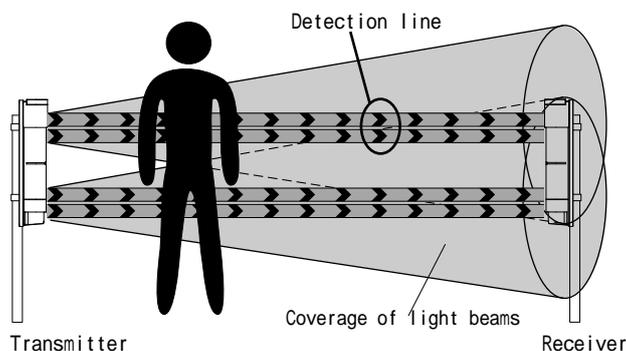


Beam Sensor

BUS-50XF	(Outdoor 50m)
BUS-100XF	(Outdoor 100m)
BUS-200XF	(Outdoor 200m)

Thank you for purchasing this product.
Read this instruction manual before using the product to make sure that you use it correctly.

This is a photoelectric beam sensor for BUSNET system which consists of photo transmitter that transmits infrared light, and a photo receiver for the transmitted light, as shown in the illustration on the right. The infrared light transmitted from the transmitter expands in a cone shape, while the light beams enter the receiver. The straight line that connects the transmitter with the receiver is the detection line. If the detection line is obstructed (light is obstructed for more than 0.05 – 0.7 seconds), the receiver detects this break in the light beams, and outputs a signal. In order to ensure that the detection line has sufficient margin of sensitivity, adjust the direction of the light beams before placing the system into operation. Providing sufficient margin of sensitivity reduces the occurrence of malfunction caused by dense fog, heavy rain, frost, snow, and other such weather conditions.



Main features

(1) DOUBLE MODULATION



Double modulated beams are designed to distinguish the external lights. It increases the reliability in the outdoor security system.

(2) WIDE BEAM



The pitch between upper beam and lower one is widened more than old models. False alarm by birds and falling leaves reduces drastically.

(3) QUAD HIGH POWER BEAM



The beam power is 100 times of the minimum requirement. The beam distance is 10 times of the described specification. This high power beam also realizes the reliability against the harsh conditions like fog, snow, heavy rain.

(4) LOW CURRENT CONSUMPTION



50% less than remaining models. The battery size may reduce, wiring diameter may lessen, installation cost may decrease.

(5) ECOLOGY



RoHS adapted – Environment friendly. Free from Lead, Mercury, Cadmium, Hexavalent chromium, Polybrominated biphenyl, Polybrominated diphenyl ether.

(6) INSECT / WATER PREVENT



Anti-insect bushing and special gasket enable IP65 rated tight housing.

(7) ANTI-BIRD SPIKE



Keeps birds and small animals away from the sensor, helping to reduce false alarms.

(8) DRIP-PROOF HOUSING



Prevents rain and snow from streaming down the front side of housing, helping to avoid false alarm.

(9) DUAL RING SIGHT



Enables better and clear view for easy beam alignment.

(10) TARGET COLOR



The vivid color of the internal structure can be recognized easily from the far end in the beam alignment procedure. The color differs between a transmitter and a receiver which helps easy installation and checking.

(11) INCREASED ANGLE ADJUSTMENT ALLOWANCE



Vertically $\pm 20^\circ$ compared with previous version. It may adapt to the slope installation flexibly.

(12) WIRELESS ALIGNMENT CHECKER



Enables easy and accurate beam alignment. (Sold separately)

(13) THUNDER PROTECTION



Minimize the damage by the induced thunder through wirings. It may stand 10000V under normal mode, 15000V under common mode.

(14) Saving wirings



Only 2 signal wirings are required from each BUSNET individual sensor to control panel.

(15) Signal input terminal



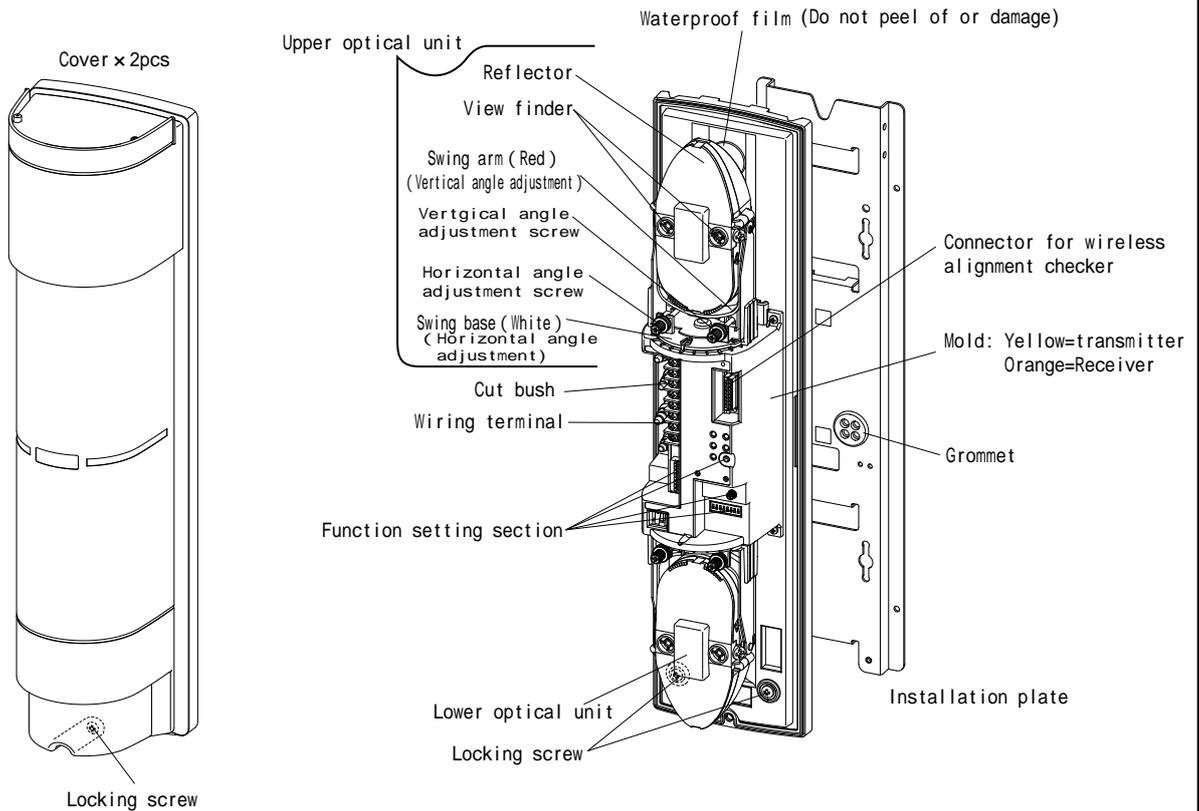
The signal of the normal sensor can be connected to this unit and sent to control panel.

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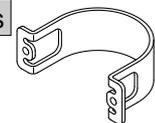
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1 Product components

1-1 Parts description



1-2 Accessories



Pole attachment
x 4pcs



Tapping screw
(4 x 30)
x 8 pcs



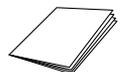
Countersunk
Oval head screw
(M4 x 20)
x 8 pcs



Cable tie
x 8pcs

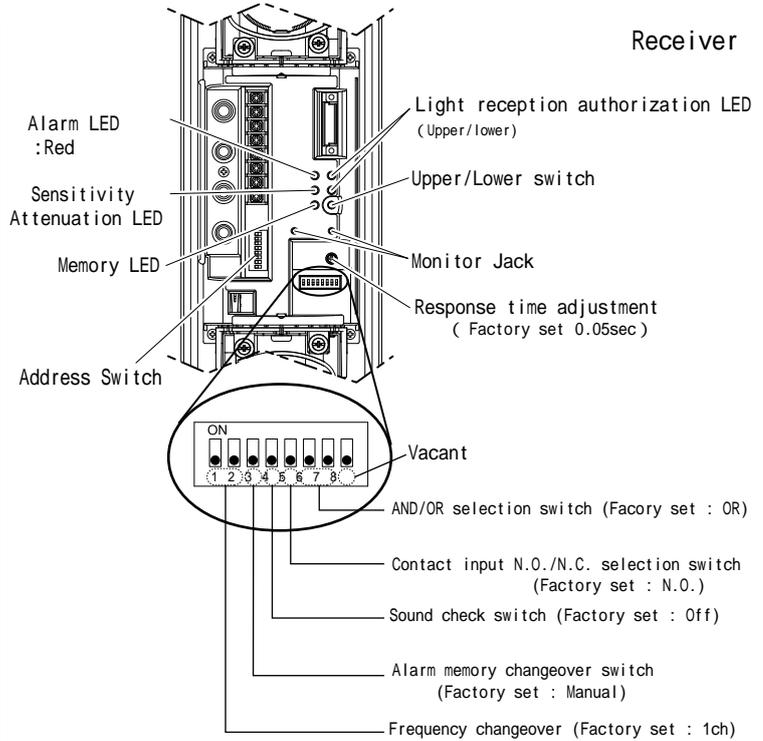
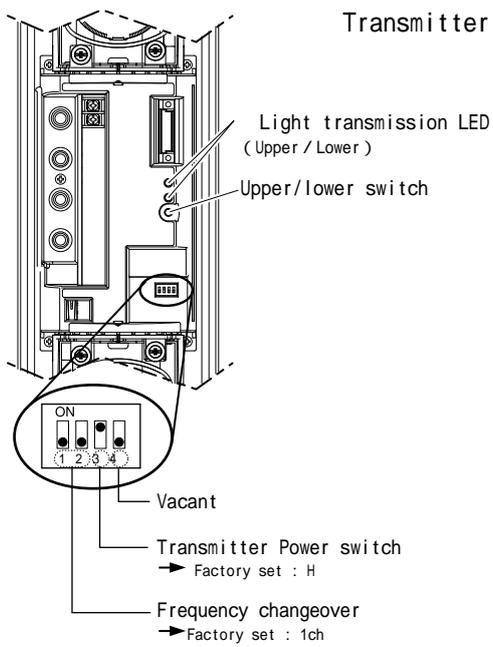


Bird stopper
x 4pcs



Instruction manual

1-3 Names of settings



2 Cautions

In case of several stacking installation, use the sensor model BUS-XF series or PXB-HF series. (Also keep the same protection distance)

Do not use with other series of sensor. (PB-IN-HF · PB-IN-100AT · PB-IN-75SW · PB-HF-KH · PB-AT-KH · PB-TE)

Description

- Warning : If this is ignored, people will face the possibility of death or serious injury.
- Notice : If this is ignored, people may suffer injury or personal property may suffer damages.
- "Don't" marking. Don't remodel.
- "Need to know" marking.

