Phantom high-speed cameras

DEWESoft®

SOFTWARE USER MANUAL

Phantom high-speed cameras V26-1

1. Table of contents

2. About this document

This is the users manual for the Phantom cameras plugin.

2.1. Legend

The following symbols and formats will be used throughout the document.

Important
It gives you important information about the subject.
Please read carefully!

Hint
It gives you a hint or provides additional information about a subject.

Example
Gives you an example of a specific subject.

3. Installation

3.1. Compatibility

The Phantom plugin is compatible with the latest DewesoftX® (2025.3 or newer) and Windows 10 (or newer and 64-bit only) operating systems. For more information about compatibility with older Dewesoft versions, you can write to our support team (support@dewesoft.com).

Hint
Phantom offers Phantom Camera Control (PCC), which provides a comprehensive imaging software user interface for controlling Phantom high-speed cameras. The program itself is useful for basic configurations before the camera configuration in DewesoftX® and debugging problems, if they exist.

3.2. Download and Installation

3.2.1. Installation and licensing of DewesoftX®

Go to our download webpage (https://download.dewesoft.com/list/dewesoftx) to find the latest version of the DewesoftX® software.

Hint
For more information about installing the DewesoftX®, go to our download web page, where you can find the DewesoftX installation manual.

Using advanced functionalities within the software, DewesoftX® requires a license. If you don't owe yours, you can request a 30-day evaluation license from the Dewesoft website. Click on the Evaluation license link and follow the instructions below.

Hint
For more information about licensing of DewesoftX®, go to our online DewesoftX® manual, where you can find an article about Licensing of DewesoftX®.

3.2.2. Installation and licensing of the Phantom plugin

When the Phantom license is successfully purchased, it needs to be registered in the same manner as all other DewesoftX® licenses. For registering the license, follow the instructions on the following link Licensing of DewesoftX®.

To test the Phantom plugin functionality, you're able to acquire an evaluation license on the https://dewesoft.com/dewesoftx-licensing under the **Evaluation license** tab. To enable the evaluation license, you will need at least Phantom v1.0 and DewesoftX 2025.3 RELEASE.

You can download Phantom plugin files directly from Download center or use installation through the installer. The latter option is described in the Installation manual (chapter: Updating or adding the plugins) in more detail.

Hint

The Phantom plugin is constantly developing and upgrading with the new Phantom high-speed cameras.

After extracting the ZIP folder, copy the files into the Addons folder of DewesoftX® software. Follow the path below for copying the files,

- **64-bit DewesoftX®** → C:\DewesoftX\Bin64\Addons64\Phantom

Restarting the DewesoftX® will simultaneously recognize the Phantom plugin and offer you to add a connected camera to your setup.

Important

When you open your existing setup file, which contains the Phantom plugin, the camera will be recognized, but you will experience the "NO LICENSING" inscription in the Setup window. When you're usign evaluation license or your license was not recognised, the framerate will be limited. The camera has to gather the license from DewesoftX to continue as a valid license. The camera is not able to trigger this step on itself; therefore, you have to navigate to Settings and press the refresh button. After scanning for devices, the camera asks for a license to DewesoftX and continues as a valid camera if the license is recognized.

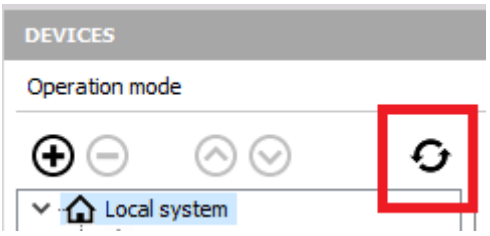


Image 1: DewesoftX update device list

4. Camera example connection

Usually, the camera operates in the “Start on Dewesoft trigger” mode, using a DewesoftX® Counter input for the highest precision.

4.1. System requirements for a single camera

- Dewesoft measurement instrument
- Phantom high-speed camera
- One free Ethernet port on the computer
- One DewesoftX® Counter input (for multiple cameras, each camera needs a separate Counter input)
- Additional light source, depending on measurement conditions

The example below shows a Phantom camera (connected over Ethernet) and a DEWE-43 (connected over USB to the PC). The accelerometer (blue cable) is used to measure the hit of the fingertip; this is also the trigger. The camera puts out a start pulse on the TRIG_TTL_OUT port, which is measured back to one of the Counter inputs of the DEWE-43.

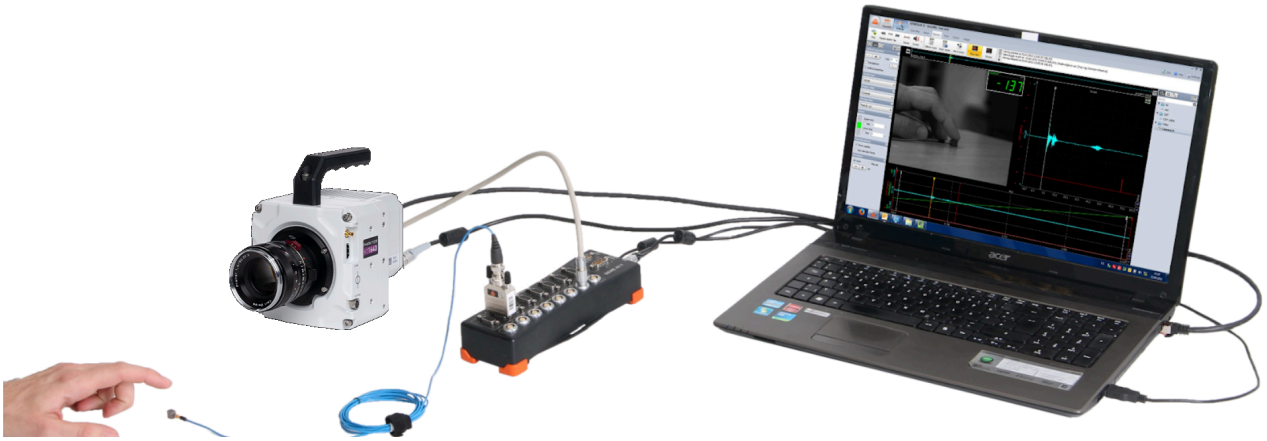


Image 2: High-speed camera with Dewesoft data acquisition instrument (DEWE-43)

Image 3: Dewesoft to Phantom camera connection in detail

4.2. System requirements for multiple cameras

The plugin itself doesn't have limitations on how many cameras you can connect. Connecting multiple cameras is possible in two different ways, which technically leads to the same operation.

4.2.1. Connect multiple cameras to only one network card

- An Ethernet switch or hub is required.
- Set up the same subnet for all cameras and the PC.
- Use Phantom PCC software to change the camera IP.
- Cameras will share Ethernet bandwidth when the measurement is finished, and video starts streaming to the PC.
- Possible to overtake bandwidth limitation using 10GBit ethernet architecture.
- Not recommended to use when large video files are recorded.

5. System preparation

5.1. Windows network configuration

Enter the Control Panel, go to the Network and Sharing Center, and select “Change adapter settings” on the left drop-down, this will open “Network Connections”. Right-click on the Ethernet port ❶, where your Phantom camera is connected to. Go to Properties and select the TCP/IPv4 protocol ❷. Depending on the model, the default IP address is usually:

- camera IP: 192.168.0.10 → set computer to 192.168.XXX.XXX.

The subnet is usually 255.255.0.0. This is the default for currently available cameras. Please refer to the Phantom camera manual for further information about IP addresses.

