Sensormatic®

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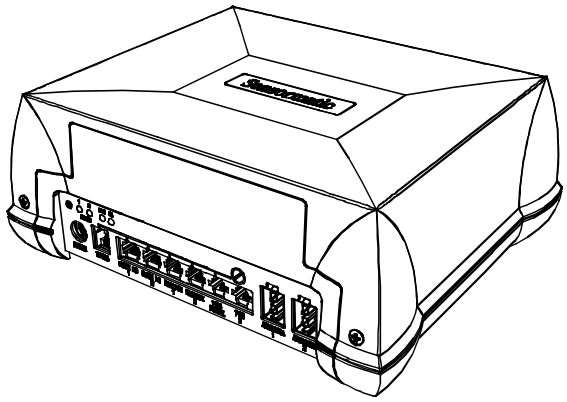
AMB-9020 Dual Antenna ScanMax® Pro Deactivator Controller

Installation and Service Guide



The Dual Antenna Deactivator controller, along with an antenna, is used to deactivate security labels. Antennas used with the controller are:

- PowerPad Pro (ZBSMPPP)
- Slim Pad Pro (ZBSMPSP)
- CompactPad Pro Tabletop (ZBSMPCP)
- CompactPad Pro Flush Mount (ZBSMPCP-F)
- HS Pro (ZBSMPHS)
- LP Pro (ZBSMPLP)
- IP Pro (ZBSMPIP)
- IS Pro (ZBSMPIS)
- NS Pro (ZBSMPNS)
- NS2 Pro (ZBSMPNS2)

IMPORTANT (all antennas)! If only one antenna is used, it MUST be plugged into the Antenna 1 port or the unit will not function properly.

IMPORTANT (IS Pro only)! If two antennas are used and one is an IS Pro antenna and one is not, the IS Pro antenna MUST be plugged into the Antenna 1 port or the unit will not function properly.

Contents

About this Guide 1
About the Product 2
  Product Overview 2
  About the Controller 2
  About the Antennas 3
  System Operation 3
  Indicators 3
  POS Integration 4
  Interconnection Cables 4
Connector Inputs/Outputs 5
Installation 5
Basic Setup 6
  Controller Status Indicators 7
  Remote Alarm Module 7
Advanced Setup and Adapter Configuration 8
Troubleshooting 9
  Basic Troubleshooting 9
  Advanced Troubleshooting 10
Specifications 12
Declarations 12

About this Guide

This guide explains how to install, setup, and service the Dual Antenna Deactivator controller. Other related documents are:

- Planning Guide, 8200-0365-03
- Software Configurator Guide, 8200-0365-04

Note: Because customer requirements dictate the placement of components, your Sensormatic representative will supply this information separately.

If you need assistance...

Call 1-800-543-9740
(Sensormatic / ADT Customer Response Center)

About the Product

Product Overview

The Dual Antenna Deactivator controller supports any two ScanMax Pro deactivation antennas used to deactivate USII and USIII labels. A universal input, 22Vdc output power supply powers the controller.

The controller contains the necessary ports for:

- Wireless synchronization
- Network communication
- Maintaining independent antenna status
- Functional control for each antenna.

The controller also has:

- Automatic antenna type detection, except if using the optional extension cable.
- Auto synchronization
- Automatic key switch detection
- Panel button for Label type (SR or DR) and power level (Full or Magnetic Media Safe)
- LEDs that indicate power on, communication activity, and diagnostics.

Product Limitations

- The controller has max duty cycle of three times a second.
- Both antennas must have the same power level and label type
- Max throughput speed of 203cm/sec (80”/second) unless otherwise limited by the antenna.
- Maximum distance between antenna and controller is expected to be 3m (9.8ft), or 6m (19.7ft) when optional extension cable 0652-0136-01 is used.
- Antennas cannot deactivate simultaneously.
- No independent antenna power selection (both antennas full or MMS)
- No independent antenna label selection (both antennas same label setting)
- Low Profile Pad and PowerPad have a 10% reduction in deactivation height.

