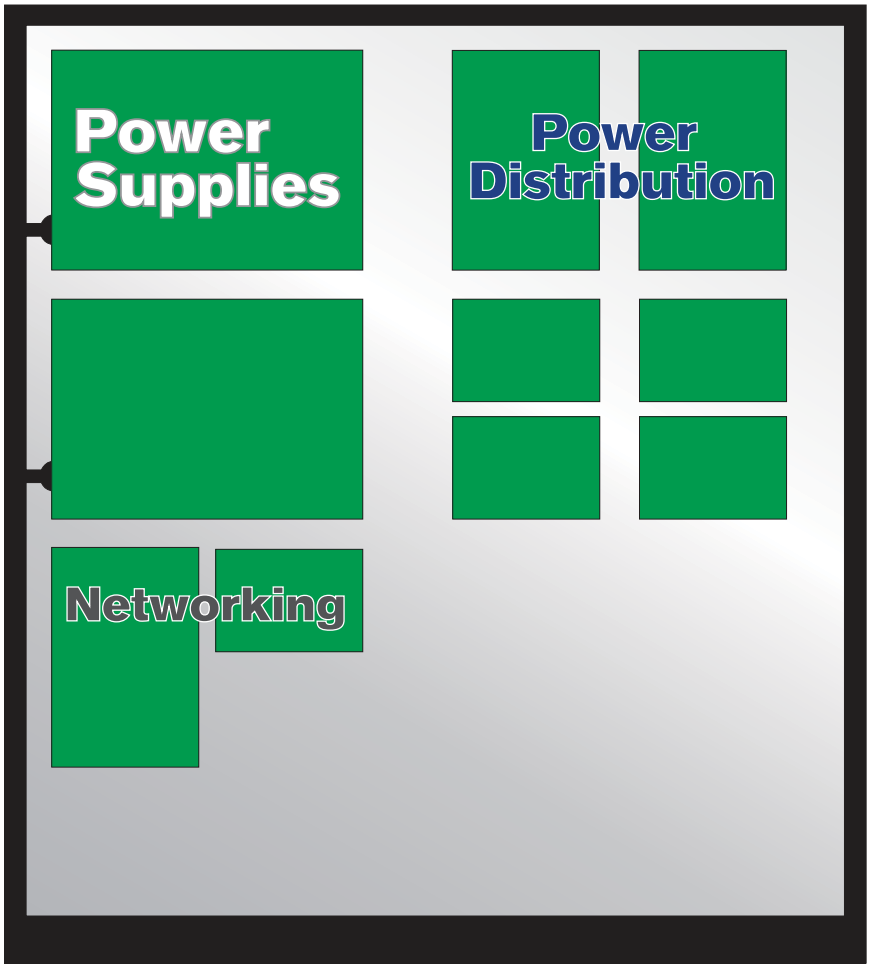
Power is knowledge.™
LifeSafety Power®

Troubleshooting Tips and Techniques

LSP
POWER GUIDE

SEP 2020

FP
FLEXPOWER STANDARD™



SELECT BOARD TO TROUBLESHOOT

POWER SUPPLIES

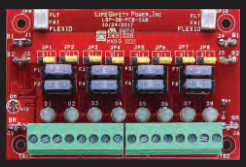
FPO75

FPO150

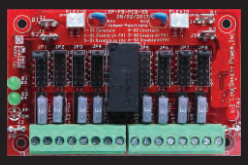
FPO250

B100

SIMPLE POWER DISTRIBUTION

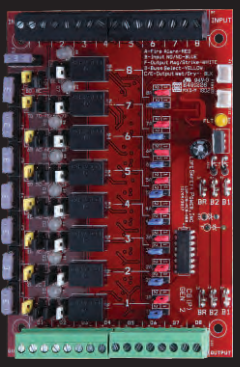


D8, D8P

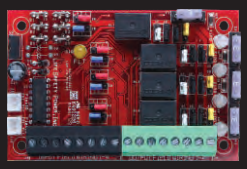


F8, F8P

CONTROLLED POWER DISTRIBUTION

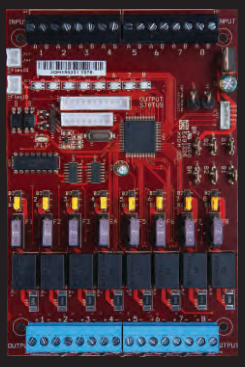


C8, C8P

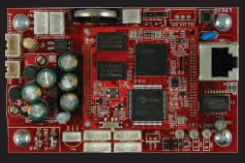


C4, C4P

MANAGED POWER & DISTRIBUTION



M8, M8P



NL4

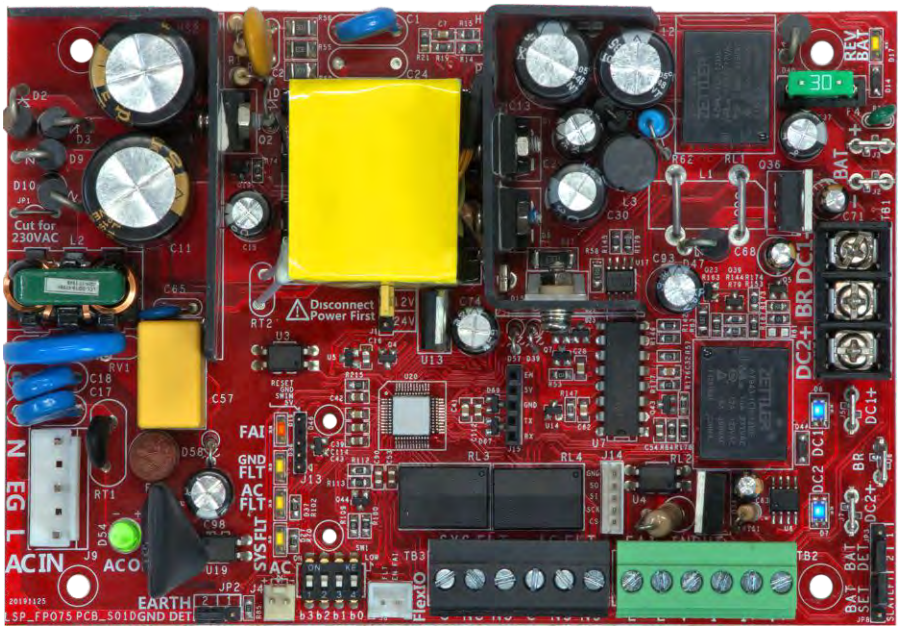
NLX

FPO75

Power Supply / Charger

Data Sheet

Install Manual



Setup & Connections

Description

Parameter	Rating
Input Voltage	100 - 230 VAC +/- 10%, 50/60Hz
Input Power (max)	83W
Main Output	12V @ 6Amp or 24V @ 3A
Maximum Charge Current	1 Amp
Low Power Disconnect	at 70% of battery voltage
System BTU/Hr	85
Operating Temperature	-4 to +122F (-20 to +50C)
Efficiency	81% 120VAC 60Hz In, Full Load
Continuous Outputs	1
Switched Outputs	1

The FPO75 is a universal input offline switchmode power supply-batterycharger specifically designed for usage in the lifesafety industry.

