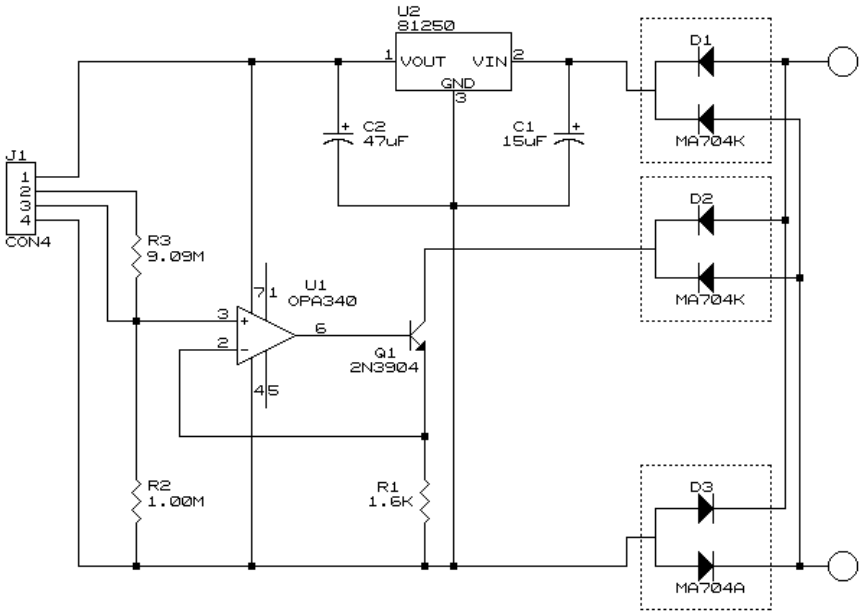
RCX Interface Brick

This device has been designed to speed and simplify adding your own sensors to the RCX. Since the RCX multiplexes the power and signal over a pair of unpolarised wires, it is necessary to correct for both polarity reversal and separate the signals. This sensor is intended to be connected to one of the RCX sensor inputs configured as an active light sensor.



Connector

Pin 1 – 5 volts DC ouput @ 10mA
Pin 2 – 0 – 5v x10 input
Pin 3 – 0 – 0.5v input
Pin 4 – ground

As can be seen from the accompanying schematic, the two double diodes, D1 and D3 constitute a bridge which provides undirectional power to the capacitor, C1. This unregulated power is converted to 5.0 Volts by U2 and filtered by C2. The double diode, D2, routes the signalling current to Q1, which is operated in constant current mode.

The input voltage, which may be optionally reduced by the x10 input attenuator, forces the op-amp, U1, to adjust the transistor's base voltage such that the voltage developed across the resistor, R1, equals it. Since this resistor is 1.6k, it follows that the current will be 0.3125mA at Vin = 0.5v. 0.3125mA is converted by the RCX to a light sensor reading of 100. Thus input voltages in the range 0 – 0.5v (or 0 5.0v) are converted to light sensor readings of 0 – 100.

If you have questions or comments, please direct them to me at barnes@sensors.com.