Magnetic Media Safe Operation

Magnetic Media Safe (MMS) operation enables security labels in audiotapes and videotapes to be deactivated without affecting the media. MMS is selectable using a software configurator, or using the push button on the controller.

Synchronization

Auto-synchronization. Auto-synchronization within the controller helps minimize tuning and adjustment service calls. The controller synchronizes to the antenna picking up the highest in-band amplitude or to a wireless synchronization input.

Wireless synchronization. The wireless synchronization module plugs into the RS485 port on the controller. If the TSP/Sensormatic network is using this port, the module can be plugged into the modular jack of the network terminal block assembly.

About the Controller

The controller consists of an aluminum and plastic enclosure that contains power and control electronics. All connections are made to a connector plate on one side of the unit.

Connections include:

- DC power in
- Two deactivation outputs
- Two remote indicator ports
- Two RS232 ports: POS 1 and POS 2 (the service configurator uses only the POS 1 port)
- Two Scan I/O ports
- RS485 port.

Connector Panel

Antenna 1
Antenna 2
Remote 1
Remote 2
LED for mag media safe (MMS)
LED for label type (SR)
Button: PROG
Control LED: Status 1 and Status 2
POS1/SERV
POS2
RS485
Scan IO 1
Scan IO 2

About the Antennas

The controller accepts any ScanMax Pro antenna. These antennas automatically set the controller for their antenna type and software settings when plugged into the controller except when using an extension cable. When using optional extension cable 0652-0136-01 use the service configurator to select antenna settings. EXTENSION IN USE must be selected on the configurator as well.

System Operation

The Dual Antenna Deactivator generates an alternating magnetic field that deactivates the label by de-magnetizing the label's bias material.

Deactivation Process

Deactivation is accomplished using electronics in the controller and deactivation coils in the antenna assembly. The Dual Antenna Deactivator uses a resonance approach to generate the magnetic fields needed for deactivation. A capacitor is charged to a high voltage (on demand when a deactivation needs to occur) and then switched in parallel with the deactivation coil.

Detection Process

The detection process uses the same antenna used for deactivation.

Digital Signal Processing (DSP) and frequency sweeping enhance detection performance and allow for hard tag discrimination.

Note: Hard tag discrimination depends on how close the tag is to the deactivator. The further away the tag is, the longer it takes the controller to determine if a non-deactivateable tag is in the deactivation zone.

Detection compensation is controlled by the microprocessor allowing for adjustments to be made for label type, antenna type, and operating mode (Full Power or Magnetic Media Safe).

Control

The controller uses a microprocessor for deactivation and detection control. The controller also acts as the TSP/Sensormatic network hub (described later in this document). The intent of the RS485 network is to allow the POS register system to communicate via RS232 (POS 1 or POS 2) to other Sensormatic peripherals by allowing commands to 'pass through' the controller to the RS485 network.

The controller, when first powered up, can also detect whether a key switch is in use. If detected, the key switch setting is set as a default for the system.

Diagnostic Capabilities

The Dual Antenna Deactivator provides power on tests as well as continuous status of detection and deactivation functions.

The LEDs on the controller display status to the user. The controller displays a solid green light for control good and red for a fault. The control LED blinks green if the key switch is disabled.

Advanced diagnostics and analysis are available through the deactivator software configurator. The configurator features include zero crossing adjustment, receive signal and noise levels, operating mode selections, deactivation and double check counts, and hours of operation. Detection, scan enable, and deactivation outputs are sent to the configurator. Settings for each antenna can be adjusted independently (except label type and power level) using their individual set-up page.

Indicators

The controller has outputs that connect to the standard remote alarm display, AcoustoLink, and Footlink for each antenna. The controller provides a visual power on/status indicator and indicators for power mode and label type selection.

