

AIRSYS Infrared Alarm System

Installation and Operation Manual

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SAFETY INSTRUCTIONS

IMPORTANT

All installation and service work must be done by qualified professional technicians. Always wear protective gear and comply with all general and local safety standards and codes. Adhere to all warnings and safety instructions on the units and in this manual. AIRSYS shall not be held liable for any damage to persons or property due to improper operation or servicing of this equipment.

WARNING

Risk of electric shock. Switch off electric breakers or fuse box before installing or servicing the indoor control panel. Failure to comply can cause serious injury or death.

CAUTION

Risk of contact with sharp edges. Always wear protective gloves when handling panels and other components. Failure to comply can cause injury.

1. INTRODUCTION

The AIRSYS Infrared Alarm System is an anti-theft alarm system that is designed to detect and prevent copper coil theft and trespassing in general.

Traditional anti-theft systems trigger after the HVAC has been broken into or when power/refrigerant lines have been cut. Although theft may be prevented, costly damage has been done to the HVAC. Using proven infrared motion sensing technology, the main advantage of the AIRSYS system is that it detects and deters before vandals can get close enough to damage the HVAC units.

The system consists of 4 main components:

- **Indoor Control Panel**

The indoor panel has a simple toggle switch to disable the alarm during maintenance or when other work is done near the HVAC units. It is powered by 48VDC to ensure continuous operation even when utility power or generator power is lost. The control panel has a form C contact relay which can be used for remote monitoring.



Figure 1: Control Panel

- **Infrared Motion Detector** (Up to 3 Detector per control Panel)

Each waterproof detector is composed of multiple high-precision passive infrared sensors and a fuzzy logic control board to filter out triggers from small animals. Adjustable detection range can reach as far as 35ft and as close as a few inches outside of the HVAC. Infrared radiation does not depend on daylight and will continue to operate at complete darkness. Tampering with or cutting the cable of the detector will trigger the alarm.



Figure 2: Motion Detector

- **Voice Alarm**

The voice alarm box provides audio message warning intruders to immediately leave the area covered by the infrared detectors.



Figure 3: Voice Alarm

- **Siren Box**

The siren box with its reflective red paint provides visual warning from afar. Should the intruder loiter or repeatedly enter the area despite the audio warning message, the siren, adjustable up to 115 dBA, and the strobe light, will activate for up to 5 minutes



Figure 4: Siren Box

2. INSTALLATION

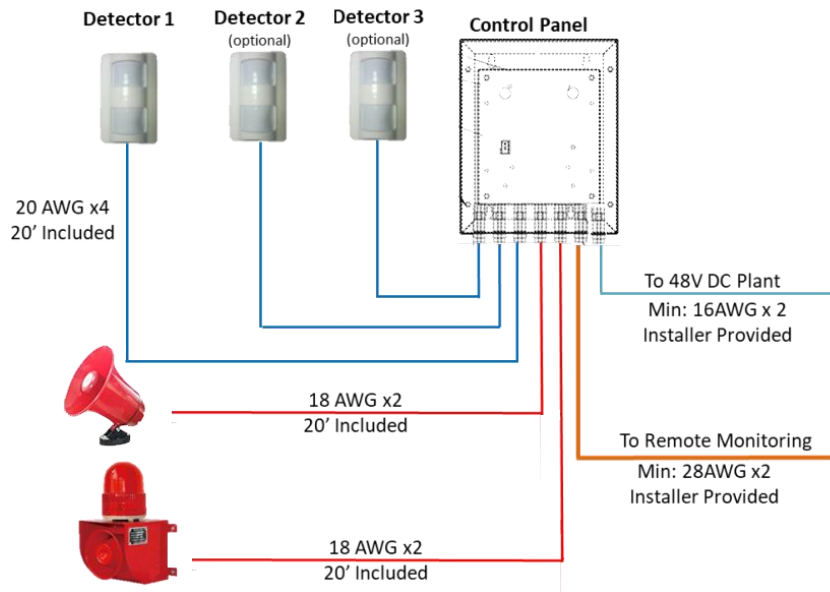


Figure 5: System Overview

2.1. AIRSYS Provided Materials

Before installation, verify that all AIRSYS Provided Material are present:

Table 1: AIRSYS Provided Material

No.	Part #	Qty	Description	Comments
1	2040003740	1	Control Panel ASATB.2	48VDC, including Connectors
2	2121007160	1	Siren Box	20' cable and connector included
3	2121007500	1	Voice warning Box	20' cable and connector included
4	2040316100	Up to 3	Infrared Motion Detector	20' cable and connector included
5	8552600560	4	M4.2*25 Self-tapping screw	For mounting control box
6	2040314380	1 (Optional)	Configuration Panel	For configuring custom settings (such as custom trigger delay). Not necessary for operation.
7		1	User Manual	This document

2.2. Installer Provided Material

Table 2: Installer Provided Material

No.	Item	Qty	Description	Comments
1	Wire for DC power supply	2	A set of two wires for -48VDC and return	Min 16 AWG
2	Breaker for DC power supply	1	5 Amp breaker for DC plant	
3	Wire Extension	As needed	As needed to extend the included 20' cable if longer distance is needed	Min 18 AWG
4	Wire for Remote Monitoring	2	A set of wire for remote monitoring	Min 28 AWG
5	Wiring Conduit	As needed	As needed based on wire routing	
6	Bolts and Anchors	As needed	As needed to secure Siren and Motion detector	

2.3. Mounting Infrared Detectors

There are several ways to install the infrared detectors and different sites may demand different sensor installation locations. Selecting an appropriate mounting location is critical for the anti-theft system.

NOTE: when the system is armed, cutting the cable to any of the detectors will trigger the alarm.

Orientation

The motion detectors senses change in infrared radiation in a fan shaped field spread out horizontally and below the sensor as shown in the diagram below. The cables route through the bottom of the detector.

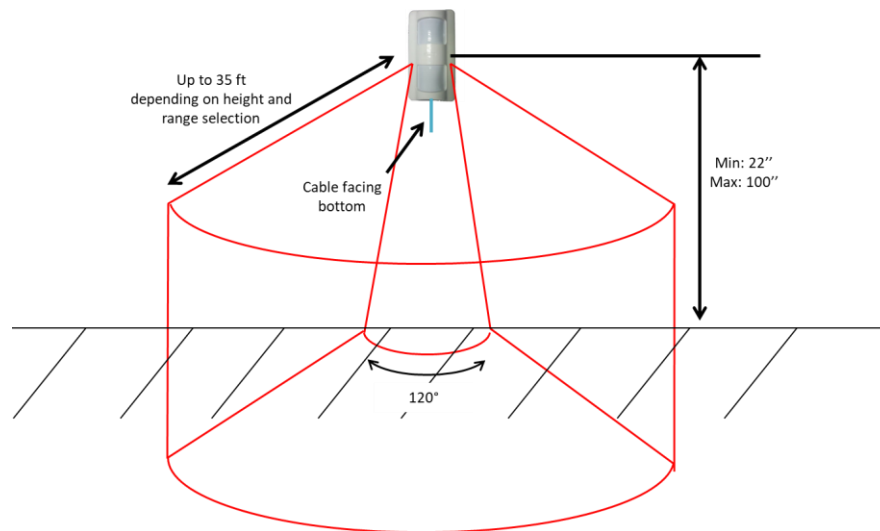


Figure 6: Detection Range

Recommended Location: Below HVAC

The recommended installation location is on the wall right below the center of each HVAC you are providing protection for. This requires the HVAC to be a minimum 25" off the ground. Place the motion detector as high as possible.

