AutoPulse

UL, ULC, CSFM Listed*

Introduction

The EAS-1 Control Unit is for use in EAS-1 Electronically Activated Sprinkler Systems. The EAS-1 Control Unit is a releasing control system that interfaces with Sprinkler Control Heat Sensors to provide supervision and control for EAS-1 compatible electronic sprinklers. An on-board Ethernet port provides fast external system communications to expedite installation and service activity. Dedicated compact flash memory archiving provides secure on-site system information storage of electronic job configuration files.

Features

Figure 1: EAS-1 Control Unit cabinets are available with one, two, or three bays (two bay cabinet shown)

Master Controller (top) bay:

- 32-Bit Master Controller with color-coded operator interface including raised switches for high confidence feedback
- Dual configuration program CPU, convenient service port access, and capacity for up to 3000 addressable Sprinkler Control Heat Sensors
- CPU assembly includes 2 GB dedicated compact flash memory for on-site system programming and information storage
- ES power supply (ES-PS) and charger (9 A total) with on-board: IDNet addressable device interface, programmable auxiliary output and alarm relay

Standard addressable interfaces include:

- IDNet addressable device interface with 200 points that support Sprinkler Control Heat Sensors and operate with either shielded or unshielded twisted pair wiring
- Alarm Relay Card for alarm, trouble, and supervisory reporting to host fire alarm control unit

Optional modules include:

- Additional electrically isolated output IDNet 2 Sprinkler Card (two loop) and IDNet Loop Card (four loop) modules with short circuit isolation output loops allowing use with either shielded or unshielded, twisted or untwisted single pair wiring. Each additional IDNet 2 Sprinkler Card allows for the support of 200 additional Sprinkler Control Heat Sensors.
- Battery brackets for seismic area protection

Software Feature Summary

CPU provides dual configuration programs

- Two programs allow for optimal system protection and commissioning efficiency with one active program and one reserve
- Downtime is reduced because the system stays running during download

PC based programmer features

- Convenient front panel accessed Ethernet port for quick and easy download of site-specific programming
- Modifications can be uploaded as well as downloaded for greater service flexibility
- Firmware enhancements are made via software downloads to the on-board flash memory

Operator interface features

- Individual analog sensing of Sprinkler Control Heat Sensors with front panel information and selection access
- Sprinkler Control Heat Sensor peak value performance report
- **Install Mode** allows grouping of multiple troubles for uninstalled modules and devices into a single trouble condition (typical with future phased expansion); with future equipment and devices grouped into a single trouble, operators can more clearly identify events from the commissioned and occupied areas
- Module level ground fault searching assists installation and service by locating and isolating modules with grounded wiring
- **Recurring Trouble Filtering** allows the control unit to recognize, process, and log recurring intermittent troubles (such as external wiring ground faults), but only sends a single outbound system trouble to avoid nuisance communications

Listings information

This equipment meets the requirements of the following agencies:

- UL (UL 864)
- ULC (S527)
- CSFM

Module Bay Description

The Master Controller Bay (top) includes a standard multi-featured ES power supply (ES-PS), the master controller board, an IDNET 2 Sprinkler Card, an alarm relay card, and operator interface equipment.

The Expansion Bays include a power distribution interface (PDI) for additional IDNet 2 Sprinkler Cards and IDNet Loop Cards.

The Battery Compartment (bottom) accepts two batteries, up to 50 Ah, to be mounted within the cabinet without interfering with module space.

