



# Fox Delta

Amateur Radio Projects & Kits

FD- MPSSC

**Schematic & Parts list: PIC18F4520 Multi-Purpose Sensor System Controller**

**This project is developed for Amateur Radio Community by:**

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**PIC18F4520 Multi-Purpose sensor System Controller: Stand-Alone Unit:**



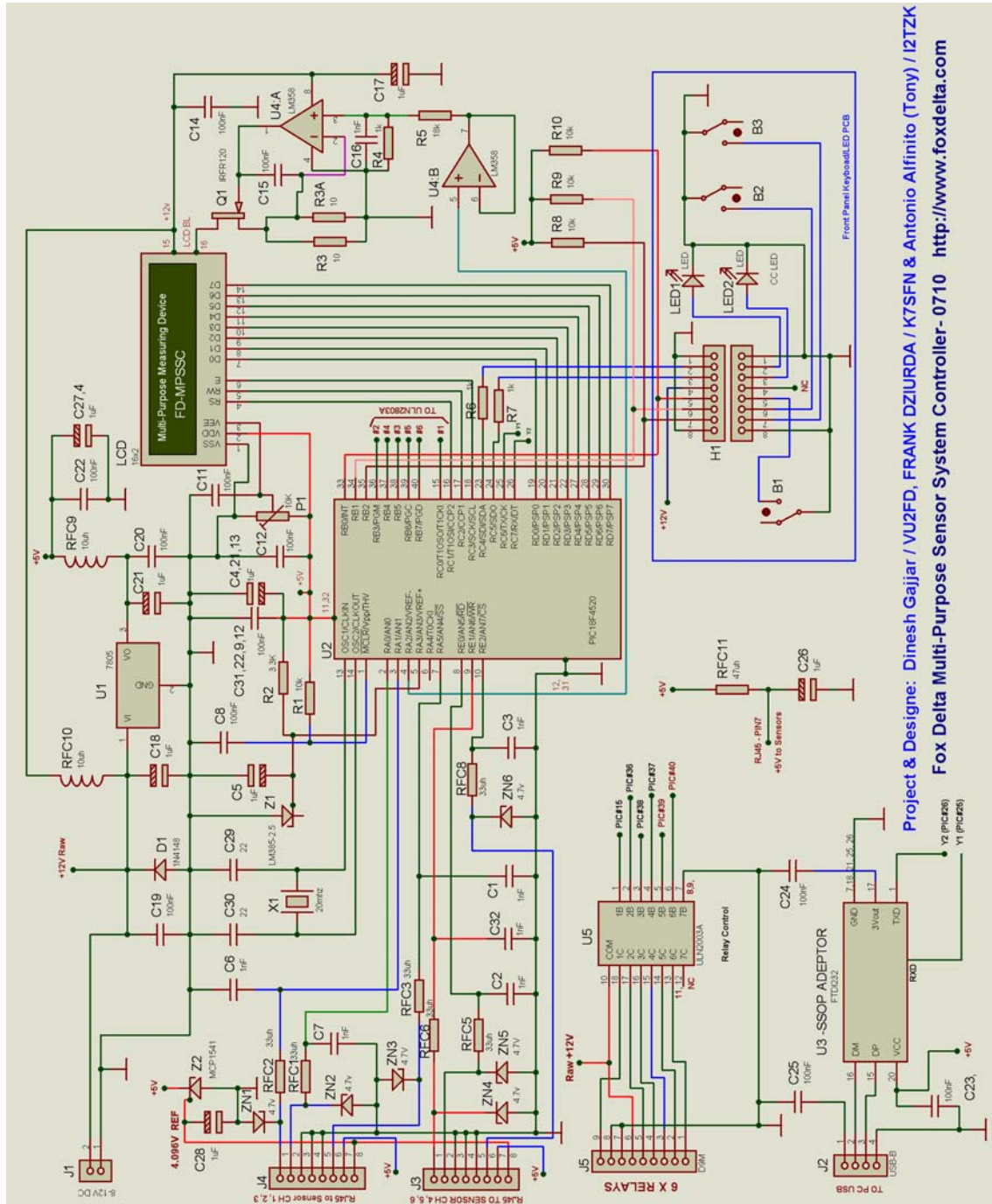
**MPSSC Complete KITS:**

MPSSC Complete kits includes: CPU with all parts including LCD, Metal case, test board and partial kit of 3 sensor board. Only optional is a Relay Board KIT as not everybody require it.

