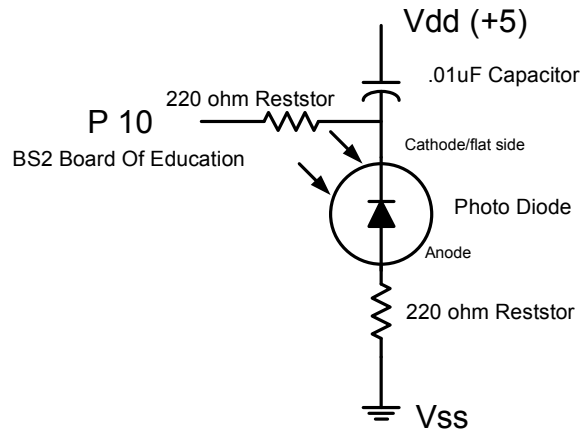


Quantity	Part
1	Photo Diode
	Optek Tech. #OP999
	Jameco #1872441
1	.01 uF capacitor (104)
2	220 ohm resistor



The OP999 is a PIN type photo diode and has an intrinsic(I) layer between the P and N layers. This photo diode shuts off in the dark using this circuit resulting in a display of 00000. The displayed number jumps from 00000 to 60000 at a very low light level. Bright light results in a low number displayed. This is an inverse reading sensor. As the graph indicates, this diode is very sensitive in the infra red range. The red and lower ranges (colors) have a response that can be used, but in it's normal IR range it is 100's of times more sensitive.

REVISIONS	
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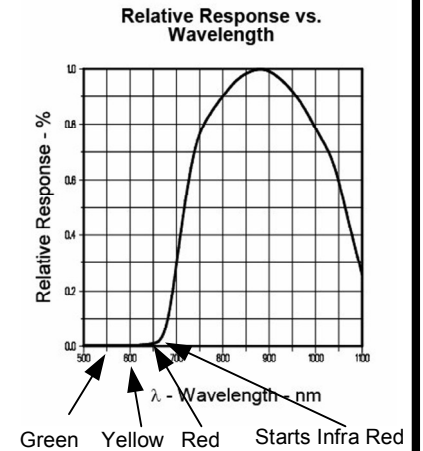
```
'-----[ Title ]-----
' Photo Diode RCTime Display Simple Sample
' Displays the R/C discharge
' {$STAMP BS2}
' {$PBASIC 2.5}
'-----[ I/O Definitions ]-----
PhotoCircuit CON 10
'-----[ Variables ]-----
PhotoVal VAR Word ' Stores measured RC times
'-----[ Initialization ]-----
DEBUG CLS ' Open, clear Debug window
'-----[ Main Code ]-----
DO
    ' Measure RC time for photo diode.
    HIGH PhotoCircuit ' Set to output-high.
    PAUSE 3 ' Pause for 3 ms
    RCTIME PhotoCircuit,1,PhotoVal ' Measure R/C time
    DEBUG HOME, " Light value = ", DEC5 PhotoVal, CR
    'Display
    'RC time measurements
    'using DEBUG Terminal.
LOOP
```

Note
A TV tuner can be used as a test source of Infra Red.

When testing the circuit and diode, the bottom and sides of the diode must be shielded from all light. This is best done using Parallax #350-90000 and #350-90001 for the sensor diode and the complete assembly #350-00017 for the IR source. If testing for spectral response or intensity sensitivity keep all ambient light away from the test. Use a dark box or black tube.

```
'-----[ Title ]-----
' Photo Diode RCTime Display with Reading Corrections
' Displays the R/C discharge
' {$STAMP BS2}
' {$PBASIC 2.5}
'-----[ I/O Definitions ]-----
PhotoCircuit CON 10
'-----[ Variables ]-----
PhotoVal VAR Word ' Stores measured RC times
PhotoVala VAR Word
'-----[ Initialization ]-----
DEBUG CLS ' Open, clear Debug window
'-----[ Main Code ]-----
DO
    ' Measure RC time for photo diode.
    HIGH PhotoCircuit ' Set to output-high.
    PAUSE 3 ' Pause for 3 ms
    RCTIME PhotoCircuit,1,PhotoVal ' Measure R/C time
    IF PhotoVal =0 THEN PhotoVal=10000 ' corrects for dark reading.
    PhotoVala=10000 - PhotoVal ' Results in a 0 to 10000 reading.
    DEBUG HOME, " Light value = ", DEC5 PhotoVala, CR
    'Display
    'RC time measurements
    'using DEBUG Terminal.
LOOP
```

Photo Diodes are operated in reverse Bias. They have the anode connected to - and cathode connected to +.



TITLE		
Infra Red Photo Diode Infra Red Sensor at 890 nm For Parallax BS2 using RC time measurement.		
DATE 3-20-2010	SCALE none	Parallax BS2 program provided.
DRAWN BY Paul Ashley	PAGES 1 of 1	www.robo-works.net