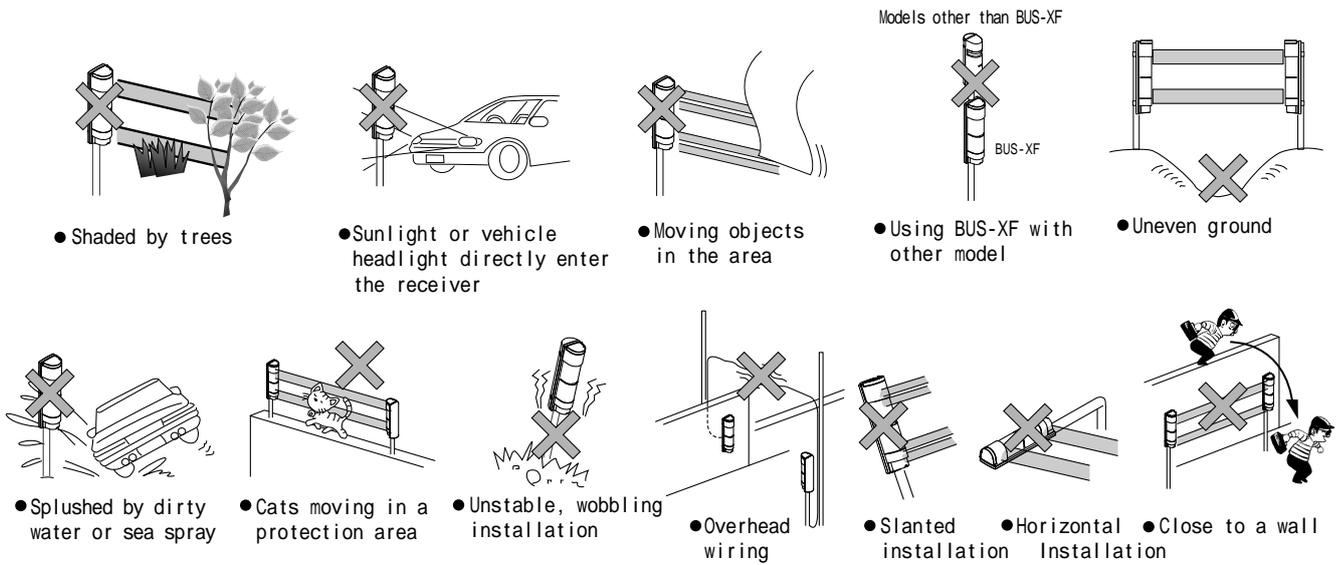
Warning

- | | |
|---|--|
| <ul style="list-style-type: none"> Use the designated battery only(DC10-30V) Keep the correct polarity for power supply and Busnet line. Don't touch the unit with wet hands. | <ul style="list-style-type: none"> Do not remodel the unit. Quit using the unit in case of strange smoke, smell or noise coming from the unit. |
|---|--|

Notice

- | | |
|---|---|
| <ul style="list-style-type: none"> Don't install the unit in a location that cannot support its weight. Use the unit within the designated protection distance. | <ul style="list-style-type: none"> This model is for BUSNET system only. It cannot be used for normal relay system. Read the manual of control panel carefully for correct use. |
|---|---|

Example of incorrect installation



Cautions

1. Trim down leaves or branches near to detection area periodically as it may interrupt the detection area by strong wind.
2. Prune bine plants regularly near the detection area.
3. Clean thge units regularly so that insect or bird droppings cause miss detection.

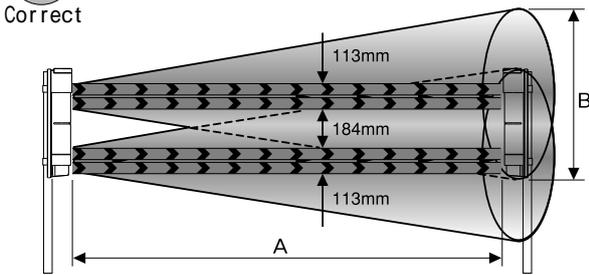
3 Precautions

3-1 Protection distance and range of beam coverage

The infrared expands into conic shape light beams and the optical axis is in the center of the light beams. The opposite units should be in the center of the light beams.



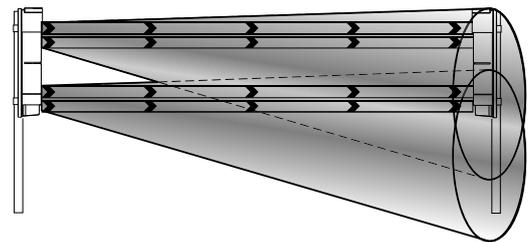
Correct alignment allows sufficient margin of sensitivity.



	A	B
BUS- 50XF	50m	1.2m
BUS-100XF	100m	2.4m
BUS-200XF	200m	5.0m

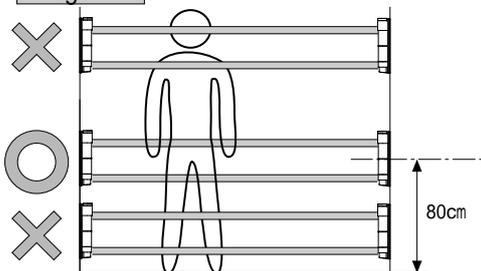


If the beam is not aligned correctly, there will be insufficient margin of sensitivity, making the system more susceptible to adverse effects of environmental.



3-2 Mounting height

Install the unit at the height 0.8m from the ground.



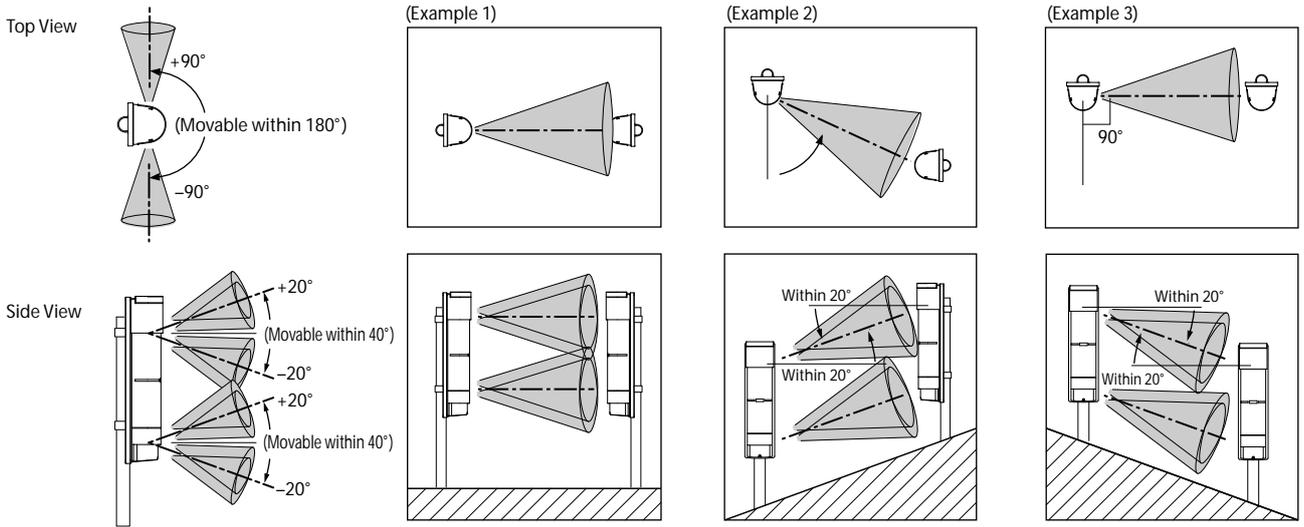
Install the unit so that the center of the unit is about 0.8m high from the ground for reliable detection.



If the installation position is too high or too low, reliable detection will be difficult.

3-3 OPTICAL AXIS ADJUSTMENT RANGE

• Refer to the diagram below, and install the sensors within the optical axis adjustment range. (Photoelectric beams are drawn in simplified form)

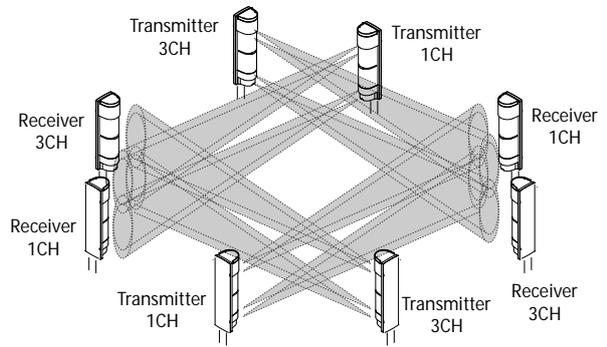


3-4 EXAMPLE OF PRACTICAL APPLICATION

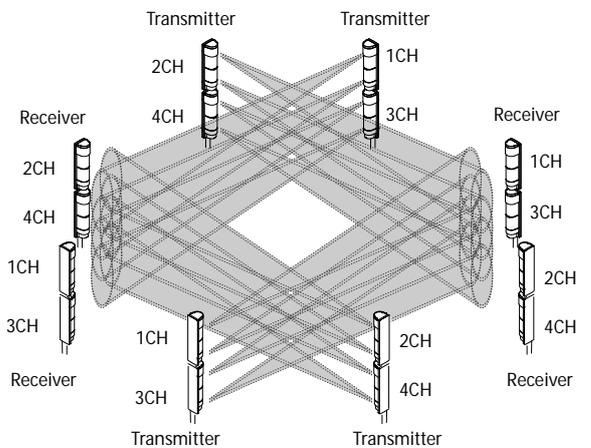
• In order to minimize the occurrence of malfunctions, refer to the protection diagram below for optimal operation. Using the sensors incorrectly may cause malfunction. (Light beams are drawn in simplified form)

- When using multi-level protection or install straight line protection at multiple spans, use a sensor for which the modulation frequency can be switched. In addition, set an appropriate channel and install a transmitter and a receiver in appropriate locations, according to the following examples. If an inappropriate channel is set, it may cause malfunction.
- For the modulation frequency channels for upper and lower sensors when multi-level protection is used, set separate channels, such as "1" and "3" or "2" and "4".
- Mutual interference or wraparound of the photoelectric beams can be prevented by changing the channels. "8 EXPLANATION OF FUNCTIONS (8-2 MODULATION FREQUENCY CHANGEOVER FUNCTION)" Note: Set corresponding transmitters and receivers to the same channel.
- For the installation methods not described in the instruction manual (installation of straight line protection with 4-span or more, 3 level protection or more, or others), contact the place of purchase or TAKEX.

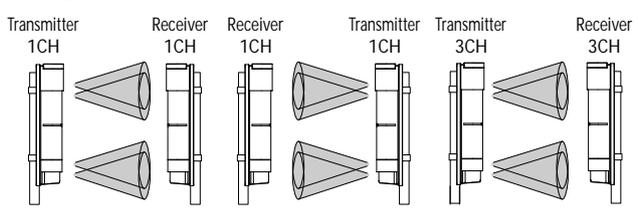
● External Perimeter Protection



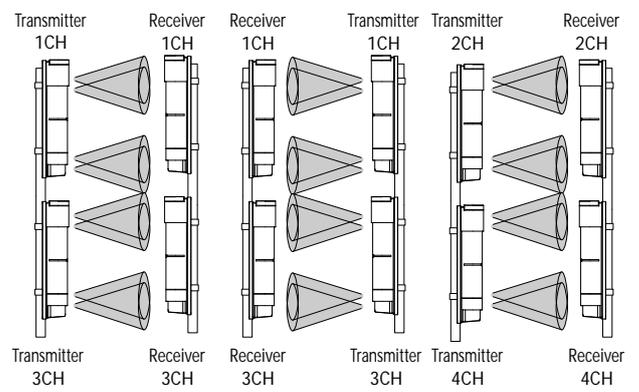
● 2 Level External Perimeter Protection



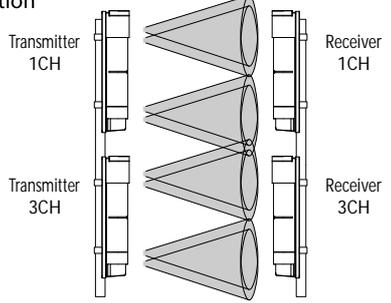
● Straight Line Protection



● 2 Level straight line protection



● 2 Level protection

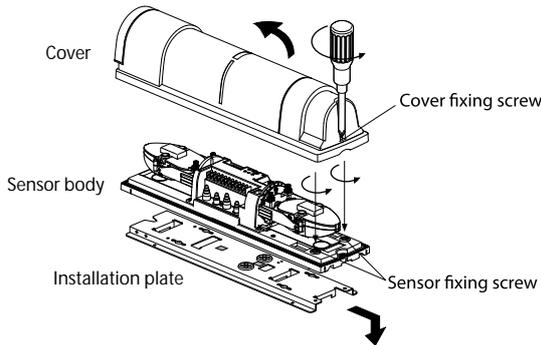


• Consult with TAKEX distributor or TAKEX regional office about the frequency selection for installations not mentioned in this instruction manual. Inappropriate choice of frequency may cause malfunction.

