



Software manual

ifm Vision Assistant
for 3D camera

UK

O3D301

O3D303

O3D311

O3D313

Contents

1	Preliminary note	4
1.1	Symbols used	4
1.2	Safety instructions	4
1.3	Further documents	4
1.4	Open source information	5
2	System requirements	6
2.1	Software	6
2.2	Hardware and accessories	6
3	Installation	7
3.1	Hardware	7
3.1.1	Measures to prevent multiple reflections	7
3.2	Software (ifm Vision Assistant)	8
3.2.1	Command line parameters	8
4	Start screen	10
4.1	Find device	11
4.1.1	Direct search	11
4.1.2	Manual connection	12
4.1.3	Options after connection	13
4.2	Recent	14
4.3	Replay	15
4.4	Wiring	16
4.5	Settings	18
4.6	Close	18
5	Structure of the user interface	19
5.1	Navigation bar	20
5.2	Status bar	20
5.3	Main area	20
6	Monitoring window	21
6.1	View options	21
6.2	2D view	22
6.2.1	Distance image	23
6.2.2	Amplitude image	23
6.2.3	Pixel properties	25
6.3	3D view	26
6.3.1	Distance image	27
6.3.2	Amplitude image	28
6.3.3	Views in the coordinate system	29
6.3.4	Type of display	30
6.3.5	Slider bar	32
6.4	Recording	33
6.5	Quit monitoring window	35
7	User defined mode	36
7.1	Activate user defined mode	36
7.2	Live image display in the user defined mode	37
7.2.1	Save image	37
7.2.2	Load image	37
7.2.3	Set live image view	38
7.3	Image settings	38
7.3.1	Set trigger source	39
7.3.2	Set resolution	39
7.3.3	Set max. background distance	40
7.3.4	Fast Frequency Mode	40
7.3.5	Set exposure mode	42
7.3.6	Set target frame rate	43
7.3.7	Apply filter	44
7.3.8	Clip 3D data	45
7.3.9	Operate several devices	46

7.4	Create output logic	47
7.4.1	General creation rules	47
7.4.2	Place logic blocks and assign signals	47
7.5	Configure interface	50
8	Application management	54
8.1	Activate application	55
8.2	Edit application	55
8.3	Add new application	55
8.4	Import application	56
8.5	Export application	56
8.6	Duplicate applications	57
8.7	Sort application list	57
9	Device setup	58
9.1	General information	59
9.1.1	Name and description	59
9.1.2	Password protection	60
9.1.3	Firmware update	60
9.1.4	Export settings	62
9.1.5	Import settings	62
9.1.6	Factory settings	64
9.1.7	Reboot device	65
9.2	Network	66
9.3	Interfaces	67
9.4	NTP	68
9.5	RTSP	69
10	Device information	70
10.1	Show device details	70
11	Appendix	71
11.1	Network settings	71
11.2	Glossary	74

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1 Preliminary note

This document describes the following tasks with the 3D camera of the O3D3xx product family and the ifm Vision Assistant software:

- Set the parameters of the camera
- Set up the applications with the ifm Vision Assistant
- Monitor the applications with the ifm Vision Assistant

As soon as an application has been installed on the 3D camera, the 3D camera can be used without the ifm Vision Assistant.

1.1 Symbols used

► Instructions

> Reaction, result

[...] Designation of keys and buttons

"..." Name of display text

→ Cross-reference



Important note

Non-compliance may result in malfunction or interference.



Information

Supplementary note

1.2 Safety instructions

Please read the operating instructions prior to set-up of the device. Ensure that the device is suitable for your application without any restrictions.

If the operating instructions or the technical data are not adhered to, personal injury and/or damage to property can occur.

1.3 Further documents

- Short instructions
- Operating instructions



The documents can be downloaded at:

www.ifm.com

1.4 Open source information

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We charge €30 for each request. Please write "source for product Y" in the memo line of your payment. Your request should include (i) the name of the covered binary, (ii) the name and the version number of the ifm product, (iii) your name and (iv) your return address.

This offer is valid to anyone in receipt of this information.

This offer is valid for at least three years (from the date you received the GLP/LGPL covered code).

2 System requirements

2.1 Software

Operating system

- Windows 7 (32/64 bits), Windows 8.1 (32/64 bits), Windows 10 (32/64 bits)

Application software

- ifm Vision Assistant 1.8.23



Other versions of the ifm Vision Assistant may contain changed or new functions which are not described in this software manual.

2.2 Hardware and accessories

Hardware:

- Camera of the O3D3xx product family
- PC with x86 or x64 type processor
- Screen: min. 1024 x 768 pixels, 32-bit colour depth

Accessories:

- Jumper for network connection (Ethernet) for setting parameters, 4 poles, M12 plug/RJ45 plug, art. no.: E11898 (2 m) or M12 plug/M12 plug, art. no.: E21138 (2 m)
- Cable for voltage supply and process connection, M12 socket, 5 poles, e.g. art. no. EVC070 (2 m, open cable end) or art. no. EVC071 (5 m, open cable end). This cable is used to connect the O3D3xx camera to the voltage supply.
- Power supply 24 V, 1.6 A, peak current min. 2.4 A
- Mounting set (clamp mounting) for mounting the camera, e.g. art.no. E3D301

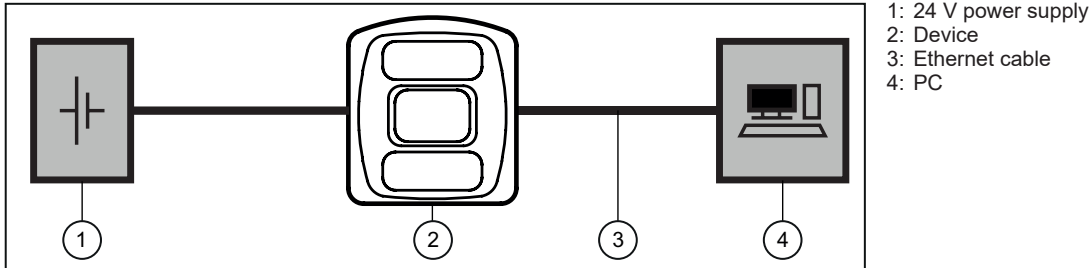


More information about available accessories is given at www.ifm.com.

3 Installation

3.1 Hardware

- ▶ Connect device to the voltage supply.
- ▶ Connect device to the Ethernet interface of the PC using the network cable.



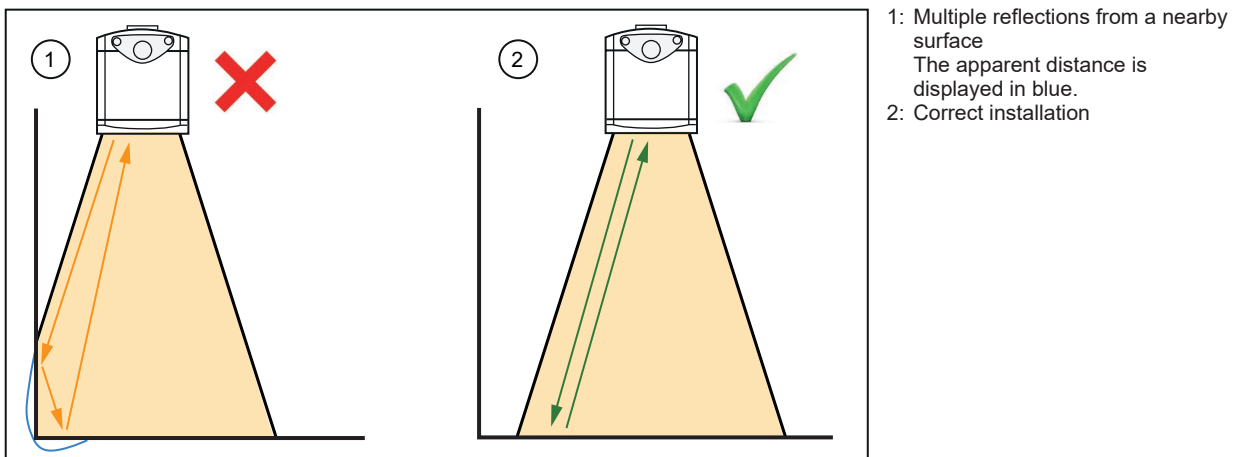
Further information about the electrical connection and the correct pin connection
→ Brief instructions or operating instructions.

3.1.1 Measures to prevent multiple reflections

When the following objects are measured, multiple reflections may occur:

- Very shiny surfaces
- Inner walls of hollow bodies (e.g. boxes)
- Surfaces at short distances to the device (e.g. walls)

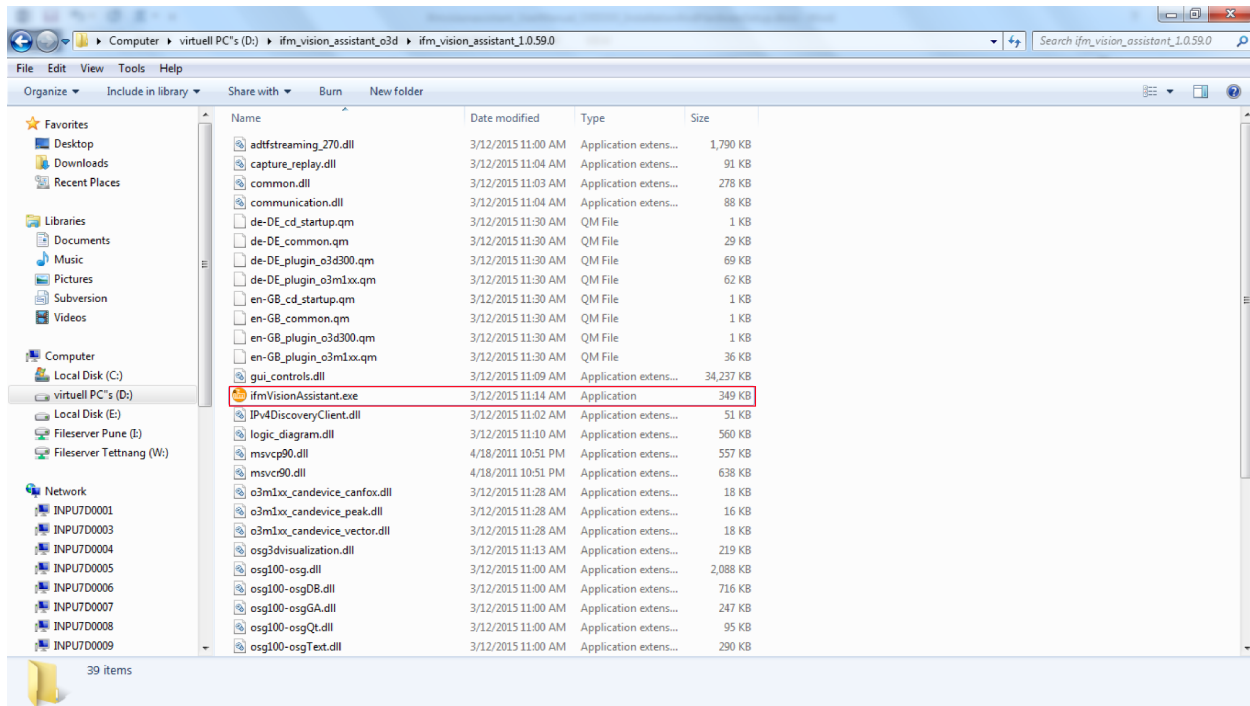
Multiple reflections increase the time of flight of the light, thus making the distance to the device seem longer.



- ▶ Install the device at a sufficient distance to surfaces.
- ▶ Do not put the device on a flat surface (e.g. a table to demonstrate the device).

3.2 Software (ifm Vision Assistant)

- ▶ Insert the data carrier with the ifm Vision Assistant software.
Alternatively: Download the ifm Vision Assistant software from the ifm website: www.ifm.com
- ▶ Copy the zip file "ifmVisionAssistant" to an appropriate directory on the PC and unzip.
- ▶ Start the "ifmVisionAssistant" application file.



- > The start screen of the ifm Vision Assistant opens.
- ▶ If the start screen does not appear after 5–10 seconds, check if the software requirements are met and if all files are properly unzipped.

3.2.1 Command line parameters

Starting the ifm Vision Assistant can be influenced with command line parameters.

Use command line parameters when starting the ifm Vision Assistant via the prompt:

- ▶ Enter parameter after "ifmVisionAssistant.exe" and separate it by a space.
- > Example: "ifmVisionAssistant.exe -log"

Use command line parameters when starting the ifm Vision Assistant via the graphic user interface Windows:

- ▶ Right-click the shortcut of the [ifm Vision Assistant].
- ▶ Click [Properties] in the submenu.
- ▶ Click the tab [Shortcut].
- ▶ Click the field [Target] and move the cursor to the end of the line.
- ▶ Enter space followed by the command line parameter.
- ▶ Click the button [OK].

The following command line parameters are available:

Command line parameter	Description
-disableclosebtn	Deactivates the button [Close] on the start screen.
-log	Creates a log file for a detailed fault analysis. The log file is saved in the following folder: "%APPDATA%\ifm electronic\ifmVisionAssistant\logs"
-autoconnect filename.xml	Automatically connects to a device. The file "filename.xml" must contain the following XML code: <pre><?xml version="1.0" encoding="UTF-8"?> <sensor> <sensorType>O3D3xx</sensorType> <addressType>IP</addressType> <name>My_sensor</name> <address> <ip>192.168.0.69</ip> <pcic_port>50010</pcic_port> <web_port>80</web_port> <mac>00:02:01:21:b9:ee</mac> </address> </sensor></pre>
-geometry [screen]:[width]x[height]+[x]+[y]	Sets the window size and position of the ifm Vision Assistant (incl. window frame). The minimum window size is 1024x768 pixels. Example: "-geometry 1:1380x768+0+0" The window is placed on screen 1 (screen=1). The window size including the window frame is set to 1380x768 (width=1380 and height=768). The window is placed at the top left (x=0 and y=0). When negative values are entered for the window position x and y the opposite corner is used as zero point. Example: "+0+0" window at the top left "-0+0" window at the top right "+0-0" window at the bottom left "-0-0" window at the bottom right
-frameless	Starts the ifm Vision Assistant without the native window frame.

4 Start screen

On the start screen, the basic functions of the ifm Vision Assistant can be selected.



Basic functions of the start screen:

Symbol	Name	Function	Device must be connected
	Find sensor	Connection to the newly connected device. Searches for connected devices and displays a selection list of the devices found (→ „4.1 Find device“).	Yes
	Recently used	Connection to a device which was already connected before and may already be configured. Opens a selection list of the devices which were already connected before (→ „4.2 Recent“).	Yes
	Replay	Plays back recorded sequences (→ „4.3 Replay“).	No
	Wiring	Display of the wiring of the voltage supply. The display is used to simplify the connection during set-up (→ „4.4 Wiring“).	No
	Settings	Language and image mode setting of the user interface (→ „4.5 Settings“).	No
	Close	Closes the ifm Vision assistant.	No

4.1 Find device

With this function, it is possible to search for connected devices or to connect manually to a connected device.

- Ensure that the device and the PC are ready for operation and that there is an Ethernet connection.
- > Without Ethernet connection, the functions of the device cannot be accessed.

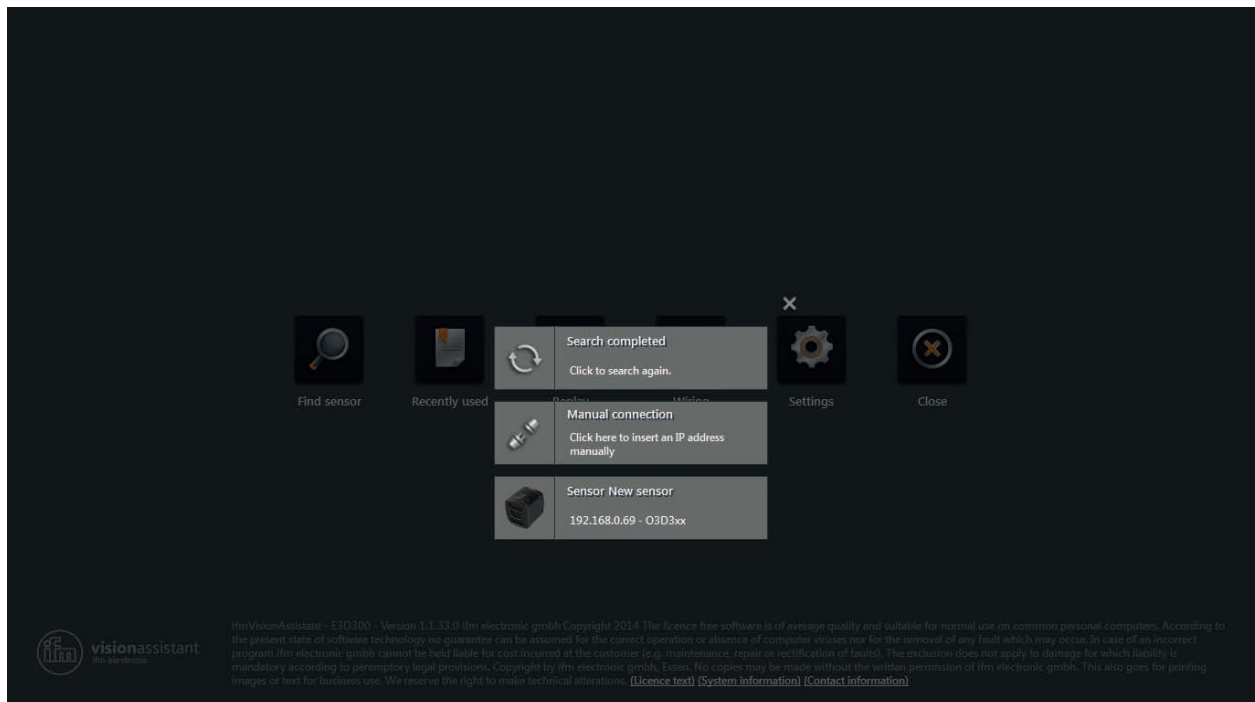


The following ports must be open (if necessary, adapt the firewall settings):

- UDP: 3321
- TCP/HTTP: 80 and 8080
- TCP: 50010

4.1.1 Direct search

- Click .
- > The ifm Vision Assistant searches for connected devices via Ethernet.
- > All devices found are shown in a selection list.
- Click the button of the device found to connect.



- If the ifm Vision Assistant does not find a device automatically:
 - Check if the device is correctly connected and ready for operation and click [Search completed] to start a new search.
 - Directly connect the device to the PC without any additional network devices in the connection (e.g. router).
 - Click [Manual connection] and enter the IP address manually (→ „4.1.2 Manual connection“).

Buttons and messages after the direct search:

Button & message	Description
 Search completed Click to search again.	Starts a new search.
 Manual connection Click here to insert an IP address manually	Enables to enter the IP address manually (→ „4.1.2 Manual connection“).
 Sensor New sensor 192.168.0.69 - O3D3xx	Displays information such as IP address and name of the device. Connects the device and continues according to the application data (→ „4.1.3 Options after connection“).
 No device found In case Windows is using DHCP, a device might only be found after waiting a few minutes.	If the IP address is retrieved automatically (via DHCP), it may take 1–2 minutes for the device to be connected and ready for operation.

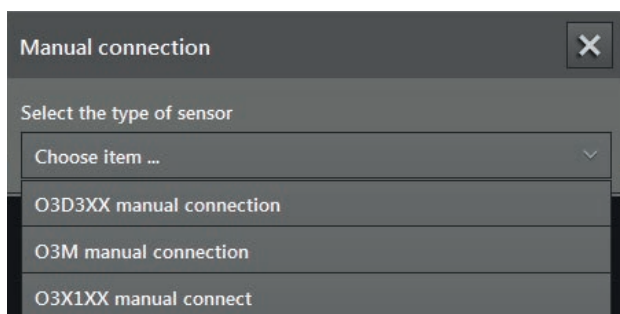


With the key combination Ctrl+C the text of a message is copied to the clipboard. This works with all messages displayed in the ifm Vision Assistant.

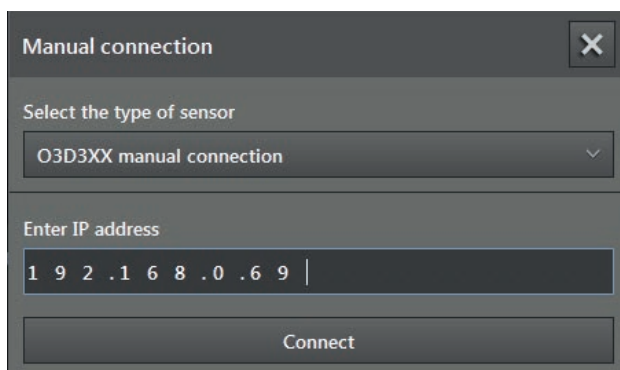
4.1.2 Manual connection

If the ifm Vision Assistant does not automatically connect to the device, the IP address can be entered manually via the button [Manual connection].

- Click .
- Click [Manual connection].
- > The window "Manual connection" opens:



- Select "O3D3XX manual connection".
- Enter the IP address of the device (default: 192.168.0.69).



- Click [Connect].
- 
 - The IP addresses of the device and PC with ifm Vision Assistant must be in the same subnet.
 - If the IP address is to remain unchanged as device address the device must be rebooted after set-up (→ „9.1.7 Reboot device“).

4.1.3 Options after connection

If connection to the device was successful, the ifm Vision Assistant continues with one of the following options depending on the state of the device:

State	Option
No application available	Edit window opens (→ „8 Application management“).
Active application available	Monitoring window opens (→ „6 Monitoring window“).
At least one application is available, but no application is active	Application management opens (→ „8 Application management“).
Error	Error message is displayed.

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Default application

A default application is available in a new camera. More applications can be created in the application management (→ „8 Application management“).

Active application available

If an application for the device is available and activated, the ifm Vision Assistant starts with the monitoring window (→ „6 Monitoring window“). To change parameters, the application must be stopped.

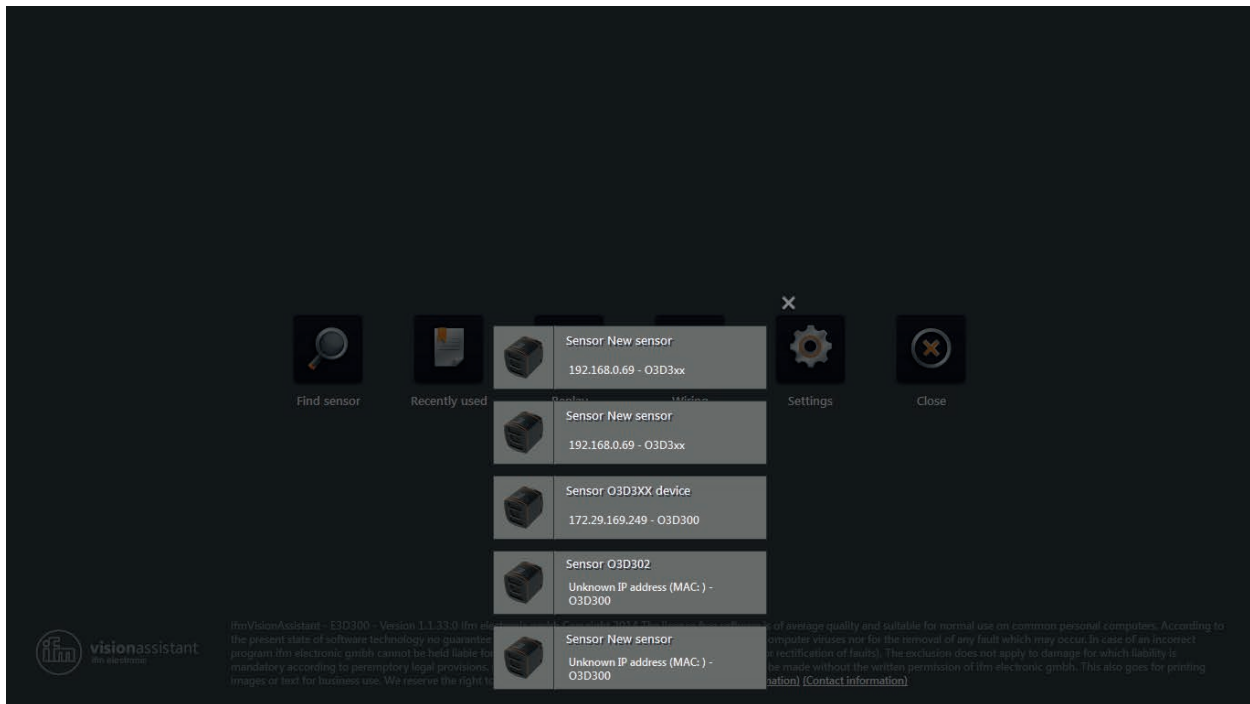
Inactive application available

If applications are available on the device but none is activated, the ifm Vision Assistant starts with the application management (→ „8 Application management“). The application management is also opened if, for example, the application activated last was deleted.

