SIGALARM®

INSTALLATION
AND
OPERATION MANUAL
GENERATION 5 WIRELESS

SIGALARM®

CONTENTS

READ THIS MANUAL
IN ITS ENTIRETY
BEFORE
ATTEMPTING
INSTALLATION
—— OR ——
OPERATION

OPERATOR
TRAINING
—— IS ——
ESSENTIAL

**SIGALARM OPERATOR TRAINING CLASSES ARE
AVAILABLE THROUGH THE SIGALARM APP.**

I. OVERVIEW

1.1 GENERAL DESCRIPTION

Sigalarm Wireless proximity alarms are tools used to assist equipment operators to avoid deadly power line contact. They are a reliable operator aid designed to detect the electric field (E-field) present around all overhead Alternating Current (AC) high voltage power lines.

This is a warning system. It is designed to give reliable and repeatable warnings to equipment operators and ground personnel in the proximity of dangerous high voltage to prevent encroachment within an electric field or contact with AC overhead power lines.

Our Sigalarm Wireless proximity alarms are an additional protection and are not intended to replace any existing safety procedures, regulations or laws. The Sigalarm Wireless proximity alarms provide visual alarms, audible alarms, and the option to auto shutdown equipment when alarms are initiated. Proximity Alarms are a powerful tool, when installed and operated by trained professionals, these products can prevent injury and even death.

1.2 UNDERSTANDING E-FIELD DETECTION

Sigalarm Wireless proximity alarms are reliable and finely tuned devices designed to receive only one selective and potentially life-threatening source: the detectible E-field present around all AC high voltage power lines. Sigalarm products use the science of E-field detection to provide equipment operators and ground personnel a warning.

The strength of the signal (E-field) depends on the lines' voltage and the distance from the lines. Simple adjustment of the settings on the Sigalarm unit will provide accurate and repeatable warnings. After the desired setting is made, a visual and audible alarm will occur whenever the specified E-field (voltage) is detected. The goal is to always alert the operator of the proximity to danger in enough time to allow the operator to move away and prevent contact. Therefore, Sigalarm warning systems are only recommended for equipment working 10ft or more from an AC overhead power line.

Our proximity alarms are an additional protection and are not intended to replace any existing safety procedures, regulations, or laws. Sigalarm products do NOT measure distance.

scan to watch video

1.3 SAFETY WARNINGS

Overhead power lines are a constant danger to anyone working with or near equipment that can come into contact with these high voltage lines. No warning system should be used in place of standard safety rules and precautions. No warning device can absolutely prevent an accident. When properly installed and operated, Sigalarm products will provide reliable and repeatable WARNINGS of the presence of voltage.

1.4 SAFETY REGULATIONS

It is the equipment operator's responsibility to know and follow all OSHA, employer, utility, and equipment manufacturers' instructions, rules, and regulations.

2. INSTALLATION

Part #	QTY	Description
WCM5.0	1	Control Module, Generation 5
WS4.0	1-16	Sensor(s)
7315-w	1	Parts Bag
WPASPC-5P	1	Speaker
5.0G5CMC	1	Cable: with Power supply, relay, and speaker cable
G5T-005	1	Mounting Bracket

2.2 INSTALLATION PRECAUTIONS

It is highly recommended that Sigalarm products are installed by a certified Sigalarm installer or competent person. Prior to the use of Sigalarm products, training should be given to the operator by a certified trainer or competent person. Always test the installation at a safe distance from high voltage power lines. Use extreme care and a spotter while testing this equipment.

2.3 INSTALLATION OF THE CONTROL MODULE; SIGALARM WCM5.0

The main component of the Sigalarm system is the control module WCM4.0. It should be mounted in the immediate vicinity of the operator in plain view, without obstructing their view of the work area.

> Systems with an IP rating will be clearly marked. If your control module does not have an IP rating displayed, do not assume it is waterproof.

2.4. CONNECTING THE CONTROL MODULE TO A POWER SOURCE

Attach the supplied cable labeled "power cable" 5.0G5CMC to a 12v to 48v DC power supply. The 5.0G5CMC cable has a Grey jacket with, red, black and a white conductor. It can be installed one of two ways.

SYNCHING WITH THE SIGALARM APP

If you are using the Sigalarm Monitoring app (when available), scan the QR code on the back of the control module to synch it to your app.

SWITCH POWER (Recommended)

5.0G5CMC, GREY Power cable - Red (Pin 9) Positive – always on 12-48v DC
5.0G5CMC, GREY Power cable - White (Pin 10) Switched power
5.0G5CMC, GREY Power cable - Black (Pin 8) Negative Ground

POWER

5.0G5CMC, Grey Power cable - Red (Pin 9) Positive – always on 12-48v DC
5.0G5CMC, Grey Power cable - White (Pin 10) Twist together with Red
5.0G5CMC, Grey Power cable - Black (Pin 8) Negative Ground

*Note- wire colors might be different pin position is constant

2.5 INSTALLATION OF THE SENSOR(S); SIGALARM WS4.0

The solar sensors are the component of the system that detects voltage.

TURN THE SENSOR ON:
use external on/off power (red button) switch to turn unit on/off.

60 HZ OR 50 HZ

Sensors are shipped with a factory setting to detect 60Hz. Upon request 50Hz presets can be made prior to shipping. Customer may also switch between 60 Hz to 50 Hz by utilizing the switch (sw2) on the sensor.

VERIFY PAIRING:

Before permanently installing the sensor and after power is applied to the main control module, verify that the correct quantity of sensors are paired. (Refer to section 3.12 Manage Sensors for further pairing instruction). Verify the correct serial numbers are listed and labeled as paired in the manage sensors screen.

PLACEMENT AND INSTALLATION:

The almost unlimited type sizes and configurations of equipment on which Sigalarm products can be used, make it impossible to cover every potential installation configuration in the manual. However, the following explanation should help you understand general sensor placement considerations.

Place a single sensor at the highest point of the equipment with the best line of sight. Where equipment has varying points that can be higher at any given time, multiple sensors should be installed at each of those points. Sensors cannot be obstructed by metal at any time. The sensors have an adjustable protection zone, set by the operator on the main control module. Always install sensors with protection zones overlapping. Please refer to the following suggested installation diagrams for examples. Wireless Sigalarm systems are not appropriate for all types of equipment or every jobsite. When in doubt consult a Sigalarm technician.

MINIMUM APPROACH DISTANCE – MAD CONSIDERATIONS:

When installing multiple sensors on a piece of equipment, spacing between sensors should be relative to minimum approach distance or MAD. The distance between two sensors must not be greater than 1.75 x MAD. This ensures there are no gaps in protection along the entire length of the boom. For example, if a minimum approach distance is 20 feet, then the spacing between sensors should be no more than 35 feet.

