

Sentinel V2

Emergency Communication System



Installation Manual / Guide

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WARNING

1. The Sentinel V2 AOR Emergency Communication System requires installation by factory trained authorized dealers/distributors, in accordance with all local, state and ANSI/NFPA 70 National Electrical Code requirements.
2. Professionally trained personnel, familiar with Telecommunications Industry Associations 568 TIA/EIA standard, are required for proper installation. Failure to terminate the wiring correctly may cause damage to the system and void the warranty.
3. The Sentinel V2 AOR Emergency Communication System shall be installed in a controlled, indoor dry environment, with temperatures maintained between 32°F and 120°F, and humidity < 80% non-condensing.
4. Component or device substitutions such as Power Supplies, Switches or required cabling types are not permissible. Any attempt to do so will void all warranty / listings.

IMPORTANT

5. The Sentinel V2 AOR Emergency Communication System recommends a dedicated internet connection to be provided to the system main unit (**SCM-4825**) WAN port. The internet connection is required for remote technical support or for Cornell to make programming changes remotely.
6. The Sentinel V2 AOR Emergency Communication System offers the ability to use the end-user's existing phone lines to dial out to a monitoring location. The system is compatible with digital (SIP) or POTS analog phone lines.
 - **SIP** = requires end-user's network connection (**WAN**) and SIP account info (username, password)
 - **POTS/Analog** = requires a dedicated RJ11 phone line connection (to FXO port on **POTS-4800S**).
7. Cornell Technologies Sentinel V2 AOR Emergency Communication System is powered by one or more 24VDC power supplies. Each power supply requires 120VAC input power to be provided by the installer. The **SCM-4825** head-end unit also requires 120VAC input power.
8. No individual CAT cable length should exceed 100m/328ft. For longer cable runs, Cornell recommends adding an **ES-4808S** expansion switch kit to bridge long-distance cable runs.
9. SFP ports are available on the main **SCM-4825** head-end unit and all **ES-4808S** expansion switch kits which can accommodate fiber SFP transceiver modules to allow for long distances between the head-end to an **ES-4808S**, or from one **ES-4808S** to another. Cornell does not supply fiber cabling or the fiber SFP transceiver modules.
10. To ensure proper operation, the Sentinel V2 AOR system should be tested on a regular basis by qualified personnel. Cornell recommends checking functionality at a minimum of twice a year (bi-annually).

Sentinel V2 AOR System Overview

General Overview:

The Sentinel V2 AOR System is network-based and designed to provide fully supervised, full duplex voice communication, between each Call Station (4800VS-3) and a Base Station (A-4800BS) phone on the system. Optionally, if a call generated by any Call Station is not answered at a Base Station phone, the system can forward the call to a programmed phone number to be answered by an ECC/remote monitoring location (not included). The amount of time a call will ring internally before it is forwarded to a monitoring location is programmable (minimum 5s).

General Operation:

When pressing a Call Station “PUSH FOR HELP” button, a message will play and an LED will begin to flash, notifying the caller that their emergency request for help has been activated and to standby for assistance.

The Base Station phone(s) will receive the incoming call, display the location of the Call Station, and begin ringing. Simply answer the call at any Base Station to speak with the caller, then hangup when finished.

If a call is not answered at a Base Station phone, the system can forward the call out to a monitoring location phone number. When a monitoring location answers a call, a repeating message will play providing the location of the Call Station and the building name and address. This message will prompt them to press the # key to connect to the call. When finished, the monitoring location can simply hangup to disconnect the call.

**Press 4800VS-3 Button
to Initiate a Call**



**Answer calls at any
A-4800BS Base Station Phone**



OR

**Press 4800VS-3 Button
to Initiate a Call**



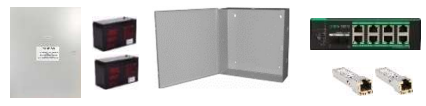
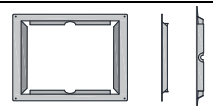
**Answer calls at any
A-4800BS Base Station Phone**



