Industrial Event Camera VOC*M-F256-B12-V1D-CR0*

Manual





Your automation, our passion.

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1	Introd	Juction5				
	1.1	Content of this Document5				
	1.2	Target Group, Personnel5				
	1.3	Symbols Used6				
2	Produ	ct Specifications7				
	2.1	Use and Application7				
	2.2	Dimensions10				
	2.3	Field of view size11				
	2.4	Display Elements				
	2.5	Electrical Connection14				
	2.6	Camera Optics15				
	2.7	The Heater				
	2.8	MicroSD card15				
	2.9	Digital Input Trigger Signal15				
	2.10	Accessories16				
3	Install	ation17				
	3.1	Storage and Disposal17				
	3.2	Preparation17				
	3.3	Mounting the Camera17				
	3.4	Connecting the Camera18				
	3.5	System Requirements21				
4	Functi	ions22				
	4.1	Streaming22				
	4.2	Recording22				
	4.3	Access Protection24				
5	Web I	nterface				
	5.1	Opening the User Interface in the Web Browser25				
	5.2	Camera Management Tool25				

	5.3	User interface	25
	5.3.1	Events	27
	5.3.2	Settings	27
	5.3.3	Expert Settings	33
	5.3.4	System	36
	5.3.5	Update	
	5.3.6	REST API Interface	
6	Mainte 6.1	enance and Repair	
	6.2	Repair	39
7	Troubl	eshooting	40
	7.1	What to Do in the Case of a Fault	40



1 Introduction

1.1 Content of this Document

This document contains information required to use the product in the relevant phases of the product life cycle. This may include information on the following:

- Product identification
- Delivery, transport, and storage
- Mounting and installation
- Commissioning and operation
- Maintenance and repair
- Troubleshooting
- Dismounting
- Disposal

Note

For full information on the product, refer to the further documentation on the Internet at www.pepperl-fuchs.com.



Note

For specific device information such as the year of construction, scan the QR code on the device. As an alternative, enter the serial number in the serial number search at www.pepperl-fuchs.com.

The documentation comprises the following parts:

- This document
- Datasheet

In addition, the documentation may comprise the following parts, if applicable:

- EU-type examination certificate
- EU declaration of conformity
- Attestation of conformity
- Certificates
- Control drawings
- Instruction manual
- Functional safety manual
- Other documents

1.2 Target Group, Personnel

Responsibility for planning, assembly, commissioning, operation, maintenance, and dismounting lies with the plant operator.

Only appropriately trained and qualified personnel may carry out mounting, installation, commissioning, operation, maintenance, and dismounting of the product. The personnel must have read and understood the instruction manual and the further documentation.

Prior to using the product make yourself familiar with it. Read the document carefully.

1.3 Symbols Used

This document contains symbols for the identification of warning messages and of informative messages.

Warning Messages

You will find warning messages, whenever dangers may arise from your actions. It is mandatory that you observe these warning messages for your personal safety and in order to avoid property damage.

Depending on the risk level, the warning messages are displayed in descending order as follows:



Danger!

This symbol indicates an imminent danger.

Non-observance will result in personal injury or death.



Warning!

This symbol indicates a possible fault or danger.

Non-observance may cause personal injury or serious property damage.



Caution!

This symbol indicates a possible fault.

Non-observance could interrupt the device and any connected systems and plants, or result in their complete failure.



Informative Symbols

Note

This symbol brings important information to your attention.



Action

1. This symbol indicates a paragraph with instructions. You are prompted to perform an action or a sequence of actions.



2 Product Specifications

2.1 Use and Application

This manual applies to the industrial event camera (hereinafter referred to as camera). The camera is supplied with 24 V DC and features a network interface (10BaseT/100Base-TX) and trigger input. The camera is used for the continuous monitoring of machinery and systems in industrial applications.

Recording can be triggered directly from the PLC via the network interface. The recording function supports a pre-run buffer of up to 15 minutes to optimally capture events. The rugged design and the integrated heater to prevent condensation mean that the camera can be used under harsh operating conditions. The camera is automated and integrated via a web interface.



Design of the Sensor

Figure 2.1 Overview

- 1 Fixed-focus camera
- 2 MicroSD card behind the cover
- 3 LED power
- 4 LED status
- 5 Ethernet port
- 6 Pressure-compensation element
- 7 Power supply and digital input connection
- 8 Mounting bracket with 4 x M6 female threads
- 9 Thread ¹/₄" 20 UNC for mounting standard photo stands

Special Product Features

Video Recording Function with Pre-Run and Post-Run Buffer

 In addition to the video recording function, the recording function supports pre-run buffers to capture actions that occur before the trigger event. The user can see what happened 60 seconds before and after an event. With the expert settings, the recording time can be extended up to 15 minutes. This can be useful for applications whereby unexpected events and operations must be stored for fault analysis or documentation purposes.

Integrated Web-Based, Password-Protected User Interface

• The camera has a web interface for easy commissioning and diagnostic purposes. The camera can be configured via a standard web browser.

Integrated Heater

 Since the camera can be used at ambient temperatures as low as -30 °C, a heater that can be adjusted via software is integrated to minimize the formation of condensation around the camera lens.

Static and Dynamic Text Overlays in the Video

- Static: camera name, time, date in live view, and recording.
- **Dynamic:** The User Datagram Protocol (UDP) interface enables user-defined overlay information to be added to the video sequence, e.g., for certain error messages. This simplifies fault analysis.

