

# **Model PD-100**

## **INSTALLATION and SET-UP**

**WHELEN ENGINEERING COMPANY, INC.**

Document # 04-0113165-01C

### **Installation -**

The PD-100 requires a four conductor cable. The cable connects to a 4 position screw-terminal connector, inside of the PD-100 housing. Two wires are for +VDC and ground and two wires are for the output contact closure. The +VDC value is 11-16 volts DC. The voltage at the detector must not drop below 11 VDC. The recommended wire gauge for +VDC and ground is:

18 AWG for runs from 1 to 100 feet  
16 AWG for runs from 100 to 250 feet  
14 AWG for runs from 250 to 500 feet

The output contact closure wiring requirement is dependent on the load. Remember that the output is only rated at 250 milliamps.

To make the wiring connections, remove the front of the unit, by loosening the four captive screws in the cover. Route the cable through the cable clamp in the bottom of the PD-100. Connector numbering is:

Pin 1    Contact +  
Pin 2    Contact -  
Pin 3    Ground  
Pin 4    +VDC

Pin 1 is to the left of the printed circuit board, Pin 4 is to the right, closest to the rotary switches. The connector may be removed for easier access to the screws.

### **Mounting -**

The PD-100 is equipped with an aluminum mounting flange. Select a fixed surface or pole for mounting. Attach the detector so that it is aimed at the target area. Make sure that the cable clamp is facing down. Seal the clamp or use a water tight clamp as required.

### **Indicator -**

The LED indicator, on the face of the unit, will be illuminated green, when +VDC is applied. The LED indicator changes to amber when the output is active.

## Switch Settings -

There are four rotary switches located along the right side of the printed circuit board. These switches are used for setting the following: (Switch 1 is the top switch, next to the connector, Switch 4 is the bottom switch, nearest to voltage regulator.)

|          |                                   |
|----------|-----------------------------------|
| Switch 1 | Minimum Detection Range (in feet) |
| Switch 2 | Maximum Detection Range (in feet) |
| Switch 3 | Mode of Operation                 |
| Switch 4 | Pulse Timing                      |

The Minimum Detection Range defines the minimum distance, from the PD-100, at which a detection output will occur. The range is expressed in feet, with a typical tolerance of +/- 6 inches.

The Maximum Detection Range defines the maximum distance, from the PD-100, at which a detection output will occur. The range is expressed in feet, with a typical tolerance of +/- 6 inches.

The Mode of Operation defines the type of detection and output which will occur. The modes are:

- Presence**        The output remains active as long as an object is detected, in the detection window, as defined by the minimum range and maximum range settings.
- Pulse on Enter**    The output pulses, for the time duration set by switch 4, when an object is detected moving into the detection window. The pulse time may be set from 100 ms to 10 seconds.
- Pulse on Exit**     The output pulses, for the time duration set by switch 4, when an object is detected moving out of the detection window. The pulse time may be set from 100 ms to 10 seconds.
- Retrigger**        The output pulses, for 15 seconds, when an object is detected moving in the detection window. The PD-100 continues to “look” for objects in the detection window, during the 15 second on time. Any subsequent detection causes the output on time to be extended by 15 additional seconds.
- Slow Presence**    The output remains active as long as an object is detected, in the detection window, as defined by the minimum range and maximum range settings. The sampling rate for this mode is 2 times per second versus 10 times per second in the regular Presence mode.
- Extended Pulse on Enter**    The output pulses, for the time duration set by switch 4, when an object is detected moving into the detection window. The pulse time may be set from 15 seconds to 30 minutes.
- Extended Pulse on Exit**    The output pulses, for the time duration set by switch 4, when an object is detected moving out of the detection window. The pulse time may be set from 15 seconds to 30 minutes.
- Test Mode**        The output continuously pulses on for 2 seconds and off for 2 seconds.