The FPO75 provides two outputs of 12VDC or 24VDC.

Complete fault detection and reporting, via independent AC Fault and System Fault form C relay contacts.

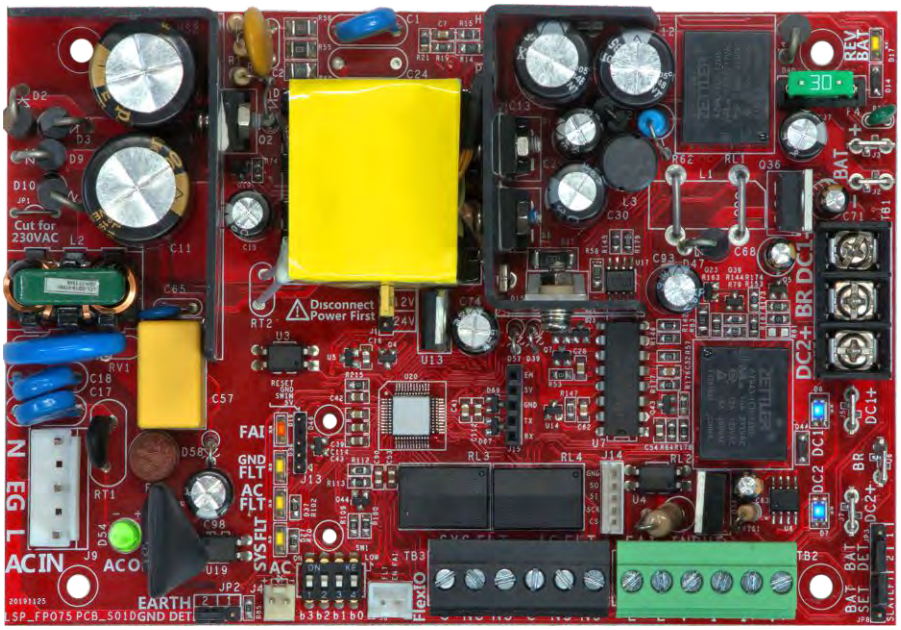
A built-in Fire Alarm Interface provides unlocking of doors on a fire alarm condition directly or through accessory boards.

FPO75

Power Supply / Charger

Data Sheet

Install Manual



Troubleshooting

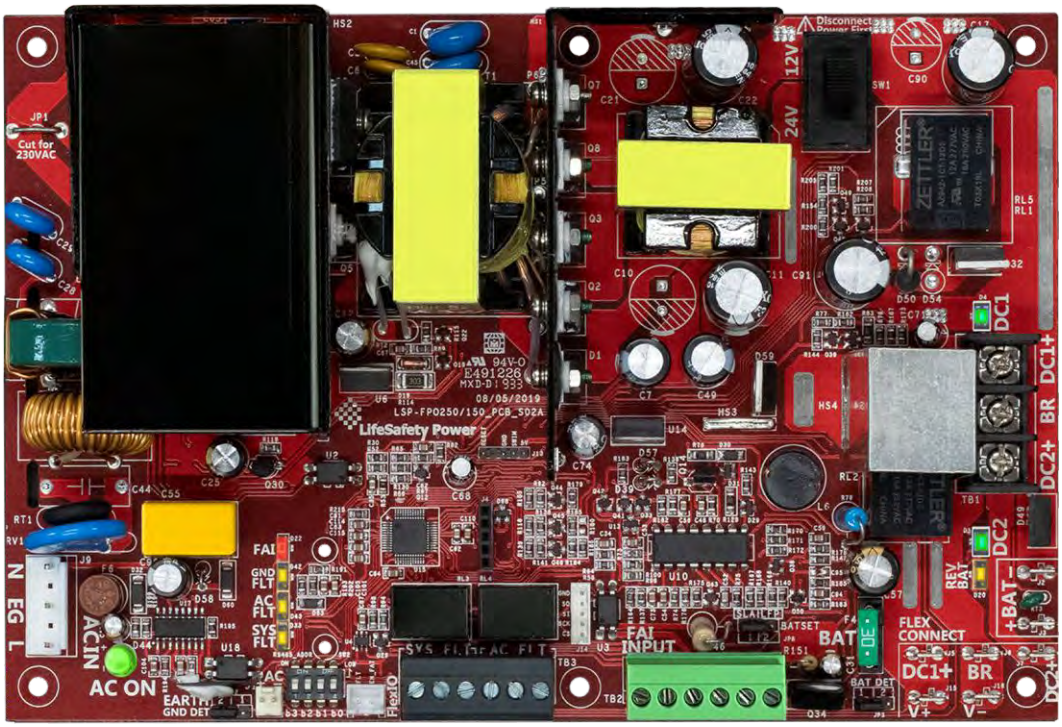
- Preparation
- No Output
- No DC1 Output
- No DC2 Output
- Incorrect Voltage
- Unit Shuts Down
- FAI Not Working
- Fault LED ON
- RS 485

Preparation

- If new install, review jumper settings and connections page to confirm correctness for purpose.
- Necessary tools
  - Multimeter
  - No.1 Phillips screwdriver
  - No.2 Phillips screwdriver
  - Long Nose Pliers
  - Wire Strippers

FPO150

Power Supply / Charger



Data Sheet

Install Manual

Setup & Connections

- Description
- Mounting
- Jumper Setup
- AC Input Voltage
- DC Output Voltage
- Battery Connection
- Visual Indicators
- Fault Relay Outputs
- Fire Alarm Input
- FlexIO Interconnect
- SPI Connection
- RS 485

Description

Parameter	Rating
Input Voltage	100 - 230 VAC +/- 10%, 50/60Hz
Input Power (max)	170W
Main Output	12V @ 12Amp or 24V @ 6A
Maximum Charge Current	2 Amp
Low Power Disconnect	at 70% of battery voltage
System BTU/Hr	85
Operating Temperature	-4 to +122F (-20 to +50C)
Efficiency	81% 120VAC 60Hz In, Full Load
Continuous Outputs	1
Switched Outputs	1

The FPO150 is a universal input offline switchmode power supply-batterycharger specifically designed for usage in the lifesafety industry.

