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B150 Installation Manual

LifeSafety Power®

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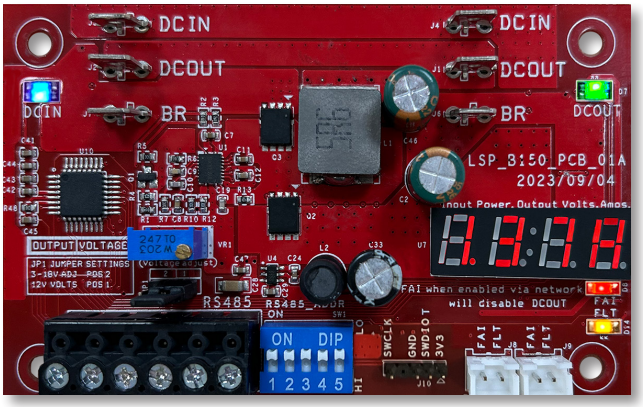

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P03-105 Rev A01

Description

The B150 intelligent step-down converter provides an additional voltage in a FlexPower system by converting a higher input voltage down to a lower output voltage. This voltage is passed to other FlexPower accessory modules for powering field devices. The B150's input is typically supplied by the B1 buss in the system, allowing the main power supply's battery set to back up the B150's output voltage without the need for a second battery set. Output settings include a fixed 12V setting and an adjustable setting of 3 to 18V. Multiple B150s can be added to a system for virtually unlimited voltage combinations.

The B150 may be used with a NetLink network connectivity module via RS485 for fault, voltage, and current monitoring, power cycling the output, and programming FAI activation.

Specifications

Input	Voltage	9.4-30V (Must be at least 3V above output voltage setting)
	Current	5.5A maximum
	Standby Current	35mA
Output	Voltage	3-18V
	Current	6A maximum
Humidity		0 to 93% RHNC (90°F / 32°C maximum)
Operating Temperature		32°F to 120°F (0°C to 49°C)
Storage Temperature		-22°F to 158°F (-30°C to 70°C)
Size		4.00" x 2.50" x 1.00" (102mm x 64mm x 45 mm)
Weight		0.20lb (0.09kg)

Regulatory Information

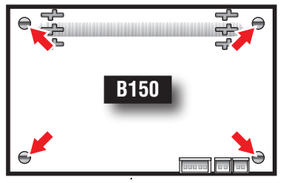
The equipment discussed within this manual has been tested to the following standards:

- UL294, UL2610
- ULC S533, ULC 60839-11-1
- CSFM Approved

Mounting the B150

The B150 can be mounted to an enclosure using 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.

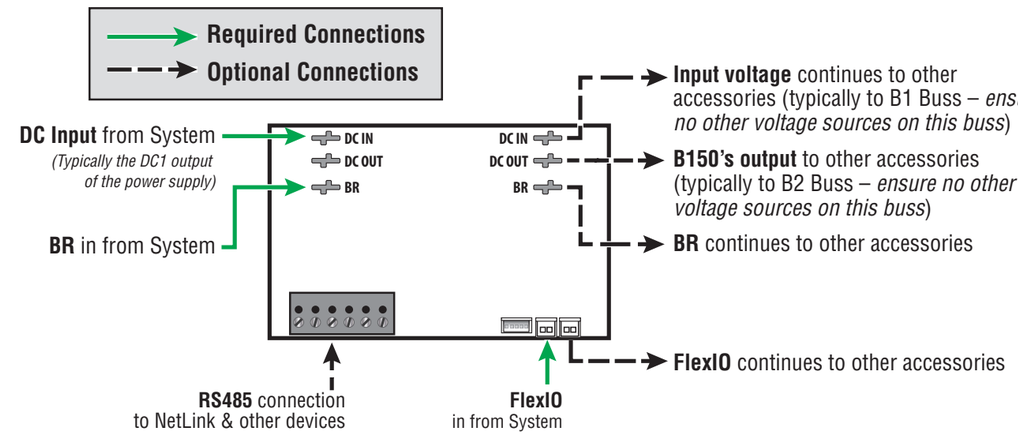


For ULC S533 Installations: Typical wiring method shall be in accordance with CSA C22.2, Canadian Electrical Code, Part I, Safety Standard for Electrical Installations, Section 32; and CAN/ULC-S524 Installation of Fire Alarm Systems

Connecting the B150

⚠ ***Remove all AC and battery power from the system before adding or replacing a B150 board.***