**MPSSC CPU Partial Board KITS:**

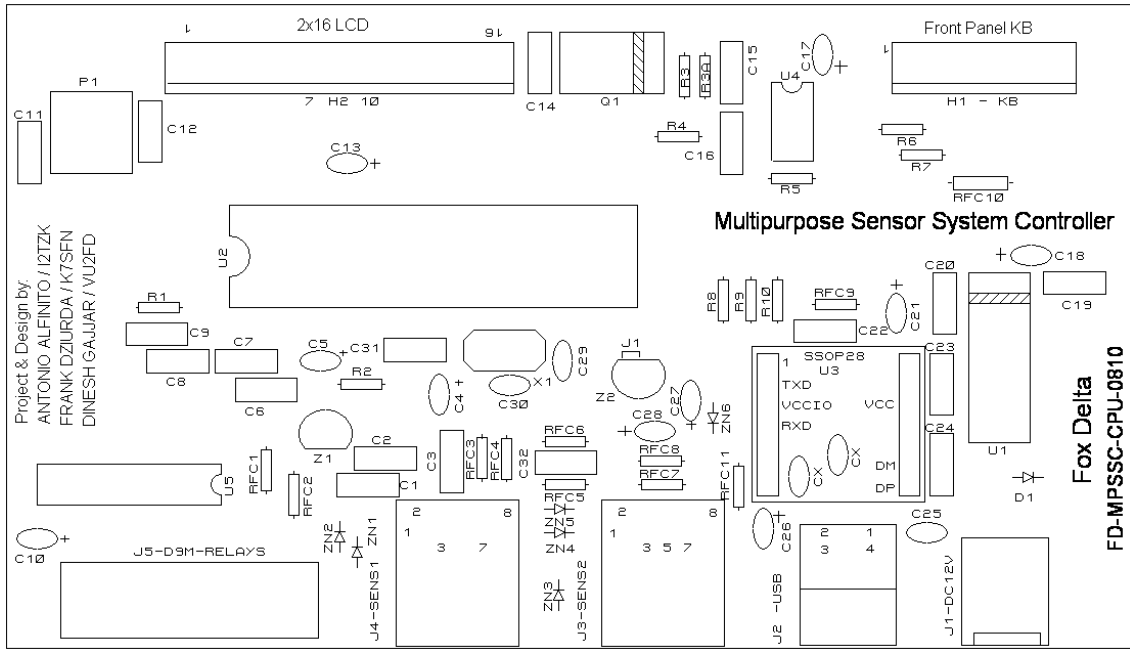
In addition to MPSSC Complete kits, Partial CPU kits are also available. CPU board works well without LCD. This will be useful to many who would like only data-logger function of CPU/Sensors and do not require an LCD Display.

