RADOVAN

PLUG READY INTERRUPTER MODULE (PRIM)

SPECIFICATION AND APPLICATION NOTES

Version 3/28/02

INTRODUCTION

Plug Ready Interrupter Modules (PRIM's) consist of a flag interruptable LED / photo transistor pair with mounting tabs and a plug which mates with standard 10 pin IDC ribbon cable connectors. These are possibly the easiest and most cost effective interrupter modules on the market today.

OPERATIONAL PARAMETERS

Beam aperture: 0.034 - 0.039”
LED voltage drop: 1.7vdc typ.
LED current: 20mA typ.
Photo transistor voltage range: 30 vdc max.
Photo transistor “on” current: 1.8mA typ.
A or B signal Max drive current (see fig. 2): 0.5mA (High), 1.0mA (Low).

Biasing resistor values as per figure 2.

Supply Voltage	R3, R4	R1, R2	Notes
5v	180 ohm	10K	TTL compatable
12v	510 ohm	24K	Not TTL compatable !
24v	1.1K	47K	Not TTL compatable !

CONNECTING CABLE

Two PRIMs can be connected to their interface circuitry with a single, easily manufactured ribbon cable assembly. The connecting cable consists of a 10 conductor ribbon cable with three industry standard 10 pin ribbon cable connectors placed as needed (one for each PRIM and one for the interface circuitry). This is possible because a PRIM can be plugged into the 10 pin connectors in two different ways (referred to as the A position and the B position, respectively).

Table 1: PRIM Plug in positions (please refer to figures 1, 5 and 6).

Position A

IDC Connector Pins	1	2	3	4	5	6	7	8	9	10
PRIM Pins	1	2					3	4		
Key Pins									X	X

Position B

IDC Connector Pins	1	2	3	4	5	6	7	8	9	10
PRIM Pins			1	2					3	4
Key Pins	X	X								

TYPICAL APPLICATION

The following steps outline a typical application using 2 PRIM's on a single connecting cable. When driving "LS" series TTL logic, typical A and B signals will measure 0.4vdc when the PRIM gap is blocked and 4.97vdc when clear. Individual results may vary and shielding of external light may be required.

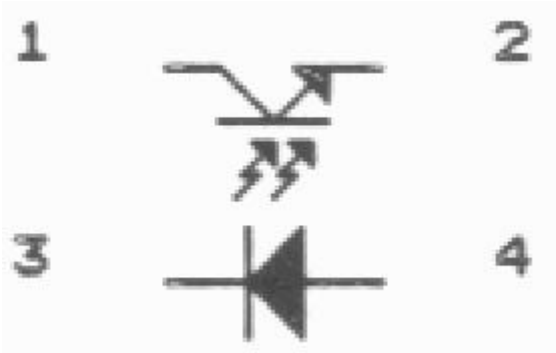
1. Add the following to your interface circuitry as shown in the schematic of figure 2.
    - Vcc = +5vdc supply
    - JP1 = 10 pin male "Berg" style shrouded header
    - R1 = 10K
    - R2 = 10K
    - R3 = 180 ohms
    - R4 = 180 ohms

2. Mount the two PRIMs to your application using size 4 mounting hardware and the hole patterns of figures 7 or 8.

3. Plug the connecting cable into both PRIMs and the interface circuitry.
    - Make sure that one PRIM is in the A position and the other PRIM is in the B position (see table 1 and figures 5 and 6).
    - Make sure that PRIM orientation points face the same side of the connector as the pin 1 arrows of those connectors.