REST API

• REST API allows an individual user interface to be programmed and for the camera to be integrated directly into IT systems. The REST API can read out information and issue commands (e.g., a trigger signal).

Real-Time Streaming Protocol (RTSP)

 The camera supports the RTSP standard protocol for video streaming, so audio-visual data can be transferred across the network. This allows the camera live view to be displayed on standard HMI displays using RTSP.

Application Examples

Accessories for Safety Devices

The camera is an accessory for safety devices to quickly identify the cause of a safety-related fault.



Figure 2.2

Safety light grid



High-Bay Warehouses

The camera will record a video leading up to and after the event if the storage process has failed.



Figure 2.3 Automated storage and retrieval systems

Production Machines

The camera sends a live view to a screen to monitor the status of a machine or a hard-to-reach area.



Figure 2.4 Wind turbine

2023-06

2.2 Dimensions

The camera housing has the following dimensions.



Figure 2.5 Housing dimensions

The camera has a powder-coated aluminum housing and a glass front panel. The mounting bracket is securely attached to the housing and cannot be removed.





2.3 Field of view size

Rotating the camera creates a zoom effect due to the 4:3 aspect ratio. With a 90°/270° orientation, the field of view becomes smaller because a rectangular field of view is transferred from the real image sensor.

VOC5M-F256-B12-V1D-CR02

Size of the Field of View

Distance	Orientation 0°/180°	Orientation 90°/270°
0.5 m	1.4 m x 0.8 m	1.0 m x 0.6 m
1.0 m	2.8 m x 1.6 m	2.1 m x 1.2 m
2.5 m	6.9 m x 3.9 m	5.2 m x 2.9 m
5.0 m	13.9 m x 7.8 m	10.4 m x 5.8 m

90°/270° Orientation

In the 90° orientation, the connector faces to the right when viewed from the rear. The 90° orientation is the factory default.





Figure 2.6

0°/180° Orientation

- In the 0° orientation, the connector faces upwards.
- In the 180° orientation, the connector faces down.



Figure 2.7



VOC10M-F256-B12-V1D-CR03

Size of the Field of View

Distance	Orientation 0°/180°	Orientation 90°/270°
0.5 m	0.6 m x 0.3 m	0.5 m x 0.3 m
1.0 m	1.2 m x 0.7 m	0.9 m x 0.5 m
2.5 m	3.0 m x 1.7 m	2.3 m x 1.3 m
5.0 m	6.0 m x 3.4 m	4.5 m x 2.6 m
10.0 m	12.1 m x 6.8 m	9.1 m x 5.1 m

90°/270° Orientation

- In the 90° orientation, the connector faces to the right when viewed from the rear. The 90° orientation is the factory default.
- In the 270° orientation, the connector faces to the left when viewed from behind.



Figure 2.8

0°/180° Orientation

- In the 0° orientation, the connector faces upwards.
- In the 180° orientation, the connector faces down.





2.4 Display Elements

Two LEDs on the front of the camera indicate the operating status.

Description of the LEDs

LED	Color	Meaning
Power	Green	Illuminates when the camera is switched on
Status	Blue	Illuminates blue from the trigger to the end of the recording
	Yellow	Lights up yellow a few seconds after the system is switched on. The LED turns off when the camera has been successfully initialized and is ready for operation. A software restart is also indicated via the yellow status LED.

2.5 Electrical Connection

The following connections are located on the sensor.

Connection Assignment





Current Consumption

Note

The maximum input current of the camera is 200 mA over the entire input voltage range with the heater deactivated. When the heater is activated, the maximum input current is 700 mA.



2.6 Camera Optics

The VOC10M* camera has a horizontal angle of view of 62.2° and a vertical angle of view of 48.8°. In comparison, the VOC5M* camera has an even wider angle of view. It offers a horizontal angle of view of 108.4° and a vertical angle of view of 92.2°.

Note

All cameras from production date 01/2023 are equipped with a motorized focus. The motorized focus can be set via the user interface.

All cameras before production date 01/2023 have a fixed focus. The object distance is 1 m at optimum depth of focus.

The integrated CMOS sensor has a resolution of 8 MP and a sensor surface of 3.68 mm x 2.76 mm.

An IR-cut filter is installed to prevent image quality from being affected by IR radiation.

2.7 The Heater

The integrated heater reduces condensation around the camera lens, especially in cold environments. The heater can be activated as required.

The temperature in the area around the heater is controlled by a two-point controller. Depending on the status of the controller, the heating power has a nominal value of P = 0 W ("off") or depending on the supply voltage V_{CC} , P = $V_{CC}^2/50 \Omega$ ("on", 18 V --> 6.5 W, 24 V --> 11.5 W).



Note

To avoid impermissibly high temperatures in the event of a control system failing due to software, a software-independent excess temperature shut-off function for the heater unit is integrated into the camera (shut-off value: $103 \degree C \pm 2.5 \degree C$).

The shut-off value refers to the position of the excess temperature sensor in the area around the heater; other areas may be even warmer.

2.8 MicroSD card

An 8 GB industrial microSD card (Class 10 U1) is integrated into the camera for storing video recordings.

