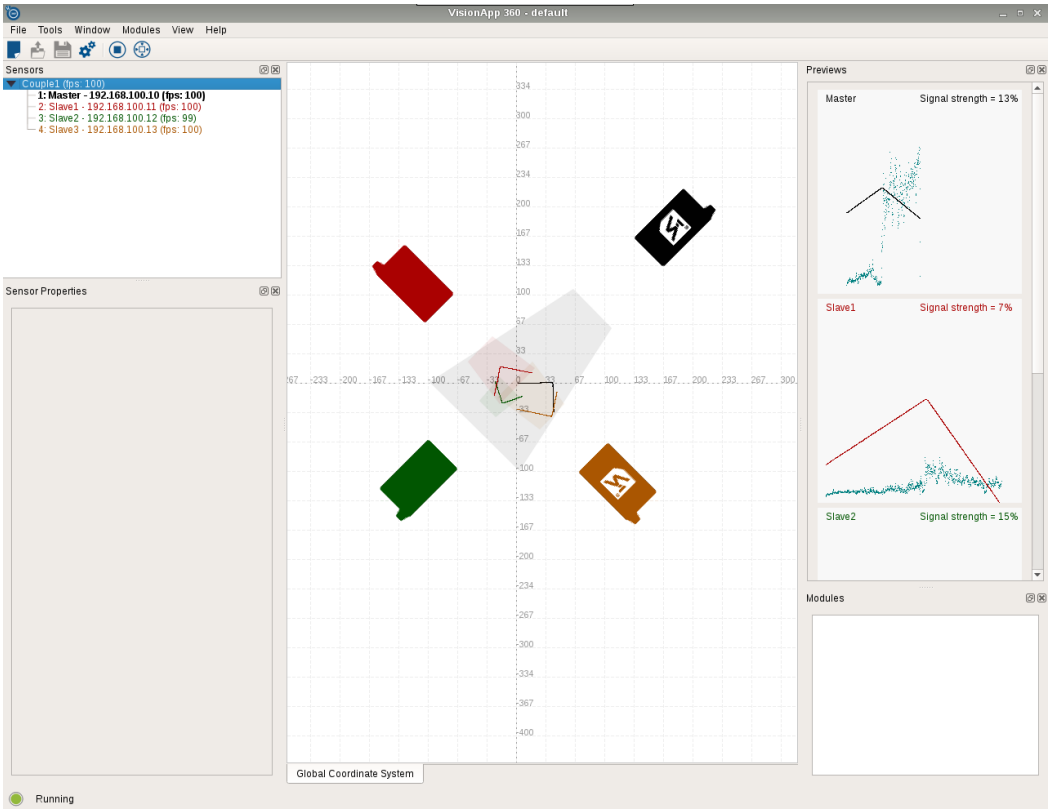


NOTE!
Inverted sensors are shown without a logo (see section “4. Installation” on page 8).

9.4.3 Carrying Out the Calibration

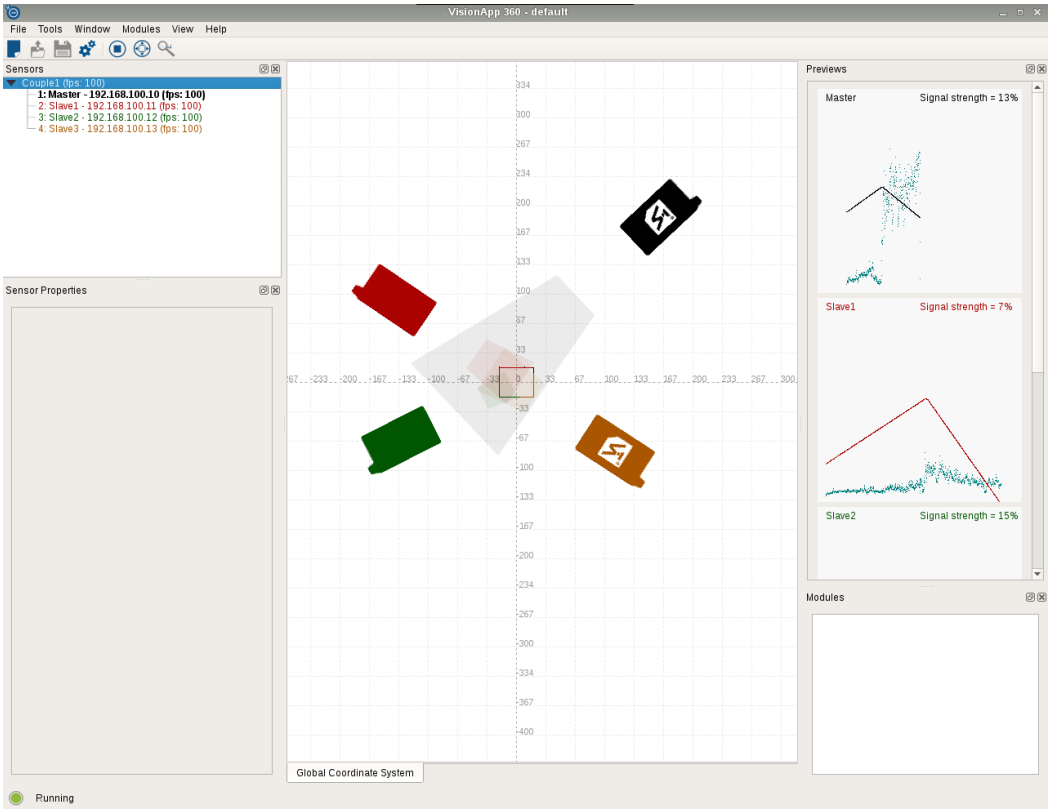
Click on “Run” in the menu bar to start the profile recording for all sensors.

