Fox Delta

Amateur Radio Projects & Kits

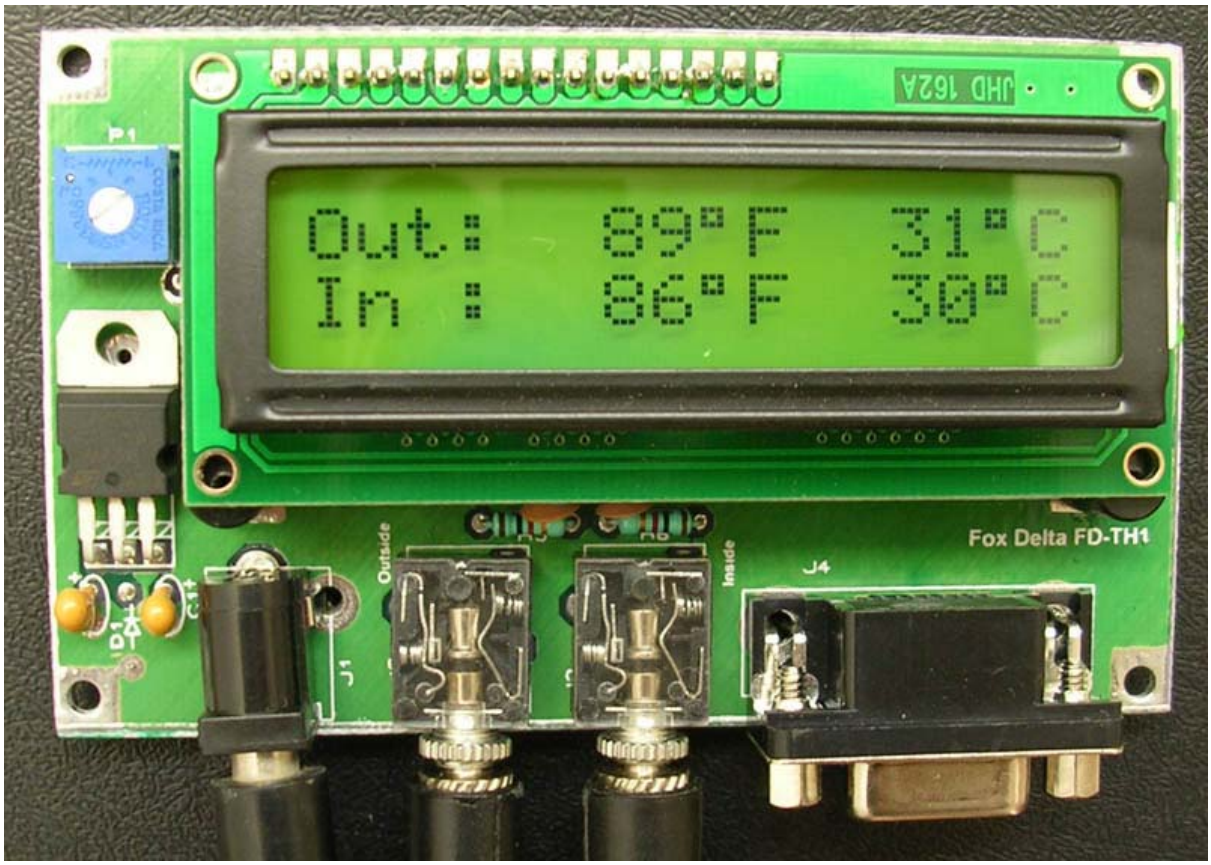
FD – TH1

Technical information: Compact PIC 16F876A LCD Dual Thermo Meter

A Simple PIC16F876A LCD DUAL Thermo Meter:

This PIC based LCD Temperature measurement project was developed to measure two Temperatures Simultaneously. It can be effectively used to measure your room temperature and may be used for measuring RF Amplifier Temp.

I made this project for a friend who wanted to measure inside & outside temp in a Vegetable cold storage. It worked very accurately and reliably for last few months.



In addition to LCD display, TH1 also produces DATA Logger output at TTL Levels available at D9F connector to supply temperature measurement data to other programs.

