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OMRON

# FQ-M VISION SENSOR

## Designed for motion tracking



» A new dimension in pick and place

» Fast & precise positioning

» Easy set-up and integration

realizing

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# Smart camera to guide your robot!

*The new FQ-M series is a vision sensor designed specifically for Pick & Place applications. It comes with EtherCAT embedded and can be integrated easily into any environment. The FQ-M is compact, fast and includes an incremental encoder input for easy tracking calibration. Omron's Sysmac Studio software is the perfect tool for configuring the FQ-M and is complemented by the TouchFinder console for on-site monitoring.*

## Key features and benefits

- Made specifically for pick & place applications
- Encoder input for conveyor tracking and calibration
- Shape based object detection
- Smart calibration wizard
- Sysmac Studio software for vision system operation and setting

### Easy set-up & integration

With intelligent wizards for calibration and communication integration into your machine is easier than ever.
The FQ-M communicates with all devices via EtherCAT, or standard Ethernet. The communication wizard lets you easily configure any robot protocol both as a server or as a client without complex programming.

### Fast detection & high stability

The FQ-M can detect up to 32 pieces at once and more than 5000 pieces per minute. The new contour based search algorithm ensures the highest reliability.

### „On-the-fly" tracking

Synchronized control is even easier, because the FQ-M vision sensor has an in-built encoder input for accurate conveyor tracking and easy calibration. The FQ-M is able to output position coordinates and the correlative encoder values and is able to manage the object queue, so that no object's coordinates are duplicated.



EtherCAT®

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# Easy set-up & integration with motion







## Programable out put format for your pick & place robot

Configuration as a server or as a client without complex programming.



## Sysmac Studio for fast configuration

The Vision Editor of the Sysmac Studio software will help you to program the optimum vision setting. Intuitive and icon driven set-up and configuration.

Ethernet

EtherCAT



Machine control



## TouchFinder for monitoring on-site

With the intuitive TouchFinder console – which fits in the palm of your hand – you can access all functions and settings quickly and easily.

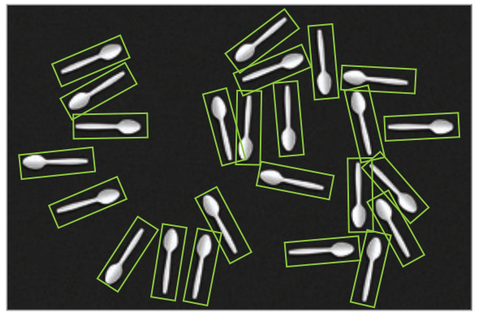
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# Fast detection and high stability

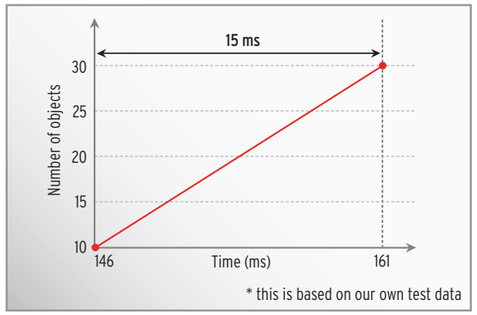
The new contour based search algorithm offers unique performance for pick & place applications. Changing lighting conditions, reflection, object inclination or partially hidden objects are no longer a problem. The FQ-M delivers a stable result even at high speed, no matter how many objects have to be detected at the same time.

## Best in class performance

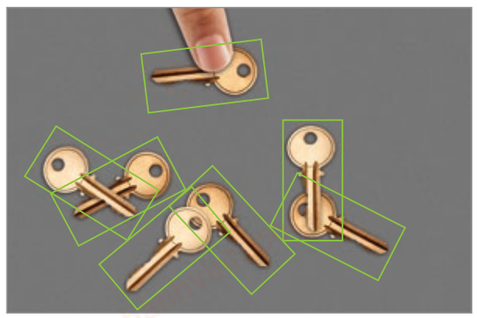


### High-speed processing

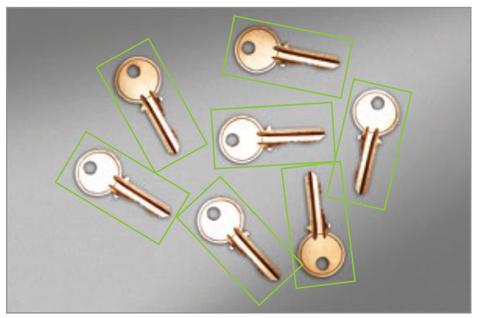
5000 pcs/min with 360° detection.




Only 15 ms time difference, detecting 10 objects or 30 objects at once.