# Multi-Purpose Sensor System Controller- CPU Schematic

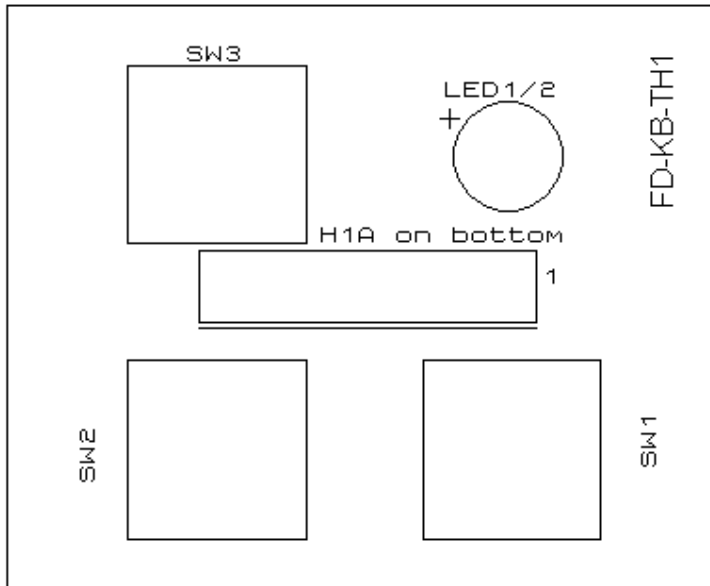


Project & Design: Dinesh Gajjar / VU2FD, FRANK DZIURDA / K7SFN & Antonio Alfinito (Tony) / I2TZK  
 Fox Delta Multi-Purpose Sensor System Controller- 0710 <http://www.foxdelta.com>

**MPSSC CPU Silk:**



**Keyboard Silk:**

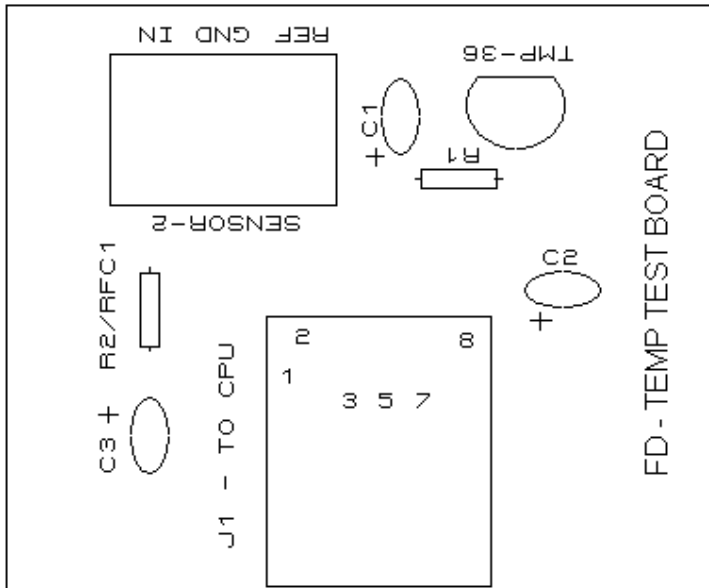


**H1A is SIL8 male connector and is installed on Bottom side of the PCB  
LED1/2 is Common cathode Dual LED**

**MPSSC CPU Board Complete KIT Parts List: Includes Free Temperature Test Board.**

Quantity	Part ID	Part Details
1	U1	7805 TO220
1	U2	PIC18F4520 Pre-Programmed
1	U3	FT232RL Pre-Soldered on 0.1inch Adepter
1	U4	LM385 DIP8
1	U5	ULN2803A Relay Driver
1	Q1	IRF120
2	Temp Sensor	Analog Devices TMP 36
1	Z1	LM385-2.5 TO92
1	Z2	MCP1541 TO92
1	D1	1N4148
1	X1	20MHZ HC49U/US
6	ZN1-6	4.7V Zener Diodes
1	Set	16SIL Male Female for LCD
1	Set	8SIL Male Female for Keyboard
1	16SIL	Ribbon Cable
1	8SIL	Ribbon Cable
1	LCD	16x2 with Backlight
1	P1	10K Bourns Preset
1	J1	12V DC Connector R/A PCB
1	J2	USB Connector R/A PCB
3	J3, 4	RJ45 R/A PCB Connector (One for Test Board)
1	J5	D9M R/A PCB
6	33-82uH	RFC1, 2, 3, 5, 6, 8,
5	10uH	RFC 4, 7, 9, 10, 11
3	DIP Sockets	40PIN, 18PIN and 8PIN
1	Set	Male/Female 0.1inch Headers for U3
1	Case	Free Powder Coated Metal Case
3	Push BTN	12mm Pushbuttons
1	LED	Dual Color 3mm LED for Keyboard
3	PCB Set	Keyboard, CPU and Test Board
1	Terminal Block	3 Pin Terminal Block for Test Board.
<b>All Resistors ¼ W 5%</b>		
1	47K	R1
1	3.3K	R2
2	10 Ohms	R3, 3A
5	1K	R4, 6, 7, (R1 & R2 For Test Board)
3	10K	R8, 9, 10
1	18K	R5
<b>Capacitors</b>		
13	1uf Tant.	C10, 18, 21, 17, 26, 27, 28, 4, 5, 13, (3 for TB
7	0.001uf Poly	C1, 2, 3, 6, 7, 8, 16
11	0.1uf Poly	C9, 11, 12, 14, 15, 19, 20, 23, 24, 22, 31
2	22pf Cer.	C29, 30
1	0.1uf Cer.	C25