Wireless Sigalarm systems are **not appropriate for all types of equipment** or every jobsite. When in doubt consult a Sigalarm technician.

SENSOR PLACEMENT

The distance between two sensors must not be greater than 1.75 x MAD.

Distance between sensors cannot exceed 1.75 x MAD

MAD
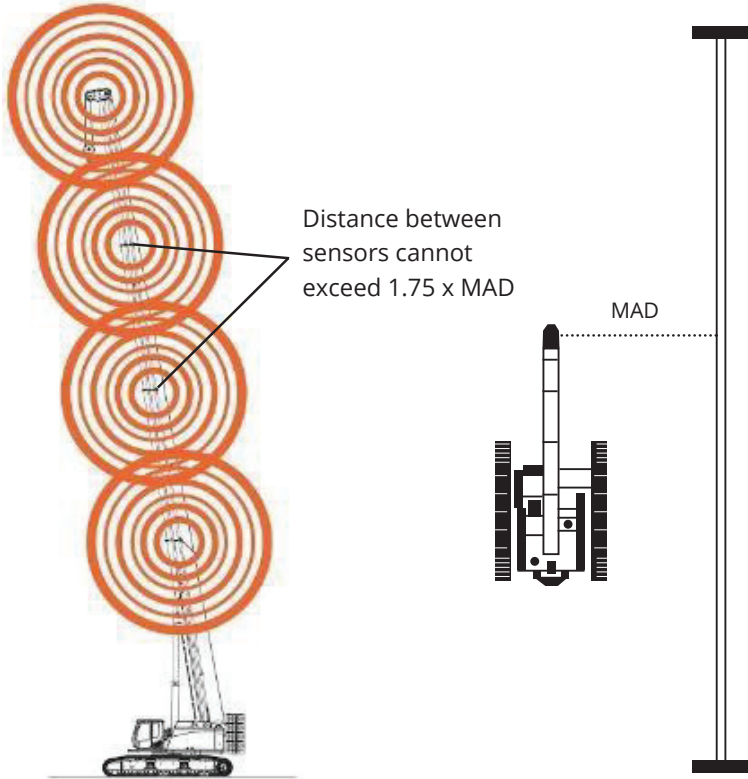
MINIMUM APPROACH DISTANCE - MAD EXAMPLE

If MAD = 20' Then 1.75 x 20' = 35' Distance between sensors < 35'

SAMPLE SENSOR PLACEMENT

The following images are meant for a visual aid only. They are in no way real life representations, actual or implied. You must not rely on the information in this diagram as an alternative to advice from an appropriately qualified technician. If you have questions about any installation matter you should consult an appropriately qualified professional.

PLACEMENT SUGGESTIONS
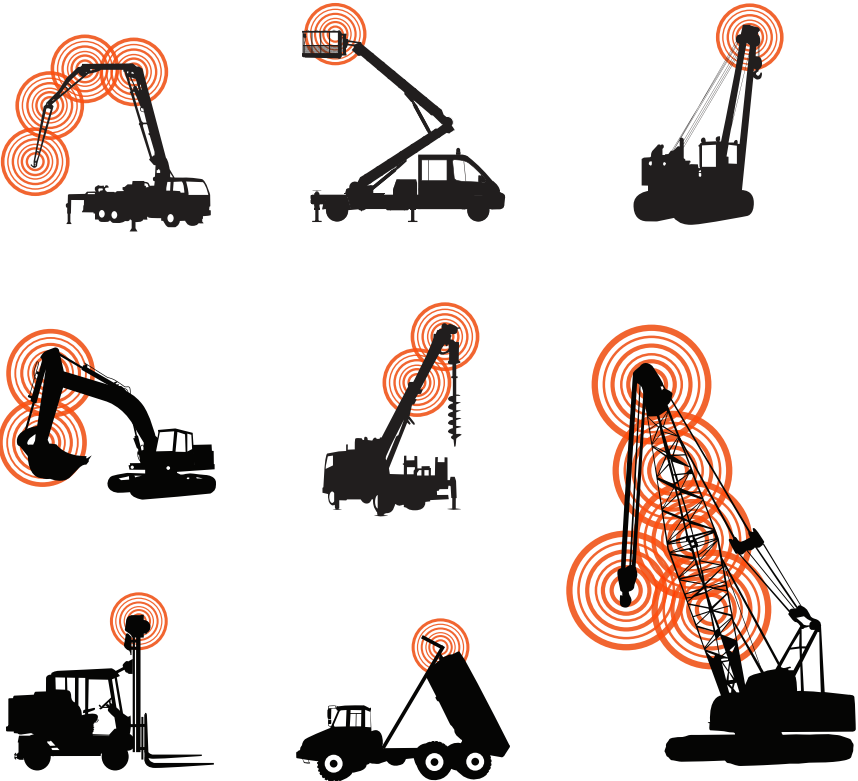
MOUNT THE SENSOR WITH OPTIMUM RADIO POSITIONING

The sensor radio should be placed with the best possible line of sight to the control module. For example, rotating the sensor so the radio is on the left versus the right could improve communication with the main control module under certain circumstances.
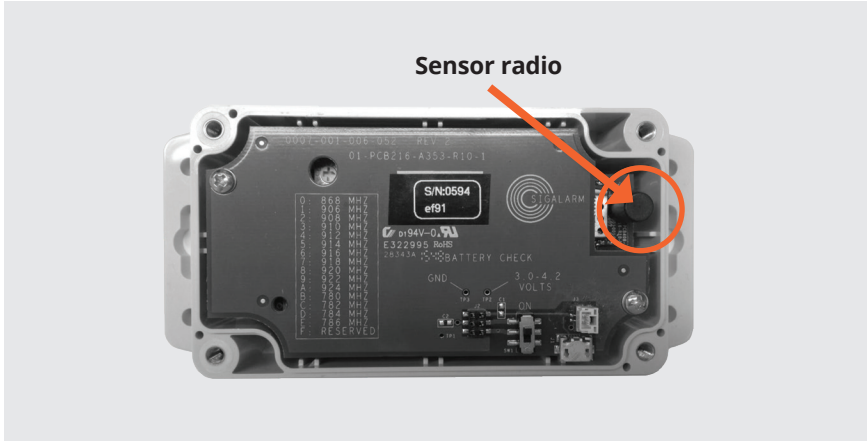
Sensor radio

RADIO DISTANCE RATING

Zigbee radio communication is rated for up to 27 meters. Wireless sensors should not be placed at a distance greater than 27 meters from the control module. Communication between Zigbee radios is affected by many things. Always test your installation for effective communication in multiple configurations where applicable.

