

# Graphing Thermometer Project Support Documentation



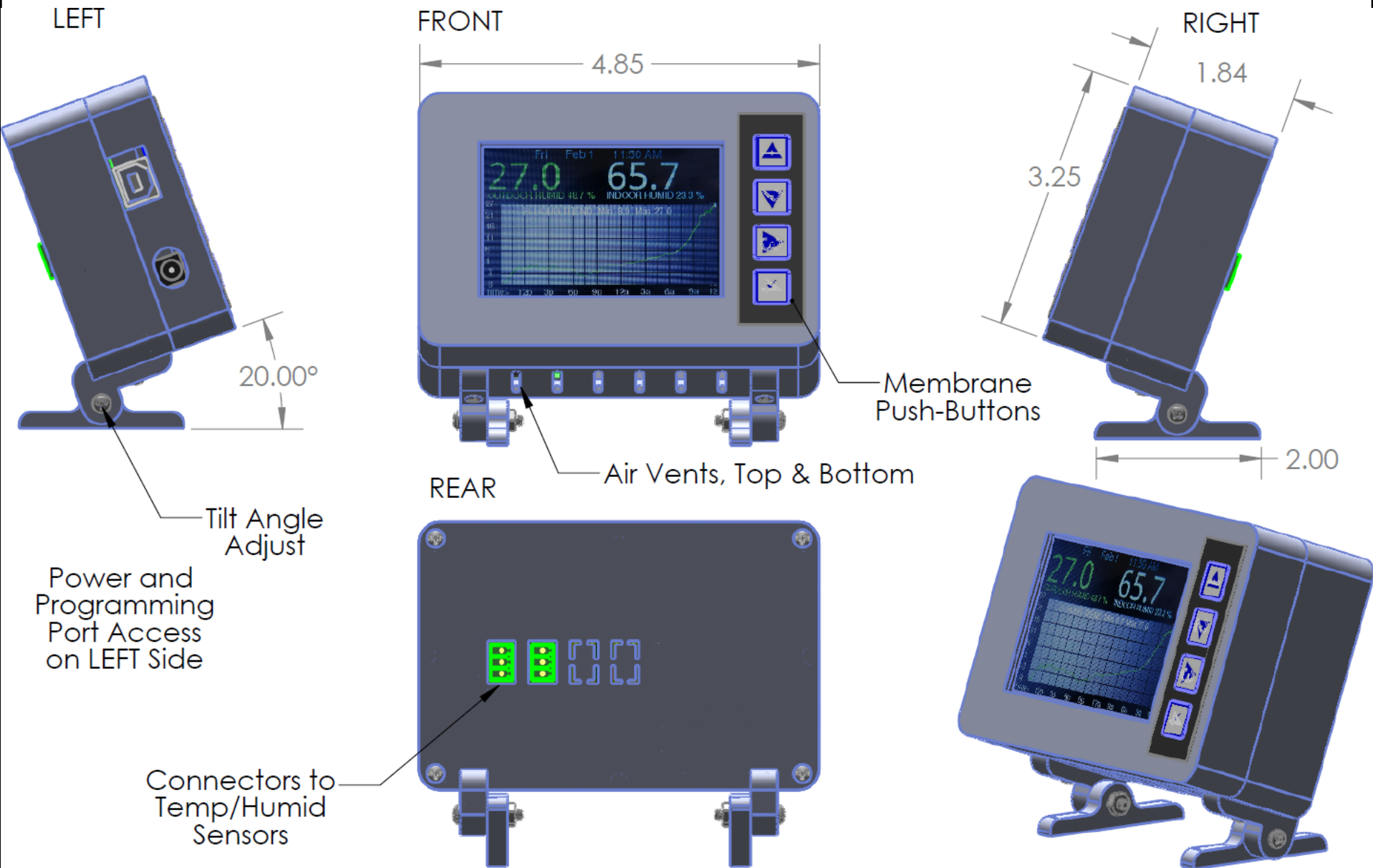
This Support Document first released for use with  
*Graphing\_Thermometer\_V3\_10.ino* code set.

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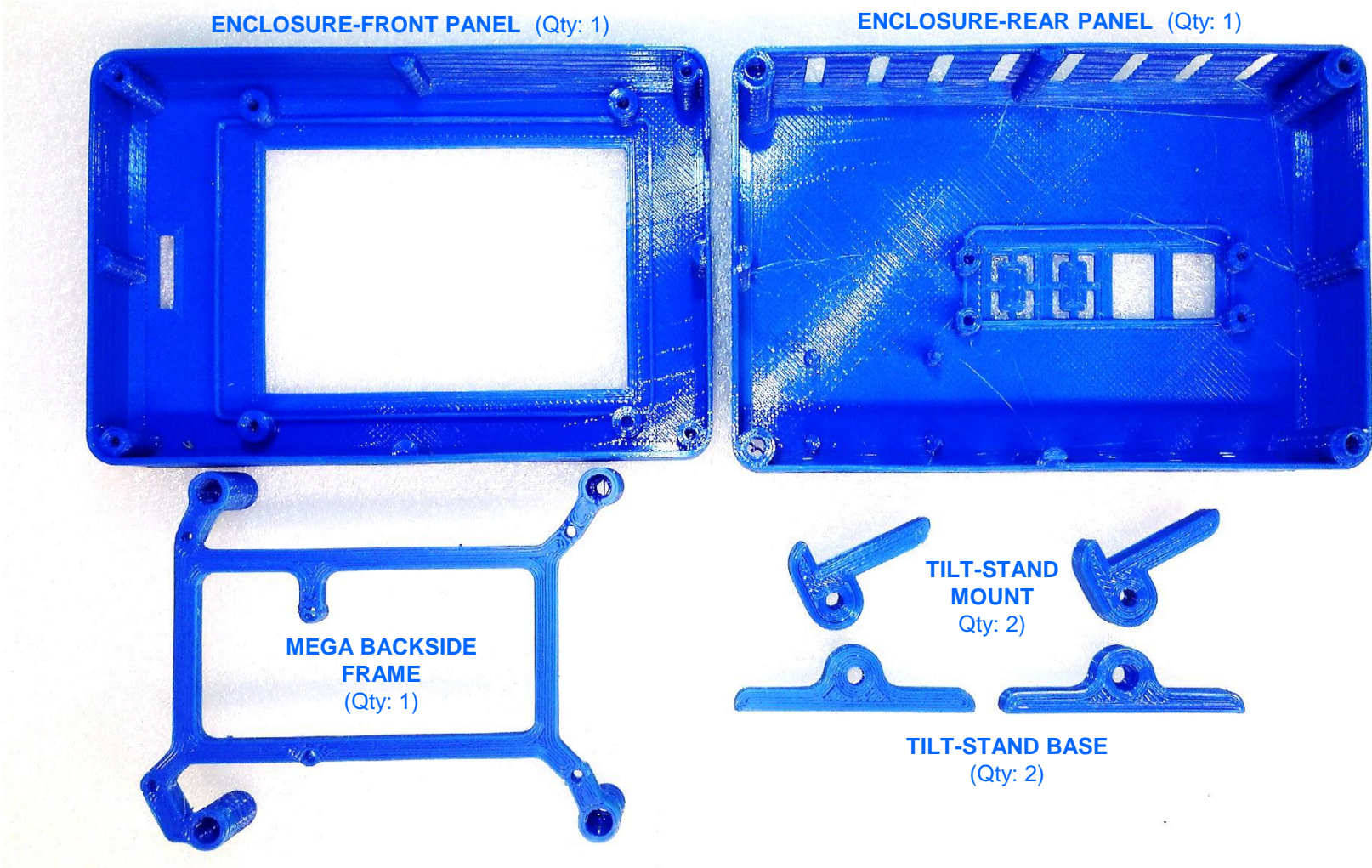




# Enclosure Overview

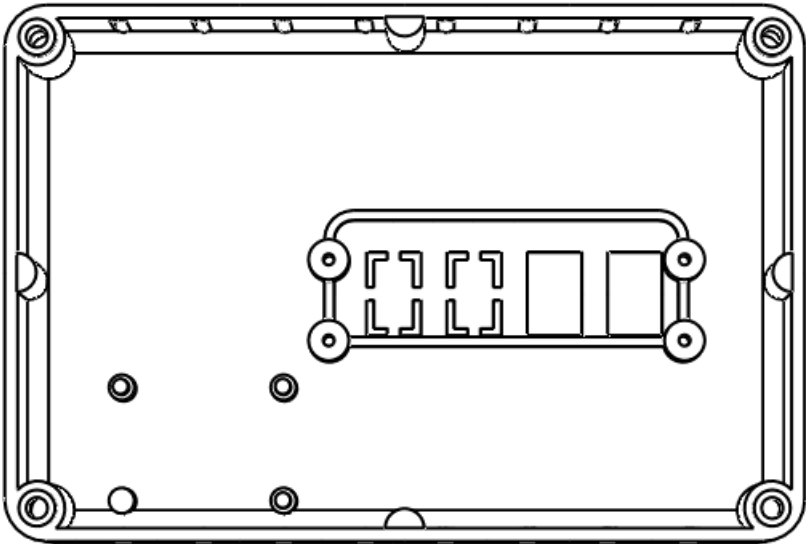


# 3D Printed Enclosure Parts Overview

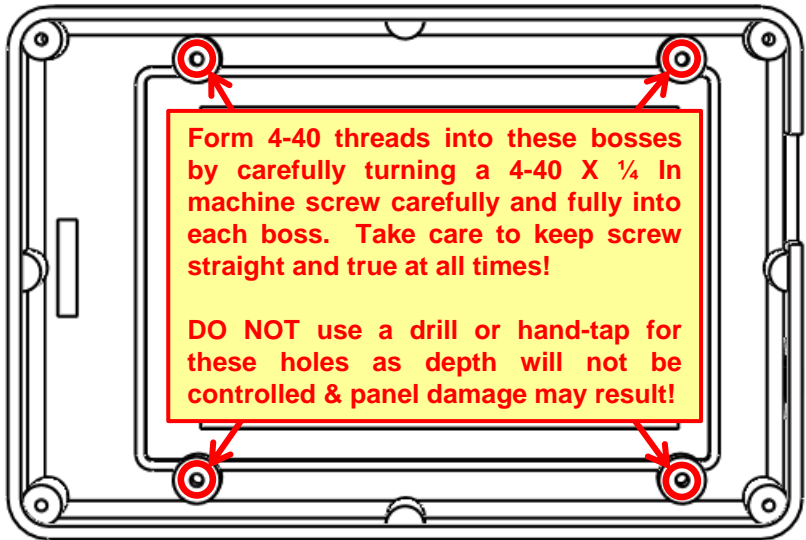


# 3D Parts Tapping Guidelines

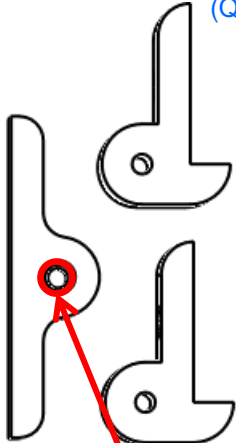
ENCLOSURE-REAR PANEL (Qty: 1)



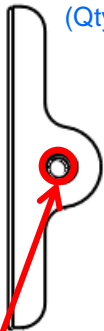
ENCLOSURE-FRONT PANEL (Qty: 1)



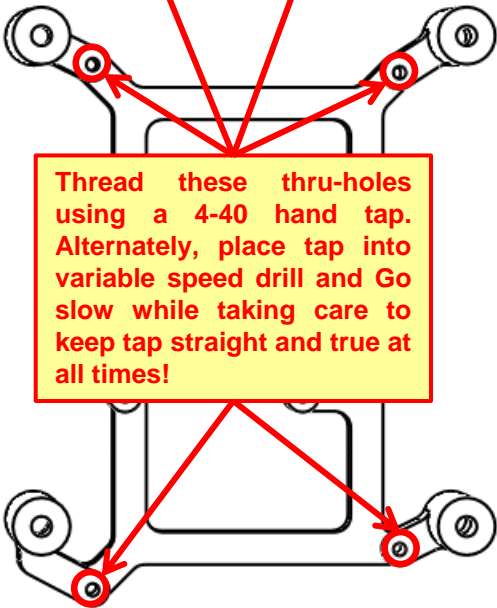
TILT-STAND MOUNT (Qty: 2)



TILT-STAND BASE (Qty: 2)

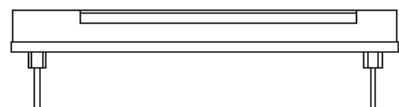
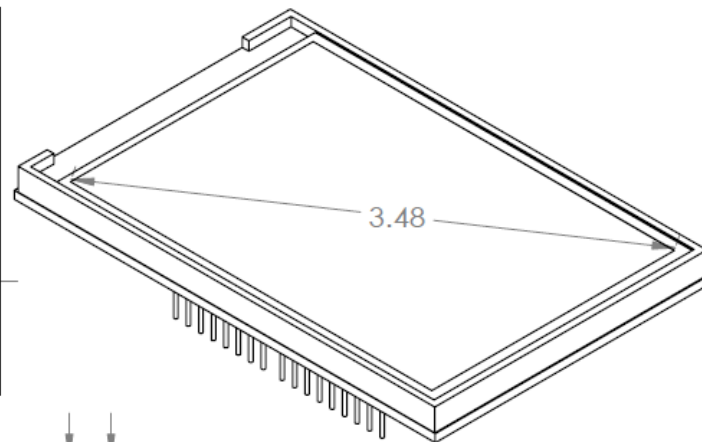
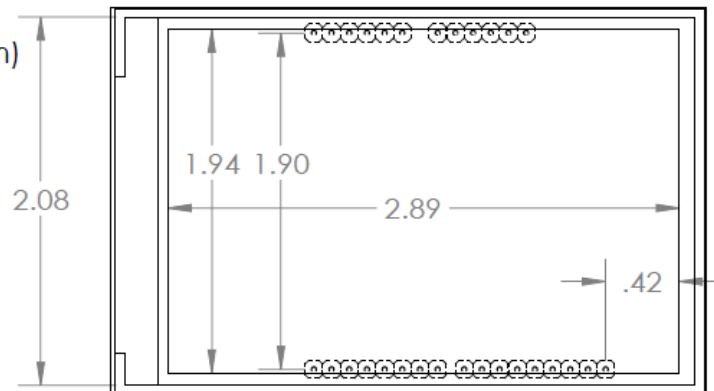


