

# Beam Switch

The first in the industry, new functions provided

**Small amplifiers for 1 or 2-beam**



**Screwless terminal base**



**Sensitivity adjustment with one push**



## OS-10C (Amplifier for point to point safety beam)

\*When the equipment is in failure, the door is kept open.  
(This is the function to secure safety of passengers.)

## ① Specifications

Type	OS-10C
Installation distance	0-10m
Detection method	point to point near infrared light beam
Power supply	12-24V AC/DC
Current Draw	135mA MAX
Power/Operating indicator	LED ON (GREEN/RED): Stand by. LED OFF (GREEN/RED): Detection. LED BLINK (GREEN/RED): Insufficient sensitivity. (Refer to "⊕ Adjustment" for the details.)
Output contact	N.O. or N.C. 50V0.3A(registance load)
Response time	Approx. 0.05 sec (from the moment of beam cut-off)
Output hold time	Approx. 0.5sec (from the moment of beam input)
Ambient use temperature	-20 to +55°C (-4°F to +131°F)
Ambient use illuminance	No malfunction with a sun-light illumination of less than 100,000 lx (±5° off beam axis)
Weight	Amplifier: 70g(2.5oz)
Components	Amplifier x 1, Mounting screws x 2 packs (Optional sensor head is necessary for operation)

Note 1) It is possible to use OS-10C as an amplifier for beam switch of 1 or 2-beams by attaching

*a separately sold sensor heads.*

When using this unit, please thoroughly read this manual to use it correctly.

In this manual a variety of illustrations and expressions to use the unit safely and correctly are shown to prevent you and other people from undergoing any injury or loss of property during use of the unit. The meanings of the expressions are as follows: Please grasp them first and then read the contents of this manual.

**Warning** Indicates that, if you use the unit improperly disregarding this warning, the unit can cause you or other people death or serious injury.

**Caution** Indicates that, if you use the unit improperly disregarding this caution, the unit can cause you or other people injury or physical damages.

**Please first read the followings without fail (explain to work contractors).**

**Caution** There is a danger of electric shock.

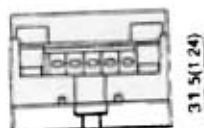
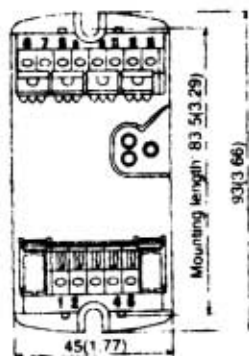
■ Be sure to cut off power supply when perform electrical works.

**Warning** There is a danger that workers may get caught between the doors. (Please, explain to the work contractor.)

■ Even when someone stops on the door rails, the door closes unless the light beam becomes cut off (The beam switch outputs the signal only when the light beam is cut off). The beam switch is not designed as an apparatus to prevent accidents. It should be used strictly for the purpose of an auxiliary apparatus for safety.

## ② Outside dimensions

<Amplifier section>

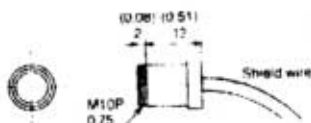


<Sensor head section>

One push installation type  
Mounting hole:  $\phi 12\text{mm}$



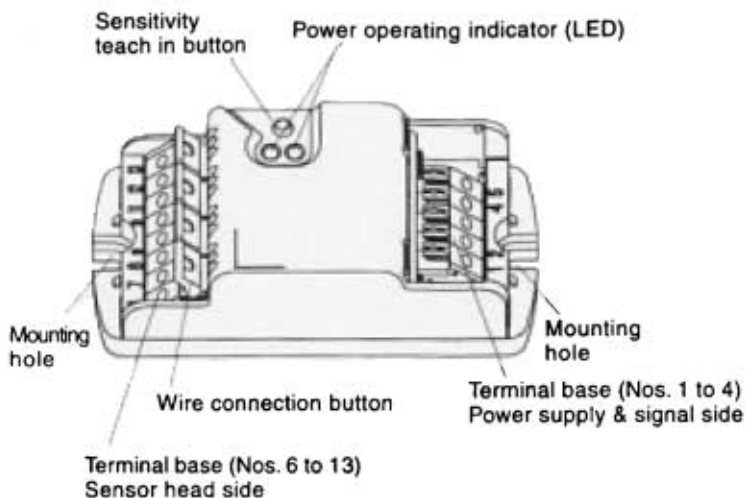
Plate installation type  
Mounting hole:  $\phi 12$  to  $13\text{mm}$



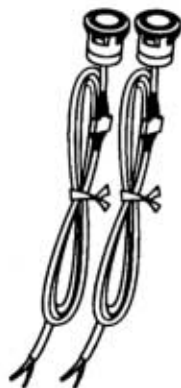
mm(inch)

