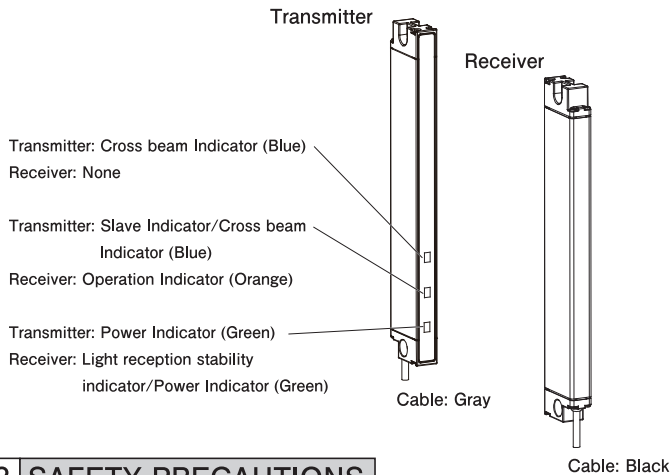


- This sensor is a through-beam type light curtain sensor with a 20 mm optical pitch having a thin-flat aluminum housing.
- Two detection modes, parallel beam mode and cross beam mode are available.
- The sensor detects opaque objects 15 mm in diameter with the cross beam mode.
- A single light beam is monitored by five receivers in the cross beam mode, which creates denser detection area than that of the parallel mode.

1 PARTS DESCRIPTION



2 SAFETY PRECAUTIONS

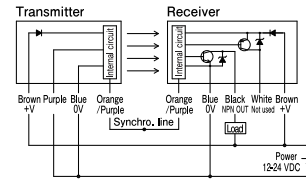
1. Do not use this product for safety critical applications.
2. Do not use this product when its housing or cable is damaged.
3. Do not attempt to disassemble, repair, or modify this product.
4. Do not use this product in an environment containing flammable, explosive or corrosive gas.
5. Do not use this product in environments where it could be exposed to chemicals or oils.
6. Do not use this product in an environment exposed to water including outdoors or under the water.
7. Use this product within the rating specifications.
8. Do not expose this product to direct sunlight.
9. Do not use this product in a place exposed to vibration or shock.
10. Periodically clean the optical window using a soft and dry cloth. Stains or dirt on the lens adversely affects performance. Do not use organic solvent such as alcohol and thinner.
11. Perform a daily operation check, weekly periodical check, and maintenance to ensure correct operation.
12. This product should be disposed of as industrial waste.

3 PRECAUTIONS DURING USE

1. Be sure to route the sensor cables separate from any power transmission or high voltage line, or else use shielded cables. Using the same conduit or duct as high voltage or power lines will cause malfunctions or damage because of electromagnetic induction.
2. Do not apply excessive force to the cable.
3. When using a DC power unit with an insulated transformer or a switching regulator, be sure to ground the frame ground (FG) terminal.
4. The sensor starts operation after a warm-up period of 3 seconds. Always power on the sensor first.
5. This product may generate an output pulse when the power is turned off. Turn off the power of the load first.
6. Avoid turning the power on and off consecutively.
7. When extending the cables, use conductors of at least 0.5 mm² cross-sectional area and check the voltage drop.
8. Limit the current of the power supply to 2 A.
9. If a load short circuit or overload occurs, the output transistor turns off. Check the load before restoring the power.

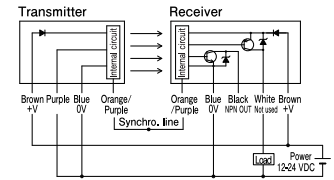
4 CONNECTION

● Parallel beam mode NPN output

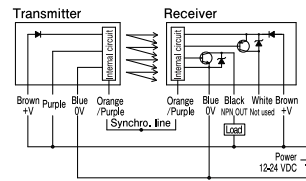


- Insulate any unused output lines.

