Photoelectric Beam Sensor Installation Manual

▣ PRO-100Q : outdoor 100m
▣ PRO-200Q : outdoor 200m

CONTENTS

1 FEATURES

The PRO-100Q/200Q are quad photoelectric detectors designed to activate an alarm relay upon the detection of Intruder through 4 pulsed infrared beams.
For stable operation, the PRO-100Q/200Q are equipped with the following features.

■ **High power infrared**
The active infrared transmission is exceptionally strong with a maximum arrival distance ten times greater than the specified protection distance.
■ **Four frequency selections**
4 separate choices of frequency avoids cross-talk in stacked or long linear installations.
■ **Beam transmission strength selection**
2 levels of beam transmission strength which can be set to suit the protection distance.
■ **Auto-gain lock**
Optimal sensitivity gain is automatically set at any coverage distance up to the maximum protection distance. (Audible tone indicates setting is completed)
■ **Environmental module**
Environmental trouble signal is sent when beam reception level is reduced below an acceptable level.
■ **Programmed AGC function**
Sensitivity is automatically increased in bad weather to contend with fog, rain, of frost.
■ **Alarm memory indicator**
Alarm memory LED located on Receiver can be manually reset (at sensor) or remotely controlled via panel.
■ **Audible signal for alignment**
An alignment tone aids in quick set-up of beams for electrical measurement of alignment
■ **Retransmitting function**
The advantage is elimination of wiring from a detector or switch, back to the control panel.
■ **Other features**
Monitor output, Level LED , Response time changeover, Tamper output.

2 INSTALLATION CONSIDERATIONS

Read the following prior to installing, wiring and regular maintenance.

WARNING !	Indicate that incorrect operation causes significant danger of accident resulting in death or serious Injury to the user.
CAUTION !	Indicate that incorrect operation causes possibility of injury to the user of damage to the unit.

CAUTION ! DO NOT INSTALL THE UNIT

① where trees, plants, of falling leaves will block the beams.
② where intense source of light, sunlight will be reflected directly into the receiver optics.
A foreign light incoming within ±3° angle of each receiver axis may cause false alarms.
③ on movable surfaces.
④ where subject to foul water or sea spray.
⑤ where over the max range on each model.
⑥ where subject to strong electrical noise or RFI
⑦ where subject to strong vibration.
⑧ where subject to corrosive or explosive gas.

AVOID

① external temperature and humidity.
② magnets or any magnetized material.
③ running power and output wires near voltage power sources.

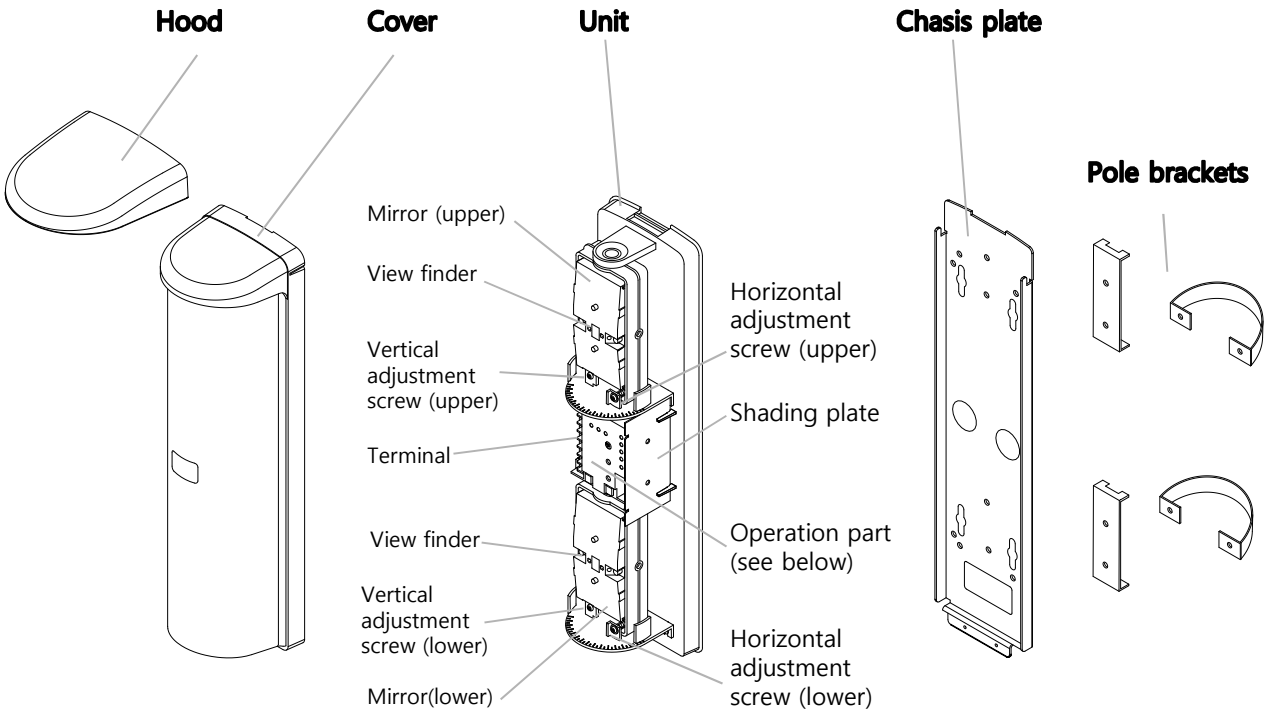
IMPORTANT

① Face upper/lower optical modules on the transmitter and receiver towards each other.
② Be sure of the beam in alignment optical modules can be adjusted within ±90° horizontally and ±3° vertically.

