



Power Entry

Version 1.1 - Dec 10, 2018

1 Overview

The Power Entry board is used for distributing AC power and 4 different DC voltages, generally 5v, 12v, 15v, and “high voltage” (typically 48v or 70v). A 12v relay and bulk filtering caps are provided for enabling and providing smooth “high voltage”. LEDs are provided to identify the presence of each of the 4 DC voltages.

The Power Entry board also ensures all voltages that are connected to it are referenced to a common ground, thereby removing the burden on system designers to connect grounds together externally.

2 Usage

Any or all of the power connectors can be used to distribute power. AC is generally wired into the J1-J3 connectors and then distributed to the rest of the system. AC can be fed to DC switching supplies and/or transformer-based supplies. Note that J3 pins 7 and 8 are “loop” pins that are connected to each other internally. These make it simple to use the Power Entry board to connect two external transformer windings in series, which is commonly done with transformers designed to work with both 110v and 220v AC voltages when wiring in 220v AC.

Up to 4 DC voltages can be wired into the Power Entry board for distribution. With the exception of the high voltage inputs (labeled 48v In), all of the DC voltage inputs/outputs can be used interchangeably. In other words, all of the 5v pins are connected together, all of the 12v pins are connected together, all of the 15v pins are connected together, and all of the ground pins are connected together (including earth ground on the AC connectors). Note that the voltage inputs don't have to be used with the labeled voltages, but the LEDs are set up to light properly with 5v, 12v, 15v, and 48v. Using different voltages can result in brighter or dimmer LEDs.

“High voltage” (labeled 48v on the board) is treated differently than the others. 48v In (J9) goes to a relay. The output from the relay is connected to 3 bulk capacitors and then to the 48v pins on J11-J17. The relay is a 12v relay. Therefore, using the relay to enable 48v requires the presence of 12v. To enable the relay, switch J10 - pin 1 to ground from a 12v control circuit. If relay control isn't necessary, a jumper wire or switch can be installed across SW2 pins 1 and 2 to force the relay on, thereby enabling the 48v output constantly.

The Power Entry board is designed to handle up to 7 amps (constant) per pin.

3 Connectors

| J1 | AC Power | Not Required |
|----------------------------------|-----------------|---------------------|
| 9-position Screw Terminal | | |
| 1 | Line | I/O |
| 2 | Neutral | I/O |
| 3 | Earth | I/O |
| 4 | Line | I/O |
| 5 | Neutral | I/O |
| 6 | Earth | I/O |
| 7 | Line | I/O |
| 8 | Neutral | I/O |
| 9 | Earth | I/O |

| J2 | AC Power | Not Required |
|----------------------------------|-----------------|---------------------|
| 9-position Screw Terminal | | |
| 1 | Line | I/O |
| 2 | Neutral | I/O |
| 3 | Earth | I/O |
| 4 | Line | I/O |
| 5 | Neutral | I/O |
| 6 | Earth | I/O |
| 7 | Line | I/O |
| 8 | Neutral | I/O |
| 9 | Earth | I/O |

| J3 | AC Power | Not Required |
|----------------------------------|-----------------|---------------------|
| 8-position Screw Terminal | | |
| 1 | Line | I/O |
| 2 | Neutral | I/O |
| 3 | Earth | I/O |
| 4 | Line | I/O |
| 5 | Neutral | I/O |
| 6 | Earth | I/O |
| 7 | Loop | I/O |
| 8 | Loop | I/O |

| | | |
|------------------------------------|-----------------|---------------------|
| J6 | 5v / 12v | Not Required |
| 4-pin Molex: 0.200" spacing | | |
| 1 | 12v | I/O |
| 2 | Ground | I/O |
| 3 | Ground | I/O |
| 4 | 5v | I/O |

| | | |
|------------------------------------|-----------------|---------------------|
| J7 | 5v / 12v | Not Required |
| 4-pin Molex: 0.200" spacing | | |
| 1 | 12v | I/O |
| 2 | Ground | I/O |
| 3 | Ground | I/O |
| 4 | 5v | I/O |