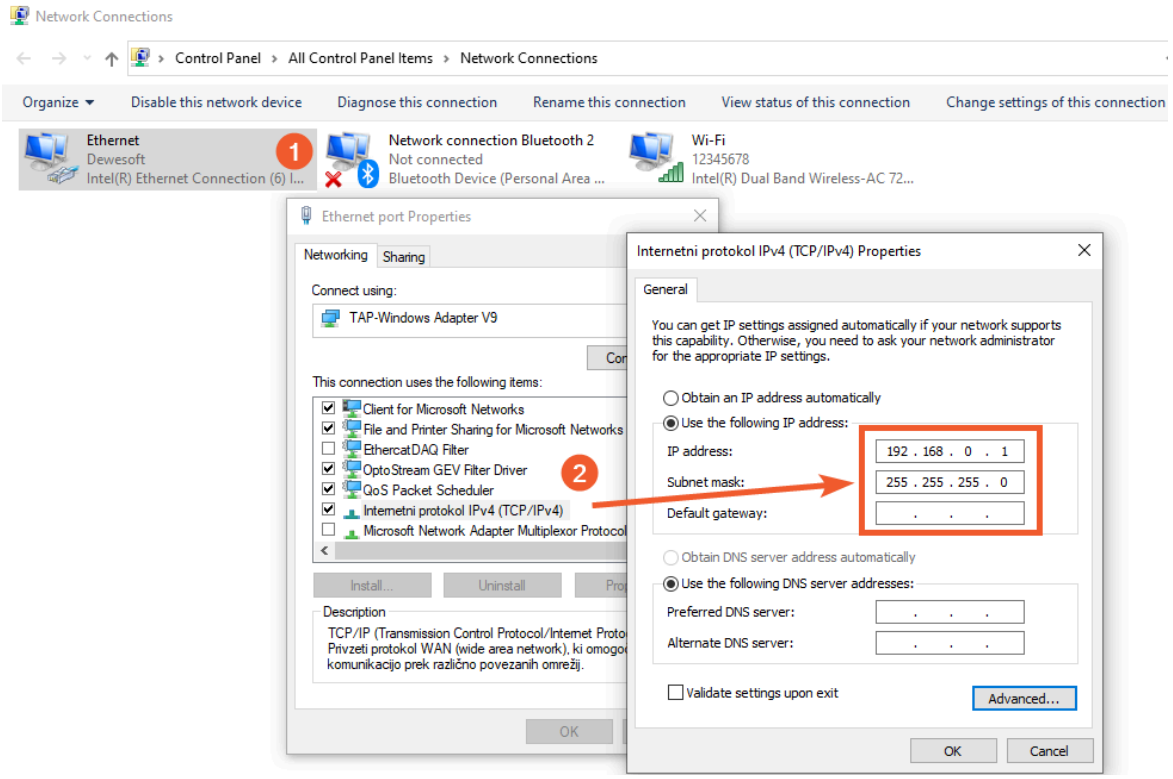


Image 4: Manually set IP address

5.2. Phantom Camera Control PCC

For checking the network connection (and changing the camera settings), you can use the previously installed Phantom Camera Control (PCC) to get and check a live picture and set advanced properties not accessible in Dewesoft.

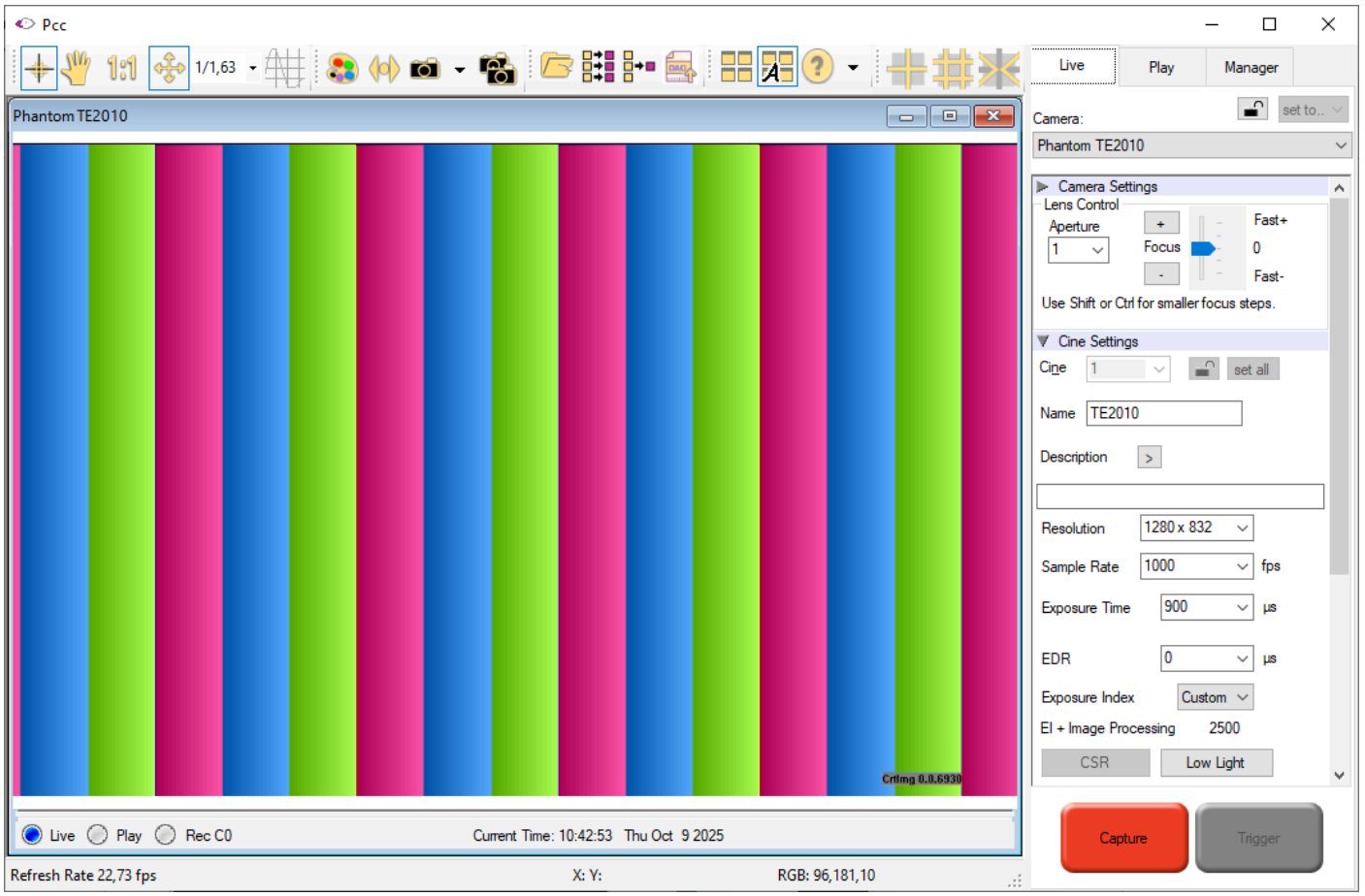


Image 5: Test connection with Phantom Camera Control (PCC)

5.3. Camera Software trigger out pulse setup

For camera frames to other Dewesoft data synchronisation, “Software trigger” out pulse is crucial. Set one of the programmable signals to “Software trigger” and set its duration to 100 usec, to guarantee a proper triggering under any circumstances.

Important
You can adjust the software trigger signal duration according to the used frame rate and the type of input used to measure it (counter, analog in).

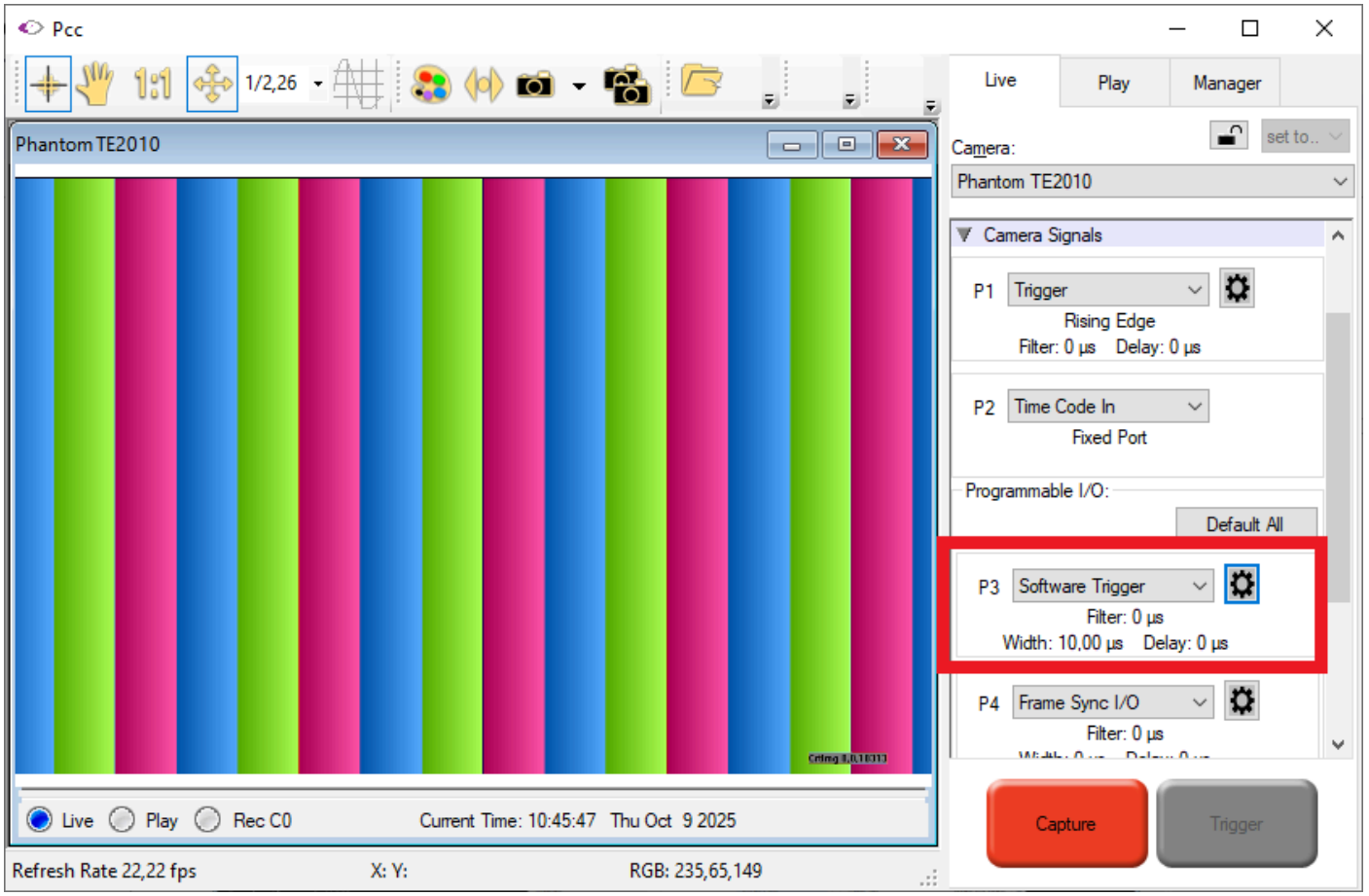


Image 6: TRIG_TTL_OUT setup in PCC

6. Setup the camera

6.1. Enabling the camera

In DewesoftX®, go to Options → Settings → Devices, click the Add button ❶ and add the “Phantom” plugin ❷.