Control Power LED (Bi-color)

- Green: active
- Red: fault condition
- Blink Green 1/sec: deactivation disabled
- Momentary Amber: deactivation in progress

Programming button LEDs

- Yellow: reduced power for magnetic media safe
- Yellow: single resonator low energy label
- MMS LED blinks to indicate EEPROM in Antenna # 1 cannot be read
- SR LED blinks to indicate the EEPROM in Antenna #2 cannot be read.

Note: SR label type and MMS selections apply to both antennas

POS Integration

Scan I/O Port

POS integration uses the Scan I/O port and/or an RS232 port. Scan I/O ports can be configured to accept specific operating voltage levels to control the deactivator. It will be compatible with the AcoustoLink and Footlink options.

SCAN I/O Port Electrical Specifications

Maximum input voltage: +25Vdc ±5%

Input 1+ and Input 2+:

- Input voltage: 5–20Vdc positive or negative polarity, >20–25Vdc positive polarity only
- Current: 10mA source minimum
- Minimum pulse duration: 100ms.

Detect Out: open-collector side of an opto-isolator

- Maximum pull-up voltage: +25Vdc
- This output remains in the open state until a deactivation occurs. It then shorts to the Detect Common for a minimum of 50ms based on label vicinity to the antenna verse deactivation time.

Detect common: Emitter side of the Detect Out opto-isolator normally should be tied to a ground return. Maximum Current limit: 60mA.

Networking

The RS232 ports, if not used by a scanner interface device or other auxiliary control device, can be used for communicating to the customer checkout register. The controller has a 6-position modular jack (RJ11) that is the input/output for the TSP/Sensormatic RS485 network. Information from the register, when addressed correctly, passes through the controller RS232 interface, to the RS485 network, and on to its intended recipient.

To connect from the controller RS485 to peripherals, such as an exit EAS system or tag detacher, an optional interface assembly is required. This assembly contains two 3 position terminal blocks, two six-position modular jacks (RJ11), and an input modular jack. The length of the input cable from the controller to the networking terminal block is determined by the baud rate and line capacitance.

Interconnection Cables

The 183cm (6ft) power cord attaches to the external power supply and into a 4-position mini-din on the controller. The cord option selected depends upon destination.

Cable length of SMPRO antennas is 3m (9.8ft). The extension cable is 3m (9.8ft) long.

Connector Inputs/Outputs

RS485: RJ11 modular jack

Pin 1: GND
Pin 2: Line Sync OUT
Pin 3: Line Sync IN
Pin 4: RS485 HI
Pin 5: RS485 LO
Pin 6: +5

Scan I/O Port (2): RJ45 modular jack

Pin 1: +12Vdc
Pin 2: Input 1 +
Pin 3: Input 1 –
Pin 4: Input 2 +
Pin 5: Input 2 –
Pin 6: Out OC
Pin 7: Out Common
Pin 8: Ground

Serial Port (2): 4/4 Modular Jack

Note: Serial Port 1 (POS 1/SERV) is the only port that can be used for the service configurator.

Pin 1: S1 Rx
Pin 2: S1 Tx
Pin 3: Ground
Pin 4: Not Connected

Remote Port (2): RJ11 Modular Jack

Pin 1: +22V
Pin 2: Red LED
Pin 3: Green LED
Pin 4: Audio
Pin 5: Key Switch
Pin 6: Ground

Antenna Out Port (2)

Pin 1: X
Pin 2: Y
Pin 3: X ret
Pin 4: Y ret
Pin 5: Shield
Pin 6: EEprom signal

Installation

The controller can be placed, out-of-the-box, on the countertop. It can also be attached to the underside of the countertop or to the sidewall of the counter using a mounting bracket. This bracket contains key slots for easy attachment.

WARNING! If mounting the controller to the sidewall of a counter, its cable connectors cannot face up.

Detailed mounting instructions are supplied with the bracket (sold separately).

