

Safety Light Curtain

## F3SG-R Series

New standard, offering both robustness and reliability

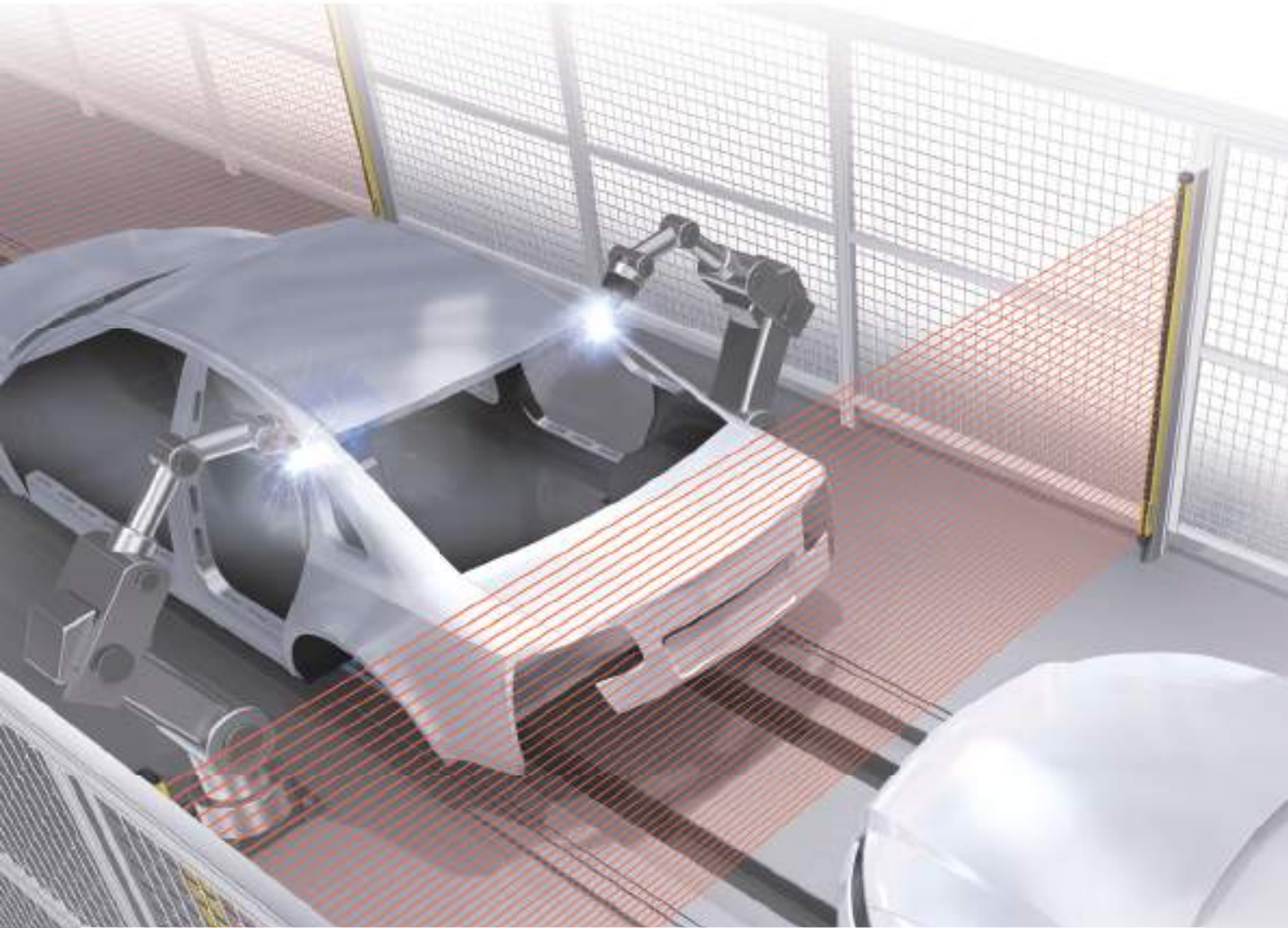


» Compact: Easy installation

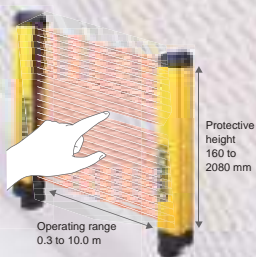
» Robust: Even in severe environments

» Global: Reliable safety solutions

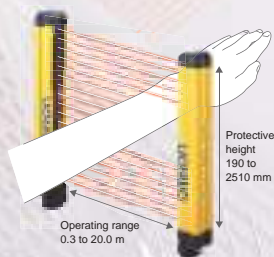
# Next generation safety



**Advance** Advance type suitable for flexible production line applications

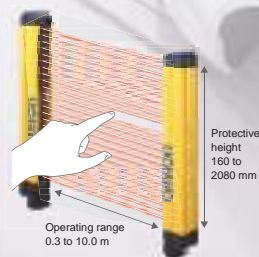


F3SG-4RA □□□□-14  
Detection capability: Dia. 14 mm

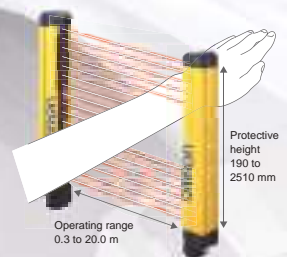


F3SG-4RA □□□□-30  
Detection capability: Dia. 30 mm  
F3SG-4RA-□□□□-25-01TS  
Detection capability: Dia. 25 mm

**Easy** Easy type ideal for simple On/Off detection applications  
**NEW**



F3SG-4RE □□□□-14  
Detection capability: Dia. 14 mm



F3SG-4RE □□□□-30  
Detection capability: Dia. 30 mm

# light curtain packed with powerful features, offering both robustness and reliability

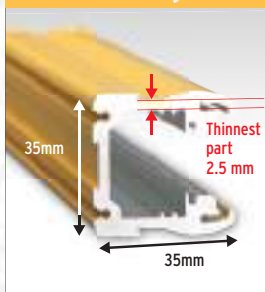
F3SG-R

Benefit

Previously it took time to select the right safety light curtains for the conditions: physical conditions such as size and operating range, ambient environments, and countries.

If just one single safety light curtain can be used in a variety of environments, the time required for selection, installation, and maintenance can be reduced.

## Selection & Design



>> p4

