

BOD-1

Single Block DC/DCC Occupancy Detector

User's Guide

Modules

The BOD-1 may be connected directly to a TC-64 or LNCP input port by connecting the desired output between the Ground (pin 6) and the appropriate input line. Each BOD-1 is equipped with dual opto isolated outputs, one active when occupied, and the other activated when unoccupied.



Sensing The BOD-1 uses the voltage drop across 3 Amp Schottky diodes for detection. Normal detection levels are 1ma. for use with 10K wheel sets. Sensitivity may be decreased to 15ma. with the on board potentiometer for situations requiring less sensitivity. To further reduce sensitivity place a resistor across either one of the diodes. Using Schottky diodes

minimizes the voltage drop between detected and undetected sections of track. (typically 2%-3%)

The nature of DCC requires the sensing of both polarities for reliable operation. (especially during analog operation) The availability of track power at all times let us to choose to power the sensor circuitry from the DCC track power itself. The current drain of this circuit is very low (3-4ma) when the track is not occupied, and only increases to about 10ma when occupied, so the power drain on a booster is not noticeable.

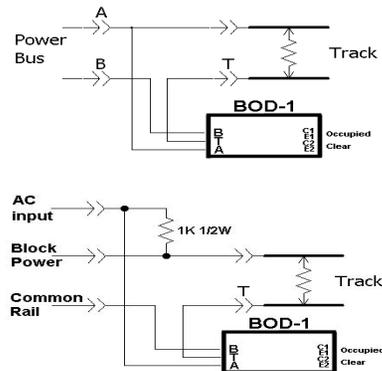
Connections

There are two output connections and three input terminals on the BOD-1 board.

Input Connections

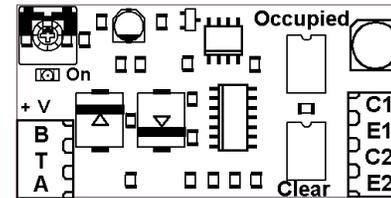
DCC mode - Rail B, Track, and Rail A.

DC mode - The Detector will also work on a standard DC layout if some power source is connected between the common rail B and the power input connection A. Connecting A to one of the accessory terminals on a simple power pack may suffice. Try yours and see. We have one old DC power pack that works like this OK, and another that does not. The 1K resistor provides detection power when the block power is off.



Output Connections

The output connections C1 and E1 are 'on' when the track is occupied. C2 and E2 are 'on' when the track is clear. The on-board LED lights when the track is occupied. The output couplers can drive 100ma. at 50V which is sufficient for driving LEDs or small relays as well as other logic.

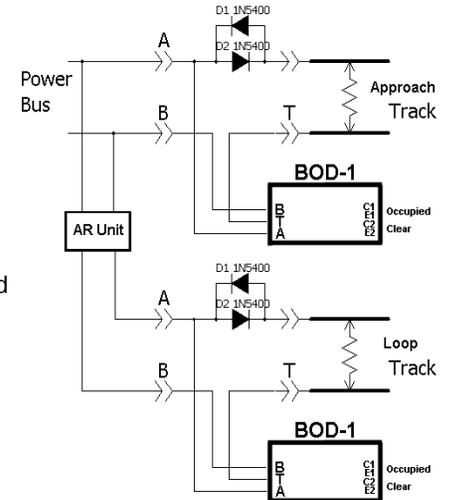


The BOD-1 outputs lines C1 to E1 are 'on' during train detection so the TC-64, LNCP, or other I/O device should be configured as "Detector" for each line that is connected to a BOD-1. This 'closed' on input mode matches most types of detector outputs.

Notes

If you are careful to keep all your detectors on the same side of your track, then you do not need any diodes in the opposite rails of your track circuits. However there are two situations that may require "dummy" detectors to prevent rolling stock or engines that are bridging between blocks from not being detected. The first is when going from a detector controlled block into a non detector controlled section such as a yard or siding. Just put a back to back diode pair between the power bus and the first uncontrolled block as if it had a detector.

The second problem is found in reverse loops. In that case add a back to back diode pair in the circuits between the power bus 'A' and the second rail. (Note: Power Bus 'A' and 'B' are for reference only, the detector may be placed in either side of your track circuit.) These extra diodes allow enough 'headroom' so that the detectors will not be bypassed by engines crossing the gaps into or out of the loop.



To drive Digitrax SE8c or DS-54 inputs connect C to +V and E to the inputs.

BOD-1 boards may also be used as simple optical detectors by connecting 10K to 470K ohm pull up resistors from the '+V' terminal to the 'T' input. Connect your sensor between these points.

RR-CirKits Contact Information

RR-CirKits, Inc.
7918 Royal Ct.
Waxhaw, NC USA 28173

<http://www.rr-cirkits.com>
sales@rr-cirkits.com
service@rr-cirkits.com
Phone: 1-704-843-3769
Fax: 1-704-243-4310