Equipment Required

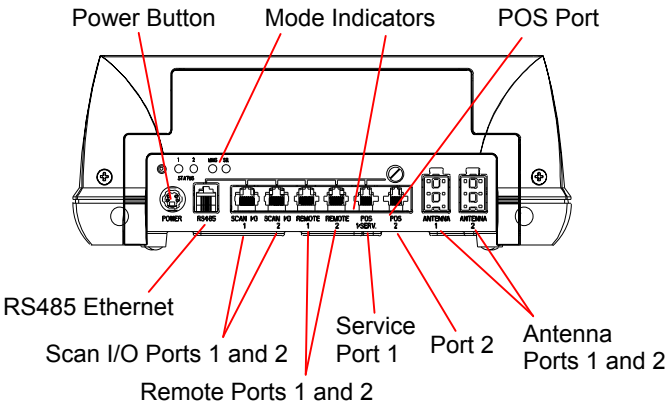
- Controller
- Hard tag (non-deactivateable Ultra•Max tag)
- Ultra•Max deactivateable low energy labels.

Additional equipment required for advanced setup:

- Laptop with minimum Windows 95
- Standard CE RS232 Ultra•Max programming cable
- Configurator software.

Basic Setup

Figure 1. Controller control panel



Note: This procedure is used for Antenna 1 and Antenna 2. If only one antenna is used, it MUST be plugged into the Antenna 1 port for the unit to function properly.

Referring to Figure 1:

1. If used, plug either the indicator board cable (PowerPad Pro antenna only) and/or the remote alarm cable into the REMOTE port of the controller. A Y-adapter is required if using both devices.

2. Plug each antenna cable into one of the two ANTENNA ports on the controller. If using only one antenna, use only Antenna Port 1.

   IMPORTANT! If two antennas are used and one is an IS Pro antenna and one is not, the IS Pro antenna MUST be plugged into the Antenna 1 port or the unit will not function properly.

   Plug the dc power supply cord into the controller. Do not plug the dc supply into the ac outlet yet.

   WARNING! Do not plug or unplug ANY controller cables with power on.

   WARNING—
   RISK OF ELECTRIC SHOCK!
   Keep the power cord and antenna cable away from cash drawers and other items whose operation may pinch or otherwise damage them. Failure to do so can damage equipment or injure people nearby.

3. Plug the power supply into an ac outlet. The status indicator may blink orange while the controller auto-synchronizes. Once synchronization is complete, this indicator should turn solid green. Auto-synchronization can take up to ten seconds.

   Note: If the status indicator is blinking green, either the deactivation or transmit function is disabled. If the indicator is alternating red/yellow or is solid red, then there is no high voltage available for deactivation. For either case, contact the Customer Response Center. The complete list of status indications is shown on page 7.

4. Verify operation by swiping a deactivateable label across the antenna and passing it through the EAS system at the exit.

Controller Status Indicators

Status Indicator on Controller (Note: Orange lamp may appear yellow.)

Solid Green	Unit ready.
Blinking Green	Transmit disabled in detect only mode or by key switch or configurator.
Blinking Orange	Controller is in auto-sync.
Solid Red	Non-recoverable fault.

Mode Indicator on Controller (Press the panel button to cycle through the selections below.)

SR LED on	The controller is set for use with an SR label.
SR LED off	The controller is set for use with a DR label.
MMS LED on	The controller is set for Mag-Safe operation.
MMS LED off	The controller is set for routine operation.
MMS LEDs blinks	Antenna 1 EEPROM fault.
SR LED blinks	Antenna 2 EEPROM fault.

Status Indicators on Remote Alarm Module (if used)

Green On, Red Off	Unit ready.
Blinking green	Transmit disabled in detect only mode or by key switch or configurator.
Blinking green and red (For PowerPad Pro, blinking orange)	Controller is in auto-sync.
Green on, Red flashing every 250ms	The high voltage circuit is not working.
One beep	The controller attempted to deactivate a label.
Slow beep until a hard tag is removed from the field.	The controller is in HT Test Mode.
Multiple Fast Beeps	Label present in Doublecheck or Detect Mode.
Solid Red	Label present in Detect Mode.