### ③ Construction

<Amplifier section>

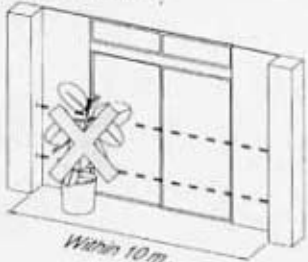


<Sensor head unit>  
(with shield wire)

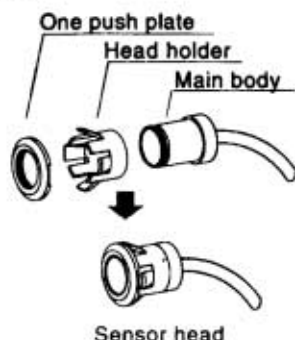


·SH-1 (7m)  
·SH-4 (10m)

### ④ Installation method

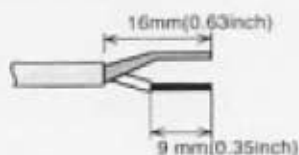
Step	Cautions
<p>① Mounting sensor heads(option)</p> <p>1 Drill the following mounting holes in the support pillars.</p> <ul style="list-style-type: none"> <li>■ One push installation type           <ul style="list-style-type: none"> <li>·Mounting hole: <math>\phi 12\text{mm}</math>(<math>\phi 0.47\text{inch}</math>)</li> </ul> </li> <li>■ Plate installation type           <ul style="list-style-type: none"> <li>·Mounting hole: <math>\phi 12</math> to <math>13\text{ mm}</math> (<math>\phi 0.47</math> to <math>\phi 0.51\text{inch}</math>)</li> <li>·Prepared screw hole: <math>\phi 3.5\text{ mm}</math> (<math>\phi 0.14\text{inch}</math>)</li> </ul> </li> </ul> <p>◆ On drilling the mounting holes ◆</p> <p>① Please be sure to mount holes, so that the sensor heads faces each other directly.</p> <p>② After drilling the holes, remove the flashes around the holes on the surface. Otherwise, the sensor heads may ride on the flashes, become tilted, and the light beam may not come in the sensor, thus keeping the door open.</p>	<p>◆ On the distance between the sensor heads ◆ Be sure to set the distance to less than 10m. If the distance is more than 10m, the door may be held open.</p> <p>◆ Surroundings of the sensor heads ◆ Do not obstruct the light beam path with shaking of potted plants or anything. Otherwise, the sensors may operate with such obstruction.</p>  <p>The diagram shows a vertical support pillar with two sensor heads mounted on it. A potted plant is placed in front of the pillar, with a dashed line representing the light beam path from one sensor head to the other. A large 'X' is drawn over the plant, indicating that it obstructs the beam path. Below the diagram, the text 'Within 10m' is written, indicating the required distance between the sensor heads.</p>

Optional parts)

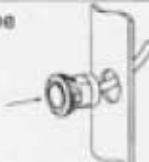
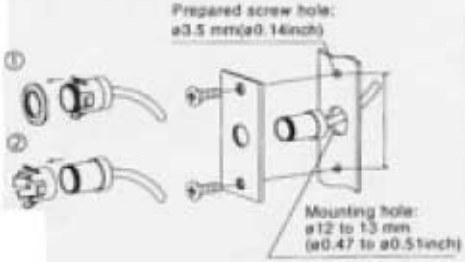


**Caution** There is a risk of breaking the apparatus.

When cutting the shield wires, prepare the tip of the wires as follows:  
If the covers of the shield wires are peeled off too long, the adjacent tips can easily contact each other causing breakdown of the apparatus.



(Full size)

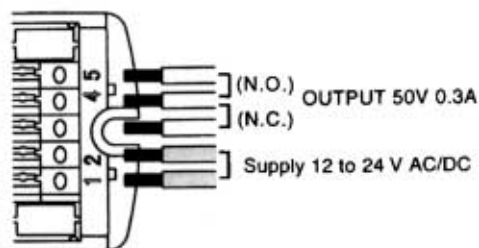
	Step	Cautions
2	<p>■ One push installation type</p> <p>Push in the sensor heads to the mounting hole.</p> 	<p>◆ On the setting of one push plate ◆</p> <p>Be sure to set the one push plate completely to the main body. If the main body is slanted, light beam might not be transmitted.</p>
	<p>■ Plate installation type</p> <p>Remove one push plate and head holder from sensor head.</p> <p>Affix the main body to the plate.</p> <p>Screw the plate to the support pillars.</p> <p>Prepared screw hole: ø3.5 mm(ø0.14inch)</p>  <p>Mounting hole: ø12 to 13 mm (ø0.47 to ø0.51inch)</p>	

## Step

## Cautions

### ① Connecting power supply wires and signal output wires

Connect the power supply wires and the signal output wires to the engine as shown below:



■ Method of connection  
Press the top of the terminal with a screwdriver, and insert the wires into the terminals.



