Switch Machine Reference Guide - Part 3 - Connecting Power

3.0 Connecting Power

The switch machine requires connection to a filtered DC supply which must be a minimum of 10 volts and a maximum of 18 volts. Supply voltages below 10 VDC may cause the electronics to operate intermittently or reset when trying to operate the turnout. Voltages above 18VDC may damage the control electronics. Use of the Walthers Control System 12 Volt DC supply (942-110) and Power Distribution Block (942-111) is recommended. This power supply will power up to 16 switch machines. The switch machine is supplied with a jumper cable for easy connection to the distribution block.

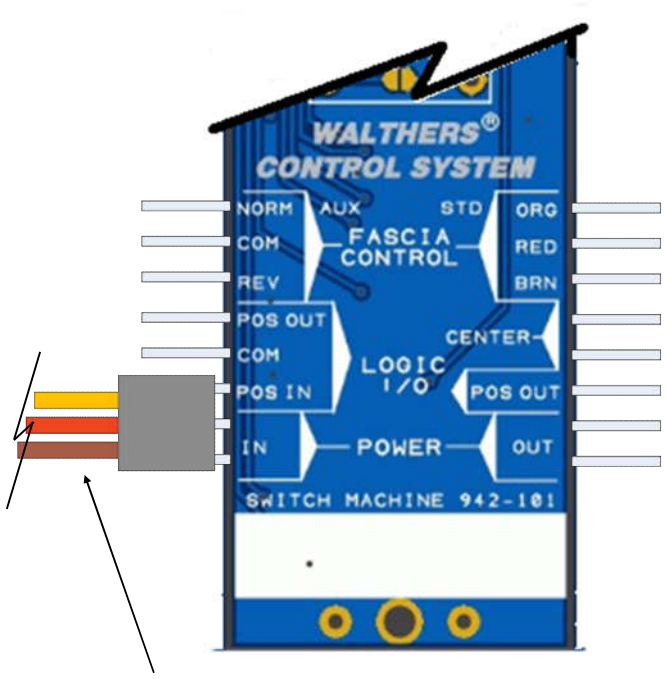
Alternately you may power the switch machine from a standard DCC booster output. The booster output can be connected through the Power Distribution Block by using the terminal strip to connect to the DCC power. See the Power Distribution Block section for more information.

— Note —

While it may be temping to wire the switch machine to nearby track when using DCC power, it is not recommended to do so. If connected to track power, any short circuit will also interrupt power to the switch machine and cause the circuitry to reset. If the short is caused by a locomotive approaching a turnout thrown against it, you will be unable to move the locomotive due to the short, and also unable to throw the turnout to clear the short circuit. Switch machines and other DCC powered accessories should use a dedicated booster or circuit breaker to avoid disruptions due to track circuit shorts.

Two sets of power connections are available on the switch machine as shown in Fig 3.1. The power in and out pins are bussed together internally and either may be used to connect to control power depending on desired function. The adjacent Position Control input and output may be picked up by the orange wire in the power cable to route it to the Power Distribution Block or to a cascaded machine when needed.

The Power Out connections may be used to daisy-chain multiple switch machines together as shown in the following sections. Two machines used on a crossover may be cascaded together allowing both turnouts to be simultaneously controlled from a single source. The cascaded machines will throw in sequence following the prior machine.

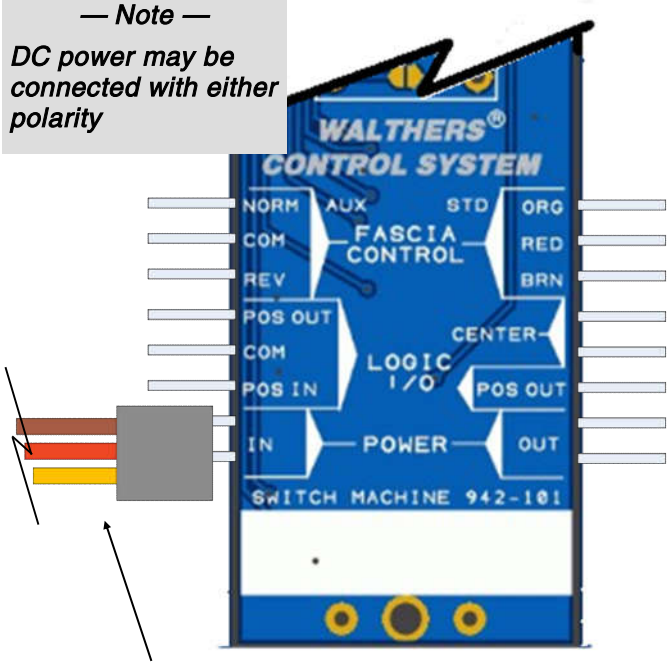


Connect jumper to power distribution block connector. Use extension cables (942-113) if needed

