



OMRON

Model **FQ-CR□**

Fixed Mount Code Reader

## 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  
2132 JD Hoofddorp,  
The Netherlands

Manufacturer:  
Omron Corporation,  
Shiokoji 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.

- Regulation of KC marking  
Please see the following URL for Korean KC mark compliance information.  
<http://www.rra.go.kr/selfform/OMR-FQ-CR1>  
<http://www.rra.go.kr/selfform/OMR-FQ-CR2>

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## SAFETY PRECAUTIONS

### ● Keys to Warning Symbols

**⚠ WARNING** Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury. Additionally, there may be severe property damage.

### ● Warning Symbols

#### ⚠ WARNING

The Sensor emits visible light which may on rare occasions have a harmful effect on the eyes. Do not look directly at the light emitted by the sensor. If the light projects onto a reflective surface, prevent the reflected light from entering a person's eyes.



## Precautions for Safe Use

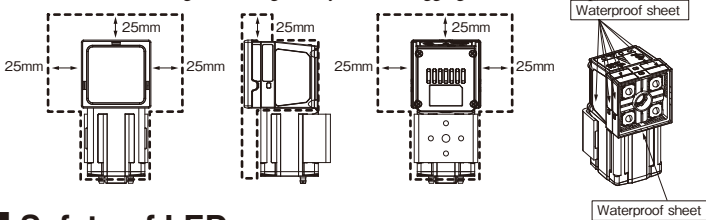
Always follow the rules below to ensure safety.

- Installation environment  
Do not use in a location where there is flammable or explosive gas.  
To ensure safe operation and maintenance, install away from high-voltage equipment and power equipment.  
Tighten the mounting screws to the torque specified in these instructions.
- Power and cable connections  
Always turn off the power of the unit before connecting or disconnecting cables.  
Do not reverse the polarity of the power connection. Do not short the load of the open collector output.  
Wire this product separately from the wiring of high-voltage wires and power wires. If wired together or in the same conduit, induction may occur and cause malfunctioning or damage.  
Use a load that is equal to or less than the rating.  
Use the specified power voltage.  
Use the specified size of crimp terminals for wiring connections. Do not connect wires that have been simply twisted together directly to the power supply or terminal block.  
Supply power from a DC power supply for which measures have been applied to prevent high voltages (e.g., a safety extra low voltage circuit).  
If UL certification is required for the overall system, use a UL Class II DC power supply.  
Use an independent power source for this product. Do not use a shared power source.
- Handling  
Do not peel off or damage the waterproof sheet attached to the side of the unit. Doing so may result in dirt, dust or water droplet entering inside the device, causing a failure of the unit.  
Always attach the covers of I/O cable connector and Ethernet cable connector. This prevents extraneous material from making a failure of the sensor.
- Other Rules  
Do not use in safety circuits for atomic energy or that are critical for human life.  
Do not attempt to disassemble, deform by pressure, incinerate, repair, or modify this product.  
Use the dedicated touch finder (FQ□-D□), cable (FQ-WN, FQ-WD). Sensor malfunction or damage may occur if any other devices or cables are used.  
When disposing of the product, treat as industrial waste.  
If you notice an abnormal condition such as a strange odor, extreme heating of the unit, or smoke, immediately stop using the product, turn off the power, and consult your dealer.  
The device surface becomes hot during use. Do not touch.

## Precautions for Correct Use

Observe the following to prevent failure, malfunctioning, and adverse effects on performance and the device.

- Installation site  
Do not install in the following locations:  
Locations where the ambient temperature exceeds the rated temperature range.  
Locations subject to sudden temperature changes (where condensation will form).  
Locations where the relative humidity is below or above 35 to 85% RH.  
Locations where there are corrosive or flammable gases.  
Locations where there is dust, salt, or iron powder.  
Locations where the device will be subject to direct vibration or shock.  
Locations where there is strong scattered light (laser light, arc welding light, ultraviolet light, etc.)  
Locations exposed to direct sunlight or next to a heater.  
Locations where there is splashing or spraying of water, oil, or chemicals.  
Locations where there is a strong electrical or magnetic field.
- Power and cable connections  
When using a switching regulator, ground the FG pin of the switching regulator.  
If there are surges on your power line, connect a surge absorber as appropriate for your conditions of use.  
Before turning on the power after the wiring is completed, verify that the power is correct, that there are no incorrect connections such as a shorted load circuit, and that the load current is suitable. Incorrect wiring may cause damage and failures.
- Optical axis and detection range  
There is a certain amount of deviation among sensors in the center of the optical axis. For this reason, when installing the sensor, be sure to check the center of the image and the detection range in the LCD monitor of the Touch Finder and in the sensor software.
- Focus adjustment knob  
Do not turn the focus adjustment knob to higher than 0.1 N m. This may cause damage.
- Maintenance and inspection  
Do not use thinner, alcohol, benzene, acetone, or kerosene to clean the sensor or Touch Finder.  
If considerable foreign matter or dust collects on the panel on the front of the sensor, use a blower brush (for camera lenses) to blow off the foreign matter. Avoid blowing it off with your breath.  
For a small amount of foreign matter or dust, gently wipe with a soft cloth. Do not wipe hard.  
If the surface is damaged, false detection may result.
- Defective pixel  
It is neither a defect of the product nor a breakdown though two or more defective pixels might be included in this product by the specification of CMOS image sensor.
- Installation of camera  
In the environment with high humidity and intense temperature change, the inside of a front plate might uncommonly become cloudy.  
Do not install an object (except for the dedicated mounting bracket) inside the dotted areas shown on the under figures. Doing so may result in fogging inside the front plate.