The following illustration identifies bay locations using a three bay cabinet for reference.
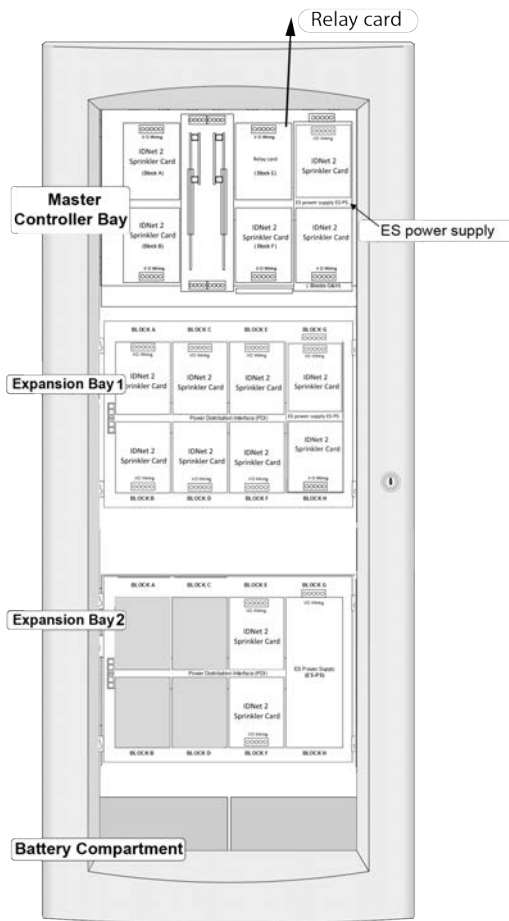

Figure 2: EAS-1 Control Unit module bay reference for a 3000 point system

Mechanical Description

- Boxes can be close-nippled; each box provides convenient stud markers for drywall thickness and nail-hole knockouts for quicker mounting
- Smooth box surfaces are provided for locally cutting conduit entrance holes exactly where required
- Cabinet assembly design has been seismic tested and is certified to IBC and CBC standards as well as to ASCE 7 categories A through F, requires battery brackets as detailed on data sheet S2081-0019
- The latching dress panel (retainer) assembly easily lifts off for internal access
- Modules are power-limited except as noted, such as relay modules
- The NEMA 1/IP30 box is ordered separately and available for early installation
- Doors are available with tempered glass inserts; boxes and doors are available in platinum
- Boxes and door/retainer assemblies are ordered separately per system requirements; refer to manual 579-117AR for details

Operator Interface Detail Reference

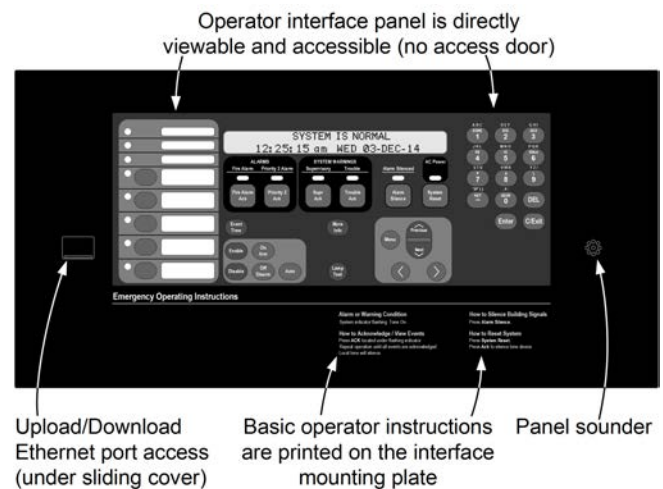The following illustration identifies the primary functions of the operator interface.

Figure 3: Operator interface detail reference

Addressable Device Control

Overview

The EAS-1 Control Unit provides standard addressable device-communications for Sprinkler Control Heat Sensors. Using a two wire communications circuit, individual Sprinkler Control Heat Sensors can be interfaced to the addressable controller to communicate their identity and status.

Addressability allows the location and condition of the connected device to be displayed on the operator interface LCD.

Addressable Operation

Each addressable device on the communication channel is continuously interrogated for status condition such as: normal, off-normal, alarm, supervisory, or trouble. Both Class B and Class A operation are available; however, Class A operation is recommended. Sophisticated poll and response communication techniques ensure supervision integrity and allow for T-tapping of the circuit for Class B operation. Devices with LEDs pulse the LED to indicate receipt of a communications poll.