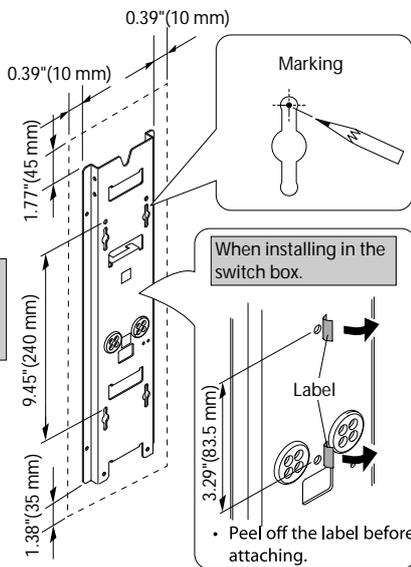
4 INSTALLATION METHOD

4-1 Wall installation method

- 1
- Loosen the cover fixing screw, and remove the cover.
 - Loosen the sensor fixing screws (2 pcs), and remove the sensor body.



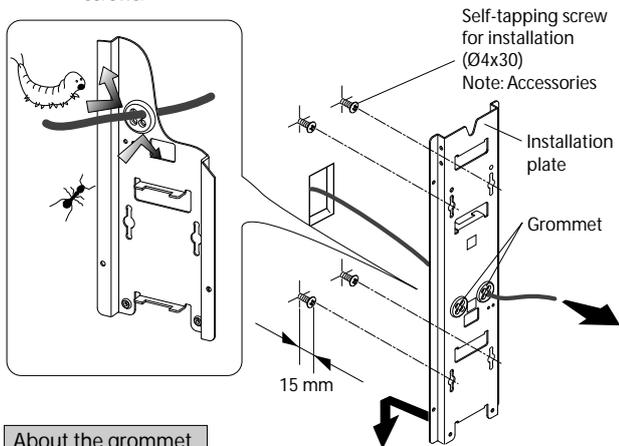
- 2
- Place the installation plate in position, then ensure that the space shown by the dotted lines is allocated before marking the positions of the screws.



When installing using the same installation holes as those for the PB-F/PB-IN-HF series

- Use the installation holes of 9.45" pitch (240 mm).

- 3
- Tighten the self-tapping screws for installation (4 pcs) in the marking locations up to 15 mm of the screw body.
 - Pass the wiring material through the grommet.
 - Attach the installation plate and secure it by tightening the screws.

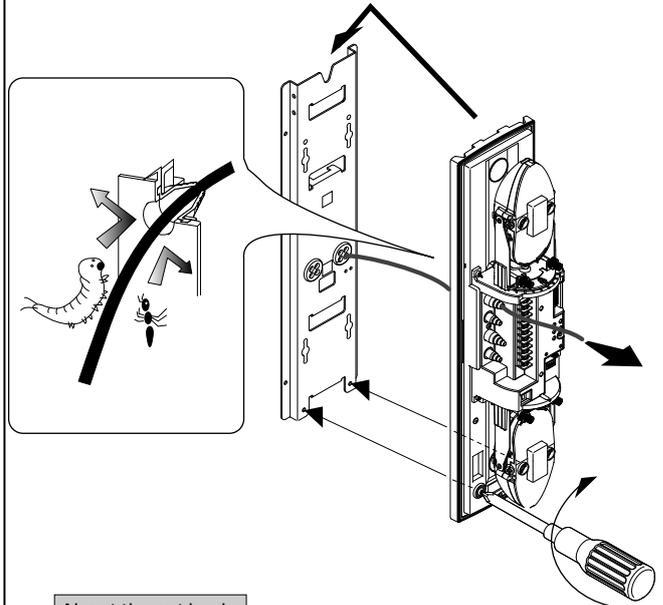


About the grommet

This work is required as an insect-proof and drip-proof countermeasure for the sensor exterior.

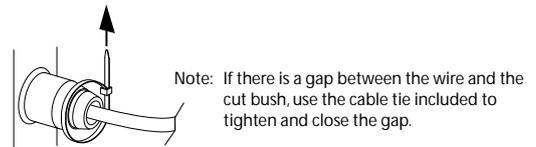
- Note 1: For wiring with an external diameter of Ø0.12" (3 mm) to Ø0.24" (6 mm), break the membrane by pressing it through the recess.
- Note 2: For wiring with an external diameter exceeding Ø0.24" (6 mm), cut off the section shown by the dotted lines in the drawing below using nippers or equivalent tools. Be sure to caulk the cut section as an insect-proof countermeasure.

- 4
- Trim down the diameter of the cut bush so that it is to a diameter smaller than that of the diameter of the wiring.
 - Pass the wiring through the cut bush.
 - Use the sensor fixing screws (2 pcs) to fix the sensor body to the installation plate.



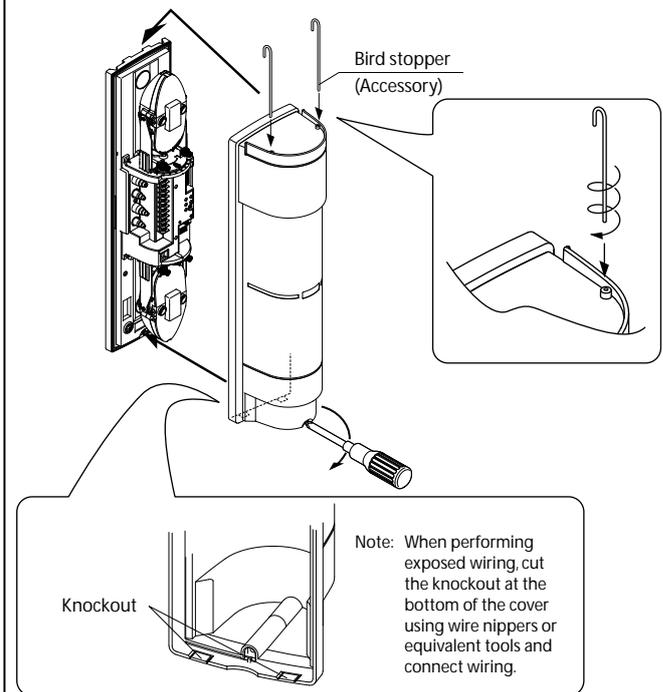
About the cut bush

This work is required as an insect-proof and dust-proof countermeasure for the sensor exterior.



- 5
- Refer to section 5. Wiring to connect the wiring.
 - Refer to section 6. Optical Axis Adjustment to adjust the optical axis.

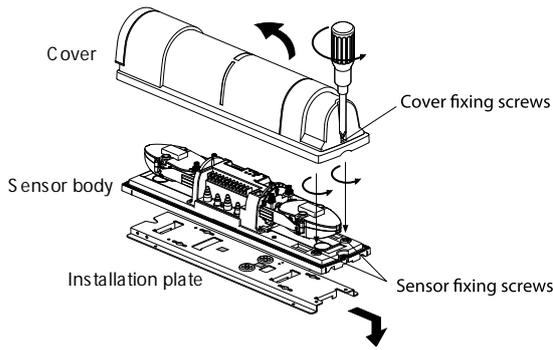
- 6
- Attach the cover to the sensor body, and fix it in place using the cover fixing screws.
 - Attach bird stoppers to the cover as and when needed.



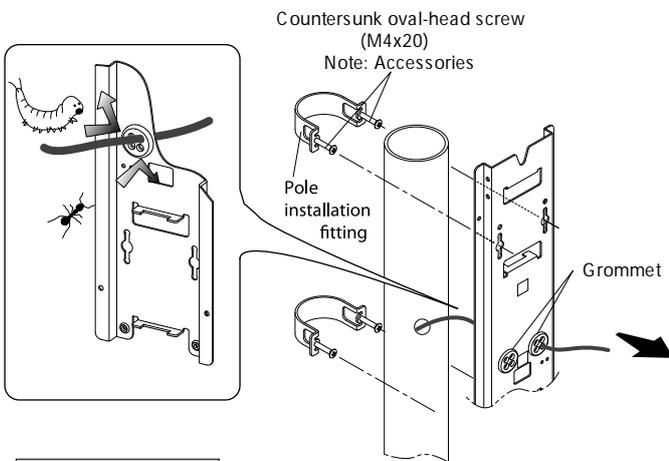
4-2 POLE INSTALLATION

Note: This device can be attached to a pole with diameters of 1.65" (Ø42 mm) to 1.95" (Ø49 mm).

- 1 • Loosen the cover fixing screws, and remove the cover.
• Loosen the sensor fixing screws (2 pcs), and remove the sensor body.

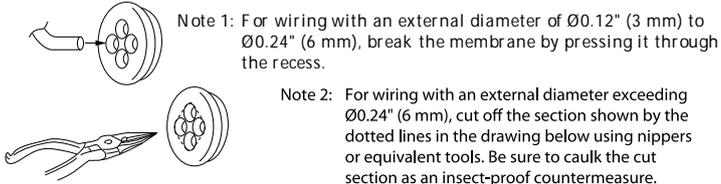


- 2 • Attach countersunk oval-head screws to the pole installation fittings. (Secure it to the end of the pole)
• Pass the wiring pulled from the pole through the grommet.
• Fix the installation plate to the pole using the installation fittings.



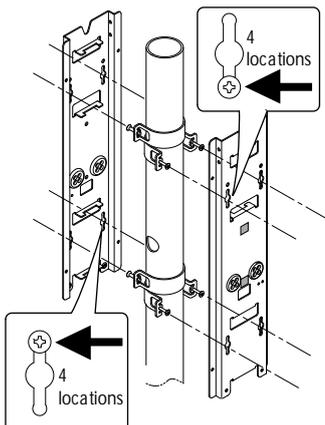
About the grommet

This work is required as an insect-proof and drip-proof countermeasure for the sensor exterior.



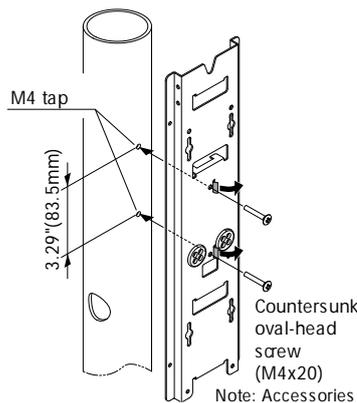
Back to back pole installation

- Pass the wiring material through the grommet.
- Install the pole installation fittings as shown in the diagram, and then fix the installation plates.