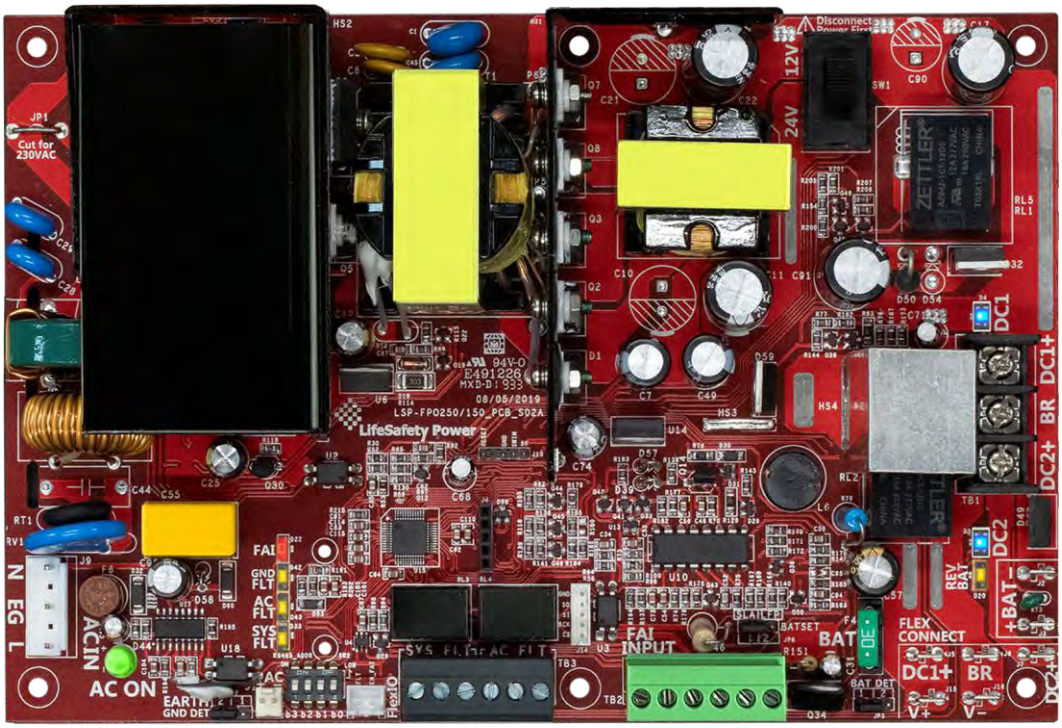
The FPO150 provides two outputs of 12VDC or 24VDC.

Complete fault detection and reporting, via independent AC Fault and System Fault form C relay contacts.

A built-in Fire Alarm Interface provides unlocking of doors on a fire alarm condition directly or through accessory boards.

FPO150

Power Supply / Charger



Data Sheet

Install Manual

Troubleshooting

- Preparation
- No Output
- No DC1 Output
- No DC2 Output
- Incorrect Voltage
- Unit Shuts Down
- FAI Not Working
- Fault LED ON
- RS 485

Preparation

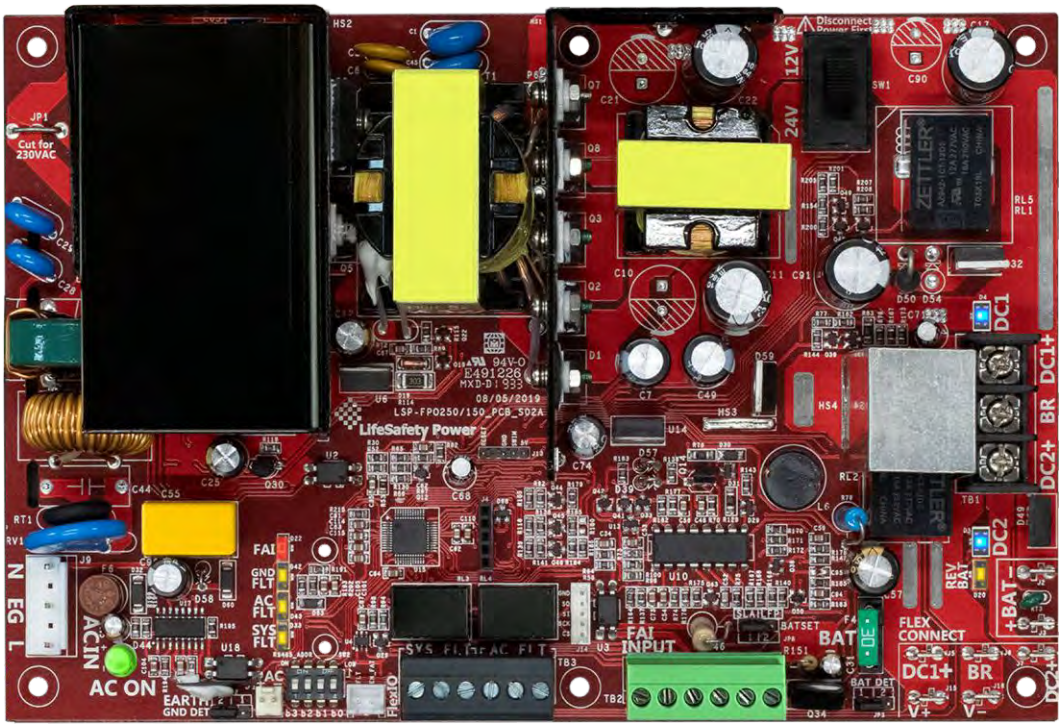
- If new install, review jumper settings and connections page to confirm correctness for purpose.
- Necessary tools
  - Multimeter
  - No.1 Phillips screwdriver
  - No.2 Phillips screwdriver
  - Long Nose Pliers
  - Wire Strippers

FPO250

Power Supply / Charger

Data Sheet

Install Manual



Setup & Connections

Description

Parameter	Rating
Input Voltage	100 - 230 VAC +/- 10%, 50/60Hz
Input Power (max)	282W
Main Output	12V @ 20Amp or 24V @ 10A
Maximum Charge Current	2 Amp
Low Power Disconnect	at 70% of battery voltage
System BTU/Hr	85
Operating Temperature	-4 to +122F (-20 to +50C)
Efficiency	81% 120VAC 60Hz In, Full Load
Continuous Outputs	1
Switched Outputs	1

The FPO250 is a universal input offline switchmode power supply-batterycharger specifically designed for usage in the lifesafety industry.

