ALERT SAFETY PRODUCTS

Forklift Warning Systems

Improving Safety With Technology

Directional Worker ALERT

With Hercules 2S Microwave Sensors

User's Manual

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Directional Worker ALERT

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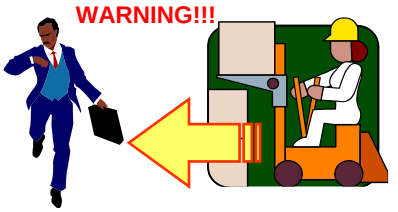
Introduction

Directional Worker ALERT is activated when a vehicle travels towards the microwave sensor. It will not activate on pedestrians or on a vehicle that is traveling away from the sensor. One or more microwave sensors can be used with the Directional Worker Alert.

Directional Worker ALERT is a warning device that alerts workers at blind corners, doorways or intersections of an approaching forklift.



How It Works

The Directional Worker Alert (DWA) has a microwave sensor that detects vehicles as they travel towards the sensor. The DWA can be used to activate our directional CAUTION sign, beacon or other warning device to warn pedestrians and forklift operators that a forklift is approaching a blind corner or intersection. Once the forklift travels through the sensor field the DWA will timeout and reset for the next vehicle. The DWA microwave sensors are configured to detect only vehicles as they approach the sensor and will not activate on pedestrians or vehicles traveling away from the sensor. The Hercules 2S sensors have independent outputs for vehicles and pedestrians so the pedestrian field can be made smaller than the vehicle field if pedestrian detection is enabled.

Directional Worker Alert Components

The Directional Worker Alert System consists of a DWA control box, one or more Hercules 2S microwave sensors, a remote control and an AC adapter. The low voltage (16VAC) plug-in AC adapter needs to be installed within 100' of the DWA control box with user supplied 2 conductor 18 gauge wire.

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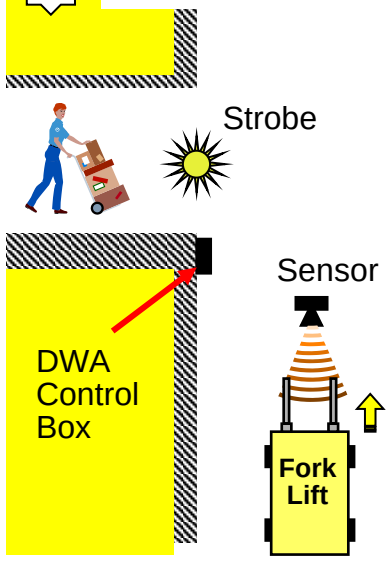
Installation & Operation

The Directional Worker ALERT has been carefully designed so that the user can install it with common tools. Just follow these steps.

1 Mount the DWA Components



Mount the sensor at a height of 8' to 23' in the middle of the aisle pointing towards the approaching traffic. Set the angle of the sensor at 60 degrees for a detection field of 25' to 45' from the sensor.

Mount the warning device at the place where workers need to be alerted of the approaching vehicle.

Mount the control box at a convenient location close to the sensor. The sensor cable is 16' long.

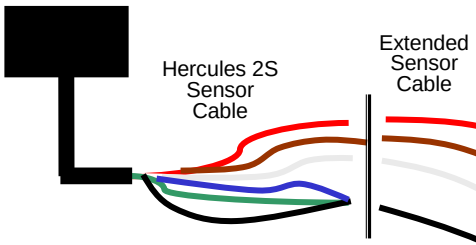
The AC adapter will plug into a standard 120VAC outlet and should be located within 100' of the DWA control box.

The sensor is adjustable in 15 degree increments from 0 degrees to 90 degrees. 0 degrees is pointing directly at the ground.

Extending the 2S Sensor Cable

If the microwave sensors can not be located within 20' of the BDWA control box you can splice up to 100' of additional cable on the sensors. Connect the sensors to the "Sensor Terminal" in the DWA as shown below. We recommend using 22 gauge multi-conductor control cable such as Belden #8443 or similar cable. You can remove the back panel from the sensor and wire a longer cable directly to the sensor terminals as shown below or splice to the existing sensor cable.