Fig 3.1: Power Input Including Position Input

— Note —

DC power may be connected with either polarity



Flip the connector if access to the logic signal pins is needed

Fig 3.2: Power Input Without Position Input

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3.1 Distribution Block and Power Supply

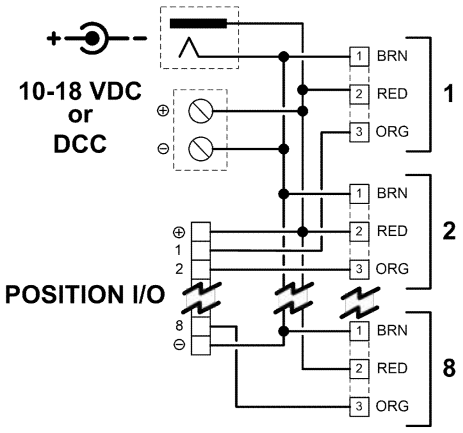
The 942-110 Filtered DC Power Supply is designed to connect directly to the 942-111 Power Distribution Block and provide 12 VDC power for up to 16 switch machines. If the full capacity is not used for switch machine power, other layout devices may also connect to the power distribution block pin connectors or terminal strip.

The power distribution block is designed to be mounted using the supplied screws and spacers. Drill pilot holes using the #43 bit from the 942-140 Drill Set if needed. Pick a location central to the switch machines which will connect to it. Note that the switch machines may be connected in daisy-chain fashion as shown in Section 3.2 and also extension cables if needed to reach locations up to 20 feet from the distribution block.

Two 942-113 Extension Cables are included with the distribution block and additional cables are available in packs of five. Each of the extension cables is 48 inches (1.2m) long and up to four cables may be used in each run from the distribution block to the switch machine location.

Plug the power supply into a suitable outlet in a well ventilated location. Route the cable to the barrel connector on the distribution block, securing as needed to prevent accidental disconnection and provide strain relief in the event the cable is accidentally snagged during maintenance.

Connect the switch machine power cables to the distribution block following the color coding as shown. This will allow the corresponding pins on the Position I/O connector to pick up the Position In or Out signals from the switch machines. You may connect the power cable to the Power Out side of the switch machine if you wish to use the Position Out signal on the distribution block connector. The Position I/O connector provides a convenient location to make signal connections to an external digital system or other control circuits such as diode matrixes.



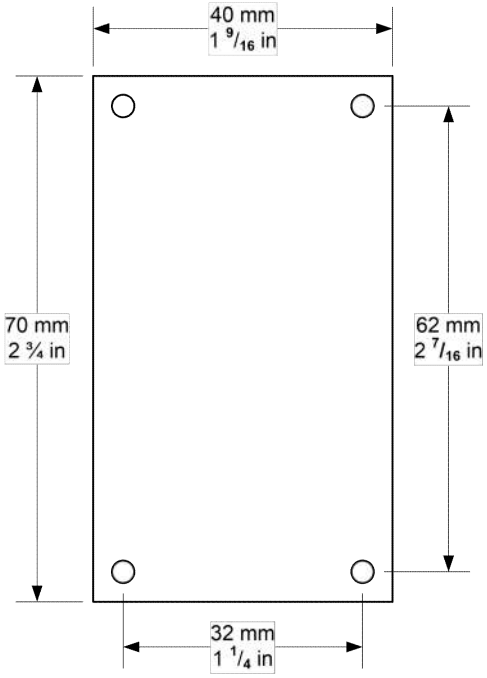
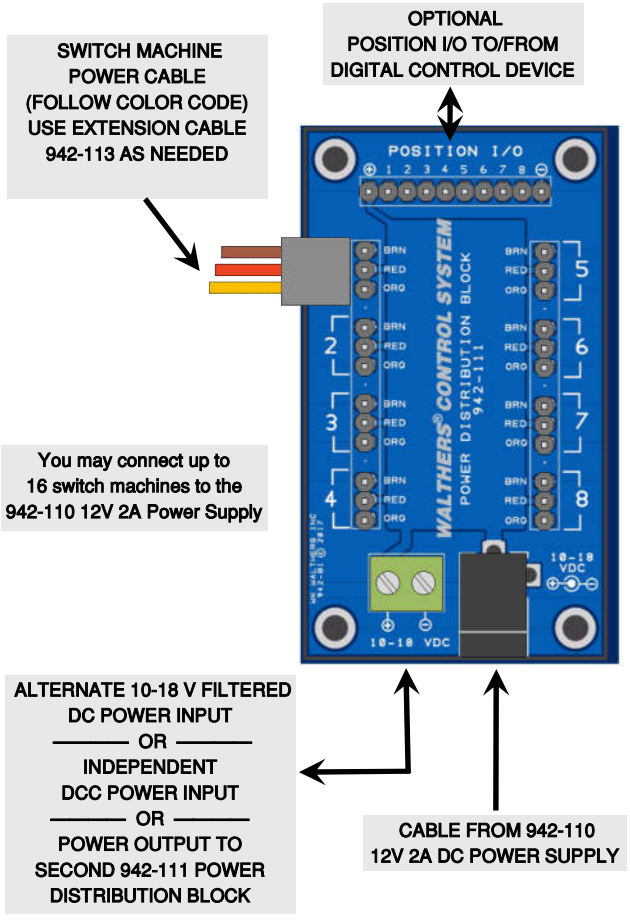


