



# Technical Manual

VoE-Camera-M 1280x1024 (IDS) in CPC

Article-No.: 07V0001A

Version: 5.0

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Version change:	Adjust the network card

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## **2 General**

### **2.1 Abbreviations**

The following section will explain abbreviations used in this document:

- V60 = Image analysis programme by the company VisionTools
- PPE = Personal protective equipment
- I/O = Inputs / outputs
- CPC = Camera protection case
- PoE = Power over Ethernet

### **2.2 Information on the manual**

This technical manual contains important instructions for working with the product named on the cover sheet. The prerequisite for workplace safety is the observance of all safety and handling instructions specified in this manual. The local accident prevention regulations and national health and safety regulations must be observed in addition to the instructions in this manual. All information and instructions are to be carefully read before use. The manual is a product component and must be kept accessible to the plant operator at all times.

### **2.3 Documents enclosed**

- Declaration of Conformity

## 2.4 Safety information

In this manual, icons (acc. to EN ISO 7010) are used to highlight correct text passages and relevant sections. If the product is sold in a non-EU country, the warning symbols may need to be amended, if necessary.

The signal word describes the severity of the impending risks:

- **Danger!** Imminent dangerous situation which will result in serious bodily injury or death.
- **Warning!** Potentially dangerous situation which could result in serious bodily injury or death.
- **Caution!** Potentially dangerous situation which could result in minor bodily injury or death. Also warning of damage to property.
- **Note!** For application instructions and other important information.



### Note

General information



### Follow the instructions

In accordance with DIN EN ISO 7010



### General warning sign

In accordance with DIN EN ISO 7010



### Warning of electrical voltage

In accordance with DIN EN ISO 7010



### Warning of oxidising substances

In accordance with DIN EN ISO 7010

## 2.5 Limitation of liability

All information and statements in this manual are compiled in consideration of valid standards and regulations, as well as state of the art technological knowledge.

The manufacturer accepts no liability for damages due to:

- Failure to observe this manual
- Inappropriate use
- Using non-trained personnel
- Undertaking unauthorized modifications
- Using impermissible replacement parts

Additionally, the obligations, the General Terms and Conditions and delivery conditions of the manufacturer, and the statutory regulations valid at the time the contract was concluded will apply.

## 2.6 Copyright law

Copyright law to this operating manual belongs to the company VisionTools Bildanalyse Systeme GmbH. This manual is intended only for the operator and the operator's personnel.

It includes regulations and information that may not be

- duplicated,
- distributed, or
- transmitted in any other manner, either in whole or in part.

Duplicating the manual within a company for the purposes of training by the operator is excepted. Violations may have criminal consequences.

## 2.7 Guarantee and Liability

Our General Terms and Conditions apply. Claims for a guarantee or for liability in case of personal injury or property damage are excluded if they are due to one or more of the following causes.

- Inappropriate use of the assembly
- Inappropriate installation, commissioning, operation, and maintenance of the device or system
- Failure to follow the information in the manual regarding transportation, storage, installation, commissioning, operation, limit values, maintenance of assemblies
- Unauthorized modifications to the assemblies
- Unauthorized modifications to the programmes
- Lack of monitoring of components subject to wear
- Catastrophic incidents due to foreign objects and force majeure
- Liability for subsequent damages is excluded

## 3 Safety

### 3.1 Appropriate use

The cameras are for industrial products only. They will be controlled, measured or archived with the from VisionTools developed image processing software V60.

### 3.2 Foreseeable misuse

Any other use besides that determined in Appropriate use this chapter or any use extending beyond this is **not** appropriate!

The operator will bear sole responsibility

- for any damages that may result from such use.
- the company VisionTools accepts no liability.

In case of changes or unauthorized modifications to the system, any liability or guarantee from VisionTools Bildanalyse Systeme GmbH will cease to exist.

The electromagnetic behaviour of the system can be impaired by additions or changes of any kind.

Therefore, make **no** changes or additions to the system without consulting with the company VisionTools Bildanalyse Systeme GmbH and receiving written approval to do so.



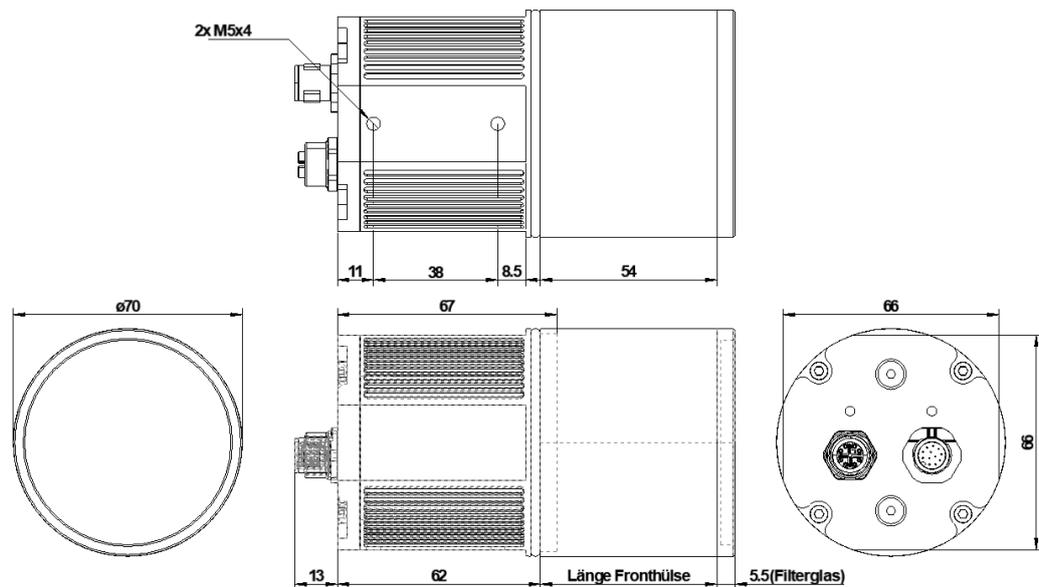
#### **Danger!**

Dangers may occur following improper use.

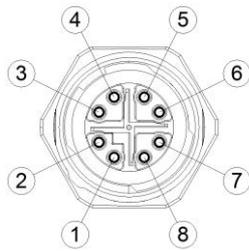
## 4 Technical data

Designation	Typ.	Unit
Sensor	1/18" CMOS	
Resolution	1280 x 1024	(H) x (V)
Pixel size	5.4 x 5.4	µm
Max. frames	50	Hz
Lens mount	C-Mount	
Digitale inputs 4 (optocoupler)	24	VDC
Digitale outputs 4 (optocoupler)	24	VDC
Power supply (unit)	24 – M12/12pin	VDC
or Power over Ethernet	IEEE802.3af	
Ethernet	1 – M12-X-cross	GBit
Power consumption	24V: 1.7 – 2.4 / PoE (56V): 3.0 – 3.7	W
Weight	approx. 490	g
Operation temperature and humidity	10°C - 45°C / 20 - 90% (none condensation)	
Storage temperature and humidity	-40°C - 70°C / 10 - 95% (none condensation)	
Other	—	
Type of protection	IP40	

