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LifeSafety Power®

BITSTREAM BX Series

PoE Input Power Supply Installation Manual

BITSTREAM™

power • data • fire over ethernet



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P03-085 Rev A03

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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

 Batteries (if used) should be maintained at an ambient temperature of between 32 and 120 degrees Fahrenheit (0-49 Celsius) or premature loss of battery power could occur

Regulatory Information

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

- CE

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.

Additional Notes

For Power Over Ethernet (PoE) applications, the following is applicable:

- a) Where the power supplied over a communications cable is less than or equal to 60 watts: Article 725.121, Power Sources for Class 2 and Class 3 Circuits;
- b) Where the power supplied over a communications cable is greater than 60 watts: Article 725.144, Transmission Power and Data.

UL 294 Access Control Performance Levels: Endurance Level IV, Power Standby Level IV, Attack Level I, Line Security Level I

Wiring methods shall be in accordance with the National Electrical Code (ANSI/NFPA70), CSA 22.1, Canadian Electrical Code (CEC), Part I, Safety Standard for Electrical Installations, local codes and the authorities having jurisdiction.

The BX50 is intended to be powered by the UL Listed BT500 PoE Injector; The BX75 is intended to be powered by a UL 294 PoE Injector (44-57Vdc, 90W)

The midspan PSE or power injector can be located at any point within the defined structured cabling channel compliant to the Standard for Balanced Twisted-Pair Telecommunications Cabling and Components, ANSI/TIA-568-C.2, between the network switch and the powered device (PD).

Category 5e cabling is the minimum performance category recommended. The performance category utilized should match the transmission speed required at the installation site.

The minimum conductor gauge permitted to connect between the PSE or power injector and the PD shall be 26 AWG (0.13 mm²) for patch cords; 24 AWG (0.21 mm²) for horizontal or riser cable.

Where a product has provisions for connection to a telephone, or outside wiring as covered by Article 800 in the National Electrical Code, NFPA 70, the product shall comply with the requirements for Protection Against Overvoltage From Power Line Crosses described in the Standard for Information Technology Equipment - Safety - Part 1: General Requirements, UL 60950-1, or the Standard for Audio/Video, Information and Communication Technology Equipment - Part 1: Safety Requirements, UL 62368-1.

Indoor Use Only

Power Supply Quick Start

This section gives a quick visual guide of installation connections and settings for installers already familiar with the BITSTREAM line of PoE input power supplies. For full information, please read this entire manual before installing.

