Shield ECS Wiring Guidelines.

LifeGuard NETWORKS
SHIELD30
BY SPACE AGE ELECTRONICS

System Wiring Description

The Shield Emergency Communication system is designed to be easy and efficient to wire. Overall system architecture is 2 wired for Power to every device and 2 wires for data in a daisy chain configuration. The Communication, originating at the master, must be wired in one continuous branch. An Isolator / Spliter (referred to as the Isolator) is used to add branches where necessary to either split communication or extend a single branch. Splitting communication may be done in the case of wiring up different risers, or out from a riser to a floor device.

Where two hour rated casing is NOT required:

- The pair of conductors for communication shall use Mid-Cap twisted data grade cable for digital communication (between 16 and 20 AWG). Wire must have 4 full (360 deg.) twists per foot minimum .

Where two hour cable IS required:

- When using CI (Circuit Integrity) cable the number of twists is low. This reduces data communication distances to apx 300ft. per. branch. An isolator will be needed in line to create a new branch and extend the distance an additional 300 ft.

- The pair of conductors for power shall be 14-18 AWG.

Wire Part Number Reference - Approved and Tested:

Two Hour:

CI Cable: Radix DuraLife II FPLR 18Ga CTU18A0104 4 conductor (non-shielded) - Max 320 Ft. per branch.
CI Cable: Radix DuraLife II FPLR 18Ga CTU18A0102 2 conductor (non-shielded) - Max 320 Ft. per branch.
CI Cable: Radix DuraLife II FPLR-CI/CM/R 18Ga CTU18A0102-I07 2 Conductor (non-shielded) 6 Twist per. Ft. - Max 450 Ft. per branch.

Plenum Cable:

14+16 Ga Twisted in Metal Clad WindyCity #MCF-761363/7960-500SAE (4 Conductor) - Max 2200 Ft. per branch.
18Ga Twisted Data Cable non-shielded WindyCity #762360SAE (2 Conductor) - Max 2200 Ft. per branch.
16Ga Twisted Data Cable non-shielded WindyCity #761363SAE (2 Conductor) - Max 2200 Ft. per branch.
18Ga Twisted Data Cable non-shielded WestPenn #60980B (2 Conductor) - Max 2200 Ft. per branch.
18Ga Twisted Data Cable non-shielded BELDEN 5320UJ (2 Conductor) - Max 2200 Ft. per branch

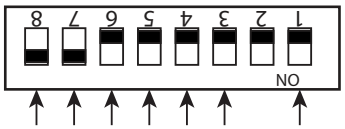
Distances:

While 2200 Ft. is the max distance, voltage drop is usually the bigger concern. The unit will not operate properley below 16VDC.

Running long distances must be done correctly. The representatives at Space Age Electronics are here to help answer questions and even review and create a riser drawing of an installation including battery requirements and wire runs. Please contact us with the site plan and we will work with you to ensure a quick and easy installation.

Module Addressing and EOL

Each device on the communication bus must have a unique address. This address is set by dip switches on the board of the device. The system has a Max of 32 devices The first device starts at address 3, and continues up through 35. Devices 3 through 33 are displayed on-screen and should be used for Remote Communication Stations (RCS). 34 and 35 may be safely used for Isolators. Any additional isolators will require an address in the range of the remotes.



Address Value 1 2 4 8 16 32 EOL

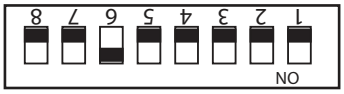
DEFAULT SHIPPING CONFIGURATION SHOWN.
Module Address = 3

Switch 1 is EOL. To be switched in up position on last device of the communication branch.

Addressing is a binary setting. The lowest number that can be used by ANY remote is 3 (default address) and the highest address is 35. To increase the address add all of the switch number values.