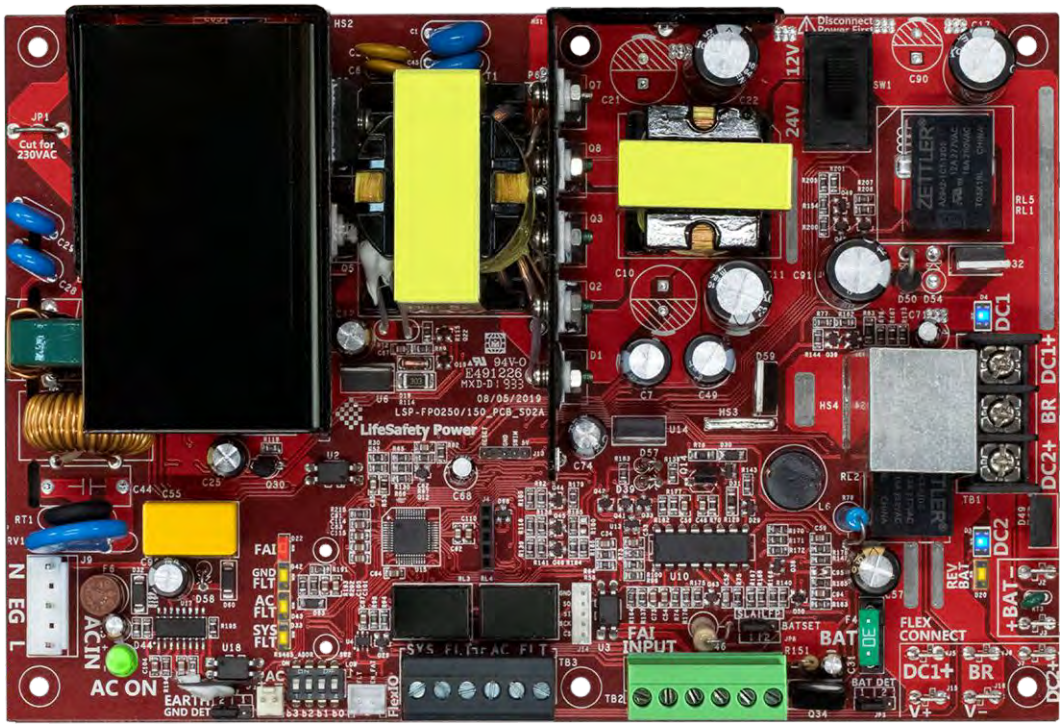
The FPO250 provides two outputs of 12VDC or 24VDC.

Complete fault detection and reporting, via independent AC Fault and System Fault form C relay contacts.

A built-in Fire Alarm Interface provides unlocking of doors on a fire alarm condition directly or through accessory boards.

FPO250

Power Supply / Charger



Data Sheet

Install Manual

Troubleshooting

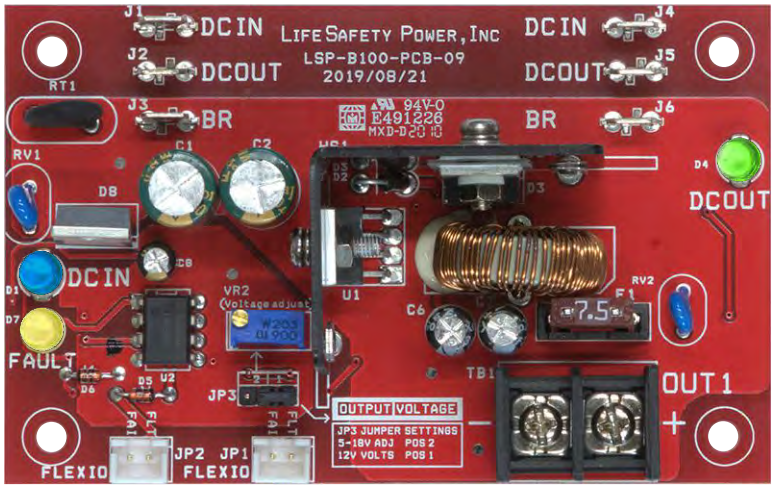
- Preparation
- No Output
- No DC1 Output
- No DC2 Output
- Incorrect Voltage
- Unit Shuts Down
- FAI Not Working
- Fault LED ON
- RS 485

Preparation

- If new install, review jumper settings and connections page to confirm correctness for purpose.
- Necessary tools
  - Multimeter
  - No.1 Phillips screwdriver
  - No.2 Phillips screwdriver
  - Long Nose Pliers
  - Wire Strippers

B100

DC - DC Converter



Data Sheet

Install Manual

Setup & Connections

- Description
- Mounting
- Jumper Setup
- DC Input Voltage
- DC Output Voltage
- Visual Indicators
- FlexIO Interconnect

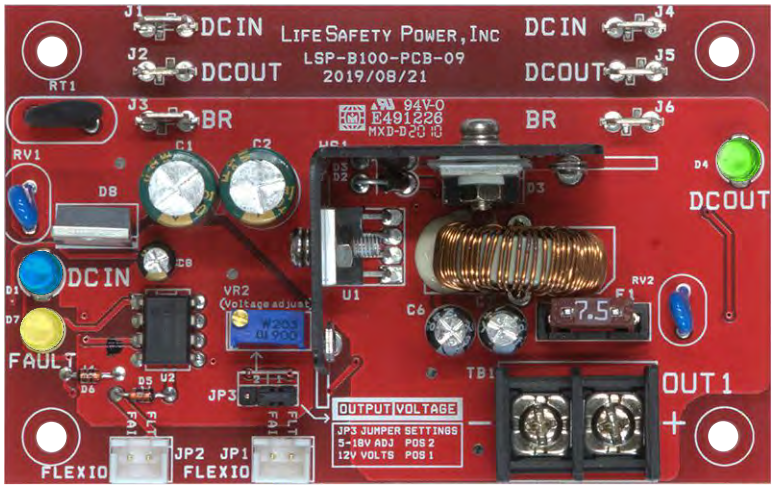
Description

Parameter	Rating
Input Voltage (from FPO power supply)	12 or 24 VDC
Output Voltage (jumper select)	12VDC or 5-18VDC (user adjustable)
Output Current (Class 2 Pwr Ltd)	4 Amps
Efficiency	91%
Output Ripple (12V@4A)	82 mVp-p
Line Regulation (12V@4A)	<0.1±%
Load Regulation (12V)	0.56 ±%

The B100 secondary voltage module provides a means to easily and economically add an additional voltage to any FlexPower system. Primary power for the B100 is derived from an FPG or FPV power supply and the B100 steps the voltage down to the user defined range (typically 12VDC).
The B100 output is *Class 2 Power Limited* and jumper selectable for either a fixed 12VDC or an adjustable range between 5-18VDC at 4 amps maximum current. Multiple B100's can be added to a system for virtually unlimited voltage combinations.

B100

DC - DC Converter



Data Sheet

Install Manual

Troubleshooting

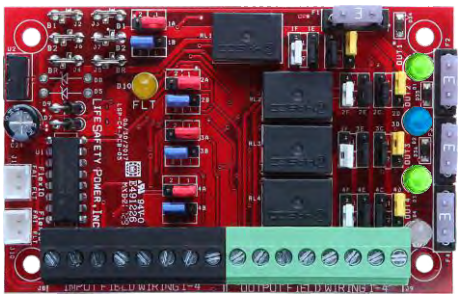
- Preparation
- No Output
- Incorrect Output
- Unit shuts Down
- Fault LED ON

Preparation

- If new install, review jumper settings and connections page to confirm correctness for purpose.
- Necessary tools
  - Multimeter
  - No.1 Phillips screwdriver
  - No. 2 Phillips screwdriver
  - Long Nose Pliers
  - Wire Strippers

C4(P)
C8(P)

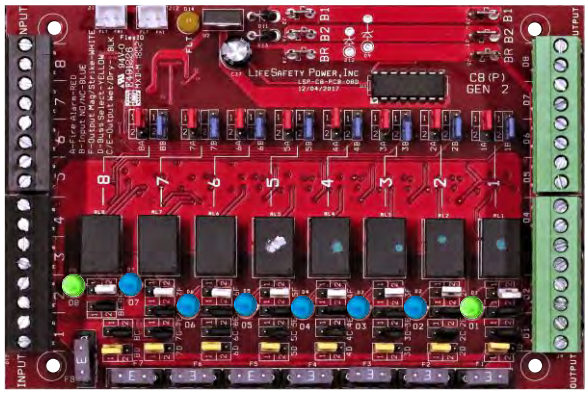
Lock Distribution Board



OUTSMART™
Now voltage is visual.

