gtbtech.com
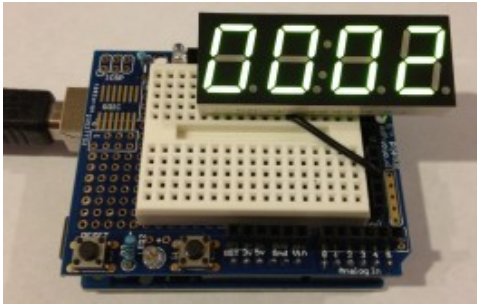
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Oasis TOFD-5465GGH-B 4 Digit LED with PT6961 Controller

January 22 2013 by gblanton in Arduino |36 Comments

Introduction

The TOFD-5465GGH-B is a 4 digit 7 segment display with a PT6961 LED driver embedded on the back. I found these on Ebay for 10 for $10 plus shipping. Ended up being about $1.30 each. The PT6961 is an LED driver with a SPI interface which means you can talk to it with any microcontroller (PIC, STAMP, Arduino, etc.) I used both a PIC 18F458 & Arduino Uno to communicate with it. Very little information was available on these displays and I owe a thanks to some members of the http://forum.43oh.com forum for pointing me in the right direction. Below are the details regarding the implementation with an Arduino Uno controller.

Pinout

 The pinout for the display is shown below. Pin 1 is the pin closes to pin 1 on the PT6961. This is the left most pin when the display is face down with the pins down.
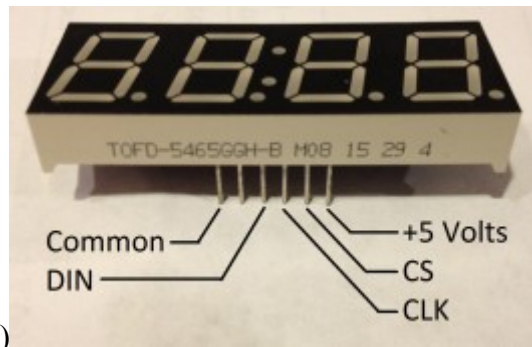
1. Power (+5 Volts)
2. Chip Select (Active Low)
3. Clock
4. DIN
5. DOUT
6. Common

The chip select is active low meaning that it must be pulled low to enable the chip for communications. The clock signal is used to load data into the display and the PT6961 reads data on the rising edge of the clock pulse. The data in pin shift data into the display LSB first. Please refer to the data sheet on the PT6961 for more information.

Segment Mapping
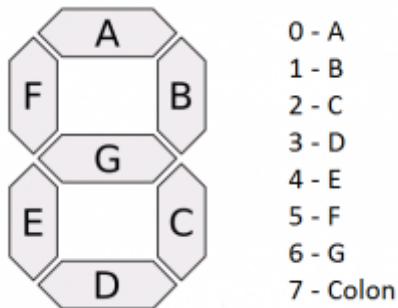
 The PT6961 controller uses display RAM to store the data that is transferred from the external device (Arduino). This dispay RAM is mapped to the LED segments. The LED display uses the RAM at addresses 0xC0 (segment 1), 0xC2 (segment 2), 0xC4 (segment 3), and 0xC6 (segment 4). Each bit at the address represents a segment on the display. The segment map is shown below. The decimal points do not appear to be connected to the LED display. The colon segments are controlled from the 7th bit of 0xC0 and 0xC2.

Program

 Below is a sample program using the Arduino Uno. I wrote a PT6961 driver for the Arduino which is available for download below.

```
 1 #include
 2 // Pin 2 = CS
 3 // Pin 3 = CLK
 4 // Pin 4 = DIN
 5 PT6961 LED(4, 3, 2);
 6 void setup()
 7 {
 8     LED.initDisplay();
 9     Serial.begin(9600);
10 }
11
12 void loop()
13 {
14     //count through 0-9,a-f
15     for(int i=0; i&lt;16; i++)
16     {
17         LED.sendDigits(0,0,0,i,0);
18         Serial.println(i);
19         delay(500);
20     }
21 }
```

PT6961 Library

This library has not been well tested, so please post any problems or comments here.

PT6961(int DIN, int CLK, int CS);

PT6961 is the constructor for the library. This is called at the first of the program and the pins used for communications are assigned.

void initDisplay();

This function is called in the setup routine of the Arduino program to initialize the display driver.

void initRAM();

This function is used to clear the display RAM in the PT6961.

void sendCmd(char cmd);

This function is used to send commands to the PT6961. A listing of the commands enumeration is shown below

- _AUTO_INCREMENT – Auto increment display RAM
- _FIXED_ADDRESS – Fixed display RAM address

- _DISPLAY_OFF – Turn display off
- _DISPLAY_1_16 – Turn display on 1/16 cycle
- _DISPLAY_2_16 – Turn display on 2/16 cycle
- _DISPLAY_4_16 – Turn display on 4/16 cycle
- _DISPLAY_10_16 – Turn display on 10/16 cycle
- _DISPLAY_11_16 – Turn display on 11/16 cycle
- _DISPLAY_12_16 – Turn display on 12/16 cycle
- _DISPLAY_13_16 – Turn display on 13/16 cycle
- _DISPLAY_14_16 – Turn display on 14/16 cycle

void sendNum(int num, char colon);

This function is used to send a number and enable the colon. Parameters are num (0-F) & colon (0=off; 1=on)

void sendDigits(char digit1, char digit2, char digit3, char digit4, char colon);

This function is used to send a number as individual digits. Parameters are digit1 (0-F), digit2 (0-F), digit3 (0-F), digit4 (0-F), & colon (0=off; 1=on)

Downloads

PT6961 Arduino Driver

PT6961 Driver

PT6961 Data Sheet

PT6961 Datasheet

36 Comments

- *mark* says:
  February 1, 2013 at 5:12 pm

  You are absolutely right about "Very little information was available on these displays" I've been looking forever but its awesome to see your pin out with a picture but i was wondering if you knew how to code it for my basic stamp 2 in Pbasic , Ive been trying to get this thing to work for weeks and still havent got it to work
  thanks
  Mark
  Email – Mark0505@live.com

  Reply

- *gblanton* says:
  February 1, 2013 at 6:35 pm

  @mark