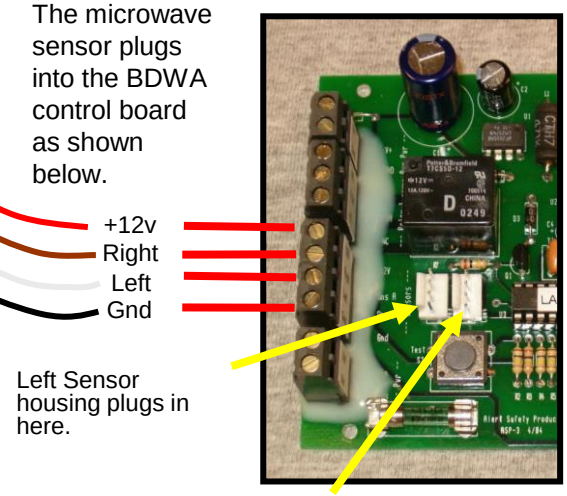
Multiple "Auxiliary" sensors can be wired to the sensor input terminals in the BDWA as shown below.



Sensor Cable & Ter #			DWA Terminal
+12V	Red	(2)	+12V
Output 1	White	(3)	Lt or Rt
Output 1Gnd	Green	(5)	Gnd
Output 2	Brown	(6)	Lt or Rt
Output 2 Gnd	Blue	(7)	Gnd
Ground	Black	(1)	Gnd

2 Connect the Sensors

The microwave sensor plugs into the BDWA control board as shown below.

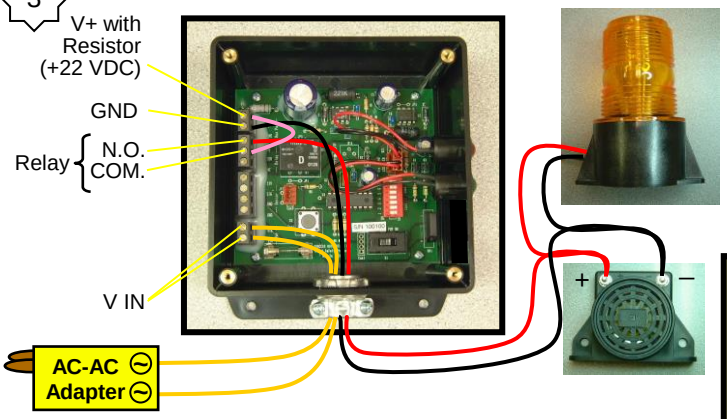


Sensor Outputs #1 and #2 are wired together on each 2S sensor (pedestrian & vehicle fields).

Use 2 conductor 18 gauge cable for the AC Adapter and 22 gauge cable for the warning devices.

The sensors should be mounted so they are pointing directly towards the approaching traffic. If they need to be swiveled they can be mounted on a 4" angle bracket using the center hole in the sensor bracket. This is shown on page 3 "optional ceiling mounting" in the Bircher 2S sensor manual.

3 Connect the Directional Worker ALERT Components



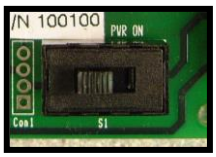
- Connect the power terminals (~ and ~) on the AC adapter to the V IN power terminals in the base unit.
- Connect the Strobe or other warning device (-) to the GND terminal.
- Connect the Strobe or other warning device (+) to the relay N.O.

Note: The AC Adapter and limiting resistor may be used to power only our warning devices. Remove the Limiting Resistor (V+ to COM) before wiring externally powered warning devices. See page 7, Externally Powered Alarms

4 Turn the Base Unit ON

Plug the AC adapter into a 120VAC outlet and turn the power switch to the ON position. The Green Power LED will be on when the DWA is turned on.

Internal Power Switch



Installation of the DWA is complete. Proceed with the sensor setup.

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2S Microwave Sensor Setup

The microwave 2S sensors settings can be read and changed from the floor using a remote control. A detailed description of the sensor settings and programming is in the Hercules 2S sensor manual from Bircher that is included with the system. Other than checking and possibly changing the setting for the sensor mounting height, all other sensor presets should work for most applications.

2S Sensor Configuration Mode

The Sensor will time out of the configuration mode 30 minutes after it was last powered on or accessed. If the configuration mode has timed out it can be entered by powering the sensor off and back on or by using the following commands:

1) Press the start key G, one of the keys 1-4 will light up.
2) Press D then 9, D and 2 light up.
3) Enter the four digit code 1234
4) Press D, D and 2 should light up, the configuration mode is now activated.