Data Sheet

Install Manual



Setup & Connections

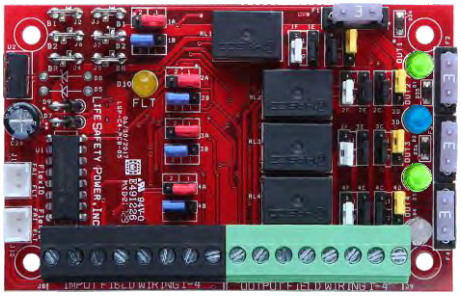
Description

Parameter	Rating
Lock Outputs	4 / 8
Access Control Inputs	4 / 8
Input Voltage	12 and/or 24 VDC
Input Current	20 Amps max
Output Voltage (Jumper Select)	12/24 VDC
Output Current C4/C8	Fused at 3A per output
Output Current C4P/C8P	Class II at 2.5A per output
Fire Alarm Interface	Per Output
Supports follow on modules	Yes

- The FlexPower C4, C8 lock controller modules add 4 or 8 lock control outputs to a FlexPower power supply and are typically supplied as part of a system or purchased as an expansion piece to an existing system.
- Each module provides either 4 or 8 access control inputs capable of voltage or dry contact activation.
- Each module provides either 4 or 8 lock outputs, each one programmable for fail-safe, fail-secure, dry contact, and fire alarm over ride for egress lock control.
- In dual voltage systems, each lock output is also programmable to either of the two voltages available when used in a FlexPower dual voltage power system. OutSmart dual color LEDs to are provided visually indicate voltage levels by output (Green for 12V, Blue for 24V). Each output is supervised for voltage and/or blown fuses.

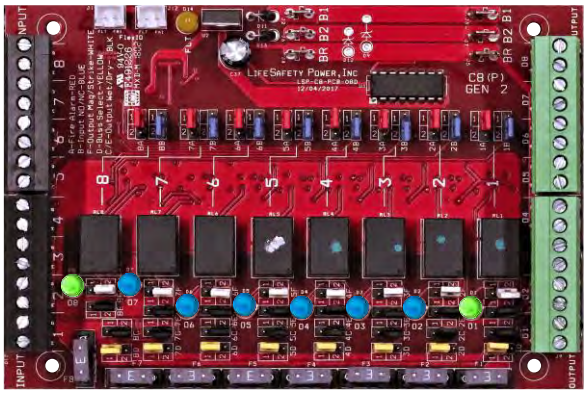
C4(P)
C8(P)

Lock Control



Data Sheet

Install Manual



Troubleshooting

- Description
- Dead Board, No LEDs
- Yellow FLT LED ON
- Access Input Problem
- Lock Output Problem
- FAI Problem
- 12/24 Lock Voltage
- Jumper Definition

Description

Parameter	Rating
Lock Outputs	4 / 8
Access Control Inputs	4 / 8
Input Voltage	12 and/or 24 VDC
Input Current	20 Amps max
Output Voltage (Jumper Select)	12/24 VDC
Output Current C4/C8	Fused at 3A per output
Output Current C4P/C8P	Class II at 2.5A per output
Fire Alarm Interface	Per Output
Supports follow on modules	Yes

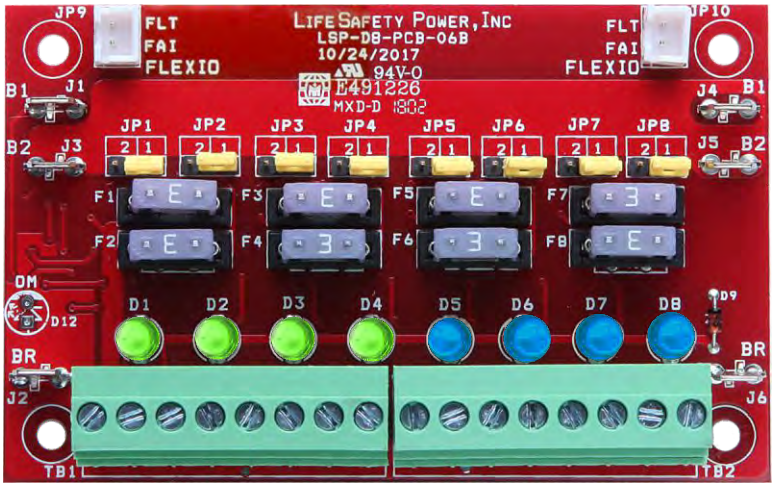
- The FlexPower C4, C8 lock controller modules add 4 or 8 lock control outputs to a FlexPower power supply and are typically supplied as part of a system or purchased as an expansion piece to an existing system.
- Each module provides either 4 or 8 access control inputs capable of voltage or dry contact activation.
- Each module provides either 4 or 8 lock outputs, each one programmable for fail-safe, fail-secure, dry contact, and fire alarm over ride for egress lock control.
- In dual voltage systems, each lock output is also programmable to either of the two voltages available when used in a FlexPower dual voltage power system. OutSmart dual color LEDs to are provided visually indicate voltage levels by output (Green for 12V, Blue for 24V). Each output is supervised for voltage and/or blown fuses.

D8-D8P

Distribution Board

Data Sheet

Install Manual



Setup & Connections

- Description
- Mounting
- Input Voltage
- Jumper Setup
- Outputs
- Visual Indicators
- FlexIO Interconnect

Description

Parameter	Rating
Power Outputs	8
Input Voltage	12 and/or 24 VDC
Input Current	20 Amps max
Output Voltage (Jumper Select)	12/24 VDC
Output Current D8	Fused at 3A per output
Output Current D8P	Class 2,Pwr Ltd, 2.5A per output
Fire Alarm Interface	Per Output (Single Voltage Only)
Supports follow on modules	Yes

The D8 power distribution module adds 8 auxiliary power outputs to a FlexPower power supply and is typically supplied as part of a system, or purchased as an expansion piece to an existing system.

The D8 provides 8 auxiliary power outputs, each one individually protected by a fuse (D8) or or solid state circuit breaker (D8P).

Each output is programmable to either of the two voltages available when used in a FlexPower dual voltage power system, or to the continuous output or the resettable output of the power supply when used in a single voltage system.

