



Technical information: Compact PIC 16F876A LCD Dual Thermo Meter

REV1011

A Simple PIC16F876 LCD DUAL Thermo Meter:

PIC based LCD Temperature measurement project was developed to measure two Temperatures Simultaneously. It can be effectively used to measure your room temperature or may be 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.



TH1 is a battery cum external power device. Front panel switches are for:

1. External or 9V battery Selection
2. Power ON / OFF
3. Back Light ON / OFF (to reduce battery power)

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

The Hardware is quite simple using a PIC16F876 using its two 10bit A/D measuring inputs. Temperature sensors are tiny 3 Terminal MCP1047A or TMP36 from Analog Devices available in TO92 pack.

Accurate reference is created for PIC by using MCP1525 (U2), which provides 2.5V from a 5V supply. MCP1541 (U1) is used to supply a steady reference of 4.096V for sensors.

An LDO type 5V regulator (MCP1702) is used to get 5V for digital circuits in view to keep unit functioning when battery is being drain out.

TH1 will send the temperature readings every second using 9600/N/8/1 format. Please note that Output from TH1 is at RS232 level available at D9 Female connector J2.

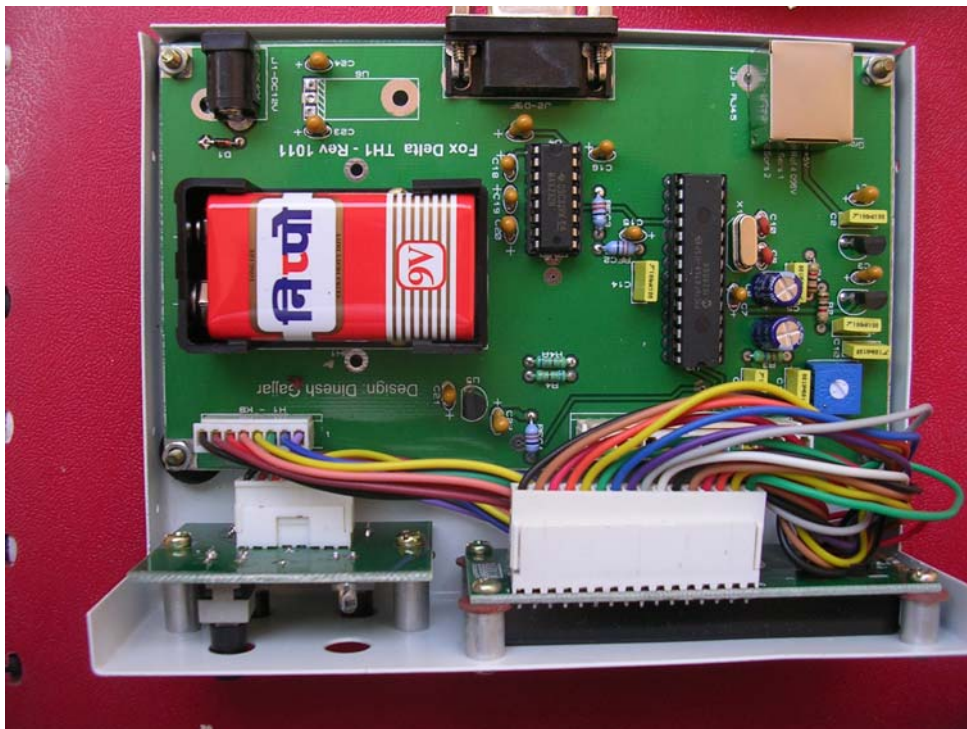
Two sensors may be used with TH1. RJ45 Connector is provided on CPU board for external connections of the sensors. A breakup board with RJ45 and Screw Terminals is part of the kit to interface external sensors.