MEGA BACKSIDE FRAME (Qty: 1)

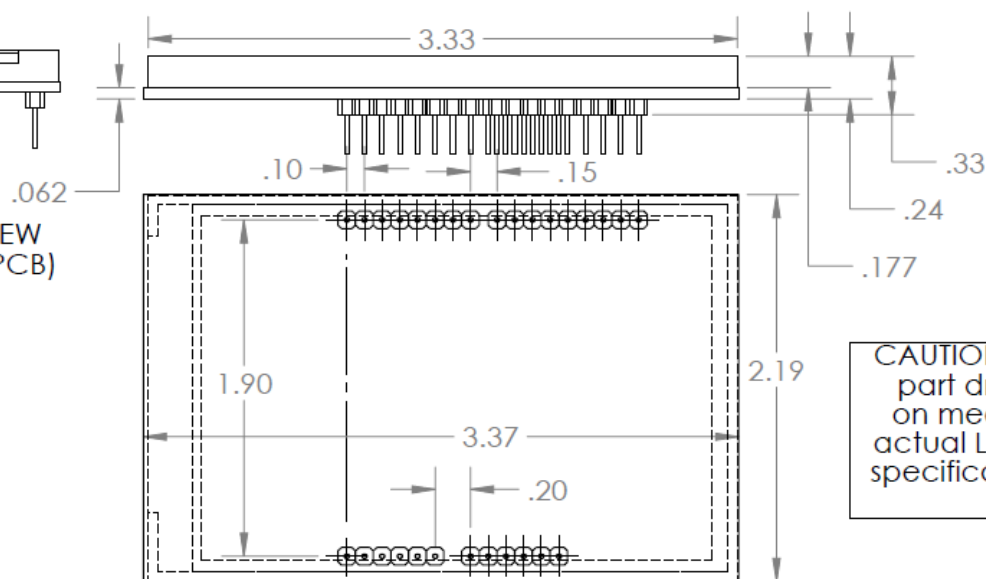


Thread these thru-holes using a 4-40 hand tap. Alternately, place tap into variable speed drill and Go slow while taking care to keep tap straight and true at all times!

TOP VIEW  
(looking at Screen)



BOTTOM VIEW  
(looking at PCB)



CAUTION: This SolidWorks model and part drawing was created based on measurements taken off of an actual LCD module. Dimensions and specifications may vary from supplier to supplier.

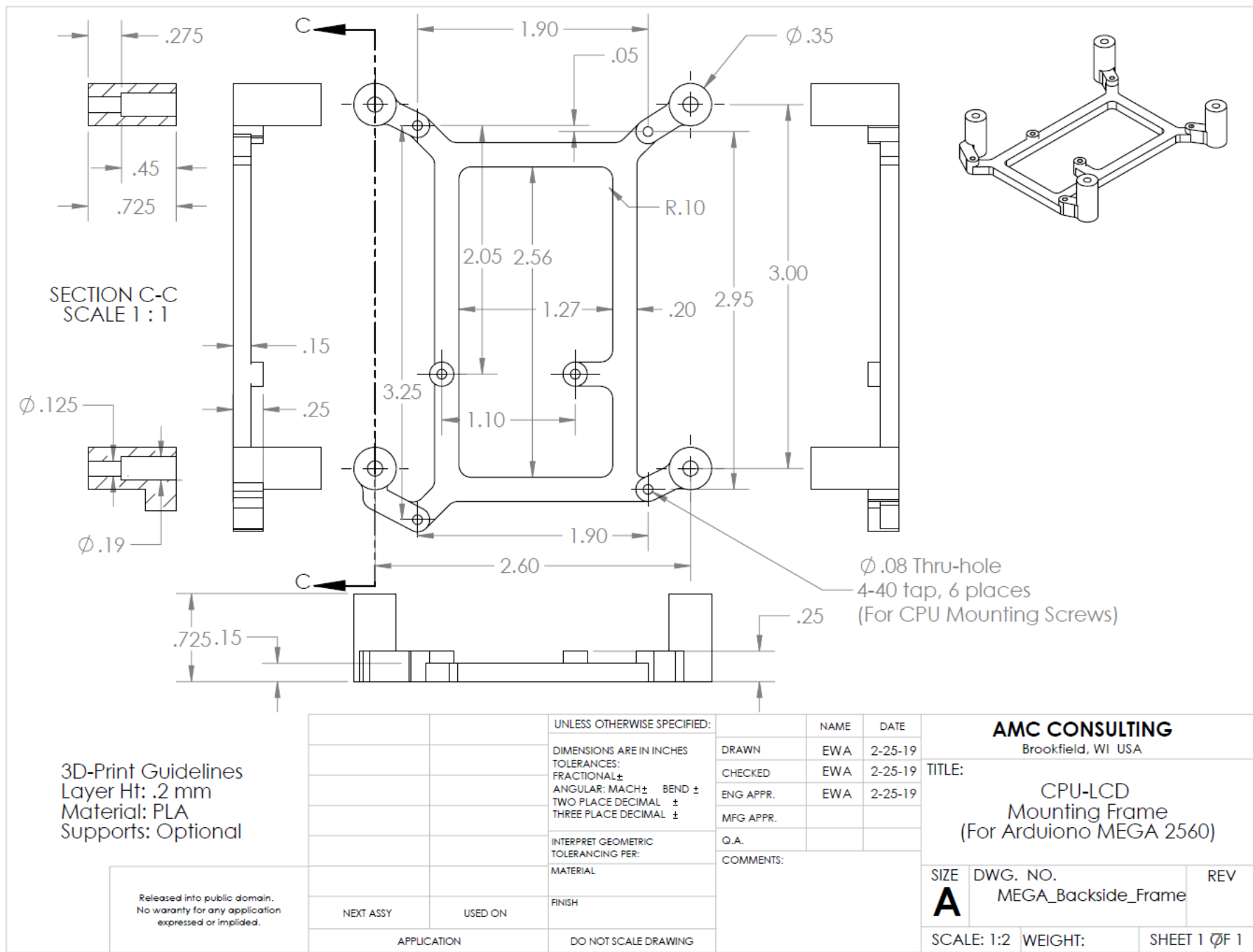
As of Feb 2019, this Module was commonly available from multiple suppliers listed on eBay. Models with and without Touch-Screen were listed. Take care when ordering!

		UNLESS OTHERWISE SPECIFIED:		NAME	DATE
		DIMENSIONS ARE IN INCHES		DRAWN	EWA 2-25-19
		TOLERANCES:		CHECKED	EWA 2-25-19
		FRACTIONAL ±		ENG APPR.	EWA 2-25-19
		ANGULAR: MACH ± BEND ±		MFG APPR.	
		TWO PLACE DECIMAL ±		Q.A.	
		THREE PLACE DECIMAL ±		COMMENTS:	
		INTERPRET GEOMETRIC TOLERANCING PER:			
		MATERIAL			
		FINISH			
NEXT ASSY	USED ON				
APPLICATION		DO NOT SCALE DRAWING			

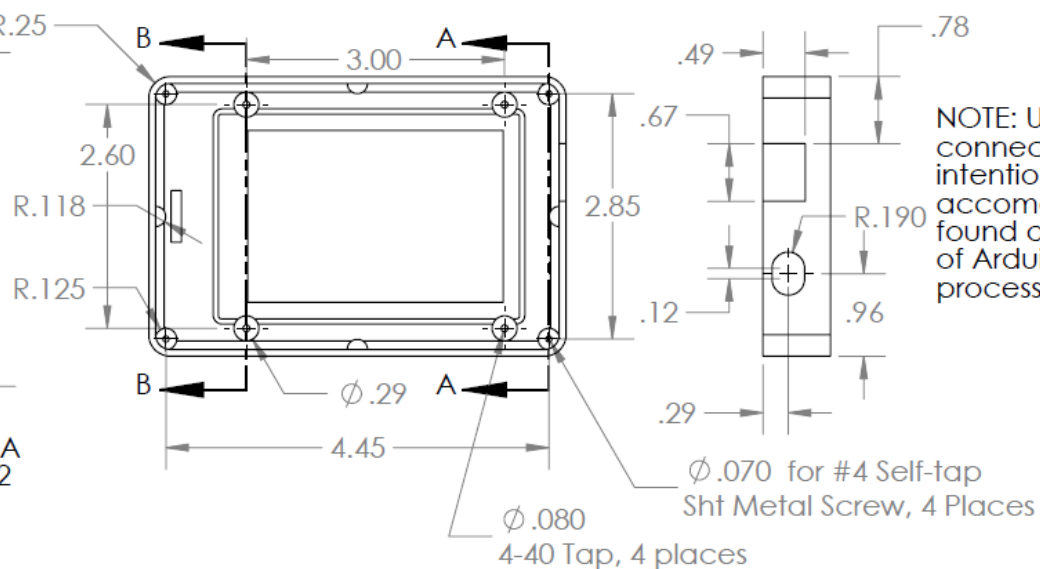
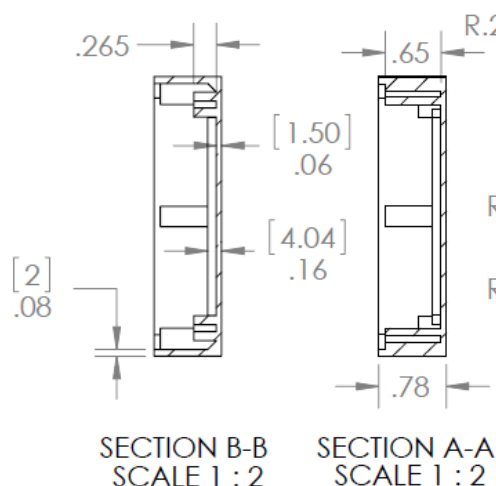
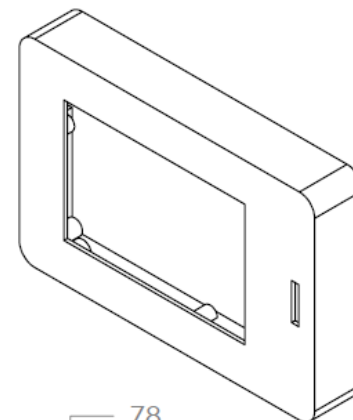
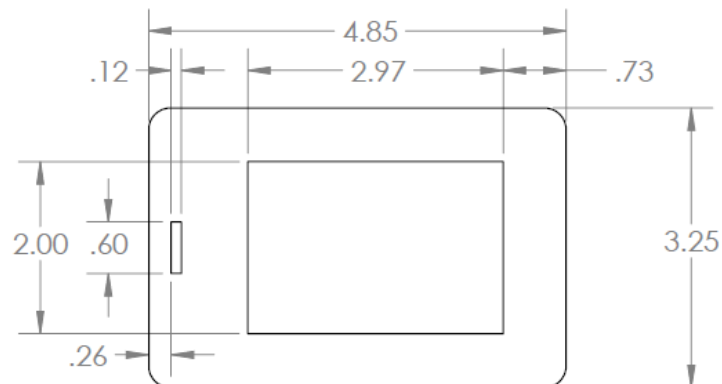
**AMC CONSULTING**  
Brookfield, WI USA

TITLE:  
480 x 320 LCD MODULE  
3.5 in Diag Measure  
Plugs directly onto  
UNO/MEGA CPU