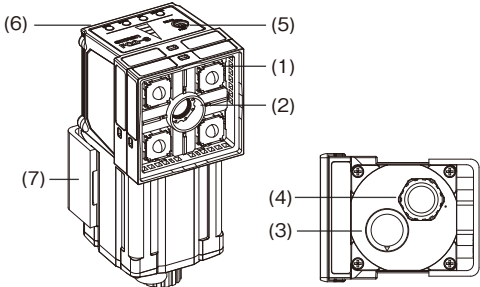


## ■ Safety of LED

The product is considered to be classified as Risk Group 2 by IEC62471.

| CAUTION                                                        |
|----------------------------------------------------------------|
| Possibly hazardous optical radiation emitted from this product |
| <b>Risk Group 2<br/>IEC 62471</b>                              |

## ■ Part Names and Functions



| No. | Name                     | Description                                                                                                                                                                                                             |
|-----|--------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| (1) | Lighting                 | LEDs for illumination are mounted here.                                                                                                                                                                                 |
| (2) | Camera lens              | Lens with a focus feature.                                                                                                                                                                                              |
| (3) | I/O Cable connector      | An I/O Cable is used to connect the Sensor to the power supply and external devices. Dedicated I/O cable: FQ-WD                                                                                                         |
| (4) | Ethernet cable connector | An Ethernet cable is used to connect the Sensor to the Touch Finder or a computer. Dedicated Ethernet cable: FQ-WN                                                                                                      |
| (5) | Focus adjustment screw   | Used to adjust the focus of the image.                                                                                                                                                                                  |
| (6) | Operation indicators     | OR Lights orange when the total judgment output (OR) signal is ON.<br>ETN Lights orange during communication by Ethernet.<br>ERROR Lights red when an error occurs.<br>BUSY Lights green while the sensor is operating. |
| (7) | Mounting Bracket         | Used to secure the Sensor in place. The Mounting Bracket can be attached to the front, left side, right side, or back of the Sensor.                                                                                    |

## ■ Power connection(when a switching regulator is connected)

The following power supply is recommended (option)

| Item                                  | Description                     |
|---------------------------------------|---------------------------------|
| Recommended Power Supply              | S8VS-06024 (OMRON 24VDC 2.5A)   |
| External power supply terminal screws | M4 (tightening torque: 1.2 N·m) |