PNP output

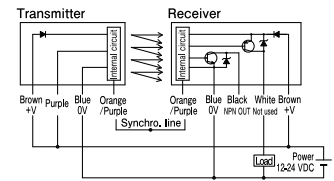


● Cross beam mode NPN output

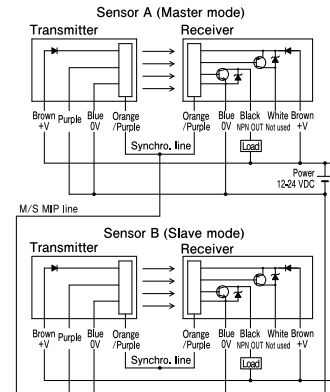


- When cross beam mode is selected, mutual interference prevention is disabled.
- Insulate any unused output lines.

PNP output

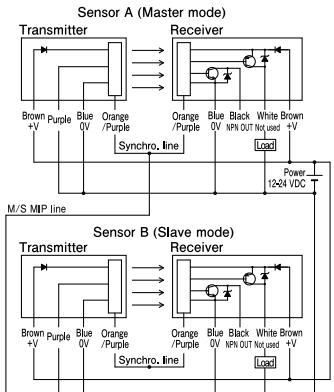


● Connection for Mutual Interference Prevention (MIP) NPN output



- When cross beam mode is selected, mutual interference prevention is disabled.
- Insulate any unused output lines.

PNP output



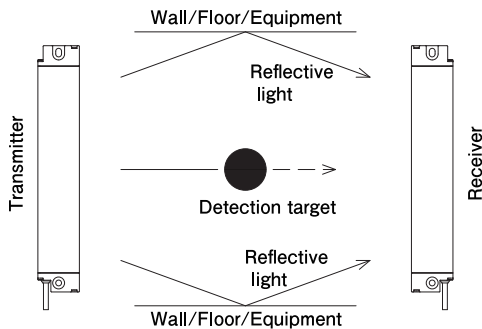
Mutual Interference Prevention

- When using a pair of sensors A and B in close proximity to each other, connect the synchronization line (orange/purple) between the transmitter and the receiver of sensor A. Then connect the synchronization line of sensor A transmitter and the M/S mutual interference prevention line (purple) of sensor B transmitter to each other.
- Check the Indicator of the transmitter:
 Sensor A transmitter (Master mode): Power Indicator (Green) turns on.
 Sensor B transmitter (Slave mode): Power Indicator (Green) turns on.
 Slave Indicator/Cross beam Indicator (Blue): turns on.

Cable Extension

- Correctly connect cables according to the above figures.
- Avoid parallel wiring close to high-voltage lines or power lines, or housing in the same conduit or duct.
- When extending the cables, the length of each cable including the synchronization line and the M/S mutual interference prevention line should not exceed 25 m for the transmitter and the receiver.

5 INSTALLATION



- Securely fix the product to ensure precise optical axis alignment, taking into account when the product is subjected to vibration.
- Use the supplied M4 SEMS screw and M4 nut for mounting. Prevent any excessive bending or twisting force from being applied to the product while mounting the sensor.
- When there is any reflective objects (wall, floor, or equipment) within the directional field between the transmitter and the receiver, the sensor may not detect an object due to unwanted light caused by reflection. Ensure a correct mounting position.
- Install the sensor aligning the cable outlet of the transmitter and the receiver in the same direction. They cannot be used if their orientation differs.