### 4.1 Dimensions (mm)

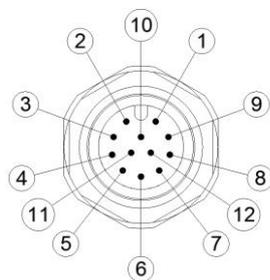


## 4.2 Pin Assignment



*M12 Female-Connector 8pin  
X-Coded*

Pin	Signal
1	MX0+
2	MX0-
3	MX1+
4	MX1-
5	MX3+
6	MX3-
7	MX2-
8	MX2+



*M12 Male-Connector 12pin  
A-Coded*

Pin	Signal
1	24 VDC VCC ext.
2	GND
3	Opto. In1
4	Opto. In2
5	Opto. In3
6	Opto. In4
7	Opto. GND
8	24VDC VCC Opto. Out
9	Opto. Out1
10	Opto. Out2
11	Opto. Out3
12	Opto. Out4

---

## **5 Commissioning**

### **5.1 Initial operation**

Specifically, the following points should be noted:

- The specified operating voltage of the camera (The operating voltage can be found in chapter Technical data)

### **5.2 Return to service**

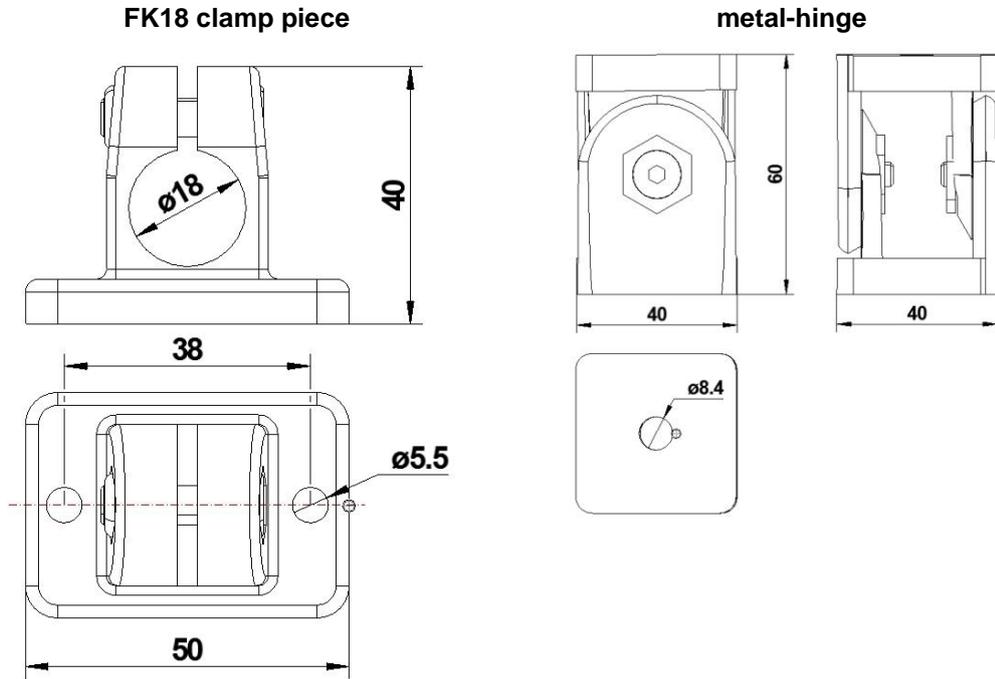
Specifically, the following points should be noted:

- The specified operating voltage of the camera (The operating voltage can be found in chapter Technical data)
- If necessary, the used lens should be cleaned with a dry cloth to eliminate dust and other dirt.

### 5.3 Assembly

#### Camera mounting with CPC

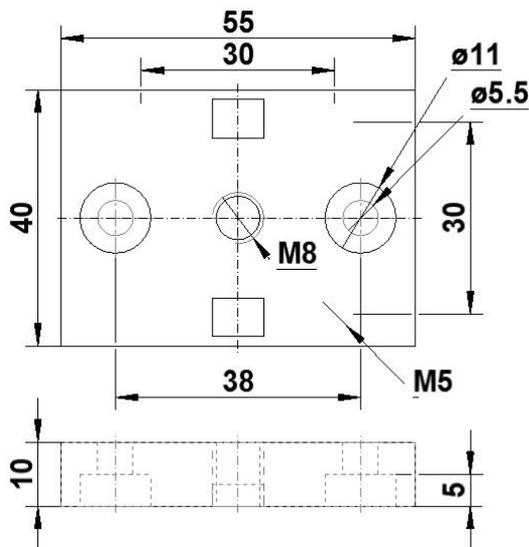
The FK18 clamp piece is mounted directly to the CPC. To mount a metal-hinge at the CPC, an adapter plate is required.



Article-No.: 10A0008A

Article-No.: 10B0006A

#### Adapter plate for CPC



Article-No.: 07E0001L

## 5.4 Input / Output

### Inputs Opto. IN 1-4

high level	+15V up to +30V
low level	-3V up to +5V
voltage range	30V
disruptive voltage	50V
input current	10mA

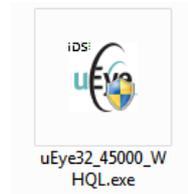
### Outputs Opto. OUT 1-4

output current short term	500mA
output current permanent	150mA
output voltage	30V
disruptive voltage	50V

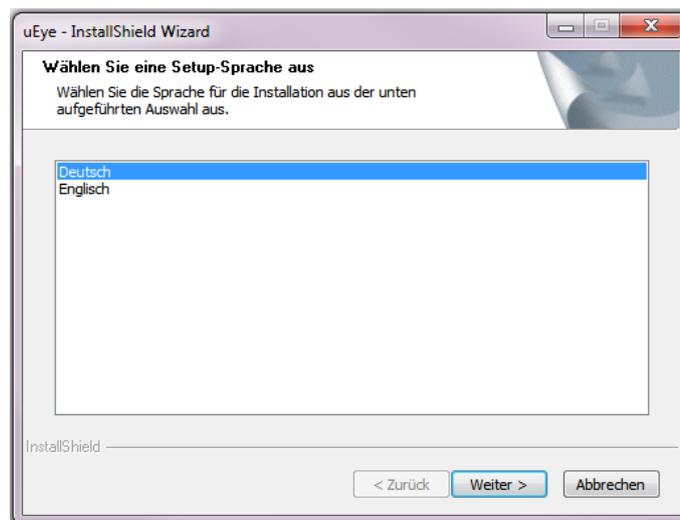
## 5.5 Driver Installation

### Driver installation

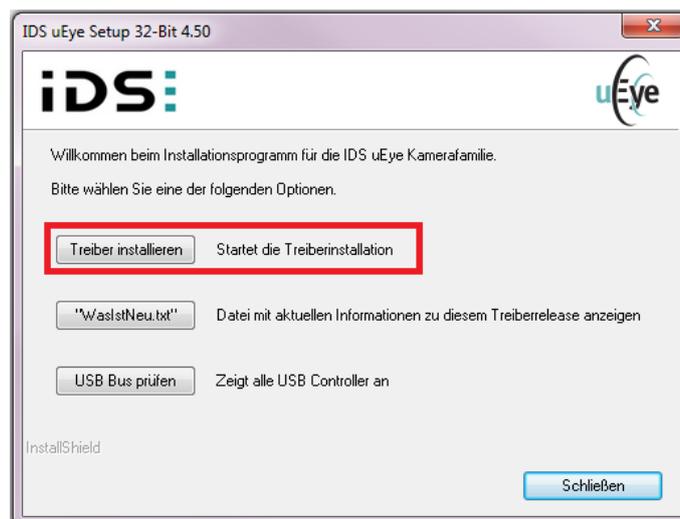
1. Access the installation menu by double-clicking on the driver file to be installed.