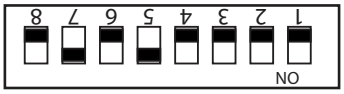
Examples:

Address 4



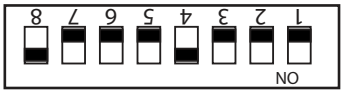
4 = 4

Address 10



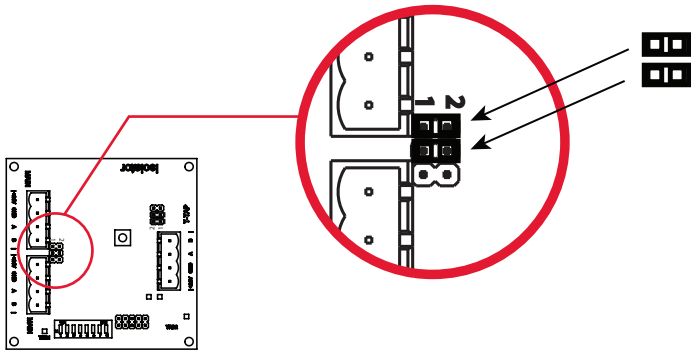
2 + 8 = 10

Address 17



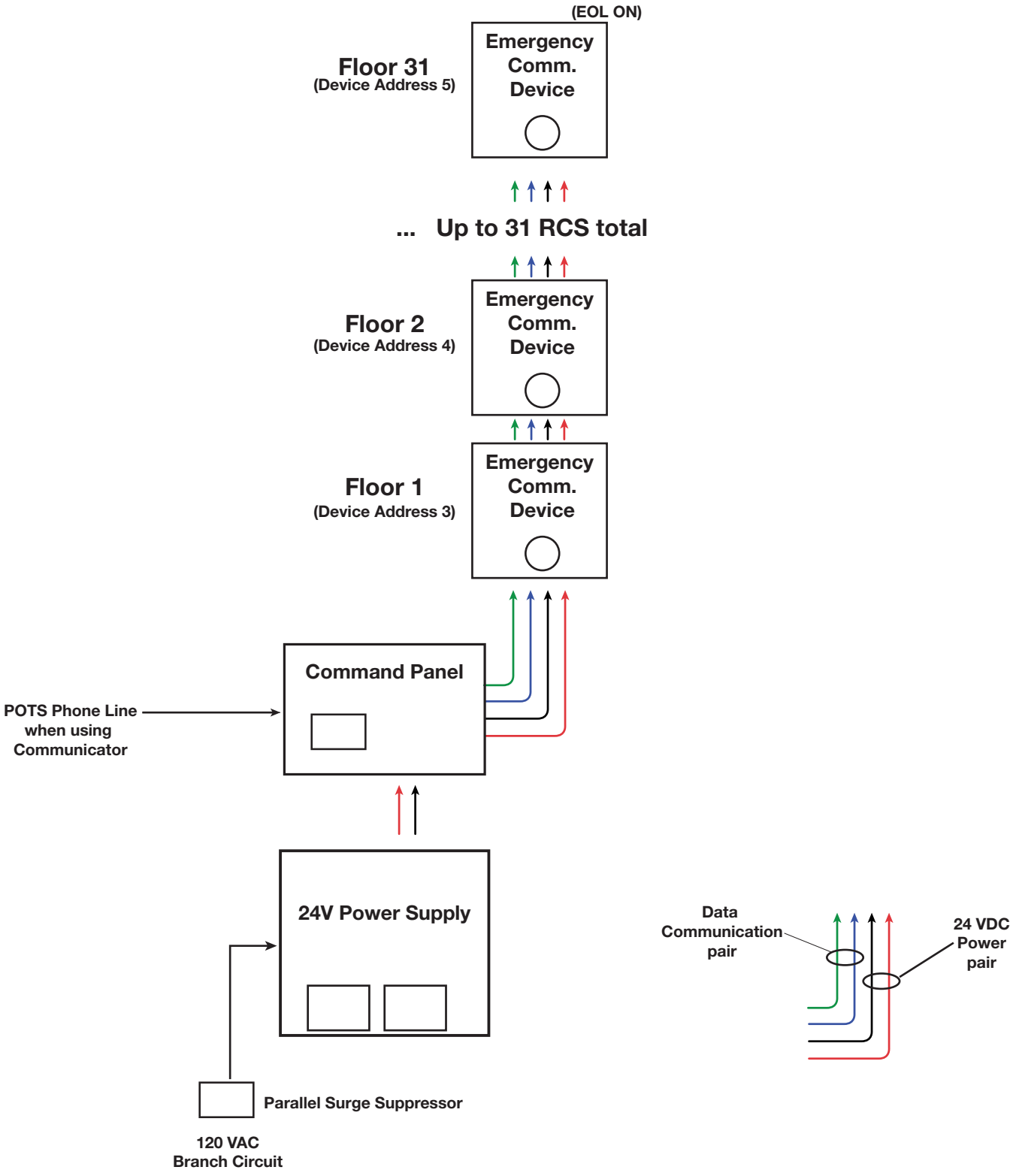
1 + 16 = 17

EOL: The last device in a communication branch should have the EOL. The EOL is a termination to make communication more robust. It is not a supervision resistor. Each device is is supervised over the digital communication. When a RCS is the last device, use dip switch 1 as shown above. When an isolator is the last device, follow the instructions below. The following pages

