

Emergency Communication System

Series 4800 Design Guide



Cornell Communications, Inc.
Milwaukee, WI 53223 USA

800-558-8957

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Cautions and Warnings

The following Manual is to be used as a guide to install the 4800 Emergency Communication System. Consult your local “Authority Having Jurisdiction” for required code compliance and installation standards. The **Caution** and **Warning** symbols are placed throughout this manual to identify critical requirements for a safe and proper installation.



- 1. Caution** - The 4800 Digital Emergency Communication System requires installation by factory trained authorized dealers/distributors, in accordance with ANSI/NFPA 70 National Electrical Code.
- 2. Caution** - Properly trained personnel, familiar with Telecommunications Industry Associations 568 TIA/EIA standard, are required for proper installation. Failure to terminate the wiring correctly will cause damage to the system and void the warranty.
- 3. Caution** - The 4800 Digital Emergency Communication System shall be installed in a controlled, indoor dry environment, with temperatures maintained between 55°F and 95°F.
- 4. Caution** - The 4800 Digital Emergency Communication System requires an **Analog “POTS”** dedicated telephone line for “Offsite” modem communication.

WARNING

- 1. Warning** – Cornell Communications manufactures proprietary Control Panels and Switches that have 8 available RJ45 ports to connect to additional Remote Control Panels, Switches and Call Stations. These devices connect using the straight-thru, TIA/EIA 568A or TIA/EIA 568B, wiring standard. Any attempt to connect an “Off the Shelf” Ethernet switch will damage the system and void all warranty!
- 2. Warning** – The 4800 Digital Emergency Communication System requires installation by factory trained authorized dealers/distributors, in accordance with NFPA 70 National Electrical Code, by qualified electricians. The 4800 System meets FCC 15, Subpart A, Section A (Commercial Use) emissions and is ICES-003 (Canada) compliant, when installed according to the installation instructions and the state/local electrical codes. Component or device substitutions such as Power Supplies, Switches or required cabling types are not permissible.
- 3. Warning** - Failure to comply with the installation instructions, the NEC, NFPA and local building code will void all agency listings and warranty coverage.
- 4. Warning** - Control Panels, Expansion Switches, Call Stations and Power Supplies require EMI suppression filters, to be added to the field wire connections during installation, for FCC compliance. Refer to page 16 of the 4800 Installation Manual.
- 5. Warning** - To ensure proper operation, the 4800 system should be tested on a regular basis by qualified personnel.

System Components

This guide will assist you in planning a typical 4800 Digital Emergency Communication System installation, by identifying the required system components, wire length limitations and system configuration options. Consult the 4800 System Installation Manual for detailed system explanation prior to completing this guide. Please contact your Cornell Regional Account Manager for assistance with any questions or concerns regarding system layout and design.

A single 4800 System is capable of supporting a maximum of the following components:

(1) Main Control Panel	A-4800M	(Located at Primary Entrance)
(4) Remote Control Panels	A-4800R	(Located at a Secondary Entrance or floor)
(32) Expansion Switches	ES-4808	(Located in Maintenance Room/Closet)
(255) Call Stations	4800V	(Located at Area of Rescue location, Stairwell etc.)

The 4800 system offers a choice of (2) UL/FCC compliant 24VDC, battery back-up power supplies listed below. Each Power Supply can support the approximate number of devices as shown. Larger systems will require the use of multiple Power Supplies, based on the Call Station count and building layout. The Power Supplies and Expansion Switches are surface mount units that are required to be located in a controlled Maintenance/Phone room environment. Power supplies require a 2/22 AWG interconnect for the AC/Fault detection circuit as shown in the riser.

<u>Model</u>	<u>Amps</u>	<u>Control Panel(s)/Expansion Switch(s)</u>	<u>Call Stations</u>
B-5243B	3.3A	1-3	22 (Max)
B-5248A	8.0A	1-7	50 (Max)

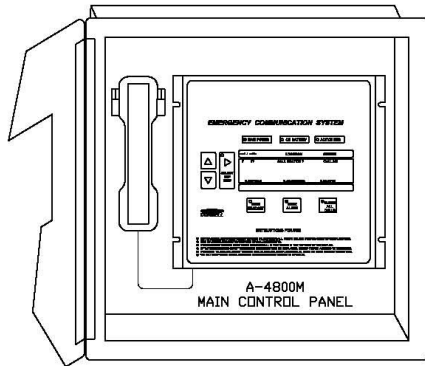
The 4800 system riser on the next page identifies a typical layout with the wire type and distance limitations as listed below.