SIZE <b>A</b>	DWG. NO. 480x320 LCD Module	REV
SCALE: 1:1	WEIGHT:	SHEET 1 OF 1







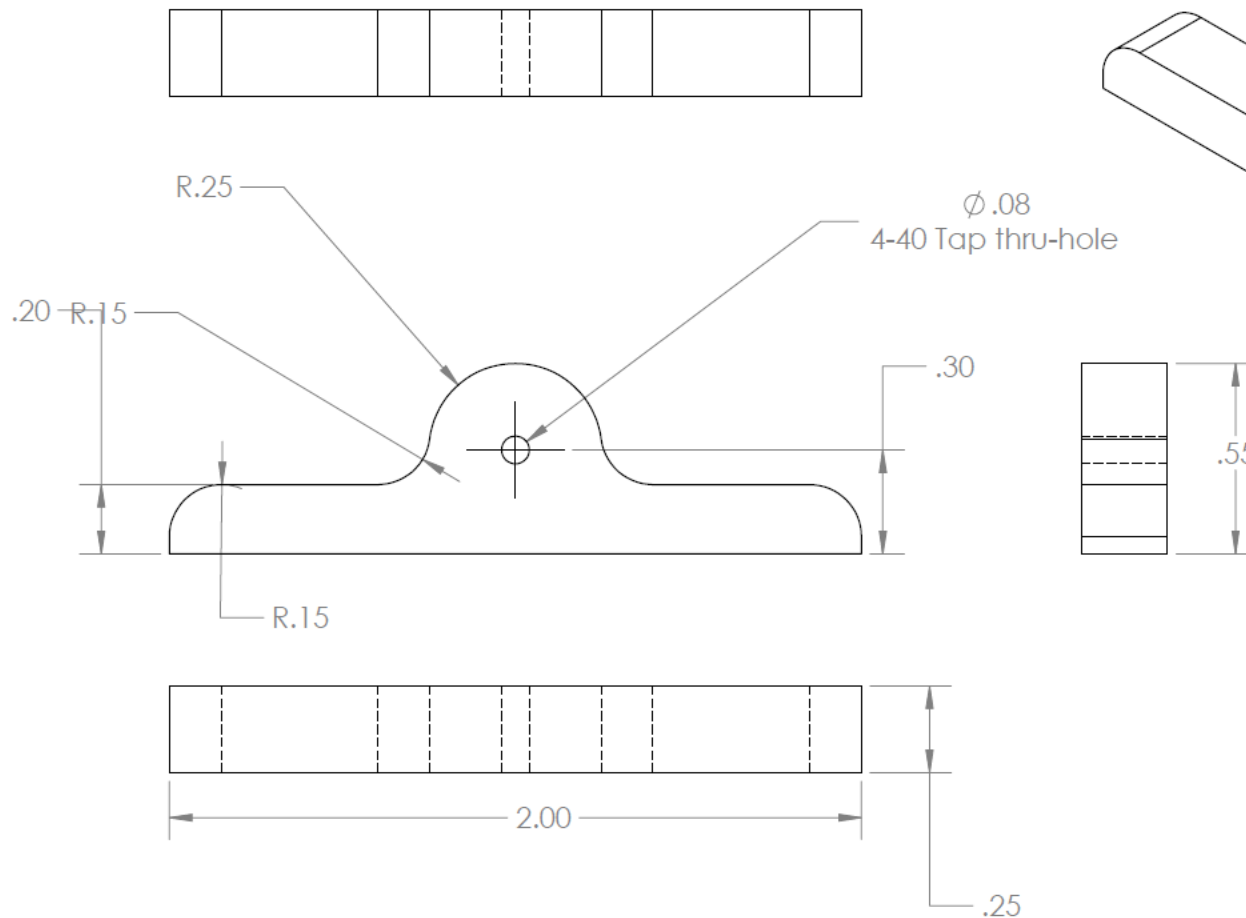
NOTE: USB & Power Plug connector openings are intentionally oversized to accommodate variances found among suppliers of Arduino-Compatible processor boards

3D-Print Guidelines  
Nozzel: 0.4 mm  
Layer Ht: .2 mm  
Material: PLA  
Supports: Optional

		UNLESS OTHERWISE SPECIFIED:		NAME	DATE	AMC CONSULTING Brookfield, WI USA		
		DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL ± ANGULAR: MACH ±    BEND ± TWO PLACE DECIMAL ± THREE PLACE DECIMAL ±	DRAWN	EWA	2-25-19	TITLE:  Enclosure - Front Panel		
			CHECKED	EWA	2-25-19			
			ENG APPR.	EWA	2-25-19			
			MFG APPR.					
			Q.A.					
		INTERPRET GEOMETRIC TOLERANCING PER:	COMMENTS:			SIZE    DWG. NO.    REV <b>A</b> 480X320_MEGA_Front_Pa nel w4_Btn_Pad Rev2    2		
		MATERIAL						
		FINISH						
NEXT ASSY	USED ON							
APPLICATION		DO NOT SCALE DRAWING						
						SCALE: 1:1	WEIGHT:	SHEET 1 OF 1



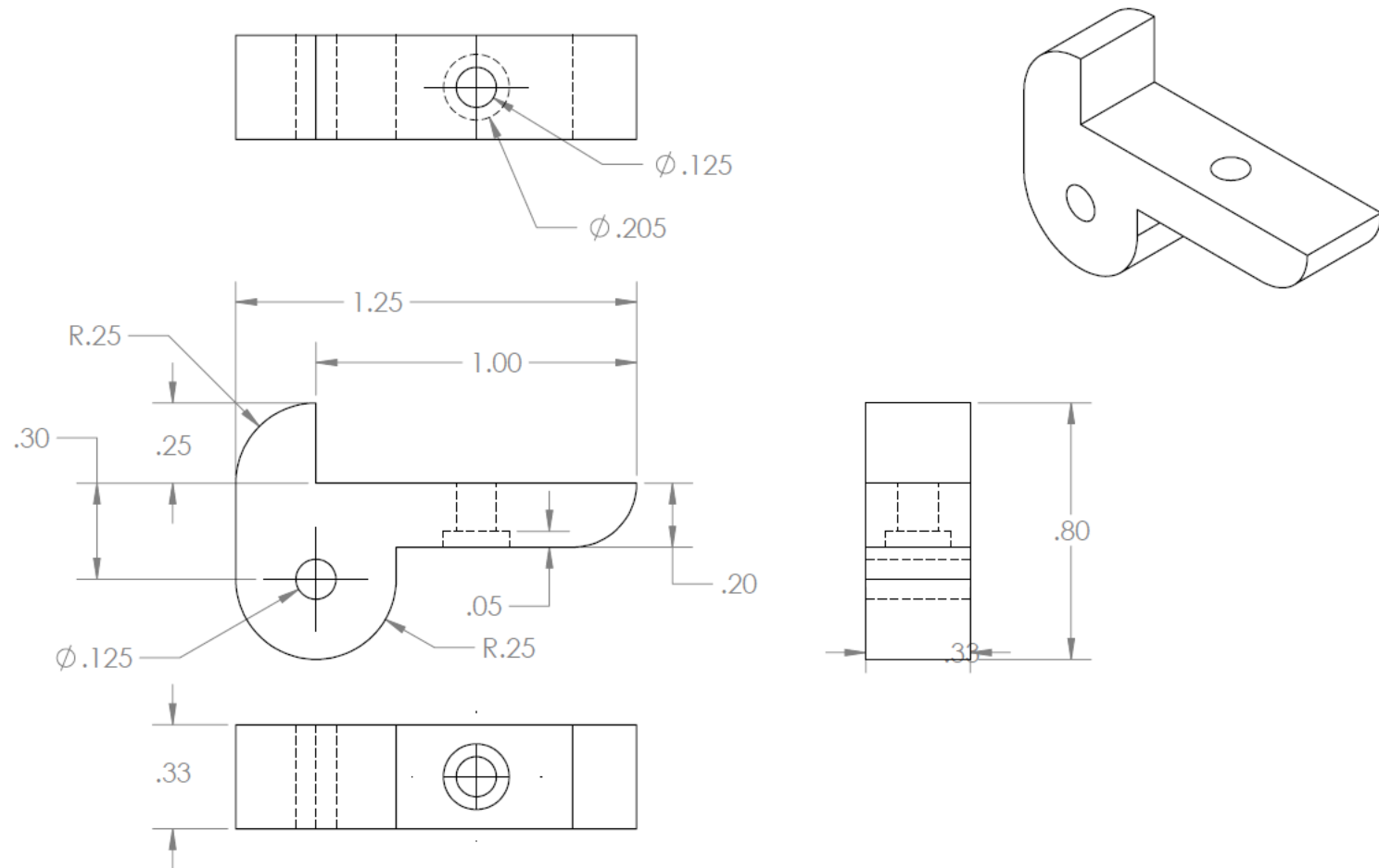




3D-Print Guidelines  
 Layer Ht: .2 mm  
 Material: PLA  
 Supports: Optional

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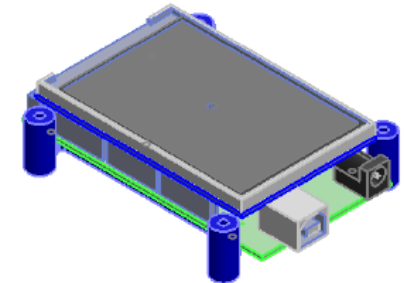
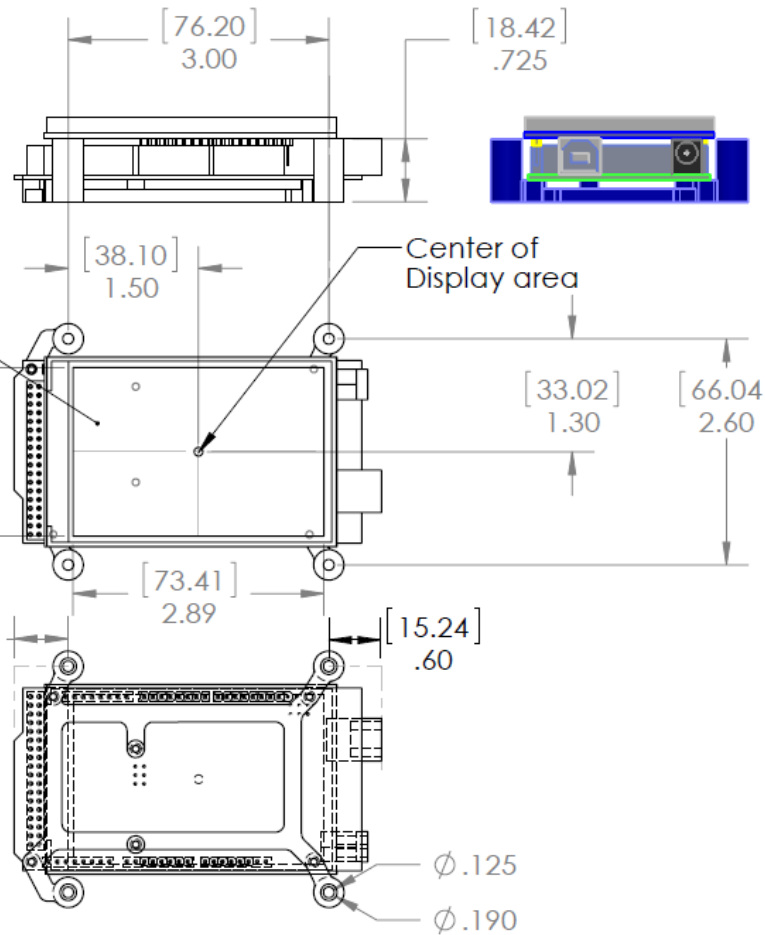
		UNLESS OTHERWISE SPECIFIED:		NAME	DATE	AMC CONSULTING Brookfield, WI USA			
		DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL ± ANGULAR: MACH ±    BEND ± TWO PLACE DECIMAL    ± THREE PLACE DECIMAL    ±	DRAWN	EWA	2-25-19	TITLE:  LCD TILT STAND BASE			
			CHECKED	EWA	2-25-19				
			ENG APPR.	EWA	2-25-19				
			MFG APPR.						
		INTERPRET GEOMETRIC TOLERANCING PER:	Q.A.			SIZE <b>A</b> DWG. NO. 480x320_Lcd_TiltStand3_Base  REV			
		MATERIAL	COMMENTS:						
NEXT ASSY	USED ON	FINISH							
APPLICATION		DO NOT SCALE DRAWING				SCALE: 1:1    WEIGHT:    SHEET 1 OF 1			



3D-Print Guidelines  
 Layer Ht: .2 mm  
 Material: PLA  
 Supports: Optional

Released into public domain.  
 No warranty for any application  
 expressed or implied.

