Software Manual

ifm Vision Assistant for 3D camera

O3X1xx

UK

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visionassistant
ifm electronic

Content

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1 Preliminary note

This document describes the interaction between the O3X1xx 3D camera and the ifm Vision Assistant software:

- Camera parameter setting
- Setting up the application using the ifm Vision Assistant
- Monitoring the application with the ifm Vision Assistant

As soon a 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 damage to property can occur.

1.3 Further documents

- Operating instructions
- Interface description

The documents can be downloaded at:
www.ifm.com

2 System requirements

2.1 Software

Windows 7 (32/64 bit), Windows 8.1 (32/64 bit), Windows 10 (32/64 bit)

2.2 Hardware and accessories

hardware:

- Camera of the O3X1xx product family
- PC with x86 or x64 type processor
- Screen: min. 1024 x 768 pixels, 32 bit colour depth
- Ethernet interface

The Ethernet interface can be retrofitted with an USB-to-Ethernet adapter.

Accessories:

- Power supply 24 V, 1.6 A, min. peak current 2.4 A

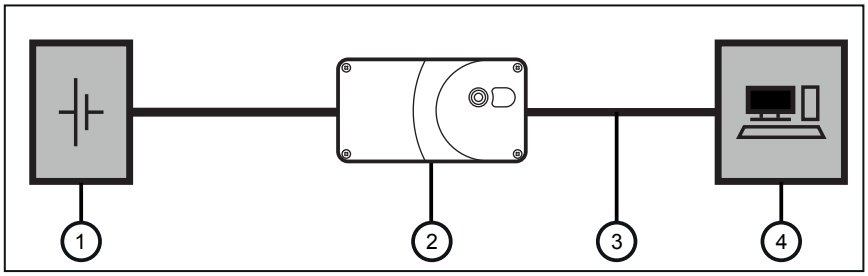
You will find further information about available accessories at:
www.ifm.com

3 Installation

3.1 Hardware

► Connect device to the voltage supply.

► Connect device to the Ethernet interface of the PC using the network cable.



1: Power supply 24 V
2: Device
3: Ethernet cable
4: PC

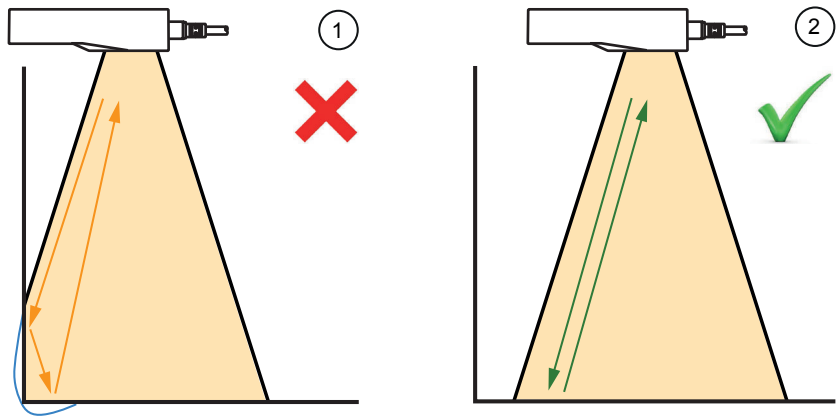
You will find further information about the electrical connection and the exact pin configuration in the operating manual.

3.1.1 Measures to avoid multiple reflections

When measuring the following objects, multiple reflections may occur:

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

Multiple reflections increase the time of flight of the light and thereby make the distance to the device seem longer.



1: Multiple reflections on a surface at a short distance.
The seeming distance is shown in blue.
2: Correct installation

► Install the device at a sufficient distance to surfaces.

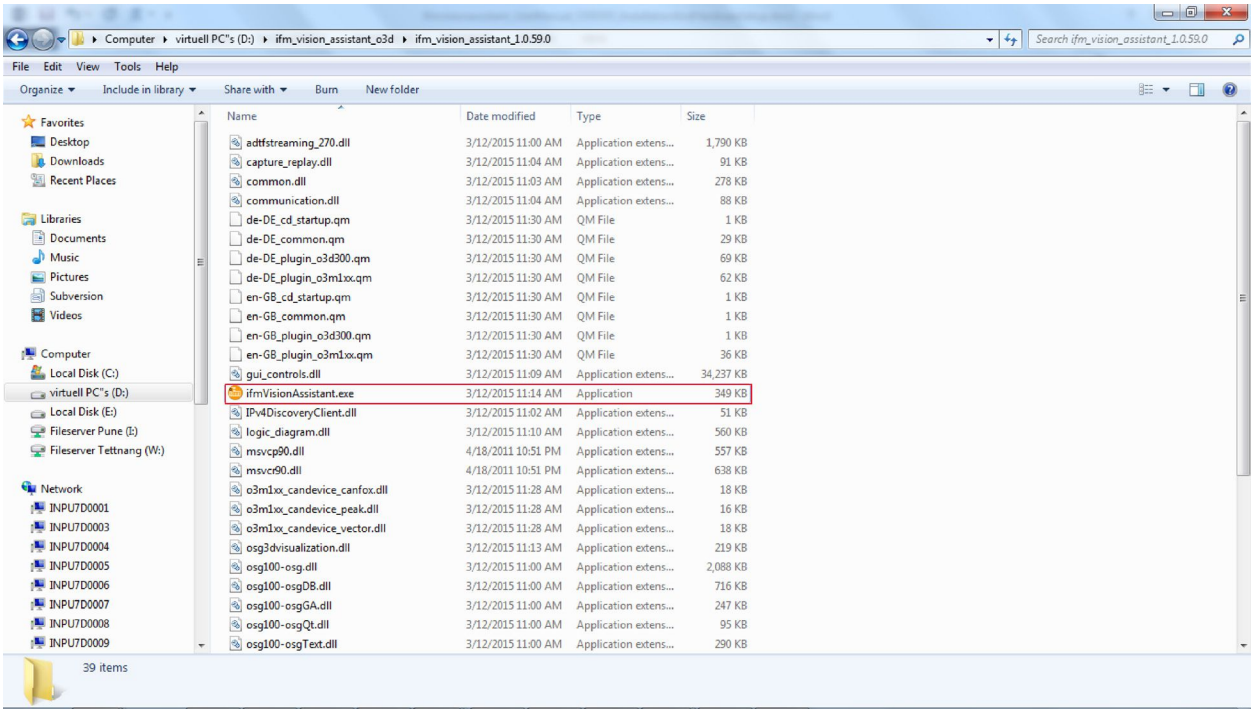
► Do not put the device on a flat surface (e.g. table) for presentation purposes.

3.2 Software (ifm Vision Assistant)

► Download the ifm Vision Assistant software from the ifm website: www.ifm.com

► Unpack the Zip file "ifmVisionAssistant" on the PC.

► Start the executable file "ifmVisionAssistant".



> The start screen of the ifm Vision Assistant opens.

If the start screen does not appear after 5–10 seconds, please check if the software requirements are complied with and if all files are properly unzipped.

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	The device must be connected
	Find sensor	Connection with the newly connected device. Searches for connected devices and displays a selection list of the found devices (→ „4.1 Find sensor“).	yes
	Recent	Connection with a device which was connected before and maybe is already configured. Opens a selection list of the devices which were already connected (→ „4.2 Recent“).	yes
	Replay	Playback of recorded sequences (→ „4.3 Replay“).	no
	Wiring	Visualisation of the wiring of the voltage supply. The visualisation is used to simplify the connection during set-up (→ „4.4 Wiring“). The "wiring" function is not supported for O3X1xx.	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 sensor

With this function, it is possible to search for the connected devices or to establish a manual connection with 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, adjust the settings of the firewall):

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

The device can only be accessed with one PC at a time. Access with several end devices (e.g. PC) is not supported.

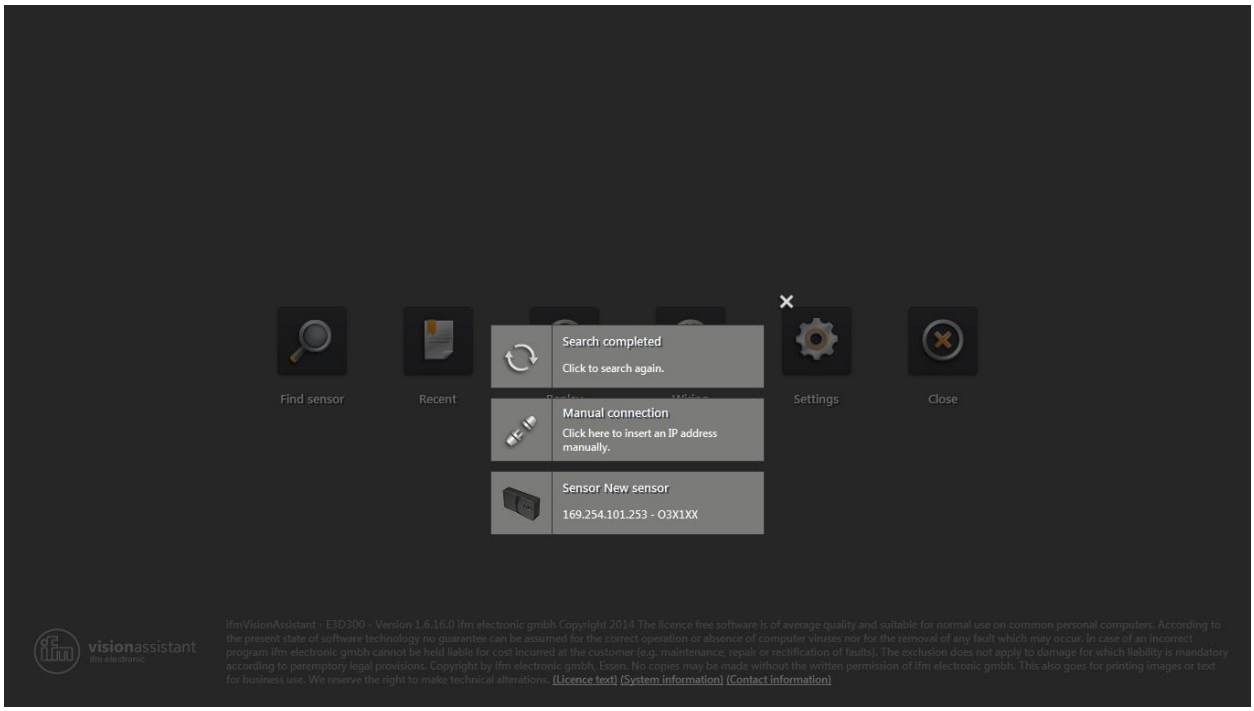
4.1.1 Connect device automatically

► Click on .

> The ifm Vision Assistant searches for connected devices via Ethernet.

> All devices found are shown in a list for selection.

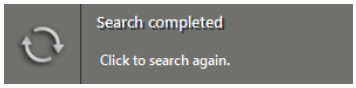
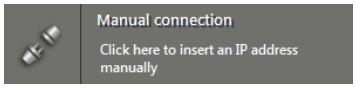
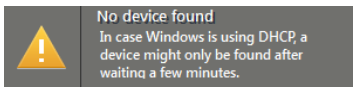
► Click on the button of the found device in order to establish connection.



If the ifm Vision Assistant does not find a device automatically:

- Check if the device is correctly connected and ready for operation and click on [Search completed] to start a new search.
- Connect the device directly with the PC without any additional network devices in the connection (e.g. router).
- Click on [Manual connection] and enter the IP address of the device manually (→ „4.1.2 Connecting the device manually“).

Buttons and notifications after the direct search:

Button & Notification	Description
	Starts a new search.
	Enables manual entry of the IP address (→ „4.1.2 Connecting the device manually“).
	Shows information such as IP address, name of the device and the firmware version. Connects the device and continues according to the application data (→ „4.1.3 Options after the connection is established“).
	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.

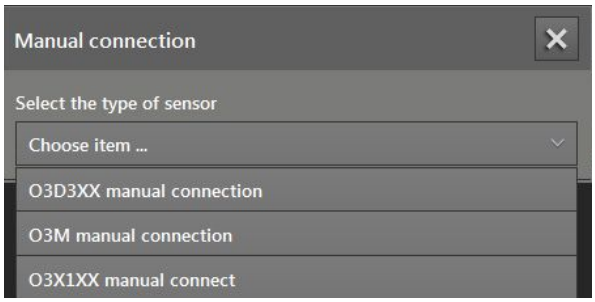
4.1.2 Connecting the device manually

If the ifm Vision Assistant does not automatically establish a connection with the device, the device can be connected manually by clicking on the [Manual connection] button.

► Click on  .

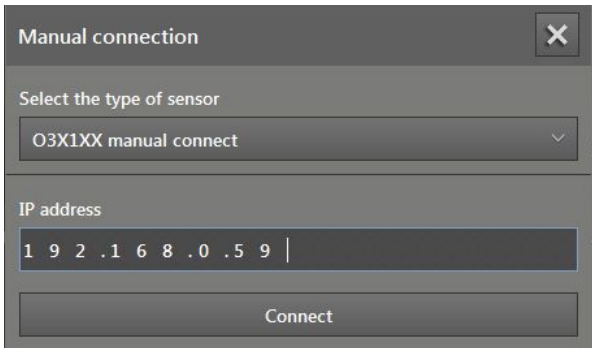
► Click on [Manual connection].

> The "Manual connection" window is displayed:



► Select "O3X1XX manual connection".

► Enter the IP address of the device (standard: 192.168.0.69).



► Click on [Connect].

The IP addresses of device and PC with ifm Vision Assistant must be in the same subnet.

4.1.3 Options after the connection is established

If the connection to the device is successfully established, the ifm Vision Assistant continues with one of the following options depending on the status of the stored files:

Status	Option
Standard applications	Monitoring window is opened (→ „6 Monitoring window“).
Error	Error message is displayed.

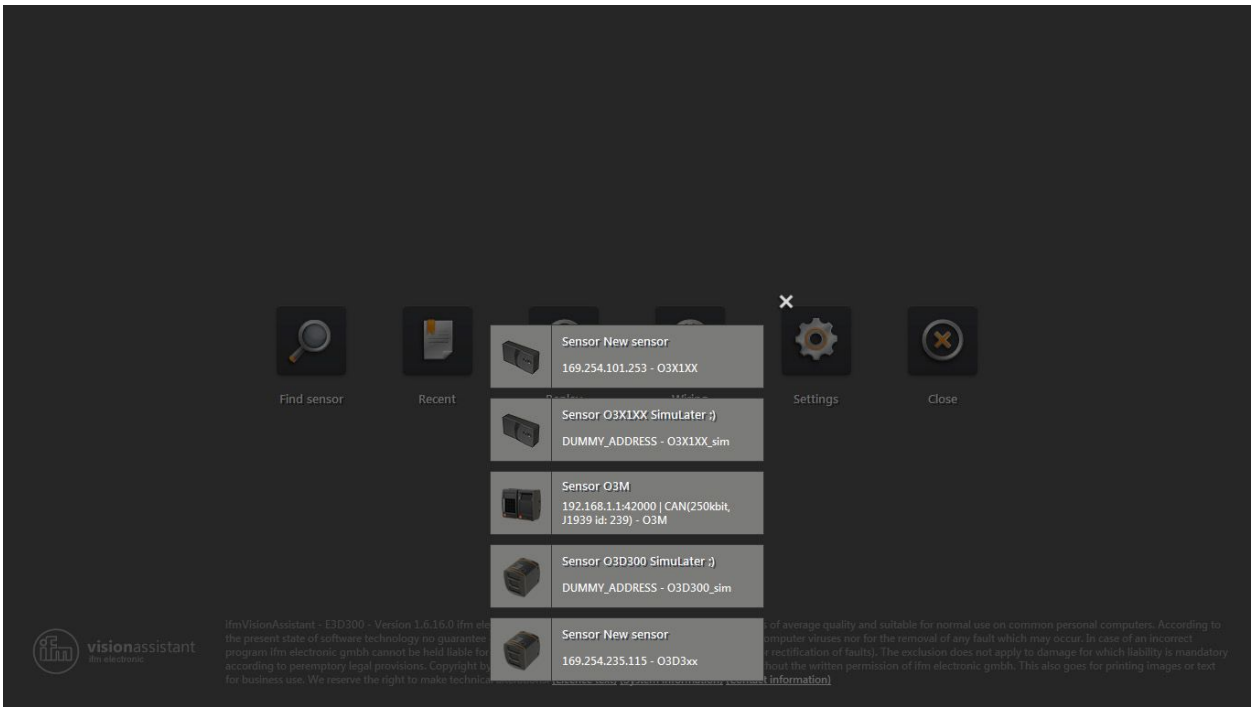
Active application

An active application is available on the device. The ifm Vision Assistant starts with the monitoring window (→ „6 Monitoring window“). In order to be able to change parameters, the application must be stopped.

4.2 Recent

The function opens a selection list of the devices that were connected before.

► Click on  .



► Ensure that the required device is connected with the PC via Ethernet or available in the network.

► Click on the device in the selection list.