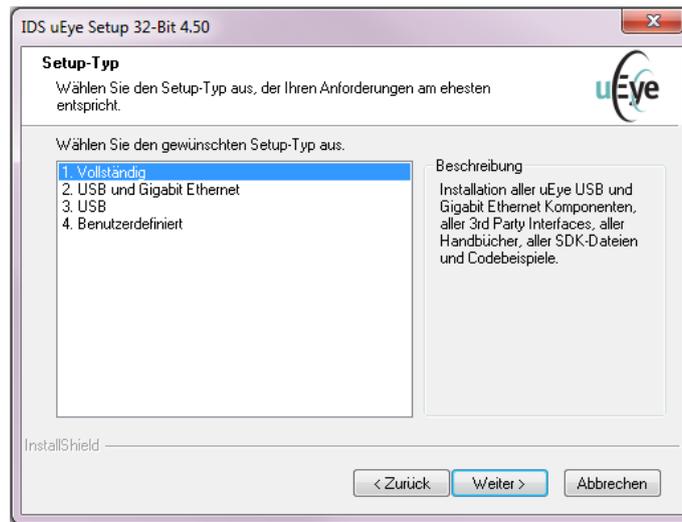
2. Select the desired language.



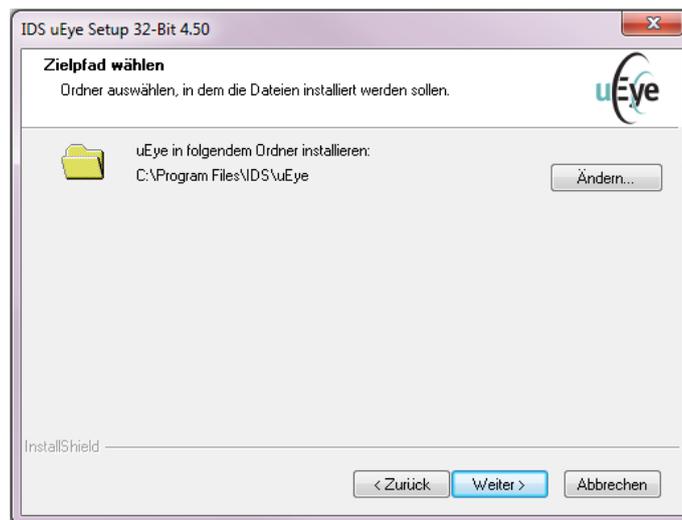
3. Click on the button "Install Driver".



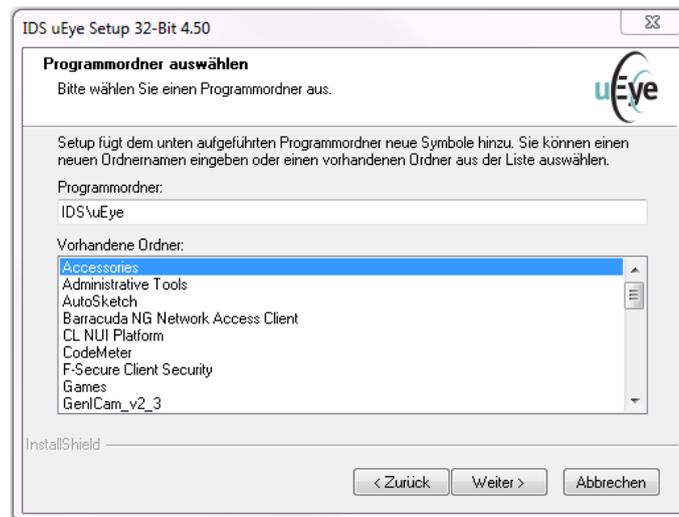
4. Complete Installation is set as the default. Keep this setting and click on "Forward >".



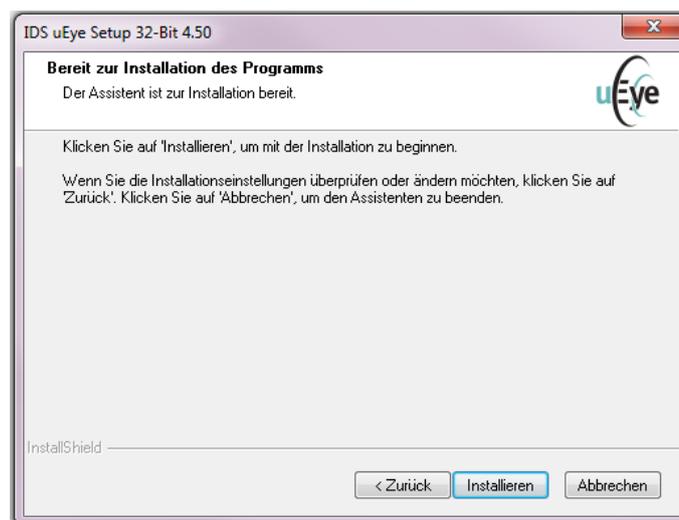
5. It is recommended to use the set default target directory. Click on "Forward >".



6. Keep the default setting and click on *"Forward >"*.



7. Click on the *"Install"* button and restart the computer after the installation.



## 5.6 Set the IP address



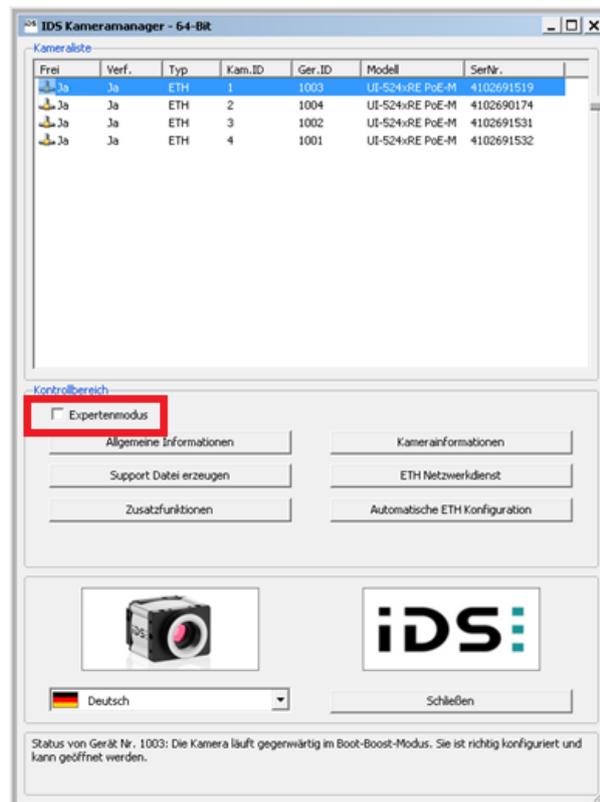
### NOTE!