On external break-up board, its possible to install two TMP36 temperature sensors if it suits your need. Following is possible:

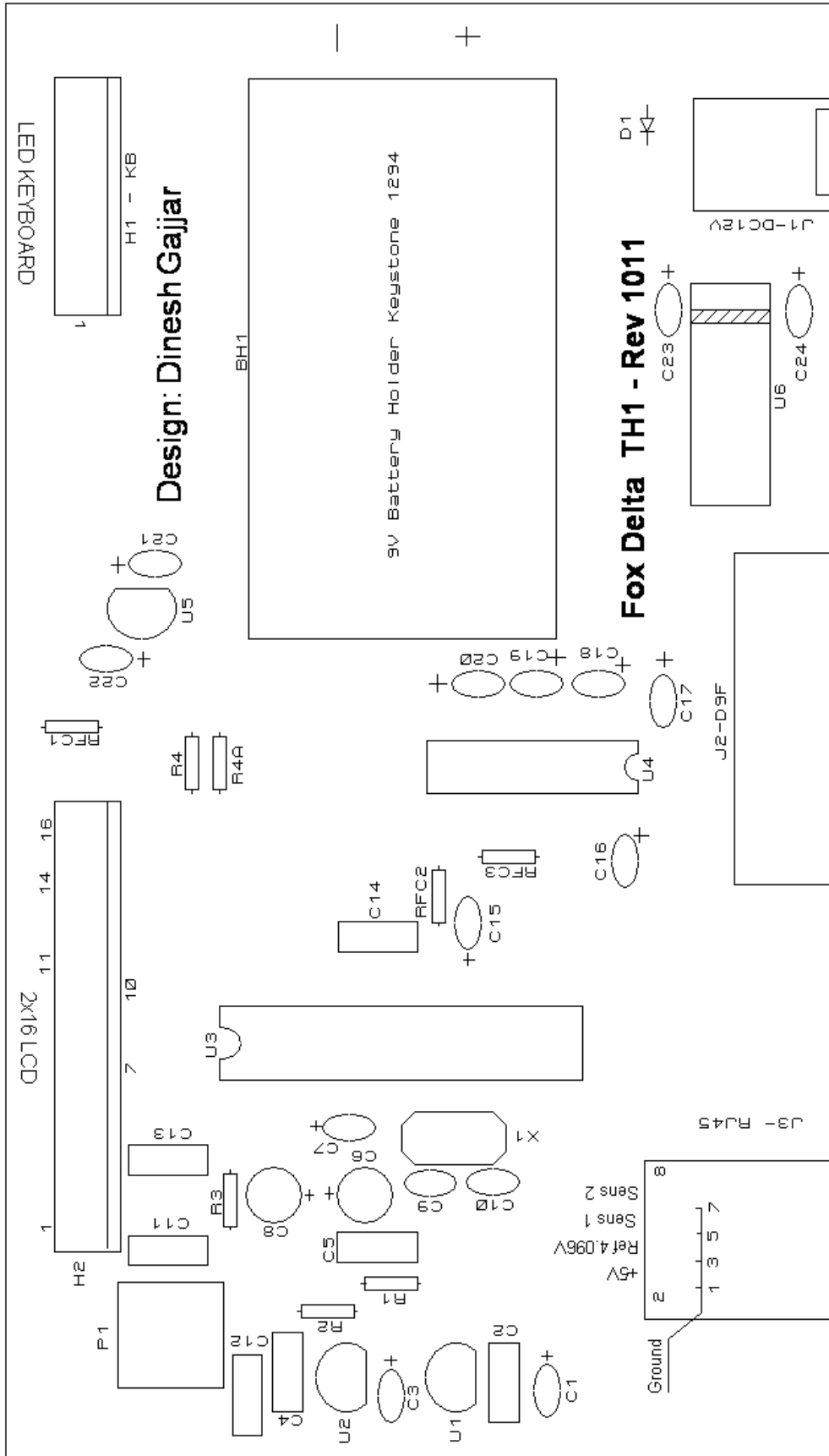
1. You may install one sensor on this board and another far way to measure another temperature region.
2. Or you may place both sensors away from this board or
3. Both sensors on this board!!

Sensors require a simple 3 Wire cable and cable is not required to be shielded variety.