4.2 Recent

This function opens a selection list of the devices already connected before.

► Click  .

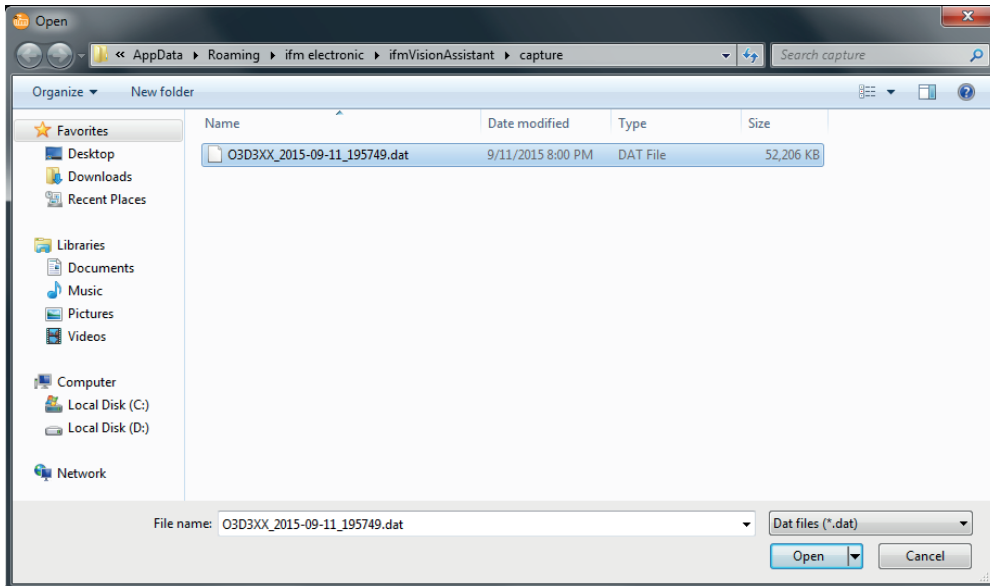


- Ensure that the corresponding device is connected to the PC via Ethernet or available in the network.
- Click the device in the selection list.
- > The ifm Vision Assistant connects to the device (→ „4.1.3 Options after connection“).

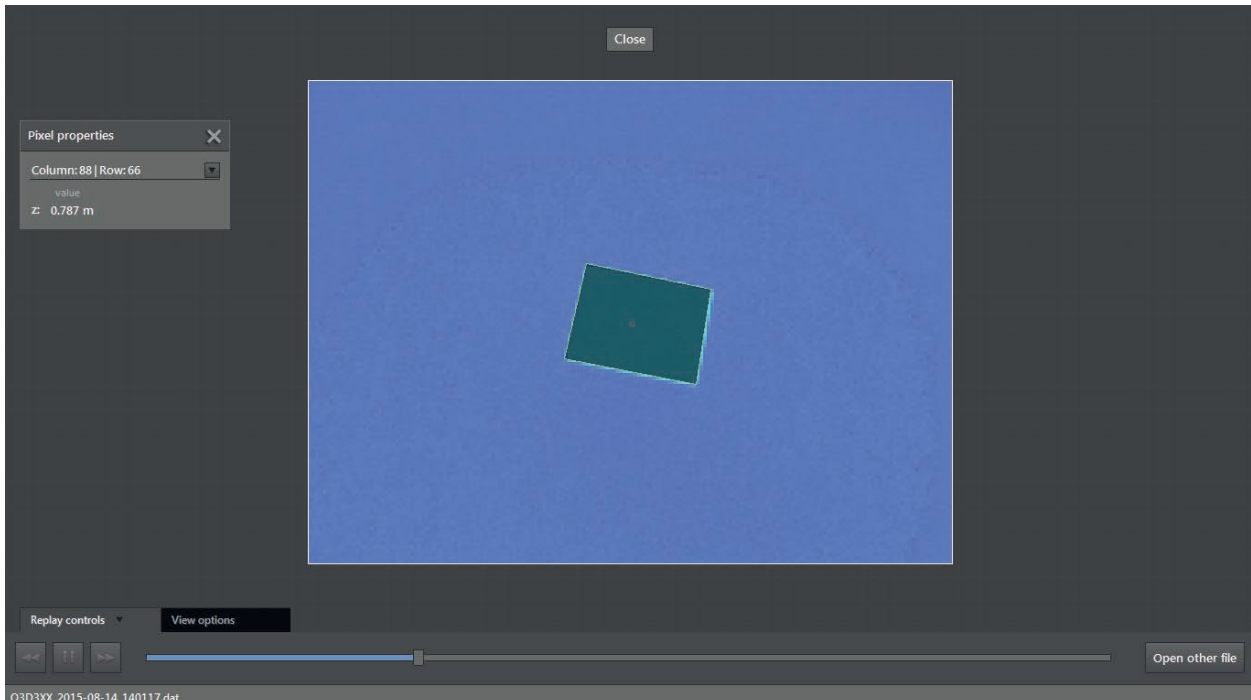
4.3 Replay

With this function, data recorded before can be viewed (→ „6 Monitoring window“). A connection to a device is not necessary.

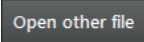
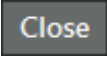
- Click .
- Select the requested file (*.dat) and click [Open].



- > The playback screen appears.



Options on the playback screen:

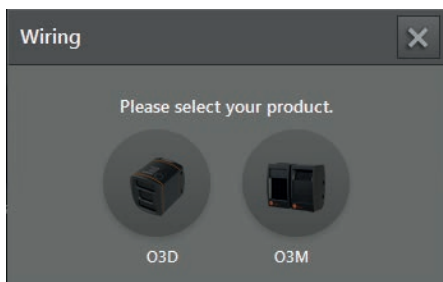
Tab	Option / button	Description
Replay options	 pause	Stops playback.
	 previous	Stops playback and shows the previous image.
	 next	Stops playback and shows the next image.
	 start	Continues playback.
	Progress bar	Indicates the current position in the recording. By clicking a position in the progress bar, playback continues at the corresponding image.
		Opens a window to select another file.
View options	—	→ „6.1 View options“
—		Closes the playback screen and opens the start screen.

- Click [Close] to return to the start screen.

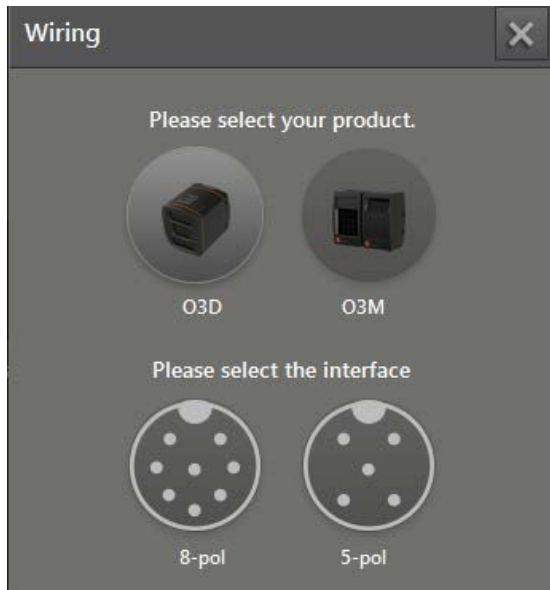
4.4 Wiring

This function allows correct wiring of the voltage supply of the 5-pole connector.

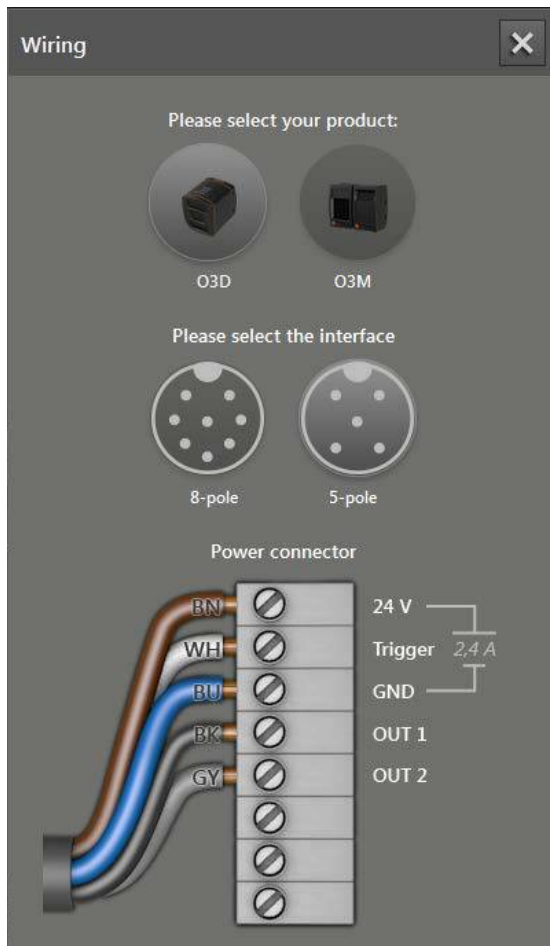
- Click .
- Select article [O3D].
- > Only necessary if a new device has been selected.



- Select interface type [5 poles] (only necessary if a new device has been selected).



> The wiring of the voltage supply of the selected cable is displayed.

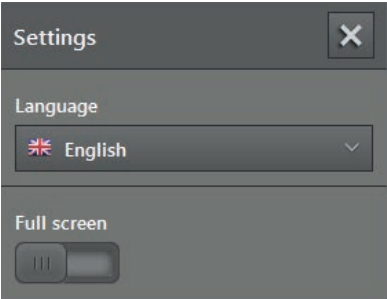


4.5 Settings

You can use this function to change the language and to switch between full screen and window view.

► Click  .

> The window "Settings" is displayed.



Options in the settings window:

Field	Option	Description
Select language	English	Selection of the available languages. "English" is set by default.
	German	
	etc.	
Full screen	 On	Switches between full screen (on) and window view (off). Full screen is set by default.
	 Off	

 With the F11 key, you can switch between full screen and window view at any time.

4.6 Close

► Click  to close the ifm Vision Assistant.

5 Structure of the user interface

The screen of the ifm Vision Assistant has the following areas:

- **Navigation bar:**
The requested option is selected in the navigation bar on the left (→ „5.1 Navigation bar“).
- **Main area:**
The main area shows the selected option or application.
- **Status bar:**
The status bar at the bottom of the screen shows the status information of the device.



- 1: Navigation bar
2: Main area
3: Status bar

5.1 Navigation bar

The navigation bar on the left features the following options:

Button	Name	Description
	Monitor	Opens a 2D or 3D view and shows the current device data (→ „6 Monitoring window“).
	Applications	Opens an overview of the applications (→ „8 Application management“). Manage and configure applications.
	Device setup	Opens the device setup (→ „9 Device setup“). For device settings that are independent of the applications.
	Device information	Shows basic information (e.g. hardware, firmware, device status) (→ „10 Device information“).
	Settings	Opens the window "Settings" (→ „4.5 Settings“).
	Disconnect	Disconnects the ifm Vision Assistant from the device. The ifm Vision Assistant returns to the start screen.

5.2 Status bar

The status bar at the bottom of the screen gives the following information:

- Shows the window name which is currently open, e.g. "monitoring window"
- Temperature information of the device, e.g. "Temperature normal"
- Name and IP address of the device, e.g. "New sensor (192.168.0.69)"
- Firmware version of the device, e.g. "1.6.2114"
- Name or status of the running application, e.g. "test application" or "stopped"
- Image processing time of the device, e.g. "232 ms"

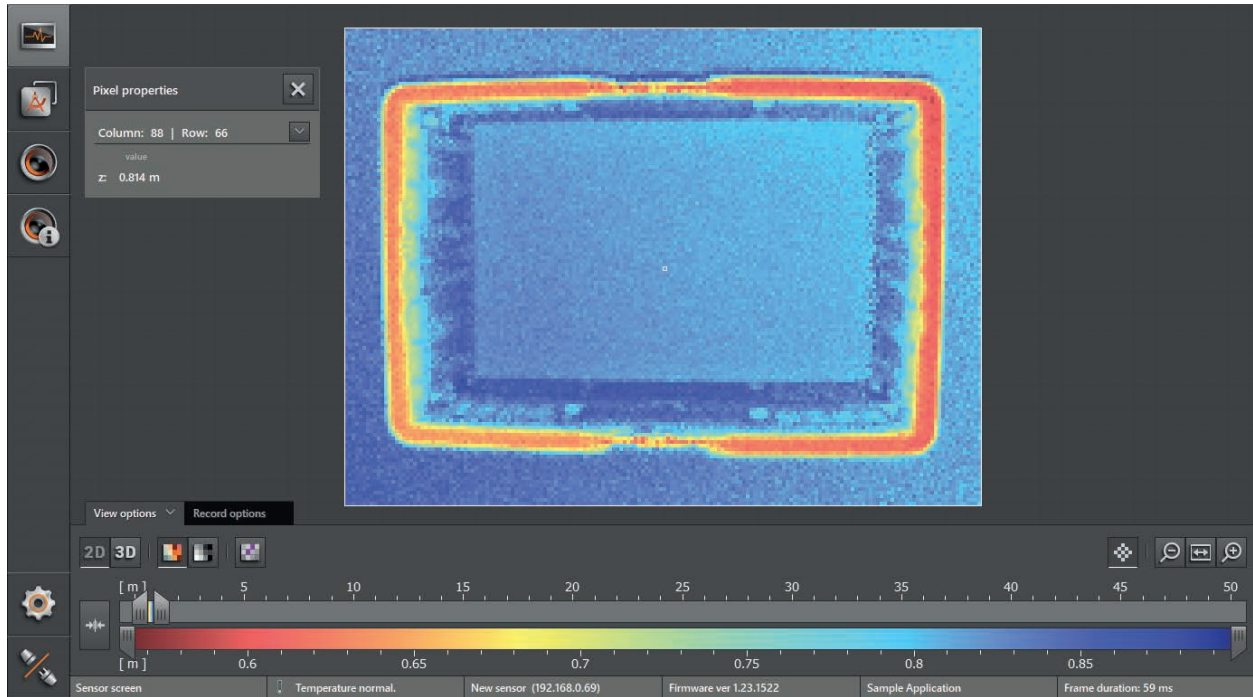
5.3 Main area

While the device is operated, the main area shows the monitoring window (→ „6 Monitoring window“). When the device is set up, the main area shows the corresponding screen pages.

6 Monitoring window

The software will continue with the monitoring screen if a connection to the device is established and an active application is available. The device runs in the operating mode. In the monitoring window, the active application can be monitored but not interrupted or changed.

► Click .



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The following tabs are under the live image of the device:

- [View options] (→ „6.1 View options“)
- [Record options] (→ „6.4 Recording“)

6.1 View options

► Click **2D** or **3D** to select the requested view.

Button	Name	Description
2D	2D view	The central view shows the device data as a 2D visualisation (→ „6.2 2D view“).
3D	3D view	The central view shows the device data as a 3D visualisation (→ „6.3 3D view“).



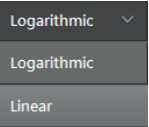
The figures in the following chapters are examples. Depending on the objects and the individual settings, the representation may differ significantly.

6.2 2D view

► Click **2D** to display the 2D view.

► Set 2D view.

The following setting options are available in the tab "View options":

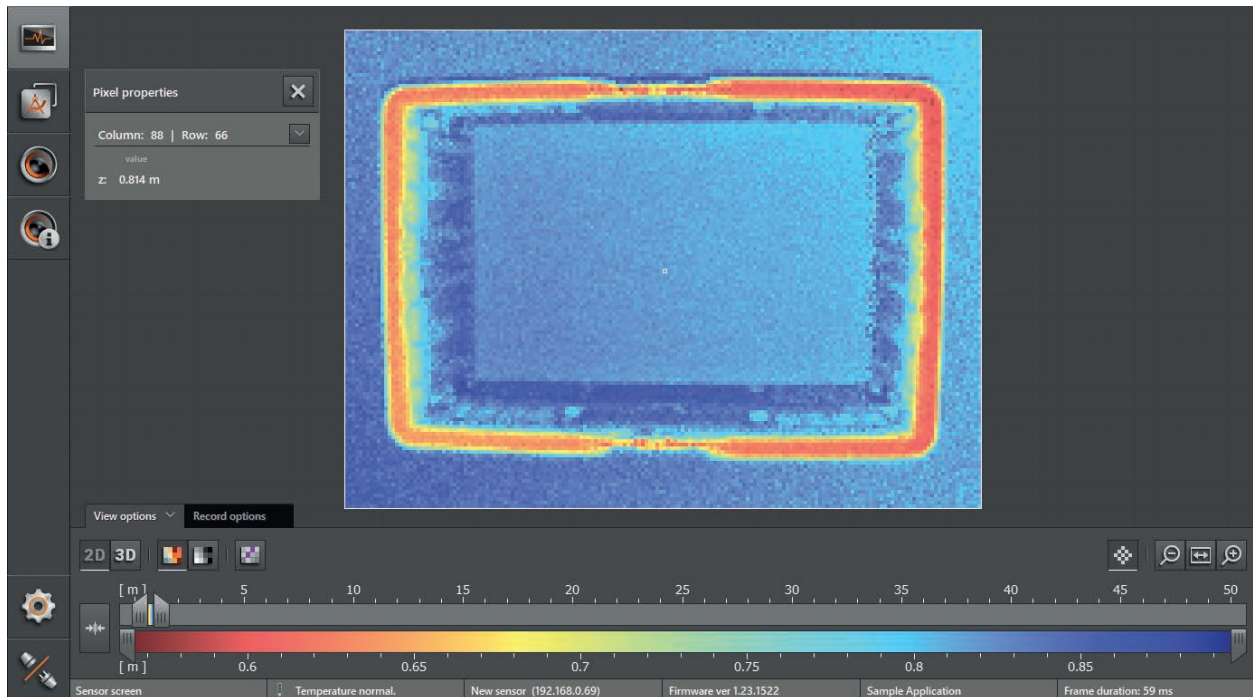
Button	Name	Description
	Distance image	Displays the pixels in the 2D view in relation to the distance values in colour.
	Amplitude image	Displays the pixels in the 2D view in relation to the amplitude values in shades of grey (brightness).
	Logarithmic	Displays the amplitude values of the 2D view in logarithmic shades of grey (only available for the amplitude image).
	Linear	Displays the amplitude values of the 2D view in linear shades of grey (only available for the amplitude image). The "linear" view is particularly helpful to set up the image.
	Show invalid pixels	If the function is active, invalid pixels are shown in "pink". If the function is deactivated, invalid pixels are shown in "black" in the distance image and in "blue" in the amplitude image.
	Pixel properties	Shows the window for the pixel properties.
	Zoom out	The 2D view is zoomed out.
	Zoom reset	Sets the image zoom to the default view.
	Zoom in	The 2D view is zoomed in.
	Rescale	Automatically sets the colour range to a suitable area. The settings of the slider bars are rejected.



The display settings (e.g. [Logarithmic] or [Linear]) only change the calculation and type of display. The application itself is not affected.

6.2.1 Distance image

► Click  to display the distance image.



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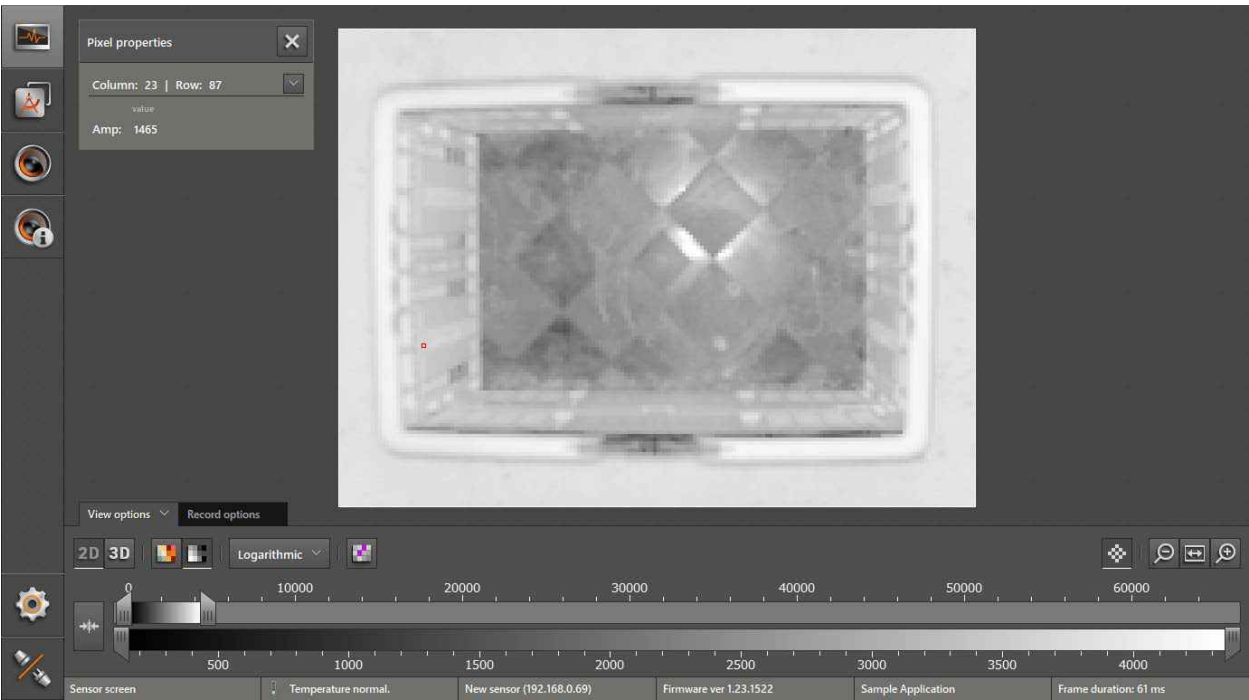
6.2.2 Amplitude image

► Click  to display the amplitude image.

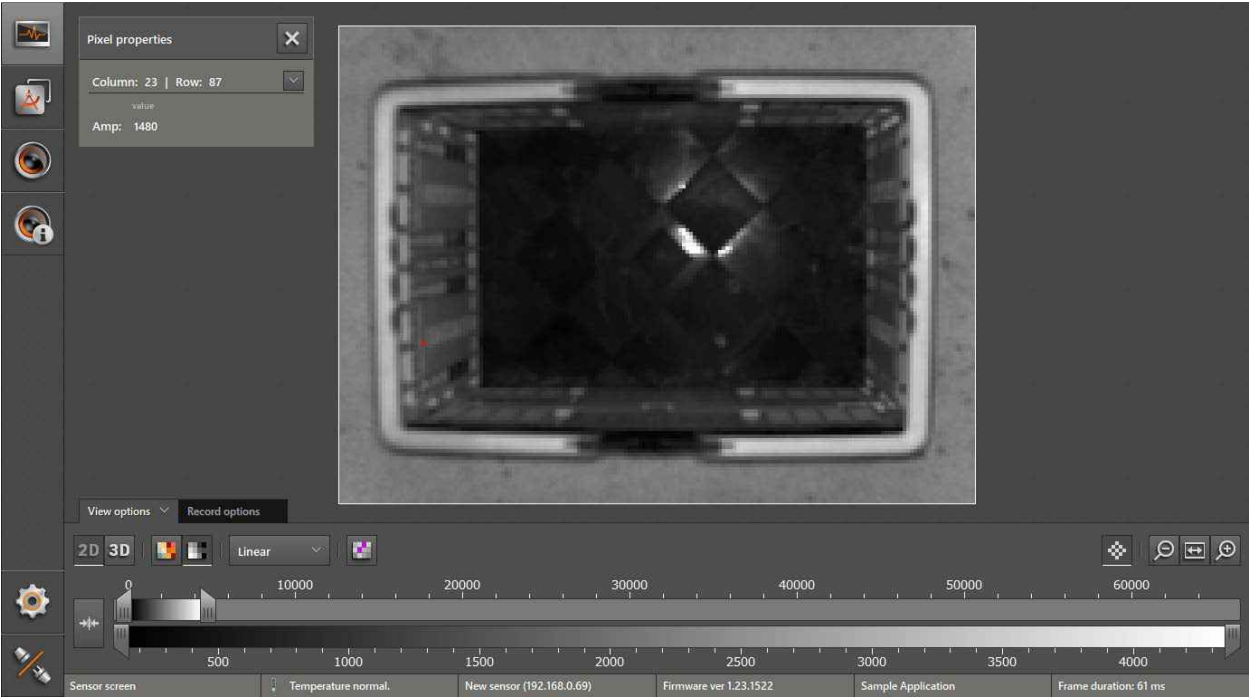


► Select the requested view via [Logarithmic] or [Linear].