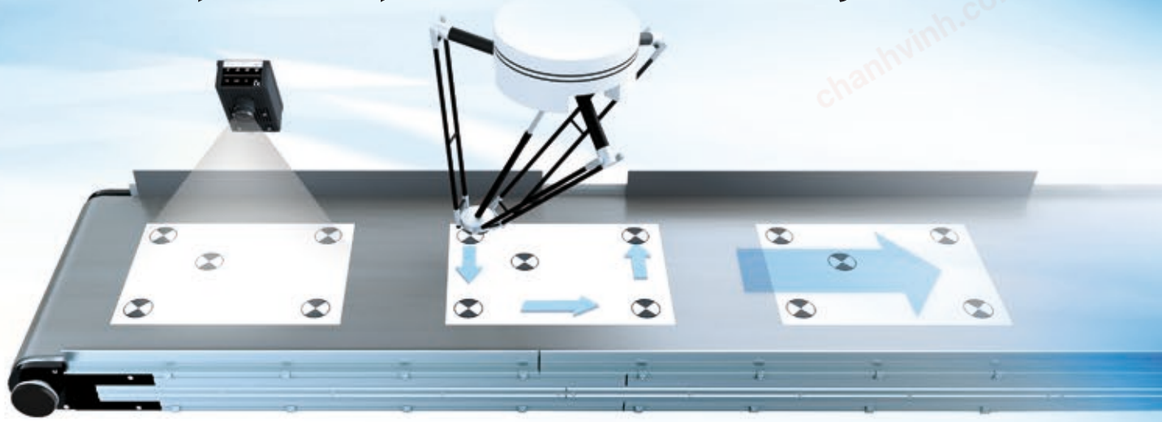
Stable and reliable detection, even if objects are overlapped or partially hidden.



Changing light conditions have no influence on the position accuracy.



# Encoder input for simplified calibration & tracking



### Step 1 – camera

Camera detects all calibration marks.

### Step 2 – robot

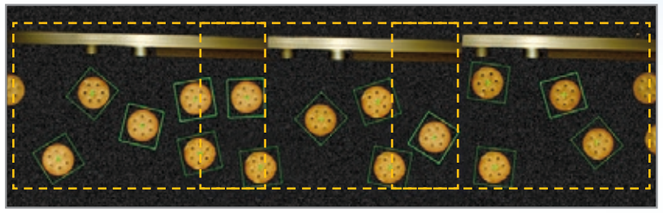
Robot moves to the calibration marks. The offset to the camera is registered through the encoder value.

### Step 3 – system

Camera, conveyor, robot and encoder are automatically aligned.

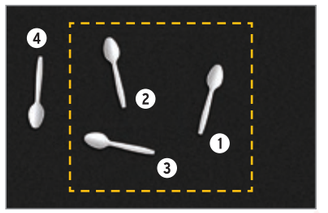
## Panorama view – Parameter setting for ideal object detection

A panoramic view can be created from 3 different images, allowing easy parameter optimisation.



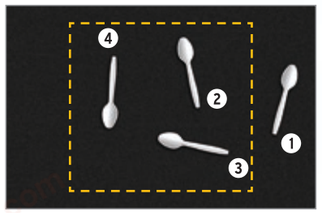
**First shot** **Second shot** **Third shot**

Objects that overlap within more than one field of view are segregated and only inserted in the picking queue once.




**First shot**

The position and orientation of objects 1, 2 and 3 is detected and added to the picking queue.




**Next shot**

Object 2, 3 and 4 are detected, but only the data of object 4 is evaluated. Position and orientation of objects 2 and 3 is ignored because they were already added to the queue with the shot before.

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Vision Sensor

# FQ-M-Series

## Designed for motion tracking

- Connectivity with EtherCAT/Ethernet
- Up to 5000 pieces per minute with 360 degree rotation*
- Vision sensor with encoder input for tracking function
- Calibration function of the complete system
- Flexible data output depending on the output devices

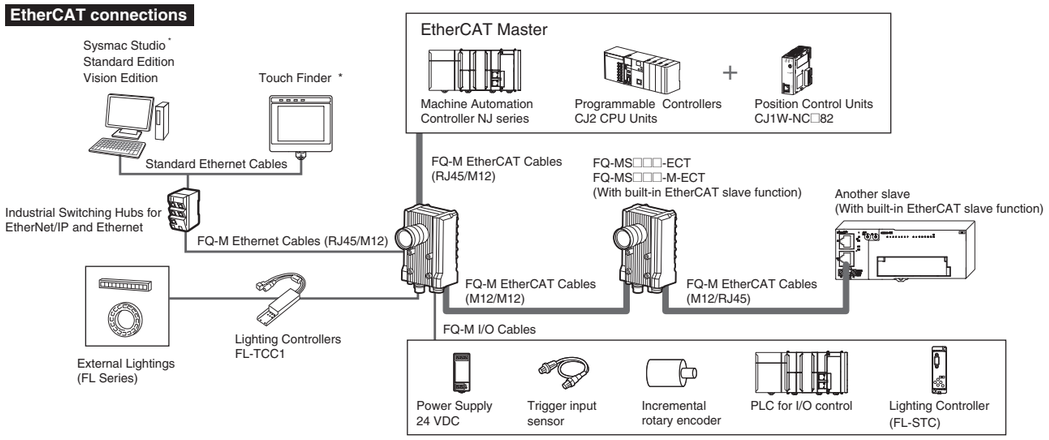
* The processing speed depends on setting conditions.





