# OMRON

# CODE READER FQ-CR SERIES

## Exceptional Reading Performance with Easy Operation

Multi Code Reader
FQ-CR1 Series

2D Code Reader for Direct Part Marking codes
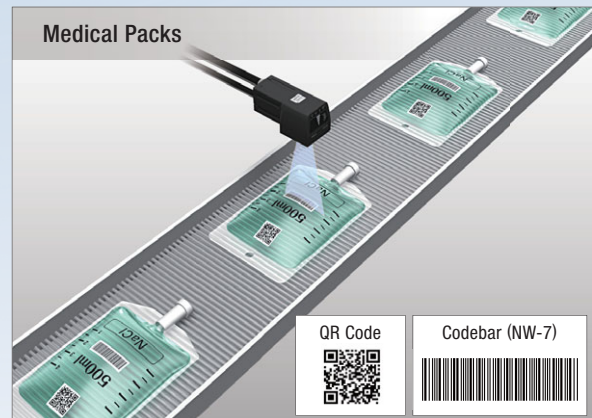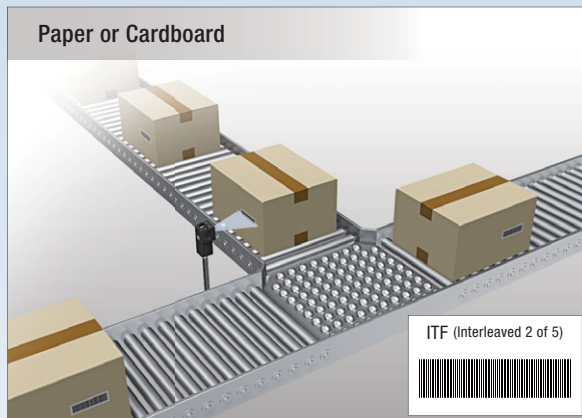FQ-CR2 Series

» Read from everything from paper and labels to metal, PCBs, and glass for a wide range of applications.

realizing

# Solve a variety off different applications with one product series

## Read Codes Printed on Paper or Labels

Multi Code Reader **FQ-CR1** Series

### Paper or Cardboard

ITF (Interleaved 2 of 5)

### Medical Packs

QR Code    Codebar (NW-7)

### PET Bottles

JAN/EAN/UPC

### Medication Boxes

Data Matrix    GS1-DataBar

## Reads 17 Different Codes

FQ-**CR1**

Many different codes are used for different applications. And for some products, different codes are printed together.
The FQ-CR1 can read many different codes without requiring any changes to its settings.

| Barcodes: Reads 9 different codes. | | |
|---|---|---|
| JAN/EAN/UPC | Code39 | Codabar (NW-7) |
| ITF (Interleaved 2 of 5) | Code93 | Code128 / GS1-128 |
| GS1-DataBar | GS1-128 Composite Code | Pharmacode |

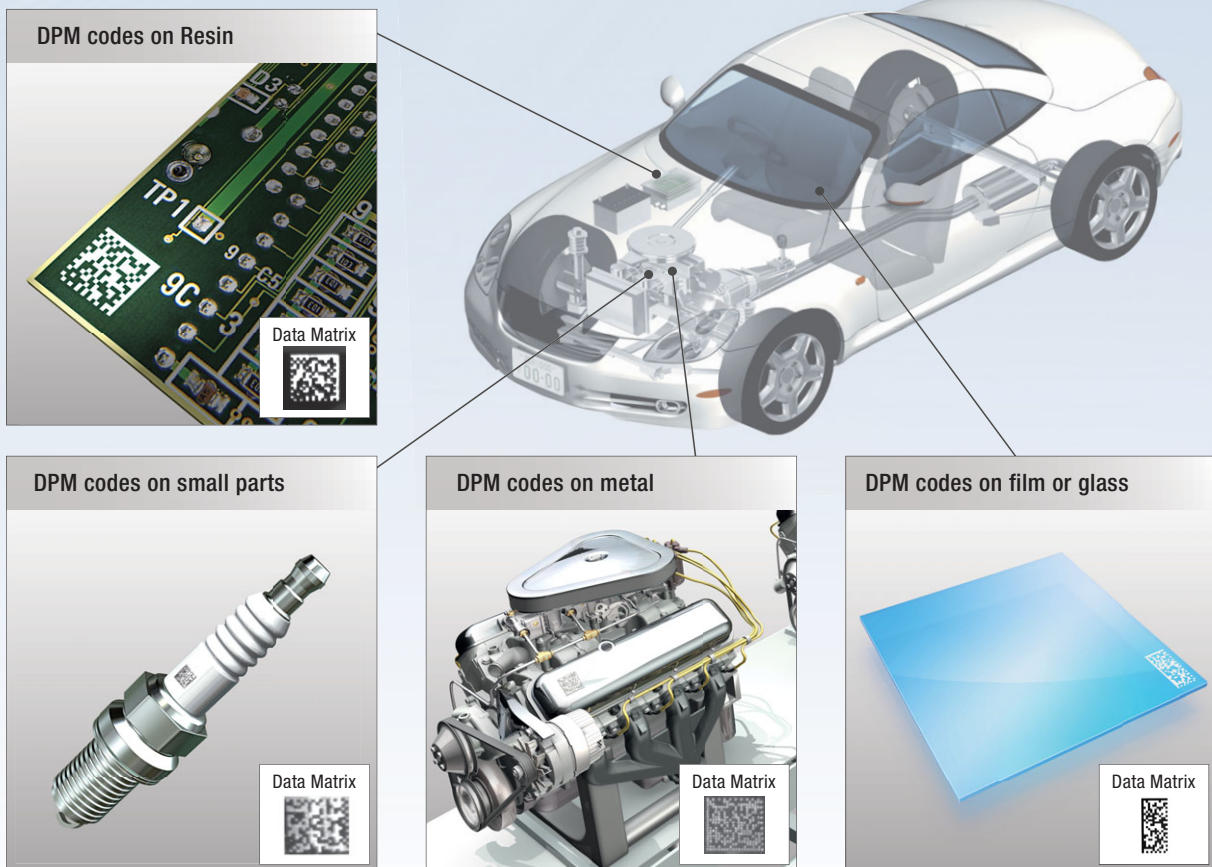| 2D codes: Reads 8 different codes. | | |
|---|---|---|
| Data Matrix | QR Code | Micro QR Code |
| PDF417 | Micro PDF417 | Maxi Code |
| Aztec Code | Codablock | |

There are many instances when different barcode or 2D code systems are used together in the same manufacturing process.

Code printing quality can also vary due to imperfect printing or low contrast.

The FQ-CR Series handles these and many other conditions.

The FQ-CR Series can be easily introduced without using different code readers and

operating procedures for each of the different processes.

