Triple Occupancy Detector

This device (the 3OD) provides current-sensing detection to three separate blocks or sections of track being powered by a single feeder. The device may be used with either DC or DCC systems.

The device may be used with or without common rail wiring as it is wired in-line with only one rail and requires no connection to the other rail. Output circuits are electrically isolated from track power to allow proper functioning whether or not the two have a common ground.

Trackside Electrical Specifications

Track current (maximum continuous per detector)	4 amperes
Track power connectors	Screw terminals: 2 for power feed 1 for each block
Track power terminal minimum wire gauge	22
Track power terminal maximum wire gauge	14
Track power terminal maximum current	16 amperes

Output Electrical Specifications

Output connectors	6-pin SIP Compatible with the Grade Crossing Controller
Output drive	Open collector
Output maximum voltage	26 volts
Output maximum continuous current *	50 milliamperes

** Detector outputs can sink up to 190 mA, however sensitivity decreases as output current increases. It is recommended that output current be limited below 50 mA. Driving a digital input is well under this limit, and driving most relays are under this limit.*

Connecting the Detector to Track Wiring

Track power source may be connected to either screw terminal on the block labeled **X1** in Figure 1. The second terminal may be used to daisy chain the power feed to another detector card.

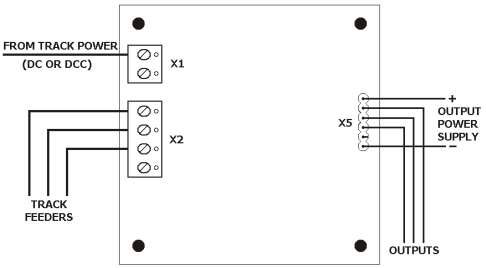

Figure 1

Feeders for each of three separately detectable track sections are connected to one of the first three of the four screw terminals on the block labeled **X2**. If one detector is to feed a block in more than one location (e.g.: provide a feed for each section of track in the block), it is recommended that a single heavier-gauge feed connect to the card and each track feeder branch off of the heavier feeder.

Once power and track feeders have been connected, track is ready for use. It is not necessary to have any outputs nor the output power supply connected in order for the detector to provide connection from the track power to the track feeders.

Connecting the Grade Crossing Controller

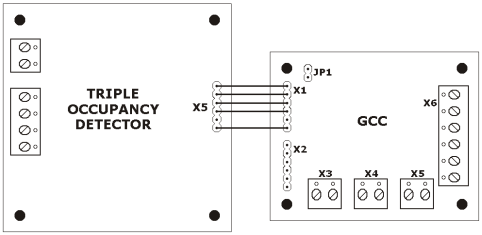

Figure 2

Connect a 6-conductor cable from **X5** on the 3OD to the either **X1** on the Grade Crossing Controller (GCC) (for the first track), or **X2** on the GCC (for the second track).

Note that the fifth connection is not necessary as there are only three occupancy detectors on the 3OD.

Lowering AC Sensitivity

Generally, the high frequencies used for DDC power or pulse-width-modulated DC power, do not cause any issues with a current sensing detector. However, if wiring between the detector and the track is long, or the track block itself is long, the capacitance of the wiring and the track can create a low impedance load that results in a tiny current that can be detected. This can generate a false detection output by the detector.

A small capacitor may be used to shunt high frequencies around the detector for each block to eliminate this effect. A place for installing this is available on the circuit board. Please see the Product Documentation on our website to obtain a copy of our application note titled **Lowering AC Sensitivity**.

Additional Information

Additional information on this product can be found on our website's Product Documentation for the Quad Occupancy Detector.

Does The Whole Train Need To Be Detectable?

The 3OD works by detecting current draw, so in addition to the locomotive, which draws current for its motor and headlight, the rest of the train needs to be "seen". If not, then the crossing will deactivate once the locomotive clears the crossing while the rest of the train is still passing through.

However, it is not necessary for the entire train to be detectable. As long as something that draws current is still in the approach block when the locomotive clears the crossing, the crossing will remain active.

Does this mean that only the rear car of the train need to be detectable? The answer is yes if your train is not too long. Since something must be in the approach block before the locomotive clears the crossing, then if the only other detectable part of the train is the last car, it must enter the approach block before the locomotive clears the island block over the crossing. Therefore, if your train is shorter than the length of these two blocks, it is only necessary to have detectable wheels on the last car of the train. Better still, the train should be shorter than the shortest approach block.

If your train is longer, there will have to be at least one detectable car in the middle so that at least something is in the approach block when whatever detectable car ahead of it clears the island block over the crossing.

Warranty

A factory-assembled Quad Occupancy Detector is tested and warranted against manufacturing defects for a period of 1 year from date of purchase. As the circumstances under which this detector card is installed cannot be controlled, failure of the detector card due to installation problems cannot be warranted. This includes misuse, miswiring, operation under loads beyond its specifications, or short circuits. The warranty is voided if the detector card is connected to an output supply voltage more than 26 volts, used for a load greater than 190 milliamperes, or used for track power exceeding 4 amperes per block, or 16 amperes in total, including daisy-chained feeds.

If the Quad Occupancy Detector fails for non-warranted reasons, it can be replaced with no questions asked for the cost of $22 plus shipping (this fee subject to change).

Send an email to **circuits@daxack.ca** for information on warranty or non-warranty replacement.

This document is available in PDF format on our website.