Note

T

The microSD card must only be removed or replaced for service purposes. If servicing is required, the two housing cover screws on the top (opposite the connector plugs) must be removed. The two black plastic screw covers must be removed first.

2.9 Digital Input Trigger Signal

Triggering the digital input (DIGIN) initiates the recording of a video file.

- This requires a rising edge at the DIGIN input in the high-level range, starting from the specified low level range, and a corresponding minimum pulse length of 20 ms. A low signal must be present for 20 ms for a trigger signal to occur again. The software prevents the acceptance of a new trigger signal for two seconds after a trigger signal is accepted.
- Trigger signals with a pulse length of < 1.5 ms are not accepted. Pulses with a length between 1.5 ms and 20 ms may result in a trigger signal.

2.10 Accessories

The following products are available as accessories.

Designation	Description
V1SD-G-GN2M-PUR-E1S-V45-G	Bus cable, Ethernet, straight M12 plug, D-coded to RJ45, Ethernet-coded, 4-pin, PUR cable, green, Cat5e
V1-G-2M-PUR	Straight single-ended female cordset, M12, 4-pin, PUR cable
PCV-MB1	Mounting bracket

Additional accessories can be found online at www.pepperl-fuchs.com.



3 Installation

3.1 Storage and Disposal

Keep the original packaging. Always store and transport the device in the original packaging. Store the device in a clean and dry environment. The permitted ambient conditions must be considered, see datasheet.

The device, built-in components, packaging, and any batteries contained within must be disposed in compliance with the applicable laws and guidelines of the respective country.

3.2 Preparation



Unpacking the Device

1. Check the packaging and contents for damage.

 \mapsto In the event of damage, inform the shipping company and notify the supplier.

2. Check the package contents against your order and the shipping documents to ensure that all items are present and correct.

 \hookrightarrow Should you have any questions, direct them to Pepperl+Fuchs.

3. Retain the original packaging in case the device is to be stored or shipped again at a later date.

3.3 Mounting the Camera

The surface must be level to prevent the housing from becoming misaligned when the fittings are tightened. Following installation of the sensor, ensure that there is still sufficient space to connect the connection cable to the sensor



Caution!

Damage to the equipment caused by improper mounting!

Device components can be damaged if the permissible screw-in depth and the maximum permissible tightening torque is exceeded.

Note that the threads on the bottom of the housing are not thru-holes.

Observe the maximum permissible screw-in depth to avoid damaging the device or mounting it incorrectly.

Never exceed the maximum permissible tightening speed for the fixing screws. The maximum tightening torque of the fixing screws must not exceed 1 Nm.

Mounting the Housing

So that the sensor can easily be mounted in your plant, the device has four M6 threads on the mounting fixture.

3.4 Connecting the Camera



Caution!

Damage to the device

Connecting an alternating current or excessive supply voltage can damage the device or cause the device to malfunction.

Electrical connections with reversed polarity can damage the device or cause the device to malfunction.

Connect the device to direct current (DC). Ensure that the supply voltage rating is within the specified device range. Ensure that the connecting wires on the female cordset are connected correctly.



Connecting the Supply Voltage

To supply voltage to the sensor, proceed as follows:

- 1. Connect the 4-pin M12 socket on the power cable to the plug located on the side of the camera.
- 2. Manually screw the union nut onto the connector as far as it will go.

→ This ensures that the power cable cannot be pulled out inadvertently.



Establishing a Network Connection

To establish a network connection, proceed as follows:

- 1. Use a network cable (minimum category 5e cable, max. length of 100 m) that has an RJ45 network connector on one side and a 4-pin M12 plug on the other. Insert the 4-pin M12 plug into the socket on the side of the camera.
- 2. Manually screw the union nut onto the connector as far as it will go.

→ This ensures that the network cable cannot be pulled out inadvertently.

3. When delivered, the camera has a fixed IP address (192.168.100.50). To facilitate communication within the network, you must configure your network. You can find the configuration data in the network configuration overview.



Network

Note

The camera has a 100 Mbit Ethernet interface. The camera has a static IP address. If required, an IP address can also be obtained via DHCP. If DHCP is enabled but not available, the static IP address is always used as a fallback solution.





Assigning a Fixed IP Address

When delivered, the sensor has a fixed IP address **192.168.100.50** and subnet mask **255.255.255.0**. To enable communication within the network, the network settings of your PC/laptop must be synchronized with the camera and may need to be adjusted. To do so, proceed as follows:



Setting the Fixed IP Address

The following section describes how to check the network connection settings of your Windows PC and adapt them accordingly. The images in this description were created using Windows 10. The description below also applies to later versions of Windows.

- 1. Click the Windows "Start" button.
- 2. Select "Control Panel > Network and Sharing Center."
- 3. In the left window range, click "Change adapter settings."
- 4. Select the required connection and right-click on your selection. In the selection window, select "Properties."



5. Double-click "Internet Protocol Version 4 (TCP/IPv4)."

Connect using:			
Intel(R) Ethemet Conne	ection (5) I219-V		
	Configure		
This connection uses the follo	wing items:		
Client for Microsoft N	letworks		
🛛 🖳 QoS Packet Schedu	ler		
🗹 🚚 File and Printer Shar	ing for Microsoft Networks		
Internet Protocol Ver	sion 6 (TCP/IPv6)		
🗹 📥 Internet Protocol Ve	rsion 4 (TCP/IPv4)		
🗹 🔺 Link-Layer Topology	Discovery Mapper I/O Driver		
🗹 🔺 Link-Layer Topology	Discovery Responder		
Install	Iningtall	n	
	Tropentes		
Description			
Iransmission Control Proto	col/Internet Protocol. The default		
across diverse interconnec	ted networks.		

