

5M Monochrome Smart Camera (External illumination)



VC Series PRODUCT MANUAL

For your safety, read and follow the considerations written in the instruction manual, other manuals and Autonics website.

The specifications, dimensions, etc. are subject to change without notice for product improvement. Some models may be discontinued without notice.

Features

- Various inspection functions
- Inspection simulator function
- Set up to 64 separate work group (32 inspection points per work group)
- Save data to FTP servers
- Support smart camera software (atVision)
 - Inspection simulator function, manage parameters and work group, inspection results monitoring, send data to FTP, multilingual support, etc.
- IP67 protection structure (IEC standard)
- C-Mount type
- Gigabit Ethernet communication

Safety Considerations

- Observe all 'Safety Considerations' for safe and proper operation to avoid hazards.
- ⚠ symbol indicates caution due to special circumstances in which hazards may occur.

⚠ Warning Failure to follow instructions may result in serious injury or death.

- 01. 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, economic loss or fire.
- 02. Do not use or store the unit in the place where flammable / explosive / corrosive gas, high humidity, direct sunlight, radiant heat, vibration, impact or salinity may be present.**
Failure to follow this instruction may result in explosion or fire.
- 03. Do not use this product for protecting human body or part of body.**
- 04. Do not connect, repair, or inspect the unit while connected to a power source.**
Failure to follow this instruction may result in fire.
- 05. Check 'Connections' before wiring.**
Failure to follow this instruction may result in fire.
- 06. Do not disassemble or modify the unit.**
Failure to follow this instruction may result in fire.

⚠ Caution Failure to follow instructions may result in injury or product damage.

- 01. Use the unit within the rated specifications.**
Failure to follow this instruction may result in fire or product damage.
- 02. Use a dry cloth to clean the unit, and do not use water or organic solvent.**
Failure to follow this instruction may result in fire.
- 03. Keep the product away from metal chip, dust, and wire residue which flow into the unit.**
Failure to follow this instruction may result in fire or product damage.

Cautions during Use

- Follow instructions in 'Cautions during Use'. Otherwise, it may cause unexpected accidents.
- Use or store the product within the rated environment specifications.
Failure to follow this instruction may result in product damage or malfunction.
- Power supply should be Class 2, SELV power supply device.
(UL certified, rated: 24 VDC=, 1.2 A min.)
- Prevent VCC wire from short to other wires in power I/O cable.
- In order to avoid malfunction from static electricity or noise, ground shield wire of the power I/O cable.
- Do not disconnect the power supply while setting operation or saving set information.
It may cause data loss
- Do not disconnect the power supply while updating firmware. Failure to follow this instruction may result in product damage.
- Keep optical section of the sensor away from the contact with water, dust and oil. It may cause malfunction.
- When not in use for a long time, disconnect and store the power cable.
- When connecting network, connection must be operated by technical expert.
- In the following case, disconnect the power supply immediately. Failure to follow this instruction may result in fire or product damage.
 - When water or foreign substances is detected in the product
 - When the product is dropped or case is damaged
 - When smoke or smell is detected from the product
- Do not use the product in the place where strong magnetic field or electric noise is generated.
- This unit is intended to be used in the following environments.
 - Indoors (in the environment condition rated in 'Specifications')
 - Altitude max. 2,000 m
 - Pollution degree 2
 - Installation category II

Ordering Information

This is only for reference, the actual product does not support all combinations.
For selecting the specified model, follow the Autronics website.

VC - ① ② ③ - ④ ⑤

1 Image element **4** Lens

M: Mono CMOS C: C-Mount

2 Resolution 5 Communication

50: 5 MP (2,560 × 2,048 pixel) E: Ethernet (TCP/IP)

3 Function

T: Total

Product Components

- Product
- Ethernet connector Cap (screw plug - waterproof) × 1
- Instruction manual

Sold Separately

- Waterproof lens cover: (HL-□□-VC)
- M12 connector cable (C□DM8-□-A)
- M12 connector communication cable (C□M8-□PR(-A), C□8-□PR(-A))

Software

Download the installation file and the manuals from the Autonics website.

■ atVision

The program allows setting of smart camera parameters and management of monitoring data such as inspection status and status information.

Network Setting

IP address	192.168.0.2	- Configure the network settings of vision sensor via atVision. - For initial IP address, refer to the table.
Subnet mask	255.255.255.0	
Gateway	192.168.0.1	

- _____

Connections

■ Power I/O connector wiring (M12 8-pin connector, Plug - Male)

- When the power is unstable, ground the shield of the provided cable.