## Reads Direct Part Marking (DPM) Codes

**2D Code Reader for Direct Part Marking (DPM) codes FQ-CR2 Series**

### DPM codes on Resin

Data Matrix

### DPM codes on small parts

Data Matrix

### DPM codes on metal

Data Matrix

### DPM codes on film or glass

Data Matrix

## Easily reads difficult codes

**FQ-CR2**

Just read the code and register it, and then let the following functions automatically tune the settings.

Depending on the conditions of the code, the automatic retry and code error correction functions let, essentially anyone, easily adjust the settings.
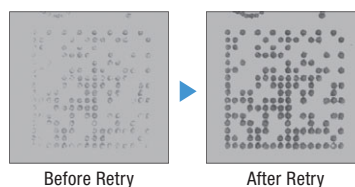
### Filter function

Three stages of filtering are automatically selected for the read image from Smooth, Dilate, Erosion, and Median filtering.
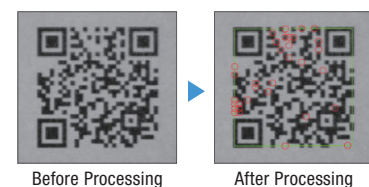
Before Dilation ▶ After Dilation
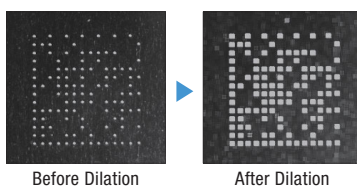
### Retry function

You can retry the settings until reading is successful while automatically changing the exposure time and other reading parameters.
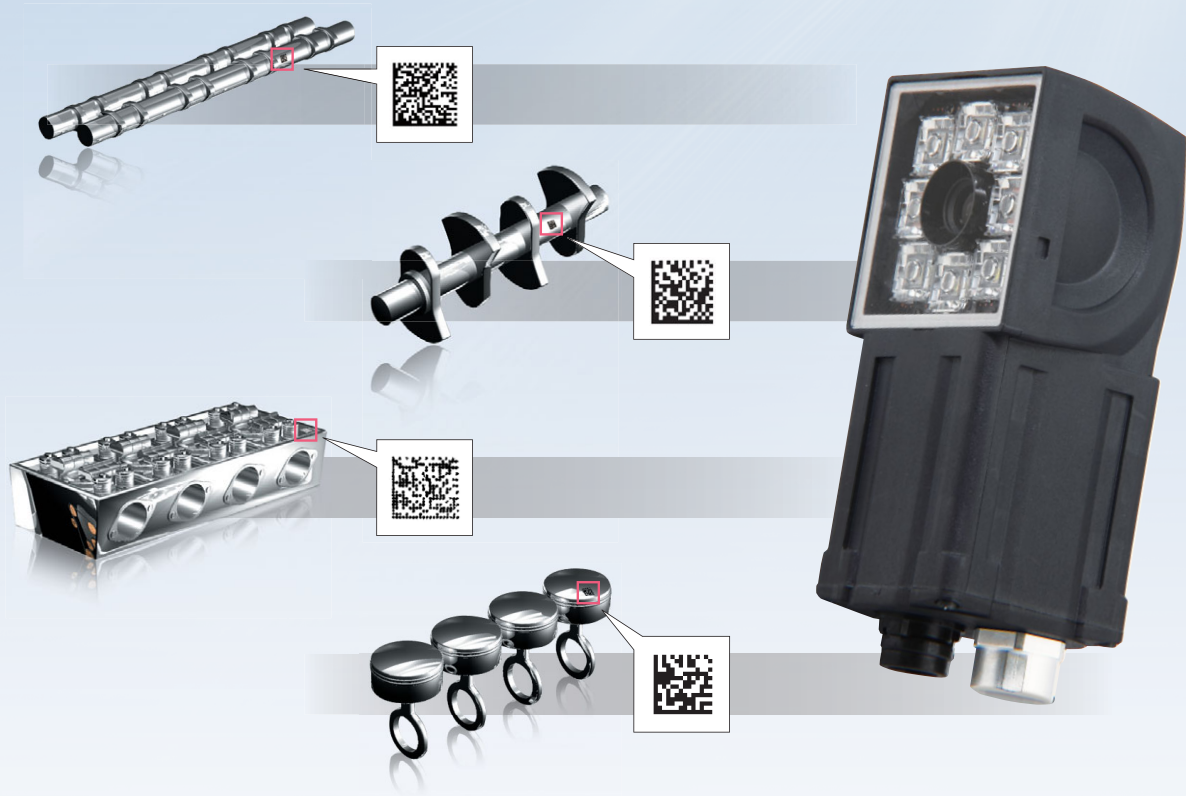
Before Retry ▶ After Retry

### Code Error Correction

Code omissions and errors are automatically corrected when the code is read.

Before Processing ▶ After Processing

# OMRON's Unique Algorithm Provides
# Superior Reading Ability for Direct Part Marking codes

**Removal of Printing Irregularities or Noise**

## Filter function

You can apply up to three of the four unique filters developed by OMRON
in the desired order to remove printing irregularities and noise, in order to achieve a stable reading.

### Types of Filtering

| | | | |
|---|---|---|---|
| **Smooth** | Smooths the image. | **Erosion** | For white codes, reduces the cell size. Effective for reading separated dot codes. |
| **Dilate** | For white codes, increases the cell size. Effective for reading codes with cell spreading. | **Median** | Removes noise. |

### Combining Filtering

Erosion and dilation can be combined to connect dots without changing the dot thickness.
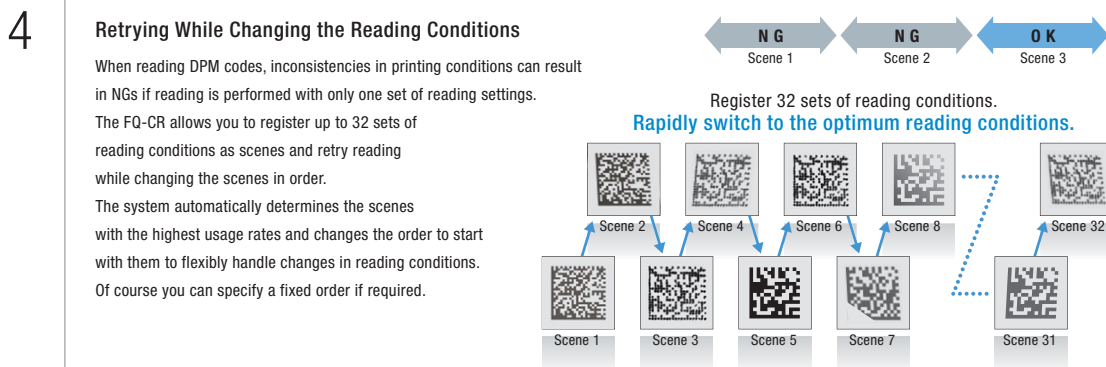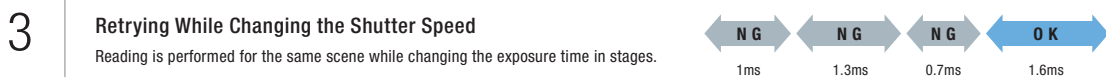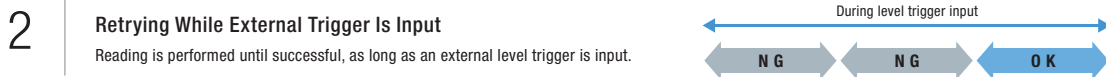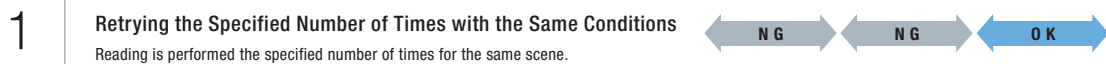
Dilate ▶▶▶ Erosion