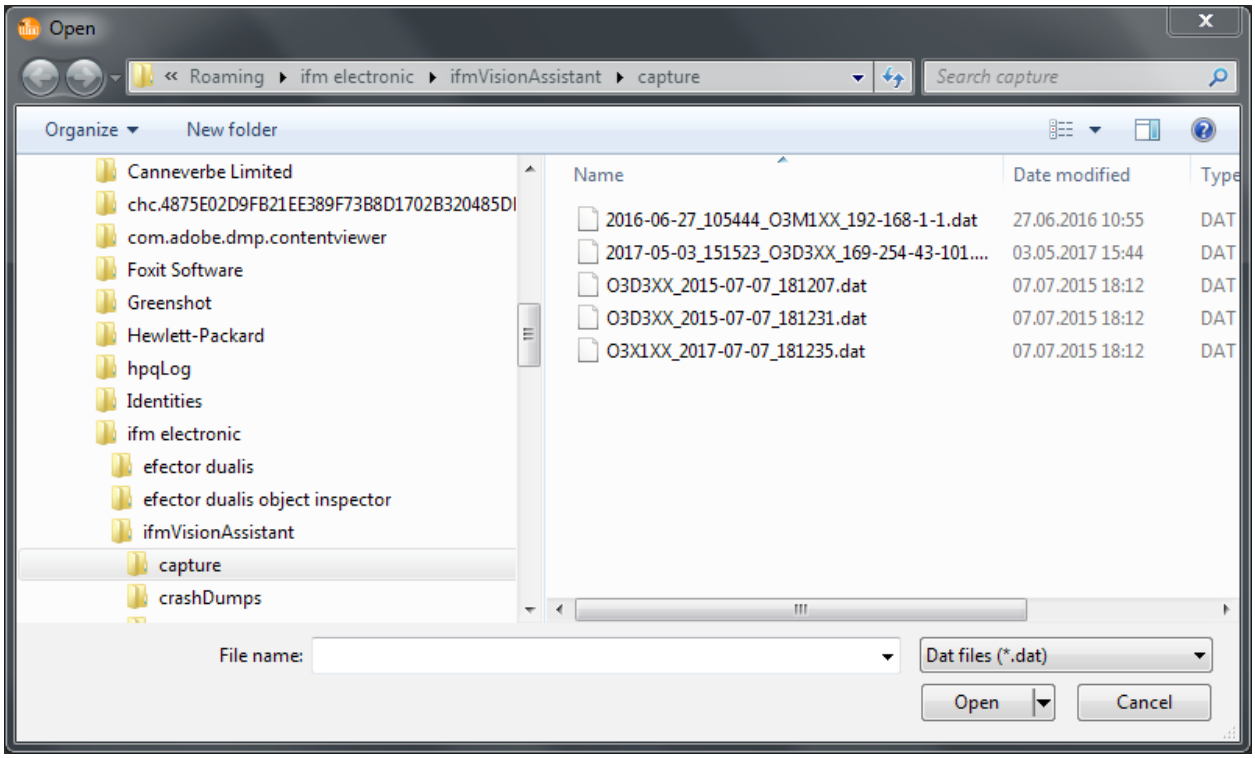
> The ifm Vision Assistant establishes a connection to the device (→ „4.1.3 Options after the connection is established“).

4.3 Replay

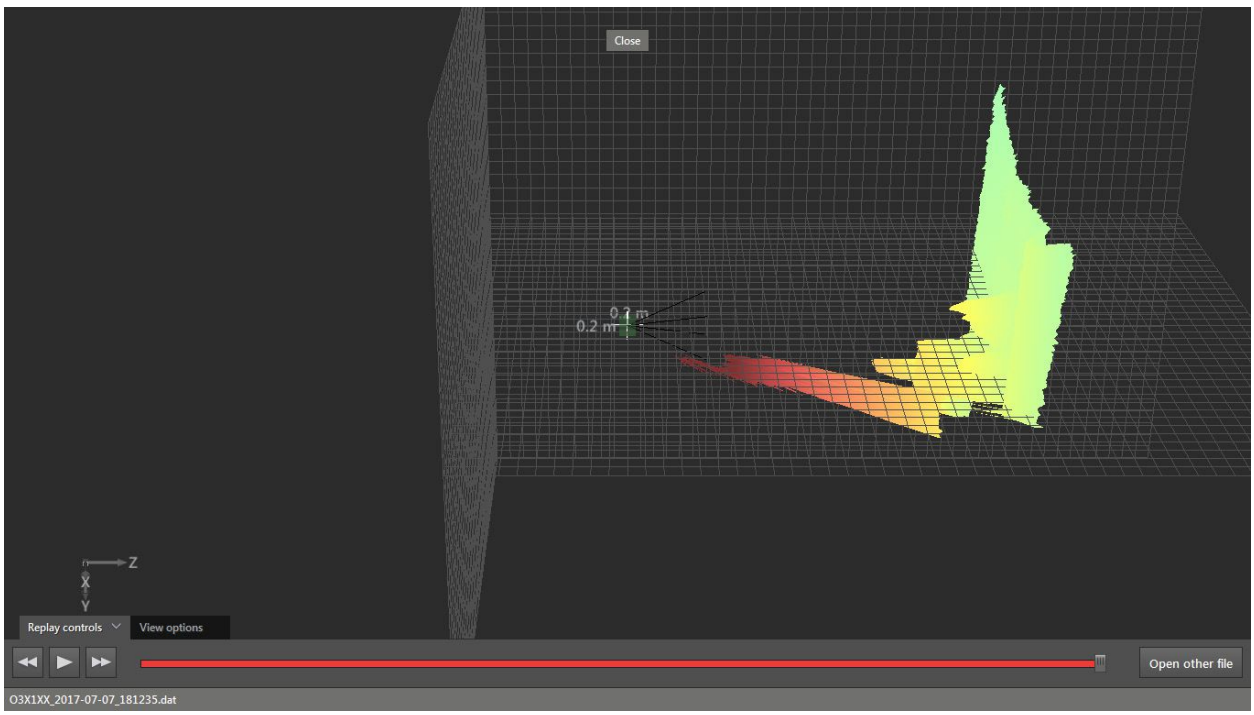
With this function, data that has been recorded can be viewed (→ „6 Monitoring window“). A connection with a device is not necessary.

► Click on  .

► Select the required file (*.dat) and click on [Open].



> The play screen appears.



Options on the play screen:

Tab	Option / button	Description
Play Options	Pause	Stops playback.
	Down	Stops playback and shows the previous picture.
	Up	Stops playback and shows the next picture.
	Start	Continues playback.
	Progress bar	Indicates the current position in the recording. By clicking on a position in the progress bar, playback is continued at the corresponding image.
	Open other file	Opens a window in which a file can be selected.
View options	–	→ „6.1 View Options“
–	Close	Closes the play screen and opens the start screen.

1. Click on [Close] to return to the start screen.

4.4 Wiring

The "wiring" function shows the correct wiring of the voltage supply.

The "wiring" function is not supported for the O3X1xx devices.

4.5 Settings

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

► Click on .

> The "Settings" window is displayed.

Options in the settings window:

Field	Option	Description
Select language	English	Selection of the available language "English" is set by default.
	German	
	etc.	
Activate fullscreen	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 on to quit the ifm Vision Assistant.

5 Structure of the user surface

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

- Navigation bar:
  In the navigation bar on the left, the required option can be selected
  (→ „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.

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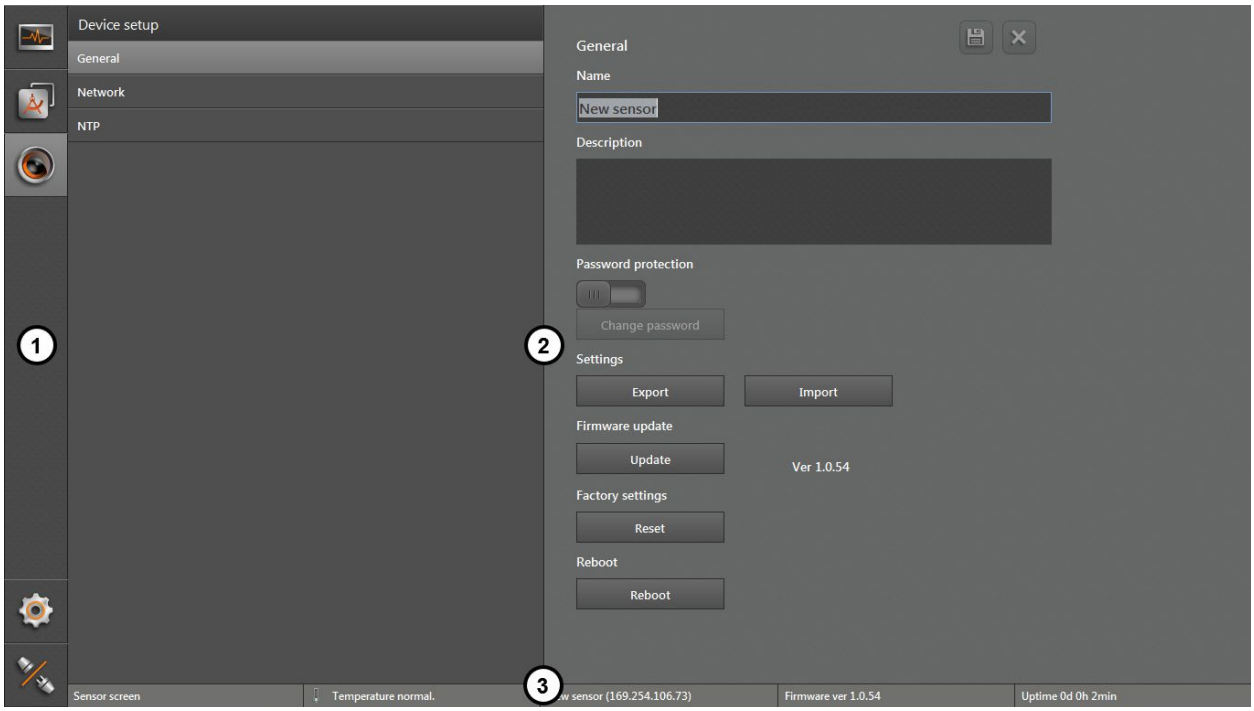


1: Navigation bar
2: Main area
3: Status bar

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“).
	Application	Opens the application (→ „7 Application“). Configuration of the applications.
	Device setup	Opens the device setup (→ „8 Device setup“). Setting the device irrespectively of the application.
	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 frame in which you currently are, 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. "0.06.39"
- Status of the running application, e.g. "stopped"
- Image processing time of the device, e.g. "232 ms"

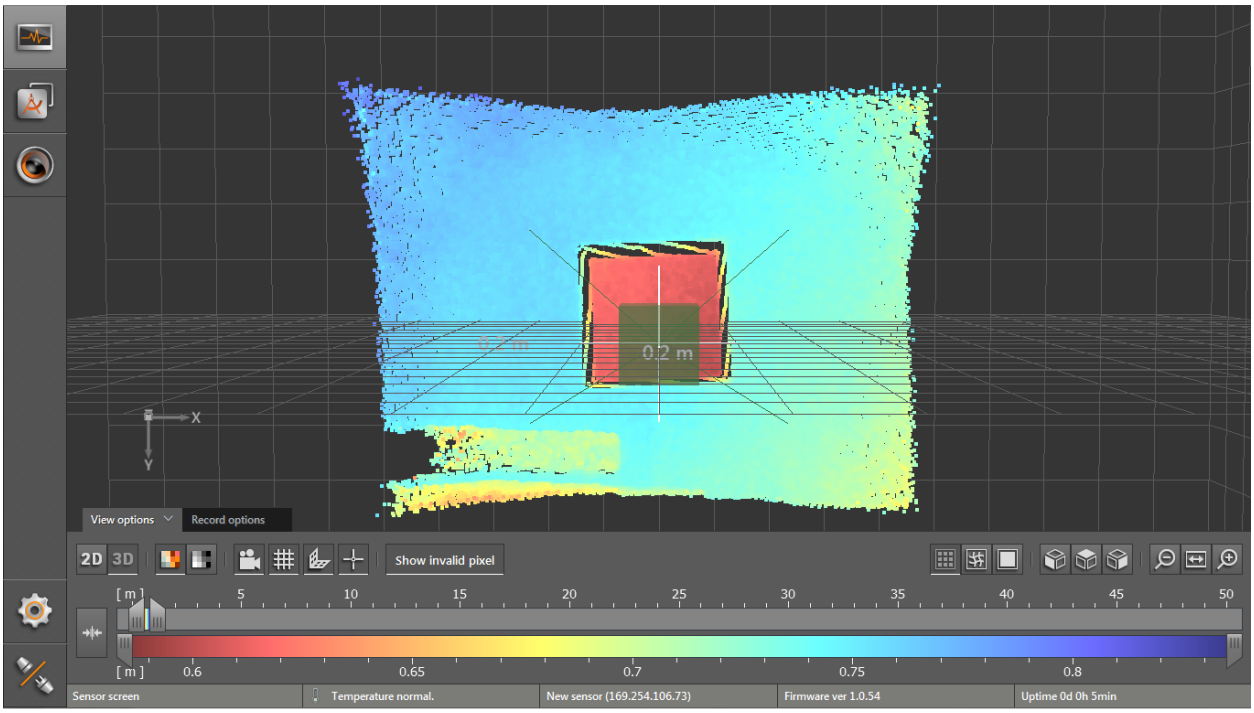
5.3 hauptbereich

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

6 Monitoring window

The software will continue with the monitoring screen if a connection with the device is established. The unit runs in the operating mode. In the monitoring window, the application can be monitored, but neither interrupted nor changed.

► Click on  .



The following tabs can be seen under the live image:

- [View options] (→ „6.1 View Options“)
- [Record] (→ „6.2 Record“)

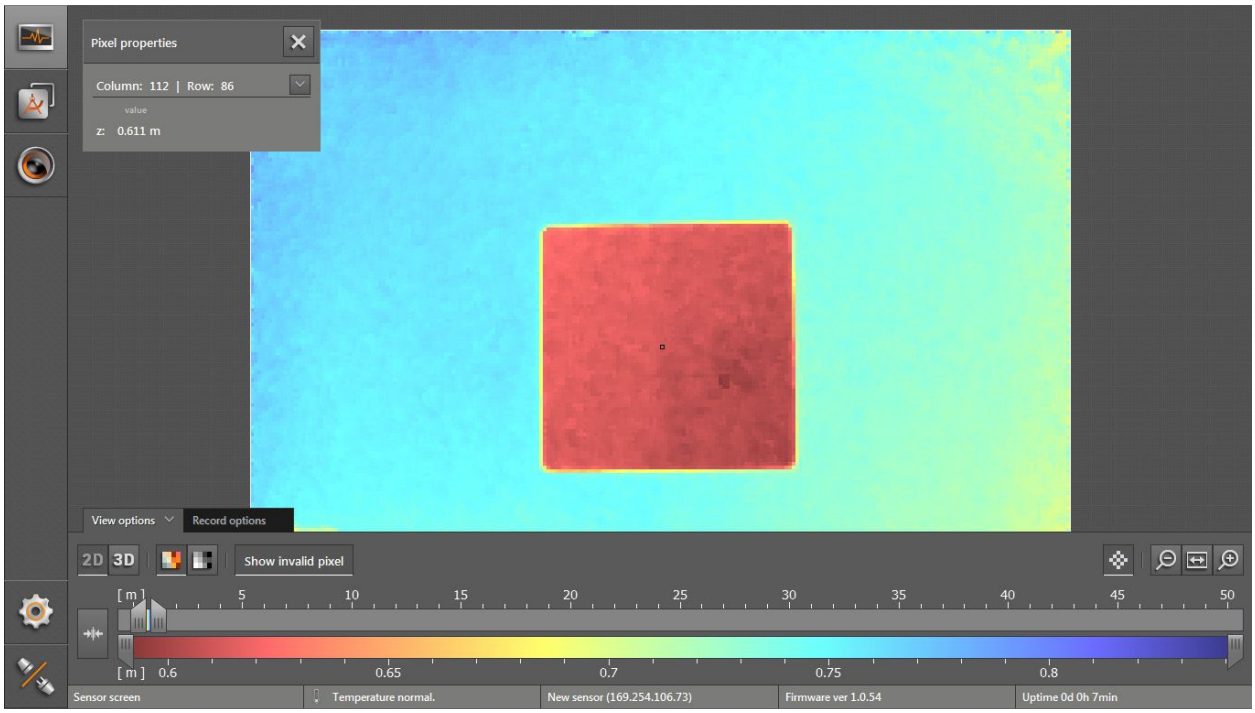
6.1 View Options

► Click 2D or 3D to select the required view.

Button	Name	Description
2D	2D view	The central view shows the device data as a 2D visualisation (→ „6.1.1 2D view“).
3D	3D view	The central view shows the device data as a 3D visualisation (→ „6.1.2 3D view“).

The graphics in the following chapters are examples. Depending on the objects and the individual settings, the visualisation may differ.

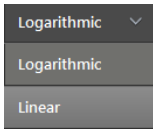
6.1.1 2D view



► Click 2D to show the 2D view.

► Adjusting the 2D view.

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

Button	Name	Description
	Distance image	Visualises the pixels in the 2D view in relation to the distance values.
	Amplitude image	Visualises the pixels in the 2D view in relation to the amplitude values in levels of grey (brightness).
	Logarithmic	Visualises the amplitude values of the 2D view in logarithmic levels of grey (only available for the amplitude image).
	Linear	Visualises the amplitude values of the 2D view in linear levels of grey (only available for the amplitude image). The "linear" view is particularly helpful when setting up the image.
[Ungültige Pixel anzeigen]	Show invalid pixel	Shows the invalid pixels in the live image.
	Pixel properties	Shows the window for the pixel properties.
	Zoom out	The 2D view gets smaller.
	Zoom 1:1	Sets the image zoom to the standard view.
	Zoom in	The 2D view gets larger.
	Rescaling	Sets the colour range automatically to an adequate area. The settings of the slider bars are dismissed.

The settings of the 2D view only change the calculation and the type of the visualisation. The application itself is not changed by them.