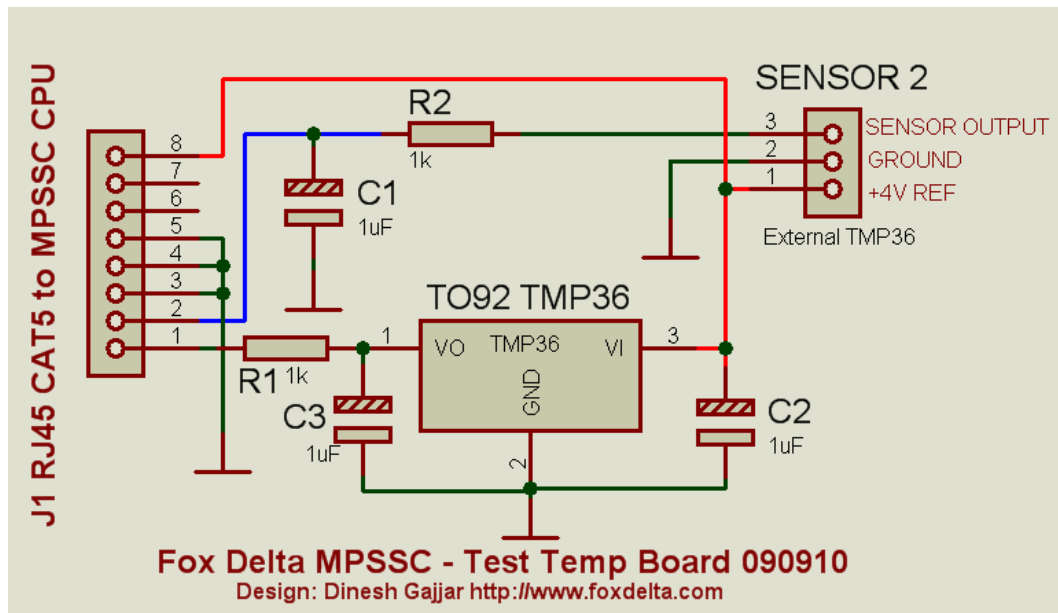
**Free Temperature Test Board Silk: INCLUDED WITH KIT / ASSEMBLED**



Test Board has 1 onboard TMP36 Temperature Sensor and Second TMP36 may be connected by way of a 3 Core cable and placed at a remote location. This way, two temperatures may be measured.

Test board will be very useful for calibration of CPU for Temperature sensor and eventually, give opportunity to user to learn how to implement a sensor in CPU configuration.