		UNLESS OTHERWISE SPECIFIED:		NAME	DATE	AMC CONSULTING Brookfield, WI USA		
		DIMENSIONS ARE IN INCHES	DRAWN	EWA	2-25-19	TITLE:  TILT STAND MOUNT		
		TOLERANCES:	CHECKED	EWA	2-25-19			
		FRACTIONAL: ±	ENG APPR.	EWA	2-25-19			
		ANGULAR: MACH ±    BEND ±	MFG APPR.					
		TWO PLACE DECIMAL    ±	Q.A.					
		THREE PLACE DECIMAL    ±	COMMENTS:			SIZE <b>A</b> DWG. NO. 480x320_Lcd_TiltStand2_Mount REV 2		
		INTERPRET GEOMETRIC TOLERANCING PER:						
		MATERIAL						
		FINISH						
NEXT ASSY	USED ON							
APPLICATION		DO NOT SCALE DRAWING	SCALE: 2:1			WEIGHT:		SHEET 1 OF 1



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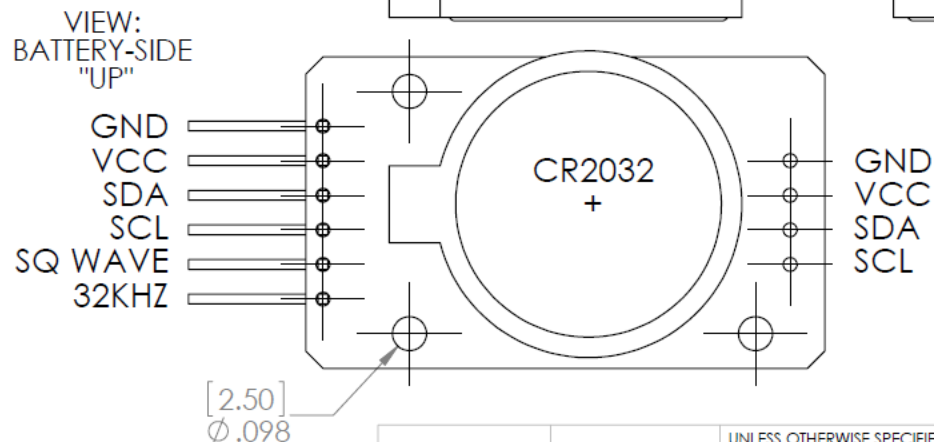
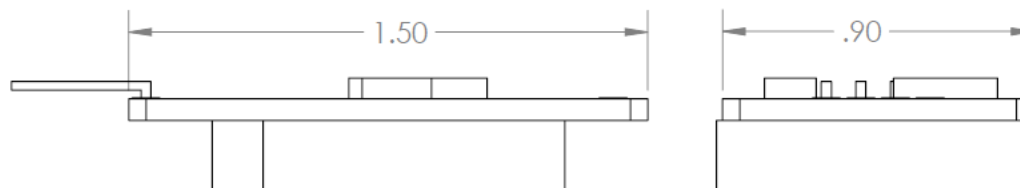
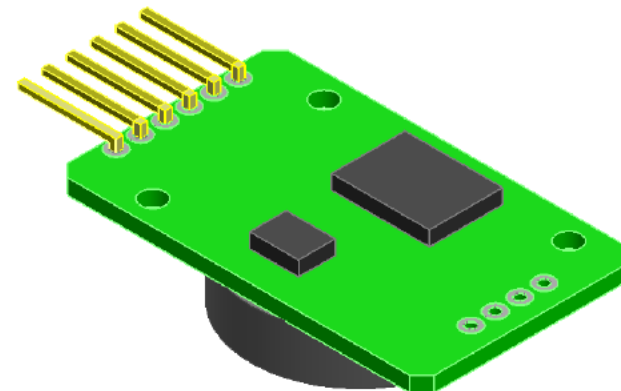
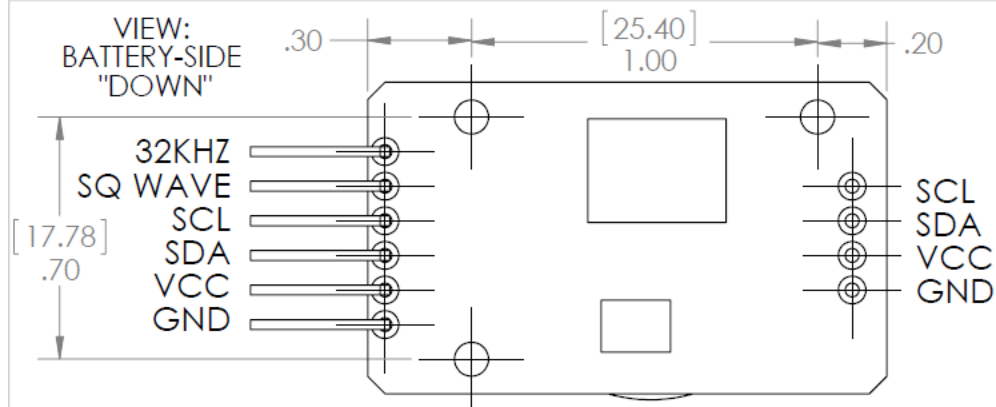
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		DIMENSIONS ARE IN INCHES	DRAWN		
		TOLERANCES:	CHECKED		
		FRACTIONAL ±	ENG APPR.		
		ANGULAR: MACH± BEND ±	MFG APPR.		
		TWO PLACE DECIMAL ±			
		THREE PLACE DECIMAL ±			
		INTERPRET GEOMETRIC	Q.A.		
		TOLERANCING PER:	COMMENTS:		
		MATERIAL			
NEXT ASSY	USED ON	FINISH			
APPLICATION		DO NOT SCALE DRAWING			

**AMC CONSULTING**  
Brookfield, WI USA

TITLE:  
LCD Display-CPU-Frame  
Sub Assembly Layout

SIZE	DWG. NO.	REV
<b>A</b>	480x320LCD_Mate_MEG A2560	
SCALE: 1:2	WEIGHT:	SHEET 1 OF 1





CAUTION: This SolidWorks model and part drawing was created based on measurements taken off of an actual RTC module. Dimensions and specifications may vary from supplier to supplier.

As of Feb 2019, this Module was commonly available from multiple suppliers listed on eBay.

Take care when ordering!

		UNLESS OTHERWISE SPECIFIED:		NAME	DATE	AMC CONSULTING Brookfield, WI USA		
		DIMENSIONS ARE IN INCHES	DRAWN	EWA	2-25-19	TITLE:  DS3231 RTC MODULE		
		TOLERANCES:	CHECKED	EWA	2-25-19			
		FRACTIONAL ±	ENG APPR.	EWA	2-25-19			
		ANGULAR: MACH ± BEND ±	MFG APPR.					
		TWO PLACE DECIMAL ±	Q.A.					
		THREE PLACE DECIMAL ±	COMMENTS:			SIZE <b>A</b> DWG. NO. DS3231_RTC_Module REV 0		
		INTERPRET GEOMETRIC TOLERANCING PER:						
		MATERIAL						
		FINISH				SCALE: 2:1 WEIGHT: SHEET 1 OF 1		
NEXT ASSY	USED ON							
APPLICATION		DO NOT SCALE DRAWING						

# 3.5 Inch LCD Display Module Overview

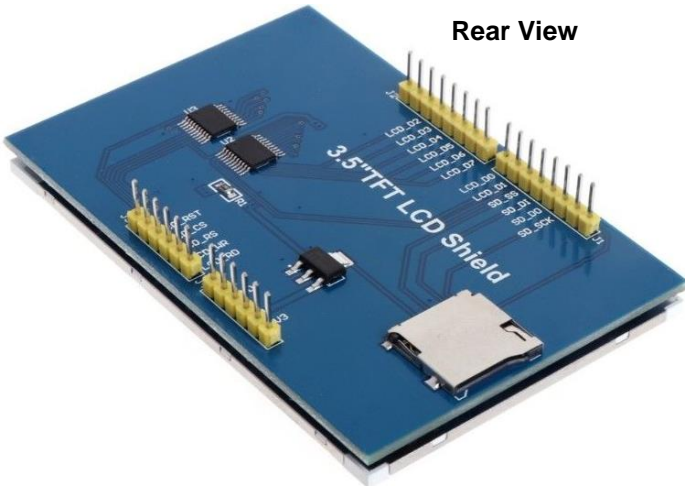
Front View

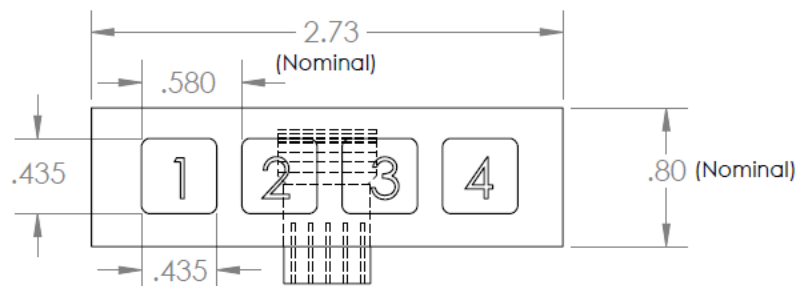


Front View

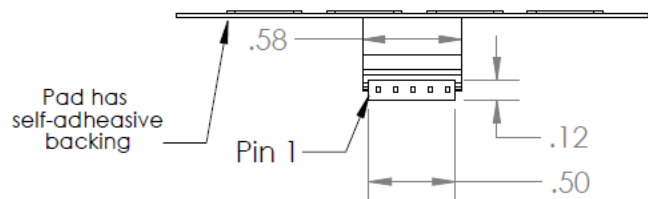


Rear View

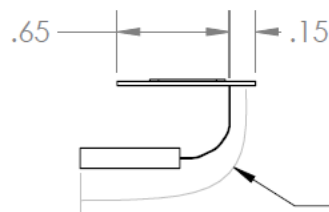




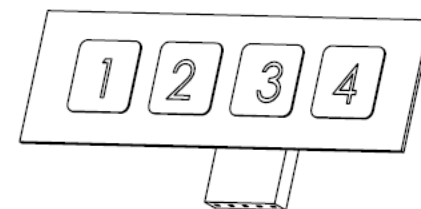
Pad material is ~ .025 thick  
with buttons raised  
additional ~ .015.



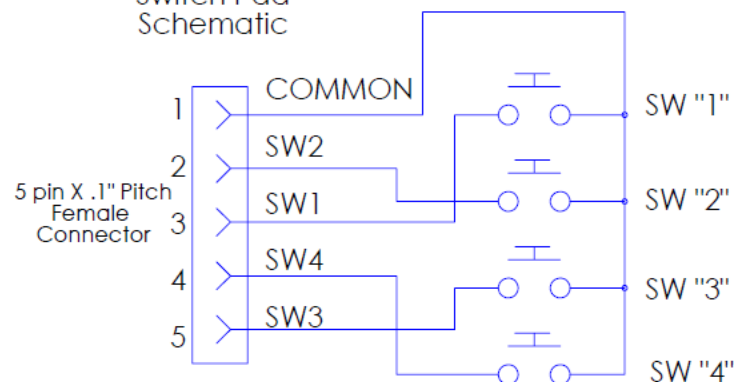
Pad has  
self-adhesive  
backing



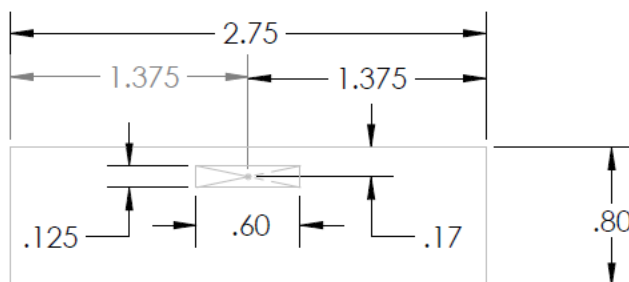
Actual Connector Tail length is 3.5 in



Switch Pad  
Schematic



Front View



Suggested Panel Layout and  
pass-through connector opening

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NEXT ASSY

USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED:

DIMENSIONS ARE IN INCHES  
TOLERANCES:  
FRACTIONAL ±  
ANGULAR: MACH ± BEND ±  
TWO PLACE DECIMAL ±  
THREE PLACE DECIMAL ±

INTERPRET GEOMETRIC  
TOLERANCING PER:

MATERIAL

FINISH

DO NOT SCALE DRAWING

DRAWN

NAME

EWA

DATE

1-21-18

CHECKED

EWA

1-21-18

ENG APPR.

MFG APPR.

Q.A.

COMMENTS:

**AMC CONSULTING**

Brookfield, WI USA

TITLE:

4 Button Switch Pad

(BLU on BLK Backgnd,  
Adhesive Backed)

SIZE

**A**

DWG. NO.

1x4 Button Array

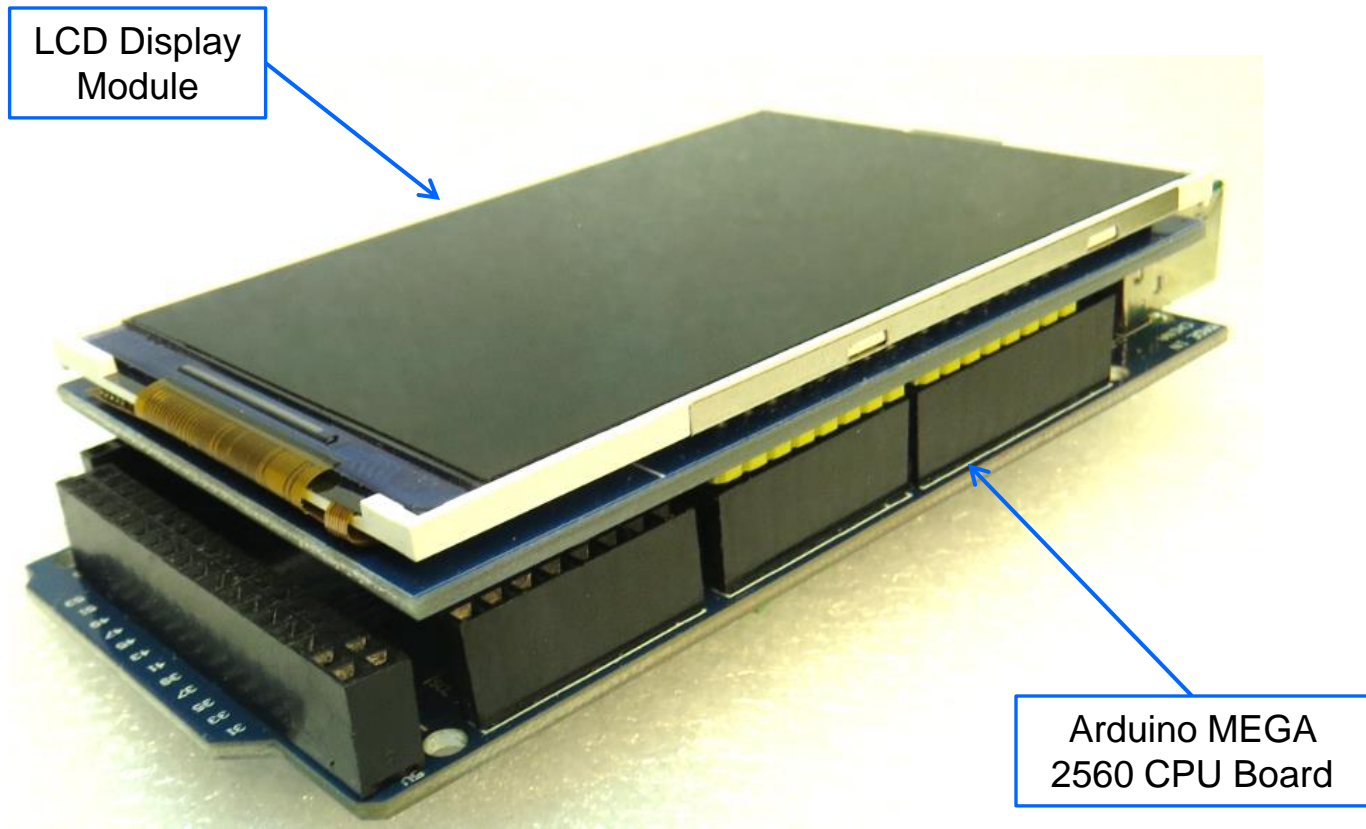
REV

0

SCALE: 1:1

WEIGHT:

SHEET 1 OF 1





# 3.5 Inch TFT LCD Screen Specifications



3.5 Inch TFT LCD Screen Module 480 x 320  
For Arduino UNO & MEGA 2560 R3 Board

★★★★★ 2 product ratings

Condition: **New**

Quantity:  More than 10 available  
91 sold / [See feedback](#)

Price: **US \$8.17**

Buy another

Add to cart

Add to watch list

100% buyer satisfaction

91 sold

More than 58% sold

Shipping: **\$1.84** ePacket delivery from China | [See details](#)  
See details about international shipping here.