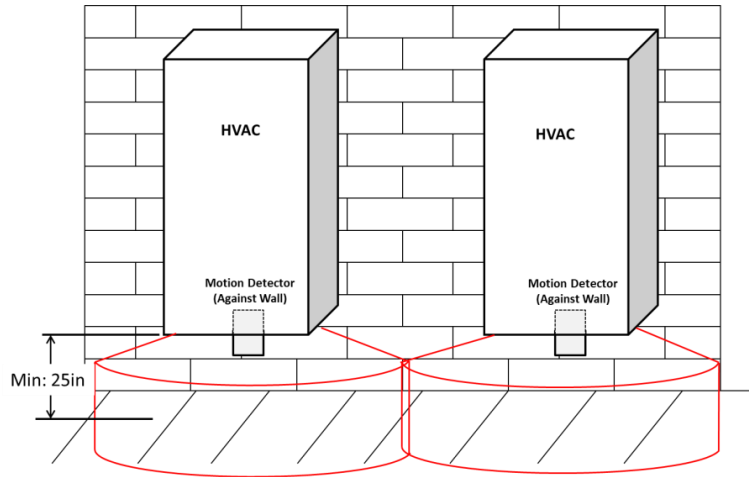


Figure 7: Mounting below HVAC

Alternative 1: on Wall

This alternative location needs minimum of 20in wall space for effective coverage.

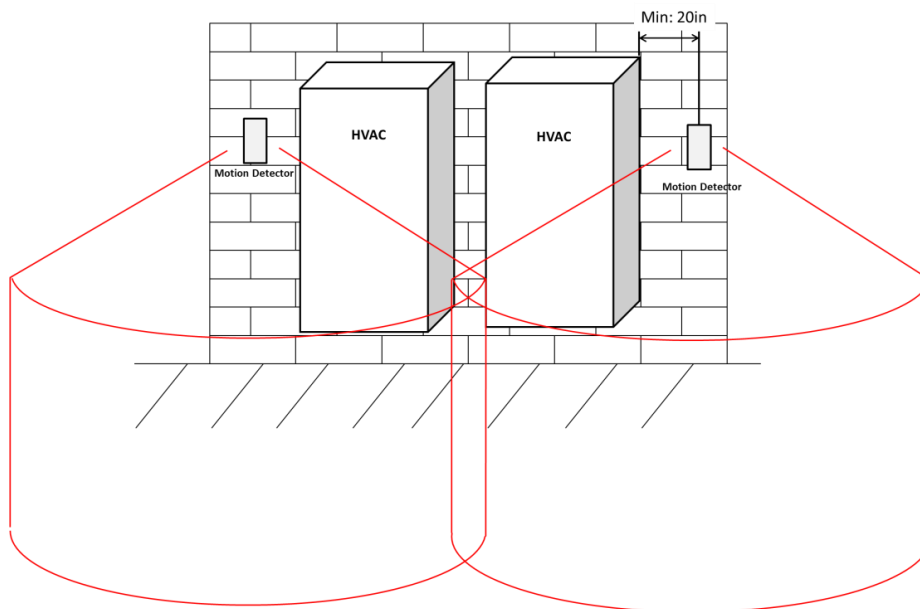


Figure 8: Mounting on Wall

Alternative 2: on HVAC

For this method, a minimum of 3 detectors for 2 side by side HVACs are required for effective coverage. Since panels should be removable for maintenance, avoid using fixed conduits with this method.

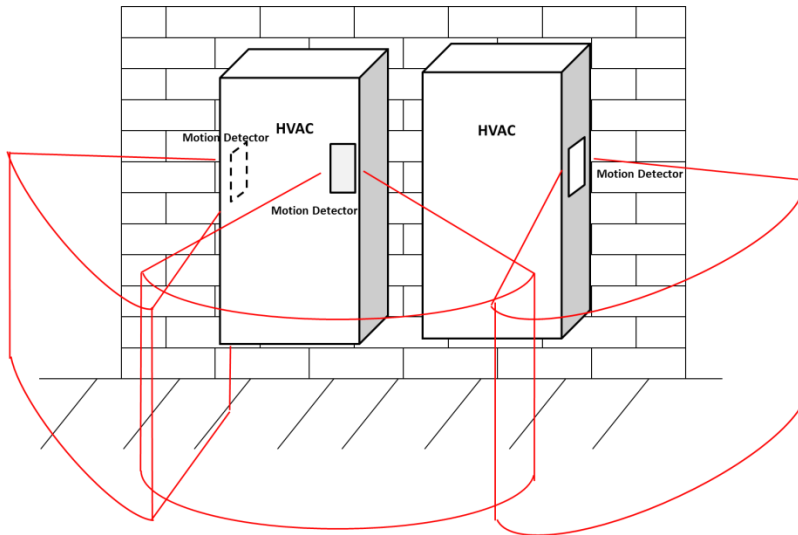


Figure 9: Mounting on HVAC

Alternative 3: On nearby surface

If there are walls or other surfaces on the side or facing the HVAC units, they can be used for motion detectors.