2.6 INSTALLATION OF THE SPEAKER; WPASPC-5P

An **exterior** weatherproof speaker is provided with each system to warn persons outside the equipment of danger. Place the speaker where it can easily be heard by ground crew, but will not be damaged during equipment operation. Connect the blunt speaker wires to the supplied speaker cable conductor with the white jacket from the 5.0G5CMC as follows:

5.0G5CMC, Red (pin 11) to white horn conductor
5.0G5CMC, Black (pin 12) to black horn conductor

EXTERNAL SPEAKER

Do not mount this speaker inside a closed cab.

2.7 RELAY OPTIONS

Your Sigalarm has two relay options supplied with the 5.0G5CMC that allow you to customize your installation. These relays will open and close under different circumstances. A normal operation, warning, or danger status will open or close these relays according to the diagram. These relay outputs are for up to a maximum of 50Vdc/75Vac only.

Some common relay usage examples include:

▶ Wiring the Sigalarm system to your vehicle's hydraulics to stop hydraulic operation (movement) while the system is in an "alarm/danger" state
▶ Wiring the Sigalarm systems to an external light that remains lit in a "normal operation" (below setpoint) state

SIGALARM RELAY STATUS DIAGRAM (FRONT VIEW)

1 - RELAY 1 NC
2 - RELAY 1 NO
3 - RELAY 2 NO
4 - RELAY 2 NC
5 - RELAY 2 COM
6 - RELAY 1 COM
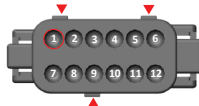
7 -
8 - GND
9 - VEHICLE PWR
10 - SWITCHED PWR
11 – ALARM HI
12 – ALARM LO

▲ NOTE KEY ORIENTATION

RELAY 1	STATUS	RELAY 2
2 ... 6	POWER OFF	4 ... 5
1 ... 6	NORMAL OPERATION	4 ... 5
1 ... 6	WARNING	3 ... 5
2 ... 6	DANGER	3 ... 5
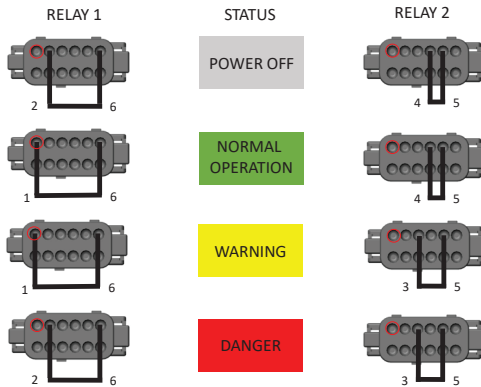
SIGALARM STATUS	DEFINITION	RELAY 1	RELAY 2
		PINS 1, 2 & 6	PINS 3, 4 & 5
POWER OFF	no power supplied to control module	OPEN	OPEN
NORMAL OPERATION	sensor status below setpoint value	CLOSED	OPEN
WARNING	approaching setpoint value	CLOSED	CLOSED
DANGER	at or above setpoint value	OPEN	CLOSED

SIGALARM STATUS	DEFINITION OF STATUS	RELAY 1	RELAY 2
		PINS 6 & 1	PINS 5 & 3
power off	no power supplied to control module	open	open
normal operation	sensor status below setpoint value	closed	open
warning	approaching setpoint value	closed	closed
danger	at or above setpoint value	open	closed

RELAY INSTALLATION EXAMPLE

Auto shut down: To stop hydraulics moving when a danger state occurs connect the supplied relay cable 1 to the equipment's hydraulics using Pin 6(red) and 1(black) so the circuit is interrupted and hydraulic movement is stopped in a danger status.

Auto shut down is never recommended for equipment moving a load

2.8 TESTING THE INSTALLATION

Verify your installation is correct and complete the operation set up prior to operating equipment near power lines.

▶ Apply power to the unit and verify the screen turns on and the unit goes into a maximum status (setpoint 5). If no sensors are paired "no sensor" will appear across the screen.

▶ Select the reset button and verify the control module reverts from max (setpoint 5) to the last displayed setpoint. The setpoint autosaves every 10 seconds.

▶ Verify the correct quantities of sensors installed are showing in the Home Screen/ Detail View.

▶ Using the decrease icon or (-) button lower the setpoint to initiate a **warning** status. Verify that the external and internal speakers alarm. Also check that visual warnings on the control module are functioning.

▶ If relay options are being utilized for a warning state, verify they are functioning properly.

▶ Using the decrease icon or (-) button lower the setpoint further to initiate a **danger** status.

▶ Verify that the external and internal speakers alarm. Also check that visual warnings on the control module are functioning.

▶ If relay options are being utilized for a danger state, verify they are functioning properly.

▶ Depress the override icon and adjust the setpoint back to the desired level.

3. MENU DISPLAY IDENTIFICATION

3.1 HOME SCREEN / DETAIL VIEW

The home screen or detail view provides the central point of access for all the system's range of applications. It consists of the following sections:

▶ Tool bar
▶ Sensor dashboard
▶ Setpoint display
▶ Sensor status gauge
▶ Touch screen button icons
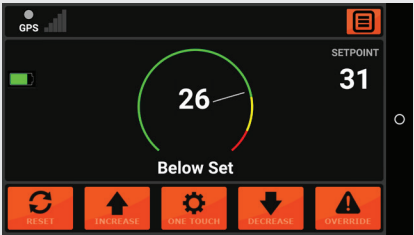
You can swipe the screen to the left or right for alternate Gauge View.

3.2 TOOL BAR
(REFER TO DIAGRAM ON PAGE 19)

Top Tool Bar	Function
GPS	Indicates if the Sigalarm system is receiving GPS service
GSM	Indicates GSM signal strength; Optional
Menu	This icon opens the Actions Screen

3.3 SENSOR DASHBOARD

Sensor Dashboard	Function
Sensor	Paired sensors are listed here by their name or EID
Reading	This is a numerical representation relative to the voltage displayed
Status	Indicates the status of the sensor in relation to the setpoint, 'below set', 'warning', 'danger'
Battery	Indicates battery status for each sensor

3.4 SETPOINT DISPLAY

Sensor Dashboard	Function
Setpoint	The adjustable numerical value at which the operator gets a danger status. Setpoint values range from 5-120

SETPOINT DISTANCE CORRELATION

The higher the numerical value of the setpoint the closer you can get to a power line. Example: A setpoint of 90 will allow an operator to get closer to a power line than a setpoint of 20.