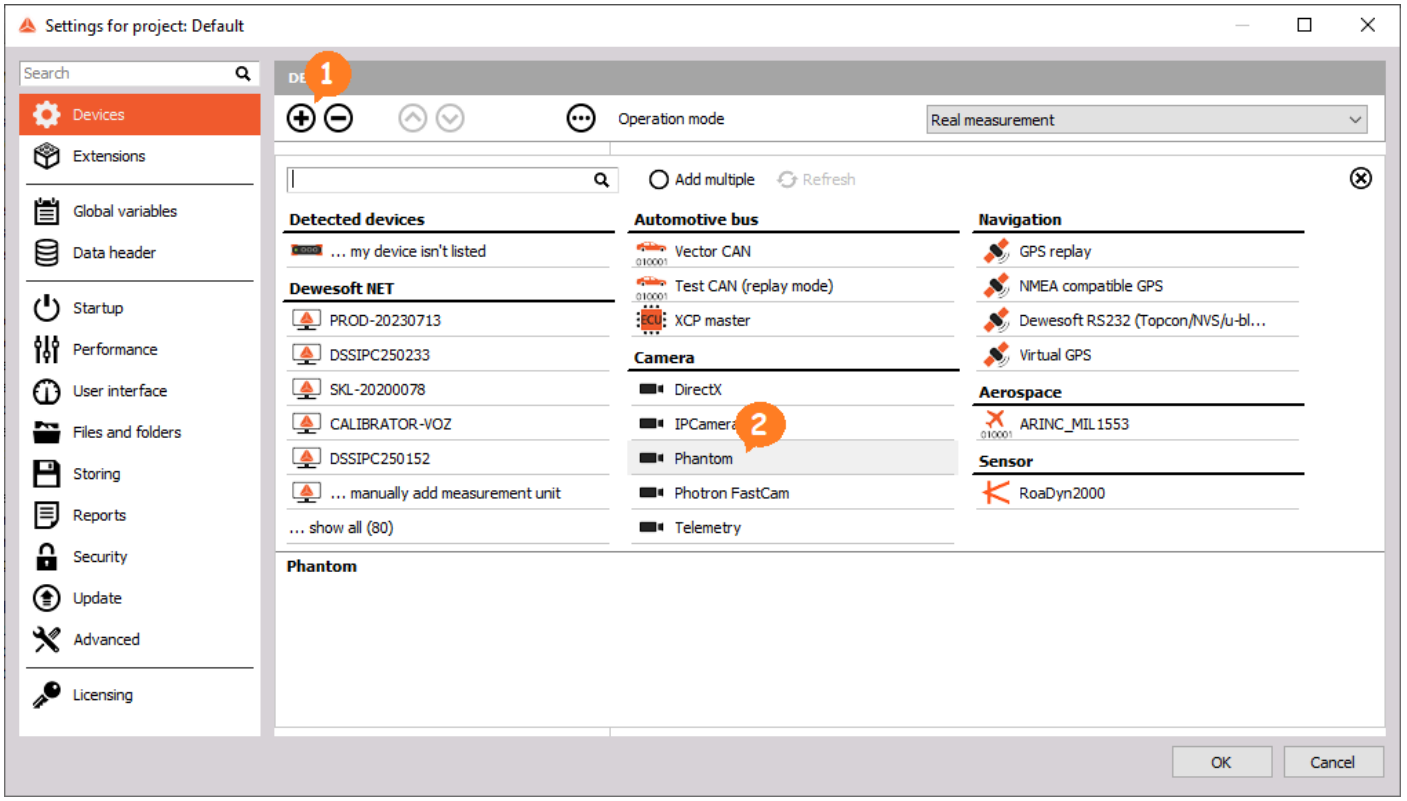


Image 7: Adding a Phantom camera

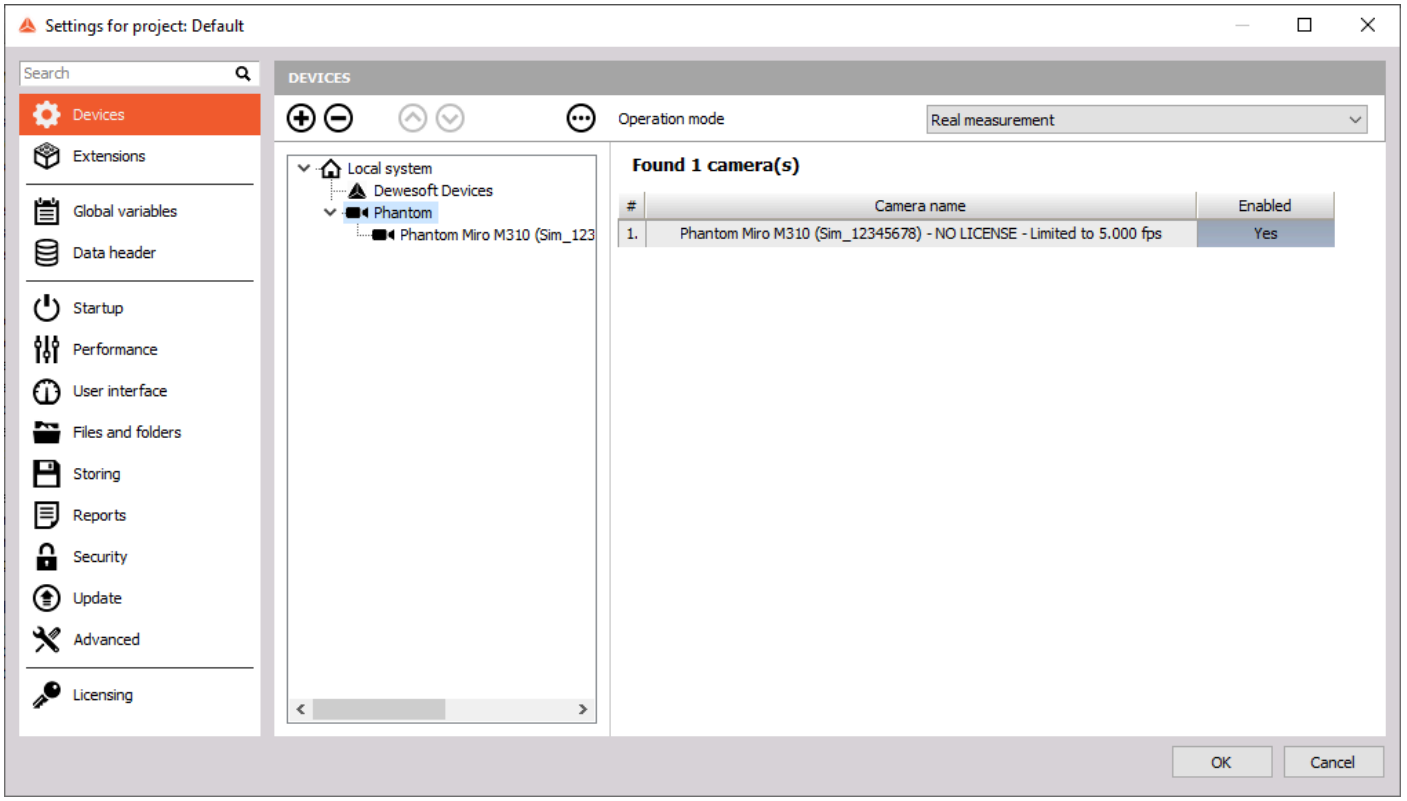


Image 8: Phantom camera setup preview

When you click on the camera, you should be able to see the model and its IP address. Otherwise, please refer to the FAQ section at the end of this document.

