EN

BBVKxxx

Machine Vision Camera

Operating Instructions

Original operating instructions
Subject to change without notice
Available as PDF file only
Revision level: 18.11.2025
Version 1.2.0
www.wenglor.com

Table of Contents

1. General

1.1 Information Concerning these Instructions

- These instructions enable safe and efficient use of BBVK Machine Vision Cameras.
- These instructions are an integral part of the product and must be kept on hand for the entire duration of its service life.
- Local accident prevention regulations and national work safety regulations must be complied with as well.
- The product is subject to further technical development, and thus the information contained in these operating instructions may also be subject to change. The current version can be found at www.wenglor.com in the product's separate download area.

NOTE!
The operating instructions must be read carefully before using the product and must be kept on hand for later reference.

1.2 Explanations of Symbols

- Safety precautions and warnings are emphasized by means of symbols and attention-getting words.
- Safe use of the product is only possible if these safety precautions and warnings are adhered to.

The safety precautions and warnings are laid out in accordance with the following principle:

ATTENTION-GETTING WORD!
Type and Source of Danger!
Possible consequences in the event that the hazard is disregarded.
- Measures for averting the hazard.

The meanings of the attention-getting words, as well as the scope of the associated hazards, are listed below:

DANGER!
This word indicates a hazard with a high degree of risk which, if not avoided, results in death or severe injury.

Warning!
This word indicates a hazard with a medium degree of risk which, if not avoided, may result in death or severe injury.

CAUTION!
This word indicates a hazard with a low degree of risk which, if not avoided, may result in minor or moderate injury.

ATTENTION!
This word draws attention to a potentially hazardous situation which, if not avoided, may result in property damage.

NOTE!
A note draws attention to useful tips and suggestions, as well as information regarding efficient, error-free use.

1.3 Limitation of Liability

- The product has been developed taking into account the state of the art as well as the applicable standards and guidelines.
- We reserve the right to make technical changes.
- A valid declaration of conformity can be found at www.wenglor.com in the download area of the product.
- wenglor sensoric elektronische Geräte GmbH (hereinafter „wenglor“) accepts no liability for:
  - » Failure to observe the operating manual,
  - » Unsuitable or improper use of the product,
  - » Excessive use, incorrect or negligent treatment of the product,
  - » Incorrect installation or commissioning,
  - » Use of untrained personnel,
  - » Use of unauthorized spare parts or
  - » Improper or unauthorized changes, modifications or repair work to the products.
- This operating manual does not contain any guarantees/warrantees from wenglor with regard to the processes described or certain product properties.
- wenglor assumes no liability with regard to printing errors or other inaccuracies contained in this operating manual, unless it can be proven that wenglor was aware of the errors at the time the operating manual was created.

1.4 Copyrights

2. For Your Safety

2.1 Use for Intended Purpose

This wenglor product is intended for use in accordance with the following functional principle:

Machine Vision Cameras are used in image processing applications for image recording.

Machine Vision Cameras can be operated in the free-running or trigger mode. With their compact format, they can be mounted even where space is limited. The C mount connection ensures flexibility by making it possible to attach various C mount lenses.

External illumination is required in order to illuminate the inspection object; for maximum brightness, this illumination can be synchronized with the image recording. The image data is transmitted via Gigabit Ethernet to the Machine Vision Controller, where images are evaluated and the results are read out.

The product may be used only within the range of the specified ambient conditions. The guidelines, safety data, and approvals specified in the technical data must also be taken into account.

2.2 Use for Other than the Intended Purpose

- The product is not a safety component in accordance with the EC Machinery Directive.
- The product is not suitable for use in potentially explosive atmospheres.
- The product may be used only with accessories supplied or approved by wenglor, or in combination with approved products. A list of approved accessories and combination products can be found at www.wenglor.com on the product detail page.

WARNING!
Risk of personal injury or property damage in case of use for other than the intended purpose!
Use for other than the intended purpose may lead to hazardous situations.
- Instructions regarding use for intended purpose must be observed.

2.3 Personnel Qualifications

- Suitable technical training is a prerequisite.
- In-house electronics training is required.
- Trained personnel who use the product must have (uninterrupted) access to the operating instructions.

DANGER!
Risk of personal injury or property damage in case of incorrect initial start-up and maintenance!
Personal injury and damage to equipment may occur.
- Adequate training and qualification of personnel.

2.4 Modification of Products

DANGER!
Risk of personal injury or property damage if the product is modified!
Personal injury and damage to equipment may occur. Non-observance may result in loss of the CE and/or UKCA mark and the guarantee may be rendered null and void.
- Modification of the product is impermissible.
- Unauthorized opening of the device is not permitted.

2.5 Repair

Trained and authorized wenglor personnel may only carry out repairs to the device. Interventions and modifications to the device by the customer will void the warranty claim against wenglor.

2.6 General Safety Precautions

NOTE!

- These instructions are an integral part of the product and must be kept on hand for the entire duration of its service life.
- In the event of possible changes, the respectively current version of the operating instructions can be accessed at www.wenglor.com in the product's separate download area.
- Read the operating instructions carefully before using the product.
- The Machine Vision Camera must be protected against contamination and mechanical influences.

CAUTION!
Danger of burns under specific conditions (e.g. high ambient temperature)!
Do not touch the housing while the device is running or shortly after switching it off, as it remains very hot.

2.7 Conditions for specified Degree of Protection

To maintain the specified degree of protection of the device during operation, the following specifications apply. In case of non-compliance, the device does not comply with any specified degree of protection.

