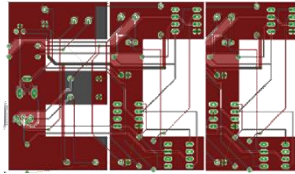


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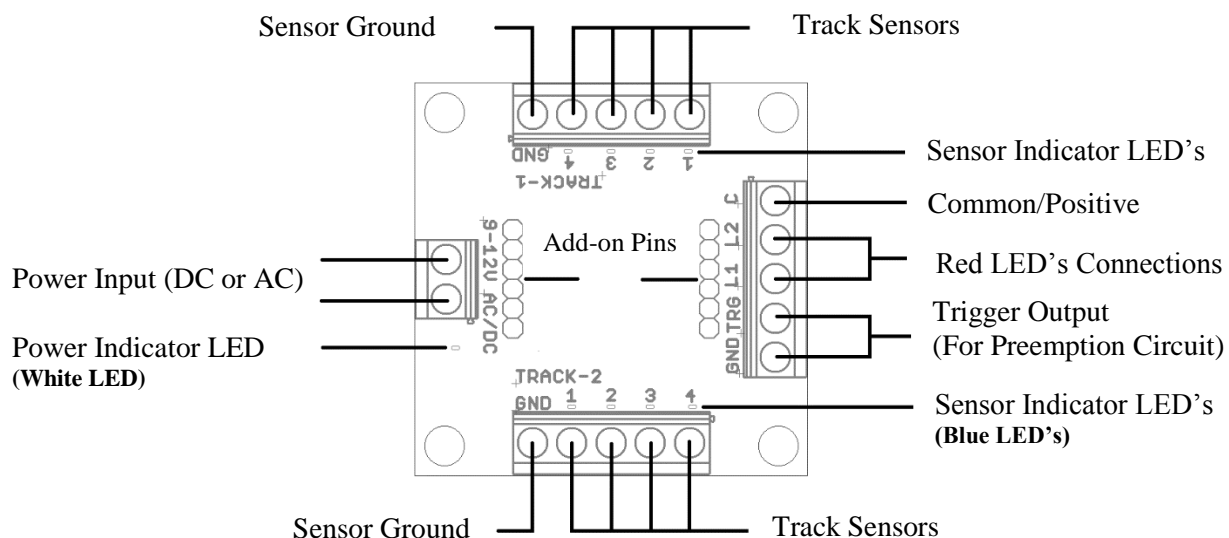
Crossing Signal Circuit #501

Instructions

Getting Started

Thank you for purchasing the ECC Crossing Signal Circuit. Please take a moment to read and familiarize yourself with the following instructions prior to installing this circuit. This kit contains: One Crossing Signal Circuit, 4 four sensors with 24" leads and four sensors with 12" leads. This circuit is suitable for modular, small and large layouts and will operate Anode based **LED** crossing signals (Common Positive).

The Crossing Signal Circuit simulates the operation of a grade crossing (**without Gates**) on single and dual tracks, bi-directional. The circuit operates using 4 sensors per track. The two outer sensors 1 & 4 are used to initiate the flashing of the signal while the two inner sensors 2 & 3 are used to turn off the signal. For instance; if sensor 4 is used to activate the signal, then sensor 2 turns it off and vice versa if the train is approaching from the opposite direction. If sensor 1 is used to turn the signal on then sensor 3 is used to turn the signal off. The Crossing Signal Circuit has a built in 20 second time-out timer (non-adjustable). If the train takes longer than 20 seconds to reach the closest sensor the circuit will assume the train has reversed and exited the block or has diverted to a different route/track in between sensors and the signal will turn off. This circuit is also equipped with an "Island Circuit" and Trigger feature. The Island circuit feature uses the two inner sensors (2 & 3) to turn the signals on and off in case of a time out. (**See Island Circuit Section**) The second feature of this circuit is the trigger output. This output can be used to power our Traffic Light Preemption System #203 (**Sold Separately**) which allows traffic lights to work in conjunction with the crossing circuit while the circuit is activated by changing all traffic lights to go and stay Red until the crossing is deactivated (The train clears the crossing) (Lights Flashing) (**See Trigger Output Section**).



Sensors

The sensors should be mounted in between the rails. Drill a 5/32" hole in between the ties through the layout table and install the sensor (wires first) from the top of your layout. The hole size is suitable for HO and larger scales. Please note when drilling on smaller scale track the drill bit may hit the ties. We recommend you start with a smaller drill diameter and gradually work your way up to the 5/32" drill hole to prevent damaging the ties. In some cases you may need to shave off a little plastic/wood from your ties in order to accommodate the sensors.

