by Cybernetic Solutions

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LaneMinder3

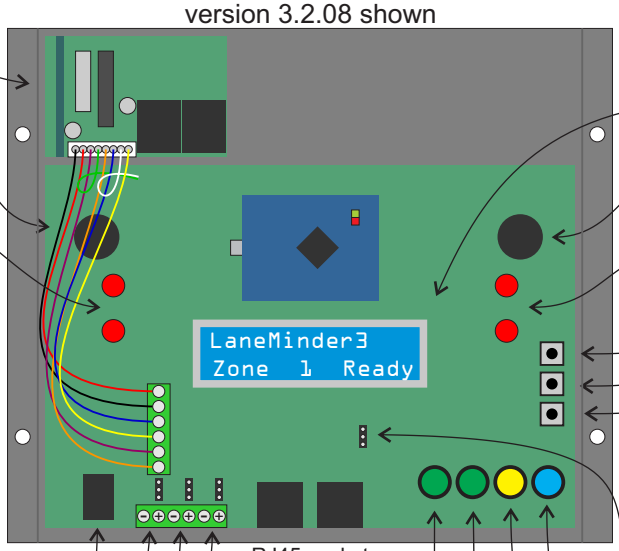
tenpintec.com

Revision 20250205

Includes updates included in software version 3.2.10

Control Box

version 3.2.08 shown



Remote Control Receiver

Buzzer

High Intensity RGB LEDs

RED steady - Ready mode - everything ok

RED FLASHING - Beam has been interrupted

GREEN FLASHING - AISLE, GETPIN or LANEMAINT timer running

AMBER FLASHING - AISLE, GETPIN or LANEMAINT timer 30sec to go

PURPLE steady - Menu mode

PALE PINK FLASHING - Beam blocked or not aligned on startup

RED/BLUE FLASHING - Communication to Transmitter and Receiver lost

LCD 2 line STATUS display

Buzzer

High Intensity RGB LEDs

Menu Buttons

When in READY mode:

UP ← Software version

SELECT ← Go to MENU

DOWN ← Alarm count

RJ45 sockets IN/OUT to Tx/Rx

Socket for 24Vdc Power Supply
2.1mm DC socket
(centre pole is positive) +

AUX OUTPUTS
each switchable by jumper
5Vdc or 24Vdc
Factory custom programable

Jumper - select GETPIN or LANEMAINT for Remote Key button 2

RESET - Push Button
LEDs flash BLUE

AISLE - Push Button for "walking the aisle beside lanes" timer (adjustable by menu)
Disables LaneMinder and automatically restarts after time delay.
LEDs flash GREEN
LEDs flash AMBER with 30sec to go

GETPIN - Push Button for "pin in gutter" timer (adjustable by menu)
Disables LaneMinder and automatically restarts after time delay.
LEDs flash GREEN
LEDs flash AMBER when 30sec left to go

LANEMAINT - Push Button for lane maintenance timer (adjustable by menu)
Disables LaneMinder and automatically restarts after time delay.
LEDs flash GREEN
LEDs flash AMBER when 30sec left to go

2 button remote control keyfob
RESET - top button
GETPIN - bottom button
or
LANEMAINT - bottom button

Use jumper in Control Box to select

* IMPORTANT *
Do not connect a LaneMinder3 to a LaneMinder2 or a computer network.
They are not compatible.
Damage will be the result!!

cat5 or cat6 cable

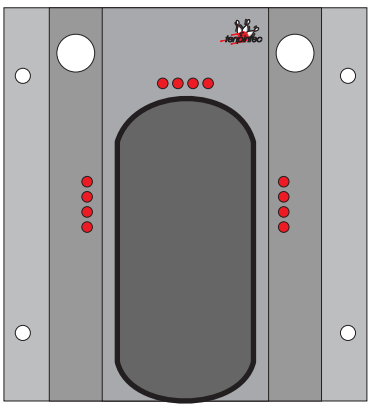
cat5 or cat6 cable

Mount Tx and Rx units between 5 and 15 feet down the lane at a height of about 18 inches (so lane machine will go under without breaking the beam)

It does not matter which side Transmitter (Tx) or Receiver (Rx) goes.

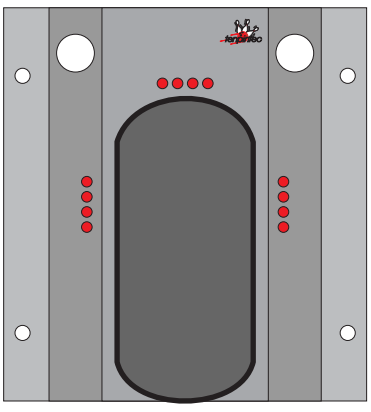
LANE AREA

DUAL BEAM



Receiver (Rx)

LEDs on RECEIVER will FLASH PALE PINK if IR beam is blocked or not aligned at STARTUP.



Transmitter (Tx)