## Easy Selection & Design

### • In almost any environment

Waterproof and shock-resistant yet compact body. Conforms to major international standards including Chinese standard GB 4585 to be used worldwide.

### • Ensuring safety in various production lines

The Muting function to automatically set a minimum muting zone according to workpiece height. Can be used for a variety of production lines.

### • Complete safety measures by detecting presence

Distinguishes between small object passing and human entry by changing resolution and response time. This maintains a high level of safety while minimizing unexpected machine downtime.

## Set-up



>> p8

## Easy Set-up

### • Drastically reduced set-up time and wiring

The Smartclick connectors and optical synchronization enable smooth set-up of machines.

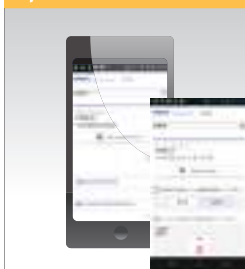
### • Simple, two-step optical adjustment

Quick adjustment by checking beam alignment with the LED indicators and Configuration Tool SD Manager2.

### • Flexible installation

More flexible layout by eliminating the need of synchronization wiring and using extension cables.

## Operation



>> p10

## Stable Operation

### • Quick troubleshooting and predictive maintenance

The sticker and error logs stored in the F3SG-R helps speed troubleshooting. Accumulated log data facilitates systematic maintenance.