We recommend securing the sensors in place by using a small amount of white glue. Don't forget to wipe any excess glue from the sensor head as failure to do so may cause the sensor not to work or to provide a false indication. Each sensor is provided with 24" and 12" leads; 24" for the outer sensors and 12" for the inner sensors. In case this isn't enough, any **30AWG** stranded wire can be used to extend the reach. The spacing between the photocells depends on how long you would like the block to be defined. **Please be aware the Sensors are programmed with a two second delay, meaning the train has to cover the sensor for 2 seconds before the circuit is triggered to eliminate any possibility of a false trigger, such as a shadow.**

Please keep in mind that there is also a 20 second delay timeout sequence. If the train takes longer than 20 seconds to reach the closest photocell, once activated, the circuit will assume the train has reversed or has diverted to a different route/track in between sensors and the crossing signal will turn off. **NOTE ** The timer delay will only occur after the last car has cleared the outer sensor. The timers will not run if the train is on top of the sensor**

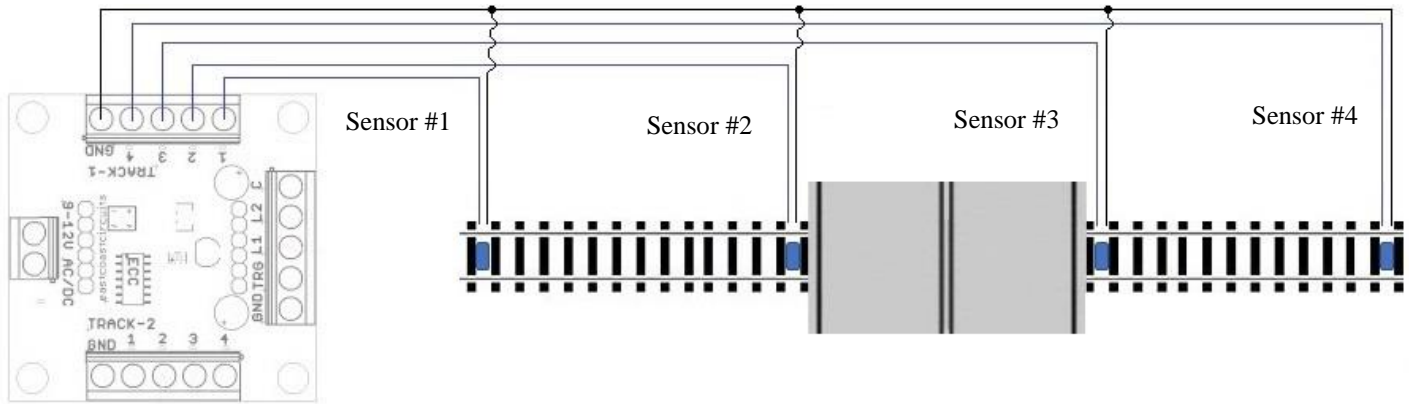
Once power is applied to the Signal Circuit, it will automatically start adjusting the sensors to your current room lighting. Each sensor is adjusted independently and at the same time the blue sensor indicator LED's will turn on indicating the LED's are working properly. **If one or more sensors indicating LED's don't turn ON this means that there is a problem with the sensors.** A couple of reasons can be a bad connection to the terminal connectors, sensors did not calibrate properly, faulty sensor or a break in the soldering connecting the wire to the sensor. For low-light operation, we recommend re-adjusting your sensors by disconnecting the power to your circuit and waiting 5 seconds before reconnecting it back to power. This will ensure any previous settings have been erased and will allow the sensors to recalibrate to your current room lighting. **Please note the Circuit/Sensors will NOT operate in the dark.**