Logarithmic view:



Linear view:

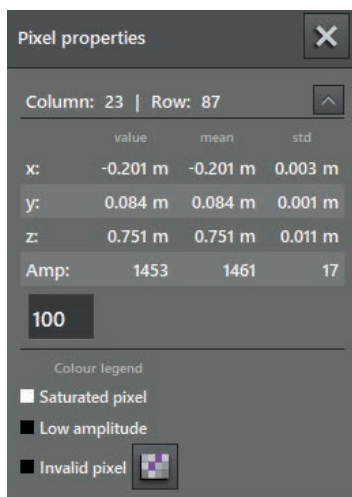


6.2.3 Pixel properties

In the 2D view the "pixel properties" display information about the selected pixel:

Field	Description
Column Row	Indicates the number of columns and rows of a specific pixel.
x	x coordinate of the selected pixel: current measured value, mean value and deviation in metres.
y	y coordinate of the selected pixel: current measured value, mean value and deviation in metres.
z	z coordinate of the selected pixel: current measured value, mean value and deviation in metres.
Amp	Amplitude of the selected pixel.
Standard deviation	Via the numerical value the device determines the standard deviation of the selected pixel (preset value: 100).
Colour legend distance image	White: saturated pixels.
	Black: low amplitude.
	Pink: invalid pixel. If the "Show invalid pixels" button is deactivated, the invalid pixels are displayed in black.
Colour legend amplitude image	Red: saturated pixels.
	Blue: low amplitude.
	Pink: invalid pixel. If the "Show invalid pixels" button is activated, the invalid pixels are displayed in "blue".

► Click  to open the "Pixel properties" window.



Show pixel properties:

- Click the pixel in the 2D view.
- > Position and z coordinate of the pixel are indicated in metres.
- Click  to open extended information.
- Click  to close extended information.

Invalid pixels

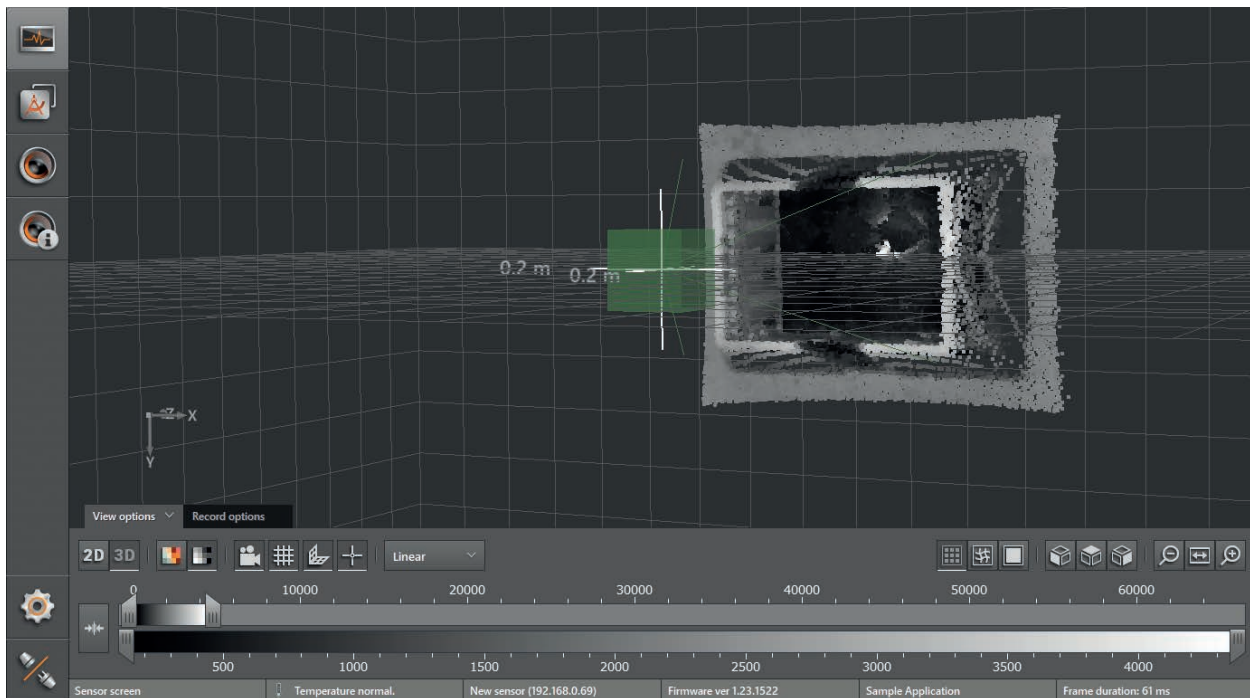
The invalid pixels are displayed with the button  in "pink".

If the function is deactivated, invalid pixels are shown in "black" in the distance image and in "blue" in the amplitude image.



The display of invalid pixels is deactivated by default.

6.3 3D view



► Click **3D** to show the 3D view.

► Set 3D view.

The following setting options are available in the tab "View options":

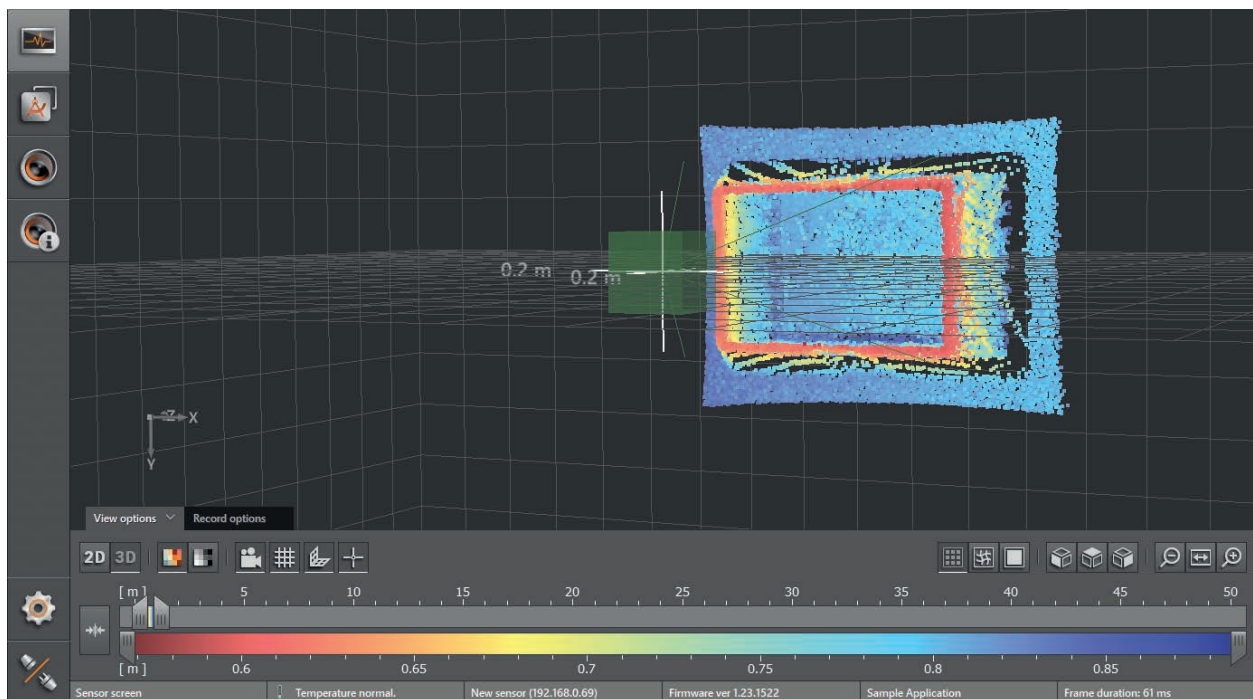
Button	Name	Description
	Distance image	Displays the pixels in the 3D view in relation to the distance values in colour.
	Amplitude image	Displays the pixels in the 3D view in relation to the amplitude values in shades of grey (brightness).
	Device position	Shows and hides the device position and angle of view in the 3D view.
	Grid	Shows and hides the plane grid (xz plane) in the 3D view.
	Background grid	Shows and hides a spatial grid (xy plane and yz plane) in the 3D view.
	Origin	Shows and hides the origin of the coordinate system in the 3D view.
 Logarithmic Logarithmic Linear	Logarithmic	Displays the amplitude values of the 3D view in logarithmic shades of grey (only for the amplitude image).
	Linear	Displays the amplitude values of the 3D view in linear shades of grey (only for the amplitude image).
	Points	Shows the data as a point cloud.
	Mesh	Shows the data as a mesh.
	Surface model	Shows the ascending gradients as colours.

Button	Name	Description
	Rear view	Rotates the 3D view to the xy plane.
	Top view	Rotates the 3D view to the xz plane.
	Side view	Rotates the 3D view to the yz plane.
	Zoom out	The 3D view is zoomed out.
	Zoom reset	Resets the image zoom to the default view.
	Zoom in	The 3D view is zoomed in.

 The settings of the view (e.g. logarithmic or linear) only change the calculation and type of display. The application itself is not affected.

6.3.1 Distance image

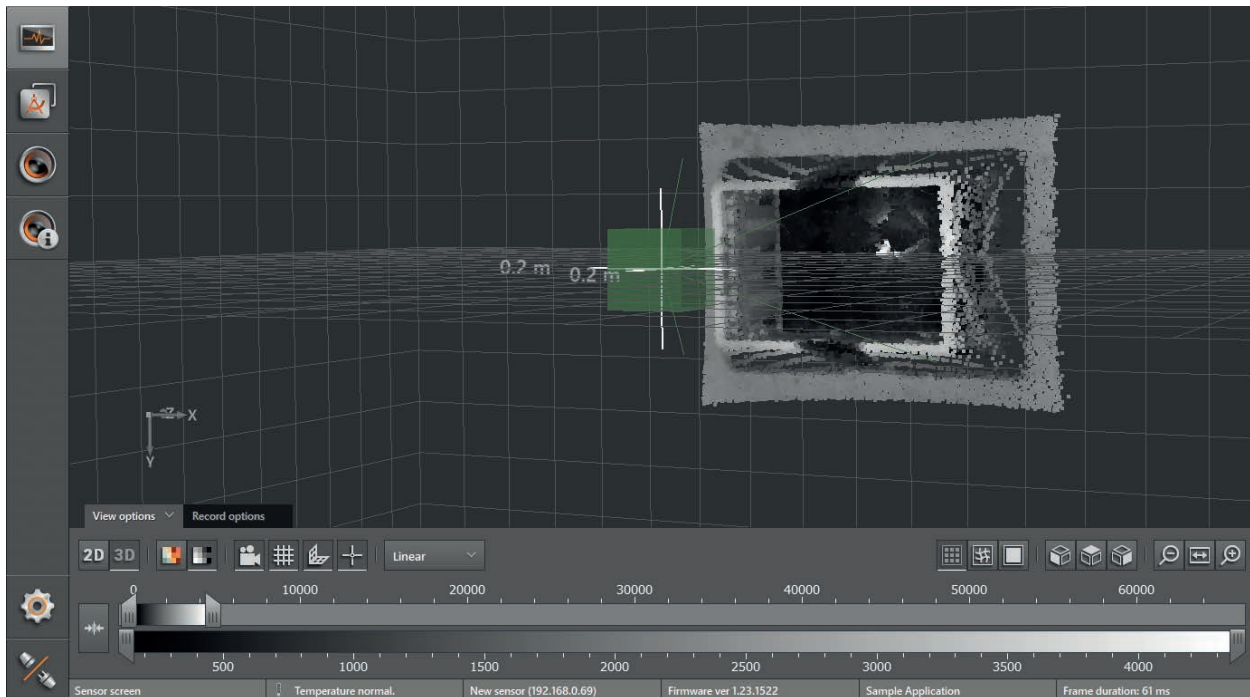
► Click  to display the distance image.



Representation in the 3D image	Description
Pixel position	Space coordinate of the pixel (x, y, z coordinates).
Pixel colour	Distance (z coordinate). The colour shade depends on the measured distance of the pixel and the setting of the colour scale (→ „6.3.5 Slider bar“).
Red	Value of the z coordinate $\leq$ minimum of the set colour scale.
Blue	Value of the z coordinate $\geq$ maximum of the set colour scale.

6.3.2 Amplitude image

► Click  to display the amplitude image.



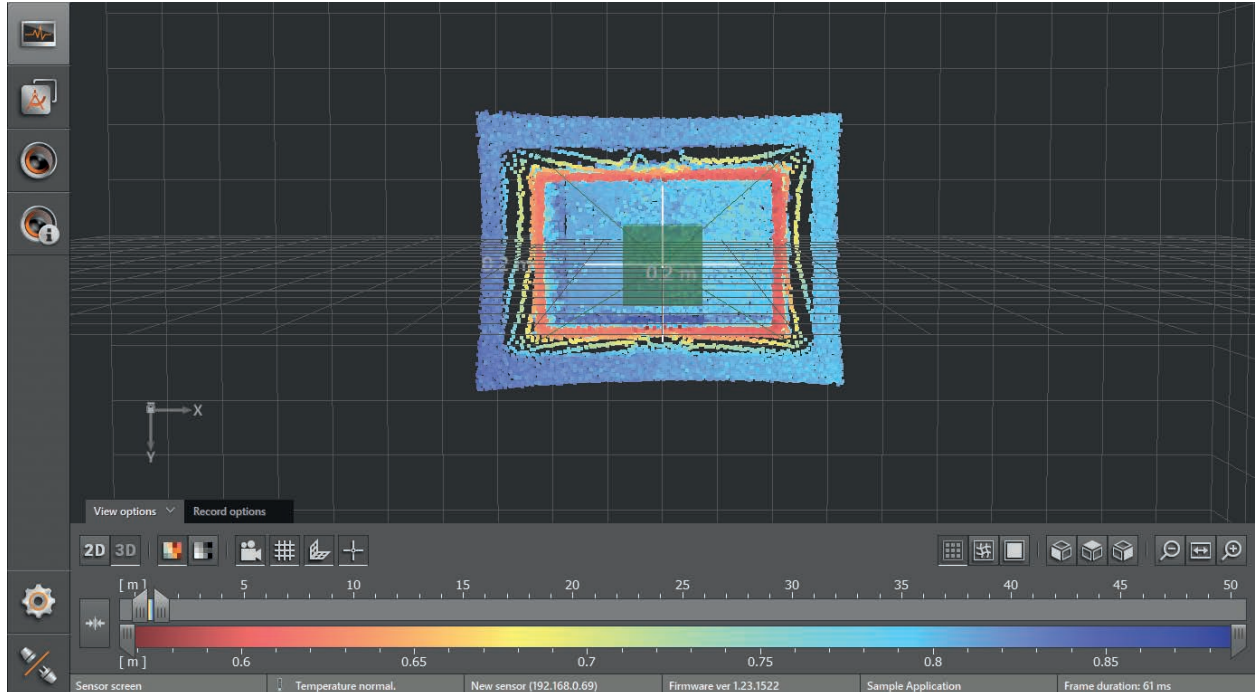
► Select the requested view via [Logarithmic] or [Linear].

Representation in the 3D image	Description
Pixel position	Space coordinate of the pixel (x, y, z coordinates).
Pixel colour (grey scale)	Amplitude value. The brightness follows the measured amplitude and the setting of the grey scale linearly or logarithmically (→ „6.3.5 Slider bar“).
Black	Amplitude value $\leq$ minimum of the set scale.
White	Amplitude value $\geq$ maximum of the set scale.

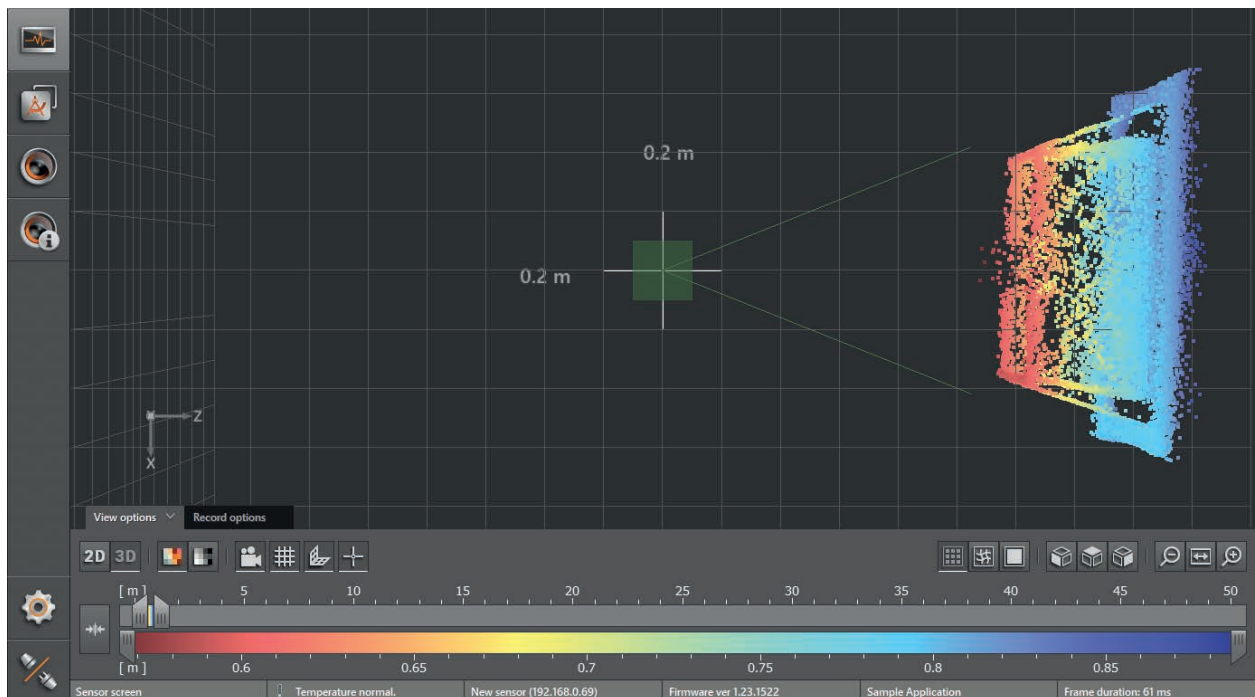
6.3.3 Views in the coordinate system

The 3D view can be rotated to a preset view in the coordinate system.

- Click  to show the rear view.
- > The object is displayed on the xy plane.

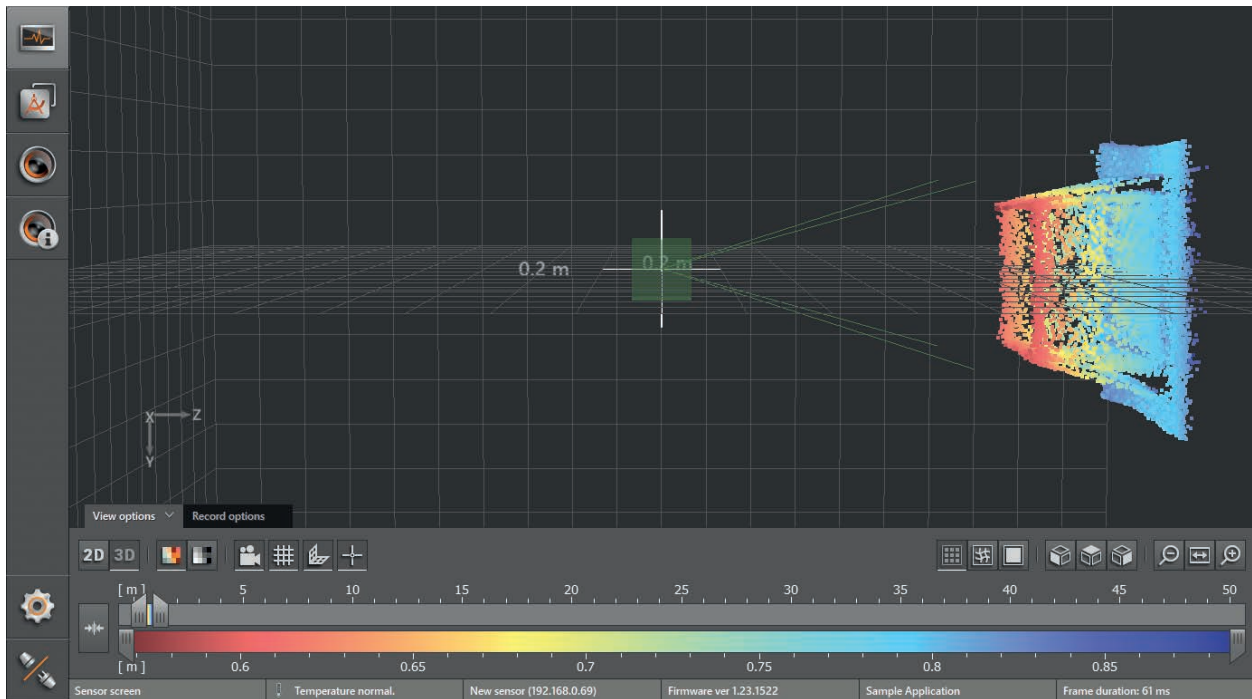


- Click  to show the top view.
- > The object is displayed on the xz plane.



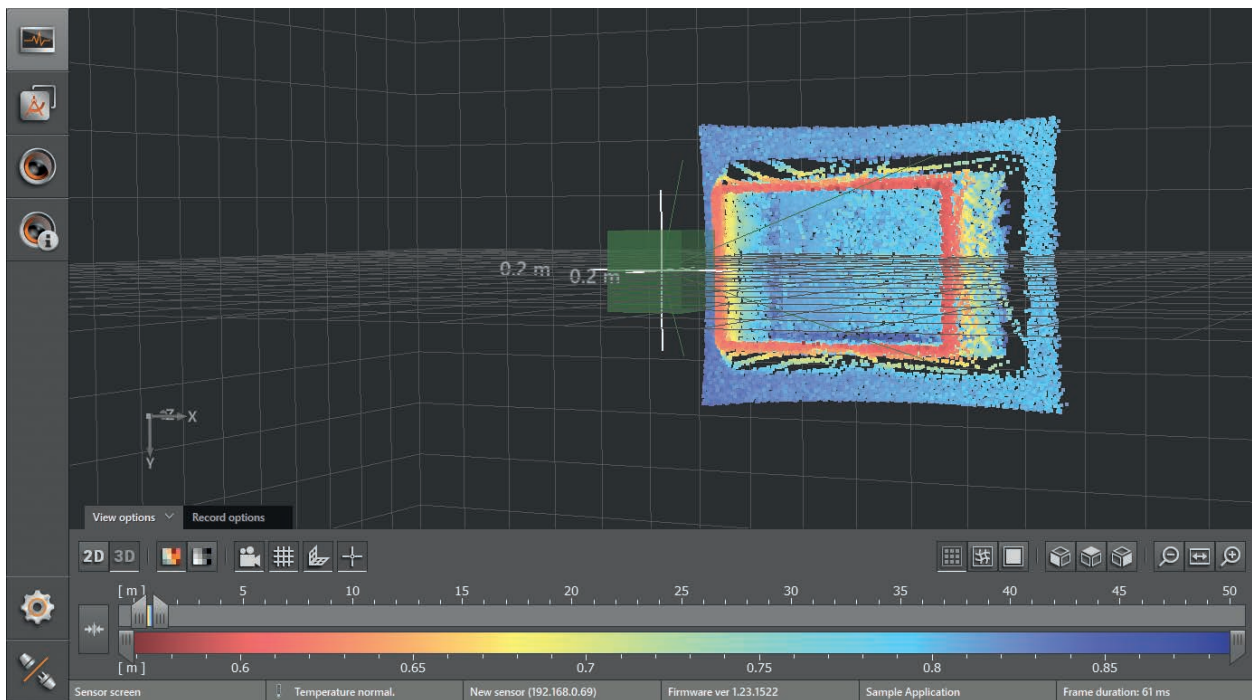
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- Click  to show the side view.
- > The object is displayed on the yz plane.