Fig 3.3: Power Distribution Block Template

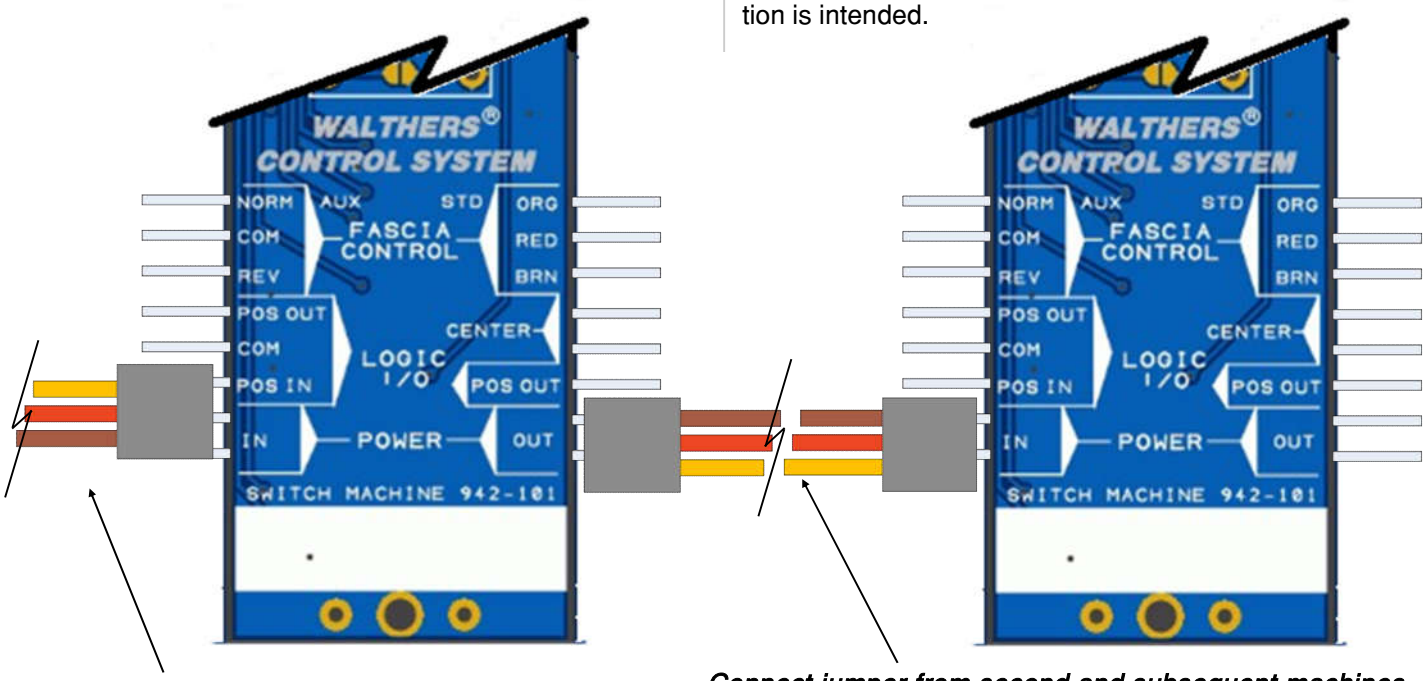


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3.2 Daisy-Chaining Power Connections

You may jumper power connections through up to four switch machines in daisy-chain fashion when convenient.

