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Vision colour sensor

FQ2-CLR

Teachable inspection area and RGB value processing



The vision colour sensor FQ2-CLR provides real colour identification functionality in combination with the flexibility and functionality of a vision sensor. The teachable inspection area provides an easy and flexible set up. The colour processing and evaluation can be carried out by the FQ2-CLR directly or the RGB values are available via Ethernet to other devices.

- Teachable inspection area
- Models with single colour detection or up to 32 colour and image processing tasks
- RGB values via Ethernet

Ordering Information

Type	Output	Tolerance adjustment	Connection method	Order code PNP*1
Single colour	Digital colour detected out and/or RGB value out (via ethernet)	– Object teaching (good sample) with manual tolerance adjustment – 2-point teaching (good and bad sample)	3 m PVC cable or 3 m Ethernet cable*2	**FQ2-CLR-V1P 3M*3**
1 to 32 colour and image processing tasks				**FQ2-CLR-V32P 3M**

*1. NPN models are available. Contact your Omron representative.
*2. Models with 2 m PVC cable or M12 pigtail connector are available. Contact your Omron representative.
*3. Programming device 'Touch Finder FQ2-D31' is not included. Order separately incl. AC power supply and battery or use PC Tool to program FQ2-CLR.

Programming device

	Type		Order code
	Touch Finder (included in FQ2-CLR-V32P)*1		**FQ2-D31**
		AC power supply (plug type c) for FQ2-D31	**FQ-AC4**
		Rechargeable battery for FQ2-D31	**FQ-BAT1**

*1. The FQ2-CLR can be programmed either with the Touch Finder or via a PC using the FQ2 PC Tool. After programming the FQ2-CLR, the programming device can be disconnected. Only one programming device is required for programming multiple FQ2-CLR. Contact your OMRON representative for FQ2-CLR-V32P version without included Touch Finder.

Content list

All products can be ordered separately under the following order codes:

FQ2-CLR-V1P 3M Package content (part list)

1 x	FQ2-S15050F	Single function vision sensor
1 x	FQ-WN003-E	Ethernet cable 3m
1 x	FQ-WD003-E	I/O cable 3m
1 x	AFBN0049	FQ2-CLR Quick Start Guide

FQ2-CLR-V32P 3M Package content (part list)

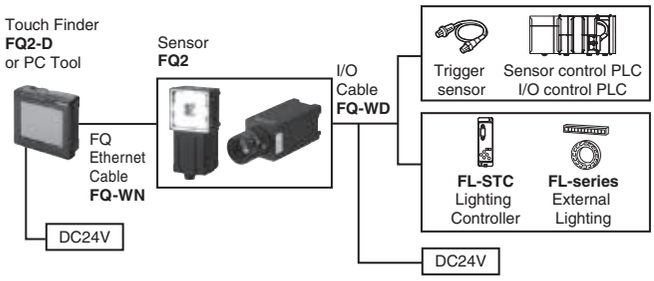
1 x	FQ2-S25050F	Multi function vision sensor
1 x	FQ-WN003-E	Ethernet cable 3m
1 x	FQ-WD003-E	I/O cable 3m
1 x	FQ2-D31	Touch Finder - programing device
1 x	FQ-AC4	AC power supply (plug type C) for FQ2-D31
1 x	FQ-BAT1	Battery for FQ2-D31
1 x	AFBN0049	FQ2-CLR Quick Start Guide

For a list of all available components see next page.