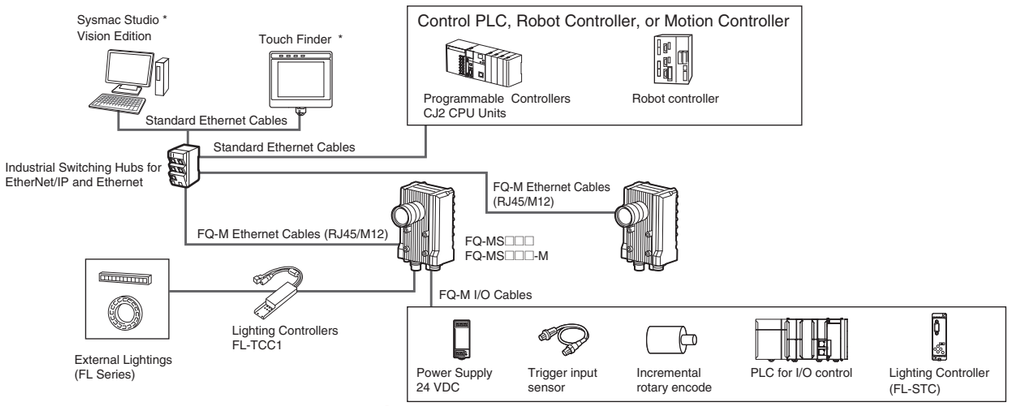
## System configuration

**EtherCAT connections**




* Sysmac Studio and Touch Finder can not be used together. When both are connected, Sysmac Studio will have a priority.
When you use the Sysmac Studio Standard Edition and connect the FQ series and the Machine Automation Controller NJ-series, connect them with a general-purpose Ethernet cable or a USB cable.

**No-protocol Ethernet and PLC Link Connections**




* Sysmac Studio and Touch Finder can not be used together.
When both are connected, Sysmac Studio will have a priority.

**Note: 1.** EtherCAT and Ethernet (PLC Link) can not be used simultaneously.
**2.** It is not possible to configure and adjust the FQ-M via an NJ-series controller, when they are connected via an EtherCAT network. For configuration and adjustment of FQ-M, connect the FQ-M and a computer or a Touch Finder via an Ethernet network.

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Windows is registered trademarks of Microsoft Corporation in the USA and other countries.
EtherCAT® is registered trademark and patented technology, licensed by Beckhoff Automation GmbH, Germany.
Other company names and product names in this document are the trademarks or registered trademarks of their respective companies.





# Ordering Information

## Sensors

| Appearance | Type | | | Model |
|---|---|---|---|---|
|  | Color | NPN | EtherCAT communication function not provided | FQ-MS120 |
| | | PNP | | FQ-MS125 |
| | Monochrome | NPN | | FQ-MS120-M |
| | | PNP | | FQ-MS125-M |
| | Color | NPN | EtherCAT communication function provided | FQ-MS120-ECT |
| | | PNP | | FQ-MS125-ECT |
| | Monochrome | NPN | | FQ-MS120-M-ECT |
| | | PNP | | FQ-MS125-M-ECT |

## Automation Software Sysmac Studio

Please purchase a DVD and required number of licenses the first time you purchase the Sysmac Studio. DVDs and licenses are available individually. Each model of licenses does not include any DVD.

| Product name | Specifications | Number of licenses | Media | Model | Standards |
|---|---|---|---|---|---|
| **Sysmac Studio Standard Edition Ver.1.□□ *2** | The Sysmac Studio provides an integrated development environment to set up, program, debug, and maintain NJ-series Controllers and other Machine Automation Controllers, as well as EtherCAT slaves.<br><br>Sysmac Studio runs on the following OS.<br>Windows XP (Service Pack 3 or higher, 32-bit version) / Vista (32-bit version)/7 (32-bit/64-bit version)<br><br>The Sysmac Studio Standard Edition DVD includes Support Software to set up EtherNet/IP Units, DeviceNet slaves, Serial Communications Units, and Support Software for creating screens on HMIs (CX-Designer).<br>For details, refer to the Sysmac Integrated Catalogue (P072). | --- (Media only) | DVD | **SYSMAC-SE200D** | --- |
| | | 1 license *1 | --- | **SYSMAC-SE201L** | --- |
| **Sysmac Studio Vision Edition Ver.1.□□** | Sysmac Studio Vision Edition is a limited license that provides selected functions required for Vision Sensor FQ-M settings. Because this product is a license only, you need the Sysmac Studio Standard Edition DVD media to install it. | 1 license | --- | **SYSMAC-VE001L** | --- |

*1 Multi licenses are available for the Sysmac Studio (3, 10, 30, or 50 licenses).
*2 The FQ-M series is supported by Sysmac Studio version 1.01 or higher.

## Touch Finder

| Appearance | Type | Model |
|---|---|---|
|  | DC power supply | **FQ-MD30** |
| | AC/DC/battery * | **FQ-MD31** |

* AC Adapter and Battery are sold separately.

## Bend resistant Cables for FQ-M Series

| Appearance | Type | | Model |
|---|---|---|---|
|  | For EtherCAT and Ethernet cable<br>Angle: M12/ Straight: RJ45 | Cable length: 5 m | **FQ-MWNL005** |
| | | Cable length: 10 m | **FQ-MWNL010** |
|  | For EtherCAT and Ethernet cable<br>Straight type (M12/RJ45) | Cable length: 5m | **FQ-WN005-E** |
| | | Cable length: 10 m | **FQ-WN010-E** |
|  | For EtherCAT cable<br>Angle type (M12/M12) | Cable length: 5 m | **FQ-MWNEL005** |
| | | Cable length: 10 m | **FQ-MWNEL010** |
|  | For EtherCAT cable<br>Straight type (M12/M12) | Cable length: 5m | **FQ-MWNE005** |
| | | Cable length: 10 m | **FQ-MWNE010** |