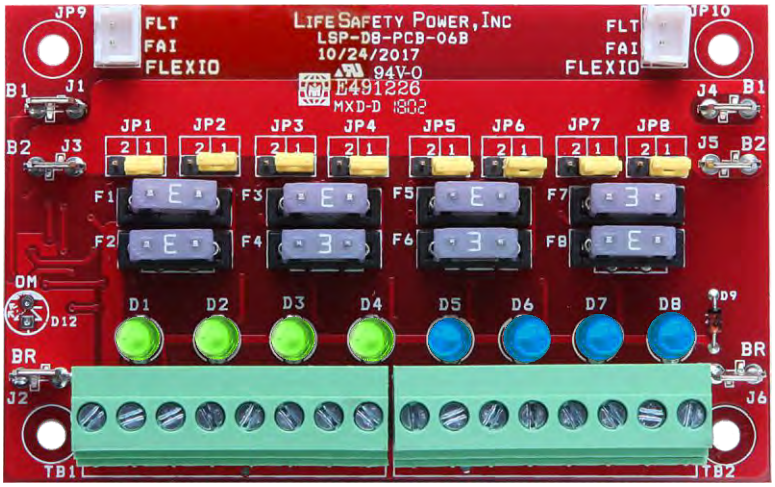
Red D8 boards are GEN 2 which add OutSmart dual color LEDs to visually indicate voltage levels by output
(Green for 12V, Blue for 24V).

D8-D8P

Distribution Board

Data Sheet

Install Manual



Troubleshooting

- Description
- D8 Issues
- No Outputs
- No Single Output
- D8P Issues
- No Outputs
- No Single Output

Description

Parameter	Rating
Power Outputs	8
Input Voltage	12 and/or 24 VDC
Input Current	20 Amps max
Output Voltage (Jumper Select)	12/24 VDC
Output Current D8	Fused at 3A per output
Output Current D8P	Class 2,Pwr Ltd, 2.5A per output
Fire Alarm Interface	Per Output (Single Voltage Only)
Supports follow on modules	Yes

The D8(P) power distribution module adds 8 auxiliary power outputs to a FlexPower power supply and is typically supplied as part of a system, or purchased as an expansion piece to an existing system.

The D8(P) provides 8 auxiliary power outputs, each one individually protected by a fuse (D8) or or solid state circuit breaker (D8P).

Each output is programmable to either of the two voltages available when used in a FlexPower dual voltage power system, or to the continuous output or the resettable output of the power supply when used in a single voltage system.

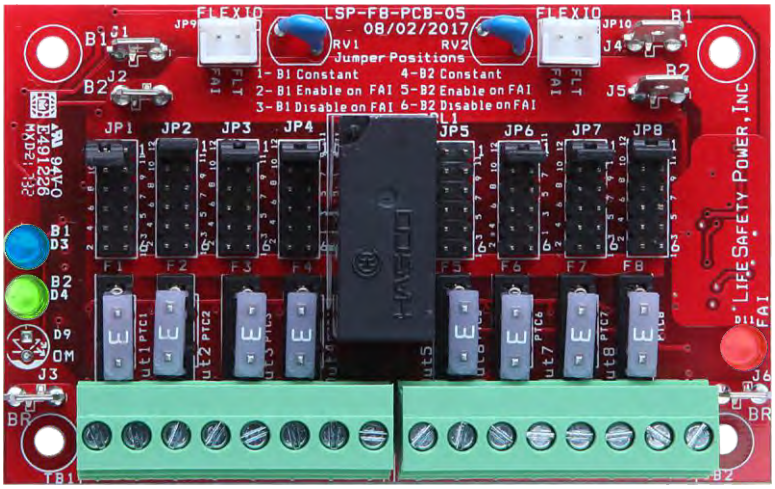
Red D8(P) boards are GEN 2 which add OutSmart dual color LEDs to visually indicate voltage levels by output
(Green for 12V, Blue for 24V).

F8-F8P

Distribution Board

Data Sheet

Install Manual



Setup & Connections

- Description
- Mounting
- Input Voltage
- Jumper Setup
- Outputs
- Visual Indicators
- FlexIO Interconnect

Description

Parameter	Rating
Power Outputs	8
Input Voltage	12 and/or 24 VDC
Input Current	20 Amps max
Output Voltage (Jumper Select)	12/24 VDC
Output Current F8	Fused at 3A per output
Output Current F8P	Class 2,Pwr Ltd, 2.5A per output
Fire Alarm Interface	Per Output
Supports follow on modules	Yes

The F8 module adds 8 FAI-controlled voltage outputs to a FlexPower power supply and is typically supplied as part of a system or purchased as an expansion piece to an existing system.

Each module provides 8 protected outputs, each output programmable to enable voltage on activation of the fire alarm interface (FAI), disable voltage on FAI or provide a constant output voltage.

Each output is also programmable to either of the two voltages available when used in a FlexPower dual voltage power system.

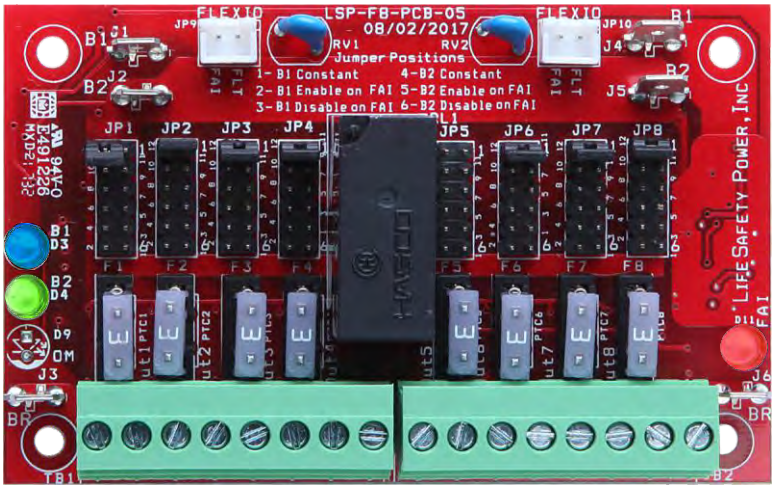
Red F8 boards are GEN 2 which adds add OutSmart dual color LEDs to visually indicate voltage levels by Buss input (Green for 12V, Blue for 24V).

F8-F8P

Distribution Board

Data Sheet

Install Manual



Troubleshooting

Description

F8 Issues

No Outputs

No Single Output

F8P Issues

No Outputs

No Single Output

Description

Parameter	Rating
Power Outputs	8
Input Voltage	12 and/or 24 VDC
Input Current	20 Amps max
Output Voltage (Jumper Select)	12/24 VDC
Output Current F8	Fused at 3A per output
Output Current F8P	Class 2,Pwr Ltd, 2.5A per output
Fire Alarm Interface	Per Output
Supports follow on modules	Yes

The F8 module adds 8 FAI-controlled voltage outputs to a FlexPower power supply and is typically supplied as part of a system or purchased as an expansion piece to an existing system.

Each module provides 8 protected outputs, each output programmable to enable voltage on activation of the fire alarm interface (FAI), disable voltage on FAI or provide a constant output voltage.

Each output is also programmable to either of the two voltages available when used in a FlexPower dual voltage power system.

