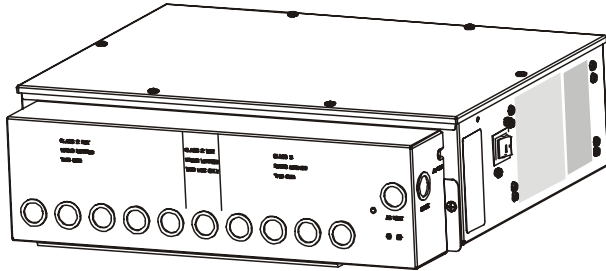


## AMS-9040 Controller

### Installation and Service Guide



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## To the Installer

This installation and service guide explains how to install, setup, and service the AMS-9040 controller.

Parts required to install this system are:

- AMS-9040 Controller (ZEAISLEPP)
- Digital AM antennas (various)
- Extension bracket 0500-9792-01 (optional)
- AMS-9040 Controller Keyswitch (optional)

Other documents that may be required for installation are:

- Planning Guide, 8200-0367-01
- Antenna Installation Guide (various)
- Antenna Controller Keyswitch, 8200-0367-04

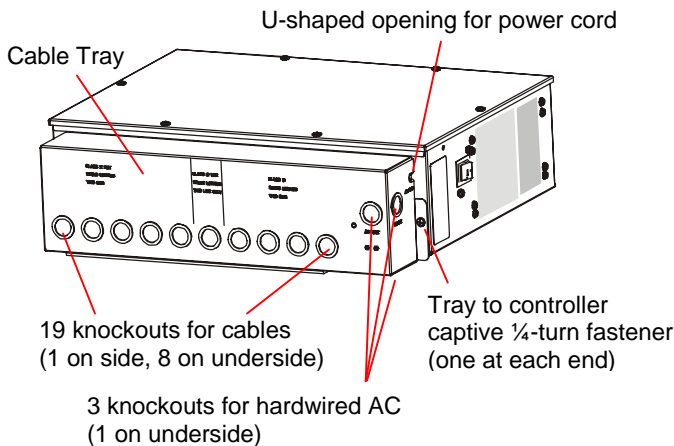
### Note:

- Because customer requirements dictate the placement of system components, your Sensormatic representative will supply this information separately.
- If this product was installed in a European Union or European Free Trade Association member state, please give the Declaration of Conformity included with this product to the manager or user. By law, this information must be provided to the user.
- There may be restrictions on the installation of certain antennas in certain countries. Please see the antenna installation guides for documentation of the restriction.

## About the Product

The AMS-9040 controller is part of a four-channel EAS detector used to detect EAS tags/labels at store exit(s). The controller:

- Supports transceiver (Tx/Rx) antennas, auxiliary receiver antennas, and noise coils in any combination up to the maximum specified.
- Supports controller-assisted tuning of Digital AM antennas.
- Can power and control up to two remote alarms. Also supports externally powered alarm devices and beacon lamps, an alarm management device, and a Sensormatic Sync Link wireless sync device.
- Has four relays used to trigger externally-powered alarm devices.
- Supports RS485 networking.
- Has connections for hardwired sync and transmit inhibit functions.
- Can be placed on a shelf or mounted to a wall.
- Consists of an integral cable tray/mounting bracket assembly and a controller housing that attaches to it. Two captive ¼-turn fasteners in the tray secure it to the controller.
- Nineteen knockouts in the cable tray support exposed cables or cables in conduit. There are designated knockouts for Class 2 wiring from low voltage devices, Class 2 “wet” wiring from an alarm management device, and Class 3 wiring from a transmit antenna.
- Three knockouts in the tray support an exposed ac cable or the cable in conduit. A U-shaped opening in the side of the tray allows access for a power cord, if used instead of the ac cable.



## Operation

The controller deters theft by activating an alarm when it detects the unique response of an active Ultra•Max hard plastic tag or disposable label.

To detect a tag, the antenna(s) connected to the controller emit a magnetic field close to the tag/label's natural frequency causing it to vibrate or “ring” at the frequency of the field. When the field is removed, energy in the tag/label dissipates causing an exponential ring down.

The controller processes signal inputs picked up by the antennas to determine if they are indicative of ring down. If they are, then the controller activates an alarm.

Audible and visual indicators located on top of each antenna indicate an active tag/label is between the antennas. Alternately, the controller can trigger a remote alarm module, or double-pole double-throw relay, one for each antenna. The controller can also trigger externally powered devices such as a security camera.

- Antenna coils can be set to aiding or figure-8. Maximum operating current is as follows for each coil configuration:

|                           | Aiding | Figure 8 |
|---------------------------|--------|----------|
| Non-European              | 16A    | 16A      |
| European (except Germany) | N/A    | 12A      |
| Germany                   | N/A    | 10A      |

- Maximum cable length between antennas and controller is 15.2m (50ft). Longer cables can reduce performance and operating current.

## Device Connections

Connector pin assignments are listed on pages 4 and 5. Device connections are as follows:

- Transceiver antenna connections (4) and antenna communication connections (4)
- General-purpose connections (4) for auxiliary receive antennas and/or noise coils\*
- Remote alarm connections (2)
- Beacon lamp connections (2)
- Relay connections (4)
- Alarm management device connection (1)
- RS485 connection (1)
- Wired Tx sync connection (1)
- Tx inhibit connection (1)
- Wireless ac synchronization (Sync Link) connection (1)
- Service connection (1).

\* Only certain inputs support noise coils.

## Transceiver (Tx/Rx) Antenna and Antenna Communication Connections

Transceiver antenna connectors and antenna communication connectors support the following transceiver antennas and families:

- Digital Door-Max\*
- Digital Floor-Max\*
- Digital Pro-Max\*
- Digital Euro Pro-Max\*
- Ultra•Loop

\* Controller-assisted tuning applies. See page 7.

**Transceiver connectors (P1, P24, P4, P35).** Four connectors support transceiver antennas designated A, B, C, and D.

- Tx/Rx antenna A connects to connector P1.
- Tx/Rx antenna B connects to connector P24.
- Tx/Rx antenna C connects to connector P4.
- Tx/Rx antenna D connects to connector P35.

**Antenna communication connectors (P5, P25, P6, P36).** Four connectors support controller-assisted tuning of digital antennas.

- Com for antenna A connects to connector P5.
- Com for antenna B connects to connector P25.
- Com for antenna C connects to connector P6.
- Com for antenna D connects to connector P36.

## General-Purpose Connections (P27, P29, P31, P33)

Four connectors accept auxiliary receive antennas such as Rangers, Digital Pro-Max, Sky•Max, and Satellite receivers, and/or noise coils up to the maximum allowed.

- These connectors default to Rx function with no auto detection or support for noise canceling coil support.
- To support noise cancellation, use the service configurator to set these connectors to noise canceling mode. Adjustments to default settings must be saved in the controller for use on the next power cycle or system reset.