**Unanswered Calls Dial
24/7 Monitoring Location**



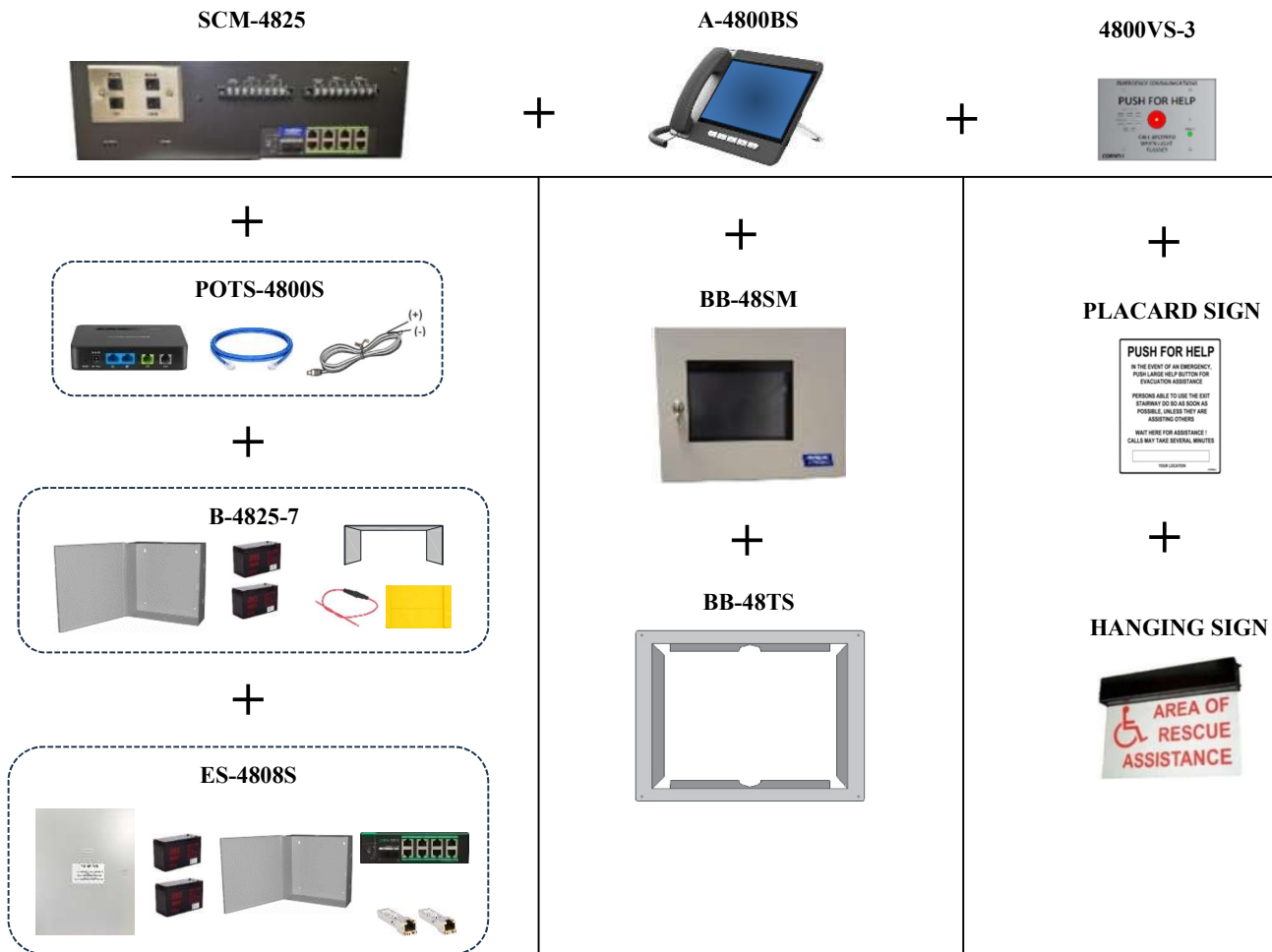
Sentinel V2 System Components

MODEL #	DESCRIPTION:	DEVICE IMAGE:
Main Components:		
SCM-4825	System main head-end unit (supports up to 8 Call Station or Base Station devices). Includes (1) RJ45 SFP adapter, (1) 1ft patch cable, (1) 120VAC power cord, (2) mounting brackets and (1) USB drive.	
A-4800BS	Base Station IP phone to answer incoming emergency pushbutton calls and display system statuses. Includes stand for desk-mounting. Metal enclosure sold separately (BB-48SM).	
4800VS-3	Remote Call Station device (3-gang) used to activate an emergency request for help. Includes (x4) mounting security screws.	
Add-on Components:		
POTS-4800S	POTS modem enables system to use an analog telephone line when dialing out to a 24/7 monitoring location. Includes the modem, power cord, and ethernet patch cable to connect to the SCM-4825 .	
ES-4808S	24VDC, 8-port PoE switch w/ brackets w/ metal enclosure backbox for wall mounting. Includes B-5243A (24VDC, 3A power supply) for power. Both enclosures mount adjacent to each other.	
B-5243A (Included w/ ES-4808S)	UL Listed 24VDC, 3A power supply in a 16"H x 12"W x 5"D metal box enclosure. Includes pair of 12VDC, 7Ah batteries. The B-5243A power supply is included with each ES-4808S expansion kit.	
ES-4808S-65	24VDC, 8-port PoE switch w/ brackets w/ metal enclosure. Includes a 24VDC power supply and the B-4865 boxes for the large batteries. The 7710-065 large batteries are sold separately.	
SN-xxxx	Various signage options for your AOR / ARA system. Electrical and photoluminescent signs offered.	
HW-02	Rack-mount hardware to mount the SCM-4825 head-end unit into a 3U networking rack space. Includes (4) cage nuts and Screws.	
Battery Backup Options:		
B-4825-7	Pair of 12VDC, 7Ah batteries w/ metal enclosure used for short-term battery backup <u>only</u> for the SCM-4825 unit. Includes (2) 12VDC batteries, metal enclosure, fuse kit and battery shelf w/ grommet.	
7710-065	A single 12VDC (55-70Ah) battery for long-term battery backup. Requires (2) batteries for any 24VDC power supply or the main SCM-4825 unit. B-4865 battery boxes sold separately.	
B-4865	Pair of standing battery boxes for the 7710-065 larger batteries. This includes a fuse kit for wiring.	
Backbox Enclosures:		
BB-48SM	Locking metal enclosure backbox with view window for wall-mounting the A-4800BS Base Station phone. Optional BB-48TS trim ring available for semi-flush mounting sold separately.	
BB-48TS	Semi-flush trim ring for the BB-48SM enclosure. Used to mount the BB-48SM recessed into a wall.	

Building a Sentinel V2 System

Required Devices:

1. **SCM-4825** = main head-end unit required for every system (max. of 1)
2. **A-4800BS** = minimum of (1) IP phone required per system (max. of 5)
3. **4800VS-3** = minimum of (1) Call Station required per system (max. of 500+)



Add-on / Optional Devices:

1. **POTS-4800S** = Add when a POTS/Analog phone line will be used to dial the monitoring location.
 - a. Cornell recommends adding the **POTS-4800S** to every system to allow for future use.
2. **ES-4808S / ES-4808S-65** = Expands the system device limit by 8 for each **ES-4808S** added to the system. Can also be used to bridge long distance cable runs (over 328ft). The **ES-4808S-65** offers extended battery backup compared to the **ES-4808S** but is otherwise the same. Add as needed to expand or extend the Sentinel network.
3. **B-4825-7** = optional short-duration battery backup option for **SCM-4825** head-end only.
4. **B-4865** = optional long-duration battery backup option for **SCM-4825** or **ES-4808S** expansions.
5. **BB-48SM** = metal enclosure for the **A-4800BS** phone.
6. **BB-48TS** = semi-flush trim ring for **BB-48SM** backbox.
7. **SN-xxxx** = (1) placard sign per Call Station is required at a minimum. Other electrical room / directional signs are available.

Detailed System Operation

The Sentinel V2 AOR system is designed to be able to initiate a call from any **4800VS-3** Call Station (or another future model) to all **A-4800BS** Base Station phone(s) on the system. Optionally, if not answered within a specified time, the Sentinel V2 AOR system can forward the call to an outbound monitoring ECC location. This is accomplished by using a customer provided trunk phone line (only SIP or POTS/Analog phone lines are compatible). See below for more detailed information about

At the Call Station:

Once an **4800VS-3** emergency Call Station button is pressed, the button LED flashes and the first message plays indicating their call has been activated. Repeating messages play every 10s at each activated call station when **1)** a button is pressed, **2)** when it forwards a call to an offsite monitoring location, and **3)** while it is waiting to connect the call. The messages provide the caller with updates on the status of their emergency request for help and instruct them to standby while the call is connected. The caller only needs to wait for their call to connect 2-way comms hands-free.

At Master/Remote Phones:

The initiated call station will generate a call internally at all base station phones for a preset amount of time (min. of 5 seconds / max. 9999999 seconds). The base station phone(s) ring and display all calls by their programmed location and extension. Answer a call at any base station phone by picking up the handset.

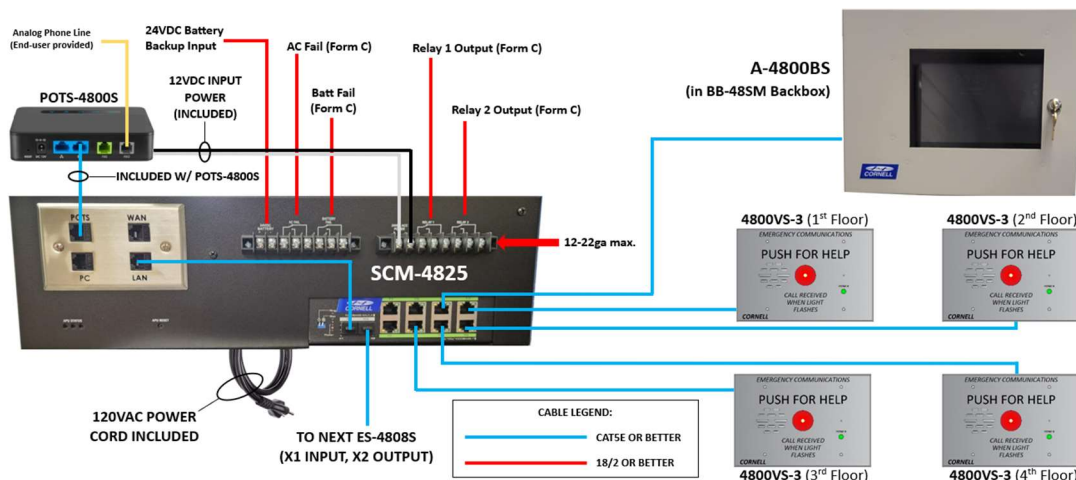
At the ECC / Offsite Monitoring Location:

If the system is programmed to dial offsite, the call will be forwarded after a preset amount of time, using the end-user's provided phone line, to the programmed phone number. When an emergency responder answers a call, they will hear a repeating message indicating the origin of the call (station location, building name and full address), and **must press the # key to connect**. When done, the responder can simply hang up the phone to disconnect the call from the call station. The station will automatically go back to standby, which is indicated by a heartbeat LED on each call station button flashing once every 10 seconds.