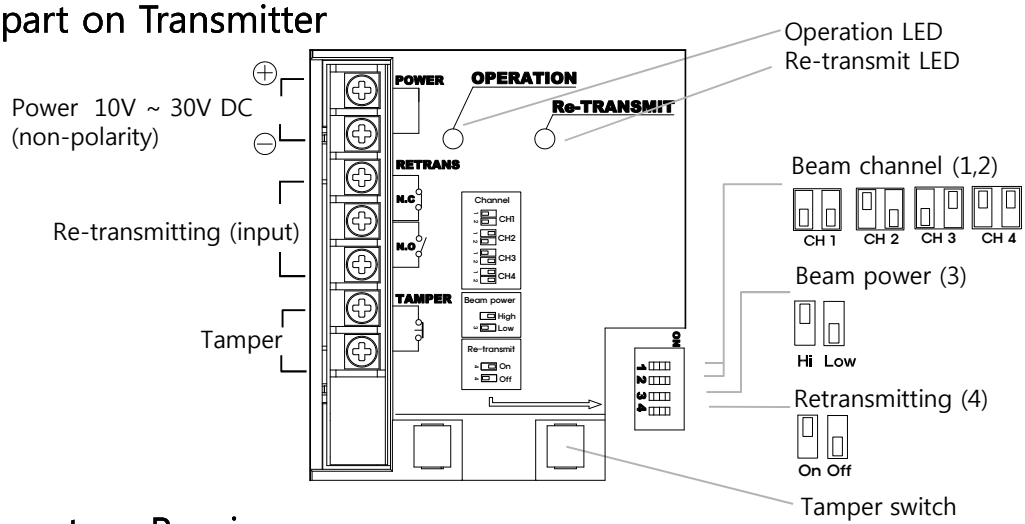
WARNING !

① Do not perform installation and wiring when it thunders.
② Do not supply power until all wiring is completed.
③ Keep power between 10 V ~ 28 VDC anytime.
④ Do not disassemble or modify the unit.

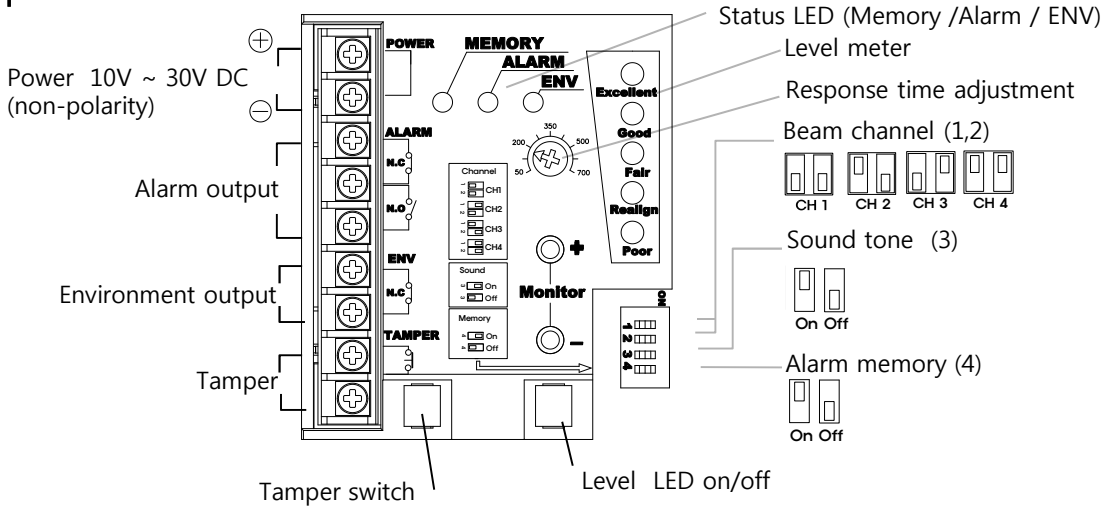
3 PARTS DESCRIPTION



Operation part on Transmitter

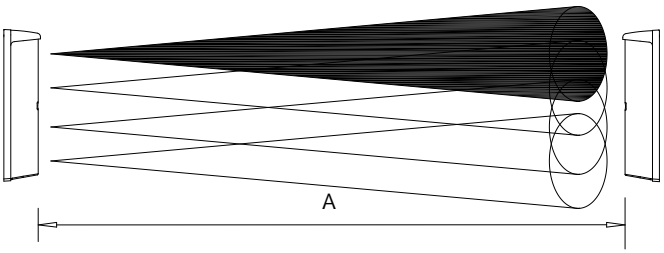


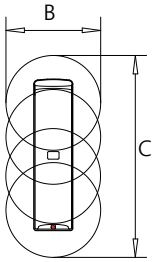
Operation part on Receiver



4 BEAM SPREAD

The beam spread sngle is 1.4° . Refer to the right table and the diagrams below to determine the installation conditions.

