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RH Rackmount Installation Manual

LifeSafety Power®



FLEXPOWER®



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The Helix RH rackmount series is factory preconfigured for either 120VAC or 230VAC - verify the proper AC Input voltage for the model being installed

Notes and Warnings

Symbol Definitions

The following symbols are used throughout this manual



This symbol is intended to alert the installer of shock hazards within the enclosure. Service should only be performed by qualified service personnel



This symbol is intended to alert the installer of important information intended to help the installer avoid personal injury or property damage

Warnings



Installation and service should be performed only by qualified service personnel and should conform to all local codes



To reduce the risk of electric shock or fire, do not expose this equipment to rain or moisture



This equipment shall be installed in a manner which prevents unintentional operation by employees, cleaning personnel, or others working in the premises, by falling objects, customers, building vibration, or similar causes



This equipment is not intended for use within the patient care areas of a Health Care Facility



Replace fuses only with the same type and rating as indicated in the specifications section of this manual.



To prevent impaired operation, ensure that all wiring is routed and secured to prevent accidental open or short circuit conditions



The system and any batteries (if used) should be tested at least once per year to ensure proper operation

Regulatory Information

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

- UL294, UL603, UL864, UL1076, UL1481, UL2044, UL2572
- ULC S318, ULC S319, ULC S527
- CSA C22.2 #107.1, CSA C22.2 #60950

FCC Information

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense

Conventions Used Within this Manual

Positional information (e.g. top, bottom, up, down, left, right, etc.) is referenced with the board or enclosure in the orientation shown in the illustrations in this manual


Introduction

Product Description

The LifeSafety Power Helix RH rackmount 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. Designed to fit neatly into standard 19"

equipment racks, the streamlined cabinetry and exceptional features combine to significantly reduce installation and service costs. Features include removable terminal strips for field wiring, input and output surge suppression, automotive blade fuses for improved reliability, a front removable chassis face plate for serviceability and is enclosed in a 16 gauge steel 2U rack mount chassis.

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 RH series 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.

HELIX RH Series

The Helix RH Series of single voltage DC power supplies provide 12 or 24 VDC power at 75W, 150W and 250W of total power. They are available with 8 or 16 outputs and the capability of remote monitoring of the supply's parameters via internet or intranet connection. Ideal for Access Control, CCTV, Burglar, Fire, or Mass Notification applications. Helix provides added

system integrity by automatically switching to the backup power supply in the event of a problem with the primary power supply. Each output is fused at 3A, but may be increased up to 7.5A by the installer for powering high power devices.

DC Product	Power	Outputs	Description	
RH75 Series	75W	2	Single Voltage	6A @ 12VDC or 3A @ 24VDC / dual output
RH150 Series	150W	2	Single Voltage	12A @ 12VDC or 6A @ 24VDC / dual output
RH250 Series	250W	2	Single Voltage	20A @ 12VDC or 10A @ 24VDC / dual output

Remote monitoring

RH75-XN	75W	8, 16	Single Voltage / Network	6A @ 12VDC or 3A @ 24VDC / multiple outputs / network
RH150-XN	150W	8, 16	Single Voltage / Network	12A @ 12VDC or 6A @ 24VDC / multiple outputs / network
RH250-XN	250W	8, 16	Single Voltage / Network	20A @ 12VDC or 10A @ 24VDC / multiple outputs / network

Section 1 – Installation

The following pages cover the installation of the Helix RH Series rack-mountable power supplies.

1.1 Mounting the Rack Mount Supply into a Standard 19" Rack

Use the following procedure when mounting an RH series supply into a standard EIA 19" equipment rack.

1. Ensure any internal configuration (voltage selection, fault detection settings, etc) are complete before mounting. See Section 1.3 of this manual for more information.
2. Securely mount the included ears to the enclosure sides using the eight included 6-32 countersunk screws (four per ear).
3. Locate the rack-mounting holes in the ears of the enclosure. (Figure 1)
4. Slide the enclosure into an open 2U location in the rack
5. Center the enclosure in the rack and secure with the four 10-32 x 3/4" screws provided.

NOTE: Use rails or other appropriate support for heavy enclosures. Keep heavier components near the bottom of the rack to reduce the risk of toppling of a top-heavy rack.

