

# OMRON

## Model FJ-SCG2/SG2

Gigabit Ethernet 0.4 Megapixel Digital Camera

### INSTRUCTION SHEET

Thank you for selecting OMRON product. This sheet primarily describes precautions required in installing and operating the product. Before operating the product, read the sheet thoroughly to acquire sufficient knowledge of the product. For your convenience, keep the sheet at your disposal.

#### TRACEABILITY INFORMATION:

Importer in EU: OMRON Europe B.V., Wegalaan 67-69, NL-2132 JD Hoofddorp, The Netherlands  
Manufacturer: OMRON Corporation, Shioikoji Horikawa, Shimogyo-ku, Kyoto, 600-8530 JAPAN

The following notice applies only to products that carry the CE mark: Notice: This is a class A product. In residential areas it may cause radio interference, in which case the user may be required to take adequate measures to reduce interference.



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### PRECAUTIONS ON SAFETY

#### ● Meaning of signal words

**WARNING** Indicates a potentially hazardous situation which, if not avoided, will result in minor or moderate injury, or may result in serious injury or death. Additionally there may be significant property damage.

**CAUTION** Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury or in property damage.

#### ● Meanings of Alert Symbols

**WARNING** This product is not designed or rated for ensuring safety of persons. Do not use it for such purposes.

**CAUTION** Burn injury may occasionally occur. Do not touch while operating and immediately after turn-off.

### PRECAUTIONS FOR SAFE USE

Be sure to respect following items for safety.

#### 1. Power supply and wiring

- Supply power from a DC power supply that prevents the occurrence of high voltage (safety ultra-low voltage circuit). (Recommended product: S8VS-03012 (OMRON))
- Before wiring the camera cable (power supply and I/O), attach a crimping terminal. Do not directly connect the merely twisted wires to terminals.
- When supplying power from an external power source, the power supply voltage specified in this manual must be used.
- Do not connect the power supply with polarity reversed.
- Do not short-circuit load on the open collector output.
- Apply load not exceeding the rating.

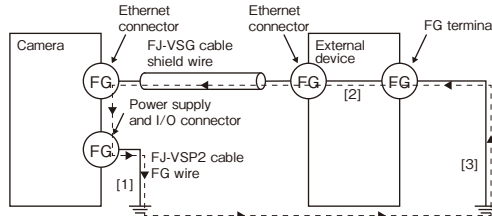
- Insulate unnecessary signal wires and avoid contact with the others. If the Output signal comes in contact with the Power\_IN signal, a failure may occur.
- After wiring the cables, confirm if the power supply is appropriate, if there is miswiring such as short-circuit of load, if the load current is appropriate, and if FG is connected appropriately. Otherwise, the product may be broken due to miswiring etc.
- When using a PoE-compliant device, it must conform to IEEE802.3af.
- Be sure to use an individual power supply for the product. Do not share the power supply with other products.

#### 2. Mounting the Camera

- Firmly tighten screws for mounting the Camera.
  - Tightening torque M3 screw: 0.54N·m
- To use this product in an environment where poorly ventilated or that exceeds the upper limit of the ambient environment temperature, take heat dissipation measures such as attaching it to a metal plate so that the surface temperature of the camera should be 64°C or less.
- Install the product so that excessive stress should not be applied to the camera cable. Otherwise the cable may be disconnected and proper measurement may not be possible.

#### 3. Grounding

- In order to prevent the product from becoming inoperable or malfunction, and to prevent other adverse effects to the performance or equipment, please observe the following.
- Perform the followings so that the outer shell of the power and I/O cable connector should be grounded.
  - The FG wire of the camera cable (power supply and I/O) must be JIS class-D grounded (ground resistance of 100Ω or less). [1]
  - The ground line should be short as much as possible.
  - Provide the grounding point dedicated to the camera cable (power and I/O). Sharing the grounding point or grounding to a pillar of the building may affect adversely.
- Perform the followings so that the outer shell of the Ethernet connectors should be grounded.
  - Make sure that the external device's Ethernet connector shell to which the camera cable (LAN) FJ-VSG (optional) is connected should be connected to the FG terminal of the external device. [2]
  - To connect the camera to an external device such as a laptop computer that does not have an FG terminal, do not connect the camera cable (LAN) directly to the device. Use an Ethernet hub for which the outer shell of its connector is connected to the FG terminal in between the device and the camera.
  - Be sure to ground the FG terminal of any external device to which the camera is connected. [3]
- Perform grounding so that the FG of the camera and that of the external device should be at the same potential. A potential difference may occur between the camera and the external device depending on the grounding method, and current may flow along the dotted path as shown below, resulting in a potential malfunction.