The Hardware is quite simple using a PIC16F876A & its two 10bit A/D measuring inputs. Temperature sensors are tiny 3 terminal MCP1047A.

Accurate reference is created for PIC by using MCP1541, which is a 4.096. A Rail-to-Rail Op.Amp MCP6022 buffers it. A voltage divided is used to get 2.56V for sensors resulting in a simple calculation of T = Reading - 200/4

Data-Logger output is available at Pin RC6, in a serial output – the TH1 will send the temperature readings every second using 9600/N/8/1 format. Please note that Output from TH1 is at TTL level.

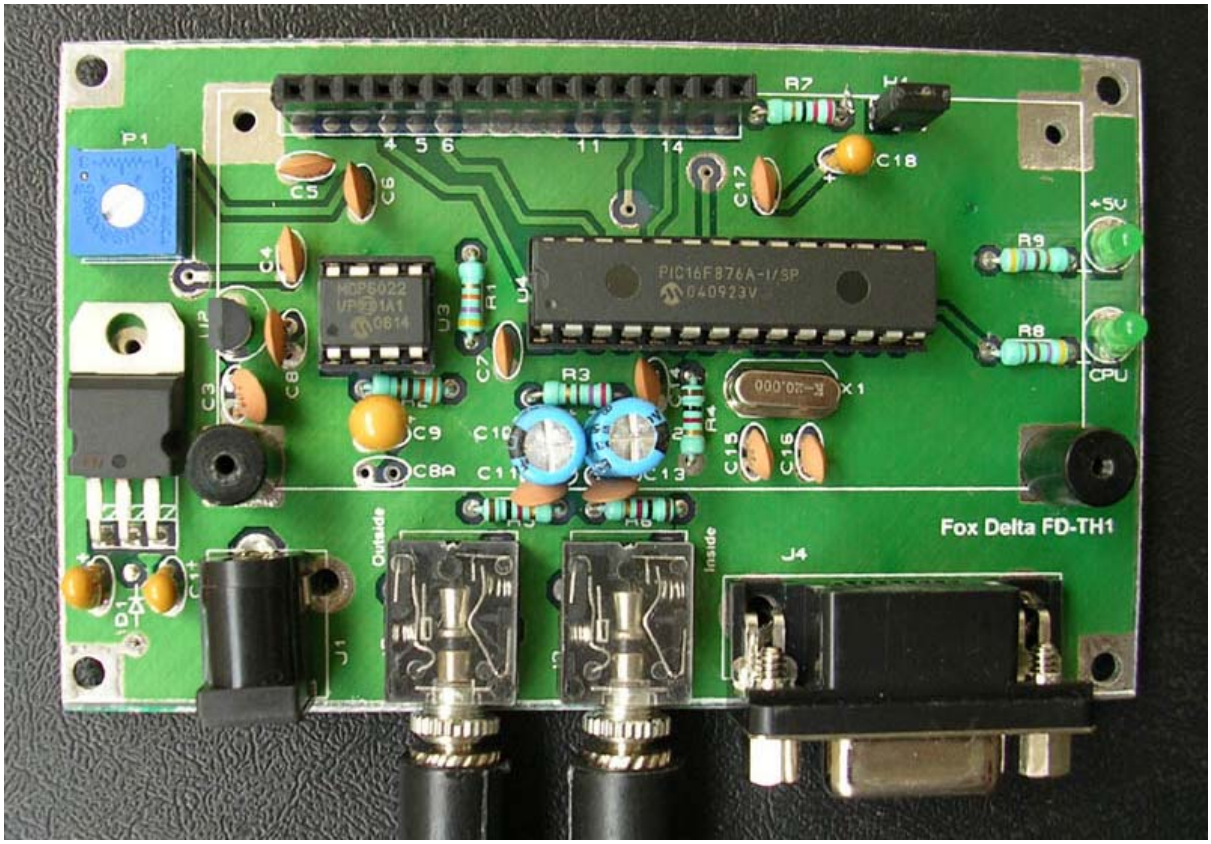
A MAX232 level converter is necessary in order to feed this info to a RS232 port and any terminal program such as HyperTerminal is suitable for this purpose. Project details of making an RS232 level converter are available on this site.

