

## FQ VISION SENSOR

Enkel og effektiv



» One-touch betjening

» Krystalklare billeder

» Fleksibel platform

# Nem konfigurering og krystalklare billeder

*Omron definerer en ny æra af enkelhed og ydeevne med den nye FQ vision sensor. FQ giver dig mulighed for at drage fordel af avanceret teknologi uden kompleks programmering eller forudgående teknisk know-how. One-touch betjening, via PC eller den intuitive TouchFinder konsol, giver dig nemt og hurtigt adgang til alle funktioner og indstillinger. Ved hjælp af avancerede procesværktøjer opnås en fremragende billedkvalitet fra selv de sværeste overflader. Samtidig er FQ tilgængelig i en bred vifte af modeller, så du ikke behøver at gå på kompromis med en løsning, hvor du er nødt til at vælge, enten for mange eller for få funktioner, i forhold til behovet. Dette sikrer dig en løsning, der passer perfekt til din specifikke applikation.*

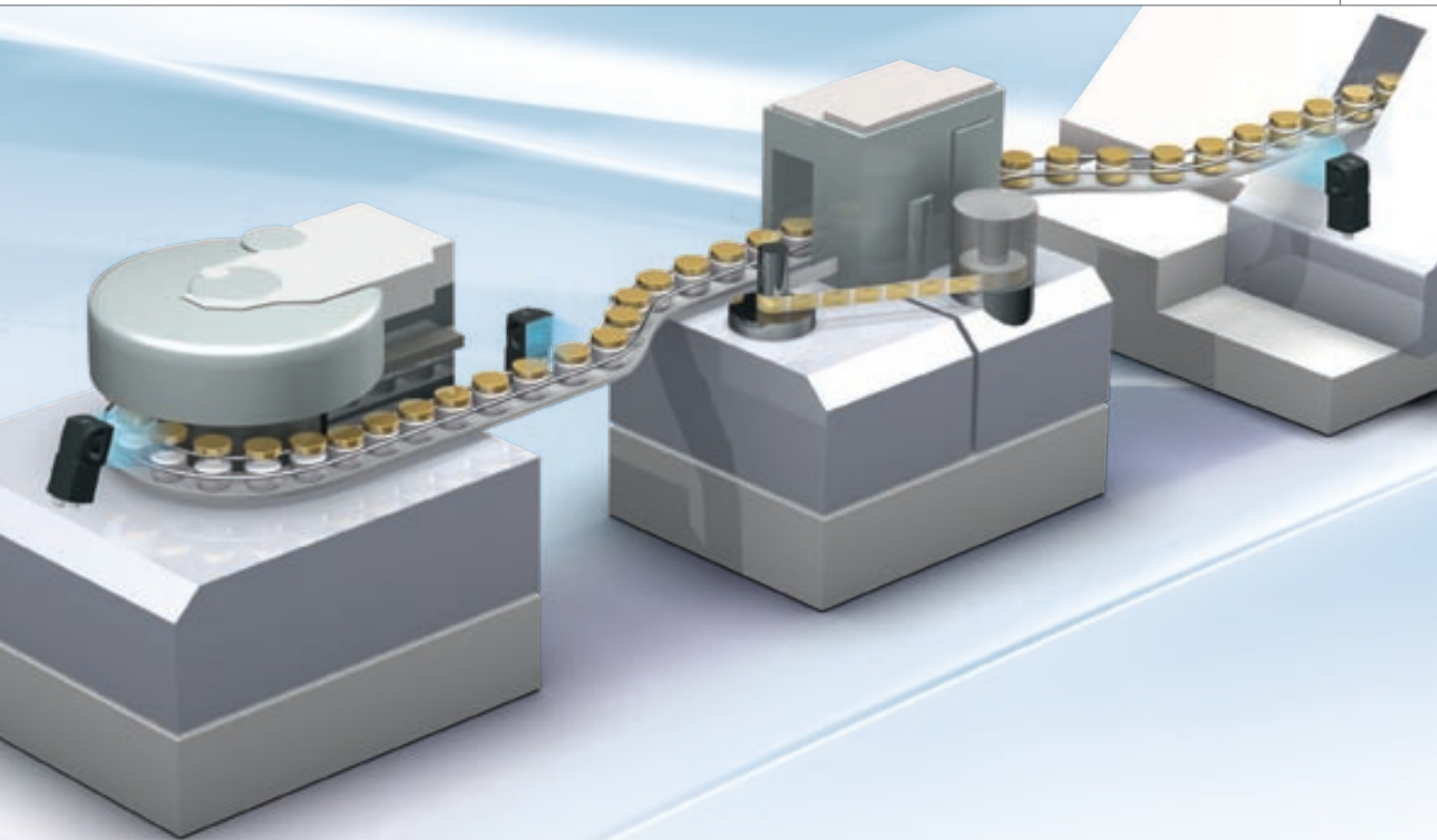
## Funktioner

- One-touch betjening via enkel ikonbaseret menu
- Krystalklar billedkvalitet
- Ægte farvebearbejdning (16 millioner farver)
- Betjening via PC eller TouchFinder konsol

## Fordele

- Enkel, guidet konfigurering
- Pålidelige resultater på alle overflader
- Bemærkelsesværdig fleksibilitet – passer altid perfekt og kompromisløst til din applikation





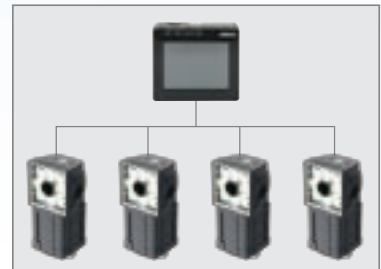
### Skarpe billeder

Højtydende LED'er og kraftfuld filtrering giver klare billeder på selv de mest vanskelige overflader.



### Nem konfiguration

Med den enkle navigationsmenu ved du altid, hvor du er med din produktion.



### Fleksibel platform

Vælg den vision sensor, der passer bedst til din applikation, og beslut hvordan du vil betjene den.

## Kompakt og robust

FQ vision sensoren er vores mest kompakte løsning, som kombinerer både et kamera og en billedprocessor i samme kabinet. Der er ikke behov for dyr og pladskrævende ekstern belysning, takket være den indbyggede linse og højtydende LED. Beskyttelsesklasse IP67 gør det muligt at anvende FQ selv i barske miljøer.

