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LifeSafety Power®

HELIX DC

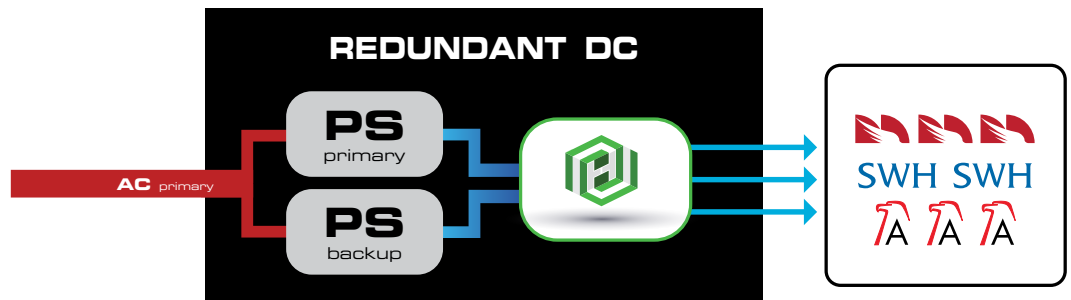
Installation / Operation Manual



FLEXPOWER®

## HELIX™ MISSION CRITICAL POWER

REDUNDANT FAULT NOTIFICATION  
HARDWIRE WIRE / EMAIL / SNMP



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## Description

The LifeSafety Power Helix line of power supplies are a redundant power source for use in the Access Control industry. Two identical FPO power supplies are combined in a single enclosure with the Helix module to provide a single output voltage. In the event of a failure of the main power source, the Helix module will automatically switch the output to the backup FPO power supply. The Helix line of power supplies are available in Wall and Rack Mount.

## Regulatory Information

The equipment discussed within this manual has been tested to the following standards:

- UL294 / ULC S318 / ULC S319

## FlexPower Helix Supplement

 Important information - READ FIRST and in conjunction with FLEXPPOWER Power Supply Manual



## Limitations

Due to the nature of this product and its intended applications, the limitations and conditions of installation of the Helix power supply must be fully understood by the system planner & installer. Please thoroughly read and understand the following sections before using the Helix power supply.

### Redundancy

The Helix line of power supplies adds a layer of redundancy over the typical FPO power supply. Only the FPO power supply is redundant - any distribution in the system is not redundant. Also, the Helix cannot overcome any problems in the field wiring or load devices - if a short circuit shuts down the main supply, the backup supply will also be shut down by this short circuit.

### Primary AC Connection

Both FPO power supplies must be powered from the same AC branch circuit. Powering the two internal FPO power supplies from different branch circuits could lead to possible improper operation and loss of output voltage.

### Backup Battery

FPO2 must have battery backup connected for proper operation. A battery should not be connected to FPO1 - this is to prevent cycling between FPO1 and FPO2 during battery discharge on loss of AC.

### Fault Contacts

The fault contacts of BOTH FPO power supplies must be monitored to annunciate failure of either power supply. The fault contacts may either be monitored separately or series/paralleled as needed for a common fault indication. Use of a Netlink network monitoring module is also highly recommended.




## Limitations - continued

### Internal Configuration

All Rack Mount Helix power supplies come fully pre-configured from the factory and should not be changed. Wall Mount Helix power supplies only require the output voltage and 120/230VAC input jumpers to be configured by the installer. Both FPO power supplies must be set to the same output voltage for proper operation. Do not rewire or reconfigure any other portion of the Helix power supply.

### FAI

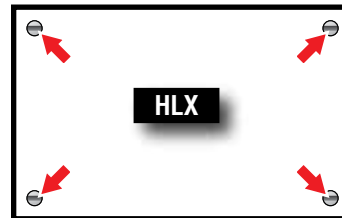
The Helix allows for FAI operation only via accessory boards that provide their own FAI control. The DC2 output of the FPO power supplies must not be used. Note that if FPO1 is still operational and FPO2 completely fails (power supply and battery backup), FAI could be activated on any accessory boards within the Helix system, shutting down any FAI enabled outputs.

 The Fire Alarm Interface (FAI) must be triggered with a NO open relay configuration to avoid a false positive visual indication under certain conditions. The FAI input of BOTH FPO power supplies must be wired for proper operation under all conditions. For a NO FAI input, parallel the I+ and I- terminals between the two FPO power supplies.