6.2. Trigger setup

There are three different types of camera triggers:

- Store on start of acquisition
- Store on Dewesoft trigger
- Store on external trigger

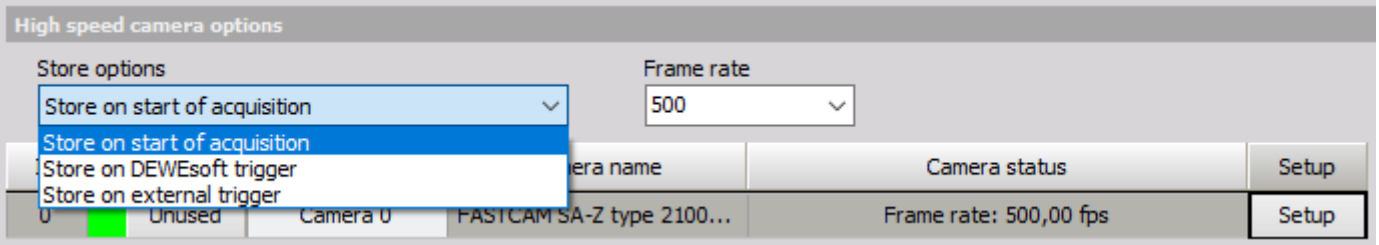


Image 9: Store trigger options

6.2.1. Store on Dewesoft trigger

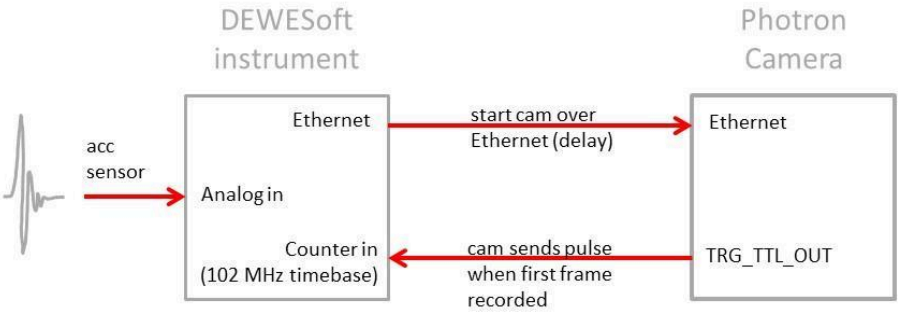


Image 10: Store on DewesoftX® trigger

This is the most commonly used wiring. The software triggers even on complex trigger conditions on the analog input, and sends the start impulse over Ethernet. The camera sends a pulse, when the first frame is recorded, this is measured back with the very accurate DewesoftX® SuperCounter® (102,4 MHz timebase) for synchronisation.

6.2.2. Store on external trigger

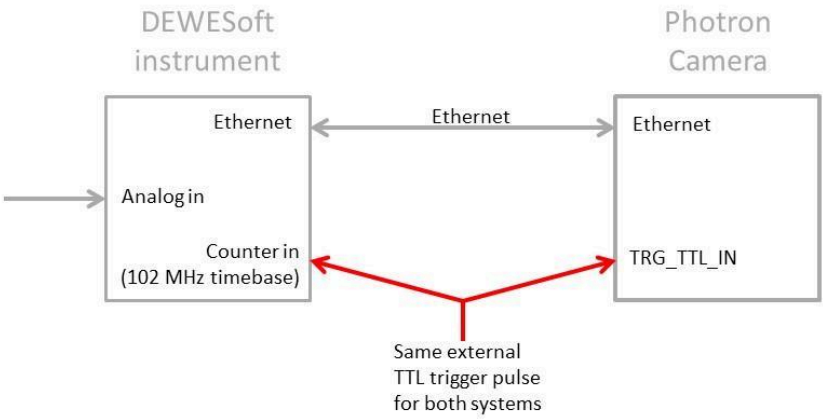


Image 11: Store on external trigger

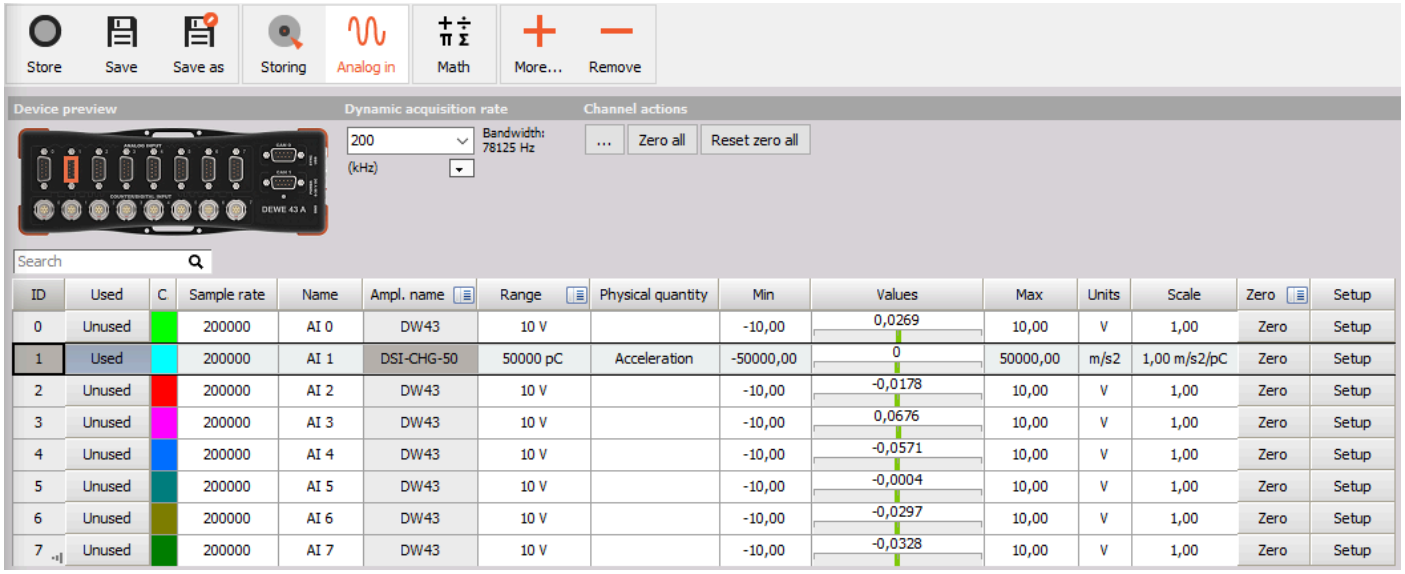
If the camera is triggered with an external trigger, then the same signal can also be used for synchronization.

6.2.3. Store on start of acquisition

The camera will start with the beginning of data recording (streaming). This is of less practical usage because, depending on the framerate, measurement duration, and camera onboard memory, the acquisition time is limited.

6.3. Store on Dewesoft trigger example

Referring to the setup shown in the chapter *Camera example connection*, we want to acquire both analog and video data of a hit of an accelerometer with the fingertip.
The analog input sampling rate is set to 200 kS/s (this does not affect the 102,4 MHz counter sampling rate).



ID	Used	C	Sample rate	Name	Ampl. name	Range	Physical quantity	Min	Values	Max	Units	Scale	Zero	Setup
0	Unused		200000	AI 0	DW43	10 V		-10,00	0,0269	10,00	V	1,00	Zero	Setup
1	Used		200000	AI 1	DSI-CHG-50	50000 pC	Acceleration	-50000,00	0	50000,00	m/s2	1,00 m/s2/pC	Zero	Setup
2	Unused		200000	AI 2	DW43	10 V		-10,00	-0,0178	10,00	V	1,00	Zero	Setup
3	Unused		200000	AI 3	DW43	10 V		-10,00	0,0676	10,00	V	1,00	Zero	Setup
4	Unused		200000	AI 4	DW43	10 V		-10,00	-0,0571	10,00	V	1,00	Zero	Setup
5	Unused		200000	AI 5	DW43	10 V		-10,00	-0,0004	10,00	V	1,00	Zero	Setup
6	Unused		200000	AI 6	DW43	10 V		-10,00	-0,0297	10,00	V	1,00	Zero	Setup
7	Unused		200000	AI 7	DW43	10 V		-10,00	-0,0328	10,00	V	1,00	Zero	Setup

Image 12: Analog channel setup (accelerometer)

We enter the channel setup to get a preview of the signal and check the appropriate trigger level.

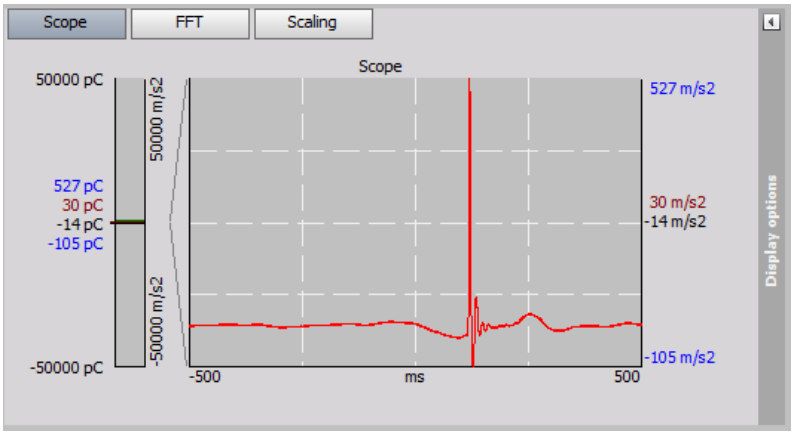


Image 13: Example signal when knocking with a finger on the sensor

If the Counter section is not visible in the first place, please add it with the **More** button on the right side of the toolbar. The Counter is set to “Event Counting” → “Basic Event Counting” by default, which is ok. Then set the CNT 1/IN0 to Used.

