IRF80 --- Infrared Range Finder

Overview

IRF80 is an infrared range finder module consisting of a GP2Y0A21YK reflective optical sensor module, which emits infrared light to detect the reflective infrared intensity and an Analog-to-Pulse (A2P) Converter board. The A2P Converter board converts the analog output of GP2Y0A21YK into pulse width. By measuring the pulse width, the analog readings can be obtained with the PulseIn command. The analog output can also be read directly with the command GetADC command from the I/O Extender module. The recommended detection range is 10~80cm.



Analog to Pulse (A2P) Converter

Applications

- Short distance range finding
- Proximity detection for collision
- Contactless switch

Features

- Measurement not affected by the color of object
- Analog to Pulse (A2P) converter module available
- Recommended detection range 10~80cm
- Input voltage 5V
- Compact size for tight space

Connection

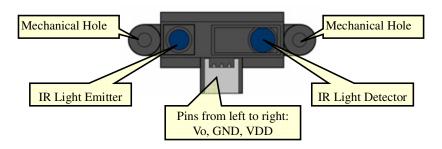


Figure 1 GP2Y0A21YK Description



Figure 2 A2P Board Description

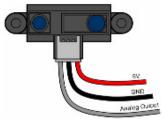


Figure 3 Connecting GP2Y0A21YK for analog output

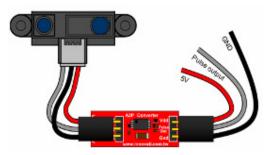
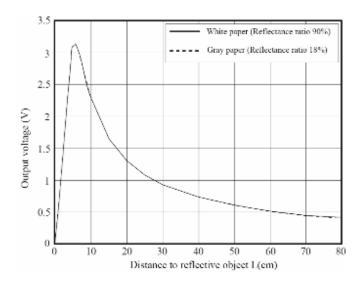


Figure 4 Connecting GP2Y0A21YK with A2P for pulse output



Specifications

Figure 5 GP2Y0A21YK Voltage vs. Distance Characteristic Curve

A2P Pulse Duty

Instead of connecting the analog output to an AD converter to get the GP2Y0A21YK analog voltage value, use the A2P Converter module to measure the pulse width directly. The pulse is emitted every 10ms (1ms=1/1000 sec). The low pulse width represents the analog voltage value. Its width varies from 0 to 4096 us (1us=1/1000 ms) with 2us resolution.

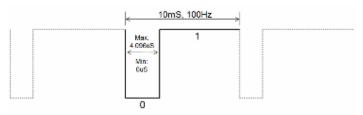


Figure 6 A2P Pulse Duty

The conversion formula is:

Width = Vi(analog input) / Vdd x 4096 (us)

Assuming the analog voltage output from GP2Y0A21YK is 3V and the supplied voltage is 5V. Applying the above formula:

 $3 / 5 \times 4096 = 2457.6 \rightleftharpoons 2458$ (us)

the low pulse width will be 2458us.

Dimensions

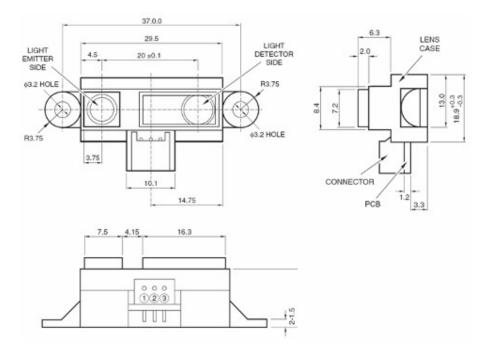


Figure 7 GP2Y0A21YK Dimensions

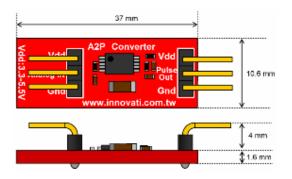


Figure 8 A2P Board Dimensions

Example Program

Example I

Use PULSEIN command to read GP2Y0A21YK analog output data through A2P module. Connect the GP2Y0A21YK to A2P board. Then connect the Pulse Output pin of A2P to BASIC Commander[®] pin 0 to measure the pulse width.

| Sub mair | ו() | |
|----------|---------------------------------|----------------------|
| Dim temp | o As Word | |
| Do | | |
| | Pulsein 0,0,temp | 'measure pulse width |
| | Debug "Input Signal =", Temp,CR | 'display pulse width |
| | Pause 100 | 'wait 100ms |
| Loop | | 'infinite loop |
| End Sub | | |

Example II

Use GETADC command of I/O Extender to measure GP2Y0A21YK analog output directly. Set the DIP switch of the I/O Extender module to 0 and connect it to the BASIC Commander[®]. Then connect the Analog Output pin of GP2Y0A21YK to I/O Extender pin PA0.

| Peripheral MyIO As IOExtenderA @ 0 | 'declare module ID as 0 | | |
|------------------------------------|------------------------------|--|--|
| Sub main() | | | |
| Dim temp As Word | | | |
| MyIO.SetADC 1 | 'start pin PA0 AD conversion | | |
| Do | | | |
| MyIO.GetADC 0,temp | 'read AD value | | |
| Debug "Input Signal =", Temp,CR | ʻdisplay AD value | | |
| Pause 100 | 'wait 100ms | | |
| Loop | 'infinite loop | | |
| End Sub | | | |