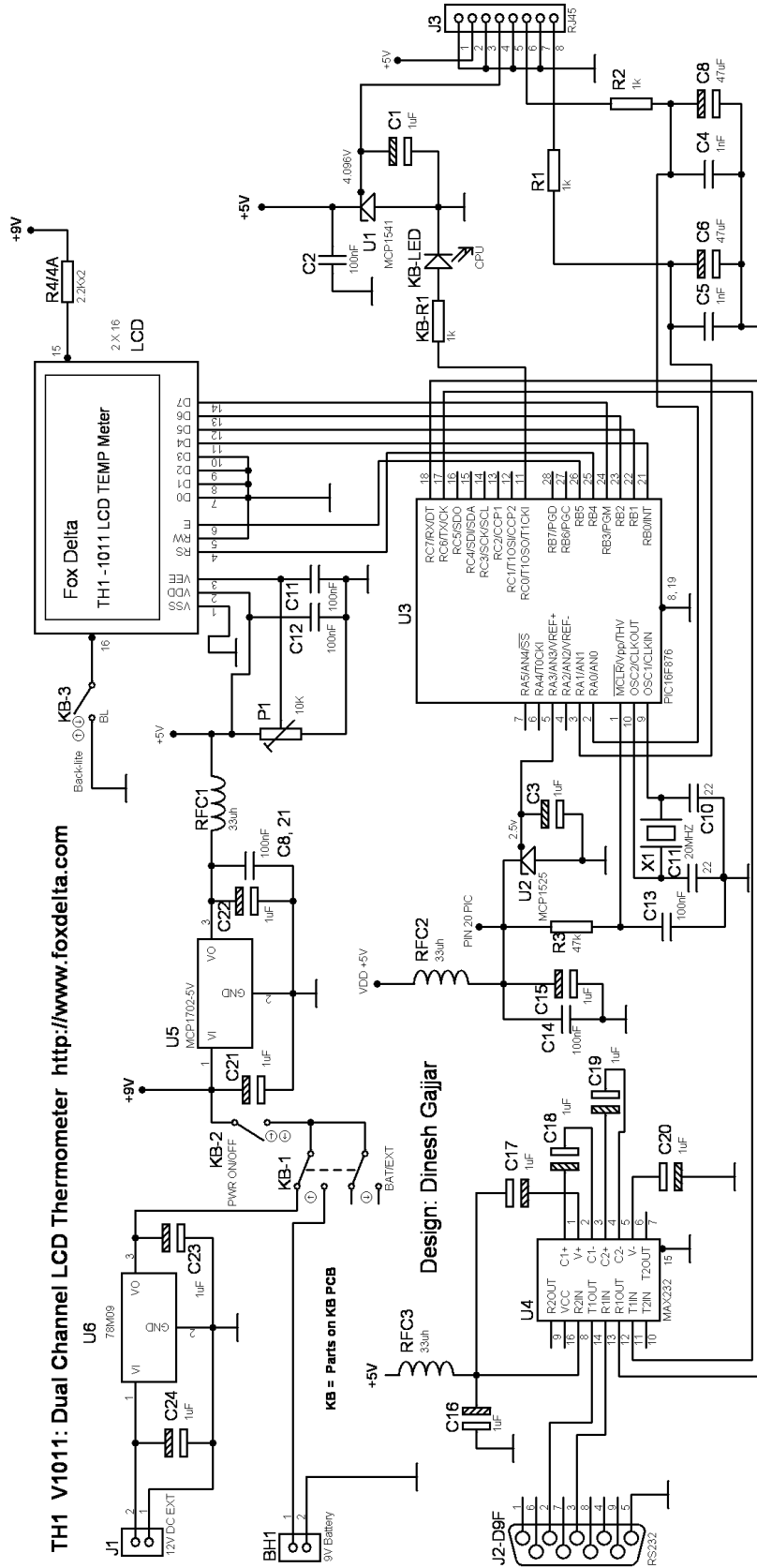
Kit includes 2xTMP36 sensors but you will wire it yourself. (See kit parts list to know what components are included in kit)