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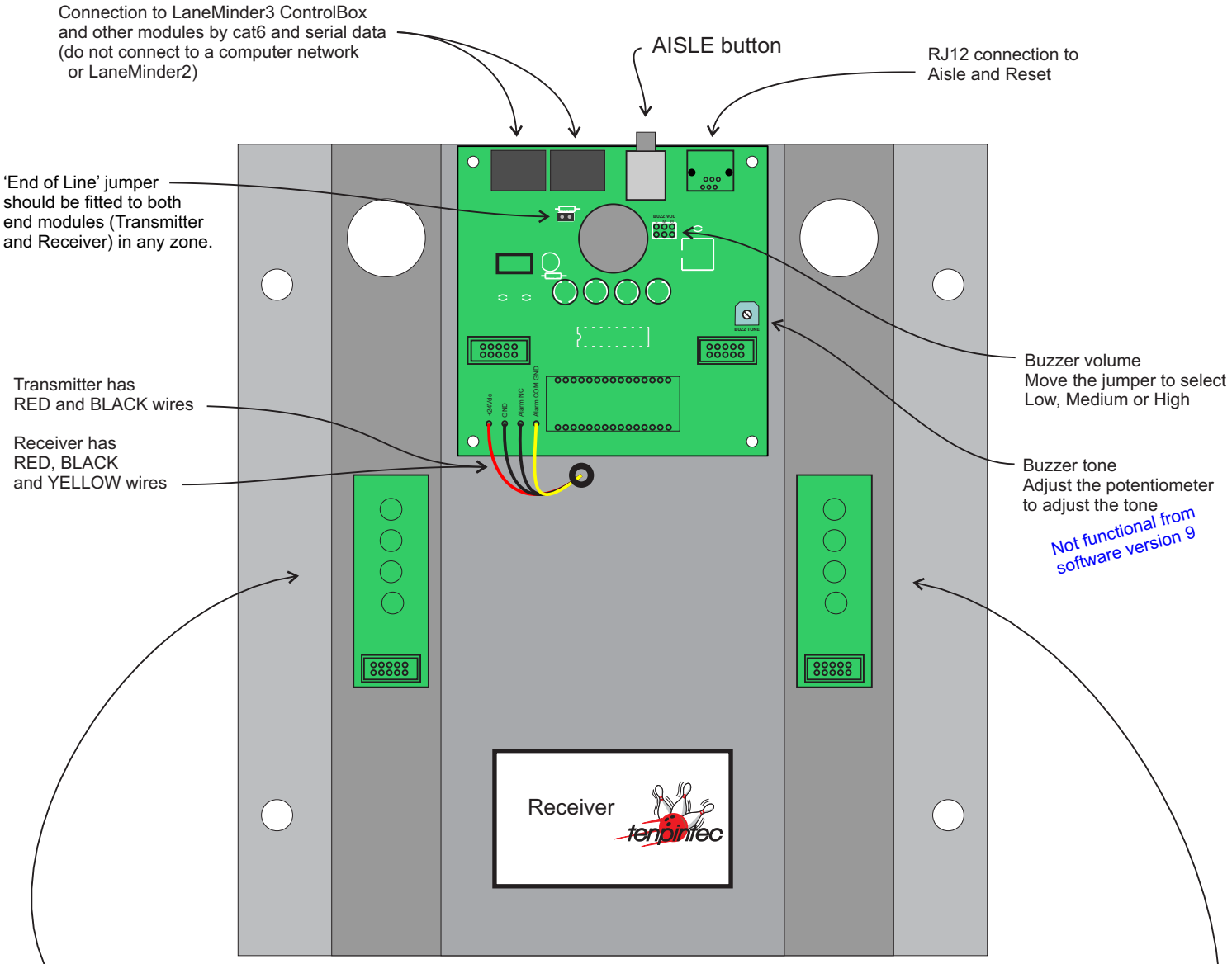
Infrared Transmitter and Receiver

version 3.2.06 shown



REAR VIEW

On startup, LEDs flash:
AMBER (Transmitter) or GREEN (Receiver)
a short pause and then
WHITE a number of times to indicate zone number (eg 2 times = Zone 2)
short pause and then
WHITE a number of times to indicate software version (eg 10 times = version 10)
PALE PINK (Transmitter) to indicate BEAM interrupted or misaligned
PALE PINK FLASHING (Receiver) to indicate BEAM interrupted or misaligned

After startup, LEDs steady or flashing:
RED - ok, ready
RED FLASHING BRIGHT - beam broken ALARM
GREEN FLASHING - a timer is active
AMBER FLASHING - a timer is within 30 seconds of ending
BLUE (1 second) - RESET
PALE BLUE - communications lost
RED/BLUE FLASHING - communications lost
BLANK/OFF - communications lost

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Installation

Mount infrared (IR) Transmit (Tx) and Receive (Rx) modules on walls or posts at opposite ends of the LANE AREA between 5 and 15 feet down the lanes at a height of about 18 inches to 2 feet above the lane surface.
The lane machine should go under the beam and not interrupt it.

Situate the LaneMinder control box on a convenient wall inside the machine room, at the main reception counter or other suitable location.

Use cat5 or cat6 cables to connect the infrared Transmitter (Tx) and Receiver (Rx) modules to the RJ45 sockets at the bottom of the LaneMinder3 Control Box. Either socket can be used for Tx or Rx.
*** DO NOT CONNECT LaneMinder3 to a computer network or a LaneMinder2 system. ***

New in 2025 with software version 3.2.10:
LaneMinder3 Tx and Rx modules can be connected to ControlBox using wireless RS485 devices.
The system communicaton protocol now includes a “heartbeat” to monitor the wireless connection.
Tx and Rx modules connected by wireless modules will each require their own 24Vdc power supply.

Align the Tx and Rx unit approximately by eye.

Plug the 24Vdc power supply into the socket at the bottom left of the LaneMinder3 Control Box, plug into a wall outlet and turn on. (Do not turn on until all cat5 or cat6 cables are plugged in)

Align the IR beams (the units are dual beam) according to the instructions on pages 12 to 15.
When the IR beams are aligned correctly, the LEDs on the ControlBox and Tx and Rx modules should be RED (READY mode).

The ControlBox LEDs will FLASH pale PINK, the Tx LEDs will be steady pale PINK and Rx LEDs will FLASH pale PINK when the unit is first powered up (and after the Tx and Rx do their startup self-check - see pages 4 and 6) if the dual beams are not aligned or the beam is otherwise blocked.

When alignment is achieved, LEDs will show BLUE (RESET) for 1 second and then go into ‘READY’ mode.

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Operation

When the Laneminder3 is first powered up, the ControlBox display will indicate “Waiting for Beam” and its LEDs will be **PALE PINK**.
At the same time, the Tx and Rx module LEDs will:
flash **ORANGE** if it’s set as a TRANSMITTER (Tx) - see page 5 for setting Tx or Rx - or
flash **GREEN** if it’s set as a RECEIVER (Rx) - see page 5 for setting Tx or Rx
* short pause
flash **WHITE** for x times indicating zone number - eg x will be 1 if the system is set to zone 1,
x will be 2 if the system is set to zone 2 etc
* short pause
flash **WHITE** for y times indicating software version - eg y will be 9 is software is version 3.2.09,
y will be 10 is software is version 3.2.10 etc

If the beam is clear and aligned after the startup routine (above) is complete, the ControlBox will do in order:
LEDs **ORANGE** flash
LEDs **BLUE** for 1sec - RESET
LCD “**RESET**” for 1sec
LEDs **RED** 30% - READY mode
LCD “**READY**”
The LEDs on the Tx and Rx modules will do in order:
LEDs **BLUE** for 1sec - RESET
LEDs **RED** 30% - READY mode

If the beam is interrupted or misaligned at startup, the LaneMinder3 will go to **StartupNoBeam** mode (LEDs **PALE PINK**, flashing on Rx and steady on Tx).
The LaneMinder3 will go to **READY** mode when the beam is cleared or realigned.

When the LaneMinder3 is **ON** and in the **READY** mode, the LEDs in the Control Box and the LEDs on the Tx and Rx modules will be **RED** 30% brightness. The LaneMinder3 is ready to detect a person crossing the infra-red beam in the lane area.

* A new feature introduced in 2025 (from software version 3.2.10) to enable the use of wireless RS485 modules to connect the Tx and Rx modules to the ControlBox is a “heartbeat”. The ContolBox LEDs will flash briefly every 10 seconds as it transmits a heartbeat signal and receives a response from the Tx and Rx. The Tx and Rx will also flash very briefly as they acknowledge the heartbeat signal.