“Run”

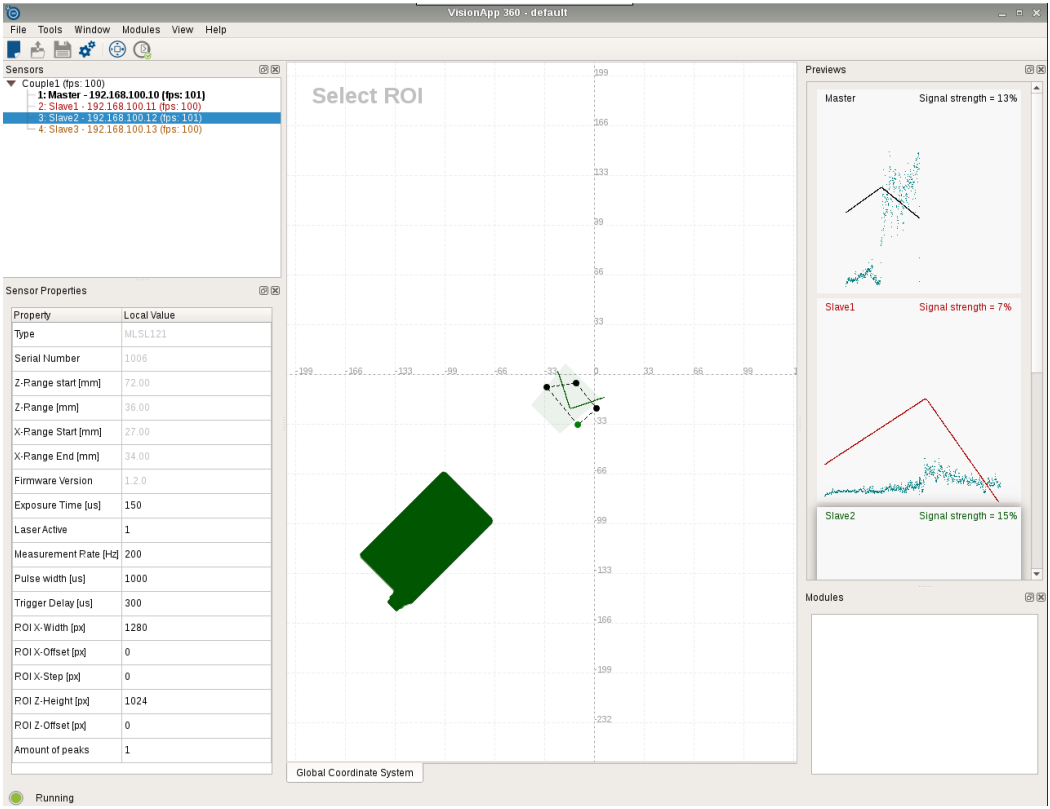


The calibration can be carried out for the entire couple or for individual sensors. To calibrate all sensors, select the couple and click on “Perform calibration”.

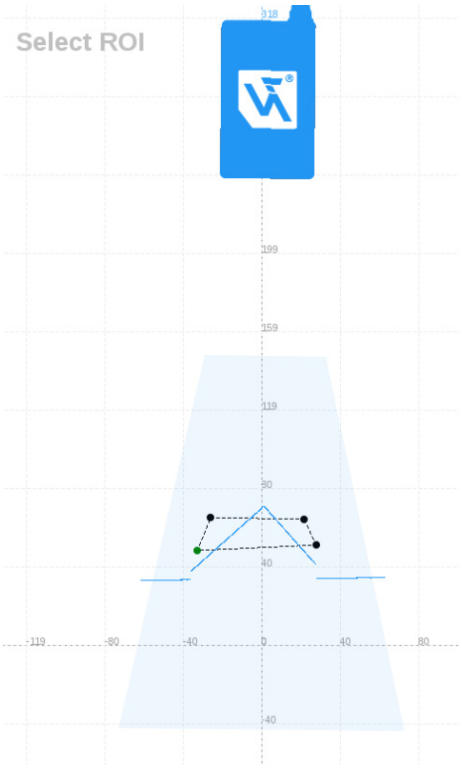
“Perform calibration”



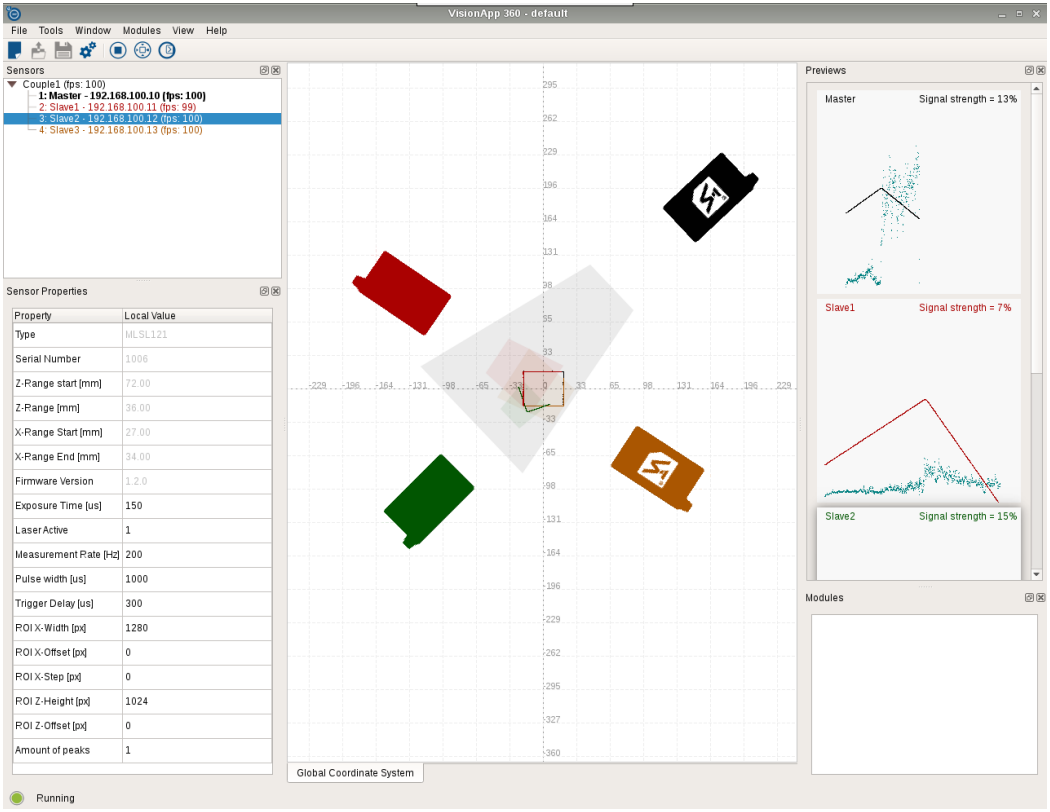
The calibration can also be carried out for individual sensors and restricted to a region of interest to eliminate interferences in the measuring range for the calibration. To do this, select the sensor and click on “Define Sensor ROI” in the menu bar. The relevant region can now be drawn in the measuring field. Points of the region of interest are created by double-clicking in the measuring field and are connected with each other automatically. The region is ended by double-clicking on the start point or by clicking on “Finish sensor ROI”.