2023-06

eneral			
You can get IP settings assigned this capability. Otherwise, you ne for the appropriate IP settings.	automatically if your network supports eed to ask your network administrator		
Obtain an IP address autom	natically		
Ose the following IP address	s:		
IP address:	192 . 168 . 100 . 100		
Subnet mask:	255 . 255 . 255 . 0		
Default gateway:			
Obtain DNS server address	automatically		
 Use the following DNS serve 	er addresses:		
Preferred DNS server:	· · ·		
Alternate DNS server:			
Validate settings upon exit	Advanced		

→ The **Properties** window for the TCP/IP protocol opens.

- 6. Select the "General" tab.
- 7. Select the input function "Use the following IP address."
- 8. Enter the IP address of the sensor, but only the first three segments of the IP address. The last segment must be different from the IP address of the sensor.
- 9. In this example, enter the following IP address and subnet mask:
 - IP address: 192.168.100.100
 - Subnet mask: 255.255.255.0
- 10. Click "OK" and click "Cancel" in the next dialog.

 \mapsto This completes the network configuration so that the device can be used.



3.5 System Requirements

Ports

To ensure that the system functions properly, the following ports must not be blocked by a firewall within the camera's network.

Port	Protocol	Function
80	TCP	Web application
5001	UDP	Text overlay
5002	UDP	Event trigger
8080	TCP	Web application
8554 or 554	TCP and UDP	RTSP stream
53100	UDP	Management tool

Browser Support

Google Chrome > 84 (stable channel)



Note

Security Information

From a security perspective, the following precautions must be taken for the product by the responsible application operator:

- · Physically secure the device against unauthorized access
 - Ensure that the device is only operated on an isolated network without connection to the corporate network, internet, or cloud services;
 - there the device may only communicate with a higher-level controller, or with a defined, trusted circle of network participants

4 Functions

4.1 Streaming

Stream	Resolution	FPS	Codec/ Container	URL
HD	1280 x 720, 1024 x 576, 960 x 540, 800 x 450, 640 x 360	24	MJPEG	http:// <camera-ip>/stream-hd</camera-ip>
RTSP Stream 1	1280 x 720, 1024 x 576, 960 x 540, 800 x 450, 640 x 360	24	H264 RTSP	rtsp:// <cameraip>: 554/stream1</cameraip>
RTSP Stream 2	640 x 360	3	H264 RTSP	rtsp:// <camera-ip>:<rtspport>/< rtsp-path></rtspport></camera-ip>

RTSP Stream 1 and 2 are mutually exclusive.

4.2 Recording

The camera can record a video sequence in response to a trigger signal. The recording begins with the set pre-run buffer time before the trigger point and ends the set post-run buffer time after the trigger point.

Video recording properties:

Resolution	FPS	Codec/Container
1920 x 1080 1280 x 720, 1024 x 576, 960 x 540, 800 x 450, 640 x 360	24	H264 MP4, adjustable quality

Trigger Settings

Digital Input

• A rising edge at the digital input triggers a recording.

UDP

• Sends the character string TRIG to UDP port 5002 of the camera.

Web Interface

• The trigger button at the top right of the user interface can be used to trigger the operation manually.

When a trigger signal is detected, the blue status LED on the camera illuminates until all ongoing recordings are complete. If the recording cannot be saved, the blue LED flashes several times. Multiple recordings may overlap. At least two seconds must pass between each trigger. No more than three recordings can run at the same time.

To ensure that there is always enough memory, there is a function that deletes older videos to make sure there is enough space available.





Note Recording Fault

A recording fault is indicated by the blue LED flashing several times after a trigger has occurred.

Possible reasons for this include:

- Memory card is full
- Memory card is missing
- Memory card is faulty

Note

Recording with a Resolution of 1920 x 1080 Pixels

Live view, recording, and RTSP share the limited computing power of the camera. Recording with a resolution of 1920 x 1080 pixels requires the most computing power and can result in the live view having a very low frame rate. To reduce the impact on the live view or in case of other performance problems, we recommend disabling the RTSP stream when recording with a resolution of 1920 x 1080 pixels.

When using 1920 x 1080, only one recording can run at a time.

When using a recording resolution of 1920 x 1080 pixels, the field of view is reduced due to sensor limitations. This applies to all streams, although only the recording function supports 1920 x 1080.

Operating Limits and Recommendations

The operating limits are automatically enforced by the system. The operating recommendations indicate the limits of the system as tested by the manufacturer. If the system is used outside of these limits, performance can be affected and manufacturer support is not always guaranteed.

Feature	Туре	Value
MicroSD memory capacity	Recommendation	8 GB
Count of recordings	Recommendation	10,000
Minimum time interval between recordings	Limit value	2 s
Simultaneous recordings	Limit value	3
Simultaneous HTTP connections	Limit value	8
Simultaneous MJPEG streams	Recommendation	2
Simultaneous RTSP streams	Recommendation	1

4.3 Access Protection

Two users are available:

- viewer
- admin

On delivery, no password is set for either user. If a password is set, a login prompt appears when the user interface is launched.