IDNet Channel Capacity

The CPU bay ES power supply (ES-PS) provides an IDNet signaling line circuit (SLC) that supports up to 200 Sprinkler Control Heat Sensors on the same pair of wires. Additional 200 point IDNet2 Sprinkler Cards are available.

Table 1: IDNet 2 Sprinkler Card Wiring Common Specifications

Specification		Description
Maximum Distance from EAS-1 Control Unit per Device Load	1 to 125	4000 ft (1219 m); 50 ohms
	126 to 200	2500 ft (762 m); 35 ohms
Connections		Terminals for 18 AWG to 12 AWG (0.82 mm^2 to 3.31 mm^2)

Table 2: IDNet 2 Sprinkler Card Wiring Specifications

Specification	Description
Wire Type	Shielded or unshielded, twisted or untwisted wire
Total Wire Length Allowed with T Taps for Class B Wiring	Up to 12,500 ft (3.8 km); 0.60 µF
Maximum Capacitance Between IDNet 2 Channels	1 µF

Note: Some applications may require shielded wiring. Review your system with your local AutoPulse product supplier.

EAS-1 System Operation

The EAS-1 Control Unit software algorithm analyzes temperature data from Sprinkler Control Heat Sensors in multiple locations and selects the optimal response for sprinkler operation in the event of a fire. Sprinkler Control Heat Sensors are monitored and controlled by the EAS-1 Control Unit. For more information related to sytem operation, please refer to the EAS-1 Electronically Activated Sprinkler System for Storage Applications datasheet, TFP360 for details.

CPU Module Details

Master Controller and Motherboard

· Mounts in Slot 4 of a two slot motherboard (Slots 3 and 4 of the Master Controller Bay) and provides one Class B or Class A, RUI+ communications channel configurable for isolated or un-isolated operation

Power Supply

· Rating is 9 A total with Special Application appliances; 4 A total for "Regulated 24 DC" appliance power
· Outputs are power-limited, except for the battery charger
· Provides system power, battery charging, auxiliary power, auxiliary relay, earth detection, on-board IDNet communications channel for 200 points.
· **IDNet SLC Output** provides Class B or Class A communications for up to 200 addressable devices (as described in Addressable Device Control)
· **Battery Charger** is dual rate, temperature compensated, and charges up to 50 Ah sealed lead-acid batteries mounted in the battery compartment (33 Ah for single bay cabinets); also is UL listed for charging up to 110 Ah batteries mounted in an external cabinet (see data sheet S2081-0012 for details)
· **Battery and Charger Monitoring** includes battery charger status and low or depleted battery conditions; status information provided to the master controller includes analog values for: battery voltage, charger voltage and current, actual system voltage and current, and

individual NAC currents
· **Alarm Relay Module** provides three Form C relays that are used for Alarm, Trouble, and Supervisory, rated 2 A resistive @ 32 VDC

IDNet 2 Sprinkler Card (4100-3113AR)

Provides IDNet communications for up to 200 Sprinkler Control Heat Sensors using two isolated Class A or Class B loop outputs. One IDNet 2 Sprinkler Card is included in the CPU Bay (4100-9707AR, 4100-9708AR) mounted on top of the ES Power Supply. Additional Sprinkler Cards are for aftermarket field installation only.

Optional IDNet Loop Card (4100-3111)

Can be used to provide additional isolated loop outputs. Two IDNet Loop Cards can be mounted on top of one IDNet 2 Sprinkler Card to provide a total of four isolated loop outputs. For aftermarket field installation only.

Operator Interface

With the locking door closed, the glass window allows viewing of the display, status LEDs, and available operator switches. Features include a two-line by 40-character, wide viewing angle (super-twist) LCD with status LEDs and switches as shown in the illustration below.

LED indicators describe the general category of activity being displayed with the LCD providing more detail. For the authorized user, unlocking the door provides access to the control switches and allows further inquiry by scrolling the display for additional detail.