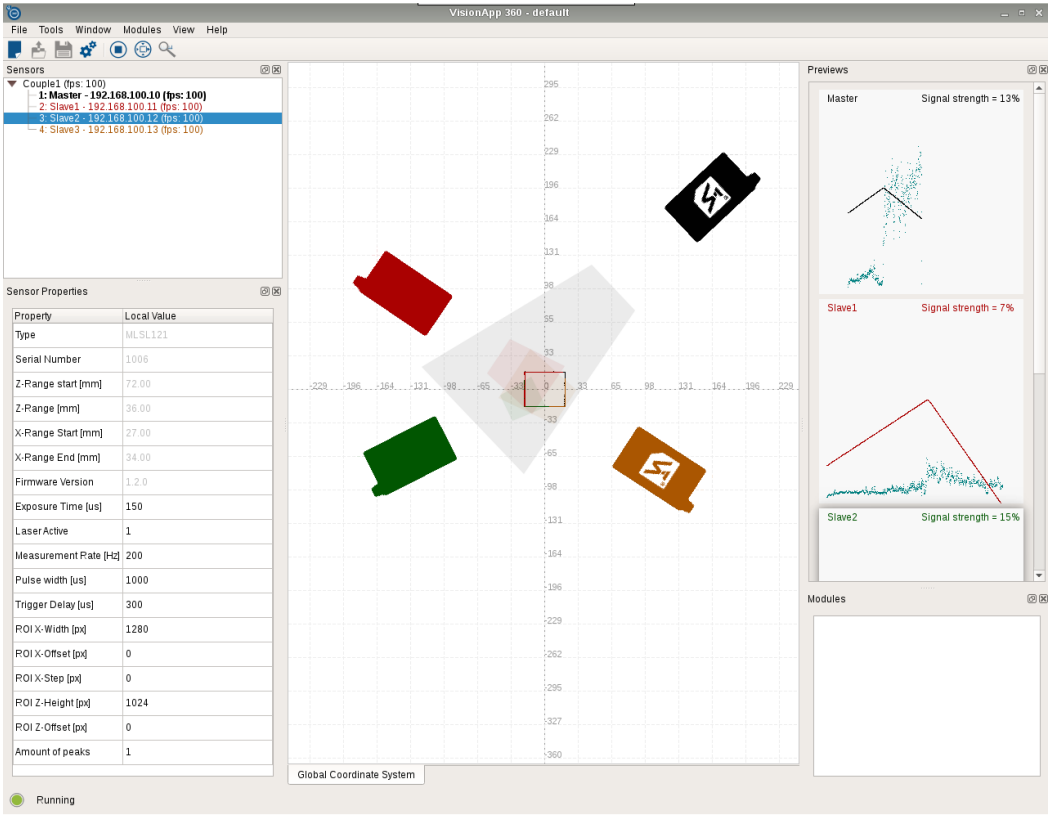
NOTE!
The region can be restricted via the ROI so that the edge is cut out. This leads to better calibration results.



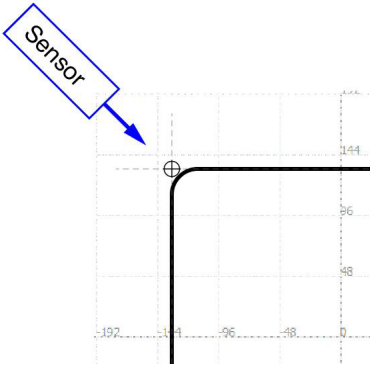
The calibration for the relevant sensor can then be carried out by clicking on “Perform sensor calibration”.



After successful calibration, the measuring profile and calibration object are congruent.