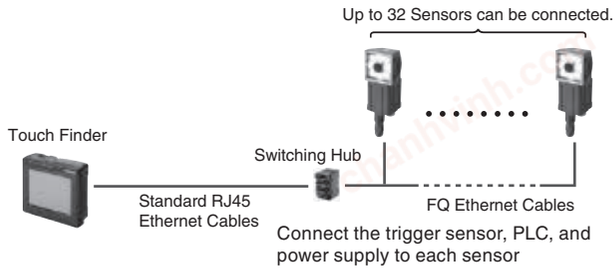
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System Configuration

Standard Configuration



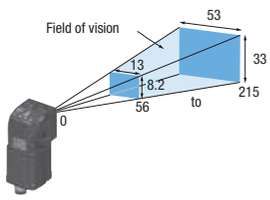
Multiple Connection



Note: If you register as a member after purchasing a Sensor, you can download free setup 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 for separate components

Sensor



Type	Standard	
	Single-function models	Standard models
NPN	FQ2-S10050F	FQ2-S20050F
PNP	FQ2-S15050F	FQ2-S25050F

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

Touch Finder

Type	Order code
DC power supply	FQ2-D30
AC/DC/battery	FQ2-D31*1

*1. AC Adapter and Battery are sold separately.

Cables (Robot cable)

Type	Cable length	Order code
FQ Ethernet Cables (connect Sensor to Touch Finder, Sensor to PC)	2 m	FQ-WN002-E
	5 m	FQ-WN005-E
	10 m	FQ-WN010-E
I/O Cables	2 m	FQ-WD002-E
	5 m	FQ-WD005-E
	10 m	FQ-WD010-E

Industrial Switching Hubs (Recommended)

Appearance	Number of ports	Failure detection	Current consumption	Order code
	3	None	0.08 A	W4S1-03B
	5	None	0.12 A	W4S1-05B
		Supported		W4S1-05C

Accessories

Application	Appearance	Name	Order code
For Sensor		Mounting Bracket (enclosed with Sensor)	FQ-XL
		Polarizing Filter Attachment (enclosed with Sensor)	FQ-XF1
For Touch Finder		Panel Mounting Adapter	FQ-XPM
		AC Adapter (for models for DC/AC/Battery)	FQ-AC□*1
		Battery (for models for DC/AC/Battery)	FQ-BAT1
		Touch Pen (enclosed with Touch Finder)	FQ-XT
		Strap	FQ-XH

*1. 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	Order code
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

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Ratings and Performance

Sensor

Item		Single-function type	Standard type
Model	NPN	FQ2-S10□□□□	FQ2-S20□□□□
	PNP	FQ2-S15□□□□	FQ2-S25□□□□
Field of view		13 × 8.2 to 53 × 33 mm	
Installation distance		56 to 215 mm	
Main functions	Inspection items	Search, shape search II, sensitive search, area, color data, edge position, edge pitch, edge width, and labeling	
	Number of simultaneous measurements	1	32
	Position compensation	Supported (360º Model position compensation, Edge position compensation)	
	Number of registered scenes	8	32
	Calibration	Supported	
Image input	Image processing method	Real color	
	Image filter	High dynamic range (HDR), image adjustment(Color Gray Filter, Weak smoothing, Strong smoothing, Dilate, Erosion, Median, Extract edges, Extract horizontal edges, Extract vertical edges, Enhance edges, Background suppression), polarizing filter (attachment), and white balance (Sensors with Color Cameras only)	
	Image elements	1/3-inch color CMOS	
	Shutter	Built-in lighting ON: 1/250 to 1/50,000 Built-in lighting OFF: 1/1 to 1/50,000	
	Processing resolution	752 × 480	
	Partial input function	Supported horizontally only.	
Lighting	Lighting method	Pulse	
	Lighting color	White	
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.)	
	Images	In Sensor: 20 images (If a Touch Finder is used, images can be saved up to the capacity of an SD card.)	
Auxiliary function		Math (arithmetic, calculation functions, trigonometric functions, and logic functions)	
Measurement trigger		External trigger (single or continuous) Communications trigger (Ethernet TCP no-protocol, Ethernet FINS/TCP no-protocol, EtherNet/IP, or PLC Link)	
I/O specifications	Input signals	7 signals Single measurement input (TRIG) Control command input (IN0 to IN5)	
	Output signals	3 signals Control output (BUSY) Overall judgement output (OR) Error output (ERROR) The assignments of the three output signals (OUT0 to OUT2) can be changed to the individual judgements of the inspection items, the image input ready output (READY), or the external lighting timing output (STGOUT).	
	Ethernet specifications	100Base-TX/10Base-T	
	Communications	Ethernet TCP no-protocol, Ethernet FINS/TCP no-protocol, EtherNet/IP, or PLC Link	
Ratings	Power supply voltage	21.6 to 26.4 VDC (including ripple)	
	Current consumption	2.4 A max.	