· Convenient and extensive operator information is provided using a logical, menu-driven display
· Multiple automatic and manual diagnostics for maintenance reduction
· Alarm and Trouble History Logs (up to 1000 entries for each, 2000 total events) are available for viewing from the LCD, or downloaded to a service computer
· Convenient PC programmer label editing
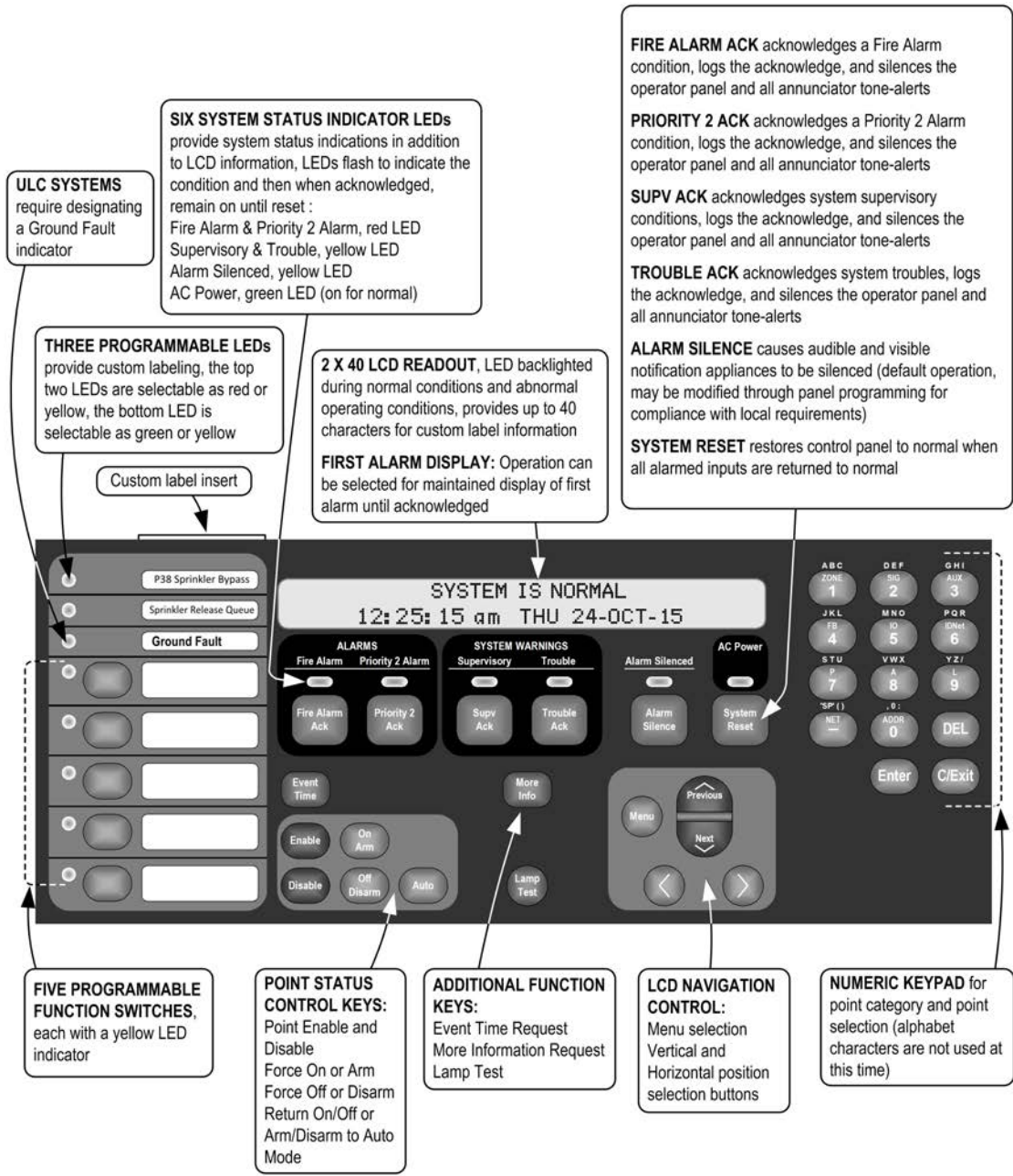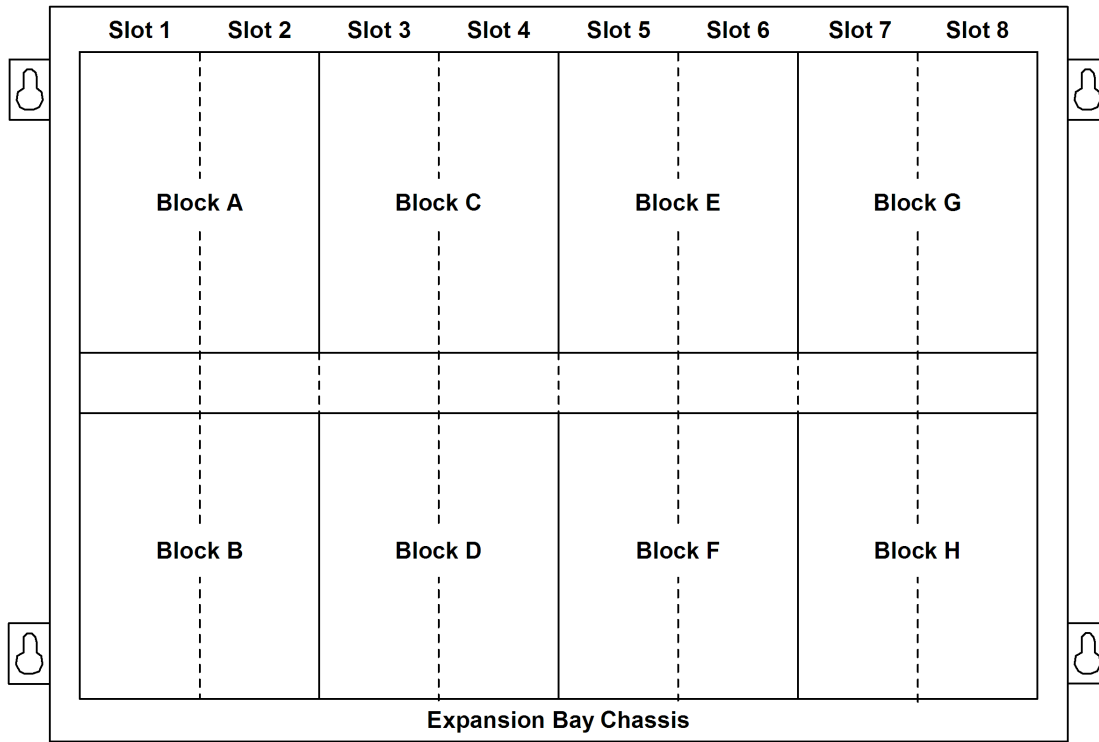· Password access control

