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Grade Crossing Pro

Application Note: Using IRDOT-1 IR detectors instead of photocells

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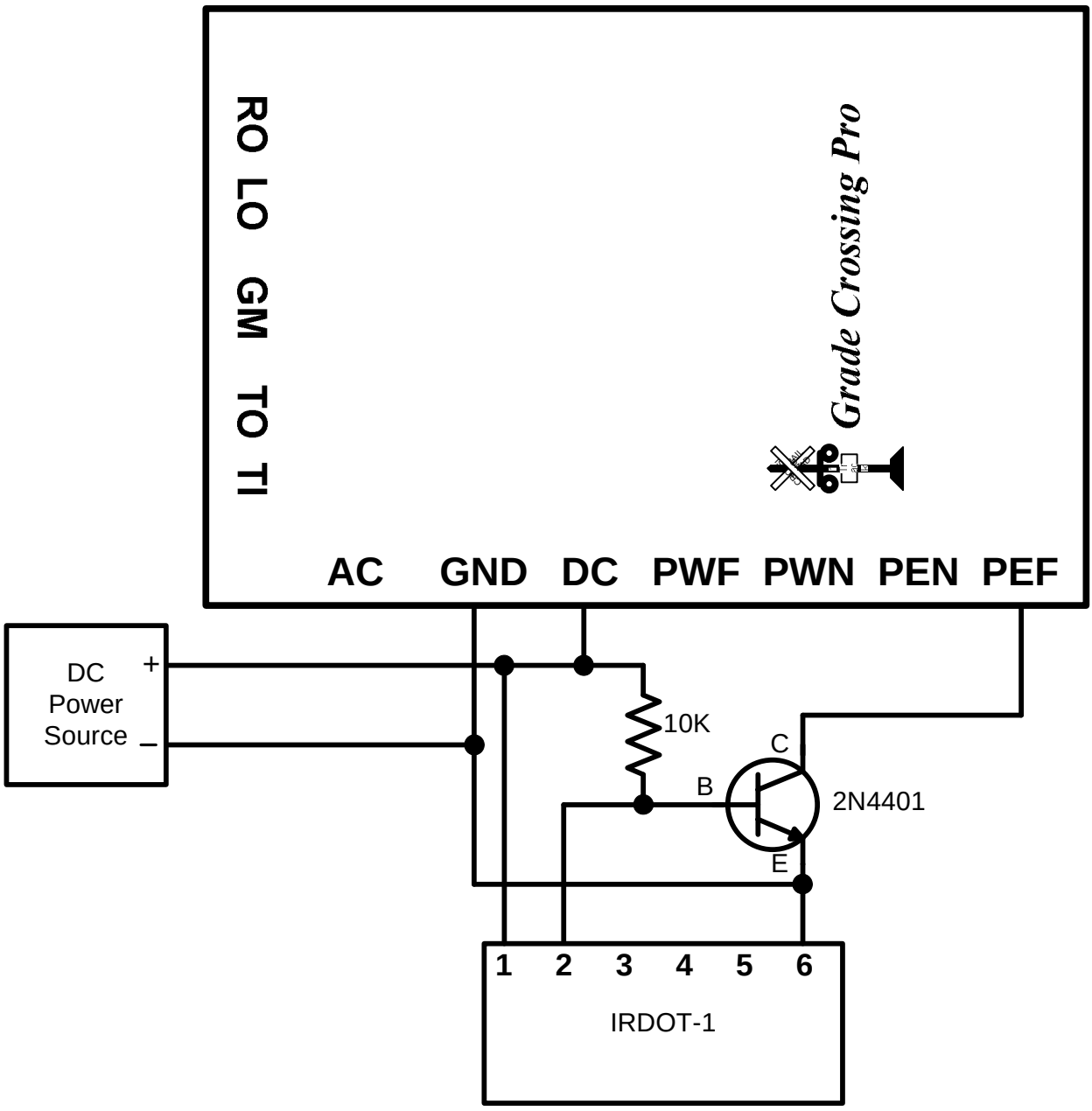
Introduction

This application note describes how to use Heathcote Electronics' IRDOT-1 IR detectors instead of the ***Grade Crossing Pro's*** (GCP) optical detection that uses photocells. This application note does not provide details on wiring your crossing signals and gates nor does it cover controlling a grade crossing bell module – these details are provided in the GCP instructions! Refer to the IRDOT-1 documentation for mounting instructions.

Illustrated below is a SINGLE instance of the circuitry to replace ONE of the photocells. You will need to replicate this circuitry for each of the four GCP photocell locations.



Circuit Operation

The nature of the GCP's photocell inputs is such that a covered photocell (i.e. very high resistance) is detected like an open circuit while an uncovered photocell (i.e. low resistance) is detected as close to 0 volts. The IRDOT-1's output is the opposite "polarity" of what the GCP requires. This is easily "fixed" with the inverter circuit consisting of a 10K ohm resistor (e.g. Radio Shack #271-1335) and an NPN transistor (e.g. Radio Shack #276-2058 or 276-2009). When the IRDOT-1's detector output is inactive the NPN transistor will turn "on" and provide close to 0 volts on the photocell input. When the IRDOT-1's detector output is active it will turn "off" the NPN transistor; the photocell input will essentially be an open circuit mimicking a covered photocell!

Photocell sensitivity setup

Each of the GCP's four photocell sensitivity adjustment potentiometers must be set to the "midway" point. This is easily accomplished by using the procedure detailed below.

1. You must have the GCP switch labeled SETUP in the ON/CLOSED position.
2. Insert the blade of a flat-blade screwdriver (from the edge of the circuit board, not from the center of the board) into the adjustment pots, one at a time. Turn the screwdriver completely **counter-clockwise** in each of the adjustment pots. Note the position/orientation of the screwdriver.
3. Rotate each potentiometer fully **clockwise** and note the position/orientation of the screwdriver.
4. Now rotate each potentiometer **counter-clockwise** until the screwdriver is approximately half-way between fully clockwise and fully counter-clockwise.
5. Place the SETUP switch in the OFF/OPEN position.

Technical Support

If you need further assistance with this application please do not hesitate to contact us by phone, fax, mail and email; our contact information can be found on the top of Page 1.