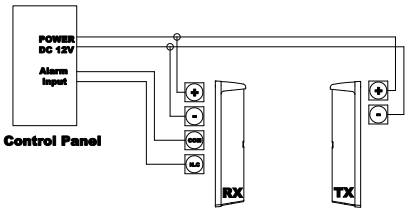




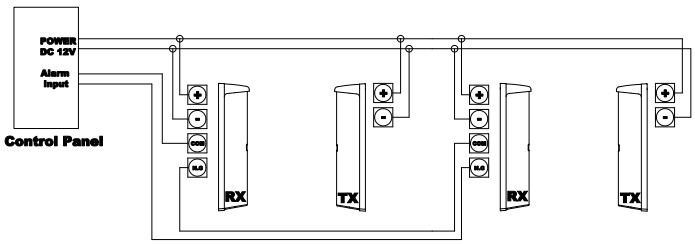
Distance (A)	Spread (B)	Spread (C)
100m	2.5m	2.7m
150m	3.7m	4.0m
200m	5.0m	5.2m

5 WIRING

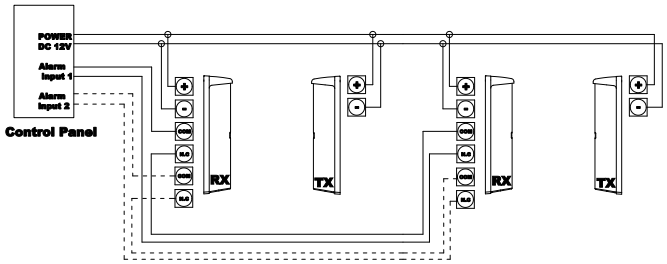
1) Standard connection



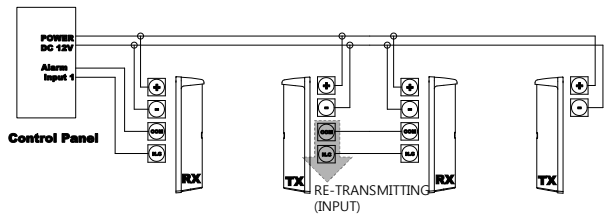
2) When 2 or more sensors are connected on the same zone.

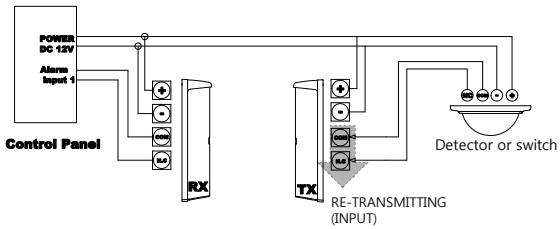


3) When alarm output and environment output



4) RE-transmitting circuit





* The advantage of this method is elimination of wiring from a detector or switch, back to the control panel.

5) Wire length (Max one way length)

Wire Gauge	Maximum distance (meter)			
	PRO-100Q		PRO-200Q	
	12V DC	24V DC	12V DC	24V DC
AWG 22	100	900	90	800
AWG 20	190	1,700	160	1,500
AWG 18	280	2,600	250	2,200
AWG 14	600	5,370	500	4,570

Note1) Max. wiring distance when two or more sets are connected is the above value divided by the number of sets.

Note2) Be sure the control panel is equipped with adequate standby battery and charging circuit. Use 12v (at least) Ni-cd or lead acid battery with minimum capacity of 0.5 AH.

6 INSTALLATION

1) Pole mounting

- Chose an appropriate mounting location for the system. Install the poles with a clear linesight between the transmitter and the receiver

- Loosen the transmitter's cover mounting screw and remove the cover.

- Loosen the 2 unit mounting screws and remove the chassis by sliding it down againse the unit.

- Attach the mounting plates to the chasis with the clamping screws (short) (see FIGURE 1)

- Firmly attach the chassis to the poles with the U-clamps and the screws (long) (see FIGURE 2). Make sure the transmitter is mounted in direct line-of- sight with the receiver.

- Route wiring through the chassis wire entrance, leaving enough wire to access the transmitter's terminal strip.

-Route wiring through the transmitter's wire entrance.

- Slide the transmitter onto the chassis. Tighten with the unit mounting screws.

- Repeat this mounting process for the receiver. Make sure it is mounted in direct line-of-sight with the transmitter.