Kompakt størrelse og robust kabinet – passer til enhver maskine

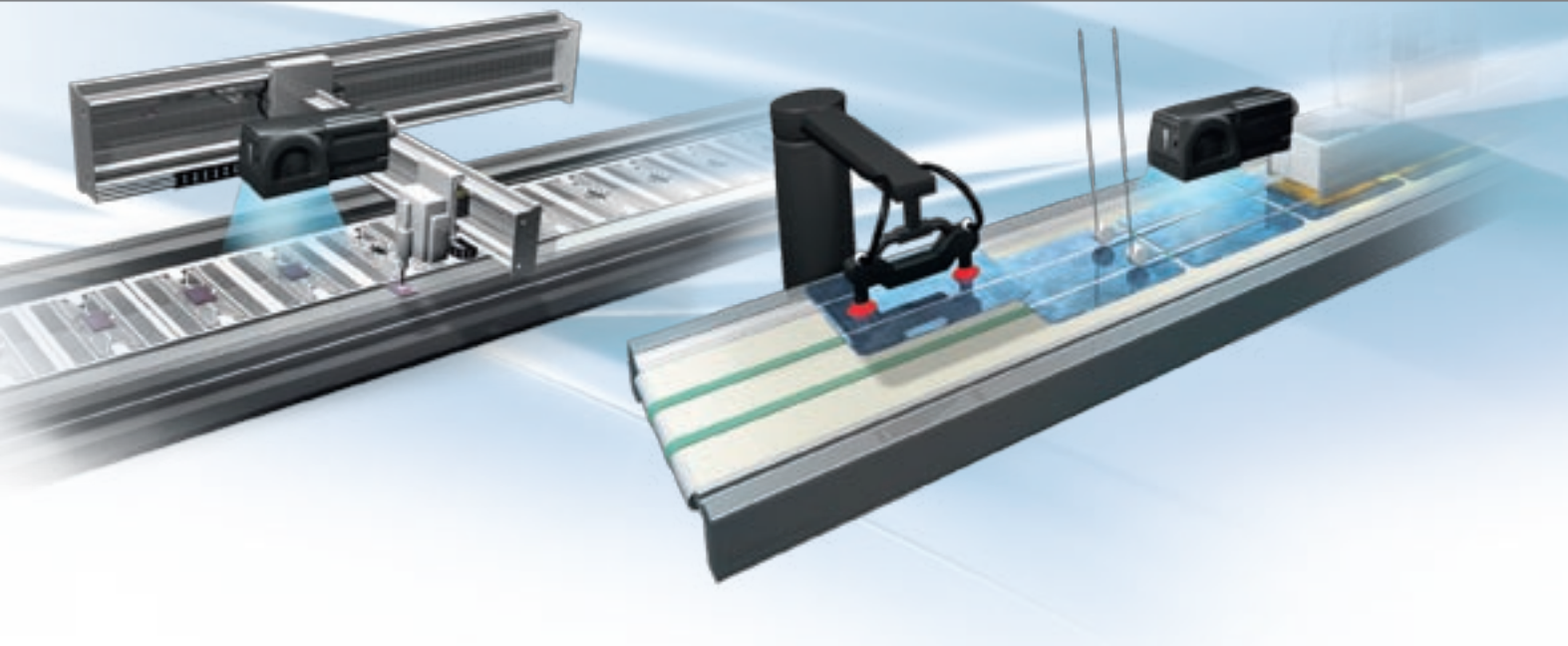
Højtydende LED'er – enestående i denne klasse

Indbygget linse – nem finjustering af kamerafokus

Kraftfuld billedprocessor – hurtig kontrol, fremragende filtrering

Industrielle stik til trigger, I/O, Ethernet og strøm

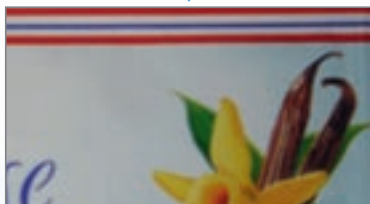




## Ny standard for klare billeder

Udover at være banebrydende mht. enkelhed giver Omron FQ vision sensoren dig også den bedste billedkvalitet og -skarphed. For første gang i denne produktklasse kan du nu få glæde af en række avancerede funktioner til billedoptagelse og -behandling. Kraftig LED, HDR billedteknik og polariseringsfiltre giver stabile inspektioner på overflader, hvor konventionelle vision sensorer ikke kan se noget. Det skarpe billede gør FQ nem at installere, da synsvinklen ikke længere er afgørende.

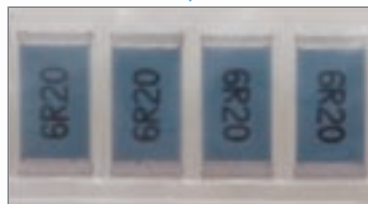
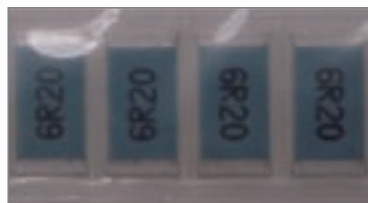
### Trykkeribranchen: farvede objekter



#### Ægte farvegenkendelse

Alle RGB nuancer (16 millioner) behandles direkte. Gråskalakonvertering og farvefiltrering er ikke nødvendig.

### Elektriske dele: laveste kontrast



#### Kraftigt lys

Kontrast var engang et stort problem inden for billedbehandling. Med FQ vision sensoren er hvert eneste billede imidlertid lyst og klart med perfekt kontrast, hvilket giver pålidelige resultater.

### Bilindustrien: genskin og refleksion



#### HDR billedteknik

Variationer i lysforholdene kan forårsage uønsket genskin eller lysreflekser. HDR minimerer disse effekter og maksimerer stabiliteten i inspektionsresultaterne, og imødegår også variationer fra emne til emne.

## Ganske enkelt det mest fleksible produkt af sin art

Fleksibilitet møder enkelhed i Omrons FQ vision sensor, både i design, funktionalitet og brugervenlighed. Den er velegnet til alle former for proces- og emballeringsapplikationer, og kan skræddersyes til selv de mest krævende behov og enhver opgave.