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| Appearance | Type | | | Model |
|---|---|---|---|---|
|  | I/O Cables | Angle type | Cable length: 5 m | **FQ-MWDL005** |
| | | | Cable length: 10 m | **FQ-MWDL010** |
|  | | Straight type | Cable length: 5 m | **FQ-MWD005** |
| | | | Cable length: 10 m | **FQ-MWD010** |

## Accessories

| Appearance | Type | | Model |
|---|---|---|---|
|  | For Touch Finder | Panel Mounting Adapter | **FQ-XPM** |
|  | | AC Adapter<br>(for models for DC/AC/Battery) | **FQ-AC□** * |
|  | | Battery<br>(for models for DC/AC/Battery) | **FQ-BAT1** |
|  | | Touch Pen<br>(enclosed with Touch Finder) | **FQ-XT** |
|  | | Strap | **FQ-XH** |
|  | | SD Card (2 GB) | **HMC-SD291** |

* AC Adapters for Touch Finder with DC/AC/Battery Power Supply. Select the model for the country in which the Touch Finder will be used.

| Plug type | Voltage | Certified standards | Model |
|---|---|---|---|
| A | 125 V max. | PSE | **FQ-AC1** |
| | | UL/CSA | **FQ-AC2** |
| | 250 V max. | CCC mark | **FQ-AC3** |
| C | 250 V max. | --- | **FQ-AC4** |
| BF | 250 V max. | --- | **FQ-AC5** |
| O | 250 V max. | --- | **FQ-AC6** |

## Industrial Switching Hubs for EtherNet/IP and Ethernet

| Appearance | Number of ports | Failure detection | Current consumption | Model |
|---|---|---|---|---|
|  | 3 | None | 0.22 A | **W4S1-03B** |
|  | 5 | None | 0.22 A | **W4S1-05B** |
| | | Supported | | **W4S1-05C** |

**Note:** Industrial switching hubs are cannot be used for EtherCAT.

## EtherCAT junction slaves

| Appearance | Number of ports | Power supply voltage | Current consumption | Model |
|---|---|---|---|---|
|  | 3 | 20.4 to 28.8 VDC<br>(24 VDC -15 to 20%) | 0.08 A | **GX-JC03** |
|  | 6 | | 0.17 A | **GX-JC06** |

**Note: 1.** Please do not connect EtherCAT junction slave with OMRON position control unit, Model CJ1W-NC□81/□82.
**2.** EtherCAT junction slaves cannot be used for EtherNet/IP and Ethernet.

## Cameras peripheral devices

| Type | | Model |
|---|---|---|
| Cameras peripheral devices | CCTV Lenses | **3Z4S-LE Series** |
| External Lightings | | **FL Series** |
| Lighting Controllers | For FL Series | **FL-TCC1** |