FIGURE 1

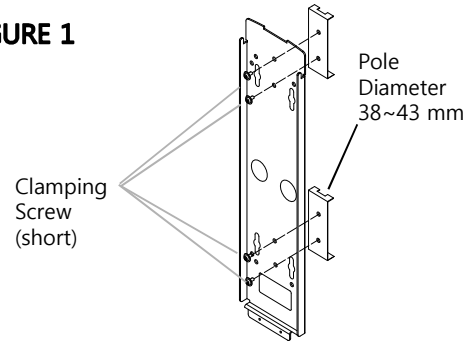


FIGURE 2

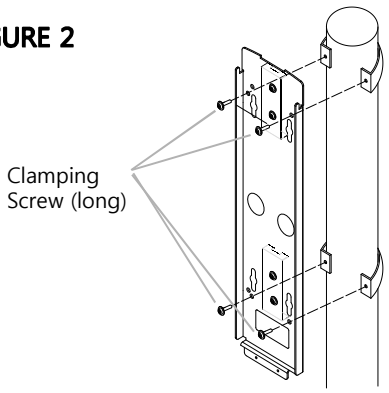
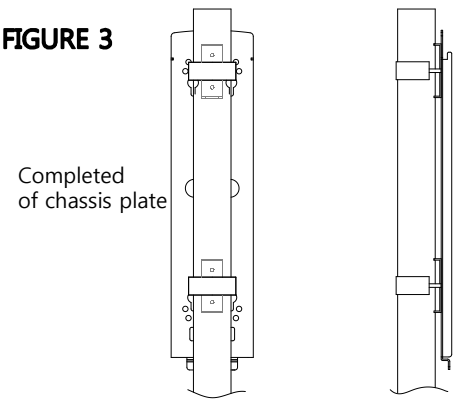


FIGURE 3



2) Wall mounting

- Loosen the transmitter's cover mounting screw and remove the cover.

- Loosen the 2 unit mounting screws and remove the chassis by sliding it down against the unit.

- Route wiring through the wire entrance of the chassis. Leave enough wire to access the transmitter's terminal strip.

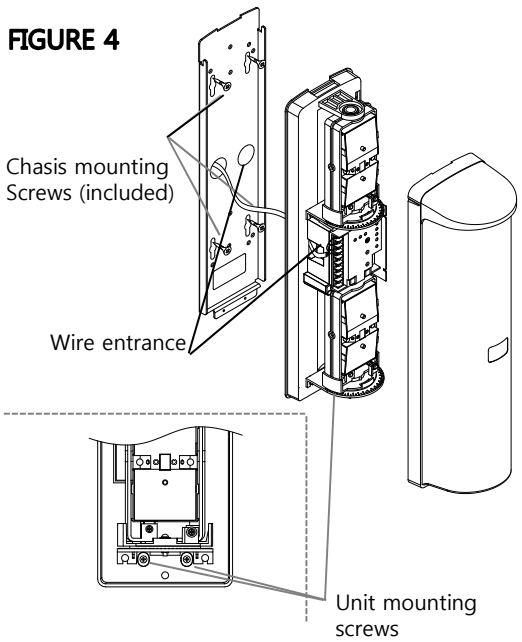
- Mount the chassis to the mounting surface with the chassis mounting screws.

- Route wiring through the wire entrance of the transmitter. If surface mounting is used, knock-out the thin-wall wire entrance at the bottom of the transmitter.

- Reattach the transmitter to the chassis.

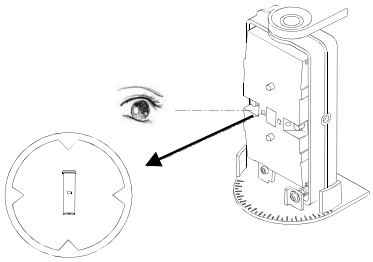
- Repeat this mounting procedure for the receiver. Make sure it is mounted in direct line-of-sight with the transmitter.

FIGURE 4



7 SET-UP FUNCTIONS AND BEAM ALIGNMNET

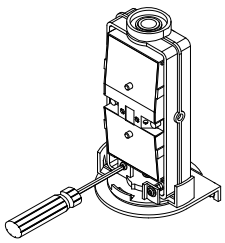
STEP 1 Rough alignment by view finder



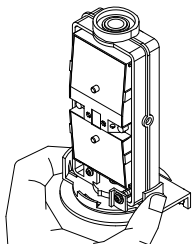
Looking through the view finder, locate the other detector in the center of the sights by adjusting vertically and horizontally.

Looking through the view finder, locate the other detector in the center of the sights by adjusting vertically and horizontally.