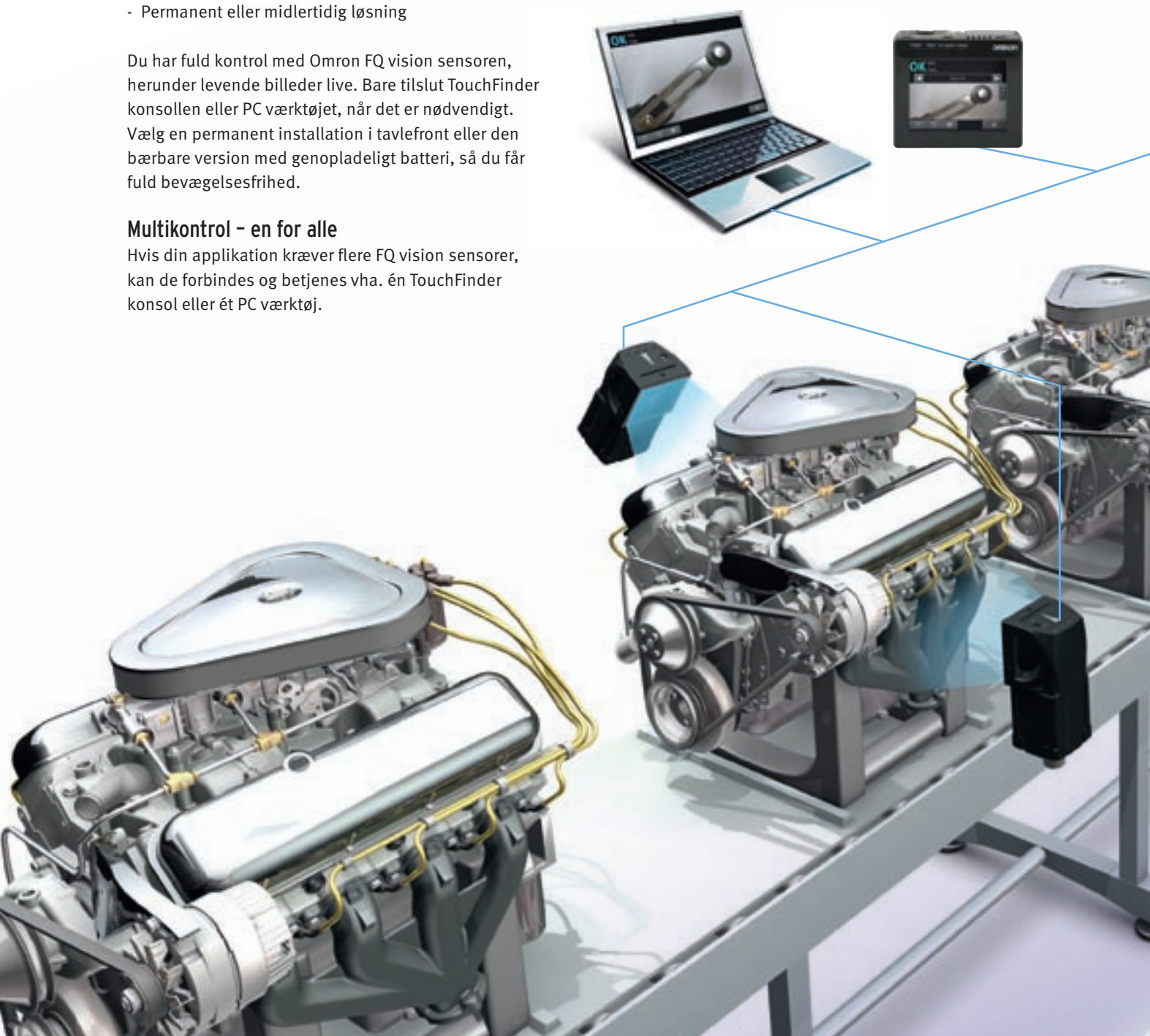
### Du bestemmer, hvordan du vil konfigurere

- PC eller stand-alone
- Lokalt eller fjernbetjent
- Bærbar eller stationær PC
- Permanent eller midlertidig løsning

Du har fuld kontrol med Omron FQ vision sensoren, herunder levende billeder live. Bare tilslut TouchFinder konsollen eller PC værktøjet, når det er nødvendigt. Vælg en permanent installation i tavlefront eller den bærbare version med genopladeligt batteri, så du får fuld bevægelsesfrihed.

### Multikontrol - en for alle

Hvis din applikation kræver flere FQ vision sensorer, kan de forbindes og betjenes vha. én TouchFinder konsol eller ét PC værktøj.

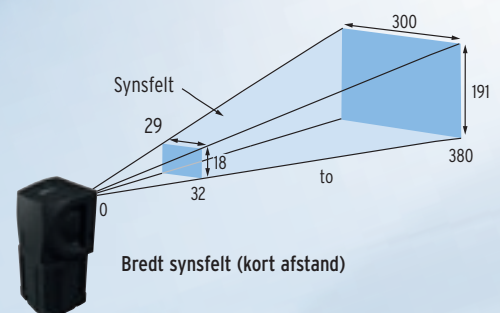
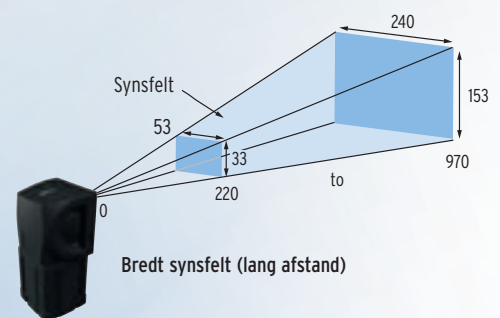
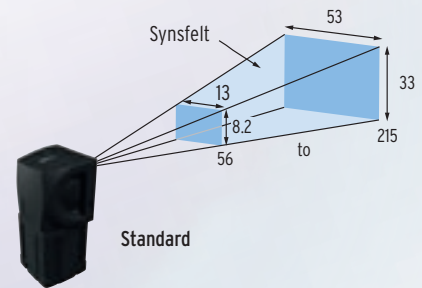
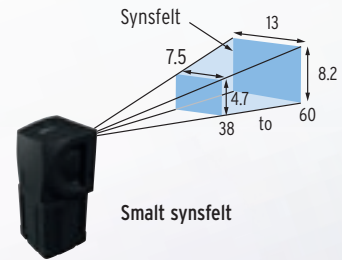


## Tilpas dit synsfelt

Uanset om der skal håndteres store eller små emner, giver udvalget af Omron FQ vision sensorer dig et produkt, der passer perfekt. Vælg en FQ model med en passende rækkevidde, og tilpas synsfeltet til din applikation. Fokusering foregår hurtigt og nemt, så du kan anvende sensoren til en lang række forskellige applikationer.



### Stor rækkevidde: synsfelt på 7,5 - 300 mm

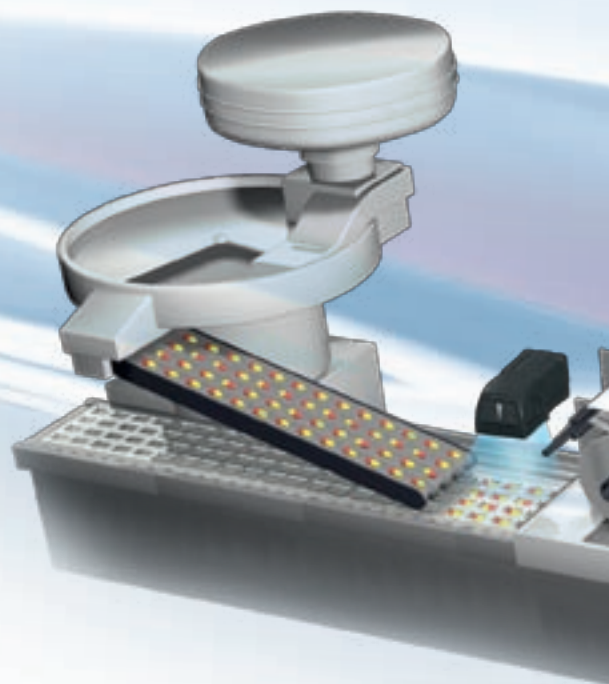


## Intuitiv brugerflade

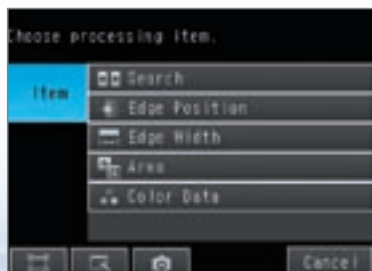
FQ vision sensoren tager dig ind i en ny dimension af enkelhed og intuitiv brugerbetjening. Du ved altid hvor i systemet du er, takket være den innovative navigationsmenuen. Du styres skridt for skridt, og vil hurtigt lære at navigere direkte til alle indstillinger og funktioner.