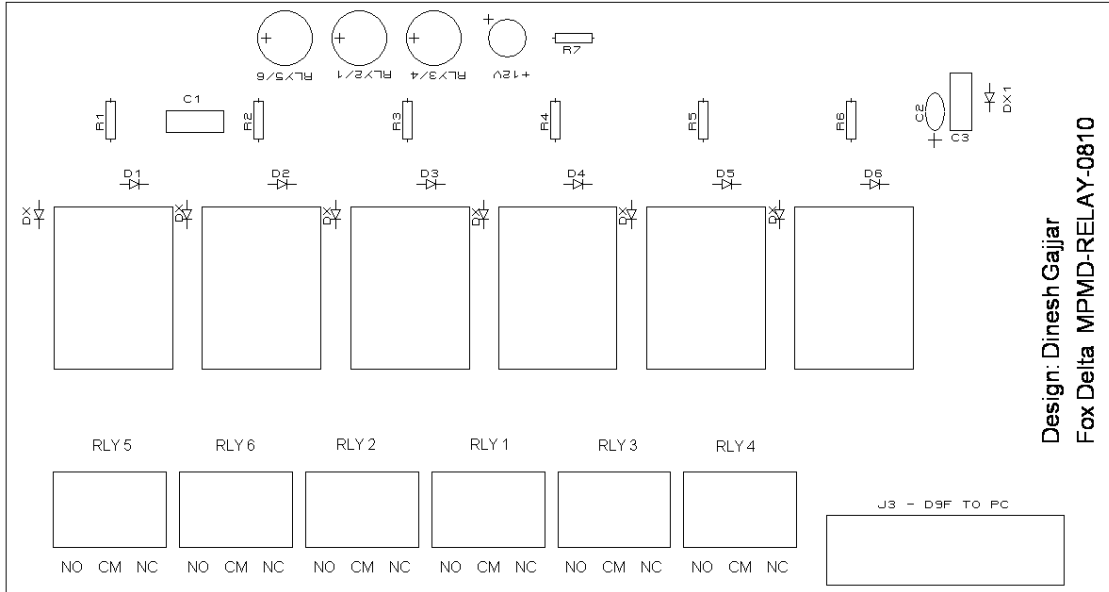
**Temperature Test Board Schematic:**



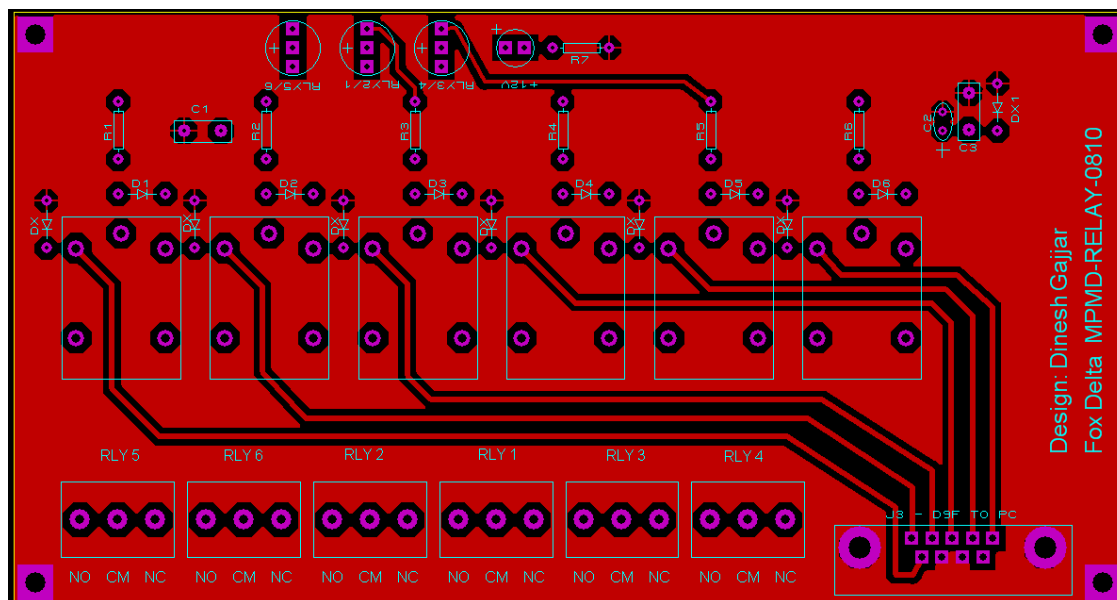
## Relay Board Silk: **OPTION**

Relay board is available as an option. Not all kit builders may require a relay to operate an AC (or DC) Load. Board has 6 relays to support the 6 sensors that CPU can handle. Both NO & NC connections are available at terminal blocks.