QUICK INSTALL - SECTION FINDER

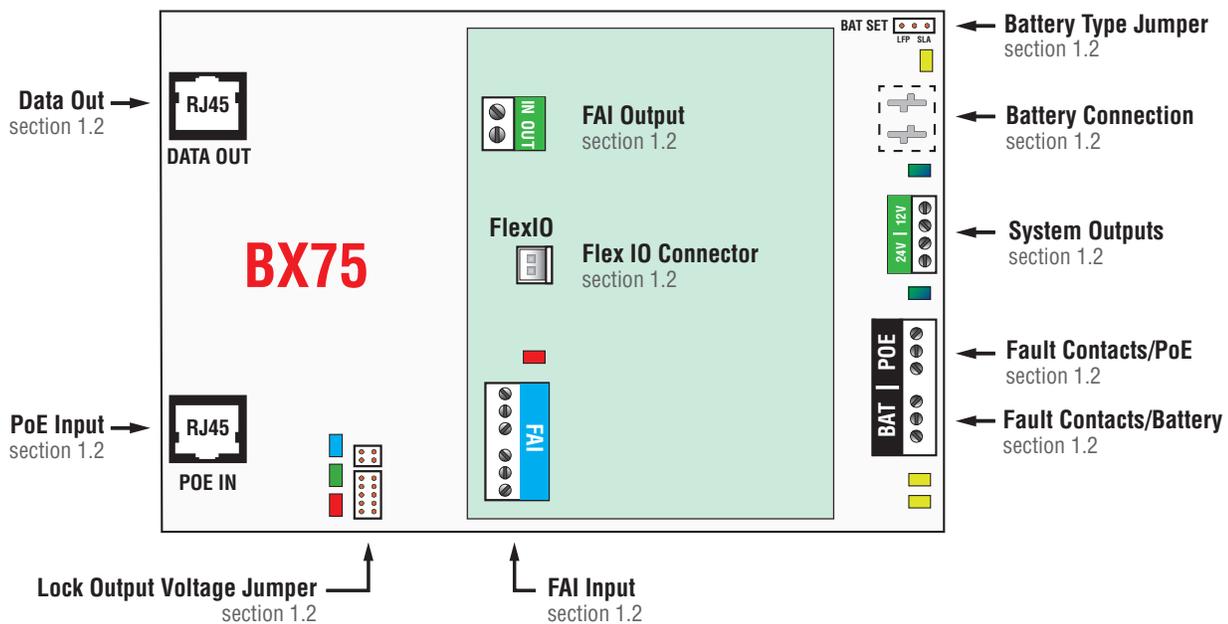
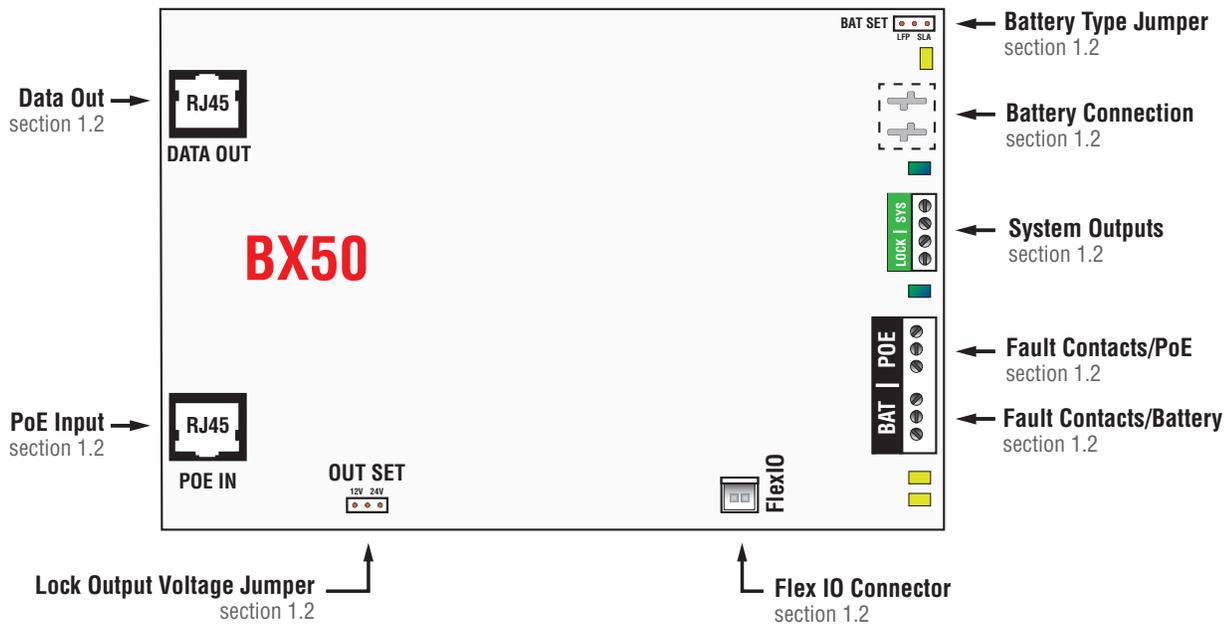


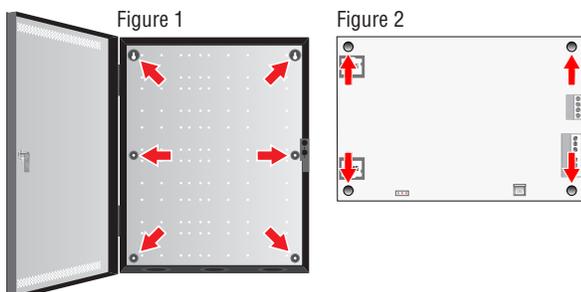
Figure 2



Section 1 – Installation and Operation

The following pages cover the installation, setup, and basic operation of the BX series power supplies.

1.1 Mounting



Mounting an Enclosure

Use the following procedure when mounting a wall-mount enclosure (figure 1).

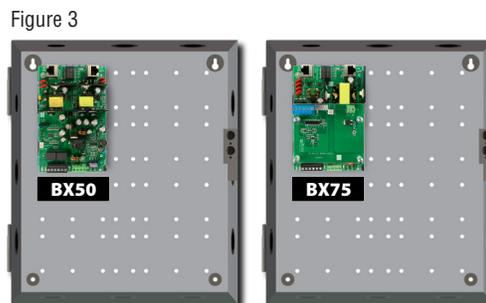
1. (Optional) Remove the enclosure's cover.
2. Locate the top keyhole mounting holes in the back of the enclosure.
3. Mark and pre-drill the locations for the keyholes in the mounting surface.
4. Partially install two fasteners appropriate for the surface on which the enclosure is being installed. Leave the heads of the fasteners approximately $\frac{1}{4}$ " out from the surface. Minimum fastener size should be #10 or larger.
5. Hang the enclosure on the two fasteners and mark the locations of the remaining mounting holes.
6. Remove the enclosure and pre-drill the locations for the remaining mounting holes.
7. Re-hang the enclosure on the top mounting fasteners, start the remaining fasteners and tighten all fasteners.
8. Reinstall the enclosure's cover, if removed in step 1.

⚠ It is the installer's responsibility to determine the appropriate fastening system for use with the surface the enclosure is being mounted to.

Mounting a BX Board to an Enclosure

Use the following procedure when mounting a BX power supply to a LifeSafety Power enclosure (figure 2).

