Read instruction completely before beginning installation.

- Optex presents a new concept, BOUNDARYGARD™, which protects a building's exterior by detecting intruders before entry is attempted and can also provide a deterrent with its Audible Alarm Indicator before break-in occurs.

- BX-100PLUS is the Photoelectric detector which is designed with this concept. Maximum detection range between transmitter and receiver for BX-100 is 100 ft (30m).

Features

1. Compact & Slim design.
2. Double Output Terminals (Individual N.O. & N.C. outputs)
3. Audible Alarm Indicator.
5. Tamper.
6. Option.

7. Water Proof.

: Easily set-up on the wall.

: BX-100PLUS can sound an alarm by a buzzer built in the receiver when alarm is occurring.

: Easy optical alignment by Audible Alignment indicator built in the receiver & Alignment LED indicator.

: N.C. output opens when cover is removed.

: White decorative cover (WC-1). White covers are to match the wall color. Hood is included which can be fixed to this cover for rain and frost proof.

: Spacer (SP-1). To avoid beam interruption by obstructions

: Metal Guard (MG-1). As the protector for the sensor unit not to be broken by vandalism in outdoor use.

: IP rating : IP54

Safety-Related Precautions

Before installation, make sure to read this instruction manual carefully for safe and effective product operation.

⚠️ Warning

This icon denotes a situation involving the risk of serious injury or even death, if the warning given is ignored.

⚠️ Caution

This icon denotes a situation involving the risk of serious injury or other property damage if the warning given is ignored.

⚠️ This icon indicates actions to be avoided. Details of the actions to be avoided are written beside or near icon. (The icon on the left indicates that the product must not be disassembled)

⚠️ Warning

We can not assume responsibility for any damages and accidents using for any applications.

⚠️ Caution

Avoid the risk of connecting terminals to the units which require high power supply or current draw.

Never attempt to disassemble or modify the products.

Avoid directly water supplied by buckets or hose. Water splashed on the unit increases the risk of fire or electric shock.

1. PARTS IDENTIFICATION
2. INSTALLATION NOTES

1. Mount unit on a solid surface only.

2. Avoid installing the unit where falling leaves or growth of branches will block the beam.

3. Prevent direct sunlight from entering into internal optics.

4. Avoid aerial wiring.

5. Line Protection
   Set up Receivers and Transmitters as drawing in the case 2 sets of BX-100 PLUS will be installed not to receive the other transmitter's beam. Avoid to install 3 sets of BX-100PULS on the line.

6. Beam Stacking
   Set up Receivers and Transmitters as drawing. And it should be at intervals of 27" (70cm) between upper sensor and lower one.

7. Perimeter Protection
   Set up Receivers and Transmitters as drawing. And receivers should be at intervals of 12" (30cm) not to receive the other Transmitter's beams.

8. Perimeter Protection
   Keep appropriate space for access the terminals between the unit and the wall as drawing.

3. INSTALLATION HINTS

1. Detection range and installation height.
   Detection range.
   Maximum distance of between Receiver and Transmitter is 100 ft (30m).
   The installation height should be at 27"~40" (0.7~1m) from ground and 8"~20" (0.2~0.5m).
   Be sure to set up at same height.

2. Alignment angle
   Horizontally 184°

3. In the case, when there is no space to set up at same height with Transmitter, set up the Receiver in sweet area as drawing.

   | Detection Range | 17 (5) | 33 (10) | 50 (15) | 66 (20) | 82 (25) | 100 (30) | ft (m) |
   | Sweet Area     | 12 (30) | 16 (40) | 20 (50) | 20 (50) | 20 (50) | 20 (50) | inch (cm) |

4. Front set up
   Be sure to set up at same height on the vertical wall.
4. INSTALLATION METHOD

1. Loosen the cover lock screw and remove the front cover.

2. Pull out the wire through the wiring hole on the Unit Base and connect to the terminal (See Sec.6).

3. Wiring Sponge
   Be sure to close the wiring hole with sponge for rain, dust and insect protection after wiring.

4. Attach the Unit Base to the wall with the screw. See Sec.5 before setting up in the case you use optional parts, white decorative cover or Spacer.

5. After checking optical alignment and operation check (See Sec.8) replace the cover, and fasten the cover lock screw tightly.

5. INSTALLATION METHOD OF WHITE DECORATIVE COVER (WC-1) & SPACER (SP-1)

White decorative cover, WC-1 are optional parts.