Sensor Wiring

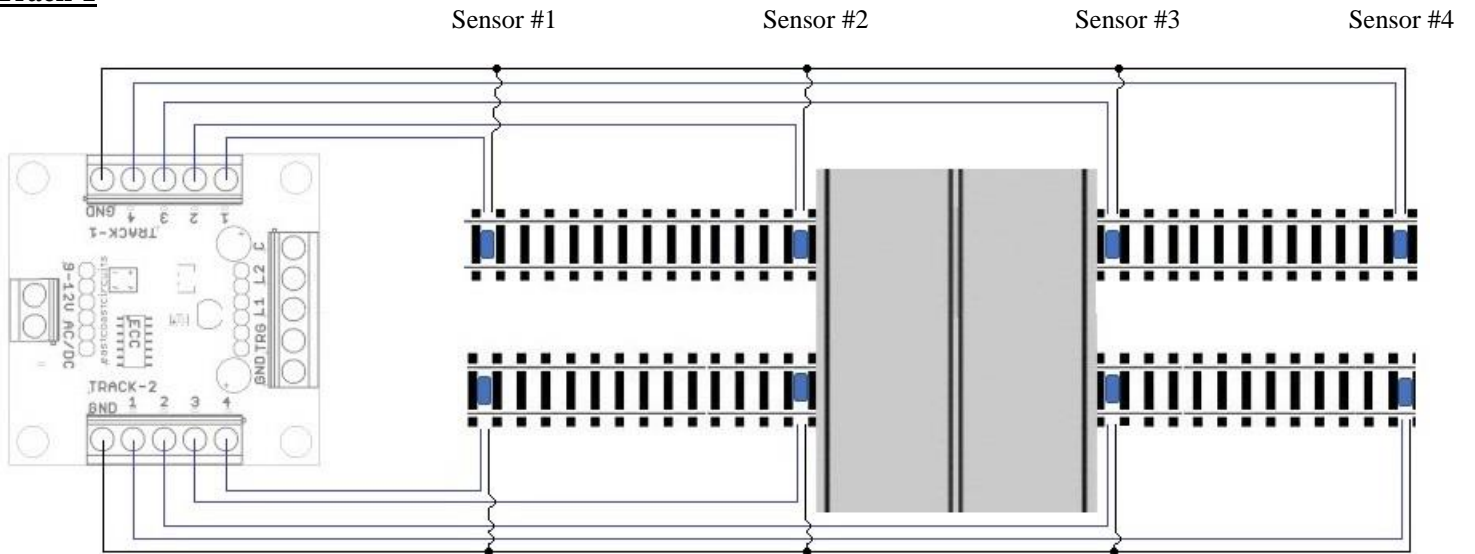
The Crossing Signal Circuit is designed to handle single or dual track operation. For single track operation please use the "Track-1" side of the circuit. The circuit includes 8 sensors with wires for ease of installation. Four of the wires are 24" in length and the other four wires are 12" in length. Following the image below place two of the sensors with the 12" leads on either end of the roadway. These sensors are in charge of turning the circuit off. Once complete please install two of the sensors with the 24" leads as far away as possible from the previously installed sensors. These sensors are in charge of activating the circuit. For dual track please follow these steps while using the "Track-2" side of your circuit.



The Crossing Signal Circuit is designed to self-adjust the LDR's to the room's lighting. This automatic process eliminates the need to adjust each individual sensor from the bottom of the layout. While following the diagram below connect any leg of sensor one to the #1 terminal and connect the other to GND, please follow these steps for sensors 2, 3 and 4. For Dual Track Wiring please follow these instructions on the "Track-2" side of the circuit.

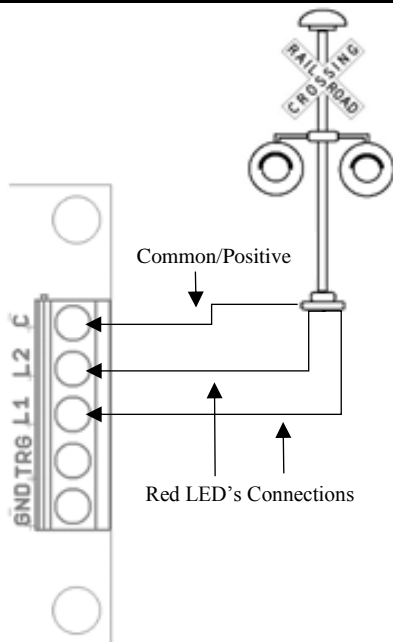


Track-1

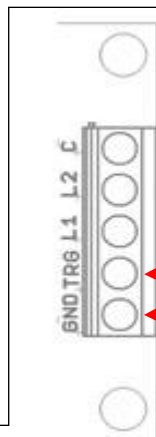


Track-2

Signal Wiring & Trigger Output



Now that your sensors are in place, let's move on to the signals. The Crossing Signal Circuit is capable of handling a total of 16 LED's at once. Please connect the negative LED leads (Sometimes White or Red) Wires to the Lamp terminals labeled "L1" & "L2" and your Common or Black wire to the terminal labeled "C". **If you have multiple signals please repeat the process making sure to not exceed 16 LED's.** The Crossing Signal Circuit has built in resistors so if your signals look too dim please remove the provided resistor that is provided with your crossing signal and reconnect to the circuit.