Automatic Parameter Adjustment Until Reading is Successful

# Retry function

Code Readers must be able to read codes even for poor printing conditions. You can automatically retry reading while changing the exposure time and other reading conditions, even for changing workpieces or environments, to enable a stable reading.

The following retry functions are provided.

**1** **Retrying the Specified Number of Times with the Same Conditions**
Reading is performed the specified number of times for the same scene.

N G → N G → O K

**2** **Retrying While External Trigger Is Input**
Reading is performed until successful, as long as an external level trigger is input.

During level trigger input

N G → N G → O K

**3** **Retrying While Changing the Shutter Speed**
Reading is performed for the same scene while changing the exposure time in stages.

N G → N G → N G → O K
1ms · 1.3ms · 0.7ms · 1.6ms

**4** **Retrying While Changing the Reading Conditions**

When reading DPM codes, inconsistencies in printing conditions can result in NGs if reading is performed with only one set of reading settings.
The FQ-CR allows you to register up to 32 sets of reading conditions as scenes and retry reading while changing the scenes in order.
The system automatically determines the scenes with the highest usage rates and changes the order to start with them to flexibly handle changes in reading conditions.
Of course you can specify a fixed order if required.

N G → N G → O K
Scene 1 · Scene 2 · Scene 3

Register 32 sets of reading conditions.
**Rapidly switch to the optimum reading conditions.**

Scene 2 · Scene 4 · Scene 6 · Scene 8 · Scene 32

Scene 1 · Scene 3 · Scene 5 · Scene 7 · Scene 31

Easy Confirmation of Code Quality
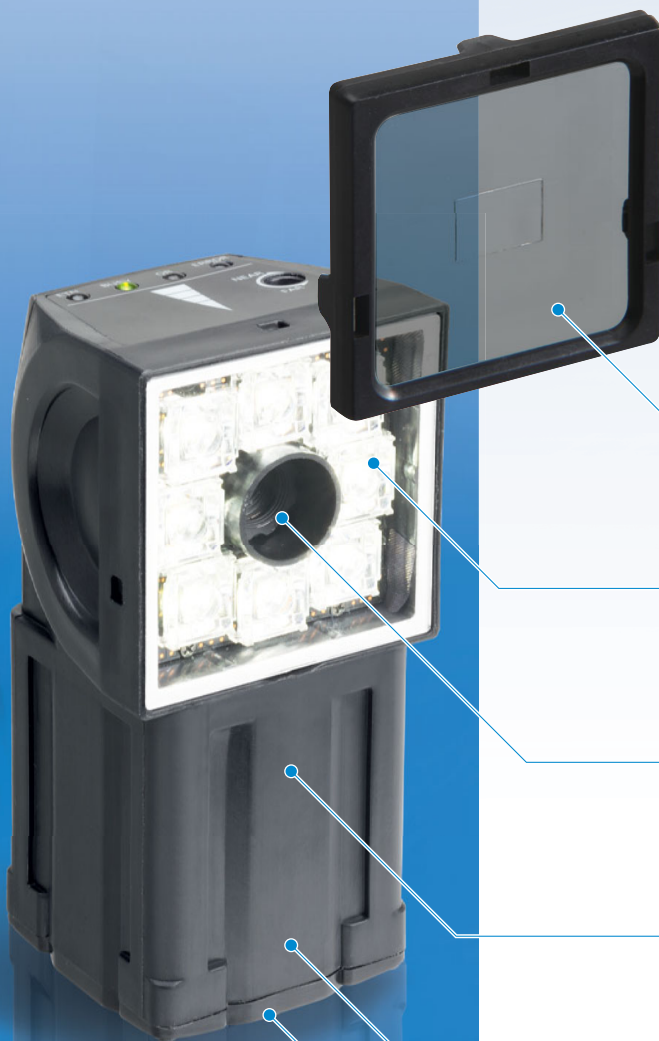
# Code Error Correction Position Display

Red circles are displayed on cells
for which the code was corrected on the display.
This clearly shows where the code quality was poor.

FQ-**CR1**     FQ-**CR2**

# Stable Reading Functions Packed into a Compact Body

Actual Size

**Polarization filter**

Cuts specular reflections.

**High power LEDs**

Four times the brightness of previous models.

**Lens and Camera**

simple fine tuning of camera focus.

**Decoder**

Built-in HDR function.

**Robust housing: IP67**

**Ethernet Output**

Output read codes on Ethernet.

Reads Codes Even with Low Contrast

## High-power LEDs

The wider the field of view, the more difficult it is to maintain consistent lighting within the field, causing errors in reading. The built-in LEDs of the FQ-CR Series use a unique OMRON DR optical system for effective light usage to maintain consistent lighting within the field of vision at a brightness that is four times that of previous models.
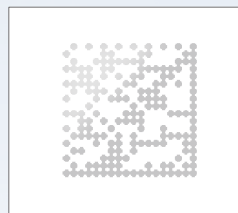
Previous Lighting
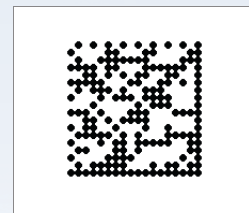
High-power Lighting

Cuts Light Interference

## HDR Function

The HDR (high dynamic range) function minimizes the influence of changes in lighting conditions and light reflection. This enables stable inspections even for materials that are difficult to light evenly, such as metal parts or glossy films, or in locations subject to external light interference.

