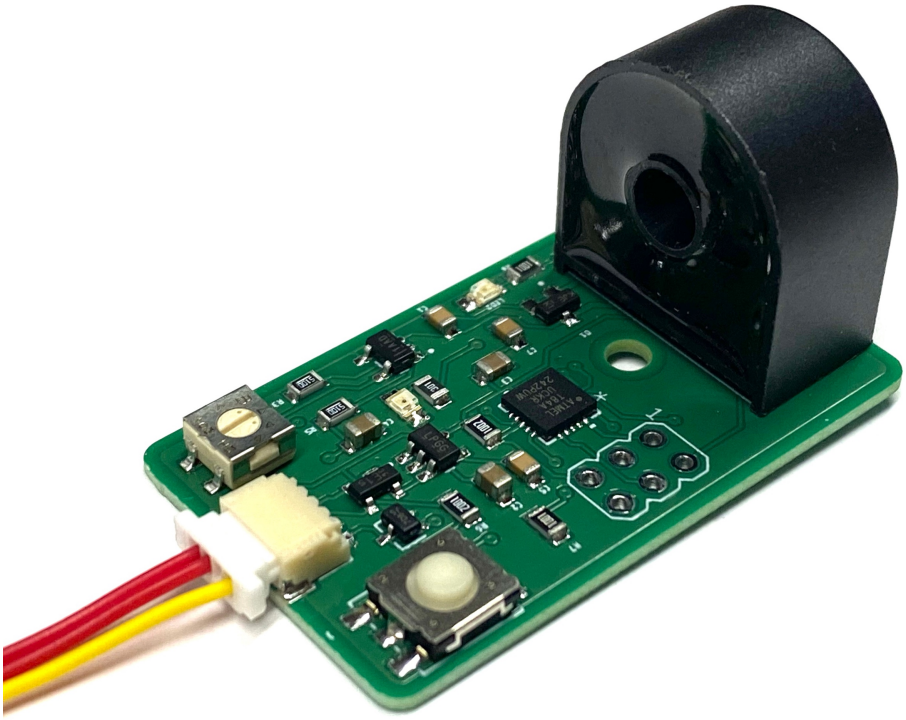
Model Train™ TECHNOLOGY

DCC CURRENT DETECTOR

Version 1.0a

Works with Any Scale



INTRODUCTION & OVERVIEW

The Model Train Technology™ ***DCC CURRENT DETECTOR™*** provides a way to detect a train in an entire section of track rather than at just a single point. This is accomplished by detecting the DCC signal's oscillating current running through a coil. This AC through a coil is the basis of most electrical power generation. In the late 18th century Michael Faraday discovered the principles of magnetism which set the stage for electricity production. Roughly 50 years later Nicola Tesla pioneered AC current (Tesla Coil) which was later modified to enable the transmission of high voltages over long distances.

The way we use this concept today is that by passing an alternating current through a coil of wire an amplified current is created. The black coil on our sensor is just such a coil and by passing one leg of the DCC track power through the coil a current is created that can be detected by our circuit.

But wait, DCC is not AC. Correct. The DCC signal is a called stepped DC. The DCC power to the track is switched on and off very rapidly. The duration of the ON and OFF time either a short time or longer time. That difference can be detected by a DCC decoder to represents 1's and 0's – the soul of the DCC digital signal. That is how DCC controls the engine/decoder.

To our coil, that on and off power is very similar (electrically) to AC, so it creates a small current in the coil. The coil is needed to amplify that signal current because it is very small.