Each switch has 16 positions, labeled 0 through F. The meaning of each switch position is shown in the tables below. Note that the pulse time meanings of Switch 4 change depending on the Mode of Operation selected with Switch 3.

| Switch 1<br>Min Detection Range |            | Switch 2<br>Max Detection Range |            | Switch 3<br>Mode of Operation |                     |
|---------------------------------|------------|---------------------------------|------------|-------------------------------|---------------------|
| Sw Pos.                         | Definition | Sw Pos.                         | Definition | Sw Pos.                       | Definition          |
| 0                               | 2 feet     | 0                               | 6 feet     | 0                             | Presence            |
| 1                               | 3 feet     | 1                               | 7 feet     | 1                             | Pulse on Enter      |
| 2                               | 4 feet     | 2                               | 8 feet     | 2                             | Pulse on Exit       |
| 3                               | 5 feet     | 3                               | 9 feet     | 3                             | Retrigger           |
| 4                               | 6 feet     | 4                               | 10 feet    | 4                             | Slow presence       |
| 5                               | 7 feet     | 5                               | 11 feet    | 5                             | Ext. pulse on Enter |
| 6                               | 8 feet     | 6                               | 12 feet    | 6                             | Ext. pulse on Exit  |
| 7                               | 9 feet     | 7                               | 13 feet    | 7                             | not used            |
| 8                               | 10 feet    | 8                               | 14 feet    | 8                             | not used            |
| 9                               | 11 feet    | 9                               | 15 feet    | 9                             | not used            |
| A                               | 12 feet    | A                               | 16 feet    | A                             | not used            |
| B                               | 13 feet    | B                               | 17 feet    | B                             | not used            |
| C                               | 14 feet    | C                               | 18 feet    | C                             | not used            |
| D                               | 15 feet    | D                               | 19 feet    | D                             | not used            |
| E                               | 16 feet    | E                               | 20 feet    | E                             | not used            |
| F                               | 18 feet    | F                               | 22 feet    | F                             | Test Mode           |

Use for Modes 1,2

| Switch 4<br>Pulse Timing |            |
|--------------------------|------------|
| Sw Pos.                  | Pulse Time |
| 0                        | 100 ms     |
| 1                        | 200 ms     |
| 2                        | 300 ms     |
| 3                        | 400 ms     |
| 4                        | 500 ms     |
| 5                        | 600 ms     |
| 6                        | 700 ms     |
| 7                        | 800 ms     |
| 8                        | 1 second   |
| 9                        | 2 seconds  |
| A                        | 3 seconds  |
| B                        | 4 seconds  |
| C                        | 5 seconds  |
| D                        | 6 seconds  |
| E                        | 8 seconds  |
| F                        | 10 seconds |

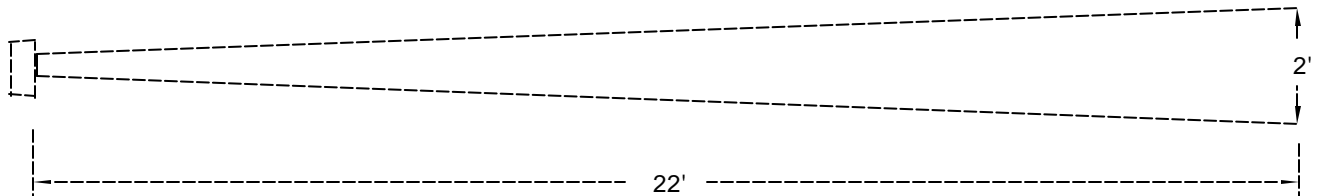
Use for Modes 5,6

| Switch 4<br>Extended Pulse Timing |            |
|-----------------------------------|------------|
| Sw Pos.                           | Pulse Time |
| 0                                 | 15 seconds |
| 1                                 | 30 seconds |
| 2                                 | 45 seconds |
| 3                                 | 60 seconds |
| 4                                 | 2 minutes  |
| 5                                 | 3 minutes  |
| 6                                 | 4 minutes  |
| 7                                 | 5 minutes  |
| 8                                 | 10 minutes |
| 9                                 | 15 minutes |
| A                                 | 20 minutes |
| B                                 | 25 minutes |
| C                                 | 30 minutes |
| D                                 | ”          |
| E                                 | ”          |
| F                                 | ”          |

## Application Notes -

### BEAM SPREAD

The beam spread of the PD-100 is has a linear spread of approximately 5%, that is +/- 2.5% either side of center. Therefore, the detection beam is about 2 feet in diameter, at a detection distance of 22 feet.



### OUTPUT RATING

The output of the PD-100 is a solid state, optically isolated, MOSFET device. The output is normally open. When the output of the PD-100 is turned on, it goes to a low resistance state of about 2 ohms. The output is rated for 250 mA, at 250 volts.

### RANGE SETTINGS

If the Maximum Detection Range (SW 2) is set to 8 or greater, it is recommended that the Minimum Detection Range (SW 1) be set to 2 or greater, for best results.