Halation

Stable Detection for
Metal Surfaces Subject to
Gloss and Inconsistent Lighting

Cuts Specular Reflections

## Polarizing Filter

A polarizing filter is included to cut specular reflection from glossy surfaces. This enables stable code reading even for metallic or other glossy surfaces.
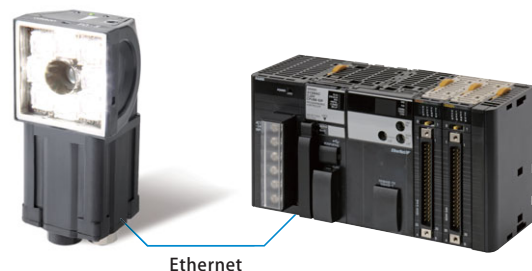
Without Polarizing Filter

With Polarizing Filter

Communications with Host Devices

## Ethernet Connection

The compact body also provides an Ethernet connector so that you can transfer read data and images via Ethernet. Smoothly transfer data to PLCs, computers, or other host devices.
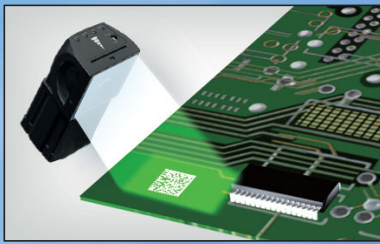
Ethernet

**FQ-CR1**   **FQ-CR2**

# Essentially, Simple Enough for Anyone to Set Up

Setup is as easy as displaying codes on the monitor and registering settings with a simple procedure.
Then, the FQ-CR will automatically tune the settings to achieve the optimum conditions.
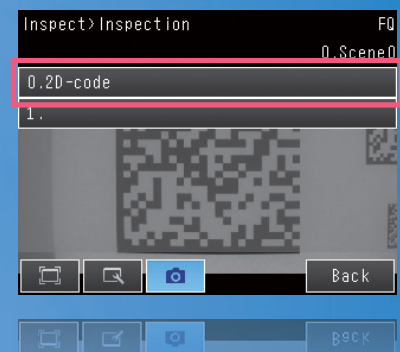
## You can automatically tune all of these reading conditions just by making the basic settings.

### Optimum Tuning in Three Steps

**Read a code.**

**Select the type of code.**

Inspect>Inspection          FQ
                          0.Scene0
0.2D-code
1.

Back

## Two Set-up Tools

Use the convenient Touch Finder
for on-site settings and control panel installations,
or use a set-up tool on a computer.

Touch Finder

PC Tool (Free)
After purchasing the Code Reader,
you can download the PC Tool free from the member's website.

Set-up and Adjustment

| Exposure Time | Gain | Dynamic Range | Filtering |

**Press the TEACH Button.**

```
Please press the TEACH button
for automatic setup.
```

TEACH

**Check to see if the conditions are correct as a reference.**

```
Teach                    0.2D-code

QR Code
Characters:
4536854511134 17107M
07011910000123456-034952389-
                    OK
```
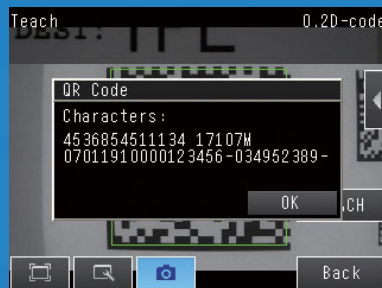
▶ **END**

## Menu Displays in Nine Languages

The nine language support for menus means that you can easily introduce systems into factory sites in other countries.
In addition, you can easily change the language on a menu.

| | |
|---|---|
| English | German |
| Japanese | French |
| Traditional Chinese | Italian |
| Simplified Chinese | Spanish |
| Korean | |

日本語
English
Deutsch
Français
Italiano
Español

以太网
语言（Language）
时间设置
触摸屏校准
初始化
重启

이더넷
언어（Language）
시간 설정
터치 스크린 보정
초기화
다시 시작

## Operation Navigation

Navigation menus for operating procedures from image adjustment through to testing and starting operation are provided so that even beginners can operate the Code Reader.

```
Setup                    FQ
                    0.Scene0
Image      Camera setup
Inspect
In/Out     Trigger setup
Test
Run        Filter Setup
```
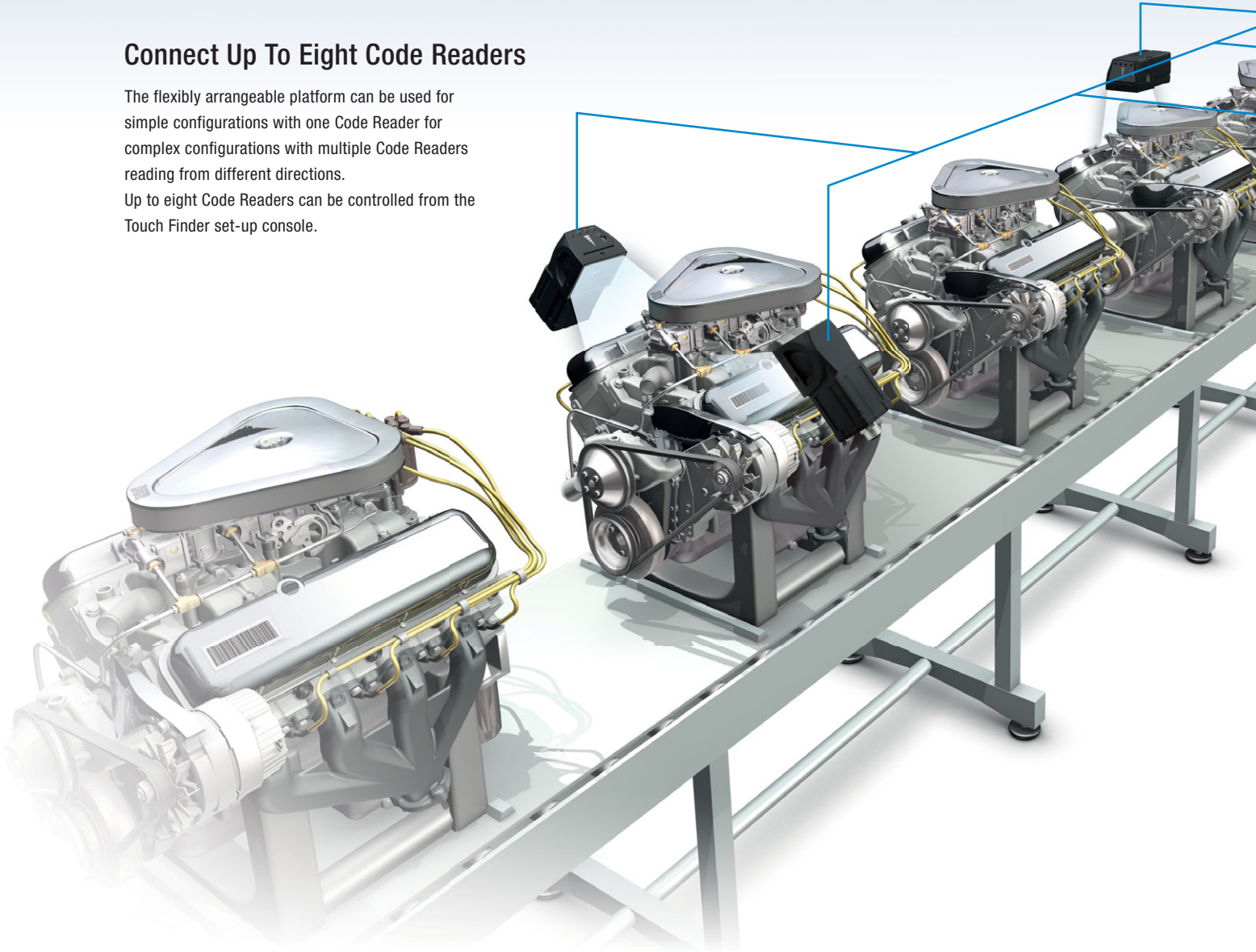
Setup flow
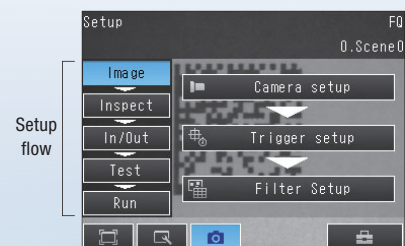
**FQ-CR1**    **FQ-CR2**