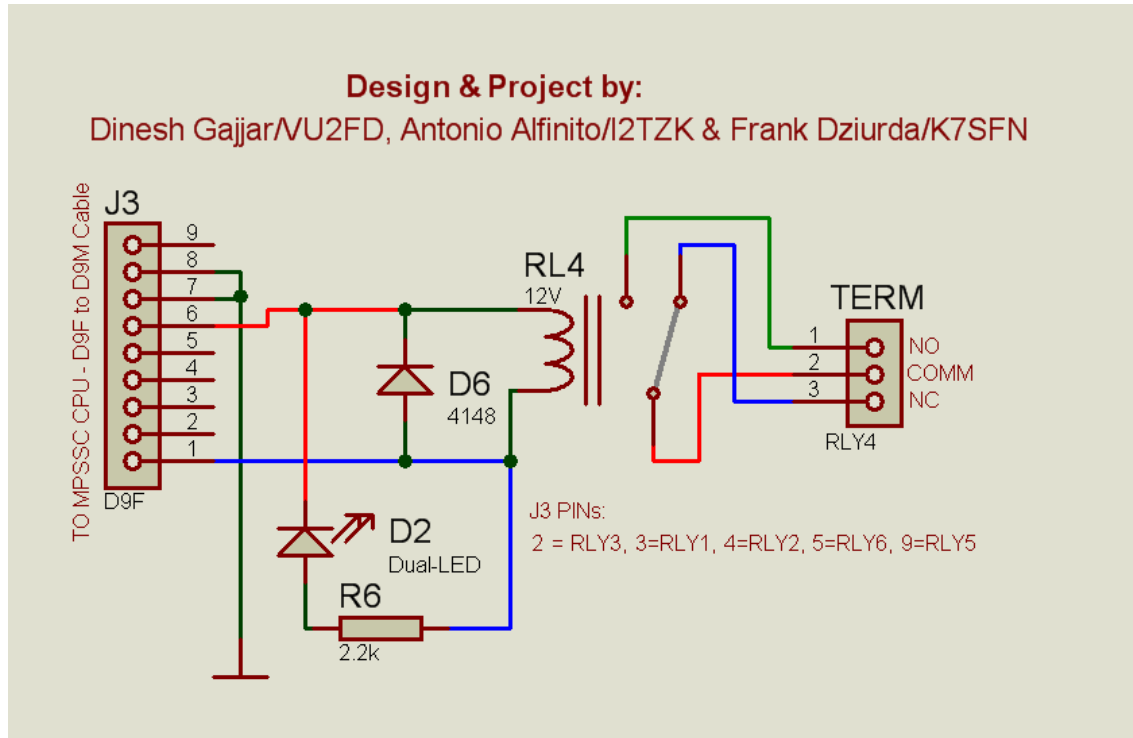
Relays used are OEN-61 type rated at 220V AC/5A. There are 7 LEDs (3 Dual Color) giving indication of relay activation and availability of +12V from CPU. A D9 Male to D9F cable is supplied with Relay Board Kits for interconnection to CPU.