# Specifications

## Sensors

| Item | | Type | EtherCAT communication function not provided | | EtherCAT communication function provided | |
|---|---|---|---|---|---|---|
| | | | Color | Monochrome | Color | Monochrome |
| **Model** | **NPN** | | FQ-MS120 | FQ-MS120-M | FQ-MS120-ECT | FQ-MS120-M-ECT |
| | **PNP** | | FQ-MS125 | FQ-MS125-M | FQ-MS125-ECT | FQ-MS125-M-ECT |
| **Field of vision, Installation distance** | | | Selecting a lens according to the field of vision and installation distance. Refer to the *"Optical Chart"* page. | | | |
| **Main functions** | **Inspection items** | | Shape search, Search, Labeling, Edge position | | | |
| | **Number of simultaneous inspections** | | 32 | | | |
| | **Number of registered scenes** | | 32 | | | |
| **Image input** | **Image processing method** | | Real color | Monochrome | Real color | Monochrome |
| | **Image elements** | | 1/3-inch color CMOS | 1/3-inch monochrome CMOS | 1/3-inch color CMOS | 1/3-inch monochrome CMOS |
| | **Image filter** | | High dynamic range (HDR) and white balance | High dynamic range (HDR) | High dynamic range (HDR) and white balance | High dynamic range (HDR) |
| | **Shutter** | | Electronic shutter; select shutter speeds from 1/10 to 1/30000 (sec) | | | |
| | **Processing resolution** | | 752 (H) × 480 (V) | | | |
| | **Pixel size** | | 6.0 (μm) × 6.0 (μm) | | | |
| | **Frame rate (image read time)** | | 60fps (16.7ms) | | | |
| **External Lightings** | **Connecting method** | | Connection via a strobe light controller | | | |
| | **Connectable lighting** | | FL series | | | |
| **Data logging** | **Measurement data** | | In Sensor: Max. 32000 items *1 | | | |
| | **Images** | | In Sensor: 20 images *1 | | | |
| **Measurement trigger** | | | I/O trigger, Encoder trigger, Communications trigger (Ethernet No-protocol, PLC Link, or EtherCAT) | | | |
| **I/O specifications** | **Input signals** | | 9 signals<br>• Single measurement input (TRIG)<br>• Error clear input (IN0)<br>• Encoder counter reset input (IN1)<br>• Encoder input (A±, B±, Z±) *3 | | | |
| | **Output signals** | | 5 signals *2<br>• OUT0 Overall judgement output (OR)<br>• OUT1 Control output (BUSY)<br>• OUT2 Error output (ERROR)<br>• OUT3 (Shutter output: SHTOUT)<br>• OUT4 (Strobe trigger output: STGOUT) | | | |
| | **Ethernet specifications** | | 100BASE-TX/10BASE-TX | | | |
| | **EtherCAT specifications** | | --- | | Dedicated protocol for EtherCAT 100BASE-TX | |
| | **Connection method** | | Special connector cables<br>• Power supply and I/O: 1 special connector I/O cable<br>• Touch Finder, Computer and Ethernet: 1 Ethernet cable<br>• EtherCAT: 2 EtherCAT cable | | | |
| **LED display** | | | • OR: Judgment result indicator<br>• ERR: Error indicator<br>• BUSY: BUSY indicator<br>• ETN: Ethernet communications indicator | | | |
| | **EtherCAT display** | | --- | | • L/A IN (Link/Activity IN) × 1<br>• L/A OUT (Link/Activity OUT) × 1<br>• RUN × 1<br>• ERR × 1 | |
| **Ratings** | **Power supply voltage** | | 21.6 to 26.4 VDC (including ripple) | | | |
| | **Insulation resistance** | | Between all lead wires and case: 0.5 MΩ (at 250 V) | | | |
| | **Current consumption** | | 450mA max. (When the FL-series Strobe controller and lighting are used.)<br>250mA max. (When external lighting is not used.) | | | |
| **Environmental immunity** | **Ambient temperature range** | | Operating: 0 to 50 °C, Storage: -20 to 65 °C (with no icing or condensation) | | | |
| | **Ambient humidity range** | | Operating and storage: 35% to 85% (with no condensation) | | | |
| | **Ambient atmosphere** | | No corrosive gas | | | |
| | **Vibration resistance (destruction)** | | 10 to 150 Hz, single amplitude: 0.35 mm, X/Y/Z directions, 8 min each, 10 times | | | |
| | **Shock resistance (destruction)** | | 150 $m/s^2$ 3 times each in 6 direction (up, down, right, left, forward, and backward) | | | |
| | **Degree of protection** | | IEC60529 IP40 | | | |
| **Materials** | | | Case: alminium die casting, Rear cover: alminium plate | | | |
| **Weight** | | | Approx. 390 g (Sensor only) | | Approx. 480 g (Sensor only) | |
| **Accessories** | | | Instruction Manual | | | |

*1 If a Touch Finder is used, results can be saved up to the capacity of an SD card.
*2 The five output signals can be allocated for the judgements of individual inspection items.

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*3 Encoder input specifications

**Pulse input Specifications (When an open collector type encoder is used.)**

| Item | | Specification | | |
|---|---|---|---|---|
| Input voltage | | 24 VDC ±10% | 12 VDC ±10% | 5 VDC ±5% |
| Input current | | 4.8 mA (at 24 VDC, typical value) | 2.4 mA (at 12 VDC, typical value) | 1.0 mA (at 5 VDC, typical value) |
| NPN | ON voltage *1 | 4.8 V max. | 2.4 V max. | 1.0 V max. |
| | OFF voltage *2 | 19.2 V min. | 9.6 V min. | 4.0 V min. |
| PNP | ON voltage *1 | 19.2 V min. | 9.6 V min. | 4.0 V min. |
| | OFF voltage *2 | 4.8 V max. | 2.4 V max. | 1.0 V max. |
| Maximum response frequency *3 | | 50 kHz (I/O cable: when the FQ-MWD005 or FQ-MWDL005 cables is used.)<br>20 kHz (I/O cable: when the FQ-MWD010 or FQ-MWDL010 cables is used.) | | |
| Input impedance | | 5.1 kΩ | | |

*1 ON voltage: Voltage to change from OFF to ON state. The ON voltage is the difference of voltages between the GND terminal of the encoder power terminals and each input terminal.
*2 OFF voltage: Voltage to change from ON to OFF state. The ON voltage is the difference of voltages between the GND terminal of the encoder power terminals and each input terminal.
*3 Select maximum response frequency depending on length of the encoder cable and response frequency of the encoder.

**Pulse input Specifications (When a line-driver output type encoder is used.)**

| Item | Specification |
|---|---|
| Input voltage | EIA standard RS-422-A line driver level |
| Input impedance *1 | 120 Ω ±5% |
| Differential input voltage | 0.2 V min. |
| Hysteresis voltage | 50 mV |
| Maximum response frequency *2 | 200 kHz (I/O cable: when the FQ-MWD005, FQ-MWDL005, FQ-MWD010, or FQ-MWDL010 cables is used.) |

*1 When terminating resistance function is used.
*2 Select maximum response frequency depending on length of the encoder cable and response frequency of the encoder.