1. Locate the appropriate mounting holes in the enclosure and snap the four standoffs provided into the holes.
2. Align the board mounting holes (mounting hole locations are indicated in the drawing above) with the standoffs and snap the board onto the standoffs. Be sure the board is properly oriented before snapping the board onto the standoffs (Figure 3).



Mounting a Sub Assembly to an Enclosure

Third Party sub assemblies will be mounted in one of three methods based on the supplied mounting hardware (figure 4).

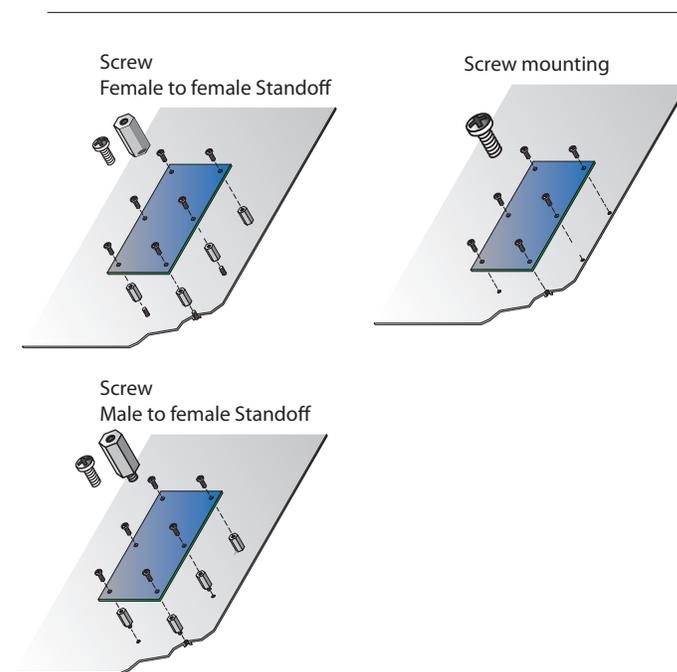
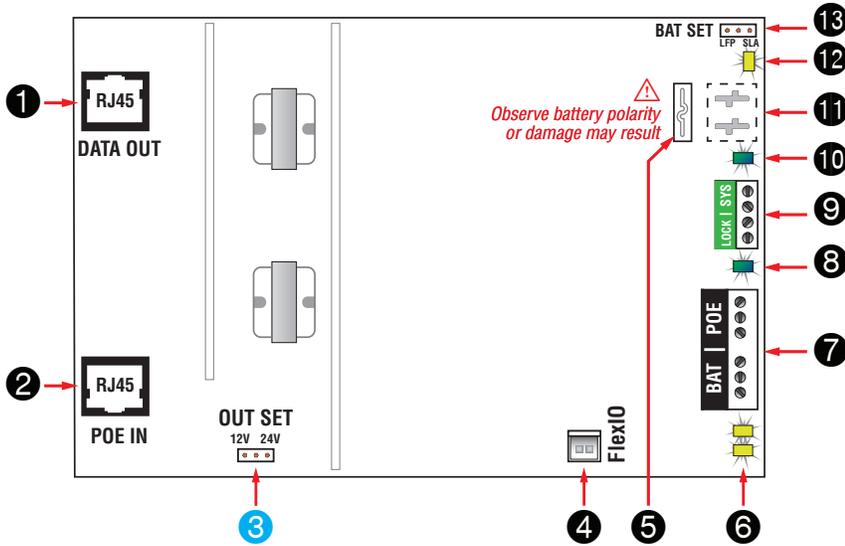
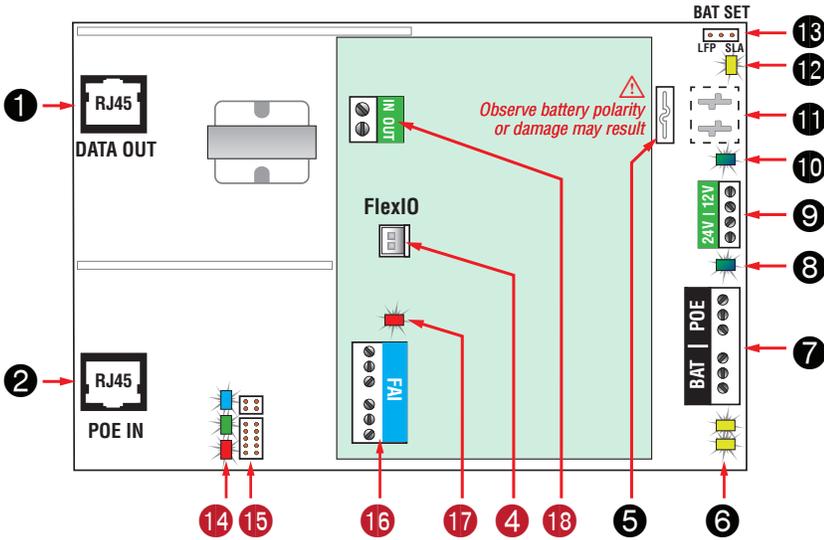


Figure 4

BX50



BX75



1 DATA OUT (SK2) Data to/from a network device - typically the access control panel. This connector accepts a standard ethernet cable.