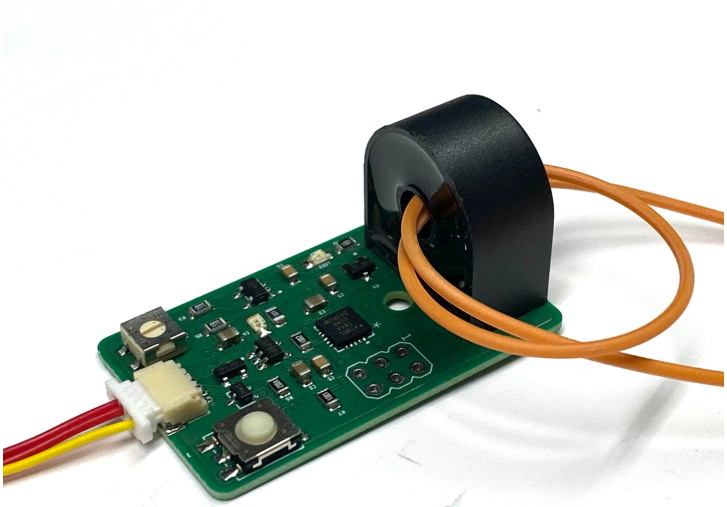
When an engine, or MTT lit passenger car or caboose, is on the section of track where the detector is, the amount current running through the wire changes. By monitoring the signal current, that change can be used to indicate the presence of the Engine motor or LED lights, and thus block occupancy. That is how our circuit works to tell you via the Signal Out (yellow wire) that a train is in the block.

One last note: this approach will only work with DCC layouts. It will not work with DC. It will not work with DC because for the coil to be activated, the polarity of the wire through the coil must “vibrate” like AC. DC does not do that.

SETUP

Setup is simple. Feed one leg of the DCC track power through the coil as shown below. In some rare circumstances where the length of track wire very long, you might have to feed the wire

through one additional loop. 90% of the time what is shown below is adequate.



POWER

Connect the two Red Wires to 12VDC, one to PLUS and one to MINUS. The polarity of the wires to + and – does not matter. Do not use a train transformer – anything with a variable speed adjustment – to power this device.

When powered correctly the blue LED will be lit. On power up and after the Blue LED lights, the green LED will blip once. This simply confirms that the LED is working along with the rest of the circuit. If you DON'T see the green LED blip, contact support for further help.

SIGNAL

The yellow wire is the SIGNAL wire. When the circuit is activated – meaning that the track is occupied – the SIGNAL will be a digital LOW signal, and the green LED will light. This signal can only be used to trigger digital circuits. It CAN NOT power a relay or an LED. Doing so will damage the circuit. You will need either a Signal Controller or one of our digital RELAYs to power or operate another device.

INVERSE MODE

Inverse mode reverses the signal out (yellow wire) so that occupied is OFF and unoccupied in ON. Press the button 5 times to enter INVERSE mode.

TIMEOUT ADJUST

On the circuit board is a small trim pot (Trim Potentiometer). Adjusting this allow you to delay the release of the occupied signal for up to 30 seconds AFTER the train has left the block.

ELECTRONICS AND STATIC ELECTRICITY

The ***MTT PRECISION DETECTOR™ - Trackside*** circuit board and components are exposed when the cover is off. Static electricity can cause component failure. Scuffing along a carpet and then touching one of the component connectors can cause a static spark. These components are fairly rugged – some designed for the automotive industry. Just be mindful of the risk. The current on the board will not harm you if the board is powered as per the instructions.

ONE YEAR MANUFACTURER WARRANTY: We warrants this product to be free from defects in workmanship and materials, under normal residential use and conditions, for a period of one (1) year for the original invoice date. Shipping and handling fees are to be paid for by the customer.

LIMITATION OF LIABILITY

UNDER NO CIRCUMSTANCE SHALL COMPANY OR ITS AFFILIATES, PARTNERS, SUPPLIERS OR LICENSORS BE LIABLE FOR ANY INDIRECT, INCIDENTAL, CONSEQUENCIAL, SPECIAL OR EXEMPLARY DAMAGES ARRISING OUT OF OR IN CONNECTION WITH YOUR USE, OR INABILITY TO USE THE PRODUCT, WHETHER OR NOT THE DAMAGES WERE FORESEEABLE AND WHETHER OR NOT COMPANY WAS ADVISED OF THE POSSIBLITY OF SUCH DAMAGES. WITHOUT LIMITING THE GENERALITY OF THE FOREGOING, COMPANY'S AGGREGATE LIABILITY TO YOU SHALL NOT EXCEED THE AMOUNT OF THE PRODUCT. THE FOREGOING LIMITATION WILL APPLY EVEN IF THE ABOVE STATED REMEDY FAILS OF ITS ESSENTIAL PURPOSE.

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