Anvend FQ's effektive auto-funktioner til at finde de ideelle indstillinger, samt at foretage finjusteringer eller konfigurationsændringer.

Som bruger behøver du ikke at være ekspert i vision sensorer, da intelligensen er indbygget i enheden selv. Du får adgang til forskellige visninger af inspektionsresultaterne: oversigt, detaljer, trend eller histogram. FQ forsyner dig med de resultater, du har brug for for at kunne tage velbegrandede beslutninger om din produktion.



### Tryk og start - inspektionskonfiguration



1. Vælg inspektionsværktøj

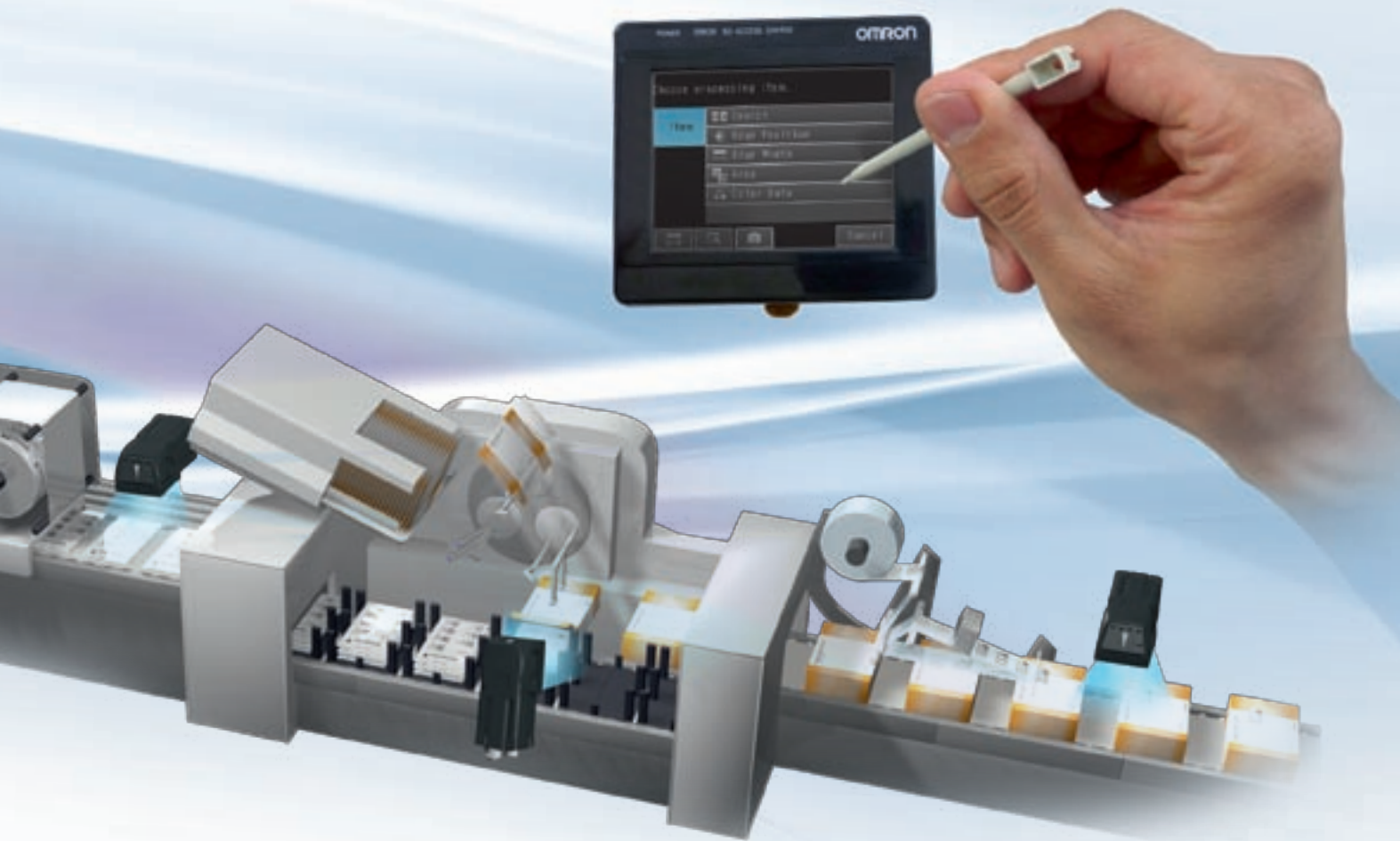


2. Indlær modellen



3. Indstil grænseværdierne





Få de rigtige resultater hver gang, i ethvert format



#### Oversigt over resultater

Vis resultaterne af alle inspektionselementer i en oversigt. Navigér direkte til ethvert resultat med ét tryk for at se detaljerne.



#### Trendovervågning

Se historikken for inspektionsresultater over en periode. Trenden for produktionskvaliteten kan nemt overvåges. Der kan straks sættes ind, hvis kvaliteten daler.



#### Histogram

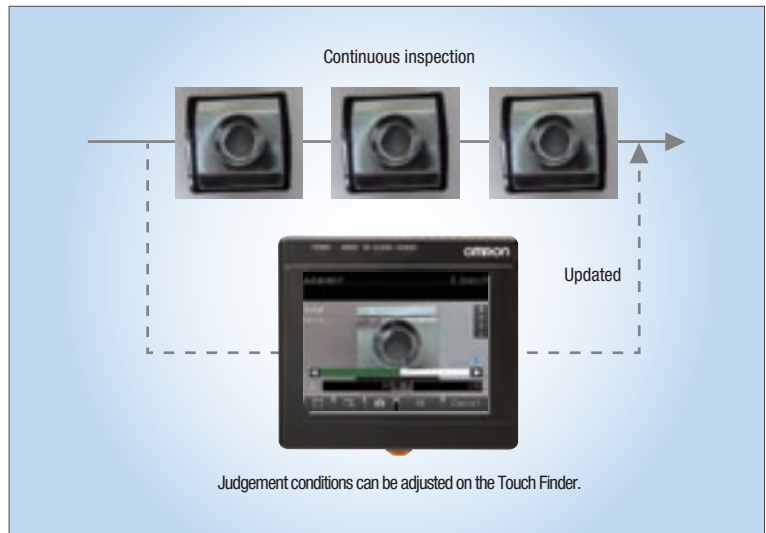
Vis fordelingen af alle måleresultater, så du med det samme får overblik over den samlede produktionskvalitet.