Auxiliary receive antennas or noise coils connected to the general-purpose inputs are designated A, B, C, and D.

- Antenna/Coil A connects to connector P27.
- Antenna/Coil B connects to connector P29.
- Antenna/Coil C connects to connector P31.
- Antenna/Coil D connects to connector P33.

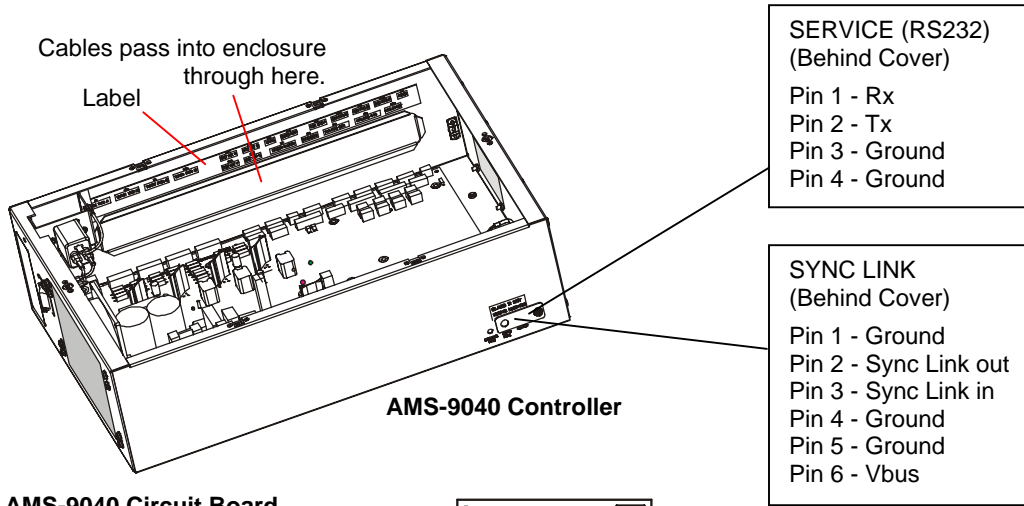
**IMPORTANT!** Each general-purpose connector has a Coil 1 input and a Coil 2 input. Noise coils can only connect to the Coil 1 input.

More about noise coils:

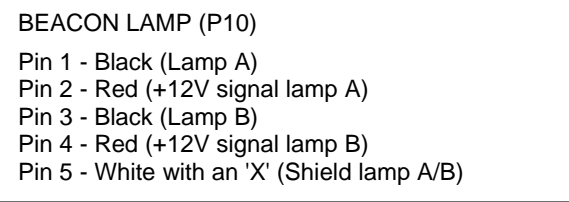
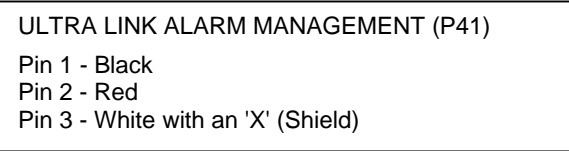
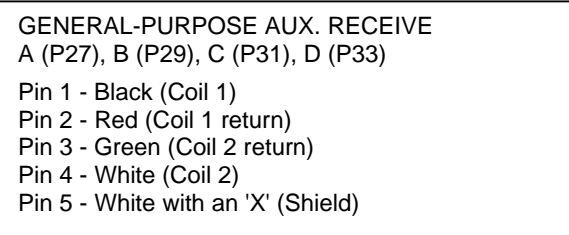
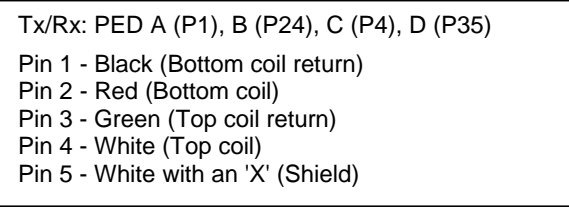
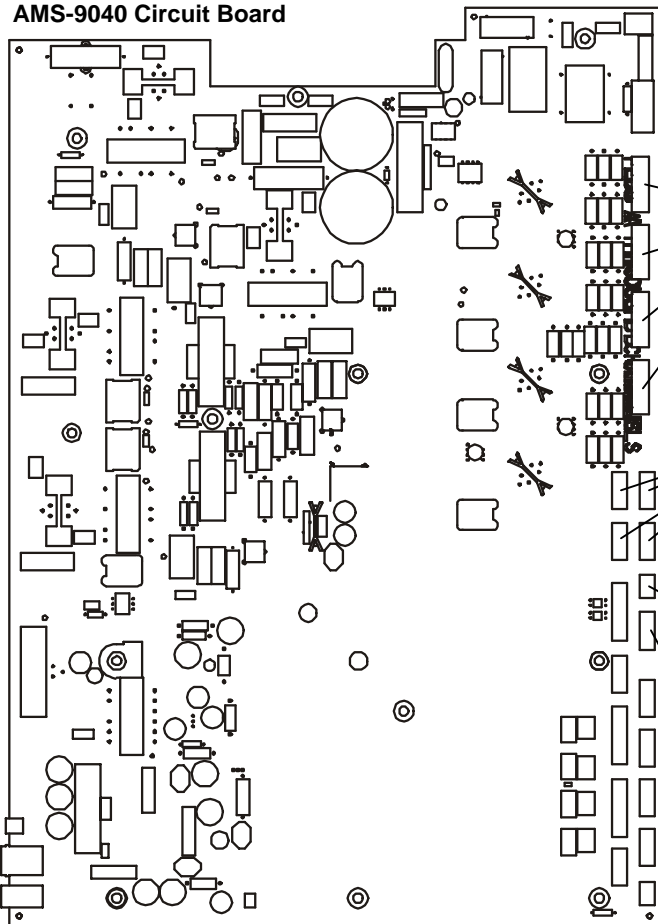
- A noise coil is used to cancel specific noise interfering with detector operation.
- Only "Coil 1" of a receive antenna can be used as a noise coil.
- To accept a noise coil, the Coil 1 part of each general-purpose input must be reconfigured to noise canceling mode using the service configurator.
- By moving a noise coil around while monitoring power levels on the service configurator, field personnel find the location where noise cancellation is best. This is where the coil is likely to be installed.
- The location for noise coil installation must be practical as well as yield satisfactory results.

*Continued on page 6*

A label inside the controller identifies connectors.