Any other remote control commands can now be accessed for 30 minutes.
The G key only needs to be pressed 1 time as long as the remote remains powered on.

Programming the Mounting Height

The sensor should be programmed with the correct mounting height. The default setting from the factory is from 10' to 13' measured from the floor to the sensor. If this is not the correct mounting height for the sensor follow these steps to program the correct mounting height for the sensor.

1) Make sure the sensor is in the configuration mode as described above.
2) Press G then A followed by the desired height setting:
   - 1 for a sensor height of 6' 6" to 8'
   - 2 for a sensor height of 8 1" to 10'
   - 3 for a sensor height of 10 1" to 13' default
   - 4 for a sensor height of 13 1" to 16 6"
   - 5 for a sensor height of 16 7" to 19 5"
   - 6 for a sensor height of 19 6" to 23'
3) To read the sensor height setting press G then A.
   The sensor height setting of 1 thru 6 will be displayed on the remote.

The other sensor commands can be programmed and read in a similar fashion as described in the Hercules 2S manual.

Mounting Angle & Field Size

The mounting angle of the sensor is adjustable and can be changed to adjust the field size. Setting it at 60 degrees will provide a detection field that covers 20' to 35' from the sensor and is approximately 12' wide. This is with a mounting height of 12' and the field dimension set at 3. The field size can be adjusted by changing the angle and field dimension setting of the sensor. A mounting angle of 0 degrees is pointing directly at the floor.

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2S Microwave Sensor Defaults

The microwave sensor comes with the following default settings which should work for most applications. Refer to the included Hercules 2S sensor manual for additional sensor specifications and settings. A small green LED on the sensor will come on when vehicles are detected and a small red LED on the sensor will come on when pedestrians are detected (if pedestrian detection is enabled).

Sensor Default Settings - Hercules 2S

Following are the default settings and commands for the microwave sensors:

Access Code:	1234 (code saved)	D,9,(2)
Mounting Height:	1-6 (10.to 13')	A,(3)
Field Size:	1-5 (large)	D,(4) output #1
	(small)	E,(2) output #2
Relay Hold Interval:	1-9 (2.0S delay)	F,1,(4) output #1
	1-9 (output off)	F,2,(9) output #2
Output Configuration:	1-9 (Vehicles, Forwards)	B,(1) output #1
	1-9 (People & Vehicles Fwds)	C,(7) output #2
Output Logic:	1,2 (Normally Open)	F,3,(1) output #1
	1,2 (Normally Open)	F,4,(1) output #2
Cross-Traffic Optimization:	1-4 (High)	F,5,(4)
Wide Field:	off	use internal programming buttons
Slow Motion Detection:	1,2 (Off)	F,7,(1)
Interference Filter:	1,2 (Off)	F,6,(1)

Values in ( ) are read back when command is entered

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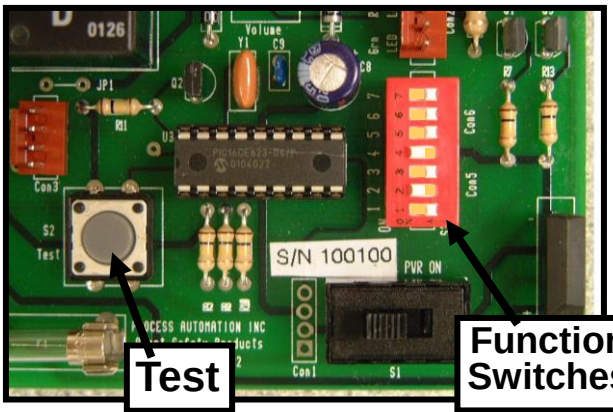
Control Unit Settings

The DWA control box has a programmable warning duration that is added to the sensor relay hold interval. This delay will begin after the sensor relay hold time has timed out.

Additional Warning Duration

An additional warning duration in the DWA control box can be adjusted from 2 seconds to 32 seconds. Use a small screwdriver to flip the switches. You can try your settings by pressing the Test switch. The default setting for this from the factory is 2 seconds.



Microwave 2S Sensor & System Testing

The microwave 2S sensors can be manually activated by entering the command F,1,8. The small green LED on the sensor will come on and the DWA and warning devices will turn on. Enter the command F,1,4 to turn the sensor off and set the hold time to 2 seconds.