When the beam is interrupted - **ALARM MODE**
Control Box - warning buzzers sound and **LEDs FLASH RED 100%**
Tx and Rx modules - warning buzzer sounds and **LED**s **FLASH RED 100%**

AISLE delay: Pressing the button (if fitted) on top of the Tx or Rx modules, or on the ControlBox will pause detection for approximately 60 seconds to all staff to walk down the side ailes of the centre without setting off the LaneMinder3.
LEDs on the ControlBox, Tx and Rx modules will **FLASH GREEN**.
All the LEDs will **FLASH AMBER** when the count-down timer gets to 30 seconds.
At the end of the count-down, the LaneMinder3 automatically resets and resumes READY mode.

GETPIN delay: Pressing the GETPIN button on the ControlBox or Remote Key will pause detection for approximately **2 minutes** (adjustable by menu) to allow staff to go down the lane to attend to escaped pins etc without setting off the LaneMinder3.
LEDs on the ControlBox, Tx and Rx modules will **FLASH GREEN**.
All the LEDs will **FLASH AMBER** when the count-down timer gets to **30** seconds.
At the end of the count-down, the LaneMinder3 automatically resets and resumes **READY** mode.

LANEMAINT delay: Pressing the LANEMAINT button on the ControlBox or Remote Key shuts off the beam for approximately **120 minutes** (adjustable by menu) to allow staff to walk in the lane area to perform lane maintenance without setting off the LaneMinder3.
LEDs on the ControlBox, Tx and Rx modules will **FLASH GREEN**.
All the LEDs will **FLASH AMBER** when the count-down timer gets to **30** seconds.
At the end of the count-down, the LaneMinder3 automatically resets and resumes **READY** mode.

RESET cancels ALL. All LEDs will **FLASH BLUE** for 1 second and LaneMinder3 will go to **READY** mode.

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How to change Transmitter or Receiver setting

From 2015 onwards, with software version 3.2.10, the Transmitter module (Tx) and the Receiver module (Rx) both have the same software, but a pre-installation setting makes them function slightly differently to each other.

The Tx needs to be set as a Tx - identified by two wires (black and red) are visible at the rear of the module - see page 2

The Rx needs to be set as a Rx - identified by three wires (black, red and yellow) are visible at the back of the module - see page 2

Tx and Rx are set at the factory, but the setting can be changed in the field:
On the Tx or Rx module, press and hold both the AISLE and RESET buttons down at the same time for three seconds.
If the module is currently a Tx, it will switch to being a Rx and the LEDs will flash GREEN. Also flashes GREEN on startup.
If the module is currently a Rx, it will switch to being a Tx and the LEDs will flash AMBER. Also flashes AMBER on startup.

How to change Zone

The LaneMinder3 can be set to Zone 1 (factory setting), 2, 3 or 4. This allows up to four LaneMinder3 systems to be connected together in a “universe”, which may also include a FrontDesk module and RemoteAlarm modules.

The LaneMinder3 zone setting can be changed via the menu on the ControlBox - see page 10.

When the zone is changed via the menu, the ControlBox transmits this change to the Tx and Rx.

The ControlBox can only commmunicate with Tx and Rx modules when they are set to the same zone.

However, the Tx and Rx must be already set to the same zone as the ControlBox to receive the change.

If a Tx or Rx are not already set to the same zone as the ControlBox, such as when replacing a module with one from another zone, use the following procedure:

1. Connect the ControlBox, Tx and Rx modules together as normal.
2. Disconnect from any another zone that may be connected to the LaneMinder3 universe.
3. Connect the 24Vdc power to the ControlBox.
4. Watch the Tx and Rx modules as they power up and note the number of flashes (LEDs WHITE) that indicate zone number - see pages 4 and 5.
5. If the number of zone flashes is the same on the Tx and Rx and also matches the ControlBox setting, all is good. There is nothing else to do.
6. If the number of zone flashes on the Tx or Rx is different to the ControlBox zone setting:
   a. Change the ControlBox zone setting (via the menu) to the zone setting of the Tx or Rx you want to change (this will enable communication with that module).
   b. Check that there is communication by pressing RESET, AISLE or one of the other buttons.
   c. When communication is confirmed, change the ControlBox zone (via the menu) back to the desired setting. This will bring the Tx or Rx module to that zone setting.
   d. Check for communication by pressing RESET, AISLE or one of the other buttons. LEDs should do the same thing on ControlBox, Tx and Rx. If they don’t, recheck the zone settings and if they don’t match, repeat the above procedure.
   e. Once the zone setting has been corrected, this system can be reconnected to the other zones of the universe (if there are other zones).

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Startup operation flow chart

STARTUP
Plug in 24Vdc power

ControlBox	Tx and Rx
LCD shows "Waiting for Beams" LEDs PALE PINK	LEDs flash AMBER (for Tx) or GREEN (for Rx), then WHITE (for zone) and WHITE (for software version)

At startup:
Transmitter flashes AMBER once, then WHITE x times, then WHITE y times
Receiver flashes GREEN once, then WHITE x times, then WHITE y times
x = Zone number; y = software version number

Beam aligned? NO

ControlBox	Tx and Rx
LCD - "Startup No Beam" LEDs - PALE PINK flashing Interrupted every 10 seconds by blinking "heartbeat"	Tx LEDs - PALE PINK steady Rx LEDs - PALE PINK flashing Interrupted every 10 seconds by "heartbeat" RED flash

NO — Beam aligned?

YES

ControlBox	Tx and Rx
Sends initial "heartbeat" signal then does a RESET (BLUE LEDs for 1 second)	LEDs flash BLUE for RESET (1 second)

All of the steps below this line are repeated continuously

READY mode

ControlBox	Tx and Rx
LCD shows "LaneMinder3" "Zone X Ready" LEDs RED 40% Sends a heartbeat signal every 10 seconds	LEDs RED 30% very fast "blink" every 10 seconds indicating heartbeat response received and returned

SerialCommsLost on only one Tx or Rx module: alternating 5 sec Zone ok and 5 sec red/blue flash

SerialCommsLost on both Tx and Rx modules: continuous red/blue flash

Heartbeat sent and response received ok? NO

ControlBox	Tx and Rx
LCD - "SerialCommsLost" LEDs - BLUE/RED flash Interrupted every 10 seconds by RED "heartbeat" blink	LEDs - RED 30% = OK LEDs - BLUE 40% flashing = connection lost

NO — Heartbeat recovered ok?