- The connected cables at the electrical connections are screwed.
- Any unused electrical connections are sealed with a screwed-on protective cap.
- The protective tube is screwed tightly to the device.

ATTENTION!
Risk of damage to the product if the conditions are not complied with
In case of non-compliance, the device does not comply with any specified protection class.

2.8 Approvals

3. Technical Data

3.1 General Data

The BBVK is available for monochrome and color images in 4 different resolutions:

- BBVK001 and BBVK002: 1.6MP
- BBVK003 and BBVK004: 5MP
- BBVK005 and BBVK006: 12.3MP
- BBVK007 and BBVK008: 24MP

The different versions can be found at Machine Vision Cameras

3.1.1 BBVKxxx

Order No. / Technical Data	BBVK001	BBVK002	BBVK003	BBVK004
Optical Data				
Resolution	1440 × 1080 px	1440 × 1080 px	2448 × 2048 px	2448 × 2048 px
Resolution	1.6 MP	1.6 MP	5 MP	5 MP
Pixel size	3.45 × 3.45 µm	3.45 × 3.45 µm	2.74 × 2.74 µm	2.74 × 2.74 µm
Sensor type	CMOS			
Sensor designation	Sony IMX273	Sony IMX273	Sony IMX547	Sony IMX547
Image chip	monochrom	color	monochrom	color
Image chip size	1/2.9''	1/2.9''	1/1.8''	1/1.8''
Frame rate	< 71.6 fps	< 71.6 fps	< 22 fps	< 22 fps
Electrical Data				
Supply Voltage	12...24 V DC			
Current Consumption (Ub = 24 V)	< 130 mA			
Temperature range	-20...55 °C			
Storage Temperature	-30...60 °C			
Atmospheric humidity	20...95 %			
Number of GPIOs (general purpose I/Os)	2			
Number of flash outputs	1			
Flash output	Optoisolator			
Number of trigger inputs	1			
Trigger input	Optoisolator			
Supported PoE standard	IEEE802.3af			
Mechanical Data				
Lens thread	C-Mount			
Housing material	Aluminium, powder-coated			
Optic cover	Glass			
Degree of Protection	IP67			
Connection	M8 × 1; 8-pin			
Type of connection Ethernet	M12 ×1; 8-pin, X-cod.			
Weight	67 g			
Function				
Global Shutter	yes			
PoE	yes			
Interface				
Ethernet	yes			

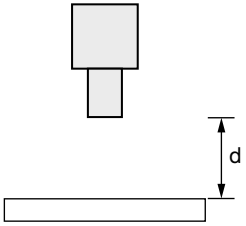
Order No. / Technical Data	BBVK005	BBVK006	BBVK007	BBVK008
Optical Data				
Resolution	4096 × 3000 px	4096 × 3000 px	5320 × 4600 px	5320 × 4600 px
Resolution	12.3 MP	12.3 MP	24 MP	24 MP
Pixel size	2.74 × 2.74 µm	2.74 × 2.74 µm	2.74 × 2.74 µm	2.74 × 2.74 µm
Sensor type	CMOS			
Sensor designation	Sony IMX545	Sony IMX545	Sony IMX540	Sony IMX540
Image chip	monochrom	color	monochrom	color
Image chip size	1/1.1''	1/1.1''	1/1.2''	1/1.2''
Frame rate	< 9 fps	< 9 fps	< 4.5 fps	< 4.5 fps
Electrical Data				
Supply Voltage	12...24 V DC			
Current Consumption (Ub = 24 V)	< 130 mA			
Temperature range	-20...55 °C			
Storage Temperature	-30...60 °C			
Atmospheric humidity	20...95 %			
Number of GPIOs (general purpose I/Os)	2			
Number of flash outputs	1			
Flash output	Optoisolator			
Number of trigger inputs	1			
Trigger input	Optoisolator			
Supported PoE standard	IEEE802.3af			
Mechanical Data				
Lens thread	C-Mount			
Housing material	Aluminium, powder-coated			
Optic cover	Glass			
Degree of Protection	IP67			
Connection	M8 × 1; 8-pin			
Type of connection Ethernet	M12 ×1; 8-pin, X-cod.			
Weight	67 g			
Function				
Global Shutter	yes			
PoE	yes			
Interface				
Ethernet	yes			

3.2 Lens

The field of view of C Mount cameras depends on the mounted lens. wenglor offers a range of different lenses with different focal length. The online Vision Caculator helps you to select the right lens.

https://www.wenglor.com/en/Vision-Calculator/s/Vision+Calculator

The following diagrams show the definition of the working distance d graphically.



NOTE!
Attaching a heavy and long lens can potentially damage the camera board. If the lens is significantly heavier than the camera itself, its weight may apply considerable force on the lens mount connected to the camera's board, leading to unintended damage to the board and its soldered components. If a heavy lens is essential for your production environment, it is advisable to use the lens as a mounting point instead of relying on the camera to prevent any damage.

3.3 IP67 Rating

3.3.1 Cables

Use IP67-rated cables with your BBVK camera to ensure that dust and water are kept out of the connection ports.

NOTE!
Custom cables must be validated by the integrator to ensure they maintain the IP67 rating.

When power over Ethernet (PoE) is used, you must attach the protection cover for power supply to achieve the IP67 rating.

3.3.2 Protective Tube (Lens Tube)

Without a lens tube, the BBVK Machine Vision Camera has an IP50 rating, providing protection against dust but not water. However, when equipped with a lens tube from wenglor portfolio, the BBVK camera achieves an IP67 rating, making it both dustproof and water-resistant.