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Item			Single-function type	Standard type
Model	NPN		FQ2-S10□□□□	FQ2-S20□□□□
	PNP		FQ2-S15□□□□	FQ2-S25□□□□
Environmental immunity	Ambient temperature range		Operating: 0 to 50ºC 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	
	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		IEC 60529 IP67 (Except when Polarizing Filter Attachment is mounted or connector cap is removed.)	
Materials			Sensor: PBT, PC, SUS Mounting Bracket: PBT Polarizing Filter Attachment: PBT, PC Ethernet connector: Oil-resistance vinyl compound I/O connector: Lead-free heat-resistant PVC	
Weight			Narrow View/Standard View:Approx.160 g Wide View:Approx.150 g	
Accessories included with sensor			Mounting Bracket (FQ-XL)(1) Polarizing Filter Attachment (FQ-XF1) (1) Instruction Manual , Quick Startup Guide Member Registration Sheet , Warning Label	
LED class			Class 2(Applicable standards: IEC 60825-1:1993 +A1:1997 +A2:2001, EN 60825-1:1994 +A1:2002 +A2:2001, and JIS C 6802:2005)	
Applicable standards			EN standard EN 61326 and EC Directive No.2004/104/EC	

Touch Finder

Item			Type	Model with DC power supply	Model with AC/DC/battery power supply
			Model	FQ2-D30	FQ2-D31
Number of connectable Sensor				Number of sensors that can be recognized (switched): 32 max. number or sensor that can displayed on monitor: 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	
		Pixels		320 × 240	
		Display colors		16.7 million	
	Back-light	Life expectancy*1		50,000 hours at 25ºC	
		Brightness adjustment		Provided	
		Screen saver		Provided	
Operation interface	Touch screen	Method		Resistance film	
		Life expectancy*2		1,000,000 touch operations	
External interface	Ethernet			100BASE-TX/10BASE-T	
	SD card			SDHC-compliant, Class 4 or higher recommended	

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Item		Type	Model with DC power supply	Model with AC/DC/battery power supply
		Model	FQ2-D30	FQ2-D31
Ratings	Power supply voltage		DC power connection: 21.6 to 26.4 VDC (including ripple)	DC power connection: 21.6 to 26.4 VDC (including ripple) AC adapter (manufactured by Sino-American Japan Co., Ltd) connection: 100 to 240 VAC, 50/60 Hz Battery connection: FQ-BAT1 Battery (1cell, 3.7 V)
	Continuous operation on Battery*3		---	1.5 h
	Power consumption		DC power connection: 0.2 A max.	DC power connection: 0.2 A max. Charging battery: 0.4 A max.
Environ-mental 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	
	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		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 included with Touch Finder			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. 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	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 (FQ2-D31). AC adapter (FQ-AC□) is required.
Charging time*1	2 h
Usage time*1	1.5 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.

System Requirements for PC tool for FQ2

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

OS	Microsoft Windows XP Home Edition/Professional SP2 or higher (32-bit version) Microsoft Windows 7 Home Premium or higher (32-bit/64-bit version)
CPU	Core 2 Duo 1.06 GHz or the equivalent or higher
RAM	1GB min.
HDD	500 MB min. available space*1
Monitor	1,024 x 768 dots min.

*1. Available space is also required separately for data logging.