Remote Alarm Module

The remote alarm module (Figure 2) plugs into the REMOTE port on the controller. It contains the following:

a. **Deactivation inhibit keyswitch.** The key is turned 90° to inhibit deactivation.

b. **LEDs.** Red and green LEDs indicate routine operation, special modes, and system faults.

c. **Beeper.** Provides audio indication of detection.

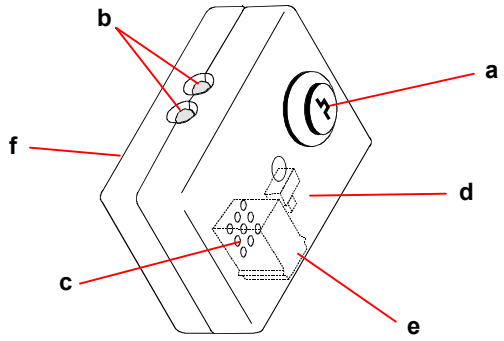
d. **High/Low volume control slide switch.**

e. **Phone jack.** Receives a 2.1m (7ft) modular cable from the REMOTE port on the controller.

f. **Two keyhole slots (not shown).** Two slots in the back of the module attach it to a suitable mounting surface. Two screws secure the unit.

Note: You may need the remote alarm module to diagnose certain problems with the deactivator.

Figure 2. Remote alarm module



Advanced Setup and Adapter Configuration

Note: Be sure to adjust the correct antenna settings as indicated on the title bar of the configurator screen.

Note: If the antenna has optional extension cable PN XXXX, you MUST select Extension Cable in the Antenna Setup for the unit to function properly.

1. Plug your laptop programming cable into the POS 1/SERV port of the controller.
2. Click the desktop icon to start the configurator software. The Setup Screen appears. For control definitions, see the *Software Configurator Guide*.
3. Verify settings correspond to the antennas used as follows. Do not change settings yet.

   Default Settings

Antenna	Tx Power	Threshold
LP Pro Pad	Med	8 (+1) inches 20 (+2.5) cm
PowerPad Pro	Med	7 (+1.5) inches 17.5 (+3.75) cm
SlimPad Pro	Med	6 (+1.5) inches 15 (+3.75) cm
IP Pro	Med	6 (+1.5) inches 15 (+3.75) cm
CompactPad Pro	Med	6 (+1) inches 15 (+2.5) cm
ScanMax IS*	Med	5 (+1) inches 12.7 (+2.5) cm
ScanMax HS	Med	5 (+1) inches 12.7 (+2.5) cm
ScanMax NS	Med	5 (+1) inches 12.7 (+2.5) cm

4. Use the Detection Height setting to adjust the detection height for the checkout environment and to compensate for special mounting such as metal countertops.
5. Click the EXIT button on the configurator to exit the configurator.

* *ScanMax IS Enhanced Detection Mode Option*. To enable 16.5–17.8cm (6.5–7in) detection with 10.2–12.7cm (4–5in) deactivation, set detection compensation on the diagnostics screen to +20 for X and Y.

If only “one” ScanMax IS antenna is used it MUST be plugged into the Antenna 1 port or the unit will not function properly.

If unexplained deactivation occurs...

Follow this procedure (except step 3) for each antenna as autosync should be completed only once. Manual operation must be used thereafter, as autosync will take both antennas out of their previous sync delay settings.

If false deactivation occurs, the configuration default values need to be modified as follows:

1. Plug your laptop programming cable into the POS 1/SERV port of the controller.
2. Start the AMB-9020 software configurator by clicking on the desktop icon. The Setup Screen appears (see *Software Configurator Guide*).
3. On the Setup screen, click the RESYNC button. Verify auto sync is enabled. If unexplained deactivation discontinues, readjust the Detection Height setting; otherwise, continue.
4. Ensuring no label/tag is close to the antenna, reduce the Detection Height setting one level at a time until the system does not false deactivate (firing without a label/tag present). Write this level down.
5. Set Detection Height level one step higher.