2 POE IN (SK1) The PoE/Data input. This connector accepts a standard ethernet cable.

BX50 Connect this input to a BT500 PoE midspan injector or BTS500 PoE switch. Enable Single-point Fire Interface on the BT or BTS to drop the lock output of the BX50 when a fire alarm is received at the BT500.

BX75 Connect this input to a BT500, BTS500, or other 802.3bt compatible PoE source capable of supplying up to 90W for proper operation.

3 OUT SET (JP28) - Unique to BX50 ONLY

This jumper sets the output voltage of the lock output (See #9). Set the jumper to the 12V or 24V setting as appropriate.

4 FLEXIO (J10 or J11)

BX50 This connector is reserved for future use. Do not connect to J10.

BX75 This connector provides the FAI signal to connected accessory boards.

5 Battery Fuse (F4) This fuse is in series with the battery connection. Replace with only the same type and rating.

6 Fault LEDs (POE FLT & BAT FLT) These LEDs indicate the fault status of the BX50 or BX75. See #7 for details on the indicated fault conditions.

7 Fault Output Connections (TB2 or TB4)

These terminals provide the Battery Fault and PoE Fault contact outputs. The terminals are removable and are labeled on the PC board in the non-powered (fault) state. These terminals accept AWG14 – AWG22 wire. Fault conditions reported include:

BAT FLT

- Battery Missing

POE FLT

- No PoE Input



1.2 Jumper / LED / Connector Descriptions

- 8 Lock Output or 24V Output LED** This LED indicates presence and voltage level of the Lock Output (BX50) or 24V Output (BX75) as follows:
- Green - 12V Output present
 - Blue - 24V Output present
 - Off - No Output Voltage
- 9 DC Outputs** These terminals supply the output voltage from the BX50 or BX75. The terminals are non-removable and are labeled on the PC board. The combined output must not exceed 50W (BX50) or 75W (BX75). These terminals accept AWG14 – AWG22 wire.
- BX50 LOCK** - These terminals provide 12V/2A or 24V/1A maximum as set by jumper JP28. This output will drop on a fire alarm condition received at the BT or BTS if Single-point Fire is enabled for the zone. This output is NOT backed up by the battery connection on the BX50. Connect a battery to the BT or BTS to provide battery backed-up lock power. Maximum wire length 30 meters.
- BX50 SYS** - These terminals provide a fixed 12V/2A maximum output that remains powered during a fire alarm condition. The SYS output is backed up by the battery connection on the BX50. Maximum wire length 30 meters.
- BX75 24V** - These terminals provide a fixed 24V/3.1A maximum output. This output is backed up by the battery connection on the BX75.
- BX75 12V** - These terminals provide a fixed 12V/6.2A maximum output. This output is backed up by the battery connection on the BX75.
- 10 Sys Output or 12V Output LED** This LED indicates presence and voltage level of the Sys Output (BX50) or 12V Output (BX75) as follows:
- Green - 12V Output present
 - Off - No Output Voltage
- 11 Battery Connection (BAT+ & BAT-)**
- Faston connectors for connection of the 12V backup battery set. Pre-terminated battery leads are provided. These terminals accept Sealed Lead Acid (SLA) or Lithium Iron Phosphate (LFP) batteries as set by the BAT SET jumper. (See #13)
- ⚠ ONLY a 12V battery set should be connected. Do not connect a 24V battery set or damage to the system will occur.**
 - ⚠ Observe polarity or damage to the system will occur.**
 - ⚠ Note that the BX50's lock output is not backed up by the local battery set - connect a battery to the BT or BTS for backup of the lock voltage.**
 - ⚠ It is the installer's responsibility to determine the proper battery size for the installation. See the Specifications section for standby current requirements.**
 - ⚠ Use Powersonic PS-1280 or similar battery.**
- 12 REV BAT (D19 or D30) – Yellow**
- This LED lights if the backup battery set is connected in the reverse polarity. The lighting of this LED will also be accompanied by the rupture of the battery fuse (F4).

13 Battery Type Selection

This jumper selects the type of battery being used. Select SLA for Sealed Lead Acid/Gel type batteries. Select LFP for Lithium Iron Phosphate batteries.

Callouts 14-18: Unique to BX75 ONLY

14 PoE Class LEDs – Blue/Green/Red

These LEDs indicate the connection class the BX75 has made to the PoE source. This determines the maximum power available from the BX75. See section 1.6 for more information.