<u>Cable Type</u>	<u>Use</u>	<u>Limitation</u>
• Cat5e Ethernet Cable	Control Panel/Expansion Switch/Call Station	100 M or 328'
• 2/16AWG UL	24VDC Power Supply	478'
• 2/22AWG UL	Batt/AC Fault Detect	2000'

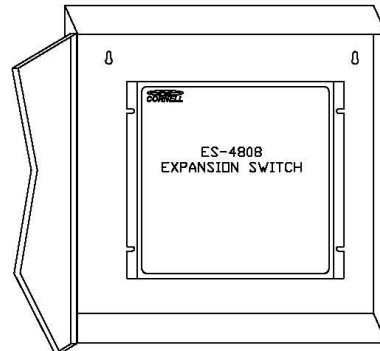


Caution - The 4800 Digital Emergency Communication System requires installation by factory trained authorized dealers/distributors, in accordance with ANSI/NFPA 70 National Electrical Code.

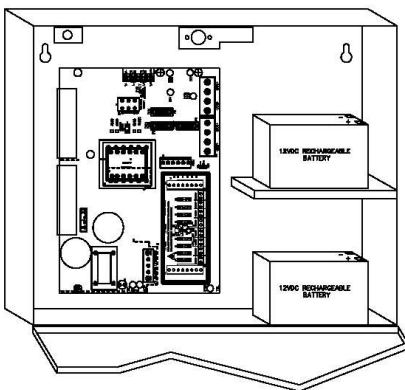
System Components



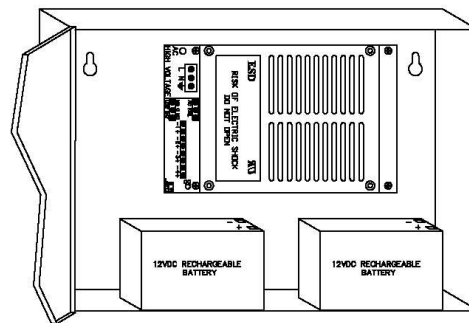
THE A-4800M (MAIN CONTROL PANEL) AND A-4800R (REMOTE CONTROL PANEL) ARE MOUNTED IN AN 18"W X 18"H X 3.25"D FLUSH MOUNT, LOCKING ENCLOSURE. THE 4800 SYSTEM REQUIRES AT LEAST (1) A-4800M MAIN PANEL AND CAN SUPPORT UP TO (4) ADDITIONAL A-4800R REMOTE CONTROL PANELS (ASSEMBLED WEIGHT: 27 LBS)



THE ES-4808 EXPANSION SWITCH IS MOUNTED IN A 15"W X 18"H X 4"D SURFACE MOUNT ENCLOSURE. THIS DEVICE CAN MOUNT IN A MAINTENANCE ROOM/CLOSET AREA AND CAN SUPPORT UP TO 8 4800V CALL STATIONS OR A COMBINATION OF CALL STATIONS AND SWITCHES. (ASSEMBLED WEIGHT: 19 LBS)



THE B-5248A 24VDC, 8AMP POWER SUPPLY IS MOUNTED IN A 15.75"W X 11.25"H X 4.50"D SURFACE MOUNT, LOCKING ENCLOSURE. THIS DEVICE CAN MOUNT IN A MAINTENANCE ROOM/CLOSET AREA AND CAN SUPPORT A COMBINATION OF 7 CONTROL PANELS OR SWITCHES. (ASSEMBLED WEIGHT: 21 LBS)