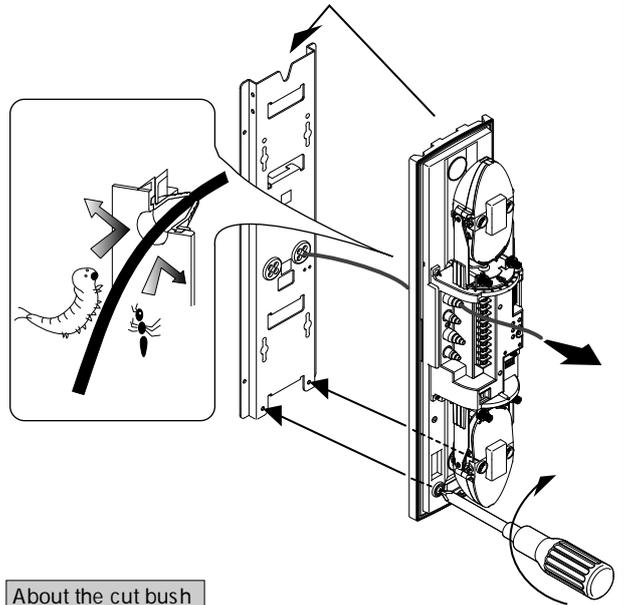


Installation to a pole exceeding Ø1.95" (Ø49 mm)

- Drill a pilot hole of Ø0.13" (Ø3.3 mm) on the pole, and then tap an M4 hole.
- Note: Be extremely careful when drilling a pilot hole on the pole.
- Peel off the label and attach the plate using screws.

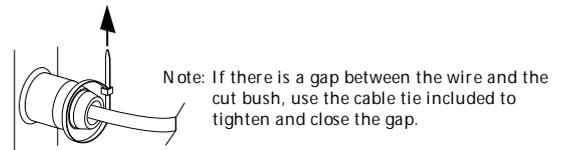


- 3 • Trim down the diameter of the cut bush so that it is to a diameter smaller than that of the diameter of the wiring.
• Pass the wiring through the cut bush.
• Use the sensor fixing screws (2 pcs) to fix the sensor body to the installation plate.



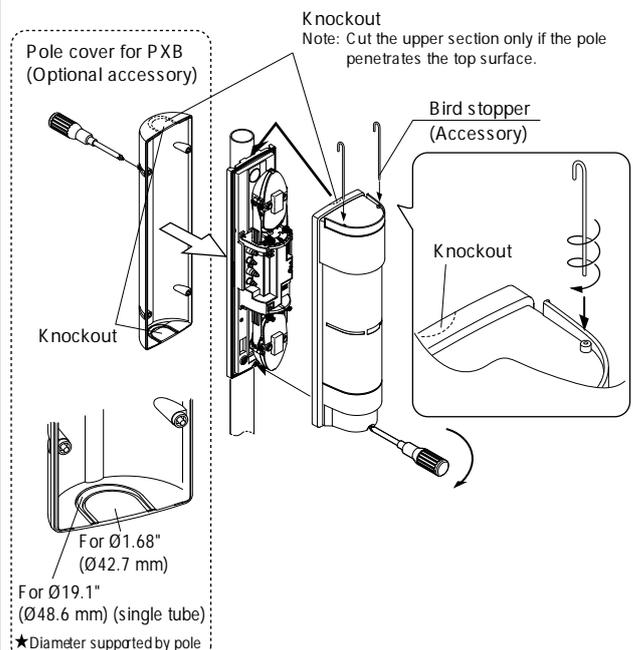
About the cut bush

This work is required as an insect-proof and dust-proof countermeasure for the sensor exterior.



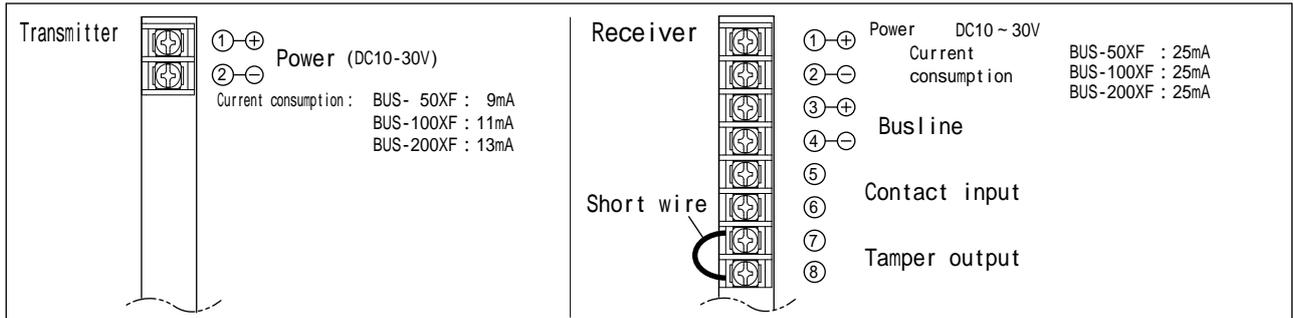
- 4 • Connect the wiring.
• Adjust the optical axis.

- 5 • Attach the cover to the sensor body, and fix it in place using the cover fixing screws.
Note: Cut the knockout at the top using nippers or equivalent tools as and when needed.
• Attach bird stoppers to the cover as and when needed.



5 Wiring

5-1 Terminals



5-2 Wiring distance between sensor and power supply

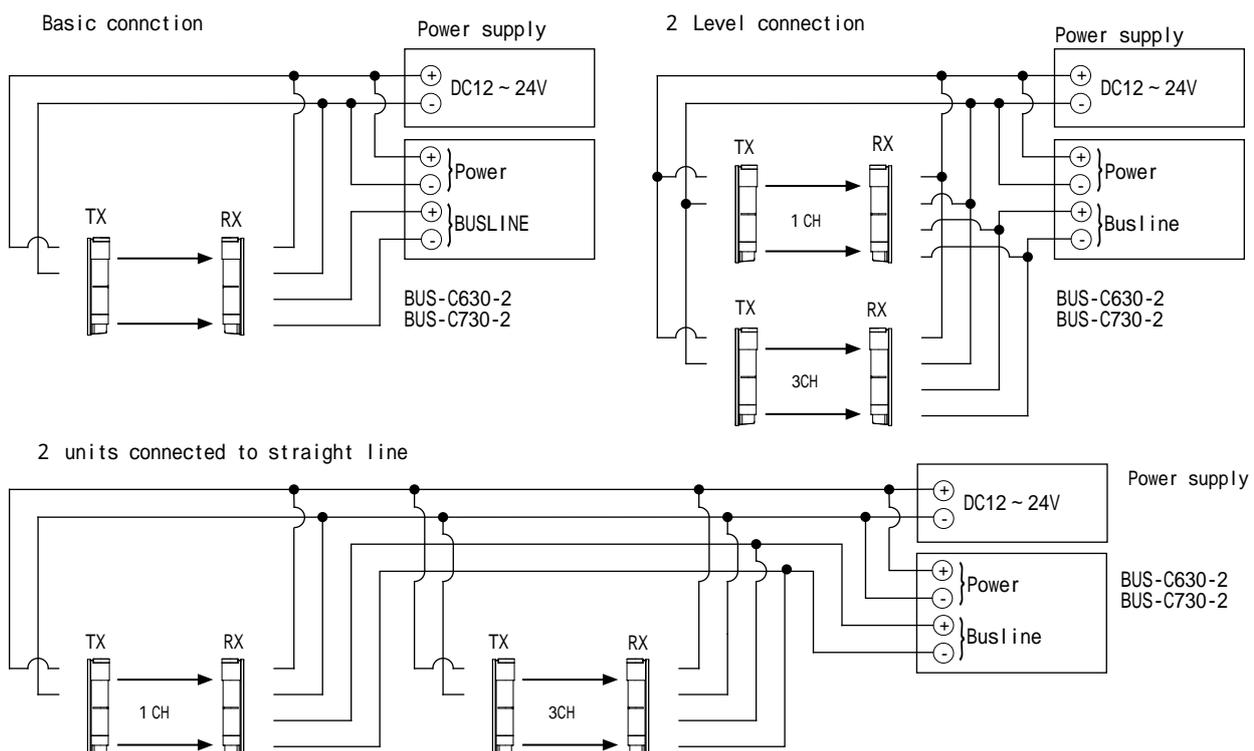
Single wire [m]							Twisted wire [m]								
Size	Model Power	BUS-50XF		BUS-100XF		BUS-200XF		Size	Model Power	BUS-50XF		BUS-100XF		BUS-200XF	
		DC12V	DC24V	DC12V	DC24V	DC12V	DC24V			DC12V	DC24V	DC12V	DC24V	DC12V	DC24V
0.65mm		250	1700	200	1700	200	1600	0.5mm ²		350	2700	350	2600	350	2500
0.90mm		450	3400	450	3300	450	3200	0.75mm ²		550	4000	550	3900	500	3800
1.20mm		850	6100	800	5900	800	5700	1.25mm ²		950	6700	900	6500	900	6300
1.60mm		1500	10800	1500	10500	1400	10100	2mm ²		1500	10800	1400	10400	1400	10100
2.00mm		2400	16900	2300	16400	2200	15900	3.5mm ²		2700	18900	2600	18300	2500	17700

When 2 or more units are connected, the wiring distance is calculated as follows: distance is divided by number of units
 For signal wire, use 0.9mm (0.64mm²) or thicker AE wire (OP wire)
 For wiring to other units connected to this model, use the same line as signal wire, less than 20m distance.
 For Busline, the longest distance to the sensor is 1,000m. Total wiring is 4,000m.

5-3 Wiring diagram

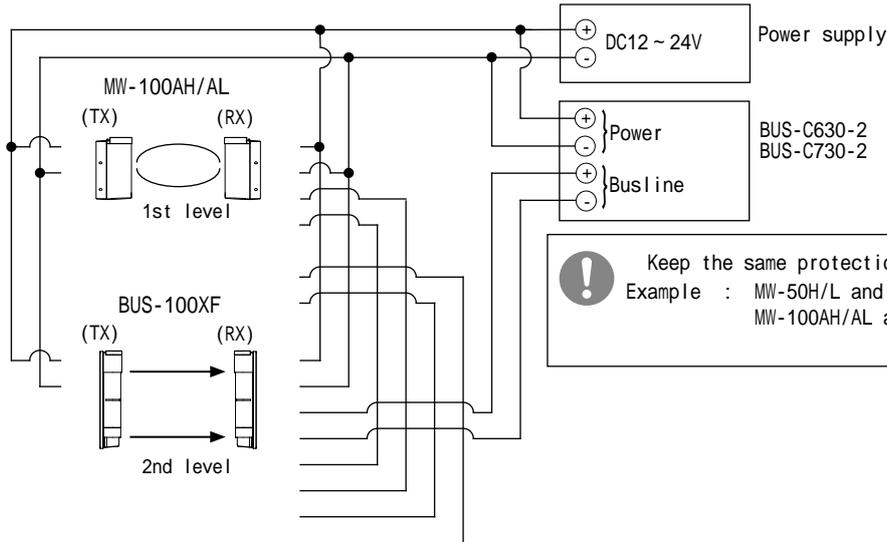


Do not connect normal sensors to BUSLINE.
 For signal wiring, power line, terminal is not No-polarity setting.
 For connecting several BUSNET sensors, connect in parallel.
 Do not use one address for several sensor.
 For stacking or multiple straight installation, see the following wiring example and set the frequency channel.
 In case of 2 level protection, set the same beam power (L or H) on upper and lower sensor.