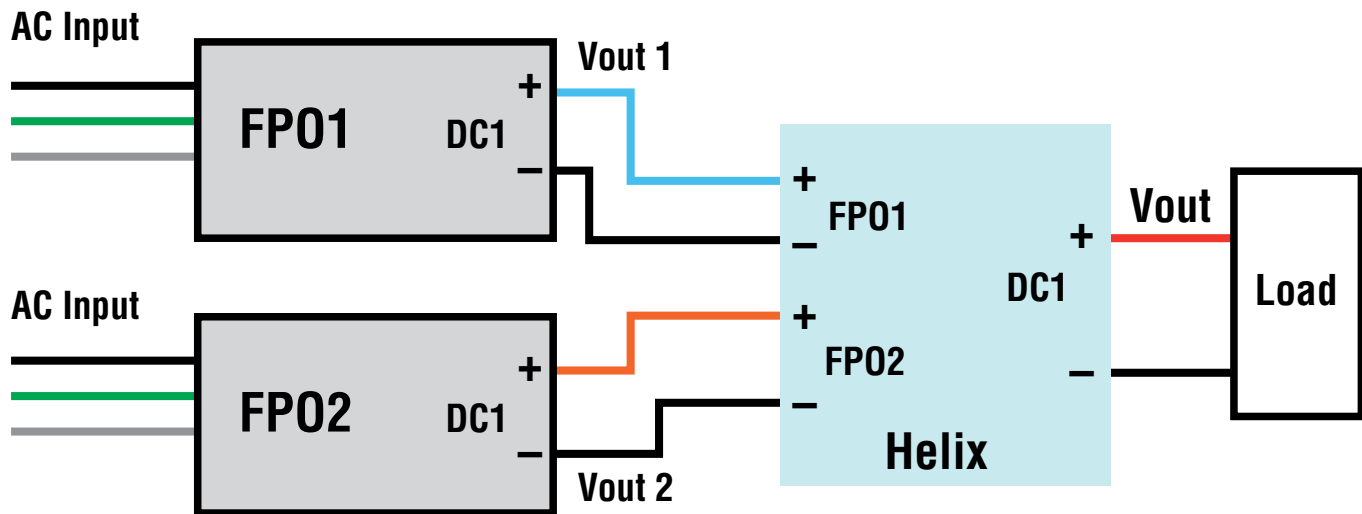
## Installation

Mounting of the board to an enclosure is via the four snap-in standoffs supplied.

1. Locate the appropriate mounting holes in the enclosure and snap the standoffs into the holes.
2. Align the board mounting holes with the standoffs (be sure the PC board is properly oriented) and snap the board onto the standoffs.