YES

READY mode

ControlBox	Tx and Rx
LCD shows "LaneMinder3" "Zone X Ready" LEDs RED 40% Sends a heartbeat signal every 10 seconds **Waiting for signals from buttons or Tx and Rx units**	LEDs RED 30% very fast "blink" every 10 seconds indicating heartbeat response **Waiting for signals from buttons or ControlBox**

Operation continued on next page

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READY mode

ControlBox	Tx and Rx
LCD shows "LaneMinder3" "Zone X Ready" LEDs RED 40% Sends a heartbeat signal every 10 seconds **Waiting for signals from buttons or Tx and Rx units**	LEDs RED 30% very fast "blink" every 10 seconds indicating heartbeat response **Waiting for signals from buttons or ControlBox**

Operation continued from startup

Heartbeat sent and response received ok?

NO

ControlBox	Tx and Rx
LCD - "Serial CommsLost" LEDs - BLUE/RED flash Interrupted every 10 seconds by RED "heartbeat" blink	LEDs - RED 30% = OK LEDs - BLUE 40% flashing = connection lost

Heartbeat recovered ok?

NO

YES

YES

Beam Interrupted?
or misaligned

YES

ControlBox	Tx and Rx
LCD - "ALARM" **LEDs - RED flashing** Auto RESET after 60min	**Tx LEDs - RED flashing** **Rx LEDs - RED flashing** Auto RESET after 60min

RESET or Beam clear or timer reached 60 min?

NO

If Beam remains interrupted, ALARM will not auto RESET

YES

NO

ControlBox	Tx and Rx
LCD - "RESET" **LEDs - BLUE** **1sec**	**Tx LEDs - BLUE** **Rx LEDs - BLUE** **1sec**

READY mode

ControlBox	Tx and Rx
LCD shows "LaneMinder3" "Zone X Ready" LEDs RED 30% Sends a heartbeat signal every 10 seconds **Waiting for signals from buttons or Tx and Rx units**	LEDs RED 30% very fast "blink" every 10 seconds indicating heartbeat response **Waiting for signals from buttons or ControlBox**

AISLE button pressed?

YES

Operation continued on next page

NO

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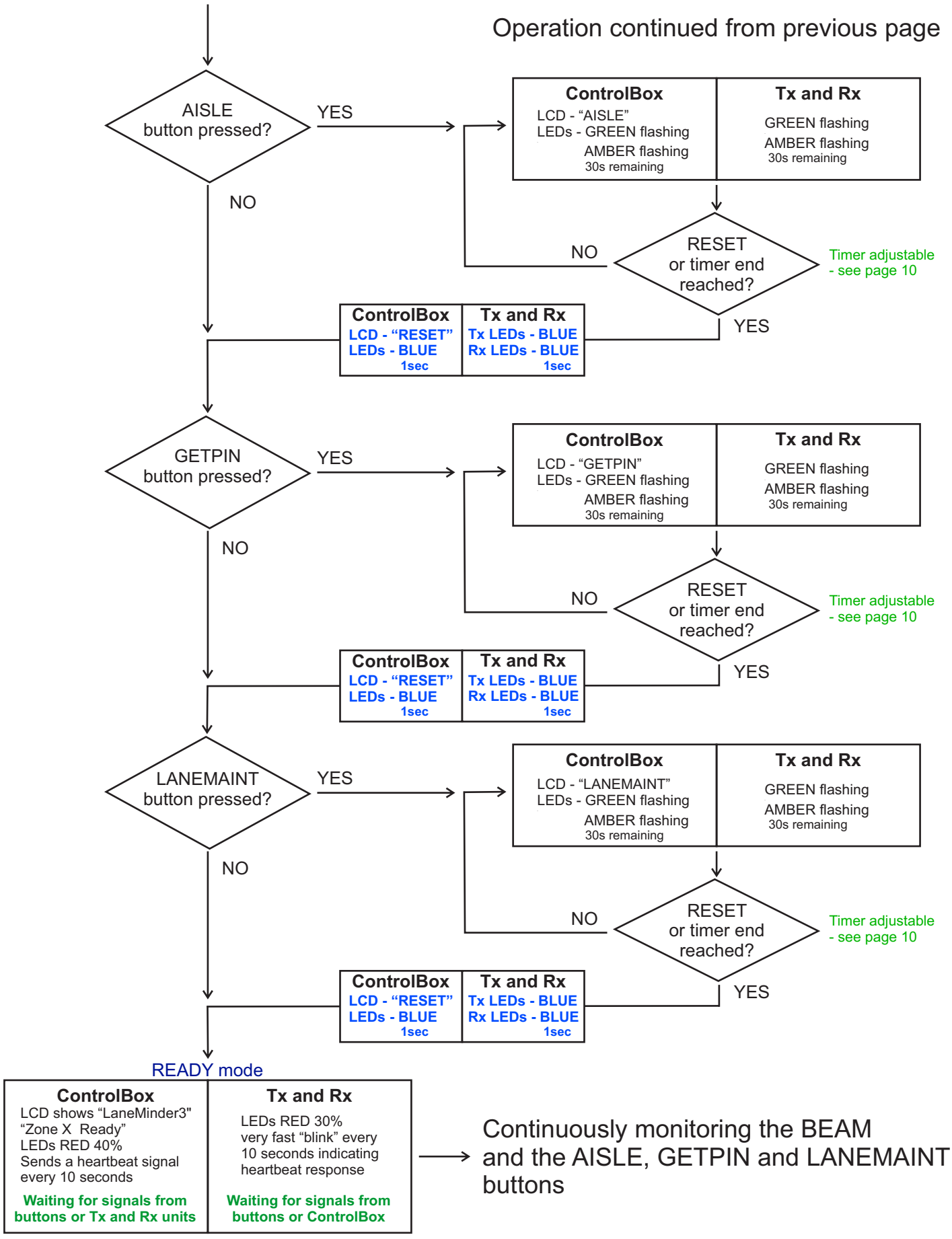
Revision 20250205

Operation continued from previous page



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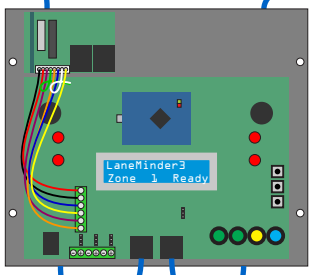
LaneMinder3 Standard layout
(for each zone of the bowling centre)



Mount Control Box on a convenient wall in the machine room behind the aisle door or at the front desk.

Each lane zone in the bowling centre requires one LaneMinder3 Control Box, one Tx and one Rx.
This differs from the LaneMinder2, where one Control Box could be configured to monitor two zones.

cat5 or cat6 cable

cat5 or cat6 cable

MACHINE AREA

Use “MachineMinder” to provide intrusion protection for the machines

CURTAIN WALL

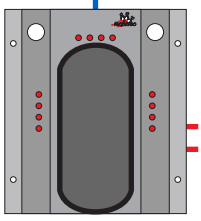
* IMPORTANT *
LaneMinder3 uses the same cat5 or cat6 cables as LaneMinder2 and computer network systems.
These systems are not compatible with each other.
Do not connect a LaneMinder3 unit to a LaneMinder2.
Do not connect a LaneMinder3 or LaneMinder2 to a computer network.
Damage is almost certain!!