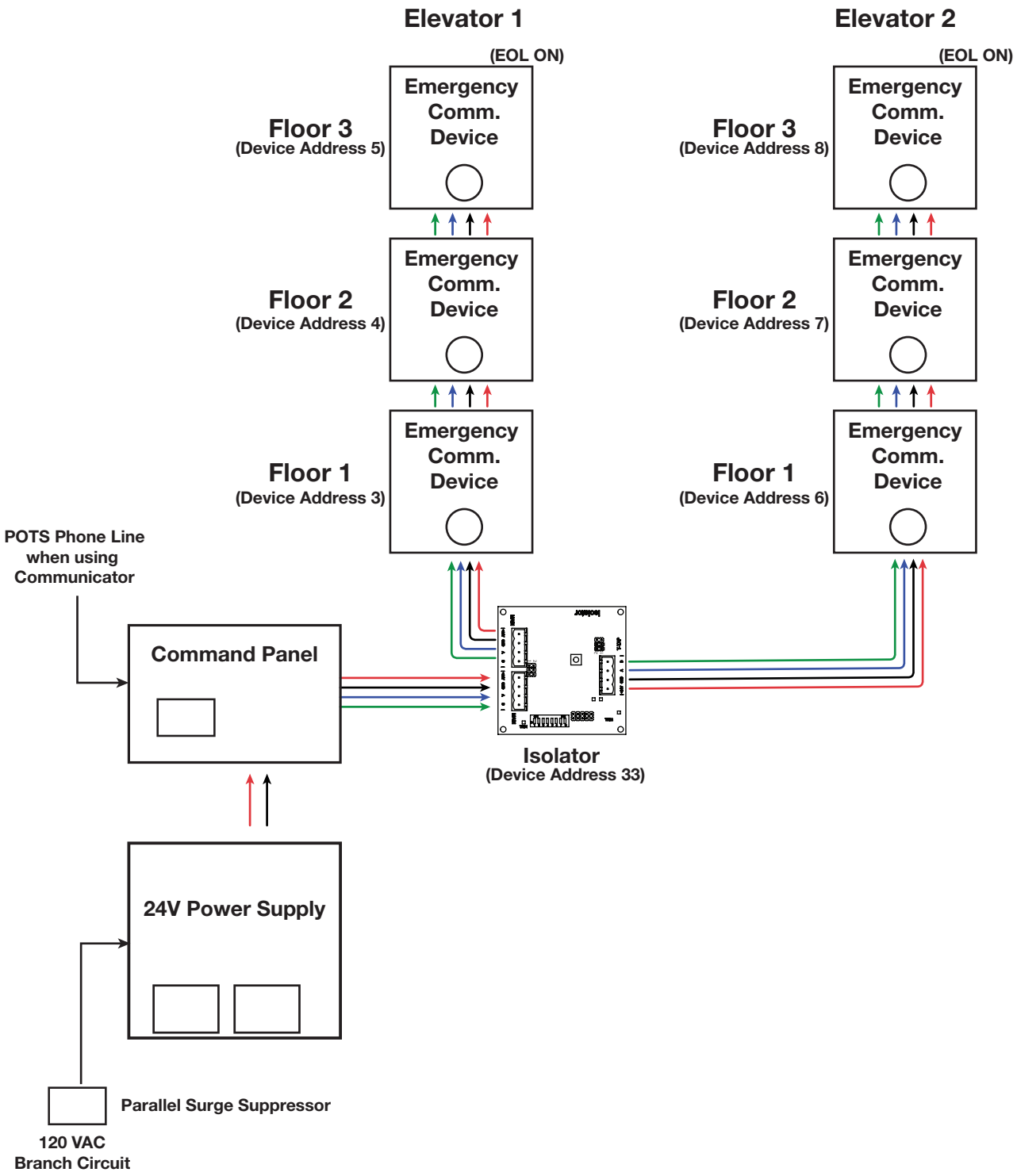


The Isolator EOL jumpers may need to be added if the riser side of the isolator is the last device of the branch. Jumpers must be installed on pins 1-2 and 3-4 as shown to add the EOL.