# Flexible System Configuration

## Connect Up To Eight Code Readers

The flexibly arrangeable platform can be used for simple configurations with one Code Reader for complex configurations with multiple Code Readers reading from different directions.
Up to eight Code Readers can be controlled from the Touch Finder set-up console.

## Code Quality Management

The FQ-CR2 contains state-of-the-art algorithms that enable the reading of codes even with poor reading quality. However, even if the code quality continues to deteriorate for some reason, auto-correction and retrying are used to enable reading, making it impossible to tell where quality was lost simply from the OK/NG reading information. Here, you can use the cell recognition rate information. The cell recognition rate changes with code printing quality, position inconsistency, installation conditions, and noise. You can log the cell recognition rate and image together to manage quality trends. The logging of recent results is useful for testing when commissioning a line. Run through some sample products and log the cell recognition rate. You can then display the results in a time-based graph to see how much leeway there is in reading performance.

* For the FQ-CR1, the number of detected characters is logged instead of the cell recognition rate.
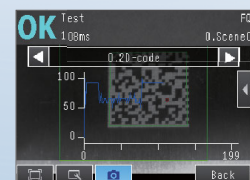
**File Logging**

**SD Card**
Cell recognition rate
Up to 10 million measurement values or more
(for a 4-GB SD card)
Up to 10,000 images or more
(for a 4-GB SD card)

**Logging of Recent Results**

Displays the most recent 1,000 cell recognition rate in graph form.
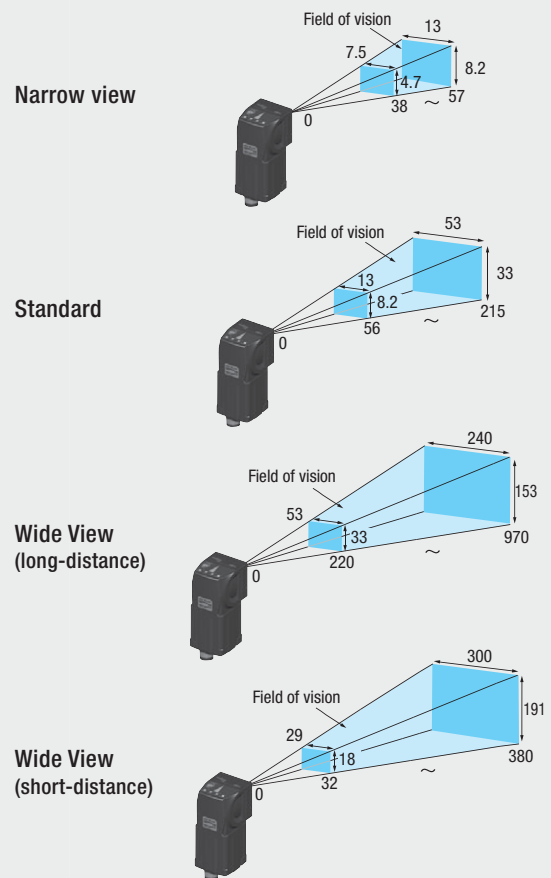
## Match your field of view

No matter whether you handle large or small workpieces, the range of Omron FQ-CR Code Readers offers a perfect match. Select the FQ-CR model with the appropriate range and adjust the field of view to your application. Focusing is quick and easy too, enabling you to use the sensor for a variety of applications.
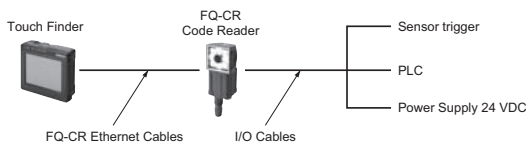
**Touch Finder**

**PC Tool**

**Narrow view**

Field of vision
13
7.5
8.2
4.7
38 ~ 57
0

**Standard**

Field of vision
53
13
33
8.2
215
56 ~
0

**Wide View (long-distance)**

240
Field of vision
153
53
33
970
220 ~
0

**Wide View (short-distance)**

300
Field of vision
191
29
18
380
32 ~
0

## Automatic Notification of NGs

If you leave the Touch Finder installed on-site, the recent NG sensor display is very useful. Even if you are monitoring more than one Code Reader with the Touch Finder, the display automatically changes to the Code Reader where an NG occurred so that you can quickly confirm conditions.
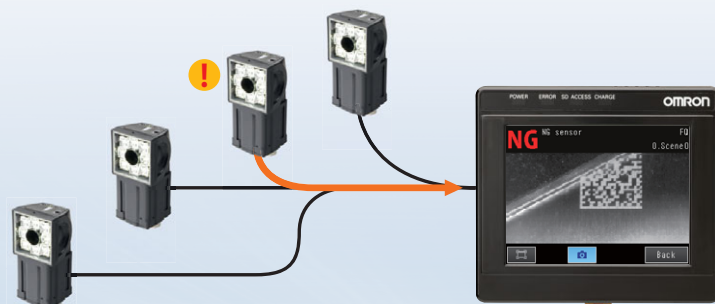
# System Configuration

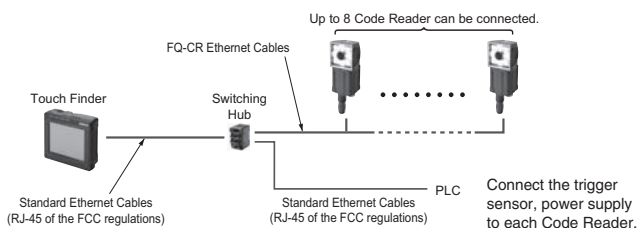## Connections for One Code Reader

**Control by parallel input/output**

Touch Finder — FQ-CR Code Reader — Sensor trigger / PLC / Power Supply 24 VDC
FQ-CR Ethernet Cables / I/O Cables