## Internal Wiring



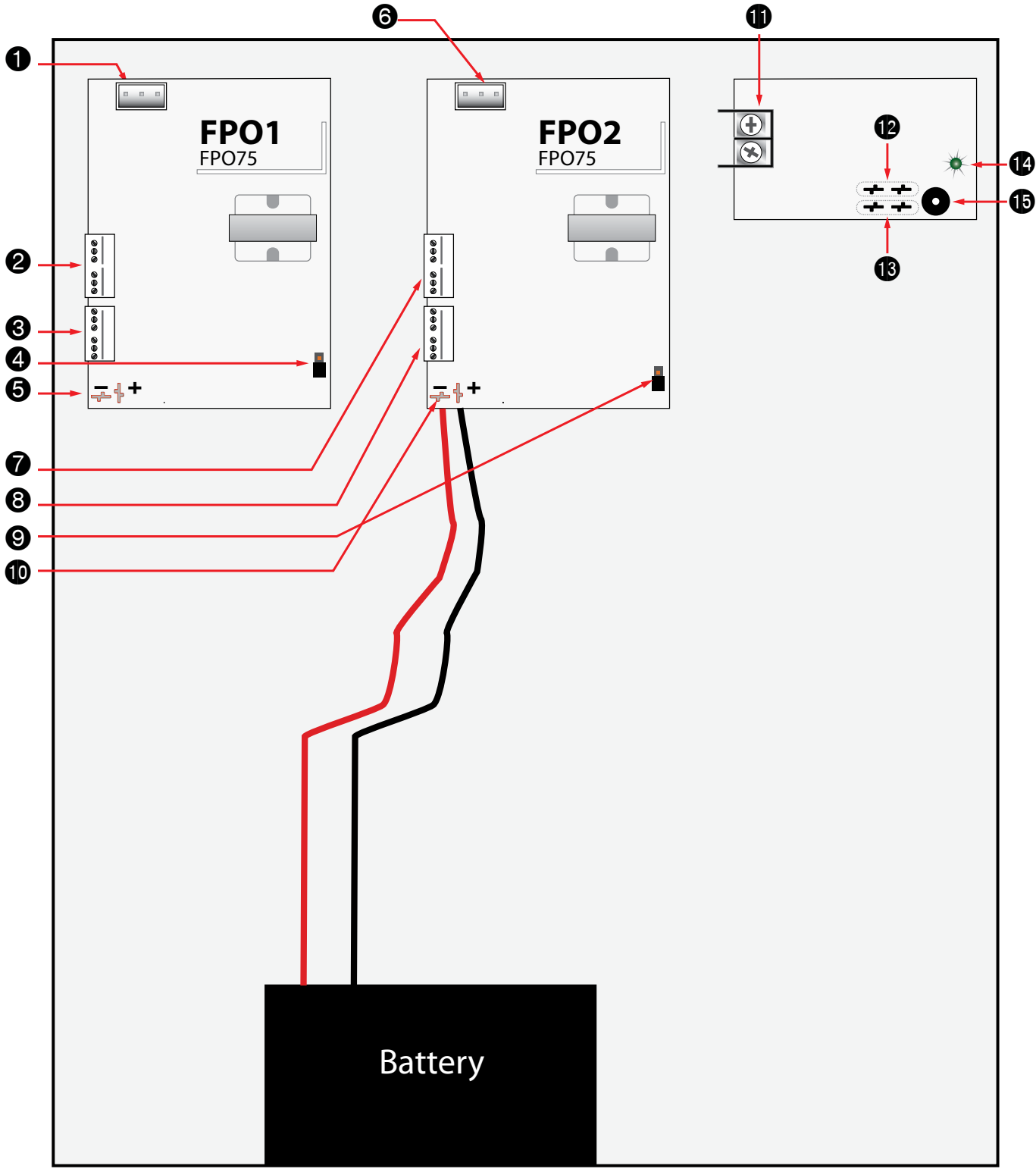
**Figure 1:** Redundant power supply system wiring with Helix board

Figure 1 shows the internal wiring configuration of the two FPO power supplies and the Helix module. Verify that both FPO power supplies are set to the same output voltage. The DC1 outputs of FPO1 and FPO2 are connected to the FPO1 and FPO2 inputs of the Helix module, respectively (observe proper polarity). The DC1 and V+/- quick disconnect terminals and the DC terminal block are electrically the same point and provide the redundant power output to the loads or any accessory boards. Do not connect any load directly to either FPO power supply in the Helix system - all load connections should be made at or after the Helix module.



## Wall Mount Field Wiring Connections

⚠ The illustration in this section depicts a Helix system using two FPO75 power supplies. Connections and configuration are the same for Helix systems using different FPO models - consult the FPO power supply manual for locations of the noted items. The layout of other Helix systems may be different than shown.



## Wall Mount Field Wiring Connections - continued

❶ **FPO1 AC Power Connection** - This is the AC input for FPO power supply #1. See the FPO manual for more information. It must be connected to the same branch circuit as FPO2.

❷ **FPO1 Fault Outputs** - These fault connections must be monitored along with the fault outputs of FPO2 to ensure notification of problems with either FPO power supply. See the FPO manual for more information.

❸ **FPO1 FAI Input** - If FAI is required in the system, make the connection to the FAI terminals of both FPO power supplies.

⚠ The Fire Alarm Interface (FAI) must be triggered with a NO open relay configuration to avoid a false positive visual indication under certain conditions. See the FPO manual for more information and for wiring information.

❹ **FPO1 Output Voltage Selection** - Selects a 12V or 24V output for FPO1. FPO2 must be set for the same output voltage. See the FPO manual for more information.

⚠ Remove all power before changing the output voltage or damage to the system could occur

❺ **FPO1 Battery Connection** - Do not connect a backup battery to FPO1. The backup battery set should be connected to FPO2.

❻ **FPO2 AC Power Connection** - This is the AC input for FPO power supply #2. See the FPO manual for more information. It must be connected to the same branch circuit as FPO1.

❼ **FPO2 Fault Outputs** - These fault connections must be monitored along with the fault outputs of FPO1 to ensure notification of problems with either FPO power supply. See the FPO manual for more information.