## Relay board Top Side View:



## Relay Board Schematic:



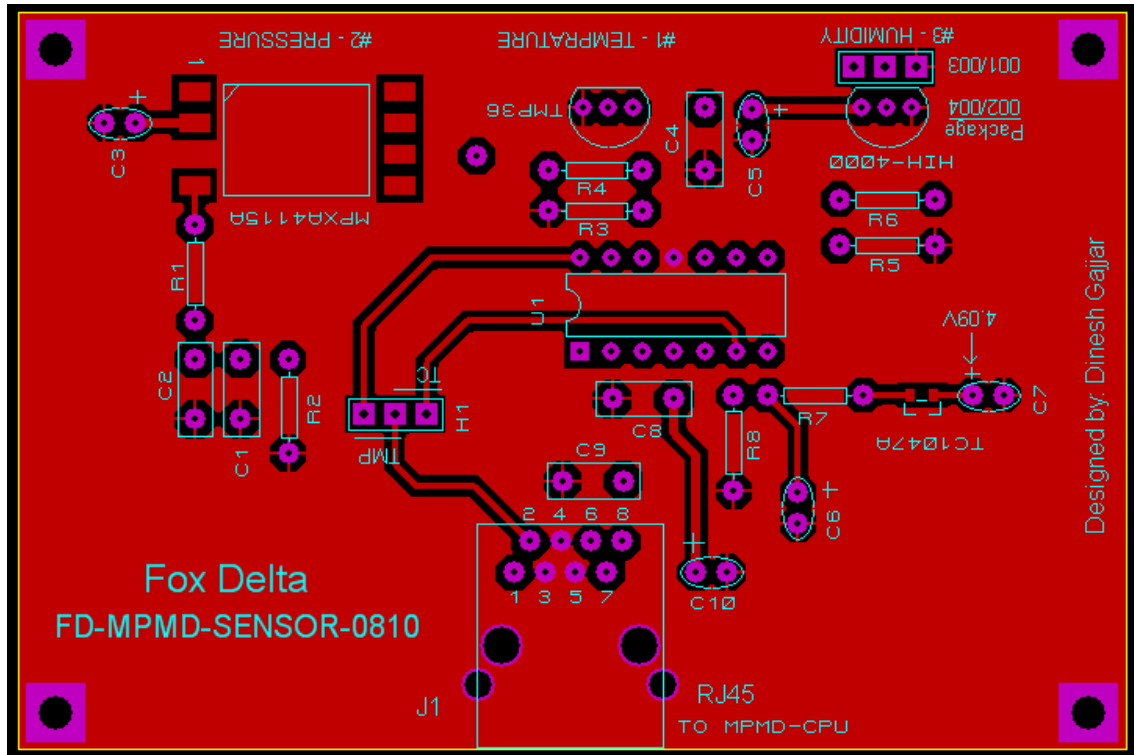
In above schematic, only one relay channel is shown. There are 6 relays on this board. Relay Board get its power from CPU.

Diodes DX (Relay coil to Ground) are not used or not supplied with Kits. User may use them if required. ULN2803A already has these diodes in its structure. DX diodes may be used where this board is used in your own project.

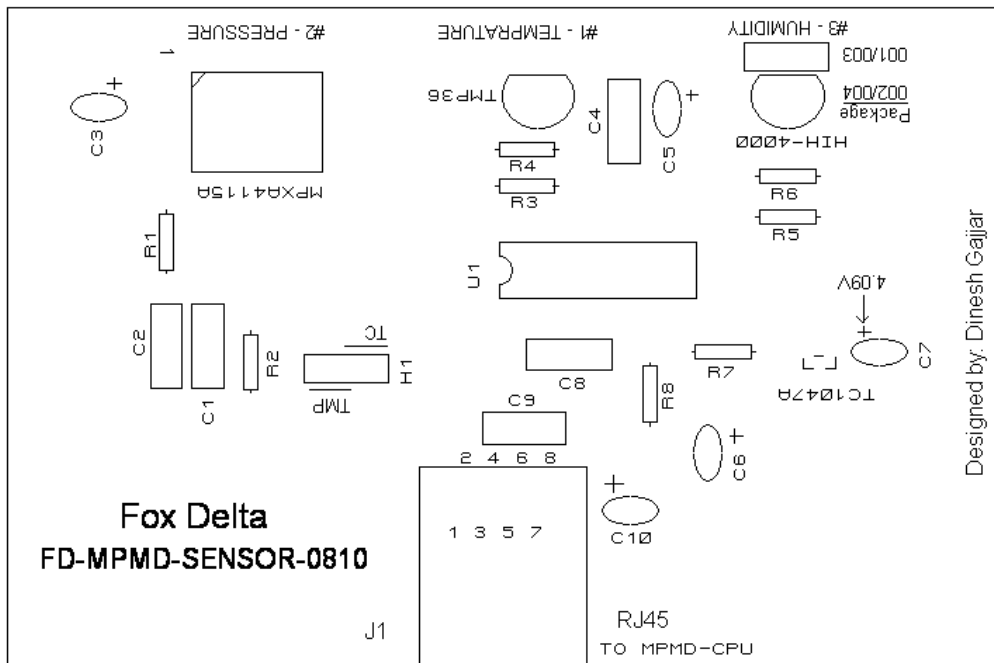
### Relay Board Parts List: (Option)

