Autonics

Vision Sensor
VG SERIES
INSTRUCTION MANUAL

CE KC

Thank you for choosing our Autonics product.
Please read the following safety considerations before use.

■ Safety Considerations

※Please observe all safety considerations for safe and proper product operation to avoid hazards.

※Safety considerations are categorized as follows.
⚠**Warning** Failure to follow these instructions may result in serious injury or death.
⚠**Caution** Failure to follow these instructions may result in personal injury or product damage.

※The symbols used on the product and instruction manual represent the following.
⚠ symbol represents caution due to special circumstances in which hazards may occur.

⚠ Warning

1. **Fail-safe device must be installed when using the unit with machinery that may cause serious injury or substantial economic loss.** (e.g. nuclear power control, medical equipment, ships, vehicles, railways, aircraft, combustion apparatus, safety equipment, crime/disaster prevention devices, etc.)
   Failure to follow this instruction may result in personal injury, fire, or economic loss.
2. **Do not use this product for protecting human body or part of body.**
3. **Do not see light LED directly or direct beam at person.**
   Failure to follow this instruction may result damage on eyes.
4. **Do not connect, repair, or inspect the unit while connected to a power source.**
   Failure to follow this instruction may result in fire.
5. **Check connections and connect cables.**
   Failure to follow this instruction may result in fire.
6. **Do not disassemble or modify the unit.**
   Failure to follow this instruction may result in fire.

⚠ Caution

1. **Use the unit within the rated specifications.**
   Failure to follow this instruction may result in fire or product damage.
2. **Use dry cloth to clean the unit. Do not use water or organic solvent when cleaning the unit.**
   Failure to follow this instruction may result in fire or product damage.
3. **Do not use the unit where flammable/explosive/corrosive gas, humidity, direct sunlight, radiant heat, vibration, impact or salt may be present.**
   Failure to follow this instruction may result in fire or explosion.
4. **Keep metal chip, dust, and wire residue from flowing into the unit.**
   Failure to follow this instruction may result in fire or product damage.

■ Ordering Information

Model	Effective focal length	Image element	Resolution	Communication	Power supply
VG-M04□-8E	8mm	Mono CMOS	752×480	Ethernet (TCP/IP)	24VDC
VG-M04□-16E	16mm				
VG-M04□-25E	25mm				

※□ stands for the color of light: W (white), R (red), G (green), B (blue)
※Only light can be purchased separately.

■ Unit Description
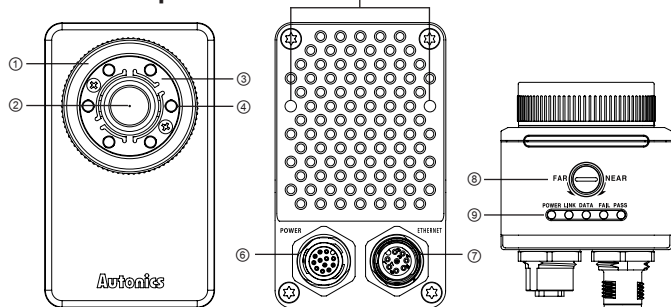
① Lens cover: Front cover of lens
   ※In case using a filter (color filter/polarizing filter), separate the lens cover with the assembly tool before insert the filter.
② Lens: There are 8mm, 16mm, 25mm models by effective focal length.
③ Light cover: Light cover fixes inner LED lights.
④ Light: Inner LED lights
   ※In order to change the light, separate lens cover and light cover.
⑤ Bracket mounting hole on back side: Install the vision master from the back side using bracket B.
⑥ Power I/O connector: Connect the power I/O cable.
⑦ Ethernet connector: Connect the Ethernet cable. It is for TCP/IP communication.
⑧ Focus adjuster: After fixing vision sensor, adjust focus by the rotating focus adjuster.
⑨ Indicators

Indicators		Color	Descriptions
POWER	Power indicator	Green LED	Turns ON when power is supplied.
LINK	Ethernet connection indicator	Green LED	Turns ON when vision sensor is connected with PC (Ethernet communication).
DATA	Data transmission indicator	Orange LED	Flashes when data is transmitted from vision sensor to PC.
FAIL	Failure indicator	Red LED	Flashes when detects failure during work group inspection.
PASS	Pass indicator	Green LED	Flashes when passed inspection during work group inspection.