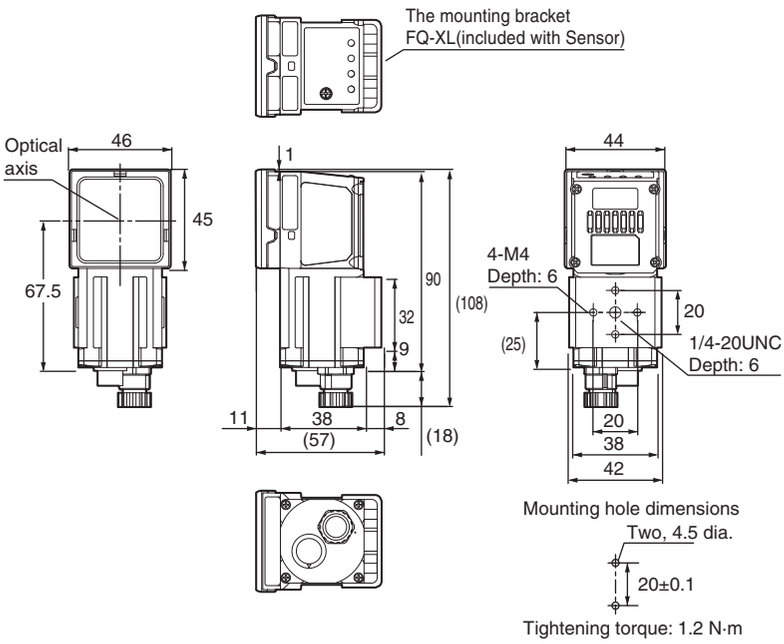
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Dimensions

(Unit: mm)
Tolerance class IT16 applies to dimensions in this data sheet unless otherwise specified.

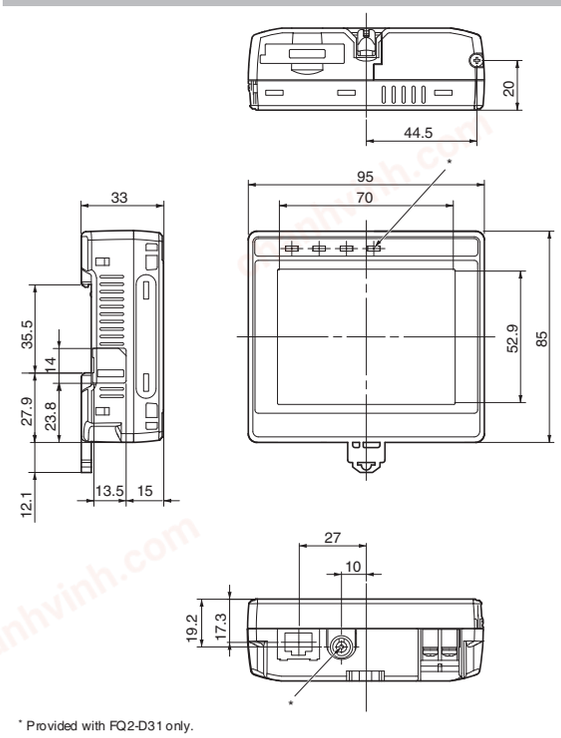
Amplifier Units

Sensor

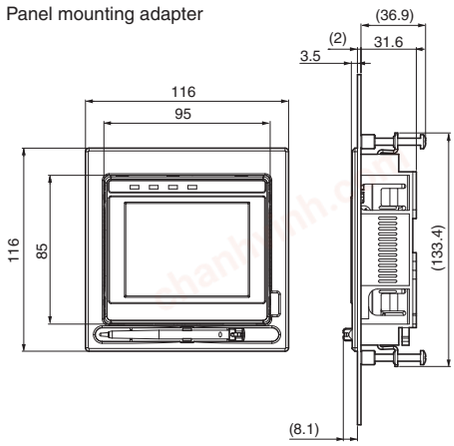


Touch Finder

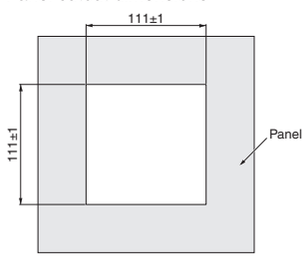
FQ2-D30/-D31



Panel mounting adapter



Panel cutout dimensions



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Cat. No. E76E-EN-02 **In the interest of product improvement, specifications are subject to change without notice.**

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