⚠ ***Observe polarity of the DCIN and BR Connections or damage to the system could occur.***

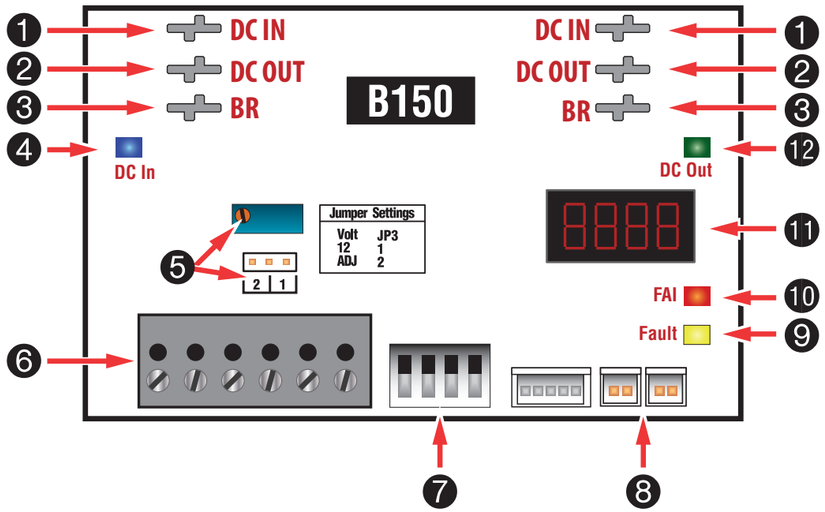


⚠ *The DC In, DC Out, and BR terminals run through the board for daisy chaining and each terminal set is interchangeable from a functional standpoint. Either DC IN may be used, either DC Out may be used or either BR may be used interchangeably.*

Use Typical Wiring Material Type: UL/CSA recognized insulated wire
Insulation Rating: 300V or higher, 105C or higher, such as UL AWM Style 1581

The maximum length of output wire on DCOUT is limited to the allowable voltage drop on the wire. As a reference, with AWG14 wire (2.525 Ohm/1000ft), connected to an electric strike rated at 24V/0.25A, minimum allowable voltage at the strike terminals is 21.6V (-10% of nominal), the allowable voltage drop on round trip wire is 3.4V. The maximum length of output wire is calculated to be 2693 feet (one way).

B150 – Intelligent Step-Down Converter



The installation and all wiring methods shall be in accordance with ANSI/NFPA70 and all local codes.
For ULC compliance, installation and all wiring methods shall be in accordance with the Canadian Electrical Code, C22.1, Part I, Section 32 .
All input wiring to the module shall be located within the same room (3m max).
Outputs are not power limited.
L'installation et toutes les méthodes de câblage doivent être conformes aux ANSI / NFPA70 et tous les codes locaux.
Pour la conformité ULC, l'installation et toutes les méthodes de câblage doivent être conformes avec le Code canadien de l'électricité, C22.1, partie I, section 32.
Tout le câblage d'entrée du module doit être situé dans la même pièce (3m max.).
Les sorties ne sont pas limitées en puissance.

❶ *DC IN Connectors (J1 & J4)*

These fastons are the input to the B150. Either faston may be used as the input. Two connections are provided to allow this voltage to pass through to other accessory boards in the system. This input voltage must always be at least 3 volts above the output voltage setting for the B150 to maintain its output.

❷ *DC OUT Connectors (J2 & J5)*

These fastons are the output of the B150 for connection to other accessories in the system. This output may be considered as an equivalent to the main output of a power supply.

Either or both DC OUT fastons may be used in the system.

⚠ ***Ensure there are no other voltage sources connected to the buss before powering the system or damage WILL occur.***

❸ *BR Connectors (J3 & J6)*

The DC Common buss in the system. All DC power boards in the system must have their BR fastons wired together for proper operation.

❹ *DC IN LED – Green/Blue*

This LED indicates the availability of voltage on the DC IN Buss. When voltage is available on the buss, the LED is lit. This LED is bi-color and indicates the input voltage as follows:

- ***Green*** – 12V Input
- ***Blue*** – 24V Input

⚠ **NOTE** LED colors are range based. Voltage Less than 13V will show Green. Voltage above 20V will show Blue. Voltage between 13 and 20 may show either voltage or a combination Green & Blue. Always verify voltage with a voltmeter.