NOTE!
Custom lens tubes must be validated by the integrator to ensure that they maintain the IP67 rating.

To attach the lens tube onto the camera, the adapter ring is needed. When attaching the adapter ring, the C-mount barrel on the BBVK should extend past the ring by approximately 0.3 mm to ensure proper alignment and functionality.

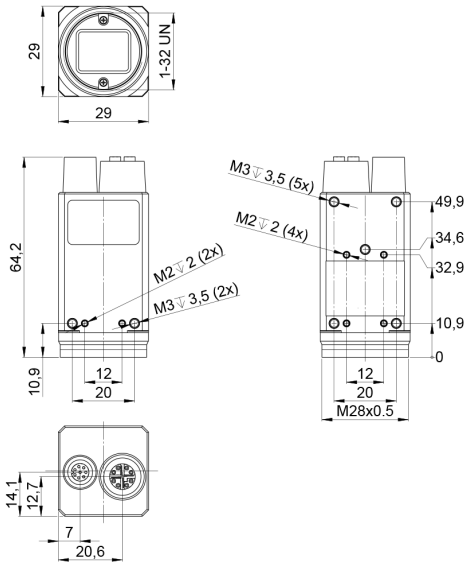
The lens tubes from wenglor for the BBVK Machine Vision Cameras consists of:

1. an adapter ring with O-ring installed
2. the lens tube

Find the protective tubes ZBVG in the wenglor web store.

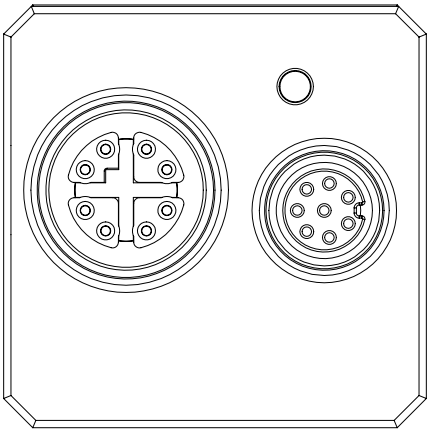
NOTE!
The camera is not fully waterproof and should not be submerged underwater for longer than 30 minutes to avoid potential damage. It's important to adhere to this guideline to maintain the camera's integrity and functionality.

3.4 Dimensional Drawing



3.5 Connection Diagram

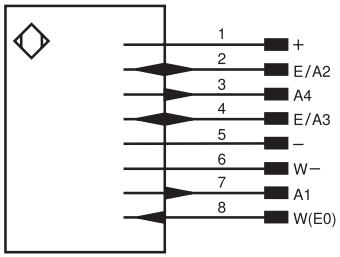
The Machine Vision Camera BBVK has 2 separate connectors. Power over Ethernet (PoE) is supported via the LAN connector. When using the LAN and Power-I/O connectors at the same time, note that power is supplied via the Power-I/O connector while PoE is disabled.



- **Power-I/O** for power supply and digital inputs/outputs
  Connection cable with connection diagram no. 539
  M8; 8-pin (A-coded)
- **Cable diagram no. S134** for power supply cable ZDKL.
- **LAN** for 1Gbit Ethernet (optional: PoE)
  M12; 8-pin (X-coded)

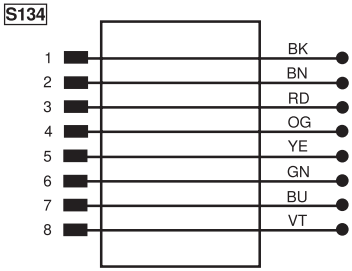
M8; 8-pin (Power-I/O)

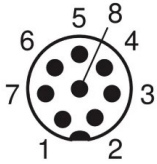
539



Cable ZDKL M8; 8-pin

S134





Default settings

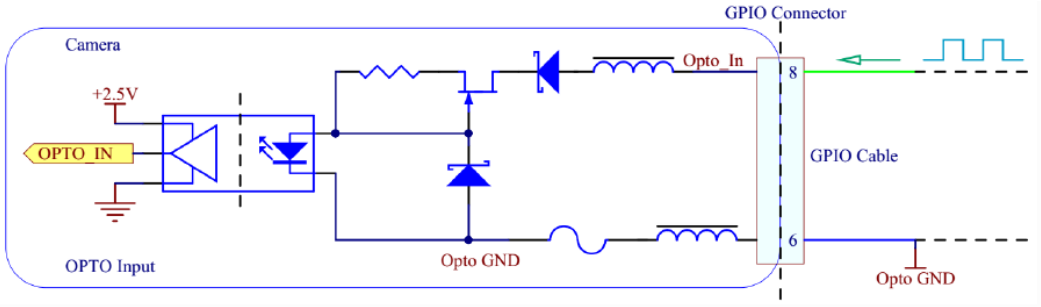
Pin	Symbol	default
1	+	12-24V DC Power Input
2	E/A2	Non-isolated bi-directional GPIO
3	A4	2.5V Power Output GPIO
4	E/A3	Non-isolated bi-directional GPIO
5	-	Camera GND
6	W-	Opto-isolated GND
7	A1	Opto-isolated Output
8	W(E0)	Opto-isolated Input

