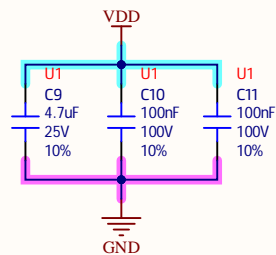
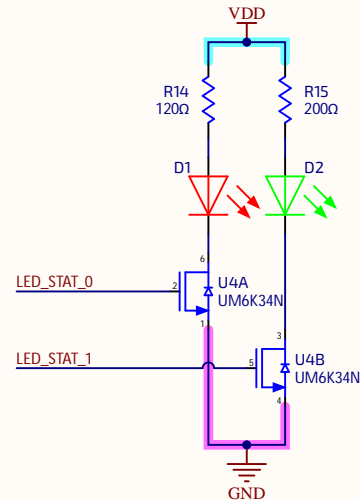


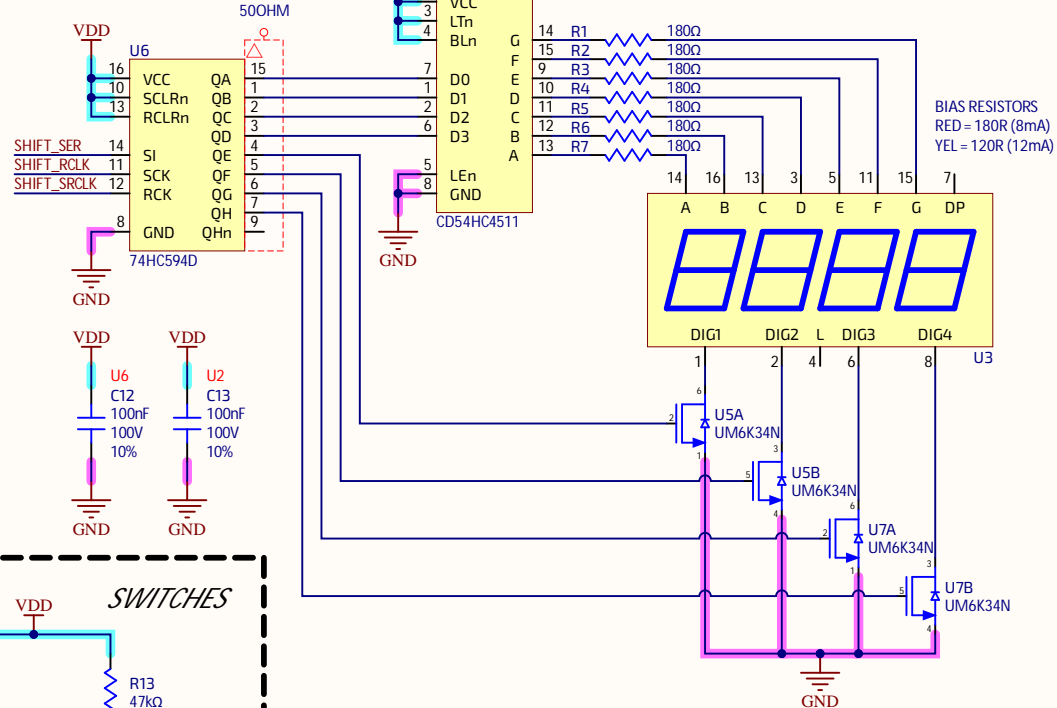
- MSP430 I/O Function Assignments**
- P1.0 = P1.0 (general purpose I/O -- transmit/receive enable)
  - P1.1 = UCA0RXD (USCL\_A0 UART receive data input)
  - P1.2 = UCA0TXD (USCL\_A0 UART transmit data output)
  - P1.3 = P1.3 (general purpose I/O -- toggle select 0)
  - P1.4 = P1.4 (general purpose I/O -- toggle select 1)
  - P1.5 = A5 (ADC10 analog input -- potentiometer measure)
  - P1.6 = P1.6 (general purpose I/O -- skip button)
  - P1.7 = P1.7 (general purpose I/O -- boot button)
  - P2.0 = P2.0 (general purpose I/O -- shift register SER)
  - P2.1 = P2.1 (general purpose I/O -- shift register RCLK)
  - P2.2 = P2.2 (general purpose I/O -- shift register SRCLK)
  - P2.3 = P2.3 (general purpose I/O -- LED status 1)
  - P2.4 = P2.4 (general purpose I/O -- LED status 0)
  - P2.5 = P2.5 (general purpose I/O -- apply button)