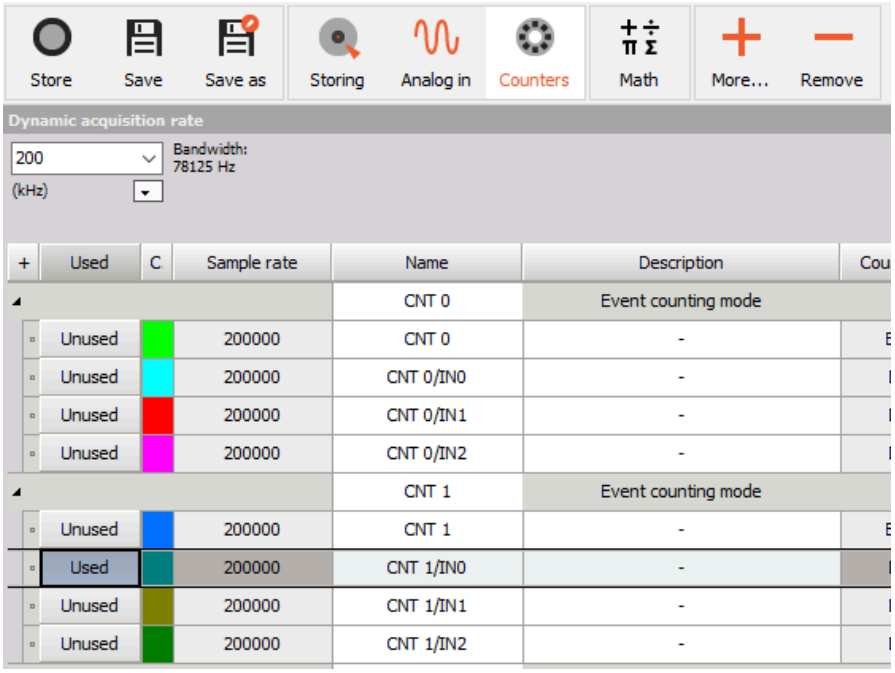


Image 14: Counter setup (TRIG pulse)

The trigger setup looks like shown below. We select “fast on trigger”, rising edge with a level of 1g. The pre-time is 100ms, post-time 500ms.
DewesoftX® supports complex trigger conditions, such as simple edge, filtered edge, window, pulse width, slope, delta amplitude, ... as well as any logical combination on any analog/digital/math channel.

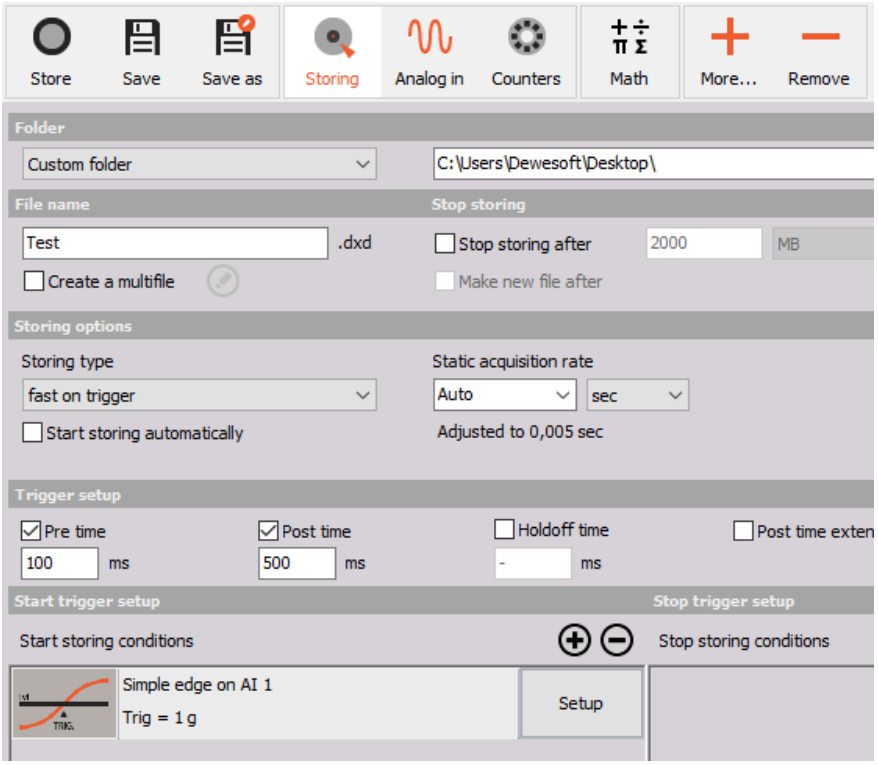


Image 15: Storing setup

6.4. Camera setup

In the video setup, you can see all available cameras. Set the camera to “Used”, then enter the Setup.

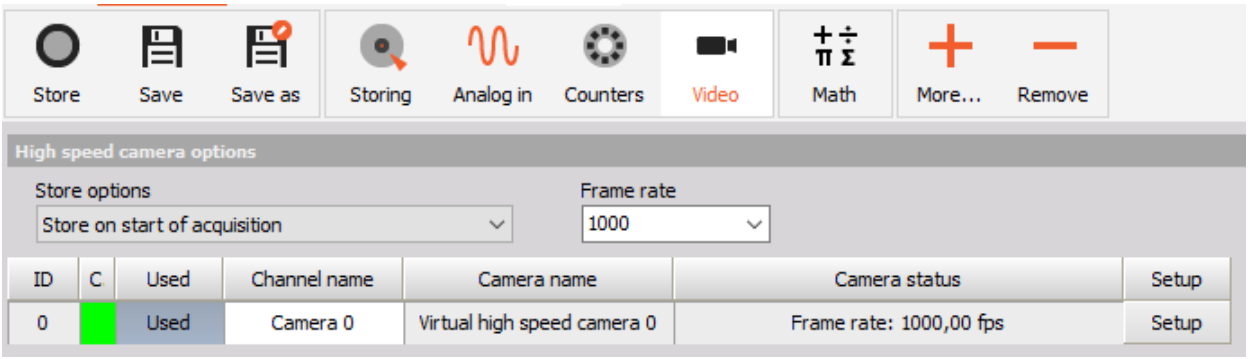


Image 16: Video setup

The setup screen shows the “Trigger setup” and the “Camera settings”, as well as a live preview for adjusting the setup (focus, light source, etc.). Here you can set Resolution, Frame rate, Shutter speed, and Sensor gain (if the camera supports hardware sensor gain) parameters. You can also calibrate the camera sensor here (more in chapter 6.6 Camera sensor calibration). The options depend on the camera model in use and also differ from each other. For example, if you increase the framerate, the shutter time will be limited.
The camera settings are applied to the camera as soon as something is changed, so the preview is always up to date with the current settings.

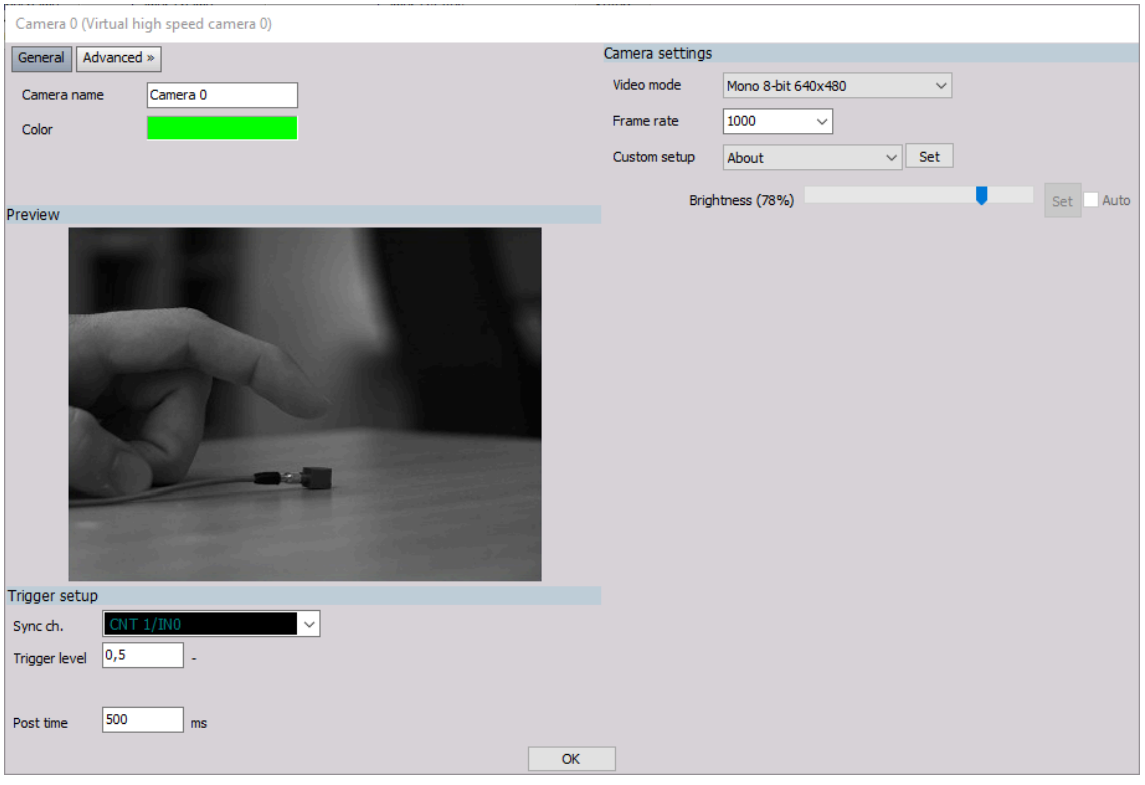


Image 17: Camera channel setup

Please select the Counter and adjust the level to 0.5, as this is a digital channel (0 to 1). When the camera is started over Ethernet, depending on system load and operating system, there will be a delay to the storing trigger. This is usually around 50...100ms (in the example below, around 70ms, red line). Therefore, we have to set the camera buffer a little bit higher to capture the whole time window.