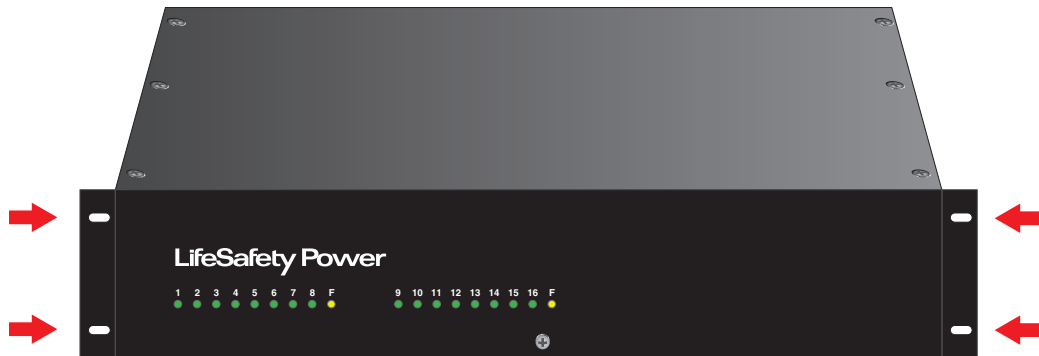


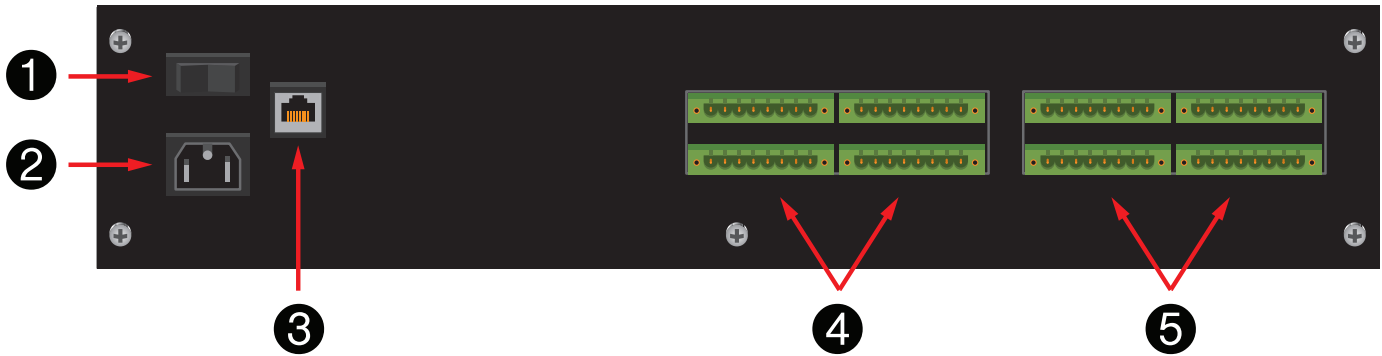
Figure 1 - The Enclosure Mounting Holes



The Helix RH rackmount series is factory preconfigured for either 120VAC or 230VAC - verify the proper AC Input voltage for the model being installed

1.2 HELIX RH Rackmount Field Wiring Connections

⚠ RH 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.





The following are basic descriptions. Refer to the appropriate section for more detailed information. Note that the front and back panels may appear different based on the configuration of your system.

① 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.

② 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.

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

③ 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.

④ 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.

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

⑤ 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

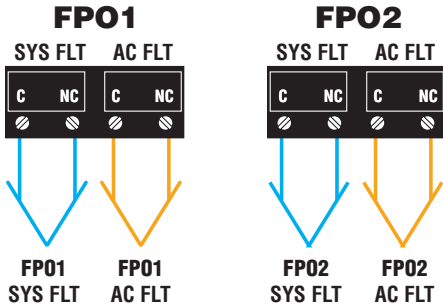
Bat (±) - This is where the battery connection is made. The voltage of the battery set must match the voltage of the Helix model being installed. Do not connect a battery to the Bat +/- terminals of Power Supply 1.

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.