FG : Frame Ground

#### 4. Others

- Use only the dedicated camera cable. If the device is turned on with the non-dedicated product connected, the device may be damaged, causing high temperature.
- This product does not support camera-mount lighting controller (FL-TCC□□□□/FLV-TCC□□) and lighting (FL-MD□□□□/CMC). Do not connect to the connector for power supply and I/O connector on the back of the Camera.
- Do not try to disassemble, repair, or modify this product.
- When an abnormal condition occurs, immediately stop operation and turn off the product. Contact an OMRON's local office or sales office.
- When disposing the product, dispose it as industrial waste.

#### 5. Regulations and Standards

- This Camera conforms to the following standards.
  - EU Directive, 2014/30/EU
  - EN Standard (European standard) EN61326-1 (Electromagnetic environment : Industrial electromagnetic environment (EN/IEC 61326-1 Table 2))

### PRECAUTIONS FOR CORRECT USE

In order to prevent the product from becoming inoperable or malfunction, and to prevent other adverse effects to the performance or equipment, please observe the following.

#### 1. Installation Site

- Do not install the product in locations subjected to the following conditions:
  - Ambient temperature outside the rating
  - Rapid temperature fluctuations (causing condensation)
  - Relative humidity outside the range of 35 to 85%
  - Presence of corrosive or flammable gases
  - Presence of dust, salt, or metallic particles
  - A location not exposed to direct vibration or impact.

- Reflection of intense light (such as other laser beams or electric arc-welding machines)
  - A location not near a heating appliance or exposed to direct sunlight.
  - Water, oil, or chemical fumes or spray
  - A location not exposed to strong magnetic/electric fields.
  - A location not near a high-voltage device or power device.

#### 2. Connecting Cable

- Be sure to turn off the power before disconnecting the cables.
- To attach the camera cable (LAN) FJ-VSG (optional), tighten the fixing screws with the recommended torque (0.15N·m). Excessive force on the camera connector may cause malfunction.
- For information on specifications of Camera cable (power supply, I/O) FJ-VSP2 (sold separately), see the pin assignment table described later.
- When not using the Camera cable (power supply, I/O) FJ-VSP2 (sold separately), perform wiring so as not to be affected by other wiring or devices.
- Attach the accessory ferrite cores to both ends of the camera cable (power and I/O) FJ-VSP2 (optional).
- Do not use the camera cable longer than the specified length.

#### 3. Optical axis of the Camera

- The optical axis may vary product by product. Therefore, when installing the Camera, always check the center of the image displayed on the monitor. The optical axis of this product may vary over a couple of pixels due to the variation of ambient temperature because of the material characteristics.

#### 4. Maintenance

- If a large dust attaches to the image sensor, use the blower brush (for the camera lens) to blow it off. Do not blow it off with your exhaled air.
- Do not use thinner, alcohol, benzene, acetone, or kerosene to clean his product.
- When the lens is not being mounted, be sure to attach the C mount cap to the lens mounting part. If a dust attached to the image sensor, the product may sense incorrectly or be broken.
- If you do not use the power and I/O cable connector on the back of the camera, always attach the cap for the connector.
- Wipe off dirt on this product with a soft cloth gently.
- Before performing maintenance and/or checkup, always turn off the power. Failing to do so may result in electric shock.

#### 5. Image sensor

- For this product, a line may appear depending on the measurement condition or sensitivity because of the specification of the image sensor. However, this is not a fault or failure of the product. In addition, although there may be multiple defective pixels, this is not a fault or failure of the product. Use the product as confirming the actual image.

#### 6. Others

- Do not wrap the camera body with cloth during operation. Otherwise the temperature inside the camera may rise too high.
- The camera connection may be blocked by security software. In such a case, disable the security software temporarily and check if the camera connection is available or not.