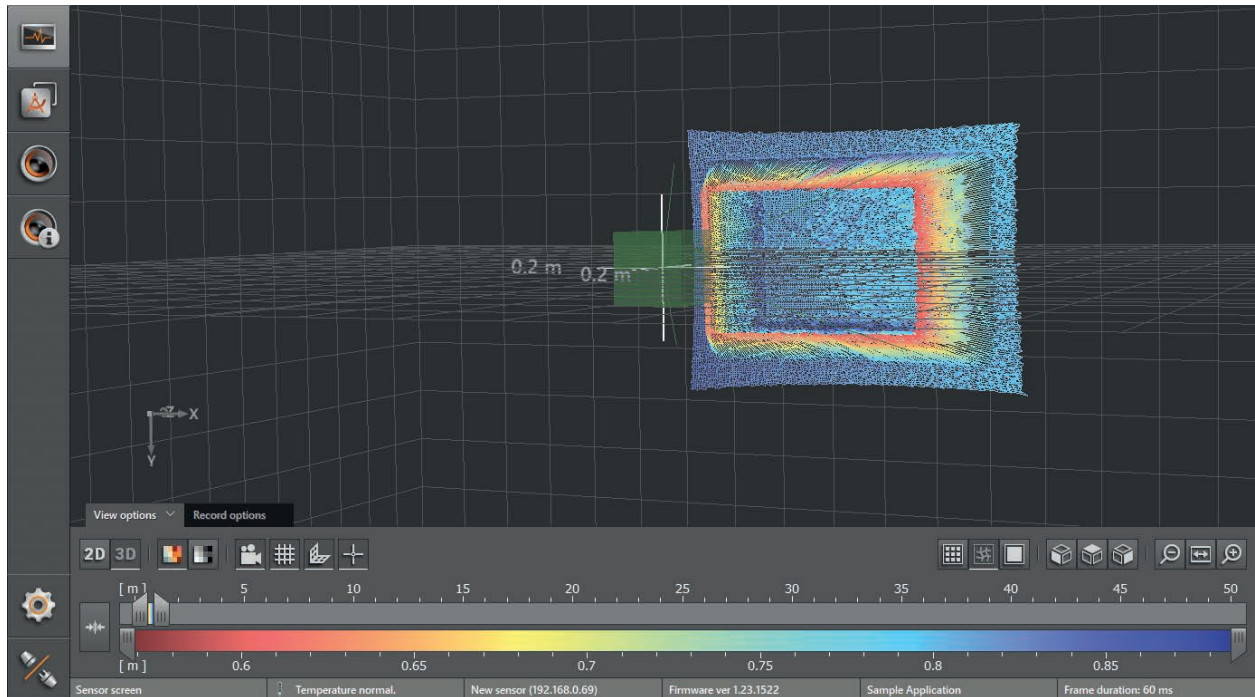


6.3.4 Type of display

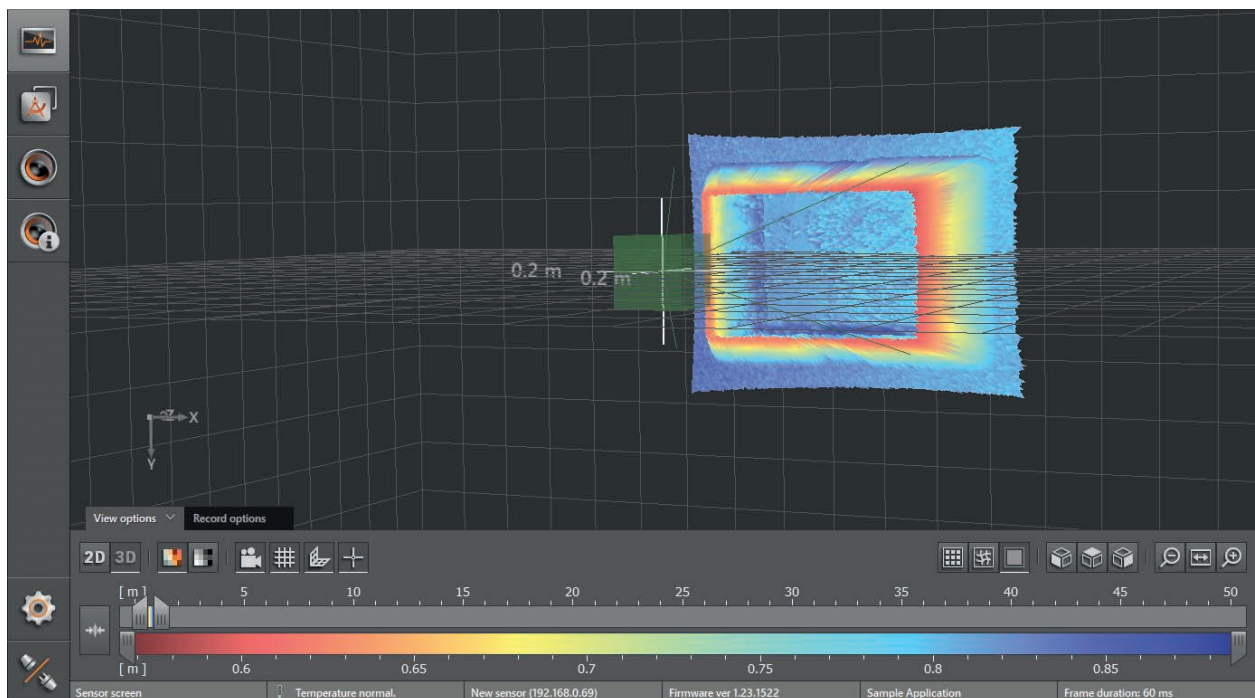
- Click  to show the 3D view as a point cloud.



- Click  to show the 3D view as a mesh.



- Click  to show the ascending gradients in the 3D view as a surface model.



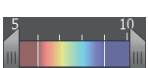
UK

6.3.5 Slider bar

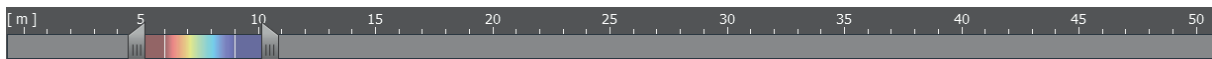
With the slider bar, the colour range of the display can be set manually. The results of the application are not changed.

- Distance image: measuring range in metres (from-to)
- Amplitude image: measuring range in amplitudes (from-to)

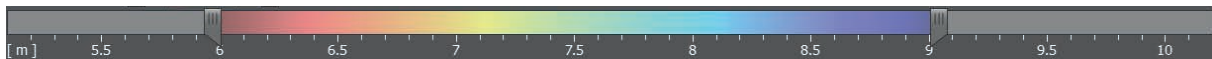
Set colour range

Operating element		Description
Automatic range selection		The button automatically sets the colour range to an appropriate range. The settings of the slider bars are rejected.
Upper slider bar		With the upper slider bar the colour range for the distance or amplitude image is roughly set.
Lower slider bar		With the lower slider bar the set colour range is fine-adjusted.
Colour range		The set colour range can be shifted using the left mouse button without changing the size of the range. The vertical white lines within the colour range indicate the colour range that is fine-adjusted with the lower slider bar.

- Set the upper slider bar to the requested colour range.



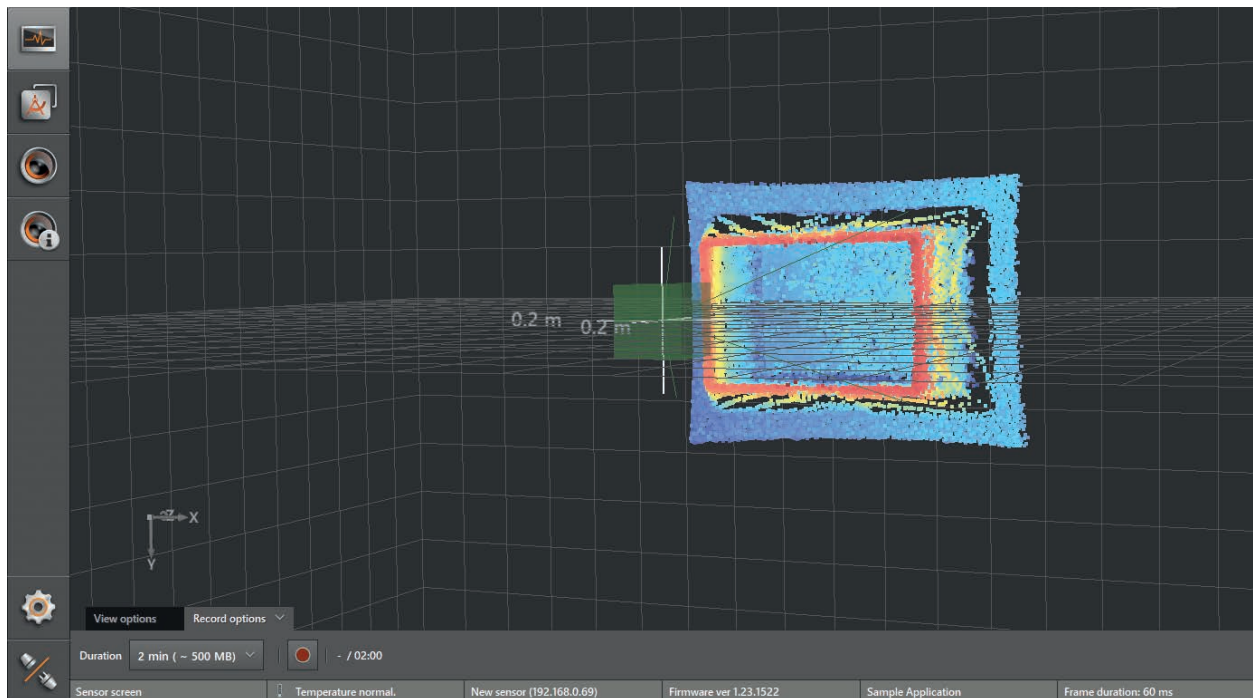
- Set the lower slider bar for fine-adjustment of the colour range.



- > The scale of the lower slider bar corresponds to the colour range set above.

6.4 Recording

With this function the device image can be recorded.



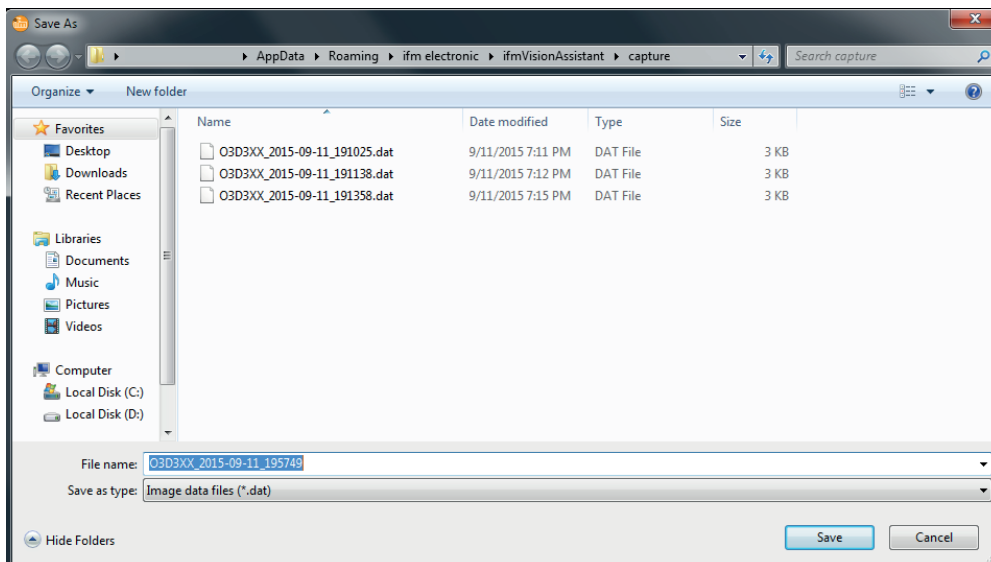
UK

- ▶ Select the duration of the recording in the tab "Record options" (1, 2, 4, 8 minutes or infinite; required space: approx. 250 MB per minute).
- ▶ Click  to start a recording.
- > The window "Save As" opens with a default folder path and default file name:
 - Default folder path: "...\\ifm electronic\\ifmVisionAssistant\\capture" (exact path depends on the Windows version and settings)
 - Default file name: "O3D3XX_YYYY-MM-DD_hhmmss.dat"



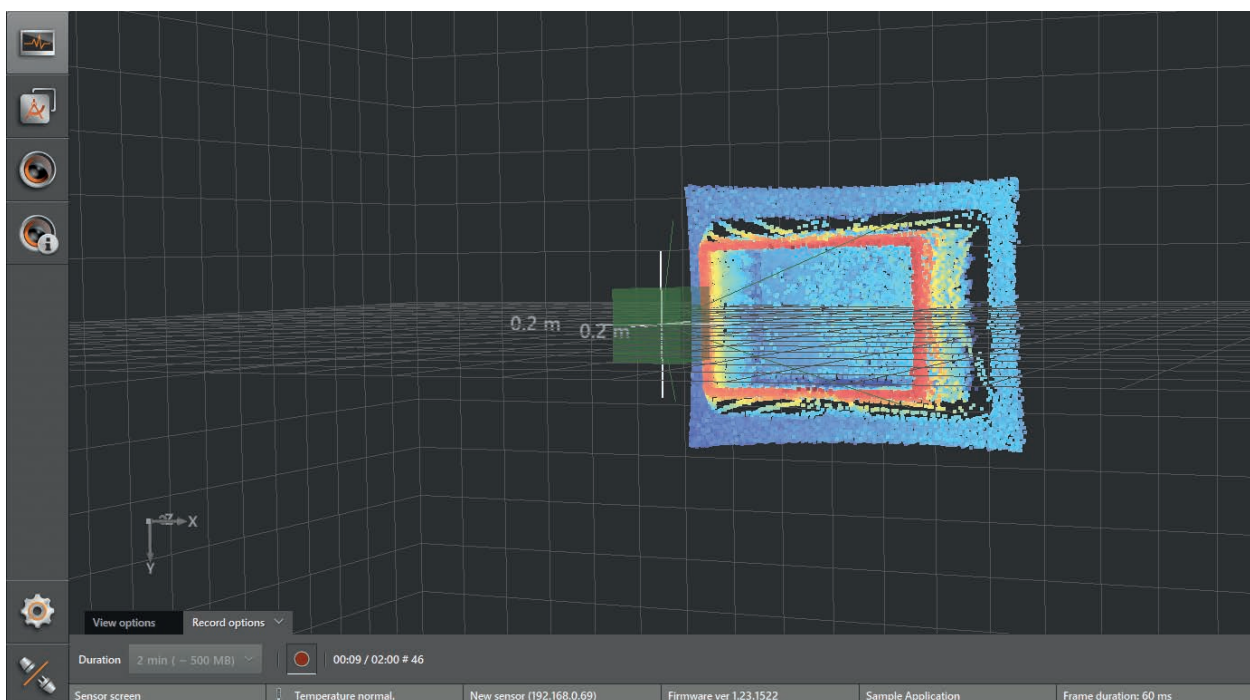
The file name consists of the characters "O3D3XX" with date and time stamp being appended to it.
 Example: The file "O3D3XX Manual Connect_2015-04-15_144726.dat" was recorded on 15 April 2015 at 14:47:26.

- > All measured and process data is recorded (e.g. recognised objects and results of the applications).



► Click [Save].

- > The recording starts and the recorded time is displayed next to the  button.
Example: 1 minute and 5 seconds of the set 2 minutes are displayed as 01:05/02:00.
- > The recording ends automatically as soon as the set recording time is reached.



- Click  again to manually stop the recording before the set recording time has elapsed.
- > The sequence is saved and can be played back using the [Replay] option on the start screen.

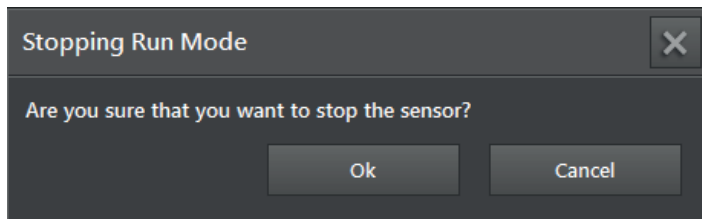
6.5 Quit monitoring window

The monitoring window can be quit as follows:

- Open another option: switches to the selected option, for example, to manage and change settings or applications of the device. An active application is stopped. This can be protected by a password (→ „9.1.2 Password protection“).
- Disconnect from the device: The ifm Vision Assistant is disconnected from the device. The active application is not interrupted and continues.

Switch to another option

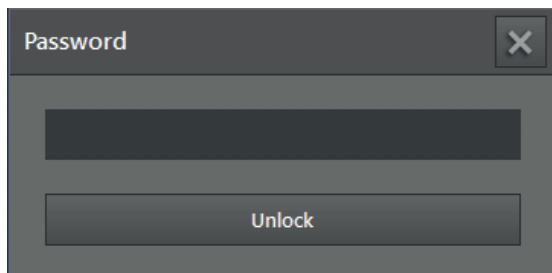
- Click the button of the requested option.
- > The window "Stopping Run Mode" appears.



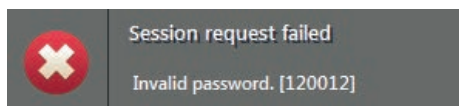
- Click [OK].
- > If the password protection has been activated, the ifm Vision Assistant asks for the password.



If the device is protected by a password, the icon  next to the buttons ,  and  indicates the lock.



- Enter password and click [Unlock].
- > The ifm Vision Assistant stops the active application and switches to the selected option.
- > Entering a wrong password triggers an error message and the ifm Vision Assistant returns to the monitoring window.

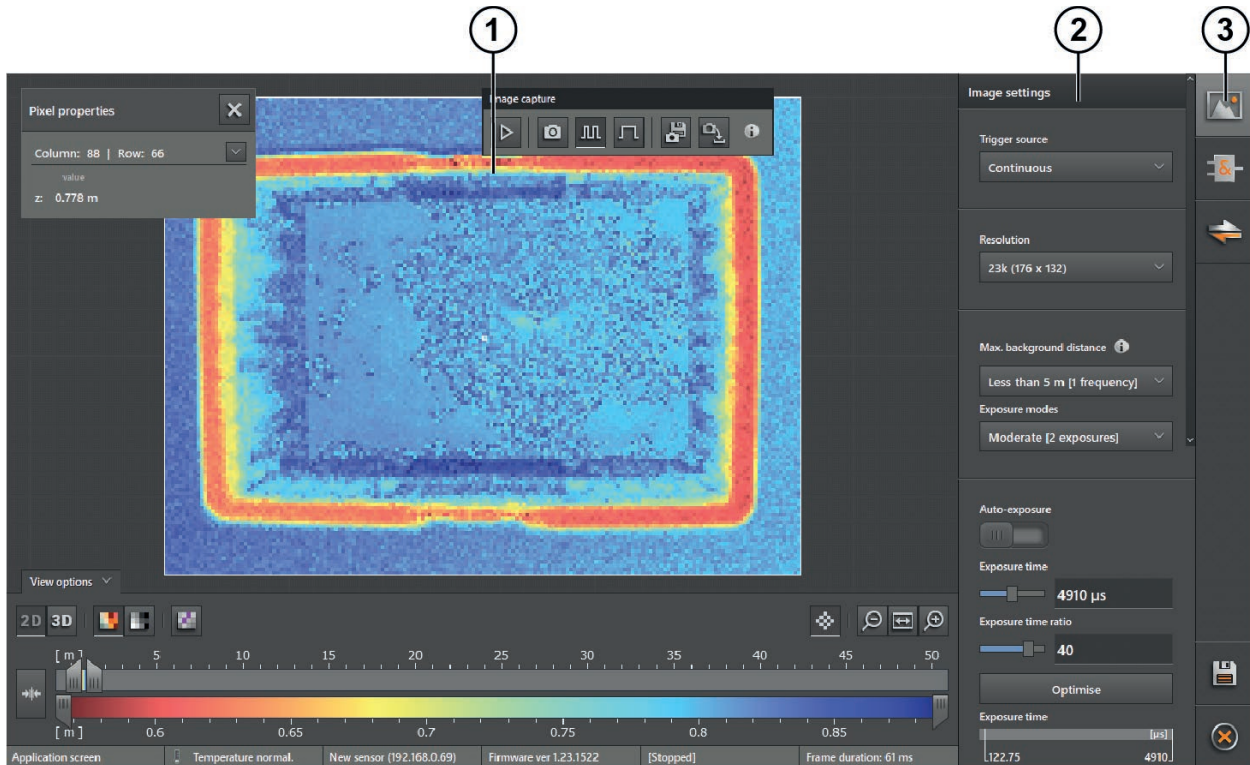


Disconnect from the device

- Click .
- > The device is disconnected.
- > The ifm Vision Assistant returns to the start screen.

7 User defined mode

The measured value acquisition can be defined in the user defined mode. The output of the measurement results can be assigned to different interfaces.



1: Live image display

2: Settings

3: Menu of the user defined mode

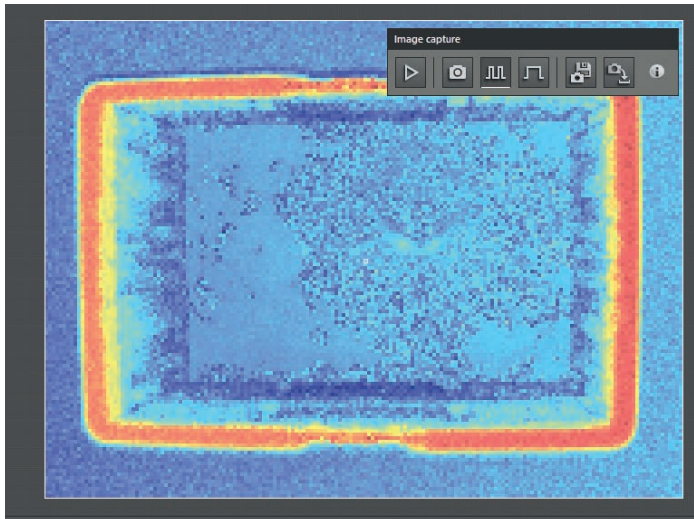
7.1 Activate user defined mode

The user defined mode is activated as follows:

Requirement	Action
An application created in the user defined mode is edited.	► Select application in the application management and start editing (→ „8 Application management“). ► The application edit window opens in the user defined mode.

7.2 Live image display in the user defined mode

The application edit window displays live images during editing.



In the menu bar "Image capture" the following options can be set:

Button	Option	Description
	Live image	The image is continuously updated irrespective of the set trigger source.
	Force trigger	The image is updated once by means of the selection irrespective of the set trigger source.
	React to trigger	The image is updated with each trigger signal of the selected trigger source.
	Wait for one trigger	With the next trigger signal of the selected trigger source the image is updated once.
	Save image	The current live image is saved.
	Load image	The live image is loaded from a file.

7.2.1 Save image

- ▶ Click .
- > The window "Save as" for saving the image opens.
- ▶ Enter requested file name.
- ▶ Click [Save].
- > The saved data has the extension "*.o3d3xximg".

7.2.2 Load image

- ▶ Click .
- > The window "Open" for loading the image opens.
- ▶ Select the file to be loaded (*.o3d3xximg) and click [Open].
- > As soon as loading has been finished the loaded image is displayed instead of the live image.
- > With the option [Live image] in the menu bar "Image capture" you can switch to the live image.

 If the file format of the loaded image does not correspond to the default format (*.o3d3xximg) an error message is displayed.

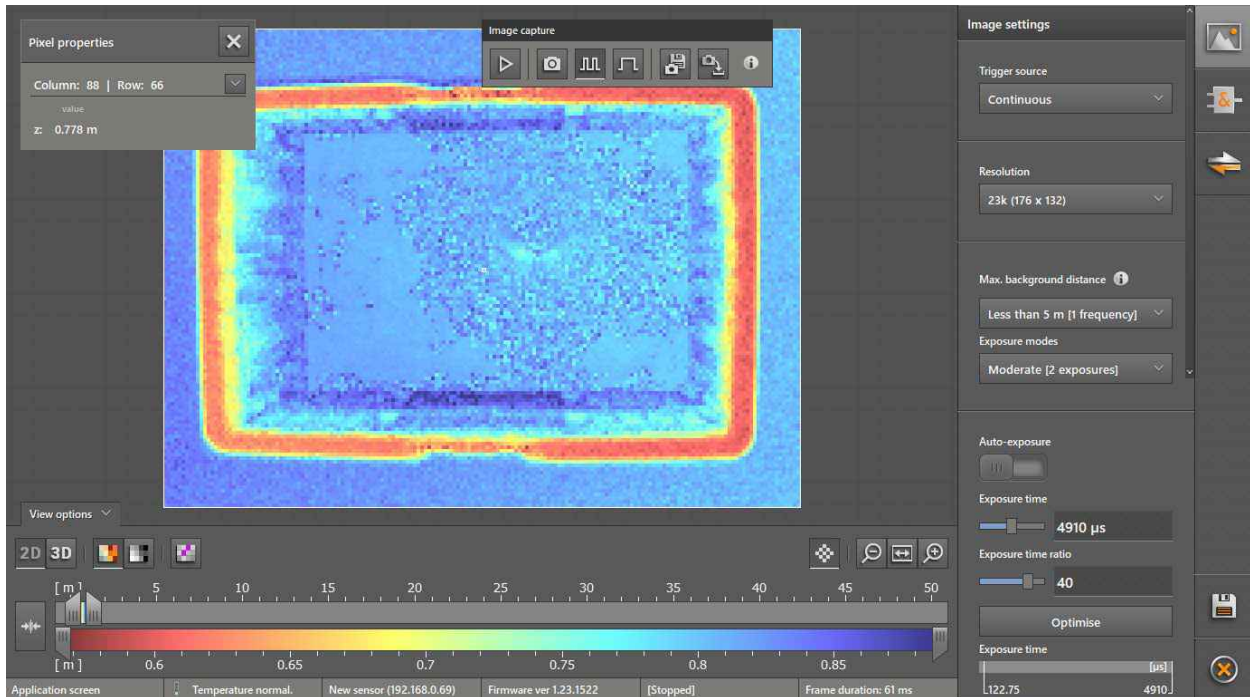
7.2.3 Set live image view

In the menu bar under the image the view options can be set. The view options for the live images are identical with the view options of the monitoring window (→ „6.1 View options“).