   Note: Maximum detection and deactivation height may be reduced compared with that listed in the table due to ambient noise and mounting locations. Note the new height.
6. If these steps fail to stop false deactivation, call the Customer Response Center for service.

Troubleshooting

Basic Troubleshooting

If the deactivator is not deactivating labels...

1. Ensure all cables are plugged into the controller. Do not hot plug the antenna cable or the power cable from the controller.
2. Is the green LED on the controller lit?
   - If not, there is no ac power and the unit cannot operate. Ensure the power supply is plugged into the ac outlet. If it is, check your store breaker panel.
   - If it is, go to next step.
3. With no EAS label on the antenna check the color of the status indicator on the controller.
   - Green—go to next step.
   - Blinking green—transmitter is disabled or the unit is in Detect Only Mode. This occurs if the unit was configured with an optional remote and/or key switch and that remote was removed or damaged. To enable deactivation, turn the key switch of the remote unit to the on position and the light should turn solid green. This also bypasses any scan-enable function. If not in Detect Only Mode and no optional remote is connected, place a service call.
   - Yellow or red is solid or blinking—call the Customer Response Center to place a service call.

   Note: It is possible that a hard tag (non-deactivateable label such as that placed on clothing) is within the deactivation area.
   - *If a remote is present:* A slow 'beep' indicates this as an issue and the tag must be found and removed from the deactivation area.
   - *If the remote is not present:* Turn the unit on and off using the green rocker switch. If the green status LED comes on and there is an immediate 2 to 3 deactivations and then deactivation no longer continues, there is a non-deactivateable label present that must be removed from the deactivation area.

     If the system indicates the presence of a non-deactivateable label, but none is found, call the Customer Response Center for service.

If the deactivator continuously deactivates...

This indicates interference from nearby POS equipment picked up by the deactivation antenna. Try to reposition equipment such as check readers or displays. If deactivation continues, a service call is necessary.

If deactivation height is significantly less than it should be...

Is the MMS LED mode indicator solid yellow?

If yes, this indicates low power deactivation, typically 7.6cm (3in), but dependent on antenna type. If low power deactivation is not a requirement, press the PROG button until both MODE LEDs go out.

The deactivator automatically adjusts its detection and deactivation areas continuously based on the noise environment. Typical operation should be at about 2.5cm (1in) less than what it would be if the Threshold were set manually. If operation is outside this tolerance, do the following:

1. Be sure a label is not within the deactivation area.
2. Turn power off and on by unplugging and then replugging the ac line cord in the ac outlet.
3. Once the status light turns green, wait five seconds and check the deactivation/detection height.
4. If performance remains poor, call the Customer Response Center to place a service call.

Certain types of counter installations may cause the deactivation height to be less than the height indicated by the configurator. In rare instances, the counter type may even cause deactivation attempts at a height outside the height specified. To ensure the deactivator operates within the indicated height, use Detection Compensation. See "If Deactivation Height is Low" and "If the Deactivator Fires at a Label Outside the Dx Area".

Advanced Troubleshooting

Use this procedure only when the following occurs:

- Unit is not deactivating labels
- Unit false fires
- Deactivation height is very low

Equipment required: EAS non-deactivateable label, laptop with minimum Window 98 SE, service configurator, RS232 programming cable (standard Ultra•Max CE cable).

Before You Begin...

Be sure you have completed basic troubleshooting before using this procedure. If troubleshooting is still necessary, turn on the controller and connect the RS232 cable to your serial port and the POS 1/SERV port of the controller.

Note: As indicated in basic troubleshooting, a solid red light on the status indicator is non-repairable at the customer site. Return the unit to the service center for repair.

Note: If swapping out the controller for a new one, no set-up is required. Simply plug in all cables and turn the unit on. Inform the customer that the unit is "advance replaceable" and that a service call is not necessary.

If the Unit does not Deactivate...