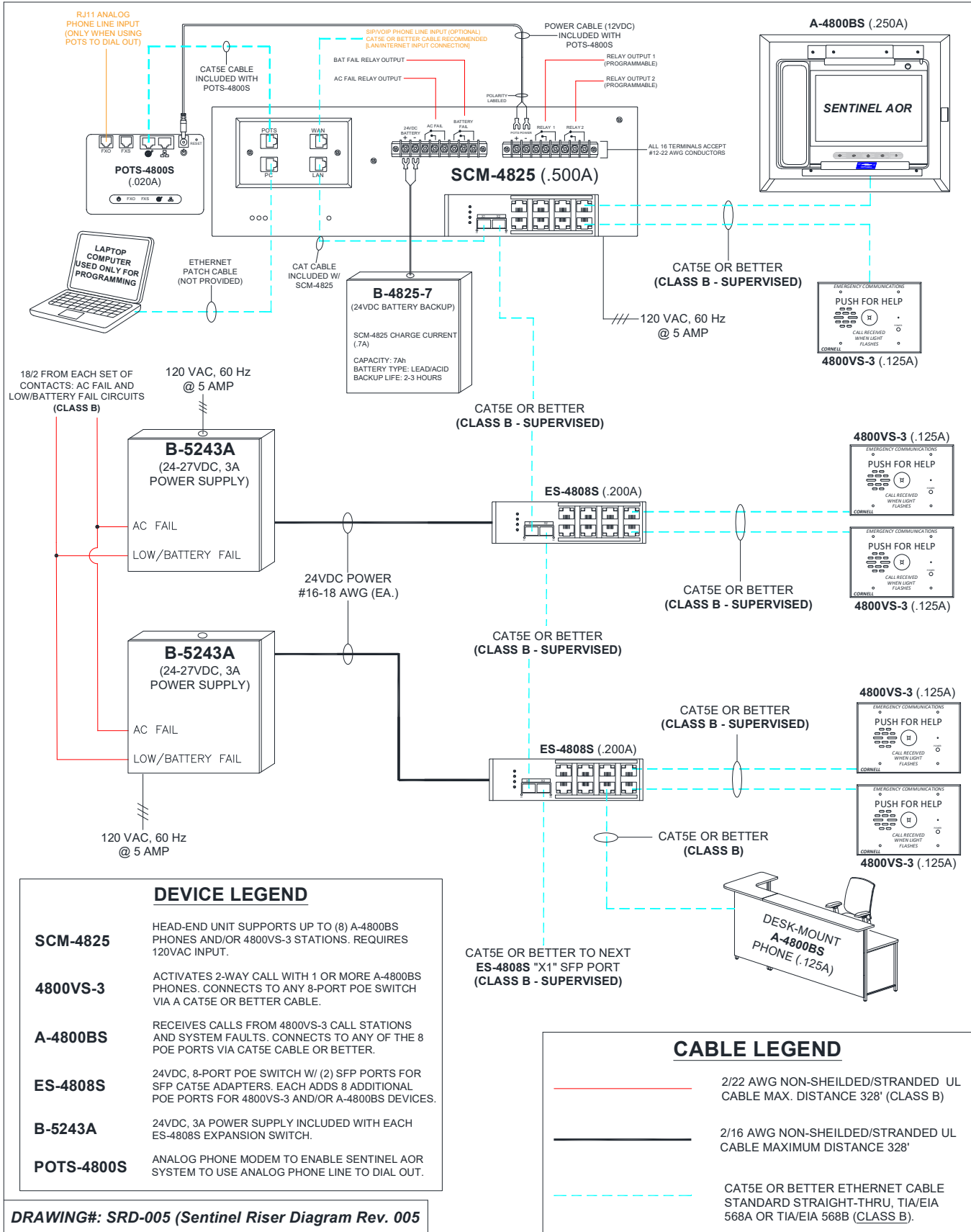
Supervisory / Trouble Calls:

The Sentinel V2 AOR System will poll (supervise) system devices and connections on a continuous basis to identify line faults and defective equipment. System faults / troubles generate a call to the A-4800BS phone(s) specified location and can also be programmed to activate one of the (2) available relays. The default is to have device fault calls ring to the Base Phone(s) and trigger the auxiliary dry contact relay #1. Supervisory fault calls will ring to the Base Phone(s) and play a message when answered specifically identifying the type/source of the fault and trigger the auxiliary dry contact relay #2.

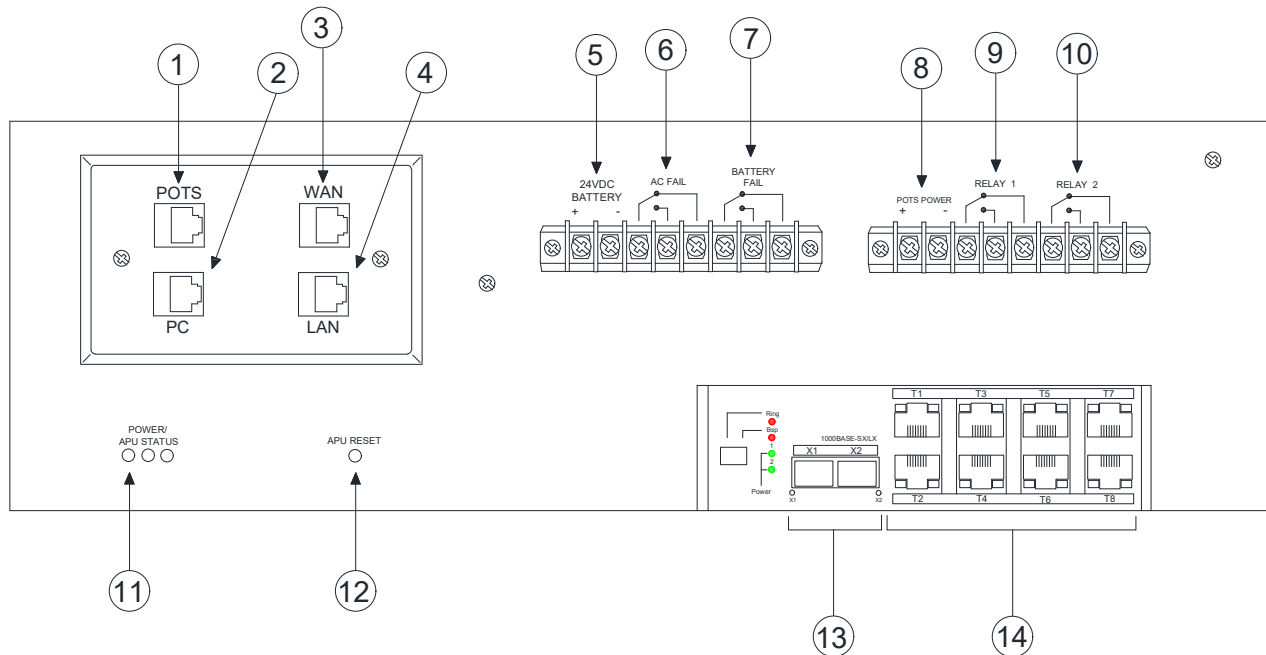
Basic Sentinel V2 System setup pictured below:



Detailed Riser Diagram



SCM-4825 Inputs and Outputs



DEFINITIONS:

- ① **POTS OUTPUT** - RJ45 (ethernet) port to POTS-4800S module. CAT5E cable included.
- ② **PC OUTPUT** - RJ45 (ethernet) port to local PC for programming.
- ③ **WAN INPUT** - RJ45 (ethernet) port input for connection to internet (may be required).
- ④ **LAN OUTPUT** - RJ45 (ethernet) port to (X1) SFP port on the 8-port PoE switch.
- ⑤ **24VDC BATTERY** - Input terminals to connect 24VDC battery backup for main unit.
- ⑥ **AC FAIL** - Form "C" contacts to monitor AC Fail condition.
- ⑦ **BATTERY FAIL** - Form "C" contacts to monitor Battery Low/Fail condition.
- ⑧ **POTS POWER** - 12VDC power output for POTS-4800S module.
- ⑨ **RELAY 1** - Programmable fault detection relay w/ Form "C" contacts.
- ⑩ **RELAY 2** - Programmable fault detection relay w/ Form "C" contacts.
- ⑪ **STATUS LEDs** - Internal APU computer device POWER and STATUS lights.
- ⑫ **RESET** - Internal "reset" button to reboot main APU unit.
- ⑬ **SFP PORTS** - (x2) SFP ports for SFP adapters used to interconnect PoE switches.
- SFP1 (X1) is an input, SFP2 (X2) is an output.
- ⑭ **PoE PORTS** - 8x output PoE ports only for 4800VS-3 stations or A-4800BS phone(s).

4800VS-3

(3-gang Call Station)



Description: The Area of Refuge Call Station (4800VS-3) will initiate a call at the Base Station phone (A-4800BS) when the red mushroom button is pressed. If the call is not answered on site after a preprogrammed amount of time has elapsed, the Main System (SCM-4825) will call off site to a pre-programmed emergency number (Outside Monitoring not Included).

Operation: Pressing the Mushroom Button (or Flush Button) will activate a call to all Base Station phones, and if not answered, can forward the call to an outside monitoring location. The pushbutton LED begins to flash when activated, and an audible message plays providing notification of the status of their request for help call to the caller. The call station will be connected with 2-way full duplex communication when a call is answered by any Master/Remote Base Station phone or a 24/7 attended monitoring location.

Mounting: It is required that each Call Station be mounted in a 3-gang electrical back box (minimum of 2.5" deep). Call Stations connect to the Main System or Expansion Module using an RJ45 connector and Cat5e (or better) cable.

Optional: Flush Button in replacement of Mushroom Button available upon request. Custom systems and systems larger than 500 are possible - contact Cornell for pricing and availability.

Engineering Specifications: The contractor shall furnish and install the CORNELL 4800VS-3 Call Stations as indicated on the plans. Faceplates shall be satin-finished aluminum with silk-screened designations. The activation button shall be via a Red Mushroom Pushbutton (Flush Mount Button Optional Replacement) with an integral LED indicator. Stations shall be mounted in a 3-gang electrical back box (minimum 2.5" deep).

Technical Information:

- Power Requirements: PoE Only (draws .05A / 50mA standby | .10A / 100mA active)
- Operating Environment: -4°F ~ 122°F
- Physical Faceplate: 6.37" x 4.49" (3 Gang); Satin-finished aluminum
- Green "Power" status LED to confirm the unit is receiving power.
- Call Button Momentary (normally open) Mushroom button; push-to-call with LED Indicator
- Mounting: Mounting Flush mount in 3-Gang box (min. 2.5" deep)
- Wiring: Cat5e (or better) Ethernet cabling is required for connections between Main System, Base Station(s), Expansion Module(s) and Call Stations. Maximum cable length of 100m/328ft when using premium wire and doing a clean installation. Interference from other cables and building construction may lower this distance.

A-4800BS

(Master/Remote Base Station Phone)



A-4800BS Phone (w/ desk stand)

Description: The A-4800BS Base Station Phone(s) are digital touch-screen IP phones used to receive all incoming calls from each Call Station (4800VS-3), which can be answered locally to provide full duplex 2-way communications. It also receives system status calls generated to notify onsite personnel of system connection issues, providing the error type and location. System statuses and information are displayed and accessible at each Base Station Phone using the screen/buttons. Multiple of the A-4800BS phones can be used on a single system.

Operation: At each A-4800BS, calls initiated on the system create an audible ringing sound and the screen visually displays a detailed description of the call origin. Answering a call with the phone handset will connect the user to the activated call station. Optionally, certain fault conditions can be programmed to initiate a call at the Base Station(s) with a message detailing the fault's cause and origin. Simply pick up the handset at any Base Station phone to answer an incoming call from the system.

(Mounted in BB-48S Metal Enclosure Backbox)

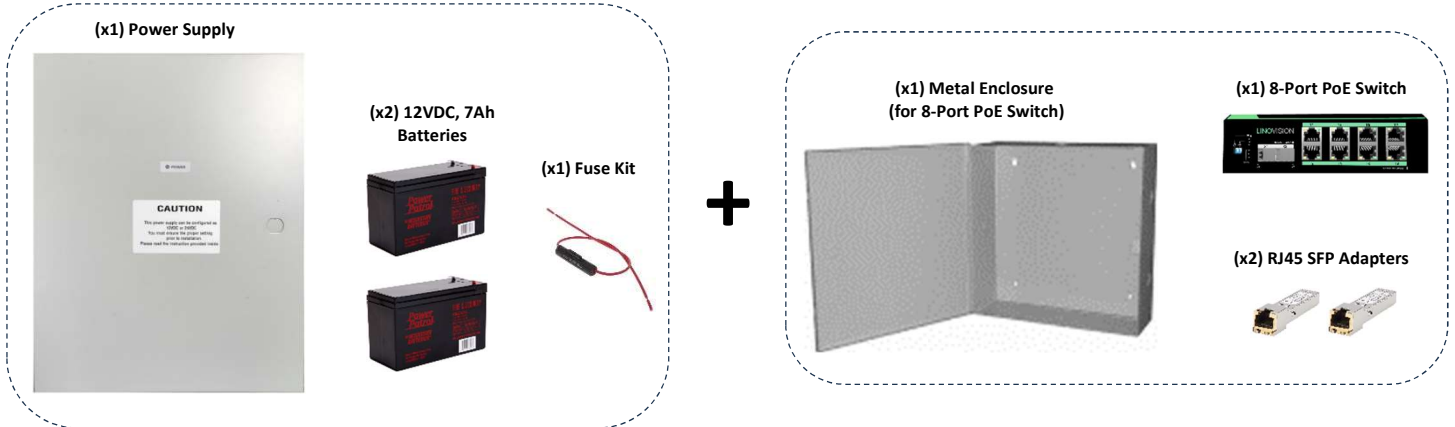
Mounting: The Base Station (A-4800BS) includes a desk-stand. It can also be mounted inside a separately ordered surface-mount wall enclosure (BB-48S). This enclosure can be semi-flush using the BB-48TS trim ring. The metal enclosure's dimensions are (14"W x 11"H x 5"D) and includes a locking hinged door with a view window to monitor incoming system calls and statuses. The A-4800BS typically mounts 5ft to center from the finished floor in centrally located strategic locations (main lobby area) for emergency responders.

Engineering Specifications: The contractor shall furnish and install the CORNELL A-4800BS as indicated on the plans. Base Station(s) shall be programmed into the Main System per customer-provided-specifications. Base Station(s) can be mounted in CORNELL enclosures (BB-48S) to be ordered separately, or on a desk or other flat, secured surface.