7.3 Image settings

► Click .

> The window "Image settings" appears.



On most screens not all image settings are displayed. Further image settings can be accessed via the scroll bar on the right edge of the window "Image settings".

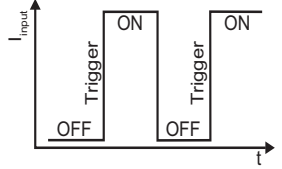
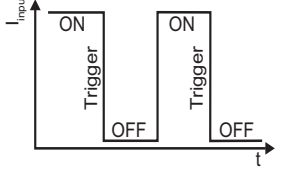
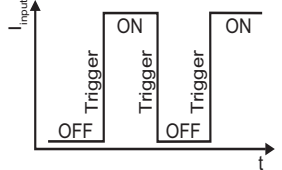
7.3.1 Set trigger source

Trigger source

Continuous

Continuous
 Process interface
 Positive edge
 Negative edge
 Positive and negative edge

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Option	Description	
Continuous	The device continuously takes pictures. This option is mainly used for tests. When this option is selected, the current frame rate is displayed in fps (frames per second) in the window "Image settings". The frame rate can be changed in the input field "Target frame rate". The max. possible frame rate depends on the exposure mode and exposure time.	
Process interface	The device is triggered via the process interface (e.g. PLC).	
Positive edge	The device is triggered by a hardware via the rising edge of an input signal.	
Negative edge	The device is triggered by a hardware via the falling edge of an input signal.	
Positive and negative edge	The device is triggered by a hardware via the rising and falling edge of an input signal.	

7.3.2 Set resolution

Resolution

100k (352 x 264)
 23k (176 x 132)
 100k (352 x 264)

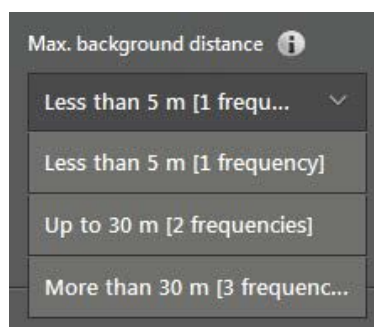
Option	Description
23 k (176 x 132)	A resolution of 176 x 132 pixels is set for the live image (23000 pixels).
100 k (352 x 264)	A resolution of 352 x 264 pixels is set for the live image (100000 pixels).



After the resolution has been set, the display of the live image is enlarged or reduced.

► Use the mouse wheel to set the size of the live image.

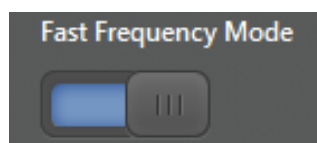
7.3.3 Set max. background distance



Option	Description
Less than 5 m [1 frequency]	The measurement of objects with a maximum distance of about 5 m is unambiguous. Objects farther away are represented in a wrong size and shape as if they were at a distance of up to about 5 m (see explanation below).
Up to 30 m [2 frequencies]	The measurement of objects up to about 30 m is possible. Due to the measurement with an additional low frequency the unambiguous range can be extended (see explanation below). With decreasing frequency noise increases and repeatability decreases. Therefore several measurements and longer measuring times are needed.
More than 30 m [3 frequencies]	Objects up to about 30 m are measured with 2 frequencies. An image is generated from this measurement. The third frequency detects measurable pixels between approx. 30 and 200 m (e.g. background reflections). To suppress ambiguity these pixels are deleted from the generated image and identified as invalid pixels. The result of the measurement is an image of objects up to a distance of approx. 30 m with increased unambiguity. With decreasing frequency noise increases and repeatability decreases. Therefore several measurements and longer measuring times are needed. Because of the limited illumination intensity of the device objects can only be measured up to a distance of only 30 m.

7.3.4 Fast Frequency Mode

From a distance of 30 m [2 frequencies] the "Fast Frequency Mode" can be activated. The mode controls image capture and processing. By means of parallelisation processing of the frames is accelerated.



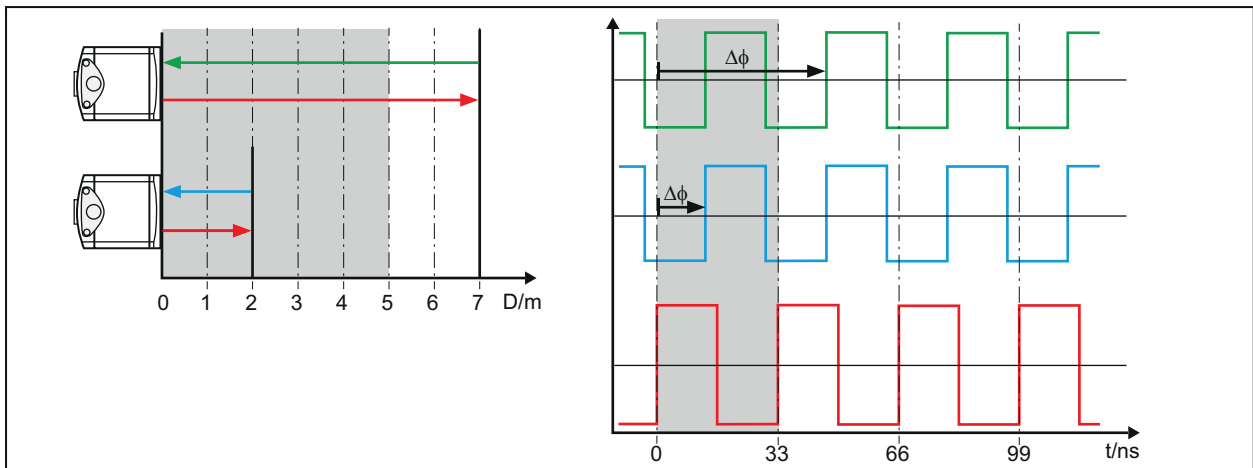
The "Fast Frequency Mode" is only available for a continuous trigger source.

Explanation of the unambiguity of the measuring range

To measure objects, the device transmits a modulated light signal and detects the light reflected from the objects. The distance of the objects is determined from the time of flight of the transmitted and reflected light.

Whereas the modulation frequency is not changed by the reflection, the phases of the transmitted and the detected light are shifted to each other depending on the distance of the reflected point.

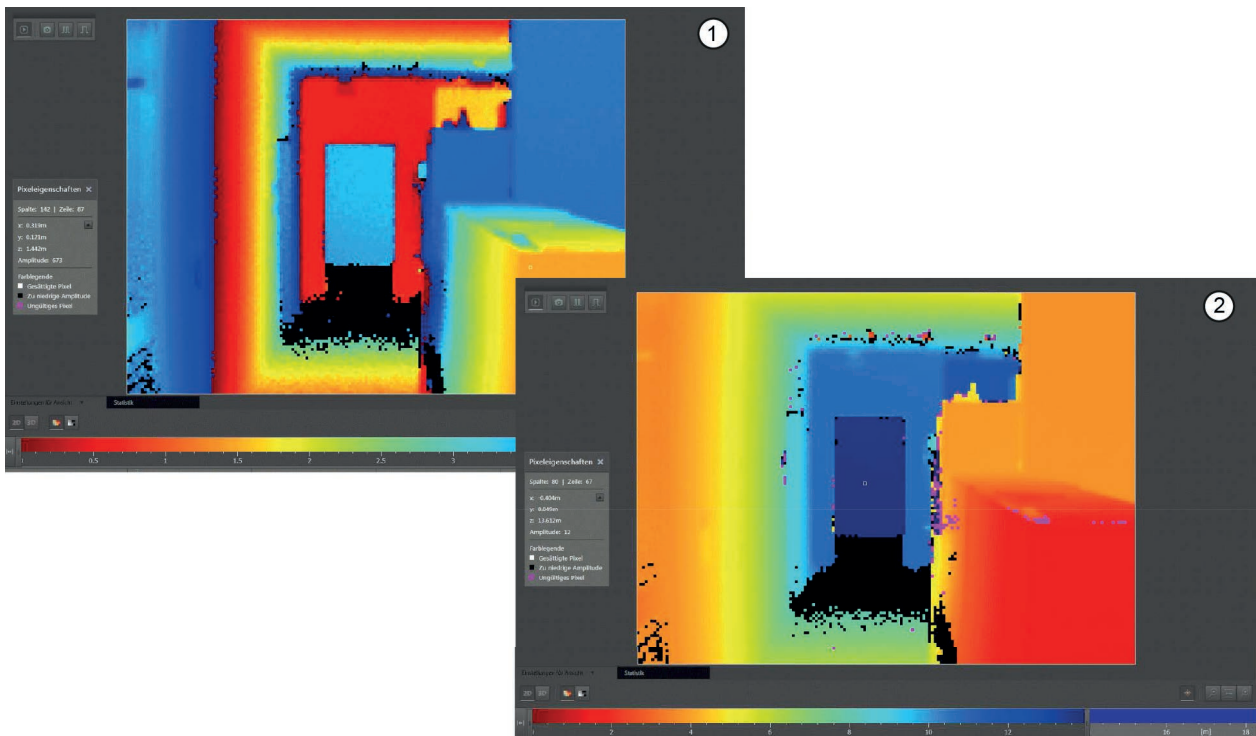
Phase shifts which are a multiple of the wave length are not differentiated. Therefore distances greater than half the wave length cannot be measured unambiguously. With a modulation frequency of 30 MHz, half the wavelength is 5 m.



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Example

The following figure shows two captures of the same scene with different distance settings.



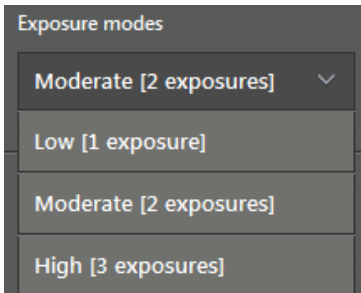
- 1: Maximum visible distance less than 5 m [1 frequency]: Colours are repeated for distant objects
- 2: Maximum visible distance up to 30 m [2 frequencies]: Colours can be clearly assigned to different distances

7.3.5 Set exposure mode

In the 3D view the scene dynamics may be too high for a single exposure. This particularly applies to the following areas:

- Areas with many different reflectivities (e.g. black, white, shiny)
- Areas with many different distances to the device

In this case the image quality can be increased by two or three exposures with different exposure times. This increases the evaluation time and the sensitivity to movements in the scene.



Option	Description	Display/settings
Auto-exposure	Automatic adaptation of the exposure time during the image capture. The exposure time is calculated between the frames by the device. Auto-exposure is only available for the trigger source continuous. After auto-exposure has been switched on the exposure settings are suppressed.	
Low [1 exposure]	Exposure mode for scenes with low dynamics. The exposure time is indicated in μs . The value can be changed with the slider bar or entered in the display window. With a click on the button [Optimise] the device captures several images and calculates the optimum exposure time for the current scene.	
Moderate [2 exposures]	Exposure mode for scenes with high dynamics. The exposure times are indicated in μs . • The value of the longer exposure time can be changed with the slider bar or entered in the display window. • The value of the shorter exposure time is set as a ratio of the longer exposure time. The ratio can be changed with the slider bar or entered in the display window. With a click on the button [Optimise] the device captures several images and calculates the optimum exposure times for the current scene.	
High [3 exposures]	Exposure mode for scenes with very high dynamics. The exposure times are indicated in μs . Default values cannot be changed manually or automatically. This exposure mode cannot be combined with the distance option "More than 30 m" (→ „7.3.3 Set max. background distance“).	

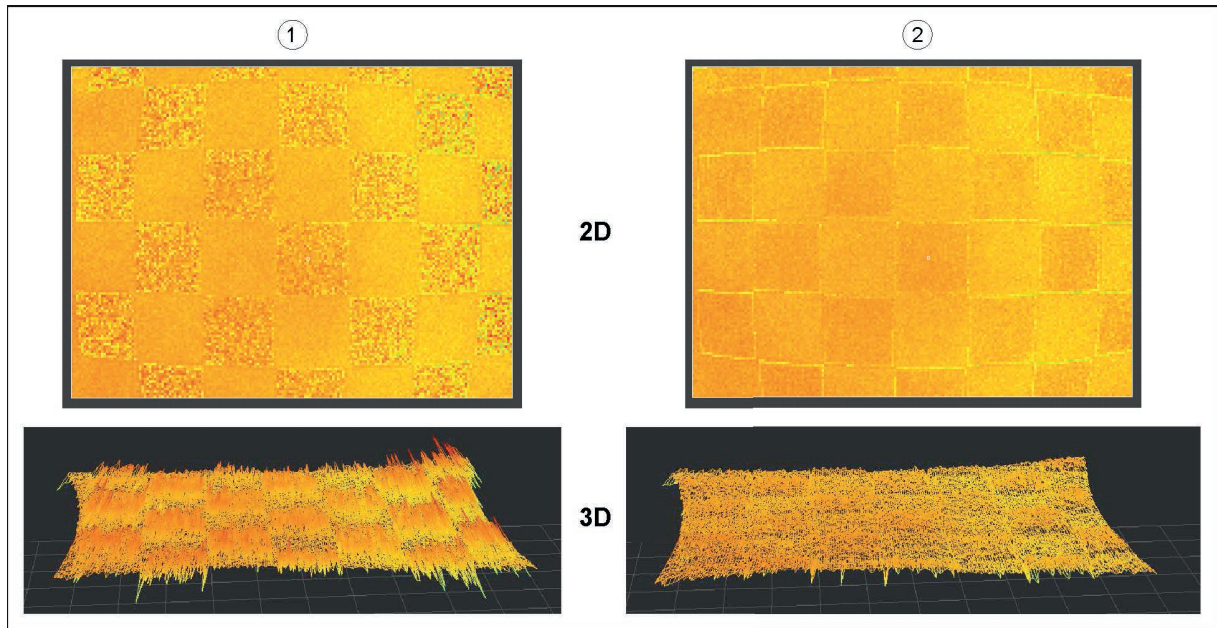
With the automatic optimisation the exposure times are set to the current scene (total device image less a frame). The scene must not change during optimisation. This avoids saturation and measurement noise is minimised. So the application is more immune to interference.

Even after optimisation of the exposure times invalid pixels or much image noise may occur. This may have the following cause:

- The pixels are outside the optimisation area (e.g. in the frame of the device image).
- The pixels represent shiny objects.
- The pixels represent dark objects whose difference to the brightest objects is too great. In this case this may be improved by increasing the number of exposure times.

Example

The following figure shows the 2D and 3D captures of a chessboard section at a distance of 60 cm with different exposure modes.



- 1: An exposure time of 500 μ s, white surfaces almost saturated, black surfaces noisy
 2: Two exposure times of 500 μ s and 3500 μ s, white and black surfaces slightly noisy

7.3.6 Set target frame rate

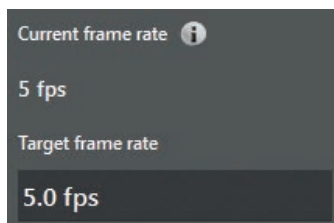
A frame rate can be defined for the device which it tries to reach.



The maximum target frame rate is 30 fps.

Set target frame rate

- Enter target frame rate in the field.



- > The current frame rate is displayed above the target frame rate.

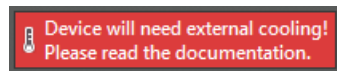
Depending on the settings activated, the target frame rate cannot be reached by the device. The following settings have an effect on the target frame rate:

- Maximum visible distance (→ „7.3.3 Set max. background distance“)
- Exposure mode, exposure time, auto-exposure (→ „7.3.5 Set exposure mode“)
- Fast frequency mode (→ „7.3.3 Set max. background distance“)

- Filters (→ „7.3.7 Apply filter“)
- Image processing



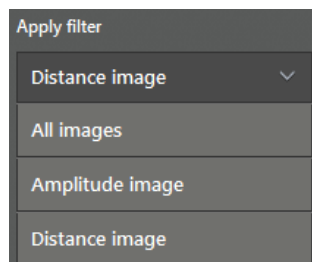
Observe the notes on device cooling in the operating instructions when the following note is displayed:



7.3.7 Apply filter

Filters can be applied to optimise the frame rate.

- In the selection list "Apply filter" select the type of image to which the filters are to be applied:



Option	Description
All images	The filters are applied to the distance image and the amplitude image.
Amplitude image	The filters are only applied to the amplitude image.
Distance image	The filters are only applied to the distance image.

- Select spatial filter:

Option	Description	Properties
Median filter	Each pixel is replaced by the median of the neighbouring pixels.	• Good edge preservation • Moderate evaluation time
Mean filter	Every signal value is replaced by the mean value calculated with the signal values of the neighbouring pixels.	• Bad edge preservation • Short evaluation time
Bilateral filter	The intensity of a pixel is replaced by the weighted mean value of the intensities of neighbouring pixels.	• Excellent edge preservation • Very long evaluation time

- Select matrix size.

> The matrix size determines the window around the pixel to be calculated. The pixels in this window are used for calculation.

- Select time filter:

Option	Description
Exponential filter	A weighted mean value across successive images is calculated. More recent images have more weight than older images. This filter can only be applied to the trigger source "continuous".

7.3.8 Clip 3D data

By clipping the 3D data the data which is to be used for further calculation can be limited. If the 3D data is clipped, only the data within the min./max. values are used for further calculation. The data outside the min./max. values is rejected.

If the button "Clipping box on 3D data" is active, a min. value and a max. value can be defined for each of the three coordinate axes.

Clip 3D data

- Set button "Clipping box on 3D data" to "on".
- > The fields for the 3D data to be clipped are shown.

Clipping box on 3D data ⓘ

X Min
-100.000 m

X Max
100.000 m

Y Min
-100.000 m

Y Max
100.000 m

Z Min
-100.000 m

Z Max
100.000 m

- Enter min./max. values for the three coordinate axes.

The data clipped is differently displayed in the views:

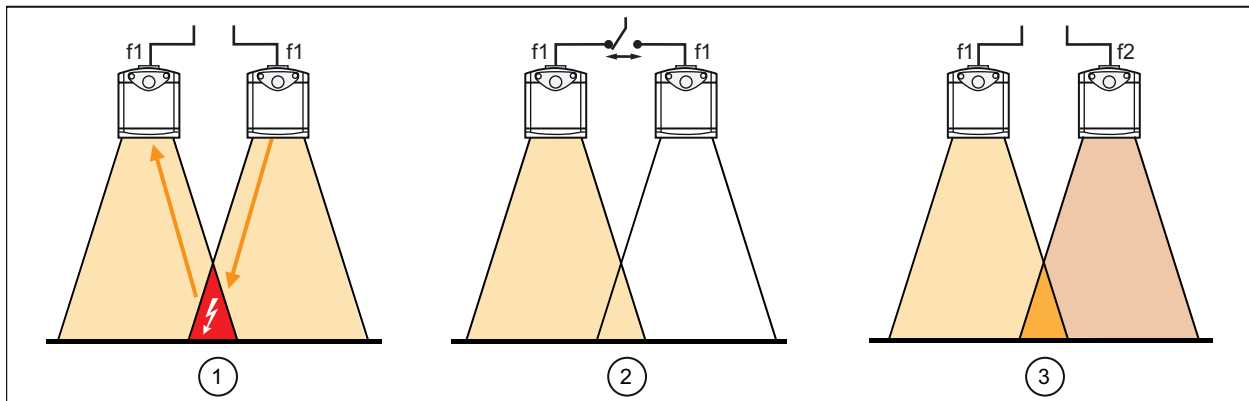
- In the 3D view the data within the area is suppressed.
- In the 2D view the data within the area is displayed in magenta.



A coordinate system can be transformed via XML-RPC. The 3D data clipped is applied to the transformation.

7.3.9 Operate several devices

The devices may interfere with each other if they are not optically separated from each other.



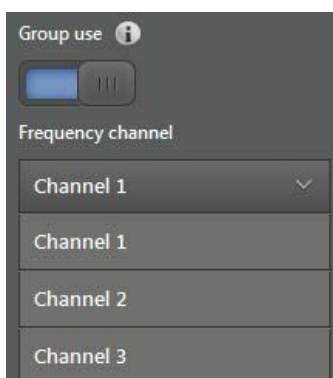
- 1: Mutual interference of the devices when operated simultaneously with a frequency f1
- 2: Prevention of interference when operated with a frequency f1 by cascading the trigger signals
- 3: Prevention of interference when operated with different frequencies f1 and f2

Interference can be prevented with the following measures:

Measure	Description
Cascading the trigger signals	The trigger signals are set so that the devices are triggered at different points in time (→ „7.4 Create output logic“ and operating instructions). This is the preferred measure to prevent interference.
Operation via different frequency channels	The devices are triggered via different frequency channels. 3 frequency channels can be selected. This measure is not possible for the option "more than 30 m" because 3 frequency channels are already used for this option. 2 of the 3 frequency channels are used for the option "up to 30 m". Therefore the devices must use one frequency channel together.

Set group use

- Set button "Group use" to "on".
- > The selection list "frequency channel" is displayed.



- Select frequency channel for the device.

7.4 Create output logic

On the screen "Logic" pin events can be assigned to the available device outputs to provide the data of a connected controller (PLC / PC).

7.4.1 General creation rules

The creation of the output logic is based on the following rules:

- Pin events are output as binary numbers (1 = true, 0 = false) and can only be assigned to digital outputs.

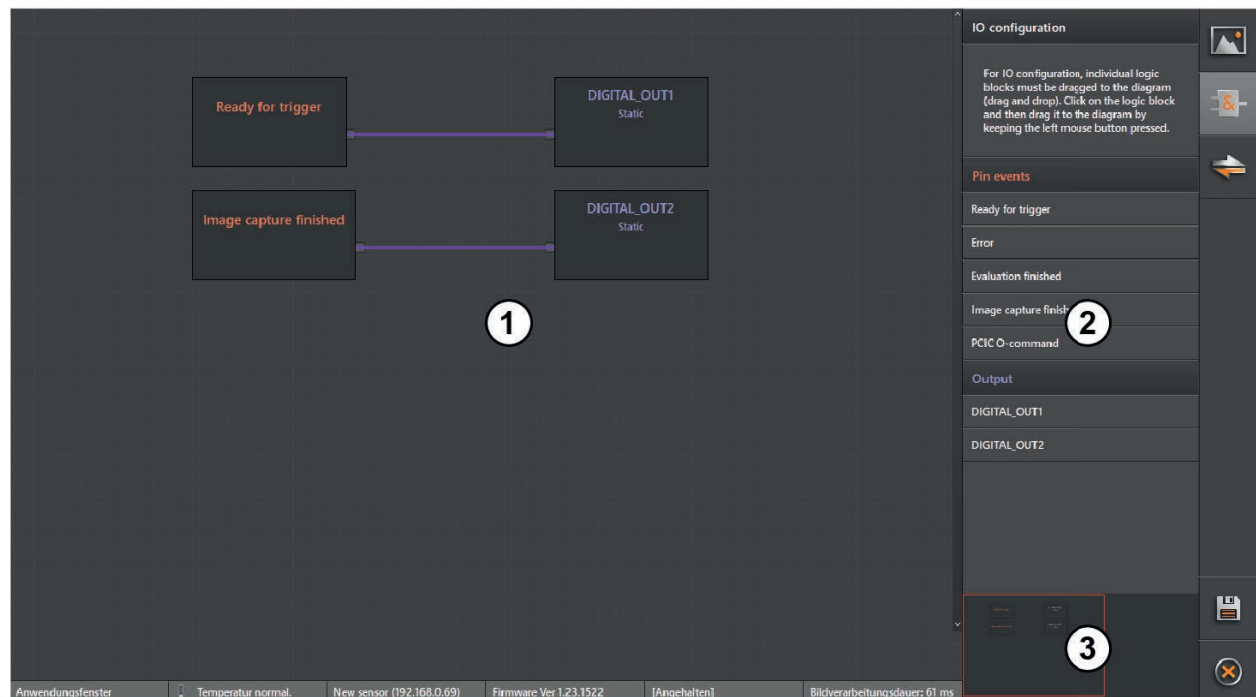
The following figure shows an overview of the configuration options in the output logic. Because of the numerous combination options the logic circuits are divided into blocks.



7.4.2 Place logic blocks and assign signals

► Click .

> The "Logic" screen appears.



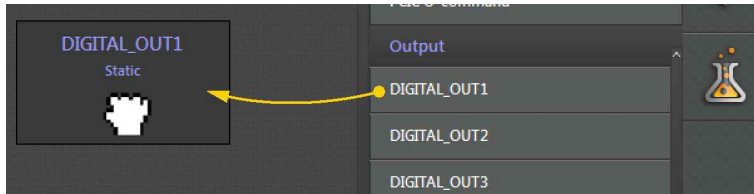
- 1: Main area
2: Selection area
3: Overview area

Window area	Description
Main area	In the main area the assignment of the pin events for the outputs is displayed. The pin events and the outputs are displayed as logic blocks in different font colour. Lines between these logic blocks represent the assignment. If the elements in the main area go beyond the visible area, this area can be shifted using the scroll bar at the edge of the main area.
Selection area	All pin events and outputs are listed in the selection area.
Overview area	In the bottom right corner of the main area a reduced main area is displayed for a better overview. If the elements in the main area go beyond the visible area, this area can be shifted by dragging the red frame with the mouse.