Two sensors are used. Sensors are encapsulated inside a 3.5mm phono jack and they were comfortable inside it! I wanted to place one sensor inside the project board but a fear of heat generated within the board (Especially from 7805 with backlight "on") made me move both sensors out-board for peace of mind!!

Sensors require a simple two core (2 wires in center and a shielding braid) shielded cable used for microphone/audio purposes.

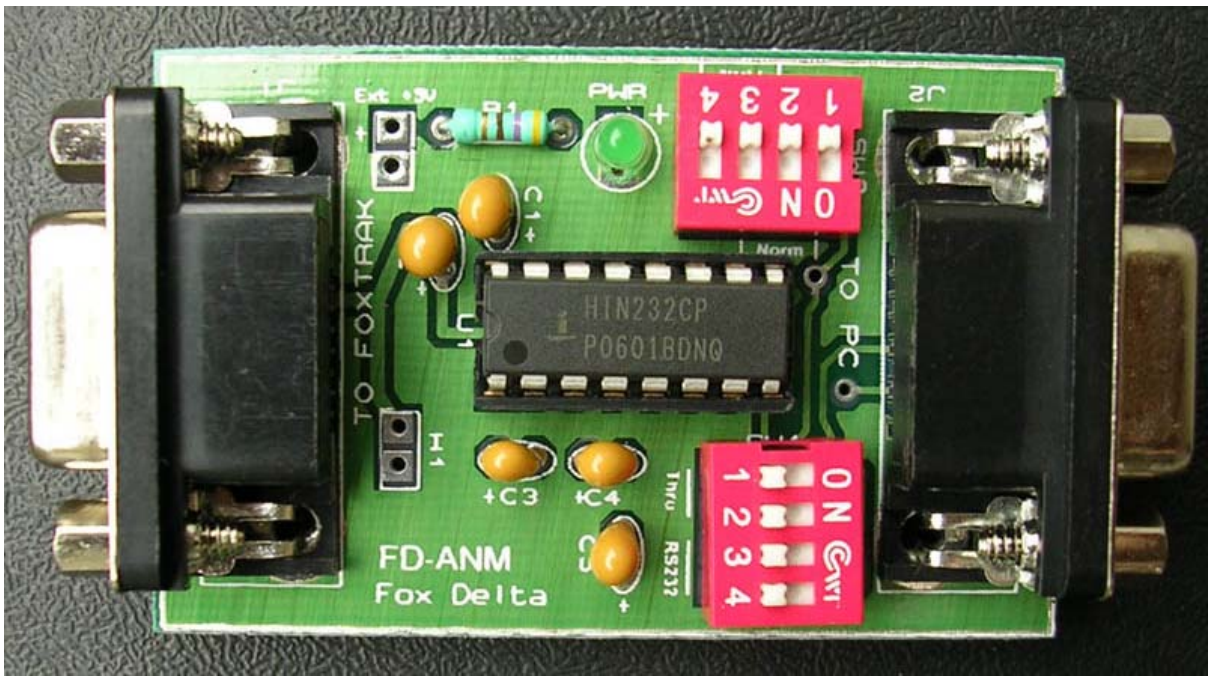
Results of this LCD meter were very encouraging and I am sure many radio amateurs would like to place this meter in their project or in their ham shack to measure various temperature levels. (Not to forget the Kitchen!!)

Picture of the LCD Thermo-Meter without LCD Module:



RS232 Level Shifter:

This LCD meter was made keeping in view simple display requirement of two temperature readings. However, for those who wish to use Data-Logger output to use in their design/project, an RS232 level shifting is required. Kindly refer to a project listed elsewhere on this site.



Link: http://products.foxdelta.com/foxnull.htm

By adding a MAX232 chip & associated components, you may convert TTL level output of TH1 to a fully compatible RS232 levels required by most PCs.

Please note that FD-ANM is designed to be used with FoxTrak. If you wish to use it as an RS232 Level Shifter for this or any other project, please apply +5V at "Ext-5V" pads.

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Date: 3rd September 07

Visit Project Page at: http://www.products.foxdelta.com