Power Entry

Version 4.0 – March 2, 2021

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 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 J18-J24 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 J26 has "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 shares a connector (J27) with AC out pins. These pins come directly from a relay. When the relay is enabled (by grounding the relay control pin J10-1), the AC pins on J27 actively power all devices connected to it, such as a 48V power supply. Power coming in on the 48V pins on J27 are connected to 3 bulk capacitors and to the 48v pins on J11-J17. For the relay to work properly, the board must have 12v power and ground connected to one of the 12v/gnd inputs. For those who want the relay to always be enabled, a jumper can be installed between J10-1 and J10-2.

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

3 Connectors

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

J10	48v Relay Control	Not Required
2-pin Molex: 0.156” spacing		
1	Relay Control (Ground:On, 12v:Off)	I
2	Ground	O

*Jumper J10 pins 1 and 2 together to always enable the relay

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

J18	AC Power	Not Required
4-pin Molex: 0.156” spacing		
1	Earth	I/O
2	Neutral	I/O
3	Key	N/A
4	Line	I/O

Warning – If any connector J18-J25 has AC power connected, they all have AC power connected. If the pins stay exposed, they present a dangerous shock hazard. Consider enclosing the board in a metal housing or put unconnected 4-position housings onto the unused connectors to isolate the pins.

J19	AC Power	Not Required
4-pin Molex: 0.156” spacing		
1	Earth	I/O
2	Neutral	I/O
3	Key	N/A
4	Line	I/O

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J20	AC Power	Not Required
4-pin Molex: 0.156” spacing		
1	Earth	I/O
2	Neutral	I/O
3	Key	N/A
4	Line	I/O

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J21	AC Power	Not Required
4-pin Molex: 0.156” spacing		
1	Earth	I/O
2	Neutral	I/O
3	Key	N/A
4	Line	I/O

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J22	AC Power	Not Required
4-pin Molex: 0.156” spacing		
1	Earth	I/O
2	Neutral	I/O
3	Key	N/A
4	Line	I/O

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J23	AC Power	Not Required
4-pin Molex: 0.156” spacing		
1	Earth	I/O
2	Neutral	I/O
3	Key	N/A
4	Line	I/O

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J24	AC Power	Not Required
4-pin Molex: 0.156” spacing		
1	Earth	I/O
2	Neutral	I/O
3	Key	N/A
4	Line	I/O

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J27	Controlled AC Power and 48V In	Not Required
4-pin Molex: 0.156” spacing		

1	48V	I
2	48V	I
3	Ground	I
4	Ground	I
1	Earth	I/O
2	Neutral	I/O
3	Key	N/A
4	Line	I/O

Warning – J27 may have exposed AC power connected. If the pins stay exposed, they present a dangerous shock hazard. Consider enclosing the board in a metal housing or put unconnected housings on the unused pins to isolate them.

4 Status LEDs

LED	Meaning
D1	5v
D2	12v
D3	15v
D4	Relay Active
D5	48v