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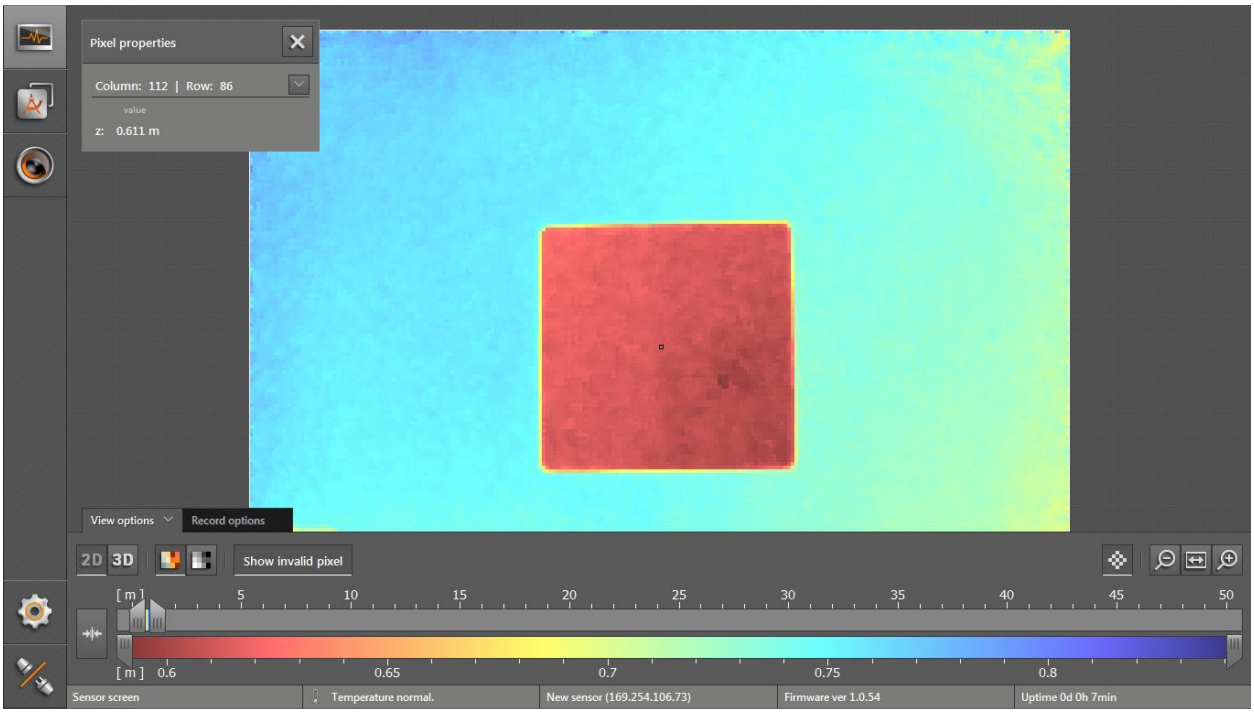
Distance image

► Click  to display the distance image.



Amplitude image

► Click  to display the amplitude image.

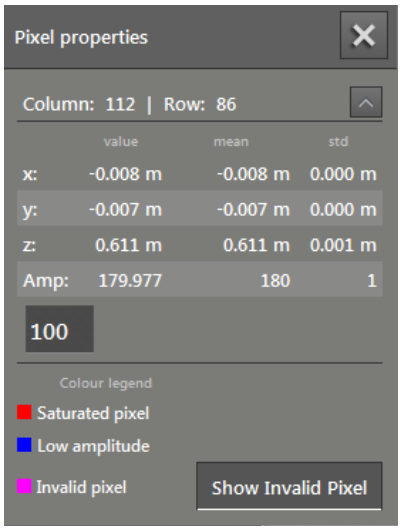
The "amplitude image" view can be displayed in logarithmic or linear levels of grey.

Pixel properties

The function "pixel properties" gives the following 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: currently measured value, mean value and deviation in metres.
y	y coordinate of the selected pixel: currently measured value, mean value and deviation in metres.
z	z coordinate of the selected pixel: currently measured value, mean value and deviation in metres.
Amplitude	Amplitude of the selected pixel.
Colour legend Distance image	White: saturated pixels.
	Black: amplitude too low.
	Violet: invalid pixel. The invalid pixels are only shown if the button Show Invalid Pixel is selected (→ "6.1.1 2D view).„6.1.1 2D view“
Colour legend Amplitude image	Red: saturated pixels.
	Blue: amplitude too low.
	Violet: invalid pixel. The invalid pixels are only shown if the button Show Invalid Pixel is selected (→ „6.1.1 2D view“).

► Click to open the "Pixel properties" window.



Pixel properties of the distance image

► Click on 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.

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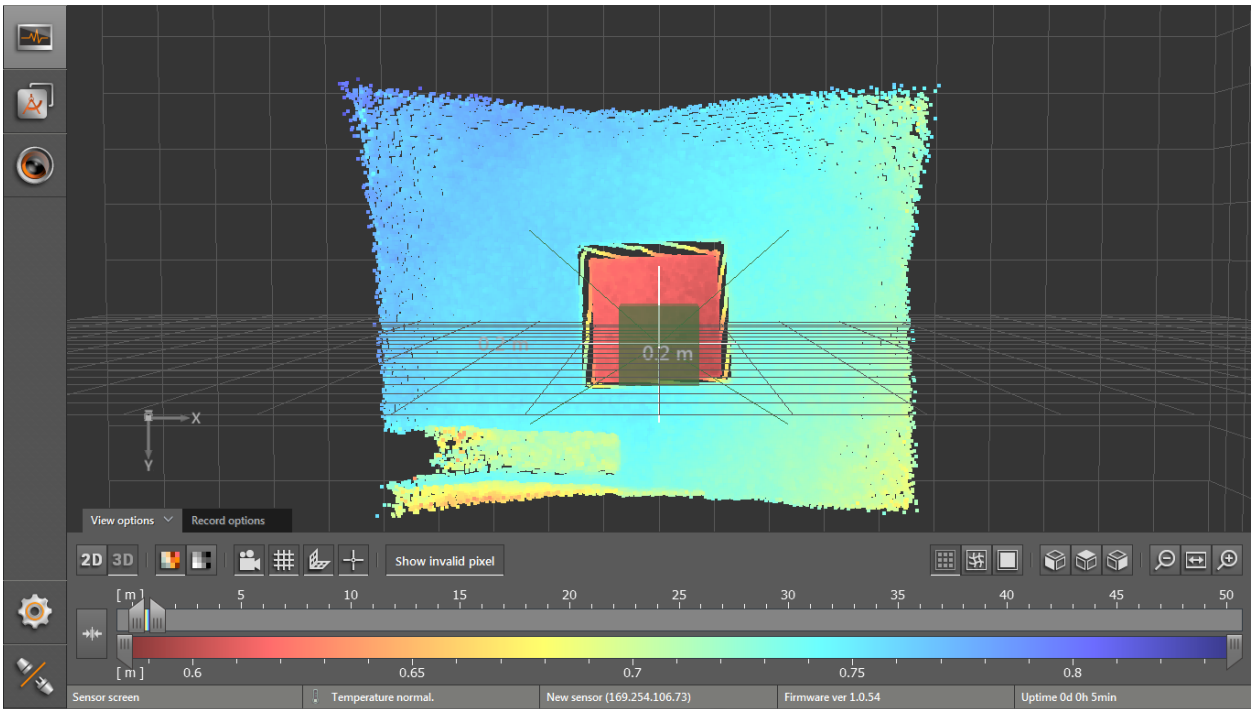
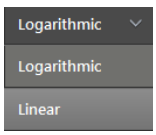
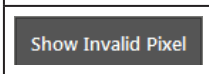
6.1.2 3D view



► Click 3D to show the 3D view.

► Adjusting the 3D view.
The following setting options are available in the tab "View options":

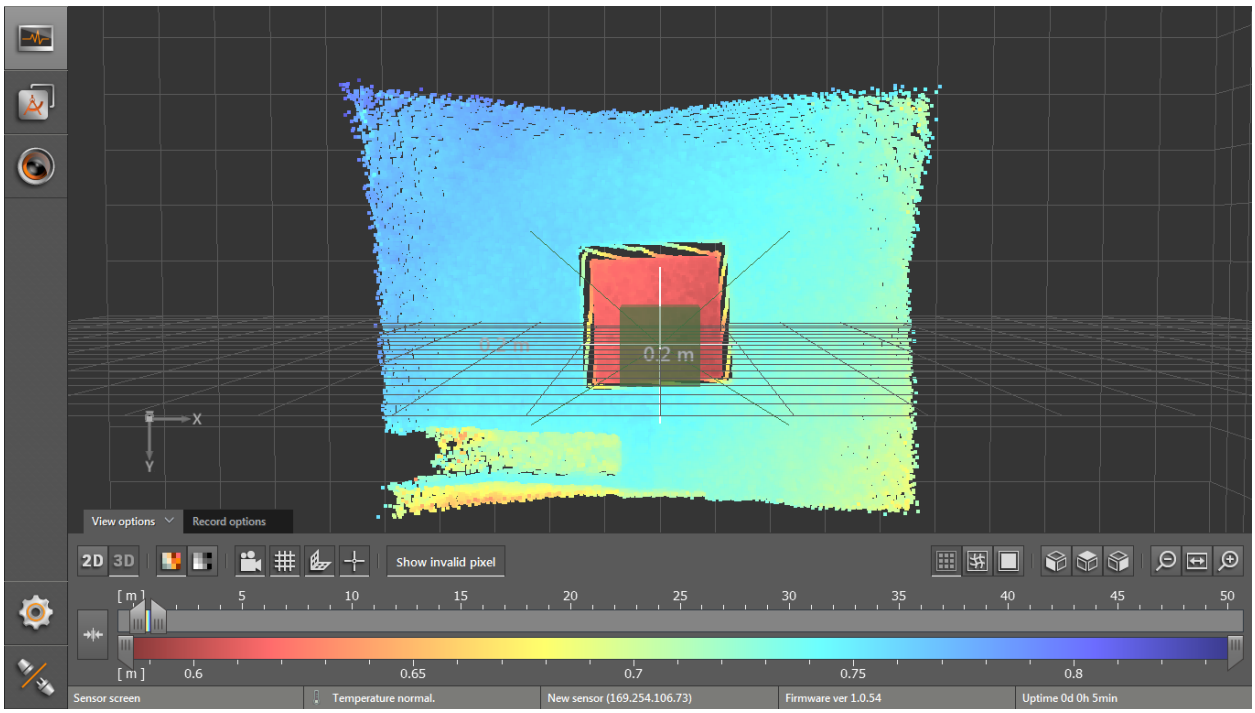
Button	Name	Description
	Distance image	Visualises the pixels in the 3D view in relation to the distance values.
	Amplitude image	Visualises the pixels in the 3D view in relation to the amplitude values in levels of grey (brightness).
	Logarithmic	Visualises the amplitude values of the 3D view in logarithmic levels of grey (only available for the amplitude image).
	Linear	Visualises the amplitude values of the 3D view in linear levels of grey (only available for the amplitude image).
	Device position	Shows and hides the device's position and the angle of view in the 3D view.
	Mesh	Shows and hides the level mesh (xz level) in the 3D view.
	Background grid	Shows and hides a spatial grid (xy level and yz level) in the 3D view.
	Origin	Shows and hides the origin of the coordinate system in the 3D view.
	Show invalid pixel	Shows the invalid pixels in the live image.
	Points	Shows the data as a point cloud.
	Mesh	Shows the data as a mesh.

Button	Name	Description
	Surface model	Shows the ascending slopes as colour gradients.
	Default view 1	Turns the 3D view to the xy level.
	Default view 2	Turns the 3D view to the xz level.
	Default view 3	Turns the 3D level to the yz level.
	Zoom out	The 3D view gets smaller.
	Zoom 1:1	Sets the image zoom to the standard view.
	Zoom in	The 3D view gets larger.

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

Distance image

► Click  to display the distance image.



Visualisation in the 3D image	Description
Pixel position	Space coordinate of the point (x, y, z coordinates).
Pixel colour	Distance (z coordinate). The colour shade depends on the measured distance of the point and the setting of the colour scale (→ „6.1.3 Slider bars“).
Red	Value of the z coordinate ≤ minimum of the set colour scale.
Blue	Value of the z coordinate ≥ maximum of the set colour scale.

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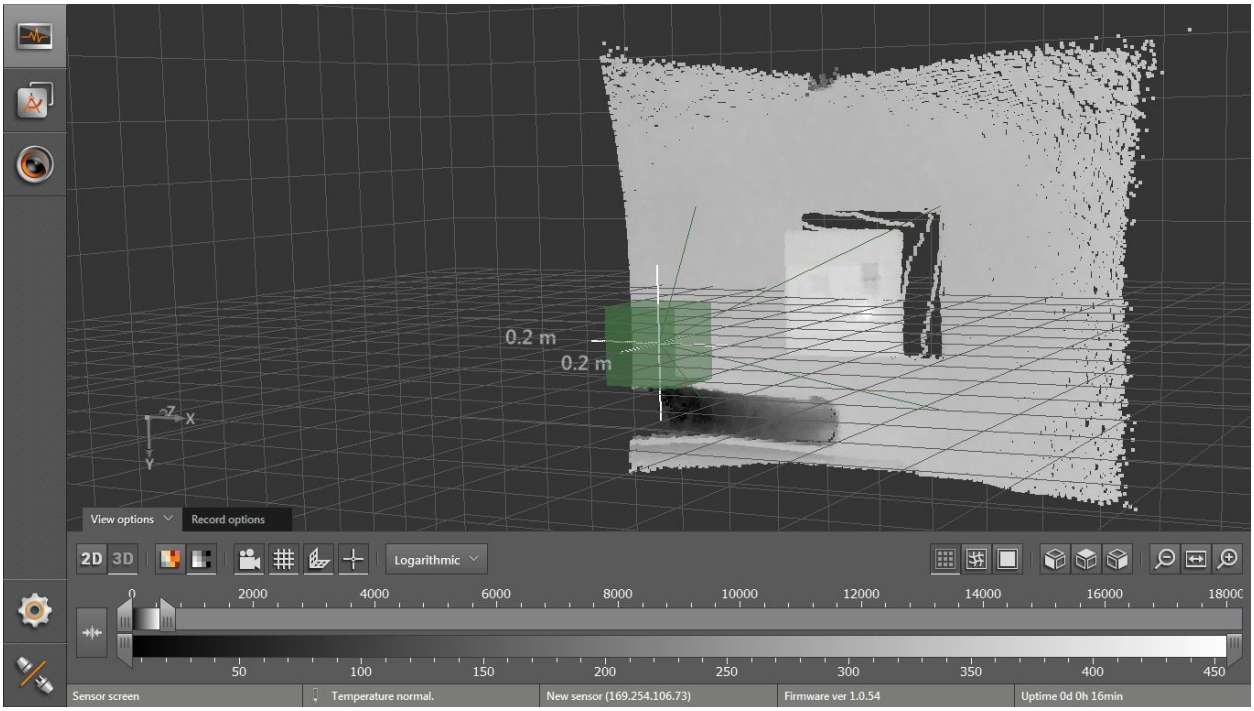
Amplitude image

► Click  to display the amplitude image.



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

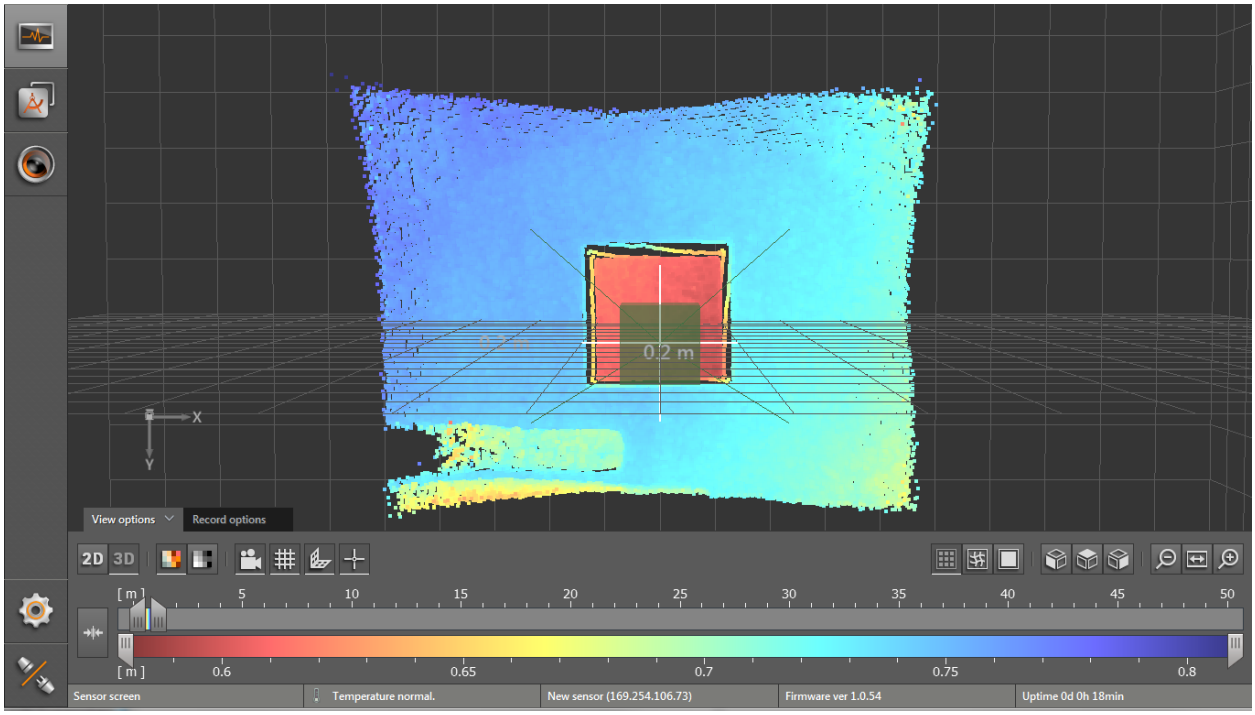
Visualisation in the 3D image	Description
Pixel position	Space coordinate of the point (x, y, z coordinates).
Pixel colour (grey-scale)	Amplitude value. The brightness follows the measured amplitude and the setting of the grey scale (→ „6.1.3 Slider bars“).
Black	Amplitude value ≤ minimum of the set scale.
White	Amplitude value ≥ maximum of the set scale.