### • Mutual interference prevention

The DIP switches is used to change emission light intensity to prevent mutual interference with other sensors.

• Microsoft product screen shot(s) reprinted with permission from Microsoft Corporation.

• The Bluetooth® word mark and logos are registered trademarks owned by Bluetooth SIG, Inc. Any use of such marks by Omron is under license.

• Other company names and product names in this document are the trademarks or registered trademarks of their respective companies.



# Robustness

## Allows use in a variety of environments

### Protects itself and production sites



### In almost any environment | For global use |

The F3SG-R is designed to be used in a variety of environments around the world, conforming to international standards.

For global use

Advance



PNP or NPN can be selected with the DIP switch. The same cables are used.



The F3SG-R conforms to major international standards including Chinese GB standards.

### Robust and Compact | Robust housing |

Advance

Easy

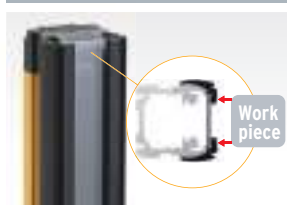
All models are equipped with a robust housing that can be used in harsh conditions and withstand shocks caused by sudden human contact or a dropped tool. The scratch-resistant material is used for the optical surface to prevent unexpected machine stops.

Slim housing



The housing structure is significantly improved to enhance resistance against shock and vibration and to reduce the thickness of the thinnest part of the housing material from 3 mm to 2.5mm.

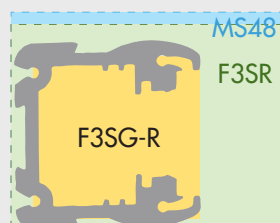
Protected with protection cover



The optical surface can be protected from contact with workpieces by using the optional protection cover together.

Downsized

The robust housing can be used in harsh conditions and withstand shocks caused by sudden human contact or a dropped tool. The scratch-resistant material is used for the optical surface to prevent unexpected machine stops.



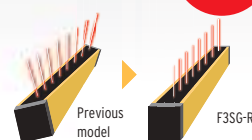
Cross-section is  
Approx. **60%**  
of previous model

For harsh environments

Advance

Easy

Secured against torsion



The risk of optical axis misalignment due to vibration or aging can be reduced.

\* Compared to OMRON previous model in December 2014.



IP67 protection allows use in environments that are subject to water.

Reliable even in harsh environments

Advance

Easy

High power



The newly designed high-power optical system provides the best-in-class\* light transmission and operating range. This allows stable operation even in dusty or other environments where light transmission is reduced.

\* Based on OMRON investigation in December 2014.

Previously... Mixing several models

Several types of safety light curtains with different environmental resistance and functionality were required to suit the installation environment. It took time to select the right models.



# New Muting Functionality

## Increases both productivity and safety

Easily distinguishes between workers and objects

### Increasing both productivity and safety

| Muting function | **Advance**

The F3SG-R provides advanced Muting function that detects the zone where workpieces pass or the position of a machine or robot and disable beams of the detected part. This increases both safety and productivity. By adding the smart muting actuator, the F3SG-R provides stable operation even for the production lines where errors occur due to vibration caused by the passing workpiece.

#### Previously...



The point detection muting sensor mistakenly disabled muting while a workpiece was passing, which led to unexpected machine stops.

#### Smart muting actuator



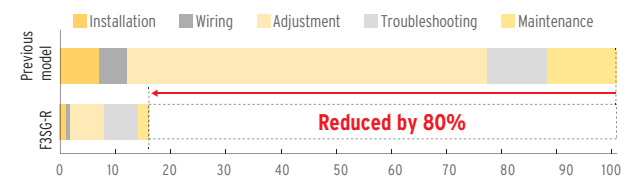
The muting actuator detects the surface of a passing workpiece. Even if a workpiece moves due to vibration, muting is kept enabled until the workpiece has passed. This prevents unexpected machine stops.