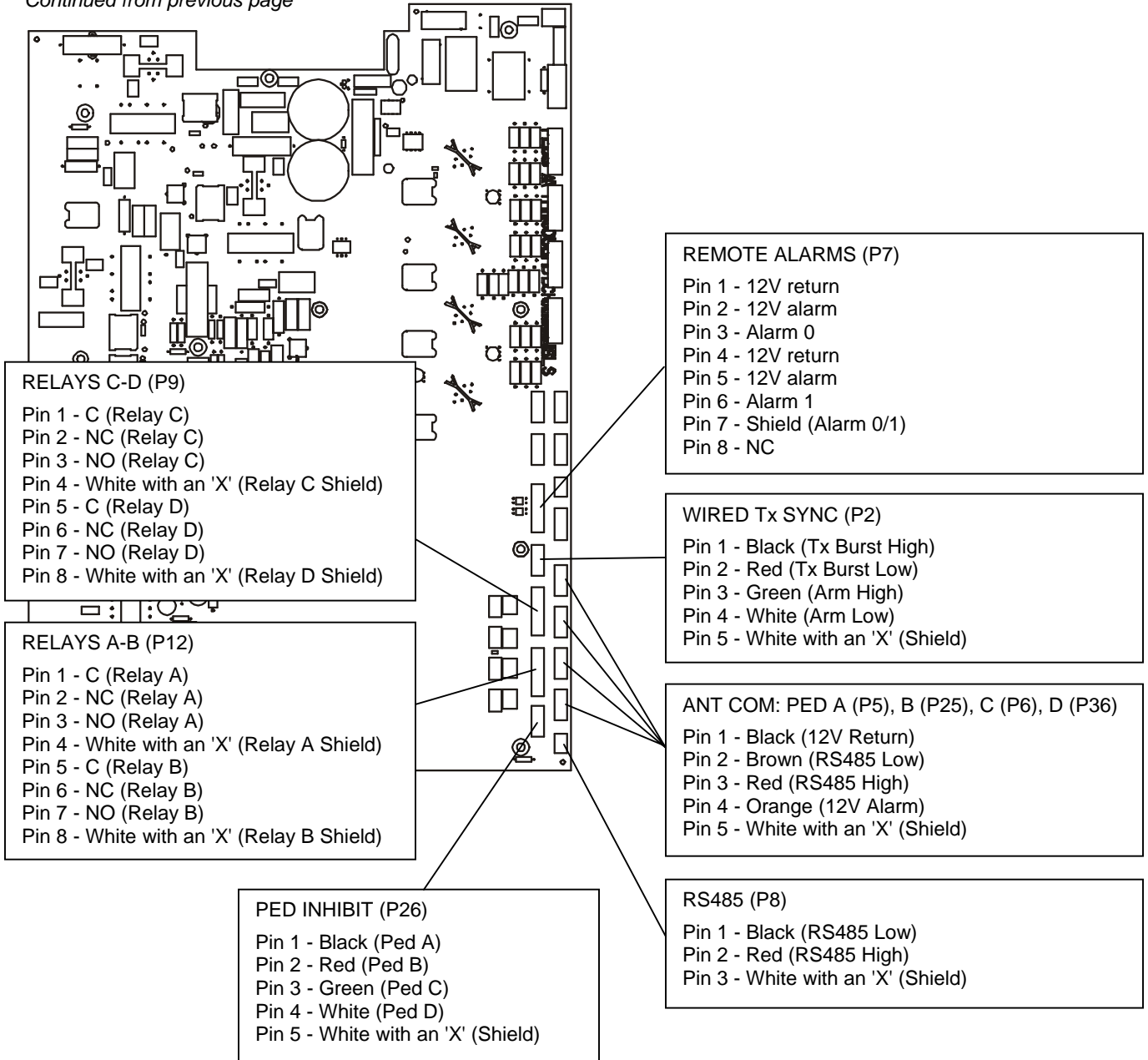


**AMS-9040 Circuit Board**



*Continued, next page*

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### Remote Alarm Connections (P7)

This connector can power and control up to two remote alarms, such as a ZC30 or ZC35.

### Beacon Lamp Connections (P10)

This connector can power and control up to two beacon lamps, supplying up to 12V at 1A for each lamp.

### Relay Connections (P9, P12)

The controller has four double pole double throw (DPDT) relays, each programmed independently. These relays are used to trigger devices such as externally powered remote alarms and beacon lamps, time lapse VCRs, and security cameras, one device per detection zone.

Each relay requires three wires and a shield. Cable shields share one pin on the connector.

### Alarm Management and RS485 Connections (P41, P8)

“Ultra” connector P41 powers a Sensormatic alarm management device. Connector P8 supports RS485 communication to the device.

### Wired Tx Sync Connection (P2)

This connector is used to wire two AMS-9040 controllers together to synchronize them so they do not interfere with each other.

**Note:** The controller also provides for a slower sequencer level synchronization to allow two Digital Floor-Max antennas to be placed next to each other when driven by different controllers.

### Wireless AC Sync Connection (On Controller)

Protected by a cover plate, this connector receives a cable from a Sync Link device which, when connected, is automatically used as the timing reference for system functions. See “Automatic AC Line Synchronization” on page 7. Also, see Appendix A.

### RS232 Service Connection (On Controller)

Protected by a cover plate, this RJ22 connector receives the cable from a modem or laptop computer used to communicate with the controller.

### Ped (Tx) Inhibit Connection (P26)

This connector has a maximum of four Tx Inhibit pins, each configurable using the service configurator. Each pin, when grounded, turns off a specified transmitter.

## Installation Features

Installation features are as follows:

- Automatic detect and setup functions
- Controller-assisted antenna tuning
- Transmitter current control
- Wall mounted controller. Requires mounting bracket with extension.

### Automatic Detect and Setup Functions

**Device Detect.** The controller automatically detects digital AM antennas, when they are connected to the controller and the controller is powered on. Once these antennas are auto-detected, the controller sets them up as transceivers and sets their sequence of operation to “simultaneous-alternating” as shown below.

| ANTENNA              | SEQUENCE   |
|----------------------|--|
| Digital Pro*Max      | Simultaneous–Alternating   |
| Digital Door*Max     | Simultaneous–Alternating   |
| Digital Euro Pro*Max | Simultaneous–Alternating   |
| Digital Floor*Max    | Alternating maximum repetition rate is 45Hz.                           |
| Unknown              | Alternating maximum repetition rate is 45Hz (60Hz), or 37.5Hz (50Hz).* |

\* When an antenna without device identification, such as an Ultra\*Post secondary antenna, is detected, the repetition rate does not exceed this value due to de-rating of capacitors on the capacitor tuning circuit board.

The controller also detects a SyncLink device, when connected. See page 6.

**Automatic ac line synchronization.** Upon power up or system reset, the controller automatically adjusts its operation to the ac input’s frequency and voltage.

Also, to avoid interference from nearby EAS detectors, upon power up or system reset, the controller automatically adjusts the ac-derived timing of its transmit and receive functions to that of nearby EAS transmitters, if detected. Auto sync status is displayed on the service configurator.

**Note:** If a Sync Link device is connected to the controller, the controller automatically uses its signal as the timing reference instead. The service configurator indicates that Sync Link is active.