## Touch Finder

| Item | Type | | Model with DC power supply | Model with AC/DC/battery power supply |
|---|---|---|---|---|
| | Model | | FQ-MD30 | FQ-MD31 |
| Number of connectable Sensors | | | 2 max. | |
| Main functions | Types of measurement displays | | Last result display, Last NG display, trend monitor, histograms | |
| | Types of display images | | Through, frozen, zoom-in, and zoom-out images | |
| | Data logging | | Measurement results, measured images | |
| | Menu language | | English, Japanese | |
| Indications | LCD | Display device | 3.5-inch TFT color LCD | |
| | | Pixels | 320 × 240 | |
| | | Display colors | 16,777,216 | |
| | Backlight | Life expectancy *1 | 50,000 hours at 25 °C | |
| | | Brightness adjustment | Provided | |
| | | Screen saver | Provided | |
| | Indicators | Power indicator (color: green) | POWER | |
| | | Error indicator (color: red) | ERROR | |
| | | SD card access indicator (color: yellow) | SD ACCESS | |
| | | Charge indicator (color: orange) | --- | CHARGE |
| Operation interface | Touch screen | Method | Resistance film | |
| | | Life expectancy *2 | 1,000,000 operations | |
| External interface | Ethernet | | 100 BASE-TX/10 BASE-T | |
| | SD card | | Omron SD card (Model: HMC-SD291) or a SDHC card of Class4 or higher rating is recommended. | |
| Ratings | Power supply voltage | DC power connection | 20.4 to 26.4 VDC (including ripple) | |
| | | AC adapter connection | --- | 100 to 240 VAC, 50/60 Hz |
| | | Battery connection | --- | FQ-BAT1 Battery (1 cell, 3.7 V) |
| | Continuous operation on Battery *3 | | --- | 1.5 h |
| | Current consumption | | DC power connection: 0.2 A | |
| | Insulation resistance | | Between all lead wires and case: 0.5 MΩ (at 250 V) | |
| Environmental immunity | Ambient temperature range | | Operating: 0 to 50 °C<br>Storage: -25 to 65 °C<br>(with no icing or condensation) | Operating: 0 to 50 °C when mounted to DIN Track or panel 0 to 40 °C when operated on a Battery<br>Storage: -25 to 65 °C<br>(with no icing or condensation) |
| | Ambient humidity range | | Operating and storage: 35% to 85% (with no condensation) | |





| Item | Type | | Model with DC power supply | Model with AC/DC/battery power supply |
|---|---|---|---|---|
| | Model | | FQ-MD30 | FQ-MD31 |
| Environmental immunity | Ambient atmosphere | | No corrosive gas | |
| | Vibration resistance (destruction) | | 10 to 150 Hz, single amplitude: 0.35 mm, X/Y/Z directions 8 min each, 10 times | |
| | Shock resistance (destruction) | | 150 m/s² 3 times each in 6 direction (up, down, right, left, forward, and backward) | |
| | Degree of protection | | IEC 60529 IP20 | |
| Dimensions | | | 95 × 85 × 33 mm | |
| Materials | | | Case: ABS | |
| Weight | | | Approx. 270 g (without Battery and hand strap) | |
| Accessories | | | Touch Pen (FQ-XT), Instruction Manual | |

*1 This is a guideline for the time required for the brightness to diminish to half the initial brightness at room temperature and humidity. No guarantee is implied. The life of the backlight is greatly affected by the ambient temperature and humidity. It will be shorter at lower or higher temperatures.
*2 This value is only a guideline. No guarantee is implied. The value will be affected by operating conditions.
*3 This value is only a guideline. No guarantee is implied. The value will be affected by the operating environment and operating conditions.

## Battery Specifications

| Item / Model | FQ-BAT1 |
|---|---|
| Battery type | Secondary lithium ion battery |
| Nominal capacity | 1800 mAh |
| Rated voltage | 3.7 V |
| Dimensions | 35.3 × 53.1 × 11.4 mm |
| Ambient temperature range | Operating: 0 to 40 °C<br>Storage: -25 to 65 °C<br>(with no icing or condensation) |
| Ambient humidity range | Operating and storage: 35% to 85%<br>(with no condensation) |
| Charging method | Charged in Touch Finder (FQ-MD31).<br>AC adapter (FQ-AC□) is required. |
| Charging time *1 | 2.0 h |
| Battery backup life *2 | 300 charging cycles |
| Weight | 50 g max. |

*1 This value is only a guideline. No guarantee is implied. The value will be affected by operating conditions.
*2 This is a guideline for the time required for the capacity of the Battery to be reduced to 60% of the initial capacity. No guarantee is implied.The value will be affected by the operating environment and operating conditions.

## Sysmac Studio

| Item | Requirement |
|---|---|
| Operating system (OS) *1, *2<br>Japanese or English system | Windows XP (Service Pack 3 or higher, 32-bit version) /Vista (32-bit version) / 7 (32-bit/64-bit version) |
| CPU | Windows computers with Celeron 540 (1.8 GHz) or faster CPU.<br>Core i5 M520 (2.4 GHz) or equivalent or faster recommended |
| Main memory | 2GB min. |
| Hard disk | At least 1.6 GB of available space *3 |
| Display | XGA 1024 × 768, 1600 million colors.<br>WXGA 1280 × 800 min. recommended |
| Disk drive | DVD-ROM drive |
| Communications ports | USB port corresponded to USB 2.0, or Ethernet port |

*1 Sysmac Studio Operating System Precaution:
System requirements and hard disk space may vary with the system environment.
*2 The following restrictions apply when Sysmac Studio is used with Microsoft Windows Vista or Windows 7.
Some Help files cannot be accessed.
The Help files can be accessed if the Help program distributed by Microsoft for Windows (WinHlp32.exe) is installed. Refer to the Microsoft homepage listed below or contact Microsoft for details on installing the file. (The download page is automatically displayed if the Help files are opened while the user is connected to the Internet.)
http://support.microsoft.com/kb/917607/en-us
*3 To use the file logging function, additional memory area to save the logging data is necessary.

