Add a Power Distribution Hub for Model Train Accessories. (Mar 2024) modeltrainsounds.com

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Occasionally the need arises to supply multiple electronic accessories with the same voltage power supply to light LEDs, signals, activate turnout switches, crossing gates bell or other devices. A power distribution hub or board using a single power supply to provide a constant

voltage to a number of terminals is used for this purpose. Each terminal provides power to a number of individual electronic circuits all using the same input voltage. This is accomplished with the board set up in a parallel circuit arrangement as shown here..

The single power source can be from

1) A Battery power ranging up to 12 Volts,

2) A plug **in wall power supply transformer** using household 110VAC (AC alternating current) transformed to a constant DC (direct current) with fixed voltage output usually rated from 5 to 12 Volts. The amperage output rating in amps or milliamps is also important as it is dependent on the current draw of the circuits attached to the output ports on the hub. A rating of 1 amp (1000 milliamps) is usually satisfactory. Also make sure that the center output wire is the Positive source as shown here. A male Power Jack Plug measuring 5.5mm 2.1mm is also advised but not necessary. (see below)

3) **The 15-20 Volt AC** source present on many DC model train transformer/controllers. In this case an AC to DC converter board is required to convert the AC input to a steady DC output of the desired voltage. Usually 9 or 12 VDC is selected.

Power Distribution Hubs

Several hubs and boards are available commercially however with a few additions they can be improved for use with model train accessories. The components have been assembled into packs that includes an adapter plug for using this hub with plug in transformer adapters as described above.

Power Hub 1 (6 outlets)

This One Input, Six Outlets Power Distribution Hub is ideal for small model train layouts where only a small number of accessories are to be powered.

The hub is set up in parallel so that each outlet carries the same Voltage, AC or DC as the input Voltage. Current draw will depends on the accessories being powered. The hub is rated for up to 42 VDC with Input current up to 9 amps and output max of 1.5 amps. The push in buttons on the input and output terminals eliminates the screws found on other power distribution boards.

If used in conjunction with the AC accessory output terminal on the train controller and a DC voltage is required an AC to DC Voltage converter board will be necessary to provide a constant DC voltage source. Most train controllers transformers put out a fixed 15-20 VAC from the accessory terminal. While some accessories use alternating current most now use direct current which requires an AC to DC conversion board. Note that momentary turnout switches can operate on DC voltage. Some controllers come with a fixed VDC output.





same voltage output terminals

Power Distribution Board (13 outlets)

This power distribution board has 1 input and 13 output terminals. The output from the terminals will be the same input voltage. The board can be chained to a second board to

provide more terminal outputs. Our pack includes the adapter plug and wires for use with most standard 110V power supply wall transformers. An LED light source to indicate power ON/OFF status and shows correct polarity of the board. Screws and collars for mounting onto your control console. Here a 9VDC power supply is used to power the board to provide 9VDC power to the 12 available terminals with the adapter plug installed. Note the crossed wires. Red to the positive (+) side and white to the negative. The polarity is listed on the plug and board. The Red LED indicates ON and correctly wired. The negative side of the LED has a 1K resistors attached.



For **Power Supply** units that do not have the standard diameter 2.1mmx5.5mm male plug such as this example of a 7VDC unit, the terminal plug can be cut off, the wires stripped and tinned with solder. The Positive and Negative wires can be identified using a voltmeter which can also confirm the output DC voltage. The positive wire terminal can be labeled or marked with red ink using a permanent marker for identification and attachment to the hub.



Testing The Output

The voltage output of each of the power distribution terminals can be confirmed using a voltmeter All terminals should register the same voltage which should match the rated input voltage. Here a 9 Volt DC power transformer rated 9 Volts reads 9.3 VDC on each of the twelve terminal. Current draw will depend on the requirements of each circuit attached . Check the milliamp rating of power unit being attached which is found on the label of the input power source.



Example of using a Power Distribution Board

This HO scale Auto-Reversing shelf display uses a control panel shown below that uses a power distribution board to power the siding turnout switch, the auto-reversing trolley and railroad crossing. The lighted bumpers are powered from the track.



In this example the power distribution board on a control panel is used to power accessories. It's power is supplied from this brown Bachmann train controller. The AC accessory terminals on the left of the controller supplies AC current to an AC to 9 VDC converter board which is attached to the Power distribution board. This older version power distributor has 9 VDC on the output ports.

Here power is supplied to

- (1) a switch for operating a track turnout,
- (2) an auto reversing board and

(3) a board that controls railroad crossing The train controller variable output is directed through the auto-reversing board to the track. More accessories could be added to this power distribution board.

The lighted bumpers use track current to operate red as the trolley approaches and green as the trolley leaves.