3.5 SENSOR STATUS GAUGE

Status Gauge	Function
Status Gauge	This gauge is a visual representation of sensor readings in relation to the setpoint

3.6 TOUCH SCREEN ICONS

Tool Bar	Function
Reset	After power is applied reverts unit to last setpoint
Increase	Increases the setpoint
One touch	Matches the setpoint to the current highest sensor reading plus five
Decreases	Decreases the setpoint
Override	The override icon can be selected in a danger state. This will put the unit in a warning state for 15 second countdown to allow the operator to move away from danger *This is especially important when the auto shutdown feature is utilized*

3.7 BUTTONS

Item	Function
Reset	After power is applied reverts unit to last setpoint, the reset button can also be held down for 10 seconds to force a system reboot
+	Increases setpoint
One Touch	Matches the setpoint to the current highest sensor reading plus five
-	Decreases the setpoint
Red	The override icon can be selected in a danger state. This will put the unit in a warning state for 15 second countdown to allow the operator to move away from danger (*This is especially important when the auto shutdown feature is utilized*)

3.8 ACTIONS SCREEN OVERVIEW

The Actions Screen provides the point of access for all the following pages:

▶ Admin (password protected)
▶ Display Settings
▶ Setup Defaults
▶ Device info
▶ Manage Sensors (password protected)
▶ Volume Adjustment

3.9 ADMIN

Action Screen	Function
Admin Icon	Adjust setpoint max, volume min and max, lock setpoint, disable alarm lockout, mute warning, Radio Frequency selection, Change Pin/password

Any adjustment that can be made from the Admin Screen should be completed while equipment is at a safe distance from power lines and in a stationary position. As an added layer of protection, access to these adjustments are password protected.

PASSWORD

Passwords should only be given to competent persons capable of making key safety decisions.

## ADMIN SCREEN FEATURES (ALL PASSWORD PROTECTED)

Setpoint Max: Maximum setpoint parameters can be set to limit the operator's ability to increase the setpoint from the Home Screen. For example: if the admin selects 55 as the maximum setpoint, the operator can only increase the setpoint to 55 or less. This also limits the one touch feature to 55 or less.

Volume Max: The volume maximum can be set to limit the operator's ability to increase the volume of the external speaker. For example: vehicles working in residential neighborhoods may require a softer alarm. This setting should never bet set low enough that ground personnel cannot hear the external speaker. This feature should always be set to the highest tolerable maximum.

Volume Min: The volume minimum can be set to limit the operator's ability to decrease the volume. A setting of 1 means the operator can adjust the volume of the external speaker all the way down to silent. This is NEVER recommended. It is imperative that ground personnel can hear the external speaker.

Lock Setpoint: The lock setpoint feature can be selected to leave the operator with no ability to increase or decrease the setpoint.

Disable Alarm Lockout: This feature will bypass normal relay continuity in "danger" mode for emergency situations, similar to a manual override. When this box is selected, relay continuity will be configured as shown below. Proceed with extreme caution when utilizing this feature.

Danger status with "disable alarm lockout" selected
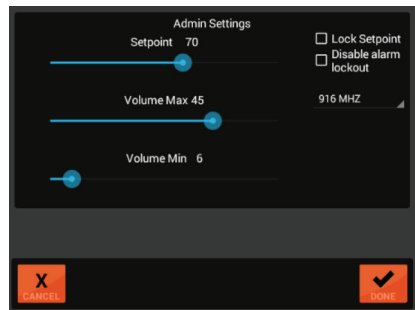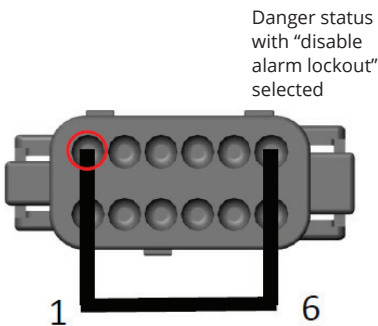
─ DISABLE ALARM LOCKOUT ─

Disable alarm lockout is only relevant if the relay cable 1 is installed. For example, a customer could utilize the relays to install the Sigalarm in such a way that that the hydraulics are interrupted, and movement is stopped in a danger state. When this installation poses a risk or hazard for a jobsite such as a swinging load, the disable alarm lockout can be selected.

Mute Warning: This feature will mute the warning sound, warning will still appear on the screen however the alarm preceding the danger sound will be muted.

Radio Frequency Selector: This feature allows you to select which radio frequency the control module will utilize. The control module and sensors must be set on the same frequency to communicate. 916 is the factory default. Use the bottom right corner to select the dropdown menu and assign the preferred radio frequency in the unlikely event that this needs to be changed.

In the USA and Canada, users may only select the radio frequencies of 906MHz, 908MHz, 910MHz, 912MHz, 914MHz, 916 MHz, 918MHz, 920MHz, 922MHz, or 924MHz.

Select the matching radio frequency by turning the dial on the sensor to the desired position. Use the table printed on the sensor board as a guide.
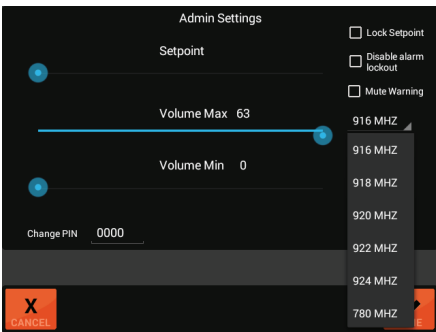
Change Pin or Password: Tap the existing pin to change it, type in the new pin, select done to save it.
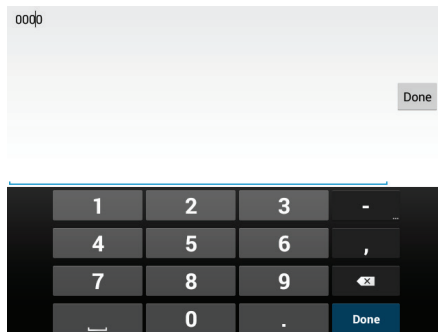
All units will have a factory preset password of 0000. Sigalarm does not have access to the password once it has been changed.

3.10 DISPLAY SETTINGS

Action Screen	Function
Display Icon	Adjust screen brightness

3.11 DEVICE INFO

Action Screen	Function
Device info	Language, Software versions, ID, Device specification

3.12 MANAGE SENSORS (PASSWORD PROTECTED)

Action Screen	Function
Manage Sensors Icon	Add or Remove Sensors

MANAGE SENSORS FEATURES

Enter your password

Sensors List: All sensors detected by the control modules will be listed in the screen.

▶ **Paired sensors** that are reporting data to this control module will say "Paired" in green text. These same sensors will appear in the Home Screen/Detail View. The installation technician should always verify that the serial number and quantity of sensors installed on the equipment are identical to the listed sensors in this column. Sensors can be removed simply by selecting the icon.
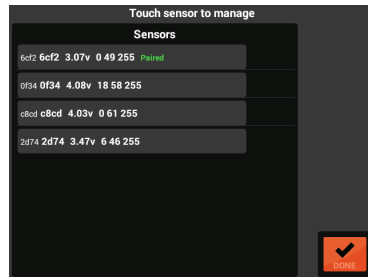
Sensors that are NOT paired will not report data to this control module.

