

FSEG SERIES

OPERATING INSTRUCTIONS

CONTROLS

OUT LED on receiver (RX)
The yellow LED ON indicates the presence of the object in the controlled area.

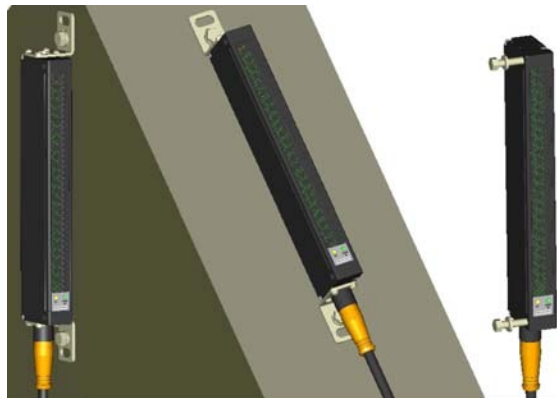
POWER ON LED on receiver (RX)
The green LED ON indicates the optimal functioning of the device.
The fast blinking of the green LED indicates a critical alignment of the device.
For the other indications, please refer to the paragraph about "DIAGNOSTICS".

POWER ON LED on emitter (TX)
The green LED ON indicates the correct functioning of the device.
For the other indications, please refer to the paragraph about "DIAGNOSTICS".

INSTALLATION MODES

General information on device positioning

- Align the receiver (RX) and emitter (TX), verifying that their distance is inside the device operating distance, in a parallel manner, placing the sensitive sides one in front of the other, with the connectors oriented on the same side. The critical alignment of the unit will be signalled by the fast blinking of the green receiver LED.



- Mount receiver and emitter on rigid supports which are not subject to strong vibrations, using specific fixing brackets and for the holes present on the device lids.

Precautions to respect when choosing and installing the device

- Choose the device according to the minimum object to be detected and the maximum controlled area requested (= operating distance x controlled height);
- In agri-industrial applications, the compatibility of light grid housing material and any chemical agents used in the production process has to be verified with the assistance of the SensoPart technical sales support department;
- The light grids are NOT safety devices, and so MUST NOT be used in the safety control of the machines where installed.

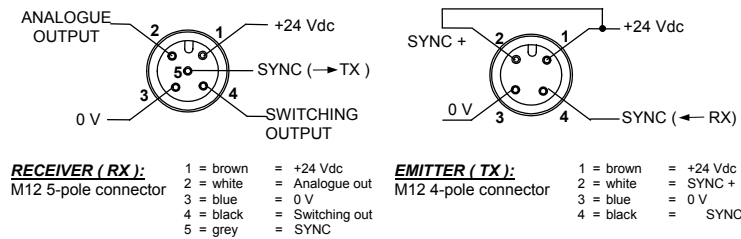
In addition, the following points have to be considered:

- avoid installation near very intense and / or blinking light sources, in particular near to the receiver unit;
- the presence of strong electromagnetic disturbances can affect the correct functioning of the device; this condition has to be carefully evaluated and checked with the SensoPart technical sales support department;
- the presence of smoke, fog and suspended dust in the working environment can reduce the operating distance of the device;
- strong and frequent temperature variations, with very low peak temperatures, can generate a thin condensation layer on the optics surfaces, compromising the correct functioning of the device;
- reflecting surfaces near the light beam of the device (above, beneath or lateral) can cause passive reflections which might affect object detection in the controlled area.
- if different devices have to be installed in adjacent areas, the emitter of one unit must not interfere with the receiver of the other unit.

General information relative to object detection and measurement

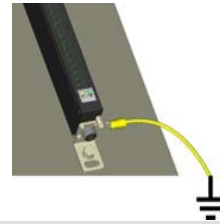
- For a correct object detection and / or measurement, the object has to pass completely through the controlled area. We recommend to test the correct detection before beginning the process.