To avoid a possible conflict between the network devices, it is recommended to assign fixed IP addresses for the cameras.

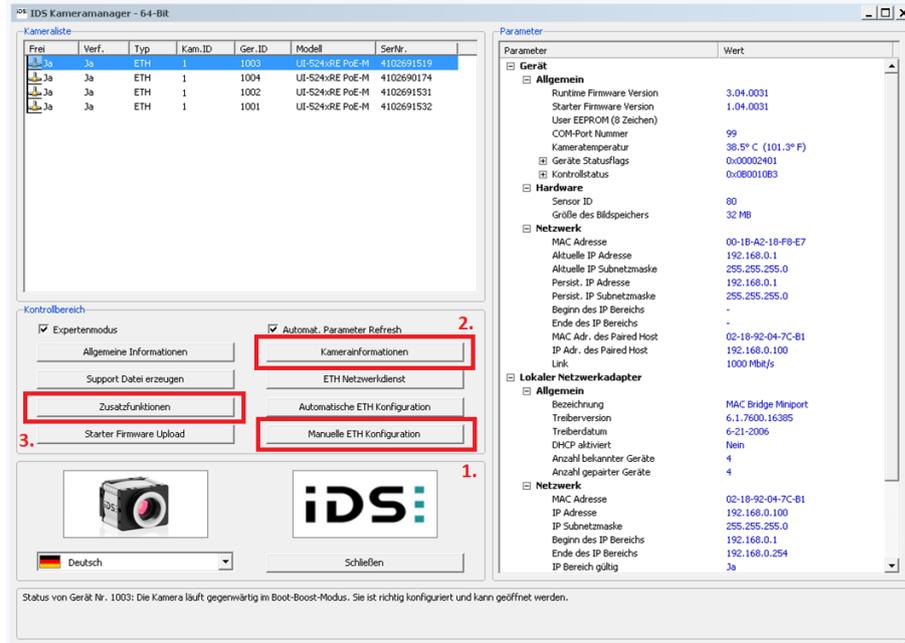
Open by double-clicking on the IDS Manager.



Activate Expert Mode.



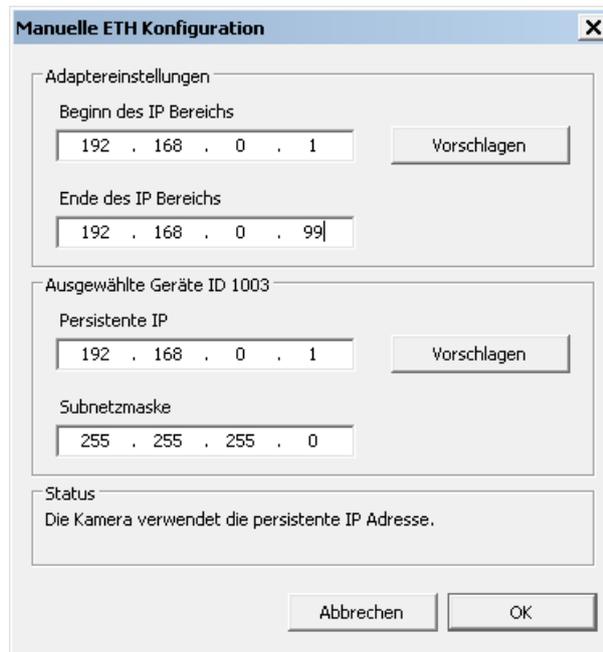
After the activation, the following setup options will appear.



**NOTE!**

If not all buttons are activated, each camera must be configured automatically by clicking the button "Automatische ETH Konfiguration".

1. The IP of the selected camera is set under Manual ETH Configuration.





**NOTE!**

- The camera must be in the same IP range as the network adapter.
- The subnet mask of the camera must correspond to the subnet mask of the network adapter.

2. An ID is assigned for the selected camera under Camera Information.

**Camera IP = Camera no.** (e.g. Camera 1 = ID 1 = 192.168.0.1)

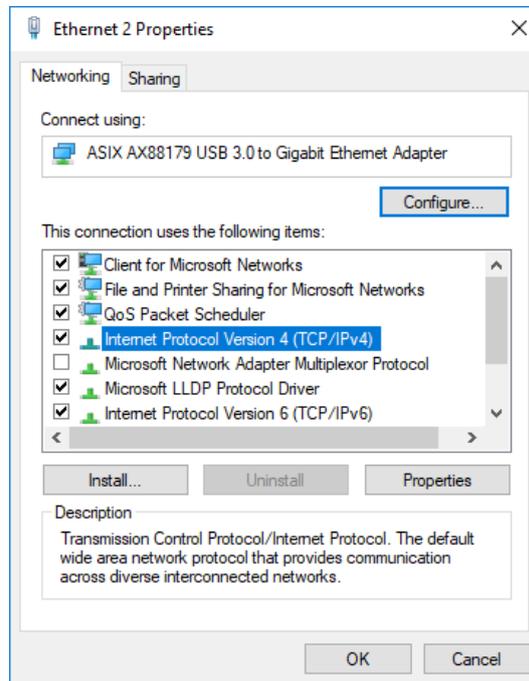
3. For a faster initialisation of the cameras, we recommend activating the *"Boot-Boost"* under the additional functions. This setting must be made for each individual camera.

Wenn  
Aktuelle Boot-Boost-Ids: LEER

„1-99“ eintragen setzen

## 5.7 Adjust the network card

Under Windows » *“Open Network and Sharing Center”* » *“LAN Connection”* » *“Properties”* » *“Configure”*



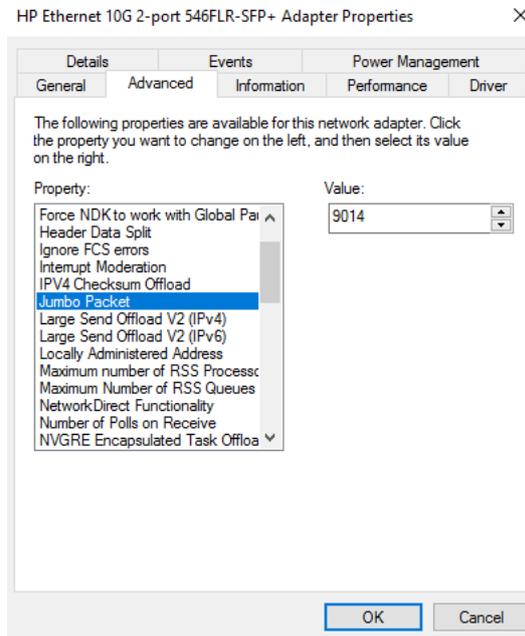
### NOTE!

The naming and appearance of the configuration menus may differ for network cards.

Also the network interface card manufacturers provide driver updates for their cards every now and then. Using the latest drivers is always recommended and might improve the overall performance of the system dramatically.

### Network card settings

1. From experience, we recommend setting the value to "9014 bytes" under the "Advanced" tab, in the "Jumbo Packet" settings.