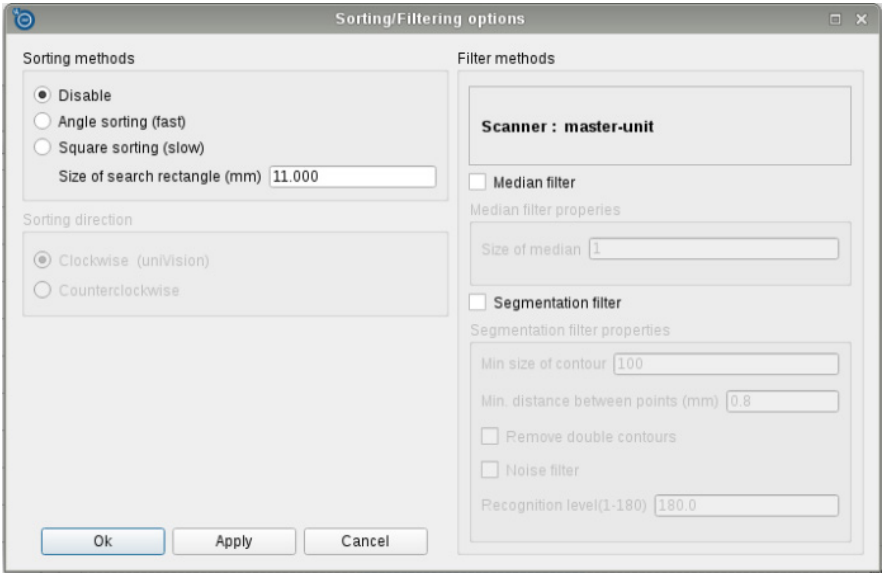


NOTE!
For the calibration, the corner point is the intersection point of the extended straight sides of two neighboring edges.



9.5 Filtering and Sorting

The filtering of the individual height profiles and the sorting of the combined height profile is disabled as standard.



To enable filtering, select the relevant sensor and click on “Sorting options” under “Tools”. A median filter and a segmentation filter are available (see section “11.2 Tools” on page 43).

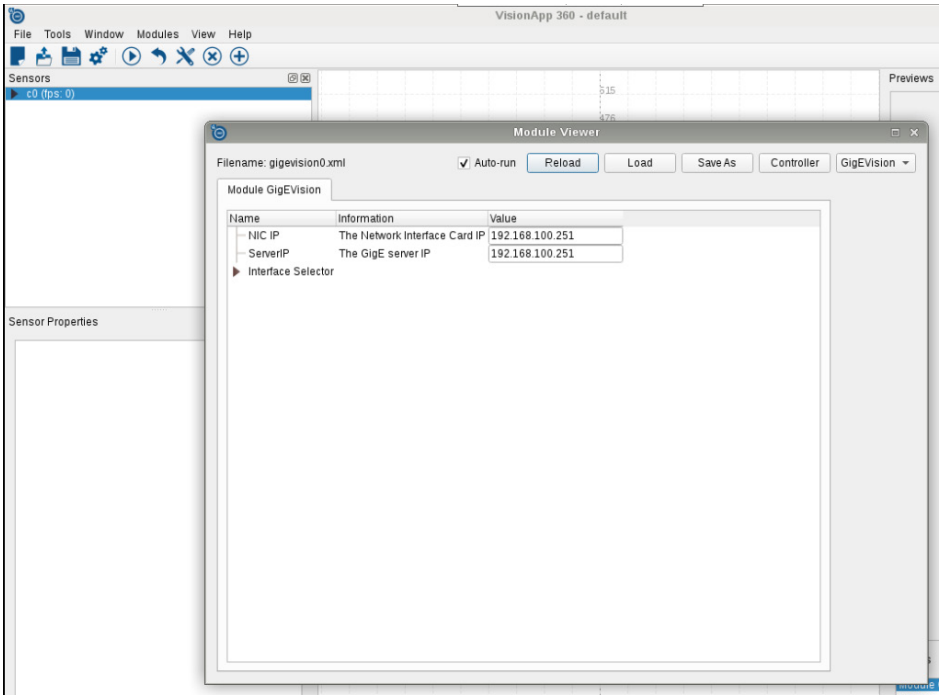
The measuring points of the combined height profile can also be sorted if the individual point clouds overlap. This must be activated in the uniVision software for individual modules for subsequent profile evaluation. Details can be found in the uniVision software operating instructions in the relevant module.

9.6 GigE Vision Module

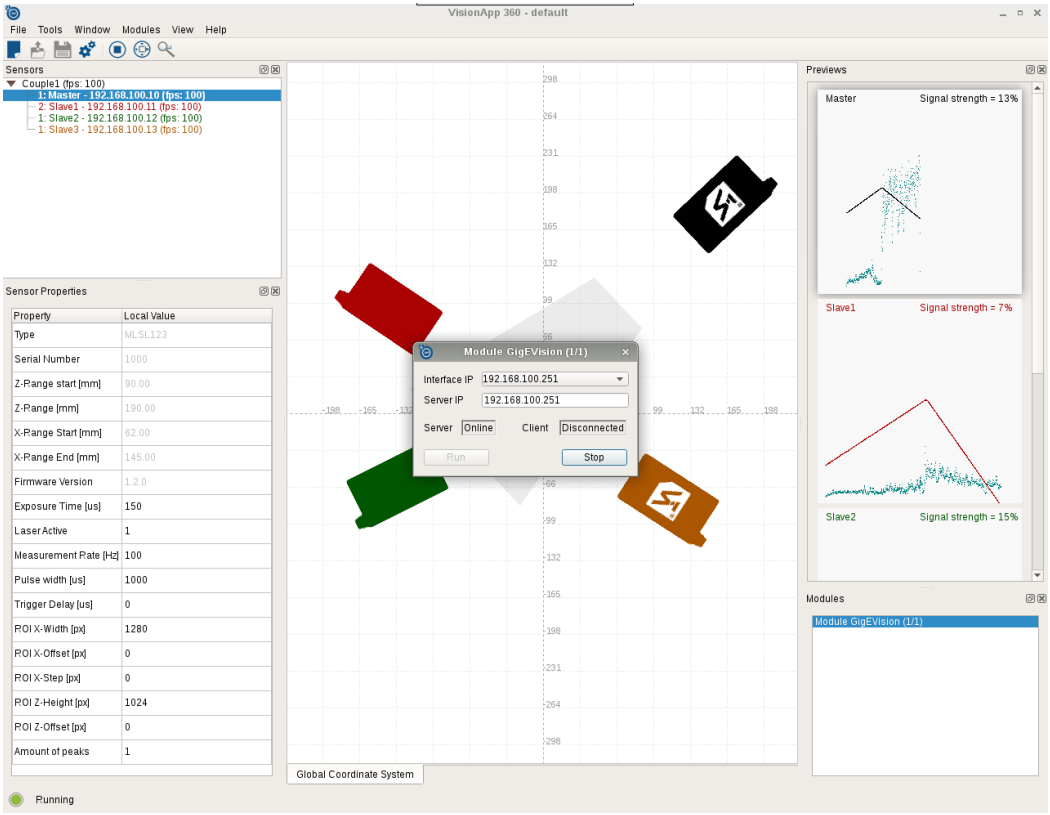
To transfer the combined height profile to the uniVision software, the data must be output via the GigE Vision module. For this purpose, select the “Module Viewer” under “Modules”. Select “Module Viewer”. Enter the IP address for the GigE Vision server and save your settings.