On the second and subsequent machines, install the jumpers to connect the power pins only unless crossover operation is intended.



Connect jumper to power distribution block

Connect jumper from second and subsequent machines to previous machine connecting power pins only as shown

3.3 Crossover Operation

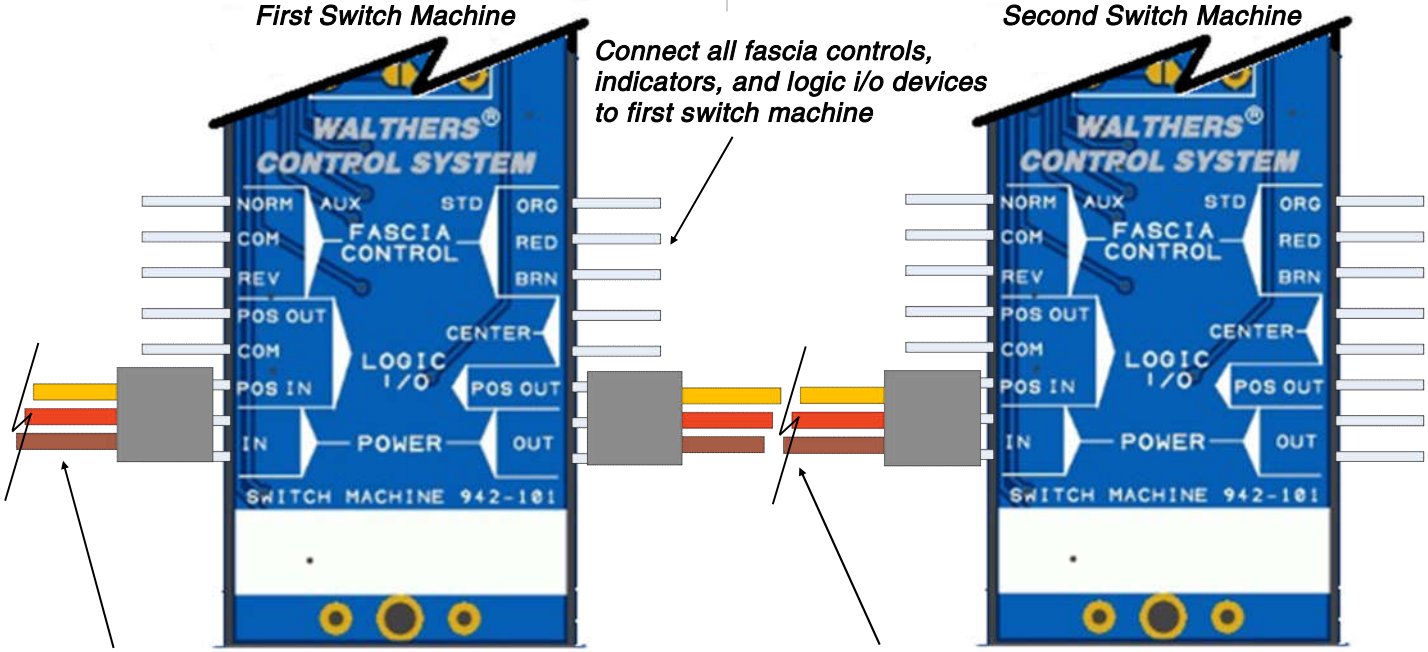
Up to four switch machines may be cascade connected allowing a single or double crossover to be controlled from a single fascia controller, digital input, or DCC signal to the first machine.

The second and subsequent machine(s) have only the power connector connected. Mixing cascade crossover connections with single turnouts in the same daisy-chain is permitted.

First Switch Machine

Second Switch Machine

Connect all fascia controls, indicators, and logic i/o devices to first switch machine



Connect jumper to power distribution block

For cascade operation, connect second machine Power and Pos In pins to Power and Pos Outputs on first machine