### Adjustment time reduced by 80%\*

| Smart muting actuator |

The use of the dedicated actuator can significantly reduce the time required to adjust the sensor to detect workpieces even in unstable conveying conditions

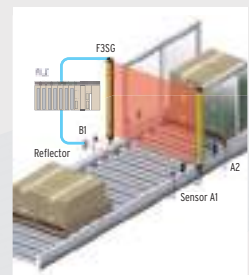
\*Compared to the previous model  
(Based on OMRON investigation in September 2014)



#### Previously...

Many processes including programming and adjustment were required

Since bypass processing to disable the safety light curtain was performed via the PLC, programming before installation required time and work. It also took a lot of time and work to install and adjust many muting sensors (sensors and reflectors).



# Powerful Features

## Prevent unexpected machine stops

Ensure stable operation

### Auto-configuration of muting zone

| Dynamic Muting | **Advance**

When workpieces with various heights are conveyed on the same line, partial muting is automatically performed based on the height of the workpiece. This advanced muting function can automatically perform normal detection at the zone where a workpiece does not pass.

Automatically minimizes muting zone according to workpiece size

1

When the muting sensor detects that a workpiece passes, all beams are muted.

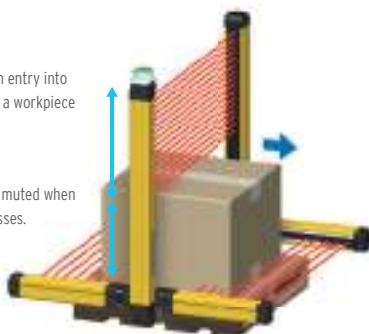


2

The only beams interrupted by the workpiece are kept muted and other beams are released from the muting state three seconds after the workpiece pass through the safety light curtain. Muting is disabled after the workpiece has passed.

Monitors human entry into the zone where a workpiece does not pass.

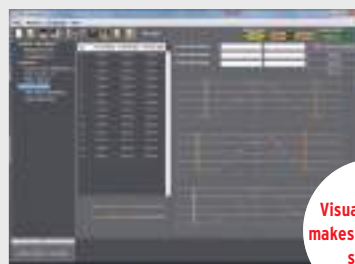
Keeps the zone muted when a workpiece passes.



### Minimizing setting and detection errors

| Configuration Tool SD Manager2 | **Advance**

The function to log the muting sensor operating conditions of the F3SG-R visualizes the installation position and setting conditions of the sensor to achieve reliable configuration. The stop due to the muting error can be analyzed using the data stored in the F3SG-R. Quick identification of the cause can reduce unexpected machine downtime.



Visualized data makes adjustment smooth!

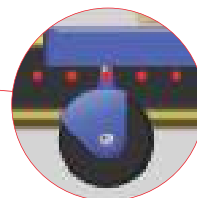




## Detecting both objects and workers

| Reduced Resolution | **Advance**

With the Reduced Resolution function that is used to change the number of interrupted beams (1 to 3 beams), the F3SG-R can detect human entry while workability is maintained. This makes easier to distinguish between objects and workers.



• Keep the safety outputs ON even when an object like a transport vehicle (with the size of 1 to 3 beams) is present discontinuously.

• Turn safety outputs OFF when an object with the size over 3 beams, like an ankle, is present.

## Preventing accidental stops due to insects

| Response Time Adjustment | **Advance**

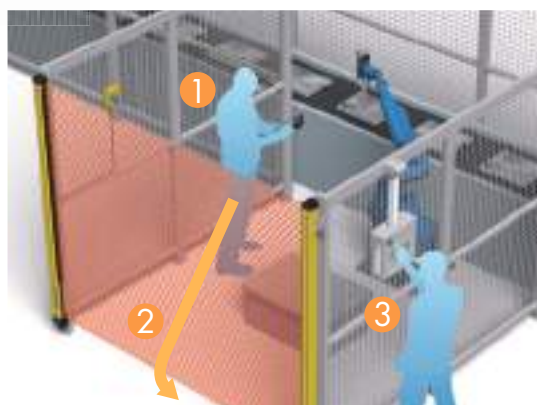
This function is used to distinguish between an instant passing of a small object such as an insect and a human passing by changing the time to respond to the block of the beam. Accidental machine stops can be avoided.