Legend

+	Supply Voltage +	nc	Not connected	ENBRS422	Encoder B/B̄ (TTL)
–	Supply Voltage 0 V	U	Test Input	ENA	Encoder A
~	Supply Voltage (AC Voltage)	Ū	Test Input inverted	ENB	Encoder B
A	Switching Output (NO)	W	Trigger Input	AMIN	Digital output MIN
Ā	Switching Output (NC)	W–	Ground for the Trigger Input	AMAX	Digital output MAX
V	Contamination/Error Output (NO)	O	Analog Output	AOK	Digital output OK
V̄	Contamination/Error Output (NC)	O–	Ground for the Analog Output	SY In	Synchronization In
E	Input (analog or digital)	BZ	Block Discharge	SY OUT	Synchronization OUT
T	Teach Input	AMV	Valve Output	OLT	Brightness output
Z	Time Delay (activation)	a	Valve Control Output +	M	Maintenance
S	Shielding	b	Valve Control Output 0 V	rsv	Reserved
RxD	Interface Receive Path	SY	Synchronization	Wire Colors according to DIN IEC 60757	
TxD	Interface Send Path	SY–	Ground for the Synchronization	BK	Black
RDY	Ready	E+	Receiver-Line	BN	Brown
GND	Ground	S+	Emitter-Line	RD	Red
CL	Clock	⏚	Grounding	OG	Orange
E/A	Output/Input programmable	SnR	Switching Distance Reduction	YE	Yellow
	IO-Link	Rx+/–	Ethernet Receive Path	GN	Green
PoE	ower over Ethernet	Tx+/–	Ethernet Send Path	BU	Blue
IN	Safety Input	Bus	Interfaces-Bus A(+)/B(–)	VT	Violet
OSSD	Safety Output	La	Emitted Light disengageable	GY	Grey
Signal	Signal Output	Mag	Magnet activation	WH	White
BI_D+/–	Ethernet Gigabit bidirect. data line (A-D)	RES	Input confirmation	PK	Pink
EN0 RS422	Encoder 0-pulse 0/0̄ (TTL)	EDM	Contactor Monitoring	GNYE	Green/Yellow
PT	Platinum measuring resistor	ENARS422	Encoder A/Ā (TTL)		

3.6 Connection Schematics

3.6.1 Opto-isolated Input W(E0)

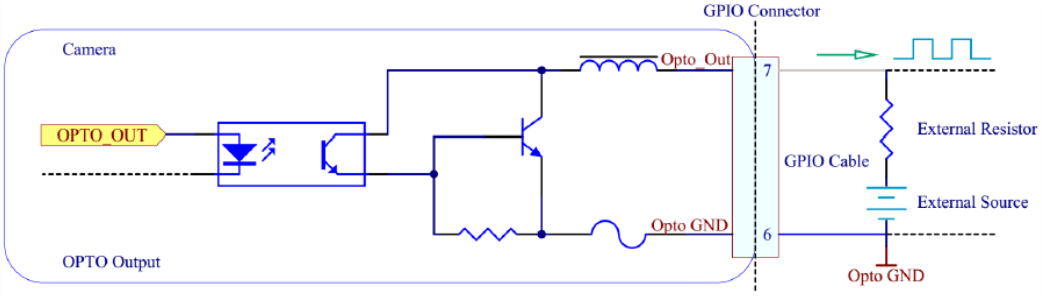


Opto-isolated Input Measurements

Voltage (V)	Max Rise Delay (µs)	Max Fall Delay (µs)	Max Rise Time (µs)	Max Fall Time (µs)	Min Pulse Input (µs)	Min Input High (V)	Min Input Low (V)
2.5	1	1	1	1	2	2.1	1.6
5	1	1	1	1	2	2.1	1.6

Sample values measured at room temperature. Results may vary over temperature and setup.

3.6.2 Opto-isolated Output A1



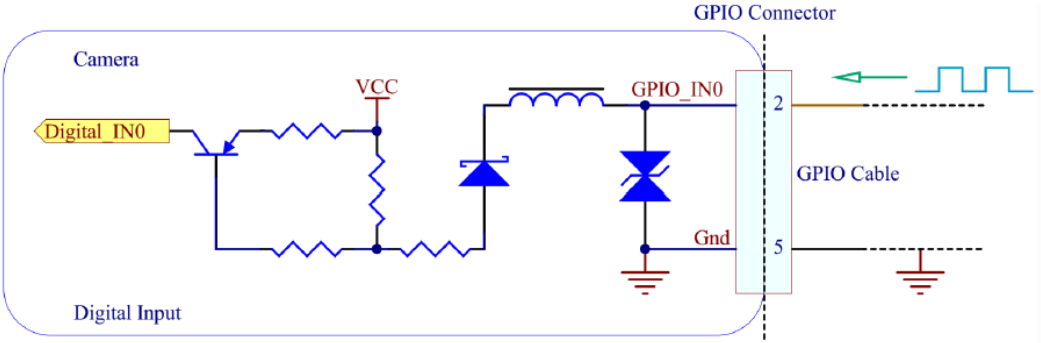
Opto-isolated Output Measurements

Voltage (V)	External Resistor (Ω)	Max Rise Delay (µs)	Max Fall Delay (µs)	Max Rise Time (µs)	Max Fall Time (µs)	Current (mA)	Low Level (V)
2.5	150	50	5	40	5	5.7	0.9
2.5	330	50	5	40	5	2.9	0.8
2.5	560	50	5	40	5	1.9	0.5
2.5	1 k	50	5	40	5	1.2	0.3

Voltage (V)	External Resistor (Ω)	Max Rise Delay (µs)	Max Fall Delay (µs)	Max Rise Time (µs)	Max Fall Time (µs)	Current (mA)	Low Level (V)
5	330	50	5	50	5	6.6	0.9
5	560	50	5	50	5	4	0.7
5	1 k	50	5	50	5	2.4	0.5
5	1.8 k	50	5	50	5	1.4	0.4
12	1 k	50	5	60	5	6	0.9
12	1.8 k	50	5	60	5	3.4	0.9
12	2.7 k	50	5	60	5	2.4	0.7
12	4.7 k	50	5	60	5	1.5	0.5
24	1.8 k	60	5	60	5	7.1	0.9
24	2.7 k	60	5	60	5	4.7	0.9
24	4.7 k	60	5	60	5	2.8	0.7
24	6.8 k	60	5	60	5	2.1	0.6

Sample values measured at room temperature. Results may vary over temperature and setup.