### Controller-Assisted Antenna Tuning

A series of LEDs on the tuning circuit board of a digital AM antenna indicate to field personnel when and where tuning jumpers are to be placed for optimum antenna performance. For specific information, see the installation guide supplied with the antenna.

**Note:** Proper AC line delay must be selected before performing controller-assisted tuning.

### Transmitter Current Control

The controller allows transmit current to be adjusted to the maximum allowed for the region of use.

- The controller checks current in each transmitter and the antenna coil configuration: aiding or figure-8.
- If current reaches a pre-determined level, a signal is sent to software that indicates current is excessive and which antenna is affected. The controller also shuts down the transmitter for one second before operation resumes.

### Mounting the Controller



**DO NOT** mount the controller with its fan facing up!

Using the mounting bracket supplied, the controller can be mounted as follows:

- On a shelf.
- On a wall. If required, use the extension bracket provided to enable mounting screws to thread into wall studs. **DO NOT** mount the controller with its fan facing up!
- To a ceiling. Secure a piece of plywood larger than the mounting bracket to the ceiling structure that holds the drywall. Then attach the bracket to the plywood.

## Service Features

Service features are as follows:

- Laptop computer service configurator
- Internal diagnostics
- LED status indicator
- Remote diagnostics via modem, Ethernet, or RS485 network. Must have external converter to support Ethernet.

### Service Configurator

A service configurator downloaded to a laptop computer is required to setup and troubleshoot the controller. The service configurator allows you to:

- Set antenna coil configuration as aiding or figure-8
- Customize detection for each antenna
- Monitor transmit and noise levels from each antenna
- Monitor transmit current from each antenna
- Customize alarm setup
- Turn off transmitters (via pedestal inhibit port)
- Monitor temperature inside the controller
- Download new software features/updates to flash memory
- Provide a system error report
- Separate a problem into one of three categories: controller, environment, or the device connected to the controller, such as antennas or remote alarms.

**Note:** Special tools are not required when installing the controller as long as antennas are installed in a reasonable noise environment and local transmitters are properly adjusted.

**Note:** If default settings are changed, you do not need to turn the controller off and on to store them.

**Operating software required:** Windows® 95, 98, 2000, or XP.

### Internal Diagnostics

The controller provides the following internal diagnostics:

- The service configurator displays operating current for each antenna.
- The service configurator displays ambient temperature within the controller.
- The service configurator enables the controller to be reset remotely after a software download.
- The controller has runaway software protection.
- Board diagnostics.

### LED System Status Indicator

An LED system status indicator on the controller indicates the following:

- Green flashing (system on and okay)
- Yellow flashing (performance downgraded; service recommended)
- Red flashing in a particular sequence (fault detected, call for service).

The number of red flashes identifies a digit in a two-digit alert code (for example, four flashes is the number four). The start of an alert code is indicated by a long LED interval. Then the first digit of the code occurs, followed by a short delay, followed by the second digit.

Alert codes are listed on page 15.

### Remote Diagnostics

Remote diagnostics enables the use of a computer at another location to troubleshoot problems and change controller parameters.

- The controller must be connected to a properly programmed modem and telephone line, or to an Ethernet or RS485 network.
- An external adapter is required.



## Installation

### Installation Requirements

#### Verifying Equipment and Unpacking

- Verify that all equipment has arrived. Ensure the system configuration is the right one for the installation site.
- Unpack major components in a back room. At the install site, lay out parts in the order you will need them. Do not clutter the aisle or cause a trip hazard.

#### Installer/Contractor

- Have electrical work comply with the latest national electrical code, national fire code, and all applicable local codes and ordinances.
- Coordinate work with other trades to avoid interference.
- Verify existing site conditions and coordinate with the owner's representative and appropriate utilities as required.
- Obtain copies of all related plans, specifications, shop drawings and addenda to schedule and coordinate related work.
- Thoroughly review the project to ensure that all work meets or exceeds the above requirements. Bring alleged discrepancies to the attention of Sensormatic Electronics.

#### Controller Requirements

If using conduit:

- In the cable tray part of the cable tray/mounting bracket assembly, there are three ½" or ¾" knockouts for hardwired ac power and nineteen ½" or ¾" knockouts for antenna and other cables.
- Select knockouts closest to cable connectors.
- DO NOT route more cables through conduit than regulation allows.

Mounting limitations are as follows:

- The wall must support 29.2kg (64.6 lbs) or four times the weight of the controller assembly.
- Mounting options are mounting directly to two metal or wood wall studs, mounting indirectly to a wood board attached to two metal or wood studs, mounting to drywall using suitable hardware that can support the weight, or placing the controller on a shelf.
- When mounting to wall studs, if holes in the controller's integral cable tray/mounting bracket assembly do not align with the two wall studs, use the extension bracket supplied to achieve alignment.
- Do not mount controller with its fan facing up.



**WARNING!** Do not install this product where highly combustible or explosive products are stored or used.



**WARNING—RISK OF ELECTRIC SHOCK!** During installation, if the antenna must be left unattended, turn off the power or cover high voltage components to prevent unauthorized access to hazardous voltages.

#### Antenna Requirements

See antenna installation guide for antenna installation requirements.

#### Equipment Required

Basic setup requires the following equipment:

- Antenna controller
- Digital AM antennas (installation instructions are supplied with the antenna)
- Hard tag (non-deactivateable Ultra•Max tag)
- Ultra•Max low energy labels.

Advanced setup requires the following additional equipment:

- Laptop with Windows® 95, 98, 2000, or XP operating software
- RS232 Ultra•Max programming cable
- Service configurator.

#### Parts Required

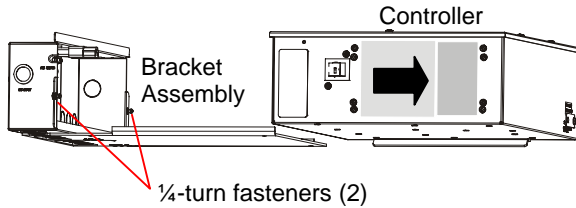
|                    |   |              |
|--------------------|---|--------------|
| Bracket, extension | 1 | 0500-9792-01 |
| Tray, cable        | 1 | 0404-0175-01 |

## Installation Procedure

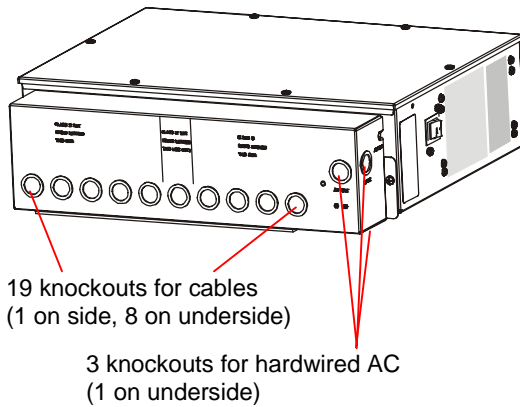
This section describes installation procedures for when the controller is to rest on a shelf, or be attached to a wall or ceiling.