## Ensuring safe restart

| Pre-reset | **Advance**

The Pre-reset function prevents possible accidents and supports safe restart of machines. Even if an worker press the reset switch of the safety light curtain without noticing another worker near the robot, restart will not be executed unless certain conditions are met.

Helps prevent workers from being trapped



1 Press the pre-reset switch in the hazardous zone (safety fence)

2 Get out of the hazardous zone (safety fence)

3 Press the reset switch in the control panel to restart the F3SG-R. The machine is ready for restart.

The machine cannot be restarted until the pre-reset switch is pressed to restart the F3SG-R.



Smart

# Wiring, Beam Adjustment, and Operation Check

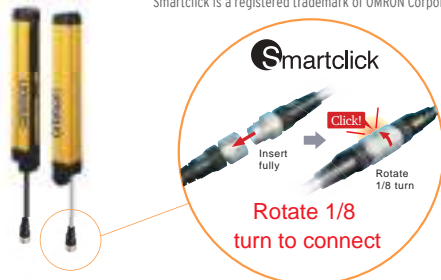
## Facilitate installation

### No torque control required | Smartclick | **Advance** **Easy**

Smartclick connectors are used to quickly connect cables. Just turn the round waterproof M12 connector 1/8 of a turn. This stress-free connection reduces time required for wiring and replacement when many devices are connected together.

#### Smartclick

Smartclick is a registered trademark of OMRON Corporation.



This popular connector is used for a variety of OMRON products to reduce time required for wiring and replacement when many devices are connected together.

#### Previously...

#### Faulty connection and need of torque control

When many safety light curtains were connected, torque control of connectors was required and delay in set-up occurred due to failure of connection. The Smartclick connector can be connected with the existing screw-type M12 connector.

### Long-distance wiring

#### | Maximum 100 m cable length | **Advance** **Easy**

The total extension cable length is up to 100 m. Flexible wiring maximizes long-distance detection and optical synchronization functionality.

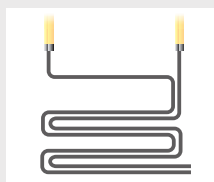
### Simple wiring

#### | Simple wiring connector | **Advance** **Easy**

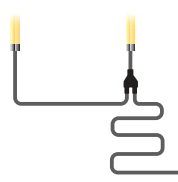
Simple wiring connector can reduce wiring time. Fewer cables mean that the risk of disconnection and noise troubles can also be reduced.

#### Previously...

Cables of the emitter and receiver



#### Only one cable



### No limitation in wiring

#### | Optical synchronization | **Advance** **Easy**

Optical synchronization eliminates the need of synchronization wiring between the emitter and receiver. Flexible wiring enables reducing disconnection risk and avoiding noise sources.

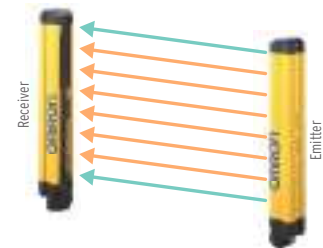
#### Flexible, new method

Fine tuning all beams, the F3SG-R provides high ambient light immunity and flexible detection functions.

High ambient light immunity

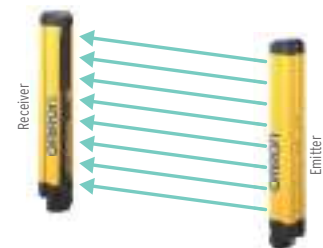
#### Start-up

The Top or Bottom beam of the emitter starts synchronizing with the corresponding beam of the receiver.