3.6.3 Non-isolated Input E/A2

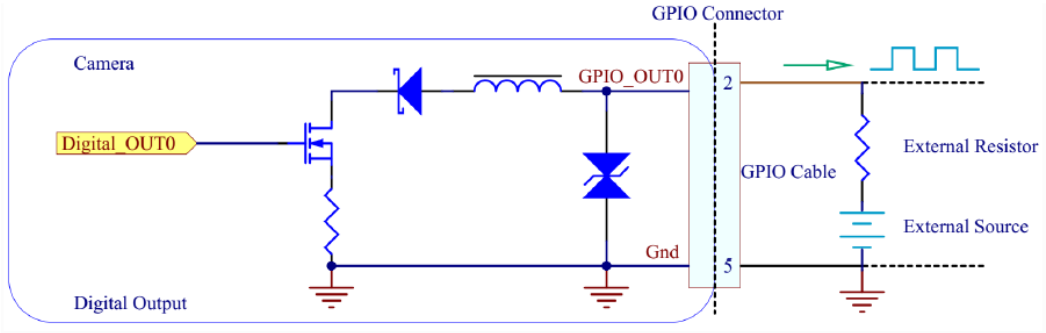


Non-isolated Input Measurements

Voltage (V)	Max Rise Delay (µs)	Max Fall Delay (µs)	Max Rise Time (µs)	Max Fall Time (µs)	Min Pulse Input (µs)	Min Input High (V)	Min Input Low (V)
2.5	1	1	1	1	2	1	0.8
5	1	1	1	1	2	1	0.8

Typical values measured at room temperature. Results may vary over temperature.

3.6.4 Non-isolated Output E/A2



Non-isolated Output Measurement

Voltage (V)	External Resistor (Ω)	Max Rise Delay (µs)	Max Fall Delay (µs)	Max Rise Time (µs)	Max Fall Time (µs)	Current (mA)	Low Level (V)
2.5	150	0.5	0.5	1	0.5	4.3	1.3
2.5	330	0.5	0.5	1	0.5	2.6	1
2.5	560	0.5	0.5	1	0.5	1.8	0.8
2.5	1 k	0.5	0.5	1	0.5	1.1	0.6
5	330	0.5	0.5	1	0.5	5.6	1.4
5	560	0.5	0.5	1	0.5	3.7	1.1
5	1 k	0.5	0.5	1	0.5	2.3	0.9
5	1.8 k	0.5	0.5	1	0.5	1.4	0.7
12	1k	0.5	0.5	1	0.5	5.5	1.4
12	1.8 k	0.5	0.5	1	0.5	3.2	0.9
12	2.7 k	0.5	0.5	1	0.5	2.3	0.9
12	4.7 k	0.5	0.5	1	0.5	1.5	0.7
24	1.8 k	0.5	0.5	2	0.5	6.5	1.6
24	2.7 k	0.5	0.5	2	0.5	4.5	1.3
24	4.7 k	0.5	0.5	2	0.5	2.6	0.9
24	6.8 k	0.5	0.5	2	0.5	1.8	0.8

Typical values measured at room temperature. Results may vary over temperature.

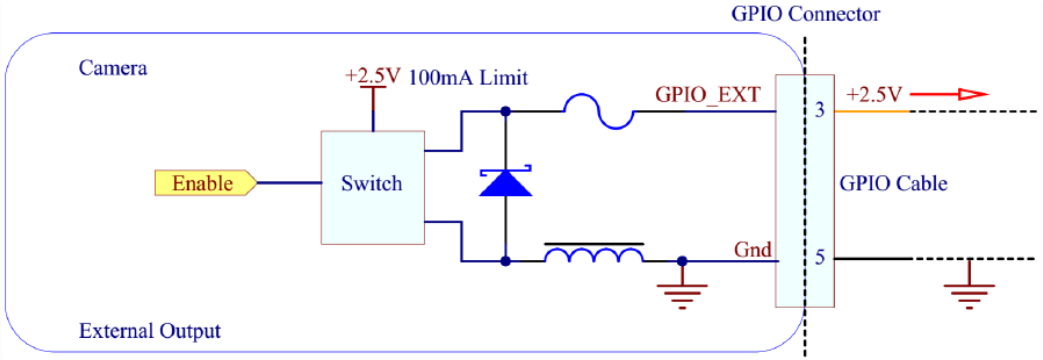
3.6.5 Non-isolated Input E/A3

Non-isolated Input E/A3 is the same as Non-isolated Input E/A1 (Input is Pin 4, GND is Pin 5).