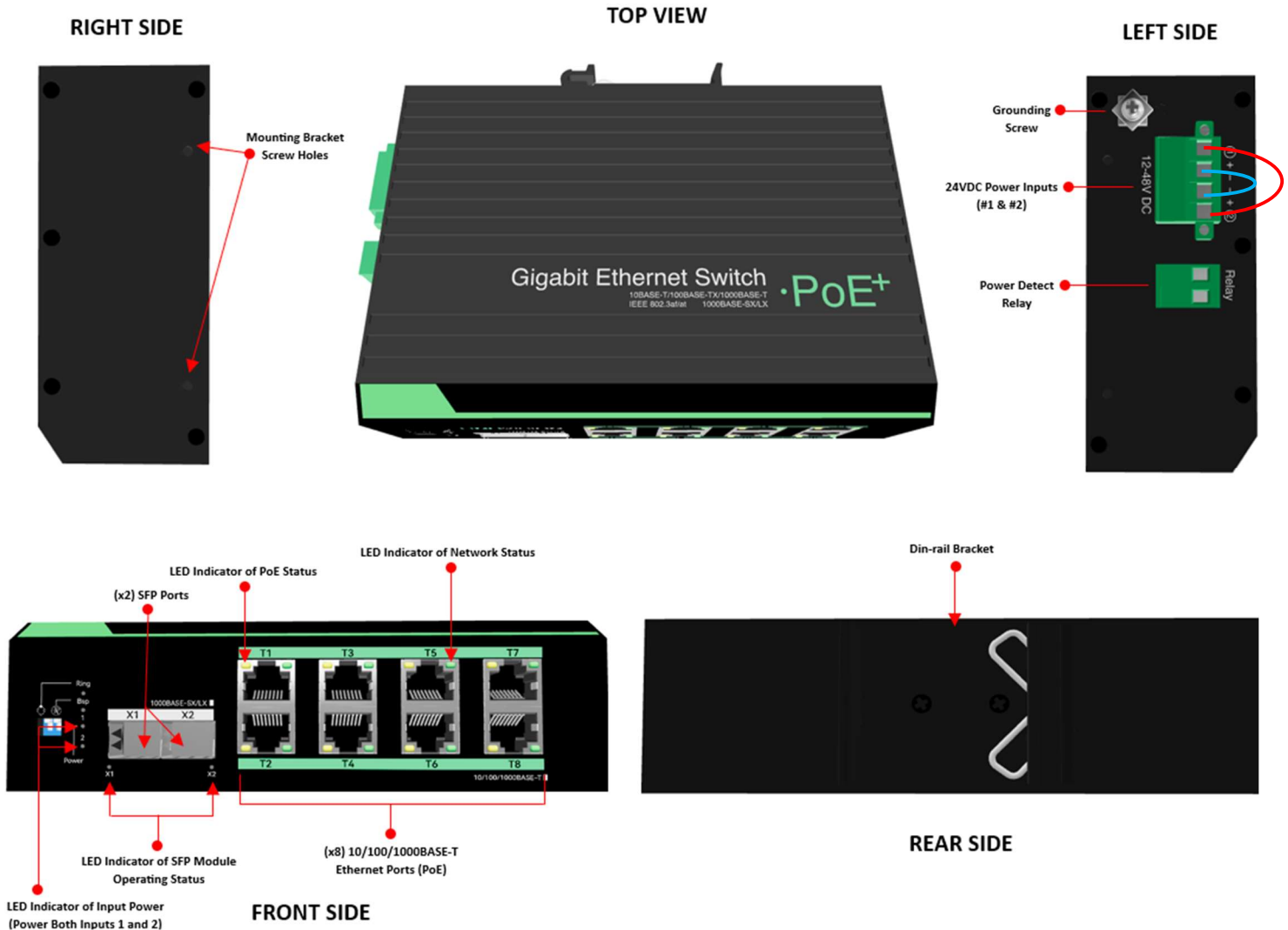
Technical Information:

- Power Requirements: PoE
- Operating Environment: 50-100°F Indoor Non-condensing; Humidity <95%
- Physical Dimensions of the Enclosure, Base Station Mounted Inside: 14"W x 11"H x 5"D
- Mounting: Follow instructions provided in installation manual
- Wiring: Cat5e (or better) Ethernet cabling is required for all network connections between Main System, Base Station(s), Expansion Module(s) and Call Stations.

ES-4808S Expansion Switch Kit



8-Port PoE Switch Details



ES-4808S Expansion Switch Kit (cont'd)

Description:

The **ES-4808S** expansion switch kit is used to expand the total # of devices you can have on the system, or to bridge long distance cable runs. Each **ES-4808S** includes an 8-port PoE switch device (pictured above) and metal enclosure to mount it in, as well as a 24VDC, 3A power supply (**B-5243A**) with battery backup. The **ES-4808S** should mount in a central strategic location from the devices being connected to it.

Installation Instructions:

1. Mount the **B-5243A** power supply backbox (approx. 5ft from the finished floor).
2. Mount the **7330-108R** enclosure to a wall adjacent to the power supply (mounting hardware not included).
2. Mount the 8-port PoE switch inside of the enclosure backbox (brackets / din-rail clip to mount are included).
4. Run power from **B-5243A** (18/2 AWG) to the **ES-4808-24L** mounted in the **7330-108R** enclosure.

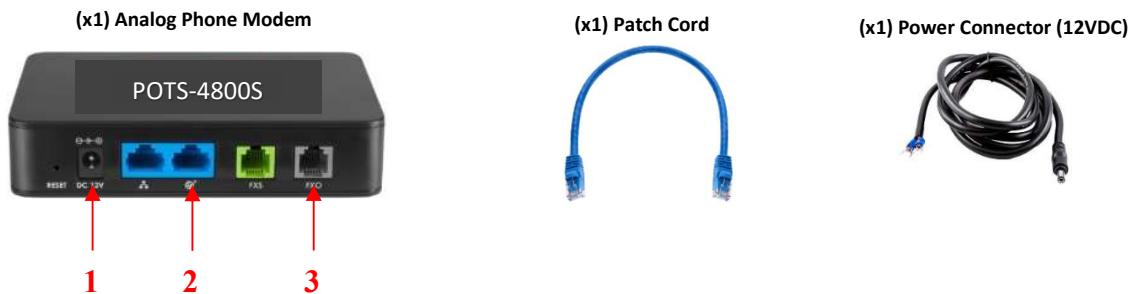
5. Jumper power to both sets of inputs on the **ES-4808-24L**.

- a. Jumper (V1+) to (V2+)
- b. Jumper (V1-) to (V2-)



6. Make all necessary network and other cable connections prior to energizing the **ES-4808-24L**.
7. Provide 120VAC input power to the **B-5243A** power supply.

POTS-4800S



The **POTS-4800S** is an add-on device which is required for the Sentinel V2 System to use an Analog/POTS phone line to dial out. Cornell recommends adding the **POTS-4800S** to every system to enable this functionality for potential future use.

The **POTS-4800S** requires:

1. Power from the **SCM-4825** unit (12VDC power cord included).
2. Network connection to the **SCM-4825** unit “POTS” port (patch cord included).
3. A dedicated RJ11 analog phone line (not included) provided by the installer / end-user.

Mounting Instructions:

Mount the **POTS-4800S** adjacent to or directly on the **SCM-4825** unit using the included Velcro tape. Make network and connect the **RJ11** phone line to the **FXO** port, then connect to power last.