NOTE!

- The IP address of the GigE Vision server for VisionApp 360 cannot be the same as the IP address of another device on the network or another virtual GigE Vision server on the same control unit.
- You can use the same IP address as the control unit itself or one of the uniVision applications.
- We recommend using the IP address of the associated uniVision application as the IP address for the GigE Vision server (192.168.100.251 by default).



Then select “GigE Vision Module” under “Modules” and click “Run”.



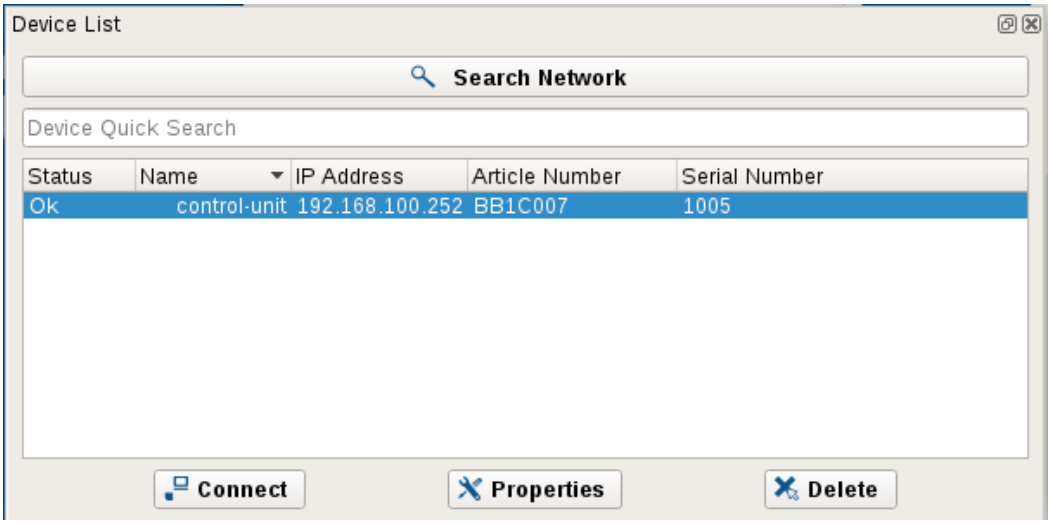
NOTE!
A valid license is required for the GigE Vision module (see section “7. Licensing” on page 12).

NOTE!
After a new calibration or changes to the sensor settings or the GigE Vision module, the couple must be restarted.

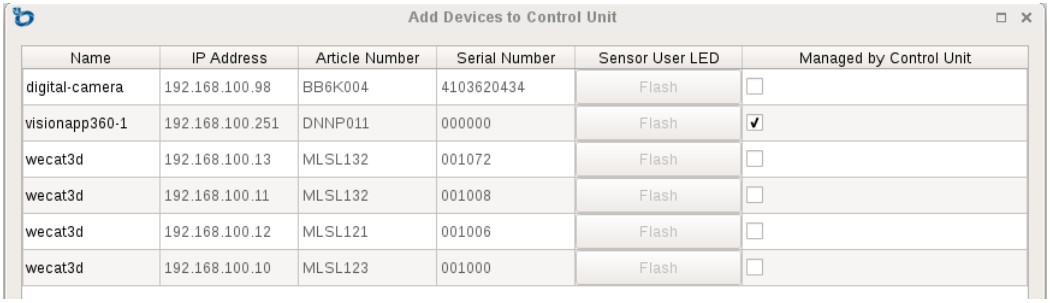
10. uniVision Software

10.1 Connecting with the VisionApp 360

Start uniVision software and click “Connect to Device”.

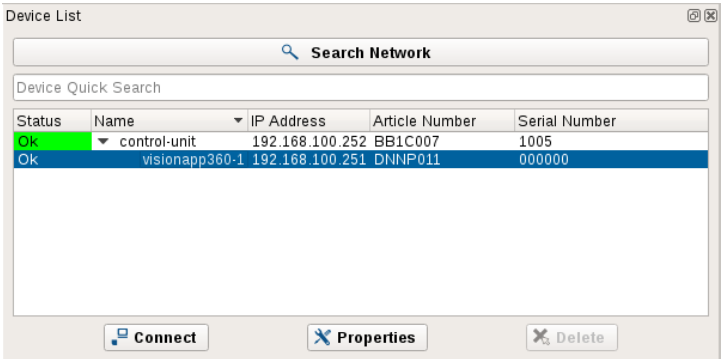


Double-click on the control unit or click on “Connect” after selecting the control unit to display all devices connected to the control unit. With VisionApp 360, select “Managed by control unit”.