4. You are ready to power up and use the PRIM's.

Figure 1: PRIM schematic



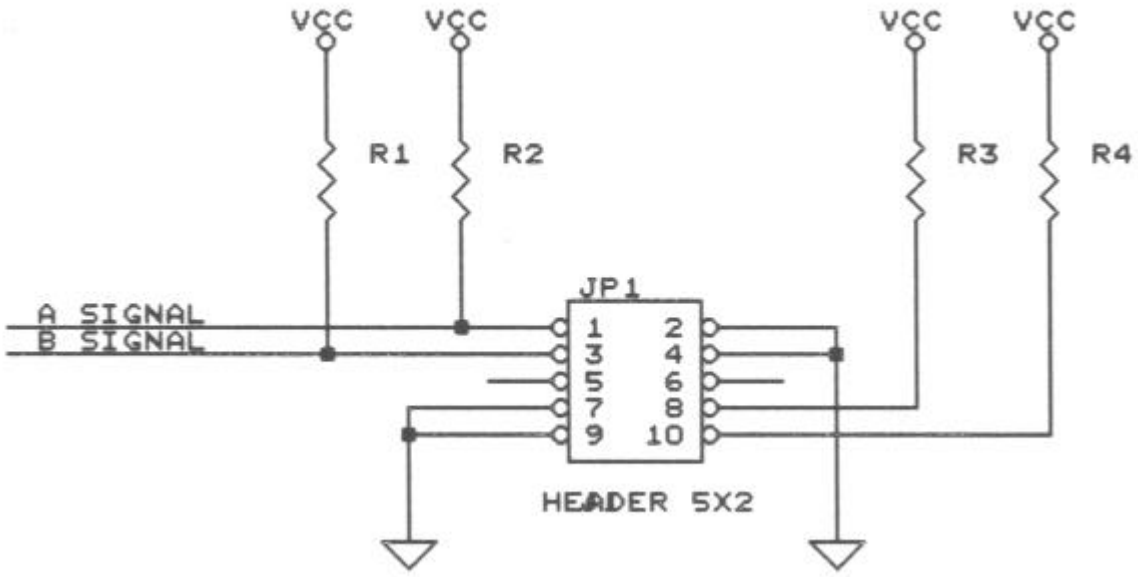
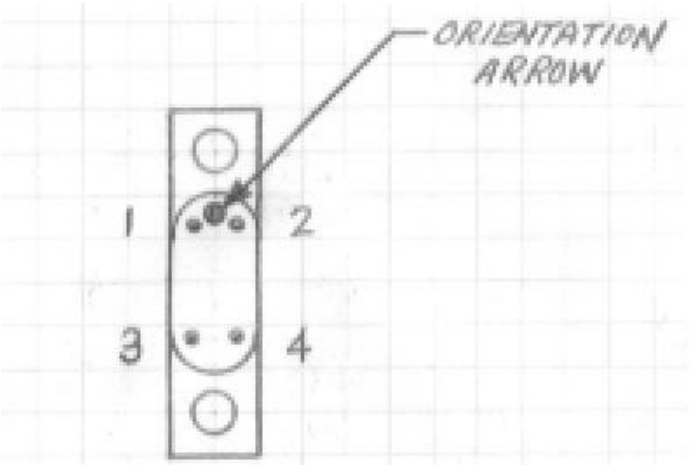
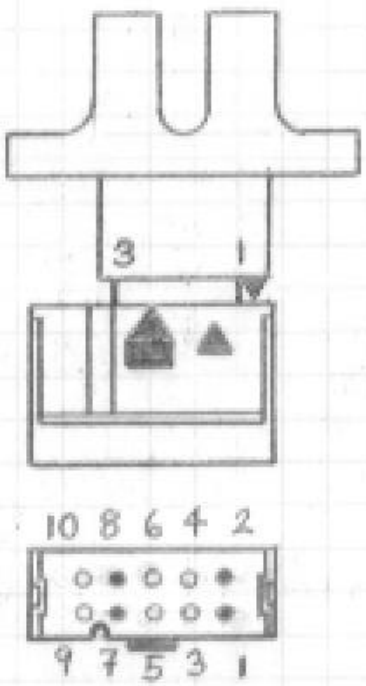


Figure 2: Typical PRIM interface.