Device Electrical Ratings

Technical Specifications/Electrical Ratings

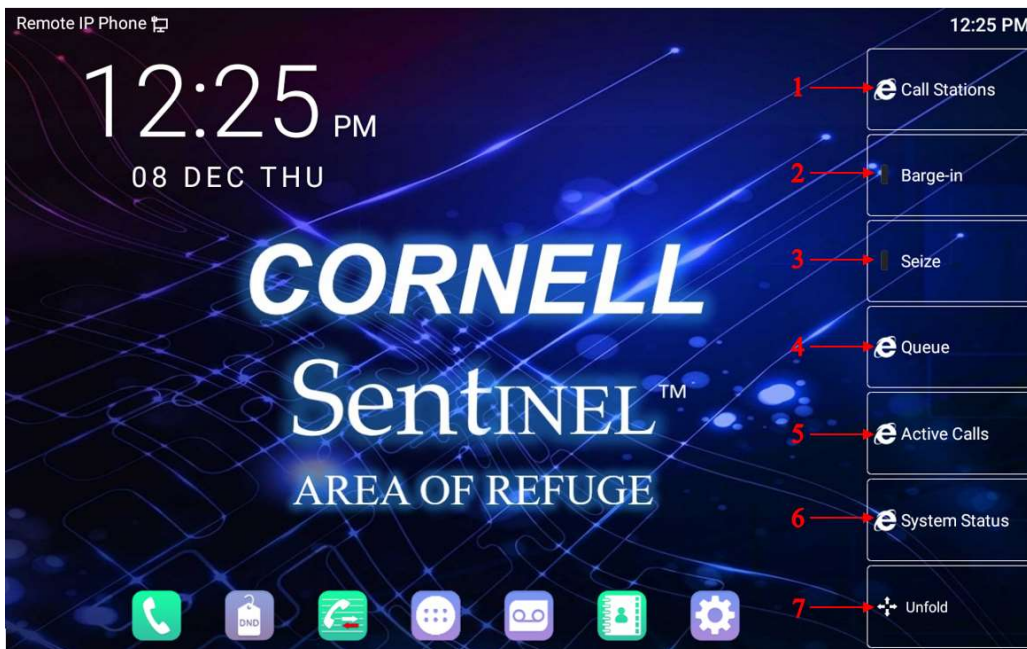
<u>CORNELL P/N:</u>	<u>DESCRIPTION</u>
SCM-4825	Main head-end unit
4800VS-3	SIP Intercom Call Station w/ Red Mushroom Button
A-4800BS	SIP IP Phone (Master / Remote phones)
ES-4808-24L	8-Port POE expansion switch w/ 2 SFP ports
POTS-4800S	POTS Phone Module (<u>Optional</u> add-on to use Analog/POTS line to dial out)
B-5243A	24VDC, 3A Power Supply w/ (2) 12VDC, 7Ah batteries (included with ES-4808S)

CORNELL P/N:	INPUT VOLTAGE	STANDBY CURRENT	ACTIVE CURRENT
SCM-4825	120VAC	N/A	500mA / .500A
A-4800BS	PoE	150mA / .150A	250mA / .250A
4800VS-3	PoE	50mA / .050A	100mA / .100A
POTS-4800S	12VDC	N/A	20mA / .020A
ES-4808-24L (8-port PoE switch)	24VDC	N/A	200mA / .200A
<i>WITH 8 DEVICES CONNECTED</i>	24VDC	1000mA / 1.0A	1250mA / 1.250A
POWER SUPPLY (24VDC)	INPUT VOLTAGE	MAX INPUT	MAX OUTPUT
• B-5243A	120 VAC, 60 Hz	1.2A	3A @ 24VDC
BATTERY BACKUP OPTIONS	OUTPUT (Volts)	(2) IN SERIES	DIMENSIONS (ea.)
• (2) B-4825-7 (2-4 hours)	12VDC	24VDC	5.94"L x 2.56"W x 4.02"H
• (2) B-4865 (28+ hours)	12VDC	24VDC	13.3"L x 6.57"W x 6.69"H

The Sentinel Area of Refuge System is completely powered by one or more 24VDC power supplies. The main **SCM-4825** unit and all Power Supplies will require 120VAC, 60Hz power, on a dedicated 15A circuit, to be provided by the installer. Cornell recommends this circuit also be connected to emergency backup power such as a generator.

Cornell also recommends connecting a battery backup option to the **SCM-4825** unit and all **B-5243A** power supplies to a battery backup option we offer to maintain continuous uninterrupted service in the event of a power outage / AC loss.

A-4800BS Master/Remote Phone Operation



Button Descriptions:

1. **Call Stations** = displays all call station locations and extensions
2. **Barge-in** = join an existing call between a call station and offsite monitoring location (3-way call)
3. **Seize** = take an existing from the monitoring location at the phone (disconnects ECC location)
4. **Queue** = view all calls currently in queue to be answered
5. **Active Calls** = view all active call(s) on the system
6. **System Status** = view the status of the different system devices
7. **Unfold** = view all buttons on the screen (not used/needed)



= **Phone** / dial out / keypad (dial call station extension to connect with it)



= **DND** (Do not disturb) [Red = Enabled and Purple = Disabled]



= **Call Log** (missed calls / outbound calls)



= **Apps** (should not need to use)



= **Voicemail** (not enabled / should not need to use)



= **Contacts** (none added by default / blank)



= **Settings** (use to edit time/date if needed)

Battery Backup Options

Cornell offers (2) battery backup options, the **B-4825-7** and **B-4865**, for the Sentinel V2 AOR system main SCM-4825 unit. Each will provide instantaneous backup power to the SCM-4825 in the event the primary power is interrupted, to maintain continuous uninterrupted service preventing loss of system functionality. Both options include batteries, enclosures, and a fuse kit and terminals for connections to the batteries and connected devices.

The **B-4825-7** is offered for short-term battery backup during power outages (3-4 hours of backup). The **B-4865** is offered for long-duration battery backup during power outages (over 28+ hours of backup) to meet the NFPA 72 2022 requirement below:

NFPA® 72 2022:

- **24.10.14. 24.10.2.1:** *The secondary power supply for two-way emergency communications systems shall be capable of operating the system under quiescent load for a minimum of 24 hours and then subsequently during a fire or other emergency condition for a period of 4 hours with all remote call stations activated and all master control stations annunciating the calls.*

Always check with your local AHJ if the above code will be required to determine battery needs

	B-4825-7	B-4865
Description:	(x2) 12VDC, 7Ah batteries	(x1) 12VDC, 55+Ah batteries
Fuse Kit Included?	YES	YES
Compatible with:	SCM-4825 or B-5243A	SCM-4825 or B-5243A
Battery Backup Duration:	Approx. 3-4 hours	Over 28 hours (24 standby, 4 active)
Backbox:	7330-108R (Included)	(x2) 7330-001 (Included)
Backbox Dimensions:	12.00"(L) x 12.00"(W) x 4.0"(H)	17.6"(L) x 10.0"(W) x 10.7"(H)
Backbox Image:		x2 
Enclosure mounting:	Wall-mounted / adjacent	Floor-mounted / nearby

Expanding/Extending the Sentinel V2 AOR System

The Sentinel V2 AOR System creates a network all devices use to operate as one complete system. All devices used on the system require a network connection. You can expand or extend the Sentinel V2 system network by adding and connecting an **ES-4808S** expansion switch.

The **SCM-4825** head-end unit allows for any combination of up to (8) **4800VS-3** Call Stations or **A-4800BS** Base Station phones within **100m/328ft**. Some buildings will require more than (8) Call Station or Base Phone devices in total, or the devices may be farther than 100m/328ft away.

Expanding the Sentinel V2 AOR System:

To support more than (8) station devices, you will need to add (1) or more **ES-4808S** expansion switches. Each **ES-4808S** will expand the system device limit by increments of (8) for each one added. The CAT cable distance limit also applies and should not exceed 100m/328ft in length between any devices on the system.