The following functions can be executed on the start screen "Logic":

Place new logic block in the main area

- Click entry in the selection area and hold the mouse button down.
- Hold the mouse button down to drag the entry to the main area and release the mouse button at the requested position (drag and drop).



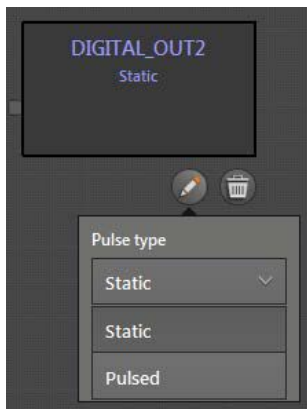
- > The respective logic block is displayed at the target position.
- > At the edge of the logic block at least one pin is displayed which is used for the assignment.
- > A logic block can be shifted to any position in the main area via drag and drop.



The device has a limited number of outputs. An error message is indicated when you try to position more logic blocks than outputs are available.

Set output signal

- Click output logic block.
- > In the bottom right corner of the output logic block a pen is displayed.



- Click pen.
- > The settings of the output signal are displayed in a selection list:

Option	Description
Static	The output is switched without time limit (recommended setting).
Pulsed	The output is switched with a limited signal duration.
Signal duration	In this window the signal duration can be set in ms for the output signal "pulsed". The minimum value is 10 ms.

Delete logic block

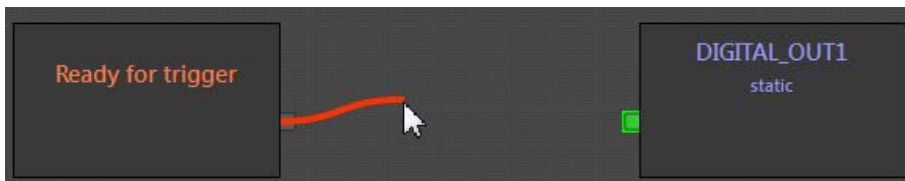
- Click logic block.
- > In the bottom right corner of the logic block a bin is displayed.



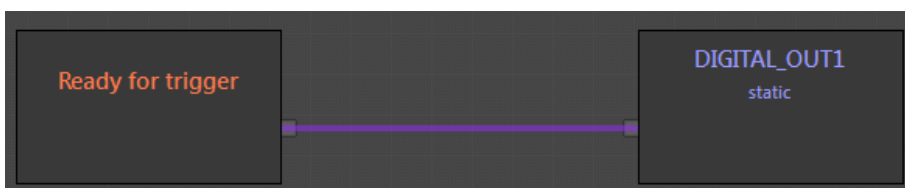
- Click bin.
- > The logic block and the connection, if any, to another logic block are deleted.

Assign pin event to output

- Put the mouse pointer to the pin at the right edge of the pin event box.
- Hold the mouse button down to drag the mouse pointer out of the pin.
- > Free digital outputs are identified by a green pin at the left edge of the output logic block. Every output can be assigned only one pin event.
- > A red line is displayed between the pin event box and the mouse pointer.



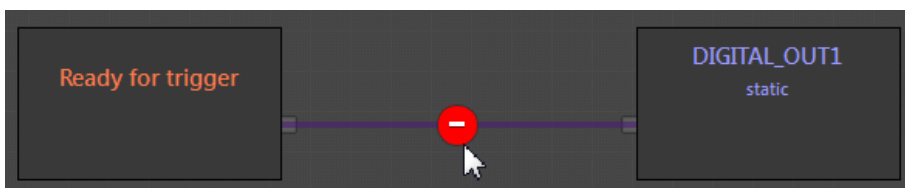
- Move the mouse pointer to the green pin of the requested output logic block.
- If the connecting line between the pin event box and the output logic block is green, release the mouse button.
- > A successful assignment is represented by a purple line.



- > When the logic blocks are shifted in the main area, the connecting lines follow.

Delete assignment of a pin event

- Click the connecting line of the assignment to be deleted.
- > A minus sign on a red background is displayed.



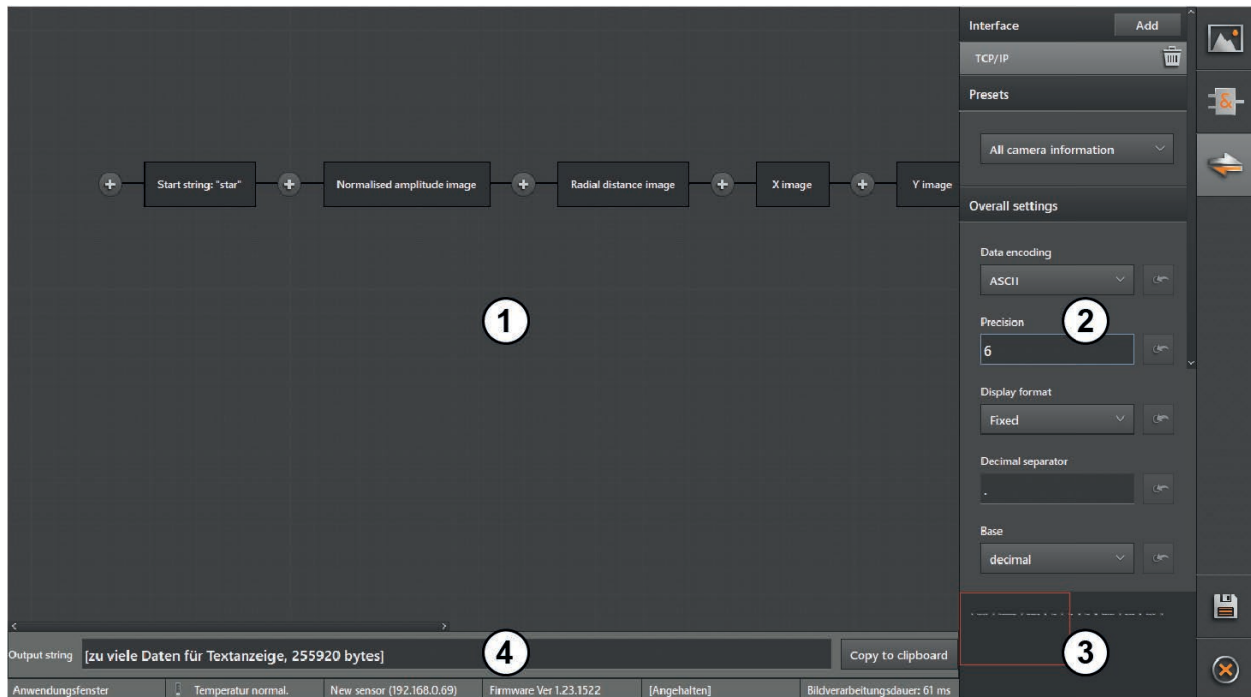
- Click minus sign.

7.5 Configure interface

The data packages which are transmitted via the Ethernet interface can be defined on the screen "Interface".

► Click .

> The screen "Interface" appears.



- 1: Main area
2: Setting area
3: Overview area
4: Output string

Window area	Description
Main area	In the main area the data blocks of a data package are displayed as boxes. The data is sent from left to right in the order of the data blocks. If the elements in the main area go beyond the visible area, this area can be shifted using the scroll bar at the edge of the main area.
Setting area	The setting area consists of the following subareas: • Interfaces: The interfaces can be configured for the network protocols EtherNet/IP and TCP/IP. All settings refer to the selected network protocol. • Preset data packages: The ifm Vision Assistant contains preset data packages that can be applied or used as templates for user-defined settings. If a preset data package changes it becomes a user-defined data package. The preset data package remains in its initial state. The data package changed last is available as user-defined data package. • General output format: The general output format refers to all data packages created (see section below).
Overview area	In the bottom right corner of the main area a reduced main area is displayed for a better overview. If the elements in the main area go beyond the visible area, this area can be shifted by dragging the red frame with the mouse.
Output string	• The output string indicates the character string which is integrated into the datagram. Depending on the overall setting "Data encoding" in the setting area the output string is displayed in ASCII code or binary code. • With the button [Copy to clipboard] the output string can be copied to the clipboard.

Set general output format

The general output format of the numerical values can be set using the overall settings. The diagnostic data can be assigned individual output formats which may differ from the general output format (→ „Set data block“).

► Click [Overall settings] in the setting area.

Setting	Description
Data encoding	Format for data encoding: ASCII or binary.
Precision	Number of decimal places.
Display format	- Fixed: fixed-point number - Scientific: exponential notation
Decimal separator	7-bit character (e.g. ".") as a separator of decimal numbers.
Base	Output format: 2: binary 8: octal 10: decimal 16: hexadecimal
Width	Minimum total length of the value. If the value exceeds this width it is not shortened.
Numeric fill	- On: Every bit position which is not used by the value is filled with a binary 0 and positive values are preceded by a plus sign. - Off: Bit positions which are not used by the value remain blank.
Fill	Fill character
Alignment	Right or left alignment of the value within the defined bit width.
Byte order	- little endian: least significant byte of a binary value at the first position or at the lowest memory address. - big endian: most significant byte of a binary value at the first position or at the lowest memory address. - Network byte order: byte order defined by the network protocol. - Fieldbus-dependent: byte order defined by the fieldbus.

With the button [Default value] the setting can be reset to your default value.

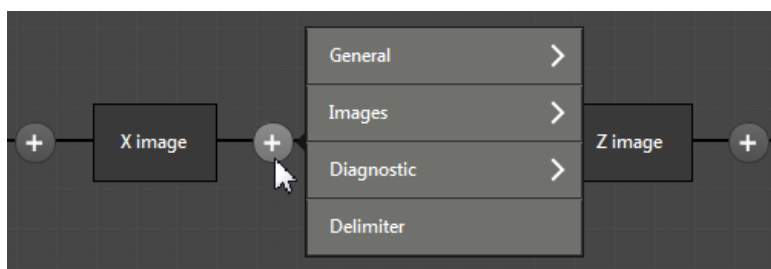


More information about the settings → Operating instructions.

Add data block

A data block can be added at the start, end or between two existing data blocks.

► Click the plus sign where the data block is to be added.



> A selection list is displayed where the data blocks are grouped as follows:

Group	Data block	Description
General	Start string	Indicates the start of the data package.
	End string	Indicates the end of the data package.
	User-driven input	Allows writing of free text in the data package.
	Unit vector matrix e1/ e2/e3	Adds a unit vector matrix to the respective axis in the Cartesian coordinate system (x, y, z) to project a radial distance
	Conversion to world coordinate system	Conversion of the current coordinates to the world coordinate system.
	Index of active application	Indicates the index of the active application.
Images	X/Y/Z image	Cartesian x, y z, coordinates of the pixels.
	Normalised amplitude image	Image of the amplitude values of the light reflected from the object. The amplitude values are normalised to the exposure time.
	Radial distance image	Image of the distance values determined through the time of flight.
	Pixel status indication	Display of the status (e.g. invalid, saturated) for each pixel.
	Amplitude image	Image of the measured amplitude values of the light reflected from the object.
Diagnostics	Temperature front end	Temperature of the image converter PCB
	Temp illu	Temperature of the device illumination.
	Evaluation time	Time to calculate the image data.
	Frame rate	Actual frame rate.
	Diagnostic data	→ Operating instructions.
Delimiter	–	Delimiter to separate data blocks



The parser configuration for complex data blocks is time-intensive and prone to errors.

► Keep data packages as simple and short as possible.

Set data block

► Click box.

> If the settings of the data block can be changed, a pen is indicated in the bottom right corner of the box.



► Click pen.

> The settings of the data block are indicated in a selection list:

Group	Data blocks that can be changed	Options
General	Start string	Input of a character string which marks the start of the data package.
	End string	Input of a character string which marks the end of the data package.
	User-driven input	Input of a character string for application-specific purposes.

Group	Data blocks that can be changed	Options
Diagnostics	Temperature front end	The following output formats can be individually set for every data block of these groups: • Data type: signed integer, unsigned integer or floating point number of different bit lengths. • Data encoding: format for data encoding (ASCII or binary). • Scale: factor for scaling the measured value. • Offset: amount added to the measured value. • Precision: number of decimal places (only with floating point numbers). • Display format: fixed point number (fixed) or exponential notation (scientific). • Decimal separator: 7-bit character (e.g. ".") to separate decimal numbers (only with floating point numbers). • Base: output format binary, octal, decimal or hexadecimal (only with integers). • Width: If the value exceeds this width it is not shortened. • Numeric fill: Every bit position which is not used by the value is filled with a binary 0 (on) or remains blank (off). • Fill: fill character. • Alignment: right or left alignment of the value within the defined bit width.
	Temp illu	
	Evaluation time	
	Frame rate	
Delimiter	–	Delimiter to separate data blocks

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Delete data block

► Click box.

> In the bottom right corner of the box a bin is indicated.



► Click bin.

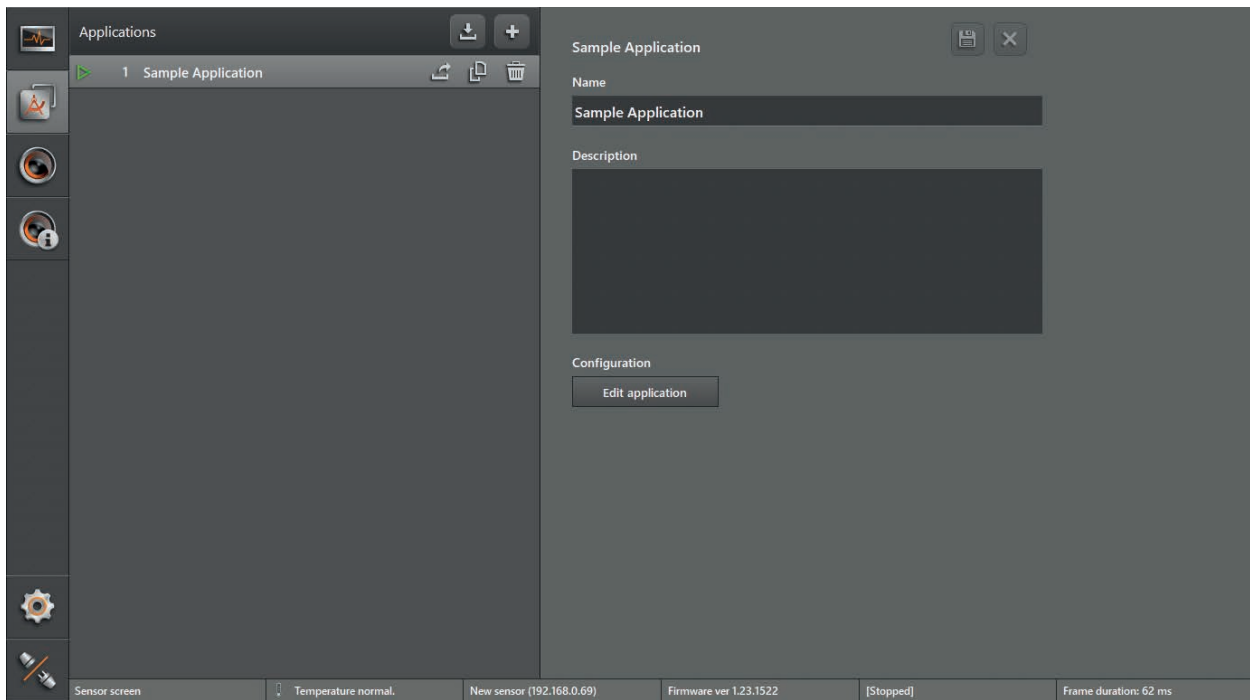
> The data block is deleted.

8 Application management

In the application management the applications of the connected device are displayed and managed.

► Click  to open the application management.

 When you switch from the monitoring window to the application management confirm that the evaluation (operating mode) of the device is stopped.



Functions:

Button	Name	Description
	Import application	Opens a window to import an application from a file.
	Add new application	Opens a window to create or add a new application.
	Export	Opens a window to export the application.
	Duplicate	Makes a copy of the application.
	Delete	Deletes the application.
	Save	Saves the changes entered in the application.
	Cancel	Rejects the changes made.

 Maximum 32 applications can be saved.

8.1 Activate application

- ▶ Click the arrow next to the requested application to activate it.
- > The arrow is displayed in green.

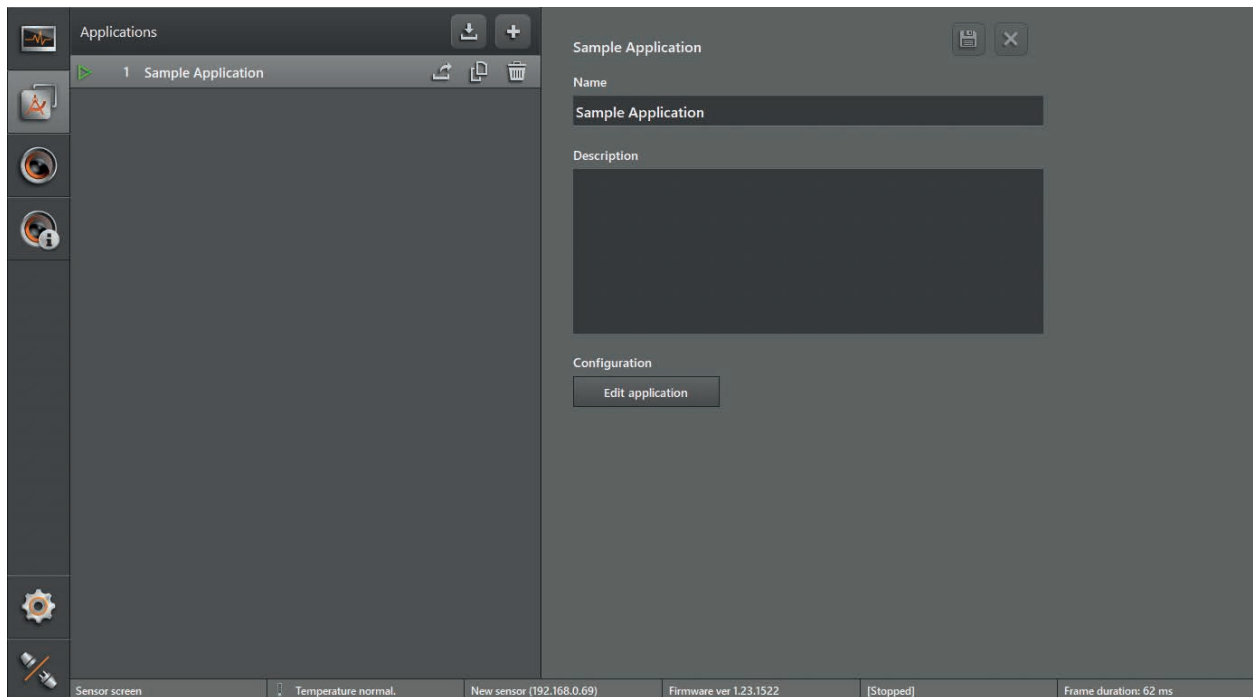
If the active application is deleted, another application is not automatically activated.

8.2 Edit application



The name and description of an application can be freely edited later on without changing the parameters and settings of the application.

- ▶ Click application.
- > The selected application is highlighted in light grey.



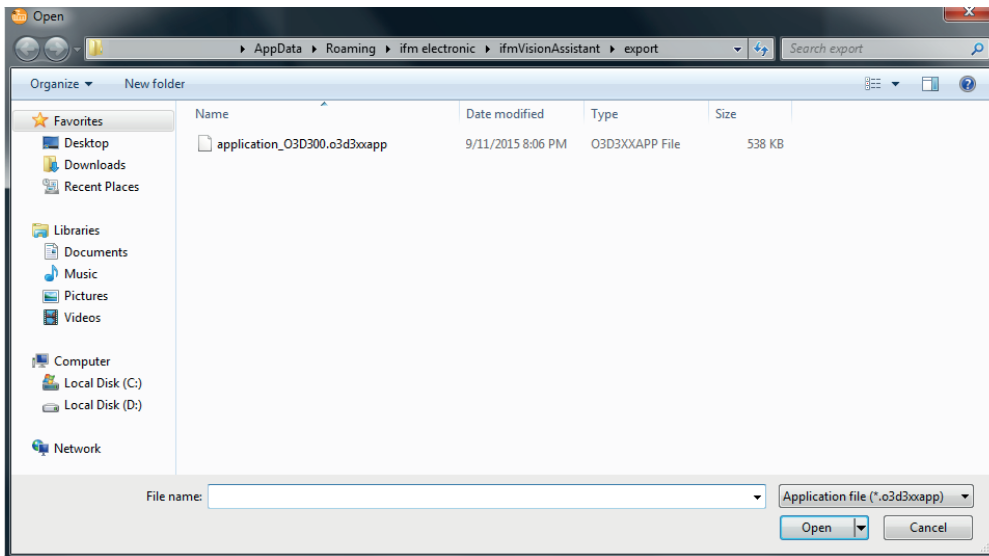
- ▶ If requested, make changes in the input fields "Name" and "Description".
- ▶ Click  to save the changes.
- ▶ Click [Edit application].
- > The edit window opens (→ „7 User defined mode“).

8.3 Add new application

- ▶ Click  to create a new application.
- ▶ Make requested changes in the input fields "Name" and "Description".
- ▶ Click [Edit application].
- > The edit window opens (→ „7 User defined mode“).

8.4 Import application

- Click .
- > The window "Open" to import the application is displayed.



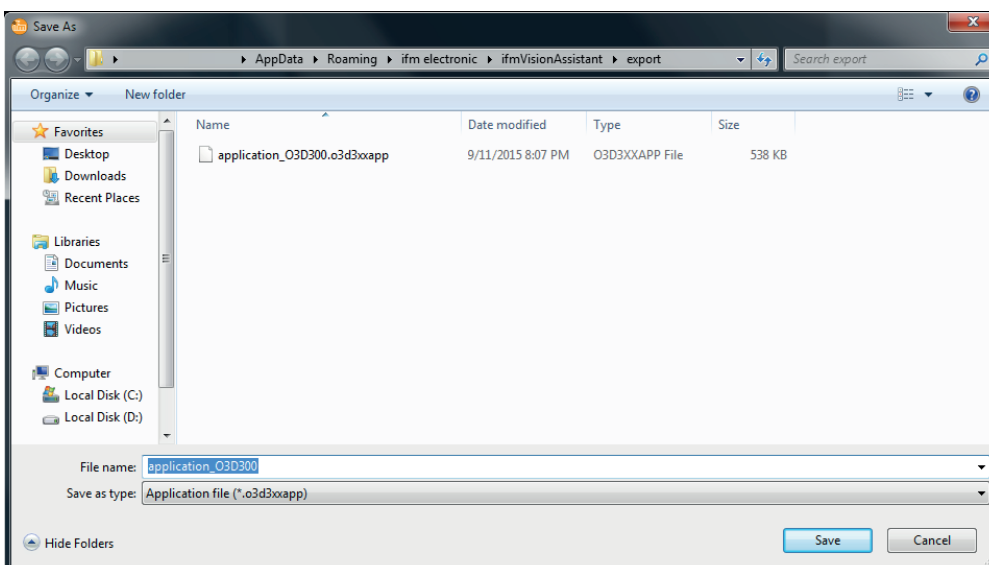
- Select the file to be imported (*.o3d3xxapp) and click [Open].
- > As soon as the import is finished the application is indicated in the application list.



If the file format of the imported application does not correspond to the default format (*.o3d3xxapp) an error message is displayed.

8.5 Export application

- Click application to be exported.
- > The selected application is highlighted in light grey.
- Click .
- > To export the application the window "Save as" is displayed.



- Select requested folder and name file.
- Click [Save]
- > The saved application file has the extension "*.o3d3xxapp".

8.6 Duplicate applications

Applications can be duplicated to create an application where only the parameters need to be changed.

- ▶ Click the application to be duplicated.
- > The selected application is highlighted in light grey.

- ▶ Click .

- > A copy of the application is added at the end of the application list.

8.7 Sort application list

The order of the applications can be changed in the application list via drag and drop.

- ▶ Click application and hold the mouse button down.
- > The application is marked in colour.
- ▶ Hold the mouse button down to shift the application to the new position.
- ▶ Release mouse button.
- > The applications are numbered in the new order.



By sorting the application list new IDs are assigned to the applications. The IDs are used for the external control via the process interface.

- ▶ Adapt external control to the new IDs.