LANE AREA

1

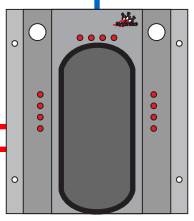
16 LANE EXAMPLE

16
(up to 40 lanes)



BEAM

Suggested
5 to 15 ft
from
FOUL LINE



Rx or Tx
(Rx in this example)

Mount Tx and Rx on side walls or posts beside lanes high enough for a lane machine to pass under beams

APPROACH AREA

Tx or Rx
(Tx in this example)

Mount Tx and Rx on side walls or posts beside lanes high enough for a lane machine to pass under beams

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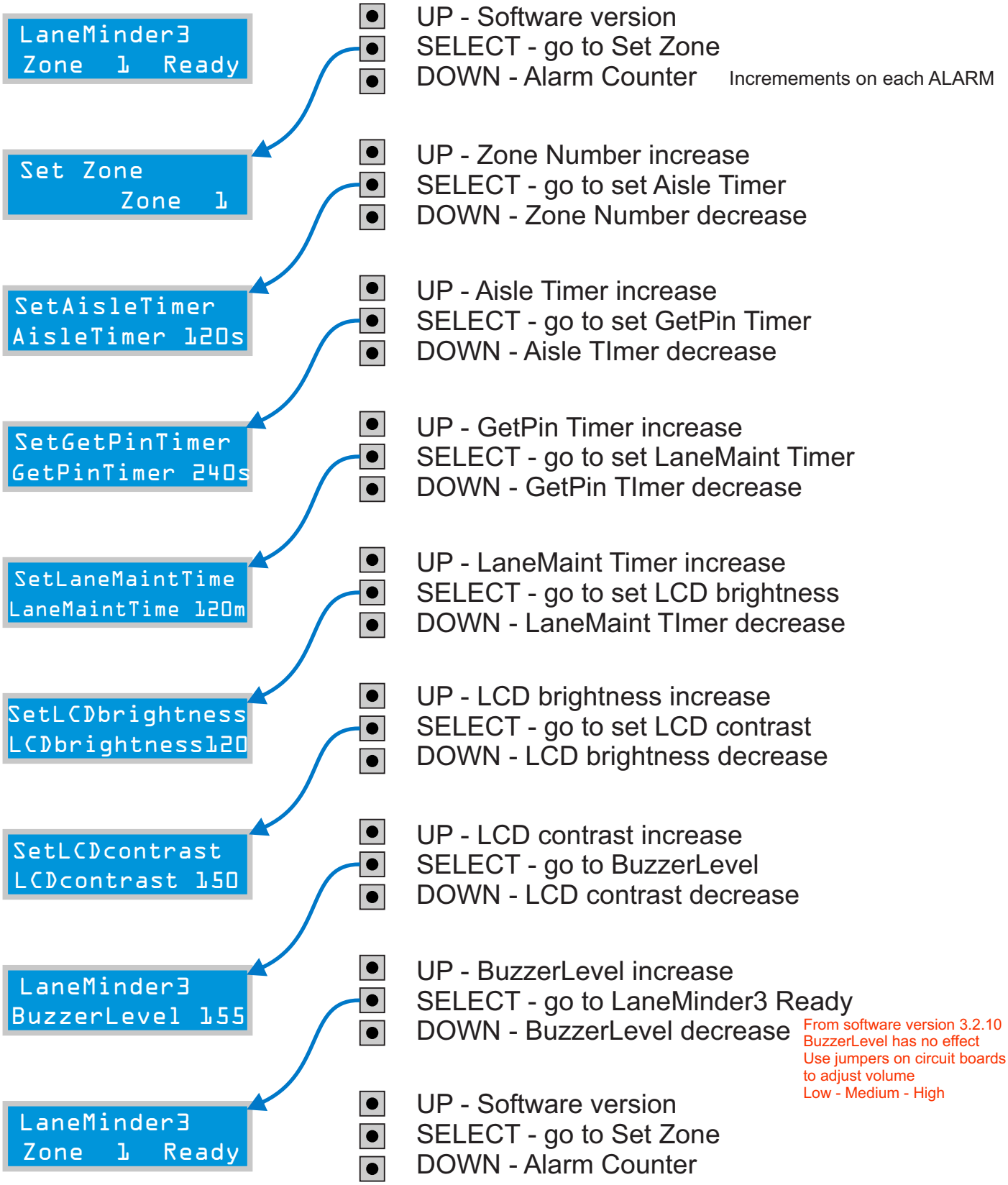
Menu Navigation



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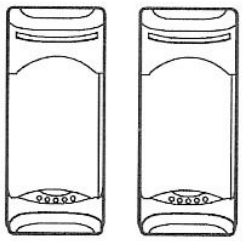
SCS Infra-red

Revision 20250205

Twin Photoelectric Beam Sensors

PB-10HD/25HD/30HD/60HD/80HD/120HD



CE

INSTALLATION MANUAL

Features:

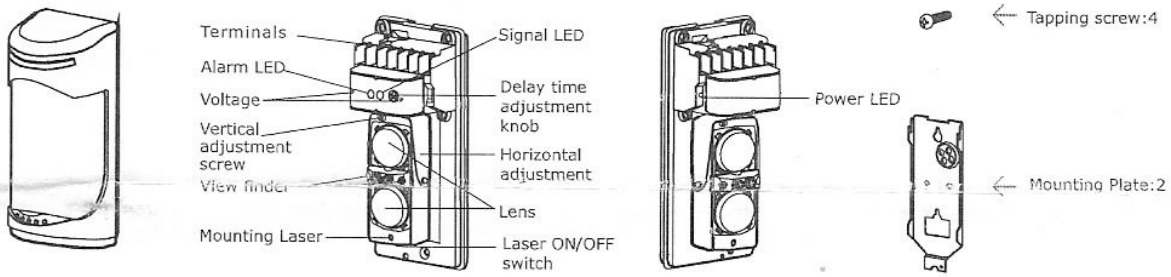
Range—

PB - 10HD :Outdoor 33ft.(10m),Indoor 66ft.(20m) (No laser)
PB - 25HD :Outdoor 83ft.(25m),Indoor 166ft.(50m) (No laser)
PB - 30HD :Outdoor 100ft.(30m),Indoor 200ft.(60m) (With laser)
PB - 60HD :Outdoor 200ft.(60m),Indoor 400ft.(120m) (With laser)
PB - 80HD :Outdoor 260ft.(80m),Indoor 520ft.(160m) (With laser)
PB-120HD :Outdoor 400ft.(120m),Indoor 800ft.(240m) (With laser)

- Twin beam provide reliable perimeter security minimizing false alarms from falling leaves,birds,etc.
- Lensed optics reinforce beam strength and provide excellent immunity to false alarms due to rain,snow,mist,etc.
- Weatherproof,sunlight-filtering case for indoor and outdoor use.
- Anti-frost system so that beam functions even in extreme conditions.
- Automatic input power filtering with special noise rejection circuity.
- N.C/N.O. Alarm output.
- N.C. Tamper circuit included.
- Non-polarized power inputs.
- Quick,easy installation with built-in laser beam alignment system.

