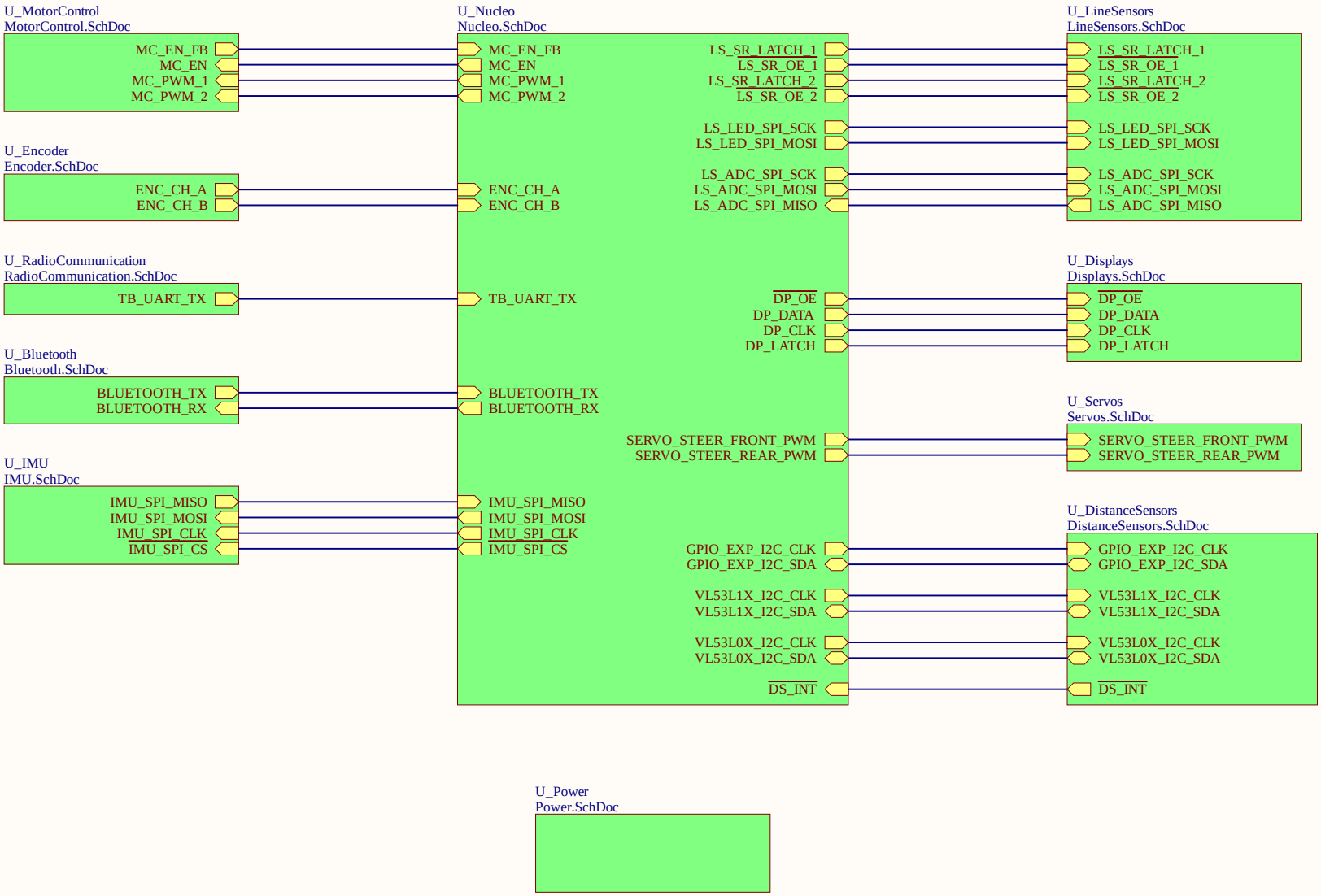
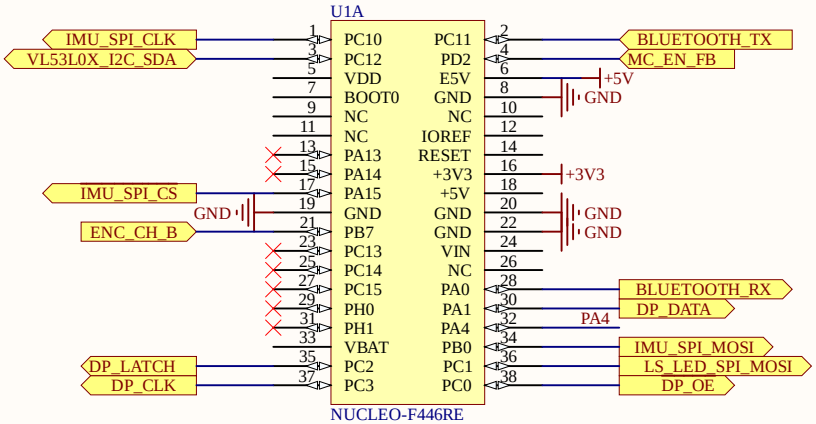