Pin	Cable color	Signal	Function
1	White	HS OUT 0	Strobe OUT
2	Brown	VCC	Power input
3	Green	TRIG +	Trigger input +
4	Yellow	TRIG -	Trigger input -
5 ⁰¹⁾	Gray	RS232 RX	RS232 receive
6 ⁰¹⁾	Pink	RS232 TX	RS232 transmit
7 ⁰¹⁾	Blue	GND	Ground
8	Red	HS OUT 1	Select 1 from inspection complete, inspection result output (PASS / FAIL), alarm



A top-down diagram of the 8-pin circular connector. The pins are arranged in a circle and numbered 1 through 8. Pin 1 is at the top right, pin 2 is at the top, pin 3 is at the top left, pin 4 is at the left, pin 5 is at the bottom left, pin 6 is at the bottom, pin 7 is at the bottom right, and pin 8 is in the center. A small semi-circular notch is located at the top of the connector housing.

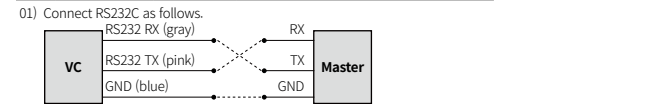
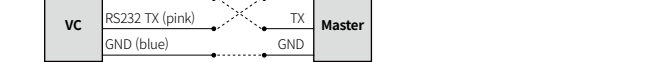


Diagram showing RS232 RX (gray) and RX connections between two modules.



■ Ethernet connector cable
(M12 8-pin-RJ45 connector, Socket - Female)

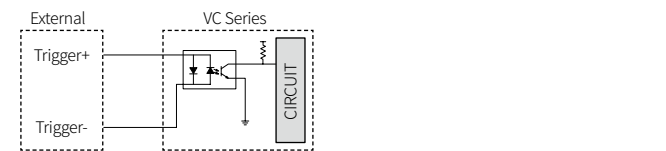
M12 8-pin	RJ45	Signal
1	5	BI_DC-
2	7	BI_DD+
3	8	BI_DD-
4	2	BI_DA-
5	3	BI_DB+
6	1	BI_DA+
7	4	BI_DC+
8	6	BI_DB-

A diagram of an M12 8-pin connector. It is a circular connector with a central pin and seven surrounding pins. The pins are numbered 1 through 8 in a clockwise direction starting from the top. Pin 1 is at the top, pin 2 is at the top-right, pin 3 is at the right, pin 4 is at the bottom-right, pin 5 is at the bottom, pin 6 is at the bottom-left, and pin 7 is at the left. The central pin is not numbered.

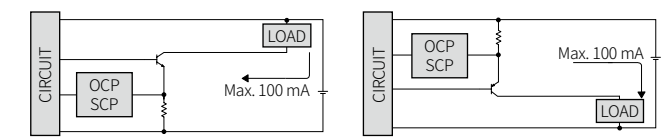


Inner Circuit

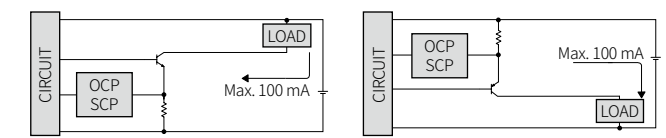
■ **Trigger (TRIG) input**



■ NPN open collector output ■ PNP open collector output



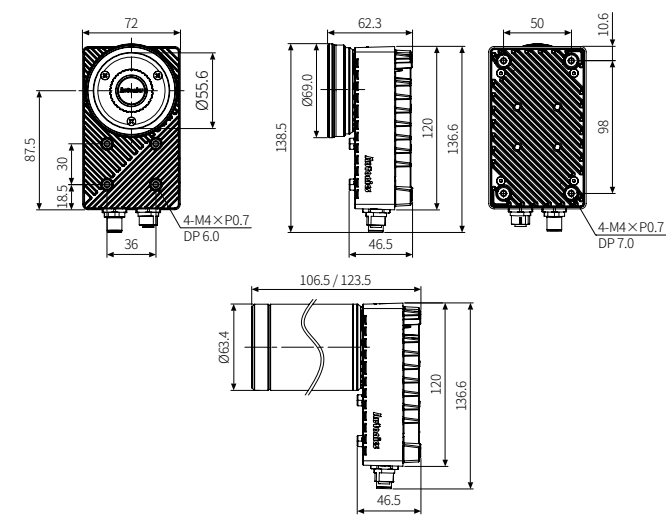
■ NPN open collector output ■ PNP open collector output



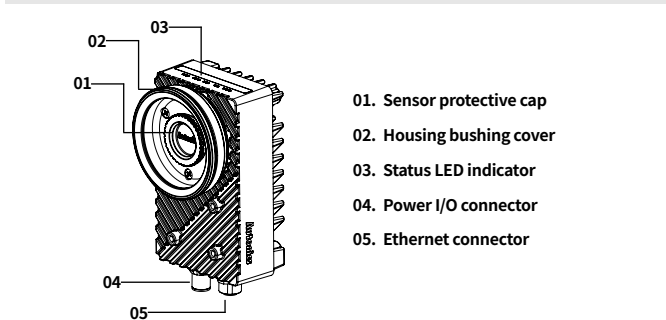
- OCP (over current protection), SCP (short circuit protection)
- If short-circuit the control output terminal or supply current over the rated specification, normal control signal is not output due to the output short over current protection circuit.