If basic troubleshooting has been completed and the green LED is still blinking:

1. See if a non-deactivateable label (hard tag) is within 30.5cm (12 in) of the antenna.
2. On the set-up screen for the antenna being tested, disable Hard Tag Check and ensure Detect Only is not enabled.
3. Unplug the DC power supply from the ac outlet and then plug it back in. If deactivation occurs, there is a non-deactivateable label or hard tag within the deactivation area preventing normal operation. Remove the label or hard tag.

   Note: If the label causing the problem cannot be found, swap the controller with one from an adjacent register. If the problem continues, something within the checkout area responds to the detection field like a label and the Hard Tag Check mode must remain disabled for operation. If the unit still does not deactivate, return it for service.

If the Unit False Fires...

1. Re-sync the controller by pressing the Re-Sync button on the configurator. Be sure AUTOSYNC is enabled. If false firing stops, troubleshooting is complete.
2. Remove the antenna and rotate it horizontally and vertically until deactivation stops. Rotate the antenna again until deactivation begins. This is the direction of interference.
3. Reposition equipment that may be causing interference such as card readers and displays. Typically, most POS equipment should be 30.5cm (12in) from the antenna.
4. If false firing stops, troubleshooting is complete. If false firing continues, do the following:
   - On the setup screen make sure that Detection Compensation is set to 0. If false firing continues, go to the next bullet.
   - On the diagnostics screen of the configurator, look at the noise levels. If possible, rotate the antenna until the noise is minimized.
   - Adjust the threshold level on the configurator down one-step-at-a-time until false deactivation stops. Set the threshold one step higher. Troubleshooting is complete. If false deactivation continues go to next step.

If the Deactivator Fires at a Label Outside the Dx Area...

It is possible that the metal counter or mounting bracket is affecting the detection field.

On the configurator, while holding a tag above the center of pad, adjust Detection Compensation negative until firing occurs *only* when tag is at or below the deactivation height set on the configurator.

On the configurator adjust the Detection Compensation negative. If false deactivation stops and the deactivation height is OK, troubleshooting is complete. If not, return the controller for service.

If Deactivation Height is Low...

1. Observe the noise level indicator on the configurator.
2. With customer approval, reposition POS equipment such as card readers and displays until the noise level minimizes. Typically, most POS equipment should be 30.5cm (12in) from the antenna.

   If deactivation performance is acceptable, troubleshooting is complete. If the noise level does not decrease to where deactivation is acceptable, continue to the next step.
3. INCREASE transmitter power to maximum. If false deactivation does not occur, this setting can be used. If deactivation height has not improved, continue to next step.
4. Is it possible that a metal counter or mounting bracket affected the detection field?

   On the configurator, while holding a label above the center of the pad, adjust Detection Compensation positive until firing occurs *only* when tag is at and below the deactivation height set on configurator.

   Note: Depending on the severity, compensation may not be enough to restore operation to maximum deactivation height.

   On the configurator, adjust Detection Compensation positive. If deactivation height improves, troubleshooting is complete. If not, return the controller for service and contact Sensormatic Technical Support via the Customer Response Center.

Specifications

The input voltage to the power supply shall be 90–264 VAC, 50 or 60 Hz ±5%. AC line current shall not exceed 2 amps rms. The power supply output to the controller must be 22Vdc +5%. Sensormatic power supply 606-0049-01 is specified for this application.

Electrical

Voltage input to power supply	90–264Vac, 50/60Hz (±5%)
Voltage input from power supply	22Vdc
AC line current	2Arms

Environmental

Operating temperature	0 to 40°C (32° to 104°F)
Non-operating temperature	–40° to 70°C (–40° to 158°F)
Relative humidity	0 to 90% non-condensing

Mechanical

Height	10cm (3.9in)
Width	26.3cm (10.4in)
Depth	22.1cm (8.7in)
Weight	2.5kg (5.5 lbs)

Declarations

Regulatory Compliance

EMC	47 CFR, Part 15 RSS 210 EN 300 330 EN 301 489
Safety	UL 60950 CSA C22.2 No 60950 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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