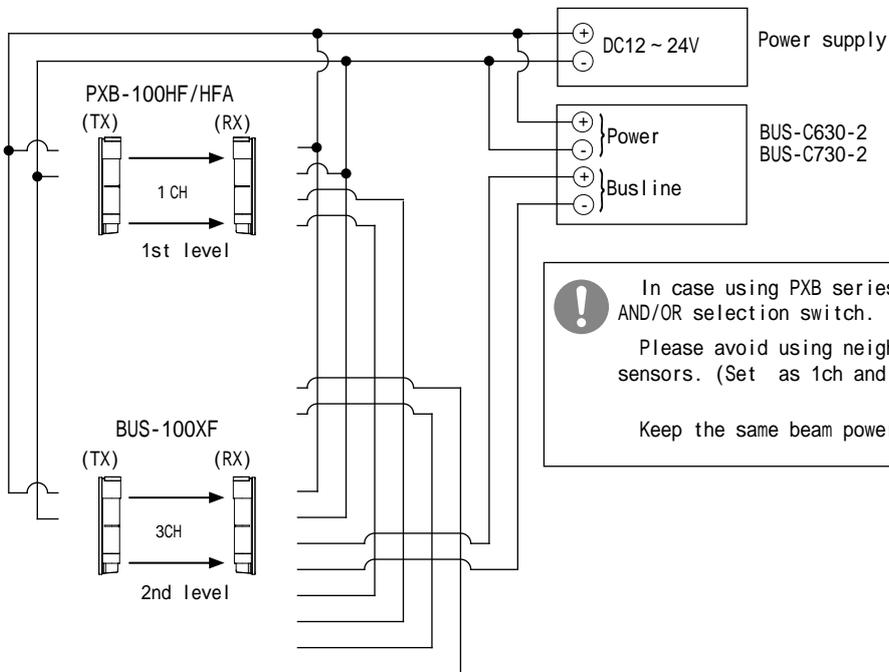
2 level protection with relay contact sensor

Using this unit and Microwave sensor, the signal is issued with "AND" system.



Keep the same protection distance for both sensor.
Example : MW-50H/L and BUS-50XF
MW-100AH/AL and BUS-100XF

Using this unit and PXB series

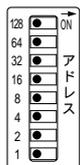


In case using PXB series, choose either AND or OR by the AND/OR selection switch.
Please avoid using neighbouring channel for 1st and 2nd level sensors. (Set as 1ch and 3ch, or 2ch and 4ch)

Keep the same beam power L or H for both sensors.

6 Initial setting

6-1 Address setting * 255 address can be set.



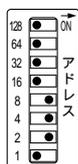
(Factory set : 0)

* Make sure address number of each sensor differs.

Register the address numbers on the control panel before operation.

There are 8 dip switches as below. Add the number whose switch is on and the total will be address number.

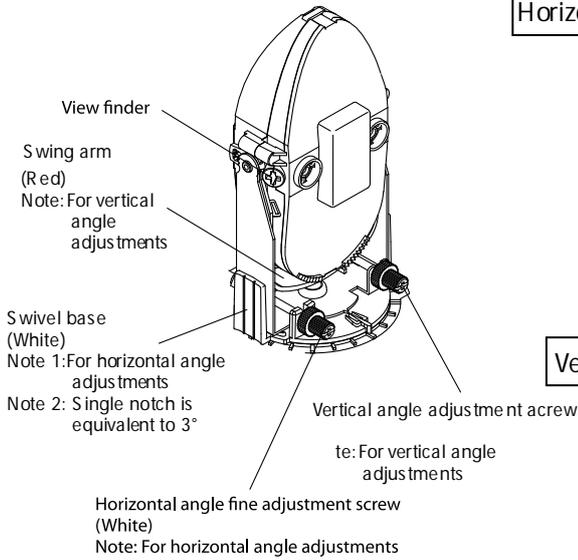
To set the address 14,
make switches on 8,4,2.



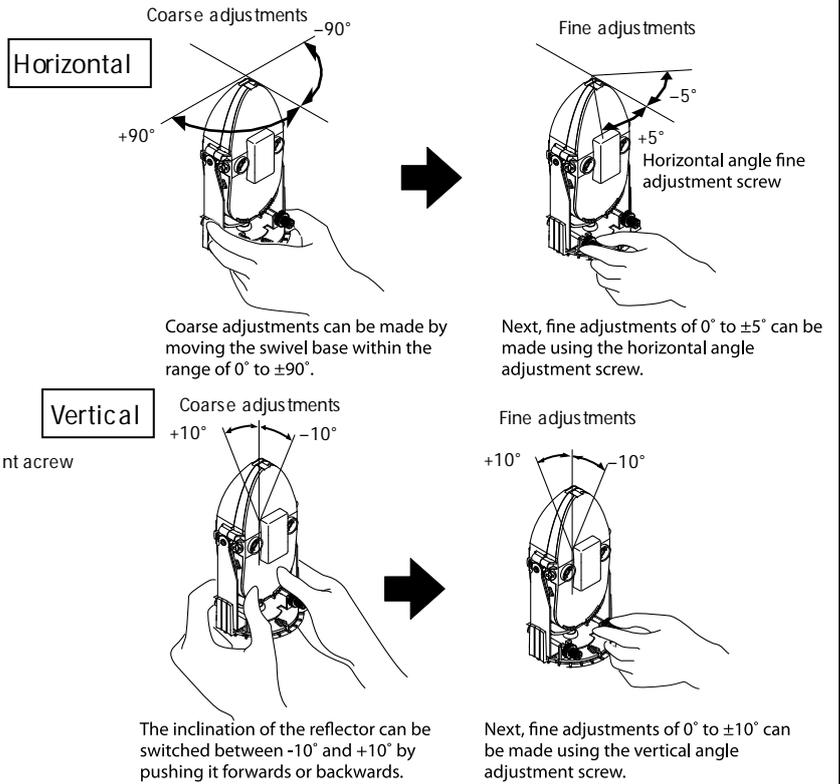
7 OPTICAL AXIS ADJUSTMENT

7-1 NAMES AND FUNCTIONS OF OPTICAL AXIS ADJUSTMENT PARTS

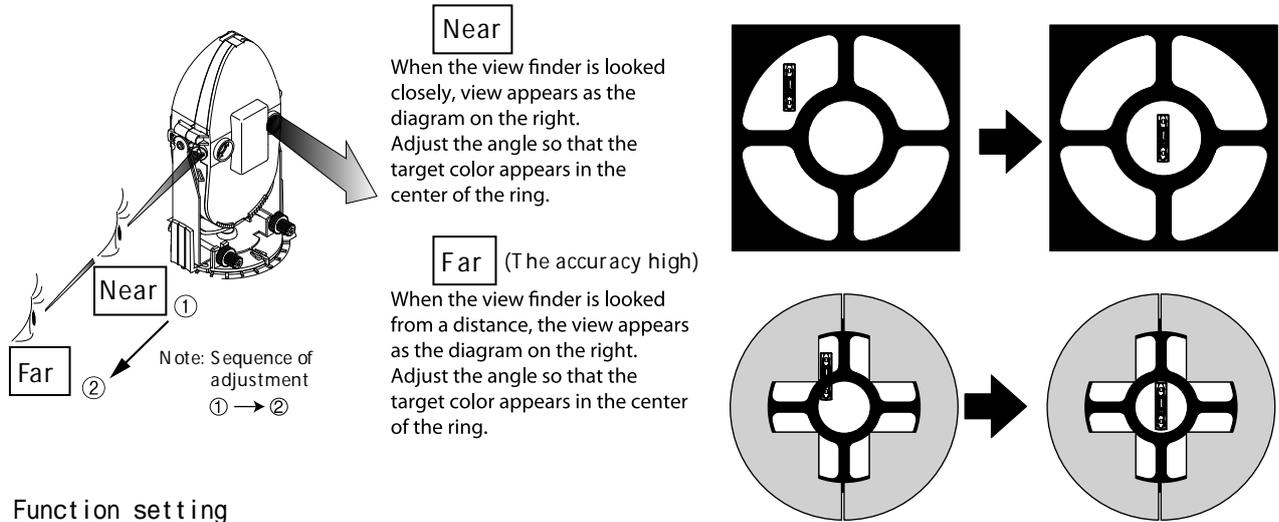
● Names of the Optical Unit



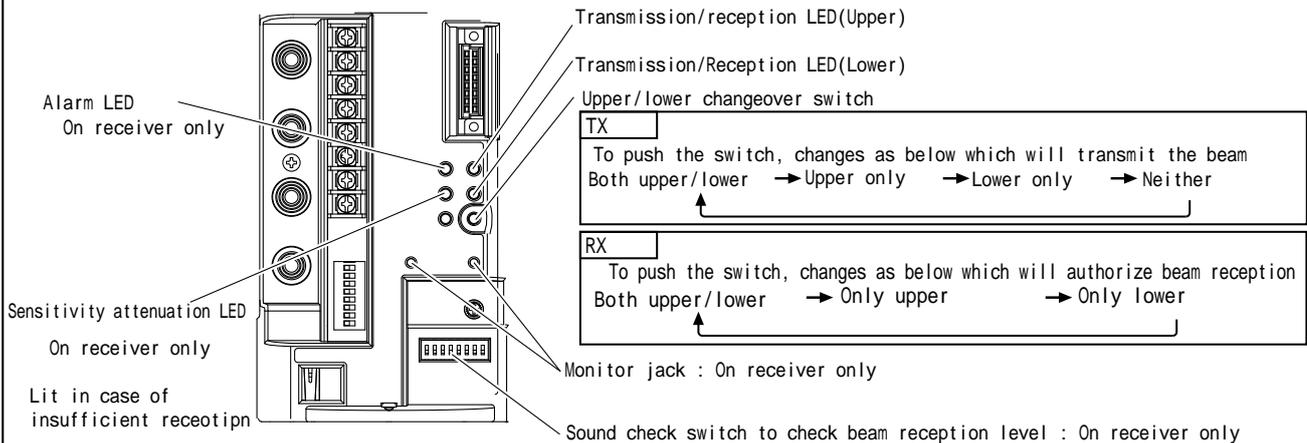
● Reflector Section Horizontal/Vertical Angle Adjustment Method