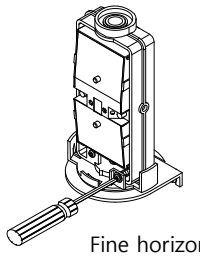
Vertical adjustment



Horizontal adjustment



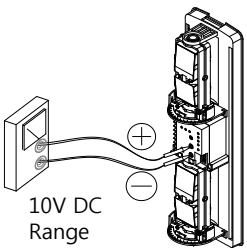
Course adjustment



Fine horizontal adjustment

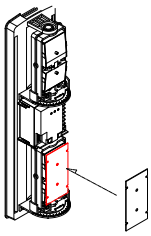
STEP 2 Upper mirror fine adjustment

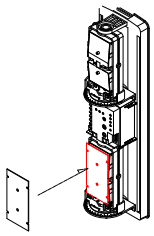
Connect the volt-meter to monitor jack input on Receiver's (+) and (-) ,then finetune optical alignment



10V DC Range

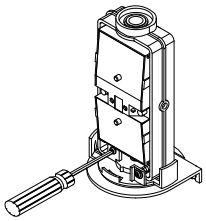
Adjust the optical alignment for Transmitter and Receiver one at a time



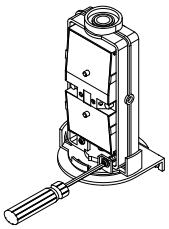


Put the attached "Shading plate" on the lower mirror of both the Transmitter and the Receiver

Vertical alignment screw



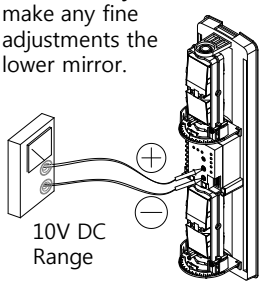
Horizontal alignment screw



Adjust the vertical (or horizontal) alignment Screw to obtain the maximum voltage from the monitor jack

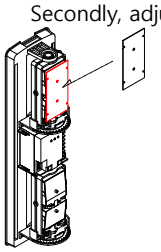
STEP 3 Lower mirror fine adjustment

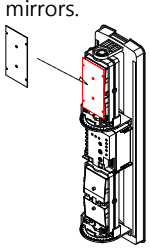
Check the voltage using the monitor jack and make any fine adjustments the lower mirror.



10V DC Range

Secondly, adjust the lower mirrors.





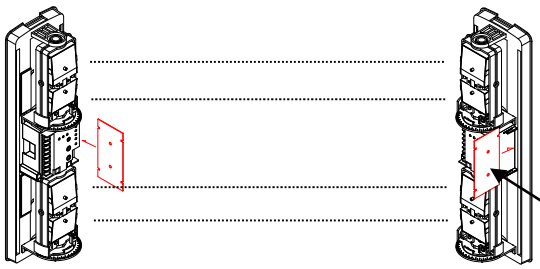
After the final adjustment are made on th upper mirror carefully without moving mirror remove "shading plate" from the lower mirrors and place them on the upper mirrors of both the Transmitter and receiver

SENSITIVITY CHART

Level	Monitor Jack output	Audio tone (beep)
Excellent	2.6V ~ 3.0 V	continuous
Good	2.0 V ~ 2.5V	Fast (0.5 sec)
Fair	1.3 V ~1.9 V	
Realign	0.6 V ~1.2 V	Slow (1.0 sec)
Poor	0.5 V or less	

After the vertical and horizontal adjustment are made, recheck the voltage from monitor jack is over 3.0 V.
If not, adjust the optical alignment again.

STEP 4 Final checking after removing the "Shading plate" from the mirror



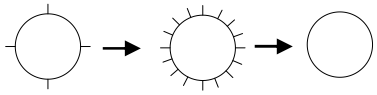
Shading plate

Carefully remove the "shading plate" from the mirror of both Transmitter and receiver also check the voltage from the monitor jack again.

Then check again that the voltage from monitor jack is more than about 3.0 V if not, adjust the optical alignment again.

■ Beam alignment using LEVEL LED

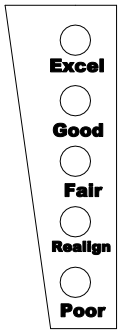
The alignment level indicators have 5 LED's, each LED represents the level of alignment, ranging from poor to excellent.
Each LED will indicate 3 steps of alignment, slow flicker = okay, fast flicker=better, continuously on = best