CONNECTIONS

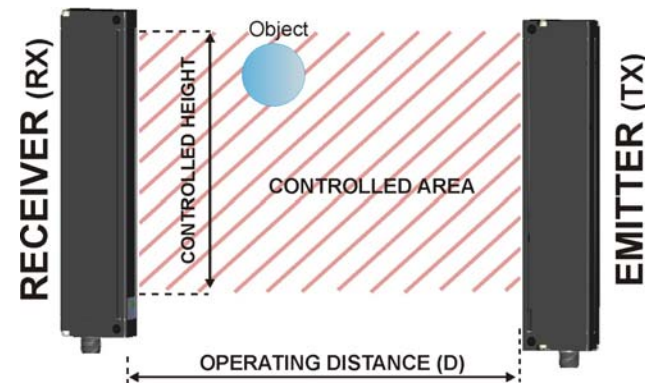


Shielded cables are not necessary for standard connection.

Ground connection of the two units is not necessary; if desired, this connection can be accomplished replacing the screw provided in the packaging with the one indicated in the drawing, which blocks the lid of the connector side of each unit. It is necessary to respect the connection shown in the drawing if ground connection of the entire system is requested.



FUNCTIONING AND PERFORMANCE FEATURES



The beam interruption due to the passage of an object inside the controlled area causes the closing of the switching output and the changing of the analogue output signal. Small objects can be detected (reaching dimensions of only 4 mm) and linear measurements determined with an accuracy of ± 3 mm max.

In particular:

The switching output is always activated when at least one beam is obscured. The status variation is signalled by the yellow receiver LED that turns on.

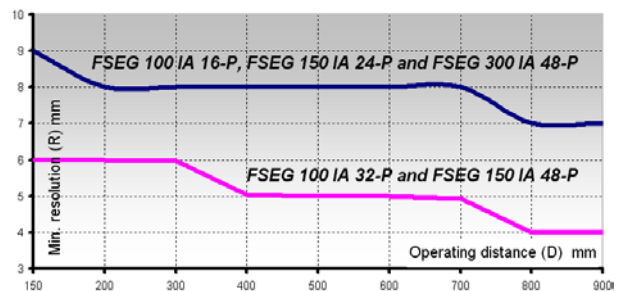
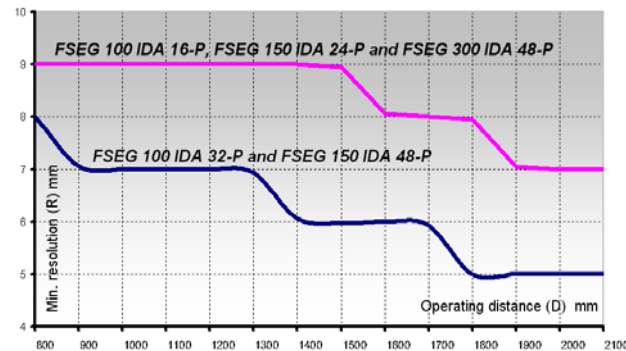
The analogue output value (0-10 V) is proportional to the number of obscured beams (0 V means that no beam is interrupted, 10 V that all beams are interrupted).

The device does not require calibration; periodical checks of the resolution and/or measurement are however suggested.

The blinking of the green receiver LED (*stability function*) signals the critical alignment of the units and/or the functioning outside or near the maximum operating distance. In optimal conditions, the LED remains on continuously.

The two units are synchronised via cable (SYNC wire); precarious connections or induced disturbances on the synchronism line can cause device malfunctioning or a temporary blocking.

The diagrams below show the typical minimum resolution trend of each model in according to the operating distance (D).



TECHNICAL DATA

Power supply:	24 Vdc $\pm 15\%$
Consumption on emitter unit (TX):	150 mA max.
Consumption on receiver unit (RX):	50 mA max without load
Switching output:	1 PNP output
Switching output current:	100 mA; short-circuit protection
Output saturation voltage:	≤ 1.5 V at T=25 °C
Analogue output:	0-10 V proportional to obscured beams
Analogue output current:	10 mA max. (1 k Ω minimum resistive load)
Minimum resolution:	4 mm (refer to "Characteristics" table)
Measurement precision:	± 3 mm (refer to "Characteristics" table)
Response time:	1 ms (refer to "Characteristics" table)
Indicators:	RX: output LED (YELLOW) / POWER ON LED (GREEN) TX: POWER ON LED (GREEN)
Operating temperature:	0...+55 °C
Storage temperature:	-25...+70 °C
Operating distance (typical values):	0.15 - 0.85 m Short distance version 0.8 - 2.1 m Long distance version (D)
Emission type:	Infrared (880 nm)
Vibrations:	0.5 mm amplitude, 10 ... 55 Hz frequency for every axis (EN60068-2-6)
Shock resistance:	11 ms (30 G) 6 shock for every axis (EN60068-2-27)
Housing material:	Black anodised aluminium
Lens material:	PMMA
Mechanical protection:	IP65 (EN 60529)
Connections:	M12 4-pole connector for TX M12 5-pole connector for RX
Weight:	300 g (FSEG 100 xx) 340 g (FSEG 150 xx) 510 g (FSEG 300 xx)