### Accessories

Main unit, instruction sheet (this manual), General Compliance information and instructions for EU

### Specifications

#### ● General Specifications

Item	Model	FJ-SCG2/SG2
Power delivery	Camera cable (LAN)	Power over Ethernet(Conform to IEEE802.3af)
	Camera cable (power supply, I/O)	10.8 to 13.2 VDC
Power consumption		PoE: 4.7 W Power supply, I/O connector: 3.7 W
Vibration resistance		10 to 150 Hz: half-amplitude: 0.35 mm: (maximum acceleration: 50 m/s <sup>2</sup> ), 10 times each in X, Y, and Z directions for 8 min
Shock resistance		150 m/s <sup>2</sup> , 3 times each in 6 directions (up/down, left/right, forward/backward)
Ambient Temperature		Operating: 0 to 39°C, or 64°C or less at the top of the casing Storage: -20 to 70°C (with no icing or condensation)
Ambient humidity		Operating and storage: 35% to 85% (with no condensation)
Ambient environment		No corrosive gases
Degree of protection		IEC60529 IP30
Materials		Aluminum alloy
Cable length (LAN)		40m max. (using FJ-VSG(sold separately))
Cable length (power supply, I/O)		10m max. (using FJ-VSP2(sold separately))
Weight		Approx. 65 g
Minimum cable bending radius		FJ-VSG: 27.2 mm FJ-VSP2: 43.2 mm

#### ● Performance Specifications

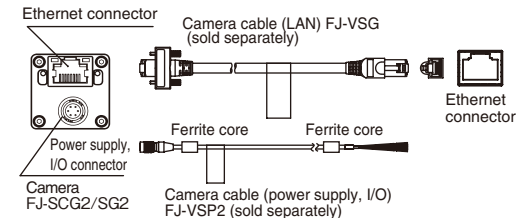
Model	FJ-SCG2	FJ-SG2
Effective pixels	1/2.9"CMOS(color)	1/2.9"CMOS(monochrome)
Scan mode	Progressive scan	
Shutter	Global shutter	
Effective pixels	720(H)×540(V)	
Pixel size	6.9(μm)×6.9(μm)	
Synchronization	Internal sync.	
Frame rate	282.8 fps	
Number of lines to be read	4 lines to 540 lines	
Gain	0 dB to 20.8dB	
Shutter speed	1μs to 16.777s	
Video output	Digital (8 bits)	
Trigger input	External trigger/software trigger (Ethernet)	
External output	Stroboscopic trigger/trigger ready (can be configured by software)	
I/F	Gigabit Ethernet (1 Gbit/s)	
Lens mounting	C mount	

### Connection

Before wiring, refer to "3. Grounding" in the Precautions for Safety.

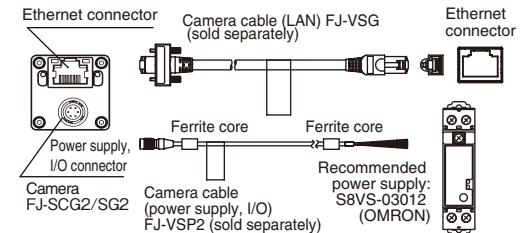
#### ● Power Supply: PoE

- (1) Using the Camera cable (LAN) FJ-VSG (sold separately), connect the connector on the back of the camera and the Ethernet connector of a device that conforms to PoE.
- (2) When using an I/O interface, connect the Camera cable (power supply, I/O) FJ-VSP2 (sold separately) to the 6-pin connector on the back of the Camera. Attach the accessory ferrite cores to both ends of the camera cable (power and I/O) beforehand.



#### ● Power Supply: External Power Source

- (1) Using the Camera cable (LAN) FJ-VSG (sold separately), connect the connector on the back of the Camera and the Ethernet connector of a device to be connected.
- (2) Connect the Camera cable (power supply, I/O) FJ-VSP2 (sold separately) to the 6-pin connector on the back of the Camera.
- (3) Supply power to the Power\_IN terminal and Power\_GND terminal of the Camera cable (power supply, I/O) FJ-VSP2 (sold separately). Attach the accessory ferrite cores to both ends of the camera cable (power and I/O) beforehand.