- White Decorative Cover, WC-1 is optional.
- Place the WC-1 on the cover of the BX-100 and tighten the provided four (4) screws through the top and bottom holes located on both sides of the unit.
- The hood which included in the package can reduce the factor of false and mis-alarm caused by rain, frost, or snow.
- Attach the hood to WC-1 with the screw as drawing.
- Then, attach WC-1 with hood to unit base as above.

- Spacer, SP-1 is optional.
- SP-1 allows the units to make space between the units and wall to avoid interruption by obstructions. (2 spacers can be used per unit)

6. TERMINAL

**Receiver**

- Power Input 10.5~28VDC
- Audio Control Input (See Sec.9)
- Tamper N.C.
- Alarm Output N.O.

**Transmitter**

- Power Input 10.5~28VDC
- Tamper N.C.

**Wiring Distance**

Power wires should not be exceed following length.

When using two or more units on the wire, the maximum length is obtained by dividing the wire length listed below by the number of units used.

<table>
<thead>
<tr>
<th>Wire Size</th>
<th>Power Supply</th>
<th>12VDC</th>
<th>24VDC</th>
</tr>
</thead>
<tbody>
<tr>
<td>AWG22</td>
<td>0.33mil</td>
<td>465 (150)</td>
<td>1640 (500)</td>
</tr>
<tr>
<td>AWG20</td>
<td>0.52mil</td>
<td>820 (250)</td>
<td>2955 (900)</td>
</tr>
<tr>
<td>AWG18</td>
<td>0.83mil</td>
<td>1315 (400)</td>
<td>4595 (1400)</td>
</tr>
<tr>
<td>AWG16</td>
<td>1.31mil</td>
<td>1970 (600)</td>
<td>6565 (2000)</td>
</tr>
</tbody>
</table>

ft (m)
7. WIRING
Refer to the drawing

2 Set in the Line
Power unit should be parallel connected.
Alarm output should be series connected when system is N.C.
Alarm output should be parallel connected when system is N.O.

Connecting the peripheral devices

8. OPTICAL ALIGNMENT
Beams should be aligned perfectly to get reliable performance following method. The alignment should be done on condition that the cover of both Transmitter and Receiver are removed.

1 Mode Selector (CH2)
Select CH2 OFF to select Alignment Mode. This setting allows to check the Alignment Status by Audible Alignment Indicator and Alignment LED Indicator.

2 Turn the optical unit with your hand as drawing. Both optical unit of Transmitter and Receiver should be faced each other up to indicate beep sound and flickering of LED.
The optical unit should be adjusted not to touch the miller's surface of it as drawing indicates. Avoid breaking the beams with your hand.

3 Receiver
Adjust finally using Audible Alignment Indicator and Alignment LED Indicator.
   ① Adjust the beam alignment of Receiver until alignment status achieves Good level in Audible Alignment Indicator and Alignment LED Indicator as the following chart.
   Audio Level Selector can set 3 volume level during Alignment Mode as follows.
   - MAX——Select MAX when big beep sound is required. (ex. Alignment of Transmitter)
   - MIN——Select MIN when small beep sound is required. (ex. Alignment of Receiver)
   - OFF——Select OFF when beep sound is not required.

   ② Adjust the beam alignment of Transmitter by alignment status until it achieves excellent in Audible Alignment Indicator and Alignment LED Indicator as drawing.
   Optical Alignment is accomplished if it indicates Good level after checking alignment status.
   If Audible Alignment Indicator and Alignment LED Indicator do not indicate Good, realign by checking ①,②.
   Should adjust the beam alignment of Receivers until alignment status achieves Excel level, Audible Alignment Indicator indicates long beeps, for reliable operation.

<table>
<thead>
<tr>
<th>Alignment Level</th>
<th>Alignment LED Indicator</th>
<th>Audible Alignment Indicator</th>
</tr>
</thead>
<tbody>
<tr>
<td>POOR</td>
<td>Flickering</td>
<td>Slow - - - Fast</td>
</tr>
<tr>
<td>GOOD</td>
<td></td>
<td>Pulsed tone - Fast</td>
</tr>
<tr>
<td>EXCEL</td>
<td></td>
<td>Continuous tone - Fast</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Alignment Level</th>
<th>Audible Alignment Indicator</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Slow - - - - - - - - - - - - -</td>
</tr>
</tbody>
</table>
Alignment status does not achieve good level when adjusted by using suggested method.

In the case Audible Alignment Indicator do not indicate the pulsed sound and Alignment LED Indicator do not indicate light in spite of adjusting.

Adjust the alignment up and down as follows.
Note: it is effective when the Receiver and Transmitter was Side set up only.
Be sure to set up at same height on the vertical wall.