Extending the Sentinel V2 AOR System:

Due to distance limitations of network cables, it may be required to add an (1) or more **ES-4808S** expansion switch to bridge connections. All network / PoE device connections require CAT5E or better cable no longer than 100m/328ft in length. If a Call Station, Base Station Phone or other device will be farther than 328ft, the **ES-4808S** should be used in between to bridge the distance.

SFP Ports:

Each **ES-4808S** includes (2) SFP ports used to interconnect them to each other. An SFP adapter is required to utilize the SFP port by inserting it into the blank SFP port. Cornell includes only Ethernet SFP adapters with our equipment.

Fiber-optic cable can be used between **ES-4808S** device SFP ports. Fiber SFP adapters (Cornell does not supply fiber SFP adapters) must be used when using fiber-optic cables between **ES-4808S** devices and must be sourced and provided by the installer. The SFP ports are compatible with single-mode and multi-mode cables.

Link **ES-4808S** Expansion Switches using SFP ports:



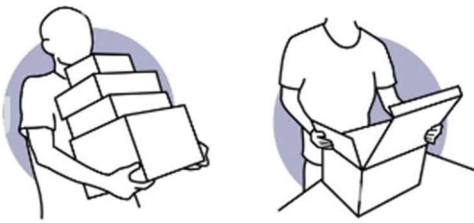
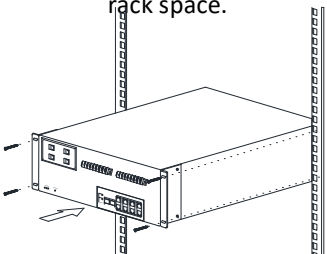
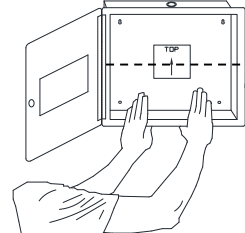
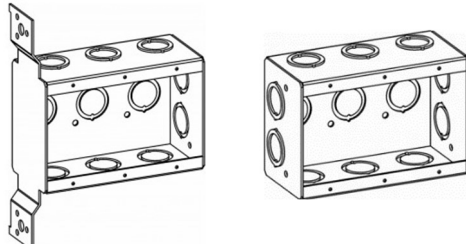
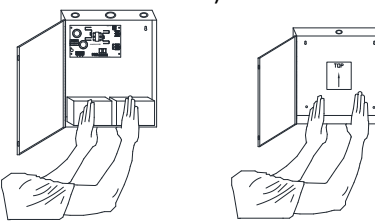
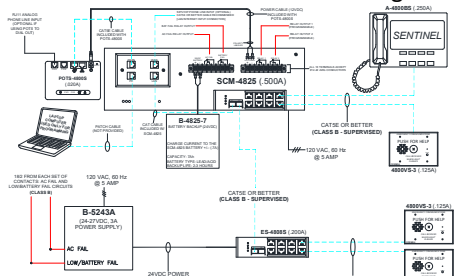
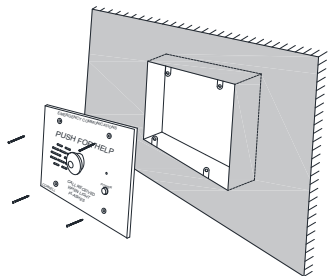
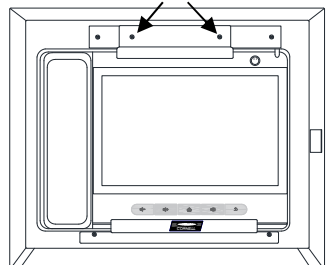
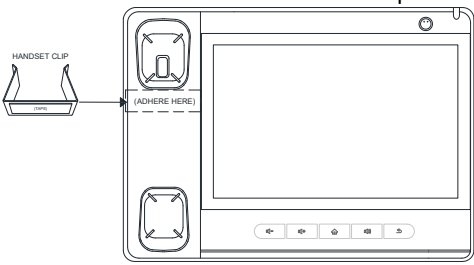
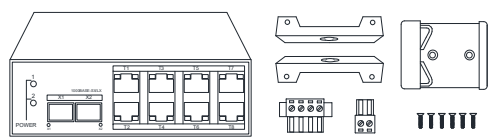
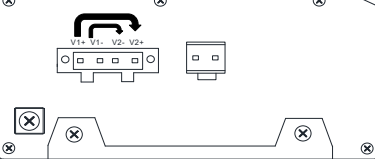
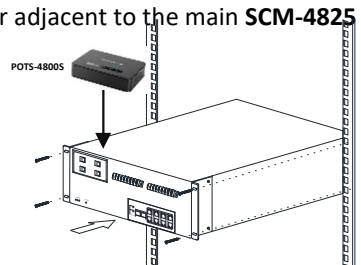
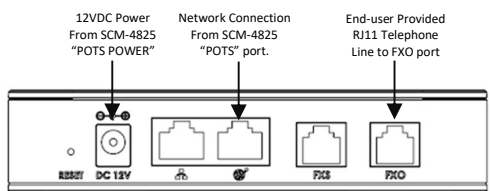
Instructions

Once you receive your Sentinel V2 AOR System, the first thing to do is confirm all parts of the system have arrived and are not damaged. Contact Cornell Tech Support at 800-558-8957 to request an RMA for any warranty returns. If all devices are accounted for and undamaged, move forward and begin installation. Below is a quick install guide:

Quick Install Guide

1. **Unbox all equipment** and confirm all parts are accounted for / there are no damages.
2. **Mount backboxes / enclosures** for all devices.
 - a. Call Stations typically mount in a 3-gang box 4ft from the finished floor to center.
 - b. Enclosures typically mount 5ft to center from the finished floor.
3. **Run all required cabling** between devices as needed.
 - a. Cat5E or better cable to each call station.
 - b. Cat5E or better cable to each base station phone.
 - c. 18/4 conductor to supply 24VDC power from the power supply to its expansion switch.
4. **Terminate all required cabling** (power, network, etc.) between the devices.
5. **Connect network and power cables** (unenergized) to the devices as needed.
6. **Install/mount all devices** (unenergized) into their designated backbox / enclosure locations.
7. **Energize/power** the **SCM-4825** unit and all **B-5243A** power supplies with 120VAC circuit.
8. **Connect battery backup(s)** chosen to **SCM-4825** and **B-5243A** power supplies.
9. **Test the system** functionality.
10. **Contact Cornell Technologies** Tech Support at 800-558-8957 for assistance.

Quick Step-by-Step Installation Guide

STEP #1 Confirm all Sentinel AOR System parts have been received and are undamaged. 	STEP #2 Mount SCM-4825 unit into a 3U rack space.  Use the included cage nuts and screws to secure	STEP #3 Mount BB-48SM phone enclosure(s) (and BB-48TS semi-flush trim ring if used)  5ft to center from finished floor
STEP #4 Mount 4800VS-3 Call Station boxes.  Mount 4ft to center from the finished floor	STEP #5 Mount ES-4808S Expansion Kits (if used)  Mount B-5243A Power Supply Mount Expansion Backbox	STEP #6 Wire as shown in the below line diagram: 
STEP #7 Install the 4800VS-3 Call Stations  Connect network cable and mount each call station	STEP #8 Mount the A-4800BS Phone inside BB-48SM (Remove/use the top bracket to secure the phone) 	STEP #9 Connect A-4800BS Handset Clip  Secure the handset clip directly below the top receiver area
STEP #10 Mount and connect the 8-port PoE Switch Inside the Expansion Backbox  Use the included mounting brackets and screws to secure as needed. Make all network and 24VDC power connections.	STEP #11 Jumper 24VDC power on ALL Expansion Switches (if used) as shown below: Jumper V1+ to V2+, then V1- to V2- 	STEP #12 Mount the POTS-4800S modem on top of or adjacent to the main SCM-4825 unit. 
STEP #13 Connect the POTS-4800S to the SCM-4825 unit using the included cables.  12VDC Power From SCM-4825 "POTS POWER" Network Connection From SCM-4825 "POTS" port. End-user Provided RJ11 Telephone Line to FXS port	STEP #14 Power ON the SCM-4825 unit and all B-5243A power supplies. Wait 5-10 minutes for the entire system to boot up. [To make programming changes, connect a laptop to the SCM-4825 unit "PC" port with a patch cable. Use a web browser and type 10.0.6.1:8000 to login.]	STEP #15 Test all devices: 1. Pushing a 4800VS-3 call station button should ring to each A-4800BS phone. 2. Unanswered calls dial out to the programmed monitoring location after the set wait time (programmable). 3. The monitoring location can press # to connect the call then hang up to end the call.