❺ *Output Voltage Selection (JP1 & VR1)*

This jumper selects the output voltage for the B150 and the potentiometer sets the output voltage when in the adjustable range. In adjustable range, voltage may be set from 3 to 18VDC.

Possible jumper settings are as follows:

- ***12V Out*** JP1 Position 1
- ***Adjustable Output*** JP1 Position 2

⚠ The VR1 potentiometer will have no effect unless the jumper is set for the adjustable range.

Note that the input must be at least 3V above the output voltage setting or the B150 will display a fault condition. It may be helpful to temporarily set the input power supply to 24V (Remove load devices first) before setting the B150 output voltage.

❻ *RS485 Connections*

These terminals provide the RS485 connection use with an NLX network board. If there is no NetLink available, this connector can be left disconnected. See the NLX manual for connection information.

❼ *RS485 Addressing Switches*

These switches set the address of the B150 when using RS485 for communication with an NLX network board. See the NLX manual for more information.

❽ *FlexIO Connectors (J8 & J9)*

These connectors allow the fault status of the B150 to be transmitted to the main power supply, receive the FAI signal from the main power supply, and pass the FlexIO buss on to other accessory boards in the system.

❾ *FAULT LED (D14) – Yellow*

This LED lights when the B150 detects a fault condition. This fault condition also transmits to the main power supply.

Fault conditions detected include no output, output overload, or output voltage out of regulation.

❿ *FAI LED (D8) – Red*

This LED lights when the Fire Alarm Input of the main power supply is activated. If connected to a NetLink module, the B150 may be set to drop power to the DC OUT when FAI is active.

⓫ *LED Display (U7) – Red*

This LED display cycles through the measured values for input power (in Watts), output voltage (in VDC), and output current (in Amps).

⓬ *DC OUT LED (D7) – Green/Blue*

This LED indicates the availability of voltage on the DC OUT Buss. When voltage is available on the buss, the LED is lit. This LED is bi-color and indicates the output voltage as follows:

- ***Green*** – 12V Output
- ***Blue*** – 24V Output

⚠ **NOTE** LED colors are range based. Voltage Less than 13V will show Green. Voltage above 20V will show Blue. Voltage between 13 and 20 may show either voltage or a combination Green & Blue. Always verify voltage with a voltmeter.

B150 Current Loading

Power drawn from the B150 subtracts from the power available from the source supplying the B150. The most accurate way to determine the draw from the source is to calculate the actual power draw and factor in the efficiency of the B150.

$P_I = P_O * 1.15$

Where:

P_I **= Input power of the B150**

P_O **= Output power draw on the B150**

B150 Current Load Examples

Example: 1

An FPO250 set for 24V is powering a B150. The B150 is set for an output of 12V and has a 3A total load connected.

P_O = 12V*3A = 36W

P_I = 36W * 1.15 = 41.4W

In this example, the B150 will draw 41.4W from the FPO250
This leaves 208.6W available from the FPO250

Example: 2

What size FPO do I need to create a dual voltage power supply providing 12V@4A and 24V@6A?

12V x 4A x 1.15 = 55.2 Watts

24V x 6A = 144 Watts

144W + 55.2W = 199.2W

The next greater FPO to 199.2 is 250
Use an FPO250 power supply with the B150 converter

Example: 3

What size FPO do I need to create a dual voltage power supply providing 12V@1A and 24V@3A?

12V x 1A x 1.15 = 13.8 Watts

24V x 3A = 72 Watts

13.8W + 72W = 85.8W

The next greater FPO to 84 is 150
Use an FPO150 power supply with the B150 converter

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Using the B150 with NetLink

This section discusses optional software programming of the B150 board. It assumes a basic understanding of the NetLink software GUI interface. Consult the NetLink manual (P03-037) for more information on using the interface.

Accessing the B150 from the NetLink interface

From the home page of the NetLink interface, click on the B150 in the "Connected Devices" section.

The B150 Status Page

The status page of the B150 gives an overview of the current state of the B150 board and allows manual output control.

Return Button - This button returns to the NetLink Home page. *Any changes must be saved prior to clicking this button or the changes will be lost.*

Programming Button - This button opens the programming page for the B150 module

Device ID - This field is the unique ID given to the B150 by the NetLink.

Model - This is the model number of the board being monitored. In this case, "B150".

B150 Notes - This field allows the user to enter any notes regarding the B150 board. Click the Save Settings button to save the notes.