Several values associated with the sensors are displayed:

- ▶ The sensors EID number
- ▶ Sensor name (optional)
- ▶ Battery voltage
- ▶ Sensor e-field reading
- ▶ Radio strength 0-100
- ▶ Radio signal quality 0-255

Sensors EID number ————— Sensor e-field reading

5933 4.10v 2 46 255 ◀———— Radio signal quality

Battery voltage ————— Radio strength
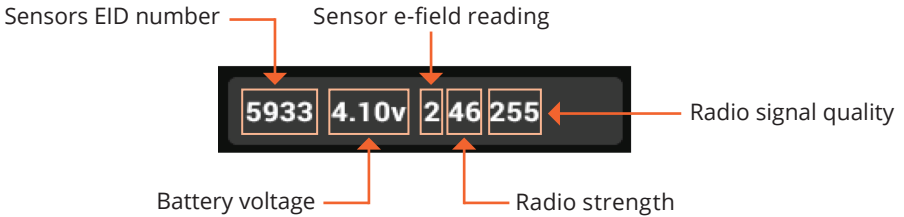
PAIRING SENSORS

To pair a sensor in this list select the sensor by tapping it to reveal the menu, once the menu is displayed select the pair icon, then select done. The word "Paired" in green text will now appear.
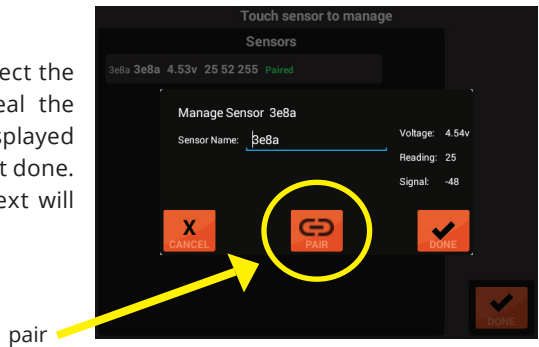
pair

REMOVING SENSORS

To unpair a sensor in this list select the sensor by tapping it to reveal the menu, once the menu is displayed select the unpair icon, then select done.

unpair
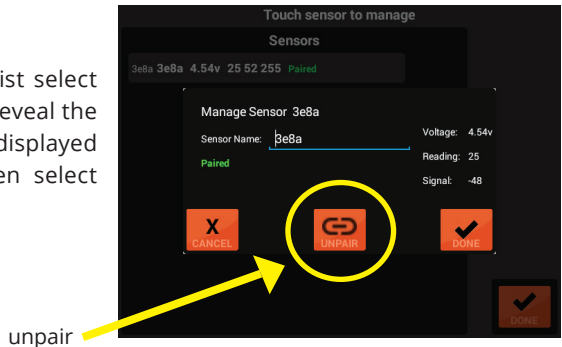
SENSOR NAME

To name a sensor (optional) in this list select the sensor by tapping it to reveal the menu, once the menu is displayed, type the name of the sensor. Then select done. Sensor can be renamed to identify which piece of equipment they are on, or possibly where the sensor is located. "Left boom knuckle" for example may be useful information to have for reporting.

3.13 MANAGE REMOTES (PASSWORD PROTECTED)

Item	Action Screen	Function
5	Manage Remotes	Pair remote

Paired remotes will be listed in this screen. To pair new remotes select manage remotes, enter password, select pair new remote, follow the prompts.

1

2

3

4
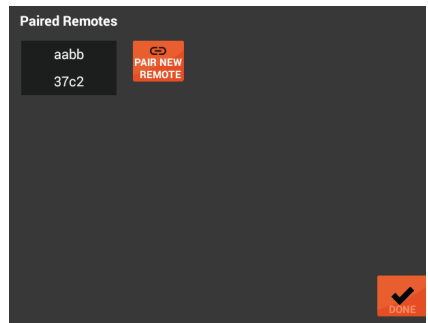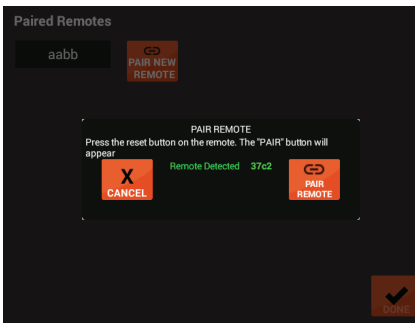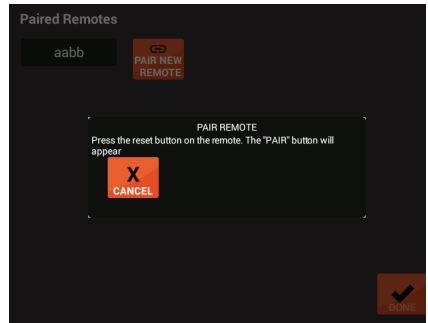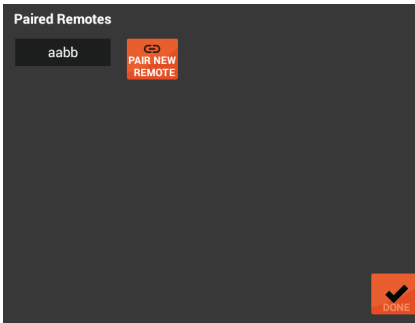
4. DUAL FUNCTIONALITY

SIGALARM WIRELESS PROXIMITY ALARMS FUNCTION IN TWO SPECIFIC WAYS

First as an **early warning system** and second as a **proximity alarm.**

 scan to watch all training videos

4.1 EARLY WARNING SYSTEM

When your Sigalarm Wireless proximity alarm is powered up, it will automatically be at its most sensitive setpoint of 5 (sometimes referred to as Maximum Sensitivity). The Sigalarm will provide an audible and visual alarm, warning the operator that they are in the vicinity of an AC high voltage power line. The operator does not need to set or adjust the system for it to operate in this mode; it occurs automatically. This first early warning is a reminder to complete the necessary practice of proper job site evaluation and field surveys to identify the electrical hazards present on the job site.

4.2 PROXIMITY ALARM

Operators can choose to adjust the Sigalarm to provide warnings at a specific setpoint that is appropriate for that job site.

5. GETTING STARTED

5.1 INITIAL CONTROL MODULE SET UP

Before the equipment is operated near power lines, the following control module set up must be completed.

A. Display settings
    I. Adjust brightness
    II. Adjust volume
    III. Select default page layout preference

B. Manage sensors
    I. Add or remove sensors as necessary
    II. Verify pairing

C. Manage devices (optional)
    I. Verify key fob status

6. OPERATION

6.1 WARNINGS

The operator must fully understand how the Sigalarm system functions, and its limitations before use. It is dangerous to operate any equipment directly beneath or above high voltage power lines. Never approach any power line closer than the minimum safe distance set by OSHA. If multiple lines are present the Sigalarm system should be set to the lowest voltage line, and additional precautions may be required.