**Control by Ethernet**

FQ-CR Ethernet Cables / I/O Cables
Touch Finder — Switching Hub — FQ-CR Code Reader — Sensor trigger / Power Supply 24 VDC / PLC
Standard Ethernet Cables (RJ-45 of the FCC regulations) / Standard Ethernet Cables (RJ-45 of the FCC regulations)
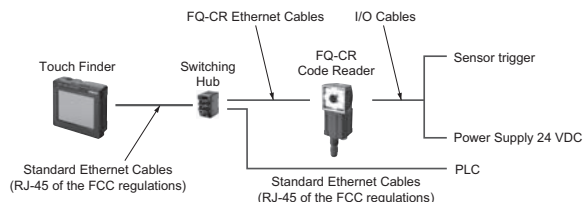
## Connections for Multiple Code Reader

**Control by parallel input/output**

Up to 8 Code Reader can be connected.
Touch Finder — Switching Hub
Standard Ethernet Cables (RJ-45 of the FCC regulations) / FQ-CR Ethernet Cables
Connect the trigger sensor, power supply to each Code Reader.

**Control by Ethernet**

Up to 8 Code Reader can be connected.
FQ-CR Ethernet Cables
Touch Finder — Switching Hub
Standard Ethernet Cables (RJ-45 of the FCC regulations) / Standard Ethernet Cables (RJ-45 of the FCC regulations) / PLC
Connect the trigger sensor, power supply to each Code Reader.

**Note:** If you register as a member after purchasing a Code Reader, you can download the free set-up software that runs on a PC and can be used in place of the Touch Finder. Refer to the member registration sheet for details.

# Ordering Information

## Code Reader
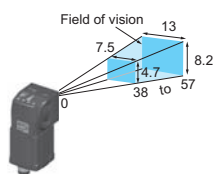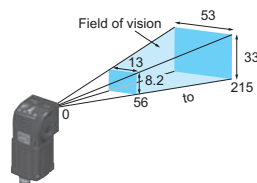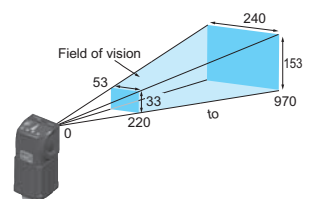
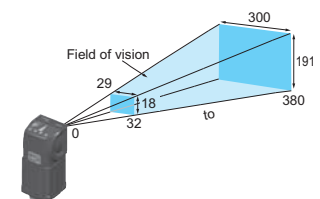**(Unit: mm)**

**Narrow View**

Field of vision 13 / 7.5 / 4.7 / 8.2 / 38 to 57 / 0

|  | 2D Code Reader | Multi Code Reader |
|---|---|---|
| NPN | FQ-CR20010F-M | FQ-CR10010F |
| PNP | FQ-CR25010F-M | FQ-CR15010F |

**Standard**

Field of vision 53 / 13 / 8.2 / 33 / 56 to 215 / 0

|  | 2D Code Reader | Multi Code Reader |
|---|---|---|
| NPN | FQ-CR20050F-M | FQ-CR10050F |
| PNP | FQ-CR25050F-M | FQ-CR15050F |

**Wide View (Long-distance)**

240 / Field of vision 53 / 33 / 153 / 220 to 970 / 0

|  | 2D Code Reader | Multi Code Reader |
|---|---|---|
| NPN | FQ-CR20100F-M | FQ-CR10100F |
| PNP | FQ-CR25100F-M | FQ-CR15100F |

**(Short-distance)**

300 / Field of vision 29 / 18 / 191 / 32 to 380 / 0

|  | 2D Code Reader | Multi Code Reader |
|---|---|---|
| NPN | FQ-CR20100N-M | FQ-CR10100N |
| PNP | FQ-CR25100N-M | FQ-CR15100N |

**Note:** Tolerance (field of vision): ±10% max.

## Touch Finder

| Type | Model |
|---|---|
| DC power supply | FQ-D30 |
| AC/DC/battery | FQ-D31 (See note.) |

**Note:** AC Adapter and Battery are sold separately.

## Cables (Robot cable)

| Type | Cable length | Model |
|---|---|---|
| FQ Ethernet Cables (connect Code Reader to Touch Finder, Code Reader to PC) | 2 m | FQ-WN002 |
|  | 10 m | FQ-WN010 |
|  | 20 m | FQ-WN020 |
| I/O Cables | 2 m | FQ-WD002 |
|  | 10 m | FQ-WD010 |
|  | 20 m | FQ-WD020 |

## Industrial Switching Hubs (Recommended)

| 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 |

## Accessories

| Application | Appearance | Name | Model |
|---|---|---|---|
| **For Code Reader** |  | Mounting Bracket (enclosed with Code Reader) | FQ-XL |
|  |  | Mounting Bracket (sold separately) | FQ-XL2 |
|  |  | Polarizing Filter Attachment (enclosed with Code Reader) | FQ-XF1 |
| **For Touch Finder** |  | Panel Mounting Adapter | FQ-XPM |
|  |  | AC Adapter (for models for DC/AC/Battery) | FQ-AC1 |
|  |  | Battery (for models for DC/AC/Battery) | FQ-BAT1 |
|  |  | Touch Pen (enclosed with Touch Finder) | FQ-XT |
|  |  | Strap | FQ-XH |
|  |  | SD Card (2 GB) | HMC-SD291 |