1.2 HELIX RH Rackmount Field Wiring Connections

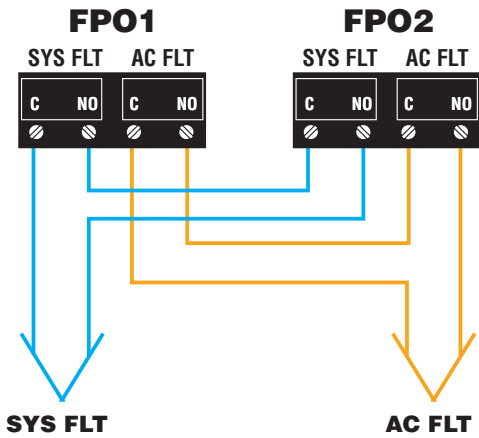
In order to monitor both FPO power supplies for problems, it is imperative that AC and System Fault contacts on both FPO power supplies be monitored. They may either be monitored separately or commoned into one or two outputs.

Seperate outputs



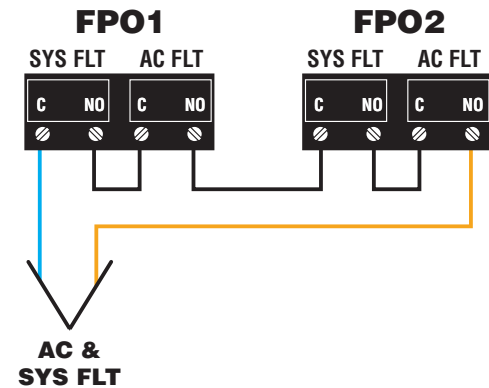
For this application, simply wire all four relay connections separately as needed

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



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

Single Fault Output (Contacts OPEN on fault)

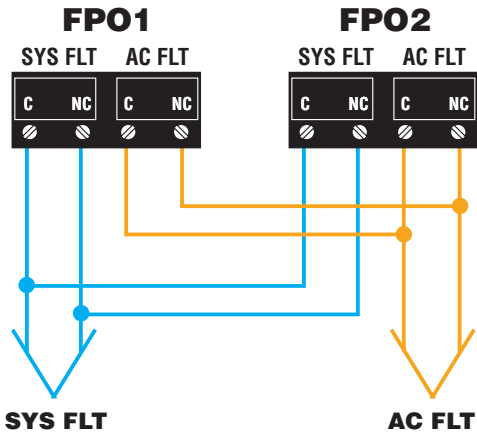


For this application, series connect all NO fault contacts



1.2 HELIX RH Rackmount Field Wiring Connections - continued

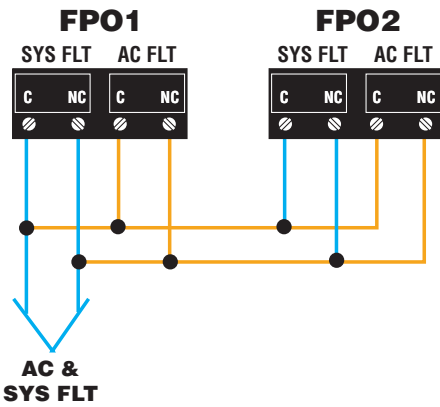
Common System Fault, Common AC Fault (Contacts CLOSE on fault)



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

See section 1.3.4 for information on changing to a NO Fault contact output.

Single Fault Output (Contacts CLOSE on fault)



For this application, parallel all NC fault contacts

See section 1.3.4 for information on changing to a NO Fault contact output.

1.3 Internal Pre-Configuration

Configuration internal to the rack mount enclosure is required on RH series power supplies prior to installation into a rack. Ensure all power is disconnected before performing this initial configuration.

1.3.1 Removing the Top Cover of the Enclosure

Use the following steps to remove the top cover of the rack-mount enclosure and gain access to the configurable settings. (Figure 2)

1. Lay the enclosure flat on its bottom surface
2. Remove and retain the six philips head screws from the top cover
3. Remove the top cover and set it aside in a safe location

When configuration is complete, reverse the removal procedure to replace the cover.