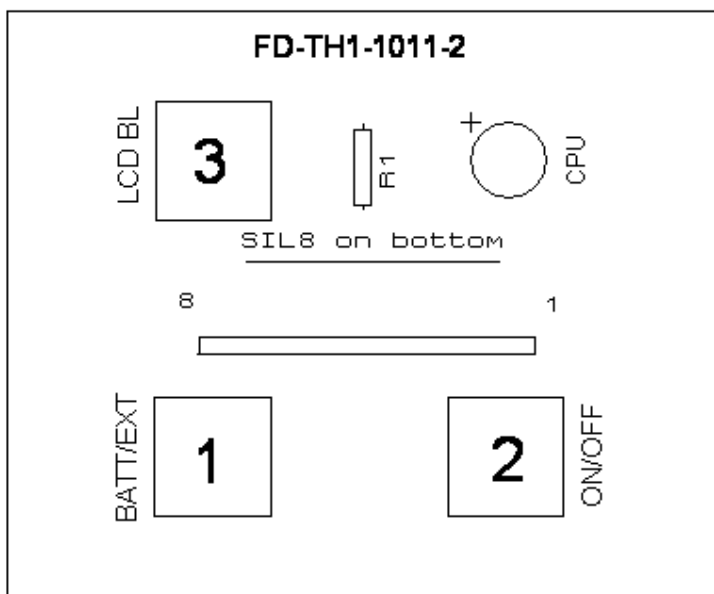
Silk Snap of the main CPU Board: TH1-1011



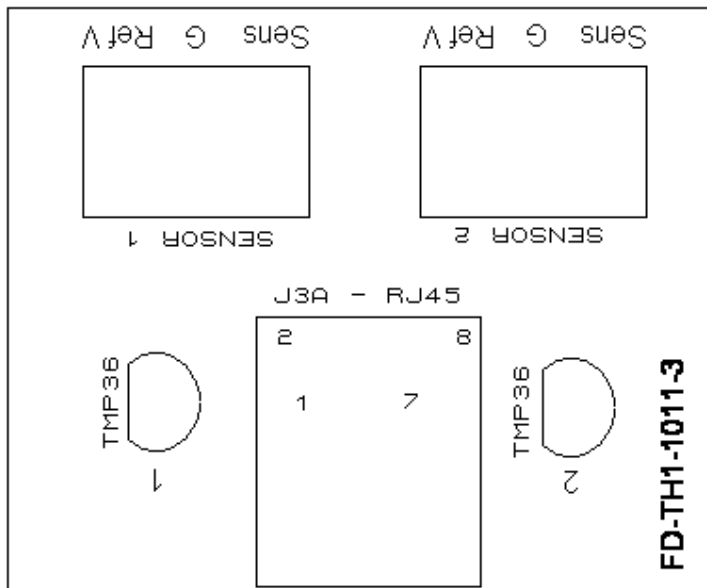
Schematic TH1-1011 CPU Board:



Silk Snap of Key Board PCB:



Silk Snap of TH1 Extension Board:



TH1 KIT Parts LIST:

Quantity	Part ID	Details
1	U3	PIC16F876A SPDIP28
1	U4	MAX232 DIP16
1	U2	MCP1525 2.5V Reference
1	U1	MCP1541 4.09V Reference
1	U6	78M09
1	U5	MCP1702 5V
1	BH1*	Battery Holder
1	J1	DC12V Socket MX27
1	J2	D9F PCB Connector
3	FP-SW	Front Panel Push ON/OFF switches
1	FP-LED	3mm
1	FP-KB-PCB	Keyboard PCB
1	TH1-PCB	TH1-Rev1011 PCB
1	Ext. PCB	Extension PCB
1	IC Socket 16	16 PIN IC Socket U4
2	H1	8PIN SIL Male with Ribbon
2	H2	16Pin SIL Male with Ribbon
1	LCD	2x16 LED with Back Light
3	RFC1, 2, 3	33-47uH RFCs
2	J3, J3A	RJ45 R/A PCB
2	Terminals	3PIN Screw Type Terminal PCB
1	Cable	RJ45 1M Long
1	Case	Powder Coated Metal Case
1	Set	LCD, KB and PCB Mounting hardware
13	C1, 3, 7, 15, 16, 17, 18, 19, 20, 21, 22 23, 24	1uf Tantalum / 35V
1	D1	Diode 1N4148
2	C6, 8	47uf Electro
2	C10, 9	22pf Ceramic
6	C2, 4, 5, 11, 13, 14,	0.1uf Poly
2	R1, 2	1K
1	R3	47K
1	X1	20MHZ Crystal HC49
2	R4, 4A	2.2K
1	P1	10K Preset: LCD Contrast

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