### When Controller Rests on a Shelf

1. Remove the cover from the top of the controller, then detach the integral cable tray/mounting bracket assembly from the controller. Two captive ¼-turn fasteners secure the assembly.



2. Of the 19 knockouts in the cable tray dedicated to cables, remove the ones closest to the connectors they are associated with. **DO NOT** remove the three knockouts used to access the ac connection area. Observe Class 2, Class 2 “wet”, and Class 3 requirements silkscreened on the cable tray.



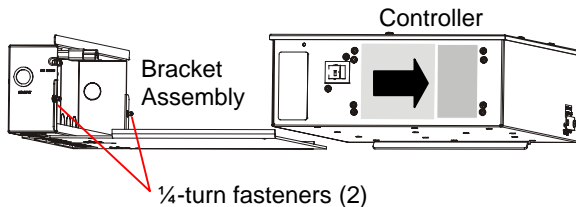
3. Thread cable clamps into the holes. Run cables (except power) through the cable clamps leaving about 30cm (12in) of excess on the other side. Tighten the clamps.
4. Attach connectors supplied to the cables, route cables through the rectangular opening in the controller housing, and referring to the diagrams on pages 4 and 5, plug them into the appropriate circuit board connectors:
  - a. Transceiver antenna(s)
  - b. Antenna communication line(s)
  - c. Auxiliary receive antenna(s), if required
  - d. Remote alarm(s), if required
  - e. Beacon lamp(s), if required
  - f. External alarm(s) or other triggered device, if required
  - g. Wired Sync, if required
  - h. Sync Link, if required
  - i. RS485 network, if required
  - j. Alarm management device, if required.
5. Connect ac power (see page 13).
6. Attach the controller to the cable tray/mounting bracket assembly using the two ¼-turn fasteners.

## Wall Mounting



**WARNING!** The wall must be able to support 29.2kg (64.6 lbs).

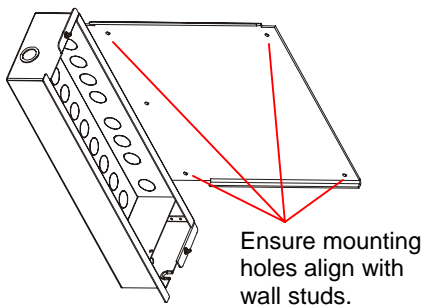
1. Remove the cover from the top of the controller, then detach the integral cable tray/mounting bracket assembly from the controller. Two captive ¼-turn fasteners secure the assembly.



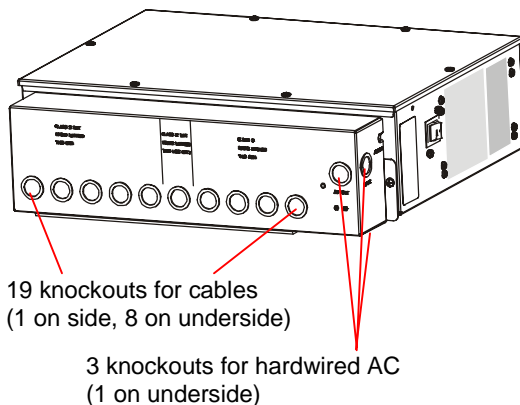
2. Place the bracket part of the assembly on the wall, level it, and mark mounting hole locations.



**WARNING!** Mounting hole locations must align with two wall studs. If not, use the extension bracket supplied.



3. Secure the cable tray/mounting bracket assembly to each of two wall studs.
4. Of the 19 knockouts in the cable tray dedicated to cables, remove the ones closest to the connectors they are associated with. **DO NOT** remove the three knockouts used to access the ac connection area. Observe Class 2, Class 2 “wet”, and Class 3 requirements.



5. **If using cable clamps:** Thread cable clamps into the holes. Run cables (except power) through the cable clamps leaving about 30cm (12in) of excess on the other side. Tighten the clamps.

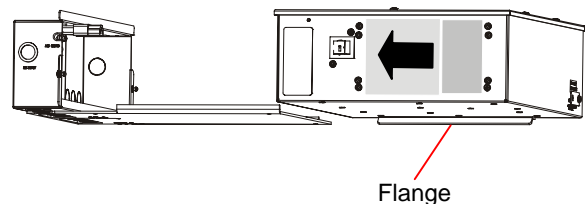
**If using conduit:** Attach conduit to the cable tray and run cables to the controller.

6. Attach connectors supplied to the cables, route cables through the rectangular opening in the controller housing, and referring to the diagrams on pages 4 and 5, plug them into the appropriate circuit board connectors:
  - a. Transceiver antenna(s)
  - b. Antenna communication line(s)
  - c. Auxiliary receive antenna(s), if required
  - d. Remote alarm(s), if required
  - e. Beacon lamp(s), if required
  - f. External alarm(s) or other triggered device, if required
  - g. Wired Sync, if required
  - h. Sync Link, if required
  - i. RS485 network, if required
  - j. Alarm management device, if required.

7. Connect ac power (see page 13).

8. Attach the controller to the cable tray/mounting bracket assembly using the two ¼-turn fasteners.

**Note:** If mounting with the cable tray vertical, hook the metal flange attached to the bottom of the controller onto the mounting bracket to hold the controller in place while you slide it into position.

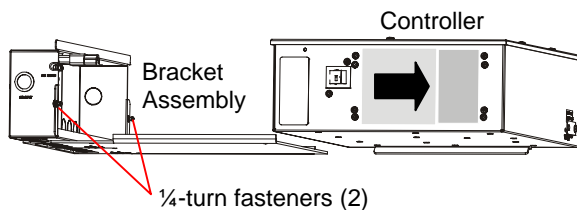


## Ceiling Mounting

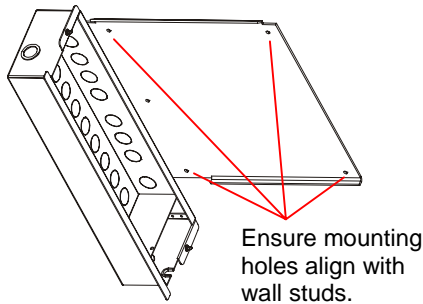


**WARNING!** The ceiling must be able to support 29.2kg (64.6 lbs).

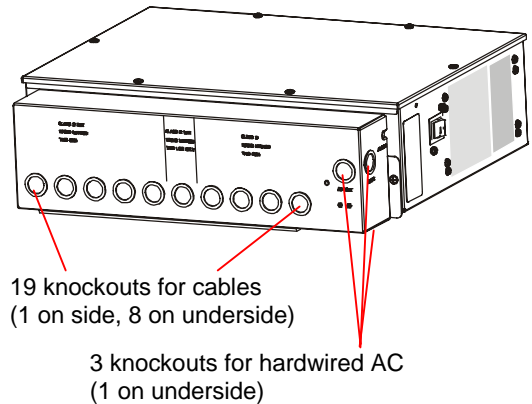
1. Remove the cover from the top of the controller, then detach the integral cable tray/mounting bracket assembly from the controller. Two captive ¼-turn fasteners secure the assembly.



