

# 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 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.
- The image sensor in the product is vulnerable to heat, humidity and shock.  
Due to risks of product failure, do not move or transport the product by ship.
- 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 $\pm$ , 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 Autonics website.

VC - ① ② ③ - ④ ⑤

① **Image element**  
M: Mono CMOS

② **Resolution**  
50: 752 × 480 pixel

③ **Function**  
T: Total

④ **Lens**  
C: C-Mount

⑤ **Communication**  
E: Ethernet (TCP/IP)

## Product Components

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

## 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

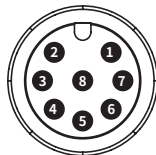
<b>IP address</b>	192.168.0.2	• Configure the network settings of vision sensor via atVision.
<b>Subnet mask</b>	255.255.255.0	
<b>Gateway</b>	192.168.0.1	• For initial IP address, refer to the table.

## Connections

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

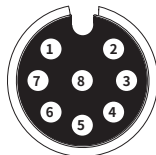
- When the power is unstable, ground the shield of the provided cable.

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	Gray	RS232 RX	RS232 receive
6	Pink	RS232 TX	RS232 transmit
7	Blue	GND	Ground
8	Red	HS OUT 1	Select 1 from inspection complete, inspection result output (PASS / FAIL), alarm



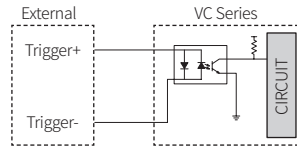
### ■ Ethernet connector cable (M12 8-pin-RJ45 connector, Socket - Female)

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-

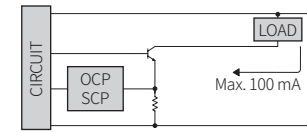


## Inner Circuit

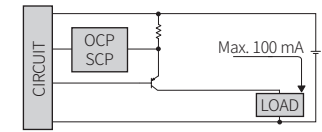
### ■ Trigger (TRIG) input



### ■ NPN open collector output



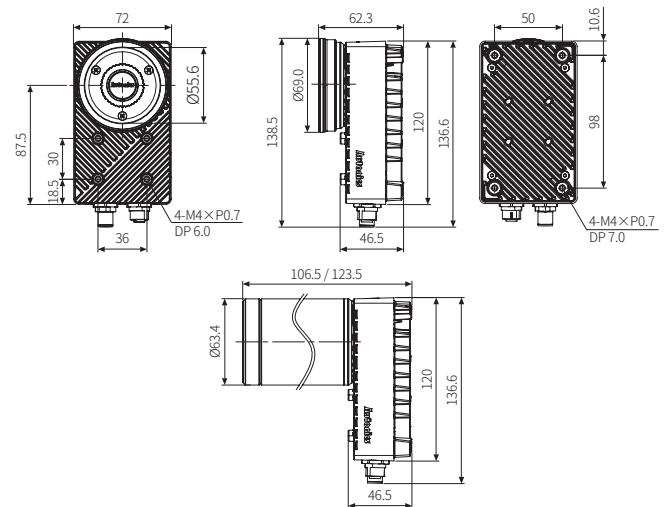
### ■ PNP open collector output



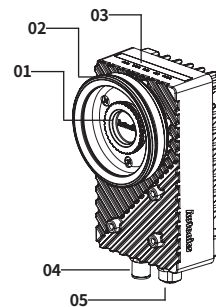
- OCP (over current protection), SCP (short circuit protection)
- If short-circuit the control output terminal or supply current over the rated specification, normal control signal is not output due to the output short over current protection circuit.