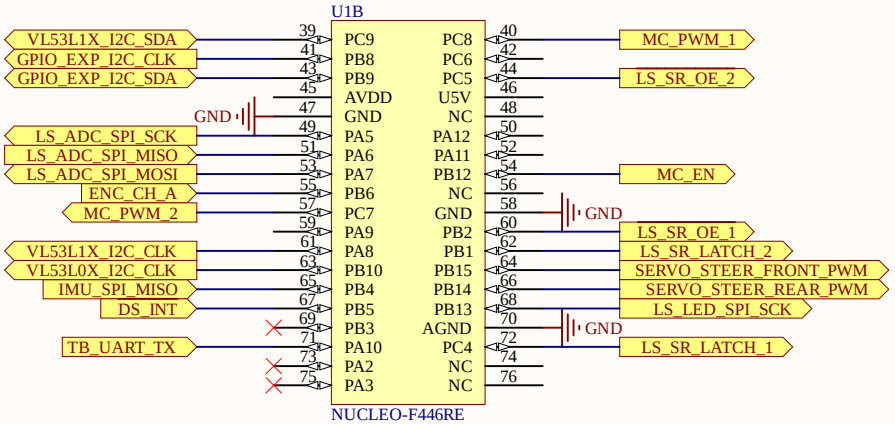
Title	***Top Level - Hierarchical View***		
Size: A4	Number: 1	Revision: 1.0	
Date: 2022 Fall		Sheet 1 of 14	
File: TopLevel.SchDoc			

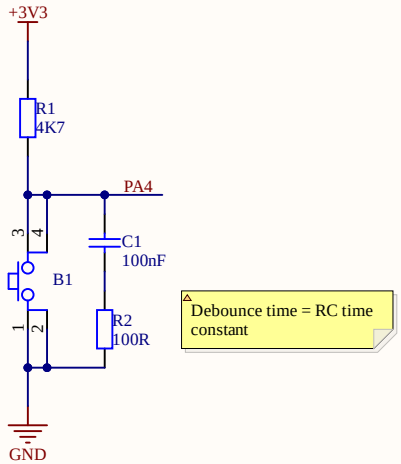
Designed by:
LK Bulls
Bagoly Zoltan
Feher Daniel
G. Varga Gabor

RobonAUT 2023

Reserved pins (do not connect anything):
PA2 - DBG UART TX
PA3 - DBG UART RX
PA5 - Green LED (?)
PA13 - SWDIO
PA14 - SWCLK
PB3 - SWO (?)
PC13 - Blue PushButton
PC14 - OSC 32.768 kHz
PC15 - OSC 32.768 kHz
PH0 - OSC 8 MHz
PH1 - OSC 8 MHz







Debounce time = RC time constant

Nucleo Connector (2 pcs are needed):
Supplier: Lomex
Reference: 43-06-67
Name: HÜVELY 20x2 P FHDH2.54-40
(T-T) 1# h=8,5mm AU

Title **Nucleo**			
Size: A4	Number: 2	Revision: 1.0	
Date: 2022 Fall		Sheet 2 of 14	
File: Nucleo.SchDoc			

Designed by:
LK Bulls
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Feher Daniel
G. Varga Gabor