Views in the coordinate system

The 3D view can be turned into a preset view in the coordinate system.

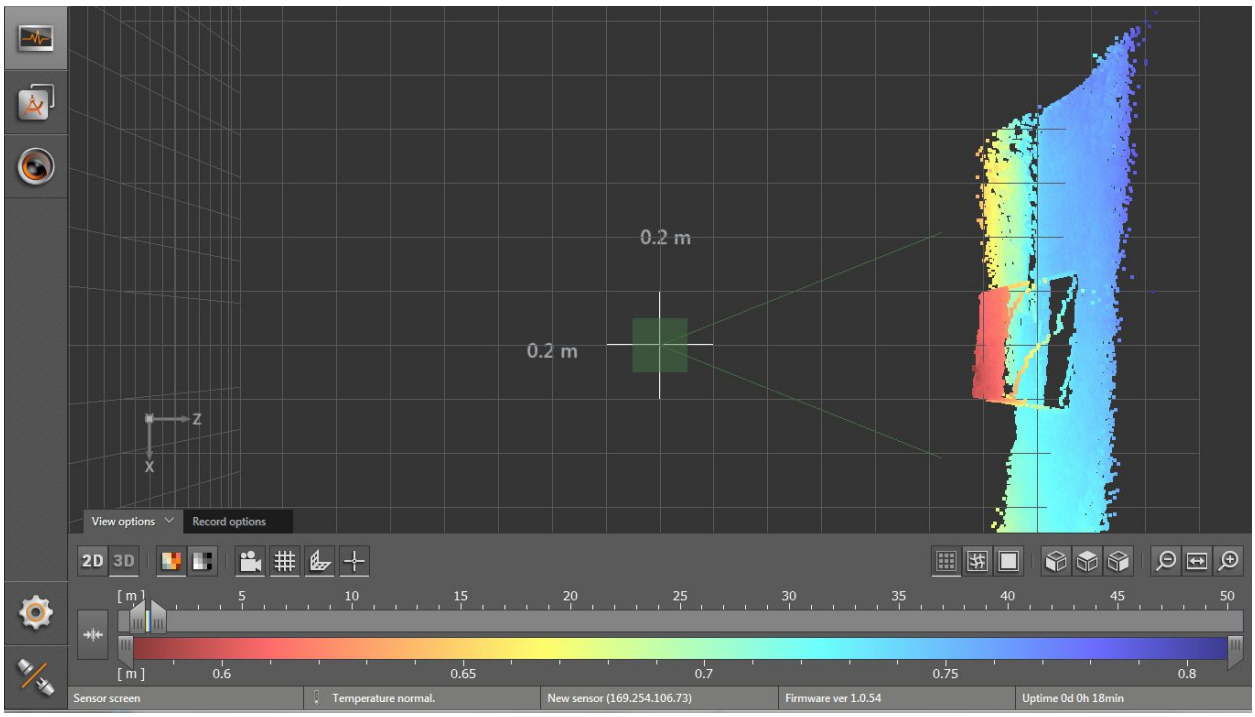
► Click  to show the rear view.

> The object is shown on the xy level.



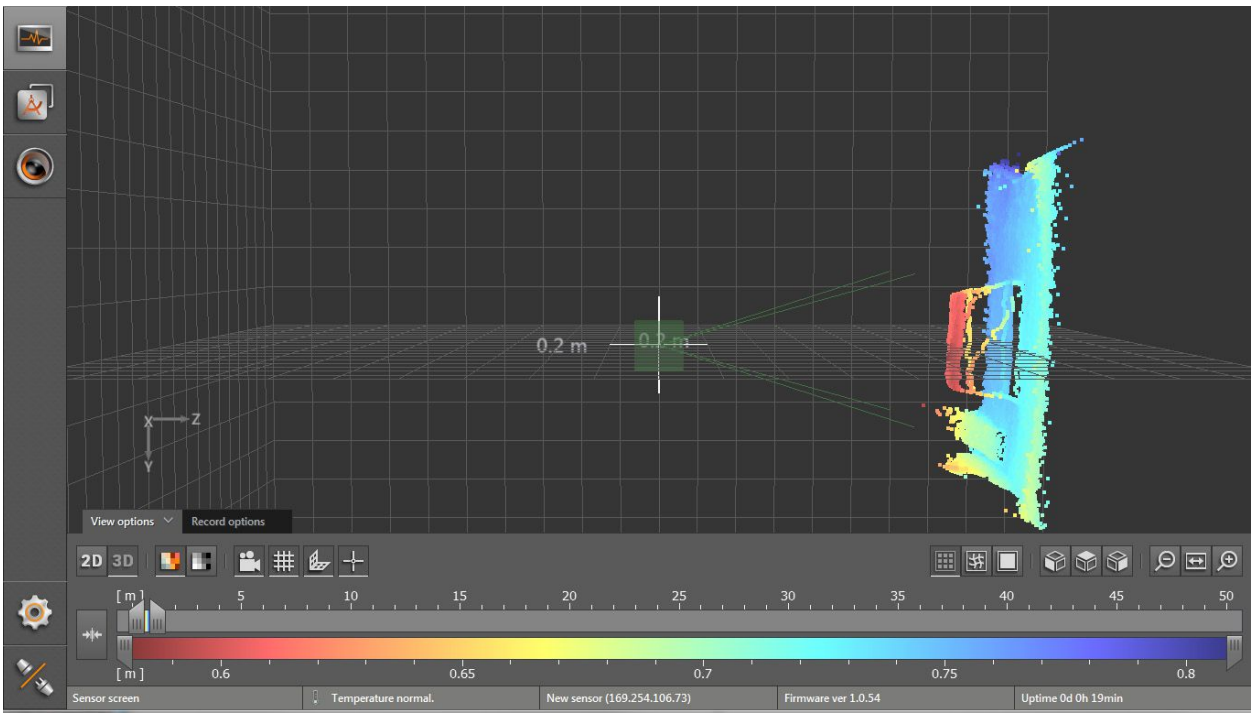
► Click  to show the top view.

> The object is shown on the xz level.



► Click  to show the side view.

> The object is shown on the yz level.



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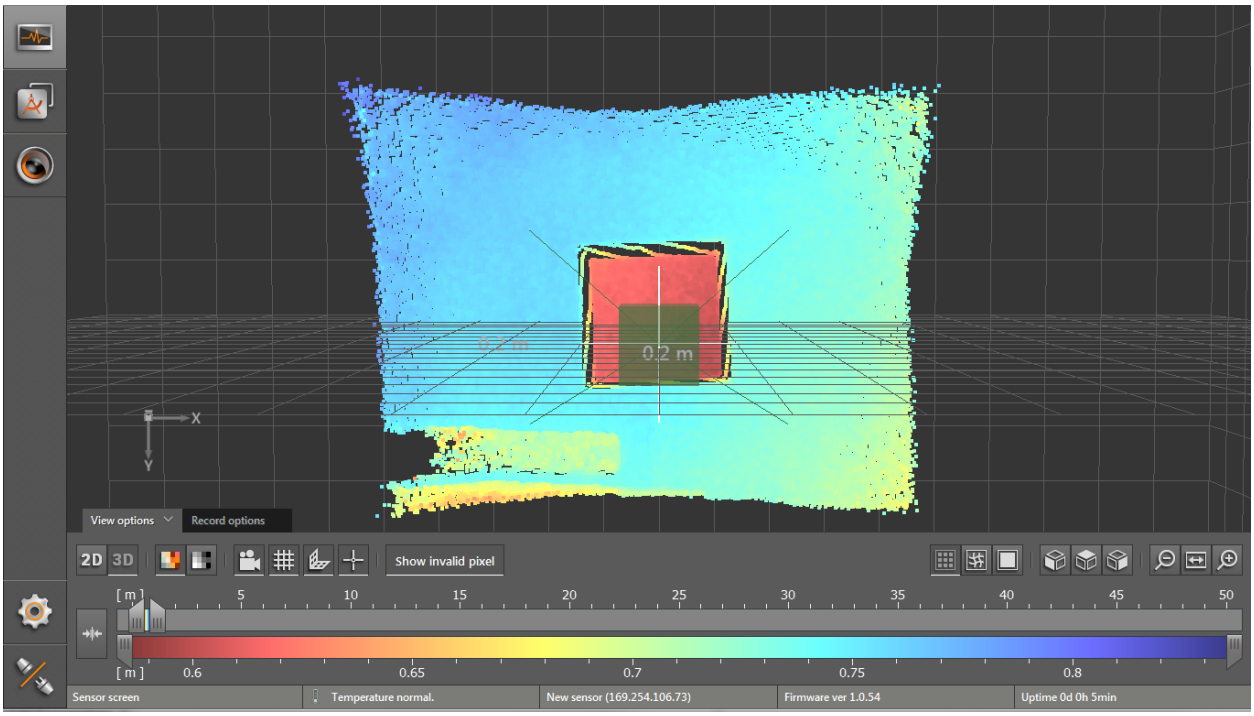
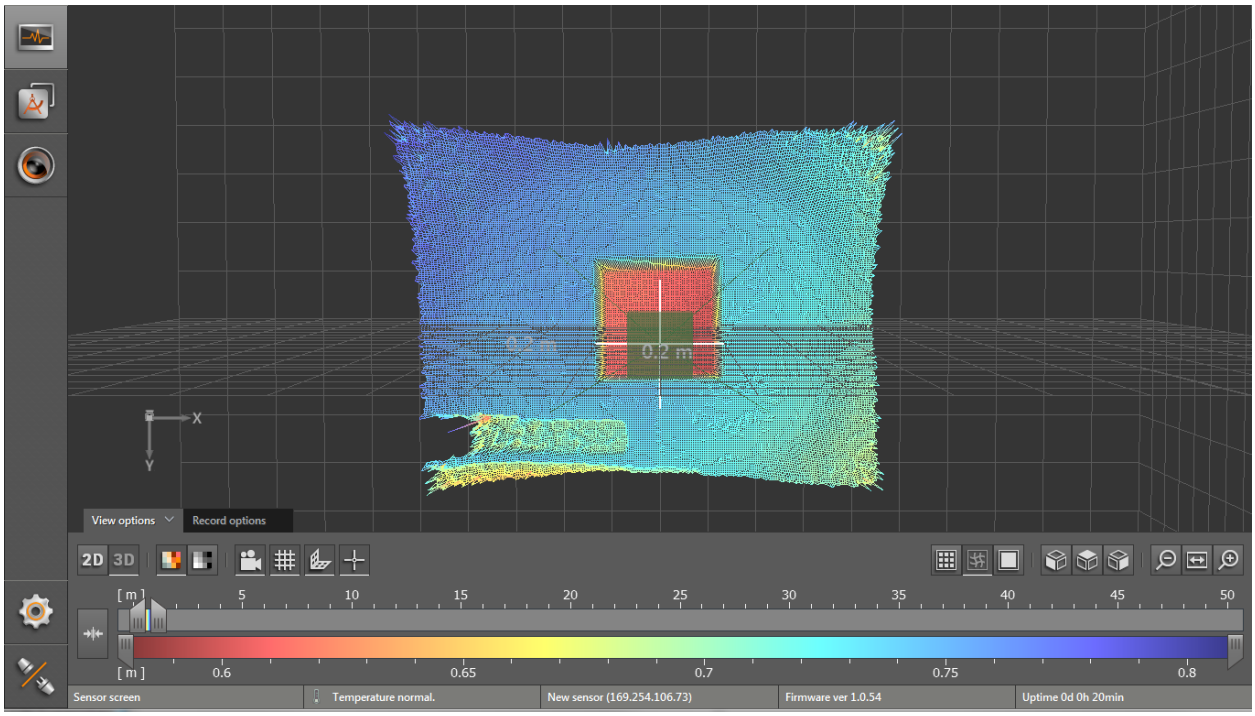
Visualisation pattern

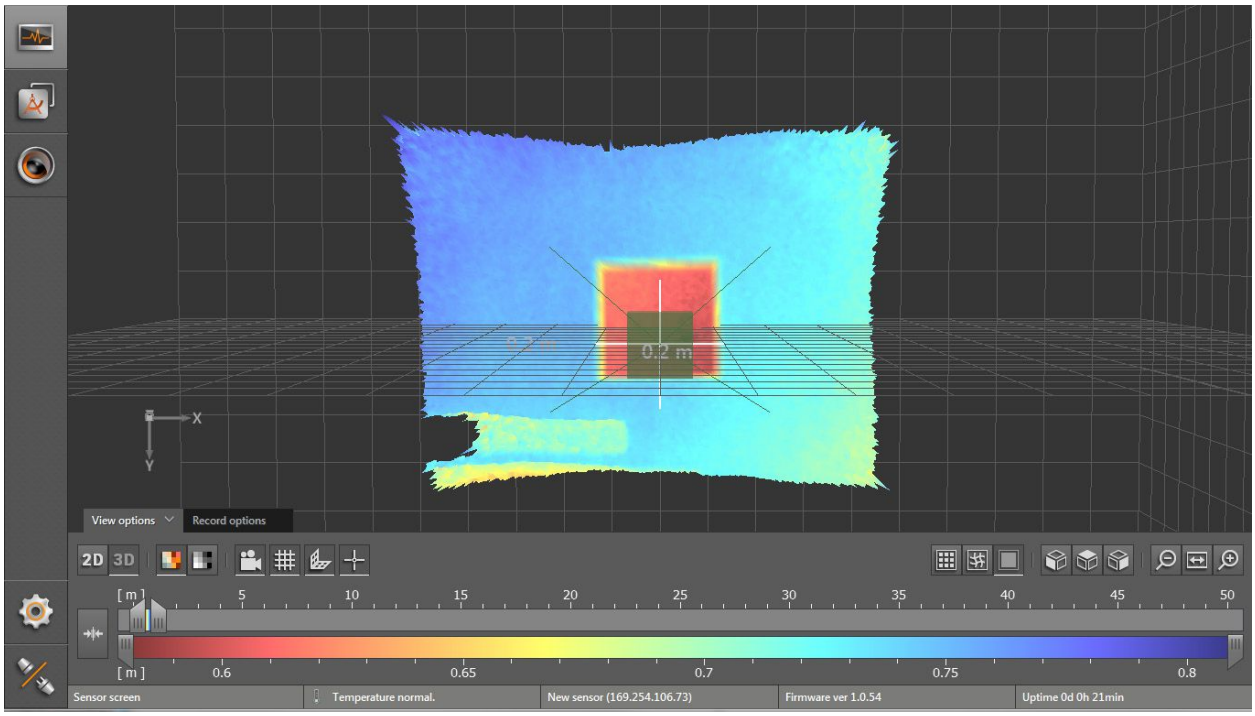
► Click  to show the 3D view as a point cloud.



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



► Click  to show the ascending slopes in the 3D view as a surface model.

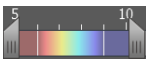


6.1.3 Slider bars

The slider bars are used to set the colour range for the distance and the amplitude image manually. The results of the application are not changed by it.

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

Setting the colour range

Operating element		Description
Automatic range selection		The button sets the colour range automatically to an appropriate area. The settings of the slider bars are dismissed.
Upper slider bar		With the upper slider bar, the colour range for the distance or amplitude image can be roughly set.
Lower slider bar		With the lower slider bar, the set colour range can be 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 bars.

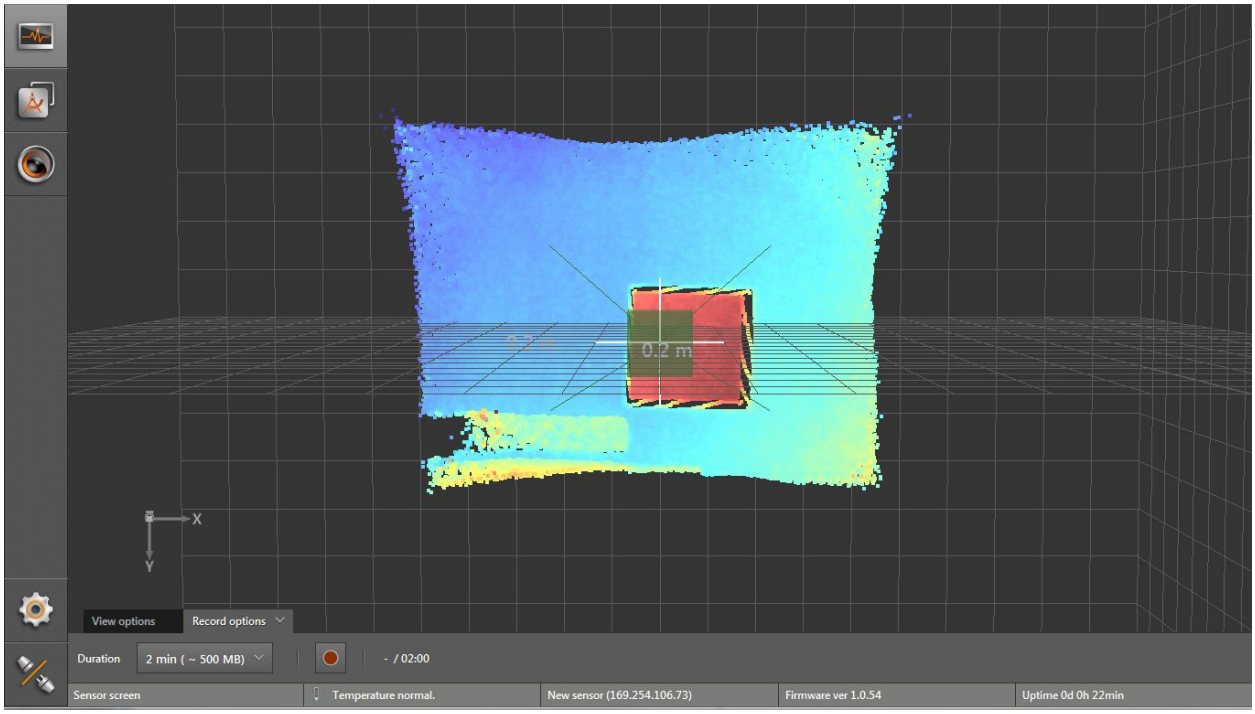
► Set the upper slider bar to the required colour range for the distance or amplitude image.