> ⚠ **IF MULTIPLE LINES ARE PRESENT, THE SIGALARM SYSTEM SHOULD BE SET TO THE LOWEST VOLTAGE LINE, AND ADDITIONAL PRECAUTIONS MAY BE REQUIRED.**

6.2 OPERATING PROCEDURES

Powering up: When power is first applied, the control module will search for sensors. No data will appear while connectivity is in progress (approx. 2 seconds). Once sensors are connected the control module will go into a maximum setting setpoint of 5. If any power lines are in the vicinity, the alarms will sound. The operator must select the reset button to revert the system to the last displayed set point.

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7. ADJUSTING THE SETPOINT

SETPOINT

The operator must decide what setpoint is appropriate for each and every jobsite. From the home screen or the gauge view you'll see the setpoint. It's controlled by the operator. The higher the setpoint the closer you are allowing yourself to be to the AC overhead powerlines. For an example, a set point of 90 will allow an operator to get closer to a powerline than a set point of 20. The setpoint values range from 5 to 120. The setpoint is displayed on both the home screen detail view and the gauge view.

Setpoint of 90   Setpoint of 20

■ = Danger   ■ = Warning
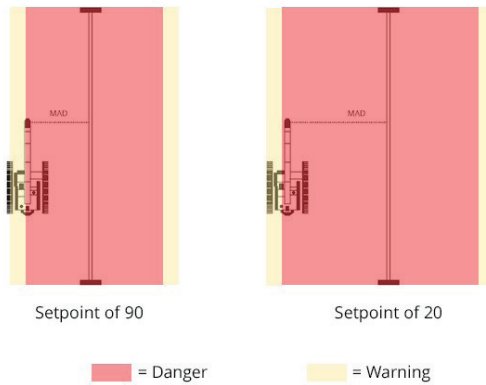
To adjust the setpoint, position the equipment at the desired location where the operator would like an alarm state, then depress the "one touch" button. This will change the setpoint to the greatest numerical sensor reading +5 at that position. When adjusting the setpoint, always position the equipment far enough away from the power line to give the operator time to react.

The Sigalarm system should be set to give a warning no closer than the minimum approach distance or MAD from the power line. Setpoint adjustments can also be made utilizing the increase or decrease buttons. Use a spotter to help you determine a safe position while adjusting the setpoint.

> ⚠ **SIGNIFICANT CHANGES IN BOOM LENGTH AND/OR ANGLE MAY REQUIRE A SETPOINT ADJUSTMENT THAT DIFFERS FROM THE INITIAL SETPOINT SELECTION AT SETUP.**

8. SENSOR READINGS

Sensor readings are displayed in two places on the control module: the Home Screen and the Gauge View. The sensor reading is vital information. The reading is displayed data that is transmitted from the sensor and corresponds to the voltage detection.

BELOW SET

A below set status occurs when all of the sensors have a reading numerically lower than the displayed setpoint. This means the equipment is in the defined work zone.

WARNING

A warning status occurs when one or more sensors are within 80% of the setpoint. This means the equipment is getting closer to but has not yet reached the danger zone.

DANGER

A danger status occurs when one of the sensor readings matches the setpoint. This means the equipment has crossed into the danger zone. No setpoint adjustments can be made during a danger status.

NO DATA

A no data status occurs when the sensor is not transmitting data to the control module for more than two seconds. This means there is no protection zone around the "down" sensor and the equipment is no longer detecting voltage. Do not operate equipment with a no data status. The system will beep alerting the operator of a no data status. See additional no data notes in the troubleshooting section.
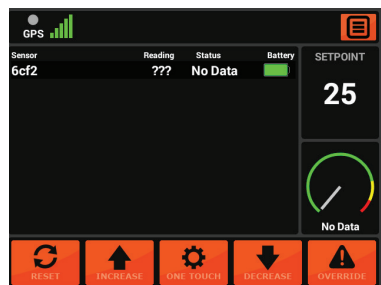
9. FIELD OPERATIONS

9.1 OPERATING WITH A SAFE READING / BELOW SET

While operating your equipment, your Sigalarm should display a Safe Reading / Below Set:

▶ The sensor reading is below the setpoint and you are at a safe distance away from power lines.

▶ It is common to have a reading of zero, it is only a problem if the sensor is near voltage.

  ▶ If the operator feels there should be a reading of voltage, then he should stop operation and troubleshoot the system.

9.2 OPERATING WITH A WARNING READING

While in the course of your work the equipment starts moving toward the AC overhead power lines, the sensor reading will begin to rise. If the equipment gets to a location where the sensor reading is approaching the setpoint value, the Sigalarm will go into a warning state.

▶ At this time the operator should stop movement and evaluate their situation.

▶ Once the operator idventifies the source of the warning, they should move the equipment away from the AC overhead power lines until the Sigalarm returns to a Safe Reading / Below Set.

9.3 OPERATING WITH A DANGER READING ⚠

If the operator continues to move toward the AC overhead power line, then the Sigalarm will go from a Warning to a DANGER state.

▶ The operator should stop movement of the equipment and identify the power source.

▶ Once the operator identifies the source of the warning, they should move the equipment away from the AC overhead power lines until the Sigalarm returns to a Safe Reading / Below Set.

9.4 OPERATING WITH AUTO-SHUTDOWN INSTALLED

Sigalarm has internal relays that can be used in many different ways. Some employers install a Wireless Sigalarm in such a way that the equipment will stop moving in a Warning or Danger state. This is referred to as "Auto-Shutdown" and is a common installation technique.

For example, a relay cable can be wired to an excavator's hydraulics so the circuit is interrupted and hydraulic movement is stopped in a Danger state.

In the event of a Danger state, where equipment movement has been interrupted, the operator must use the Override feature in order to get out of the situation.

> ⚠️ **AUTO-SHUTDOWN IS NEVER RECOMMENDED FOR EQUIPMENT MOVING A LOAD.**

9.5 OVERRIDE FEATURE FOR OPERATING WITH AUTO-SHUTDOWN

If a Danger status occurs, the operator can depress the Override icon. The control module will then display an override countdown. The override countdown keeps the unit in a Warning state for 15 seconds. If the Auto-Shutdown feature has been utilized, then this will close the opened circuit allowing the operator to pull away from the line.

> ⚠️ **USE EXTREME CAUTION WHEN UTILIZING THE OVERRIDE FEATURE**

9.6 OPERATING WITH A NO DATA ⚠️

A no data status occurs when the sensor is not transmitting data to the control module for more than two seconds. This means there is no protection zone around the "down" sensor and the equipment is no longer detecting voltage. To alert the operator, a distinct audible alert will occur every 15 seconds if there is a sensor with a "No Data" status.

Do not operate equipment with a No Data status and refer to the Troubleshooting section of the operators' manual for further instructions.