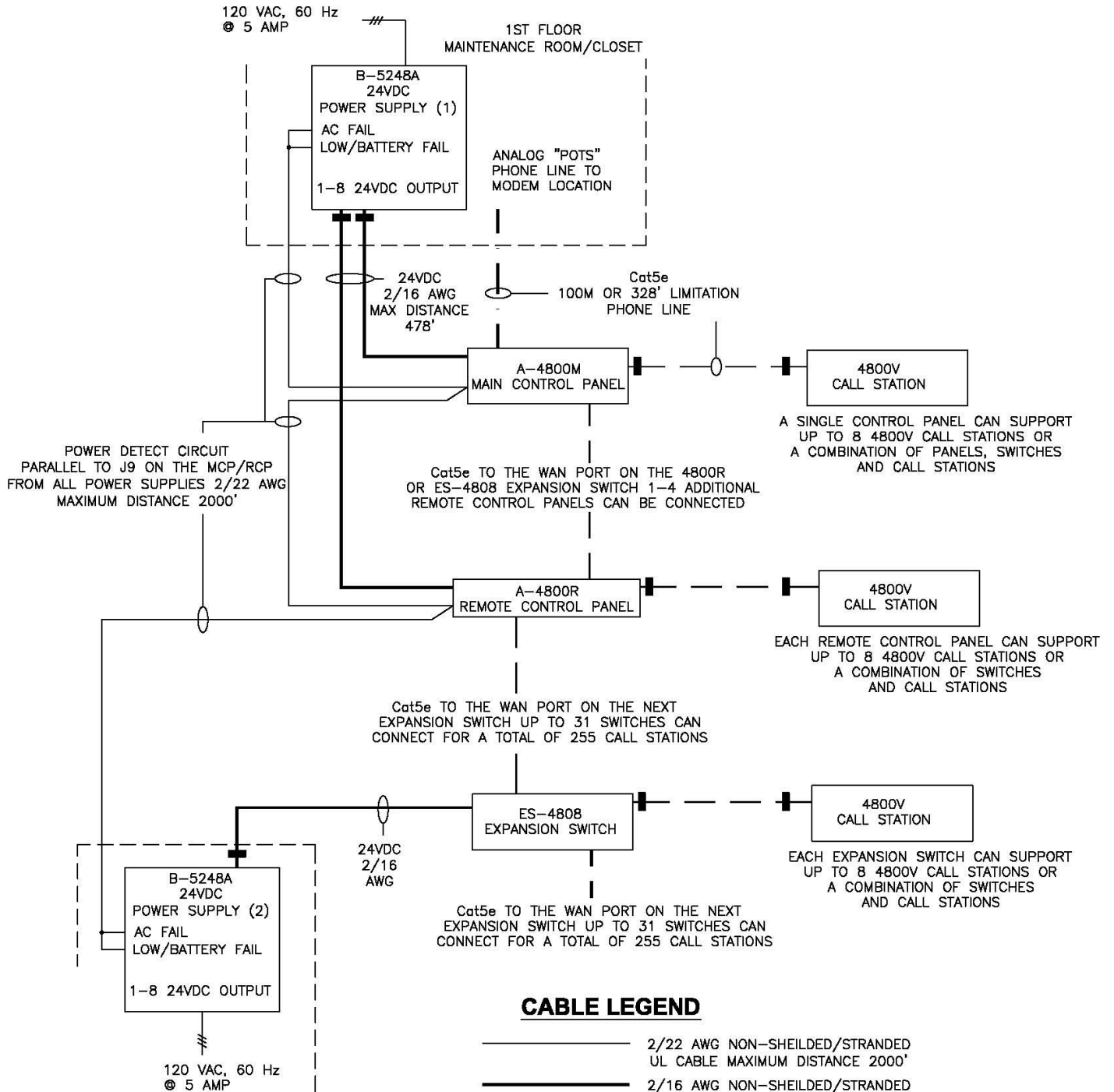
THE B-5243B 24VDC, 3.3AMP POWER SUPPLY IS MOUNTED IN A 14.25"W X 9.50"H X 3.75"D SURFACE MOUNT, LOCKING ENCLOSURE. THIS DEVICE CAN MOUNT IN A MAINTENANCE ROOM/CLOSET AREA AND CAN SUPPORT A COMBINATION OF 3 CONTROL PANELS OR SWITCHES. (ASSEMBLED WEIGHT: 17 LBS)



THE 4800V CALL STATION DEVICE MEASURES 4.57"W X 4.50"H X 2.25"D AND MOUNTS IN A STANDARD 4" SQUARE ELECTRICAL OR MASONRY BOX. (ASSEMBLED WEIGHT: 1.0 LB)

USE A 4" SQUARE RACO #232 BOX AND #769 5/8" RAISED PLASTER RING WITH BOX MOUNTING HOLES OR A WIREMOLD V5744-2 2.75"D SURFACE MOUNT BOX.