Location - This field allows the user to enter the location of the B150 board. Click the Save Settings button to save the location.

Input Indicator - This shows the displayed color of the DC IN LED, indicating the input voltage of the B150.

Output Indicator - This shows the displayed color of the DC OUT LED, indicating the output voltage of the B150.

Input Voltage (V) - This field shows the measured input voltage to the B150 board in volts DC.

Output Voltage (V) - This field shows the measured output voltage from the B150 board in volts DC.

Input Current (A) - This field shows the measured input current into the B150 board in amps.

Output Current (A) - This field shows the measured output current out of the B150 board in amps.

Input Power (W) - This field shows the calculated input power into the B150 board in watts.

Output Power (W) - This field shows the calculated output power out of the B150 board in watts.

FAI State - This field shows the FAI status of the B150. If FAI control is disabled, the field will show "Disabled". If enabled, the field will show "Active" or "Inactive" to show the FAI status.

Output Status -This field shows the status of the B150. "Normal" indicates that the B150 is working and configured correctly, and that there are no faults on the B150. "Fault" indicates a problem with the B150.

Close Time - This field selects how long the output of the B150 will shut down when the "Close Output" button is clicked. Valid values are 5-21600 seconds.

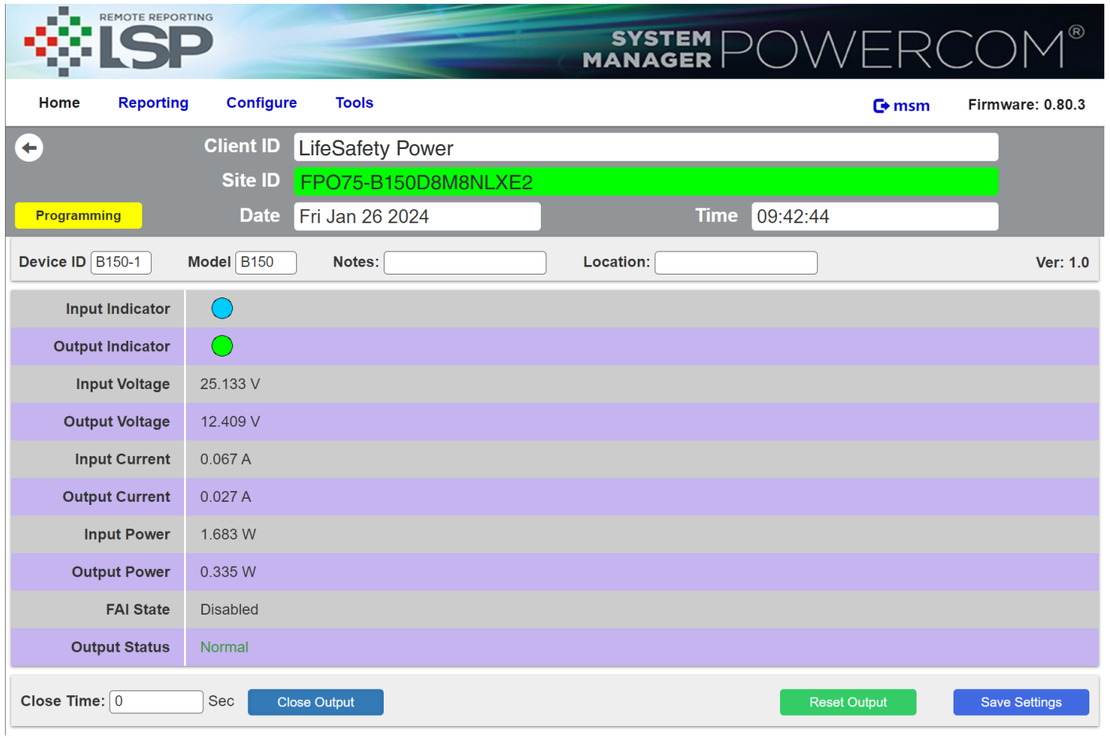
Close Output - This button will power cycle the output of the B150 for the length of time entered into the "Close Time" field.

Reset Output - This button will power cycle the output for one second.

Save Settings - This button saves the B150 Notes and Location fields.

The interface with NetLink has not been investigated by UL.

NetLink B150 Status Page



The B150 Status Page

Programming the B150

From the B150 Status page of the NetLink interface, click the "Programming" button near the top left corner. This will open the B150's Programming page.