6 RATED VOLTAGE/PERFORMANCE/SPECIFICATIONS

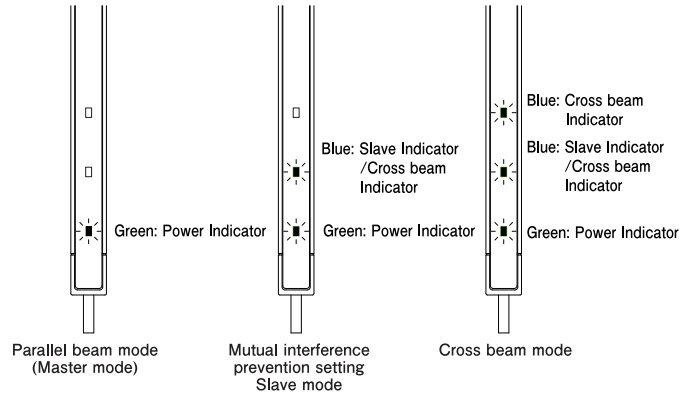
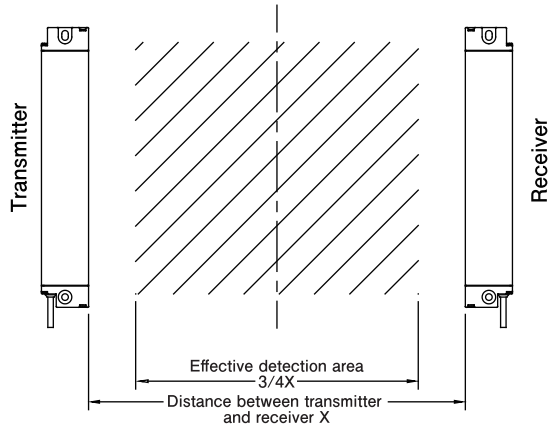
Model	SSX20-T160	SSX20-T240	SSX20-T320	SSX20-T400	SSX20-T480	SSX20-T560	SSX20-T640	SSX20-T720	
Detection method	Through beam								
Detection distance	Parallel beam mode: 0–4m				Cross beam mode: 0.5–4m				
Detection target	Parallel beam mode: Opaque ϕ 25 mm or more				Cross beam mode: Opaque ϕ 15 mm or more				
Optical axis interval	20 mm								
Number of optical axes	9	13	17	21	25	29	33	37	
Detecting width	160 mm	240 mm	320 mm	400 mm	480 mm	560 mm	640 mm	720 mm	
Power supply	12–24VDC \pm 10%, Ripple 10%								
Power consumption	75mA or less	75mA or less	90mA or less	95mA or less	105mA or less	105mA or less	120mA or less	120mA or less	
Output mode	NPN/PNP Open collector output (Output selectable) Load current: 50mA (30VDC) or less Residual voltage: 2V or less								
Operation mode	Light ON: Activated when beams of all optical axes are received (Deactivated when a beam of any optical axis is blocked).								
Response time	Parallel beam mode: 20ms or less when light blocked, 30ms or less if when light received. Cross beam mode: 30ms or less when light blocked, 50ms or less if when light received.								
Light source (wavelength)	Infrared LED (850nm)								
Light receiving element	Photo IC								
Indicators	Transmitter: Power Indicator (Green), Slave Indicator/Cross beam Indicator (Blue), Cross beam Indicator (Blue) Receiver: Power Indicator/Light stabilization state Indicator (Green), Operation Indicator (Orange)								
Auxiliary functions	Automatic sensitivity compensation, Mutual interference prevention for close proximity installations (Up to 2 sets in Parallel beam mode), Reverse polarity protection, Short-circuit protection								
Protection Material	Case: Aluminum, Front cover: Poly carbonate, Mounting part: Zinc alloy die casting								
Connection	Attached cable ϕ 3.5mm, 3m Transmitter: 0.15mm ² \times 4 cores (Gray), Receiver: 0.15mm ² \times 5 cores (Black)								
Weight	Transmitter	Approx. 160g	Approx. 195g	Approx. 230g	Approx. 265g	Approx. 300g	Approx. 340g	Approx. 370g	Approx. 405g
	Receiver	Approx. 165g	Approx. 200g	Approx. 235g	Approx. 270g	Approx. 305g	Approx. 345g	Approx. 375g	Approx. 410g
Accessories Instruction	Manual, small 3-point SEMS screw M4								

ENVIRONMENTAL PERFORMANCE

Ambient light	10,000 lux or less
Ambient temperature	-10 °C to +55 °C (No freezing)
Ambient humidity	35 to 85 % RH (No corrosion)
Protective structure	IP 65
Vibration	10 Hz to 55 Hz, 1.5 mm double amplitude, 2 hours each in 3 directions (X, Y, Z)
Shock	300 m/s ² , 3 directions (X, Y, Z), three times for each axis
Dielectric withstand voltage	1000 VAC, 1 minute
Insulation resistance	500 VDC, 20 M Ω

- The product is equipped with a noise filter between the case and the charger section to avoid malfunctions caused by noise. Accordingly, the maximum breakdown voltage rating and the insulation resistance in the above specifications show the values without the noise filter.