15 PoE Class Jumpers

These jumpers select the class of the BX75 as seen by the PoE source. These jumpers can be used to limit the potential power draw from the source if the load on the BX75 is known to be less than the maximum. See section 1.5 for more information

16 FAI Input Connections

These terminals accept the optional FAI input for controlling the FAI Control terminals (See #18) and any FAI capable accessory boards connected to the BX75 power supply. The terminals are removable and are labeled on the PC board. These terminals accept AWG14 – AWG22 wire. See Section 1.3. Connections are as follows:

- **I+ & I- Terminals** These terminals are the input terminals for the FAI Input. The FAI input is activated when a voltage between 9 and 30 volts is applied across these terminals in the correct polarity. **See Section 1.3 - FAI Input Usage for more information.**
- **V+ & V- Terminals** These terminals are a low-current auxiliary voltage output and are typically used with a dry contact or open collector for activating the FAI Input's I+ and I- terminals.
- **L Terminals** Latch Reset contact input. If a latching FAI Input is desired, a normally closed contact is placed across these terminals. When the FAI Input is activated, it will latch in the activated state until this contact is momentarily opened. **If the latching feature is not desired, leave these terminals open.**

⚠ Maximum wire length 30 meters.

17 FAI Status Indicator - Red

This LED lights when a valid FAI signal is received on the FAI input terminals. (See #16)

18 FAI Control Terminals

These terminals are used to interrupt the positive lead to a lock during a fire alarm condition. See section 1.4 for more information. This terminal accepts AWG12 – AWG18 wire.

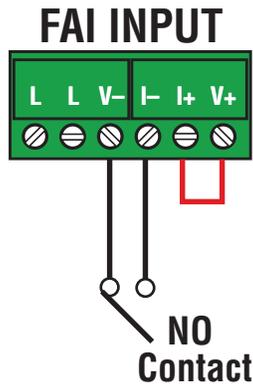
- **IN Terminal** The positive input from the BX75's 12V or 24V output.
- **OUT Terminal** The positive output to the locking device. This output will be interrupted when a valid FAI signal is received on the FAI Input (See #16)

1.3 FAI Input Usage - BX75 ONLY

This section provides more detailed information on the connection and usage of the FAI input of the BX75. For fire alarm disconnect on the BX50, consult the BT500 or BTS500 manual.

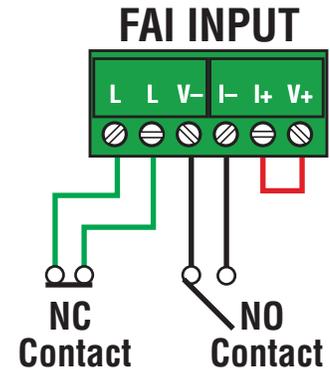
Activation with a Normally Open Relay Contact

FAI Activates when the NO contact CLOSES.
FAI Deactivates when the NO contact OPENS.



Latching the FAI Input

Latching of the FAI Input is achieved by placing a NC contact across the two 'L' terminals. The FAI may be activated by any of the methods listed. FAI Deactivates when the input is deactivated AND the NC Latching contact is momentarily OPENED.



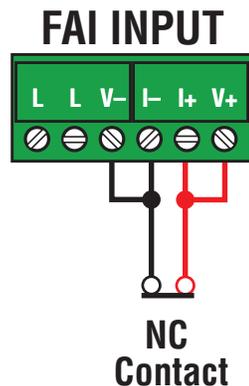
Example – NO Contact activation with latching

FAI Activates when the NO contact CLOSES. FAI Deactivates when the NO contact OPENS AND the NC contact momentarily OPENS.

Activation with a Normally Closed Relay Contact

FAI Activates when the NC contact OPENS.
FAI Deactivates when the NC contact CLOSES.

Note: FAI with a NC contact cannot be tested by removing the terminal strip, as this will remove the jumper wires from V+ and V- as well. To test, remove one wire going to the NC Contact.



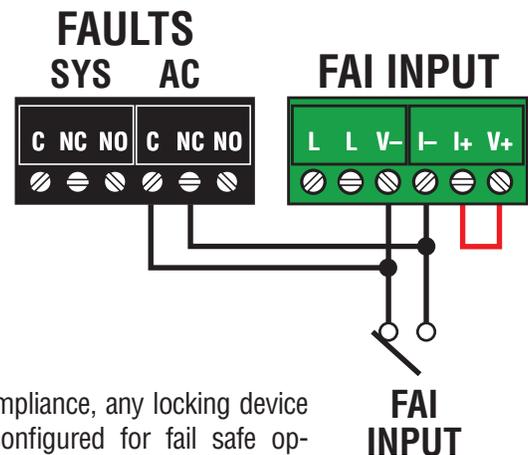
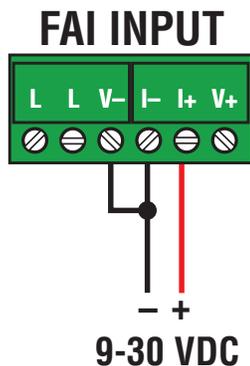
FAI Activation with a Normally Open Relay Contact and FPO AC Fault Lock Override

FAI Activates either when the Fire Alarm NO contact CLOSES, or when the AC Fault NC contact CLOSES

FAI Deactivates either when the Fire Alarm NO contact OPENS, or when the FPO AC Fault NC contact OPENS

Activation with a Voltage Input

FAI Activates when voltage is APPLIED in the correct polarity. FAI Deactivates when voltage is REMOVED or the polarity of the voltage is REVERSED. Polarity shown in the ACTIVATED state