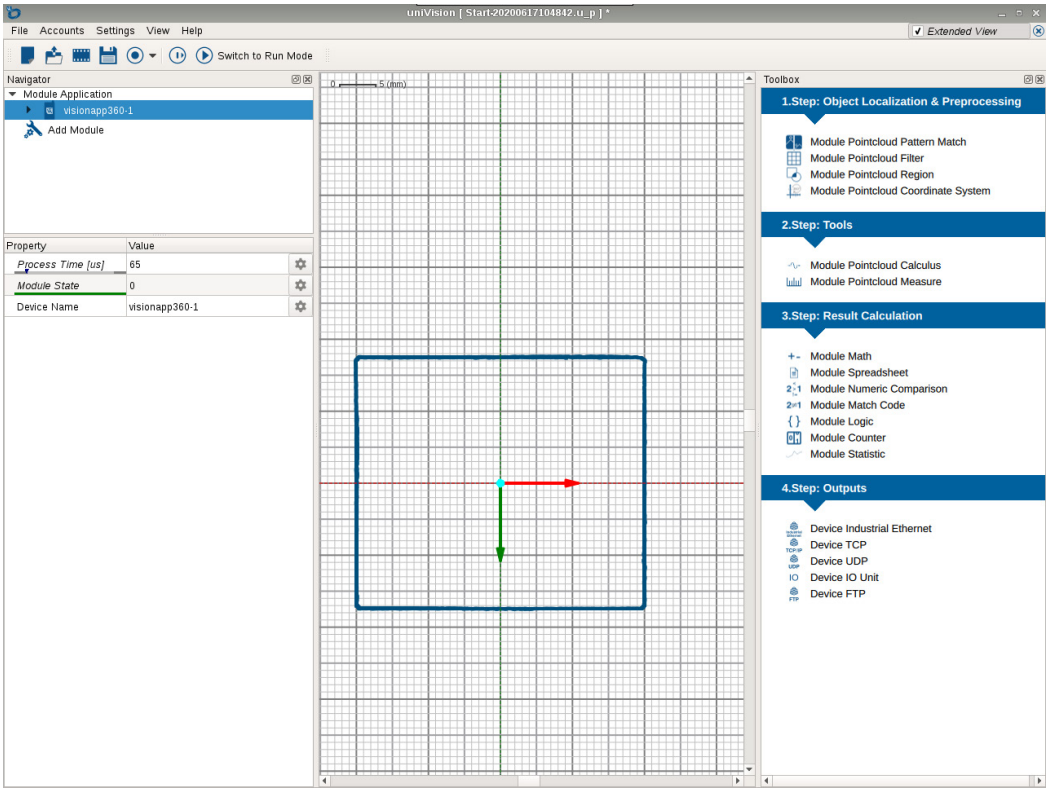


NOTE!
The individual 2D/3D profile sensors (weCat3D sensors) must not be selected for this, as the network configuration and operating mode of the individual sensors are otherwise changed and they are no longer accessible by the VisionApp 360 plugin. Simply check the box next to VisionApp 360.

Close the “Add devices to control unit” window and double-click on the VisionApp 360 to create a uniVision application for evaluating the combined height profile.



An empty uniVision project is opened and the combined height profile is displayed.



10.2 VisionApp 360 Device

Individual parameters of the VisionApp 360 can be displayed or set in the VisionApp 360 device.

Settings

Processing time [µs]	Processing time for the module in µs
Module status	0: No error Value not equal to 0: Error (details on the error codes can be found in the operating instructions for the uniVision software)
Device name	The name of the current device is displayed.
Error handling	In the event of an error, values with a definable value are replaced.

10.2.1 Image Format Control

Component ID value	The selected component ID is displayed.
Region selection	Width, height, offset x and y are displayed for the Scan3D Extraction 0.
Component selection	The component intensity can be deactivated.  **NOTE!** The range value cannot be deactivated.

10.2.2 Recording Control

Trigger mode	Continuous: After the acquisition start signal, each trigger signal results in a recording until a recording stop signal is issued.	
Trigger selection	Make the settings for the line start trigger:	
	Trigger mode	The trigger mode for the trigger source software can be activated or deactivated. If the trigger mode for the trigger source software is enabled, exactly one combined profile is evaluated with each software command.  **NOTE!** Other trigger settings must be set in the VisionApp 360 for the master unit (see section “9.2 Setting Up the Master Unit” on page 17).
	Trigger source	The trigger source software is displayed.

10.2.3 Transport Layer Control

User data size	Value in bytes that determines how much data per profile is transferred from the Vision-App 360 to the uniVision application.

10.2.4 Data Control

Chunk data selection	The encoder value and the frame counter can be transferred as chunk data with every height profile. The relevant chunk value must be activated for this.

10.2.5 3D Scan

3D scan output mode	The 3D scan is output as “CalibrateABC_PointCloud”.	
Number of profiles	Defines the number of profiles that are read out together. The value is set to 1 by default so that each profile in the uniVision application is evaluated separately. A value greater than 1 is currently not supported in uniVision.	
3D scan coordinate selection	The following coordinates are available:	
	Coordinate A	Corresponds to the X-value (cannot be changed)
	Coordinate B	Corresponds to the Y-value (adjustable scale, adjustable offset and adjustable coordinate source)
	Coordinate C	Corresponds to the Z-value (cannot be changed)

10.2.6 Device Control

Device type:	Device type (fixed)
Device recording type:	Device recording type (fixed)
Device model name:	Article number (fixed)
Device manufacturer name:	Manufacturer (fixed)
Device version:	Version (fixed)
Device serial number:	Serial number (fixed)
Device TL type:	Device type GigE Vision
Device temperature selection:	The temperature of the CPU is displayed for the selected device.