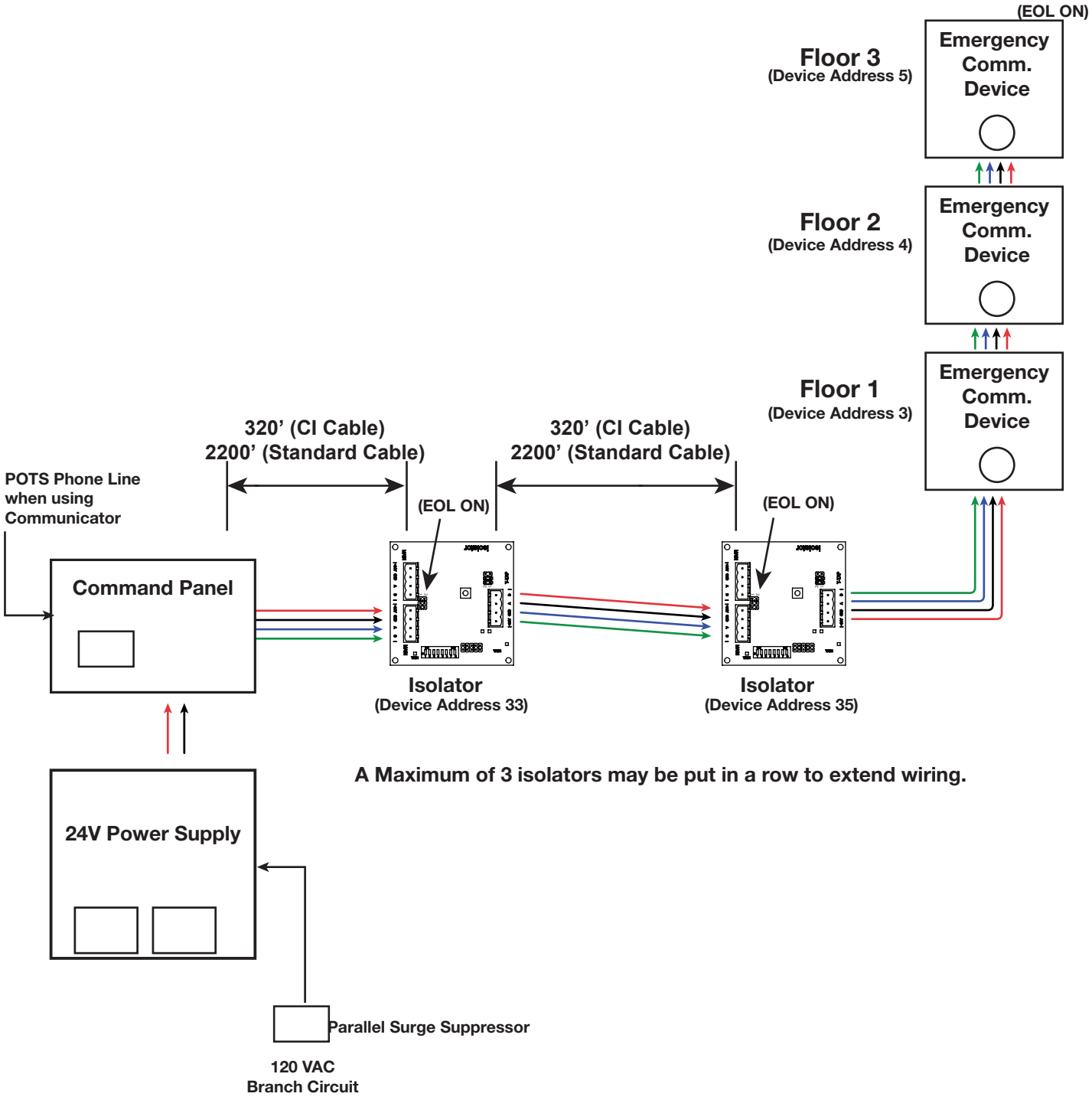
Example: Simple



Example: 2 Risers using Isolator

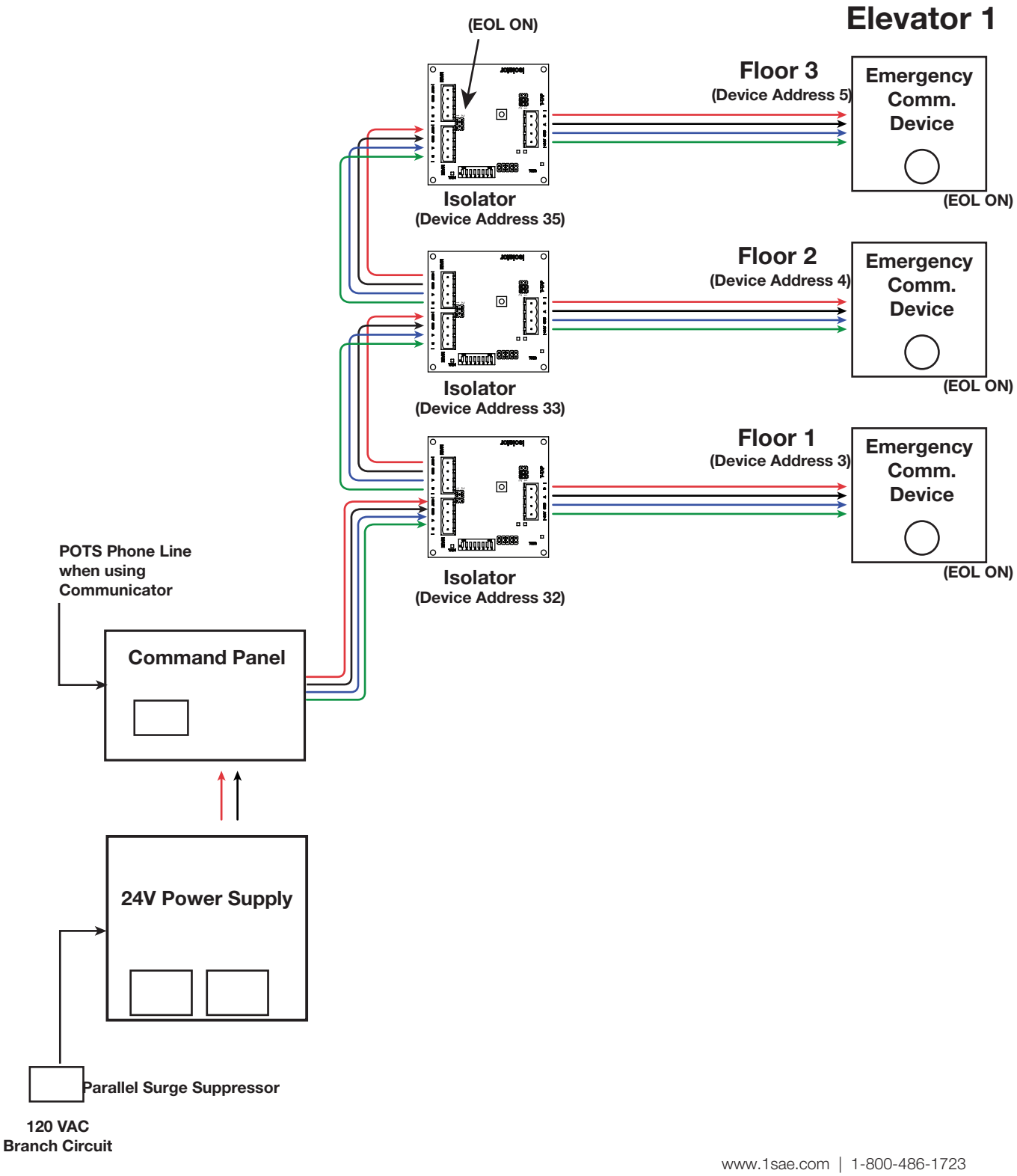


Example 3: Extend range using Isolator



A Maximum of 3 isolators may be put in a row to extend wiring.

Example 4: Isolators In riser to floor devices



Example Worksheet

Shield 30 Power Calculation Worksheet.				Rev. 3 2022-07-01
Remote (Standby)	0.015	0.015	0.015	
Communicator	0.047	0.047	0.047	
ISO	0.025	0.025	0.025	
PSN-64 Supply	0.075	0.075	0.075	
Rem In Alarm	0.055	0.055	0.055	
Communicator Dialing	0.047	0.047	0.047	
Supervision Relay	0.014	0.014	0.014	
Alarm Relay	0.012	0.012	0.012	
SM30 Cmd Panel (Includes Supervision and Alarm Relay)	0.111	0.111	0.111	