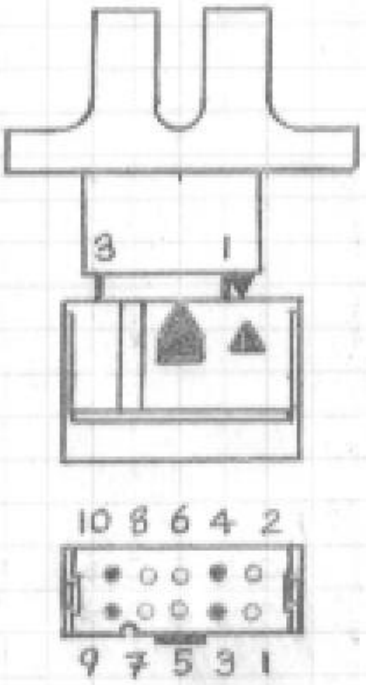


PINOUTS



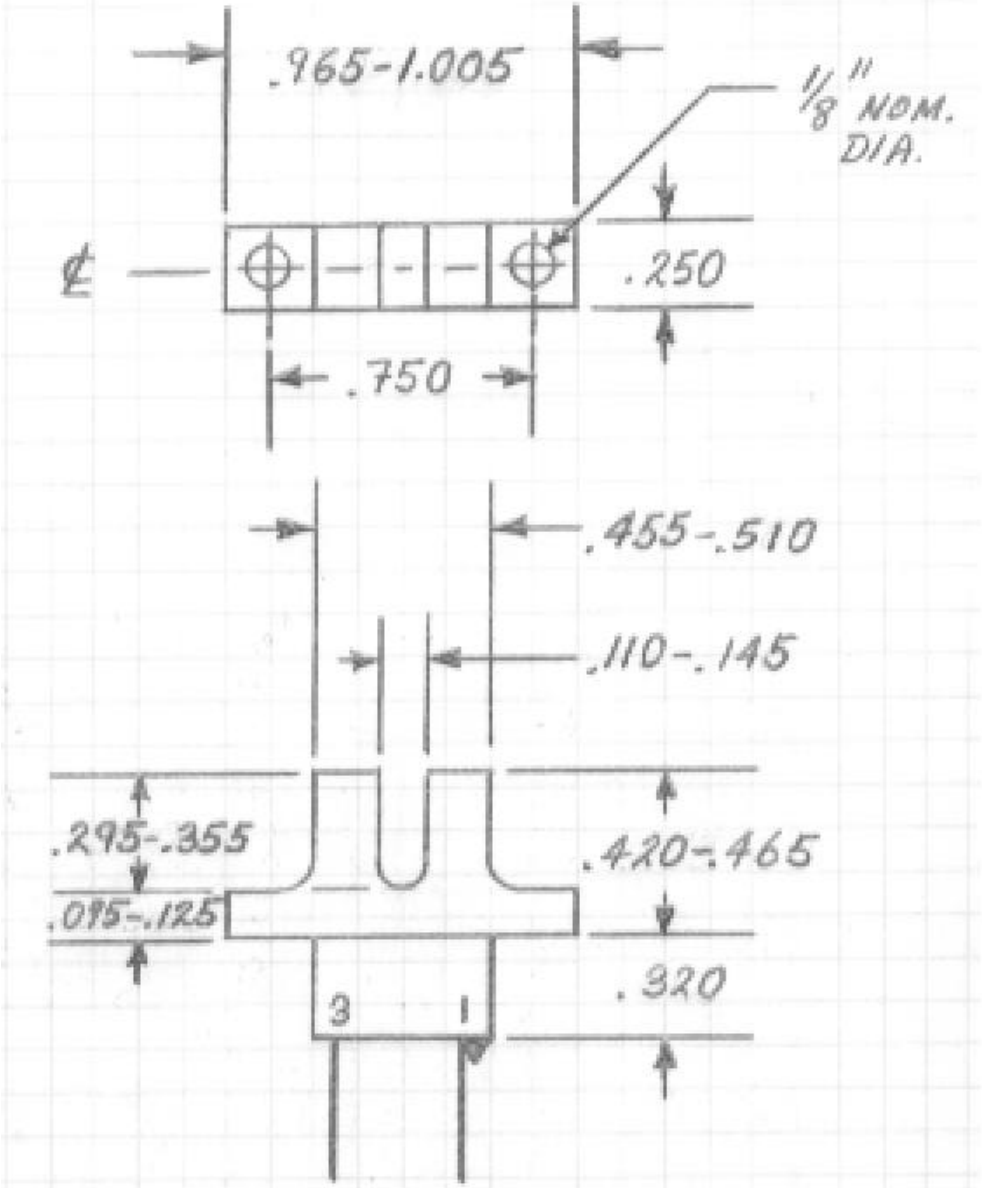
"A"

POSITION



"B"

POSITION



SWITCH DIMENSIONS

FLAG MATERIAL

Many different types of materials will work as a “flag” to pass through a PRIMs gap and interrupt its light beam. It is important however, that the flag block the beam completely. Completely opaque materials such as sheet metal, aluminum and opaque plastics will work fine. Thinner materials such as paper, thin plastics or translucent plastics will not block the beam.