1.PARTS DESCRIPTION

[COVER] [RECEIVER]



2.CAUTIONS ON INSTALLATION

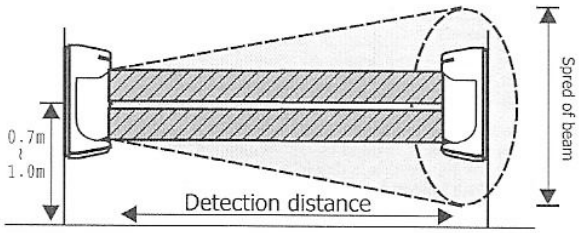
Do Not

- Remove all abstructions (trees,clothes,lines,etc.) between Transmitter and Receiver.
- Avoid strong light from the sun, automobile headlights etc.directly shining on Transmitter/Receiver. When strong light stays in optical axis for a long time,it does not cause malfunction but will affect the product life.
- Do not install the unit on places where it may be splashed by dirty water or direct sea spray.
- Do not install the unit on unsteady surfaces.

Expansion of beam

The protection distance(between Transmitter /Receiver)should be placed in the rated range.

Model	Detection distance	Spred of beam
PB-10HD	10m(33 ft.)	0.6m(2.0 ft.)
PB-25HD	25m(83 ft.)	0.9m(3.0 ft.)
PB-30HD	30m(100 ft.)	0.9m(3.0 ft.)
PB-60HD	60m(200 ft.)	1.8m(6.0 ft.)
PB-80HD	80m(260 ft.)	2.4m(8.0 ft.)
PB-120HD	120m(400 ft.)	3.6m(12.0 ft.)



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SCS Infra-red

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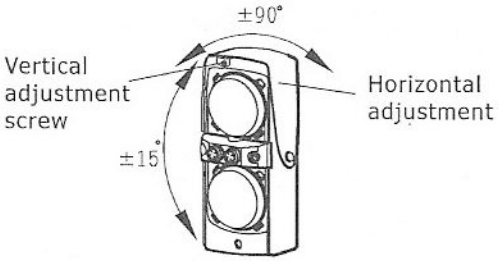
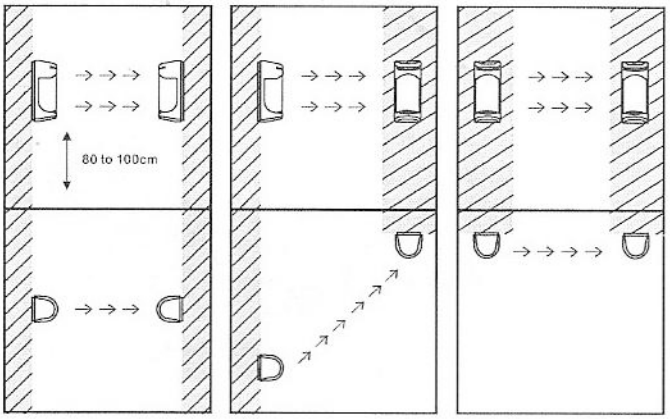
Position of installation

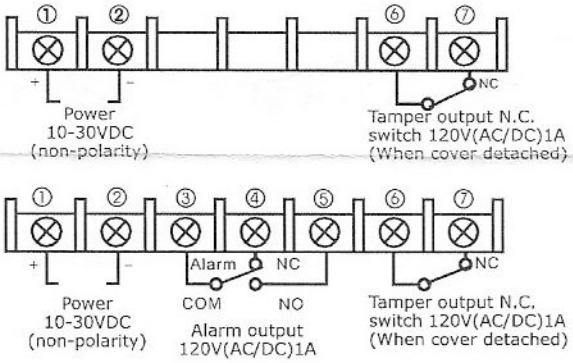
The photoelectric beam lens can be adjusted horizontally ±90°, and vertically ±15°. This allows much flexibility in terms of how the transmitter and receiver can be mounted. Install at a distance of 32" to 39"(80 to 100cm)above the ground for most situations.





3.WIRING

Wiring



Running the Cable

Run a cable from the alarm control panel to the photobeam sensor.If burying the cable is required,make sure to use electrical conduit. Shielded cable s strongly suggested.See table 1 for maximum cable length.

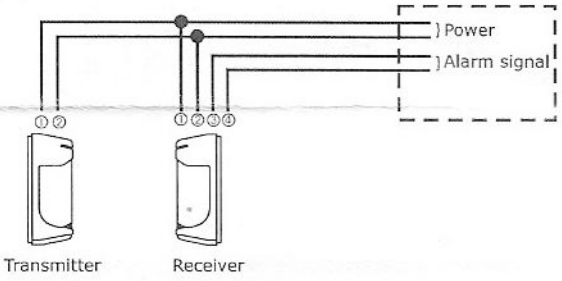
Table1:Cable Length

Model No.	PB-10HD		PB-25HD		PB-30HD	
Wire/Volt.	12V	24V	12V	24V	12V	24V
AWG22	360m	3,200m	320m	2,800m	320m	2,800m
AWG20	600m	5,400m	550m	4,800m	550m	4,800m
AWG18	1,000m	8,640m	800m	7,200m	800m	7,200m
AWG16	1,200m	12,000m	980m	8,800m	980m	8,800m
Model No.	PB-60HD		PB-80HD		PB-120HD	
Wire/Volt.	12V	24V	12V	24V	12V	24V
AWG22	280m	2,400m	200m	1,600m	110m	900m
AWG20	450m	4,200m	350m	3,000m	170m	1,400m
AWG18	700m	6,200m	500m	4,200m	250m	2,200m
AWG16	850m	7,600m	590m	5,200m	310m	2,600m

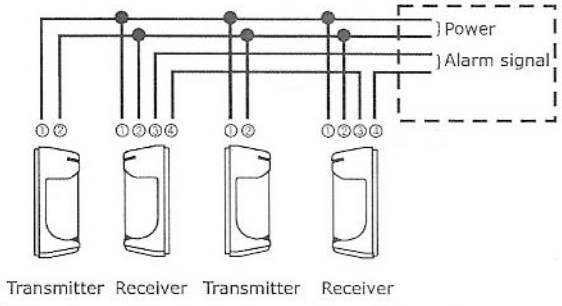
Note(1):Max.cable length when two or more sets are connected is the value show in Table 1 divided by the number of sets.
Note(2):The power line be wired to a distance of up to 3,300 ft.(1,000m) with AWG22(0.33mm)telephone wire.