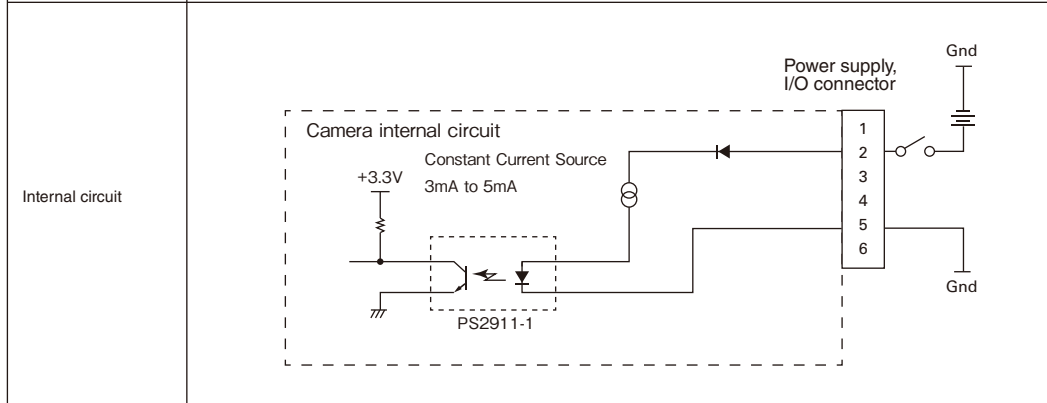


## Power Supply, I/O Interface

### I/O Specifications

#### Inputs (TRG)

Input voltage	3.3 to 24 VDC
ON current *1, *2	15 mA min.
ON voltage *1, *2	3.0 V min.
OFF current *1, *3	0.2 mA max.
OFF voltage *1, *3	1.0 V max.
ON delay	0.1 ms max.
OFF delay	0.1 ms max.



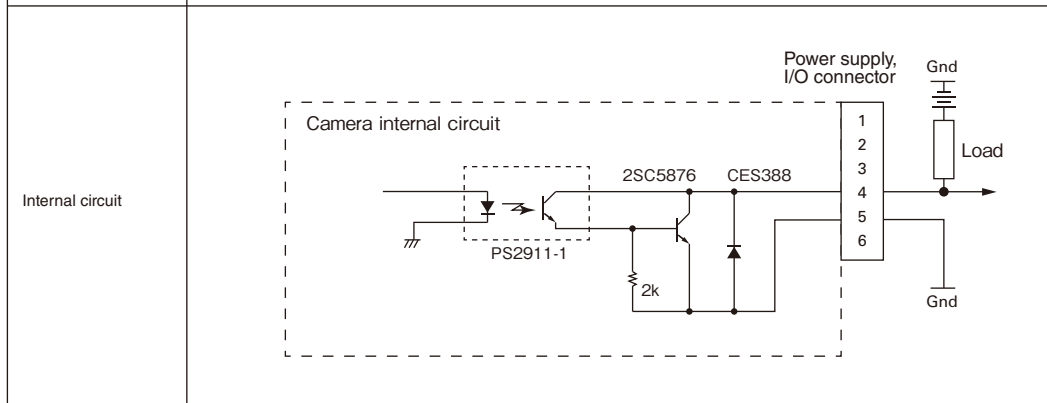
\*1 ON/OFF indicates the status of the photocopler installed inside the Camera.

\*2 ON current/ON voltage indicates the current value or voltage value to be turned OFF to ON. The value of ON voltage is the potential difference between the TRG and I/O\_GND terminals.

\*3 ON current/ON voltage indicates the current value or voltage value to be turned ON to OFF. The value of OFF voltage is the potential difference between the TRG and I/O\_GND terminals.