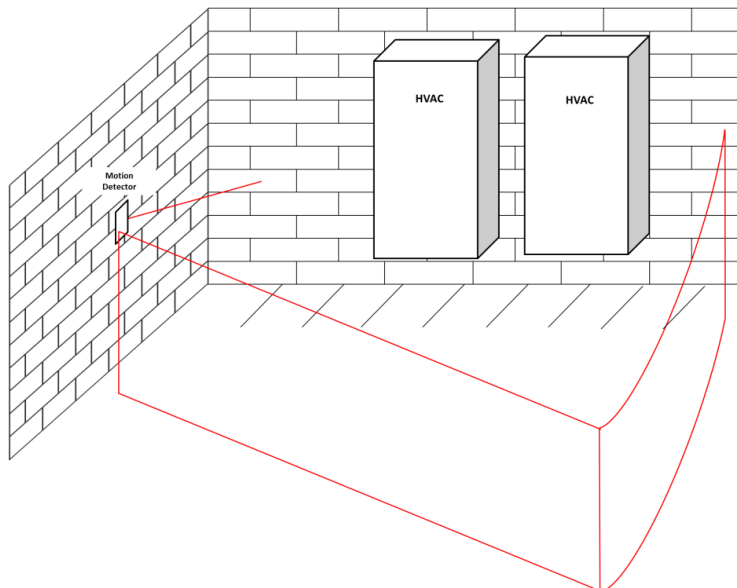


Figure 10: Mounting on Nearby Surface

2.4. Mounting the Control Panel

Find a suitable location inside the shelter to mount the controller box. Mount the controller box so that it is near the operator's eye level.

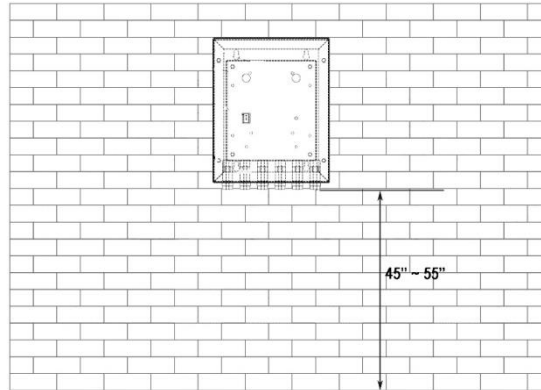


Figure 11: Mounting Control Panel

2.5. Mounting the Voice Alarm

The voice alarm comes with neodymium magnets at the base and can be mounted directly on the HVAC unit.

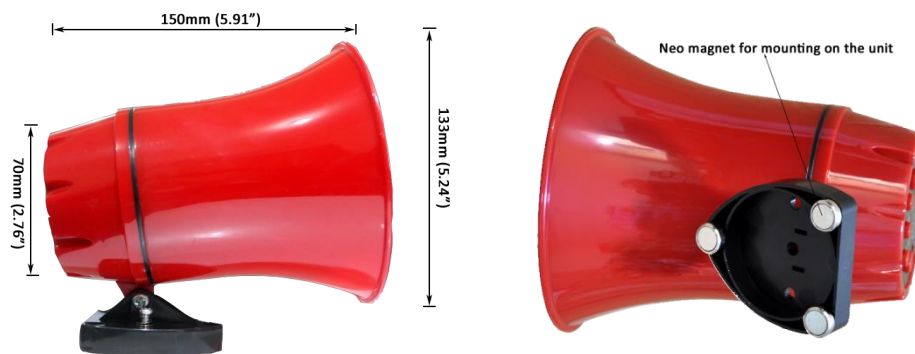


Figure 12: Voice Alarm

2.6. Mounting the Siren Box

It is recommended to mount the Siren box in a visible place, such as on the wall near the HVACs. The siren box should NOT be accessible without first entering areas protected by the infrared detectors.