Item location: Shenzhen, China

Ships to: Worldwide [See exclusions](#)

Delivery:

Estimated between **Fri, Jan. 4 and Fri, Jan. 25**

This item has an extended handling time and a delivery estimate **greater than 10 business days.**

## Description

### Features

- Support Arduino Mega2560 Directly inserted
- OnBoard level conversion chip for 5V/3.3V MCU
- Compatible with 3.3/5V operation voltage level
- Compatible with Arduino-Series development Board
- Compatible with UTFT / UTFT\_Buttons /Utouch Library for arduino
- Provided 12-examples with Arduino
- Provided 3-examples with STM32
- With SD Card Socket
- With SPI FLASH circuit

### Specifications

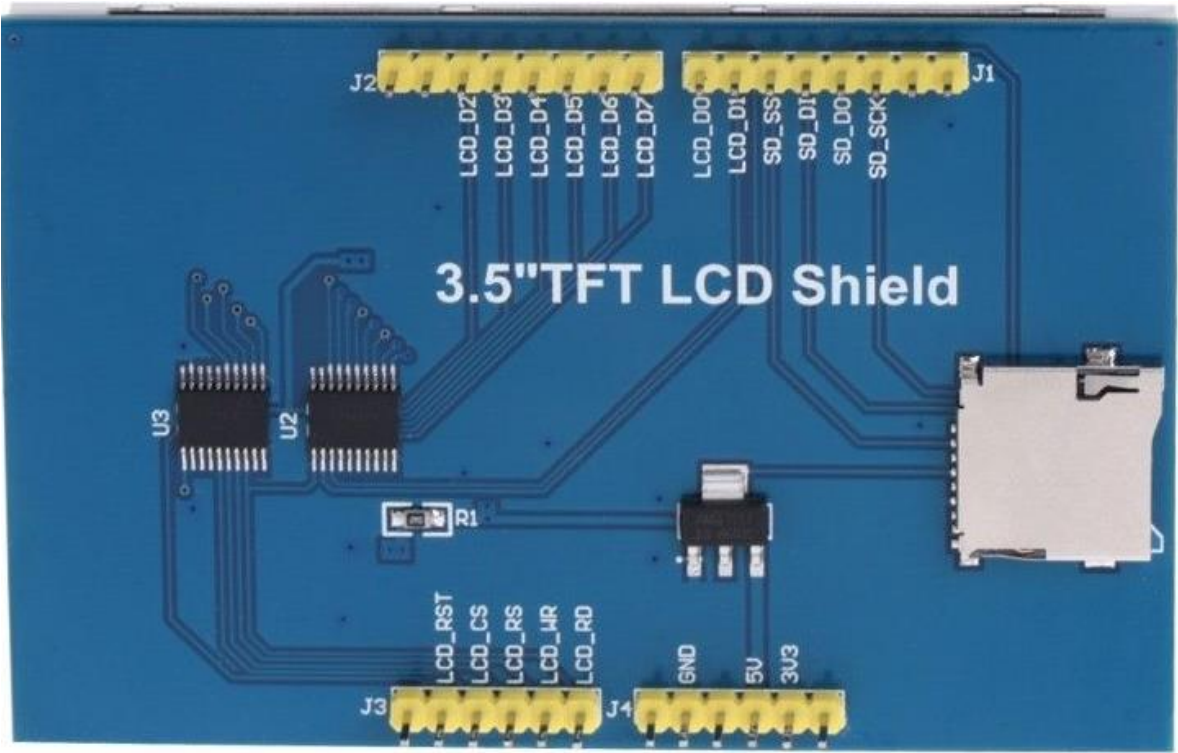
- Input Voltage: DC 3.3-5.5V
- Screen Size: 3.5"
- Screen Material: TFT
- Resolution: 320X480
- Drive IC: ILI9486
- Interface mode: parallel 8 bit
- Module Pin: 28Pin (8+8+6+6)
- Touch: No
- Module Size: 55x85mm/2.17x3.35"
- Quantity: 1 Pc

Source: [https://www.ebay.com/itm/3-5-Inch-TFT-LCD-Screen-Module-480-x-320-For-Arduino-UNO-MEGA-2560-R3-Board/232753924860?ssPageName=STRK%3AMEBIDX%3AIT&\\_trksid=p2057872.m2749.l2649](https://www.ebay.com/itm/3-5-Inch-TFT-LCD-Screen-Module-480-x-320-For-Arduino-UNO-MEGA-2560-R3-Board/232753924860?ssPageName=STRK%3AMEBIDX%3AIT&_trksid=p2057872.m2749.l2649)

Ref to library that works for this board: <https://forum.arduino.cc/index.php?topic=537903.0>  
That is a Blue 3.5 inch Uno Shield. Usually contains ILI9481 or ILI9486.  
This runs well with Uno, also runs on a Mega2560 (but is slower than Uno!).

Install Adafruit\_GFX library with the Library Manager.  
Install MCUFRIEND\_kbv library with the Library Manager.

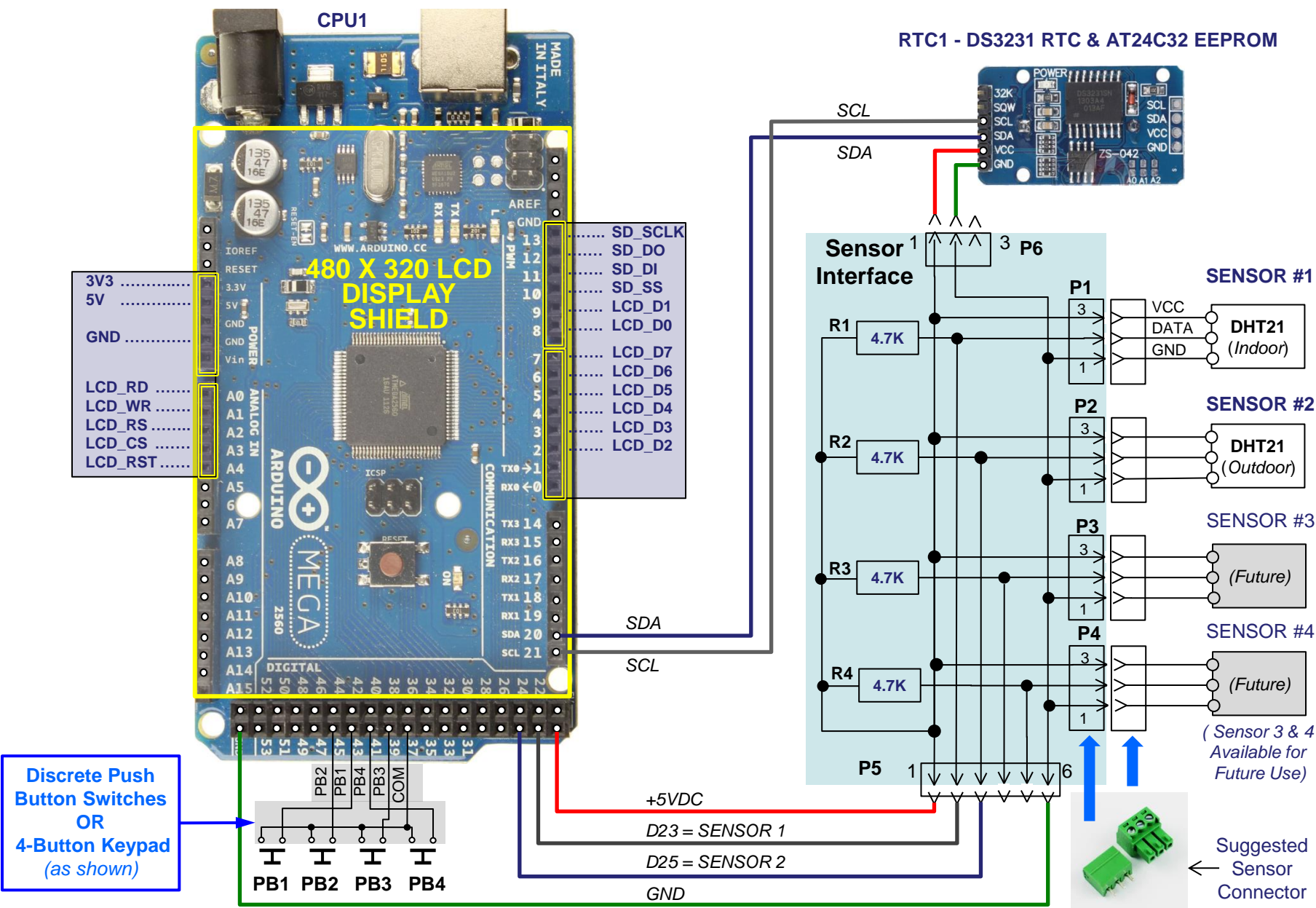
Rear View



Controller: ILI9486

Original Ref to Henning Karlsen Library that does not work with this board: <http://www.rinkydinkelectronics.com/library.php?id=51>