3.6.6 Non-isolated Output E/A3

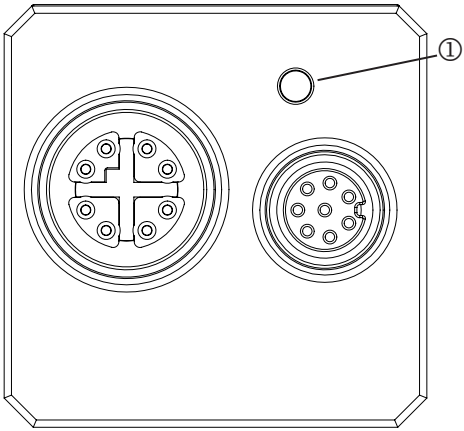
Non-isolated Output E/A3 is the same as Non-isolated Output E/A1 (Output is Pin 4, GND is Pin 5).

3.6.7 2.5V Power Output A4



3.6.8 Device Status LEDs

The Machine Vision Camera has (one) LED to display the current function status.



1: Status LED

Status options

LED color	State	Function status
Red	Blinking	Active (No Ethernet link established)
Green	Blinking	Active (Ethernet link established, no network traffic)
Green	On	Active (Ethernet link established, network traffic)
Red/Green	Blinking	Firmware update in progress
Red	On	Error - Firmware update failed

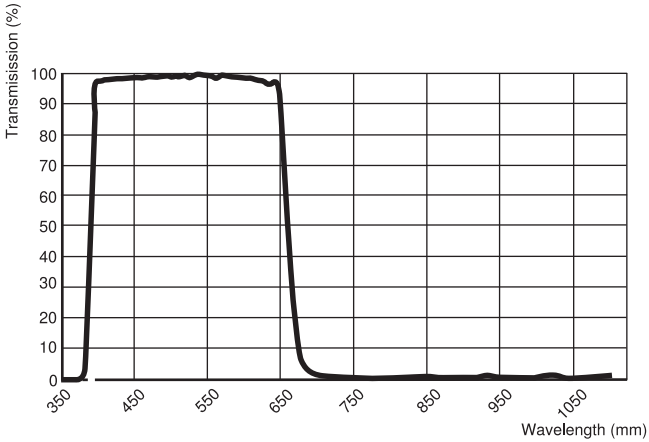
The following LED sequence occurs when the camera is powered on and connected to a network:

1. LED off, plug in the Ethernet cable.
2. LED on, blinking red.
3. After link is established, LED becomes blinking green.
4. Launch application and start capturing images, LED lights up green.

3.7 IR Filter

The Machine Vision Cameras BBVK with a color sensor are equipped with an IR filter located beneath the gasket of the mount. In contrast, mono cameras feature a transparent glass window instead of an IR filter. The dimensions of the IR filter and transparent glass window are for as follows:

Size: 18 × 14,5 mm
Thickness: 1 mm



The IR filter and transparent glass window are coated with an anti-reflective layer on one side.

3.8 White Balance

The white balance module is designed to adjust the balance between the Red, Green and Blue channels so that a white object appears white in the captured images. BBVK Machine Vision Cameras offer users the option for manual white balance adjustment or automatic white balance adjustment based on statistics from previously captured frames. Various external lighting conditions and different sensors can cause color shifts in the acquired images. The White Balance module enables users to correct these color shifts by adjusting the gain value of each color channel.

3.9 Scope of Delivery

- BBVK in ordered variant
- Commissioning Instructions
- General Safety Precautions
- Protection cover for power supply

3.10 Complementary Products

You can reach the product page of the BBVK Machine Vision Cameras via the link below. From there, navigate to the desired product and the corresponding system components.

- Complementary products
- Spare Parts
- Illumination Technology
- Mounting technology
- Connection equipment
- Software

BBVK Machine Vision Camera

Or go to the System Overview of the Machine Vision Camera BBVK.

4. Transport and Storage

4.1 Transport

Upon receipt of shipment, the goods must be inspected for damage in transit. The manufacturer must be informed without delay concerning damage to the package. When returning the package, clear indication of transport damage must be attached.

4.2 Storage

The following points must be taken into consideration with regard to storage:

- Do not store the product outdoors.
- Store the product in a dry, dust-free place.
- Protect the product against mechanical impacts.
- Protect the product against exposure to direct sunlight.
- Observe storage temperature.

ATTENTION!
Risk of material damage if not stored properly!
Damage to the product possible.

- Observe storage regulations.

5. Installation and Electrical Connection

5.1 System overview

The current system overview is located at BBVK System Overview

5.2 Mounting and General Installation Instructions

ATTENTION!
Danger of material damage in case of improper installation!
Damage to the product possible.
- Observe mounting instructions.

CAUTION!
Risk of personal injury and damage to property during installation!
Damage to personnel and product possible.
- Ensure a safe installation environment.

- Protect the product from contamination during assembly.
- Observe electrical and mechanical regulations, standards, and safety rules.
- Make sure that the Machine Vision Camera is mounted firmly and securely.
- The Machine Vision Camera must be protected against mechanical influences.
- The Machine Vision Camera should not be subjected any vibration
- Adequate heat dissipation must be assured for the device. This can be accomplished, for example, by means of a metallic connection between the Machine Vision Camera housing and the mounting base.
- The Machine Vision Camera needs approx. 30 sec. to boot.

Use only standard accessories for mounting the products (see product detail page).

Use mounting adapters for illuminations to attach the BBVK directly to external illuminations and aluminium profiles.

5.2.1 Mounting

The camera features seven M3 mounting holes and six M2 mounting holes. One pair of M2 holes and one pair of M3 holes are located on opposite sides of the lens mount surface. Additionally, there are two M2 holes positioned towards the center on the bottom side of the camera, see section „3.4 Dimensional Drawing“.