2. Cut a piece of plywood larger than the mounting bracket and large enough to attach two ceiling beams that support the drywall or hard ceiling. Secure the plywood to the beams using suitable hardware.
3. Place the bracket part of the assembly on the plywood and mark mounting hole locations. Then secure the cable bracket to the plywood.



4. Of the 19 knockouts in the cable tray dedicated to cables, remove the ones closest to the connectors they are associated with. **DO NOT** remove the three knockouts used to access the ac connection area. Observe Class 2, Class 2 “wet”, and Class 3 requirements.



5. **If using cable clamps:** Thread cable clamps into the holes. Run cables (except power) through the cable clamps leaving about 30cm (12in) of excess on the other side. Tighten the clamps.
- If using conduit:** Attach conduit to the cable tray and run cables to the controller.
7. Attach connectors supplied to the cables, route cables through the rectangular opening in the controller housing, and referring to the diagrams on pages 4 and 5, plug them into the appropriate circuit board connectors:
  - a. Transceiver antenna(s)
  - b. Antenna communication line(s)
  - c. Auxiliary receive antenna(s), if required
  - d. Remote alarm(s), if required
  - e. Beacon lamp(s), if required
  - f. External alarm(s) or other triggered device, if required
  - g. Wired Sync, if required
  - h. Sync Link, if required
  - i. RS485 network, if required
  - j. Alarm management device, if required.
8. Connect ac power (see page 13).
9. Attach the controller to the cable tray/mounting bracket assembly using the two ¼-turn fasteners.

## Power Connections

Ac power connects to the controller using a power cord or hardwired cable.

- The power source can be 100-120Vac or 220-240Vac.
- The controller automatically senses the voltage so no jumper settings are required.



**WARNING—RISK OF ELECTRIC SHOCK!** The ac power cord could be carrying 120Vac or 240Vac.



**CAUTION:** When using a power cord, a socket-outlet must be installed near the controller and in an easily accessible location.

Für Installationen mit einem Stromkabel muß die Steckdose an einem Standort installiert werden, welcher einfachen Zugang erlaubt.



**CAUTION:** A 6A, 2 pole, ganged disconnect device, which also provides short circuit and overload protection, and has a minimum 3mm open circuit clearance, in accordance with the National Electric Code and applicable local codes must be installed by a licensed electrician at a location readily accessible to the equipment.

Ein 6A, 2-poliges, gekoppeltes Ausschaltgerät, welches auch über einen Kurzschluß- sowie Überbelastungsschutz verfügt, und einen minimum 3mm offenen Schaltabstand aufweist, nach Übereinstimmung mit den Nationalen Elektrischen Regelungen sowie lokalen Regeln, muß an einem Standort installiert werden, welcher einfachen Zugang zum Gerät erlaubt.

## Power Cord

Referring to the figure opposite:

1. Route the power cord through the U-shaped opening accessing the ac connection area in the cable tray. **DO NOT** remove the three knockouts used to access the ac connection area.
2. Plug the cord into the IEC320 receptacle in the controller housing.
3. Return to the installation procedure beginning on page 10.

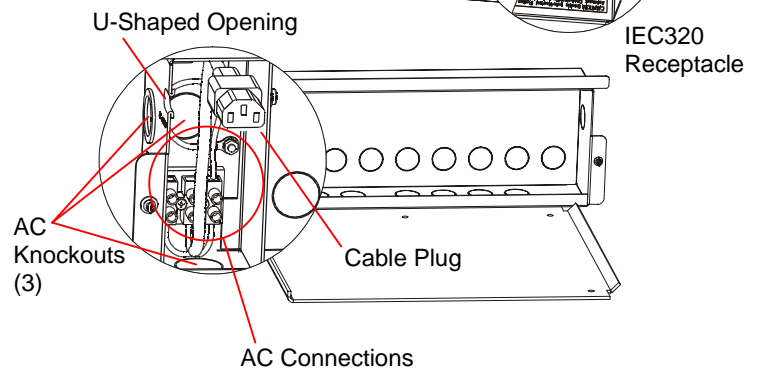
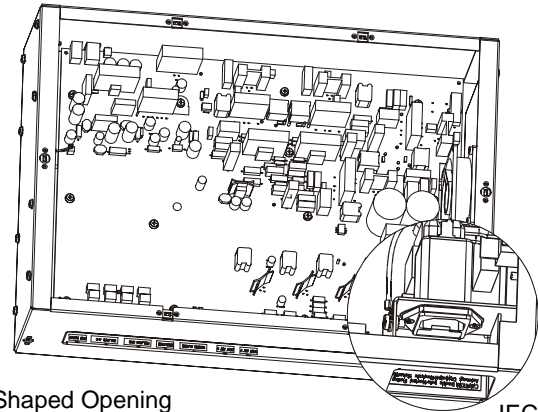
## Hardwired Cable



**CAUTION:** Use only copper wire.

Referring to the figure below:

1. Remove one of the three knockouts accessing the ac connection area in the cable tray. Thread a cable clamp into the hole.
2. Route the ac cable through a cable clamp, leaving about 15.2cm (6in) out the other side. Tighten the clamp around the cable.
3. Expose about 5cm (2in) of insulated wires: hot, common, and ground.
4. Using a small screwdriver, connect ac wires to the two-pin connector: white wire to N (neutral); black wire to L (line). Connect the green wire to ground on the controller chassis.
5. Plug the short power cord into the IEC320 receptacle in the controller housing.
6. Return to the installation procedures beginning on page 10.



## Sample Hookups

Because antennas and equipment can be connected to the controller in various ways based on the number of store exits involved, security zones required, coverage desired, and customer preferences, system configurations are too numerous to describe in this document. Instead, study the sample systems shown in this section to provide a feel for how to connect these devices.

(TBD)

## Troubleshooting

### System Status Alert Codes

#### Fault Condition Monitoring

The controller generates alert codes. Software reads the codes, reports them, and takes corrective action if possible depending on the code received. The following critical faults are backed up with hardware support and provide the necessary action when encountered.

- Current fault 1 per channel
- Fan fault
- Ambient temperature fault.
- Primary current fault
- Secondary current fault
- Last resort current fault to maintain Class 2 wiring requirements.

Alert codes require different actions: critical, severe, hardware, and warning. These codes repeat until the condition is resolved.