► Set the lower slider bar to fine-adjust the colour range.

The scale of the lower slider bar corresponds with the colour range that is set above.

6.2 Record

This function is used to record the device image up to infinite length.



► Select the duration of the recording in the "Record options" tab (1, 2, 4, 8 minutes or infinite duration; required space: approx. 250 MB per minute).

The maximum length of the recording depends on the size of the data carrier.

► Click ● to start a recording.

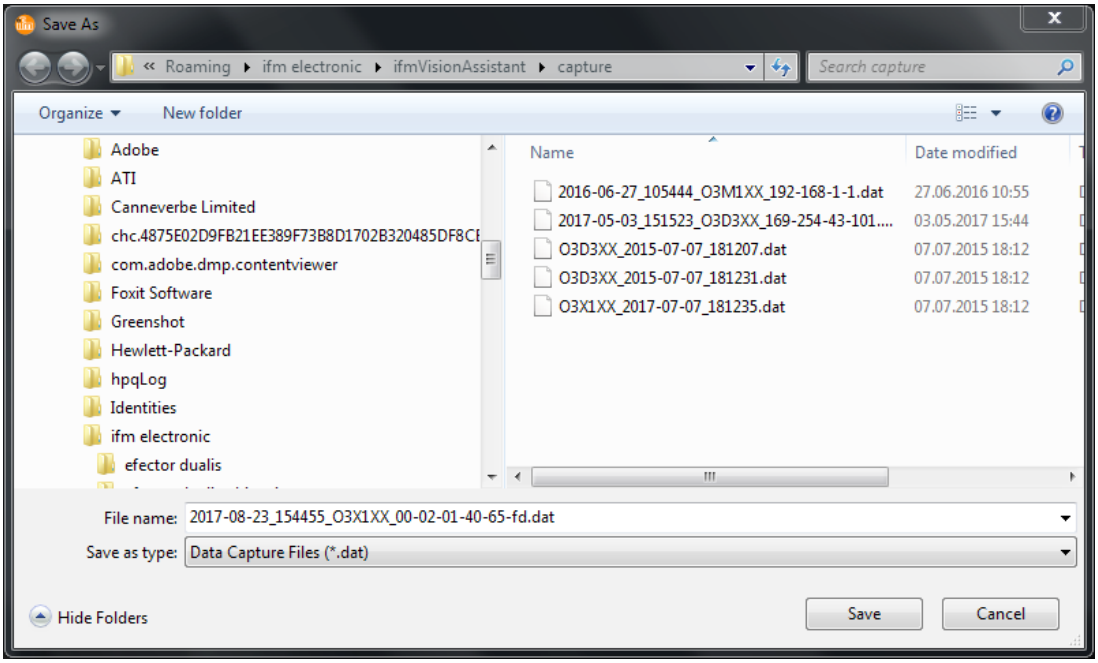
> The window "Save as" opens with a standard storage location and standard file name:

- Standard storage location: "…\ifm electronic\ifmVisionAssistant\capture" (the exact and complete storage location depends on the Windows version and settings)
- Standard file name: "O3X1XX_yyyy-mm-dd_hhmmss.dat"

The file name includes the characters "O3X1XX", the date and the time when the recording was made.

Example: The file "O3X1XX_2017-07-15_144726.dat" was recorded on 15 July 2017 at 14:47:26.

> All measurement data is recorded (e.g. recognised objects and results of the application).



► Click on [Save]

> The recording starts and the recording 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 is reached.

> The recording is stored and can be played back by clicking [Replay] on the start screen.

UK

6.3 Quit the monitoring window

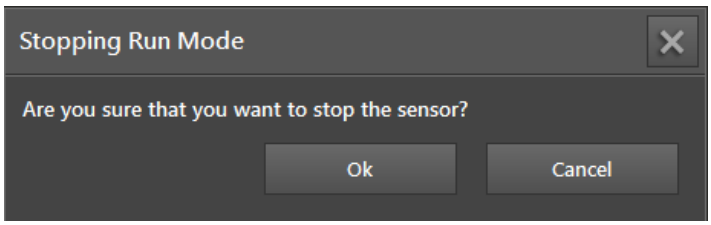
The monitoring window can be quit in the following ways:

- Change to the application or the device setup. When changing to the device setup, the application is stopped. The change can be protected by a password (→ „8.1.2 Password protection“).
- Disconnect the ifm Vision Assistant from the device. The application is not interrupted and continues.

Change to another option

► Click on the required button in the navigation area.

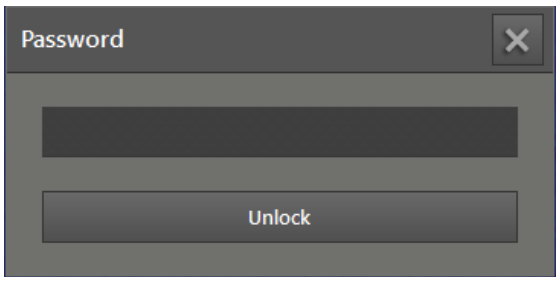
> The window "Stopping Run Mode" appears.



► Click on [OK].

> If the password protection has been activated, the ifm Vision Assistant asks for the password.

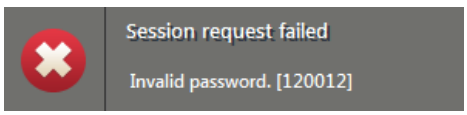
If the device is protected by a password, the icon is shown next to the buttons and .



► Enter the password and click on [Unlock].

> The ifm Vision Assistant stops the application and changes to the option that has been selected.

> Entering a wrong password triggers an error message and the ifm Vision Assistant returns to the monitoring window.



Disconnecting the device

► Click on .

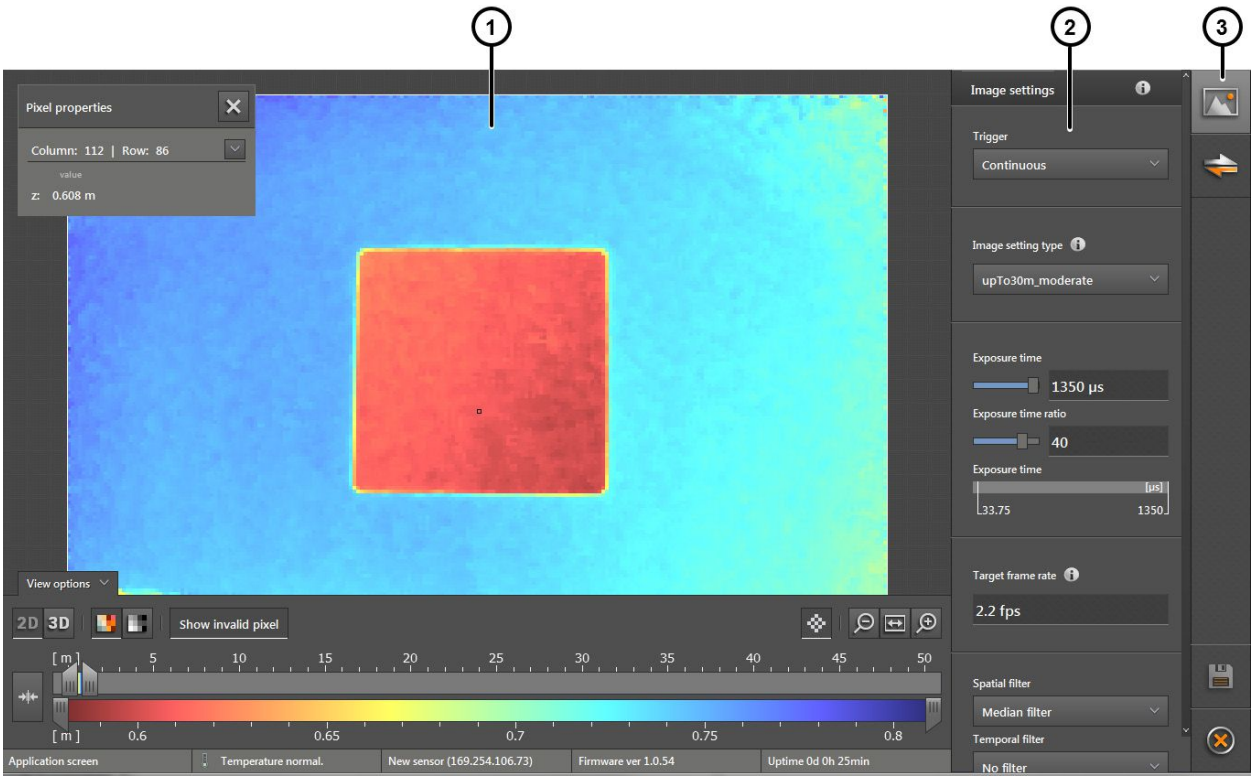
> The device is disconnected.

> The ifm Vision Assistant returns to the start screen.

7 Application

The way the measured values are detected is set in the "Application" mode.

► Click on  .



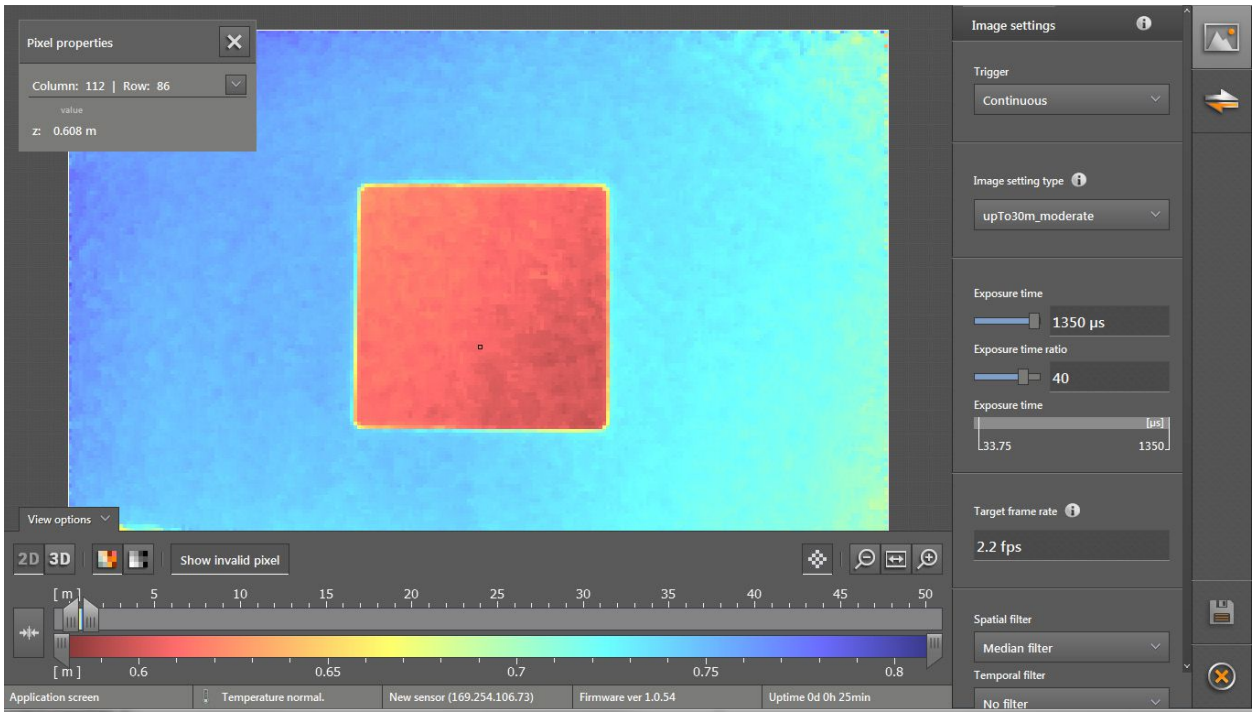
1: Live image display
2: Settings
3: Menu of the "Application" mode

UK

7.1 Image settings

► Click on .

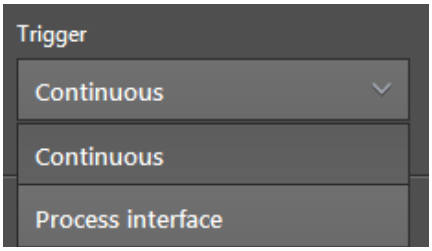
> The window "Image settings" appears.



Depending on the size of the window, some image settings are not displayed. Further image settings can be accessed via the scroll bar on the right edge of the "Image settings" window.

7.1.1 Setting the trigger source

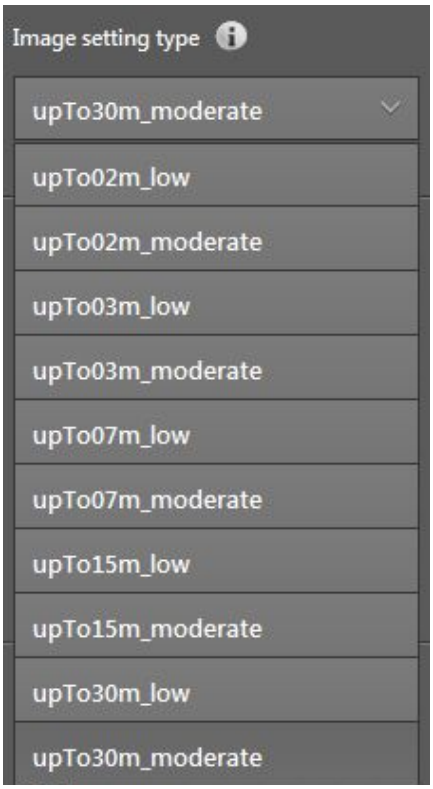
The trigger source can be set in the "Trigger" list.



Option	Description
Continuous	The device continuously takes pictures. This option is mainly used for tests. When selecting this option, the current image repetition rate is displayed in fps (frames per second) in the "image settings" window. The image repetition rate can be changed in the input box "Target frame rate". The max. possible image repetition rate depends on the exposure mode and the exposure time.
Process interface	The device is controlled via the process interface (e.g. PC).

7.1.2 Setting the capture mode

The capture mode is set in the "Image setting type" list. In the capture mode, the characteristics of an image capture can be set.



The following "Capture mode" is preset:

upTo30m_moderate

upTo30m_
- Unambiguous range "30 m"
- 2 measurement frequencies

_moderate
- 2 exposure times

The capture mode consists of:

upTo30m_
- Length of the unambiguous range
- 1 measurement frequency: unambiguous range < "7m"
- 2 measurement frequencies: unambiguous range >= "7m"

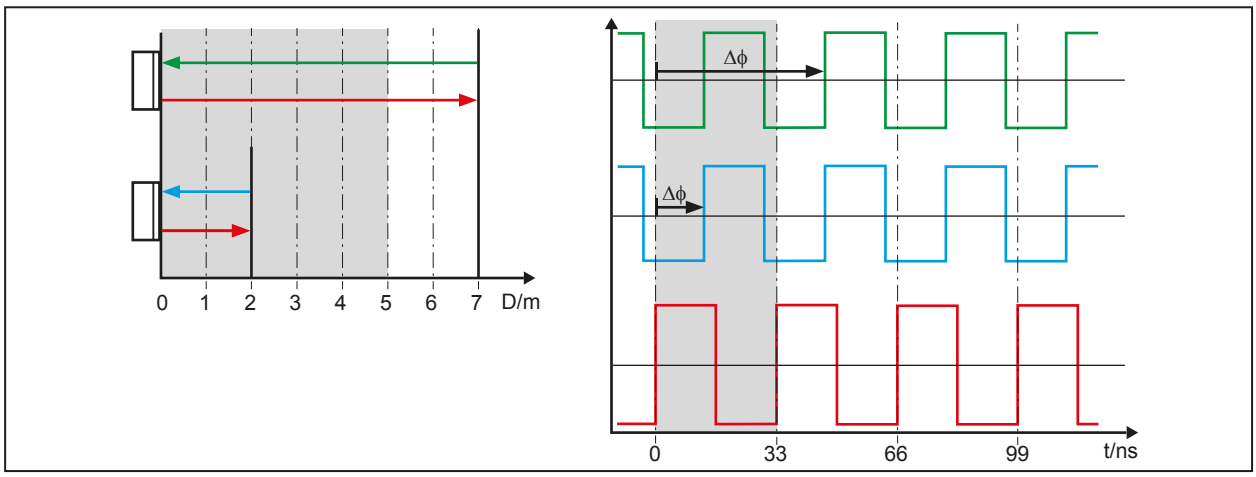
_moderate
- 2 exposure times

_low
- 1 Exposure time

Explanation of the unambiguity of the measuring range

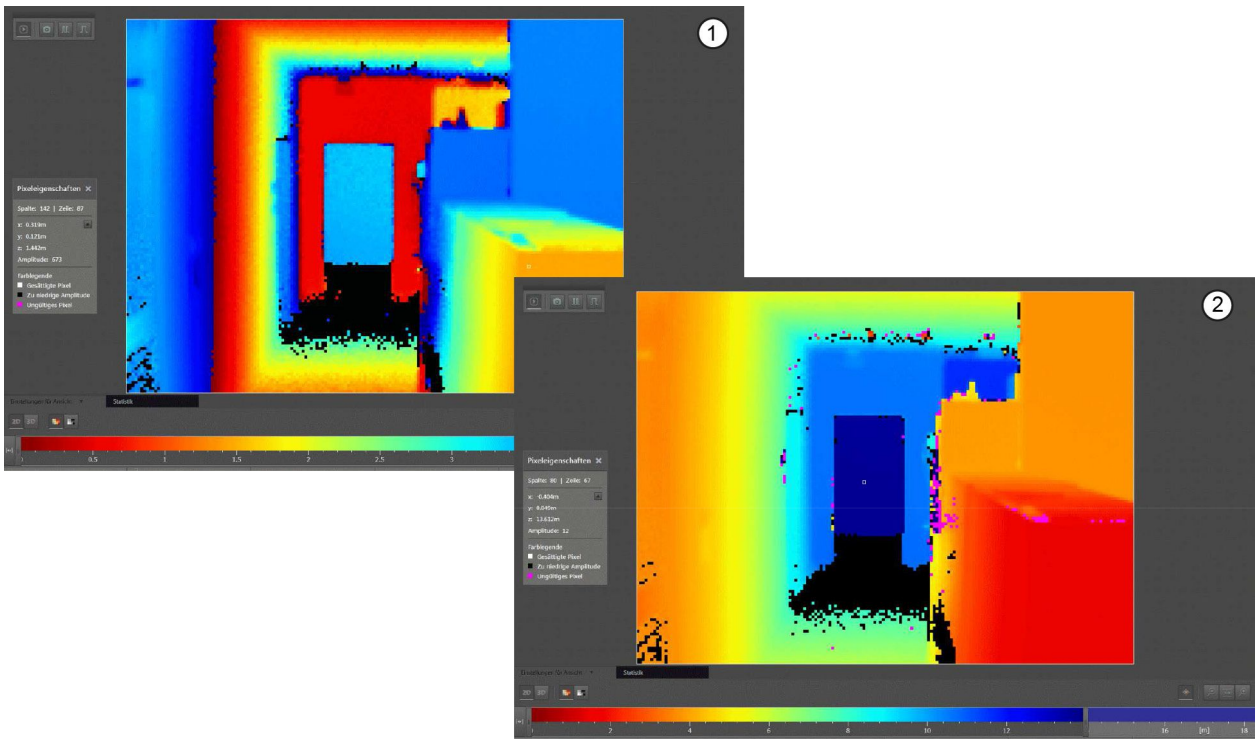
To measure objects, the device emits a modulated light signal and detects the light reflected on the objects. The distance of the objects is determined by means of the time of flight of the emitted and the reflected light.