Adjustment of the alignment vertically.
The hole of base unit is large to be used for vertical adjustment. Loosen the lock screw and shift the unit base right and left, adjust the beam alignment vertically.
However it is effective when the Receiver and Transmitter was Side set up only.
Attach the unit at same height and mount flat surface.

4 Mode Selector (CH2)

Select CH2 ON to select Alignment Mode after optical alignment when Audible Alignment Indicator indicates beep sound and Alignment LED Indicator is flickering.
This setting allows Audible Alignment Indicator to switch to Audible Alarm Indicator.
If Mode Selector is not selected to Alignment Mode, the beep sound of buzzer would not stop.

9. AUDIBLE ALARM INDICATOR FUNCTION

Audible Alarm Indicator is the function which warns against Intruders with the beep sound (70dB) when they block the beams.
This function can be controlled by program output of Control Panel.
Audible Alarm Indication Function is not intended to replace the required audible sounding devices of a UL Certified Burglar Alarm System.

<table>
<thead>
<tr>
<th>Status Selector (CH1)</th>
<th>Audio Level Selector</th>
</tr>
</thead>
<tbody>
<tr>
<td>Select CH1 ON or OFF refer to following chart.</td>
<td>Select the Audio Level Selector MAX or MIN when the Audible Alarm Indicator is used. The volume is always MAX not to concern the setting is MAX or MIN. Select OFF when the function is not used.</td>
</tr>
<tr>
<td>Alarm : Closed/Low</td>
<td>OFF</td>
</tr>
<tr>
<td>Alarm : Open/High</td>
<td>MIN</td>
</tr>
</tbody>
</table>

<Wiring for setting the Audible Alarm Indicator only when the status of control panel is arming.>

Non-Voltage type
The switch is acquired when there is not PGM output at control panel.

Voltage type
The switch is acquired when there is PGM output at control panel.
Connect BX-100PLUS to control panel as drawing.

In the case Audio Control output is not connected, select the Status Selector (CH1) as follows.
Select CH1 OFF when Audible Alarm Indicator is acquired. Select CH1 ON when Audible Alarm Indicator is not acquired.
10. CONFIRMATION OF ACTION

Be sure to confirm after installing.

Alarm LED Indicator

Select the Mode Selector (CH2) ON to select Alarm Mode for conducting a walk test. (See Sec 9). Check that Alarm LED Indicator of the Receiver is OFF.

If the Alarm LED Indicator is ON even though the beams are not blocked, re-adjust the optical alignment (See Sec. 8).

Walk test and cleaning the covers should be conducted annually.

11. TROUBLE SHOOTING CHECK SHEET

When defective conditions are encountered, proceed with the following.

If you have any questions on these procedures, call Technical Support.

1. "No Action" on the transmitter or receiver after power has been applied.

   Check to see that power cables are properly connected and polarity is correct. Yes NO
   
   Correct terminal connection and/or polarity.

   Check to see that input power is within 10.5-28VDC. Yes NO
   
   There is a possibility that the power line has been cut.

   Remove power wires from Power supply's output terminals. Does the power now satisfy the requirements? Yes NO
   
   The power line is short circuited or grounded. Repair as required.

   The power supply may be faulty. Repair is required, or call power supply manufacturer.

2. Alarm signal is being generated or the Audible Alarm Indicator does not stop even though beams are not blocked.

   Go to page 1, trouble shooting procedure, number 1. Yes NO
   
   Check to see that power cables are properly connected.

   Mode Selector(CH2) OFF, which means Alignment Mode. Is the buzzer or the Audible Alignment Indicator beeping? Is the Alignment LED Indicator on the receiver ON? Yes NO
   
   Output is in alarm condition.

   Remove the alarm circuit wire from the receiver, then check the alarm output relay with volt meter. Yes NO
   
   Check the alarm circuit wires for shorts, opens or grounds. Also, check the control panel for proper function.

   Re-align the beams using the Audible Alignment Indicator and the Alignment LED Indicator. Is the buzzer of the Audible Alignment Indicator beeping? Is the Alignment LED Indicator on the receiver ON? Yes NO
   
   Does the unit work properly?

   Is the Power Indicator on the transmitter ON? Yes NO
   
   Double check to see that there are no objects that may be blocking the beams.

   Go to page 1, see trouble shooting procedure, number 1.

   Select Mode Selector(CH2) ON, which means Alarm Mode.
3. “No Action” on alarm zone even though the beams are blocked.