❽ **FPO2 FAI Input** - If FAI is required in the system, make the connection to the FAI terminals of both FPO power supplies.

⚠ The Fire Alarm Interface (FAI) must be triggered with a NO open relay configuration to avoid a false positive visual indication under certain conditions. See the FPO manual for more information and for wiring information.

❾ **FPO2 Output Voltage Selection** - Selects a 12V or 24V output for FPO2. FPO1 must be set for the same output voltage. See the FPO manual for more information.

⚠ Remove all power before changing the output voltage or damage to the system could occur.

❿ **FPO2 Battery Connection** - A backup battery set (not included) must be connected to FPO2 for proper operation of the Helix power supply. The voltage and AH capacity must be selected appropriately for the application. See the FPO manual for more information.

⓫ **Helix DC +/-** - This terminal block provides the redundant power output from the two FPO power supplies. This is a redundant equivalent of the DC1 output terminals on a typical FPO power supply.

⓬ **Helix V+/-** - These quick disconnect terminals provide redundant output voltage for powering a Netlink network monitoring module.

⓭ **Helix DC1 +/-** - These quick disconnect terminals provide redundant output voltage for powering any accessory boards in the Helix system. These are a redundant equivalent of the DC1 quick disconnect terminals on a typical FPO power supply.

⓮ **Helix Status LED** - This LED indicates the current status of the Helix board

*Steady Green* System OK, Running on FPO1


*Steady Yellow* Problem with FPO1, Running on FPO2

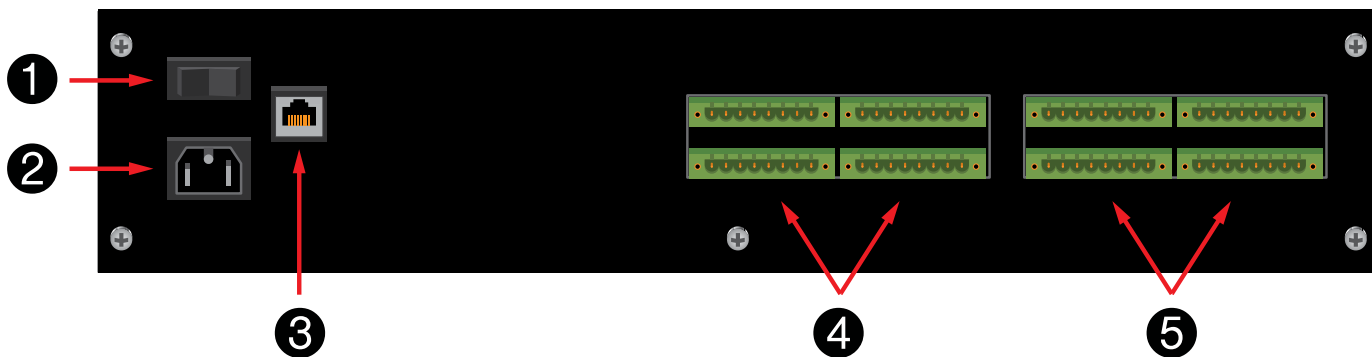
*Flashing Yellow* Helix Fault - See Helix Faults section of this manual for more information

⓯ **Helix Audible Sounder** - This sounder will sound a pulsing alert when the Helix detects a fault condition. See the Helix Faults section of this manual for more information.



## Rack Mount Field Wiring Connections

 Rack Mount Helix models are pre-configured for AC Input and DC Output voltage. All models are single voltage and, although FAI Inputs are present, FAI control is not available.



## Rack Mount Field Wiring Connections - continued

❶ **Main AC Power Switch / Circuit Breaker** - This is the main AC power switch for the enclosure. This switch lights when power is on and also has a built-in circuit breaker rated at 8A. If the circuit breaker trips, reset it by cycling the switch to off then back to on.

❷ **AC Line Input** - This is the connector for the AC line cord. Plug the included computer-style line cord into this connector. Connect the other end of the cord to the power strip inside the rack or another suitable AC power receptacle.

⚠ Rack Mount Helix models are preconfigured for either 120VAC or 230VAC input - Verify the input voltage for the model being installed prior to applying AC power.

❸ **Ethernet Connection (Optional)** - This is the RJ45 jack for the network connection for the internal NetLink board (if present). The ethernet cable is plugged into this jack. This jack is only present on Helix series power supplies with a model number ending in "N". See the corresponding NetLink manual for more information.

