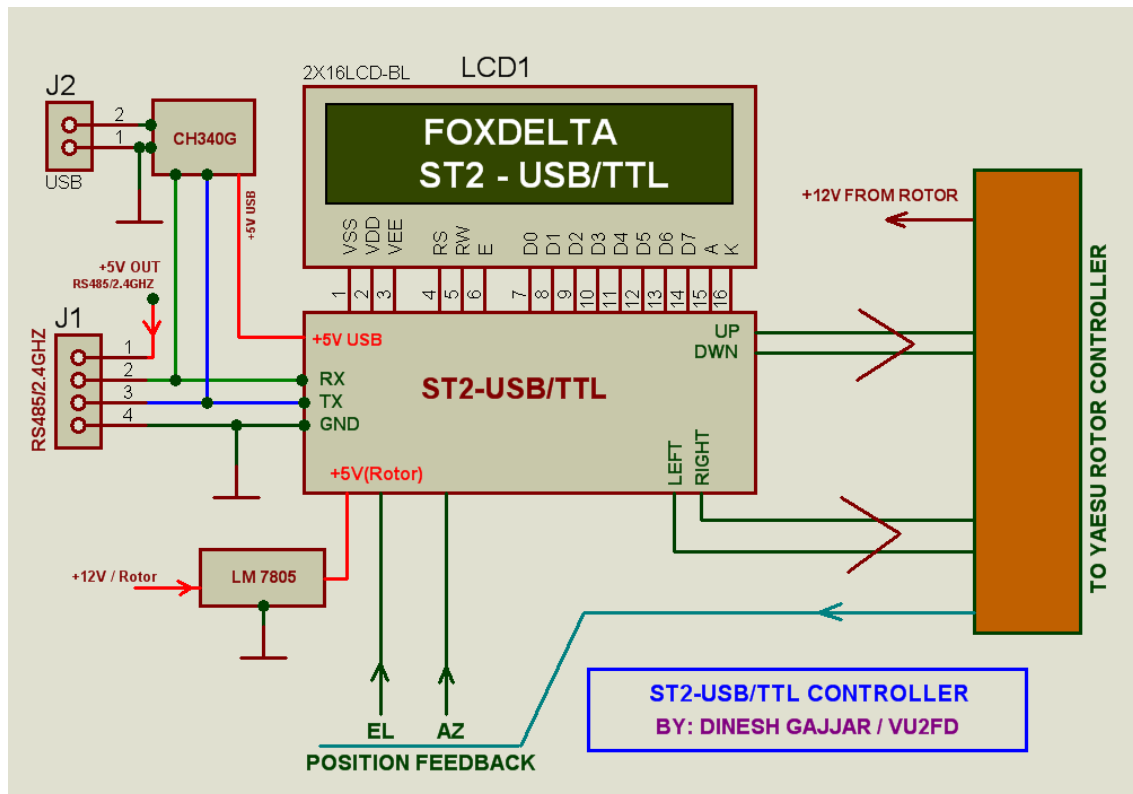




Technical Info Doc: PIC16F876A Rotor Controller for USB & RS485 / 2.4GHZ

ST2 – USB / TTL Interface: BASIC CONCEPT:



Basic Concept:

ST2-USB-TTL Interface is developed for Yaesu G5400/5500 & homebrew Rotators. Kits are supplied in a PLC type plastic case.

Project uses PIC16F876A and is electronically identical to design of an [ST2-USB Kits](#). It can be configured by changing headers for use as an USB interface or a TTL / 2.4GHZ controller.

ST2 controller uses a standard "Yaesu GS232" type instruction sets for communication with PC software, such as SatPC32, Nova, HRD etc.

ST2-USB/TTL may be used as:

1. A standard USB interface for Yaesu Controller
2. Remotely placed controller using a RS485 or 2.4GHZ adapters.

ST2-USB/TTL Kit do not include RS485 or 2.4GHZ modules which may be purchased from [aliexpress](https://www.aliexpress.com) or [ebay](https://www.ebay.com).

USB section uses CH340 type chip whereas TTL IN/OUT are directly from the PIC16F876A.