While the modulation frequency is not changed by the reflection, the phases of the emitted and the detected light are shifted according to the distance of the reflected point. Phase shifts that are a multiple of the wavelength cannot be differentiated. Thereby, distances that are longer than half the wavelength cannot be measured without ambiguity. In case of a modulation frequency of 30 MHz, half the wavelength is 5 m.



Example

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



1: Maximum visible distance under 5 m [1 frequency]: The colours repeat themselves for distant objects
2: Maximum visible distance up to 30 m [2 frequencies]: Colours can be clearly assigned to different distances

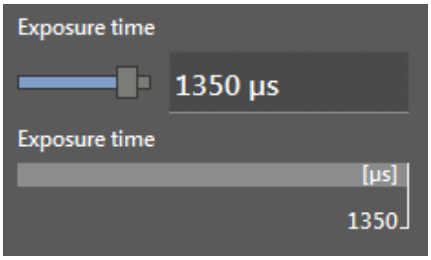
7.1.3 Setting the exposure time

Depending on the scene, the dynamics for 1 exposure time may be too high. This applies in particular to:

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

In this case, the image quality is increased by 2 exposure times. This increases the evaluation time and the sensitivity to movements in the scene.

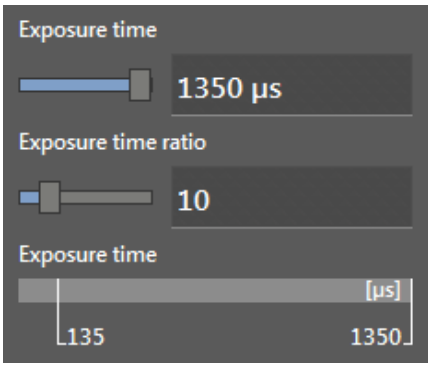
In case of a "capture mode" with 1 exposure time, the following settings are available:



The single exposure is intended for scenes with low dynamics.

The exposure time is set in µs. The value can be changed with the slider bar or entered in the box.

In case of a "capture mode" with 2 exposure times, the following settings are available:



The double exposure is intended for scenes with high dynamics.

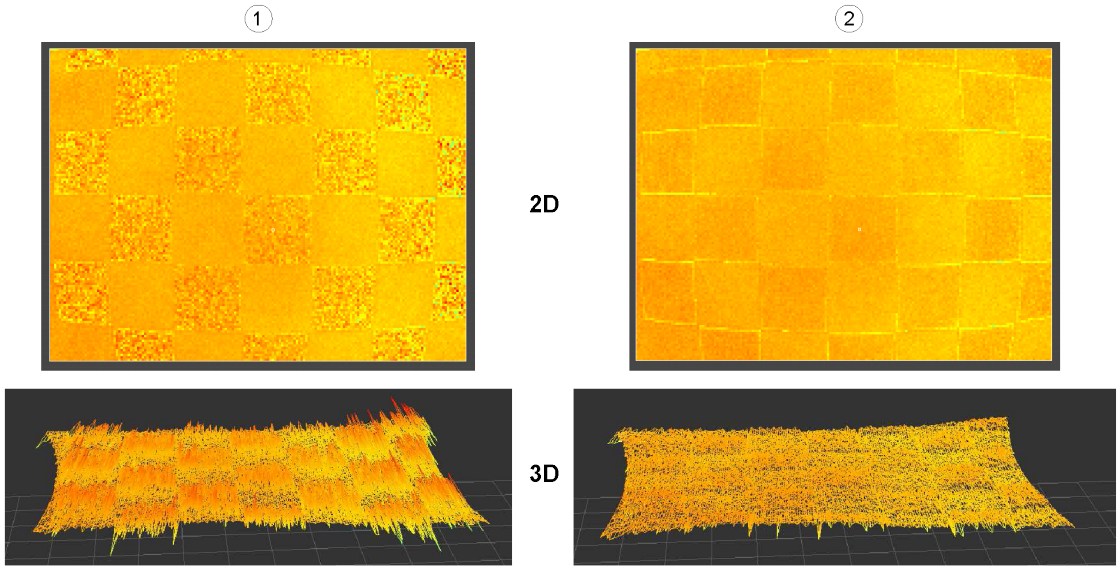
The exposure time is set in µs.

The longer exposure time can be changed with the "Exposure time" slider bar or entered in the box.

The shorter exposure time can be changed with the "Exposure time ratio" slider bar or entered in the box.

Example

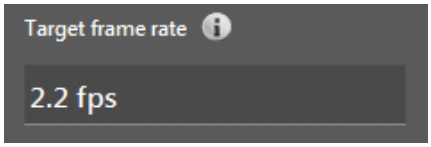
The following figure shows the 2D and 3D captures of a chessboard section at a distance of 60 cm with different exposure modes.



1: An exposure time of 500 µs, white surfaces almost saturated, black surfaces noisy
2: Two exposure times of 500 µs and 3500 µs, white and black surfaces sightly noisy

7.1.4 Setting the image repetition rate

The image repetition rate to be reached by the device is set in the field "Target frame rate". The "target frame rate" is set in fps.



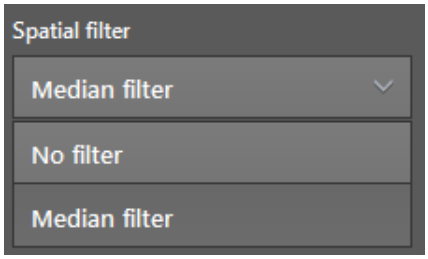
Depending on which settings are activated, the target image repetition cannot be reached by the device. The following settings have an influence on the target image repetition rate:

- Capture mode (→ „7.1.2 Setting the capture mode“)
- Exposure time (→ „7.1.3 Setting the exposure time“)
- Filter (→ „7.1.5 Setting the filters“)

7.1.5 Setting the filters

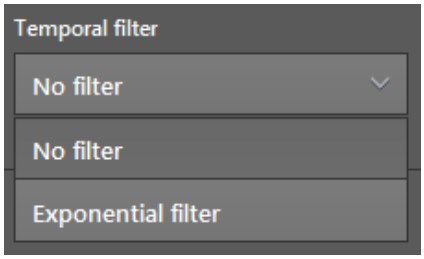
The repeatability is optimised using the filters "Spatial filter" and "Temporal filter".

The "Spatial filter" list contains the following filters:



Filter	Description	Properties
Median filter	Each pixel is replaced by the median of the neighbouring pixels.	Good edge preservation

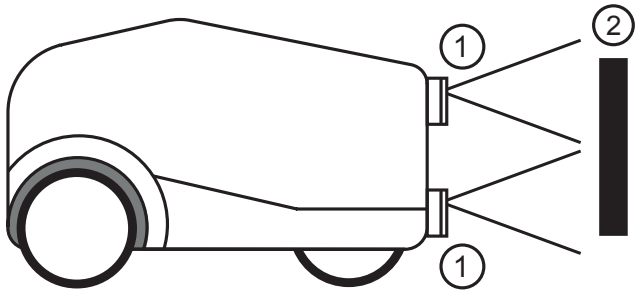
The "Temporal filter" list contains the following filters:



Filter	Description
Adaptive exponential filter	A weighted average across successive images is calculated. More recent images have more weight than older images. The filter can only be used with the trigger source "Continuous".

7.1.6 Operating several devices

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



1: Device, installed horizontally
2: Object

Devices that are pointing to the same scene may cause measurement errors due to simultaneous exposure.

Avoid measurement errors by taking the following measure:

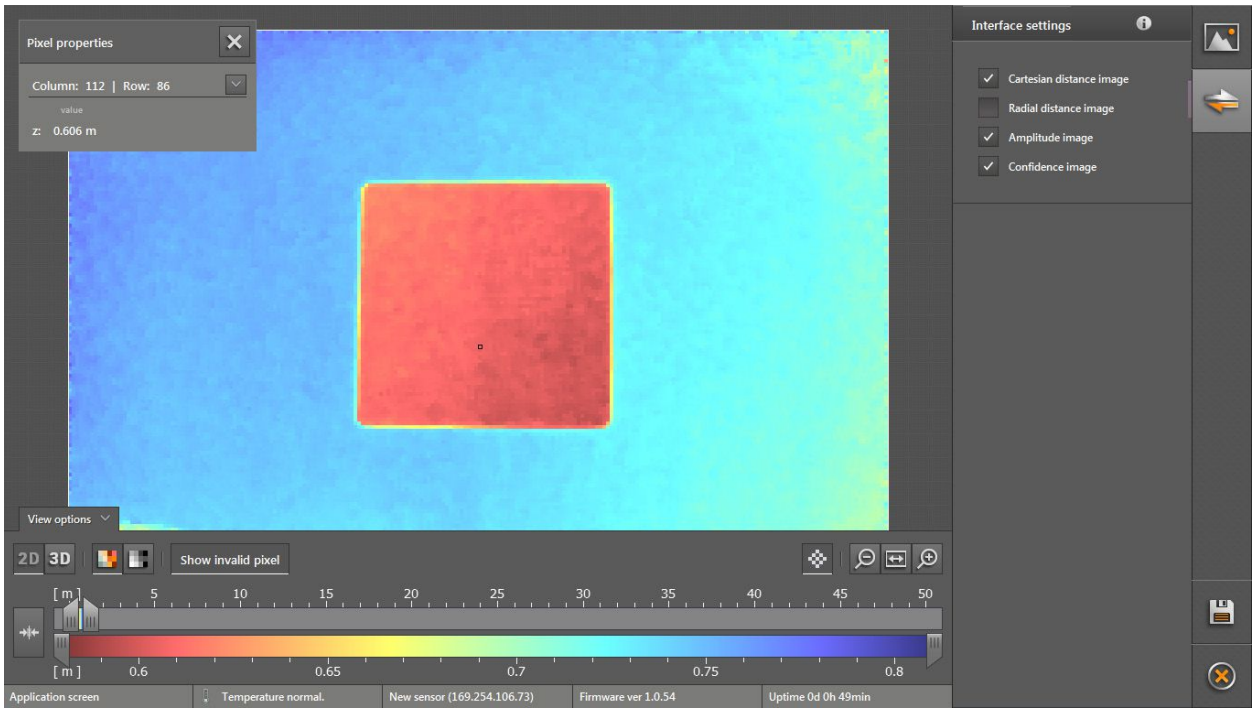
► Trigger devices one after the other using the software trigger via the process interface.

7.2 Configuring the interface

On the "Interface settings" screen, the data can be defined that are transmitted via the Ethernet interface can be defined.

► Click on  .

> The "Interface settings" screen appears.



The following data can be transmitted via the interface:

Data	Description
Cartesian distance image	Cartesian x, y z, coordinates of the pixels.
Radial distance image	Image of the distance values determined through the time-of-flight.
Amplitude image	Image of the measured amplitude values of the light reflected on the object.
Confidence image	Display of the status (e.g. invalid, saturated) for each pixel.

The device can only be accessed with one PC at a time. Access with several end devices (e.g. PC) is not supported.

If all data of the interface is deactivated,

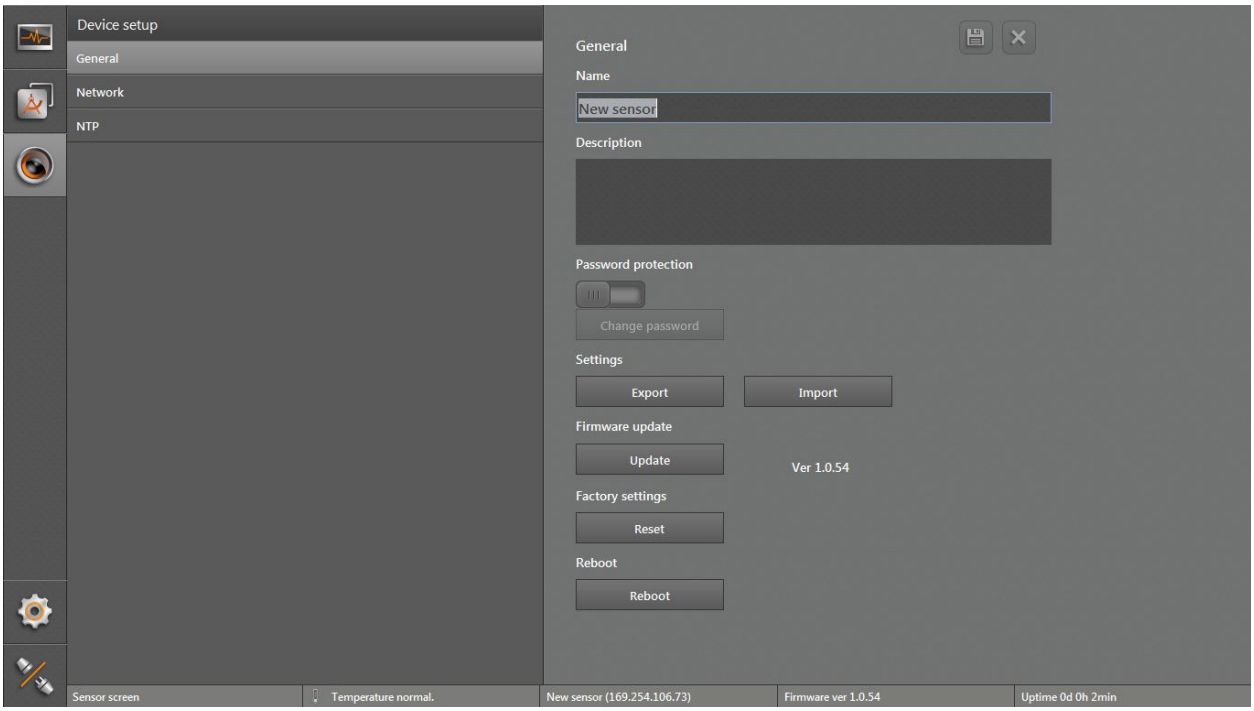
- no live image is displayed (→ „6 Monitoring window“),
- no 3D data is sent via the interface.

8 Device setup

The general settings of the connected device, the network and the NPT function are set in the window "Device setup".

► Click on  .

> The "Device setup" screen appears.



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8.1 General

General settings of the connected device are set in the window "General".

► Click on the [General] window.

Functions in the "General" window

Field	Button	Description
Name	–	Set the name of the device (→ „8.1.1 Name and description“).
Description	–	Set the description of the device (→ „8.1.1 Name and description“).
Password protection	 on  off (standard)	Activate or deactivate the password protection. When the password protection is activated, the windows "Application" and "Device setup" can only be accessed if the password has been entered.
	Input field	Editable field to enter a password
Settings	[Export]	Exports a copy of the settings and application on the PC (→ „8.1.3 Exporting the settings“).
	[Import]	Imports a copy of the settings and application from the PC to the device (→ „8.1.4 Importing settings“).
Firmware update	[Update]	Installs a firmware update (→ „8.1.5 Installing a firmware update“). The current version of the firmware is shown next to the button.
Factory settings	[Reset]	Resets the factory settings and deletes all current settings.
Reboot	[Reboot]	Reboots the device.
Save		Saves the settings.
Cancel		Rejects the settings.

8.1.1 Name and description

The name and the description of the device can be edited at will.

► Click on the field.