❹ **Distributed Outputs** - These are the redundant zone outputs. The Helix Series is available with 8 or 16 outputs. The output numbers correspond with the output zone numbers on the front panel. Bulk Output models without distribution will not have these terminals.

⚠ Rack Mount Helix models are preconfigured for either 12VDC or 24VDC output - Verify the output voltage for the model being installed prior to connecting field wiring.

❺ **Power Supply Connections** - These are the connections to the internal FPO Power Supplies. Only the following connections should be made - leave all other terminals disconnected:

### Power Supply 1

**ACF & SF** - These are the AC and System Fault outputs for FPO1. From the factory these are set to provide a closed connection when there is no fault. These fault connections must be monitored along with the fault outputs of FPO2 to ensure notification of problems with either FPO power supply.

### Power Supply 2

**Bat (±)** - This is where the battery connection is made. The voltage of the battery set must match the voltage of the Helix model being installed. Do not connect a battery to the Bat +/- terminals of Power Supply 1.

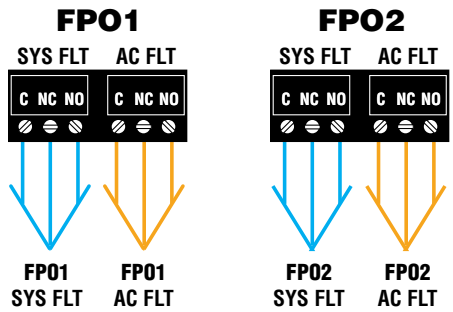
**ACF & SF** - These are the AC and System Fault outputs for FPO2. From the factory these are set to provide a closed connection when there is no fault. These fault connections must be monitored along with the fault outputs of FPO1 to ensure notification of problems with either FPO power supply.



## Fault Output Connections

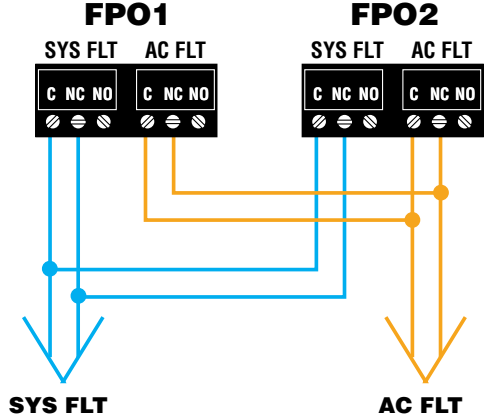
In order to monitor both FPO power supplies for problems, it is imperative that AC and System Fault contacts on both FPO power supplies be monitored. They may either be monitored separately or commoned into one or two outputs.

### Seperate Outputs



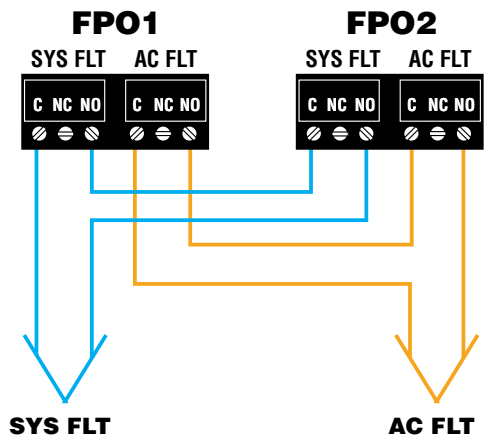
*For this application, simply wire all four relay connections separately as needed*

### Common System Fault, Common AC Fault (Contacts CLOSE on fault)



*For this application, parallel the NC fault contacts for the Sys Fault and also for the AC Fault*

### Common System Fault, Common AC Fault (Contacts OPEN on fault)

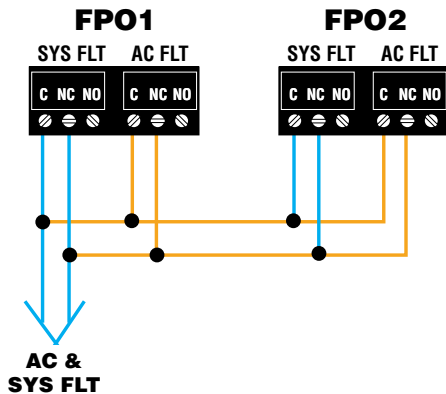


*For this application, series connect the NO fault contacts for the Sys Fault and also for the AC Fault*