ST2- USB / TTL Controller PLC Type Plastic Case:



ST2-TTL/USB :



Possible adapters for remote placement/operation of ST2-0522:

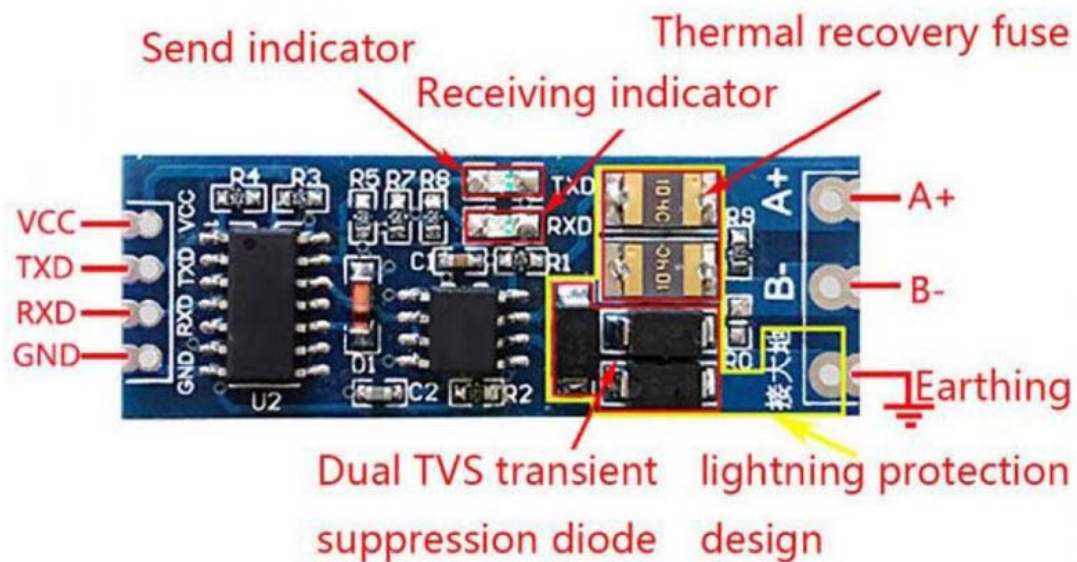
This controller may be remotely placed at antenna site and controlled by PC using following interfaces: (Not part of this kit)

1. RS485 Module
2. 2.4GHZ module

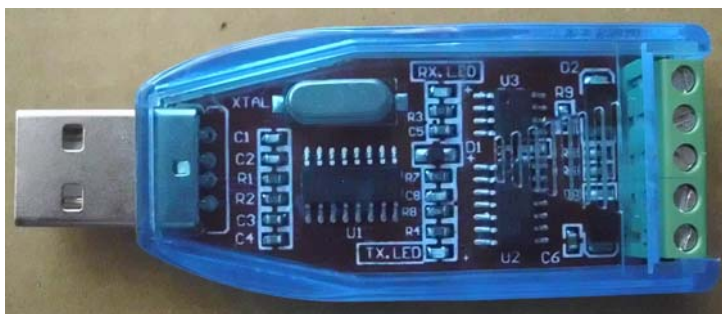
INFORMATION ON ADD-ON Modules (Not included with this kit)

Using an RS485 Module:

Economically available RS485 module connects to ST2-USB/TTL. Two data lines and 5V +, Ground are available at ST2-USB/TTL's screw terminals for this purpose.



Use this RS485 module at PC's USB Port:



Using 2.4GHZ modules for remote operation:

There are many ways that TTLdata from this controller is interfaced to PC. This can be achieved by using variety of 2.4GHZ (or any other RF modules) at controller and at PC.

We tested following 2.4GHZ module available for USD 5 or 7.