※**The above specifications are subject to change and some models may be discontinued without notice.**
※**Be sure to follow cautions written in the instruction manual, user manual and the technical descriptions (catalog, homepage).**

■ Specifications

Model		VG-M04□-8E	VG-M04□-16E	VG-M04□-25E
Effective focal length		8mm	16mm	25mm
Min. sensing distance		50mm	100mm	200mm
Power supply		24VDC⎓ (±10%)		
Power consumption		1A		
Inspection / Inspection item		Alignment, brightness, contrast, area, edge, length, angle, diameter, the number of objects		
Work group		32		
Simultaneous inspection		64		
Camera frame per second※1		Max. 60fps		
Image snap / Image filter		Preprocessing, external filter (color filter, polarizing filter)		
Image element		1/3 inch mono CMOS		
Resolution		752×480 pixel		
Camera frame per second※1		Max. 60fps		
Shutter		Global shutter		
Exposure time		20 to 10,000μs		
Light / ON/OFF method		Pulse		
Color		White, red, green, blue		
Trigger mode		External trigger, internal trigger, free-run trigger		
Input / Signal		Rated input 24VDC⎓ (±10%)		
Type		External trigger input (TRIG), encoder input (IN2, IN3), work group change (IN0 to IN3)		
Output / Signal		NPN or PNP open collector output Max. 24VDC⎓ 50mA, residual voltage: max. 1.2VDC⎓		
Type		Control output (OUT0 to OUT3) : inspection completion, inspection result, external light trigger, alarm, camera busy		
FTP transmission		Possible		
Communication		Ethernet (TCP/IP), 100BASE-TX/10BASE-T		
Protection circuit		Output short over current protection circuit		
Indicator		• Power indicator (POWER), Ethernet connection indicator (LINK), pass indicator (PASS): green LED • Data transmission indicator (DATA): orange LED • Failure indicator (FAIL): red LED		
Insulation resistance		Over 20MΩ (at 500VDC megger)		
Dielectric strength		500VAC 50/60Hz for 1 min		
Vibration		1.5mm amplitude at frequency of 10 to 55Hz (for 1 min) in each X, Y, Z direction for 2 hours		
Shock		300m/s² (approx. 30G) in each X, Y, Z direction for 3 times		
Environ-ment / Ambient temp.		0 to 45℃, storage: -20 to 70℃		
Ambient humi.		35 to 85%RH, storage: 35 to 85%RH		
Protection structure		IP67 (IEC standard)		
Material		Case: aluminium, lens cover/focus adjuster: polycarbonate, cable: polyurethane		
Accessories		Assembly tool, bracket A, mounting screw: 2		
Sold separately		Light, color filter, polarizing filter, power I/O cable, Ethernet cable, bracket B, protection cover		
Approval		CE KC		
Weight※2		Approx. 415g (approx. 273g)	Approx. 416g (approx. 274g)	Approx. 416g (approx. 274g)

