Basic Express BX-35
Application Note

Interfacing Infrared Sensors to BasicX Systems

Introduction

This application note describes the hardware and software required to interface a Sharp infrared sensor to a BasicX BX-35 system.

The Sharp GP1U52X infrared detector (Radio Shack #276-137) is designed to receive modulated IR data signals from most handheld IR remotes. The sensor demodulates a 40 kHz IR signal and converts it into a serial data stream. By connecting the device to the input capture pin of a BX-35 system (pin 20), this steam of data can be captured and saved as an array of integers. The array can then be transformed into unique command codes.
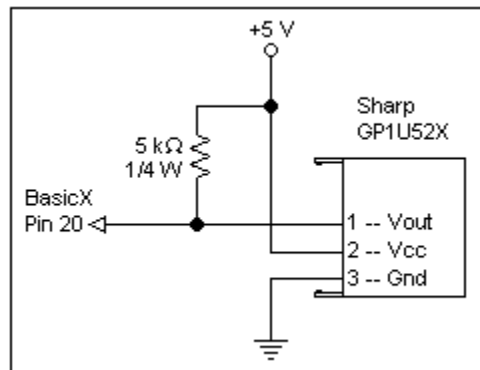

Figure 1

Hardware interface

As shown in figure 1, interfacing the Sharp IR detector to the BasicX requires only one 5 kΩ resistor and three wires. You can solder the resistor to the back of the IR unit and eliminate the need for a separate circuit board. The device also requires a stable 5 volt supply for reliable operation.

Example programs

There are three example programs that accompany this application note. Each program senses a pulse stream and uses the BasicX Com1 serial port to send the results to the PC. These are the filenames for the programs:

IRcapture.bas	Displays the pulse widths of an InputCapture data stream
IRbinary.bas	Converts IR code to sequence of 15 binary digits
IRcodes.bas	Converts IR code to 16-bit number

Program IRcapture is useful if you have an unknown IR source. IRcapture doesn't depend on any particular encoding scheme -- the program just displays the pulse widths it sees. Pulse widths are in units of microseconds.

Programs IRbinary and IRcodes are designed to read the IR data codes from Sharp VCR remote controls. If you don't already have a compatible Sharp remote, it is recommended that you purchase a programmable universal remote control (about $10 to $25) and set it to VCR universal IR code 048. This way you immediately see results from the various IR example programs without the need to alter the example code.

If the program doesn't work correctly, you might try using different IR codes, since standardization varies among manufacturers. Some users report that code 012 works with the example programs.

Warning -- if you connect the sensor to the input capture pin and call procedure InputCapture to read the IR data, you should avoid using the Com2 serial port because of conflicts with Timer1. This applies to all 3 example programs.

For more information about the Sharp GP1U52X infrared detector, see:

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http://support.tandy.com/support_supplies/doc3/3313.gif
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