● Double Ring Alignment Mechanism Visible from the view finder

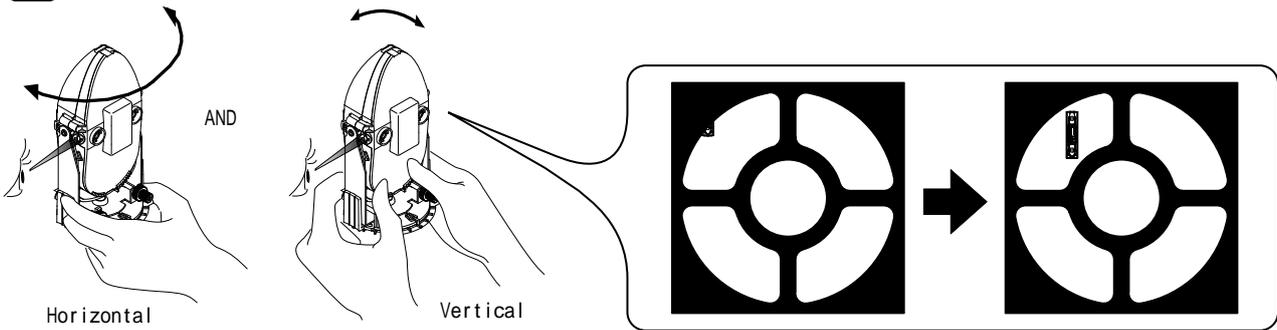


Function setting

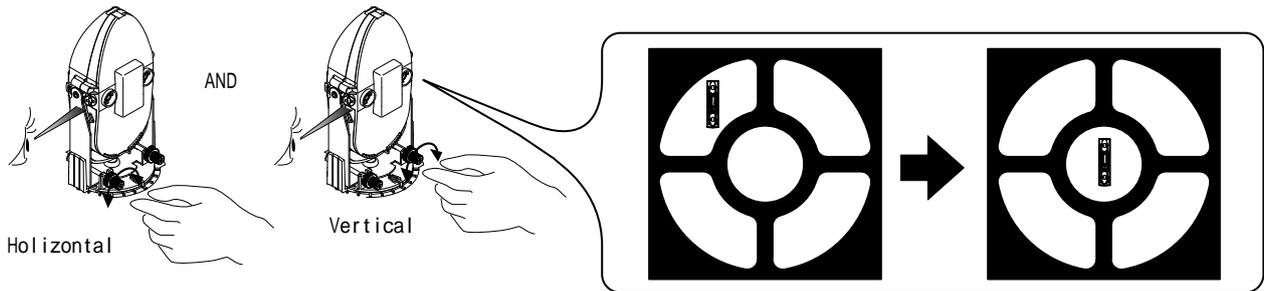


7-2 OPTICAL AXIS ADJUSTMENT BY ALIGNMENT MECHANISM

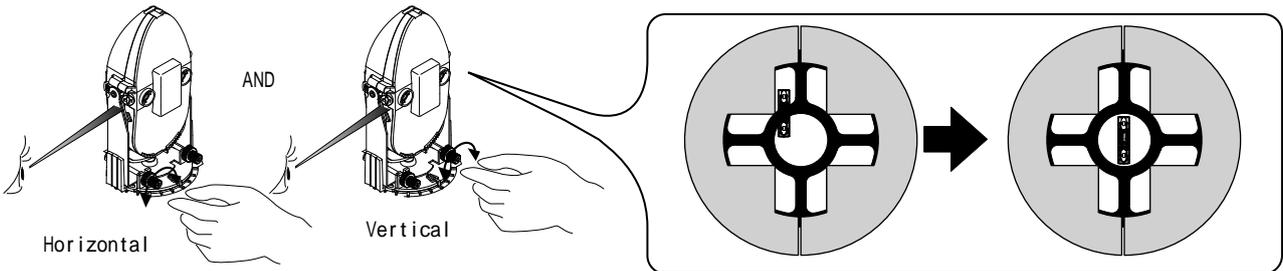
- 1 Move the upper and lower reflection sections on TX/RX and roughly align view finder.



- 2 Look closely through the view finder, and finely adjust the position so that the sensor of the opposite device is visible at the center of the ring. (By adjustment screw)



- 3 Look through the view finder from a distance, do the same procedure.



- 4 Power on TX and RX, check the LED conditions.



* See the below table and take the necessary remedy of receiver if required.

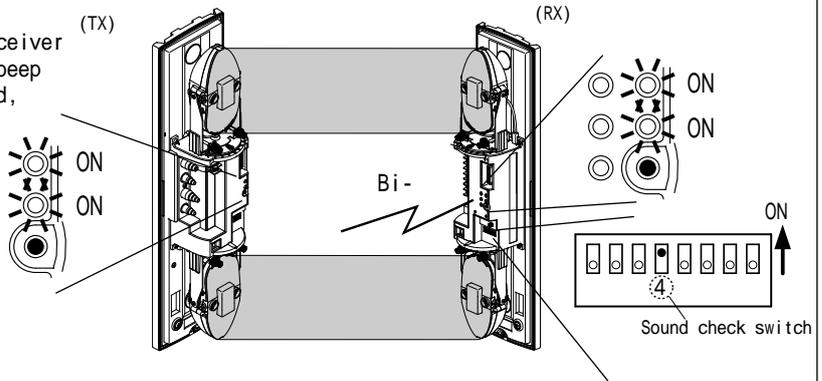
		Possible cause	Remedy
Receiver		Insufficient beam reception due to wrong alignment	Proceed to next page and arrange finer alignment
		Frequency channel differs between TX/tRX Cross talk with other beam sensor	Match the channel Change the frequency channel
		No beam reception at all due to poor alignment.	Repeat beam alignment from the beginning

5 For more accurate alignment, use sound check, monitoring voltage, wireless checker.

Sound check alignment

Only on receiver

- 1 .Set the Sound check switch on the receiver "ON". If the alignment is good, the beep sound will be on. In case of no sound, the alignment is not good.

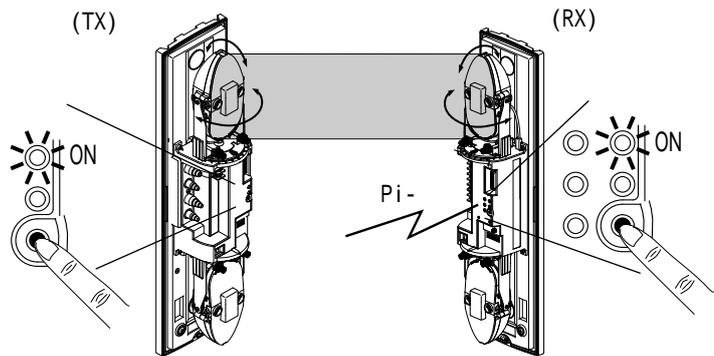


- 2 Upper level optical axis adjustment

Press the upper/lower changeover switch on the transmitter to select (Upper transmission)

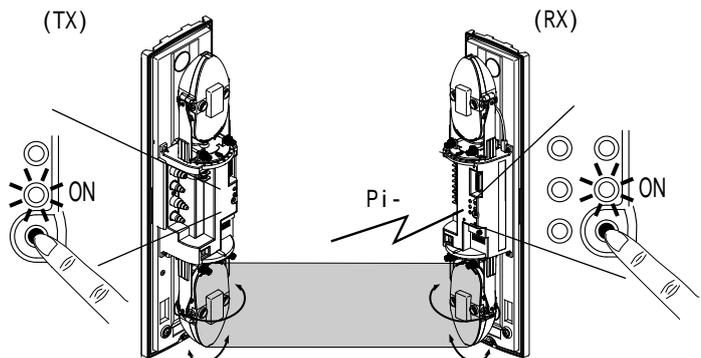
Press the upper/lower changeover switch on the receiver to select (Upper reception authorized)

Use the adjustment screw to perform fine adjustment until the highest tone is reached.



- 3 Lower level optical axis adjustment

Repeat the same procedure of upper level adjustment choosing lower switch selection.

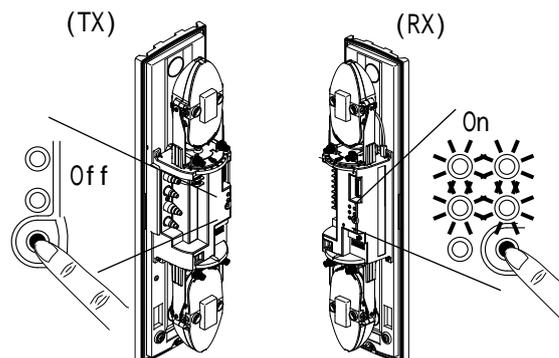


- 4 .Interference check from other beam sensor

Press the upper/lower changeover switch on TX to switch to "NO TRANSMISSION"

Press the upper/lower changeover switch on RX to switch to "Upper/lower both RECEPTION"

Check if Alarm LED or Sensitivity LED is off. Otherwise the infrared beam from other sensors is interfering the units.



Beam alignment by Monitoring level

《Notice》

Check the upper beam first, then lower beam.

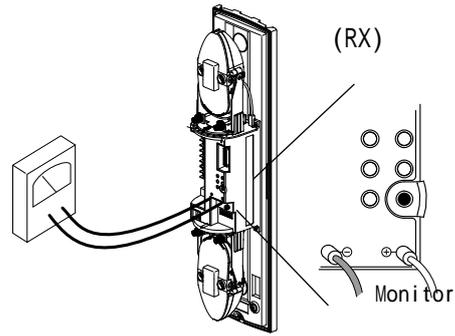
Monitor output voltage value

Monitor voltage	Sensitivity
DC2.5 V or more	Best
DC2.3 ~ 2.5V	Good
DC2.3 V or less	Poor, re-adjust

- 1 .Using a commercially available tester, measure the output voltage.

《Caution》

The monitor jack is polarized.
Check the polarity of the tester pin before inserting it.
The tester's internal resistance is over 100k

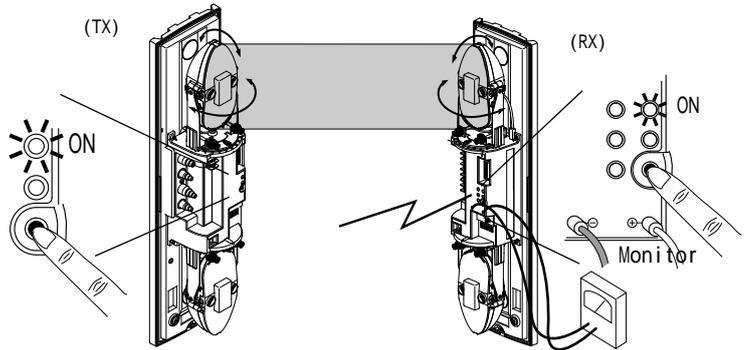


- 2 .Upper beam alignment

Press upper/lower changeover switch on TX to set "Only upper beam transmission"

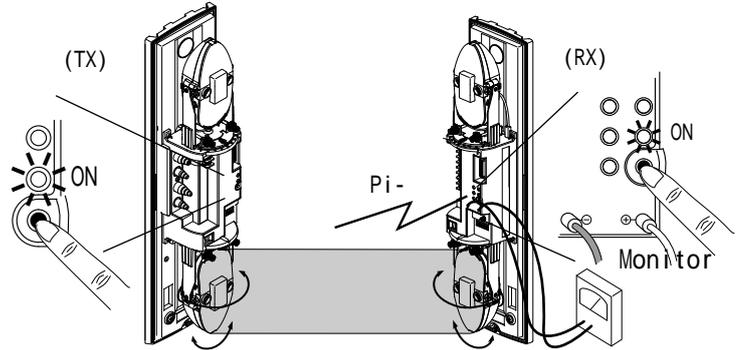
Press upper/lower changeover switch on RX to set "Only upper beam reception"

Adjust the angle both of TX/RX so that the voltage value will be maximum.



- 3 .Lower beam alignment

Arrange the same procedure for lower beam as mentioned above.



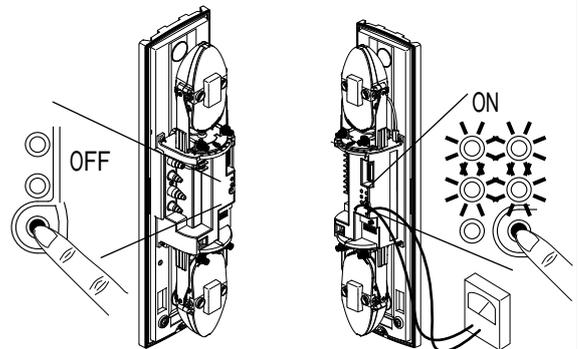
- 4 .Interference check from other beam sensor

Press the upper/lower changeover switch on TX to switch to "NO TRANSMISSION"

Press the upper/lower changeover switch on RX to switch to "Upper/lower both RECEPTION"

Check the monitor output to ensure that no other light from other beam sensor is received.