9.7 OPERATING NEAR INTERSECTING LINES ⚠️

Intersecting lines, especially of different voltages, can create complex E-fields. Extreme caution should be taken when working around these conditions. Use additional layers of safety whenever appropriate possible.

▶ If multiple lines are present, the Sigalarm should be calibrated to the lowest voltage line, and additional preventative measures may need to be utilized.

▶ The operator MUST fully understand how the Sigalarm is installed, operates, and it's limitations before use. It is highly recommended that a Sigalarm distributor or an equally competent person complete installation.

▶ Prior to use, operator training should be done by Sigalarm, its representatives, or a competent person. When operating in close proximity to high voltage power lines, vehicles should be prohibited from traveling between the boom and power line.

▶ Adjust the Sigalarm setpoint when the boom angle and length is significantly different than that used for the last setting.

▶ It is dangerous to operate any high lift vehicle beneath or above high voltage lines.

— GREATER THAN 10FT —

Sigalarm systems should not be used on equipment operating closer than 10 feet to a power line.

9.8 OVERRIDE FEATURE

If a danger status occurs the operator can depress the override icon. The control module will then display an override countdown. The override countdown keeps the unit in a warning state for 15 seconds. If the auto shutdown feature has been utilized this will allow the operator to pull away from the line.

⚠️ **USE EXTREME CAUTION WHEN UTILIZING THE OVERRIDE FEATURE**

9.9 REMOTE CONTROL OPERATION

Some units are equipped with remote control capabilities. Those units can be operated as follows: The control module will automatically go into max when power is applied. The operator can depress the reset button from the remote key fob. If a danger status occurs the operator can depress the override button on the remote key fob. The control module will then display an override countdown. The override countdown keeps the unit in a warning state for 15 seconds to allow the operator to pull away from the line.

10. DATA MANAGEMENT

DATA LOGGER

All control modules record events up to 2 gigs of storage. This data can be accessed through the Sigalarm App.

11. SPECIFICATIONS

11.1 DIMENSIONS

Control Module	W 7.5	D 3.0	H 5.25
Sensor	W 4.5	D 2.5	H 1.5
External Speaker	W 5	D 5	H 5
Cables	30 Ft		

11.2 MATERIAL

Control Module	ABS plastic enclosure
Sensor Enclosure	Built with ABS plastic
External Speaker	ABS with stainless steel hardware
Cables	18 AWG stranded tinned copper conductors with PVC insulation, water blocking tape, foil shield and PVC jacket

11.3 POWER SUPPLY REQUIREMENTS

12-48 Volt Operating voltage range or ranges (input)

► 12 volts Standby < 0.05 AMP DC Max Operating Peak 1 AMP DC Max 24 volts; Standby < 0.05 AMP DC Max Operating Peak 0.5 AMP DC Ma

11.4 E-FIELD DETECTION

Electric Field 60 Hz or 50Hz
selector switch located on board default is 60Hz

► 50Hz or 60Hz AC, this system is designed for detecting 7,200v AC or more at distances of 10ft or greater. While the systems can detect lower voltages, it should not be relied upon to provide a warning for voltages less than 7,200v AC.

► Sigalarm systems are not designed to detect DC voltage

11.5 RANGE OF EFFECTIVENESS

Voltage Detection – Between 10 to 200 feet depending on voltage
Zigbee Communication – 27 meters (between sensors and control module)

11.6 SENSOR BATTERY

Each sensor is equipped with a lithium polymer battery that should last approximately 660 hours with no sunlight. Variables such as extreme heat or cold will affect estimated battery life. The solar panels will continually charge this battery for years. Completely dead batteries will take approximately 24 hours to charge (at approximately 100 milliamps per hour). If the battery is allowed to run down to 3.0 volts or less the sensor will enter self-preservation mode and shut down. The sensor will resume operations at 3.2 volts and, is considered fully charged at 3.75 volts.

The sensor battery can be charged using any micro USB. Plug the USB in the external micro usb port. The switch must be in the on position to charge the battery. Periodic cleaning of the solar panels may be necessary to preserve the charging capabilities.

11.7 CONTROL MODULE SCREEN

5.7 Full color display, High Brightness 900 Nits, 640 x 480 res.

11.8 TEMPERATURE SPECIFICATIONS

-10° c to +70°c

11.9 SPEAKER

Freq Resp: 300-15 kHz
Power Rating 15W max
Sensitivity: 105dB / 1W/1M

11.10 OPERATING HUMIDITY RANGE

20% - 90%

12. TROUBLESHOOTING

12.1 WILL NOT POWER UP

▸ Verify the wiring per the instructions in the manual (sections 2.3 - 2.4).
▸ Hold down the manual reset button for 15 seconds to force a "hard reboot".
▸ Unplug the power cord for 60 seconds and restart.
▸ Call Sigalarm at 800-589-3769 for remote assistance if available.

12.2 NO DATA

When there is no data, it could be a few things:

▶ The distance between the sensor and the control module may be too great, try repositioning.

▶ Verify that the battery is charged using test points on the board.

▶ Check that the sensor is turned on

If the radio isn't communicating:

▶ Check the radio strength and quality. To check radio strength and quality go to the Manage Sensors screen. The radio strength minimum should be 10. A radio quality minimum should be 200. To adjust, reposition the sensor on equipment, better line of sight can give you better radio strength and quality, or check the distance between the sensor and control module.

▶ Check for obstruction between line of sight and control module.

The battery may be dead. The battery strength can be measured by placing a voltmeter on test points 2 and 3. A fully charged battery tests at 3.72 or greater.
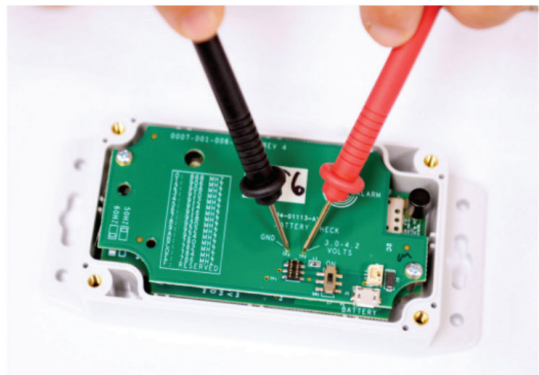
The sensor is not turned on:

▶ All sensors are shipped turned off.

The frequency of the sensor and control module does not match:

▶ Change the frequencies to matching frequencies.

12.3 SENSOR READING IS 0

▶ It is common to have a reading of zero, it is only a problem if the sensor is near voltage.

▶ Test that the sensor is detecting voltage by plugging in an extension cord and moving it near the sensor, check that the reading increases.

▶ The voltage may be too low to detect at that distance.

▶ The power line may be too far away for the sensor to detect at that voltage.