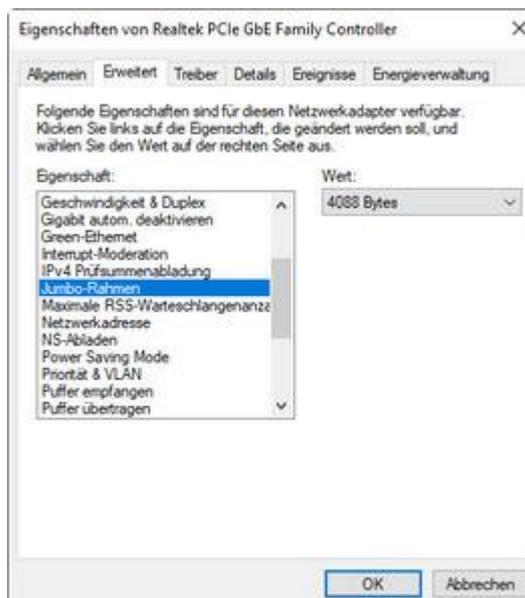
When you use "VoE-NETBoxes I", the "Jumbo Packet" must be set to the value "4088 Bytes". Please note the following.



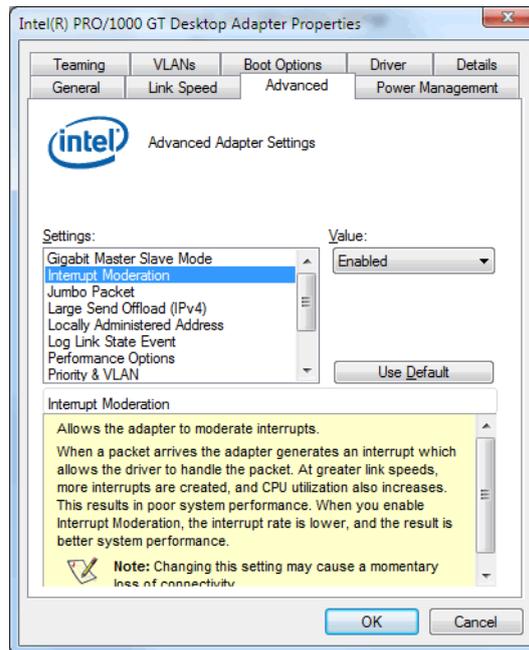
#### NOTE!

To avoid problems with the connected cameras, please note that when cascading the "VoE-NETBoxes II" and the "VoE-NETBoxes I", always connect the "VoE-NETBoxes I" behind them.

If possible, the "VoE-NETBoxes I" should be exchanged for the "VoE-NETBoxes II".



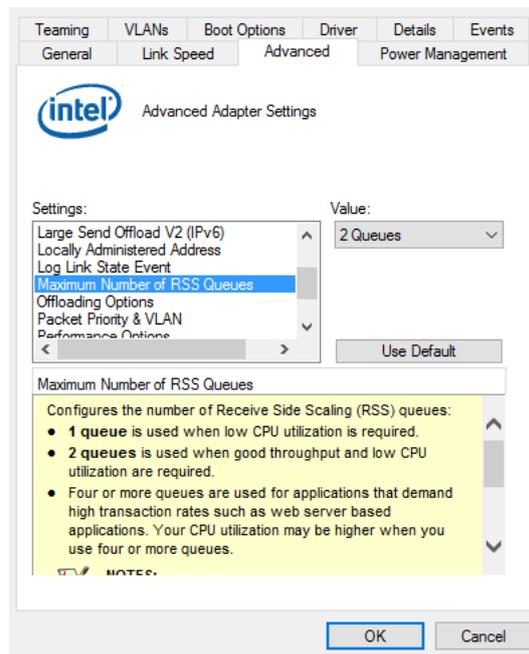
2. The following should be set if the driver allows it.  
In Settings "Interrupt Moderation" » "Value" » "Enabled".



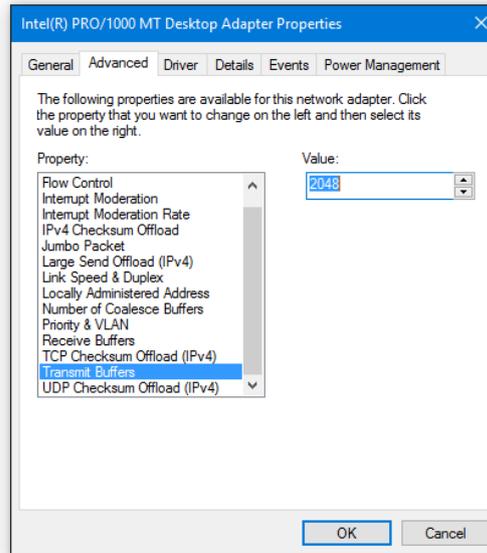
3. Some NICs might also offer to configure the number of "RSS (Receive Side Scaling) Queues". In certain cases this technology might help to improve the performance of the system but in some cases it might even reduce the performance. The feature in general offers the possibility to distribute the CPU load caused by network traffic to different CPU cores instead of handling the full load just on one CPU core.

Configuring more RSS queues than physical cores available in the system might have even a negative impact on the overall performance. So if your system has 6 physical CPUs and your network card allows either 4 or 8 RSS queues then 4 is the better option.

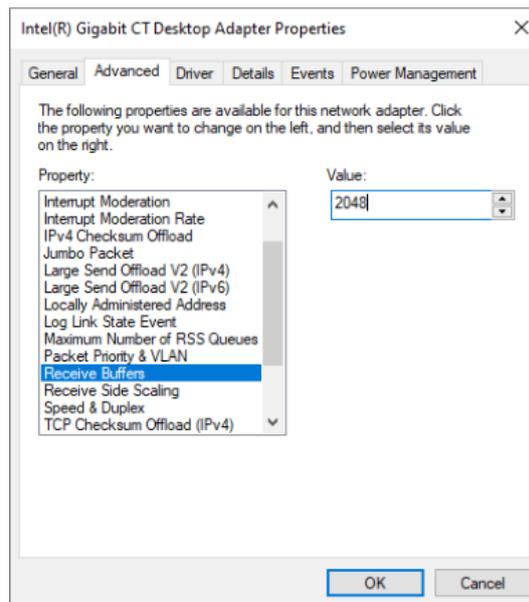
Therefore, we recommend that the number of queues is equal to the number of CPU cores and should not be exceeded.



4. In the settings *"Transmit Buffers"* set the maximum value.



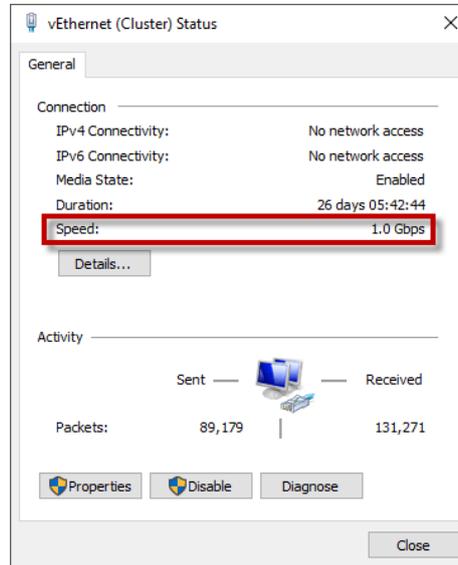
5. In the settings *"Receive Buffers"* set the maximum value.