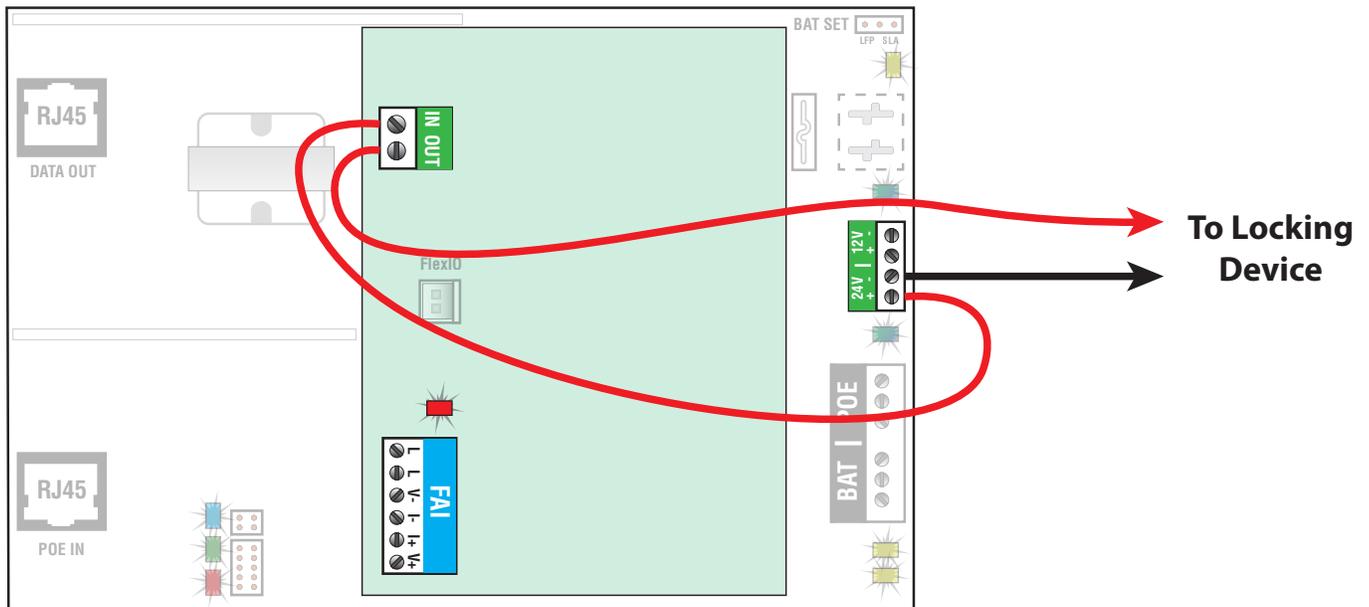


For UL compliance, any locking device shall be configured for fail safe operation upon occurrence of an alarm as shown in "Activation with a NC Relay Contact above"



1.4 Wiring the FAI Control Terminals - BX75 ONLY

The FAI input on the BX75 controls a terminal for switching the positive lead of either the 12V or 24V output to provide egress control to fail safe locks during a fire alarm condition. The positive lead of the desired voltage output connects to the "IN" terminal. The "OUT" terminal continues on to the locking device or the control panel's output relay. The negative terminal of the voltage output connects directly to the locking device. The diagram below shows this connection for a 24V locking device. The FAI input may be wired for any method as shown in section 1.3.

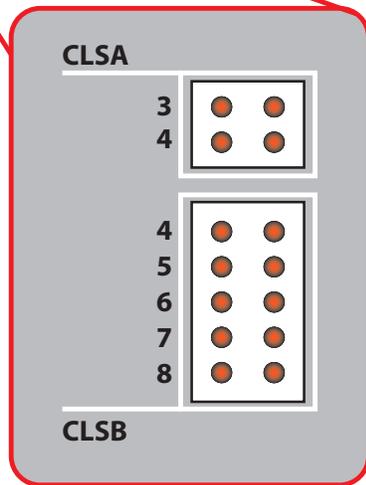
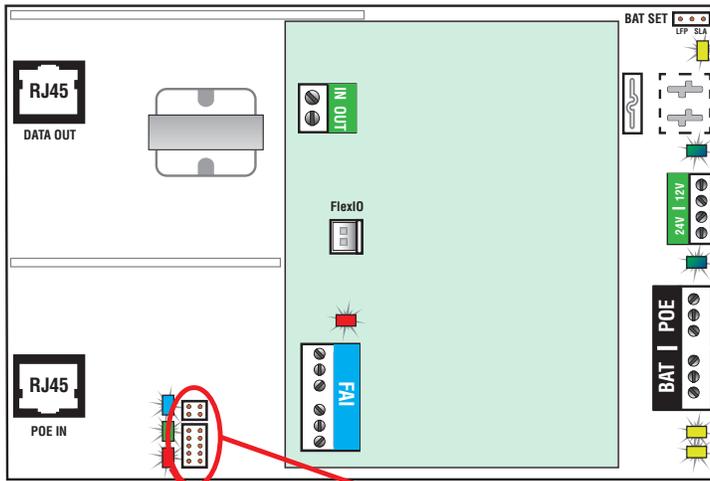


Note that the BX50 provides fire alarm control through the ethernet cable using the BT500's fire alarm input. The BX50 does not have a local fire alarm connection.