| | | |
|------------------------------------|------------|---------------------|
| J8 | 15v | Not Required |
| 2-pin Molex: 0.156" spacing | | |
| 1 | 15v | I/O |
| 2 | Ground | I/O |

| | | |
|------------------------------------|---------------|---------------------|
| J9 | 48v In | Not Required |
| 5-pin Molex: 0.156" spacing | | |
| 1 | 48v In | I/O |
| 2 | 48v In | I/O |
| 3 | Key | N/A |
| 4 | Ground | I/O |
| 5 | Ground | I/O |

| | | |
|------------------------------------|------------------------------------|---------------------|
| J10 | 48v Relay Control | Not Required |
| 2-pin Molex: 0.156" spacing | | |
| 1 | Relay Control (Ground:On, 12v:Off) | I |
| 2 | Key | N/A |

| J11 | Distribution | Not Required |
|------------------------------------|---------------------|---------------------|
| 8-pin Molex: 0.156" spacing | | |
| 1 | 5v | I/O |
| 2 | 12v | I/O |
| 3 | Ground | I/O |
| 4 | 15v | I/O |
| 5 | Ground | |
| 6 | Key | N/A |
| 7 | 48v Out | I/O |
| 8 | Ground | I/O |

| J12 | Distribution | Not Required |
|------------------------------------|---------------------|---------------------|
| 8-pin Molex: 0.156" spacing | | |
| 1 | 5v | I/O |
| 2 | 12v | I/O |
| 3 | Ground | I/O |
| 4 | 15v | I/O |
| 5 | Ground | |
| 6 | Key | N/A |
| 7 | 48v Out | I/O |
| 8 | Ground | I/O |

| J13 | Distribution | Not Required |
|------------------------------------|---------------------|---------------------|
| 8-pin Molex: 0.156" spacing | | |
| 1 | 5v | I/O |
| 2 | 12v | I/O |
| 3 | Ground | I/O |
| 4 | 15v | I/O |
| 5 | Ground | |
| 6 | Key | N/A |
| 7 | 48v Out | I/O |
| 8 | Ground | I/O |

| J14 | Distribution | Not Required |
|------------------------------------|---------------------|---------------------|
| 8-pin Molex: 0.156" spacing | | |
| 1 | 5v | I/O |
| 2 | 12v | I/O |
| 3 | Ground | I/O |

| | | |
|---|---------|-----|
| 4 | 15v | I/O |
| 5 | Ground | |
| 6 | Key | N/A |
| 7 | 48v Out | I/O |
| 8 | Ground | I/O |

| J15 | Distribution | Not Required |
|------------------------------------|---------------------|---------------------|
| 8-pin Molex: 0.156" spacing | | |
| 1 | 5v | I/O |
| 2 | 12v | I/O |
| 3 | Ground | I/O |
| 4 | 15v | I/O |
| 5 | Ground | |
| 6 | Key | N/A |
| 7 | 48v Out | I/O |
| 8 | Ground | I/O |

| J16 | Distribution | Not Required |
|------------------------------------|---------------------|---------------------|
| 8-pin Molex: 0.156" spacing | | |
| 1 | 5v | I/O |
| 2 | 12v | I/O |
| 3 | Ground | I/O |
| 4 | 15v | I/O |
| 5 | Ground | |
| 6 | Key | N/A |
| 7 | 48v Out | I/O |
| 8 | Ground | I/O |

| J17 | Distribution | Not Required |
|------------------------------------|---------------------|---------------------|
| 8-pin Molex: 0.156" spacing | | |
| 1 | 5v | I/O |
| 2 | 12v | I/O |
| 3 | Ground | I/O |
| 4 | 15v | I/O |
| 5 | Ground | |
| 6 | Key | N/A |
| 7 | 48v Out | I/O |
| 8 | Ground | I/O |

4 Status LEDs

| LED | Meaning |
|------------|----------------|
| D1 | 5v |
| D2 | 12v |
| D3 | 15v |
| D4 | 48v In |
| D5 | 48v Out |