Network / Programming Information

The Sentinel V2 AOR System is typically factory programmed with the site information provided by the end-user / installer (when the system was ordered).

A copy of the programming / settings is included with each system on a USB drive. Manuals, wiring diagrams and other helpful information can be found there.

Programming changes can be done onsite using the included programming manual (also found on the USB drive). This is done by connecting a laptop to the system and logging into our Sentinel V2 dashboard. Only a trained technician should make changes to the programming.

MAC ADDRESSES

All devices in the Sentinel V2 AOR system have a unique MAC (Media Access Control) Address. MAC Addresses are needed to identify a device on the system network. The MAC Address will be required to add or remove a device from the system programming. Cornell typically pre-programs the entire system. This requires each 4800VS-3 and A-4800BS device be installed into their programmed location(s). A copy of the site-specific programming will be included with your system. Contact Cornell at 800-558-8957 to request a copy.

IP ADDRESSES

The Sentinel V2 AOR System is a network based system which uses a router to create a basic network. An IP Address is assigned automatically by the system router when connected to its network. The default IP address range that is setup on the router is **10.0.6.2** thru **10.0.6.254**. Many of the system devices require their IP Address to be made “static”, locking in that device as the assigned IP Address on the network. DO NOT duplicate the same IP Address for any device on the network.

Reminder: Installer must **Deactivate DHCP** in the “**Network**” tab and then **Update**.

- i. DHCP MUST BE DISABLED TO ACTIVATE/USE THE SENTINEL SYSTEM
 1. *May require entering info (IP Address, Subnet Mask, and Gateway IP).
 - a. IP Address = 10.0.10.100
 - b. Subnet Mask = 255.255.255.0
 - c. Gateway IP = 10.0.10.1

Troubleshooting Guide

The Sentinel V2 AOR System is a network-based system and is designed to notify onsite personnel when it detects issues with connections or devices. System errors typically generate a call to all **A-4800BS** phones with a message describing the origin of the error. Check the A-4800BS phones for incoming or missed calls regularly to ensure the system is working.

A-4800BS phones have a “System Status” button used to obtain a quick overview of the system’s devices and other connections. If the status is “OK” then there are no issues with that specific part of the system. If the status indicates “Failed” then an error has been detected with the associated part of the system.

All troubleshooting, repair and maintenance of the system should be done by properly trained personnel. Technicians should be familiar with basic electrical / networking knowledge to troubleshoot effectively. Contact Cornell Technologies at 800-558-8957 with any questions or for technical support. Cornell recommends the onsite technician have a laptop to help provide remote support or assistance.

Helpful Troubleshooting Tips:

1. Test for the correct input/output voltage(s) at different devices.
 - a. Confirm **B-5243A** power supplies have:
 - i. 120VAC input power
 - ii. **24-27VDC** output power.
 - iii. Confirm 24VDC is provided to both V1 and V2 inputs on the **ES-4808S**.
2. Confirm **4800VS-3** Call Station button LEDs should blink every 10 seconds. This indicates the network connection is working and the device is ready to use or test.
 - a. If a Call Station is flashing faster than once every 10s, it indicates the device is:
 - i. Not getting its programming info (network connection issue).
 - ii. Activated and the call needs to be answered (locally or offsite).
 1. Cycle power on the call station to restart the call to clear/answer it.
3. The **A-4800BS** Base Station phone(s) can be used to check the system statuses:
 - a. A “System Status” button can be used to check for general system errors.
 - b. Check for missed / received calls. There may be “fault” calls received that indicate a connection error between or at a device. Fault call messages will indicate the location.
4. Login to the Sentinel “**Dashboard**” and check device statuses:
 - a. Dashboard shows Trunk Line / Analog Line statuses (should be GREEN)
 - b. Call Station Management shows Call Station “registered” status (all should be GREEN)
 - c. Master/Remote Management tab shows phone(s) “registered” (all should be GREEN)
 - d. Instructions to login are included with the Programming Guide document.
5. Bypass the field wiring for devices to determine if an issue follows the device or field wiring.
 - a. If the device works after bypassing field wiring, the issue is usually with the cable run.
 - b. If the device still does not operate correctly, it may be an issue with the device itself.

Maintenance

Periodic Maintenance

In general, the Sentinel V2 AOR system is designed to provide system fault and trouble calls to each **A-4800BS** Master/Remote phones. Regularly check the **A-4800BS** phones on the system for missed calls which may indicate a fault or error has occurred. With a laptop connected to the system, a technician can access the system **Dashboard** (see Sentinel V2 Programming Guide for more information), which will display system events and may provide more detailed information.

The phone line circuit (SIP or POTS) is checked every 5-15 seconds for proper operation. A call will ring to all **A-4800BS** phones, and when answered, a message will notify the callee that the system detected a connection or status error regarding the trunk phone line (SIP or POTS).

B-5243A power supplies self-monitors for AC Fail and also Low/Fail Battery conditions using Form “C” dry contact outputs. These contacts can be wired to a fire panel etc. for monitoring the power supply statuses.



To ensure proper operation, the Sentinel V2 AOR system should be functionally tested on a regular basis by qualified personnel (recommended every 6months).

24VDC Power Supply Maintenance (B-5243A)

Each power supply unit should be tested at least once a year for the proper operation as follows:

- **Output Voltage Test:** Under normal load conditions, the DC output voltage(s) should be checked for proper voltage 24-27VDC. Very little - no AC voltage should be coming from the DC outputs.
 - If the voltage is not correct, check incoming 120VAC with a voltmeter.
 - Visually inspect power supply board for damages, burnt/broken components.
 - Remove the load and retest the power supply to see if the load is causing it to fail.
 - Replace the power supply PCB or entire power supply.
- **Battery Test:** Under normal load conditions, check the battery is fully charged to approx. 24VDC. Check specified voltages both at the battery terminals and at the board terminals marked with [+ BAT -] to insure there is no break in the battery connection wires. All batteries backup options include a pair of 12VDC batteries wired in series to create 24VDC. The power supply provides a maximum charge current of 0.7A to recharge the connected batteries.
 - Replace batteries if voltages are incorrect or if the batteries do not hold a charge.
 - Visually inspect batteries for excessive corrosion, leakage or other damage.

Note: Cornell recommends referring to the battery OEM (Original Equipment Manufacturer) for testing requirements, life expectancy and/or replacement information.

Service

The Sentinel V2 AOR system does not have any field serviceable parts or components. All defective units should be returned to the manufacturer for repair.

Contact Cornell Technologies Tech Support at 800-558-8957 with any questions.