7 INDICATOR



Cross beam mode

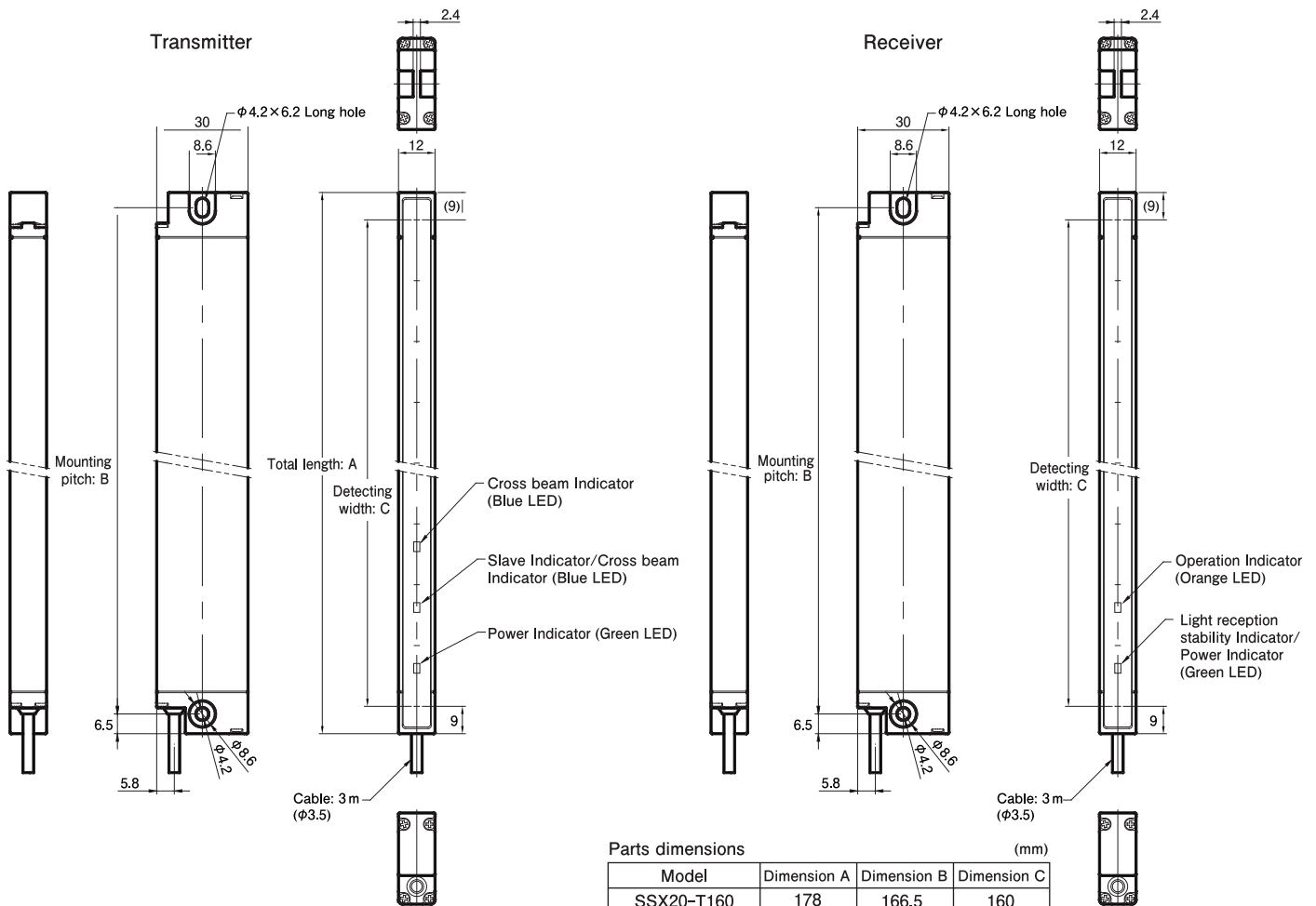
Use the area $\frac{3}{4}$ of the center between the transmitter and the receiver as an effective detection area to detect opaque objects 15mm or more in diameter.

In the remaining areas near the sensor the minimum detection object is 25mm in diameter.

- When the distance between the transmitter and the receiver is 2 m, the effective detection area is: $2 \times \frac{3}{4} = 1.5$ m

In each mode setting, the Indicator of the transmitter turns on as in the above figure. Ensure correct setting.