## Trouble-free Operation On Site

### Real-time Threshold Adjustment

The FQ vision sensor allows fast and easy real-time parameter adjustment.

Eliminating the need to stop the machine for fine tuning and optimisation of settings, resulting in zero machine downtime.




### Inspection History Logging

Historical results logging is very useful for testing a new line. Samples are fed down the line and inspection results are logged. The logged data can be checked on a time scale in graph form and used to adjust judgement conditions.


File Logging is convenient during operation. Large inspection histories can be saved in SD cards and used later for traceability.

**Recent Results Logging**



Displays the most recent 1,000 inspection results in graph form.

**File Logging**

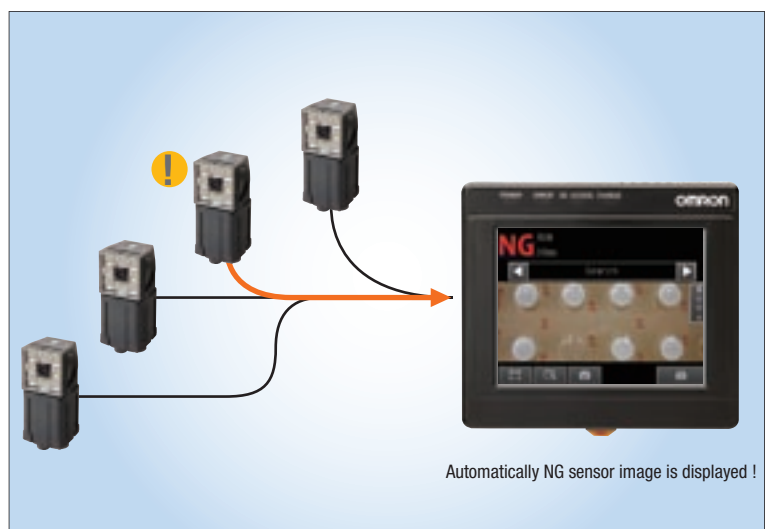


SD card  
Up to 10 million measurement values or more (for a 4-GB SD card)  
Up to 10,000 images or more (for a 4-GB SD card)

### Auto Detection

When multiple sensors are connected to the Touch Finder, the display automatically switches to the image of the sensor which has produced an NG result.

This allows dynamic visualisation of reject conditions.

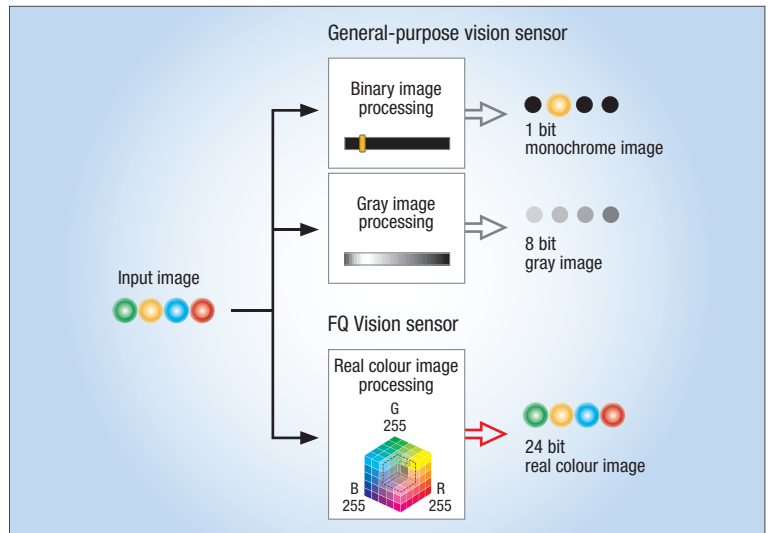


## Authentic Vision Technologies are Gathered on FQ

### Real Colour Sensing

Most vision sensors on the market operate using greyscale image processing, due to the high demand of processing colour images. However, many applications may be unsuitable or unstable using greyscale processing due to the requirement of colour inspection or poor image contrast.

In order to offer solutions for such issues, the FQ vision sensor combines a high power processor unit and real-colour processing technology which enables fast inspections using colour images. The same technology is used in Omron's flagship model of vision sensors and is widely utilised throughout industry.

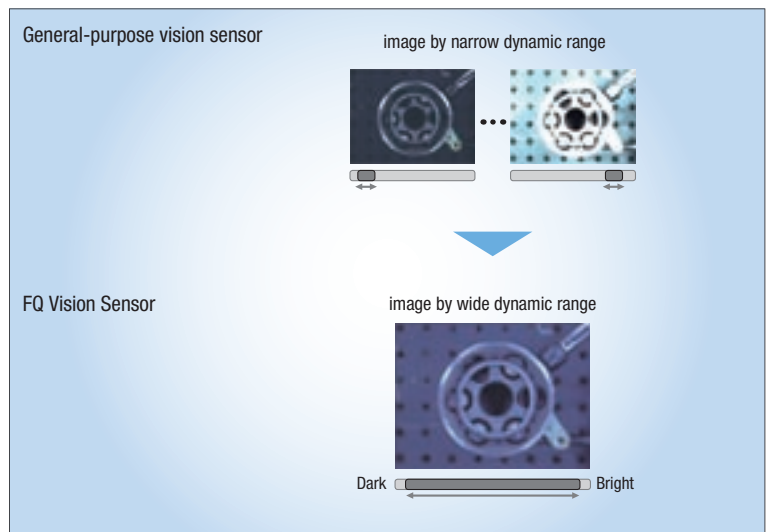


### HDR Sensing

Glossy & highly reflective surfaces can often result in "halation" or uneven brightness across an image, coupled with inconsistent workpiece placement inspections can become unstable and unreliable. Such halation is a result of the narrow dynamic range of standard vision sensors.

The FQ vision sensor uses Omron's High Dynamic Range (HDR) processing technology, which increases the dynamic range of the system up to 16 times that of conventional vision sensors.

The result is stable detection of objects which are highly reflective, even if workpiece placement is not consistent.