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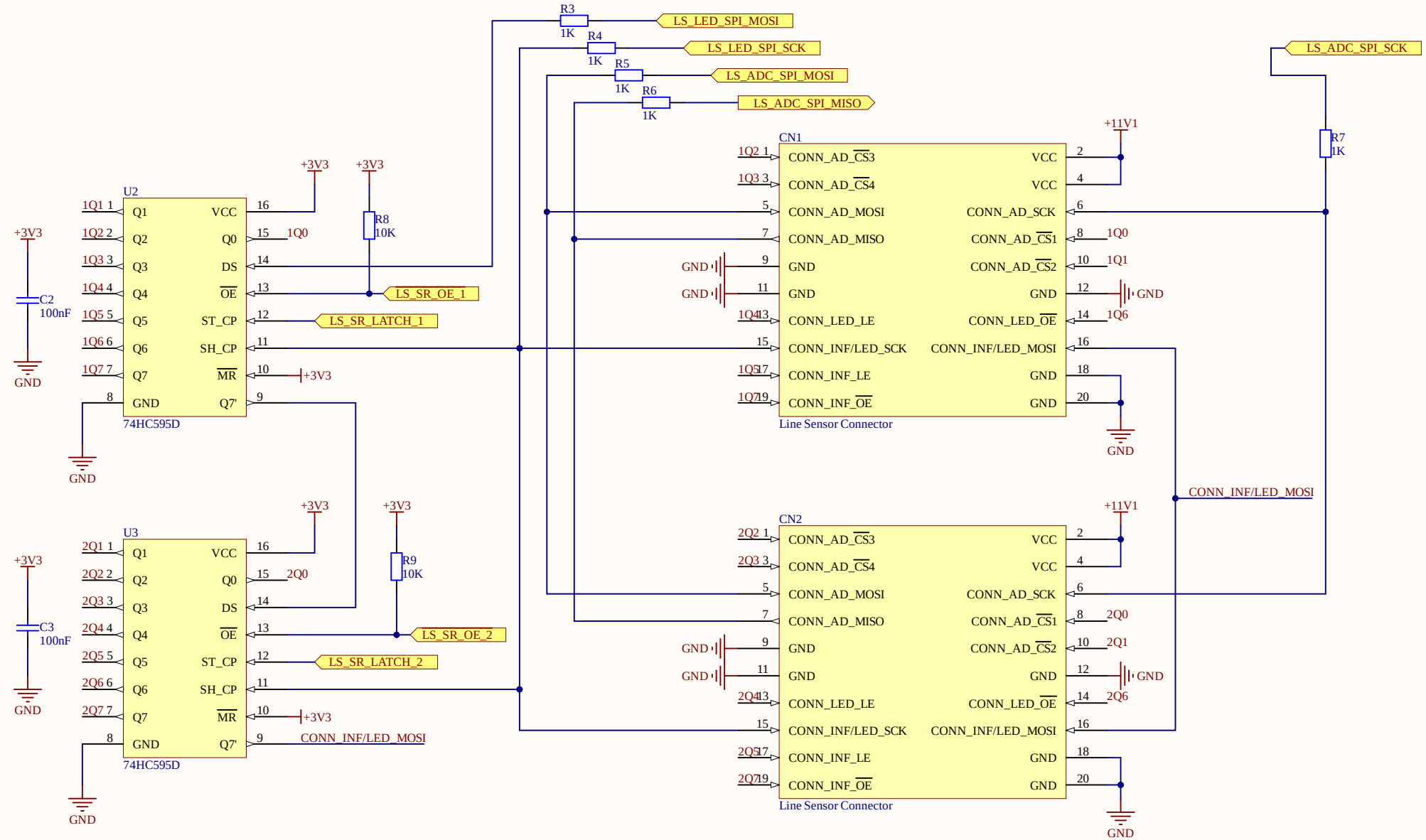
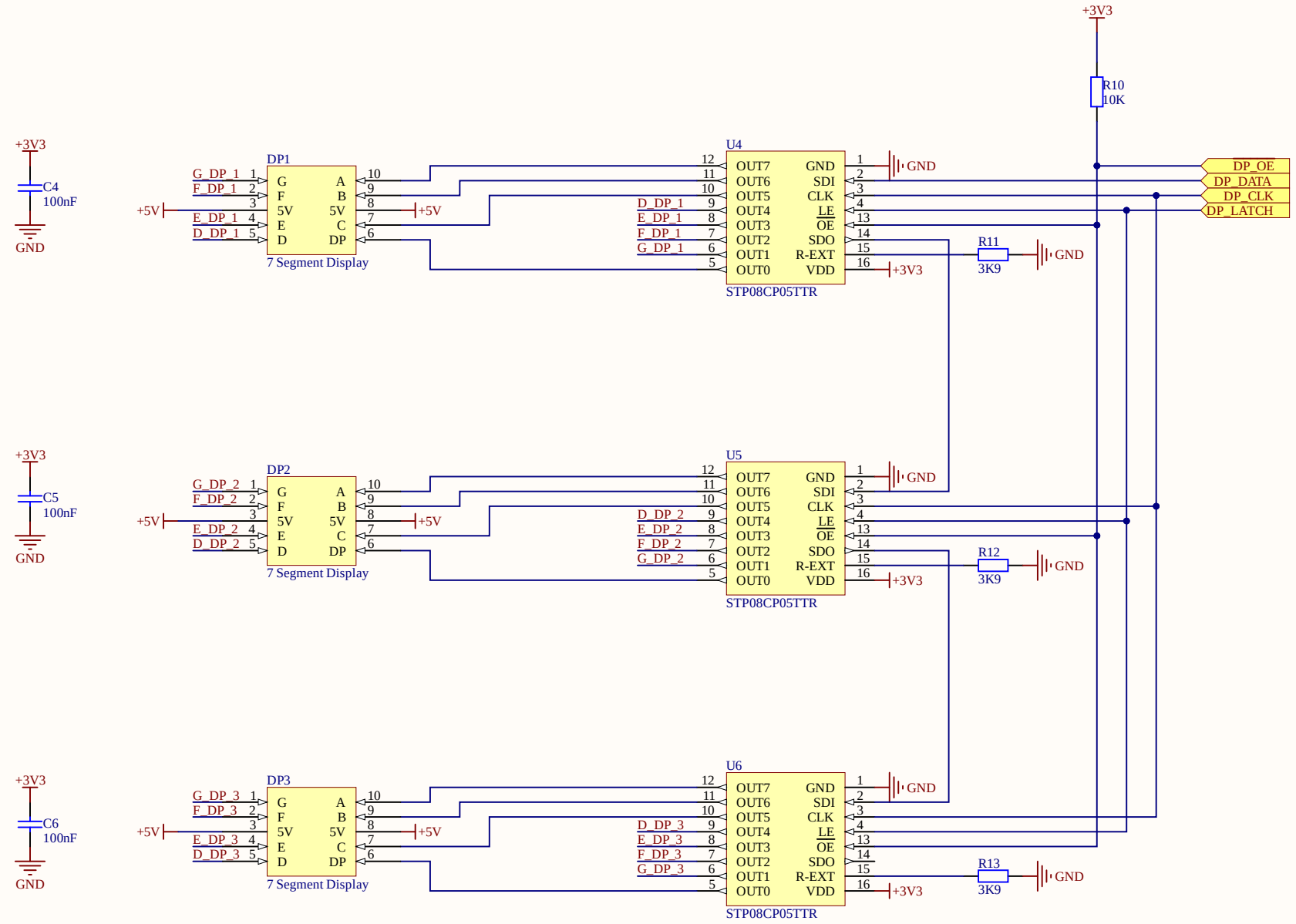