## Fault Output Connections - continued

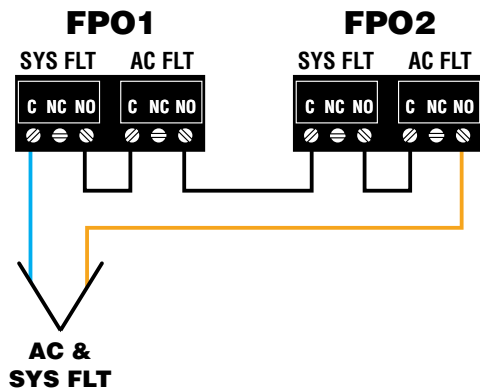
In order to monitor both FPO power supplies for problems, it is imperative that AC and System Fault contacts on both FPO power supplies be monitored. They may either be monitored separately or commoned into one or two outputs.

### Single Fault Output (Contacts CLOSE on fault)



*For this application, parallel all NC fault contacts*

### Single Fault Output (Contacts OPEN on fault)



*For this application, series connect all NO fault contacts*

## Verifying System Operation

To verify system operation, power the system and connect the battery to FPO2. Measure the Helix voltage at the DC+/- terminals. Remove the AC connector from FPO1 while continuing to monitor the Helix voltage. Verify that the voltage remains the same before, during, and after transfer to FPO2.

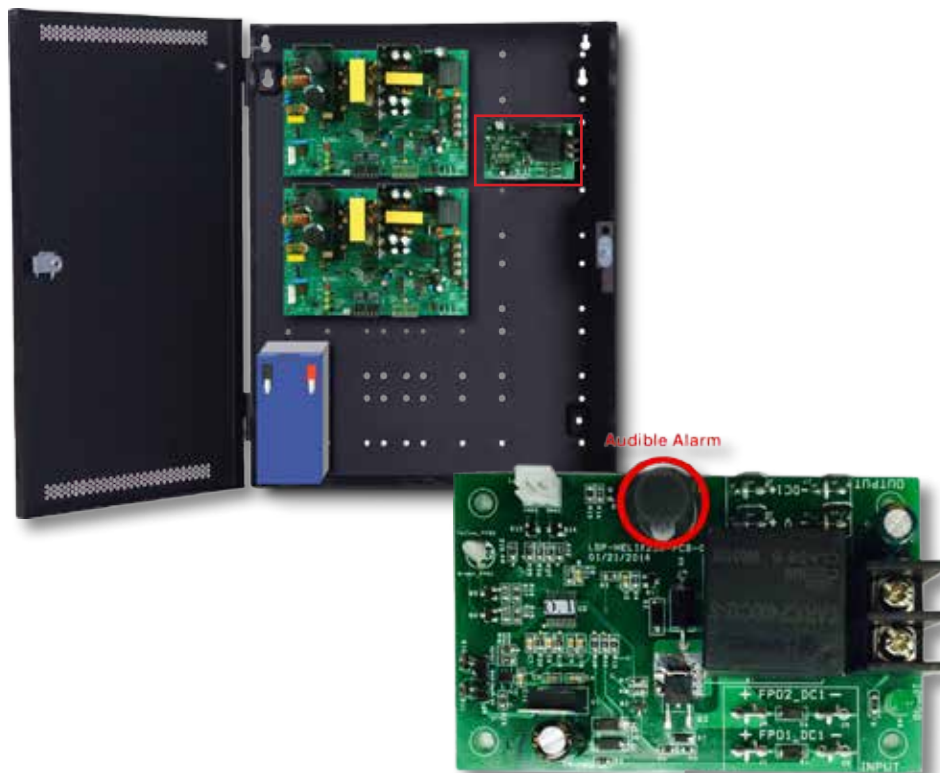


## Helix Audible Alarms

The Helix board has an audible alarm that will sound on various fault conditions that require immediate attention to maintain redundancy.

***The fault conditions include:***

- The two FPO boards connected are not set to the same output voltage (i.e. one supply set for a 12V Output and the other set for 24V)
- The output voltage of the backup FPO power supply has gone out of range (high or low)
- The output voltage of both FPO power supplies is abnormal
- Improper power up. One FPO power supply was powered before the other.
- Bad FPO power supply or other internal problem - Contact LifeSafety Power



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