**Caution** There is a risk of breaking down the apparatus.

Connect the supply wires to terminal 1 and 2 without fail. If wrongly wired, the apparatus would be broken down.

◆ Rated connecting capacity ◆

- Solid (Rigid)  $\phi 0.4$  -  $\phi 1.2$  mm (AWG26-18)
- Stranded (Flexible)  $0.3$  mm<sup>2</sup> -  $0.75$  mm<sup>2</sup> (AWG22-20)

(Strand diameter shall be more than 0.18mm)

◆ Warning about wiring ◆

Do not connect more than 2 wires in one terminal

### ② Checking the operation

Check the operation of the apparatus according to the following flowchart:

#### ■ Operation flowchart ■

Performance

Power/Operating indicator

OFF

ON  
(green/red)

OFF

ON  
(green/red)



	LED indication	State
Press one second. ↓ Release	Green/Red blinks together.	Starting setup
	Green/Red illuminates together.	Finishing setup
	Result	

**Confirm the result with the LEDs after one second**

■ Possible results of the adjustment

LED	Result and action
Green/Red ON	The sensitivity has been set correctly. The adjustment is finished. (When two beams)
Green ON	The sensitivity has been set correctly. The adjustment is finished. (When one beam)
Green/Red blink alternately	The sensitivity is insufficient. Check the followings. ① Is there any obstruction between the projector and receptor? ② Any dirt is sticking to the lens surface? ③ The shield wires are cut or contact each other? The wires are connected securely? ④ The emitter or receiver sensor head is not tilted?

with water. Otherwise, the water may enter the apparatus and cause failures.

◆ Surroundings of the sensor heads ◆  
Do not obstruct the light beam path with shaking of potted plant or anything. Otherwise, the sensors may operate with such obstruction.

◆ Maintenance ◆  
Check the LED state.

LED	Result and action
Green ON Red ON (when 2 beams)	Green ON (when 1 beam) Nothing particular
Green blinking Red ON (when 2 beams)	The blinking indicates an insufficient sensitivity.
Green blinking Red OFF (when 1 beam)	Readjust the sensitivity by pressing "Sensitivity teach in button" in the left steps.
Green ON Red blinking (when 2 beams)	* Green LED indicates the state of the sensor connected with the receiver terminal ①, and Red LED indicates the state with the receiver terminal ②.
Green blinking Red blinking (when 2 beams)	
Green/Red blinking alternately	There is a possibility of an insufficient sensitivity or failure of the apparatus. Readjust the sensitivity by pressing "Sensitivity teach in button" in the left steps.
Green/Red OFF	

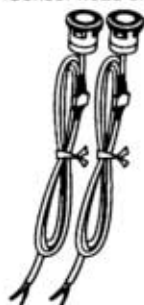
## ⑥ Trouble shooting

Symptom	Countermeasure	Checkpoint	Sub title	
				No.
No operation	Irregular supply voltage	Set it to the rated voltage.	① Specifications	Power supply
	Wire cut or bad connection	Check the wiring.	② Installation method	① ②
	Inappropriate set distance or condition	Check the set distance and condition.	④ Installation method	③
Operates by itself	Inappropriate set distance or condition	Check the set distance and condition.	④ Installation method	③
	Something swinging cuts off the beam between the sensor heads.	Remove the obstruction.	④ Installation method	③
		Remove the dirt.	⑤ Adjustment	③

Status	Power OFF *Failure of the apparatus	Obstruction of sensor status *No person or nothing exists between the sensor heads	Obstruction of sensor status is passing between the sensor heads (the light beam is cut off)	After the passing and during waiting	
Out put relay status	N.O.	OPEN	OPEN	CLOSE	OPEN
	N.C.	CLOSE	CLOSE	OPEN	CLOSE

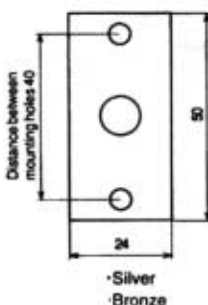
## Separately sold optional items

<Sensor head unit>



·SH-1 (7 m)  
·SH-4 (10 m)

<Mounting plate>



<One push outer plate>



·Mirror surface  
·Chrome

### ■FCC statement(aplicable in U.S.)

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions : (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

#### Warning:

This equipment has been tested and found to comply with the limits for a Class B device , pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment dose cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures :

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio / TV technician for help.