## ■ Ratings/Performance

| Item                                | Fixed Mount Multi Code Reader                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Fixed Mount 2D Code Reader                                                                                                                                |
|-------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|
| Model                               | NPN FQ-CR10□□□□-M<br>PNP FQ-CR15□□□□-M                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | FQ-CR20□□□□-M<br>FQ-CR25□□□□-M                                                                                                                            |
| Field of view/installation distance | Refer to the optical diagram (listed in the User's Manual).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                           |
| Main functions                      | Inspection items Bar code (JAN/EAN/UPC, Code39, Codabar (NW-7), ITF (Interleaved 2 of 5), Code 93, Code128/GS1-128, GS1 DataBar* (Truncated, Stacked, Omni-directional, Stacked Omni-directional, Limited, Expanded, Expanded Stacked), Pharmacode, GS1-128 Composite Code (CC-A, CC-B, CC-C), 2D code (Data Matrix (ECC200), QR Code, MicroQR Code, PDF417, MicroPDF417)<br>Number of simultaneous inspections 32<br>Position compensation Supported (Correcting rotational position and edge position)<br>Number of registered scenes *3 32<br>Retry function —                                                        | 2D code (compatible code: Data Matrix ECC200 from 10 x 10 to 64 x 64, 8 x 18 to 16 x 48, QR Code model 1 and 2 from 21 x 21 to 57 x 57 (version 1 to 10)) |
| Image input                         | Image processing method Monochrome<br>Image filter High dynamic range (HDR) polarizing filter (attachment)<br>Image elements 1/3-inch monochrome CMOS<br>Shutter 1/250~1/32258 (sec)<br>Processing resolution 752(H) x 480(V)<br>Partial capture function Available (horizontal and vertical directions)                                                                                                                                                                                                                                                                                                                 | High dynamic range (HDR) polarizing filter (attachment), and smoothing, expansion, reduction, median                                                      |
| Illumination                        | Illumination method Pulse illumination<br>Illumination color White                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                           |
| Auxiliary Functions                 | Operations (four arithmetic operations, enumeration function, trigonometric function, logic function)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | —                                                                                                                                                         |
| Data logging                        | Measurement data In Sensor: 1,000 Items (If a Touch Finder is used, results can be saved up to the capacity of an SD card.)<br>Images In Sensor: 20 Images (If a Touch Finder is used, images can be saved up to the capacity of an SD card.)                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                           |
| Measurement trigger                 | External trigger (single or continuous).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                           |
| I/O specifications                  | Input signals 7 signals: Single measurement input (TRIG), Control Command Input (IN0 to IN5)<br>Output signals 3 signals *1: Control output (BUSY), overall judgment output (OR), error output (ERROR)<br>Ethernet specifications 100Base-TX/10Base-T Numerical output, control command compatible (Non-procedural communications)<br>Input specifications Refer to *2.<br>Output specifications<br>Connection method Special connector cables<br>For power supply, I/O : 1 (FQ-WD□□□) Touch Finder and computer: 1 cable (FQ-WN□□□)                                                                                     |                                                                                                                                                           |
| Indicator                           | BUSY indicator (BUSY/green), Judgment results indicator (OR/orange), ERROR indicator (ERROR/red), Ethernet communication indicator(ETN/orange)                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                           |
| Ratings                             | Power supply voltage 21.6 to 26.4 VDC (including ripple)<br>Insulation resistance Between all lead wires and case: 0.5 MΩ (at 250 V)<br>Current consumption 2.4A MAX                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                           |
| Environmental immunity              | Ambient temperature range Operating: 0 to 50°C Storage: -25 to 65°C (no icing or condensation)<br>Ambient humidity range Operating and storage: 35% to 85% (with no condensation)<br>Ambient atmosphere No corrosive gas<br>Vibration resistance(destructive) 10 to 150 Hz, single amplitude: 0.35 mm in 3 directions (X, Y and Z), 10 sweeps each (8 min/sweep)<br>Shock resistance (destructive) 150m/s <sup>2</sup> 3 times each in 6 directions (up/down, left/right, forward/backward)<br>Degree of protection IEC 60529 IP67(except when the polarizing filter attachment is mounted or connector cap is removed). |                                                                                                                                                           |
| Materials                           | Sensor: PBT,PC,SUS Mounting bracket: PBT,brass,sponge rubber(EPDM)<br>Deflection filter attachment: PBT, PC<br>Ethernet connector: Oil resistant vinyl compound I/O connector: Lead free heat resistant PVC                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                           |
| Weight                              | 200 g max.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                           |
| Accessories                         | · Mounting bracket (FQ-XL) x1<br>· Deflection filter attachment (FQ-XF1) x1<br>· Instruction manual (This Instruction Sheet)<br>· SYSMAC membership registration sheet                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                           |
| LED Safety                          | Risk Group 2 (IEC62471)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                           |

\*1. The three output signals can be allocated for the judgments of individual inspection items.  
\*2. The following table gives the I/O specifications.

| Item                  | NPN                                                                           | PNP                                                                                                                  |
|-----------------------|-------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------|
| Input specifications  | ON: Shorted to 0 V, or 1.5 V max.<br>OFF: Open (leakage current: 0.1 mA max.) | ON: Shorted to power supply voltage, or power supply voltage -1.5 V max.<br>OFF: Open (leakage current: 0.1 mA max.) |
| Output specifications | NPN open collector<br>30 VDC, 50 mA max., residual voltage: 1.2 V max.        | PNP open collector<br>30 VDC, 50 mA max., residual voltage: 1.2 V max.                                               |

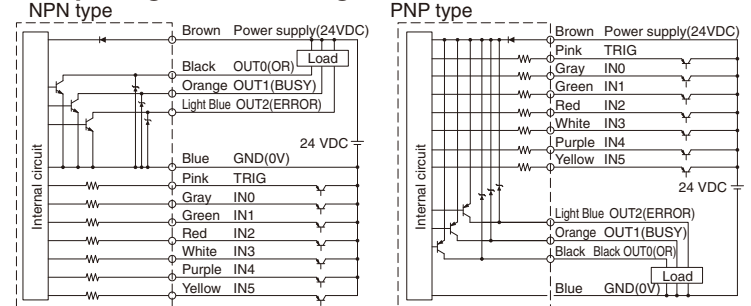
\*3. All scene may not be possible to be registered according to some settings.