DIAGNOSTICS

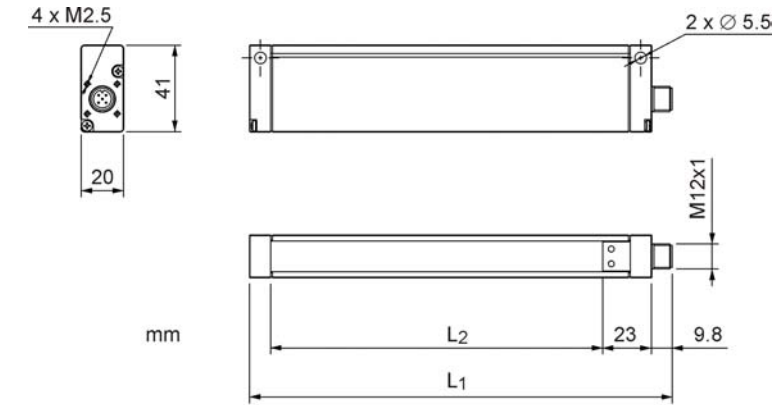
RECEIVER:

Signal	State	Cause	Action
OUT LED RECEIVER	ON	Switching output: Presence of an object in the controlled area.	
	OFF	Switching output: Controlled area free of objects.	
POWER ON LED RECEIVER	ON	Optimal functioning	
	Fast blinking	Operation just within the maximum working range and/or incorrect alignment of the unit	
	Slow blinking	Wrong connections and/or malfunctioning	- Check the output connections for any short-circuits - Switch ON and switch OFF the device. - If condition persists, contact SensoPart.
	OFF	Device is switched off	- Verify the connections. - If condition persists, contact SensoPart.

EMITTER:

Signal	State	Cause	Action
POWER ON LED EMITTER	ON	Normal functioning	
	Blinking	Malfunctioning	- Switch the device OFF and ON again. - If condition persists, contact SensoPart.
	OFF	Absence of powering and/or synchronism with receiver	- Verify the connections and correct value of power supply. - If condition persists, contact SensoPart.

DIMENSIONS



MODEL	L1(mm)	L2(mm)
FSEG 100	149.8	107
FSEG 150	199.8	157
FSEG 300	349.8	307

CHARACTERISTICS

Model	Protected height (mm)	N° of beams	Minimum resolution (mm)	Sensitivity analogue output (V)	Measuring accuracy (mm)	Response time (ms)	Operating distance (m)
FSEG 100 IA 16-P	100	16	7	0.63	± 6	1	0.15...0.85
FSEG 100 IA 32-P	100	32	4	0.31	± 3	2	0.15...0.85
FSEG 150 IA 24-P	150	24	7	0.42	± 6	1.5	0.15...0.85
FSEG 150 IA 48-P	150	48	4	0.21	± 3	2.75	0.15...0.85
FSEG 300 IA 48-P	300	48	7	0.21	± 6	2.75	0.15...0.85
FSEG 100 IDA 16-P	100	16	7	0.63	± 7	1	0.8...2.1
FSEG 100 IDA 32-P	100	32	5	0.31	± 3.5	2	0.8...2.1
FSEG 150 IDA 24-P	150	24	7	0.42	± 7	1.5	0.8...2.1
FSEG 150 IDA 48-P	150	48	5	0.21	± 3.5	2.75	0.8...2.1
FSEG 300 IDA 48-P	300	48	7	0.21	± 7	2.75	0.8...2.1

TYPE KEY

F = Photo sensor
SE = Emitter/Receiver
G = Grid

100, 150 and 300 = protected height in mm
IA = normal working range, analogue output
IDA = extended working range, analogue output

16, 24, 32, 48 = number of beams
P = PNP-output