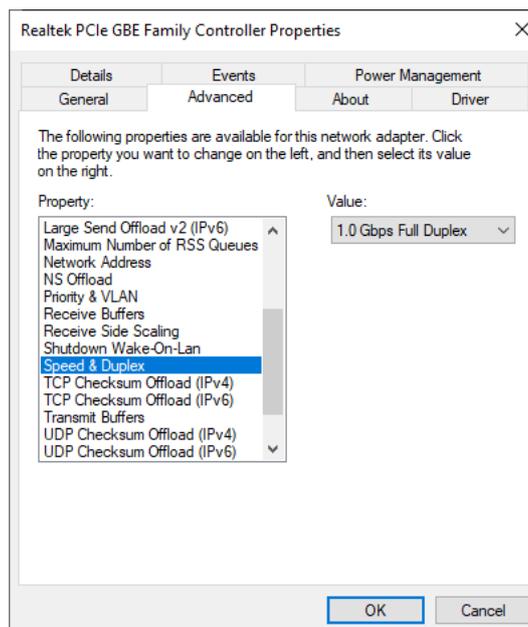
**NOTE!**

In case of problems with image grabbing, check the transmission rate of the network adapter. GigE cameras require a transmission rate of 1.0 Gbps. A lower transmission rate of e.g. 100 MBit/s can lead to black images.



Under "*Speed & Duplex*" of a network adapter, the default value is set to "*Autom. Negotiation*". We recommend changing the value to "*1.0 Gbps Full Duplex*", so the connection to the camera will be disconnected in case of a defect of the network cable.

For a transmission with 1 GBit/s, eight wires are required. If one of the eight wires is damaged, the transmission rate of the adapter is reduced (to e.g. 100 MBit/s), as only four wires are required for this. At least one "Cat 5e" network cable should be used.



## 5.8 Lens Settings

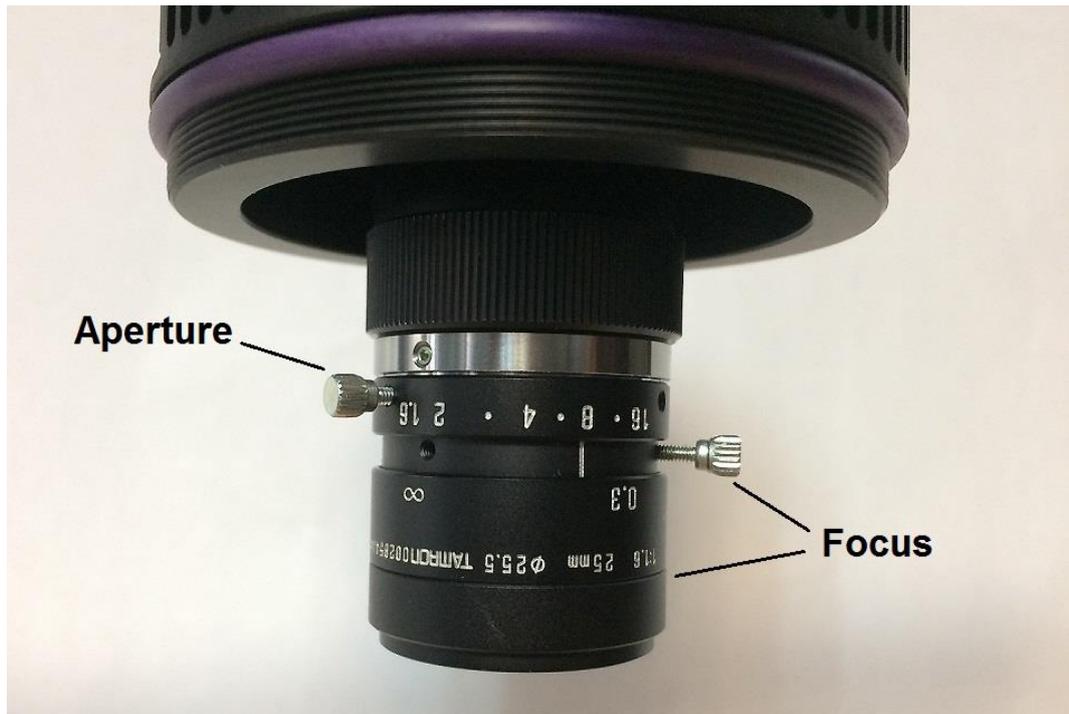
### Focus

To set the focus, the fit knurled screw must be turned. Close again after adjusting the knurled screw.

### Aperture (brightness)

To set the brightness, the fit knurled screw must be turned. Close again after adjusting the knurled screw.

At full aperture (lowest aperture number), the sharpness (depth of field) of the lens is the lowest and also the interference from outside light the highest.



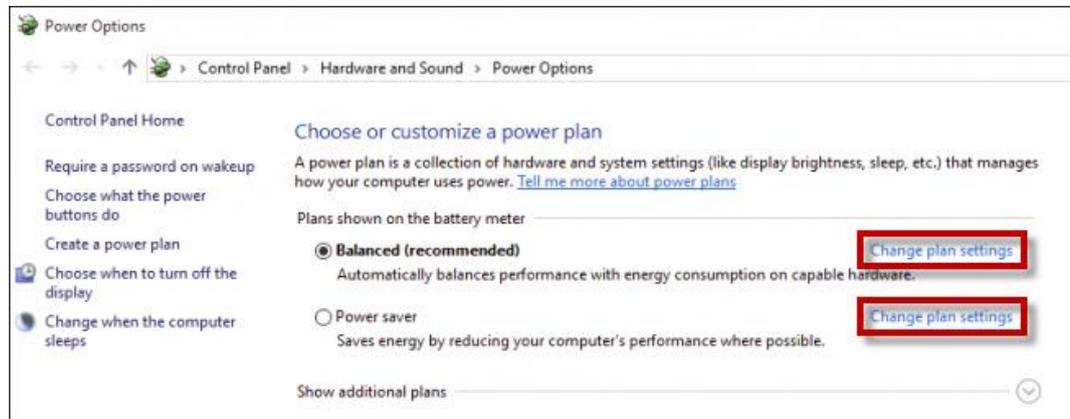
### NOTE!

Depending on the lens type the dial of the aperture and focus can be interchanged.

## 5.9 Disable power saving mode

It is recommended to check the computer's power saving settings to prevent the computer from unintentionally hibernating.

To do this, click on the "Windows key" on the keyboard and press "energ". Now click on "Select Power Options" to access the Windows power options.



Here you can change or set the desired plan settings.