## FQ-M Series EtherCAT Communications Specifications

| Item | Specifications |
|---|---|
| Communications standard | IEC 61158 Type12 |
| Physical layer | 100BASE-TX (IEEE802.3) |
| Connector | M12 × 2<br>E-CAT IN : EtherCAT (IN)<br>E-CAT OUT : EtherCAT (OUT) |
| Communications media | Use the cables for FQ-MWN□□, or FQ-WN□□ series. |
| Communications distance | Use the communication cable within the length of FQ-MWN□□ or FQ-WN□□ series cables. |
| Process data | Variable PDO Mapping |
| Mailbox (CoE) | Emergency messages, SDO requests, SDO responses, and SDO information |
| Distributed clock | Synchronization with DC mode 1 |
| LED display | L/A IN (Link/Activity IN) × 1, L/A OUT (Link/Activity OUT) × 1, RUN × 1, ERR × 1 |

## Version Information

### FQ-M Series and Programming Devices

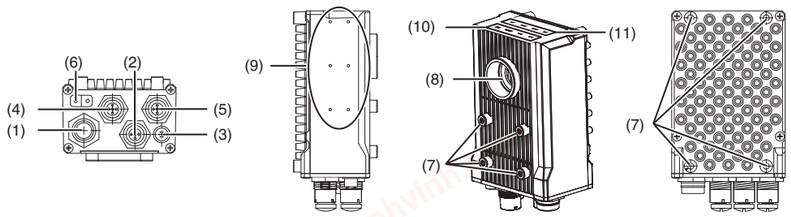
| FQ-M Series | Required Programming Device | |
|---|---|---|
| | Sysmac Studio Standard Edition/Vision Edition | |
| | Ver.1.00 | Ver.1.01 or higher |
| FQ-MS□□□(-M)<br>FQ-MS□□□(-M)-ECT | Not supported | Supported |

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# Components and Functions

## Sensor

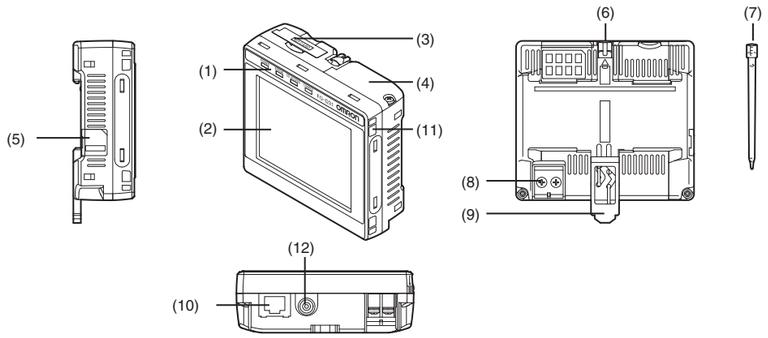



| No. | Name | Description |
|---|---|---|
| (1) | I/O Cable connector | An I/O Cable is used to connect the Sensor to the power supply and external I/O. |
| (2) | Ethernet connector | An Ethernet cable is used to connect the Sensor to external devices such as PLCs, the Touch Finder, or computers. |
| (3) | Lighting connector | Connect an external lighting (strobe controller). |
| (4) | EtherCAT connector (IN)* | Connect an EtherCAT compatible device. |
| (5) | EtherCAT connector (OUT)* | Connect an EtherCAT compatible device. |
| (6) | Node address switch * | Set the node address for EtherCAT communications. |
| (7) | Installation holes | Holes to install and secure the camera. |
| (8) | C-mount lens connection part | Install the C-mount lens in this part. Determine the field of view depending on the measurement target and select a suitable CCTV lens (C-mounting lens). |

| No. | Name | | Description |
|---|---|---|---|
| (9) | Strobe controller connection holes | | Install the strobe controller in this part. FL-TCC1 can be mounted. |
| (10) | Measure-ment process Operation indicators | OR | Lit in orange while OR signal is ON. |
| | | ETN | Lit in orange while in Ethernet communi-cations. |
| | | ERROR | Lit in red when an error occurs. |
| | | BUSY | Lit in green while the sensor is processing. |
| (11) | EtherCAT Operation indicators | L/A IN | Lit in green when Link with EtherCAT device is established and flickers in green when communicating (data IN). |
| | | L/A OUT | Lit in green when Link with EtherCAT device is established and flickers in green when communicating (data OUT). |
| | | ECAT RUN | Lit in green when EtherCAT communica-tion is available. |
| | | ECAT ERROR | Lit in red when an EtherCAT communica-tions error occurs. |

* FQ-MS□□□-ECT and FQ-MS□□□-M-ECT only.