The admin user has no restrictions.

The **viewer** user can view streams and recordings but cannot make any changes. The viewer is not permitted to change settings, delete videos, or perform updates.

The names of the two users can be changed.



Forgotten Password

Note

All camera settings are saved to the SD card in the file ipcam settings.json.

Delete this file from the SD card to reset the camera to factory settings. This is only necessary if the password for the admin user has been forgotten. Otherwise, all settings can be adjusted via the user interface.



5 Web Interface

The camera has a web interface that allows you to configure the camera and perform diagnostics.

5.1 Opening the User Interface in the Web Browser



Accessing the User Interface

- 1. Open the web interface using a current web browser, such as Google Chrome. The web interface is accessed via an HTTP request: http://<ip address> .
- 2. Enter the camera IP address (192.168.100.50).

5.2 Camera Management Tool

Auto Rang	e 🔿 Manual: 192.168	.246.1-254	Find	Select all	UpNate	Copy serials	Copy mfr.	serials	Oper
Р	Name	Serial		Mfr. Serial	Softwa	re Version		Hard	ware Ve
						Car		ive und	0
-ound U came	ras					Car	neras: U Act	ive upa	ates: U

- Display general information
 - Name
 - Serial number
 - Software version
 - Hardware version
 - Free / used memory
 - Uptime (operating time since the last restart)
 - Status
- Update cameras (download firmware)
- Copy serial numbers
- Open cameras in the browser
- Export settings from cameras / back up data
- Import settings into cameras / import backups

5.3 User interface

The following descriptions refer to the user interface display on a desktop PC.

Main Window

The main window is divided into the following areas:





Figure 5.1

Main window

Item	Designation		Function
1	Main menu	Live	Main window
		Events	The Event view allows access to the record- ings
		Settings	Camera settings
		System	System information
		Update	Use this menu to install a software update
2	Camera information		This area contains camera information such as the camera name, current IP address, and MAC address.
3	Recent events		The right window range displays the most recent record- ings.
4	Live preview		The live preview shows the current camera recording.
5	Status bar		Displays current sta- tus information about the application
6	Event button		Prompts a recording trigger and starts a recording.
7	Snapshot download bu	utton	Downloads an image with the set live view resolution



5.3.1 Events

The Event view allows access to the recordings. The recordings are presented via thumbnails of a still image taken at the time of the trigger. The images are spread over several pages, which can be selected via the navigation menu (1) above the thumbnails. Memory usage is displayed next to the navigation menu (2).

The events displayed can be filtered by selecting a date range from the dropdown list (3) in the top left-hand corner.

The thumbnails include three buttons:



Figure 5.2 Event view

Thumbnails

Item	Buttons	Function
4	Play	Plays the video in the browser and displays the file name.
5	Download video	Starts downloading the video and displays the file size.
	Download snapshot	Downloads an image with the set live view resolution.
6	Delete	Deletes the video following confirmation.

5.3.2 Settings

All camera settings are saved to the SD card in the file <code>ipcam_settings.json</code>. If this file does not exist or is invalid due to incorrect manual editing, the default settings are loaded and a message appears at the top of the Settings page.



When settings are saved on the Settings page, the ipcam settings.json file is created or overwritten.

Delete this file from the SD card to reset the camera to factory settings. This is only necessary if the password for the admin user has been forgotten. Otherwise, all settings can be adjusted via the user interface.

By clicking the Backup/Restore button, you can either download the settings file or restore the settings from a previously backed up file. The backup file should not be edited manually.

Camera	' X' Streams	Recording	@ Access	Hetwork
Camera name	E2 Live stream resolution	M Pre-event recording time (s)	🌲 Admin name	Camera IP address Netmask (CIDR)
Enter camera name	1280 x 720 *	10	admin 🖬	192.168.100.50 24
-	妻 Live stream quality (100 %)	H Post-event recording time (s)	2 Change Admin User	Gateway IP address
Rotation	•	10		Enter IP address of your gateway
50 V	RTSP	53 Recording resolution	Unless an admin password is set, each user acts as an administrator by default.	DNS server IP address
Focus setpoint	Enable RTSP	1024 × 576 •		Enter IP address of your DNS server
Change focus	Require Authentication (Viewer User) Stream 1 (24fps, adj. resolution)	靈 Recording quality (50 %)	Viewer ame	DHCP Enable DHCP (with failback to static IP)
Dverlays	 Stream 2 (3fps, 640x360) rtsp://camera:554/stream1 	•	28 Change Viewer User	Change of the (mark filling the static fir) NTP server address
Camera name Date and time Custom strengthere in the second strengthere	[]RTSP Stream 1 resolution	Delete oldest recordings when the storage is full		192.168.100.254
Text background	1280 x 720 0	Delete all recordings	1	EuropalPartin
Heater				Laroperterm
• no				FTP Upload Utdeos (mp4) Snapsihots (jip)
we changes and restart canners Factory reset and restart o	annera Backup/Restore • Discard changes Expert Setting		La	



Camera

Setting	Default Setting	Values	Description
Camera name	-	0 255 characters, a z, A Z, 0 - 9, "-"; no "-" as the first or last character; special characters are not allowed.	The name of the cam- era, which is freely selectable, is dis- played on the start page and can be superimposed on the camera stream.
Rotation	0 °	0 °, 90 °, 180 °, 270 °	Image rotation. The aspect ratio remains the same, which enlarges the image by 90 ° and 270 °.
Focus setpoint	-	Far - Near	The preview is used to set the focus distance.