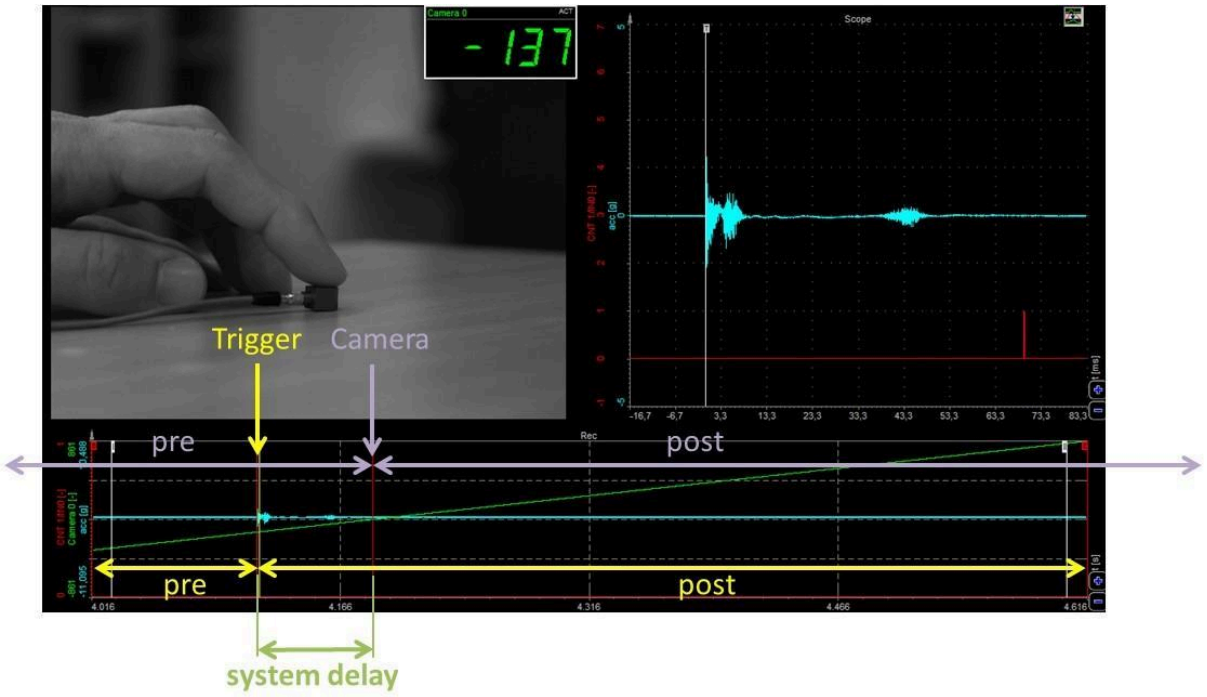


Image 18: Camera and Storing pre- and post-times

7. Video range selection and download

After the measurement, DewesoftX® will show the whole recorded video data. You can navigate without noticeable delay in the camera onboard memory. If you have verified the data to be good, you can even zoom in with the cursors and only select the range of interest: This saves valuable download time.
Then download the video to the computer. This can take from minutes to hours, depending on the file size.