10.3 Further uniVision Modules

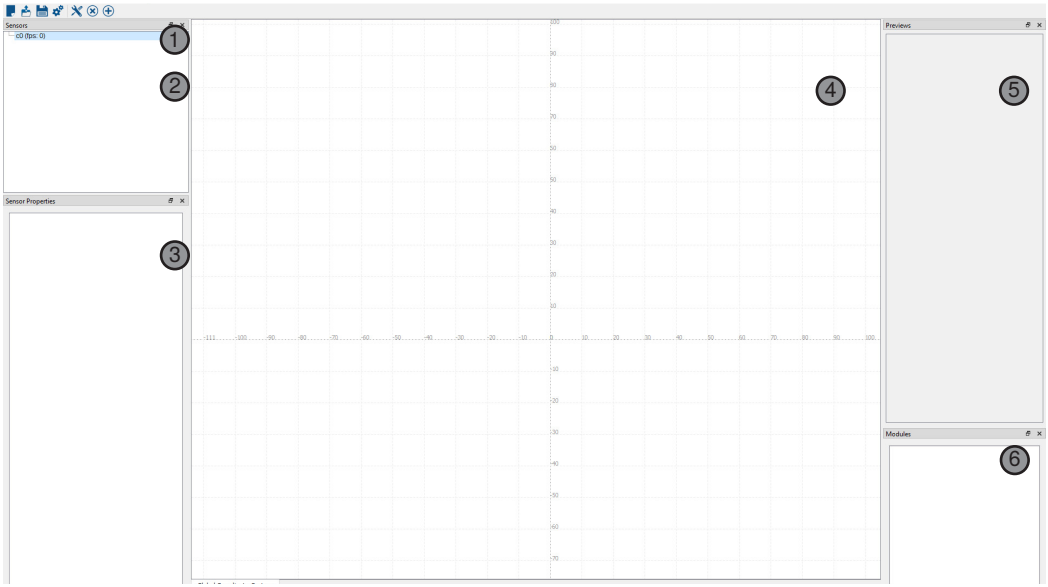
The combined height profile can then be evaluated flexibly with all available modules in uniVision and the results can be output on the control unit via the existing interfaces. The cross-sectional area of a 360° height profile can be determined in the module point cloud region, for example.

NOTE!
For specific module functions, the sorting of the combined height profile must be activated in the VisionApp 360 software (see section “9.5 Filtering and Sorting” on page 33). Different filters (point cloud module filter), the “Find edges” tool (point cloud module calculus) and the region calculation (point cloud module region) require a sorted height profile, for example.

10.4 Setting a Start Project

The saved uniVision project can be set up as a start project in the global settings of the uniVision application. To do this, open the device list in the uniVision software and click on Settings after the application has been selected.

11. VisionApp 360 User Interface



① = Menu bar and icons
② = Sensors: Created sensor group and sensors
③ = Sensor settings: Properties of the marked sensor
④ = Global coordinate system: Main window with coordinate system
⑤ = Previews: Display of measuring profiles and intensity distribution
⑥ = Modules: Activated software modules

11.1 Menu bar

Open	**Open a saved project.** **NOTE!** The GigE Vision module and the measurement must be stopped before the project change.
Save	**Save current project.** **NOTE!** Projects can be saved under any name. When the control unit or VisionApp 360 software is restarted, the last loaded project is opened.
Exit	Close the program. **NOTE!** The VisionApp 360 software is restarted automatically on the control unit after the software is closed.

11.2 Tools

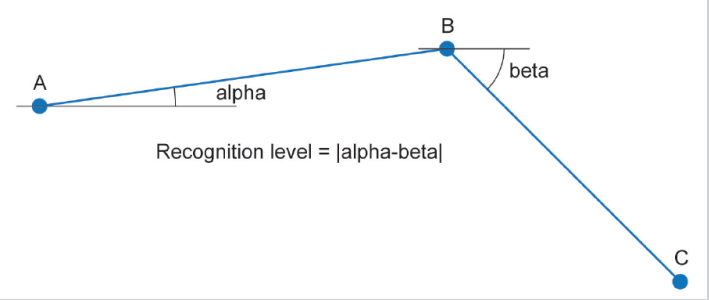
Undo chart	**Undo the last input.**	
Redo chart	**Redo the last undone input.**	
Preferences	Further options can be selected.	
	Run couple automatically	Start sensor group automatically.
	Reset sensors automatically	Reset sensors automatically.
	Use sequence indices	Display sequence indices.
	Enable login	Record log files. The log files are saved in the VisionApp 360 folder (under /media/card/projects/VisionApp360/resources)
	Enable log terminal	The log terminal under “Window” can be activated or deactivated.
	Simulate triggering sequence	Display the trigger signal via a flashing visual field.
	Enable global coordinate system	Display the coordinate system.
	Enable coordinates next to cursor	Display coordinates next to the cursor.
	Enable sensor preview	Display the measuring profile with intensities in the preview window.
	Job Manager TCP/IP Server	LIMA commands can be forwarded via the port 62232 (see section “12. LIMA Protocol” on page 47).
	Grid size	Width x in mm for the coordinate system

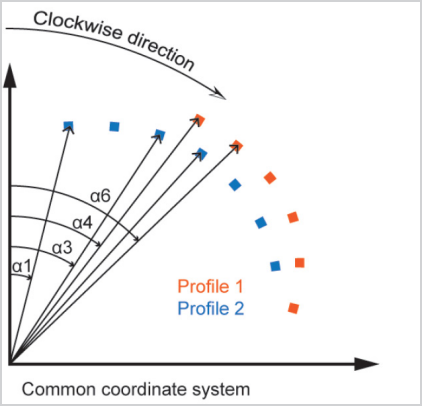
<table>
<tr><td>Sorting options</td><td colspan="2">Open the sorting and filter settings.

The filter options can be activated for the relevant selected sensor.</td></tr>
<tr><td></td><td>Median filter</td><td>The height profile is filtered according to the set median size.</td></tr>
<tr><td></td><td>Segmentation filter</td><td>The height profile is divided into segments. Filtering can be carried out based on the minimum size of a segment (minimum number of measuring points per segment) and the minimum distance between the measuring points so that segments that are too small are removed.

Remove double contour: In the case of ambiguous/overlapping contours, the shorter contour is deleted.