Figure 4: Operator Interface

Expansion Bay Module Loading Reference

Size Definitions: Block = 4in. W x 5in. H (102 mm x 127 mm) card area
Slot = 2in. W x 8in. H (51 mm x 203 mm) motherboard with daughter card

Table 3: Expansion bay loading reference

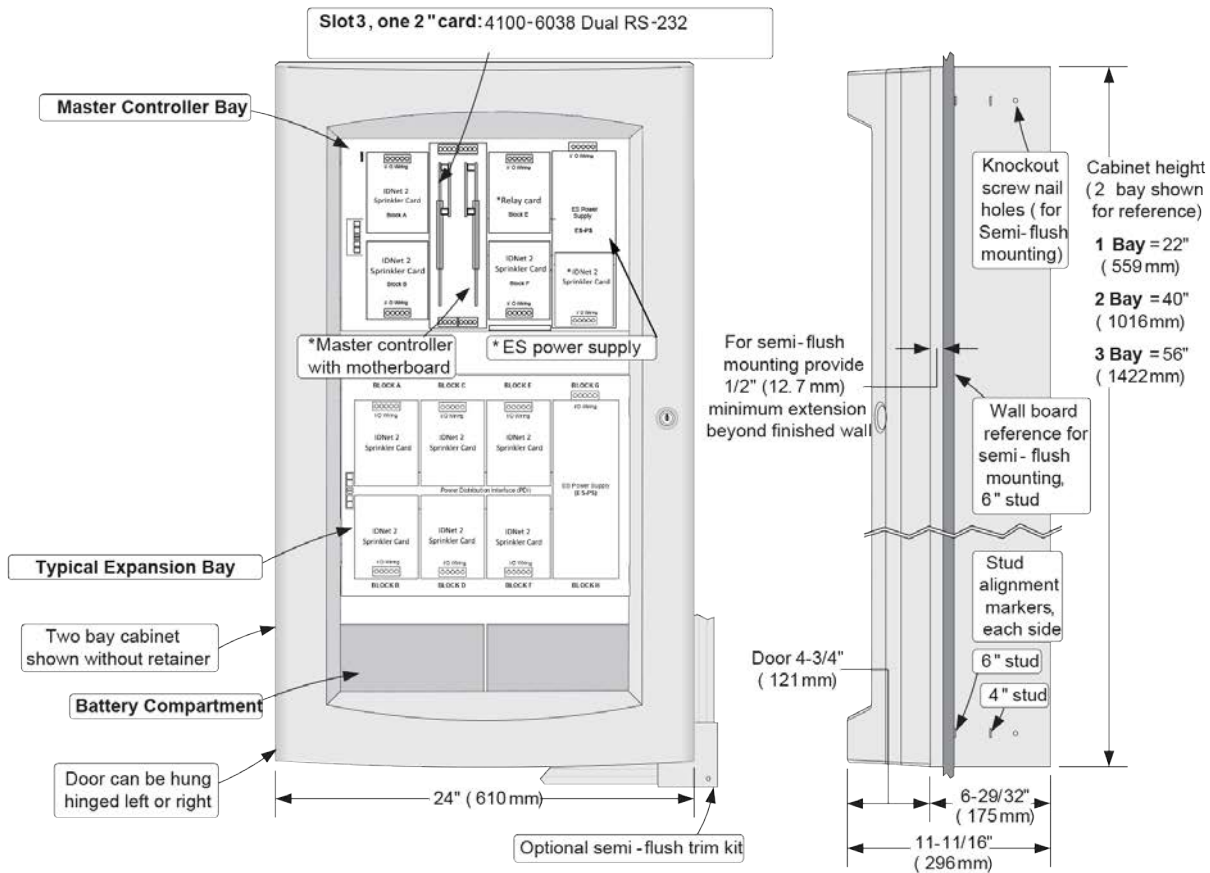| Description	Mounting
IDNet 2, Sprinkler Card Modules	1 Block

Mounting and CPU Bay Module Reference

Figure 5: Mounting and CPU bay module reference

Note:

1. Side View dimensions are shown with minimal cabinet and door protrusion from the exterior wall. For 6 inch stud construction with minimum protrusion shown, the door will open 90 °. To allow the door to open 180 °, the exposed cabinet dimension from the exterior wall must be a minimum of 3 in. (76 mm) for both 4 inch and 6 in. stud construction.

2. Asterisks (*) in Figure 5 indicates supplied modules.

3. A system ground must be provided for earth detection and transient protection devices. This connection shall be made to an approved, dedicated earth connection per NFPA 70, article 250, and NFPA 780.

General Specifications

Table 4: General Specifications

Specification			Rating	
Input Power	System Power Supplies (ES-PS)		120 VAC Models	4 A maximum @ 102 VAC to 132 VAC, 60 Hz
Regulated 24 DC Appliances			Power for other UL listed appliances; use associated external synchronization modules where required	
Environmental	Operating Temperature		32°F to 120°F (0°C to 49°C)	
	Operating Humidity		Up to 93% RH, non-condensing @ 90°F (32°C) maximum	
Additional Technical Reference	Installation Instructions		579-1385AR	
	Operating Instructions			

Master Controller Selection Information

Notes for Table 5 and Module Selection Information

1. Master Controller current does not subtract from 9 A output rating.
2. Supervisory and alarm currents are without IDNet devices. Add IDNet device currents separately.