### Power management of individual network adapters

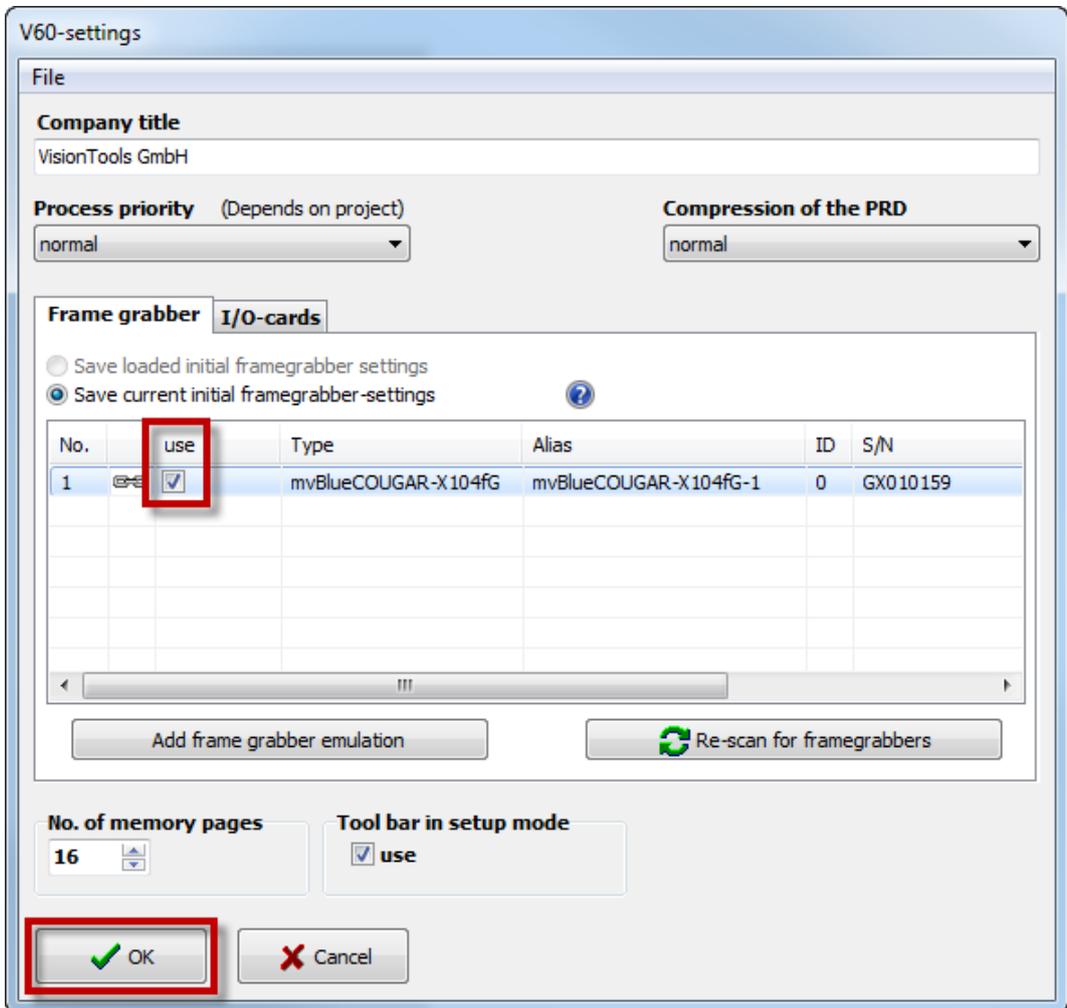
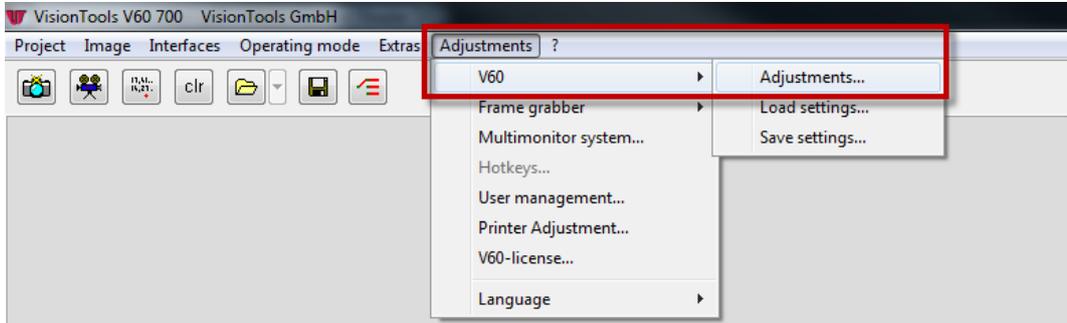
In addition to the general power saving settings, the settings of the network cards used to connect the cameras/switches must be deactivated.

1. Click *Windows button* + *R* on the keyboard.
2. Enter **mmc devmgmt.msc** and confirm with "Enter".
3. To find the network adapter you are using, "right click" » "Properties".
4. Switch to the tab „Power Management/Energieverwaltung" and uncheck the box next to "Computer can switch off the device to save energy".
5. Confirm with "OK" and restart the computer.

## 5.10 Integrate cameras in V60

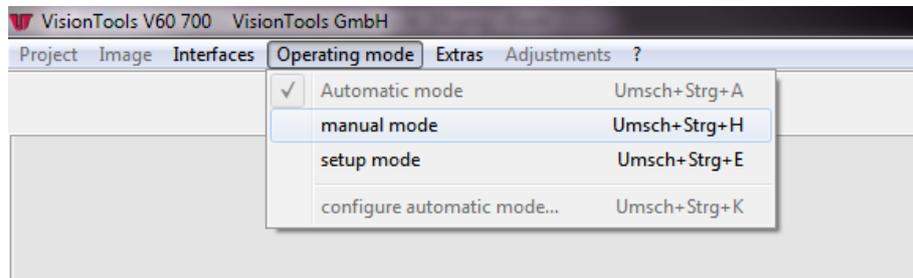
In V60 setup mode under the "Adjustments" » "V60" » "Adjustments..." menu item, the GigE cameras connected via the network are displayed.

Checking the box will use the camera in the V60 software.

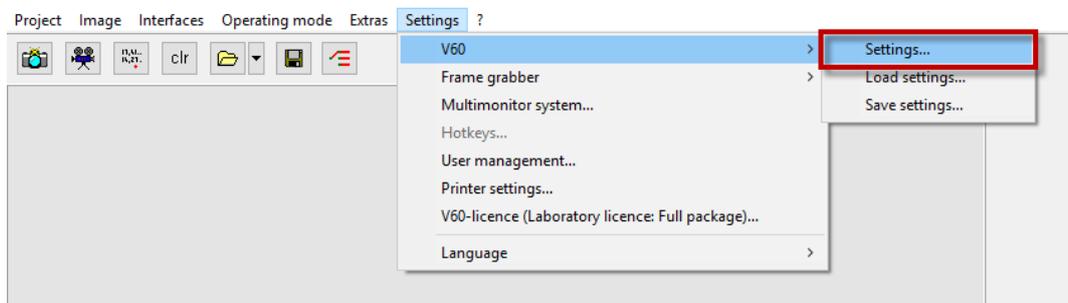


## 5.11 Save basic hardware settings

In order to be able to save changed software settings of the hardware in the project file, you must first switch to "setup mode" in the V60 via "Operating mode".



Now you can switch to the V60 settings via the enabled "Settings" » "V60" » "Settings...".



By default, the setting "Save basic hardware settings loaded from PRD" is selected under "Frame grabber". The "Save currently used basic hardware settings" setting must be selected so that the current settings can be applied.