"Return" Button - This button returns to the B150 Status page. *Any changes must be saved prior to clicking this button or the changes will be lost.*

"Save Settings" Button - This button will save all changes on the page.

Input Voltage Lower Limit (V) - This field allows setting a lower input voltage limit to trigger a fault. For example, if the lower voltage limit is set for 23.5V, a fault will be triggered if the input voltage falls below 23.5V.

Input Voltage Upper Limit (V) - This field allows setting an upper input voltage limit to trigger a fault. For example, if the upper voltage limit is set for 26.0V, a fault will be triggered if the voltage on the input rises above 26.0V.

Input Current Lower Limit (A) - This field allows setting a lower input current limit to trigger a fault. For example, if the lower current limit is set for 1.0A, a fault will be triggered if the current on the input of the B150 falls below 1.0A. This limit will not be triggered during an intended deactivation such as when the Reset Output button is clicked or during an FAI activation.

Input Current Upper Limit (A) - This field allows setting an upper input current limit to trigger a fault. For example, if the upper current limit is set for 2.0A, a fault will be triggered when the current on that zone goes above 2.0A.

Output Voltage Lower Limit (V) - This field allows setting a lower output voltage limit to trigger a fault. For example, if the lower voltage limit is set for 11.5V, a fault will be triggered if the output voltage falls below 11.5V. This limit will not be triggered during an intended deactivation such as when the Reset Output button is clicked or during an FAI activation.

Output Voltage Upper Limit (V) - This field allows setting an upper output voltage limit to trigger a fault. For example, if the upper voltage limit is set for 13.0V, a fault will be triggered if the voltage on the output rises above 13.0V.

Output Current Lower Limit (A) - This field allows setting a lower output current limit to trigger a fault. For example, if the lower current limit is set for 1.0A, a fault will be triggered if the current on the output of the B150 falls below 1.0A. This limit will not be triggered during an intended deactivation such as when the Reset Output button is clicked or during an FAI activation.

Output Current Upper Limit (A) - This field allows setting an upper output current limit to trigger a fault. For example, if the upper current limit is set for 4.0A, a fault will be triggered when the current on that zone goes above 4.0A.

Email Alert on Fault - This field has a drop-down list to select whether a fault condition will send an email alert when email is configured in the NetLink. Choices are "Yes" and "No".

Disable on FAI - This field has a drop-down list to select whether an FAI condition will affect the output of the B150. Choices are "Yes" and "No"

Input Voltage Lower Limit of Cutoff (V) - This field allows setting a lower voltage limit to cause the B150 to disable the output if the input voltage falls below the entered value.

Input Voltage Upper Limit of Cutoff (V) - This field allows setting an upper voltage limit to cause the B150 to disable the output if the input voltage rises above the entered value.

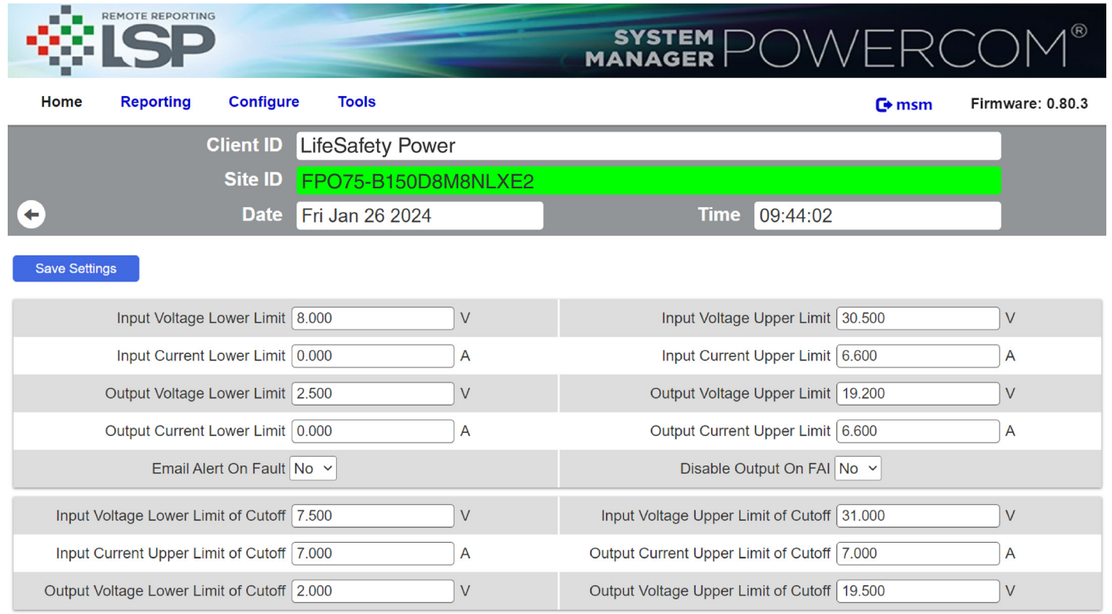
Input Current Upper Limit of Cutoff (A) - This field allows setting an upper current limit to cause the B150 to disable the output if the input current rises above the entered value.