Noise filter: The “Recognition Level” (angle value between 1 and 180°) is used to determine which maximum angle value between 3 measuring points is accepted. If the angle is larger, point B is removed.

 
</td></tr>
</table>

Sorting options	The sorting options can be applied to the combined height profile.	
	Disable	Sorting is deactivated as standard.
	Angle sorting (fast)	For round objects, the fast sorting option can be selected. For this purpose, the measuring points must be clearly assigned in the coordinate system. Sorting is carried out from the center of the detected contour. 
	Square sorting (slow)	Suitable for all shapes. The combined height profile is scanned via squares and sorted in this way. The size of the square must be set accordingly. The smaller the value, the more precisely the contour is recorded. The value must be at least 10 times higher than sensor resolution.
		NOTE! Individual functions in the uniVision software require a sorted height profile. Details can be found in the operating instructions for the uniVision software.
Export sensor data	Export sensor data.	
Disable/ Enable features	Enable or disable password protection to prevent unwanted changes.	
Change password	Change the password to disable or enable changes.	

11.3 Window

Full screen	**Switch back and forth between full screen and window mode.**
Log terminal	**Open log terminal.**

11.4 Modules

Viewer module	Overview of all software modules
GigE Vision module	With the GigE Vision module, the combined height profiles can be output and transferred to the uniVision application (see section “9.6 GigE Vision Module” on page 34).

11.5 View

Sensors	Display sensors.
Sensor properties	Display sensor settings.
Previews	Display a preview of the sensors.
Modules	Display modules.

11.6 Help

Licensing	Open license dialog.
Manual	Open operating instructions.
About	Display software version.

12. LIMA Protocol

First, carry out the sensor settings and save the VisionApp 360 project. LIMA commands can then be used, for example, to load projects or to start or stop the measurement.

12.1 Establish a TCP/IP Connection

Establish a TCP/IP connection to the VisionApp 360 on the control unit:
- IP address of VisionApp 360
- Port: 62232

Example based on the control unit's default settings:
- IP address: 192168100251
- Port: 62232

NOTE!
To establish a LIMA connection, the "Job Manager TCP/IP server" must be activated under "Tools" -> "Preferences".

12.2 General Information on LIMA Communication

The following general points must be observed for LIMA communication:
- LIMA commands may only be sent sequentially to the VisionApp 360.
- Data consistency must be assured during communication.

12.3 LIMA Commands

12.3.1 Stop the GigE Vision Module

Command	<LIMA CMD="Module_SetNode" DIR="Request" MODULENAME="GigEVision" PATH="Start" VALUE="0" />
Description	Den GigE Vision Server stoppen.

12.3.2 Stop Measurement

Command	<LIMA CMD="Module_SetNode" DIR="Request" MODULENAME="couple_name" PATH="Start" VALUE="0" />
Description	Stops the measurement of the couple. Parameter: • Couple_name: Name des Couples Example with couple name “couple”: <LIMA CMD="Module_SetNode" DIR="Request" MODULENAME="couple" PATH="Start" VALUE="0" />  **NOTE!** Before stopping the measurement, the GigE Vision module must be stopped.

12.3.3 Load Project

Command	<LIMA CMD="Module_SetNode" DIR="Request" MODULENAME="PROJECT" PATH="SetFile" VALUE="Path to file name" />
Description	Load a project. Parameter: • Path to file name: Path information on the control unit where the project is located Example: <LIMA CMD="Module_SetNode" DIR="Request" MODULENAME="PROJECT" PATH="SetFile" VALUE="/media/card/projects/VisionApp360/resources/0.vcfg" />  **NOTE!** Before the project load command, the GigE Vision module and the measurement must be stopped.

12.3.4 Start Measurement

Command	<LIMA CMD="Module_SetNode" DIR="Request" MODULENAME="couple_name" PATH="Start" VALUE="1" />
Description	Starts the measurement of the couple. Parameter: • Couple_name: Name of the couple Example with couple name “couple”: <LIMA CMD="Module_SetNode" DIR="Request" MODULENAME="couple" PATH="Start" VALUE="1" />

12.3.5 Start the GigE Vision Modules

Command	<LIMA CMD="Module_SetNode" DIR="Request" MODULENAME="GigEVision" PATH="Start" VALUE="1" />
Description	Starts the GigE Vision Server.

13. Index of Changes Operating Instructions

Version	Date	Description/Change
1.0.0	17.06.2020	Initial version of documentation
1.0.1	08.07.2021	• Small bug fixes and extensions • Additions to bug fix 1.3.1
1.1.0	21.12.2021	• Description of the new functions for the VisionApp 360 plugin (V 1.4) • Integration of the LIMA interface description within the operating instructions • Small bug fixes and extensions
1.2.0	22.06.2022	• Additions to Modul GigE Vision on page 34 • Update of the software changelog
1.3.0	25.05.2023	• Description of the new functions for the plugin VisionApp 360 (V1.4.3)

14. Index of Changes Plugin

Version	Date	Description/Change
1.3.0	17.06.2020	First version (compatible with control unit firmware 2.2.x and 2.3.x)
1.3.1	28.06.2021	Small bug fixes (compatible with control unit firmware 2.4.x or higher)
1.4.1	21.12.2021	New functions (compatible from firmware 2.5.x of the control unit and from firmware 2.0.x of the 2D/3D profile sensors): • Save projects in VisionApp 360 with different names • Load projects in VisionApp 360 via LIMA command • Encoder configuration for triggering the sensors • Profile Enable to trigger the sensors • New sensor functions “Amount of peaks” and “Signal selection” **Bug fixes:** • Synchronization problems with GigE Vision modules have been resolved
1.4.2	22.06.2022	**Bug fixes:** • Compatability with firmware 2.2.0 of the 2D/3D Profile Sensors of the weCat3D series
1.4.3	25.05.2023	• Support of the BB1C5xx control units