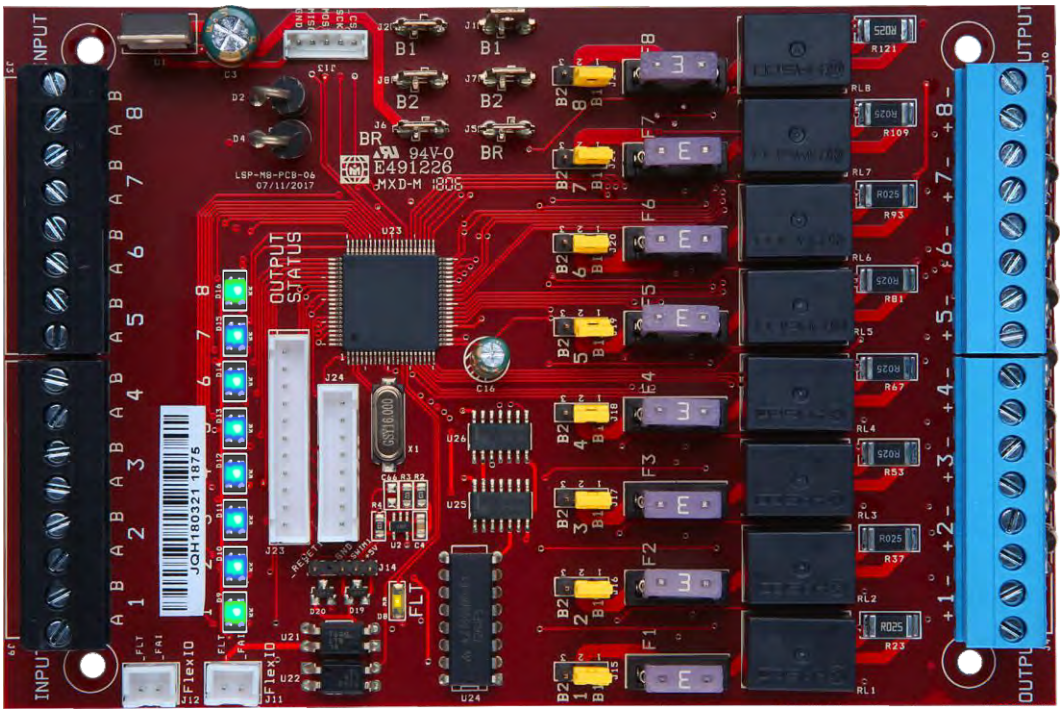
Red F8 boards are GEN 2 which adds add OutSmart dual color LEDs to visually indicate voltage levels by Buss input (Green for 12V, Blue for 24V).

M8-M8P

DC - DC Converter

Data Sheet

Install Manual



Setup & Connections

Description

Parameter	Rating
Lock Outputs	8
Access Control Inputs	8
Input Voltage	12 and/or 24 VDC
Input Current	20 Amps max
Output Voltage (Jumper Select)	12/24 VDC
Output Current M8	Fused at 3A per output
Output Current M8P	Class 2, Pwr Ltd at 2.5A per output
Fire Alarm Interface	Per Output
Supports follow on modules	Yes

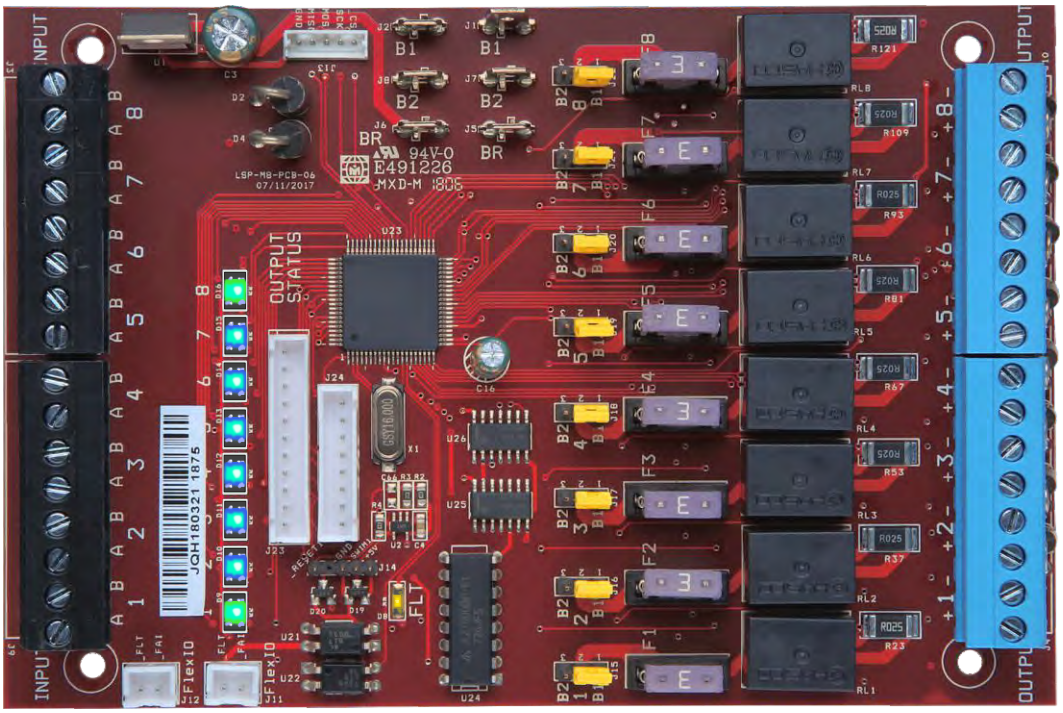
The M8 smart power controller communicates with the NL4 network module to make the M8(P) accessible from a network or the internet.

The M8 provides eight (8) control INPUTS capable of voltage or dry contact activation and eight (8) relay controlled, monitored OUTPUTS, with each output network programmable for fail-safe, fail-secure, fire alarm over ride, and AC loss over ride for egress lock control. Each output is also programmable to either of two voltages available when used in a dual voltage iSCAN power system. OutSmart dual color LEDs visually indicate voltage levels by output (Green for 12V, Blue for 24V).

Each output may also be individually enabled/disabled through a browser interface, the voltage and current of each output monitored via network or internet, and trigger points may be set up on each output to generate an alert when that output is outside of selected parameters. The NL4 or NLX is required.

M8-M8P

Lock Control



Data Sheet

Install Manual

Troubleshooting

- Description
- Dead Board, No LEDs
- Yellow FLT LED ON
- Access Input Problem
- Lock Output Problem
- FAI Problem
- 12/24 Lock Voltage

Description

Parameter	Rating
Lock Outputs	8
Access Control Inputs	8
Input Voltage	12 and/or 24 VDC
Input Current	20 Amps max
Output Voltage (Jumper Select)	12/24 VDC
Output Current M8	Fused at 3A per output
Output Current M8P	Class 2, Pwr Ltd at 2.5A per output
Fire Alarm Interface	Per Output
Supports follow on modules	Yes

The M8 smart power controller communicates with the NL4 network module to make the M8(P) accessible from a network or the internet.