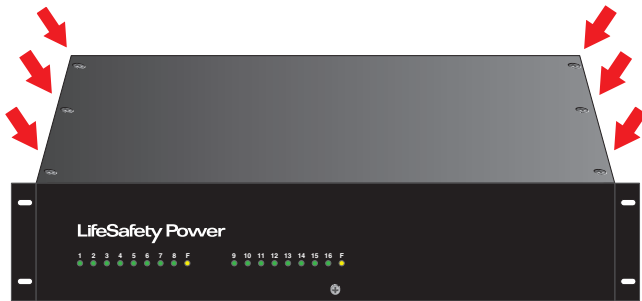


Figure 2 - The Top Cover Mounting Screws

1.3.2 Enabling or Disabling Battery Presence Detection

Each FPO power supply may be set to detect a missing battery set. If required, battery presence detection should only be enabled on the secondary FPO, as the primary FPO does not receive a battery set. To enable battery presence detection, place the BATDET jumper ON. To disable battery presence detection, remove the BATDET jumper, or place it on only one pin. (See #2 in Figure 3)

1.3.3 Enabling or Disabling Earth Ground Detection

Each FPO power supply is able to detect earth ground faults. To enable earth ground fault detection, place the EARTH GND DET jumper ON. To disable earth ground fault detection, remove the EARTH GND DET jumper or place it on only one pin. (See #1 in Figure 3)

⚠ Only one device in a system should have earth ground fault detection enabled or conflicts may occur. In addition, only ONE FPO power supply in a HELIX RH system should have earth ground fault detection enabled or a conflict may occur.

1.3.4 Changing the Operation of the Fault Contact Output

From the factory, RH series supplies are shipped with a normally open fault contact operation (relay contact closed until a fault occurs).

This operation may be switched to a normally closed contact (relay contact open until a fault occurs) by moving a wire on each fault contact.

To switch from the default NO fault contact to a NC contact, locate the fault output terminal strip on the FPO power supply. Identify the contact you want to change (SYS FLT or AC FLT), loosen the terminal, remove the wire from the NO terminal, move it to the NC terminal, and tighten the terminal.

⚠ This must be done on *both* HELIX FPO power supplies.