4800 SYSTEM RISER



CABLE LEGEND

- 2/22 AWG NON-SHEILDDED/STRANDED
 UL CABLE MAXIMUM DISTANCE 2000'
- 2/16 AWG NON-SHEILDDED/STRANDED
 UL CABLE MAXIMUM DISTANCE 478'
- - - - - Cat5e ETHERNET CABLE
 STANDARD STRAIGHT-THRU,
 TIA/EIA 568A OR TIA/EIA 568B
- EMI SUPPRESSION FILTERS
 REQUIRED FOR FCC COMPLIANCE

System Layout

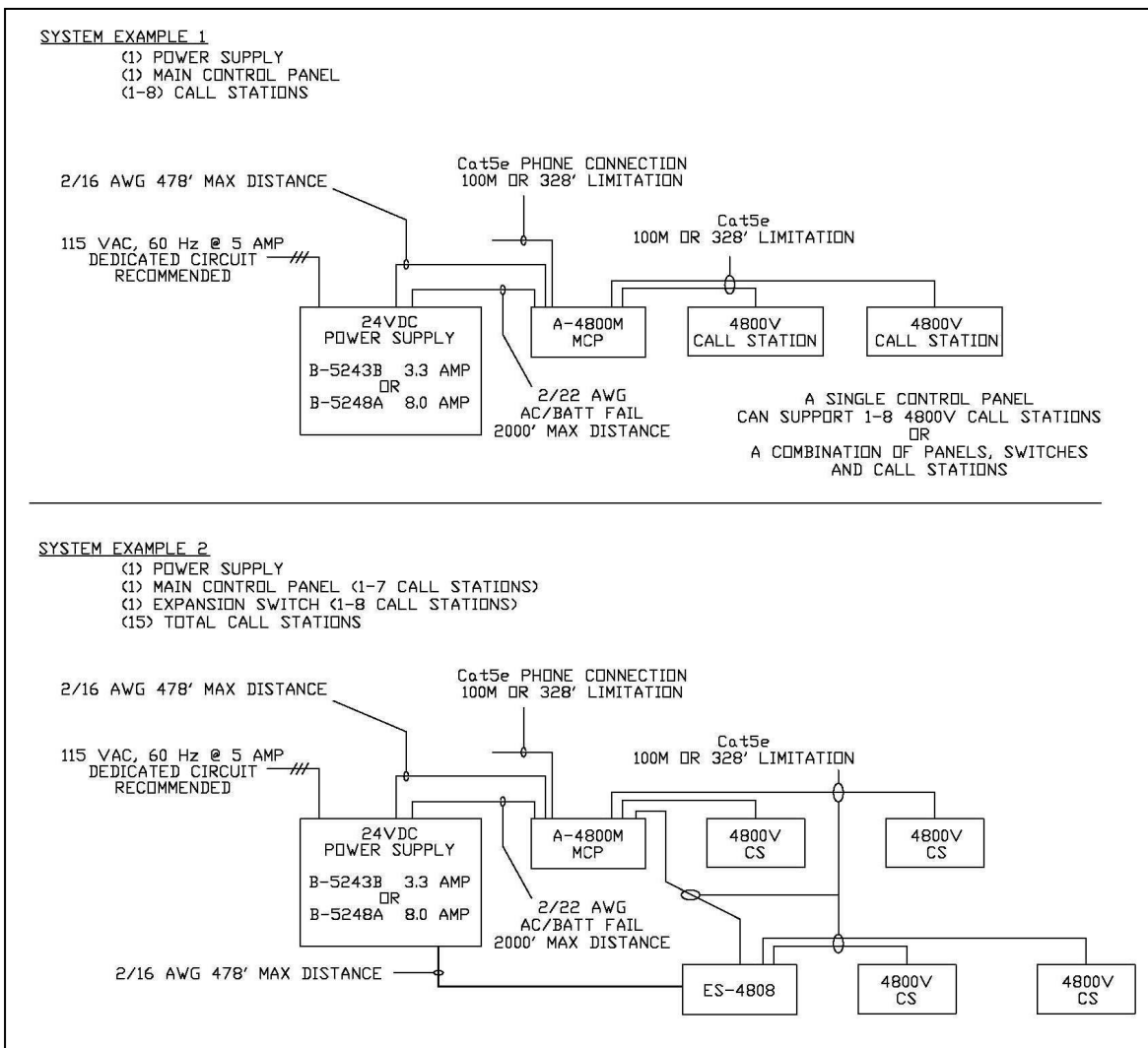
There are many different types of facilities and building layouts. Single story buildings will have a general floor plan that can provide the lineal footage, to ensure the 4800 system is installed within the distance limitations provided. Multi-story buildings require extra attention to the additional 13' -15' vertical rise per floor.