► Enter name,

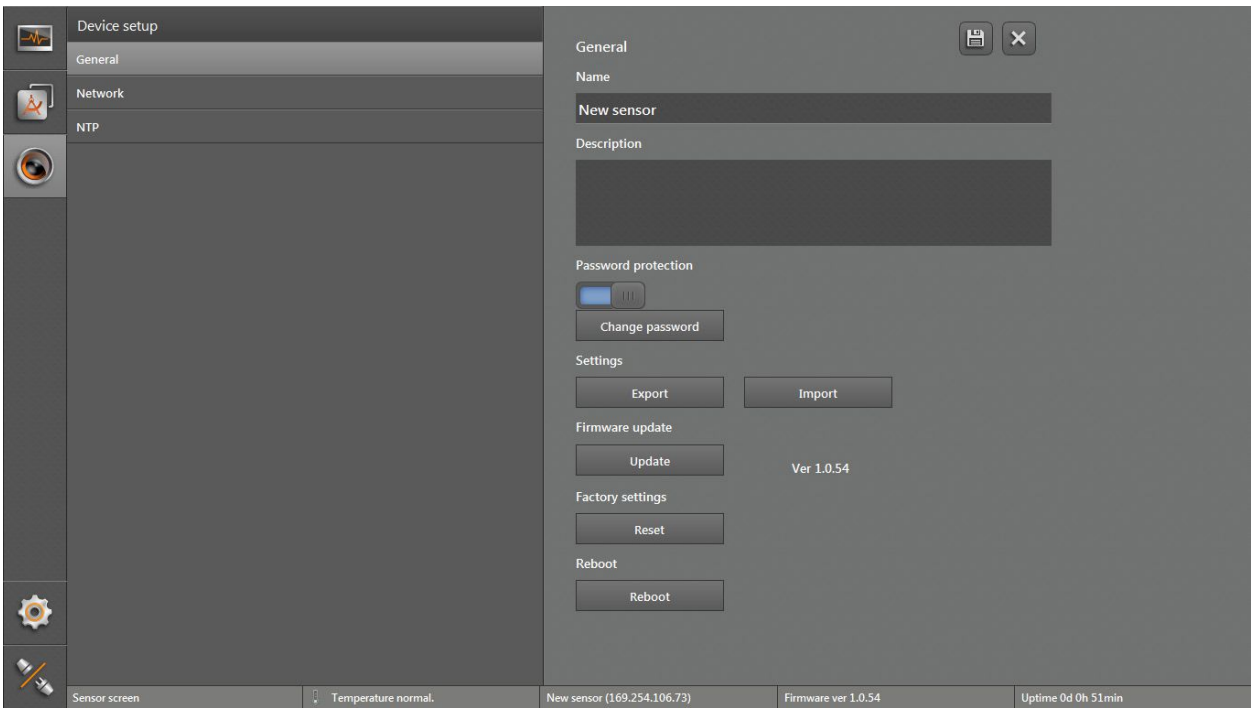
► enter description (optional).

► Click  to save the changes.

8.1.2 Password protection

If the password protection is active, the "Application" and "Device setup" screens are blocked and are only accessible after the password is entered. Without entering the password, only the monitoring window opens.

► Activate password protection.



► Enter the password in the input box.

► Click to save the changes.

> The changes are saved on the device.

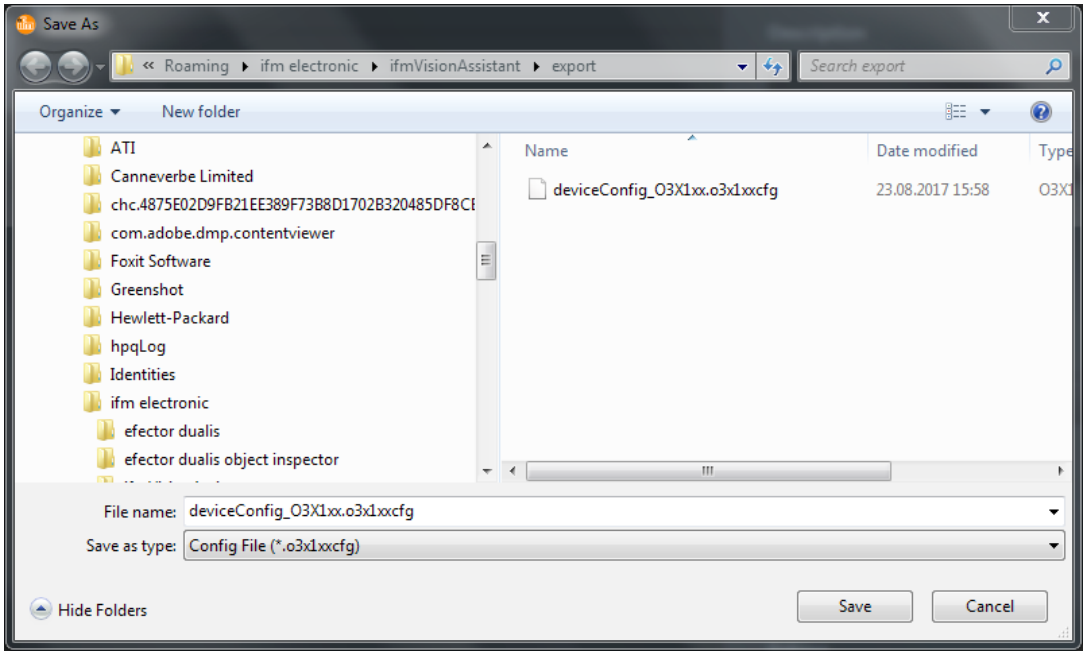
There is no master password! If the password is lost, the device must be sent to the manufacturer.

8.1.3 Exporting the settings

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

► Click on [Export] to start the export of the settings.

> The "Save As" window appears.



► Enter the name and click on [Save].

> The settings will be saved to a file with the extension .o3x1xxcfg.

8.1.4 Importing settings

The "Import" function imports the settings and the application either separately or together. The following options are imported:

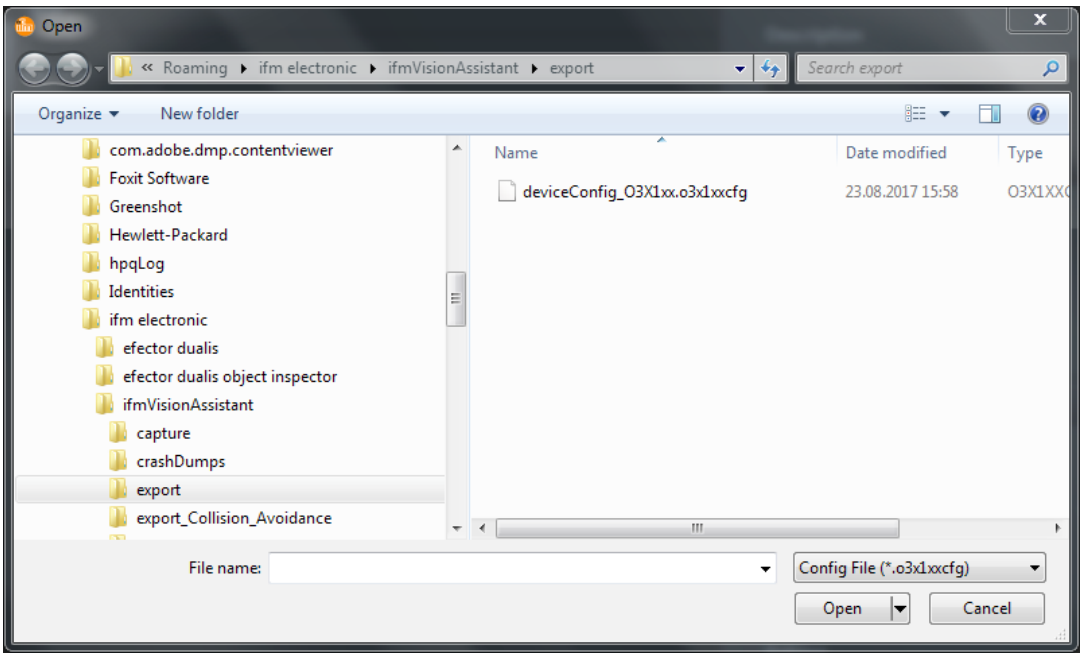
- Global settings (settings in the "General" window)
- Network (settings in the "Network" window)
- Application settings (settings of the application)

Existing settings and the application are overwritten during the import.

► If necessary, export the existing settings beforehand.

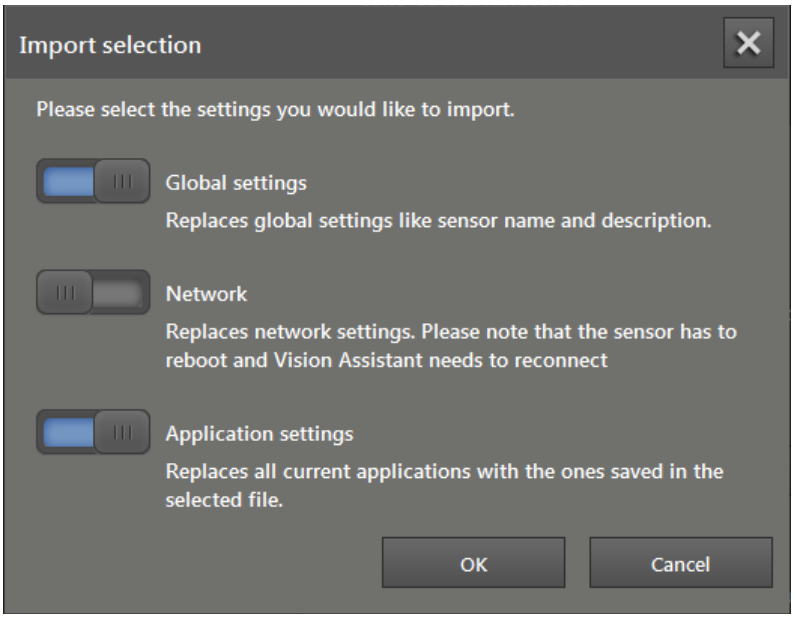
► Click on [Import] to start the import of the settings.

> The "Open" window appears.



► Select the required file with the ending .o3x1xxcfg and click on [Open].

> The "Import selection" window appears.



► To import the selection, switch "on".

► Click on [OK].

> The selected settings will be imported.

8.1.5 Installing a firmware update

The ifm Vision Assistant can be used to update the firmware of the device.

Settings saved on the device get lost when the firmware is updated. Create a backup of the settings before updating the firmware:

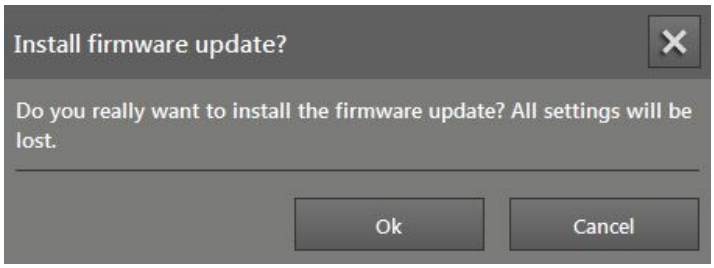
► Export the settings before updating the firmware.

► Import the settings after updating the firmware.

Firmware updates are available on the internet: www.ifm.com

► Click on the [Update] button.

> A message window appears.



► Confirm the message window with [Ok].

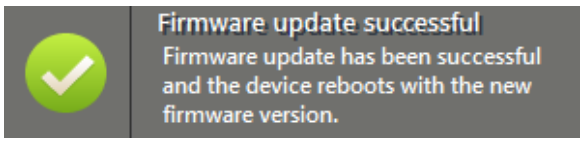
> The file selection window is displayed.

► Select firmware file.

> The firmware has the extension ".swu".

► Click on the [Open] button.

Firmware update will be executed. After the successful firmware update, the message "Firmware update successful" is displayed.



The ifm Vision Assistant re-establishes the connection to the device again.

In case of problems with the firmware update, see → „9.3.1 Error messages during firmware updates“.

8.1.6 Factory settings

To delete data such as device setup, application, etc. from the device, the device can be reset to factory settings.

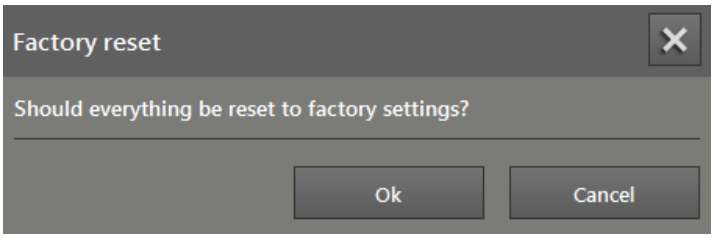
Existing settings and the application are deleted when the device is reset to factory settings.
When resetting the device to the factory settings, the firmware is not reset to the firmware that was installed at the factory.

► If necessary, export the existing settings beforehand.

When resetting the device to the factory settings, the firmware is not reset to the firmware that was installed at the factory.

► Click on [Reset].

> A message window appears.



► Confirm the message window with [Ok].

> All settings are reset.

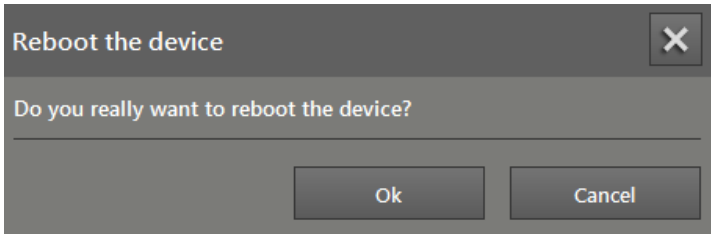
> The device setup is closed and the start screen appears.

8.1.7 Reboot

The "Reboot" function reboots the device.

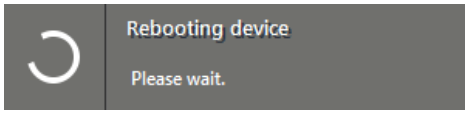
► Click on [Reboot].

> A message window appears.



► Confirm the message window with [Ok].

> The device reboots.



> The ifm Vision Assistant re-establishes the connection with the device.

> The device setup is closed and the monitoring window appears.

If the new connection to the device fails, search the device with in the start screen or connect manually (→ „4 Start screen“).

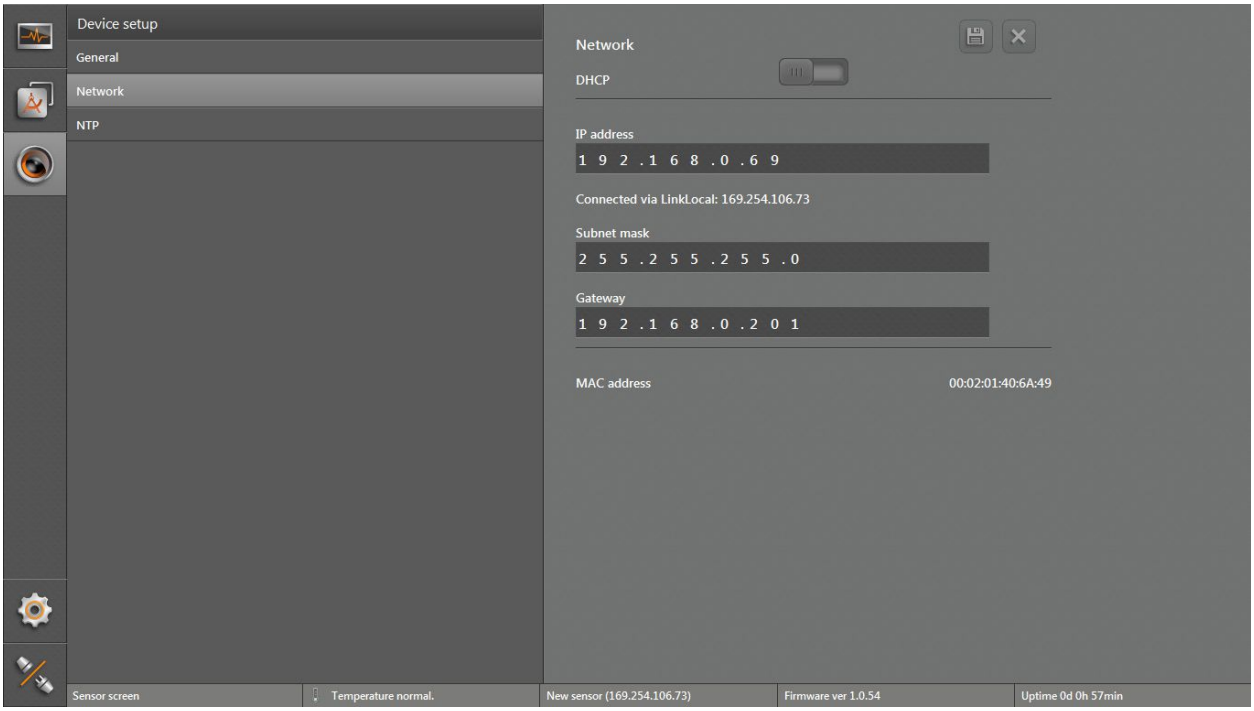
8.2 Network

The network settings of the connected device are set in the "Network" window.

If a new device is connected and automatically found, the standard network data is already entered.

► Click on the [Network] window.

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



Functions in the "Network" window

Field	Button	Description
DHCP	 on  off (standard)	Switch DHCP on or off. When DHCP is switched on, the device adopts the network settings from the network.
IP address	Input field	Set the IP address of the device. The default setting is "192.168.0.69".
Subnet mask	Input field	Set the subnet mask of the network. The default setting is "255.255.255.0".
Gateway	Input field	Set the gateway of the network. The default setting is "192.168.0.201".
MAC address	MAC address	The MAC address of the device is displayed.
Save		Saves the network settings.
Cancel		Rejects the network settings.

If the new connection to the device fails, search the device with  in the start screen or connect manually (→ „4 Start screen“).

The ifm Vision Assistant re-establishes the connection to the device after the network settings are saved.