It is advisable to use the M3 mounting holes to enhance the overall rigidity of the system when a heavy lens is attached.

NOTE!
Whenever feasible, the four M3 mounting holes located at the corners on the bottom should be utilized for mounting instead of the M2 holes, particularly for applications that involve vibration and those that use the IP67 lens tube.

5.2.2 GigE Cable

- The BBVK Machine Vision Camera is equipped with an x-coded 8-pin M12 connector, which complies with the IEC 61076-2-109 standard for Ethernet communication.
- To ensure optimal performance, it is recommended to use a shielded Ethernet Cat5e cable or higher. STP shielding is advised to minimize electromagnetic interference in environments with severe EMI conditions.
- Using an unshielded or lower-grade Ethernet cable may lead to loss of camera connection and/or result in lost and inconsistent image data.
- For optimal performance, the cable should support 1 Gigabit Ethernet throughout.
- The maximum cable length from the camera to the host, without any switches or repeaters in between, is 30 meters.
- It is recommended to use qualified Ethernet cables available in the wenglor web store.

5.2.3 GPIO Cable

- The BBVK Machine Vision Camera features an 8-pin General Purpose Input/Output (GPIO) connector located at the rear.
- For optimal performance, the GPIO cable should be shielded.
- Using low-quality, unshielded GPIO cables may lead to false or missed triggers.
- The maximum cable length for the power supply of the camera is 30 meters.
- Any GPIO cable with an M8 connector that complies with IEC 61076-2-104 will be compatible. An example of a suitable connector for the BBVK is the ZDKL cable.
- It is recommended to use certified GPIO cables available in the wenglor web store.

NOTE!
Find the connection diagram in section „3.5 Connection Diagram“.

5.3 Electrical Connection

Depending on the usage only one or two connections are needed. Connect the Machine Vision Camera to 24 V DC
(± 10%). Alternatively, PoE functionality can be used via the LAN connector (e.g. using a PoE switch) (see section „3.5 Connection Diagram“).

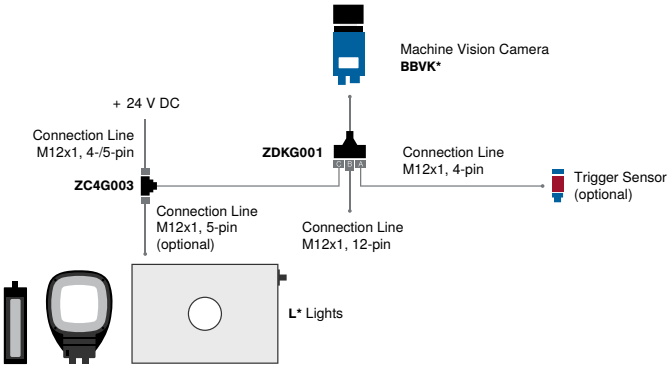
NOTE!
Suitable connection lines and connection cables can be found on the product details page.

DANGER!
Risk of personal injury or property damage due to electric current.
Voltage-carrying parts may cause damage to personnel and equipment.
- Appropriately, qualified personnel may only connect the electrical device.

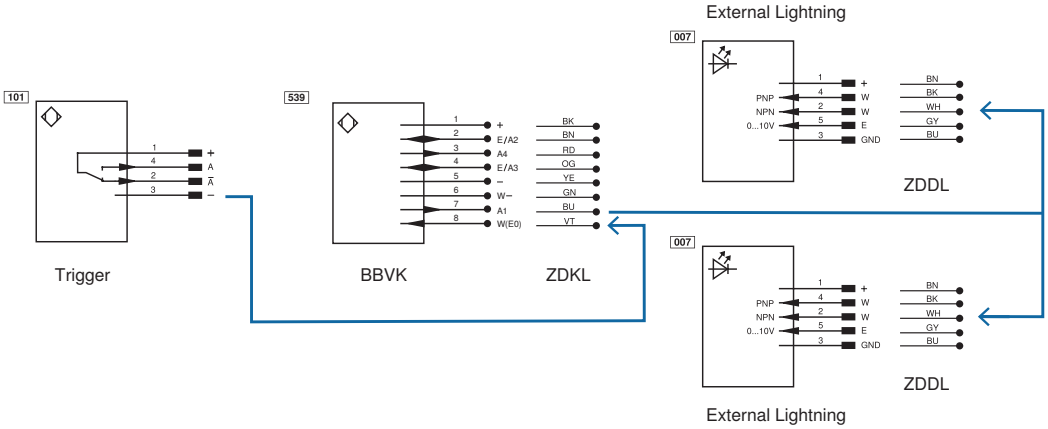
ATTENTION!
Malfunctions in operation and defects in the device or the system due to improper wiring
Improper wiring can lead to malfunctions during operation and to defects.
- Follow the wiring instructions exactly.

5.4 Connection to External Illumination and Trigger Sensor

For L* Lights



When using several lights at the same time, the following connection diagram must be followed to ensure smooth operation.



NOTE!
Please note!
- Pin 2 (E/A2): Non-isolated bidirectional GPIO
- Pin 3 (A4): 2,5 V voltage output GPIO
- Pin 4 (E/A3): Non-isolated bidirectional GPIO

6. Interface Protocol

The interface protocol can be found at the download area of each Machine Vision Camera BBVK.