<u>Cable Type</u>	<u>Use</u>	<u>Maximum Limitation</u>
• Cat5e Ethernet Cable	Control Panel/Expansion Switch/Call Station	100 M or 328'
• 2/16AWG UL	24VDC Power Supply	478'
• 2/22AWG UL	Batt/AC Fault Detect	2000'



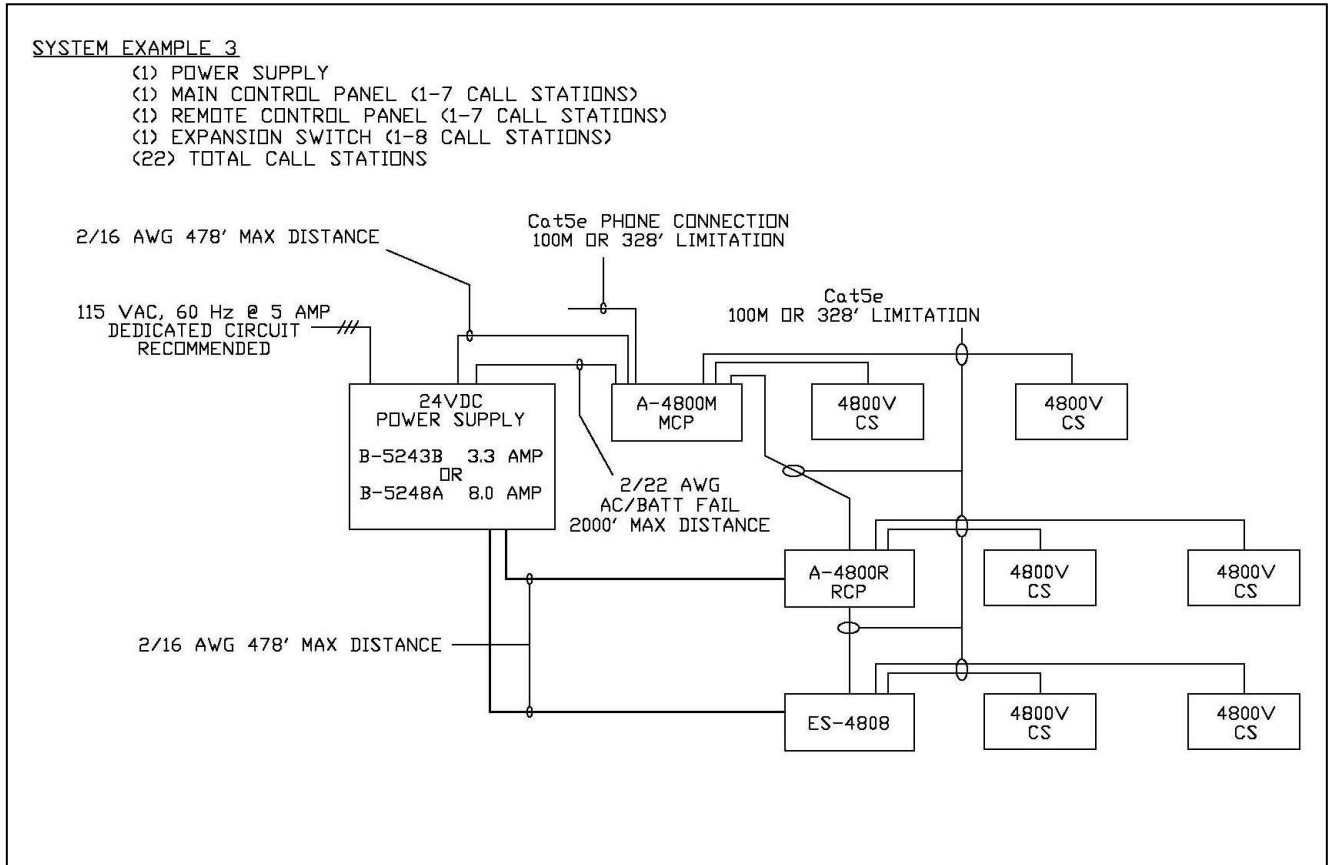
Caution – The power supplies (B-5243B or B-5248A) need to be centrally located within the group of Control Panels and Expansion switches, to ensure the maximum distance limitations are met.

The (3) system examples below utilize the basic layout information that should be applied to all system designs.