SM30 Cmd Panel in alarm (Includes Supervision and Alarm Relay	0.112	0.112	0.112	
Wire Type	SOLID FPLP	SOLID FPLP	SOLID FPLP	
Wire Gague	**14**	**16**	**18**	
	Note: Wire gague power is referring to the 24V pair. The Data pair should remain as 18 Ga. for best performance.			
Number of Remotes	**20**	**20**	**25**	**<-- Input number of remotes.**
Number of 3.5" SM30 Cmd Panels	1	1	1	
Power Supply	1	1	1	
Communicator	1	1	1	**<-- Input number of communicators.**
Isolator	1	1	1	**<-- Input number of Isolators.**
Nominal Voltage	24.0	24.0	24.0	
Distance	**100**	**300**	**390**	**<- Enter wire distance from Command panel to last remote.**
Wire resistance (Per. Ft.)	0.0025194	0.0041	0.00651	
Ohms per 1kft	2.5194	4.1	6.51	
Total Resistance Pair of wires	0.50388	2.46	5.0778	
Total Current of Remotes in ALARM	1.1	1.1	1.375	
Remotes in ALARM + Isolators	1.125	1.125	1.4	
Remotes + Isolators in Standby	0.325	0.325	0.4	
Complete System - Standby	0.483	0.483	0.558	
Complete System - In Alarm	1.284	1.284	1.559	
System + Power Supply	0.558	0.558	0.633	
Voltage drop	0.64698192	2.7675	7.10892	
End Voltage	**23.4**	**21.2**	**16.9**	**<-- End Voltage must be > 16vdc**
Total Amp Hous Required for run time on battery				
battery De-Rating factor = 20%	1.2	1.2	1.2	Note: de-rating is factored in here.
12 hours	8.0352	8.0352	9.1152	
24 hours (+ 15 min of Talk Time)	16.2543	16.2543	18.4368	
24 hours (+ 4 hours of Talk)	**19.0128**	**19.0128**	**21.5328**	**<- Battery Requirement for 24+4**