Dimensions

- Unit: mm, For the detailed drawings, follow the Autonics website.



Unit Descriptions



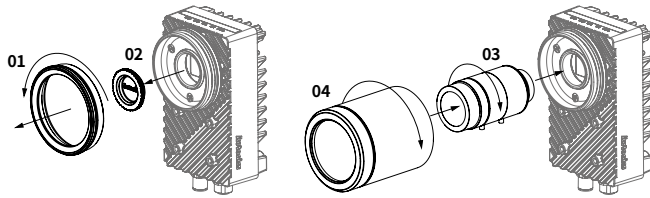
■ Indicator

Indicator	Color	Name	Function
POWER	Green	Power indicator	Turns ON when power is supplied.
LINK	Green	Ethernet connection indicator	Turns ON in Ethernet communication status.
DATA	Green	Data transmit indicator	Flashes when data is transmitted between product and PC.
USER 1	Green / Red	User setting indicator	Turns ON or flashes in operation of inspection complete, inspection result (PASS, FAIL), alarm, and product work.
USER 2			

Components: Ethernet Connector Cap

- Ethernet connector cap protects unused Ethernet connector from foreign substances.
 - Tightening torque: 0.4 N m
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Waterproof Lens Cover Assembly



01. Remove the housing bushing cover by rotating CCW direction.
02. Remove the sensor protective cap.
03. Tighten the C-mount lens by rotating CW direction.
04. Tighten firmly the waterproof lens cover by rotating CW direction until there is no gap.

Specifications

Model	VC-M50T-CE
Image element	1 inch mono CMOS
Resolution	5 MP (2,560 × 2,048 pixel)
Frame per second ⁰¹⁾	16 fps
Bit Depth	8 bit (256 gray level)
Shutter	Global shutter
Exposure time	3 μs to 3 sec
Lens type	C-Mount
eMMC	8 GB
DDR4	2 GB (LPDDR4), 512 MB (DDR4)
Inspection work group	64 (simultaneous inspection: 32)
Trigger mode	Continuous, External Trigger, Manual, Ethernet, RS232
Communication	Ethernet (TCP/IP, 10 / 100 / 1000 Base-T), Modbus (TCP, RTU)
FTP trans. output	YES
Certification	CE, RoHS, REACH, ENEC, EAC
Unit weight (packaged)	≈ 600 g (≈ 780 g)

01) The number of camera frames per second can be different by image setting or inspection item.

Power supply	24 VDC= ±10%
Current consumption	≤ 1 A
Rated input signal	24 VDC= ±10%
Output signal	NPN-PNP open collector output setting (software)
HS OUT 0	Strobe OUT
HS OUT 1	Inspection complete, Inspection result output (PASS / FAIL), Alarm, Product work
Load voltage	24 VDC=
Load current	≤ 100 mA
Residual voltage	≤ 2.5 VDC=
Protection circuit	Output short overcurrent protection circuit, reverse voltage polarity protection circuit
Vibration	1.5 mm double amplitude at frequency 10 to 55 Hz in each X, Y, Z direction for 2 hours
Shock	300 m/s ² (≈ 30 G) in each X, Y, Z direction for 3 times
Ambient temp.	0 to 45 °C, storage: -30 to 80 °C (no freezing or condensation)
Ambient humi.	0 to 95%RH, storage: 0 to 95%RH (no freezing or condensation)
Protection structure	IP67 (IEC standard / When mounting waterproof lens cover)
Connection	Connector type
Connector spec.	Power I/O: M12 8-pin, Ethernet: M12 8-pin / RJ45 (cable tightening torque: 0.4 N m)
Material	Die-cast Aluminum Housing

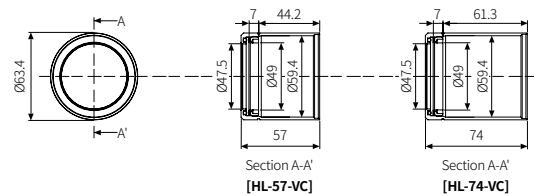
Troubleshooting

Please check routinely whether product is operating in normal status or not.
For more information, refer to atVision software manual.

