

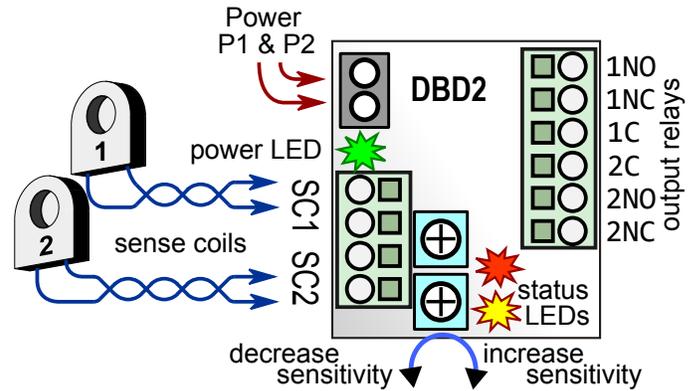
**What it is:** The DBD2 has two current sensing block occupancy detection circuits that operate independently. Each detector circuit senses whether or not electrical current is flowing into a section ("block") of track. If current is flowing, the circuit closes a relay contact. The relay contact is used to activate a signal or accessory circuit. The detector is sensitive to the rapidly changing currents of digital train control systems such as DCC.

This detector will not work with traditional analog DC train power.

Power required: 9 to 16 volts, ac or dc.  
 Output contacts: 350mA (0.35 amp) max, 28v max.

**Kit contents:**

- ★ Circuit board
- ★ Two current sensing coils for remote sensing
- ★ Mounting screws.

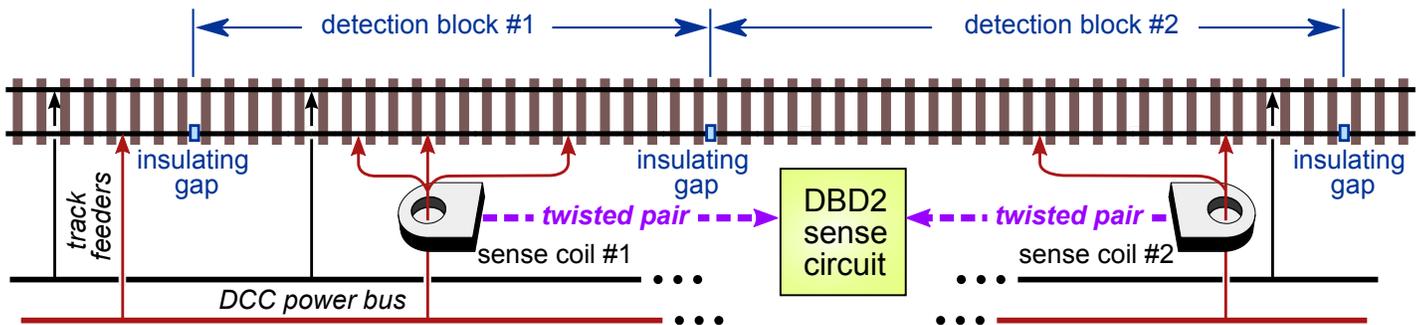


**How it works:** Track current is sensed by passing the track's power feed wire through a current sensing coil. To detect a train in a defined block of track, one rail of that block must be electrically insulated from the rest of the layout. All power to that block must be passed through the detector circuit's sensing coil.

**Installation**

There are four installation steps: Install sense coils, Connect power, Adjust sensitivity and Output connection.

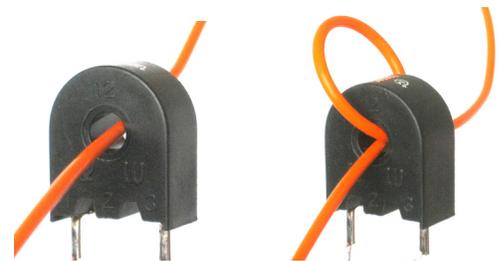
**First, install the sense coils:**



Each of the two detection blocks must have one rail electrically isolated from the rest of the layout. Cut an insulating gap in the rail or use plastic rail joiners at each boundary of the detection block.

All track power for the detection block must pass through the sense coil. Pass the feed wire through the sense coil. To increase the sensitivity, loop the wire around and pass it through the sense coil again.

A single pass is sufficient to detect locomotives, lighted cars or a 10k-ohm resistor in most cases. To detect a higher value resistor, loop the feed wire and pass it through the sense coil a second time.



Connect each sense coil to the DBD2 module with twisted pair wire, such as from telephone or "Cat 5" ethernet cable. Keep the twisted pair away from track power wires to avoid inducing a false signal in the sense wires. If the twisted pair wires are kept away from track power and other digital signal sources, the sense coils can be placed as far as 12 ft (4 m) from the DBD2 module.