## Touch Finder




| No. | Name | | Description |
|---|---|---|---|
| (1) | Operation indicators | POWER | Lights green when the Touch Finder is turned ON. |
| | | ERROR | Lights red when an error occurs. |
| | | SD ACCESS | Lights yellow when an SD card is inserted. Flashes yellow when the SD card is being accessed. |
| | | CHARGE * | Lights orange when the Battery is charging. |
| (2) | LCD/touch panel | | Displays the setting menu, measurement results, and images input by the camera. |
| (3) | SD card slot | | An SD card can be inserted. |
| (4) | Battery cover * | | The Battery is inserted behind this cover. Remove the cover when mounting or removing the Battery. |
| (5) | Power supply switch | | The Battery is inserted behind this cover. Remove the cover when mounting or removing the Battery. |

| No. | Name | Description |
|---|---|---|
| (6) | Touch pen holder | The touch pen can be stored here when it is not being used. |
| (7) | Touch pen | Used to operate the touch panel. |
| (8) | DC power supply connector | Used to connect a DC power supply. |
| (9) | Slider | Used to mount the Touch Finder to a DIN Track. |
| (10) | Ethernet port | Used when connecting the Touch Finder to the Sensor with an Ethernet cable. Insert the connector until it locks in place. |
| (11) | Strap holder | This is a holder for attaching the strap. |
| (12) | AC power supply connector * | Used to connect the AC adapter. |

* Applicable to the FQ-MD31 only.



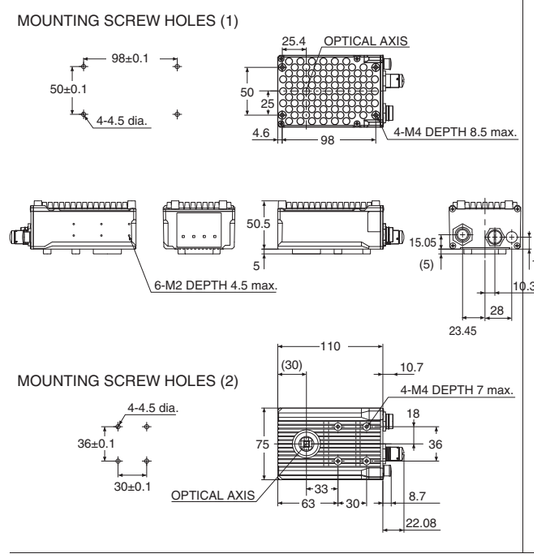


# Dimensions

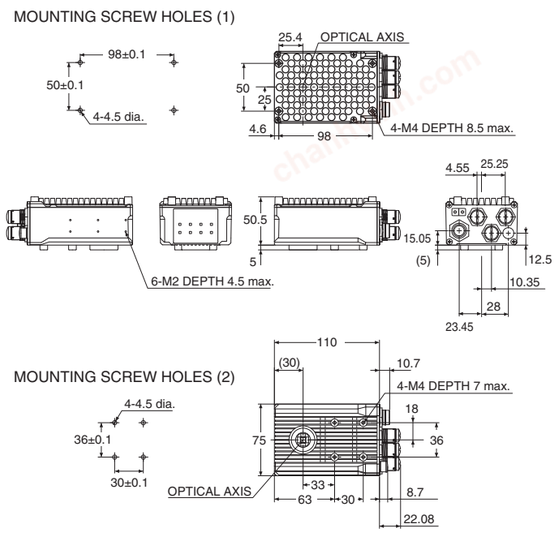
(Unit: mm)

## Sensor

### FQ-MS120/MS120-M
### FQ-MS125/MS125-M

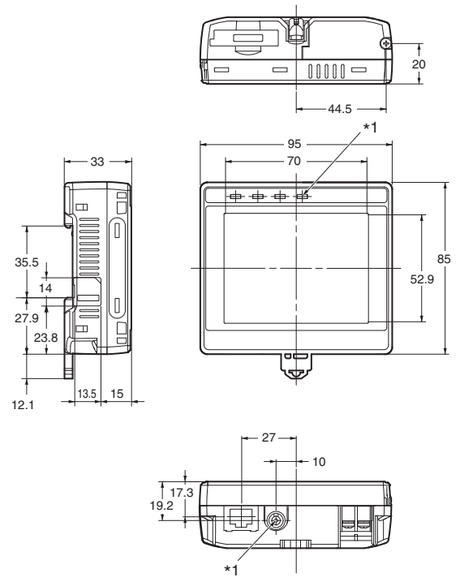



### FQ-MS120-ECT/MS120-M-ECT
### FQ-MS125-ECT/MS125-M-ECT

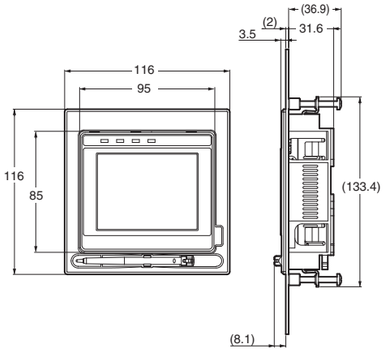



## Touch Finder

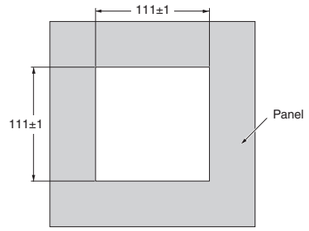
### FQ-MD30/MD31




Panel Mounting Adapter *2




Panel Cutout Dimensions




*1 Provided with FQ-MD31 only.
*2 The dimension of the panel mounting adapter does not include that of a FQ-MD□□.

Q183-E2-01-X+FQ-M+KPP

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