Setting	Default Setting	Values	Description
Overlays	Camera name, Date and time, Custom overlay, Text background	-	The activated ele- ments appear at the top of the camera image. The overlay is limited to 255 charac- ters and is shortened if necessary. For the overlay, the fields are combined, truncated to 255 char- acters, and overlayed at the top of the screen. An automatic line break is applied if necessary. A black background for the white overlay text can be configured in the settings.
Heater	off	off, low, medium, high	Activate and set the heater level

>

Adjust motorized focus

All cameras from production date 01/2023 are equipped with motorized focus. Starting with software version 2.2.0, the motorized focus can be set via the user interface. The following describes how to set the focus using the user interface.

- 1. Make sure your camera has motorized focus and software version 2.2.0 or higher.
- 2. Turn on the camera and open the user interface in your web browser (see chapter 5.1).



Figure 5.4

- 3. Find the focus settings under Camera > Focus setpoint > Change focus (1).
 - → After opening the "Change focus" menu, the "Focus preview" (2) window appears for setting the focus.



- 4. Locate the focus slider (3) at the bottom of the Preview window. This slider allows you to manually adjust the focus setpoint. Note the icons at the edge of the slider. There is a flower icon (4) for close-ups and a mountain icon (5) for distant shots.
- 5. Move the slider to the right toward the flower icon to adjust the focus point for close-ups. This movement optimizes focus on nearby objects.
- 6. Move the slider to the left toward the mountain icon to adjust the focus point for distant shots. This movement optimizes focus on distant objects.
- 7. Check the on-screen preview as you move the slider to make sure the focus is correct. Adjust the slider until the desired focus is achieved.
- 8. After setting the desired focus point, confirm your selection with the "Submit" button (6) and close the focus menu. To transfer the settings to the camera, select the "Save changes and restart camera" button (7).
 - → The camera will now reboot to apply the changes. During the reboot, the camera's LEDs will display certain signals to indicate progress (see chapter 2.4).

Streams

Setting	Default Setting	Values	Description
Resolution of the live stream	1280 x 720	1280 x 720, 1024 x 576, 960 x 540, 800 x 450, 640 x 360	Resolution of the live stream
Quality of the live stream	100	0 100 %	Quality of the live stream

RTSP

The RTSP stream can be switched between stream 1 and stream 2.

- Stream 1: up to 1280 x 720 (configurable), 24 fps
- Stream 2: 640 x 360, 3 fps
- RTSP stream can be protected with name/password

Stream 1	Stream 2
RTSP	RTSP
Enable RTSP	Enable RTSP
Require Authentication (Viewer User)	Require Authentication (Viewer User)
 Stream 1 (24fps, adj. resolution) Stream 2 (3fps, 640x360) 	 Stream 1 (24fps, adj. resolution) Stream 2 (3fps, 640x360)
rtsp://camera:554/stream1	rtsp://camera:8554/
CRTSP Stream 1 resolution	RTSP Stream 2 preset
1280 x 720 ¢	Custom ¢
640 x 360 800 x 450 960 x 540 1024 x 576	 RTSP Stream 2 path /
1280 X 720	RTSP Stream 2 port
	8554 554 8554

Figure 5.5

2023-06

Setting	Default Setting	Values	Description
Enable RTSP	active	-	Enable RTSP stream, not recommended when using 1920x1080 recording resolution to avoid live stream frame drop- ping
Require Authentica- tion	inactive	-	If password protection is enabled, RTSP stream requires viewer user creden- tials
Stream 1/2	Stream 2	-	Select the active RTSP stream
RTSP Stream 1 reso- lution	1280 x 720	1280 x 720, 1024 x 576, 960 x 540, 800 x 450, 640 x 360	Resolution of RTSP Stream 1
RTSP Stream 1 quality	50	0 100%	Quality of RTSP Stream 1
RTSP Stream 2 path	<empty></empty>	0 30 characters, a z, A Z, 0 9	Path segment of the RTSP URI
RTSP Stream 2 port	8554	554, 8554	RTSP port



Note

- Stream 1 and Stream 2 cannot be active at the same time, there is not enough computing power.
- For Stream 2, the path and port can be changed for backward compatibility.
- If multiple clients need to access an RTSP stream at the same time, it is recommended to distribute the stream through an RTSP proxy and only allow this proxy to access the camera.
- The server ports for RTP and RTCP have changed to 8000-8001

Recording

Setting	Default Setting	Values	Description
Pre-event recording time (s)	10	1 60	Recording before the trigger
Post-event recording time (s)	10	1 60	Recording time after the trigger
Recording stream res- olution	640 x 360	1920 x 1080 1280 x 720, 1024 x 576, 960 x 540, 800 x 450, 640 x 360	Recording stream res- olution
Recording stream quality	50	0 – 100 %	Recording stream quality
Delete oldest when memory is full	active	-	Deletes the oldest vid- eos, if necessary.

Access

Setting	Default Setting	Values	Description
Admin user name	admin	1 255 characters	User name for admin user
Admin password	<empty></empty>	1 50 characters	Password for the admin user. Password protection can be dis- abled.
Viewer user name	viewer	1 255 characters	User name for viewer user
Viewer password	<empty></empty>	1 50 characters	Password for the viewer user. Pass- word protection can be disabled.