## Dimensions

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



## Unit Descriptions

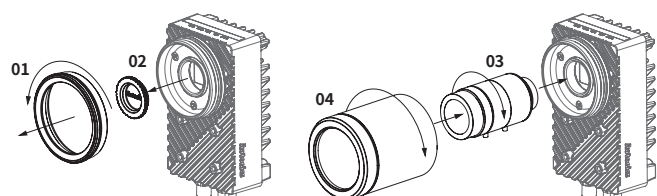


- 01. Sensor protective cap
- 02. Housing bushing cover
- 03. Status LED indicator
- 04. Power I/O connector
- 05. Ethernet connector

### ■ Indicator

Indicator	Name	Function
POWER	Power indicator (green)	Turns ON when power is supplied.
LINK	Ethernet connection indicator (green)	Turns ON when vision sensor is connected with PC (Ethernet communication).
DATA	Data transmit indicator (green)	Flashes when data is transmitted between smart camera and PC.
USER 1	User setting indicator (green / red)	Turns ON or flashes in operation of inspection complete, inspection result (PASS, FAIL), alarm, camera work
USER 2		

## 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

<b>Model</b>	<b>VC-M50T-CE</b>
<b>Image element</b>	1 inch mono CMOS
<b>Resolution</b>	5 MP (2,560 × 2,048)
<b>Frame per second</b>	16 fps <sup>01)</sup>
<b>Bit Depth</b>	8 bit (256 gray level)
<b>Shutter</b>	Global shutter
<b>Exposure time</b>	3 μs to 3 sec
<b>Lens type</b>	C-Mount
<b>eMMC</b>	8 GB
<b>DDR4</b>	2 GB (LPDDR4), 512 MB (DDR4)
<b>Inspection work group</b>	64 (simultaneous inspection: 32)
<b>Trigger mode</b>	Continuous, External Trigger, Manual, Ethernet, RS232
<b>Communication</b>	Ethernet (TCP/IP & Modbus, 10/100/1000Base-T), RS232C
<b>FTP trans. output</b>	YES
<b>Indicator</b>	Power, LINK, DATA, USER 1, USER 2
<b>Approval</b>	CE UK RoHS REACH ENEC
<b>Unit weight (packaged)</b>	≈ 600 g (≈ 780 g)

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

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

## Troubleshooting

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

Symptom	Troubleshooting
When supplying power, POWER LED 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.
Work is failed 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.
	Check the output wire is connected properly.
Work is failed due to the external output error.	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.
Unable to connect 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)

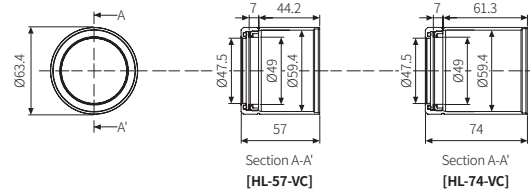
## Components: Ethernet Connector Cap

- Ethernet connector cap protects unused Ethernet connector from foreign substances. (tightening torque: 0.4 N m)






## Sold Separately: Waterproof Lens Cover

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



## 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	CLDM8-2-A
				5 m	•  EAC	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)	C1M8-2PR		
				5 m		C1M8-5PR		
				10 m		C1M8-10PR		
		M12 (Plug-Male) 8-pin, L type	RJ45	2 m	• TPE	C4M8-2PR		
				5 m		C4M8-5PR		
				10 m		C4M8-10PR		
		M12 (Plug-Male) 8-pin	RJ45	PVC	2 m		C18-2PR	
					5 m		C18-5PR	
					10 m		C18-10PR	
		M12 (Plug-Male) 8-pin, L type	RJ45	PVC	2 m		C48-2PR	
					5 m		C48-5PR	
					10 m		C48-10PR	
		M12 (Plug-Male) 8-pin	RJ45	PVC	2 m	• Drag chain type (5 million)	C1M8-2PR-A	
					5 m		C1M8-5PR-A	
					10 m		C1M8-10PR-A	
		M12 (Plug-Male) 8-pin, L type	RJ45	PVC	2 m	• IP65 / IP67 • PUR	C4M8-2PR-A	
					5 m	•  EAC	C4M8-5PR-A	
					10 m		C4M8-10PR-A	
		M12 (Plug-Male) 8-pin	RJ45	PVC	2 m	• IP65 / IP67 • PUR	C18-2PR-A	
					5 m			C18-5PR-A
					10 m			C18-10PR-A
		M12 (Plug-Male) 8-pin, L type	RJ45	PVC	2 m	•  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.