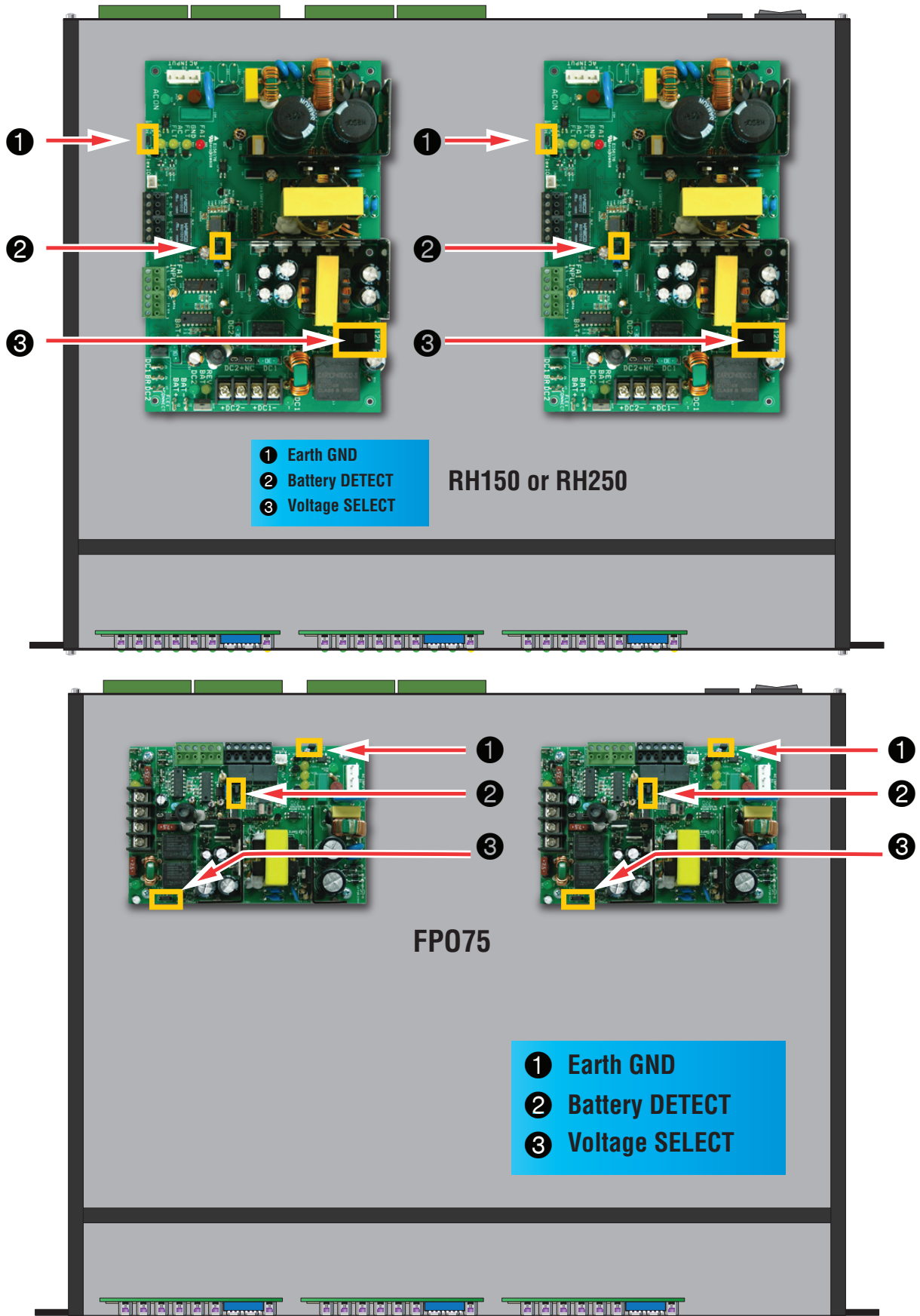


Figure 3 - Configuring the Internal FPO Power Supplies in a HELIX RH Series Supply

1.4 Making the Wiring Connections

Field wiring connections are made on the rear panel after installing the Helix enclosure into the rack. Field wiring connections are made to the removable terminal strips, which accept AWG 12-22 wire. The back panel is also where the main AC power and optional ethernet connections are made.

1.4.1 Helix RH Series Field Wiring

The RH series has terminals for various inputs and outputs as follows:

Distributed Outputs

Helix Series models with distributed outputs provide DC voltage on each output terminal pair on the rear of the enclosure. Depending on model, there will be either 8 or 16 output zones. The output zone numbers will correspond with the the numbering of the zones on the front panel. Bulk output Helix Series models will not have these outputs.

Battery (Bat+, Bat-)

This pair of terminals is for connection to a backup battery set, if required for the installation. Polarity is noted adjacent to the terminals. These terminals also charge the battery set. A battery set should only be connected to the secondary power supply.

⚠ Observe polarity or damage to the system will occur. Ensure the voltage of the battery set matches the voltage of the power supply.

⚠ It is the installer's responsibility to determine the proper battery size for the installation. See the Specifications section for battery standby current requirements.

DC1+, DC1-

The main DC output of the FPO power supply. The full current of the FPO is available on these terminals at all times.

AC Fault (ACF)

These terminals provide the AC Fault relay output from the FPO power supply. This relay signals when the internal FPO power supply detects a low or missing AC input voltage.

From the factory this output is set to provide a CLOSED connection when there is no fault. During a fault condition, the connection between these terminals will OPEN.

To reverse this operation, see Section 1.3.6 of this manual.

System Fault (SF)

These terminals provide the System Fault relay output from the FPO power supply. This relay signals when any of the following conditions occur:

- Missing Battery (If BAT DET jumper is ON)
- Earth Ground Fault (If EARTH GND DET jumper is ON)

- Battery voltage out of range
- DC output voltage out of range
- Ruptured fuse
- Accessory Board Fault
- Internal Fault

From the factory this output is set to provide a CLOSED connection when there is no fault. During a fault condition, the connection between these terminals will OPEN.

To reverse this operation, see Section 1.3.6 of this manual.

1.4.2 Main AC Power Connection

Verify the proper AC input voltage for the model being installed prior to connecting the system to AC power.

⚠ Connecting a 120VAC model to a 230V AC power source will damage the system and void the warranty.

1.4.3 Ethernet Connection (Optional)

Helix RH models with a model number ending in "N" contain a Netlink communication ethernet module. The Netlink allows access to the Helix rackmount via the internet or local intranet. See Section 2.5 for more information.

To make the ethernet connection, connect one end of a standard (RJ45) ethernet cable to the connector on the back of the Helix rackmount chassis. Connect the other end of the ethernet cable to a live network connection.