**OPTEX CO.,LTD.** (ISO 9001 Certified by LRQA)

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1845W.205th Street Torrance,CA 90501-1510 U.S.A.  
TEL(310)533-1500 FAX(310)533-5910

**Secumatic B.V.**

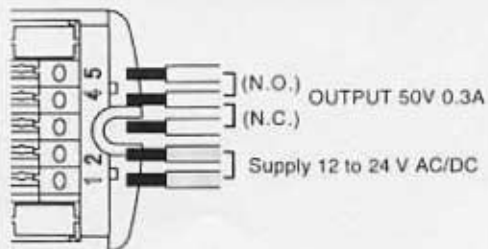
Tiber 2 (Forepark) P.O. Box 252 2260 AG Leidschendam  
Tel:(0)70-4194100 Fax.Sales:(0)70-3177321

## Step

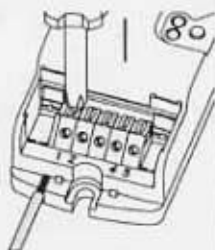
## Cautions

## ④ Connecting power supply wires and signal output wires

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- Stranded(Flexible) 0.3mm<sup>2</sup>-0.75mm<sup>2</sup> (AWG22-20)

(Strand diameter shall be more than 0.18mm)

◆ Warning about wiring ◆

Do not connect more than 2 wires in one terminal

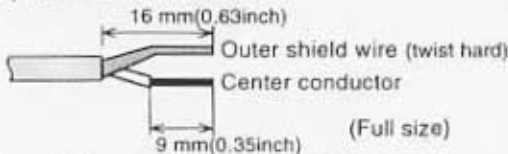

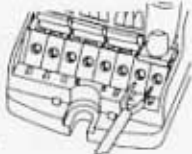

## ② Checking the operation

Check the operation of the apparatus according to the following flowchart

## ■ Operation flowchart ■

Performance				
Power/Operating indicator	OFF	ON (green/red)	OFF	ON (green/red)

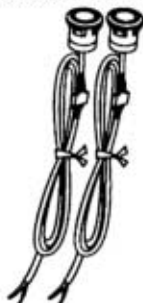
## ④ Installation method (continued)

Step	Cautions
<p><b>② Installing amplifier</b></p> <p>Use the supplied screws (nominal size 4X12; bind 2 pieces). The size of the prepared holes is <math>\phi 3.5</math> mm (<math>\phi 0.14</math>inch).</p>	
<p><b>③ Wiring sensor heads</b></p> <p>◆ Cutting the shield wires ◆ When cutting the shield wires, prepare the tip of the wires as follows:</p>  <p>16 mm (0.63inch) Outer shield wire (twist hard) 9 mm (0.35inch) Center conductor (Full size)</p> <p>Connect the wires to the terminal Nos. 6 to 13 of the terminal base as illustrated below:</p>  <p>Emitter gray wire ② Emitter gray wire ① Receiver blue wire ② Receiver blue wire ①</p> <p>■ Method of connection While pressing the wiring button with your finger, insert both the outer shield wire and center conductor simultaneously into the terminals, and then move your finger off the button.</p> 	<p><b>⚠ Warning</b> There is a danger of electrical shock. Before starting the construction, be sure to cut off the power supply.</p> <p><b>⚠ Caution</b> There is a risk of breaking the apparatus. When cutting the shield wires, be sure to prepare the tip of the wires as shown on the left: If the covers of the shield wires are peeled off too long, the adjacent tips can easily contact each other causing breakdown of the apparatus.</p> <p>◆ Prohibition of extending shield wires ◆ Do not extend the shield wires. Otherwise, the apparatus may be affected by noises and may malfunction.</p> <p>Make sure that all the wires are securely connected.</p>
<p><b>⑤ Adjustment</b></p>	
<p>Step</p> <p><b>① Setting up the sensitivity</b></p> <p><b>Be sure to go through the following steps.</b> Perform the adjustment while there is nothing swinging in or cutting off the light beam.</p> <p>After turning on power, press "Sensitivity teach in button" for more than one second. The setup is completed when the green and red LEDs simultaneously changes from blinking to lighting on.</p> 	<p>Cautions</p> <p>◆ On maintenance of sensor heads ◆</p> <ul style="list-style-type: none"><li>Do not stain sensor heads. Otherwise, the sensor heads may not operate normally. If any dirt sticks to them, wipe it off with a cloth damped with a neutral detergent. Do not use any solvent for cleaning. Otherwise, the lens surface may be melted with the solvent and the apparatus may not operate normally.</li><li>Do not directly wash the sensor heads</li></ul>

Status	Power OFF *Failure of the apparatus	status No person or nothing exists between the sensor heads	is passing between the sensor heads (the light beam is cut off)	After the passing and during waiting	
Out put relay status	N.O.	OPEN	OPEN	CLOSE	OPEN
	N.C.	CLOSE	CLOSE	OPEN	CLOSE

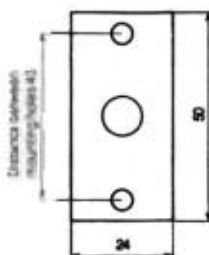
## Separately sold optional items

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·SH-4 (10 m)

<Mounting plate>



<One push outer plate>



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