**Connect power to the DBD2 module:** Connect a power supply of 9 to 16 volts AC or DC to terminals P1 and P2. A green LED on the DBD2 module will light when power is applied.

**Adjust the sensitivity:** With no trains in the detection blocks, the red and yellow LEDs on the DBD2 should be off. If the red or yellow LED is on, decrease that detector's sensitivity by turning the sensitivity adjuster anti-clockwise.

**Test for train detection.** Place a train in detection block #1. Make sure the rails and the wheels are clean. The train must have an electrical connection from one rail to the other, either a motor, lamp, sound module or a resistor. Turn on the track power. The red LED should light. If not, increase the detector's sensitivity by turning the adjuster clockwise. If the red LED still does not light, loop the track feed wire around the sense coil for an additional pass through the coil (see pg. 1).

Repeat for detection block #2. The yellow LED shows the state of detection for block #2.

**Output connection:** Connect the output relay terminals to the circuits or accessories that will be controlled by the DBD2.

Each of the two detectors has two output relay contacts.

- The 'NO' contact is **normally open** ('off'), it only closes (turns 'on') when a train is detected in the block.
- The 'NC' contact is **normally closed** ('on'), it opens (turns 'off') when a train is detected.

The relays can switch AC or DC current.

Both contacts open when power to the DBD2 terminals P1 & P2 is turned off.

Note that the output relays are switch contacts only -- the DBD2 does not provide power to your signal or accessory. Power must come from an accessory power supply.

**For higher load current:** The DBD2's output contacts are rated for a maximum current of 350 milliamps (0.35 amp) each.

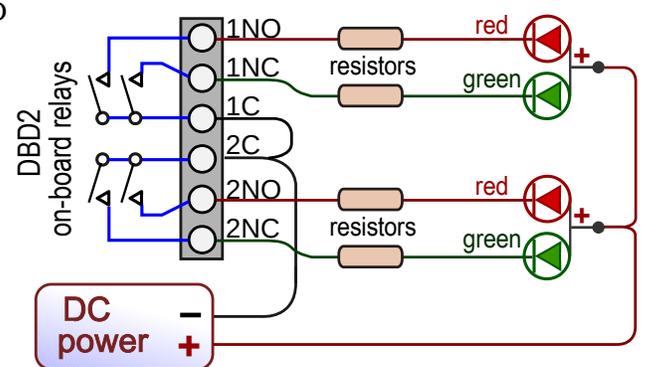
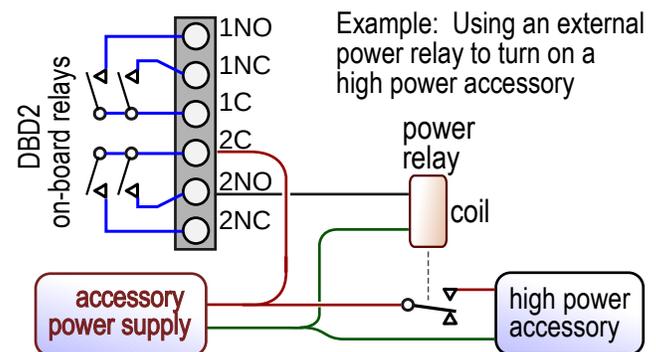
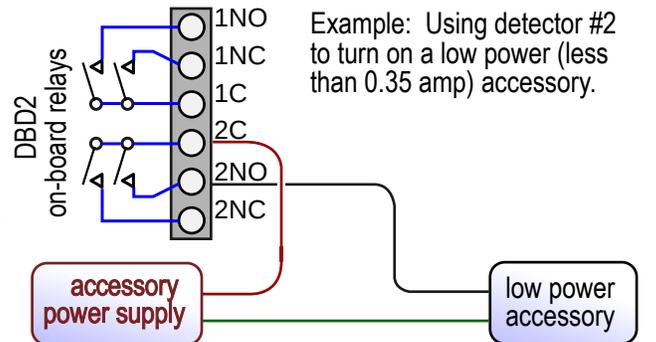
To control a high power accessory, use the DBD2 output contact to control a power relay, such as the Azatrax MRAPR. Then use the contacts of the power relay to turn on the accessory.

**LED signals:** Below are examples for using simple green/red LED signals with the DBD2. The signal shows green when its block is clear, and red when occupied.

The signals shown here are wired in "common anode" (+) configuration, which is typical of most commercially made signals.

If "common cathode" (negative) signals are used, swap the +/- connections to the DC power supply.

**Always use resistors with LED signals.** The resistors may be connected in line with the individual green and red wires, or a single resistor may be connected in series with each signal's common wire. Follow the signal manufacturer's recommendation.



More information and assistance is available at the Azatrax website: [www.azatrax.com](http://www.azatrax.com)