1. **Critical.** Critical and Fatal System Alerts are displayed on the System Alert LED until a timer resets the system. If the timer is not enabled, a unique LED sequence indicates that this condition has occurred and repeats continuously.
2. **Severe.** Severe System Alert codes are displayed by the System Alert LED and result in the software recovering from the error in a deterministic and reliable method.
3. **Hardware.** Hardware System Alert codes are displayed by the System Alert LED and result in the software and hardware working together to recover from the error in a deterministic and reliable method when the Alert is resolved.
4. **Warning.** Warning System Alert codes are displayed by the System Alert LED and result in the software recovering from the error in a deterministic and reliable method.

When a status alert occurs, the LED indicator changes color and pattern. Red is used for serious or critical system alerts while yellow is for less serious alerts and warnings.

- The number of red flashes identifies a digit in a two-digit error code (for example, four flashes is the number four). The start of an error code is indicated by a long LED interval. Then the first digit of a two-digit error code occurs, followed by a short delay, followed by the second digit.
- An alert code does not necessarily mean action is taken; it simply is a notification that the system is performing some operation. Most alert conditions are automatically resolved.
- Up to 80 alert codes are displayed by the Status LED, except codes that begin or end with a zero such as 0-9 and 10, 20, 30, 40, 50, 60, 70, 80 and 90. Codes not displayed on the LED may be accessed only via the service configurator.
- Alert codes are stored in RAM and lost when the controller is reset. Code storage has a time stamp in days, hours, minutes, seconds, milliseconds/ ticks of when the system alert occurred.

#### Alert Codes

Alert codes are as follows:

|    |                          |
|----|--------------------------|
| 11 | Illegal Instruction      |
| 12 | Unimplemented Interrupt  |
| 13 | NVM Write Failed         |
| 14 | Invalid Device           |
| 15 | Sequence Table Error     |
| 16 | Out of Memory            |
| 17 | Undecided: No Split      |
| 18 | Watchdog: Task Reset     |
| 21 | AntA S/W Current Fault   |
| 22 | AntB S/W Current Fault   |
| 23 | AntC S/W Current Fault   |
| 24 | AntD S/W Current Fault   |
| 25 | H/W Current Fault        |
| 26 | AntA Current Sense Fault |
| 27 | AntB Current Sense Fault |
| 28 | AntC Current Sense Fault |
| 29 | AntD Current Sense Fault |
| 31 | Ped A Not Tuned          |
| 32 | Ped B Not Tuned          |
| 33 | Ped C Not Tuned          |
| 34 | Ped D Not Tuned          |
| 35 | Ped A Tuning TX Off      |
| 36 | Ped B Tuning TX Off      |

|    |                            |
|----|----------------------------|
| 37 | Ped C Tuning TX Off        |
| 38 | Ped D Tuning TX Off        |
| 39 | Sequence Table Mismatch    |
| 41 | Missing Zero Crossing      |
| 42 | Wired Sync: Missing Signal |
| 43 | Temperature Fault          |
| 44 | S/W Temperature Fault      |
| 45 | PWM Fault                  |
| 46 | Fan Fault                  |
| 49 | Realtime Error             |
| 51 | Autosetup Owner Timeout    |
| 52 | Autosetup Release W/O Lock |
| 53 | Autosetup Buffer Overrun   |
| 54 | Autosetup Mailbox Full     |
| 55 |                            |
| 56 | Notch Select Timeout       |
| 57 | Window Select Timeout      |
| 58 | Autosetup Illegal Owner    |
| 61 | Detector Overrun           |
| 62 | Alarm Mailbox Full         |
| 63 | Host Comm Mailbox Full     |
| 64 | Host Comm Mailbox Full     |
| 71 | Host Comm Mailbox Full     |

### Controller-Assisted Tuning Disabled

If configurator-assisted tuning cannot be performed, a message indicating the cause will be posted on the service configurator. Causes the software recognizes are:

- Tx set to off in the service configurator.
- Tx inhibit active.
- Auto line delay not ready.
- Key switch turned to off (locked).

Once the CE has turned the transmitter on, controller-assisted tuning can be performed.

### Laptop/Modem Connections

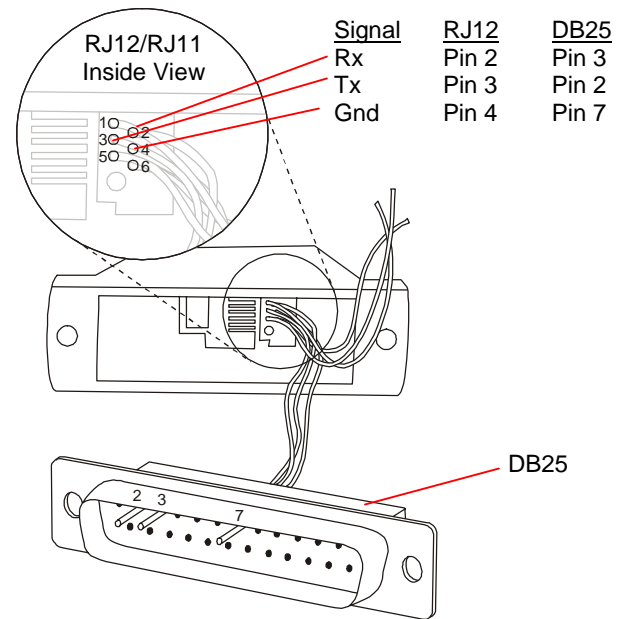
A modem enables you to use your computer to dial-up the controller for remote service.

Hardware required is as follows:

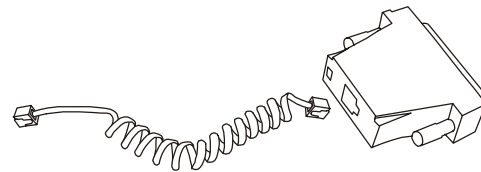
- External modem
- DB25 male to RJ12/RJ11 female connector
- RJ11 male to RJ10 male cable

### Procedure

1. Prepare the DB25 to RJ12/RJ11 null modem connector.



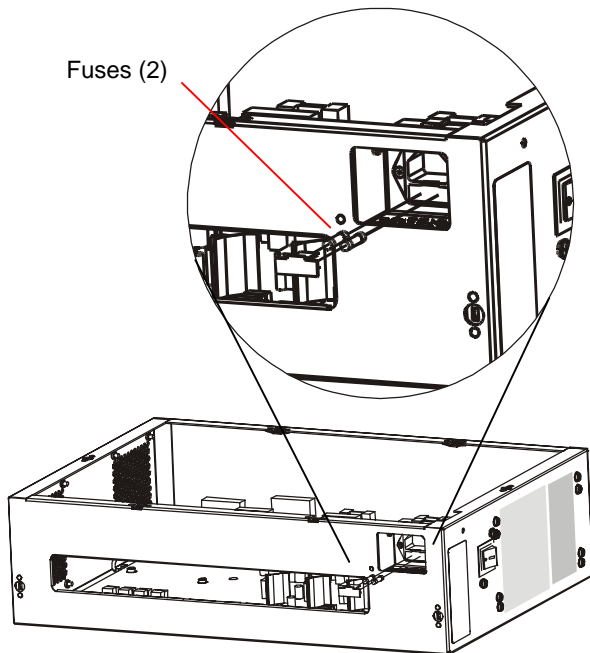
2. Connect the DB25 connector to the modem.
3. Connect the RJ11 connector to the DB25 to RJ12/RJ11 connector.