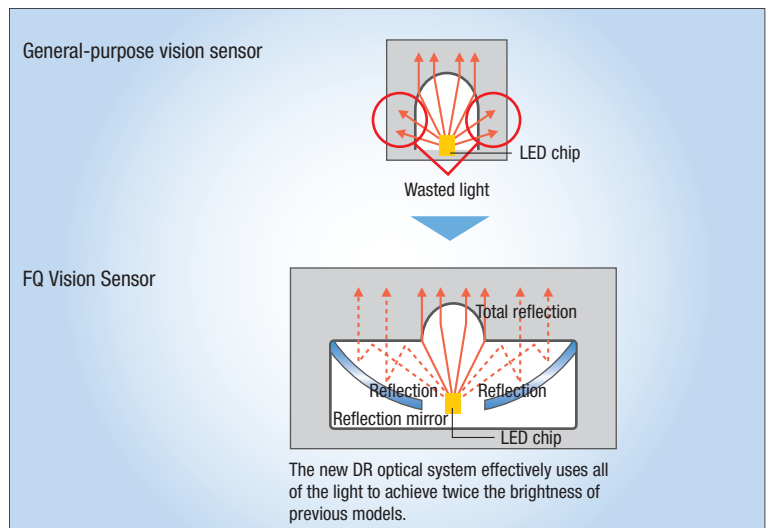
### High Power Lighting

Providing suitable illumination for inspections can often be the deciding factor between application success or failure. Especially when inspecting large field of views, even and consistent lighting can be difficult to achieve.

In order to handle such issues, a new DR optical system has been developed for the FQ vision sensor. This system effectively uses all of the LED light to maintain consistent brightness across the field of view at twice the brightness of previous models.

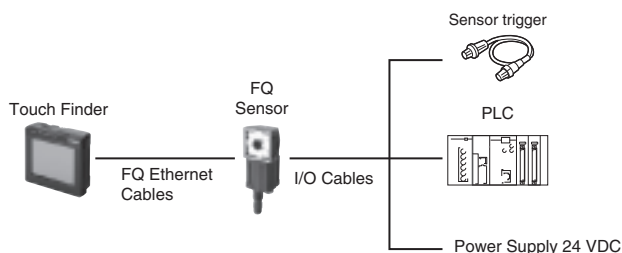
The FQ vision sensor also has a polarisation filter, to cut off the specular reflection light which can result from highly reflective objects, resulting in reliable and consistent inspections.

DR optical system : Double-reflection optical system

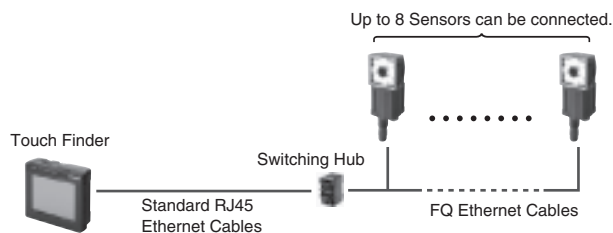


## System Configuration

### Standard Configuration



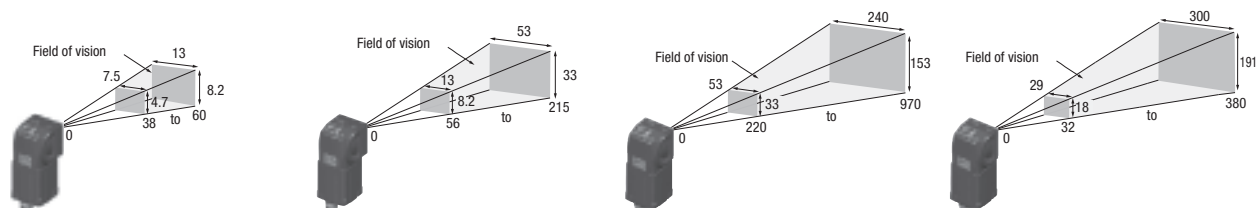
### Multiple Connection



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

### Sensor



Type	Narrow View		Standard		Wide View			
	Single-function models	Standard models	Single-function models	Standard models	Long-distance		Short-distance	
					Single-function models	Standard models	Single-function models	Standard models
NPN	FQ-S10010F	FQ-S20010F	FQ-S10050F	FQ-S20050F	FQ-S10100F	FQ-S20100F	FQ-S10100N	FQ-S20100N
PNP	FQ-S15010F	FQ-S25010F	FQ-S15050F	FQ-S25050F	FQ-S15100F	FQ-S25100F	FQ-S15100N	FQ-S25100N

Note: Tolerance (field of vision):  $\pm 10\%$  max.

### Touch Finder

Type	Order code
DC power supply	FQ-D30
AC/DC/battery	FQ-D31 <sup>*1</sup>

<sup>\*1</sup> AC Adapter and Battery are sold separately.

### Cables

Type	Cable length	Order code
FQ Ethernet Cables (connect Sensor to Touch Finder, Sensor 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	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 <sup>*1</sup>
		Battery (for models for DC/AC/Battery)	FQ-BAT1
		Touch Pen (enclosed with Touch Finder)	FQ-XT
		Strap	FQ-XH

<sup>\*1</sup> 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
C	250 V max.	Europlug	FQ-AC4
BF	250 V max.	UK	FQ-AC5

## Specifications

Item	Type	Single-function models	Standard models
Model	NPN	FQ-S10_	FQ-S20_
	PNP	FQ-S15_	FQ-S25_
Field of vision	Refer to the table below.		
Installation distance	Refer to the table below.		
Main functions	Inspection items	Search, area, average colour, edge position, and edge width	
	Number of simultaneous inspections	1	32
	Position compensation	None	
	Number of registered scenes	8	32
Image input	Image processing method	Real colour	
	Image filter	High dynamic range (HDR), polarizing filter (attachment), and white balance	
	Image elements	1/3-inch colour CMOS	
	Shutter	1/250 to 1/30,000	
	Processing resolution	752 x 480	
Lighting	Lighting method	Pulse	
	Lighting colour	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.)	
Measurement trigger	External trigger (single or continuous)		
I/O specifications	Input signals	7 signals <ul style="list-style-type: none"> <li>Single measurement input (TRIG)</li> <li>Command input (INO to IN5)</li> </ul>	
	Output signals	3 signals <ul style="list-style-type: none"> <li>Control output (BUSY)</li> <li>Overall judgement output (OR)</li> <li>Error output (ERROR)</li> </ul> Note: The three output signals can be allocated for the judgements of individual inspection items.	
	Ethernet specification	100BASE-TX/10BASE-T	
	Connection method	Special connector cables <ul style="list-style-type: none"> <li>Power supply and I/O: 1 cable</li> <li>Touch Finder and computer: 1 cable</li> </ul>	
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 Storage: -25 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	
	Degree of protection	IEC 60529 IP67 (with polarizing filter attachment mounted.)	
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	Depends on field of vision and installation distance. Refer to the table below.		
Accessories	<ul style="list-style-type: none"> <li>Mounting Bracket (FQ-XL) (1)</li> <li>Polarizing Filter Attachment (FQ-XF1) (1)</li> <li>Instruction Manual</li> <li>Quick Startup Guide</li> <li>Member registration sheet</li> </ul>		