# Graphing Thermometer Schematic

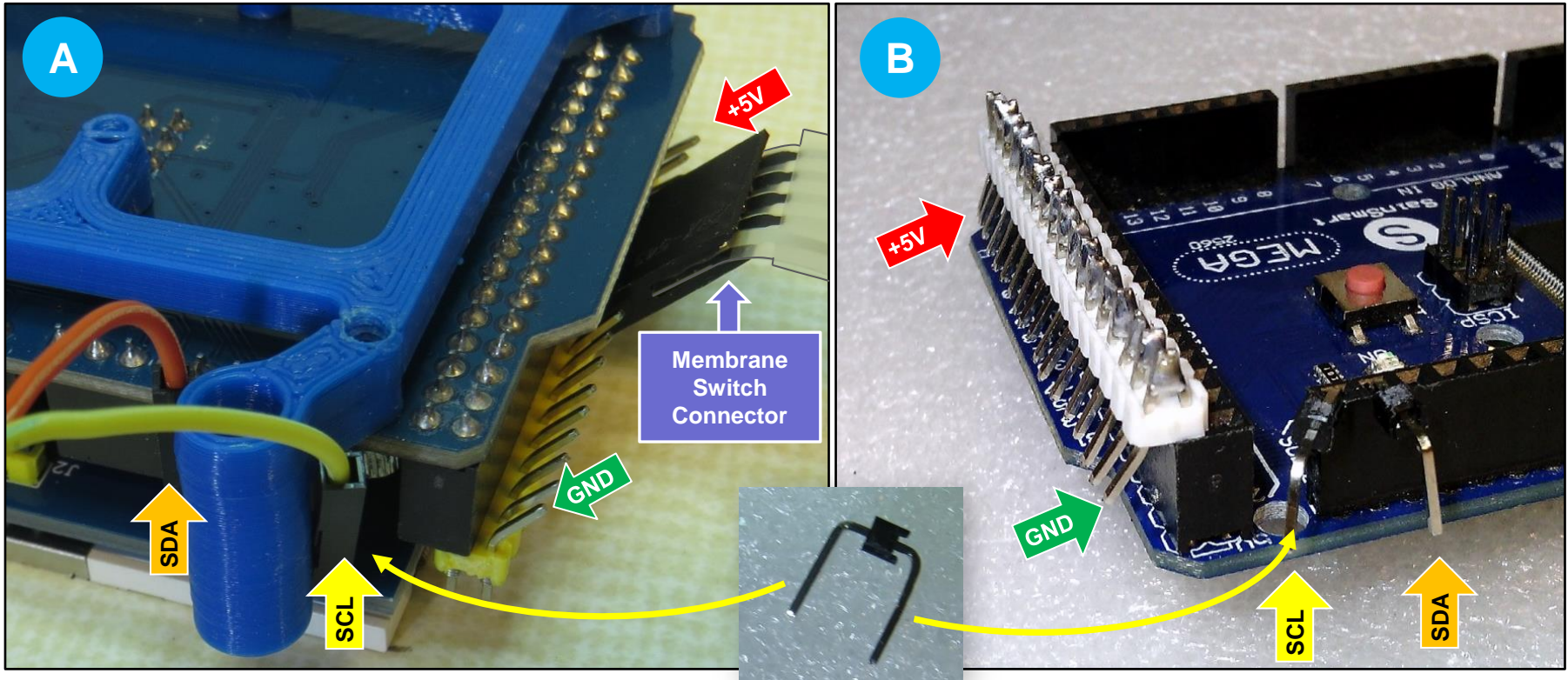


Bill of Materials

ITEM	QTY	DESCRIPTION	SOURCE	PN/ORDERING INFO	NOTES
1	1	ARDUINO MEGA CPU	Arduino.cc + Others	ARDUINO MEGA CPU <a href="https://store.arduino.cc/usa/arduino-mega-2560-rev3">https://store.arduino.cc/usa/arduino-mega-2560-rev3</a>	Alt: Search eBay for MEGA compatible
2	1	ARDUINO AC POWER SUPPLY	Various, eBay	UNO/MEGA POWER SUPPLY, 9VDC 1A eBay Search: <i>Arduino UNO Power Supply Adapter 9VDC</i>	5V phone charger + cable is an option
3	1	3.5 INCH 480X320 LCD DISPLAY	eBay	3.5 Inch TFT LCD Screen Module 480 x 320 For Arduino UNO & MEGA Search for: <i>TFT LCD Screen Module 480x320 Arduino UNO MEGA</i>	Consider adding "Touch Screen" to eBay quiry
4	1	DS3231 RTC MODULE	Various, eBay	DS3231 RTC MODULE eBay Search: <i>DS3231 RTC Real time Clock Module</i>	
5	1	CR2032 BATTERY	Various, eBay	CR2032 BATTERY eBay Search: <i>CR2032 BATTERY</i>	For use w/item 4
6	1	PB1,2,3,4. 1X4 PUSH BUTTON ARRAY	Various eBay	Membrane 1X4 push button array eBay Search: <i>1x4 Matrix Array Keypad</i>	Not Req'd if Item 3 has Touch Screen
7	1	SENSOR INTFC PCB ASSEMBLY	-----	Consists of items a-e below	
7a	1	PCB - PROTOTYPE CIRCUIT BOARD	Various, Including eBay	DIY Prototype Circuit Breadboard PCB Universal Board 2x8 cm eBay Search: <i>2x8 cm Double Side Prototype PCB</i>	See on-line build layout details to match 3D case mtg holes
7b	2	P1, P2. TERM BLOCK HDR 3POS VERT 3.5MM PCB MNT. NOTE: SCREW TERM MATE REQUIRED	Digikey  eBay	PCB part: WM7752-ND @ \$ .78 ea Mating Part: WM7733.ND @ \$1.14 ea eBay Search: <i>3 Pin 3.5mm Pitch PCB Plug in Terminal Block</i>	
7c	1	P7. 3 PIN RT ANG MALE TERM	Digikey  eBay	SAM1051-03-ND @ .25 ea eBay Search: <i>40Pin 2.54mm Single Row Right Angle Pin Header Strip</i>	ALTERNATE: Cut from longer strips; eBay link is for 10 Pcs X 40-pin @ \$3.80
7d	1	P5. 6 PIN RT ANG MALE TERM	Digikey	AM1051-06-ND @ .46 ea	ALTERNATE: Cut from longer strips (See notes for item 8)
7e	2	R1, R2, RES 4.7K 1/4W 1% AXIAL	Digikey  eBay	4.75KXBK-ND eBay Search for: <i>4.7K .25 Watt Metal Film Resistor</i>	Value not critical. Can use 4.7K to 10K value, 5-10% precision OK
8	2	S1, S2. DHT21 TEMP/HUMIDITY SENSOR MODULE	Various  eBay	DHT21 AM2301 Digital Temperature Humidity Sensor Module for Arduino eBay Search: <i>DHT21 AM2301 Sensor Module</i>	
9	4	NO_4 X.25 IN SELF TAP SCRW	Various McMaster	STEEL, NUM 4, 1/4" SHEET METAL SCRW 90077A106 (Box of 100 Pcs @ \$1.45)	See McMaster PN for more details
10	4	NO_4 X.5 IN SELF TAP SCRW	Various McMaster	STEEL, NUM 4, 1/5" SHEET METAL SCRW 90077A110 (Box of 100 Pcs @ \$42.21)	See McMaster PN for more details
11	4	4-40 X .5 SOCK HD MACH SCRW	Various McMaster	STEEL, NUM 4, 1/4" SHEET METAL SCRW 92196A110 (Box of 100 Pcs @ \$4.20)	See McMaster PN for more details
12	4	4-40 X .25 SOCKHD MACH SCRW	Various McMaster	STAINLESS STL SCKT HD SCRW 4-40 x 1/4" 92196A106 (Box of 100 Pcs @ \$3.92)	See McMaster PN for more details
13	4	4-40 X.75 PHIL HD MACH SCRW	Various McMaster	STAINLESS STL PHIL HD SCRW 4-40 x 3/4" 92196A113 (Box of 100 Pcs @ \$4.97)	See McMaster PN for more details
14	4	4-40 HEX NUT	Various McMaster	STAINLESS STL HEX NUT 4-40 91841A005 (Box of 100 Pcs @ \$3.02)	See McMaster PN for more details
15	1	INTERNAL WIRING	Various	MISC PINS, CONNECTORS, WIRES	Misc "Odds and Ends"
16	1	ENCLOSURE - FRONT PANEL	3D PRINTED	FRONT PANEL, 3D PRINTED (PLA)	SEE ON-LINE DOCS FOR DETAILS
17	1	ENCLOSURE - REAR PANEL	3D PRINTED	REAR PANEL, 3D PRINTED (PLA)	SEE ON-LINE DOCS FOR DETAILS
18	1	CPU/LCD MOUNTING FRAME	3D PRINTED	MOUNTING FRAME, 3D PRINTED (PLA)	SEE ON-LINE DOCS FOR DETAILS
19	2	TILT BASE, CASE MOUNT	3D PRINTED	TILT-CASE MNT, 3D PRINTED (PLA)	SEE ON-LINE DOCS FOR DETAILS
20	2	TILT BASE, FOOT	3D PRINTED	TILT-FOOT, 3D PRINTED (PLA)	SEE ON-LINE DOCS FOR DETAILS



# U-Turn Connector Fabrication



See Nuts and Volts article for detailed fabrication guidance

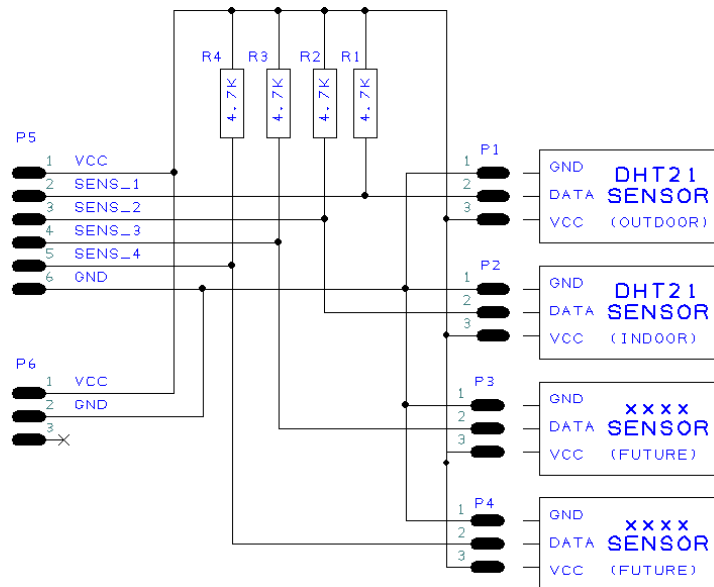
Sensor Intfc – PCB Build Details

To Arduino CPU

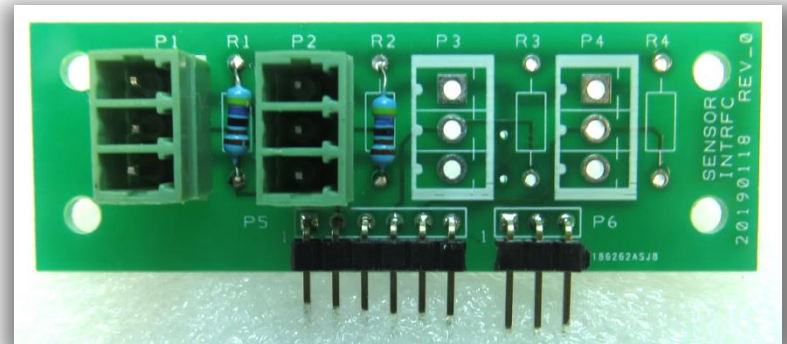
+5VDC  
D23  
D23  
D25 (Optional)  
D27 (Optional)  
GND

To RTC Module

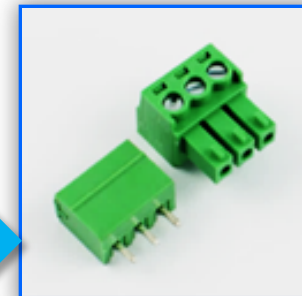
+5VDC  
GND  
No Connect



TOP VIEW (Component Side, Fully Assembled)



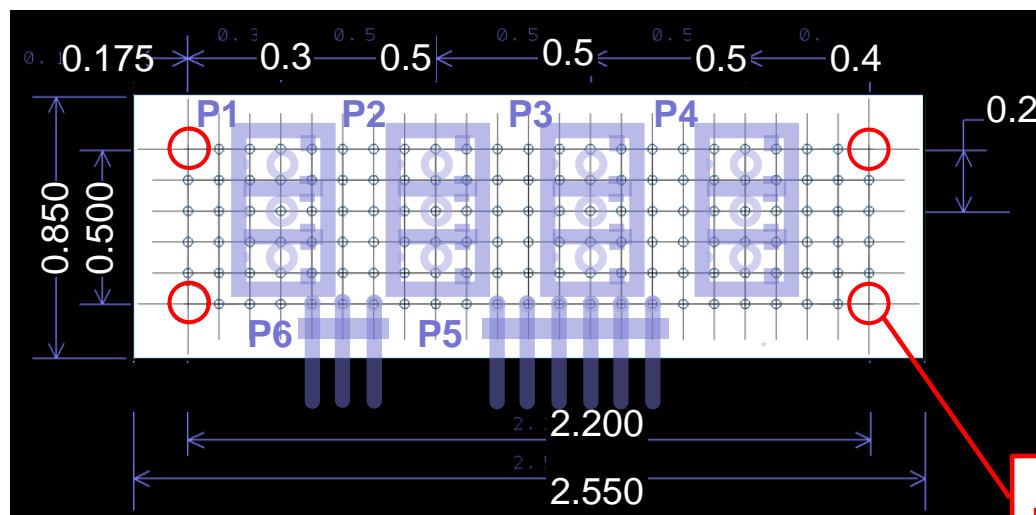
ITEM	QTY	DESCRIPTION	SOURCE	PN/ORDERING INFO	NOTES
7	1	SENSOR INTFC PCB ASSEMBLY	----	Consists of items a-e below	
7a	1	PCB - PROTOTYPE CIRCUIT BOARD	Various, Including eBay	DIY Prototype Circuit Breadboard PCB Universal Board 2x8 cm eBay Search: 2x8 cm Double Side Prototype PCB	See on-line build layout details to match 3D case mtg holes
7b	2	P1, P2. TERM BLOCK HDR 3POS VERT 3.5MM PCB MNT. NOTE: SCREW TERM MATE REQUIRED	Digikey eBay	PCB part: WM7752-ND @ \$ .78 ea Mating Part: WM7733.ND @ \$1.14 ea eBay Search: 3 Pin 3.5mm Pitch PCB Plug in Terminal Block	
7c	1	P7. 3 PIN RT ANG MALE TERM	Digikey eBay	SAM1051-03-ND @ .25 ea eBay Search: 40Pin 2.54mm Single Row Right Angle Pin Header Strip	ALTERNATE: Cut from longer strips; eBay link is for 10 Pcs X 40-pin @ \$3.80
7d	1	P5. 6 PIN RT ANG MALE TERM	Digikey	SAM1051-06-ND @ .46 ea	ALTERNATE: Cut from longer strips (See notes for item 8)
7e	2	R1, R2, RES 4.7K 1/4W 1% AXIAL	Digikey eBay	4.75KXBK-ND eBay Search for: 4.7K .25 Watt Metal Film Resistor	Value not critical. Can use 4.7K to 10K value, 5-10% precision OK



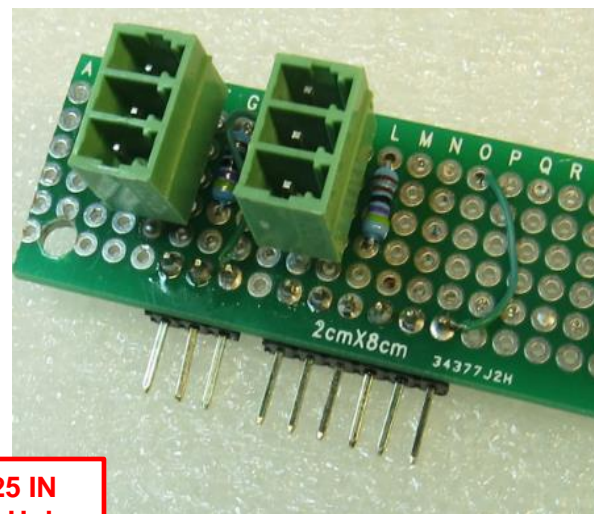
## Sensor Intfc – Proto Board Build Details

### TOP VIEW (Component Side)

*(Only P1 & P2 are used for Graphing Thermometer Project)*



All Dimensions are in inches.