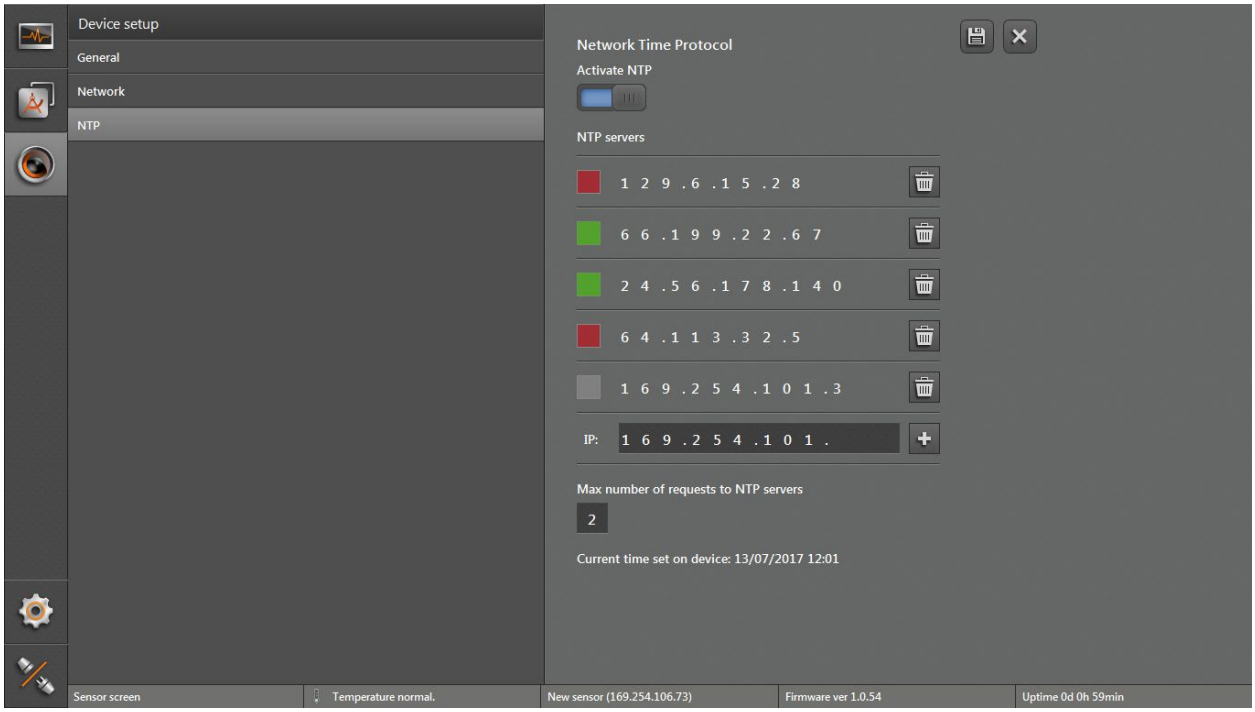
8.3 NTP

The real-time clock of the device is set in the window "NTP" (Network Time Protocol).

A real-time clock which can be synchronised via NTP 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 on the [NTP] window.

> The settings in the "NTP" window are displayed:



Functions in the "NTP" window

Field	Button	Description
Activate NTP	on off (standard)	Switch NTP on or off. When NTP is on, the device adopts the date and the time from the network.
NTP server	green	The set NTP server has responded to the last request.
NTP server	red	The set NTP server did not answer to the last request.
NTP server	grey	The set NTP server has not yet been requested.
NTP server	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	Indication of the last date and time saved on the device.
Save		Saves the network settings.
Cancel		Rejects the network settings.

9 Appendix

9.1 Network settings

The following network settings describe the method for PCs with an installed Windows 7 operating system.

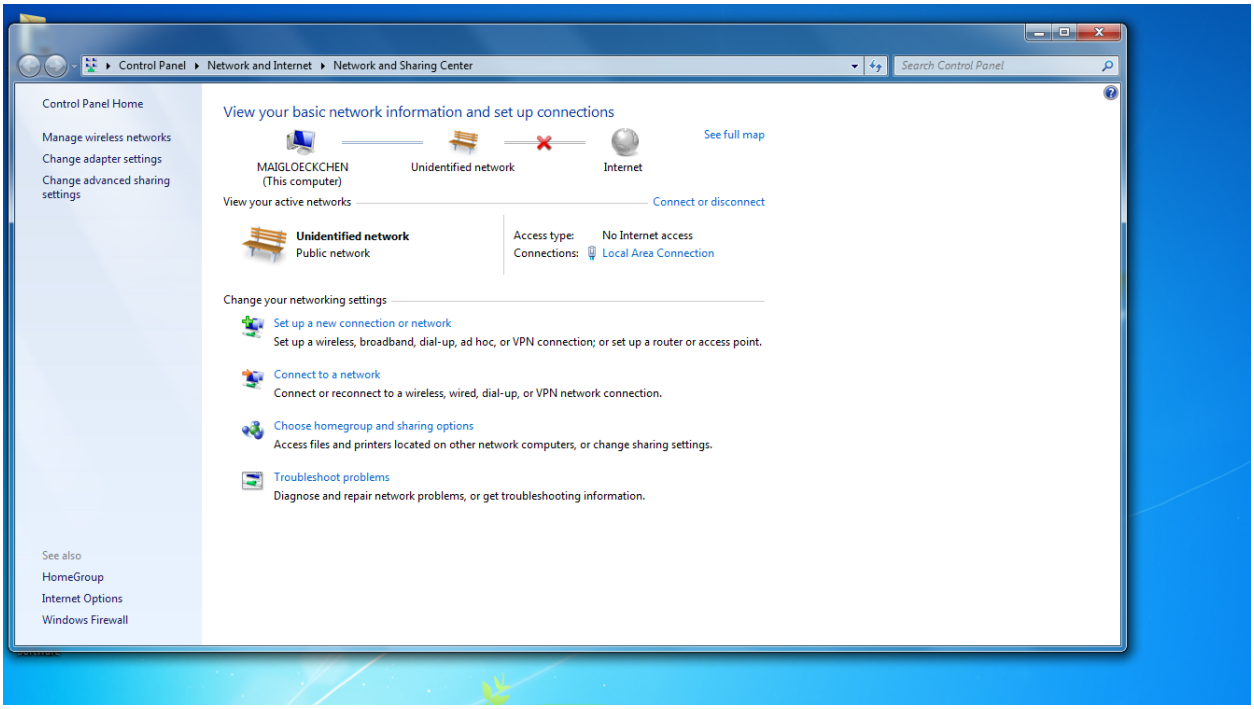
Modifying network settings in a PC requires administrator rights.

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

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

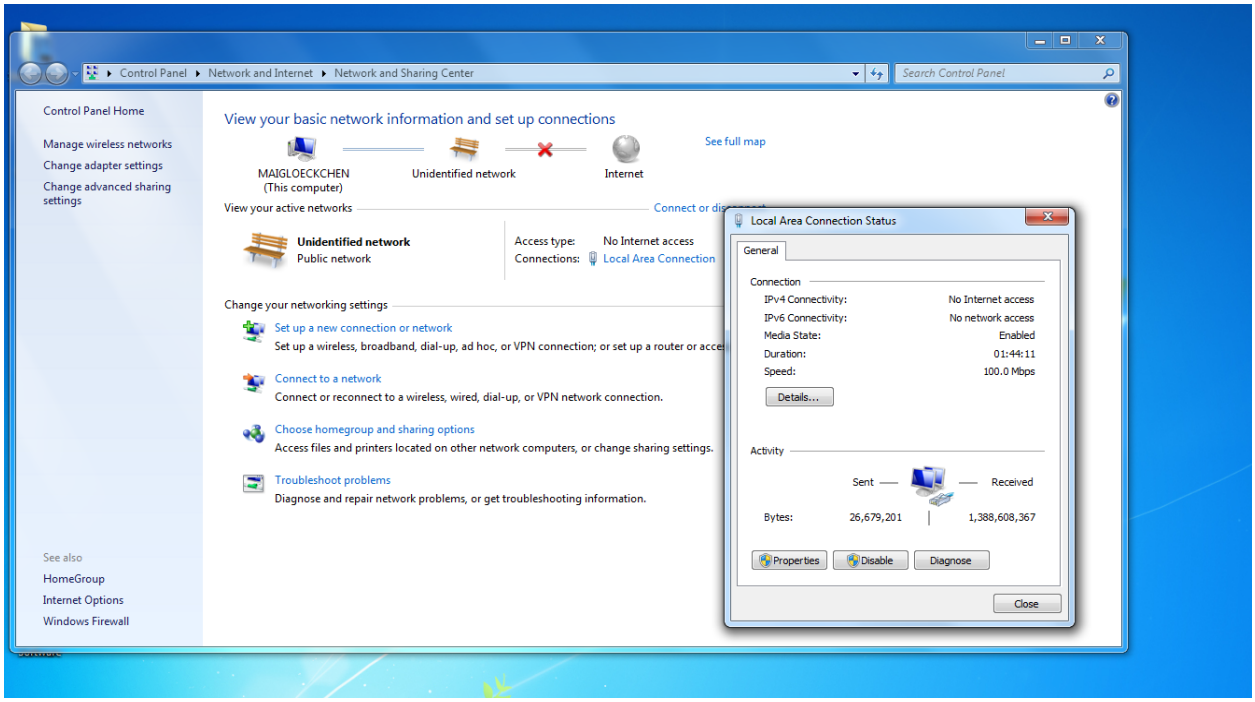
UK

► Open [Network and Sharing Center].



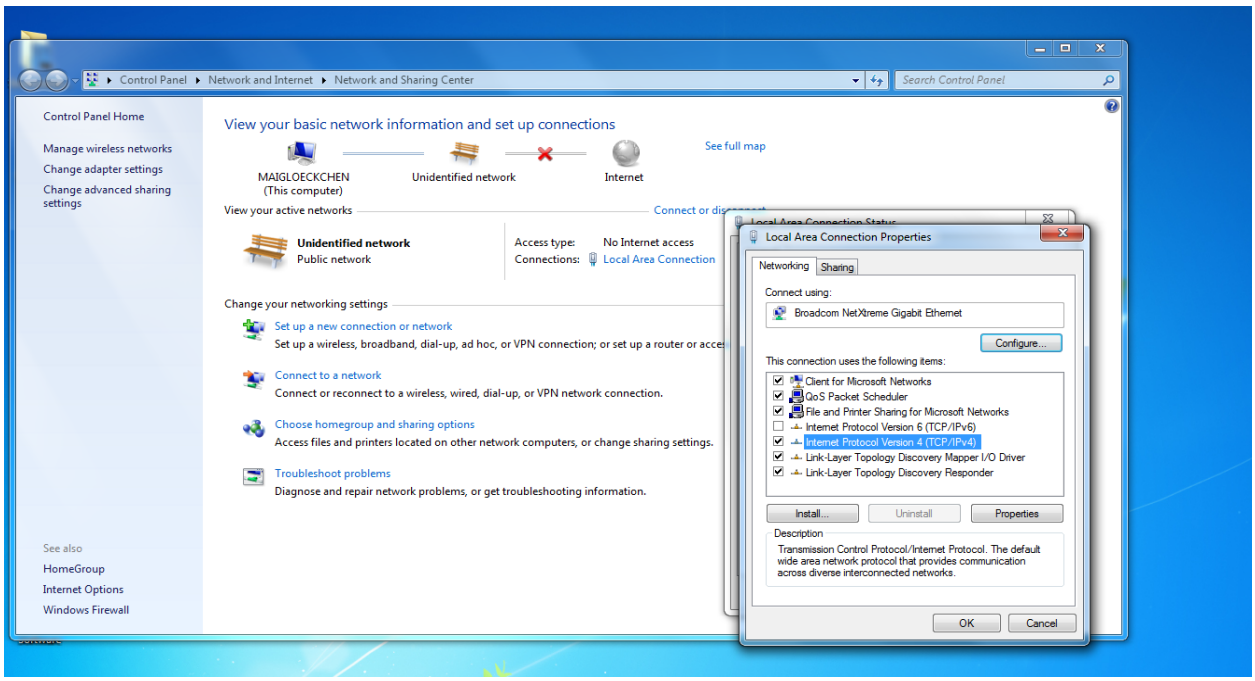
► Click on the name of the local network under [Connections].

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



► Click on [Properties].

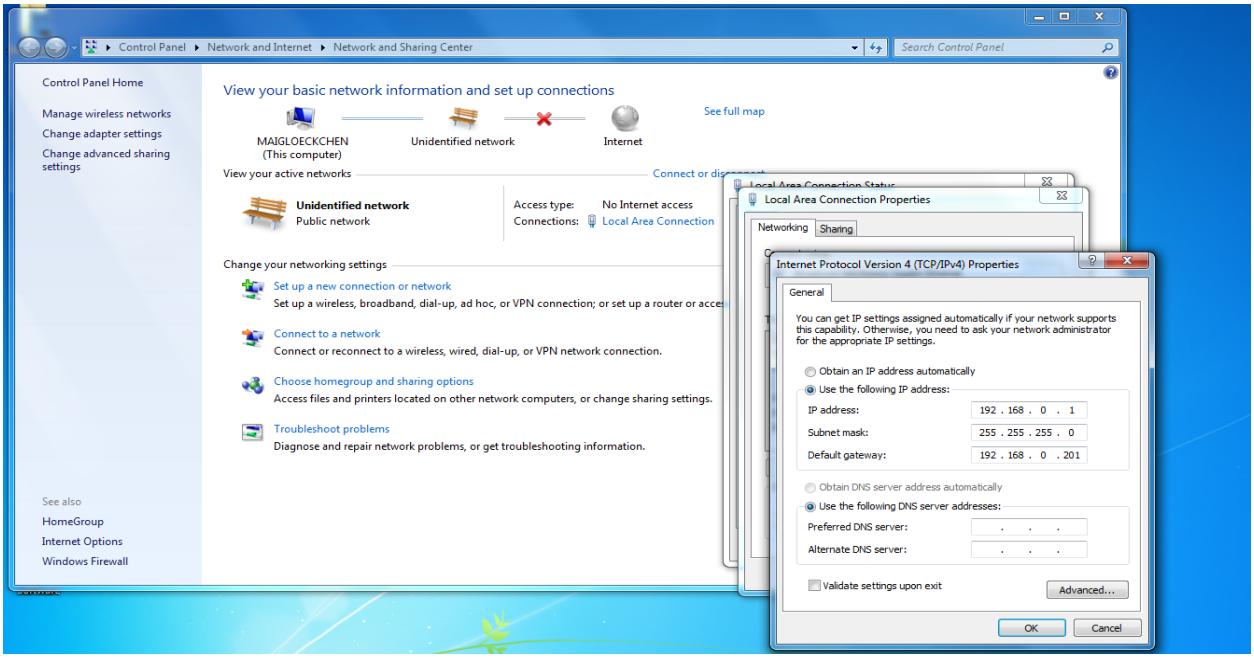
> The window " Local Area Connection Properties" of the local network opens.



► Select [Internet Protocol Version 4 (TCP/IPv4)].

► Click on [Properties].

> The window "Internet Protocol Version 4 (TCP/IPv4)" opens.



► Select the option [Use the following IP address:].

► Set the following standard values:

- IP address: 192.168.0.1
- Subnet mask: 255.255.255.0
- Default gateway: 192.168.0.201

► Click on [OK].

9.2 Glossary

Amplitude

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

Operating mode

Active mode by default. The application is executed.

NTP

NTP is the abbreviation for Network Time Protocol. The protocol is used to synchronise the date and the time via package-based networks.

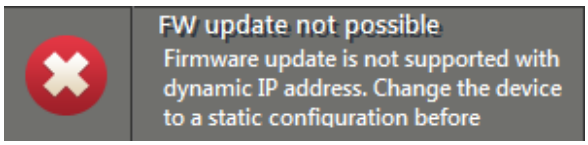
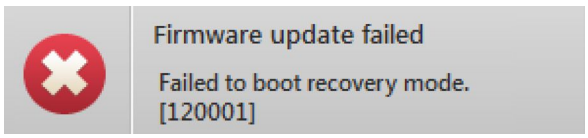
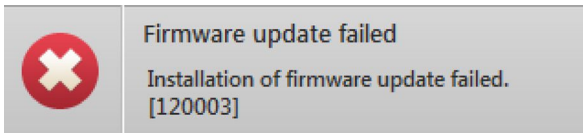
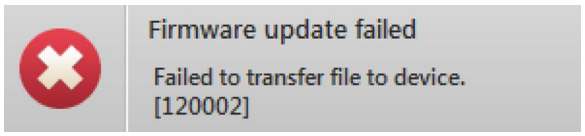
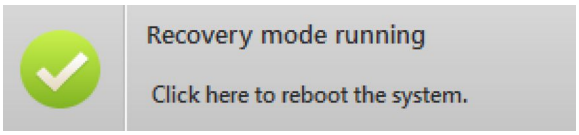
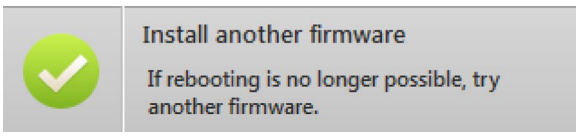
Pixel

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

9.3 Error messages

9.3.1 Error messages during firmware updates

The firmware update may fail and display one of the following error messages:

Error message	Solution
	The device has a dynamic IP address or is set to DHCP. ► Change network settings of the device to a static IP address. > After saving the settings, the ifm Vision Assistant tries to establish the connection automatically.
  	1. Restart ifm Vision Assistant. 2. Click on  . > The ifm Vision Assistant searches for connected devices via Ethernet. 3. Click on the button of the found device. > The message "Recovery mode running" is displayed:  4. Click on the notification "Install another firmware":  5. Install firmware update (→ „8.1.5 Installing a firmware update“).