Slow flicker =Okay

Fast flicker =Better

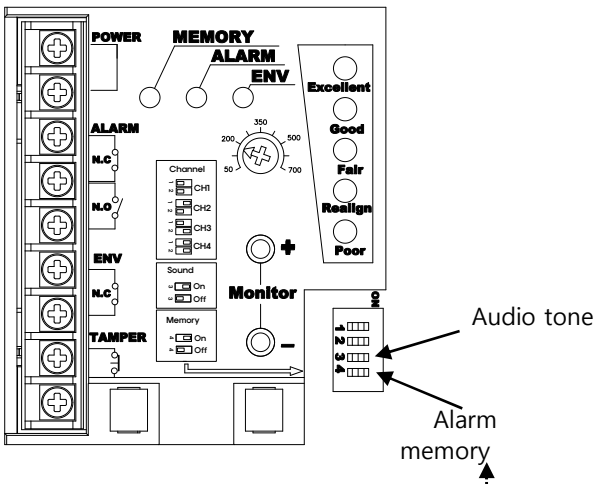
Continuously on =Better



■ Audio tone indicator

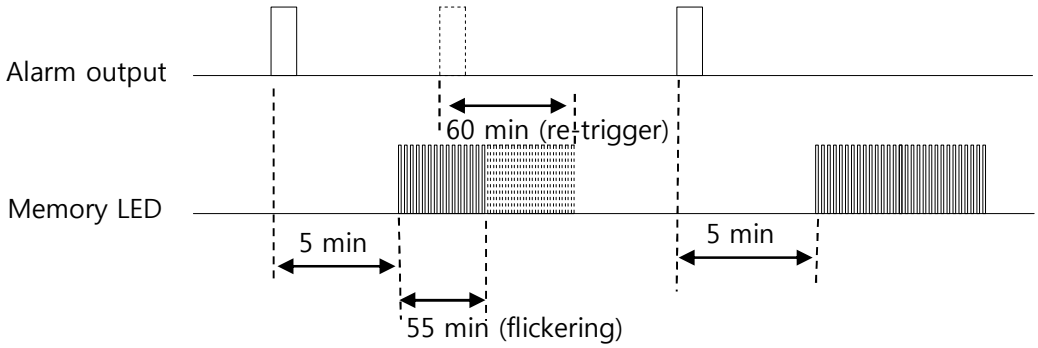
1) Initial beam alignment can be achieved by using the alignment tone indicator.
2) Attach the shading plates (stored on sides of both Transmitter and Receiver. Turn the receiver
3) Alignment tone switch to ON.
4) Adjust the optics with the adjustment screws until highest tone is reached.
5) Reverse the procedure. i.e. attach shading plates to upper optics of Transmitter /Receiver and repeat adjustment
6) After adjustment, replace the shading plates in storage areas of Transmitter / Receiver.
7) Turn the alignment tone indicator to OFF (Dip switch 3).

RECEIVER



■ Alarm memory function

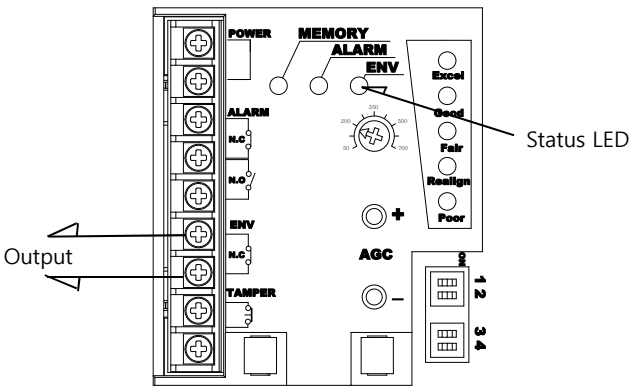
The alarm memory LED indicates which sensor has triggered when two or more sensors are placed on a zone.
An audible tone in addition is an optional selection. (Alignment alarm memory switch to ON)



The memory LED will light five minutes after an alarm signal and then continue to flicker for 55 minutes before returning to normal mode. If additional alarm signal are triggered, the process repeats.

■ Environment function (Receiver)

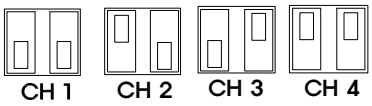
Environment function will send a trouble signal when the beam strength is below an acceptable level due to heavy fog, rain, snow or other changes in the installation site.
The trouble signal output continues as long as the beam strength is below an acceptable level.
It will reset when the environmental conditions clear



8 FUNCTIONS DESCRIPTION

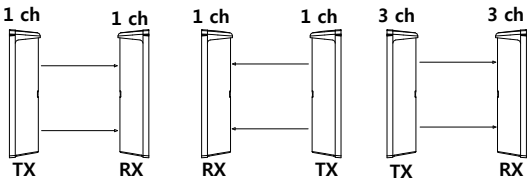
8.1) Four channel frequency selection

- The beam pairs may be set at various frequency levels to avoid crosstalk between units which are stacked, in-line. Or other configurations which have the potential of spill-over transmission from to another .
- Set the frequency level as illustrated.

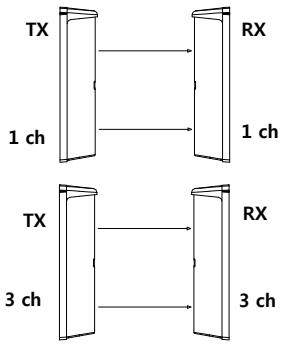


Make sure Transmitter and receiver of pair are set at same channel !
paired Transmitter / Receiver will not set up unless set at the same channel.