NOTE: The internal Netlink communication module must be configured before connecting to a network. See the included Netlink manual for more information.

Section 2 – Configuration and Usage

This section describes the final configuration as well as operation details for the Helix RH series power supplies.

2.1 Removing the Faceplate of the Enclosure

Use the following steps to remove the faceplate of the rack-mount enclosure and gain access to the front boards.

1. Remove and retain the five philips head 6-32 screws from the faceplate. DO NOT remove the four 10-32 screws securing the enclosure to the rack.
2. Carefully remove the faceplate and set it aside in a safe location

When configuration is complete, reverse the removal procedure to replace the cover, taking care to align the LEDs with the holes in the faceplate. (See Figure 4)

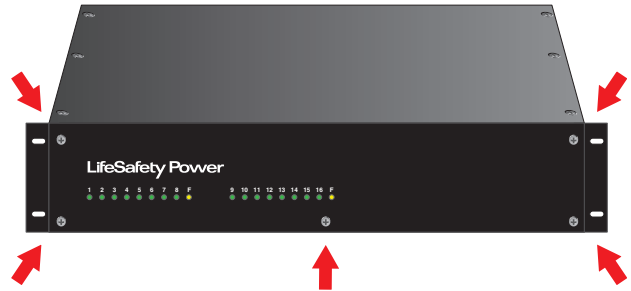


Figure 4 - Removing the Faceplate

2.2 Disabling Faults

Sometimes it is desirable to disable fuse fault detection for individual zones. This allows removal of the fuse for specific unused zones or zones with unfinished wiring.

Faults can be disabled via the block of switches on the top right of each front board (See Figure 5). Note that the color of this switch block may vary. Switch numbers correspond with zone numbers of the board (Switch 1 disables faults for Zone 1, etc.). Switch settings are as follows:

- **ON** Fault Detection Enabled
- **OFF** Fault Detection Disabled

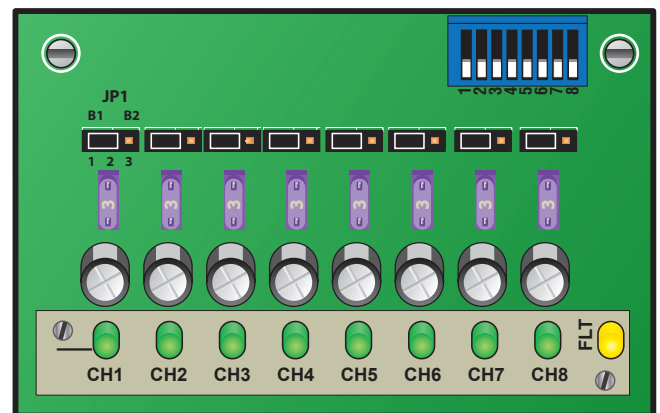


Figure 5 - The Front Board

2.3 Status LEDs

Each front board has nine LEDs (See Figure 5). The eight green LEDs give the voltage availability of the associated zone. The yellow LED will light if a fault condition is detected.

2.4 Remote Access via Ethernet

Helix RH Series power supplies with model numbers ending in "N" may be accessed over the internet or local intranet via the ethernet port on the back of the enclosure (Figure 6). Functionality varies by model type. This section only gives basic information. See the included Netlink manual for more information.

The RH Series has full Netlink NL4 functionality. See the NL4 network communication module manual for information on using and configuring the NL4.

Features available with the NL4 in an Helix product include monitoring and email reporting of voltage, battery status, AC and System Fault status and other parameters. Additionally, a periodic status report can be emailed.

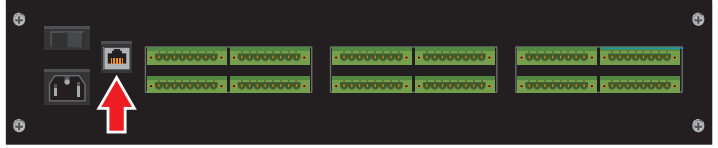


Figure 6 - Ethernet Network Connection

2.5 HELIX Audible Alarms

The Helix board has an audible alarm that will sound on various fault conditions that require immediate attention to maintain redundancy. (See Figure 7)