Connection

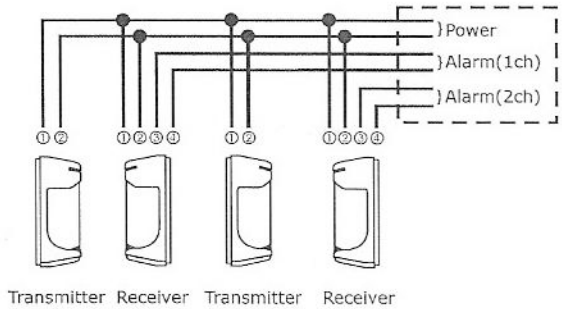
Example connection 1 - Standard



Example connection 2 - In-line Single Channel



Example connection 2 - Dual Sensors,Separate Channels



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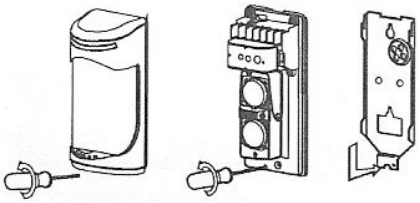
4.INSTALLATION METHOD

Wall Mount

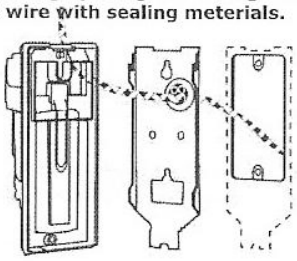
(1)Loosen the cover locking screw and remove the cover.Loosen the unit setting screw at lower part of unit base. Side the mounting plate downwards and remove it.



(2)Pull wire through on the installation site.

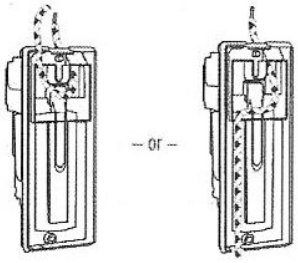
(3)Break grommet on mounting plate and pull wire through it.Secure the plate with 4mm screws.

Note:Plug opening between grommet and wire with sealing meterials.



Pull wire through sensor body(back to front) and attach it to the mounting plate.

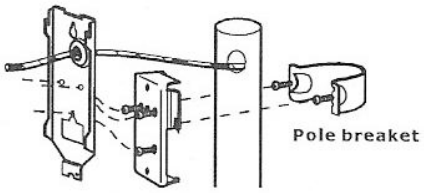
(4)When exposed wired break knockouts (2 positions)on the rear of unit,pull wire through as the figure and attach it to the mounting plate.



(5)After wiring is completed,adjust alignment ,check operation and attach cover.

Pole Mount

(1)Use dia 38mm to 45mm pole.
(2)Insert 2 pcs.of oval countersunk head screws(M4x20)in a pole bracket with a few rotation.
(3)Fix pole mounting plate to pole with pole bracket.
(4)Detach cover,and remove mounting plate from sensor body.
(5)Temporily insert 2 pcs of M4x10 screws in pole mounting plate and fix sensor,mounting plate on them.
(6)Do the same procedure as (3)-(5)of wall mount.

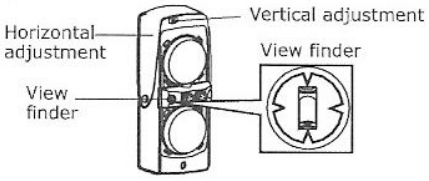


5.ALIGNMENT AND OPERATION

Eyeball adjustment

(1)Remove the transmitter cover, and look into one of the alignment viewfinders (one of the four holes located between to two lenses)at a 45 angle.
(2)Adjust the horizontal angle of the lens vertically and horizontally until the receiver is clearly seen in the viewfinder.
(3)Repeat steps 1 and 2 for the receiver.
(4)Replace the transmitter and receiver covers.

NOTE:If you cannot see the opposite unit in the viewfinder,put a sheet of white paper near the unit to be seen,



Laser adjustment

(1)Remove the transmitter cover, then turn the laser on with the ON/OFF switch.
(2)Adjust the transmitter's sensor unit vertically and horizontally until the red dot is centered on the receiver and both the receiver's LEDs turn off.
(3)Repeat steps 1 and 2 for the receiver.
(4)Turn the lasers off,and then replace the covers.

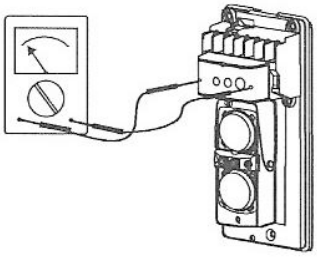
WARNING:Do not look directly at the lasers.

Alarm	Singnal Single	Signal
OFF	OFF	Best
OFF	OFF	Good
OFF	ON	Fair
ON	ON	Re-adjust

Fine Tuning the Receiver

(1)Once the sensor is mounted and aligned,the sensor can be fine tuned using the voltage output jack.
(2)Set the range of a volt-ohm meter(VOM)to 0~10VDC.
(3)Measure the voltage.
(4)Adjust the horizontal angle by hand until the VOM indicates the highest voltage.
(5)Adjust the vertical angle by turning the vertical adjustment screw until the VOM indicates the highest voltage.

Voltage output	Alignment quality
>2.8V	Best
1.7~2.7V	Good
1.1~1.6V	Fair
<1.0V	Re-adjust



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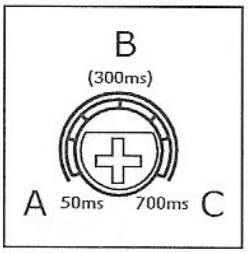
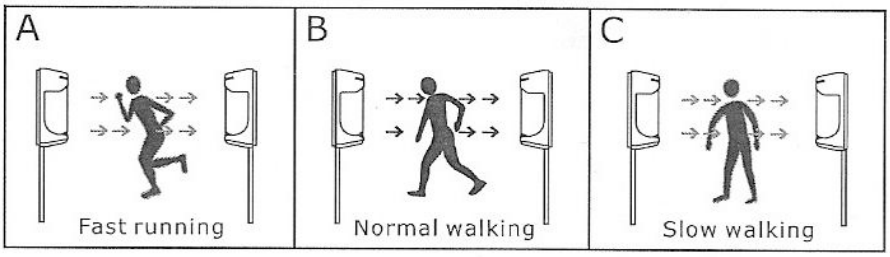
6.RESPONSE TIME

Adjust response time as follows.The unit does not detect the passing object faster than the response time set. If the response time is set longer,the unit does not detect human beings. Adjust to a little longer response time in a site where large passing objects,newspaper or carton box may move.