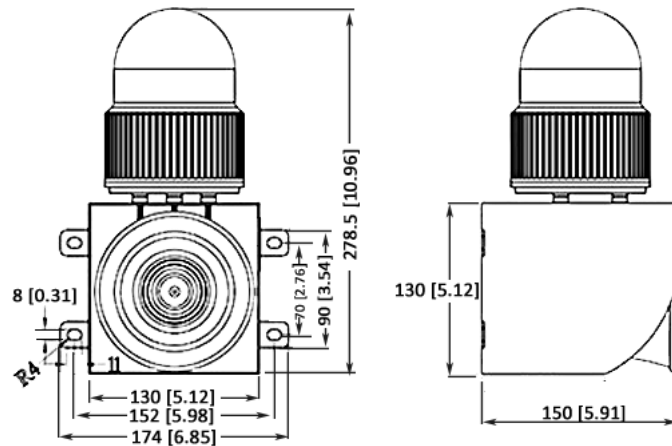


Figure 13: Siren Box

2.7. Electrical Connections

Connect the system according the connection list and diagrams below

Table 3: List of Electric Connection

No.	Connection	Comments
1	Control Panel to 48 VDC plant	Supplies power to the controller. Requires 16AWG or larger cable.
2	Siren to Control Panel	Connect the siren to the control panel using the included cable. Extend with 18AWG as needed
3	Voice Alarm to Control Panel	Connect the voice alarm to the control panel using the included cable. Extend with 18AWG as needed
4	Detector to Control Panel	Connect the detectors to the control panel using the included cable and connector. Extend with 24 AWG as needed.
5	Remote Monitoring Output	Supplies alarm output to external devices. N.O. or N.C.

Field Wiring Diagram

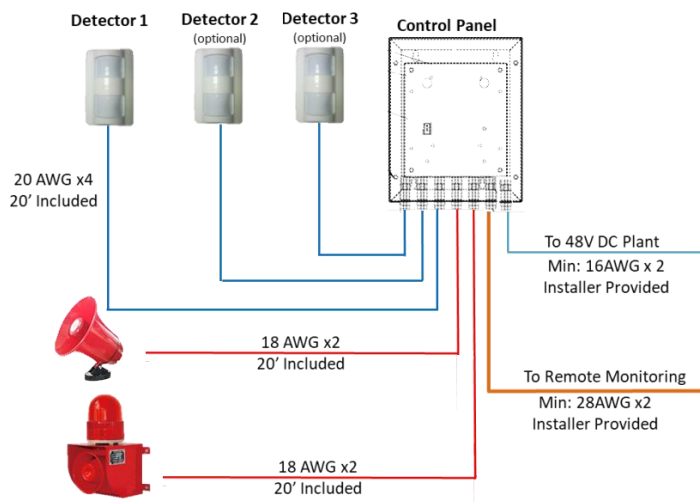


Figure 14: Field Wiring Diagram

2.8. Select Detection Range

Detection range can be independently selected on each of the infrared detectors. There are 4 settings, 3-6m (10-20'), 5-9m (16-30'), 6-12m (20-40'), and 9-18m (30-60'). To select a range setting, open the sensor cover and adjust setting as shown below:

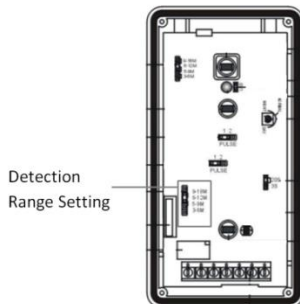


Figure 15: Detection Range Setting

Actual detection range is determined by the range setting as well as installation height of the sensors.

Table 4: Detection range based on setting and installed height

Detection Setting Installation Height	3-6m	5-9m	6-12m	9-18m
	Approximate Max Detection Range			
22"	60"	135"	185"	200"
50"	120"	165"	250"	300"
80"	140"	200"	260"	360"
100"	160"	250"	300"	400"

2.9. Verification Test

Follow the steps below to verify that the alarm system is installed correctly:

1. Supply 48VDC to the control panel.
2. Switch the power switch to ON.
3. Switch the control switch to ARMED.
4. After initial ~5 seconds start up, enter the area protected by the motion detectors. The voice warning alarm should activate.
5. Repeatedly enter and leave the area 3-4 times in a minute. You should hear the siren. You should also verify that the remote alarm has triggered. HINT: A Faint red LED from the motion detector will display when it triggers.