The M8 provides eight (8) control INPUTS capable of voltage or dry contact activation and eight (8) controlled and monitored OUTPUTS, with each output network programmable for fail-safe, fail-secure, fire alarm over ride, and AC loss over ride for egress lock control. Each output is also programmable to either of two voltages available when used in a dual voltage iSCAN power system. OutSmart dual color LEDs visually indicate voltage levels by output (Green for 12V, Blue for 24V).

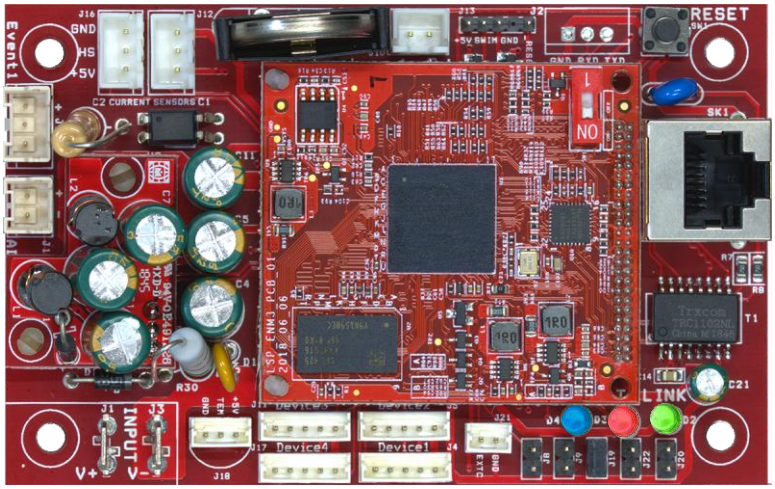
Each output may also be individually enabled/disabled through a browser interface, the voltage and current of each output monitored via network or internet, and trigger points may be set up on each output to generate an alert when that output is outside of selected parameters. The NL4 or NLX is required.

NL4

Network Management

Data Sheet

Install Manual



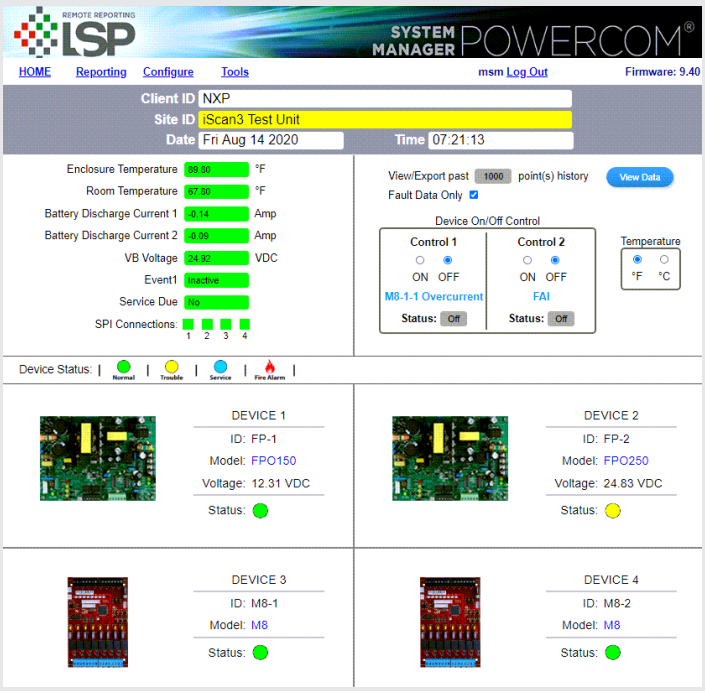
Setup & Connections

- Description
- Mounting
- Input Voltage
- Jumper Setup
- Software Setup
- Sensor Inputs
- Communications
- Outputs
- Visual Indicators
- Fault Detection

Software Setup

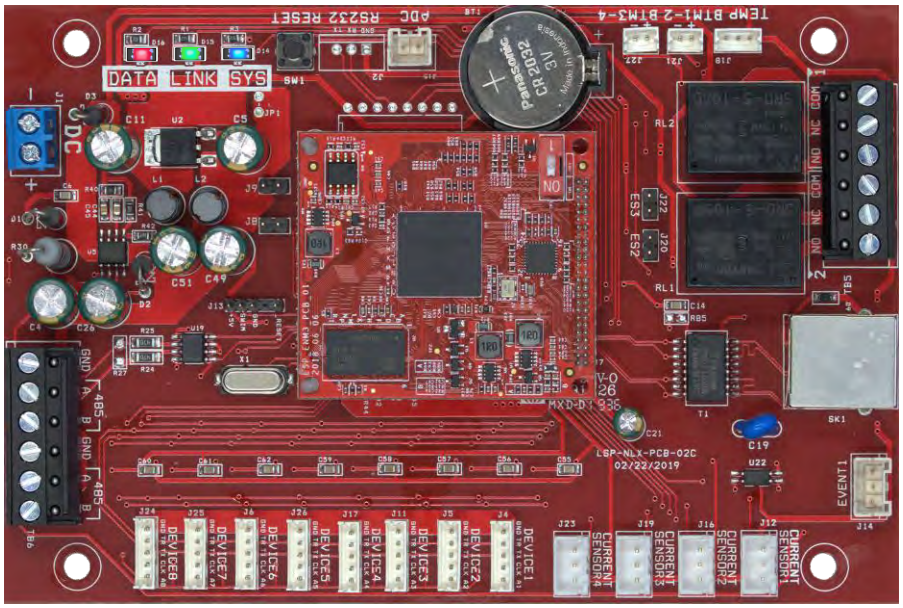
It is beyond the scope of this guide to provide enough information to configure the M8(P) software.

The manuals for both the M8(P) and the NL network module are necessary and may be downloaded if an internet connection is available.



NLX

Network Management



Data Sheet

Install Manual

Setup & Connections

Description

The NLX is a twenty-four data port network module that communicates and controls power status over a local or wide area network. Eight SPI ports and sixteen RS485 ports are provided for connection to FlexPower devices for monitoring and control of the power system. Typical data gathered and reported includes operational fault status, power supply output voltage, battery charging voltage, battery charging current, and fire alarm input status.

Automated reports may be generated on any detected fault condition, battery aging, fire alarm interface activation, and event activation, or on a time base for scheduled confirmation of proper operation. A time and date stamped log of the past 1000 events is kept as history in a buffer and may be accessed as a scheduled report, or immediately on an alert or occurrence. The buffer is updated periodically with all parameters in normal range.

In addition to twenty-four data connections, the NLX provides four current sensor inputs, a remote temperature sensor input, a volt meter input, and a contact monitor input. The current, voltage, and temperature sensors may be given upper and lower limits to trigger an alert if the measured value goes out of range. The contact monitor input may be programmed to respond to either a normally open or normally closed contact or voltage presence or loss. Two Form ‘C’ relay outputs are also provided for use in power cycling or controlling external equipment.

See the full data sheet for more information.