## Code Reader

| Item | Type | 2D Code Reader | Multi Code Reader |
|---|---|---|---|
| **Model** | NPN | FQ-CR20□□□□-M | FQ-CR10□□□□ |
| | PNP | FQ-CR25□□□□-M | FQ-CR15□□□□ |
| **Field of vision** | | Refer to the table below. | |
| **Installation distance** | | | |
| **Minimum resolution** | | FQ-CR2□010F-M/-CR1□010F: 0.040 mm  FQ-CR2□050F-M/-CR1□050F: 0.070 mm<br>FQ-CR2□100F-M/-CR1□100F: 0.282 mm  FQ-CR2□100N-M/-CR1□100N: 0.155 mm | |
| **Main functions** | Code | 2D Code (DataMatrix (EC200), QR Code) | 2D Code (DataMatrix (EC200), QR Code, MicroQR Code, PDF417, MicroPDF417, Maxi Code, Aztec Code and Codablock) |
| | | | 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 and Expanded Stacked), Pharmacode and GS1-128 Composite Code (CC-A, CC-B, CC-C)) |
| | Image filter | Filter function (Smooth, Dilate, Erosion,Median), Retry function, Code Error Correction Position Display | None |
| | Verification function | None | Supported |
| | Number of simultaneous inspections | 32 | |
| | Number of registered scenes | 32 | |
| **Image input** | Image filter | High dynamic range (HDR), polarizing filter (attachment) | Real color, high dynamic range (HDR), polarizing filter (attachment), white balance |
| | Image elements | 1/3-inch monochrome CMOS | 1/3-inch color CMOS |
| | Shutter | 1/250 to 1/32,258 | 1/250 to 1/30,000 |
| | Processing resolution | 752 × 480 | |
| **Lighting** | Lighting method | Pulse | |
| | Lighting color | White | |
| | LED class (See note 1.) | Class 2 | |
| **Data logging** | Measurement data | In Code Reader:1,000 items (If a Touch Finder is used, results can be saved up to the capacity of an SD card.) | |
| | Images | In Code Reader: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<br>• Single measurement input (TRIG)<br>• Control command inputs (IN0 to IN5) | |
| | Output signals | 3 signals<br>• Control output (BUSY)<br>• Overall judgement output (OR)<br>• Error output (ERROR)<br>**Note:** The three output signals can be allocated for the judgements of individual inspection items. | |
| | Ethernet specification | Numerical outputs and control commands are supported with no-protocol communications. 100BASE-TX/10BASE-T | |
| | Connection method | Special connector cables<br>• Power supply and I/O:  1 cable (FQ-WD□□□)<br>• Touch Finder and computer: 1 cable (FQ-WN□□□) | |
| **Ratings** | Power supply voltage | 20.4 to 26.4 VDC (including ripple) | |
| | Current consumption | 2.4 A max. | |
| **Environmental immunity** | Ambient temperature range | Operating: 0 to 50°C<br>Storage:  −25 to 65°C<br>(with no icing or condensation) | |
| | Ambient humidity range | Operating and storage: 35% to 85% (with no condensation) | |
| | Ambient atmosphere | No corrosive gas | |
| | Degree of protection | IEC 60529 IP67 (Except when Polarizing Filter Attachment is mounted.) | |
| **Materials** | | Code Reader:  PBT, PC, SUS<br>Mounting Bracket:  PBT<br>Polarizing Filter Attachment: PBT, PC<br>Ethernet connector:  Oil-resistance vinyl compound<br>I/O connector:  Lead-free heat-resistant PVC | |
| **Accessories** | | • Mounting Bracket (FQ-XL) (1)<br>• Polarizing Filter Attachment (FQ-XF1) (1)<br>• Instruction Manual | • Quick Startup Guide<br>• Member registration sheet<br>• Warning Label |

| 2D Code Reader | | Multi Code Reader | | Field of view (See note 2.) (Horizontal × Vertical) | Installation distance | Weight |
|---|---|---|---|---|---|---|
| NPN | PNP | NPN | PNP | | | |
| FQ-CR20010F-M | FQ-CR25010F-M | FQ-CR10010F | FQ-CR15010F | 7.5 × 4.7 to 13 × 8.2 mm | 38 to 57 mm | |
| FQ-CR20050F-M | FQ-CR25050F-M | FQ-CR10050F | FQ-CR15050F | 13 × 8.2 to 53 × 33 mm | 56 to 215 mm | 200 g max. |
| FQ-CR20100F-M | FQ-CR25100F-M | FQ-CR10100F | FQ-CR15100F | 53 × 33 to 240 × 153 mm | Long-distance model: 220 to 970 mm | |
| FQ-CR20100N-M | FQ-CR25100N-M | FQ-CR10100N | FQ-CR15100N | 29 × 18 to 300 × 191 mm | Short-distance model: 32 to 380 mm | |

**Note: 1.** Applicable standards: JIS C 6802:2005
    **2.** Tolerance: ±10% max.

## Touch Finder

| | Type | Model with DC power supply | Model with AC/DC/battery power supply |
|---|---|---|---|
| Item | Model | FQ-D30 | FQ-D31 |
| Number of connectable Code Reader | | 8 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, German, French, Italian, Spanish, Traditional Chinese, Simplified Chinese, Korean, Japanese | |
| Indications | LCD — Display device | 3.5-inch TFT color LCD | |
| | LCD — Pixels | 320 × 240 | |
| | LCD — Display colors | 16,777,216 | |
| | Backlight — Life expectancy (See note 1.) | 50,000 hours at 25ºC | |
| | Backlight — Brightness adjustment | Provided | |
| | Backlight — Screen saver | Provided | |
| Operation interface | Touch screen — Method | Resistance film | |
| | Touch screen — Life expectancy (See note 2.) | 1,000,000 | |
| External interface | Ethernet | 100BASE-TX | |
| | SD card | SDHC-compliant, Class 4 or higher recommended | |
| Ratings | Power supply voltage | DC power connection: 20.4 to 26.4 VDC (including ripple) | 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 |
| | Continuous operation on Battery (See note 3.) | --- | 1.5 h |
| | Power consumption | DC power connection: 0.2 A | DC power connection: 0.2 A, Charging battery: 0.4 A |
| Environmental immunity | Ambient temperature range | Operating: 0 to 50ºC Storage: −25 to 65ºC (with no icing or condensation) | Operating: 0 to 50ºC when mounted to DIN Track or panel Operation on Battery: 0 to 40ºC Storage: −25 to 65ºC (with no icing or condensation) |
| | Ambient humidity range | Operating and storage: 35% to 85% (with no condensation) | |
| | Ambient atmosphere | No corrosive gas | |
| | Degree of protection | IEC 60529 IP20 (when SD card cover, connector cap, or harness is attached) | |
| Weight | | Approx. 270 g (without Battery and hand strap attached) | |
| Materials | | Case: ABS | |
| Accessories | | Touch Pen (FQ-XT), Instruction Manual | |

**Note: 1.** This is a guideline for the time required for the brightness to diminish to half the initial brightness at room temperature and humidity. The life of the backlight is greatly affected by the ambient temperature and humidity and 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 | | 1,800 mAh |
| Rated voltage | | 3.7 V |
| Ambient temperature range | | Operating: 0 to 40ºC Storage: −25 to 65ºC (with no icing or condensation) |
| Ambient humidity range | | Operating and storage: 35% to 85% (with no condensation) |
| Charging method | | Charged in Touch Finder (FQ-D31). AC adapter (FQ-AC□) is required. |
| Charging time (See note 1.) | | 2 h |
| Battery backup life (See note 2.) | | 300 charging cycles |
| Weight | | 50 g max. |

**Note: 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.

## System Requirements for PC tool for FQ

The following Personal Computer system is required to use the software.

| OS | Microsoft Windows XP Home Edition/Professional SP2 or higher (See note 1.) Microsoft Windows 7 Home Premium or higher (See note 1.) |
|---|---|
| CPU | Core 2 Duo 1.06 GHz or the equivalent or higher |
| RAM | 1GB min. |
| HDD | 500 MB min. available space (See note 2.) |
| Monitor | 1,024 × 768 dots min. |

**Note: 1.** The Japanese and English versions support only 32-bit OS versions.
**2.** Available space is also required separately for data logging.