7. Firmware Update

The latest firmware file (fwa) required to update the firmware can be found on your camera's product detail page under Downloads → Soft- and Firmware

BBVK001 Machine Vision Camera

1 Available from stock

Add to Cart

Comparison Share On the Request List

Machine Vision Cameras make it possible to record images in vision applications. The images are read out via a 1-gigabit Ethernet interface. The camera can be connected via a PoE port so that only one cable is required. The small and rugged housing and the C mount threaded connection can be easily and flexibly integrated. State-of-the-art CMOS sensor technology ensures high resolution and optimum image quality without noise even in difficult lighting conditions.

Features at a Glance

- Image chip with Global Shutter for dynamic applications
- Flexible mounting options from 4 sides
- Compact and robust housing in 29 × 64.4 × 29 mm format
- Different lenses can be adapted thanks to standard thread

Technical data | Downloads | Vision Calculator | Applications | Product Highlights

Data sheet

Operating instructions

CAD data

Soft- and Firmware

SOFT WARE

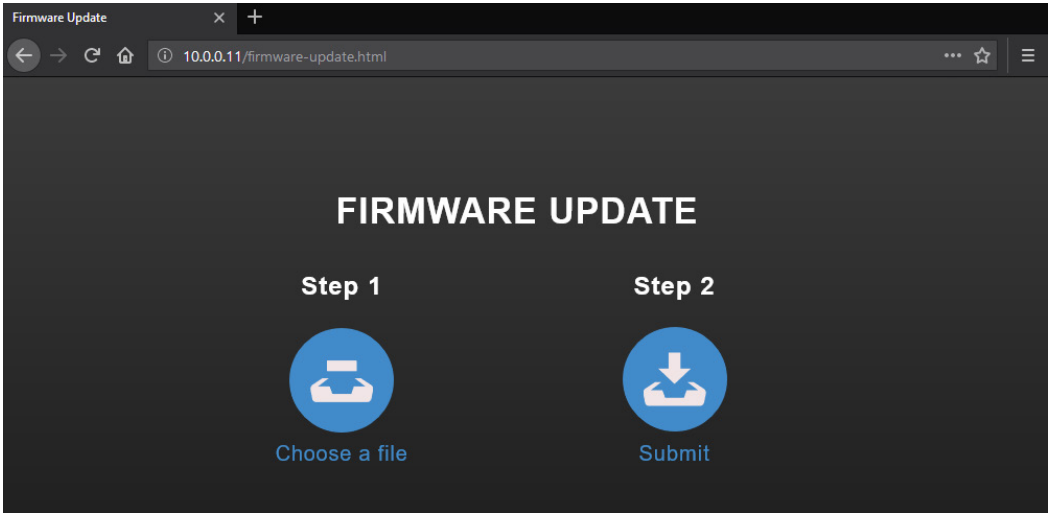
Firmware_BBVK_1.97.45.10.zip

Download

The Machine Vision Camera has an integrated firmware update page that you can access directly via a web browser.

To perform the update, please proceed as follows:

1. Open the firmware update page in your camera's web browser:
   http://{your-camera-IP-address}/firmware-update.html
2. On the "Firmware Update" page, click "Choose a file" and select the desired fwa file.



3. Click on "Submit" on the firmware update page. This will start the firmware update process.

The progress of the update is displayed on the firmware update page. During the update, the camera cannot be controlled and no image can be recorded. The update may take a few minutes.

NOTE!
Please do not switch off the camera during the update!

As soon as the firmware update is complete, the camera will restart. You can now close the firmware update page and access the camera again.

4. Software

The camera BBVK can either be used with our Machine Vision Controller MVC and our uniVision software or as a GigE Vision camera with any third party software that supports GigE Vision.
You can find an overview of the different versions of the MVC on the portfolio.

For more information how to connect and use the camera with wenglor controller and software, please read the operating instructions of the Machine Vision Controller MVC, wenglor Discovery Too (DNNF022) and software uniVision (DNNF023).

5. Maintenance Instructions

NOTE!

- This Machine Vision Camera does not require any cyclical recalibration.
- Regular inspection of the plug connections is recommended.
- Cleaning of lens covers at regular intervals is recommended in order to assure uniform good quality of the aquired image and evaluation. A commercially available cloth for cleaning eyeglasses can be used for this purpose.
- Do not clean the Machine Vision Camera with solvents or cleansers which could damage the product.

6. Proper Disposal

wenglor sensoric GmbH does not accept the return of unusable or irreparable products. Respectively valid national waste disposal regulations apply to product disposal.

7. Change Index of Operating Instruction

Version	Date	Description/Changes	Compatability
1.0.0	07.10.2024	Initial version of the operating instructions of BBVK Machine Vision Cameras	Firmware BBVK 1.0.0 Firmware MVC 1.0.0 Software: wenglor uniVision 3.3.0
1.0.1	19.11.2024	Correction of Firmware version specification	Firmware BBVK 1.97.45.10 Firmware MVC 1.0.0 Software: wenglor uniVision 3.3.0
1.1.0	30.04.2025	• Change of Pin assignment • Minor corrections • Added section: Firmware update	Firmware BBVK 1.97.45.10 Firmware MVC 1.1.0 Software: wenglor uniVision 3.4.0
1.1.1	18.11.2025	• Minor corrections	Firmware BBVK 1.97.45.10 Firmware MVC 1.1.0 Software: wenglor uniVision 3.4.0

8. Appendix

8.1 Declarations of Conformity

Declarations of conformity can be found on our website at www.wenglor.com in the product's separate download area.

wenglor sensoric GmbH
wenglor Straße 3
88069 Tettnang
GERMANY
Phone: +49 7542 5399-0
info@wenglor.com

For further wenglor contacts please see www.wenglor.com