7.TROUBLESHOOTING

Trouble	Possible Origin(s)	Remedy(s)
Transmitter LED does not light.	Incorrectly wired and/or insufficient voltage	Ensure the power supply to the transmitter is 10 to 30 VDC.
Receiver LED never lights up when the beam is interrupted.	a.Insufficient voltage b.Beam reflected away from receiver c.Beams not simultaneously interrupted.	a.Double-check the voltage. b.Clean the cover. c.Check overall installation.
Beams interrupted and LED lights,but no alarm tigger.	Alarm tigger cable may be cut,or the relay contact stuck due to overloading.	Check the continuity of the wiring between the sensor and the alarm.
Alarm LED continuously lit.	a.Lenses out of alignment. b.Beam are blocked. C.Cover is foggy or dirty.	a.Realign the lenses. b.Remove any obstacles. c.Clean the cover.
Alarm tigger becomes erratic in bad weather.	Lenses out of alignment.	Check overall system installation.If still erratic, realign the lenses.
Frequent false triggers from leaves,bird.etc.	a.Too sensitive. b.Bad location.	a.Reduce the response time. b.Change the transmitter and/or location.

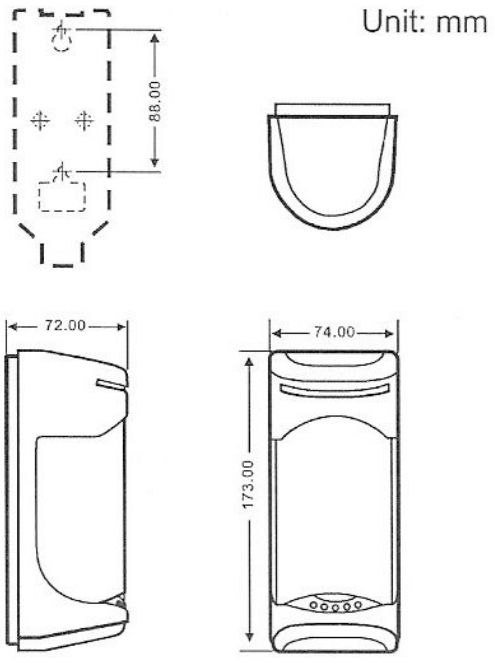
8.SPECIFICATIONS

Model	PB-10HD	PB-25HD	PB-30HD	PB-60HD	PB-80HD	PB-120HD
Max. ragne(outdoor)	33'(10m)	83'(25m)	100'(30m)	200'(60m)	260'(80m)	400'(120m)
Max. ragne(indoor)	66'(20m)	166'(50m)	200'(60m)	400'(120m)	520'(160m)	800'(240m)
Current	61mA	63mA	65mA	69mA	73mA	77mA
Power	10~30VDC(Non-polarity)					
Response time	50~700msec(variable)					
Alarm output	Contact capacity:NC./NO. 1A/120VAC					
Tamper output (Tx & Rx)	NC switch, 1A@120VAC					
Alarm LED (Receiver)	Red LED -ON:When transmitter and receiver are not aligned or when beam is broken.					
Signal LED (Receiver)	Yellow LED -ON:When receiver's signal is weak or when beam is broken.					
Power LED (Receiver and Transmitter)	Green LED -ON:Indicates connected to power.					
Laser wavelength	650nm					
Laser output power	≤5mW					
Alignment angle	Horizontal: ±90°, Vertical: ±15°					
Operating temperature	-23°F(-25°C)to +131°F(+55°C)					
Weight	2.5lbs.(1.1kg)					
Case	PC Resin					
Humidity	<70%					

** No laser beam alignment :PB-10HD/PB-25HD
** With laser beam alignment :PB-30HD/PB-60HD/PB-80HD/PB-120HD

9.EXTERNAL DIMENSIONS

Unit: mm



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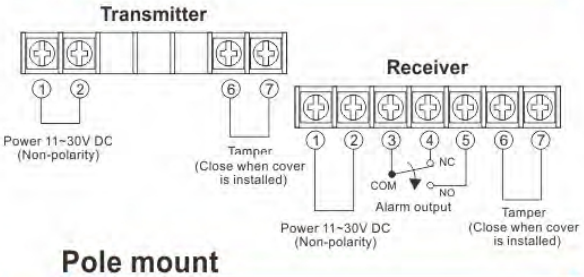
Features

1. Powerful and reliable twin beam detector
2. Easy optical alignment with LED indication
   - ◎ 10-level LED indicator, one can check beam strength easily.
   - ◎ Highly accurate alignment, no need to use voltmeter.
   - ◎ No need for using beam blocking plate.

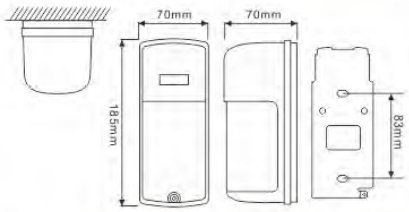
3. Double modulation synchro-twin beam (20KHz/500Hz.)
4. Adjustable beam interruption period (50~700msec)
5. Lighting & surge protection. Automatic gain control circuit.
6. Form C relay providing more applications.
7. Anti- Frost design.
8. IP rating up to 66, made possible by the high-sealing silicone rubber packing.
9. Target structure color, is tuned to the peak wavelengths of human vision, to be easily targeted in the beam alignment process.

Terminals

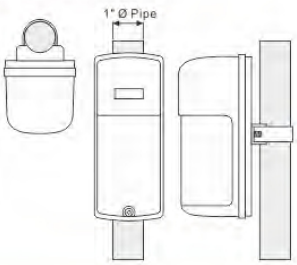


Dimensions

Wall mount



Pole mount



Pole mount

Specifications

Model	LK-25HD	LK-40HD	LK-60HD	LK-80HD	LK-100HD	LK-120HD
Coverage outdoor use	25m	40m	60m	80m	100m	120m
Response time	50~700msec (variable)					
Power input	11~30VDC (no polarity)					
Power consumption (at 12VDC input)	45mA	55mA	60mA	80mA	90mA	100mA
Indication LED	Power LED: GREEN LED (transmitter) / ALARM LED: RED LED (receiver) BEAM alignment level LED: 3 RED LEDS (receiver)					
Alarm duration	1±0.5sec					
Relay output	Form C relay dry contact, 1A/120VAC, 2A/24VDC (resistor load)					
Tamper	Open when cover is removed (1A/120VAC)					
Alignment angle	Vertical 20° (±10°), horizontal 180°(±90°)					
IP rating	IP66					
Mounting	Wall mount or pole mount					
Operation temperature	-25°C~ +60°C					
Weight	730g					
Accessories	Wall mount screw (4 pcs), pole mount screw (4 pcs), metal mounting bracket (2 pcs), mounting hook (2 pcs), U-clamp (2 pcs)					

The specifications are subject to change without notice.