System Layout

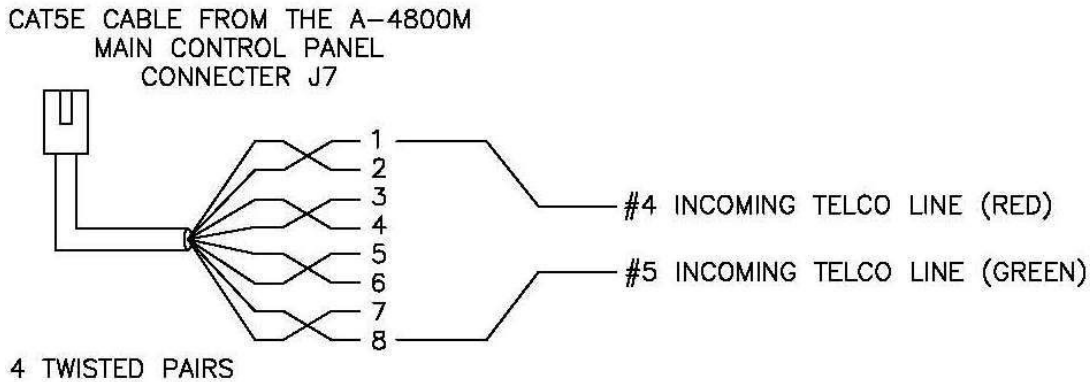
The 4800 Control Panels and Expansion Switches can support up to (8) device connections. The diagram below shows the Main Control Panel (MCP) having (1-7) Call Stations and (1) Remote Control Panel (RCP) connection. The Remote Control Panel (RCP) has (1-7) Call Stations and (1) Expansion Switch (ES) connection. The Expansion Switch (ES) can support up to (8) Call Stations (CS), or a combination of Control Panels, Expansion Switches and Call Stations.



These are just a few small scale examples of the 4800 system capabilities. For large capacity applications, questions or concerns, please contact your Cornell Regional Account Manager for assistance.

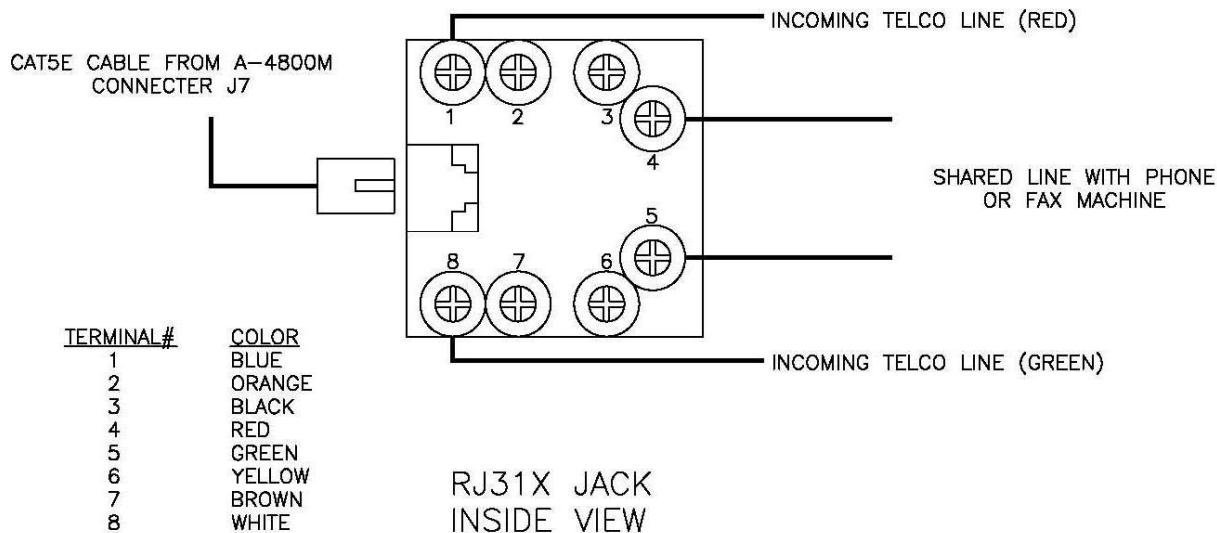
Dedicated Phone Line Connection

The 4800 Digital Emergency Communication System has an internal modem that can be connected to an Analog “POTS” dedicated telephone line, as shown in the diagram below.



Shared Phone Line Connection

The 4800 Digital Emergency Communication System also incorporates a telephone line “Seizure” capability. If the 4800 system is required to share a phone line with another device, an RJ31X jack must be installed as illustrated below. Proper installation of the RJ31X jack will allow the 4800 system to “Seize” the shared analog “POTS” line and place an emergency call to the assigned monitoring location.