When using multi-level protection, the monitor output voltage may become close to 1V due to beam from other beam sensor. In this case readjust other beam sensor to reduce the effects to the minimum possible.



Alignment by wireless checker(Optional)

By connecting an alignment wireless checker sold separately, it is possible to transmit data bidirectionally, check the monitor output voltage of the receiver from the transmitter, and simultaneously switch the optical axis light obstruction.

8 OPERATION CHECK

Be sure to perform an operation check after the optical axis adjustment.

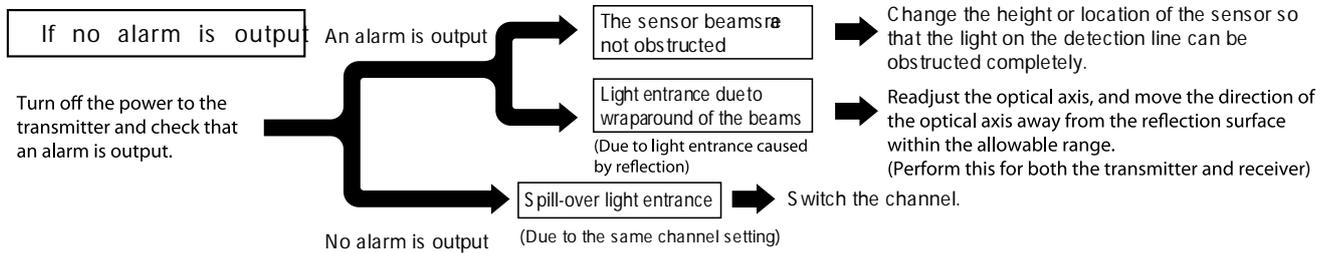
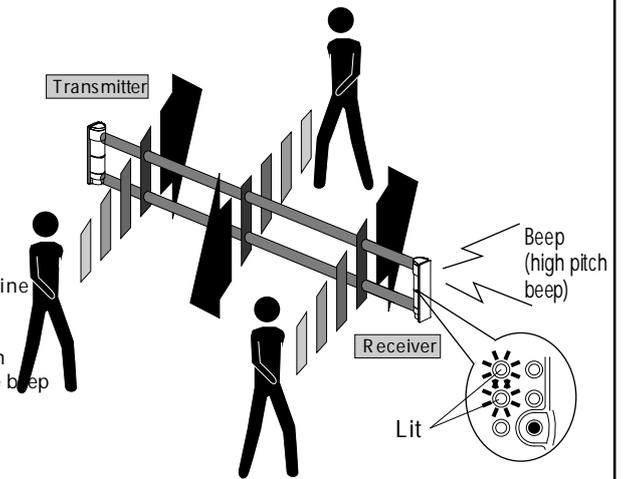
- After optical axis adjustments are completed, attach the cover in position while the receiver is in light reception mode, and wait for approximately 5 seconds.
If a "beep" tone sounds once, the auto gain lock is completed.

<<Caution>>

- If the beep sounds continuously in short intervals [peep-peep-peep-peep-peep...], the light reception level is insufficient. At this point, the LED for the relevant level starts flashing. Perform optical axis adjustments again.
- When using multi-level protection, if light is entering the receiver from somewhere other than the opposite transmitter, appropriate gain lock cannot be performed. In such a case, turn off the power to other transmitters, and then set the auto gain lock.

- Obstruct the sensor beams near the sensor or the center of the detection line and check that an alarm can be output correctly.

- If the sound check switch is set to ON, after the auto gain lock has been completed normally, the walk test mode is activated for 5 minutes. The beep sound is generated in synchronization with the alarm output. The alarm LED lights up according to the alarm output.

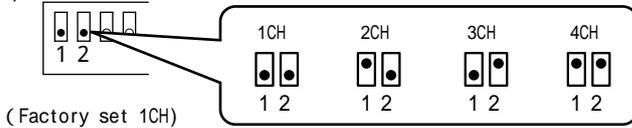


9 Function

To set by TX or RX	Setting	Setting details
Both TX and RX	Frequency channel	<input type="checkbox"/> 1CH <input type="checkbox"/> 2CH <input type="checkbox"/> 3CH <input type="checkbox"/> 4CH
TX only	Transmitter power	<input type="checkbox"/> H <input type="checkbox"/> L
RX only	Alarm memory	<input type="checkbox"/> Auto Reset <input type="checkbox"/> Manual reset
	Sound check	<input type="checkbox"/> ON <input type="checkbox"/> OFF
	Contact input	<input type="checkbox"/> N.O. <input type="checkbox"/> N.C.
	AND/OR selection	<input type="checkbox"/> OR <input type="checkbox"/> AND <input type="checkbox"/> Microwave sensor
	Response time	<input type="checkbox"/> 0.05SEC <input type="checkbox"/> 0.3SEC <input type="checkbox"/> 0.7SEC
	Address	

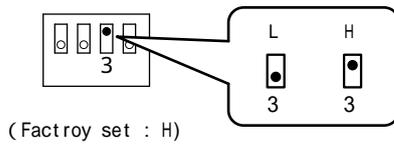
9-1 Frequency channel On TX and RX

To prevent potential interference of infrared or cross talk between units when straight line protection or multi-level protection is used.



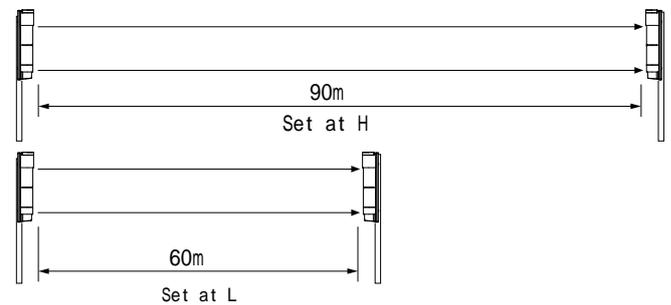
9-2 Transmitter power On TX only

To control the beam power relative to the protection distance. It may prevent interference or spill-over transmission of infrared.



Model	Power	L	H
BUS-50XF		25m or less	25m - 50m
BUS-100XF		75m or less	75m - 100m
BUS-200XF		150m or less	150m - 200m

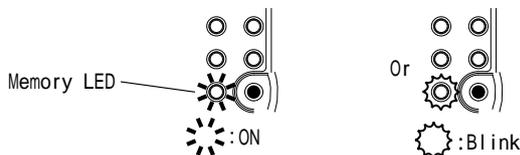
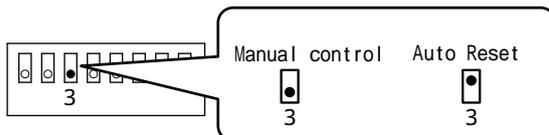
《Example》 BUS-100XF



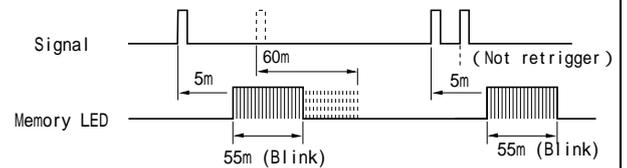
9-3 Alarm memory

Only on receiver

When multiple sensors are used, memory LED shows which sensor was activated.

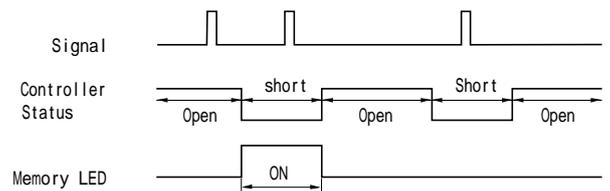


Auto Reset : The memory LED will be on/off automatically.



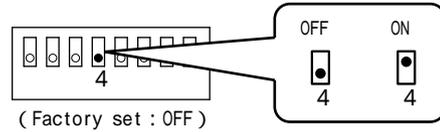
Manual control : Memory LED is manually controlled

Connected to BUS-C630-2, BUS-C730-2



9-4 Sound check function Only on the reciver

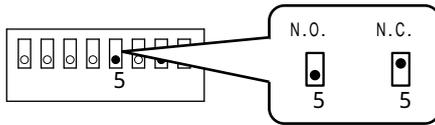
This function informs you of the operation and conditions of the receiver by sounds.



Item	Details	Setting
Beam reception level	Light reception level can be checked by sound tone. The tone pitch becomes higher as the light reception level increases.	When the receiver cover is removed.
Walk test	When performing operation checks, the beep sound is generated in connection with the alarm LED.	

9-5 Contact input N.O./N.C. selection switch * Only on receiver

Choose N.O. or N.C. for the unit connecting to signal input terminal.



9-6 AND/OR selection switch Only on receiver

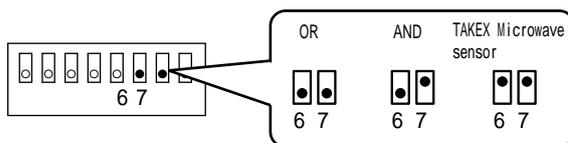


- 1) In case connecting TAKEX Microwave sensor, select Microwave sensor.
- 2) In case connecting other sensors, select AND/OR.

OR : When either this unit or other devise connected to this unit is triggered, this unit issues a signal.
 AND : Only when both of this unit and other devise connected to this unit is triggered, this unit issues a signal.

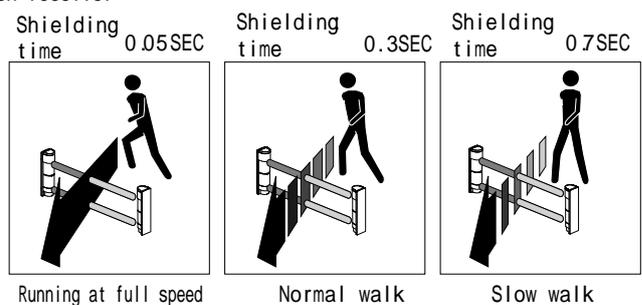
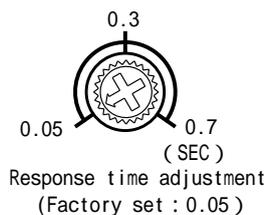
Microwave sensor : In case connecting TAKEX Microwave sensor. Only when both of this unit and Microwave sensor is triggered, this unit issues a signal.

Alarm LED is on by "OR" theory regardless of this setting.



9-7 Response time adjustment Only on receiver

Detection response time to be adjusted by the volume

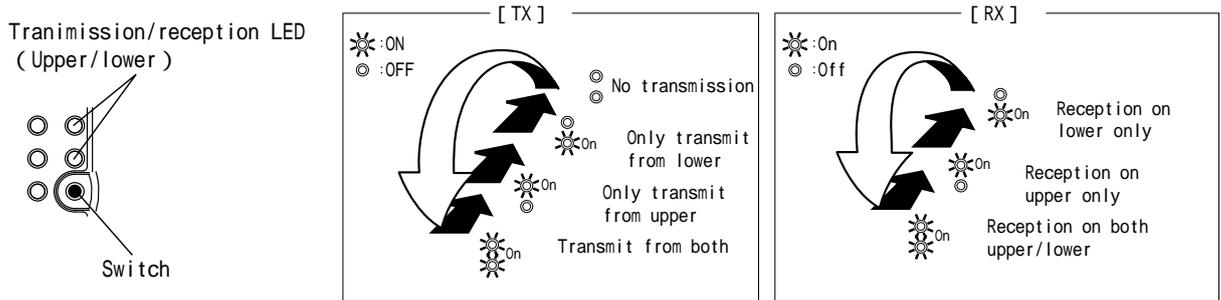


The shielding time is shorter than set time, the objects will not be detected.
 In areas where there are big birds or big objects that could obstruct the detection zone, set the response time slightly longer but still detecting human.