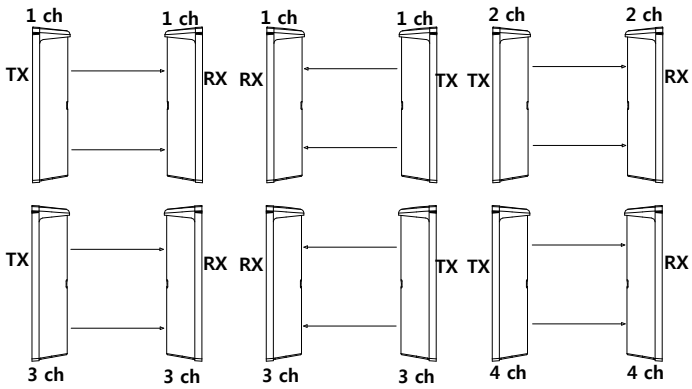
1) Linear protection



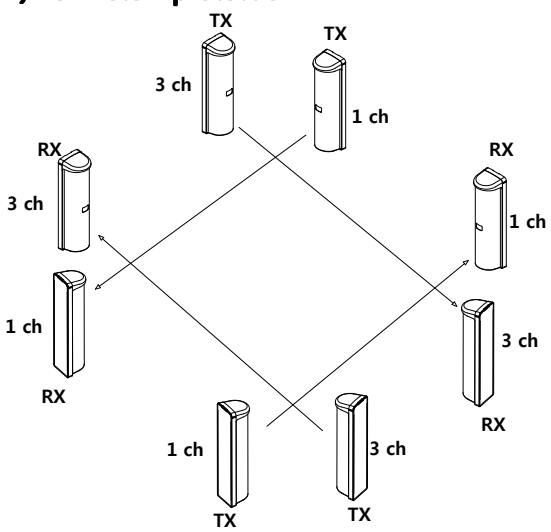
2) Double stack protection



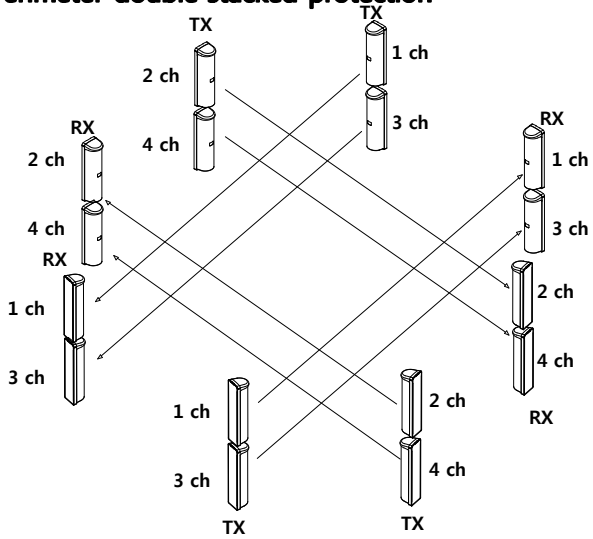
3) Double stacked linear protection



4) Perimeter protection



5) Perimeter double stacked protection



8.2) Beam power selection ((Dip switch 3 of Transmitter).

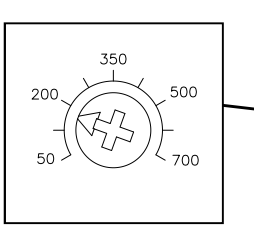
This option allows field selection of the appropriate beam intensity relative to the application. For distance significantly less than the specified protection distance, the beam intensity should be reduced to eliminate protential reflection problems. For zones reaching maximum protection distance, the beam level should be set to the highest level.

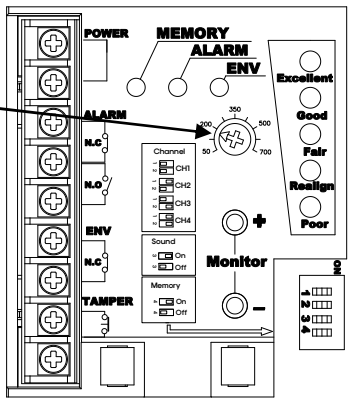
Note) For interior applicartions where greater chance for reflection occurs, the setting should be at LOW.

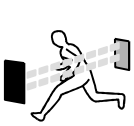
Model	LOW	HIGH
PRO-100Q	60 m	60~100 m
PRO-200Q	120 m	120~200 m

8.3) Response time changeover function

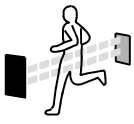
This feature can be used to alert the response time of the beam to best fit the application.
Exercise caution in using the 700msec setting.
Non-detection of fast moving human could result.



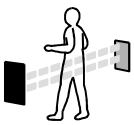




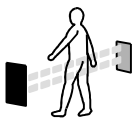
Run at full speed
(50 msec)



Walk with quick steps
(150msec)



Walking
(250msec)



Walk with slow steps
(500msec)

Go over a fence
(700msec)