#### After sync

Once synchronization is done, the emitter is kept synchronized with the receiver while at least one beam is unblocked.

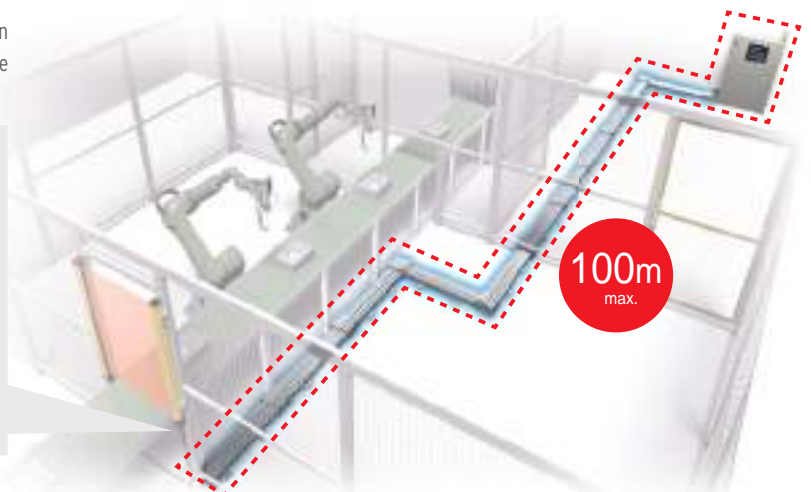


#### Previously...

#### Limitations imposed by synchronization wiring

Wiring and connection works between the emitter and receiver were required.

- With the previous synchronization function, if the Top or Bottom beam was blocked, synchronization was not maintained.





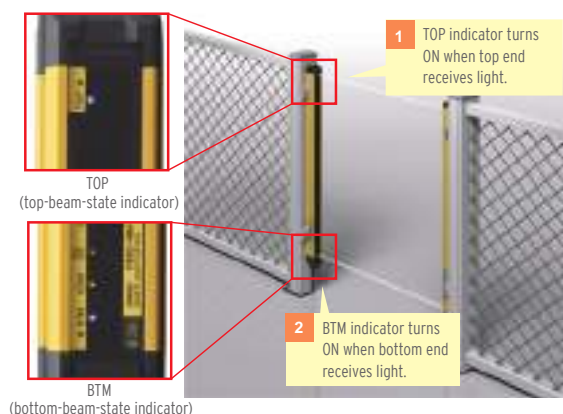


## Simple two steps | Beam adjustment | Advance

The benefit of robust, torsion-resistant housing contributes to reduce the time required to install the safety light curtain.

### Simple adjustment: Coarse adjustment → positional alignment

Beam adjustment can be done easily by checking the TOP and BTM LED indicators. The SD Manager 2 helps install the safety light curtain by showing the incident light levels of each beam.



**1** Adjustment is completed when the TOP, BTM, and STB LED indicators turn ON.



**2** Finer adjustments can be made using the Configuration Tool SB Manager2.



## Easy adjustment after mounting

### | Mounting bracket | Advance Easy

Two types of mounting brackets are available.

#### Standard fixed bracket



After mounted on a safety fence, the F3SG-R can be slid vertically to adjust. This means this mounting bracket allows for a wider adjustment range than the existing top/bottom mounting bracket.

#### Standard adjustable bracket

(sold separately)



In addition to vertical adjustment, the angle can be adjusted up to  $\pm 15^\circ$ .