V60-settings

File

**Company title**  
VisionTools GmbH

**Process priority** (Depends on project)  
Default

**Compression of the PRD**  
Default

**CPU-affinity mask**  
00,01,02,03

**Frame grabber** **VoE Module lights** **I/O-cards** **Auto backup**

Save basic hardware settings loaded from PRD  
 Save currently used basic hardware settings

No.	use	Type	Alias	ID	S/N	Startup ch...	Driv
1	<input checked="" type="checkbox"/>	Emulation	Emulation-1	1		<input checked="" type="checkbox"/>	

Add frame grabber emulation      Re-scan for framegrabbers

**No. of memory pages** 16      **Tool bar in setup mode**  use

In the last step, the project file (.PRD) must be saved once and then reloaded.

VisionTools V60 700 VisionTools GmbH

**Project** Image Interfaces Operating mode Extras Settings ?

New

Convert to...

Auto load: ""  
Delete auto load entry  
Move current project into auto load

## 6 Maintenance and repair

### 6.1 Cleaning of filter glasses and optics



**NOTE!**

In order to guarantee trouble-free image recording, it is advisable to wipe off unwanted dirt deposits with a dry cloth once a week. The frequency of such tests depends on the cleanliness of the environment.

In general, it is recommended to clean optical surfaces, i.e. lenses, flat optics/filters, with alcohol (e.g. isopropanol) in combination with a microfiber cloth. Apply the liquid to the cloth for better distribution. Alternatively, a mixture of water, alcohol and soap/washing detergent can be used. This also applies to coated surfaces, e.g. AR or bandpass coatings. These coatings are robust against the cleaning agents, but to avoid scratches all particles on the surface should be removed before cleaning, e.g. with dry, compressed air.

### 6.2 Accessories

Article-no.	Product
09P0011F	VoE data cable M12   10m
09P0011G	VoE data cable M12   15m
09P0011H	VoE data cable M12   20m
07E0001L	Adapter Plate for alu-joints
10A0008A	Flange clamping piece FK 18
10B0006A	Alu Hinge 8 40x40
07E0001V	Front casing l=30mm
07E0001O	Front casing l=41mm
07E0001P	Front casing l=48mm
07E0001Q	Front casing l=54mm
07E0001R	Front casing l=66mm
07E0001S	Front casing l=88mm
07E0004A	Protection glass

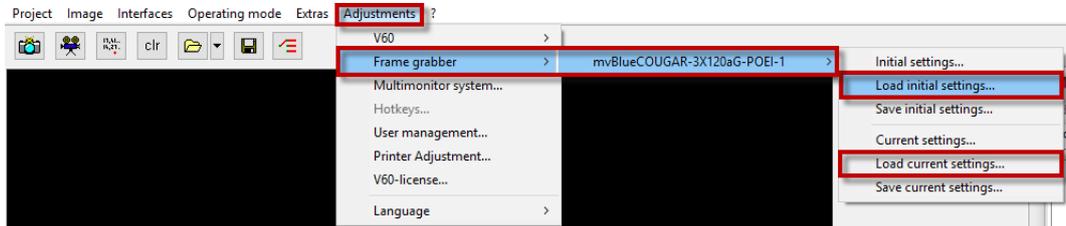


**NOTE!**

Special cables on request.

## 6.3 Loading camera settings

If frame grabber settings have been made and saved for the cameras used, these must be loaded via "Adjustments" » "Frame grabber" » "Camera" » "Load current settings...". It is also possible to load the saved basic settings.



## 6.4 Fault analysis

### Black image troubleshooting

#### Possible errors caused by the hardware

- Check the grey values in the captured image first. Therefore open the grey-value dump in the V60 and move the mouse over the whole picture. If one of the values is bigger than 0, the lighting may be switched off, the exposure time of the camera may be too short or the aperture of the lens may be closed.
- Check the network cable between the cameras and the switch, but also between the switch and the network card. It must be connected with a "Cat 5e" cable. Among other things, this involves 8 wires so that a transmission of 1.0 Gbit/s can be guaranteed.

#### Possible external influences

- Check if there is a remote maintenance on the PC, which can lead to a high load on the network and thus to black images.
- Check the computer's network load for data transfers in the background. This does not have to affect the same network card to which the cameras are connect. For example, data could be backed up to external drives.
- Check the virus scanner and firewall on the computer. Regularly checking the data can lead to a high network load. We recommend whitelisting V60 and the camera drivers.

#### Possible cause of error by old programmes

- Check the driver of the network card. This may be too old and should be checked for a newer one on the homepage of the manufacturer of the network card.
- Check the driver and firmware of the cameras. Too old versions can lead to black images and should be replaced with newer ones.

## 7

### Disposal

Dispose special waste and garbage according to company-internal provisions and regulations. These must be brought to the correct collection stations.

Your responsible administrative authority can give you more specific information on where authorized collection stations can be found.



**NOTE!**

Observe national regulations and internal operational solutions!

Dispose of the packaging of production materials (including in the product cycle of the system) appropriately!

Ensure appropriate separation and disposal.

## 8 Notes

## **9 Attachment**

### **9.1 Declaration of conformity**



## EG-Konformitätserklärung

Original

**Hersteller:**

Firmenname: VisionTools  
Bildanalyse Systeme GmbH  
Straße: Heinrich-Hertz-Straße 7  
Ort: 68753 Waghäusel  
Land: Deutschland

**Bevollmächtigte Person,**  
für die Zusammenstellung der technischen  
Unterlagen:

Name: Josef Djulic  
Funktion: Geschäftsführer

**Produkte:**

„VoE-Kameras“

**Artikel-Nr.:**

07V0001A, 07V0001B, 07V0001C, 07V0001D, 07V0001E, 07V0001F, 07V0002A, 07V0002B,  
07V0002C, 07V0002D, 07V0002E, 07V0002F, 07V0003A, 07V0003B, 07V0003C, 07V0003O,  
07V0004A, 07V0004B, 07V0004C, 07V0005A, 07V0005B, 07V0005C, 07V0006C

Hiermit erklären wir, dass die bezeichneten Produkte aufgrund ihrer Konzipierung und Bauart in der von uns in Verkehr gebrachten Ausführung den grundlegenden Sicherheits- und Gesundheitsanforderungen der nachfolgend aufgeführten EG-Richtlinien entsprechen.

**Angewandte Richtlinien:**

- Elektromagnetische Verträglichkeit 2014/30/EU

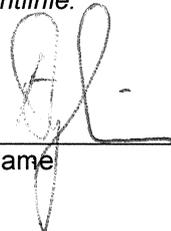
**Angewandte harmonisierte Normen:**

- DIN EN 61000-6-2; VDE 0839-6-2:2006-03  
Elektromagnetische Verträglichkeit (EMV) - Störfestigkeit für Industriebereiche
- DIN EN 61000-6-4; VDE 0839-6-4:2011-09  
Elektromagnetische Verträglichkeit (EMV) - Störaussendung für Industriebereiche

Hinweis:

*Die Produkte sind keine Maschinen im Sinne der Maschinenrichtlinie.*

Waghäusel, den 18.01.2021

  
\_\_\_\_\_  
Vorname, Name