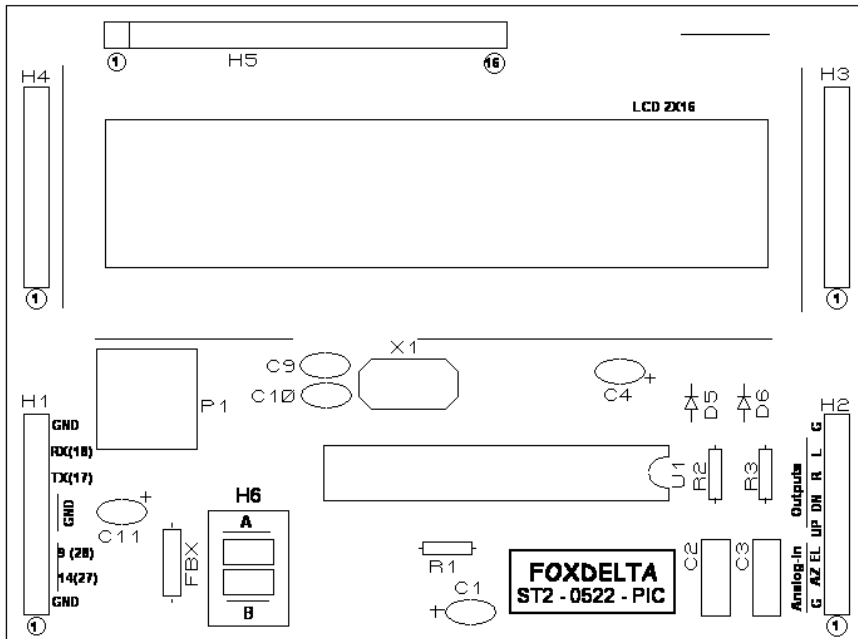
2.4GHz / 27dBm / 5000m

nRF24L01+ E34-2G4H27D

Note:

You require two identical modules: One at ST2 and another at your PC.

PIC BOARD SILK:

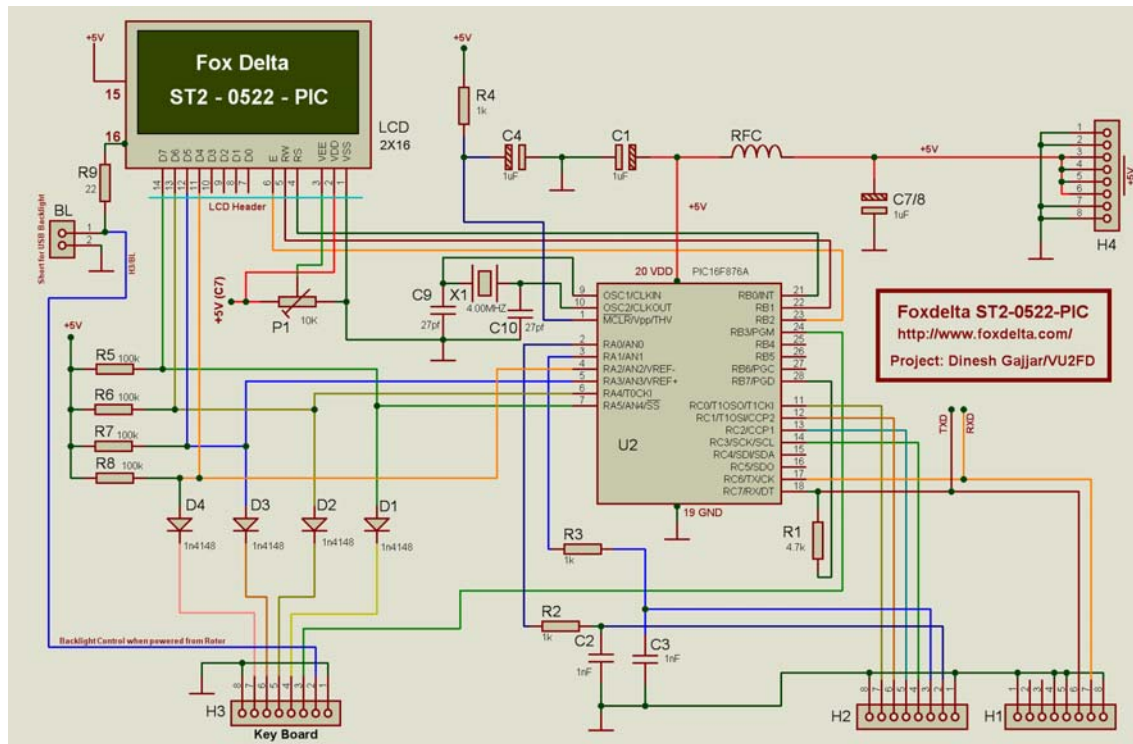


ST2 - 0522 – PIC Board Parts List:

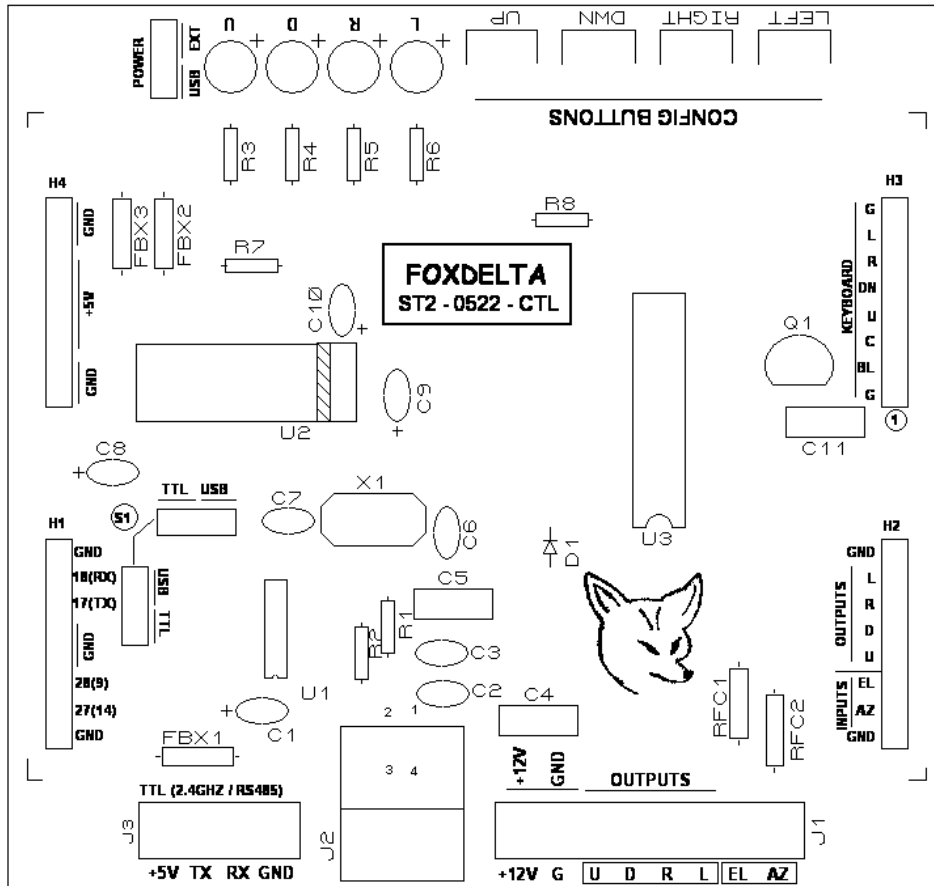
Quantity	Part ID	Details
1	U1	PIC16F876A DIP28
2	H6: Headers	Handshake control - Optional
2	PCB	ST2-0522-PIC DSPTH PCB
1	LCD	2x16 LCD with BL
1 Set	H5 - LCD Headers	16PIN SIL male Headers
4	Board Headers	8Pin Male headers for Inter-connect
6	D1, 2, 3, 4, 5, 6	1N4148
1	BL Header	2PIN Male + shorting pin
1	X1	4MHZ HC49US Crystal
1	FBX	RFC 10uH
1	P1	LCD Contrast Preset 10K

Quantity	Part ID	Details
3	R 2, 3, 4	1K 1/4w
1	R1	4.7K
1	R9	22 Ohms
4	R5, 6, 7, 8,	100K
7	C1, 4, 5, 6, 7, 8, 11	1uf Tantalum
4	C8, 9	27 – 33pf Ceramic
2	C2, 3	0.001uf Poly

PIC Board Schematic:



CTL BOARD SILK:

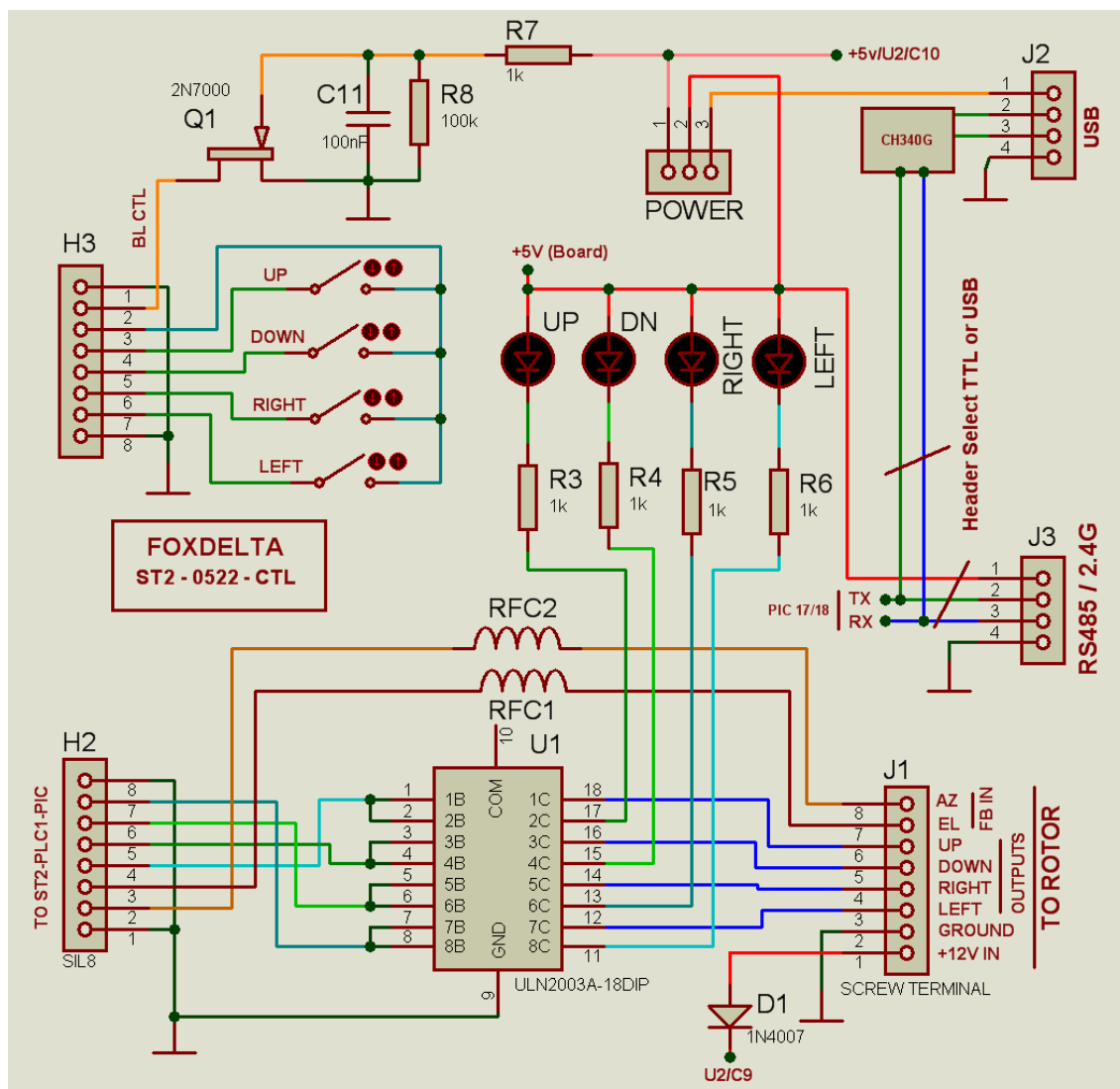


ST2-0522-CTL Board Parts List:

Quantity	Part ID	Details
1	U3	ULN2803A DIP 18
1	IC Sockets	DIP18
1	U2	7805 TO220
1	U1	CH340G SO16
1	D1	1N4007
1	X1	12MHZ Crystal HC49US
2	S1	3PIN DATA / USB select header
1	POWER	USB / Rotor Power : Source Select
1	Q1	2N7000 TO92
4	CONF BTN	4mm Push Buttons
4	LED	4 X LEDs 3mm
3	FBX1, 2, 3	RFC 10uH - 47uH
2	RFC1, 2	RFC 10-47uH
4	H1, 2, 3, 4,	8PIN Female Headers (Board Interconnect)
3	C4, 5, 11	Capacitor 0.1uF
4	C2, 3, 6, 7	Capacitor 22pf Ceramic
4	C1, 8, 9, 10	Capacitor 1uF Tantalum
1	J1	3.5mm SCREW TERMINAL 2 X 4 = 8

1	J3	3.5mm SCREW TERMINAL 2 X 1 = 4
1	J2	USB PCB
2	R1, 2	Resistor 22 Ohms
5	R3, 4, 5, 6, 8	Resistor 100K 1/4w
1	R7	Resistor 4.7K /14w
1	Case	Plastic PLC case

CTL Board Schematic:



73s / Dinesh Gajjar / 25th May 2022

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