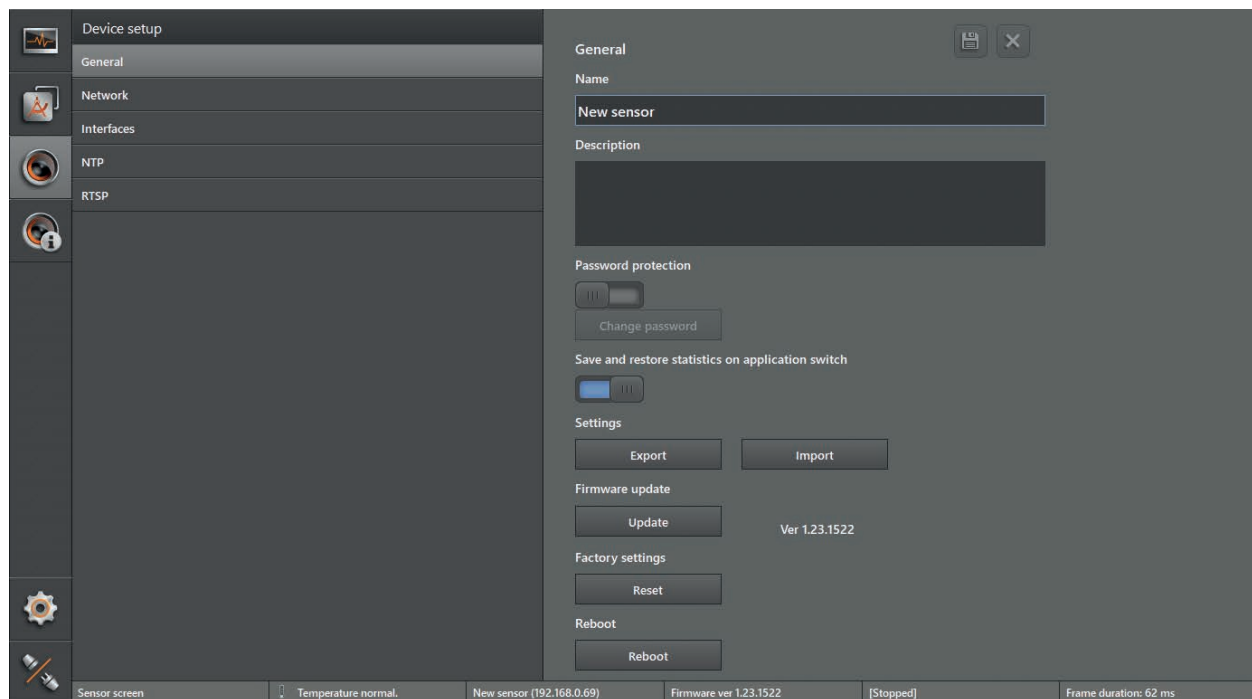
9 Device setup

For the device setup the setting options are as follows:

- General:
 - Enter name and description of the device
 - Password protection on/off
 - Import and export settings
 - Carry out firmware update
 - Reset to factory settings
- Network
 - Configure network protocol and network address
- Interfaces
 - Configure the process interface
- NTP
 - Set real-time clock
- RTSP
 - Set Real Time Streaming Protocol

► Click .

> The "Device setup" screen is displayed.



9.1 General information

Basic functions and options of the device are set in the window [General].

► Click [General] to switch to the window "General".

Functions

Field	Button	Description
Name	–	Editable field to enter a device name
Description	–	Editable field for additional device information
Password protection	 on	Switches the password protection on or off.
	 off	
	Input field	Editable field to enter a password
Save and restore statistics on application switch	 on	If the function is switched on, the statistics of an application are saved before switching to another application. If there are statistics saved for an application, they are restored.
	 off	
Settings	[Export]	Makes a copy of the settings and applications on the PC.
	[Import]	Saves a copy of the settings and applications that are on the PC to the device.
Firmware update	[Update]	Installs a firmware update. The current firmware version is shown next to the button.
Factory settings	[Reset]	Restores the factory settings and deletes all current settings and applications.
Reboot	[Reboot]	Reboots the device.
Save		Saves the changes made on the device.
Cancel		Rejects the changes made.

9.1.1 Name and description

The name and the description of the device can be freely edited.

► Click input field.

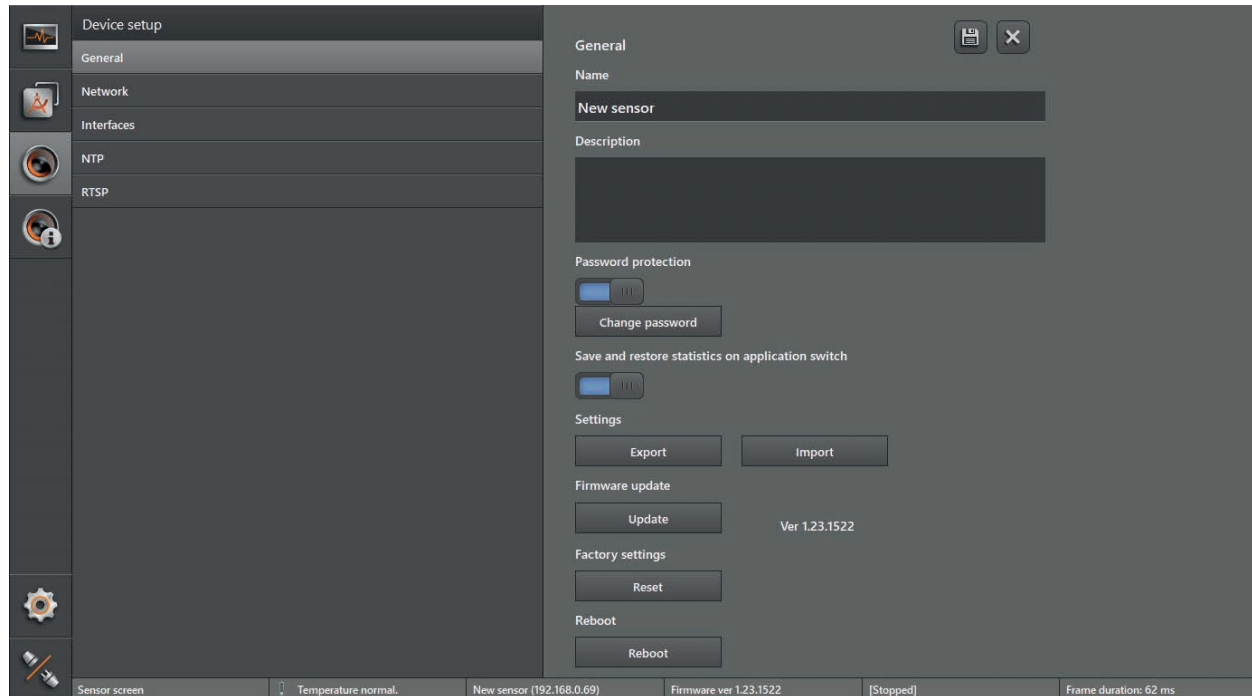
► Enter requested text.

► Click  to save the changes.

9.1.2 Password protection

When the password protection is active, the "Applications", "Device setup" and "Device info" screens are locked and only accessible after the password has been entered. Without entering the password, only the monitoring window opens.

- Activate password protection.



- Enter password in the input field.
- Click  to save the changes.
- > The changes are saved on the device.

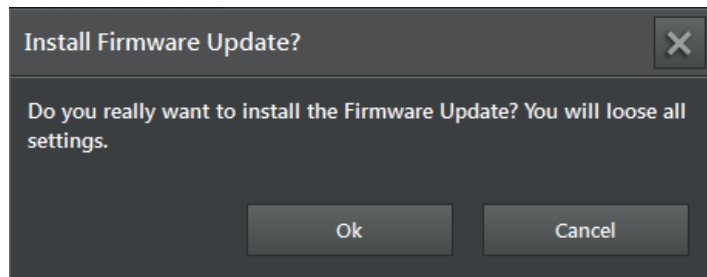
9.1.3 Firmware update

The current firmware is on the supplied data carrier or can be downloaded from the internet if needed: www.ifm.com



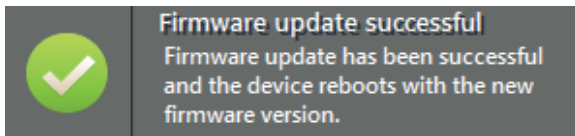
The firmware update will delete all settings and applications.

- If necessary, export the existing settings beforehand.
- Click [Update] to update the firmware.
- > A safety query is displayed.



- Click [OK].
- > The window "Open" appears.

- ▶ Select requested firmware file (*.swu).
- ▶ Click [Open].
- > A message indicates that the firmware update has been successfully completed.



- > The ifm Vision Assistant connects to the device.



After the update the default application is available on the device. With this application the ifm Vision Assistant switches to the monitoring window.

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Failed firmware update

Problem	Solution
Error message: The device is set to a temporary address or to DHCP.	▶ Change network settings of the device to a static IP address. > After saving the settings the ifm Vision Assistant tries to connect automatically.
Error message: – or – – or –	▶ Click on the start screen and connect device. ▶ Click message. > The following messages are displayed: ▶ Click the message "Install another firmware". ▶ Install another firmware.

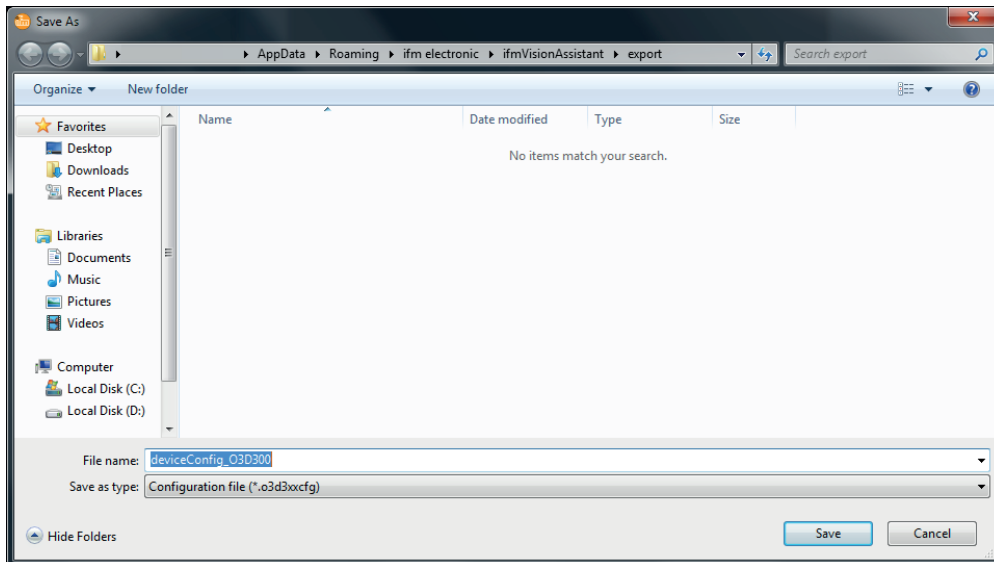


With the key combination Ctrl+C the text of a message is copied to the clipboard. This works with all messages displayed in the ifm Vision Assistant.

9.1.4 Export settings

With the "Export" function, all settings and applications are exported from the device to the PC.

- ▶ Click [Export] to start the export of the settings.
- > The window "Save As" appears.



- ▶ Enter name and click [Save].
- > The settings are saved in a file with the extension .o3d3xxcfg.

9.1.5 Import settings

Settings and applications can be imported separately or together. The following options are available:

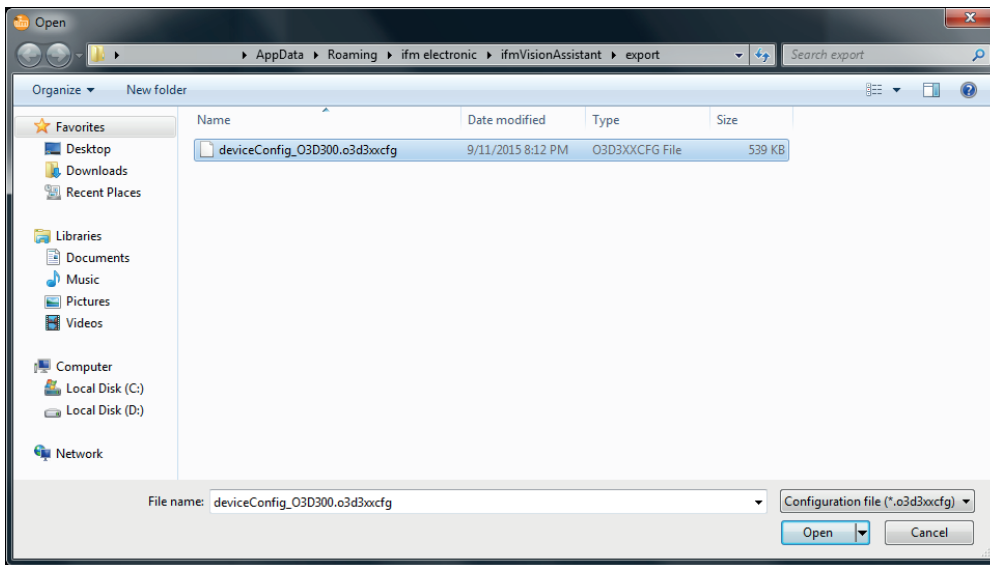
- General (name, description etc.)
- Network settings
- Applications



Existing settings and applications are overwritten during the import.

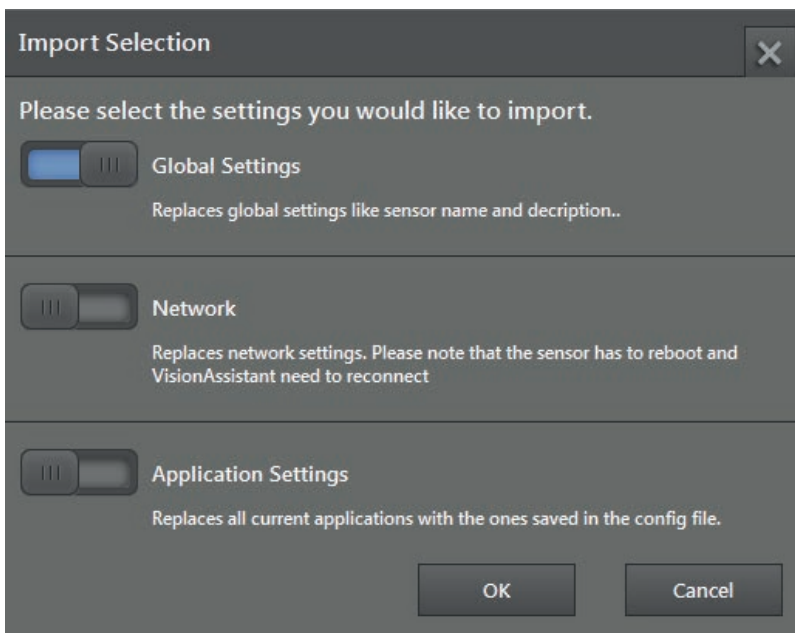
- ▶ If necessary, export the existing settings beforehand.
- ▶ Click [Import] to start the import of the settings.

> The window "Open" appears.



► Select the requested file with the extension .o3d3xxcfg and click [Open].

> The window "Import Selection" appears.



► Set the button of the settings to be imported to "on" (global settings, network and / or application settings).

► Click [OK].

> The selected settings are imported.

9.1.6 Factory settings

To delete all data on the device (setup, applications, etc.) the device can be reset to factory settings. The firmware version is not reset.

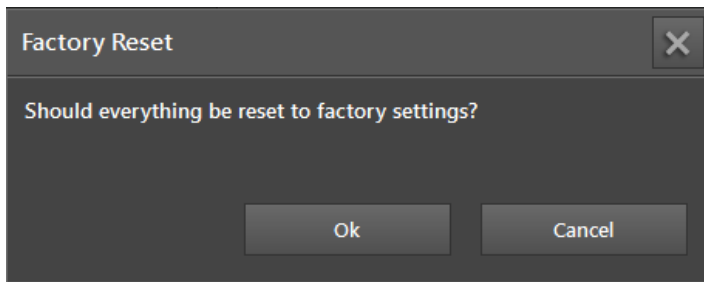


Existing settings and applications are deleted when the device is reset to factory settings.

► If necessary, export the existing settings beforehand.

► Click [Reset].

> A safety query is displayed.



► Click [OK].

> All settings are reset.

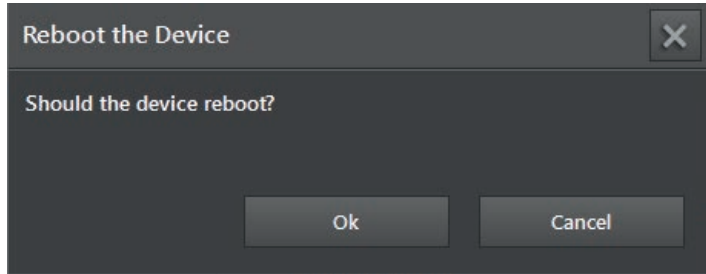
> The device setup is closed and the start screen appears.

9.1.7 Reboot device

The device must be rebooted if the EtherNet/IP interface is used after a change of the IP address. If TCP/IP is used, it is not necessary to reboot the device.

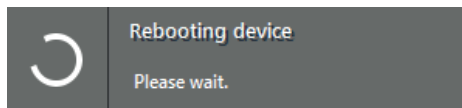
► Click [Reboot].

> A safety query is displayed.

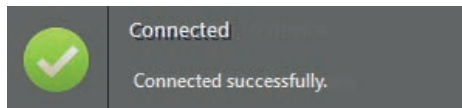
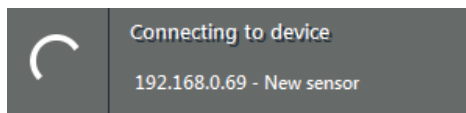


► Click [OK].

> The device reboots.



> The ifm Vision Assistant connects to the device.



> If an application is active, the ifm Vision Assistant continues with the monitoring window. If no application is active, the ifm Vision Assistant switches to the edit window.

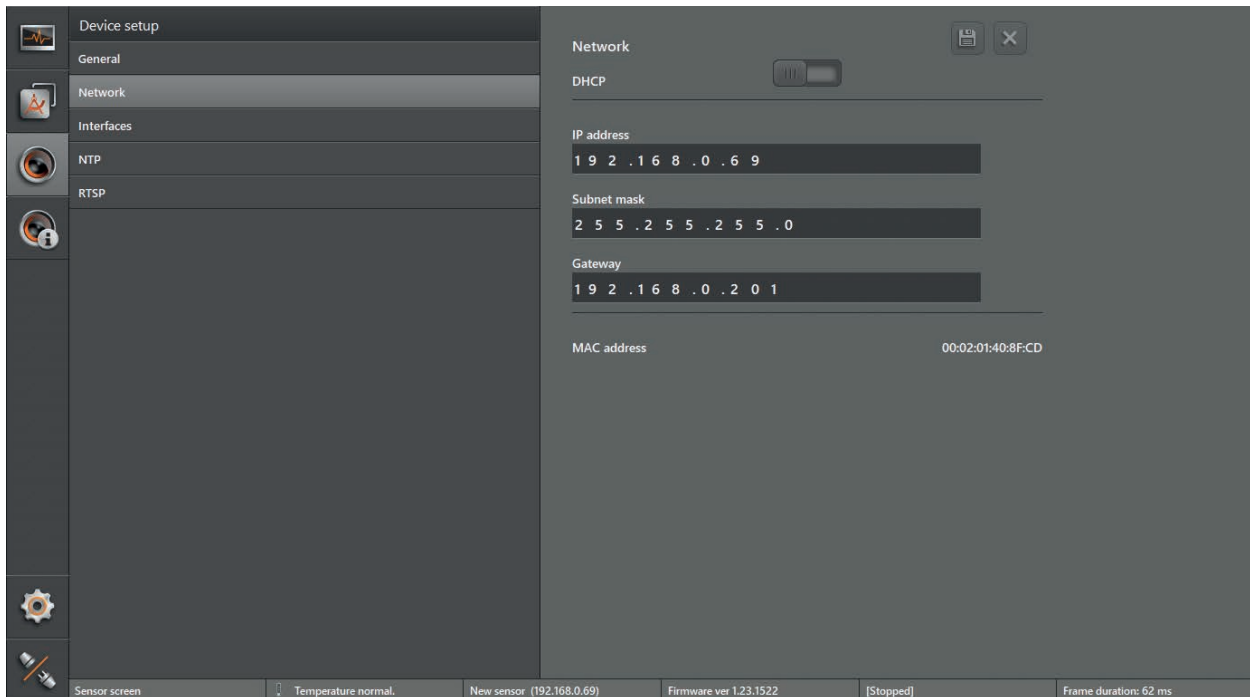
► If connecting to the device fails, search for the device via  on the start screen or connect it manually.

9.2 Network

The network settings of the device are set in the window [Network]. If a new device is connected and the ifm Vision Assistant automatically finds the device, the default network data has already been entered.

► Click [Network].

> The network settings are displayed in the window "Network".



► Set button "DHCP" to "on" to activate DHCP (default: "off").

► Enter network settings in the input fields.

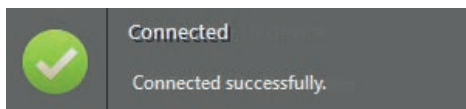
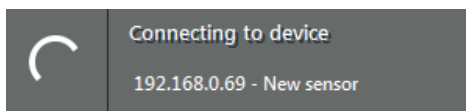
Default settings:

- IP address: 192.168.0.69
- Subnet mask: 255.255.255.0
- Gateway: 192.168.0.201

► Click  to save the changes.

> The changes are saved on the device.

> The ifm Vision Assistant connects to the device.



> If an application is active, the ifm Vision Assistant continues with the monitoring window. If no application is active, the ifm Vision Assistant switches to the edit window.

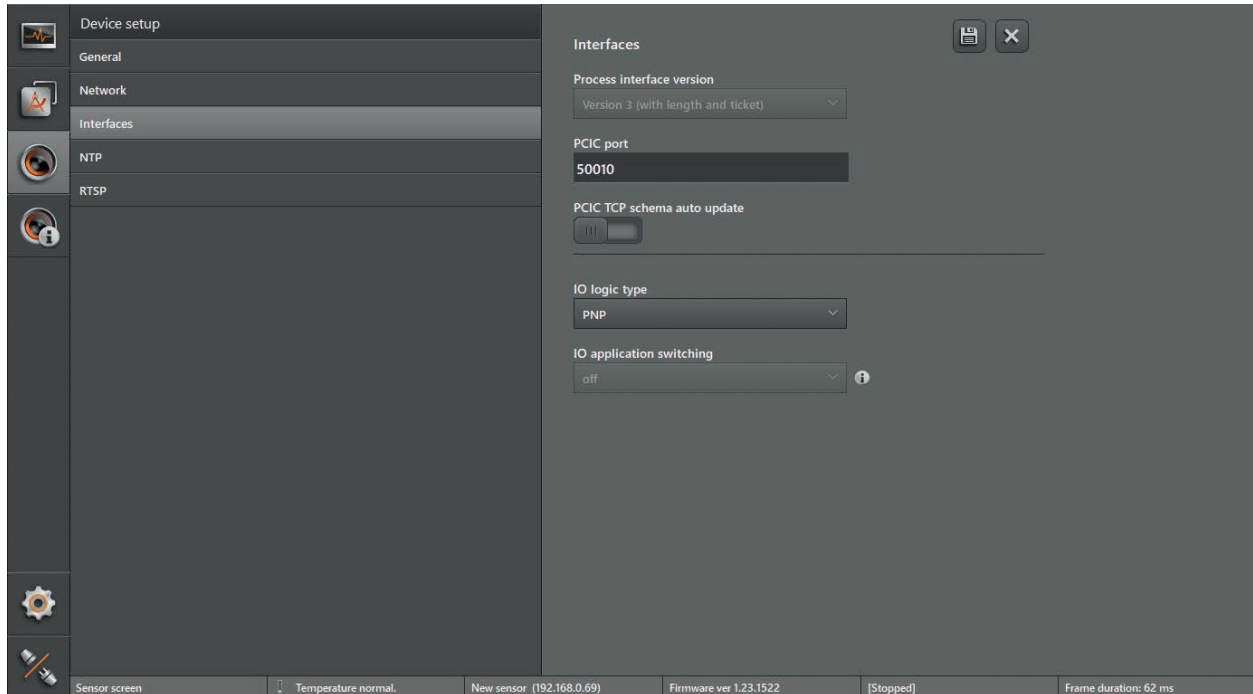
► If connecting to the device fails, search the device via  on the start screen or connect it manually.

9.3 Interfaces

In the [Interfaces] window the fieldbus and the output logic of the device are set.

► Click [Interfaces].

> The settings of the process interface are indicated in the window "Interfaces".



 Depending on the interface not all options are available.