8 DIMENSIONS (Unit : mm)



Parts dimensions

Model	Dimension A	Dimension B	Dimension C
SSX20-T160	178	166.5	160
SSX20-T240	258	246.5	240
SSX20-T320	338	326.5	320
SSX20-T400	418	406.5	400
SSX20-T480	498	486.5	480
SSX20-T560	578	566.5	560
SSX20-T640	658	646.5	640
SSX20-T720	738	726.5	720

9 WARRANTY

The product is covered by a warranty based on the Quality Regulations of Takenaka Electronic Industrial Co., LTD. (Takenaka). Regarding the warranty, please feel free to ask any questions to Takenaka, Takex sales office or authorized distributors.

1 《Warranty period》

The warranty period is one (1) year after delivery to a designated location. This warranty does not apply to expendable supplies like batteries or relays, and products of other manufacturers which Takenaka markets.

2 《Scope of warranty》

If any defect is found during the warranty period, Takenaka will, at its option, repair or replace the defective product at the location of delivery. This warranty is void and of no effect if the product is subject to improper use or handling, improper maintenance, modification, repair made by persons not authorized by Takenaka or a lack of reasonable care. The warranty does not cover defects caused by the other product, reason including fire, flood, earthquake, lightning surge and other natural disasters.

- ① If the product is used inappropriately or used under inappropriate conditions that are not described in the instruction manual or specifications.
- ② If the defect is caused by improper maintenance, including a failure to replace consumable or periodical parts as described in the instruction manual or specifications.
- ③ If the defect is not directly caused by the warranted product.
- ④ If the product is modified or repaired by persons not authorized by Takenaka.
- ⑤ If the defect is caused by rough handling, dropping, or collision after the product is delivered.
- ⑥ If the defect could not be predicted from a technical viewpoint at the time Takenaka made the agreement for, manufactured, or installed the product.
- ⑦ If the defect is caused by a natural disaster such as a fire, flood, earthquake, lightning (including a lightning surge) and so on, or an accident such as an abnormal voltage that Takenaka is not responsible for.

The warranty provided here is only for the Takenaka product and does not cover any secondary damage caused by problems related to the product.

3 《Target of Warranty》

(1) In case that the product is used in combination with other products or as a part of a system, Buyer should confirm the compatibility of the product to the application by relevant laws, decrees, standards and regulations.

(2) This product is designed and manufactured for use in general industries. This warranty does not cover the application of the product to:

- ① Nuclear power facilities including power station, incineration plant, public utilities including railway, Vehicle and airway facilities, medical devices, amusement machines, safety devices and facilities that are governed by regulation of government or industrial organization.
- ② Facilities that may cause danger or serious effects on human life and assets.
- ③ Utilities like electricity, gas or water facilities. Facilities that are required 24 hour continuous operation.
- ④ Outdoor use or use in improper conditions or environment.
- ⑤ Other facilities which requires broad and detail consideration concerning safety and reliability equivalent to the above.

This warranty may cover these applications in case that Takenaka is notified about the application of the product before sale and Buyer approves the compatibility and the specifications of the product by written agreement and / or by providing required safety measures.

10 DISCLAIMER

- This product is designed for use in general industries to detect a presence or passage of an object. This product does not have any function to prevent accidents, death or injuries.
Takenaka will assume no responsibility for damages or losses resulting from accidents or disasters caused by a failure of the product, complete wiring or installation or any act that does not follow the instruction manual.
- Earthquakes, lightning (including lightning surges), fires that we are not responsible for, acts or incidents caused by third parties, intentional or accidental misuse, or usage under other abnormal conditions.
- Any secondary damage caused by the usage, faulty operation, or malfunction of the product like suspended operation or malfunction of a connected device or system, damage to a device, loss of profit, interruption of business, corruption or loss of memory contents, cost of restoration, etc.
- Misuse, failure related to maintenance, installation or deinstallation, or failure to follow the contents of the instruction manual.
- Any malfunction (including false alarm or lost alarm) caused by the combination with a connected device or software over that we have no control.
- The responsibility of Takenaka is limited to the extent of repair or replacement of the product. The expenses we are liable for will not exceed the original product cost.