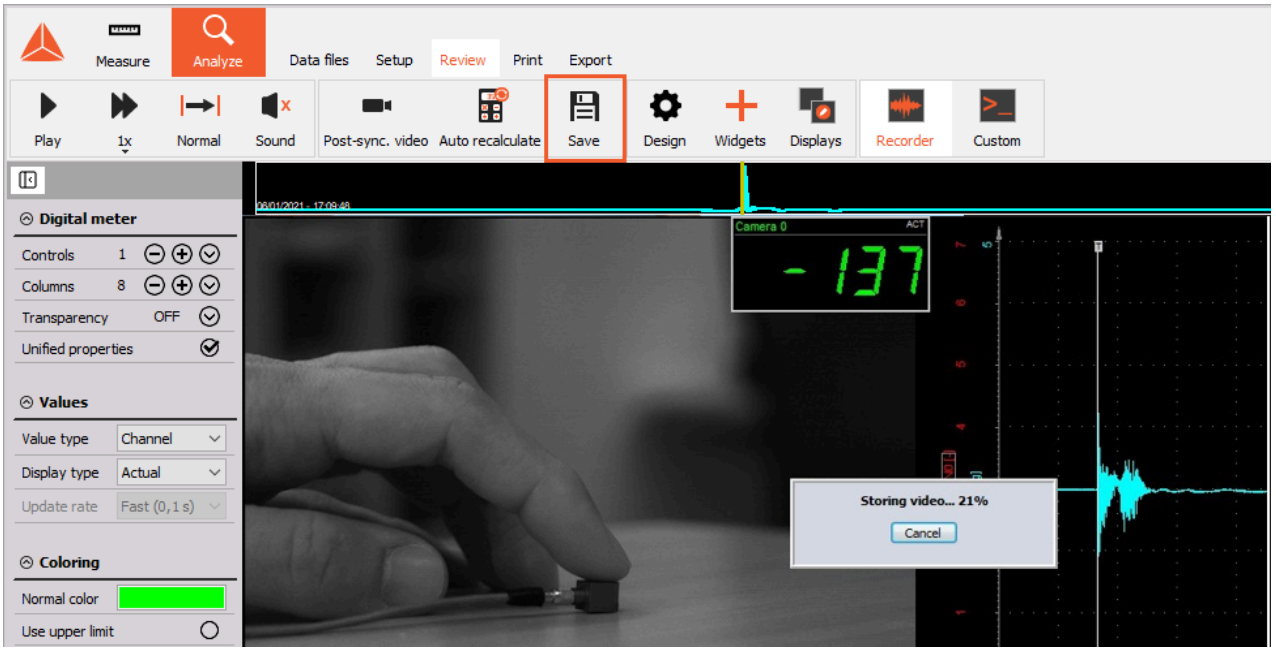


Image 21: Video file download

7.1. Slow motion replay

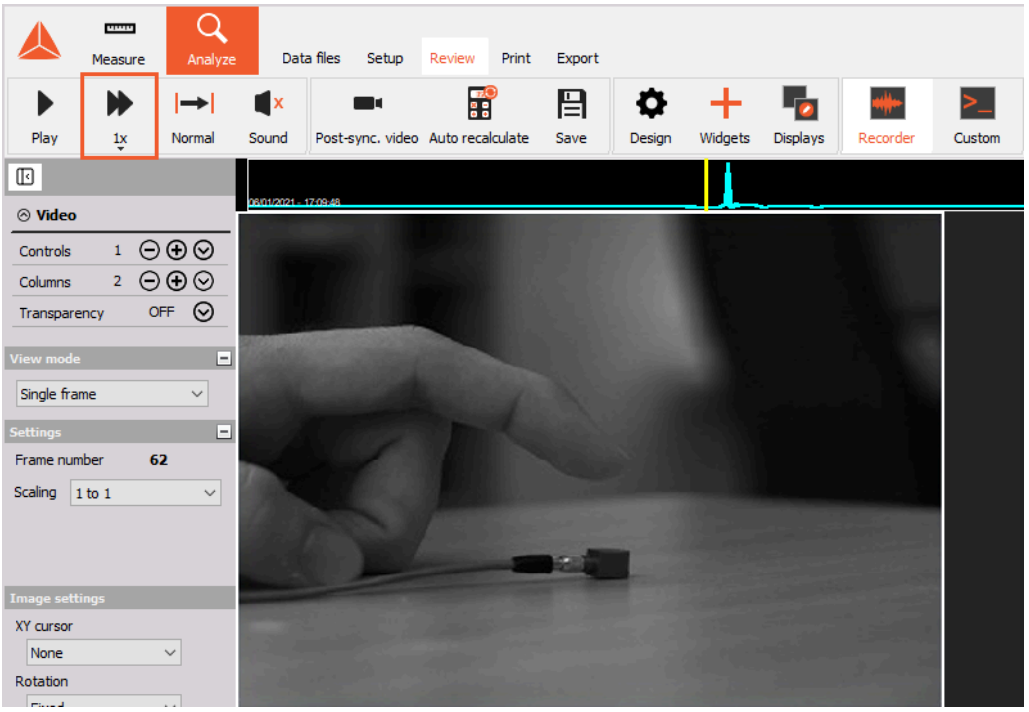


Image 22: Adjust playback speed

8. Example datafile

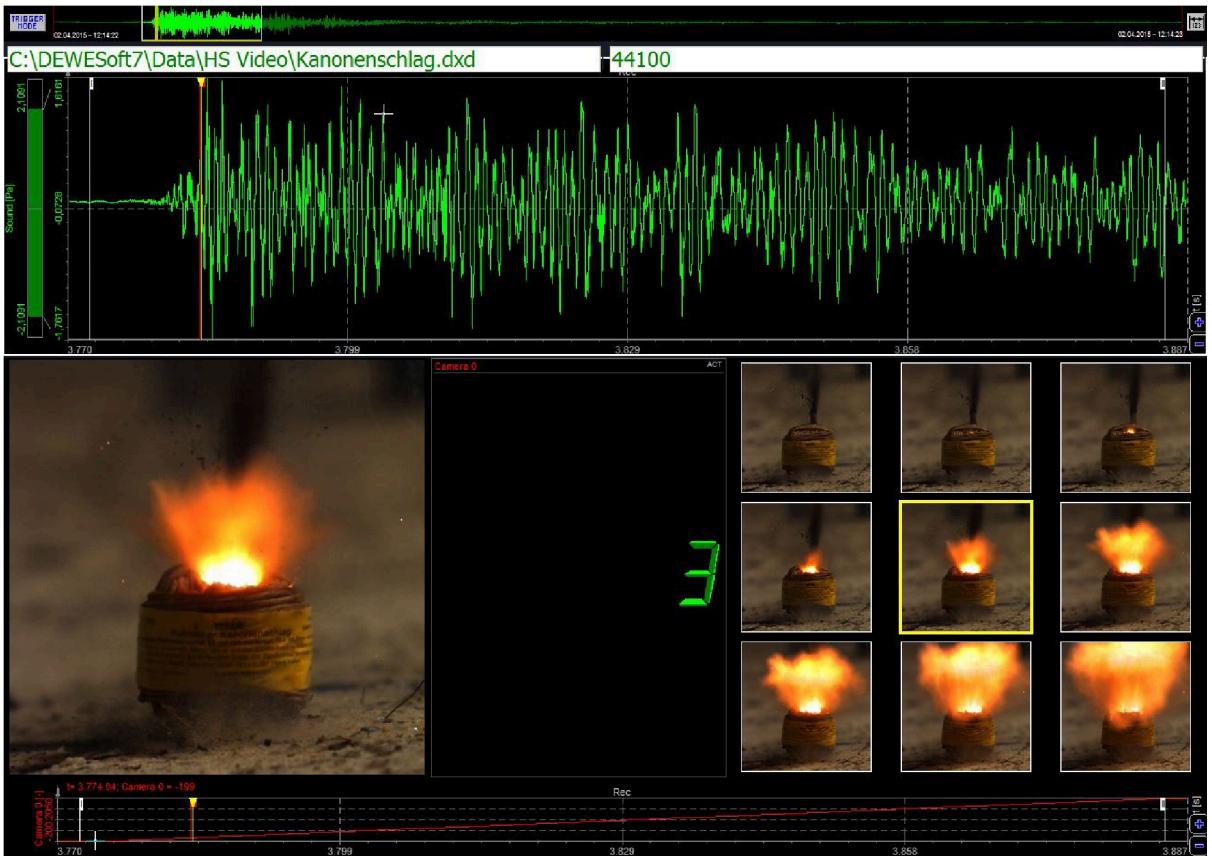


Image 23: Example data file

9. FAQ

This section should help to find quick solutions for known problems.

9.1. Camera not detected in PCC

- After closing DewesoftX®, please wait 20 seconds before starting the Phantom Camera Control (PCC).
- Check the Subnet and the manually assigned IP address on the network card.

In Windows settings, navigate to *Windows Defender Firewall* and click on the *Allow an app or feature through Windows Defender Firewall,* and finally add DewesoftX and Phantom camera to exclusions.

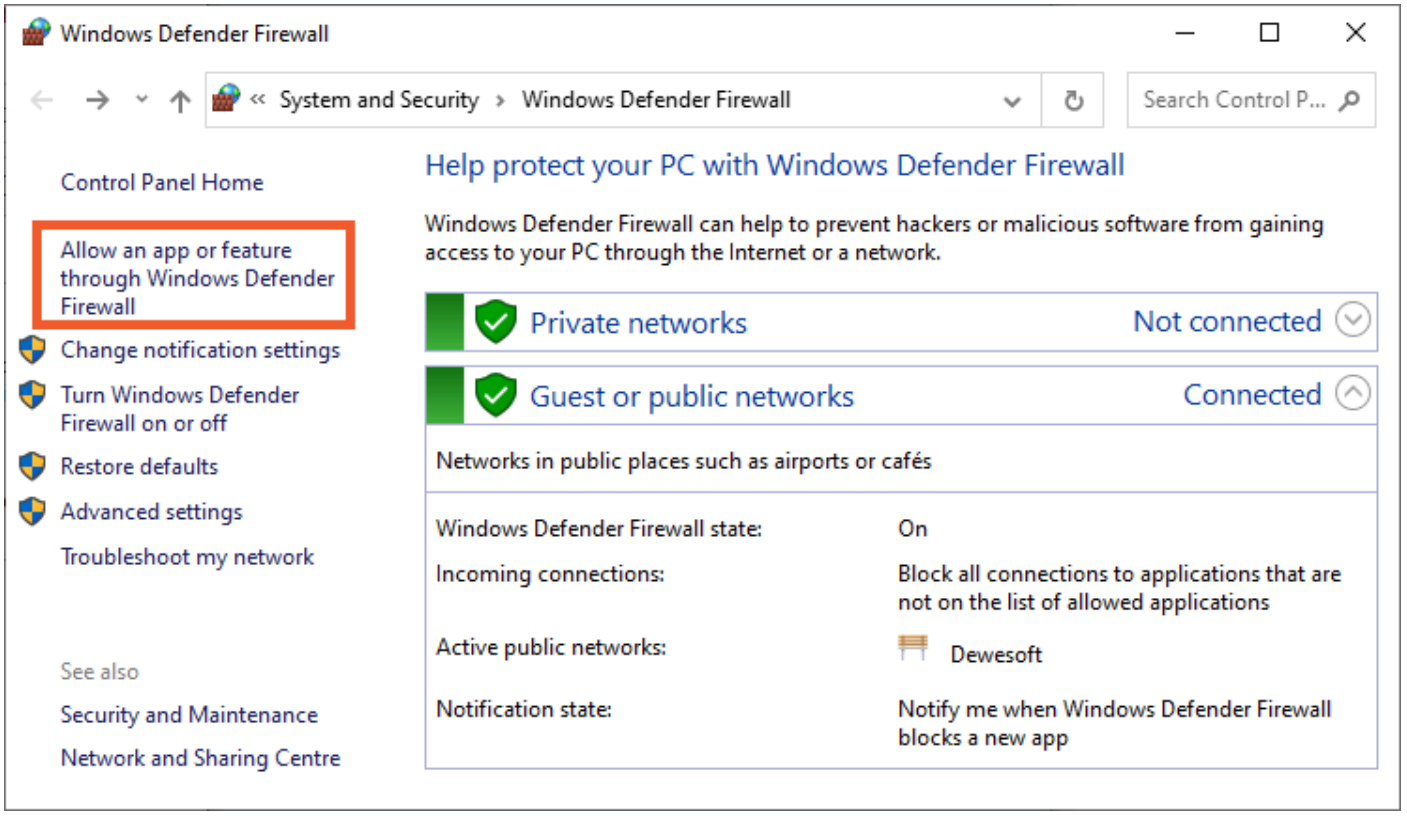


Image 24: Windows Firewall exclusion

10. Warranty information

Notice
The information contained in this document is subject to change without notice.

Note:
Dewesoft d.o.o. shall not be liable for any errors contained in this document. Dewesoft MAKES NO WARRANTIES OF ANY KIND WITH REGARD TO THIS DOCUMENT, WHETHER EXPRESS OR IMPLIED. DEWESOFT SPECIFICALLY DISCLAIMS THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. Dewesoft shall not be liable for any direct, indirect, special, incidental, or consequential damages, whether based on contract, tort, or any other legal theory, in connection with the furnishing of this document or the use of the information in this document.

The copy of the specific warranty terms applicable to your Dewesoft product and replacement parts can be obtained from your local sales and service office. To find a local dealer for your country, please visit https://dewesoft.com/support/distributors.