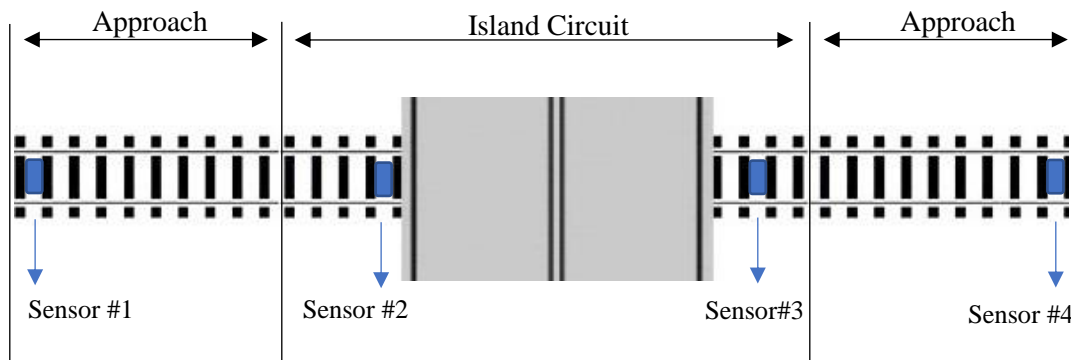


The Crossing Signal Circuit is also equipped with a Trigger function. This feature can be used to power any 3V device while the flashing circuit is in operation.

If you have an ECC Preemption System #203 please use these terminals to automatically initiate the preemption effect. Make sure to connect the "GND" wire from this circuit to the "GND" Terminal connector on your preemption circuit and "TRG" wire from this board to the "TRG" terminal on your preemption circuit.

Island Circuit

The Island Circuit Feature operates very simple. Let's say your circuit timed-out because the train didn't reach the nearest sensor within the 20 second timer, diverted or stopped at a station in between sensors. The crossing signal circuit can use sensors #2 & sensor #3 to initiate and stop the flashing. If sensor #3 is used to start the sequence then sensor #2 will turn it off once the last car clears the sensor and vice versa. This feature is also suitable for switching operations where an approach is not needed. Just make sure sensor 2 & 3 are spaced out a little further from the road to get a more realistic operation. **Please keep in mind that once the train activates the flashing lights on Island Mode it has to commit to cross the road in order to stop the lights from flashing as this feature doesn't have a time-out timer. Once the train crosses the road and the lights stop flashing it has to wait five (5) seconds before the signals can be reactivated by another train.**



Power

The **Crossing Signal Circuit** accepts **AC and DC ONLY (9V- 12V)**. The Crossing Signal Circuit will draw approximately 26mA under a full load. This circuit is designed to operate under any straight DC or AC current provided that the voltage doesn't exceed **12V**. Exceeding the Power requirements will cause the circuit components to overheat causing it to fail and will void the warranty. You should make all connections to the circuit prior to applying power. You can mount this circuit anywhere. We suggest mounting the circuit under the layout using #4 screws and adding a small piece (1/2" minimum) plastic tubing for the screws. The spacing will keep the circuit off the actual mounting surface. The circuit is equipped with holes for easy mounting. Do not enlarge holes as doing so can cause damage to the circuit and will void your warranty.

Warranty

This Circuit is warranted to be free from defects in workmanship and materials for a period of ninety (90) days from the date of purchase. This warranty covers all defects experienced during normal operation except for the following conditions:

If current or voltage limitations has been exceeded

If product has been modified in any way (e.g. Missing/Additional Components, Soldering)

If product has been mishandled or abused.

Requests for warranty service must contact us first to receive a RMA (Return Merchandise Authorization) at eastcoastcircuits@gmail.com

Please include a written description of the issue and purchase receipt when returning the product to us.

Technical Support

We hope the foregoing instructions are adequate for answering any questions you might have about the installation and operation of this circuit. However, if you still have any questions or problems with your circuit, technical support is available through email at eastcoastcircuits@gmail.com

Warning:

This product is not a toy. Keep away from children. It is not suitable for children under the age of 14, as small parts and/or broken parts may present a choking hazard. If swallowed, seek immediate medical help.

This product contains known Chemicals which are known to the state of CA to cause cancer, birth defects, or other reproductive harm.
REV. 09/2019