To test system with pedestrian traffic enter the command F,2,8. The red LED on the sensor, the DWA and warning devices will turn on as you walk towards the sensor and are in the small pedestrian detection field. Enter the command F,2,9 to turn the sensor output #2 off (the default setting).

Press and hold the “G” button on the remote for 2 seconds to turn on the remote.

Function Switches							Duration
1	2	3	4	5	6	7	Seconds
				*	**	---	2
On				*	**	---	4
	On			*	**	---	6
On	On			*	**	---	8
		On		*	**	---	10
On		On		*	**	---	12
	On	On		*	**	---	14
On	On	On		*	**	---	16
			On	*	**	---	18
On			On	*	**	---	20
	On		On	*	**	---	22
On	On		On	*	**	---	24
		On	On	*	**	---	26
On		On	On	*	**	---	28
	On	On	On	*	**	---	30
On	On	On	On	*	**	---	32

Legend:

Blank = Off
SW 5(*):
Not Used
SW 6(**)
Not Used
SW 7 (---)
Not Used

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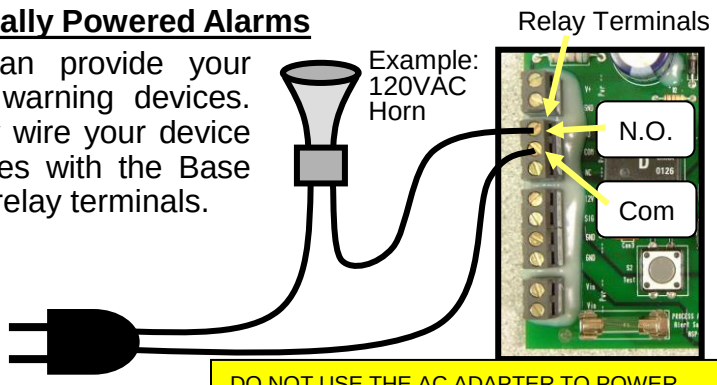
Specifications

Special Message

While we cannot anticipate all of the conditions you may encounter, we hope that we have given you enough information that your inventive spirit will take over to solve those really challenging cases. On the other hand, our consulting services are always available to create custom solutions for unique problem areas.

Externally Powered Alarms

You can provide your own warning devices. Simply wire your device in series with the Base Unit's relay terminals.



DO NOT USE THE AC ADAPTER TO POWER USER-SUPPLIED WARNING DEVICES. REMOVE THE LIMITING RESISTOR (V+ to COM) SUPPLIED WITH THE UNIT AND WIRE YOUR EXTERNAL DEVICES AS SHOWN ABOVE.

Specifications

- Sensor:
  - Max Range: 55'
    w/appx field width of 12' at 35'
  - Mounting angle: 15 to 90 degrees
    adjustable in 15 degree increments
  - See sensor manual for other sensor specifications
- Power Requirements
  - 120 VAC Standard Wall Outlet
  - Plug-in Class II AC Adapter provides 16 VAC 40W
  - V+ Accessory Power 24VDC at 1.5 amps max
  - Fuse: 5.1 Amp, slow-blow, 5x20 mm
- Mounting:
  - DWA control box - 4 mounting holes
- DWA Control Box User Adjustments:
  - Timeout Warning Duration
    - 2S to 32S in 2 second steps.

Directional Worker Alert is intended to enhance safety, not to relieve the user's responsibility to comply with OSHA and other safety requirements. The user is responsible for maintaining and testing all ALERT Safety components. See the "Terms and Conditions of Sale" for specific warranty and other information.

Important Notice!!!

The use of this system or any other warning device does not insure that all drivers and pedestrians can or will observe or react to a warning signal. Never take the right-of-way for granted, it is your responsibility to be sure you can proceed safely. The effectiveness of this warning system is highly dependent upon correct mounting, wiring and installation. Vehicle operators and plant personnel should insure daily that all features of the system are operating correctly.

Alert Safety Products are intended to enhance safety, not to relieve the user's responsibility to comply with OSHA or other safety requirements. The user is responsible for maintaining, testing and cleaning all Alert Safety components including photo sensors and reflectors. Alert Safety Products, Inc assumes no liability for any loss resulting from the use of this warning system. See the "Terms and Conditions of Sale" for specific warranty and other information.

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