※1: The number of camera frames per second can be different by image setting or inspection item.
※2: The weight includes packaging. The weight in parenthesis is for unit only.
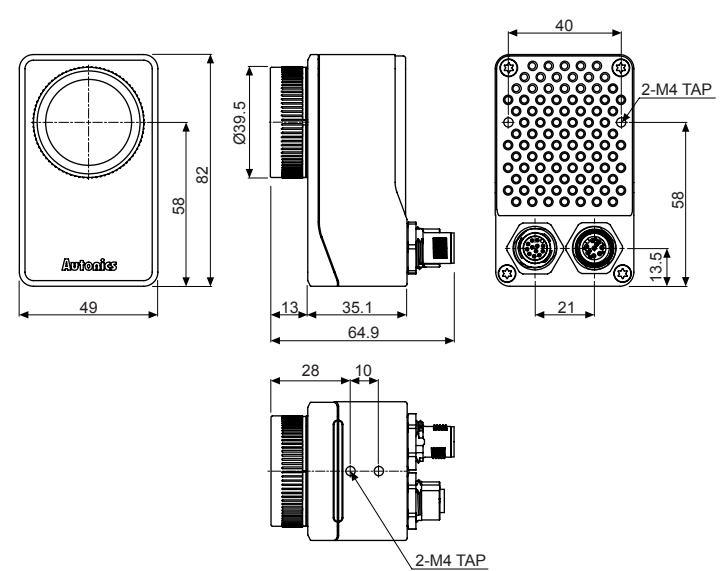※Environment resistance is rated at no freezing or condensation.

■ Connections

● Power I/O cable (M12 12-pin connector)

Pin arrangement	Pin No.	Cable color	Signal	Function	
	1	Brown	24VDC	24VDC	
	2	Blue	GND	GND	
	3	White	TRIG	Trigger input	
	4	Green	IN0	Work group change Bit 0	Work group change Clock
	5	Pink	IN1	Work group change Bit 1	Work group change Data
	6	Yellow	IN2	Work group change Bit 2	Encoder - Up counter - Quadrature A
	8	Gray	IN3	Work group change Bit 3	Encoder - Down counter - Quadrature B
	11	Gray/Pink	COMMON	COMMON	
	7	Black	OUT0	Inspection completion, inspection result, external light trigger, alarm, camera busy	
	9	Red	OUT1		
	10	Purple	OUT2		
	12	Red/Blue	OUT3		

● Ethernet cable (M12 8-pin/RJ45 connector)

Pin arrangement	M12 8-pin		Cable color	RJ45	
	Pin No.	Signal		Pin No.	Signal
	6	RX+	White/Orange	1	TX+
	4	RX-	Orange	2	TX-
	5	TX+	White/Green	3	RX+
	8	TX-	Green	6	RX-
	1	—	White/Blue	5	—
	7	—	Blue	4	—
	2	—	White/Brown	7	—
	3	—	Brown	8	—

■ Dimensions

(unit: mm)

■ Installation

● Install horizontally from the bottom - bracket A (accessory)
● Install vertically from the bottom - bracket B (sold separately)
● Install vertically from the back side – bracket B (sold separately)

■ Input Circuit Diagram

● External trigger input (TRIG) Work group change input (IN0 to IN3)
● Encoder input (IN2, IN3)
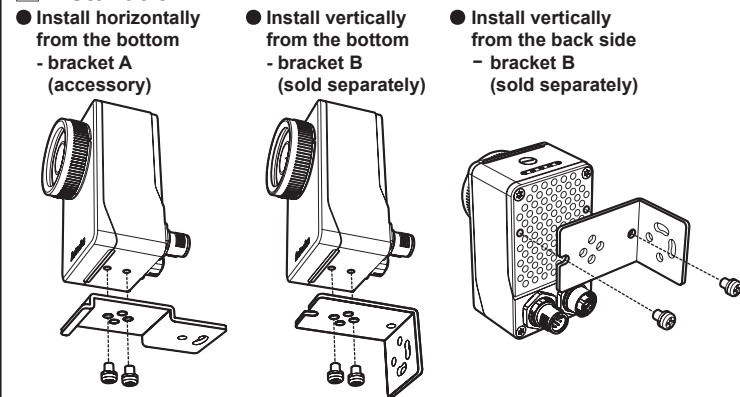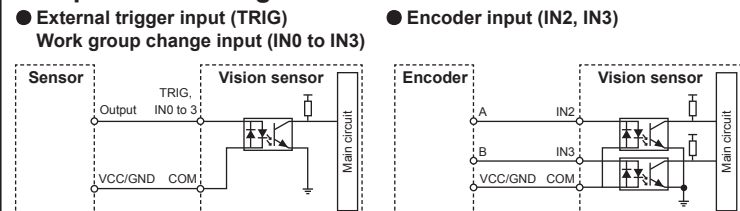
■ Control Output Circuit Diagram