Quantity	Part ID	Part Details
1	PCB	FD-RELAY 0810.
1	Case	Free with kits or assembled
1	J1	RJ45 R/A PCB Connector
1	D9F	D9F to D9F Cable
6	Relays	OEN61 Type
3	Dual LEDs	Relay Operation
1	LED	+12V Indication
6	Terminals	3 PIN Terminal Blocks
7	R1 to R7	2.2K Resistors
7	D1 to D6 and DX1	Relay and Polarity Protection
1	J3	D9F PCB Connector
2	C1, 3	0.1uf Poly
1	C2	10uf Electro or Tantalum

**3 Sensor Board with Humidity, Temp & Pressure Sensor:  
(Partial Kit Included with CPU KIT)**

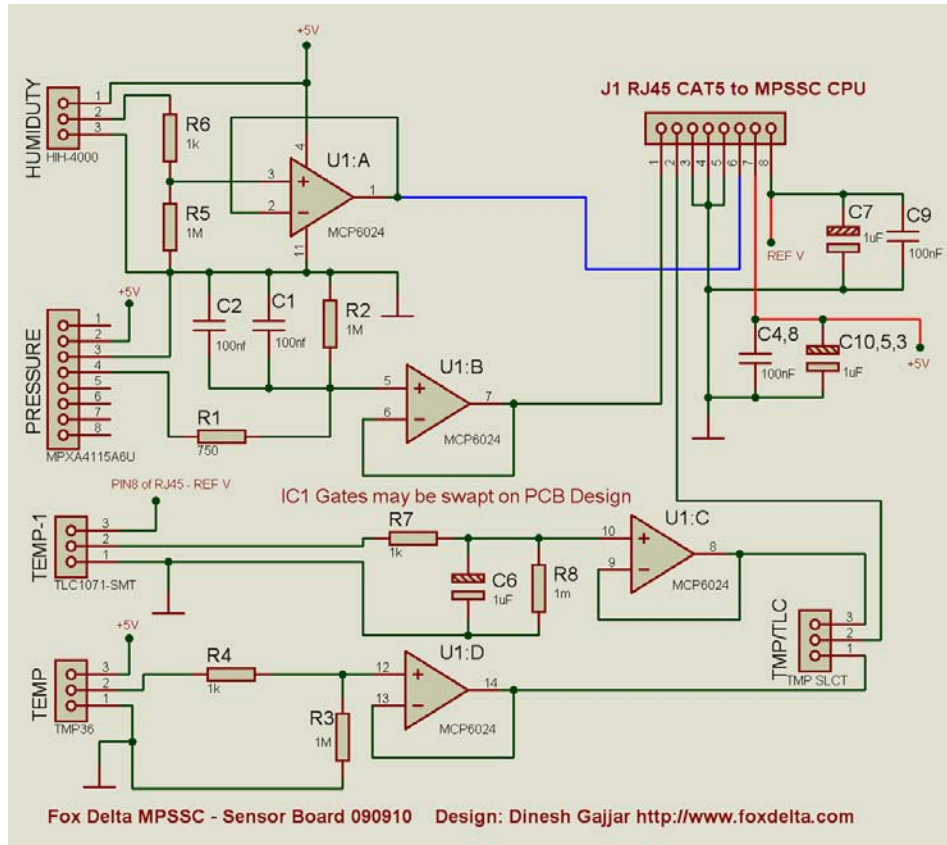


**3 Sensor Board Silk: Top**





### 3 Sensor Board Schematic:



### 3 Sensor Board Partial KIT Parts List: (Included with CPU KIT)

Quantity	Part ID	Part Details
1	MCP6024	4xOpamp. Microchip
1	J1	RJ45 R/A Connector
1	IC Socket	14 PIN
1	PCB	MPMD-0810
1	H1	3 Pin header
5	Tantalum Caps	1uf / 35V
5	Poly Caps	0.1uf (C1, 2, 4, 8, 9)
1	R1	750 Ohms
3	R6, 4, 7	1K
4	R2, 3, 5, 8	10K

73s

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24<sup>th</sup> March 2011

For more details, please visit Project Page: <http://www.foxdelta.com>