1.5 Setting the PoE Class Jumpers - BX75 ONLY

The BX75 has two jumpers which set the PoE class and type for the device. This can be used to limit the maximum draw from the PoE source if the load on the BX75 is less than the maximum. There are two multi-position jumper blocks, labeled CLSA and CLSB, as shown in the following illustration.

These jumpers can be set in various combinations to limit the maximum output power of the BX75 as shown in the table below. Normally these jumpers should remain in position 4 (CLSA) and 8 (CLSB) for full output power.

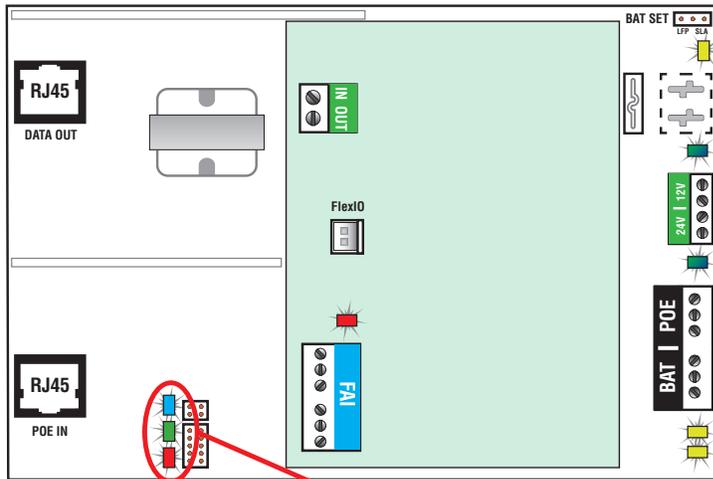


BX75 Max Total Output Power	Jumper Position	
	CLSA	CLSB
13W	3	8
26W	4	4
40W	4	5
51W	4	6
62W	4	7
71W	4	8



1.6 Reading the PoE Class LEDs - BX75 ONLY

These LEDs indicate the connection class and type negotiated between the BX75 and the PoE source. These LEDs light in various combinations to indicate the actual connection (which may or may not match the connection type programmed by the PoE Class Jumpers (See section 1.5). Possible LED patterns related to the maximum output power of the BX75 are below. If connected to a 90W 802.3bt source, all three LEDs should be lit.

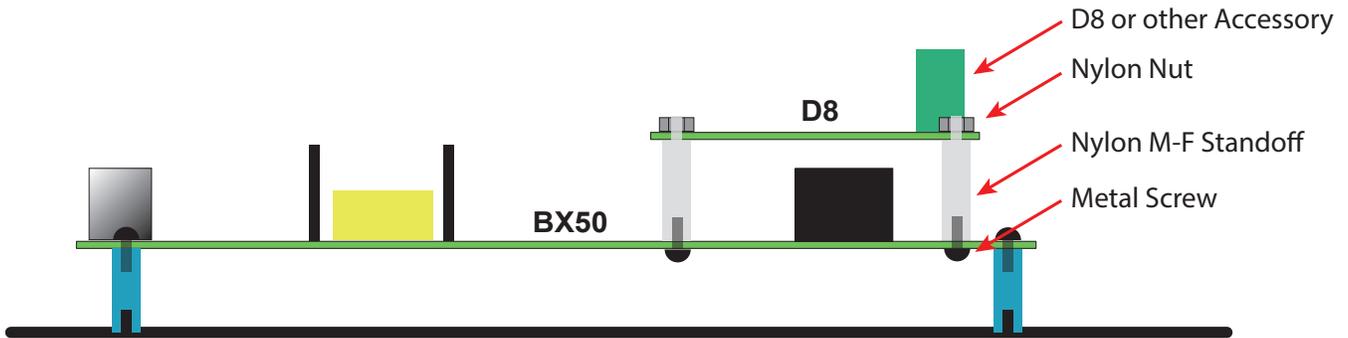


BX75 Max Total Output Power	LED		
	BT	TPH	TPL
13W	ON		
26W	ON		ON
40W / 51W	ON	ON	
62W / 71W	ON	ON	ON