1. Connect a standard straight-thru Cat5e cable from the RJ31X jack to the J7 port on the Control Panel. (See pages 11 & 12)
2. Connect the incoming phone line to terminal #1 and #8 as shown.
3. Connect the sharing phone or fax machine lines to terminal #4 and #5 as shown.

POTS Phone Line Options

In the event that an analog “POTS” line is not available, the following options have been evaluated and provided satisfactory operation.

VoIP Service

A **Cisco SPA 112** analog adapter has been tested and found to be a viable alternative to the “POTS” line connection. The Cisco adapter emulates the “POTS” line by providing DTMF tones and line voltage.

Requirements:

- Active Internet & Voice over IP accounts
 - VoIP adapter model confirmation is required for each individual VoIP service. **(Cornell completed the operational testing using VoIP service provided by Nextiva)**

Disclaimers:

The 4800 offsite notification process requires a standard “POTS” line for proper operation. As with any method of offsite voice connection, if the phone service, internal/external network or power system fails, the 4800 system will not be able to connect to the offsite monitoring location.

The example VoIP service disclaimers below are generally included with service contracts.

WARNING

- You may experience interruption of Service (or of certain features of the Service) or degraded service quality at any time and without notice. You will likely experience Service outages in the event of electric power outages affecting your business.
- Voice over IP requires that the infrastructure, on which the telephony system is built, is capable of handling voice services. This includes the proper hardware infrastructure (gateways, switches, routers, data/voice lines) and configuration of Quality of Service (QOS) and VLANS on these devices.

Several manufacturers offer analog voice phone adapters. Please confirm with the current/prospect VoIP service for the correct certified hardware device.

POTS Phone Line Options. Cont

Cellular Service

A **Shield Tech Security STS-GSMC-4G** GSM Dialer has been tested and found to be a viable alternative to the “POTS” line connection. The Shield Tech Dialer emulates the “POTS” line by providing DTMF tones and line voltage.

Requirements:

- Active AT&T cellular SIM card/monthly fee

Disclaimers:

The 4800 offsite notification process requires a standard “POTS” line for proper operation. As with any method of offsite voice connection, if the phone service, internal/external network or power system fails, the 4800 system will not be able to connect to the offsite monitoring location.

The example Cellular service disclaimers below are generally included with service contracts.



- You may experience interruption of Service (or of certain features of the Service) or degraded service quality at any time and without notice. You will likely experience Service outages in the event of electric power outages affecting your business.
- Just as VoIP phone line service can fail, cellular service can also fail, preventing an alarm condition from being reported to a monitoring location.

The 4800 system phone line circuit is checked every 24 hours for proper operation. A notification of a fault will be shown on the Control Panel(s) display, in the event of a failure.

System Configuration

The 4800 Emergency Communication System requires a minimum of: (1) A-4800M Main Control Panel, (1) BB-48 Flush Mount Enclosure, (1) 4800V Call Station, (1) B-5243B or B-5248A Power Supply, and the appropriate Signage. Fill in the amount of devices required below.

<u>MODEL #</u>	<u>QTY</u>
• A-4800M Main Control Panel	<u>1</u>
• BB-48 Flush Mount Enclosure	<u>1</u>
• A-4800R Remote Control Panel (1-4)	_____
• BB-48 Flush Mount Enclosure (1 for each A-4800R required)	_____
• 4800V Call Stations (1-255)	_____
• ES-4808 Expansion Switch (1-32)	_____
• BB-49 Surface Mount Enclosure (1 for each A-4800R required)	_____
• B-5243B 3.3 Amp Power Supply (Supports 22 Call Stations)	_____
• B-5248A 8 Amp Power Supply (Supports 50 Call Stations)	_____