Network

Setting	Default Setting	Values	Description
IP address	192.168.100.50	IPv4 address	The IPv4 address of the camera If DHCP is enabled, it is used as the fallback address.
Netmask (CIDR)	24	0 – 30	Netmask in CIDR notation
Gateway IP address	<empty></empty>	IPv4 address, optional	The gateway is required if the NTP server is on a different subnet.
DNS server IP address	<empty></empty>	IPv4 address, optional	DNS server, currently not required
DHCP	enabled	-	DHCP enabled. If a DHCP server is not available, the camera uses the set IP address as the static address.
NTP server address	<empty></empty>	IPv4 address, optional	NTP server. Required to set the time on the camera.
Time zone	Europe/Berlin	-	Time zone of the cam- era for local time in the overlay and record- ings.

FTP Upload

Automatically upload snapshots (.jpg) and/or videos (.mp4) of events to an FTP server. Failed uploads are not repeated. This function is available from firmware 2.2.0.



FTP Upload Videos (.mp4) Snapshots (.jpg)	
FTP server IP/Hostname	Port
FTP Host	21
User	Password
User	Password
FTP path	
Path	

Figure 5.6

Setting	Default Setting	Values	Description
Videos	-	-	Upload videos to FTP server
Snapshots	-	-	Upload event snap- shots to FTP server
FTP Server IP / Hostname	<empty></empty>	0 255 characters	-
Port	21	0 65536	-
User	<empty></empty>	0 255 characters	-
Password	<empty></empty>	0 255 characters	-
FTP path	<empty></empty>	0 255 characters	Optional Path



Note

- At the end of a recording, the image and/or video will be uploaded, depending on the setting.
- If the upload fails, e.g. because the FTP server is down, no new attempt will be made. If you want more control here, you should use a manual download via HTTP API instead of the FTP upload, ideally in combination with HTTP triggers.

5.3.3 Expert Settings



Note

Expert settings can limit the functionality of the camera in certain areas. Use these settings only if the limitations are known and acceptable in your application.

The expert settings are available as of firmware 2.2.0.

ao Expert Se	tungs					
Manual Expos Shutter 1/25 s	sure Control A ISO (Gan) auto	Extended Recording Time Pae-west recording time (s) 12	Extended File Size Limit A Size limit 2 08 (Estended)	Storage quota		
ave changes and re-	Start camera Factory reset and re	estart camera Backup/Restore • Discard changes Expert Se Software version 22.0	tings 🖸	w more	Logout	

2023-06



Setting	Default Setting	Values	Description
Manual Exposure Controls	inactive	-	Use a fixed shutter and fixed or auto gain control. Limit or dis- able automatic adjust- ment to changing light conditions.
Shutter	1/25 s	1/25, [], 1/8000	Shorter shutter time decreases motion blur, but also reduces image brightness.
ISO (Gain)	auto	auto, 50, [], 3200	Higher ISO increases image brightness, but also noise. Auto can only use range 100 800.
Extended Recording Time	inactive	-	Overwrites Pre- and Post-Time settings
Pre-event recording time [s]	120	1 900	Pre-event buffer is lim- ited to 150MB. Video is shorter than requested if buffer limit applies.
Post-event recording time [s]	120	1 900	Video file size is lim- ited to 500MB. Recording will stops when this limit is reached.
Extend File Size Limit	inactive	-	Extends the video file size limit to 2 GB. Pro- cessing of large files may slow down Cam- era and Web Inter- face.
Storage quota for named and unnamed events	-	-	Can be useful when naming events using the API for triggering. Limits the used stor- age for each event type to the selected percentage of the whole storage to ensure free space for the others.

Manual Exposure Controls

When this function is selected, automatic exposure control is disabled. This function is not suitable for environments with changing light conditions, such as daylight.

Manual Exposure Control A			
Shutter ISO (Gain)			
1/25 s	auto		
Configure Exposure			

Figure 5.8

• Manual selection of exposure time

2023-06



- Manual selection of sensitivity / gain (ISO / Gain)
- Automatic ISO selection also possible with fixed shutter time
- The automatic ISO setting only works in the range 100 ... 800

Note

To capture moving objects without motion blur, the exposure time can be fixed at a correspondingly short value. Stronger illumination may be required.

At speeds above approx. 1 m/s, the image is significantly distorted by the rolling shutter effect. It must be checked on an application-specific basis whether this is a problem.

Extended Recording Time

The recorded files can be very large. The Pre-event recording time is limited to 150 MB, the actual Pre-event recording time will be shorter when this size is reached. The total file size is limited to 500 MB, the actual Post-event recording time will be shorter when this file size is reached.

Extended Recording Time A	
Pre-event recording time (s)	
900	~
Post-event recording time (s)	2
120	~

Figure 5.9

- Default setting for pre- and post-trigger time is max. 60 seconds
- Pre- and Post-trigger can be extended up to 900 seconds with the expert setting.
- The pre-trigger has a maximum file size of 150 MB. The video is correspondingly shorter if the file size is not enough for the required time.
- The total size of the video is limited to 500 MB. Recording ends when this limit is reached.



