Hints and sample code for DA5

This document contains hints and sample code for interfacing the ATmega328p with the LCD and keypad. These instructions use the 1602F LCD and the 96ab2-152-F 3x4 keypad. Again, if your keypad differs, the same principles still apply.

LCD:

The 1602F is a 16x2 display which has 16 characters for each of 2 lines. The datasheet is posted on WebCampus: LCD_HY-1602F.pdf (for the LCD module): specifications for the chip (including some setup instructions).

See the datasheet for the physical layout of the pins and the pin numbering. For the provided code, connect the 8 data pins (DB0-7, physical pins 4-11) to PORTB.0-7. Connect the control pins (RS, RW, and EN) to PORTC.0-2, respectively.
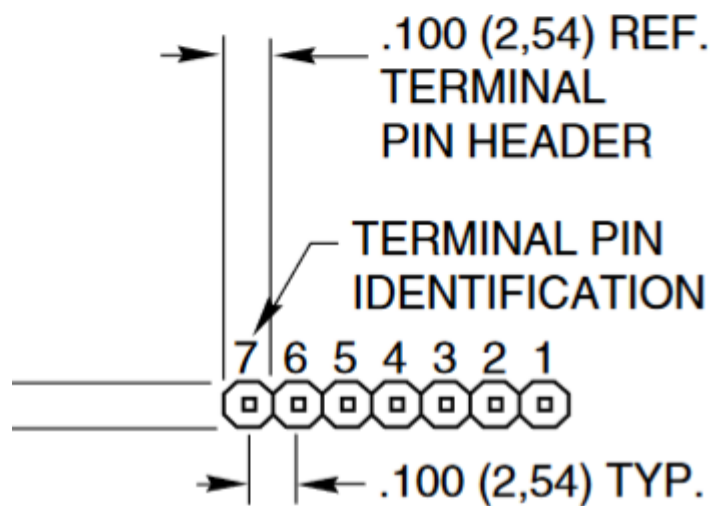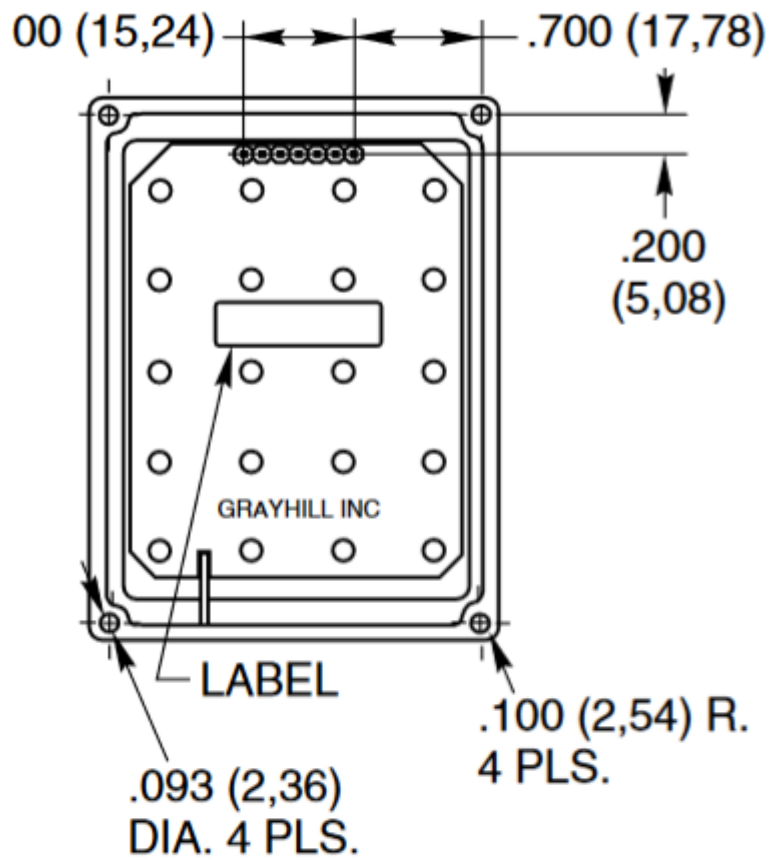
A few hints and reminders when connecting the LCD module:

- Be sure to connect power (5V) and ground (pins 2 and 1, respectively).
- Connect a 10kΩ – 20kΩ variable resistor between power (5V) and ground. Then connect the center terminal to pin 3 of the LCD module to control the brightness of the LCD letters.
- Pins 15 and 16 of the LCD module are used for the backlighting. Pin 15 is the anode (positive supply terminal) and pin 16 is the cathode (negative supply terminal). Connect them to power (pin 15) and ground (16) through a 150 Ohm resistor.

See **LCDExample.c** (posted on WebCampus) for sample code.

Keypad:

Here are some diagrams from the datasheet showing the pinout and the connections.

00 (15,24) — .700 (17,78)

.200
(5,08)

GRAYHILL INC

LABEL

.100 (2,54) R.
4 PLS.

.093 (2,36)
DIA. 4 PLS.

.100 (2,54) REF.
TERMINAL
PIN HEADER

TERMINAL PIN
IDENTIFICATION

7 6 5 4 3 2 1

.100 (2,54) TYP.

12 Button Keypads

3x4	MATRIX CODES																
BUTTON LOCATION	Standard							Shielded/Backlit									
	5	6	7	1	2	3	4	6	7	8	2	3	4	5	1	9	10
1	•			•				•			•						
2		•		•					•		•						
3			•	•						•	•						
4	•				•			•				•					
5		•			•				•			•					
6			•		•					•		•					
7	•					•		•					•				
8		•				•			•				•				
9			•			•				•			•				
10	•						•	•						•			•
11		•					•		•					•			•
12			•				•			•				•			•
	5	6	7	1	2	3	4	6	7	8	2	3	4	5	1	9	10
	TERMINAL LOCATION																

Shielded keypad = Shielded
Backlit keypad = NC
Shielded and backlit keypad = Shielded

Shielded keypad = NC
Backlit keypad = EL Panel 1
Shielded and backlit keypad = EL Panel 1

Shielded keypad = NC
Backlit keypad = EL Panel 2
Shielded and backlit keypad = EL Panel 2