12.4 FROZEN TOUCH SCREEN

► If you try to make adjustments to the setpoint using the Touch Screen with no response, the screen might be frozen. Try using the manual buttons.

► If the manual buttons allow you to adjust the setpoint, then power cycle the unit to resolve the situation. Never touch the screen while the system is powering up to avoid this problem.

► Hold down the manual Reset button for 15 seconds to force a "hard reboot."

12.5 CANNOT ADJUST SETPOINT

► Verify that the system is not in a danger state. Adjustments cannot be made when the system is in a danger state.

► Verify that the Lock Setpoint feature in the Admin Screen is not selected.

► Verify that the max setpoint parameter in the Admin Screen is set in such a way that allows adjustment.

12.6 RADIO FREQUENCY INTERFERENCE

Sigalarm has radio frequency filters built in. However, there are times that very strong signals can disrupt the normal functionality and make the Sigalarm alarm (for example near an airport). In this case you may want to change the frequency.

To change the frequency, follow these steps.

1. Select Admin Settings.
2. Put in the admin password.
3. Select the dropdown on the right and set it to the desired frequency.
4. Set the sensor to the same frequency as the control module.
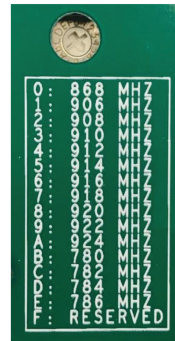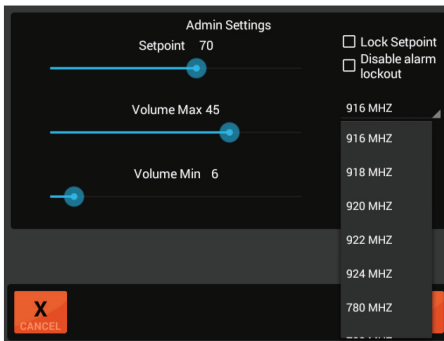
12.7 RADIO TOWERS AND OTHER HIGH ENERGY TRANSMITTER NOTES

High energy transmitters such as those seen around airports and cell towers can cause interference with the wireless Sigalarm system. For example, the sensor reading could fluctuate. So, use extreme caution when working around these special circumstances.

13. INTENDED USES & LIMITATIONS

Proximity alarms are a powerful operator aid. The intended use for proximity alarms is to detect the E-field present to provide a warning of danger. OSHA requires the employer to determine the distance or minimum approach distance (MAD) required for that job site.

Proximity alarms should not be used to determine distance. Safety professionals, standard bodies, and others should be careful not to perpetuate this misuse. Here are the limitations and intended uses for effective operation.

Sigalarm products:

▶ Are not intended to measure distance.

▶ Are not intended to detect DC power lines.

▶ Are not intended to detect underground electrical sources.

▶ Are not intended to provide warning closer than 10ft to a power line.

▶ Are best used for detecting voltages at 7,200v. or greater. Relying solely on Sigalarm proximity alarms to detect lower voltages may result in warning too near the power source.

▶ This device is NOT a replacement for any other safety requirements.

▶ Sigalarm High Voltage Proximity Alarm are tool to aid YOU.

▶ YOU must manually verify the correct number of sensors are reporting to the home screen on the control module prior to operation. **Warning** if any of the sensors show no data or the number of sensors reporting is different from the number installed. Do not proceed and notify your supervisor immediately. DO NOT OPERATE the unit.

▶ **Warning** if you have moved locations the current setting may not be right for this job site. You will have to adjust the set point as per the manual.

► **THE DISPLAYED READING OF THE SENSOR DOES NOT MEASURE DISTANCE HOWEVER READS THE E-FIELD STRENGTH (SHOWN AS A NUMERIC REPRESENTATION BETWEEN 5-120) AT A PARTICULAR BOOM POSITION.**

► This alarm point should be set far enough away from the power lines to give the operator time to react to an alarm.

► If for any reason any sensor displays a lower than expected signal reading or a zero reading (near power lines) do not operate and verify sensor is operational.

► The wireless high voltage proximity alarm systems have a continuous self-check of connected sensors if any sensor loses communication an alarm beep will sound every 15 seconds notifying the operator of a lost sensor.

► **In no way should this device be used as a substitute** for any other safety measures required by law or your employer including a spotter.

► The accuracy of the proximity alarms could be adversely affected by such factors as: (1) Operating the equipment with a boom angle and length significantly different than that used for the devices last setpoint adjustment; and (2) operating the equipment on sites with multiply overhead power lines, especially where those power lines had differing voltages or involved intersecting installations.

14. REGULATORY WARNINGS

14.1 FCC COMPLIANCE STATEMENT

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

(1) this device may not cause harmful interference, and

(2) this device must accept any interference received, including interference that may cause undesired operation.

CAUTION: The grantee is not responsible for any changes or modifications not expressly approved by the party responsible for compliance. Such modifications could void the user's authority to operate the equipment.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy, and if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

Reorient or relocate the receiving antenna.

Increase the separation between the equipment and receiver.

Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

Consult the dealer or an experienced radio/TV technician for help.

This equipment complies with the FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20cm between the radiator and all persons. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

I4.2 CANADIAN COMPLIANCE STATEMENT

This device contains license-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada license-exempt RSS(s). Operation is subject to the following two conditions:

(1) This device may not cause interference.

(2) This device must accept any interference, including interference that may cause undesired operation of the device.

L'émetteur/récepteur exempt de licence contenu dans le présent appareil est conforme aux CNR d'Innovation, Sciences et Développement économique Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes:

(1) L'appareil ne doit pas produire de brouillage;

(2) L'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible

NOTE: Afin d'assurer la conformité aux exigences de la FCC en matière d'exposition aux radiofréquences, aucune modification de l'antenne ou de l'appareil n'est autorisée. Toute modification de l'antenne ou de l'appareil pourrait avoir pour conséquence que l'appareil dépasse les exigences en matière d'exposition aux radiofréquences et annule le droit de l'utilisateur de faire fonctionner l'appareil.

NOTES:

Customers wishing to return units to Sigalarm for any reason must complete the Return Material Authorization (RMA) form before returning the units. This includes both Warranty and Out of Warranty repairs.

Send unit to 4150 St. Johns Pkwy, Ste 1002 Sanford FL 32771
Attn: Warehouse Service Technician.

TO DOWNLOAD RMA FORM VISIT:

SIGALARMINC.COM/RMA
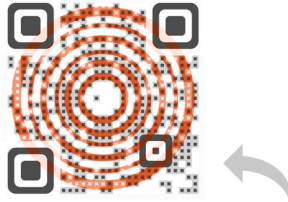
scan to download form

OPERATOR TRAINING IS ESSENTIAL:

SIGALARM OPERATOR TRAINING CLASSES ARE AVAILABLE THROUGH THE SIGALARM APP.

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