Note

The video size depends on the following factors:

- Image content (static / dynamic) due to video compression
- Brightness change
- Resolution and quality setting (changeable in the user interface)
- —> Rough values: 0.1 ... 1.5 MB/s



Example

The data rate can be set according to the requirement:

- Recording: e.g. 2 min
- File size: e.g. 60 MB
- -- 60 MB / 120 s = 0.5 MB/s

Extend File Size Limit





Note

Large video files (>500 MB) can slow down the camera and interface. You may experience lost triggers, jumps in the video, and similar performance issues.

- Large video files may load very slowly or not at all in the browser.
- Aborted loading processes can block one of the max. 8 HTTP connections to the camera for several minutes —> User interface will not load if all connections are blocked —> wait
- Each customer needs to check if this setting is unproblematic, absolutely necessary or not.

5.3.4 System

This page displays system information:



Figure 5.11 System

- Camera name
- System time
- Time zone
- System uptime
- Application uptime
- Serial number
- Software version
- Hardware version
- Heater temperature
- IP address
- MAC address
- RTSP URL
- microSD available
- microSD file system
- Total storage
- Used storage
- Free storage
- Recording count

5.3.5

Update

This page is used to install a software update. Select the update file and start the update using the "Update software" button.



Note

Do not switch off the camera during the update.



Event Camera Live Events Settings System Upda	ite				EPEPPERL+FUCHS
Curre	nt version	2.0.0u-beta1			
Updat	e file	Choose file		Browse	
Upd	ate software				
Serial number 4800000651690	Software version 2.0.0u-beta1	[DO NOT USE IN PRODUCTION]	Show more	Logout	

Figure 5.12 Update

First, the update file is uploaded to the camera. The upload speed depends on the network connection between the user's computer and the camera. When the upload is complete, the update file is checked and the update process begins. This may take a few minutes. Do not cancel the process or interrupt the power supply to the camera while the update is taking place. The camera restarts once the update is complete.



Note Update fault

If something has gone wrong and the camera cannot start the new software version following a restart, it will automatically revert to a backup copy of the old software, which is available again after a restart.

5.3.6 REST API Interface

REST API allows an individual user interface to be programmed and for the camera to be integrated directly into IT systems. The REST API can read out information and issue commands (e.g., a trigger signal).

http://<camera-ip>/api/ui/ takes you to the API description / command list. Individual commands can be tested here.

2023-06

events				
DELETE /events Delete all events.				
GET /events List all events descending by triggeredAt property.				
POST /events Create event.				
DELETE /events/{fileName} Delete event.				
GET /events/{fileName} Get event.				
sse				
GET /sse/recordings Get recording info.				
streams				
GET /streams Get video streams.				

- Customizable user interface.
- Transfer status indicators to the PLC via HTTP commands.
- Automated file download via HTTP command
- Direct use of the camera via the controller
- Independent of a platform and programming language because it is based on HTTP. Device for data retrieval only needs to support the HTTP protocol.





6 Maintenance and Repair

6.1 Servicing



Danger!

Danger to life due to electrical current!

Contact with live parts causes immediate danger to life.

- Allow only qualified electricians to carry out work on the electrical installation.
- Switch off the power supply before carrying out servicing, cleaning, and repairs, and prevent the supply from being switched on again.
- Keep the live parts free from moisture.

The device is maintenance-free. To get the best possible performance out of your device, keep the optical unit on the device clean, and clean it when necessary.

Observe the following instructions when cleaning:

- Do not touch the optical unit with your fingers.
- Do not immerse the device in water. Do not spray the device with water or other liquids.
- Do not use abrasive agents to clean the surface of the device.
- Use a cotton or paper cloth moistened (not soaked) with water or isopropyl alcohol.
- Remove any residual alcohol using a cotton or paper cloth moistened (not soaked) with distilled water.
- Wipe the device surfaces dry using a lint-free cloth.

6.2 Repair

The device must not be repaired, changed, or manipulated. In case of failure, always replace the device with an original device.

7 Troubleshooting

7.1 What to Do in the Case of a Fault

Before you have the device repaired, perform the following actions:

Checklist

Fault	Cause	Fault Repair
"Power" LED does not light up	The power supply is switched off	Check whether there is a reason why the power supply is switched off (installation or maintenance work, etc.). Switch on the power supply if necessary.
	Wiring fault in the splitter or switch cabinet, cable break	Check the wiring carefully and repair any faults with the wiring. Check the cables to ensure that they are functioning properly.
Control panel receiving no	Connection cable not con- nected	Connect the connection cable.
data	Incorrect connection cable used	Use the appropriate connection cable only.
Recording fault, blue LED flashes sev- eral times	 Memory card is full Memory card is missing Memory card is faulty 	Change or replace memory card
Event not recorded	Incorrect trigger setting	Change the trigger setting, see chapter 4.2.
Update fault	Fault during update	If something has gone wrong and the camera cannot start the new software version follow- ing a restart, it will automatically revert to a backup copy of the old software, which is available again after a restart.
Camera switches off	Camera overheats	To avoid impermissibly high temperatures in the event of a control system failing due to software, a software-independent excess tem- perature shut-off function for the heater unit is integrated into the camera (shut-off value: $103 \degree C \pm 2.5 \degree C$). The shut-off value refers to the position of the excess temperature sensor in the area around the heater; other areas may be even warmer. See chapter 2.7

2023-06

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