Single-function models		Standard models		Field of view <sup>*1</sup> (Horizontal x Vertical)	Installation distance	Weight
NPN	PNP	NPN	PNP			
FQ-S10010F	FQ-S15010F	FQ-S20010F	FQ-S25010F	7.5x4.7 to 13x8.2 mm	38 to 60 mm	Approx. 160 g
FQ-S10050F	FQ-S15050F	FQ-S20050F	FQ-S25050F	13x8.2 to 53x33 mm	56 to 215 mm	Approx. 160 g
FQ-S10100F	FQ-S15100F	FQ-S20100F	FQ-S25100F	53x33 to 240x153 mm	Long-distance model: 220 to 970 mm	Approx. 150 g
FQ-S10100N	FQ-S15100N	FQ-S20100N	FQ-S25100N	29x18 to 300x191 mm	Short-distance model: 32 to 380 mm	Approx. 150 g

\*1 Tolerance: ±10% max.

## Touch Finder

Item	Model with DC power supply		Model with AC/DC/battery power supply
	FQ-D30		FQ-D31
<b>Number of connectable Sensors</b>	8 max.		
<b>Main functions</b>	<b>Types of measurement displays</b>		Last result display, Last NG display, trend monitor, histograms
	<b>Types of display images</b>		Through, frozen, zoom-in, and zoom-out images
	<b>Data logging</b>		Measurement results, measured images
	<b>Menu language</b>		English, German, French, Italian, Spanish, Traditional Chinese, Simplified Chinese, Korean, Japanese
<b>Indications</b>	<b>LCD</b>	<b>Display device</b>	3.5-inch TFT colour LCD
		<b>Pixels</b>	320 x 240
		<b>Display colours</b>	16,777,216
	<b>Backlight</b>	<b>Life expectancy<sup>*1</sup></b>	50,000 hours at 25°C
		<b>Brightness adjustment</b>	Provided
	<b>Screen saver</b>	Provided	
<b>Operation interface</b>	<b>Touch screen</b>	<b>Method</b>	Resistance film
		<b>Life expectancy<sup>*2</sup></b>	1,000,000
<b>External interface</b>	<b>Ethernet</b>		100BASE-TX/10BASE-T
	<b>SD card</b>		SDHC-compliant, Class 4 or higher recommended
<b>Ratings</b>	<b>Power supply voltage</b>		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
	<b>Continuous operation on Battery<sup>*3</sup></b>		1.5 h
	<b>Power consumption</b>		DC power connection: 0.2 A
<b>Environmental immunity</b>	<b>Ambient temperature range</b>		Operating: 0 to 50°C Storage: -25 to 65°C (with no icing or condensation) Operating: 0 to 50°C when mounted to DIN Track or panel Operation on Battery: 0 to 40°C Storage: -25 to 65°C (with no icing or condensation)
	<b>Ambient humidity range</b>		Operating and storage: 35% to 85% (with no condensation)
	<b>Ambient atmosphere</b>		No corrosive gas
	<b>Degree of protection</b>		IEC 60529 IP20 (when SD card cover, connector cap, or harness is attached)
<b>Weight</b>	Approx. 270 g (without Battery and hand strap attached)		
<b>Materials</b>	Case: ABS, Hand strap: Nylon		
<b>Accessories</b>	Touch Pen (FQ-XT), Instruction Manual		

<sup>\*1</sup> 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.

<sup>\*2</sup> This value is only a guideline. No guarantee is implied. The value will be affected by operating conditions.

<sup>\*3</sup> 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
<b>Battery type</b>	Secondary lithium ion battery
<b>Nominal capacity</b>	1,800 mAh
<b>Rated voltage</b>	3.7V
<b>Ambient temperature range</b>	Operating: 0 to 40°C Storage: -25 to 65°C (with no icing or condensation)
<b>Ambient humidity range</b>	Operating and storage: 35% to 85% (with no condensation)
<b>Charging method</b>	Charged in Touch Finder (FQ-D31). AC adapter (FQ-AC_) is required.
<b>Charging time<sup>*1</sup></b>	2.5 h
<b>Battery backup life<sup>*2</sup></b>	300 charging cycles
<b>Weight</b>	50 g max.

<sup>\*1</sup> This value is only a guideline. No guarantee is implied. The value will be affected by operating conditions

<sup>\*2</sup> 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.

<b>OS</b>	Microsoft Windows XP Home Edition/Professional SP2 or higher <sup>*1</sup> Microsoft Windows 7 Home Premium or higher <sup>*1</sup>
<b>CPU</b>	Core 2 Duo 1.06 GHz or the equivalent or higher
<b>RAM</b>	1GB min.
<b>HDD</b>	500 MB min. available space <sup>*2</sup>
<b>Monitor</b>	1,024 x 768 dots min.

<sup>\*1</sup> The Japanese and English versions support only 32-bit OS versions.

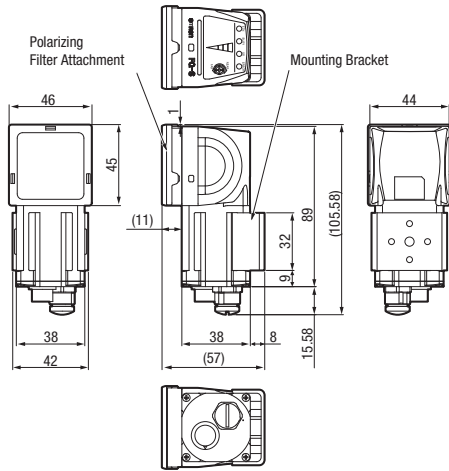
<sup>\*2</sup> Available space is also required separately for data logging.

## Dimensions

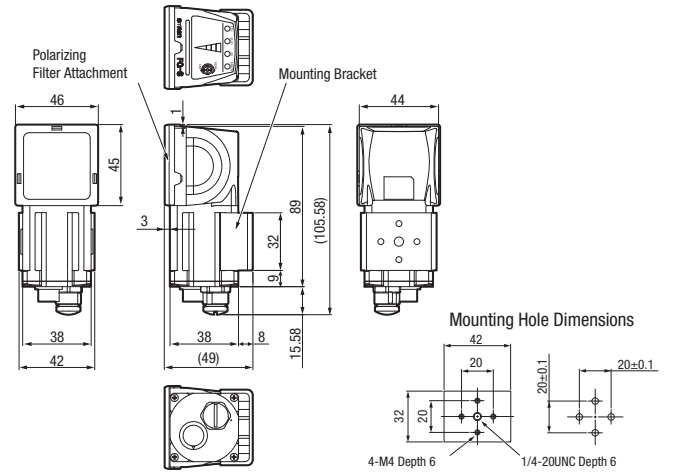
(Unit: mm)