NOISY ENVIRONMENTS

Although it is unnecessary for most applications, electromagnetic or optical shielding may be required where that type of “noise” is excessive. If this is occurring in your application or you suspect that it is because of random false signal switching, we recommend that you try one or more of the following:

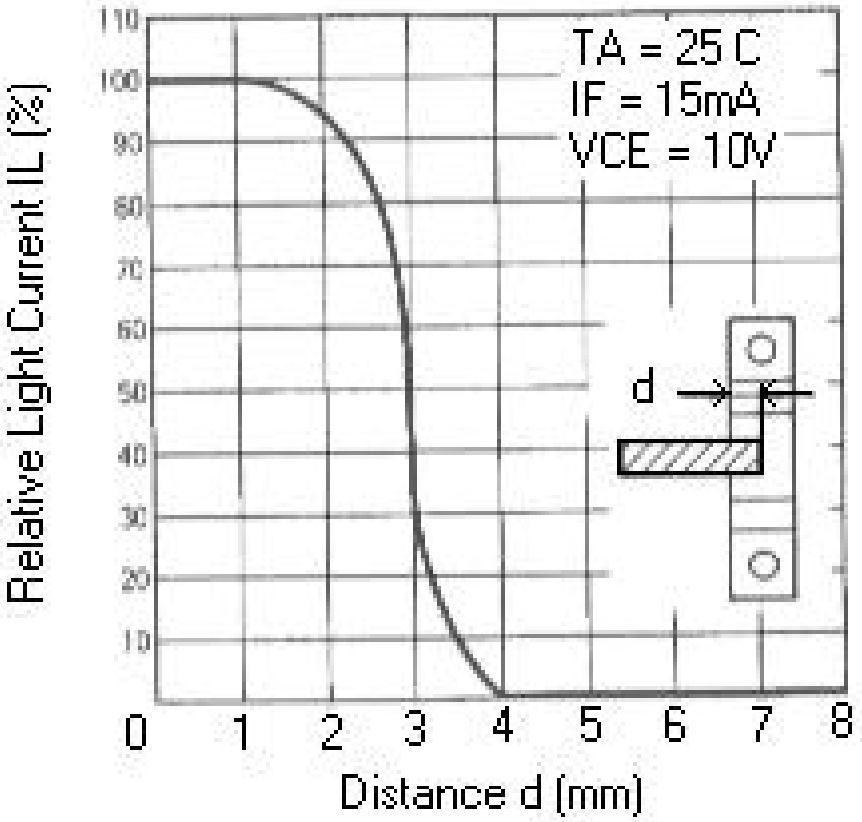
- Keep cable lengths as short as possible.
- Shade the PRIM’s gap from external light as much as possible.
- Use interface logic with input hysteresis.
- Use shielded flat cable.

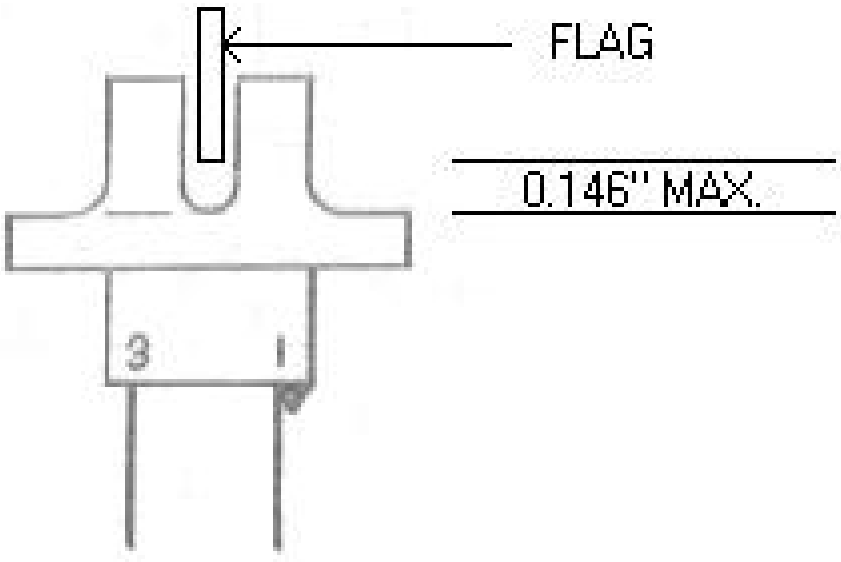
CONNECTOR KEYING

Keying the connectors insures that each PRIM is plugged into its proper A or B position. Respective key locations for the A and B positions are listed in table 1. Note that due to the PRIM symmetry, connector keying will establish A and B positions only. Orientation of the part is dependent upon the position of the molded orientation point.

Connector key pins are available from Radovan Robotics. To install a key pin, hold the large tab between your thumb and fore finger and insert the small key into its appropriate location on the connector. When it is fully inserted, gently break off and dispose of the large tab.

Sensing Position (Typical)





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