Field	Button	Description
Process interface version	Version X	Version of the process interface protocol.
PCIC port	50010	Editable field for the PCIC port on which the data of the process interface is available with a socket connection.  In the event of connection problems activate the port in the firewall.
PCIC TCP schema auto update	 on  off (standard)	Switch "PCIC TCP schema auto update" on or off. If "PCIC TCP schema auto update" is off, the PCIC data output of the previous application remains active when the active application is changed (→ Operating instructions). Only if the connection to the device is separated will the PCIC data output change. If "PCIC TCP schema auto update" is on, the corresponding PCIC data output is activated when the active application is changed (→ Operating instructions).
IO logic type	[PNP] [NPN]	Hardware logic for the signals of the digital outputs of the device: • PNP: switches positive potential to the output • NPN: switches ground to the output
IO application switching	[deactivated] [static] [pulsed] [pulsed via trigger input] [pulsed via input 1]	Configures the external application switching via the digital inputs.

 The external application switching is described in the operating instructions.

► Click  to save the changes.

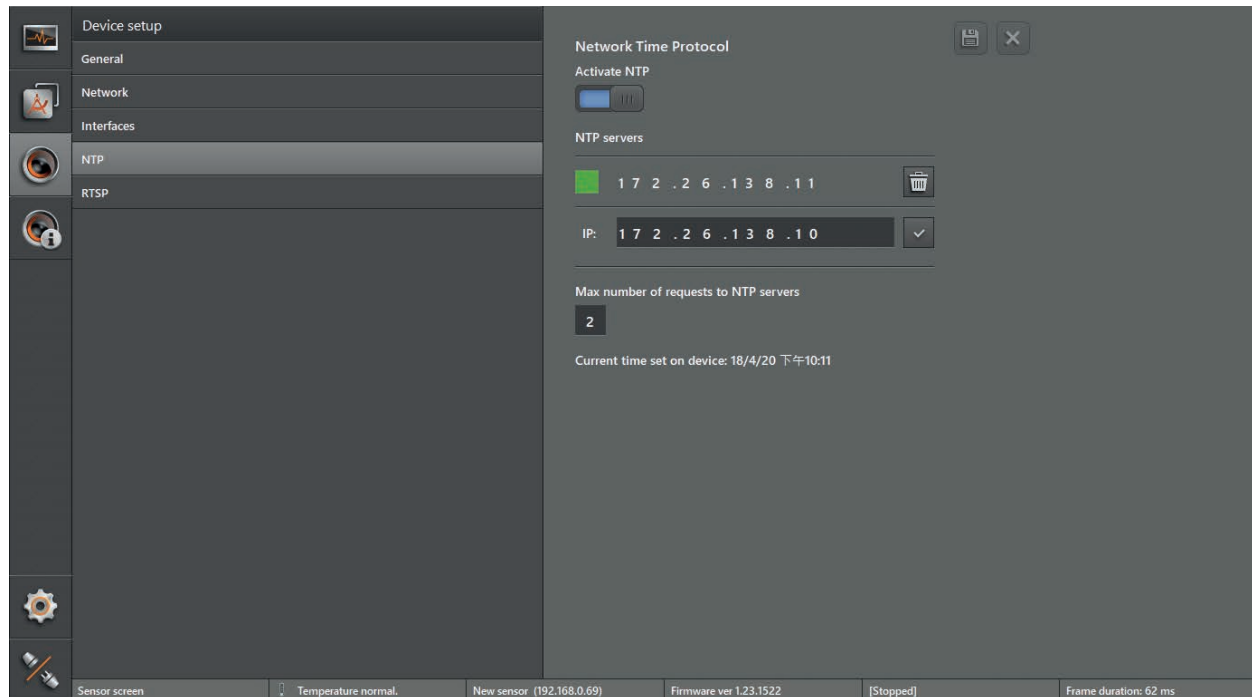
> The changes are saved on the device.

9.4 NTP

In the window [NTP] the real-time clock of the device is set. A real-time clock which can be synchronised via NTP (Network Time Protocol) is integrated in the device. If several devices are used, it is ensured via NTP that the real-time clocks of the devices run synchronously.

► Click [NTP].

> The NTP settings are indicated in the window "NTP".



Field	Button	Description
Activate NTP	 on  off (default)	Switch NTP on or off. When NTP is on, the device gets the date and time from the network.
NTP servers	 green	The set NTP server replied to the last request.
NTP servers	 red	The set NTP server did not reply to the last request.
NTP servers	 grey	So far no request has been sent to the set NTP server.
NTP servers	IP address	IP address of the set NTP server.
Add server		Adds the NTP server.
Delete		Deletes the NTP server.
Max. number of requests	Input field	Set maximum number of requests. If the NTP server does not reply within the set number of requests, the NTP server will be ignored in future.
Current time set on device	Date and time	Display of the date and time saved last in the device.
Save		Saves the network settings.
Cancel		Rejects the network settings.

9.5 RTSP

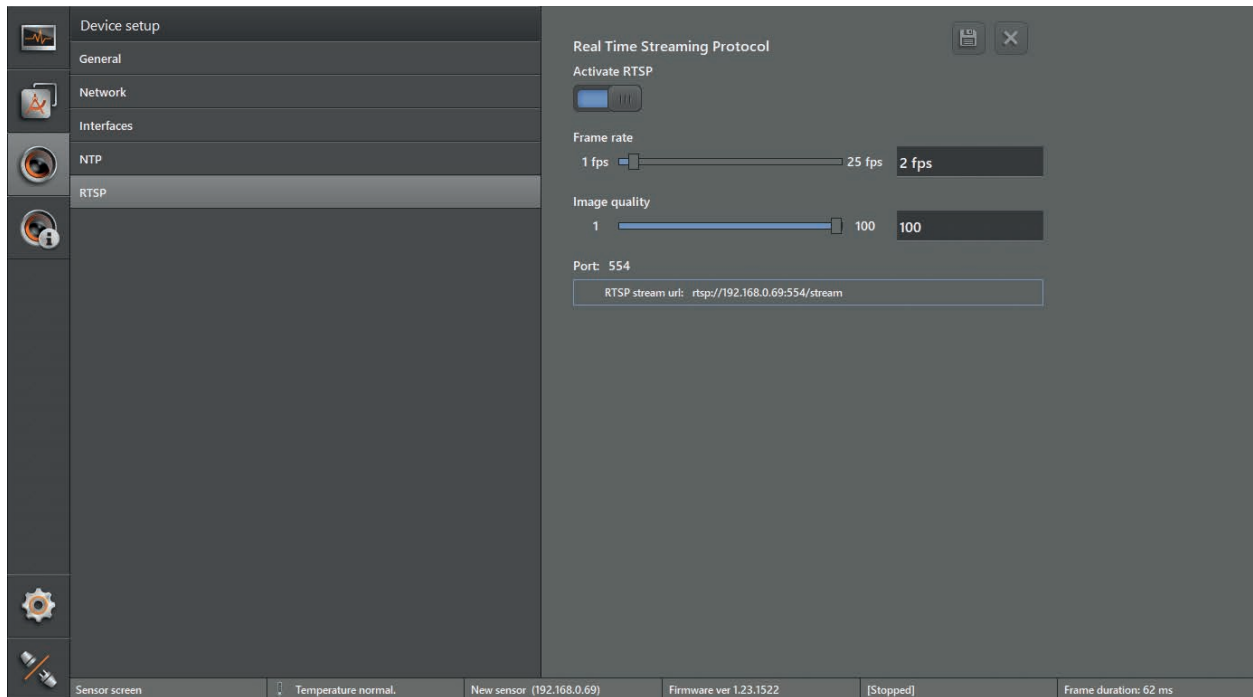
The Real Time Streaming Protocol is set in the [RTSP] window.

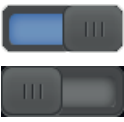
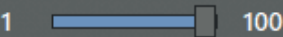
The network protocol RTSP controls the transfer of video data as stream. The stream can be replayed with a client software (video player with RTSP support).

Once the network protocol RTSP is active, the 2D amplitude image (logarithmic) of the device is transferred and it can be retrieved via the displayed URL.

► Click [RTSP].

> The RTSP settings are shown in the "RTSP" window.



Field	Element	Description
Activate RTSP	 on off (standard)	Switch RTSP on or off. If RTSP is on, the 2D amplitude image (logarithmic) of the device is transferred.  If RTSP is activated, the speed and the evaluation time of the device are reduced.
Frame rate	 1 fps 25 fps	Sets the images per second (fps). A high value leads to smoother image transitions and requires more band width in the network.
Image quality	 1 100	Sets the quality of the images. A higher value means a higher image quality, low compression and requires a higher band width. A lower value means a lower image quality, high compression and requires a lower band width.
Port	554	Port "554" is preset.  In the event of connection problems activate the port in the firewall.
RTSP stream url	RTSP stream url	The URL "RTSP stream url" makes it possible to replay the stream with a suitable client software (video player with RTSP support). The URL can be marked and copied.
Save		Saves the settings.
Cancel		Rejects the settings.



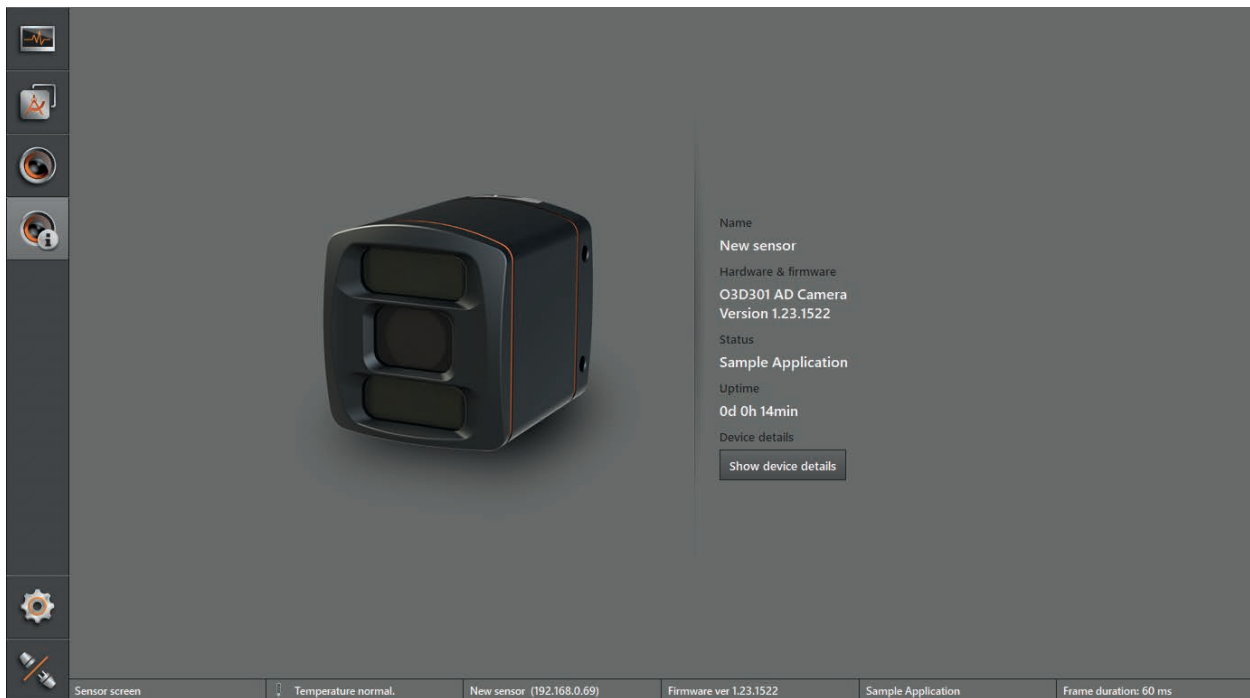
For transferring the video data to the network the following conditions have to be met:

- one application is active (→ „8.1 Activate application“).

10 Device information

► Click .

> An image of the device and basic information are displayed.



Field	Description
Name	Name of the device; example: "New sensor". The name of the device can be edited (→ „9.1.1 Name and description“).
Hardware & firmware	Hardware and firmware version of the device.
Status	Current status of the device.
Uptime	Uninterrupted runtime of the device. Time format: ##d (days) ##h (hours) ##min (minutes).
Device details	Display of hardware and software details of the device (→ „10.1 Show device details“).

10.1 Show device details

For the diagnostics by support people detailed information about the device hardware and software used can be displayed. The information is saved in a text file.

- Click [Show device details].
- > The device details are displayed.
- Click [Save].
- > The window "Save As" appears.
- Enter name and click [Save].
- > The settings are saved in a file with the extension .txt.

11 Appendix

11.1 Network settings



The details of the network setting in this document describe the procedure for PCs with the operating system Windows 7.

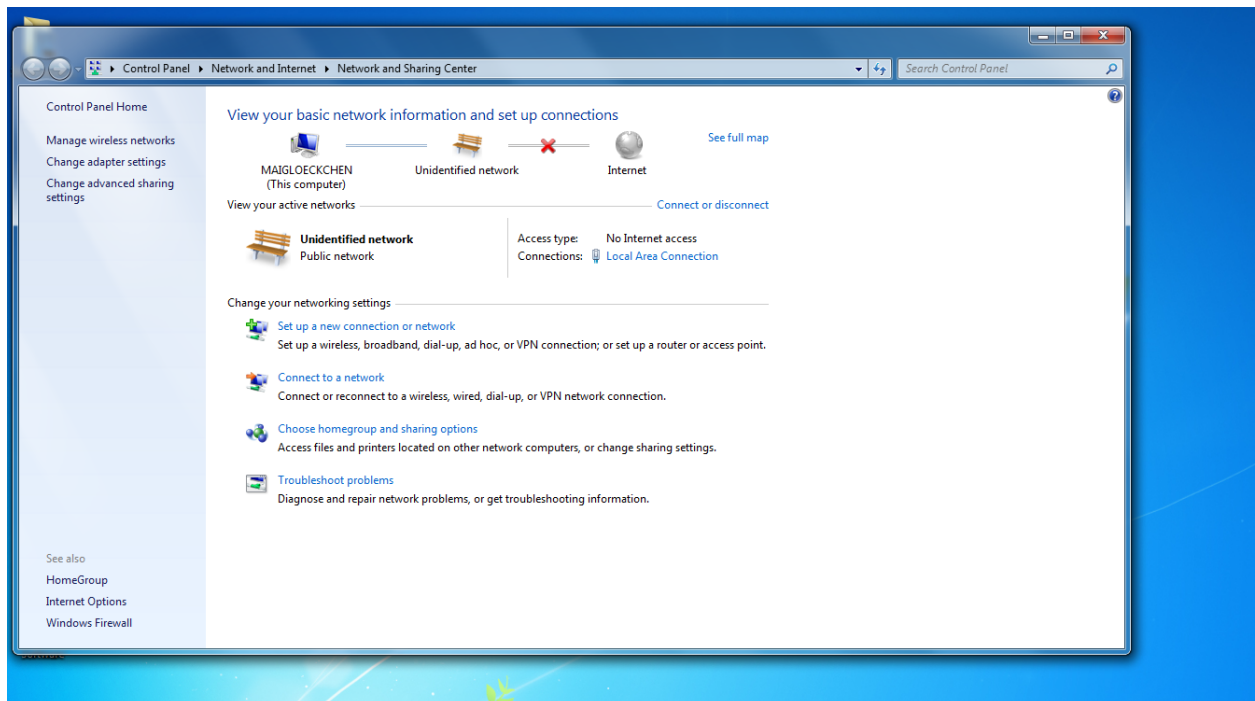
Changing network settings in a PC requires administrator rights.

The following ports must be open (if necessary, adapt the firewall settings):

- UDP: 3321
- TCP/HTTP: 80 and 8080
- TCP: 50010

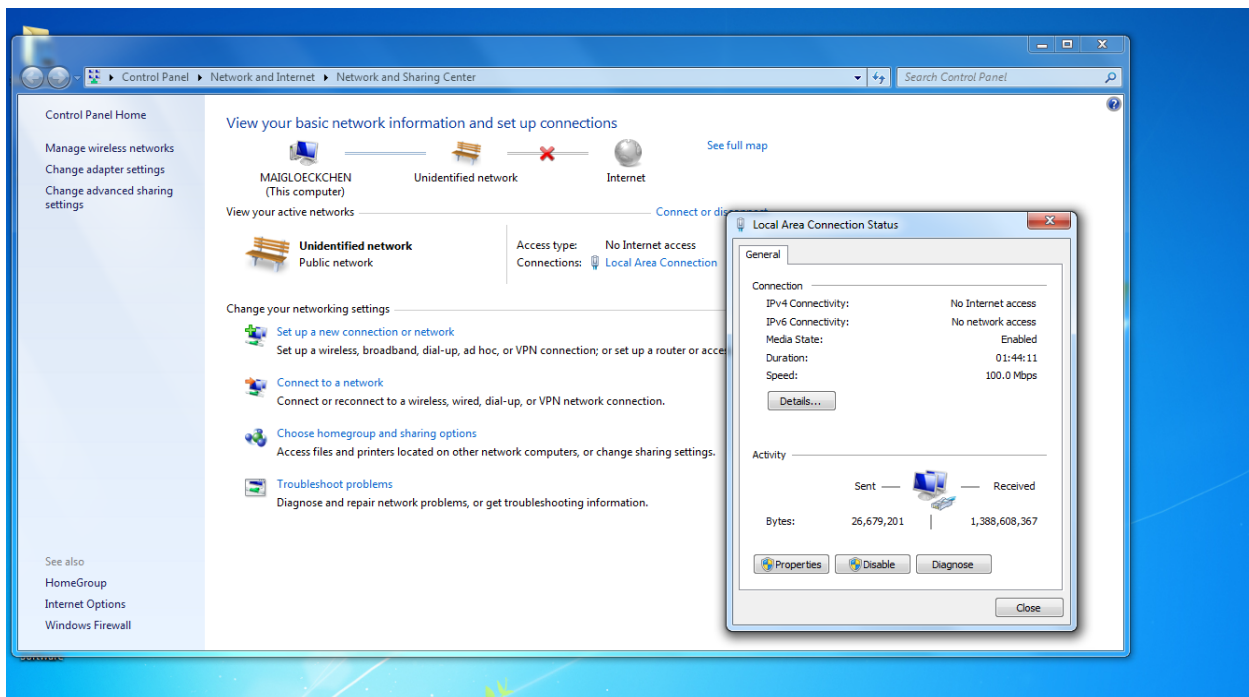
UK

► Open [Network and Sharing Center].

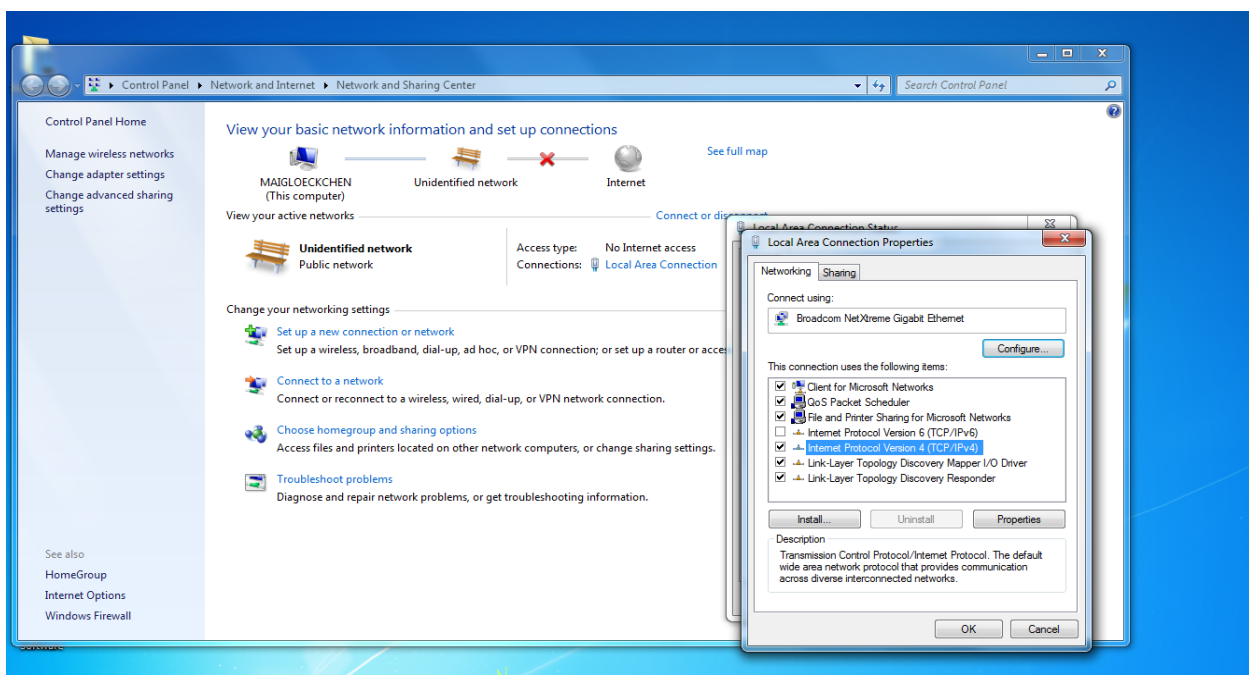


► Click the name of the local network next to [Connection].

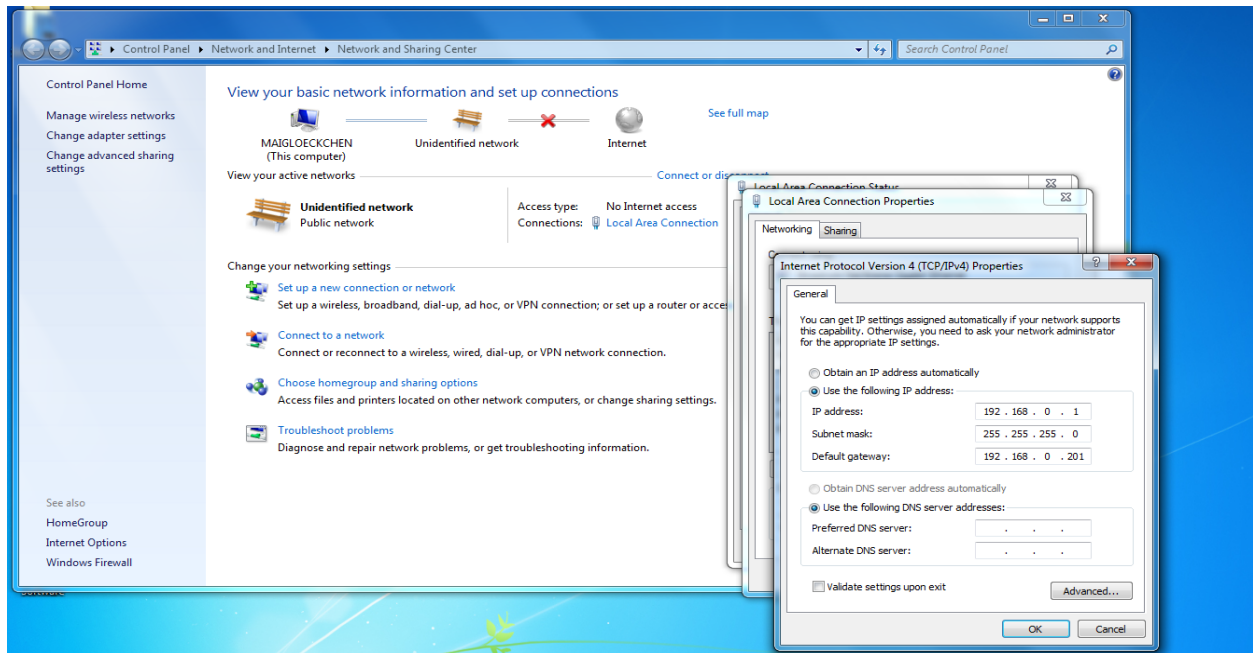
> The window "Local Area Connection Status" of the local network opens.



- Click [Properties].
- > The window "Local Area Connection Properties" of the local network opens.



- Select [Internet Protocol Version 4 (TCP/IPv4)].
- Click [Properties].
- > The window "Internet Protocol Version 4 (TCP/IPv4) Properties" opens.



- ▶ Select the option [Use the following IP address:].
- ▶ Set the following default values:
 - IP address: 192.168.0.1
 - Subnet mask: 255.255.255.0
 - Default gateway: 192.168.0.201
- ▶ Click [OK].

11.2 Glossary

Active application

The application set to "active" in the device: This application is running when the device is ready for operation.

Amplitude

Refers to the reflectivity of the objects in the infrared range: The device provides a greyscale representation of the measurement result - the higher the reflection, the lighter the shade of grey.

Anchor function

The anchor function enables the detection of the object's position and orientation, for example in completeness monitoring. This enables to compensate for a rotation of the object up to 40°.

Application switching

The application switching can be triggered via the process interface or via the digital inputs.

Operating mode

Active mode by default if an active application is available on the device. The active application is in the process of being executed.

User defined mode

Mode to configure and set the device and the applications: no application is executed.

Pixel

Individual data point in a 2D/3D image.

Process interface

Interface for external hardware: Data can be transmitted by or received from a PLC, for example, via the process interface.