- The Alarm LED Indicator ON but control panel does not recognize the alarm signal.
- When the receiver's cover is removed and the beams are blocked, the Alarm LED Indicator does not turn ON.
- When the power for the Transmitter is shut down, the relay goes into an alarm condition.
- Are there any other photoelectric beams near the installation site?
- Although the Alarm LED Indicator is ON, the Audible Alarm Indicator is not sound.
- Does the Audio Level Selector for buzzer select MAX or MIN?
- Cut off branches, mow grass or secure debris to avoid unnecessary activation. Or move the beams.
- Change the mounting place to avoid breaking beams for birds.
- Change the mounting place or height to avoid breaking beams for small animals.
- Move the beams to avoid the rising or setting sun. Or switch transmitter and receiver locations.
- Keep out the cars blocking beams, or move the beams.
- Check for shorts, open grounds and high resistance values on the alarm circuit wires only, then repair as required. Or, if everything looks to be OK, call Technical Support for further assistance.
- Clean covers both inside and outside using a dry soft cloth or mild soap and water only. Do not use any oil or alcohol based solvents to clean the covers; doing so will cloud or etch the cover and reduce its efficiency.

4. False actuation

- Is the buzzer of the Audible Alignment Indicator beeping? Is the Alignment LED indication on the receiver ON?
- Re-align the beams using the Audible Alignment Indicator and the Alignment LED Indicator.
- Change the footing, pole or structure to insure a stable mounting surface.
- Are the beams mounted on a stable footing with little movement of the mounting structure?
- There are plants, trees or debris that may block the beam during windy conditions.
- The unit may be detecting a large bird.
- The units may be detecting small animals (dog, cat, etc...)
- The receiver is facing directly at the rising or setting sun.
- The covers are very dirty or dusty.
- Bad wiring or corroded splice.
- There are cars that may block the beam.

Important
The majority of false activation can be attributed to poor beam alignment. Should adjust the beam alignment until alignment status achieves “Good” level.
12. SPECIFICATIONS

<table>
<thead>
<tr>
<th>Model</th>
<th>BX-100PLUS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Range</td>
<td>Outdoor 100 ft (30 m)</td>
</tr>
<tr>
<td></td>
<td>Indoor 200 ft (60 m)</td>
</tr>
<tr>
<td>Maximum Arrival Distance</td>
<td>1000 ft (300 m)</td>
</tr>
<tr>
<td>Detection Method</td>
<td>Simultaneous interruption of 2 infrared beams</td>
</tr>
<tr>
<td>Beam Characteristics</td>
<td>Pulsed Infrared</td>
</tr>
<tr>
<td>Interruption Period</td>
<td>50 ms</td>
</tr>
<tr>
<td>Power Input</td>
<td>10.5 - 28 VDC</td>
</tr>
<tr>
<td>Current Draw</td>
<td>55 mA (Stand by) / 75 mA (Max)</td>
</tr>
<tr>
<td>Alarm Period</td>
<td>2 ± 1 sec (Delay)</td>
</tr>
<tr>
<td>Relay Output</td>
<td>2 relay outputs N.O. and N.C. 28 VDC 0.2 A (Max) each</td>
</tr>
<tr>
<td>Beeping Period</td>
<td>15 sec</td>
</tr>
<tr>
<td>Volume of Audible Alarm Indicator</td>
<td>70 dB (at 1 meter distance)</td>
</tr>
<tr>
<td>Tamper</td>
<td>N.C. opens when cover is removed 28 VDC 0.2 A (Max)</td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>-30°F ~ +131°F (-35°C ~ +55°C)</td>
</tr>
<tr>
<td>Environmental Humidity</td>
<td>95% (Max)</td>
</tr>
<tr>
<td>Alignment Angle</td>
<td>±92 Horizontal</td>
</tr>
<tr>
<td>Mounting</td>
<td>Wall (indoor / outdoor)</td>
</tr>
<tr>
<td>Weight</td>
<td>14.1 oz (400 g)</td>
</tr>
<tr>
<td>IP rating</td>
<td>IP54</td>
</tr>
<tr>
<td>Accessories</td>
<td>Self Tapping Screws x4</td>
</tr>
<tr>
<td></td>
<td>Wring Sponges x2</td>
</tr>
</tbody>
</table>

C

N219

Specification and design are subject to change without prior notice.

WC-1

WC-1&HOOD

SP-1

1 piece

2 pieces

NOTE

This unit is designed to detect an intruder and activate an alarm control panel.
Being only a part of complete system, we can not accept responsibility for any damages or other consequences resulting from an intrusion.