Output Current Upper Limit of Cutoff (A) - This field allows setting an upper current limit to cause the B150 to disable the output if the output current rises above the entered value.

Output Voltage Lower Limit of Cutoff (V) - This field allows setting a lower voltage limit to cause the B150 to disable the output if the output voltage falls below the entered value.

Output Voltage Upper Limit of Cutoff (V) - This field allows setting an upper voltage limit to cause the B150 to disable the output if the output voltage rises above the entered value.

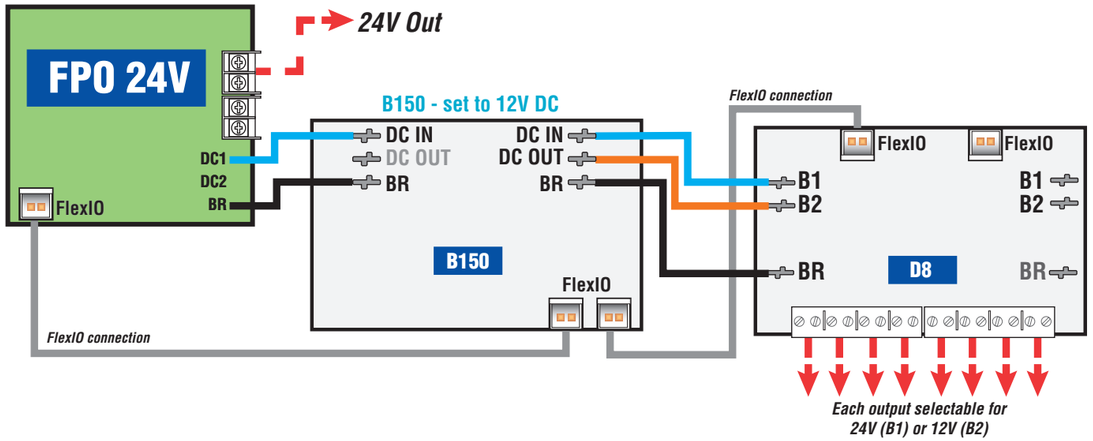
The B150 Programming Page



The B150 Programming Page

B150 Wiring Application Examples

Dual Voltage (24V/12V) using one FPO, one B150 with 8 output distribution



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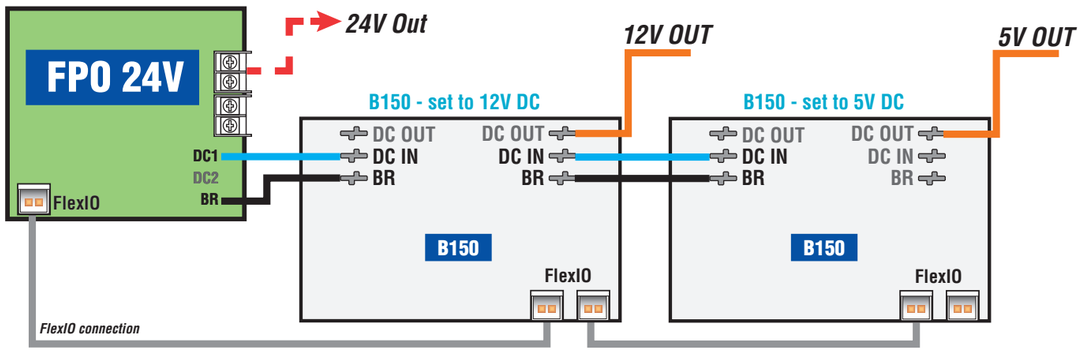
Triple Voltage (24V/12V/5V) using one FPO, two B150's



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