“Trigger” ≡ locked into alarm (siren and bubble light will engage)

2.10. Installation Checklist

You should now have completed all the installation steps. Before starting the system, ensure that no steps have been omitted by completing this installation and wiring checklist.

Table 5: Installation Checklist

Date: _____	
PHYSICAL	√ or X
Detection sensors have been mounted firmly at the appropriate position on the unit or wall.	
Any wall penetrations made for wiring have been sealed	
Control panel has been mounted firmly at the proper position.	
Siren has been mounted firmly at the proper position.	
ELECTRICAL	
The connections are tight & secure from the Indoor Control Panel to 48VDC power supply	
The plug-in connectors are well connected to Indoor Control Panel.	
Alarm system has been verified according to section 2.7 Verification Test	

3. OPERATION

3.1. Basic Operation

Power switch: Turns the system on/off. Turning the power switch off will shut down the alarm system. Turning the switch off and back on will reset any alarm (including the siren).

Control switch: When switched to “Bypassed”, the alarm will be disabled for maintenance for 4 hours. After 4 hours, the system will re-arm regardless of the position of the control switch. This is to prevent against leaving the alarm disabled after maintenance. If the system needs to be shut off for an extended period, use the power switch. The corresponding LED above the switches will also indicate the alarm status.

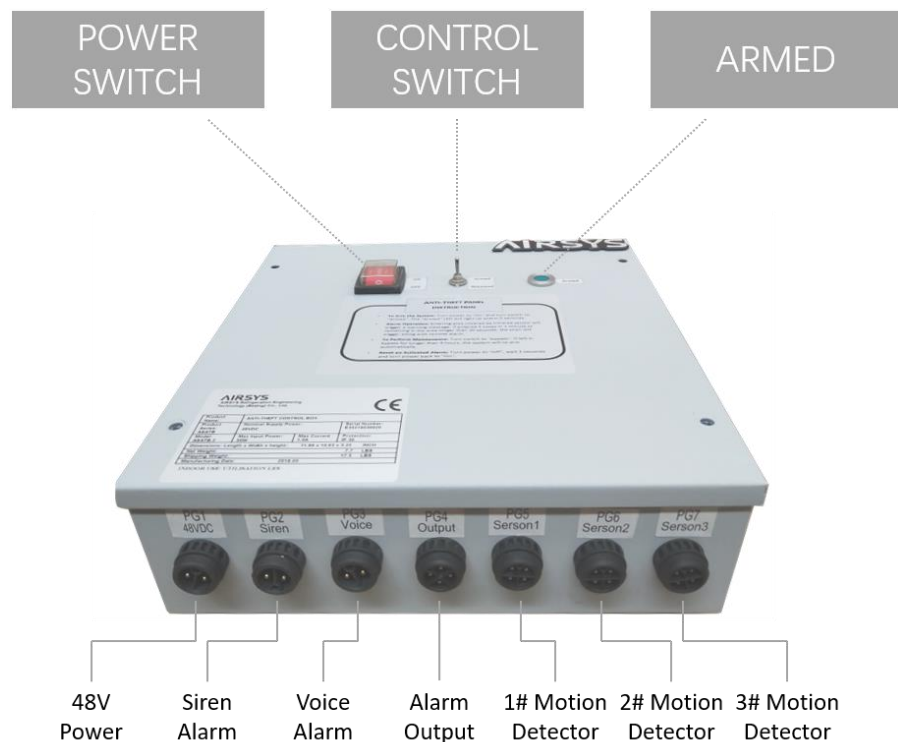


Figure 16: Control Panel Interface

3.2. Alarming Logic

The alarm system will become armed 5 Seconds after the control switch is flipped to “Armed”.