Table 5: ES-PS master controller and expansion bay selection (Canadian models have low battery cutout)

Model	Model Type and Listing		Description	Standby Current (A)	Alarm Current (A)
4100-9707AR	120 VAC Input	-	4100-9707AR Master Controller – English, 2 x 40 Display, CPU Card, Alarm Relay Card, one IDNet 2 Sprinkler Card, ES-PS Power Supply (120-240V 50 Hz/60 Hz, 200 Sprinkler Points, 24 V Aux. Relay, 24 V Aux. Power Tap/Simple NAC, 110 Ah Battery Charger)	0.342	0.148
	English				
4100-9708AR	120 VAC Input		4100-9708AR Master Controller – French, 2 x 40 Display, CPU Card, Alarm Relay Card, one IDNet 2 Sprinkler Card, ES-PS Power Supply (120-240V 50 Hz/60 Hz, 200 Sprinkler Points, 24 V Aux. Relay, 24 V Aux. Power Tap/Simple NAC, 110 Ah Battery Charger)		
	Canadian French				

Module Selection Information

Current Calculation Notes

To determine total supervisory current, add the current ratings of the control unit modules, the base system, and all control unit power supply powered external loads.

To determine total alarm current, add the current ratings of the control unit modules, the base system alarm, and all control unit power supply powered NAC loads and external load.

Table 6: IDNet Addressable Interface Modules

Model	Description		Supv. Current	Alarm Current
4100-3113AR	IDNet 2 Sprinkler Card, 200 point capacity; electrically isolated output with two short circuit isolating Class B or Class A output loops, 1 block; alarm currents for 50 and above devices includes 20 device LEDs in alarm	0 devices	50 mA	60 mA
		50 devices	90 mA	150 mA
		125 devices	150 mA	225 mA
		200 devices	210 mA	300 mA
4100-3111	IDNet Short Circuit Isolating Loop Output Module; mount up to two on a 4100-3113AR module; for use with 4100-3113AR modules; this option is for aftermarket field installation only			

Note: Loading per IDNet device (no LEDs on) = 0.8 mA supervisory and 1 mA alarm. Each IDNet 2 and Short Circuit Isolating Loop Output can be individually controlled for system diagnostics.

Table 7: Additional Parts

Model	Description
4100-0634	Power Distribution Module 120 V
4100-0644	Power Distribution Module Harness 120 V
4100-5128	Battery Terminal Block (needed for 110 Ah batteries)

Table 7: Additional Parts

Model	Description
4100-2300	Expansion bay (one needed to support 1001-2600 Sprinkler Control Heat Sensors, two needed to support 2601-3000 Sprinkler Control Heat Sensors)
4100-5401	ES-PS Power Supply

Table 8: Back Boxes, Doors, and Dress Panels

Model	Description
2975-9444AR	1 Bay Box, Glass Door (Plastic) & Dress Panels – Platinum
2975-9445AR	2 Bay Box, Glass Door (Plastic) & Dress Panels – Platinum
2975-9446AR	3 Bay Box, Glass Door (Plastic) & Dress Panels – Platinum
2081-9282	Remote Battery Cabinet (Red only; for 100 Ah batteries only)

Table 9: Miscellaneous Accessories

Model	Description
4100-1279	Single blank 2" display cover; 4100-2302 provides a single plate for a full bay

Additional EAS-1 Product Reference

Table 10: Additional EAS-1 Product Reference

Subject	Data Sheet
Battery and Battery Cabinet Reference for 4100ES	S2081-0006
110 Ah Batteries and Cabinets for 4100ES	S2081-0012
Seismic Battery Brackets Reference	S2081-0019
TrueInsight Remote Gateway	S4100-0063