### Sensor

FQ-S10010F/-S10050F/-S15010F/-S15050F  
FQ-S20010F/-S20050F/-S25010F/-S25050F

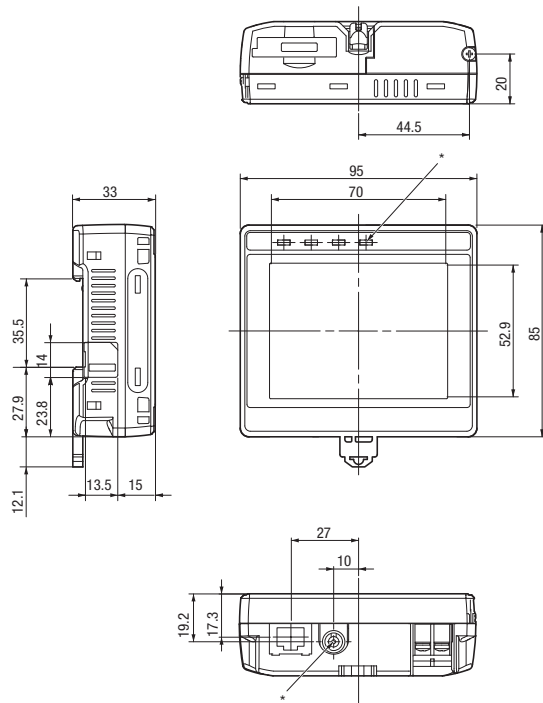


FQ-S10100F/-S10100N/-S15100F/-S15100N  
FQ-S20100F/-S20100N/-S25100F/-S25100N

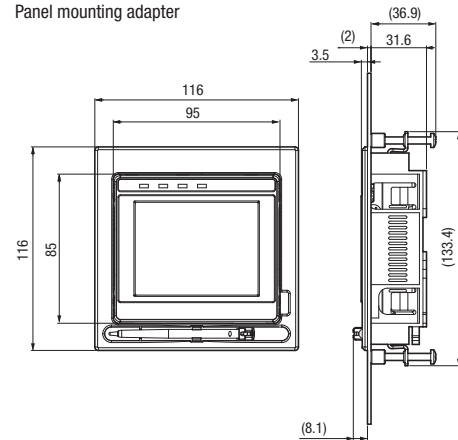


### Touch Finder

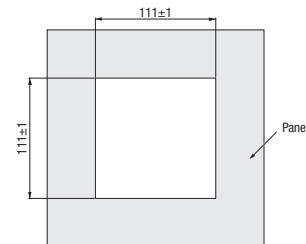
FQ-D30/-D31



Panel mounting adapter



Panel cutout dimensions



\* Provided with FQ-D31 only.

OMRON EUROPE B.V. Wegalaan 67-69, NL-2132 JD, Hoofddorp, Holland. Tel: +31 (0) 23 568 13 00 Fax: +31 (0) 23 568 13 88 [www.industrial.omron.eu](http://www.industrial.omron.eu)

## DANMARK

**Omron Electronics A/S**  
Lykkebækvej 2, DK-4600 Køge  
Tel: +45 43 44 00 11  
Fax: +45 43 44 02 11  
[www.industrial.omron.dk](http://www.industrial.omron.dk)  
[omron.dk@eu.omron.com](mailto:omron.dk@eu.omron.com)

## Belgien

Tel: +32 (0) 2 466 24 80  
[www.industrial.omron.be](http://www.industrial.omron.be)

## Finland

Tel: +358 (0) 207 464 200  
[www.industrial.omron.fi](http://www.industrial.omron.fi)

## Frankrig

Tel: +33 (0) 1 56 63 70 00  
[www.industrial.omron.fr](http://www.industrial.omron.fr)

## Holland

Tel: +31 (0) 23 568 11 00  
[www.industrial.omron.nl](http://www.industrial.omron.nl)

## Italien

Tel: +39 02 326 81  
[www.industrial.omron.it](http://www.industrial.omron.it)

## Norge

Tel: +47 (0) 22 65 75 00  
[www.industrial.omron.no](http://www.industrial.omron.no)

## Polen

Tel: +48 (0) 22 645 78 60  
[www.industrial.omron.pl](http://www.industrial.omron.pl)

## Portugal

Tel: +351 21 942 94 00  
[www.industrial.omron.pt](http://www.industrial.omron.pt)

## Rusland

Tel: +7 495 648 94 50  
[www.industrial.omron.ru](http://www.industrial.omron.ru)

## Schweiz

Tel: +41 (0) 41 748 13 13  
[www.industrial.omron.ch](http://www.industrial.omron.ch)

## Spanien

Tel: +34 913 777 900  
[www.industrial.omron.es](http://www.industrial.omron.es)

## Storbritannien

Tel: +44 (0) 870 752 08 61  
[www.industrial.omron.co.uk](http://www.industrial.omron.co.uk)

## Sverige

Tel: +46 (0) 8 632 35 00  
[www.industrial.omron.se](http://www.industrial.omron.se)

## Sydafrika

Tel: +27 (0)11 608 3041  
[www.industrial.omron.co.za](http://www.industrial.omron.co.za)

## Tyrkiet

Tel: +90 216 474 00 40  
[www.industrial.omron.com.tr](http://www.industrial.omron.com.tr)

## Tyskland

Tel: +49 (0) 2173 680 00  
[www.industrial.omron.de](http://www.industrial.omron.de)

## Tjekkiet

Tel: +420 234 602 602  
[www.industrial.omron.cz](http://www.industrial.omron.cz)

## Ungarn

Tel: +36 1 399 30 50  
[www.industrial.omron.hu](http://www.industrial.omron.hu)

## Østrig

Tel: +43 (0) 2236 377 800  
[www.industrial.omron.at](http://www.industrial.omron.at)

**Flere Omron-repræsentanter**  
[www.industrial.omron.eu](http://www.industrial.omron.eu)

## Automatiseringssystemer

- PLC (Programmable Logic Controllers) • HMI-moduler (operatørterminaler)
- Decentrale I/O-moduler • Industrielle PC'er • Software

## Motion & Drives

- Motion controllere • Servosystemer • Frekvensomformere

## Control Components

- Temperaturregulatorer • Strømforsyninger • Timere • Tællere
- Programmerbare relæer • Digitale panelmetre • Elektromekaniske relæer
- Overvågningsprodukter • Solid State-relæer • Endestop • Trykknapper
- Lavspændingsmateriel

## Sensing & Safety

- Fotoaftastere • Induktive følere • Kapacitive følere og trykfølere • Kabler
- Afstands- og breddemålingssensorer • Visionsystemer • Sikkerhedsnetværk
- Sikkerhedssensorer • Sikkerhedsmoduler/relæmoduler • Sikkerhedsendestop