Grade Crossing Controller Assembly

Circuit board and components supplied in kits are RoHS compliant. Using RoHS-compliant (non-lead) solder will result in a finished board that is also RoHS compliant. If maintaining RoHS-compliancy is not important to you, you may use solder containing lead.

To avoid excessive heating of components, it is recommended that one lead of each component at a time be soldered, followed by some time for the component to cool. If multiple components are in the same step, go on to solder the same lead of the next component, to give the first component time to cool.

Component Order of Assembly

There is no mandatory order of assembly for components. However, the job may be a little easier by starting with the shortest components (ones that lie flattest on the board) and work towards the taller components.

Some components must be oriented correctly. These are described in the order of shortest to tallest:

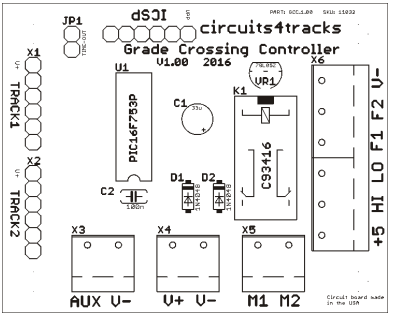


Figure 1

- Diodes D1 and D2
  Diode D2 is only used for kits with stall-motor output. Orientation is important. The cathode lead of each diode is marked by a dark band on the diode and this must be oriented so that it is at the same end as the line on the image on the circuit board.

- Integrated Circuit U1
  Pin 1 of the IC must be oriented at the end with the notch image on the circuit board. The end of the device with pin 1 will have a notch similar to the image, and may also have a dot next to pin 1. Compare the photo in Figure 2 with the layout shown in Figure 1.

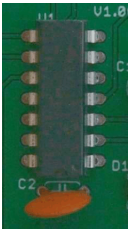


Figure 2

- Voltage Regulator VR1
  This voltage regulator must be oriented so that its package matches the image on the circuit board. Compare photo in Figure 3 with the image in Figure 1. The flat edge of the voltage regulator is at the top in both figures.


Figure 3

- Capacitor C2
  Orientation is not important. This is a flat disk capacitor with the number "104" on one side.

- Jumper JP1
  Orientation is not important.

- SIP Headers X1 and X2
  Orientation is not important.

- Screw terminal blocks X3, X4, X5, and X6
  X4 is for the power input and is green in colour.
  X3 is for auxiliary input (from another GCC for a multiple track crossing), and X5 is only used for kits with stall-motor output. Both of these are black in colour.
  X6 is for all other outputs and has six-positions. X6 is black in colour.

- Relay K1
  K1 is only used for kits with stall-motor output. Due to its pin spacing, there is only one way to install the relay.

- Capacitor C1
  This is the 33 µF capacitor and must be oriented so that its longer lead goes through the hole marked with a "+".

Warranty

Card and components are warranted against manufacturing defects for a period of 1 year from date of purchase. As the circumstances under which this kit is assembled and installed cannot be controlled, failure of the detector card due to assembly or installation problems cannot be warranted. This includes over-heating during assembly, 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.

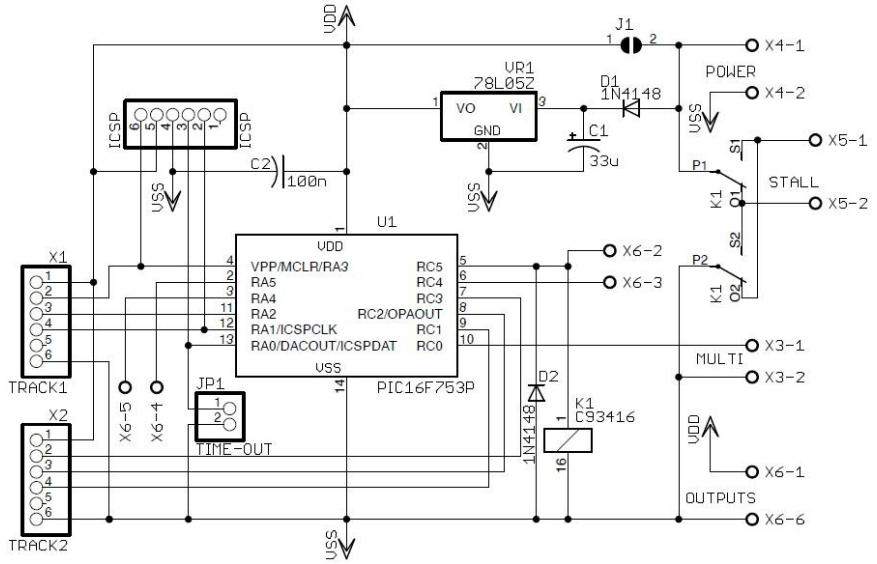
If the detector card fails for non-warranted reasons, it can be replaced with no questions asked for the cost of $22 plus shipping for an assembled card, or for $11 plus shipping for a replacement kit (fees subject to change).

Email to **circuits@daxack.ca** for information on warranty or non-warranty replacement.

Installation

See the enclosed installation instruction sheet.

Circuit Schematic



Component values:

C1	33µF, 35 volt electrolytic
C2	100 nF, 10 volt or greater capacitor
D1, D2*	1N4148
JP1	1x2 header
K1*	DPDT relay, 5 volt/40 mA coil, 2 Form C
U1	PIC16F753P
VR1	78L05Z regulator
X1, X2	1x6 header
X3, X4, X5*	2-position screw terminal block
X6	6-position screw terminal block *Three 2-position terminal blocks may be used in place of a 6-position*

* D2, K1, and X5 are only used for the stall-motor version.

If powering from a 5-volt regulated supply, D1, C1, and VR1 may be omitted and a solder bridge is created across J1.

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