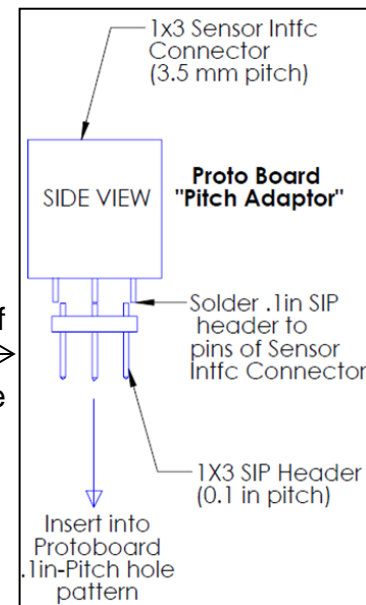


**4 X 0.125 IN  
Mounting Holes**

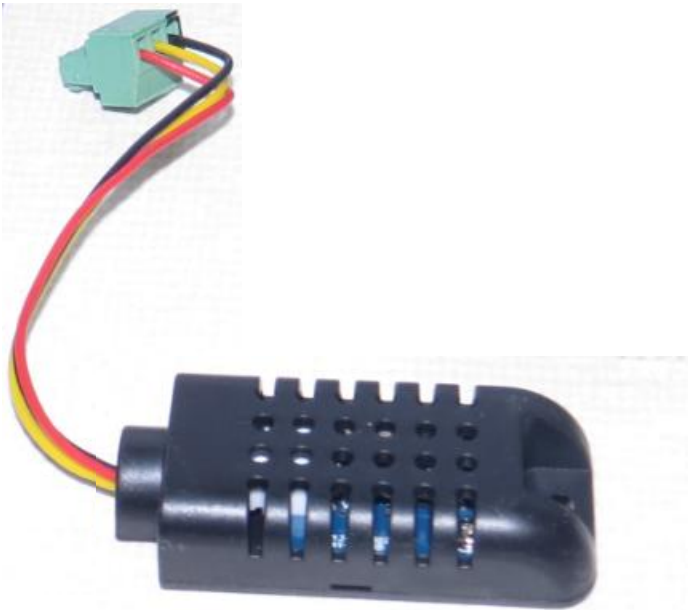
## Sensor Interface Build Notes

1. Make from .1 X .1 In grid Prototype PCB Stock, cut to size.
2. Drill 4 Mounting Holes as shown.
3. Mount 3.5mm Pitch 2-piece connectors into locations shown.
4. Only P1 & P2 are required for Graphing Thermometer – *P3 & P4 are for future use.*
5. Add new holes for “off-grid” pins of P1-P4 **-OR-** adapt by soldering a 3 Pin SIP strip to bottom of each P1 & 2 so that they have a .1 In pitch and can be placed into PCB.
6. Exact Locations of P5 and P6 are not critical; Install 1 X 3 Pin (P6) and 1 X 6 (P5) Pin Right Angle Connectors approximately where shown.
7. Wire per interface board schematic and install 4.7K Pull-Up resistors per schematic.

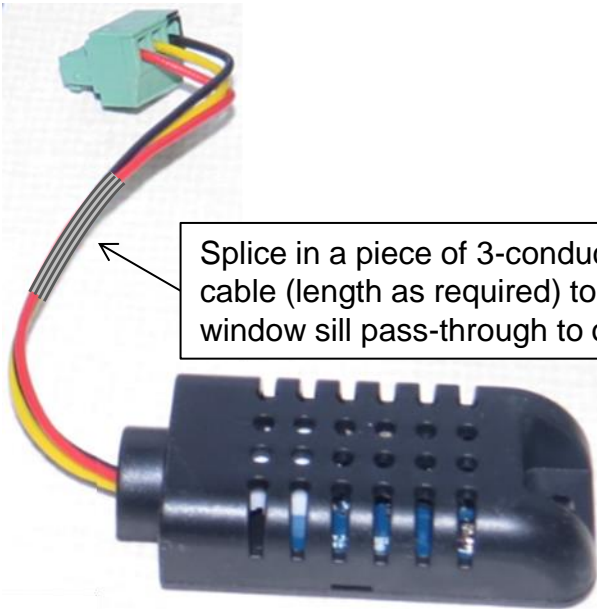
**CAUTION – It is easy to mix up wiring of 2-part connectors and subsequent connection to Sensors. Pay careful attention to connect sensor power and ground wires properly as reverse power connections will damage the sensors!**



INDOOR DHT21 SENSOR



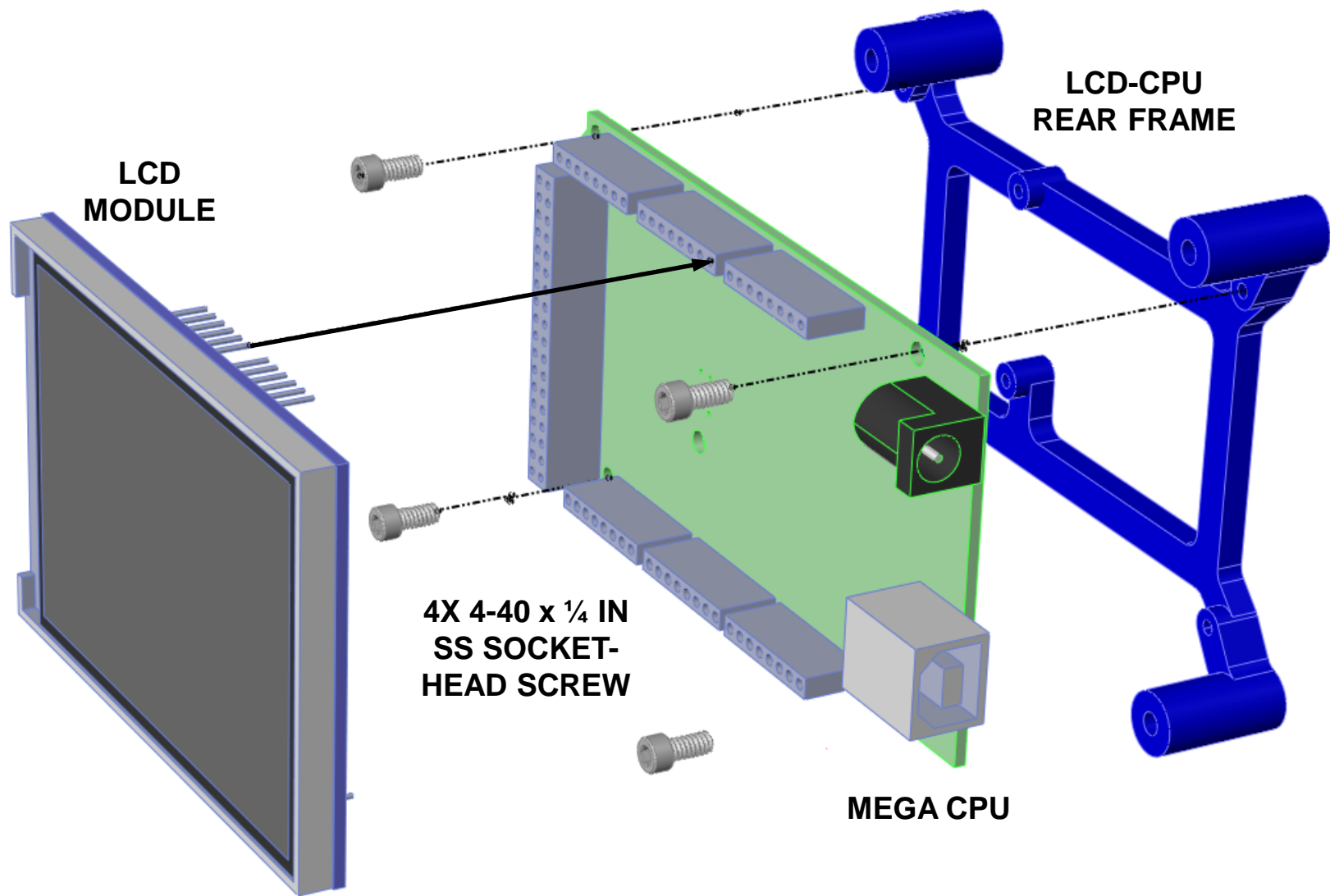
OUTDOOR DHT21 SENSOR

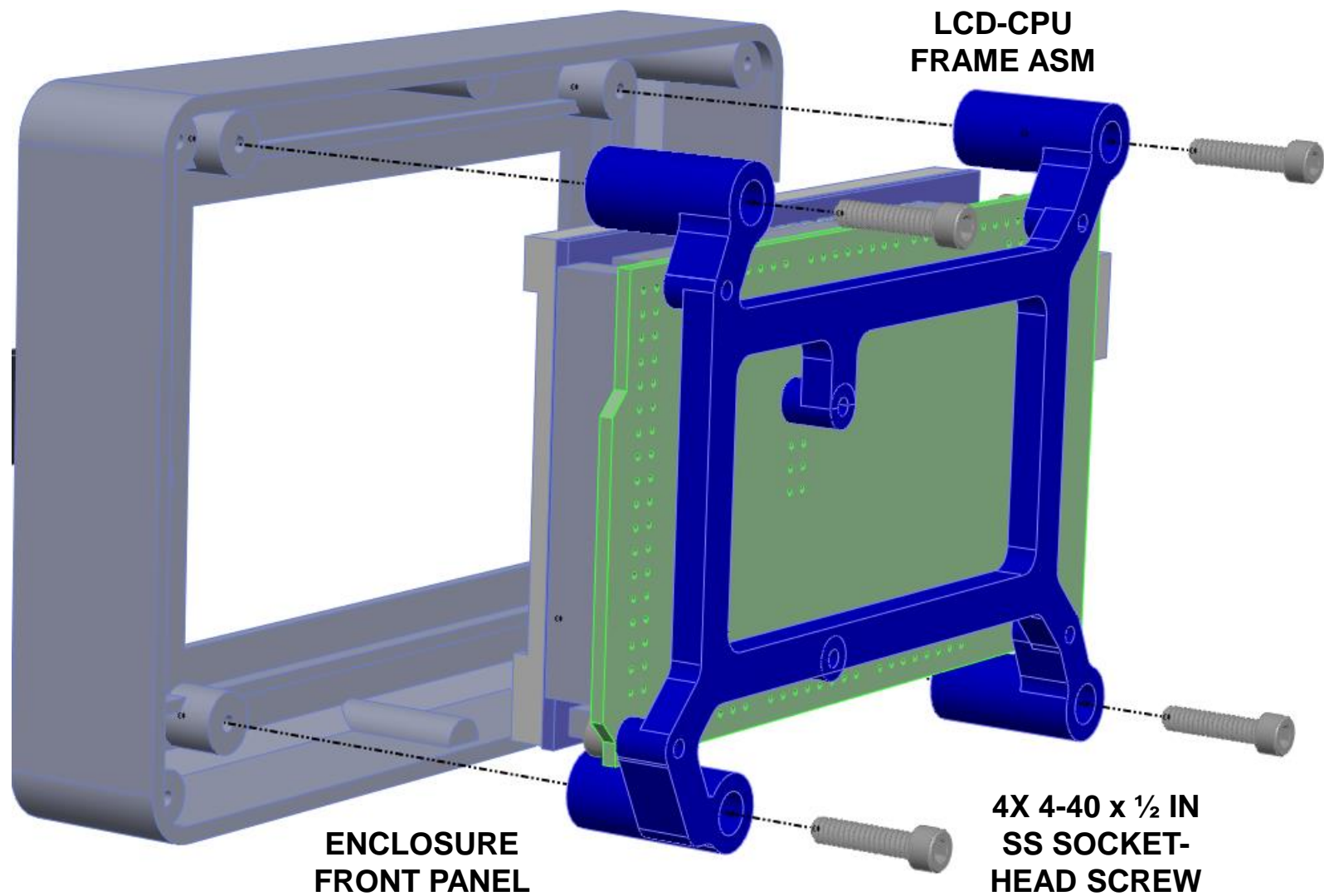


Splice in a piece of 3-conductor flat ribbon cable (length as required) to facilitate easy window sill pass-through to outdoor sensor