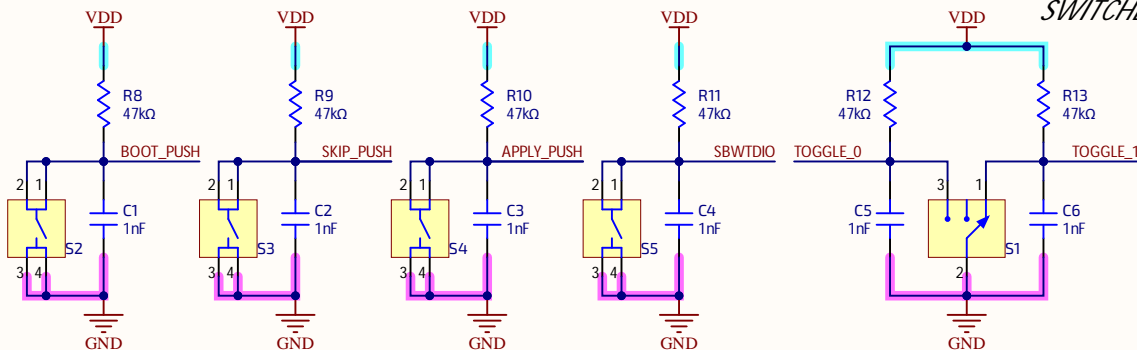
### LED INDICATORS



### DISPLAY DRIVER



### SWITCHES



## MODBUS Over Isolated RS-485 Demo

Last Modified 6/11/2022

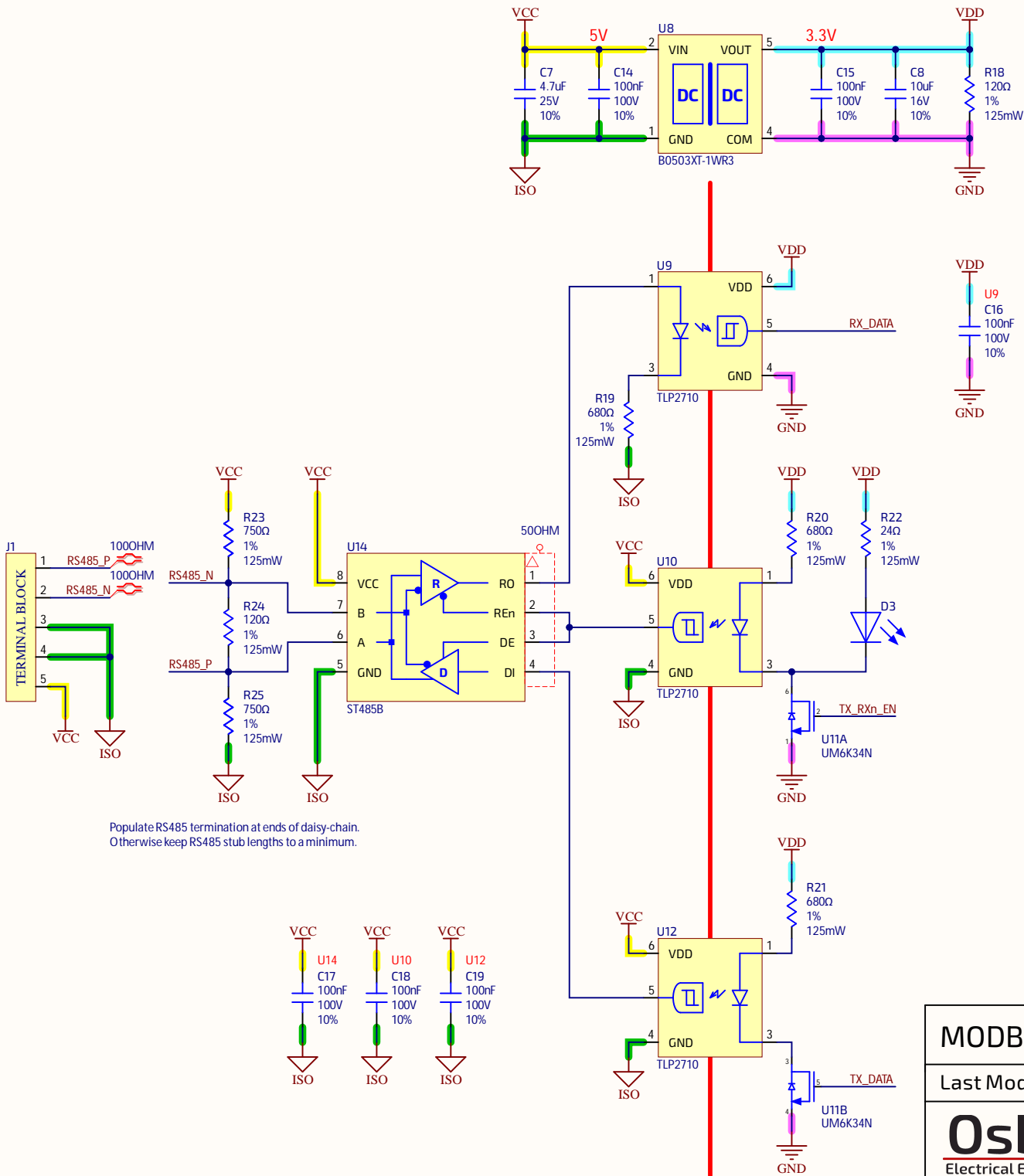
Drawn by Alexander Osborne

**Osborne**  
Electrical Engineering

[www.osborneee.com](http://www.osborneee.com)