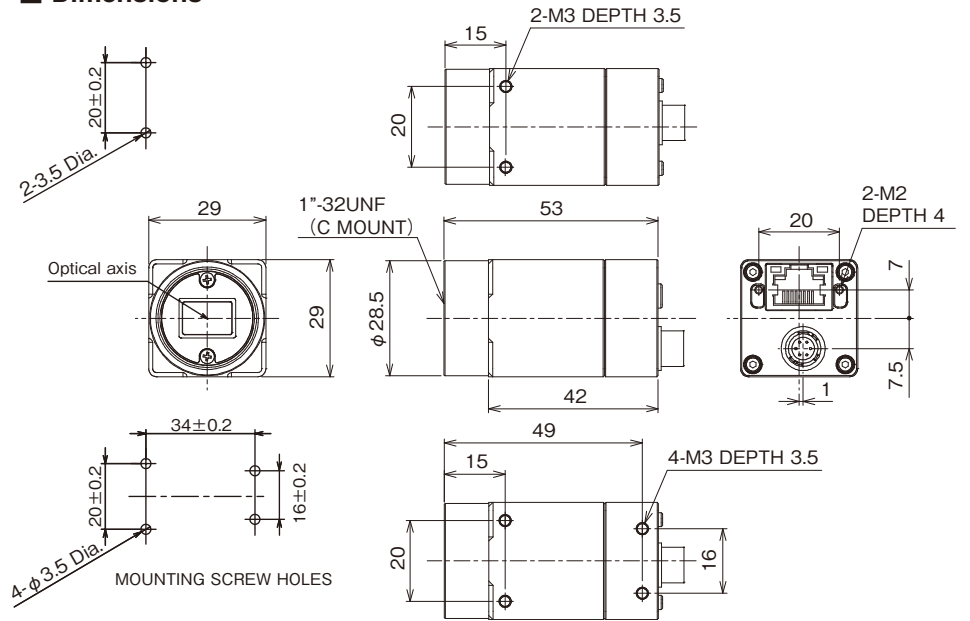
#### Outputs

Output voltage	3.3 to 24 VDC
Load current	50 mA max.
ON residual voltage *1	2.0V max.
OFF leakage current *1	0.2 mA max.



\*1 ON/OFF indicates the status of the photocopler installed inside the Camera.

## Dimensions



(Unit: mm)

## Pin Assignment

### Power Supply, I/O Connector

Pin	Signal name	Type	Function	FJ-VSP2 (sold separately) wire color(Thickness)	
1	Power_IN	Power	-	External power supply (12 V)	Brown(AWG20)
2	TRG	I/O	IN	Measurement trigger input	Gray(AWG28)
3	Reserve	-	-	Not used (avoid contact with other power supply, grounding, and signal wires)	Black(AWG28)
4	Frame Trigger Wait/Timer 0 Active	I/O	OUT	-Frame Trigger Wait: Turns ON while the trigger signal input is acceptable. -Timer 0 Active: For strobe trigger (Frame Trigger Wait is assigned by default. Can be changed to Timer 0 Active.)	Green(AWG28)
5	I/O_GND	I/O	-	Common for input and output signals	Red(AWG28)
6	Power_GND	Power	-	External power supply (0 V)	Blue(AWG20)
Shell	FG	Ground	-	Must be grounded.	White(AWG20)



Dispose of in accordance with WEEE Directive

### Suitability for Use

Omron Companies shall not be responsible for conformity with any standards, codes or regulations which apply to the combination of the Product in the Buyer's application or use of the Product. At Buyer's request, Omron will provide applicable third party certification documents identifying ratings and limitations of use which apply to the Product. This information by itself is not sufficient for a complete determination of the suitability of the Product in combination with the end product, machine, system, or other application or use. Buyer shall be solely responsible for determining appropriateness of the particular Product with respect to Buyer's application, product or system. Buyer shall take application responsibility in all cases.

NEVER USE THE PRODUCT FOR AN APPLICATION INVOLVING SERIOUS RISK TO LIFE OR PROPERTY WITHOUT ENSURING THAT THE SYSTEM AS A WHOLE HAS BEEN DESIGNED TO ADDRESS THE RISKS, AND THAT THE OMRON PRODUCT(S) IS PROPERLY RATED AND INSTALLED FOR THE INTENDED USE WITHIN THE OVERALL EQUIPMENT OR SYSTEM.

Pin	Data Signal Name
1	BI_DA+
2	BI_DA-
3	BI_DB+
4	BI_DC+
5	BI_DC-
6	BI_DD-
7	BI_DD+
8	BI_DD-

Yellow LED status Green LED status



## Indicator

### Ethernet Connector

Green LED status	Yellow LED status	State
Lit	Not lit	Power is ON (1 Gbps NIC)
Not lit	Not lit	Power is ON (100 Mbps NIC)
Lit	Flashing	Transferring at 1 Gbps
Not lit	Flashing	Transferring at 100 Mbps

### OMRON Corporation Industrial Automation Company

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