● NPN open collector output
● PNP open collector output
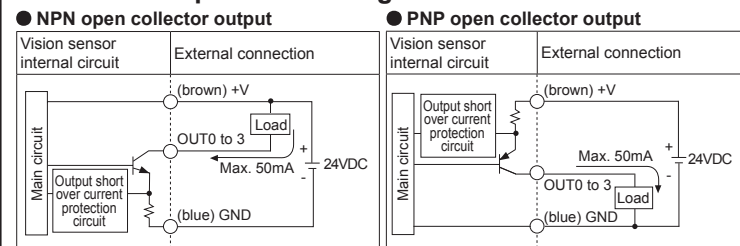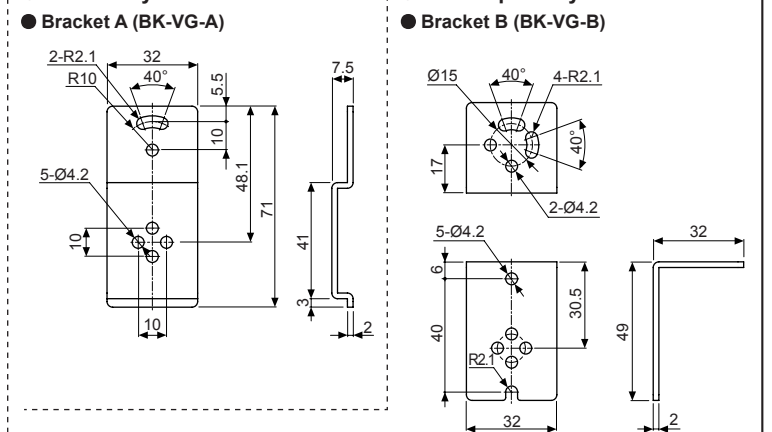

■ Vision Sensor Program [Vision Master]

Vision Master is the vision sensor program that allows setting of vision sensor parameters and management of monitoring data such as inspection status and status information.

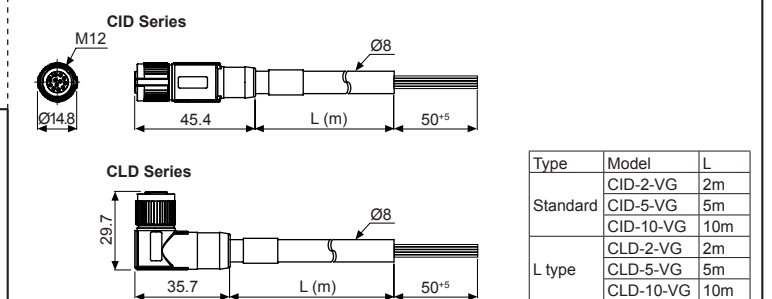| Item	Minimum specifications
System	32bit (×86) or 64bit (×64) processor over 1GHz
Operations	Microsoft Windows 7/8/10
Memory	1GB+
Hard disk	400MB+ of available hard disk space
VGA	Resolution: 1024×768 or higher
Others	RJ45 Ethernet port

※Vision sensor is connected with Vision Master in Ethernet (TCP/IP) communication.
※For initial IP address of vision sensor, refer to the following table.
   Configure the network settings of vision sensor via Vision Master.