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

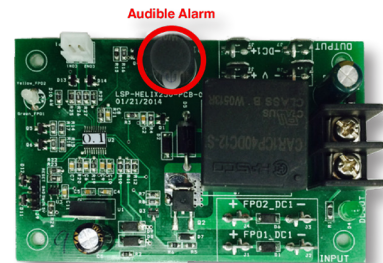


Figure 7 - Audible Alarm

Section 3 – Specifications

3.1 Electrical Specifications

Helix RH Series Power Supplies

Specifications		RH75 Series	RH150 Series	RH250 Series
AC Input	Voltage	120/230VAC ±15% at 50-60Hz	120/230VAC ±15% at 50-60Hz	120/230VAC ±15% at 50-60Hz
	Power	100 Watts	200 Watts	300 Watts
Standby	Current	100mA	100mA	100mA
Rated Current for UL603 Proprietary Alarm Installations	Current	1.25A maximum from all circuits in system	2.5A maximum from all circuits in system	2.5A maximum from all circuits in system
DC Output at 12V Setting	Voltage	12.5V ±0.5V nominal	12.5V ±0.5V nominal	12.5V ±0.5V nominal
	Max Current	6A	12A	20A
	Ripple	120mV	120mV	120mV
	Regulation	±2%	±2%	±2%
	Efficiency	85% (120VAC 60Hz In, Full Load, No Batt)	88% (120VAC 60Hz In, Full Load, No Batt)	89% (120VAC 60Hz In, Full Load, No Batt)
DC Output at 24V Setting	Voltage	25.0V ±0.5V nominal	25.0V ±0.5V nominal	25.0V ±0.5V nominal
	Max Current	3A	6A	10A
	Ripple	120mV	120mV	120mV
	Regulation	±2%	±2%	±2%
	Efficiency	85% (120VAC 60Hz In, Full Load, No Batt)	88% (120VAC 60Hz In, Full Load, No Batt)	89% (120VAC 60Hz In, Full Load, No Batt)
Battery	Size & Type	4-40AH Lead Acid or Gel Cell	4-80AH Lead Acid or Gel Cell	4-80AH Lead Acid or Gel Cell
	Charge Current	1A (±10%) Maximum (Adjustable via PowerCom Software)	2A (±10%) Maximum (Adjustable via PowerCom Software)	2A (±10%) Maximum (Adjustable via PowerCom Software)
Fuse Ratings	DC1 (Internal)	ATM 7.5A	ATM 15A	ATM 30A
	DC2 (Internal)	ATM 7.5A	ATM 15A	ATM 30A
	Battery (Internal)	ATM 7.5A	ATM 15A	ATM 30A
	Distributed Zones	ATM 3A	ATM 3A	ATM 3A
BTU Output	BTU	33	66	109
Fault Setpoints	Low AC	95V (±6%)	95V (±6%)	95V (±6%)
	Earth GND	2000 Ohms	2000 Ohms	2000 Ohms
	Output Voltage	±10% of nominal	±10% of Nominal	±10% of Nominal
	Batt Voltage	±10% of nominal	±10% of Nominal	±10% of Nominal
	Batt Presence	6–15V (12V Setting), 11–29V (24V Setting)	6–15V (12V Setting), 11–29V (24V Setting)	6–15V (12V Setting), 11–29V (24V Setting)
Fault Relay Contacts	AC FLT	1A at 24VDC	1A at 24VDC	1A at 24VDC
	SYS FLT	1A at 24VDC	1A at 24VDC	1A at 24VDC
Distributed Outputs	Count	2, 8, or 16	2, 8, or 16	2, 8, or 16
	Current	3A (7.5A max with fuse change)	3A (7.5A max with fuse change)	3A (7.5A max with fuse change)

IMPORTANT

All information, including illustrations, is believed to be reliable. Users, however, should independently evaluate the suitability of each product for their particular application. LifeSafety Power makes no warranties as to the accuracy or completeness of the information, and disclaims any liability regarding its use. LifeSafety Power's only obligations are those in the LifeSafety Power Standard Terms and Conditions of Sale for this product, and in no case will LifeSafety Power or its distributors be liable for any incidental, indirect, or consequential damages arising from the sale, resale, use, or misuse of the product. Specifications are subject to change without notice. In addition, LifeSafety Power reserves the right to make changes—without notification to Buyer—to processing or materials that do not affect compliance with any applicable specification.