WARNING: If motion is detected on any of the motion detectors, the voice alarm will immediately trigger to function as a warning. If the person immediately leaves the area (within 20 seconds) and no more motion is detected, the voice alarm will shut off in 30 seconds and no further action will be taken..

ALARM: If the intruder remains in the area for 20 seconds or repeatedly enters and leaves the areas 3 times within one minute, the siren is triggered to provide high volume warning and the remote alarm is triggered to notify user/authority simultaneously. The siren will latch on for up to 5 minutes after the last motion detection or until it is shut off from the inside at the control panel. **NOTE:** Tampering with the motion detector or cutting the detector cables will trigger the alarm system.

NOTE: Most delays described in this section can be adjusted according to specific site needs with an optional configuration panel. See section 3.3 “Customizing Configuration” for more details.

3.3. Customizing Configuration

Detection Mode

The infrared motion detector can be configured to trigger based on light level. This can be useful for high traffic area where the alarm is only needed after dark.

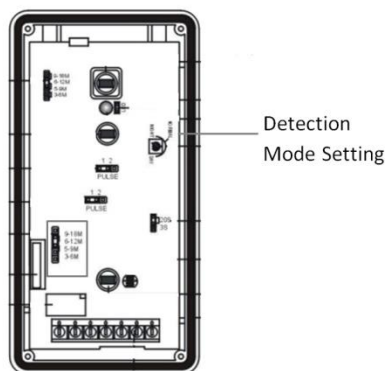


Figure 17: Detection Mode

- Day (default): This should be used in most cases. The alarm triggers regardless of light level
- Normal: Only activates at low light level (evening)
- Night: Only activates at complete darkness

Siren

NOTE: The siren should be installed in areas protected by the motion sensor.

There are several pre-recorded sirens that can be selection. Turn the recording setting knob to scroll through the selections.

Use the volume control knob to adjust the volume from 50-110 dBA.

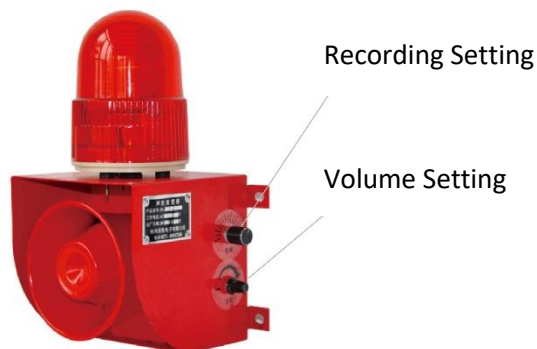


Figure 18: Siren

Alarm Logic Configuration

If changes to the default alarm delays and logic are needed, an optional configuration panel can be used on the indoor control panel. For a complete list of options, see Table 7.

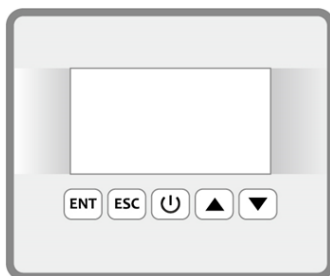







Figure 19: Configuration Panel

Table 6: Configuration Panel Interface

	ENT: Enter selection
	ESC: Return to upper level menu or cancel selection
	Power: Switch the configuration panel on/off
	Up: Increase value or move up cursor
	Down: Decrease value or move down cursor

To enter system configuration:

1. Press ENT to enter main menu
2. Select Set/cfg and press ENT
3. Input password (default: 0003) and press ENT
4. Select and change paramter. See table below for more detail:

Table 7: Alarm Logic Parameters

Label	Description	Default
Auto Re-Arm	Delay in automatically re-arming the system after the control switch is set to "Bypassed". This is to prevent leaving the alarm system disabled after maintenance	4 Hr
D/C Alarm	Siren duration after sensor has been disconnected	1 min
Alarm Latch	Voice alarm duration after intrusion is detected	30 sec
3X Trigger	If the intruder repeated enters and leaves the area 3 times in this amount of time, the siren will trigger	1 min
Cont. Trigger	Siren duration after an alarm has been triggered	120 sec

4. SUPPORT

Support for this system is provided by AIRSYS North America.

If assistance is required, please contact us at:

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