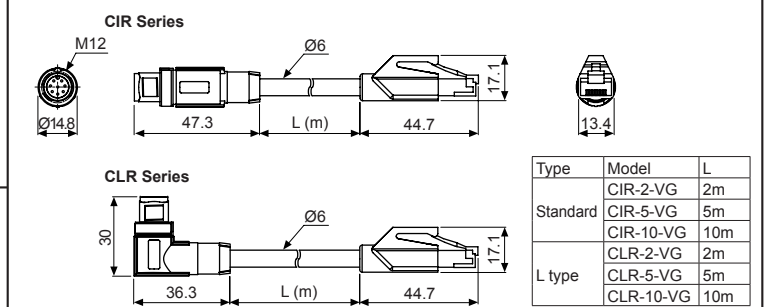| IP address	192.168.0.2
Subnet mask	255.255.255.0
Gateway	192.168.0.1

◎ Accessory

● Bracket A (BK-VG-A)

◎ Sold separately

● Bracket B (BK-VG-B)

● Power I/O cable (M12 12-pin connector)

CID Series

CLD Series

Type	Model	L
Standard	CID-2-VG	2m
	CID-5-VG	5m
	CID-10-VG	10m
L type	CLD-2-VG	2m
	CLD-5-VG	5m
	CLD-10-VG	10m

● Ethernet cable (M12 8-pin/RJ45 connector)

CIR Series

CLR Series

Type	Model	L
Standard	CIR-2-VG	2m
	CIR-5-VG	5m
	CIR-10-VG	10m
L type	CLR-2-VG	2m
	CLR-5-VG	5m
	CLR-10-VG	10m

■ User Manual

For the detail information and instructions, please refer to user manual, and be sure to follow cautions written in the technical description (catalog, homepage).
Visit our homepage (**www.autonics.com**) to download manuals.

■ Cautions during Use

1. Follow instructions in Cautions during Use. Otherwise, it may cause unexpected accidents.
2. In case of 24VDC model, power supply should be insulated and limited voltage/current or Class 2, SELV power supply device.
3. In order to avoid malfunction from static electricity or noise, ground shield wire of the power I/O cable.
4. Do not disconnect the power supply while setting operation or saving set information.
   It may cause data loss.
5. Do not disconnect the power supply while updating firmware. It may cause product damage.
6. Keep optical section of the sensor away from the contact with water, dust and oil.
   It may cause malfunction.
7. When changing the light or filter, use the assembly tool and observe installation instruction.
8. When the sensor is not used for a long time, separate the power cable and to store.
9. When connecting network, connection must be operated by technical expert.
10. In the following case, disconnect the power supply immediately. It may cause fire or product damage.
    ① When water or foreign substance is detected in the product
    ② When the product is dropped or case is damaged
    ③ When smoke or smell is detected from the product
11. Do not use the product in the place where strong magnetic field or electric noise is generated.
12. This unit may be used in the following environments.
    ① Indoor (in the environment conditions in specifications)   ② Altitude max. 2,000m
    ③ Pollution degree 2   ④ Installation category II

■ Major Products

- Photoelectric Sensors
- Fiber Optic Sensors
- Door Sensors
- Door Side Sensors
- Area Sensors
- Proximity Sensors
- Pressure Sensors
- Rotary Encoders
- Connectors/Sockets
- Switching Mode Power Supplies
- Control Switches/Lamps/Buzzers
- I/O Terminal Blocks & Cables
- Stepper Motors/Drivers/Motion Controllers
- Graphic/Logic Panels
- Field Network Devices
- Laser Marking System (Fiber, CO₂, Nd: YAG)
- Laser Welding/Cutting System
- Temperature Controllers
- Temperature/Humidity Transducers
- SSRs/Power Controllers
- Counters
- Timers
- Panel Meters
- Tachometer/Pulse (Rate) Meters
- Display Units
- Sensor Controllers

Autonics Corporation
http://www.autonics.com

■ **HEADQUARTERS:**
18, Bansong-ro 513beon-gil, Haeundae-gu, Busan, South Korea, 48002
TEL: 82-51-519-3232
■ E-mail: sales@autonics.com