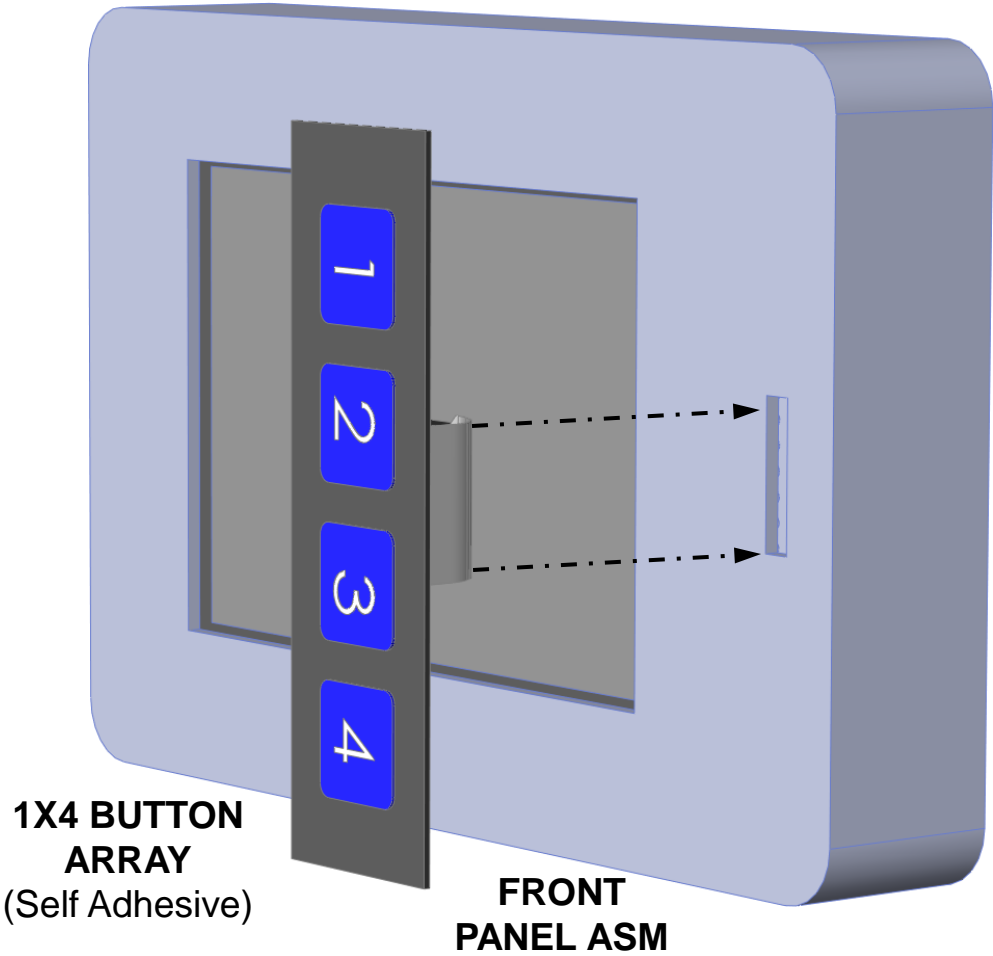
**Caution:** Be sure to verify polarity and wiring going to sensor connectors.  
Sensor can be damaged by reversed power and ground connections!







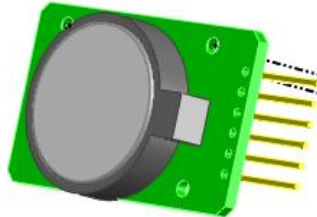
**BUTTON INSTALLATION**



4X #4 X ¼ IN  
Self Tap  
Sheet Metal Screw

ENCLOSURE REAR PANEL

SENSOR  
INTFC PCB

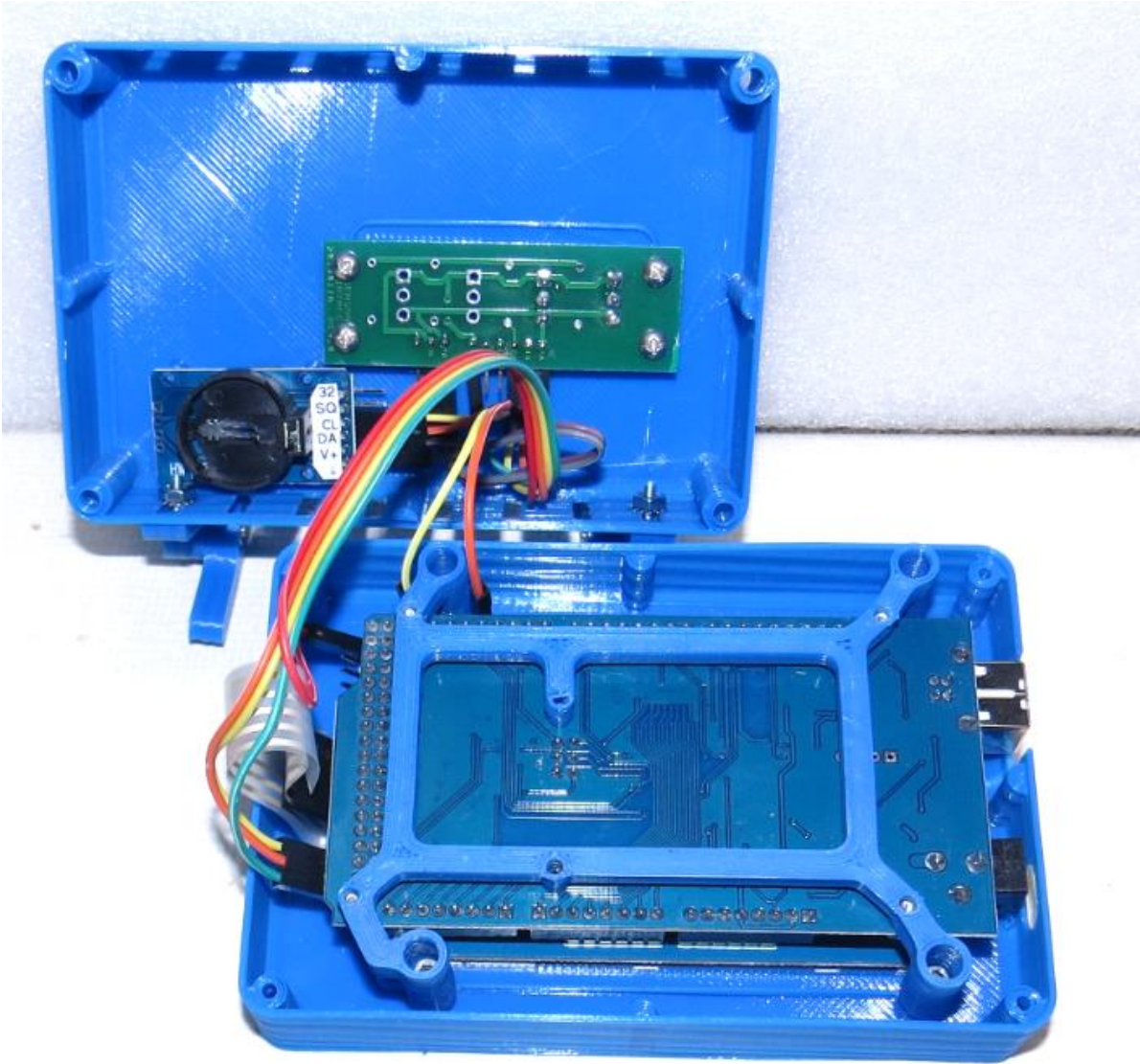


RTC MODULE

Use 2-Sided Tape -OR-  
Melt Pins to Hold RTC in Place

4X 1/2 IN  
PHILLIPS HD & NUT  
To Attach each Tilt-stand  
to Rear Panel.

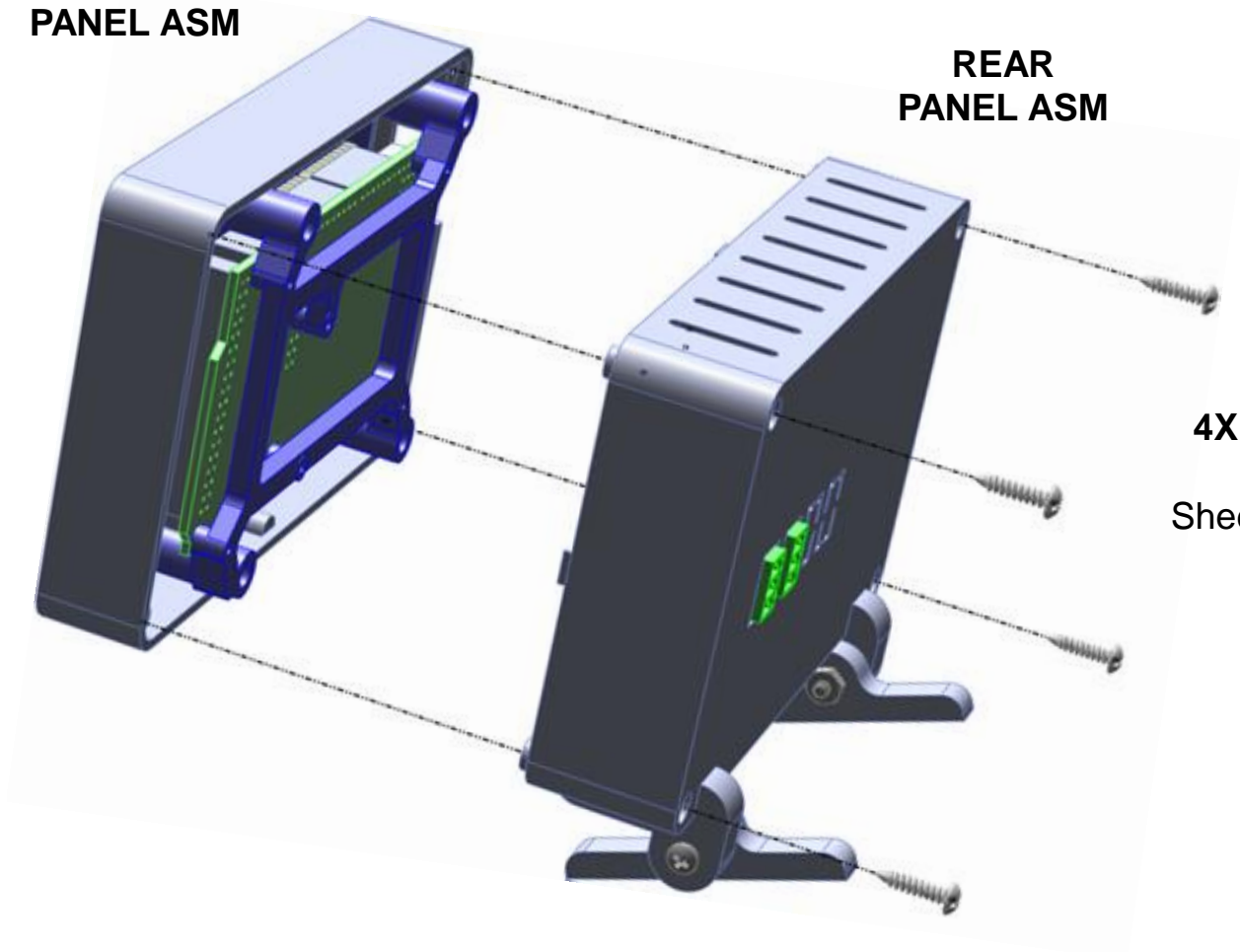
4X ½ IN  
PHILLIPS HD & NUT  
To Assembly Tilt-Stand  
Base to Mount





FRONT  
PANEL ASM

REAR  
PANEL ASM



4X No. 4 x 1/2 IN  
Self Tap  
Sheet Metal Screw

# Software Libraries Needed

NOTES:

- 1. The Graphing Thermometer\_Vx\_xx.ino program was developed using **Arduino IDE V 1.8.5**. Program may need adjustments to compile on other IDE versions. The program was not tested on other versions of IDE.
- 2. You must download the program and install it into a directory of the same name on your PC. This directly must include:  
C:\...\Graphing\_Thermometer\_V3.10\Graphing\_Thermometer\_V3,10.ino  
C:\...\Graphing\_Thermometer\_V3.10\droid\_mono\_40pt7b.h
- 3. The following LIBRARIES indicated in the following table, items 2 through 9, must be installed into your IDE.

Ref#	Include File Source Code Statement	Descripton/Installation Notes	Link
1	GraphingThermometer.ino	Mainline Arduino Code for Project	
	#include "droid_mono_40pt7b.h"	Included with item 1. Must be installed in the SAME DIRECTORY as the mainline program.	
2	#include <Wire.h>	Part of IDE - No special installation needed	
3	#include <OneWire.h>	Part of IDE - No special installation needed	
4	#include <RTCLib.h>	Download and install in "IDE library"	<a href="https://github.com/adafruit/RTCLib">https://github.com/adafruit/RTCLib</a>
5	#include <PString.h>	Download and install in "IDE library"	
6	#include <DHT.h>	Download and install in "IDE library"	<a href="https://github.com/adafruit/DHT-sensor-library">https://github.com/adafruit/DHT-sensor-library</a>
7	#include <MCUFRIEND_kbv.h>	Download and install in "IDE library"	<a href="https://github.com/prenticedavid/MCUFRIEND_kt">https://github.com/prenticedavid/MCUFRIEND_kt</a>
8	#include <Bounce2.h>	Download and install in "IDE library"	<a href="https://github.com/thomasfredericks/Bounce2">https://github.com/thomasfredericks/Bounce2</a>
9	#include <Adafruit_GFX.h>	Download and install in "IDE library"	<a href="https://github.com/adafruit/Adafruit-GFX-Library">https://github.com/adafruit/Adafruit-GFX-Library</a>
	#include <Fonts/FreeSans9pt7b.h>	Included with item 9	
	#include <Fonts/FreeSans12pt7b.h>	Included with item 9	
	#include <Fonts/FreeSerif12pt7b.h>	Included with item 9	
	#include <Fonts/FreeMono24pt7b.h>	Included with item 9	
	#include <Fonts/FreeSansBoldOblique24pt7b.h>	Included with item 9	
	#include <Fonts/FreeSansBold24pt7b.h>	Included with item 9	

General Info for commonly available libraries: <https://www.arduinolibraries.info/>