#### Standard fixed bracket

The bracket is included in the F3SG-R.

| Protective height  | No. of brackets included |
|--------------------|--------------------------|
| Less than 1,280 mm | 2 sets                   |
| 1,280 to 2,270 mm  | 3 sets                   |
| 2,350 mm or more   | 4 sets                   |

Quick

# Troubleshooting and Predictive Maintenance

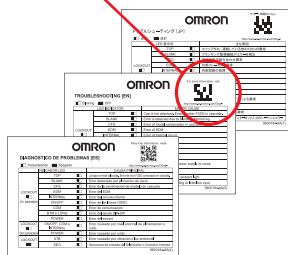
**Eliminate machine downtime to ensure stable operation**

## For global operators

| Multilingual troubleshooting | **Advance** **Easy**

Troubleshooting in eight languages is published on the website to find causes and solutions of errors that occur during operation. Operators across the world can check the error details in their local languages, which will help them minimize time to troubleshoot.

### Troubleshooting Web



Troubleshooting guide sticker

\* English, Chinese, Italian, Korean, French, German, Spanish, and Japanese



\* The Interface Unit F39-GIF is required to connect with a personal computer.

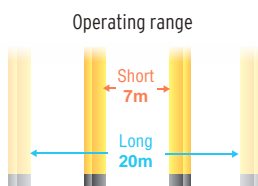
## Quick troubleshooting | Data logging 1 | **Advance**

The error logs stored in the F3SG-R can be obtained by connecting with a personal computer via the interface unit. The Configuration Tool SD Manager2 analyzes error logs to identify causes of errors and suggest solutions. This helps simplify troubleshooting.

## Reducing stops due to mutual interference

| Operating Range Selection | **Advance** **Easy**

When other sensors are installed near the F3SG-R, Operating Range Selection helps reduce mutual interference.



Mutual interference with the other sensor near the F3SG-R can be reduced by changing the mode from Long \* to Short (7 m).

\*. Maximum operating range of 20 m for hand/arm protection or 10 m for finger protection



The mode of Operating Range Selection can be selected with the DIP Switches\* on the emitter.

\*. For the F3SG-RE, the mode can be selected by wiring.

## Systematic maintenance based on trend management

| Data logging 2 | **Advance**

By using the Configuration Tool SD Manager2, the data of light intensity, power-ON time, and switching frequency of the F3SG-R can be collected regularly to predict when systematic and preventive maintenance is required.

NEW

Easy type

Easy-to-use safety sensor

# Ideal for Simple On/Off Detection Applications

Robust but slim housing and basic safety functions are inherited from the F3SG-R Advance type. Providing only simple safety functions, the Easy type helps save TCO (Total Cost of Ownership) by reducing errors that required a lot of time to identify the causes.



## Simple wiring

Only four wires are required for the minimum configuration, which is as simple as wiring a photoelectric sensor. Simple connection with a safety controller makes it easy to build a safety circuit. Commercially available M12 connector cables can be used for extension cables.

## Fast response time of 5 ms

The Easy type that allows the distance between the light curtain and hazard source to be reduced is best suited to use in a small machine.

### F3SG-R Line-up

For flexible production lines

#### Advance type F3SG-RA



#### Easy type F3SG-RE



For small machines

### List of Feature

| Feature                         | Advance type<br>F3SG-RA             | Easy type<br>F3SG-RE                | Factory default setting<br>(Advance type)   |
|---------------------------------|-------------------------------------|-------------------------------------|---|
| PNP/NPN Selection               | <input checked="" type="checkbox"/> |                                     | PNP output  |
| External Test                   | <input checked="" type="checkbox"/> |                                     | 24 V Active   |
| Interlock                       | <input checked="" type="checkbox"/> |                                     | Auto Reset Mode   |
| Pre-Reset                       | <input checked="" type="checkbox"/> |                                     | Disabled  |
| External Device Monitoring(EDM) | <input checked="" type="checkbox"/> |                                     | Disabled  |
| Auxiliary Output                |                                     |                                     | Safety output (Inverted signal output)  |
| Muting                          |                                     |                                     | Standard Muting mode  |
| Override                        |                                     |                                     | Enabled   |
| Fixed Blanking                  | <input checked="" type="checkbox"/> |                                     | Disabled  |
| Floating Blanking               | <input checked="" type="checkbox"/> |                                     | Disabled  |
| Reduced Resolution              |                                     |                                     | Disabled  |
| Warning Zone                    |                                     |                                     | Disabled  |
| Scan Code Selection             | <input checked="" type="checkbox"/> |                                     | CodeA   |
| Operating Range Selection       | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | Long mode   |
| Response Time Adjustment        |                                     |                                     | Standard mode   |
| Lamp                            |                                     |                                     | Red:Safety output information (Inverted signal output)<br>Orange:Stable-state information (Inverted signal output)<br>Green:Safety output information |
| Designated Beam Output          |                                     |                                     | Disabled  |
| Cascade Connection              | <input checked="" type="checkbox"/> |                                     |   |