## Code Reader

### FQ-CR
**Mounting with the FQ-XL Mounting Bracket**

Polarizing Filter Attachment

Mounting Bracket

46

45

(See note 1.)

38
42

89
(105.58)
32
9
15.58

38   8
(See note 2.)

**Mounting Hole Dimensions**

20±0.1

Two, 4.5 dia.

Tightening torque: 1.2 N·m

✽ Dimentions with the FQ-XL Mounting Bracket

| Type | Model | Note 1. | Note 2. |
|------|-------|---------|---------|
| Narrow View, Standard | FQ-CR1□010F/-CR2□010F-M/-CR1□050F/-CR2□050F-M | 11 | 57 |
| Wide View | FQ-CR1□100F/-CR2□0100F-M/-CR1□100N/-CR2□100N-M | 3 | 49 |
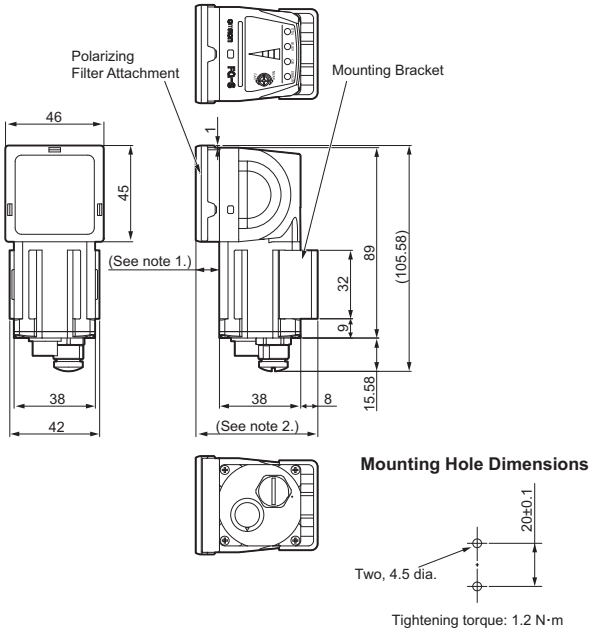
**Mounting with the FQ-XL2 Mounting Bracket**

Optical axis

(57)

(65)

(105.6)

67
40
30
5

59
20±0.1

20±0.1
38.8

Four-M4
Depth: 6

1/4-20UNC
Depth: 6

Four machine screws
(double pan-head set screws)

Cushion   Plate   t1 Base

41
38

49   8

**Mounting Hole Dimensions**

Two, 4.5 dia.

20±0.1

## Touch Finder

### FQ-D30/-D31

20

44.5

(See note.)

95
70

33

35.5
14
27.9
23.8
12.1

13.5   15

95
52.9   85

27
10

19.2
17.3

(See note.)

**Note:** Provided with FQ-D31 only.

**Panel Mounting**

(36.9)
(2)   31.6
3.5

116
95

116
85

(133.4)

(8.1)
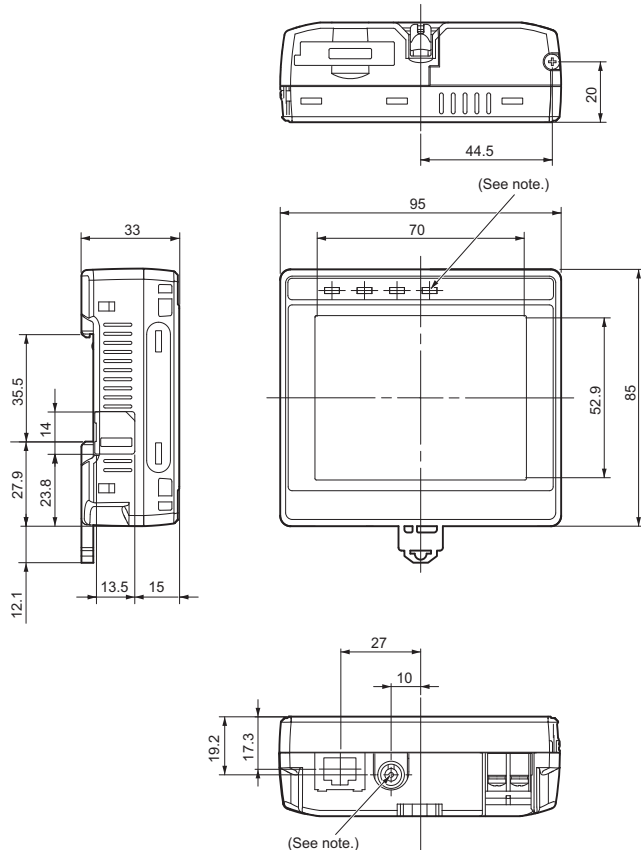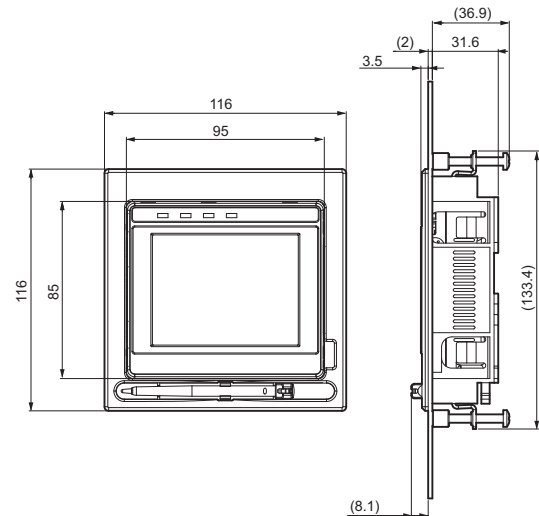
**Panel Cutout Dimensions**
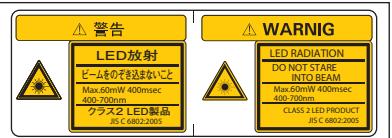
111±1

111±1

Panel

## LED Safety

| ⚠ warning |
|---|
| The Code Reader emits visible light, which may adversely affect the eyes in rare instances. Do not look directly into the light emitted from the Code Reader. If the subject is a specular reflective object, protect your eyes from reflected light. |

**Warning Label**

Attach the enclosed LED warning label to the cable or other location so that it can be seen from the side of the Code Reader.

⚠警告
LED放射
ビームをのぞき込まないこと
Max.60mW 400msec
400-700nm
クラス2 LED製品
JIS C 6802:2005

⚠ WARNIG
LED RADIATION
DO NOT STARE
INTO BEAM
Max.60mW 400msec
400-700nm
CLASS 2 LED PRODUCT
JIS C 6802:2005

**Note: Do not use this document to operate the Unit.**