Comment: _____

Signage

Are Signs Specified? Yes ____ No ____

<u>QTY</u>	<u>MODEL #</u>	<u>DESCRIPTION</u>
_____	SN-C48	Instruction Sign Braille – Photoluminescent, Push For Help 8” X 8”
_____	SN-P42F	Room Sign, Rescue 6"H x 16"W
_____	*SN-P42F(R)	Room Sign, Refuge 6"H x 16"W
_____	SN-P42L	Directional Sign, Rescue - Left Arrow 6"H x 16"W
_____	*SN-P42L(R)	Directional Sign, Refuge - Left Arrow 6"H x 16"W
_____	SN-P42R	Directional Sign - Right Arrow 6"H x 16"W
_____	*SN-P42R(R)	Directional Sign, Refuge - Right Arrow 6"H x 16"W
_____	SN-P48GL	Area of Refuge – Photoluminescent, Braille 6”W X 10”H
_____	SN-P48SL	Area of Rescue – Photoluminescent, Braille 7”W X 11”H
_____	**SN-B42S	Electric A/C Single Battery Backup Inc 9.5"H x 13.75"W x 1.7"D
_____	**SN-B42D	Electric A/C Double Battery Backup Inc 9.5"H x 13.75"W x 1.7"D
_____	**SN-E42S	Electric A/C Single Face illuminated 9.5"H x 13.75"W x 1.7"D
_____	**SN-E42D	Electric A/C Double Face illuminated 9.5"H x 13.75"W x 1.7"D

****For Electric only: Add "R" for Area of Refuge. Add "M" for metal**

Electric Edge Lit

_____	SN-B48DG	Electric A/C Double, Refuge, Battery Backup 11"H x 13"W x 2"D
_____	SN-B48SL	Electric A/C Double, Rescue, Battery Backup 11"H x 13"W x 2"D
_____	SN-LM42S	Radiance™ Photoluminescent Single Sided Area of Rescue
_____	SN-LM42D	Radiance™ Photoluminescent Double Sided Area of Rescue
_____	SN-LM42SR	Radiance™ Photoluminescent Single Sided Area of Refuge
_____	SN-LM42DR	Radiance™ Photoluminescent Double Sided Area of Refuge

Prepared by: _____ Company: _____
 City/State: _____ Phone: _____
 Fax: _____ Project Name: _____
 Email: _____

Please contact your Cornell Regional Account Manager for assistance.

Cornell Communications, Inc
 Phone: 800-558-8957

Maintenance

Periodic Maintenance

In general, the 4800 system will provide system fault information at the Control Panel(s) display. The “ACTION REQUIRED” LED represents an active call or a fault in the system that needs to be corrected.

The phone line circuit is checked every 24 hours for proper operation. A notification of a fault will be shown on the Control Panel(s) display, in the event of a failure.

The power supply is monitored at the Control Panel(s) for AC Fail, and Low Battery/Fail. The “ON BATTERY” LED will illuminate if the AC power has failed and the system is powered by batteries.

WARNING

Warning – To ensure proper operation, the 4800 system should be tested on a regular basis by qualified personnel.

Power Supply Maintenance

Each 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 should be checked for proper voltage level. (24VDC)
- **Battery Test:** Under normal load conditions check that the battery is fully charged, check specified voltage both at battery terminal and at the board terminals marked [+ BAT -] to insure there is no break in the battery connection wires.

Note: Expected battery life is 5 years. However, it is recommended changing batteries in 4 years or less if needed. (See install documentation provided with each Power Supply)

Service

It is recommended that all defective units be returned to the manufacturer for repair. The 4800 system does not have any field serviceable parts or components.

Warranty>Returns

Warranty:

CORNELL warrants its products to be free from defects in materials and workmanship for thirty-six (36) months from the date of manufacture, under normal use and service.* Obligation of *CORNELL* is limited to repairing or replacing at its option, any part, which, in its opinion, shall be proved defective in materials or workmanship, under normal use and service. This warranty is void if the product is altered, damaged by lightning or repaired by anyone other than *CORNELL* personnel. No other warranty, expressed or implied, will be allowed unless agreed to in writing by the factory.

***36 month Warranty does not apply to 3rd Party OEM products which carry the original manufacturer's warranty. Please verify OEM warranty with your Cornell Regional Account Manager if you have any questions.**

Returns:

Warranty returns will be accepted with RMA# for no cost. Defective materials will be repaired for a minimum of \$100 and cost of the repair will be for time and materials not to exceed the cost of a new unit. Returns of unused, unmarked boxed equipment are subject to a MANDATORY 25% restocking charge when returned within 90 days of purchase. **ABSOLUTELY NO RETURNS WILL BE ACCEPTED AFTER 90 DAYS.** Returns of used equipment or custom equipment will not be accepted. All returns/repairs must be adequately packaged for shipment.

For an RMA #, (Return Materials Authorization) please call Cornell at 1-800-558-8957.

Agency Approvals:



This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:
(1) This device may not cause harmful interference, and (2) This device must accept any interference received, including interference that may cause undesired operation.