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MODBUS Over Isolated RS-485 Demo		
Last Modified 6/10/2022	Drawn by Alexander Osborne	
<b>Osborne</b> Electrical Engineering	<a href="http://www.osborneee.com">www.osborneee.com</a> <a href="https://github.com/amosborne">www.github.com/amosborne</a> <a href="https://www.linkedin.com/in/alexander-m-osborne/">www.linkedin.com/in/alexander-m-osborne/</a>	

Line #	Description	Designator	Quantity	Manufacturer 1	Manufacturer Part Number 1
1	USB-to-Optical Isolated RS-422/485 Adapter		1	usbgear	USBG-COMi-SI-M
2	CAP, CER, 1nF ±10%, 100V, 0805	C1, C2, C3, C4, C5, C6, C21	7	Würth Electronics	885012207116
3	CAP, CER, 4.7uF ±10%, 25V, 0805	C7, C9	2	Samsung	CL21B475KAFNNNE
4	CAP, CER, 10uF ±10%, 16V, 0805	C8	1	Samsung	CL21B106KOQNNNE
5	CAP, CER, 100nF ±10%, 100V, 0805	C10, C11, C12, C13, C14, C15, C16, C17, C18, C19, C20	11	Würth Electronics	885012207128
6	Red LED Indicator 0805	D1	1	Würth Electronics	150080RS75000
7	Green LED Indicator 0805	D2	1	Würth Electronics	150080GS75000
8	Blue LED Indicator 0805	D3	1	Würth Electronics	150080BS75000
9	Screw Terminal Block, 5-Position	J1	1		
10	Header, 1-Row, 6-Position	J2	1		
11	RES, 180Ω ±1.00%, 125mW, 0805	R1, R2, R3, R4, R5, R6, R7	7	Yageo	RT0805FRE07180RL
12	RES, 47.0kΩ ±1.00%, 125mW, 0805	R8, R9, R10, R11, R12, R13, R16	7	TE Connectivity	CRGCQ0805F47K
13	RES, 120Ω ±1.00%, 125mW, 0805	R14, R18, R24	3	TE Connectivity	CRGCQ0805F120R
14	RES, 200Ω ±1.00%, 125mW, 0805	R15	1	Yageo	RT0805FRE07200RL
15	50kOhm Thumbwheel Potentiometer	R17	1	Bourns	3352T-1-503LF
16	RES, 680Ω ±1.00%, 125mW, 0805	R19, R20, R21	3	Stackpole Electronics	RMCF0805FT680R
17	RES, 24Ω ±1.00%, 125mW, 0805	R22	1	Vishay	CRCW080524R0FKEA
18	RES, 750Ω ±1.00%, 125mW, 0805	R23, R25	2	Yageo	RT0805FRE07750RL
19	SPDT Toggle Switch, On-Off-On, Through Hole	S1	1	CIT Relay & Switch	AST13SNCO
20	PTS647 Series Tactile Switch	S2, S3, S4, S5	4	ITT C&K	PTS647SN70SMTR2LFS
21	MSP430 16-BIT, 16KB FLASH, 20-TSSOP	U1	1	Texas Instruments	MSP430G2553IPW20R
22	BCD Decoder, 7-Segment Display Driver	U2	1	Texas Instruments	CD74HC4511MT
23	Quad 7-Segment Display, Common Cathode	U3	1	Vishay Lite-On	LTC-4727JR
24	NCH+NCH 50V 200mA Small Signal MOSFET	U4, U5, U7, U11	4	Rohm	UM6K34NTCN
25	Shift Register, 8-Bit	U6	1	Toshiba	74HC594D
26	Isolated DC/DC, 5Vin, 3.3Vout, 300mA	U8	1	MORNSUN	B0503XT-1WR3
27	Logic Output Optoisolator 5MBd	U9, U10, U12	3	Toshiba	TLP2710(TP4,E
28	1/1 RS485 Transceiver, Half-Duplex	U14	1	STMicroelectronics	ST485BDR
29	32.768kHz Tuning Fork Crystal, 6pF	X1	1	Würth Electronics	830014219B