## Fuse Replacement

The controller contains two 5A, 250V, slow-blow fuses. To replace the fuse(s) in the controller, do the following:



1. Detach the controller from the cable tray. Two screws secure the tray, one on each side.
2. On the controller, pry the rectangular cover plate from the IEC320 receptacle using a small slotted screwdriver. Two spring-loaded fuses should pop out.
3. Replace the blown fuse (or fuses) with 5A, 250V slow-blow fuses (P/N 5111-0028-11).
4. Reattach the cover plate to the receptacle.
5. Attach the controller to the cable tray using two screws previously removed.

## Specifications

### Electrical

#### Power Supply

|                         |                                       |
|-------------------------|---------------------------------------|
| Primary input .....     | 100-120Vac or<br>220-240Vac @ 50-60Hz |
| Primary power fuse..... | 5A, 250V, slo-blow,<br>hi-breaking    |
| Current draw.....       | 4.0Arms @ 120Vac                      |
| Input power.....        | <400W                                 |

#### Transmitter

|                                |                 |
|--------------------------------|-----------------|
| Operating frequency .....      | 58 kHz (±200Hz) |
| Transmit burst duration.....   | 1.6ms           |
| Transmit current maximum ..... | 16A peak        |
| Burst Repetition Rate:         |                 |
| Based on 50Hz ac .....         | 75Hz or 37.5Hz  |
| Based on 60Hz ac .....         | 90Hz or 45Hz    |

#### Receiver

|                               |                |
|-------------------------------|----------------|
| Center frequency .....        | 58 kHz         |
| Receive coil resistance ..... | 1.6 ohms (±5%) |

#### Alarm

|                                 |                                  |
|---------------------------------|----------------------------------|
| Alarm relay output.....         | DPDT contacts                    |
| Contact switching current ..... | 1.0A max.                        |
| Contact switching voltage ..... | 28V max.                         |
| Lamp/Audio duration.....        | 1-30 sec.<br>(1 sec. increments) |

### Environmental

|                           |                                |
|---------------------------|--------------------------------|
| Ambient temperature ..... | 0°C to 50°C<br>(32°F to 122°F) |
| Relative humidity .....   | 0 to 90%<br>non-condensing     |

### Mechanical

|                             |                  |
|-----------------------------|------------------|
| Length.....                 | 50.8cm (20in)    |
| Width with bracket .....    | 43.4cm (17.1in)  |
| Width without bracket ..... | 32.2cm (14.3in)  |
| Height .....                | 15cm (5.9in)     |
| Weight .....                | 7.3kg (16.1lbs.) |

## Declarations

### Regulatory Compliance

|             |  |
|-------------|--|
| EMC .....   | 47 CFR, Part 15<br>EN 300330-1 U1.3.2 (2002)<br>ETSI EN 300330-2 V1.1.1<br>(2001-06)<br>ETSI EN 301489-3 V 1.2.1<br>(2000-08)<br>ETSI EN 301489-1 V 1.2.1<br>(2000-08)<br>RSS210 |
| Safety..... | UL 60950<br>CSA C22.2 No 60950<br>EN 60950   |

**FCC COMPLIANCE:** This equipment complies with Part 15 of the FCC rules for intentional radiators and Class A digital devices when installed and used in accordance with the instruction manual. Following these rules provides reasonable protection against harmful interference from equipment operated in a commercial area. This equipment should not be installed in a residential area as it can radiate radio frequency energy that could interfere with radio communications, a situation the user would have to fix at their own expense.

**EQUIPMENT MODIFICATION CAUTION:** Equipment changes or modifications not expressly approved by Sensormatic Electronics Corporation, the party responsible for FCC compliance, could void the user's authority to operate the equipment and could create a hazardous condition.

### Other Declarations

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MDR 04/04

## Appendix A: About Auto Sync

**Note:** Auto Sync is expected to be only about 80% reliable due to external environmental issues.

### Initialization Phase

Auto sync initialization occurs during power up or system reset. During initialization, auto sync can have four different outcomes depending on whether or not nearby EAS transmitters are detected, whether they are properly aligned with the ac-derived functions of the controller, and whether too much ambient noise exists

**No transmitters detected.** During initialization, the controller determines if EAS transmitters are nearby. If none are found, transmitter delay is set to zero if this is the initial power on, or set to the value stored in NVM if this is not the initial power on. The service configurator displays "No Signal" and normal operation proceeds.

**Transmitters detected and aligned.** During initialization, the controller determines if EAS transmitters are nearby. If transmitters are found, and are correctly aligned, transmitter delay is calculated and set to that value, and the value is stored in the controller for reference. The service configurator displays "Locked" and normal operation proceeds.

**Transmitters detected and unaligned.** During initialization, the controller determines if EAS transmitters are nearby. If transmitters are found, and are not correctly aligned, transmitter delay is set to zero if this is the first power on of the controller, or if not, the delay value is set according to the value retrieved from the controller and the service configurator displays "Too Many Signals". Operation continues as normal. The user is advised that system performance might be compromised. The yellow LED flashes to indicate system performance is downgraded.

**Too much ambient noise.** During initialization, the controller determines if EAS transmitters are nearby. If noise in the environment prevents the location other transmitters and if this is the first power on of the controller, the delay is set to zero. If this is not the first power on of the controller, the zero crossing delay is retrieved from storage within the controller and the service configurator displays "Too Much Noise". Operation continues as normal. The user is advised that the system performance might be compromised. The status LED flashes yellow to indicate system performance is downgraded.

**Note:** The controller stores the zero crossing delay for the instance when, during subsequent power cycles, the controller could not determine a reliable lock. Instead of using zero for the delay, the controller uses the zero crossing delay stored.

### Sync Link Detection

The Sync Link port is scanned for activity. If activity is found, the controller automatically switches over to using the Sync Link signal as the timing reference. The service configurator indicates that the Sync Link is active.

**Note:** If the Sync Link device does not receive the timing reference signal, it will add up to 60 additional pulses ( $\pm 100\mu\text{s}$ ). If the controller stops receiving the required pulse signals, it will measure the delay from the zero crossing to the SYNCB signal and start transmitting at that delay until it reacquires the Sync Link pulse.