9-8 Upper/lower changeover function

Available on transmitter and receiver

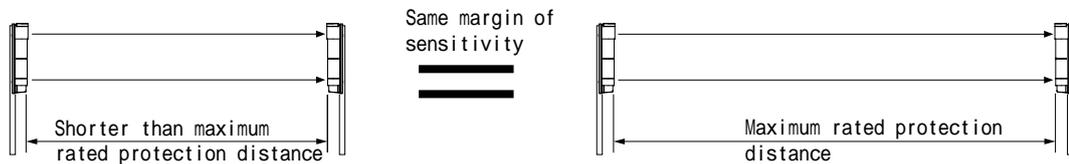
This function allows the upper and lower sensors to be switched on and off by a switch. The sensors switch as shown in the diagram below when the upper/lower changeover switch is pressed.



9-9 Auto Gain Lock Function

Only on receiver

Provided the units are used within the maximum rated protection distance, this function is used to automatically set the optimum margin of sensitivity for the receiver in any protection distance.



Auto Gain Lock results

5 sec. after closing receiver cover, beep sound indicates the results of gain.

Beep sound rings regardless of the setting of sound check switch.

○ Off ☀:On ⚙:Blink

Beep	LED	Results	Cause	Remedy
"Pi-" (1 sec)	Off both of upper/lower	OK	—	—
"PiPiPi" (20sec)	Upper beam insufficient Lower beam insufficient Both upper and lower beam insufficient	NG	Beam is interrupted when the receiver cover is closed Less beam reception by wrong alignment Sensitivity LED lights, too.	Remove the interrupting objects and close the cover again. Readjust alignment.

9-10 Programmable AGC function

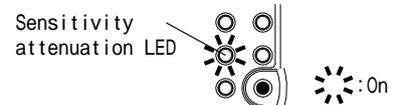
Only on receiver

During adverse environmental conditions such as dense fog or heavy rain, this function operates in connection with the external environmental diagnostic function to automatically increase the sensitivity of the receiver.

9-11 Sensitivity attenuation LED

Only on receiver

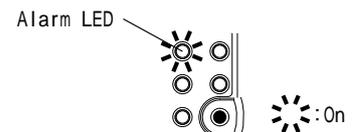
When insufficient reception, LED will light.



9-12 Low battery detection

* Only on receiver

When the supply voltage becomes less than certain figure, the unit sends a signal and lights LED.



9-13 External environmental diagnostic function

This function outputs a notification before a warning is output as an environmental output when such impairments as fog or damp mist occur.

It will keep on sending signal until upper/lower beam reception level will exceed regulated volume.

9-14 Alignment by wireless checker

On transmitter and receiver

By connecting an alignment wireless checker (Sold separately), it is possible to transmit data bidirectionally, check the monitor output voltage of the receiver from the transmitter, and simultaneously switch the optical axis light obstruction.

10 Trouble shooting

Sympton	Cause	Remedy
LED does not light	Power failure Wrong wiring or breaking wire, short. Transmitter is set to "Do not transmit"	Connect power source Check again Press the upper/lower changeover switch
Alarm LED does not light even if the beam is interrupted.	Power failure Wrong wiring or breaking wire, short. Infrared beam is reflected by some object and entering the receiver. 4 beams are not interrupted simultaneously. Short interruption time	Connect power source Check again Improve the conditions Block 4 beams simultaneously. Set the response time shorter
Alarm LED does not go out	Improper beam alignment There is an obstruction between TX and RX TX or RX cover or reflection section is dirty Frequency channel between TX and RX differs Low battery	Perform angle adjustment Remove the object Clean using a soft cloth Set the channel Stabilize power voltage
No alarm (Sensor connected to signal input terminals)	Signal selection is set "AND" Signal selection is set "AND" while Microwave sensor is connected.	Both sensor to be triggered Select "Microwave sensor"
Continually activated (Alarm LED off)	The sensor connected to the signal input terminal is triggered in case of OR setting Signal input setting is opposed. While no sensor is connected to signal input terminal, the setting is N.C. (OR setting)	Reset the system Match the setting Set the N.O.
Tamper signal continues	The cover is opened Short-circuit wire is broken	Close the cover Short the tamper terminal
No tamper signal	Tamper terminal is short.	Remove short wiring.
Continually activated	Wrong wiring Unstable power supply Obstruction between TX and RX (Trees moving by the wind ETC) The wiring is nearby other power line Unstable sensor installation Dirty cover or reflection section Improper alignment Big bird or cat acrossing the detection area Transmission power is set "L"	Check again Stabilize power supply Remove it Change wiring route Fix in a stable location Clean with soft cloth Perform optical axis adjustment again, set the gain lock and secure sensitivity margin Set the response time longer Set the power "H", remove the receiver cover and set the gainlock again.

Daily care

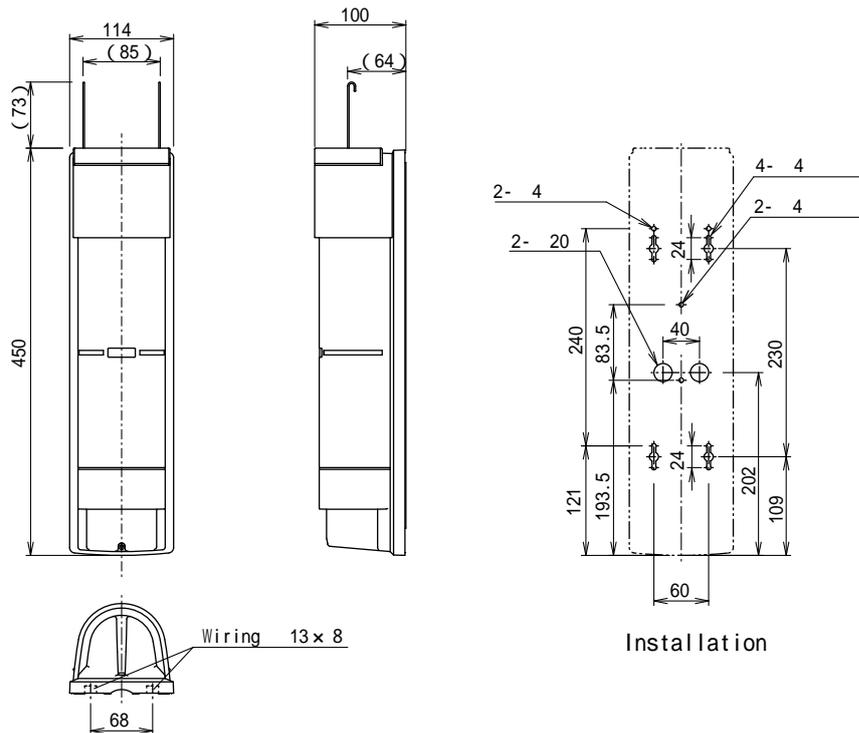
* To clean the unit, use a soft cloth and then wipe off any water drops. If the unit is particularly dirty, dip the cloth in a water that includes a weak neutral detergent and clean the unit.

* Perform operation checking on a regular weekly base.

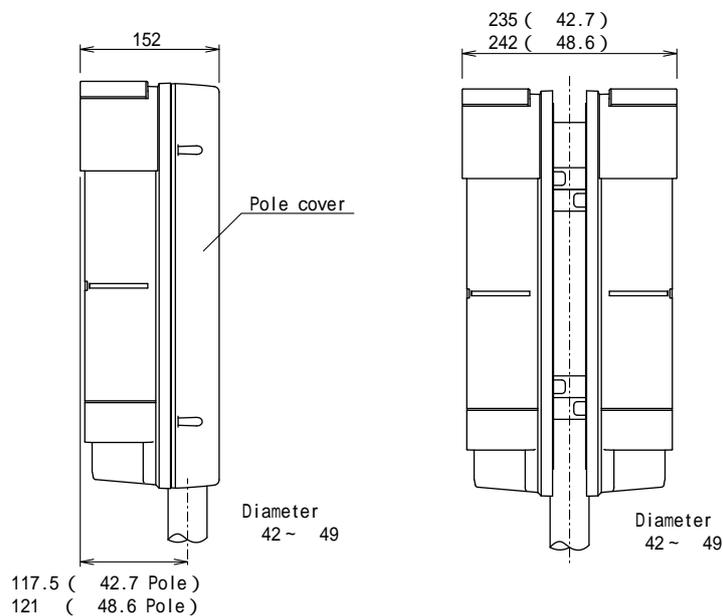
11 Specifications

Model	BUSNET Beam sensor		
Model No.	BUS-50XF	BUS-100XF	BUS-200XF
Detection system	Near infrared pulsed beam interruption system		
Infrared beam	Double modulation pulsed beam by LED		
Protection distance	Outdoor 50m or less	Outdoor 100m or less	Outdoor 200m or less
Max. distance	500m	1000m	2000m
Response time	0.05 ~ 0.7sec. (Variable)		
Power supply	DC10 ~ 30V (Polarity)		
Current consumption	34mA or less (At protection) 60mA or less (Max)	36mA or less (At protection) 62mA or less (Max)	38mA or less (At protection) 64mA or less (Max)
Alarm signal	Time division multiple transmission / (Polarity)		
Transmission signal	Alarm signal Environmental signal Tamper signal (Receiver only) Low battery signal		
Alarm input	1 signal (N.O./N.C. selectable)		
Tamper input	1 signal (N.C. only)		
Alarm LED (RED)	Beam interruption : ON (Receiver) Signal receipt : ON (Receiver) Low battery : ON (Receiver)		
Sensitivity LED (RED)	RED LED lights when beam reception is attenuated		
Alarm Memory LED (RED)	Auto-reset : Blink Manual-reset : Light Only when the control panel is in Operation mode.		
Check LED (Red)	Light on when alarm is issued. Only when the control panel is in Checking mode.		
Functions	Modulated beam frequency selection, Beam power selection, Alarm memory, External signal input, Sound check, Auto-gain lock, Programmed AGC, Monitor jack, Tamper, Response time adjustment, Monitor output, Low battery signal.		
Beam adjustment	Horizontal : $\pm 90^\circ$ Vertical : $\pm 20^\circ$		
Ambient temperature	- 25 ~ + 60		
Mounting position	Outdoor, Indoor (IP65)		
Wiring	Terminals		
Weight	Transmitter : 1,500 g Receiver : 1,550 g		
Appearance	PC Resin (Winered)		

12 External dimensions (mm)



Pole installation



Limited Warranty :

TAKE X products are warranted to be free from defects in material and workmanship for 12 months from original date of shipment. Our warranty does not cover damage or failure caused by Acts of God (including inductive surge by lightning), abuse, misuse, abnormal usage, faulty installation, improper maintenance or any repairs other than those provided by TAKE X. All implied warranties with respect to TAKE X, including implied warranties for merchantability and implied warranties for fitness, are limited in duration to 12 months from original date of shipment. During the Warranty Period, TAKE X will repair or replace, at its sole option, free of charge, any defective parts returned prepaid. Please provide the model number of the products, original date of shipment and nature of difficulty being experienced. There will be charges rendered for product repairs made after our Warranty period has expired.

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