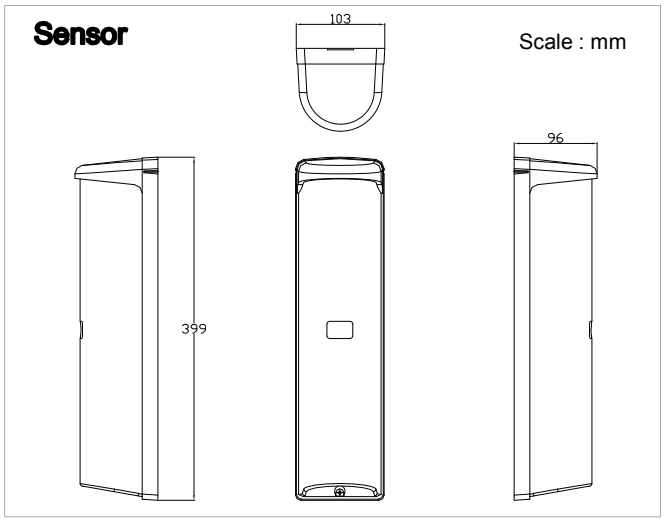
9 TROUBLE SHOOTING

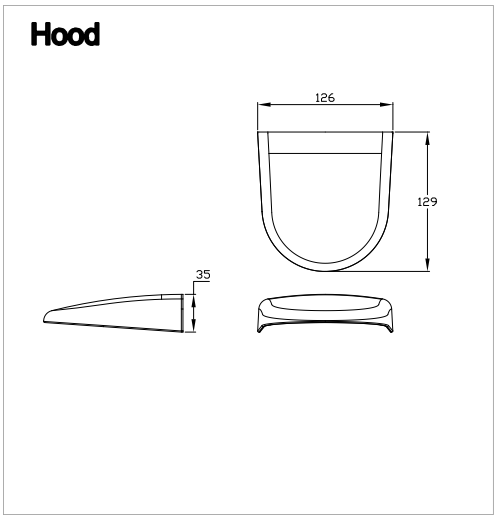
Symptom	Possible cause	Remedy
Operation LED does not light	1.Disruption of power or inadequate power 2.Bad wiring connection or broken wire, short	1.Correct power source 2.Check and correct wiring
Receiver Alarm LED Does not light when The beam is broken	1.Disruption of power or inadequate power 2.Bad wiring connection or broken wire, short 3.Reflecton of beam is flooding receiver and sent into the receiver 4.4-Beams are not broken simultaneously 5.Beam interruption time is shorter than response time	1.Correct power source 2.Check and correct wiring 3.Remove reflecting object. 4.Ensure all beams are broken at same time 5.Adjust response time
Receiver Alarm LED Stays lit	1.Alignment is off 2.Shading object between transmitter and receiver 3.Optics of units are soiled 4.Frequency channel setting on transmitter does not match with that on receiver	1.Check and adjust 2.Check site/remove any possible obstacles 3.Clean the optics with a soft cloth 4.Readjst to the same channel
Intermittent alarm	1.Bad wiring connection 2.Change of supply voltage 3.Shading object between transmitter and receiver 4.The wiring of power machine is located nearby transmitter and receiver 5.Unstable installation of transmitter and receiver 6.Optics of unit are soiled 7.Improper alignment 8.Small animals may pass through the 4 beams 9.Beam power switch is set at L, which does not keep enough sensitivity allowance	1.Check again 2.Stanilize supply voltage 3.Remove the shading object 4.Change the place for installation 5.Stabilize 6.Clean the optics with soft cloth 7.Check and re-adjust 8.Change environments or the place for installation 9.Set beam power switch at H and make the unit gain-locked with receiver cover detached

10 SPECIFICATIONS

Model		Specifications	
		PRO-100Q	PRO-200Q
Power supply		DC 10V to 30V DC (non-polarity)	
Current comsumption		55mA or less (Max 75mA or less)	70mA or less (Max 100mA or less)
Channel		4-channel	
Protection distance		Outdoor 100 meter	Outdoor 200 meter
Response time		50msec. to 700 m/sec	
Output	Alarm output	Dry contact relay : 1 c (COM. NC. NO) Contact operation : Irruption time + 2 sec Contact capacity : AC/DC 30V 1A or less	
	Environmental output	Dry contact relay : 1 b (COM. NC) Contact operation : Output when weather condition get worse Contact capacity : AC/DC 30V 1A or less	
	Tamper output	Dry contact relay : 1 b (COM. NC) Contact operation : Output when receiver cover is detached Contact capacity : AC/DC 30V 0.1A or less	
Display	Alarm LED	Red LED (receiver) lights when an alarm is initiated	
	Memory LED		
	Level LED	Excellent, Good, Fair, Realign, Poor	
Beam adjustment		Horizontal : ±90° Vertical : ±10°	
Functions		Modulated beam frequency selection. Tone indicator, Environmental module, Beam power selection, Alarm memory indication, Programmed AGC	
Ambient temperature range		-35 ℃~ +65℃	
Mounting position		Outdoor	
Appearance		PC resin	
IP		55	
Weight		Transmitter : 1,050g , Receiver : 1,070g	

11 EXTERNAL DIMENSIONS





Photoelectric Beam Sensor

▣ PRO-100Q : outdoor 100m ▣ PRO-200Q : outdoor 200m

MEMO

- Caution : Please consult the instruction manual to ensure safe and proper operation of the product. Specification and design are subject to change without prior notice for improvement.
- FAQ & Inquiry : Homepage www.sensorpro.co.kr E-mail sensorpro@sensorpro.co.kr