Symptom	Troubleshooting
When supplying power, POWER indicator is not turned ON.	Check the status of power supplying and power cable are connected properly. Check the power is supplied within the rated range. Check the polarity of power is connected properly. Check the power terminal is tightened thoroughly.
Product does not work due to the external input error.	Check whether status of input COMMON or each of input wire is connected properly. Check whether the problem occurs in input device work.
Product does not work due to the external output error.	Check the output wire is connected properly. Check the power to output is supplied within the rated range. Check whether the problem occurs in output device work. Check the specifications of load connected to output is within the rated range.
Error occurs in Ethernet communication.	Check LINK LED is turned ON. If not, check wiring. Check the communication (IP address, subnet mask and gateway) is set correctly. Check the connection or specification of the communication cable is corresponding to Autonics Guide. Use the cable distributed by Autonics. (sold separately)

Sold Separately: Waterproof Lens Cover

- Unit: mm, For the detailed drawings, follow the Autonics website.



Sold Separately: M12 Connector Cable

- For more information, refer to the M8/12 Connector Cable Product Manual.
- Tightening torque: 0.4 N m

Appearance	Power supply	Connector 1	Connector 2	Length	Feature	Model
	DC	M12 (Socket-Female) 8-pin	8-wire	2 m	• Drag chain type (2 million)	CIDM8-2-A
				5 m		CIDM8-5-A
				10 m		CIDM8-10-A
		M12 (Socket-Female) 8-pin, L type	8-wire	2 m	• IP65 / IP67 • PUR • EAC	CLDM8-2-A
				5 m		CLDM8-5-A
				10 m		CLDM8-10-A

Sold Separately: M12 Connector Communication Cable

- For more information, refer to the M12 Connector Communication Cable Product Manual.
- Tightening torque: 0.4 N m

Appearance	Power supply	Connector 1	Connector 2	Length	Feature	Model
	DC	M12 (Plug-Male) 8-pin	RJ45	2 m	Drag chain type (16 million) TPE	C1M8-2PR
				5 m		C1M8-5PR
				10 m		C1M8-10PR
		M12 (Plug-Male) 8-pin, L type	RJ45	2 m	PVC	C4M8-2PR
				5 m		C4M8-5PR
				10 m		C4M8-10PR
		M12 (Plug-Male) 8-pin	RJ45	2 m	PVC	C18-2PR
				5 m		C18-5PR
				10 m		C18-10PR
		M12 (Plug-Male) 8-pin, L type	RJ45	2 m	PVC	C48-2PR
				5 m		C48-5PR
				10 m		C48-10PR
		M12 (Plug-Male) 8-pin	RJ45	2 m	Drag chain type (5 million) IP65 / IP67 PUR EAC	C1M8-2PR-A
				5 m		C1M8-5PR-A
				10 m		C1M8-10PR-A
		M12 (Plug-Male) 8-pin, L type	RJ45	2 m	IP65 / IP67 PUR EAC	C4M8-2PR-A
				5 m		C4M8-5PR-A
				10 m		C4M8-10PR-A
		M12 (Plug-Male) 8-pin	RJ45	2 m	IP65 / IP67 PUR EAC	C18-2PR-A
				5 m		C18-5PR-A
				10 m		C18-10PR-A
		M12 (Plug-Male) 8-pin, L type	RJ45	2 m	IP65 / IP67 PUR EAC	C48-2PR-A
				5 m		C48-5PR-A
				10 m		C48-10PR-A

atVision

For more detail, refer to atVision software manual.

■ Basic setting

- Camera setting
- Network setting
- I/O setting
- Advanced setting

■ Inspection function

Function	Descriptions
Alignment	Calibrates position and rotation based on selected object.
Bar Code	Read bar code.
Matrix	Read data matrix code.
QR Code	Read QR code.
Extract Text	Separate text from background.
Read Text	Read separated text from background.
Area	Inspect the object area.
Angle	Inspect the angle between two edges.
Brightness	Inspect the object average brightness.
Contrast	Inspect the object average contrast.
Diameter	Inspect the diameter of the circle.
Length	Inspect the distance between two edges.
Edge	Inspect the existence of edges.
Object Counting	Inspect the object count.
Shape Compare	Inspect the edge loss rate.
Shape Multi Compare (Edge)	Inspect the multi shape with object edge shape.
Shape Single Compare (Edge)	Inspect the single shape with object edge shape.
Shape Multi Compare (Pixel)	Inspect the multi shape with object pixel shape.
Shape Single Compare (Pixel)	Inspect the single shape with object pixel shape.