### ● Connection with external devices

Use only the dedicated external connecting devices.

|                                      | Model    | Name           |
|--------------------------------------|----------|----------------|
| Dedicated external connecting device | FQ□-D□□  | Touch finder   |
|                                      | FQ-WD□□□ | I/O cable      |
|                                      | FQ-WN□□□ | Ethernet cable |

### ■ Input signal circuit diagram



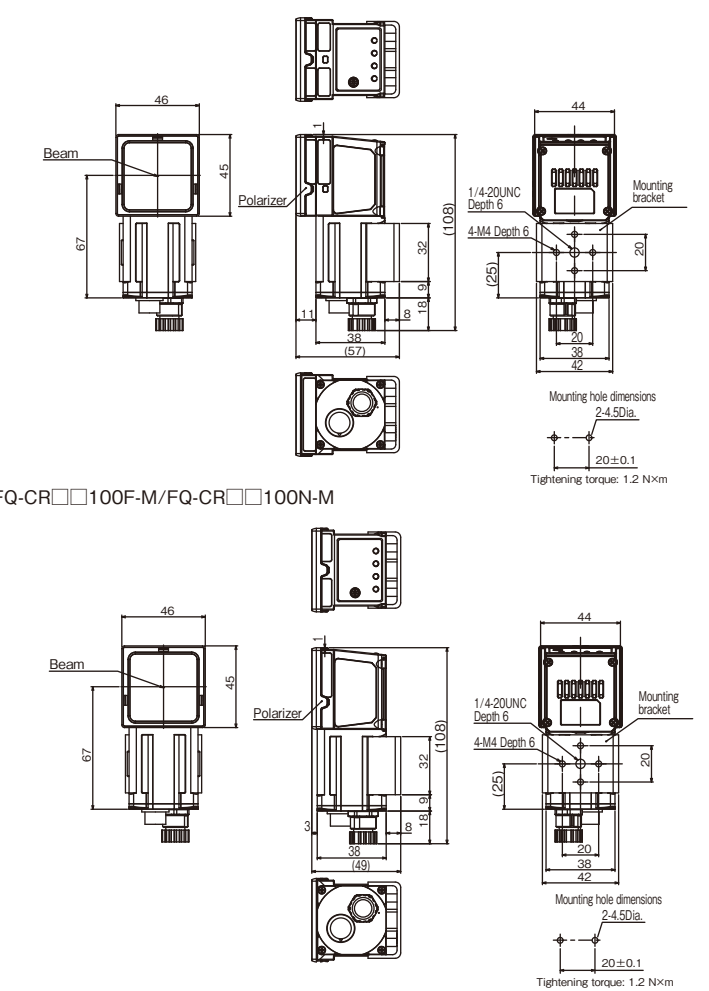
#### Important

Measures to prevent chattering  
Although the sensor has a chatter prevention function, an incorrect input by chattering cannot be prevented when chattering of 100 us or more occurs. (An input signal of less than 100 us is ignored, and 100 us or more is judged as an input signal.)  
Be sure to use a non-contact relay (SSR, PLC transistor output) for input signals. Using a relay with contacts may allow for additional trigger inputs during measurement due to a bound of the contacts.

## ■ Dimensions

\* Dimension diagram with mounting bracket (rear-side attachment) and polarizing filter attachment is shown.

(Unit: mm)



### 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.

**OMRON Corporation** Industrial Automation Company  
Kyoto, JAPAN Contact: [www.ia.omron.com](http://www.ia.omron.com)

#### Regional Headquarters

■ **OMRON EUROPE B.V.**  
Wegalaan 67-69, 2132 JD Hoofddorp  
The Netherlands  
Tel: (31)2356-81-300/Fax: (31)2356-81-388

■ **OMRON ELECTRONICS LLC**  
2895 Greenspoint Parkway, Suite 200  
Hoffman Estates, IL 60169 U.S.A.  
Tel: (1) 847-843-7900/Fax: (1) 847-843-7787

■ **OMRON ASIA PACIFIC PTE. LTD.**  
438B Alexandra Road, #08-01/02 Alexandra  
Technopark, Singapore 119968  
Tel: (65) 6835-3011 / Fax: (65) 6835-3011

■ **OMRON (CHINA) CO., LTD.**  
Room 2211, Bank of China Tower,  
200 Yin Cheng Zhong Road,  
PuDong New Area, Shanghai, 200120, China  
Tel: (86) 21-6023-0333 / Fax: (86) 21-5037-2388

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