☒ Setting by DIP Switch ☐ Setting by Configuration Tool ☒ Setting by Wiring

Note: The F3SG-4RA□□□□-25-01TS provides only the monitoring functionality.

## Safety Sensor Line-up

### More slim models

Safety Light  
Curtain F3SJ  
Cat. No. F074



### For flexible zone detection

Safety Laser  
Scanner  
Cat. No. Z298





**OMRON Asia Pacific Regional HQ**

**T** (65) 6835 3011  
**F** (65) 6835 2711  
**E** [apac\\_enquiry@ap.omron.com](mailto:apac_enquiry@ap.omron.com)  
**W** [omron-ap.com](http://omron-ap.com)

**Get Constant Updates**

[facebook.com/OmronAPAC.IAB](https://facebook.com/OmronAPAC.IAB)

**Australia**

**TF** 1300 766 766  
**F** 1300 434 682  
**E** [au\\_enquiry@ap.omron.com](mailto:au_enquiry@ap.omron.com)  
**W** [omron.com.au](http://omron.com.au)

**India**

**T** (91-22) 7128 8400  
**F** (91-22) 7115 5602  
**E** [in\\_enquiry@ap.omron.com](mailto:in_enquiry@ap.omron.com)  
**W** [omron-ap.co.in](http://omron-ap.co.in)

**Indonesia**

**T** (62-21) 2949 7500  
**F** (62-21) 2949 7555  
**E** [id\\_enquiry@ap.omron.com](mailto:id_enquiry@ap.omron.com)  
**W** [omron.co.id](http://omron.co.id)

**Malaysia**

**T** (60-3) 7688 2888  
**F** (60-3) 7688 2833  
**E** [my\\_enquiry@ap.omron.com](mailto:my_enquiry@ap.omron.com)  
**W** [omron-ap.com.my](http://omron-ap.com.my)

**New Zealand**

**T** (64-9) 358 4400  
**F** (64-9) 358 4411  
**E** [nz\\_enquiry@ap.omron.com](mailto:nz_enquiry@ap.omron.com)  
**W** [omron-ap.co.nz](http://omron-ap.co.nz)

**Philippines**

**T** (63-2) 811 2831  
**F** (63-2) 811 2583  
**E** [ph\\_enquiry@ap.omron.com](mailto:ph_enquiry@ap.omron.com)  
**W** [omron-ap.com.ph](http://omron-ap.com.ph)

**Singapore**

**T** (65) 6547 6789  
**F** (65) 6547 6769  
**E** [sg\\_enquiry@ap.omron.com](mailto:sg_enquiry@ap.omron.com)  
**W** [omron-ap.com.sg](http://omron-ap.com.sg)

**Thailand**

**T** (66-2) 942 6700  
**F** (66-2) 937 0501  
**E** [th\\_enquiry@ap.omron.com](mailto:th_enquiry@ap.omron.com)  
**W** [omron-ap.co.th](http://omron-ap.co.th)

**Vietnam**

**T** (84-28) 3920 4338  
**F** (84-28) 3920 4335  
**E** [hcm\\_enquiry@ap.omron.com](mailto:hcm_enquiry@ap.omron.com)  
**W** [omron.com.vn](http://omron.com.vn)