10.1. Calibration

Every instrument needs to be calibrated at regular intervals. The standard norm across nearly every industry is annual calibration. Before your Dewesoft data acquisition system is delivered, it is calibrated. Detailed calibration reports for your Dewesoft system can be requested. We retain them for at least one year, after system delivery.

10.2. Support

Dewesoft has a team of people ready to assist you if you have any questions or any technical difficulties regarding the system. For any support please contact your local distributor first or Dewesoft directly.

Dewesoft d.o.o.
Gabrsko 11a
1420 Trbovlje Slovenia

Europe Tel.: +386 356 25 300
Web: http://www.dewesoft.com
Email: Support@dewesoft.com
The telephone hotline is available Monday to Friday from 07:00 to 16:00 CET (GMT +1:00)

10.3. Service/repair

The team of Dewesoft also performs any kinds of repairs to your system to assure a safe and proper operation in the future. For information regarding service and repairs please contact your local distributor first or Dewesoft directly on https://dewesoft.com/support/rma-service.

10.4. Restricted Rights

Use Slovenian law for duplication or disclosure. Dewesoft d.o.o. Gabrsko 11a, 1420 Trbovlje, Slovenia / Europe.

10.5. Printing History

Version 2.0.0, Revision 217 Released 2015 Last changed: 23. July 2018 at 16:54.

10.6. Copyright

10.7. Trademarks

We take pride in our products and we take care that all key products and technologies are registered as trademarks all over the world. The Dewesoft name is a registered trademark. Product families (KRYPTON, SIRIUS, DSI, DS-NET) and technologies (DualCoreADC, SuperCounter, GrandView) are registered trademarks as well. When used as the logo or as part of any graphic material, the registered trademark sign is used as a part of the logo. When used in text representing the company, product or technology name, the ® sign is not used. The Dewesoft triangle logo is a registered trademark but the ® sign is not used in the visual representation of the triangle logo.

11. Safety instructions

Your safety is our primary concern! Please be safe!

11.1. Safety symbols in the manual

Warning

Calls attention to a procedure, practice, or condition that could cause the body injury or death

Caution

Calls attention to a procedure, practice, or condition that could possibly cause damage to equipment or permanent loss of data.

11.2. General Safety Instructions

Warning

The following general safety precautions must be observed during all phases of operation, service, and repair of this product. Failure to comply with these precautions or with specific warnings elsewhere in this manual violates safety standards of design, manufacture, and intended use of the product. Dewesoft d.o.o. assumes no liability for the customer's failure to comply with these requirements.

All accessories shown in this document are available as an option and will not be shipped as standard parts.

11.2.1. Environmental Considerations

Information about the environmental impact of the product.

11.2.2. Product End-of-Life Handling

Observe the following guidelines when recycling a Dewesoft system:

11.2.3. System and Components Recycling

Production of these components required the extraction and use of natural resources. The substances contained in the system could be harmful to your health and to the environment if the system is improperly handled at its end of life! Please recycle this product in an appropriate way to avoid unnecessary pollution of the environment and to keep natural resources.

This symbol indicates that this system complies with the European Union's requirements according to Directive 2002/96/EC on waste electrical and electronic equipment (WEEE). Please find further information about recycling on the Dewesoft web site www.dewesoft.com

Restriction of Hazardous Substances
This product has been classified as Monitoring and Control equipment and is outside the scope of the 2002/95/EC RoHS Directive. However, we take care of our environment and the product is lead-free.

11.2.4. General safety and hazard warnings for all Dewesoft systems

Safety of the operator and the unit depend on following these rules.

- Use this system under the terms of the specifications only to avoid any possible danger.
- Read your manual before operating the system.
- Observe local laws when using the instrument.
- DO NOT touch internal wiring!
- DO NOT use higher supply voltage than specified!
- Use only original plugs and cables for harnessing.
- You may not connect higher voltages than rated to any connectors.
- The power cable and connector serve as Power-Breaker. The cable must not exceed 3 meters, the disconnect function must be possible without tools.
- Maintenance must be executed by qualified staff only.
- During the use of the system, it might be possible to access other parts of a more comprehensive system. Please read and follow the safety instructions provided in the manuals of all other components regarding warning and security advice for using the system.
- With this product, only use the power cable delivered or defined for the host country.
- DO NOT connect or disconnect sensors, probes or test leads, as these parts are connected to a voltage supply unit.
- Ground the equipment: For Safety Class 1 equipment (equipment having a protective earth terminal), a non-interruptible safety earth ground must be provided from the mains power source to the product input wiring terminals.
- Please note the characteristics and indicators on the system to avoid fire or electric shocks. Before connecting the system, please read the corresponding specifications in the product manual carefully.

- The inputs must not, unless otherwise noted (CATx identification), be connected to the main circuit of category II, III and IV.
- The power cord separates the system from the power supply. Do not block the power cord, since it has to be accessible for the users.
- DO NOT use the system if equipment covers or shields are removed.
- If you assume the system is damaged, get it examined by authorized personnel only.
- Adverse environmental conditions are Moisture or high humidity Dust, flammable gases, fumes or dissolver Thunderstorm or thunderstorm conditions (except assembly PNA) Electrostatic fields, etc.
- The measurement category can be adjusted depending on module configuration.
- Any other use than described above may damage your system and is attended with dangers like short-circuiting, fire or electric shocks.
- The whole system must not be changed, rebuilt or opened.
- DO NOT operate damaged equipment: Whenever it is possible that the safety protection features built into this product have been impaired, either through physical damage, excessive moisture, or any other reason, REMOVE POWER and do not use the product until the safe operation can be verified by service-trained personnel. If necessary, return the product to Dewesoft sales and service office for service and repair to ensure that safety features are maintained.
- If you assume a more riskless use is not provided anymore, the system has to be rendered inoperative and should be protected against inadvertent operation. It is assumed that a more riskless operation is not possible anymore if the system is damaged obviously or causes strange noises. The system does not work anymore. The system has been exposed to long storage in adverse environments. The system has been exposed to heavy shipment strain.
- Warranty void if damages caused by disregarding this manual. For consequential damages, NO liability will be assumed!
- Warranty void if damage to property or persons caused by improper use or disregarding the safety instructions.
- Unauthorized changing or rebuilding the system is prohibited due to safety and permission reasons (CE).
- Be careful with voltages >25 VAC or >35 VDC! These voltages are already high enough in order to get a perilous electric shock by touching the wiring.
- The product heats during operation. Make sure there is adequate ventilation. Ventilation slots must not be covered!
- Only fuses of the specified type and nominal current may be used. The use of patched fuses is prohibited.
- Prevent using metal bare wires! Risk of short circuit and fire hazard!
- DO NOT use the system before, during or shortly after a thunderstorm (risk of lightning and high energy over-voltage). An advanced range of application under certain conditions is allowed with therefore designed products only. For details please refer to the specifications.
- Make sure that your hands, shoes, clothes, the floor, the system or measuring leads, integrated circuits and so on, are dry.
- DO NOT use the system in rooms with flammable gases, fumes or dust or in adverse environmental conditions.
- Avoid operation in the immediate vicinity of high magnetic or electromagnetic fields, transmitting antennas or high-frequency generators, for exact values please refer to enclosed specifications.
- Use measurement leads or measurement accessories aligned with the specification of the system only. Fire hazard in case of overload!

- Do not switch on the system after transporting it from a cold into a warm room and vice versa. The thereby created condensation may damage your system. Acclimatise the system unpowered to room temperature.
- Do not disassemble the system! There is a high risk of getting a perilous electric shock. Capacitors still might be charged, even if the system has been removed from the power supply.
- The electrical installations and equipment in industrial facilities must be observed by the security regulations and insurance institutions.
- The use of the measuring system in schools and other training facilities must be observed by skilled personnel.
- The measuring systems are not designed for use in humans and animals.
- Please contact a professional if you have doubts about the method of operation, safety or the connection of the system.
- Please be careful with the product. Shocks, hits and dropping it from already- lower level may damage your system.
- Please also consider the detailed technical reference manual as well as the security advice of the connected systems.
- This product has left the factory in safety-related flawlessness and in proper condition. In order to maintain this condition and guarantee safety use, the user has to consider the security advice and warnings in this manual.

EN 61326-3-1:2008
IEC 61326-1 applies to this part of IEC 61326 but is limited to systems and equipment for industrial applications intended to perform safety functions as defined in IEC 61508 with SIL 1-3.

The electromagnetic environments encompassed by this product family standard are industrial, both indoor and outdoor, as described for industrial locations in IEC 61000-6-2 or defined in 3.7 of IEC 61326-1.

Equipment and systems intended for use in other electromagnetic environments, for example, in the process industry or in environments with potentially explosive atmospheres, are excluded from the scope of this product family standard, IEC 61326-3-1.

Devices and systems according to IEC 61508 or IEC 61511 which are considered as “operationally well-tried”, are excluded from the scope of IEC 61326-3-1.

Fire-alarm and safety-alarm systems, intended for the protection of buildings, are excluded from the scope of IEC 61326-3-1.

11.3. Documentation version history

Version	Date	Notes
V26-1	05.01.2026	Initial version