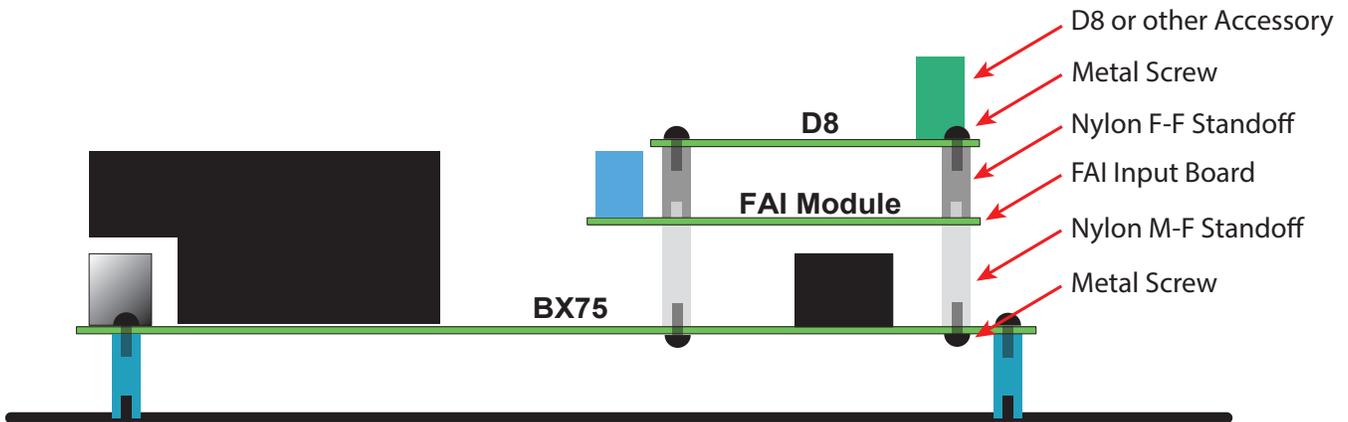
1.7 Mounting an Accessory Board

The BX50 and BX75 can each have an accessory board mounted on top using the supplied hardware as shown below.

BX50 Accessory Stack



BX75 Accessory Stack





Section 2 – Specifications

2.1 Electrical Specifications

BX Power Supplies

Specifications		BX50	BX75
Input	Power (Max)	90W PoE	90W PoE
	Standard	(BT500)	802.3bt
Total Output	Power	50W	75W
	Ripple	120mV	120mV
	Regulation	±2%	±2%
	Efficiency	84%	88%
SYS (BX50) or 12V (BX75) Output	Voltage	12V	12V
	Max Current**	1.15A	4.9A
LOCK (BX50) or 24V (BX75) Output	Voltage	12V or 24V	24V
	Max Current**	2A or 1A	1.8A
Fire Alarm Disconnect		SFI Only	Local Only
Battery	Type	Lead Acid, Gel Cell, or Lithium Iron Phosphate	Lead Acid, Gel Cell, or Lithium Iron Phosphate
	Charge Current	0.85A (±10%) Maximum	1.3A (±10%) Maximum
Fuse Ratings	Battery	ATM 3A	ATM 10A
BTU Output	BTU	34	41
Fault Relay Contacts	BAT FLT	1A at 24VDC	1A at 24VDC
	POE FLT	1A at 24VDC	1A at 24VDC



Section 2 – Specifications

2.2 Temperature Specifications

All Models

Ambient Temperature	-20°C to 50°C (-4°F to 122°F)
Ambient Humidity	93% at 32°C (90°F) maximum
Storage Temperature	-30°C to 70°C (-22°F to 158°F)

2.3 Mechanical Specifications

Visit www.lifesafetypower.com for AutoCAD files.

Power Supply Board - BX50

Size	6.00" L x 4.00" W x 1.18" H (152mm L x 102mm W x 30mm H)
Approximate Weight	0.49 lbs. (0.222 kg)

Power Supply Board - BX75

Size	6.00" L x 4.00" W x 1.18" H (152mm L x 102mm W x 30mm H)
Approximate Weight	0.81 lbs. (0.367 kg)

Enclosure E1; M, V

Size	14" H x 12" W x 4.5" D (356mm H x 305mm W x 114mm D)
Approximate Weight (base cabinet)	8 lbs. (3.5 kg) empty

Enclosure E2; M, V

Size	20" H x 16" W x 4.5" D (508mm H x 406mm W x 114mm D)
Approximate Weight (base cabinet)	18 lbs. (8.0 kg) empty

Enclosure E5; M

Size	8.63" H x 11" W x 3" D (286mm H x 219mm W x 76mm D)
Approximate Weight (base cabinet)	4 lbs. (2.0 kg) empty

Enclosure E4; A, B, BL, H, G, K, L, M, P, S, SO, X, T, V, 1, 2, 3

Size	24" H x 20" W x 6.5" D (508mm H x 508mm W x 165mm D)
Approximate Weight (base cabinet)	21 lbs. (9.5 kg) empty

Enclosure E6; A, B, BL, H, G, K, L, M, P, S, SO, X, T, V, 1, 2, 3

Size	30" H x 23" W x 6.5" D (762mm H x 584mm W x 165mm D)
Approximate Weight (base cabinet)	45 lbs. (21.0 kg) empty

Enclosure E8; A, B, BL, H, G, K, L, M, P, S, SO, X, T, V, 1, 2, 3

Size	36" H x 30" W x 6.5" D (910mm H x 760mm W x 165mm D)
Approximate Weight (base cabinet)	55 lbs. (25.0 kg) empty

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IMPORTANT

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