R3
1K
LS_LED_SPI_MOSI
R4
1K
LS_LED_SPI_SCK
R5
1K
LS_ADC_SPI_MOSI
R6
1K
LS_ADC_SPI_MISO
LS_ADC_SPI_SCK
R7
1K
+11V1
CN1
1Q2 1
CONN_AD_CS3
VCC
2
1Q3 3
CONN_AD_CS4
VCC
4
5
CONN_AD_MOSI
CONN_AD_SCK
6
7
CONN_AD_MISO
CONN_AD_CS1
8
1Q0
GND
9
GND
CONN_AD_CS2
10
1Q1
GND
11
GND
GND
12
GND
1Q4 13
CONN_LED_LE
CONN_LED_OE
14
1Q6
15
CONN_INF/LED_SCK
CONN_INF/LED_MOSI
16
1Q5 17
CONN_INF_LE
GND
18
1Q7 19
CONN_INF_OE
GND
20
Line Sensor Connector
GND
+3V3
+3V3
U2
1Q1 1
Q1
VCC
16
1Q2 2
Q2
Q0
15
1Q0
1Q3 3
Q3
DS
14
1Q4 4
Q4
OE
13
LS_SR_OE_1
1Q5 5
Q5
ST_CP
12
LS_SR_LATCH_1
1Q6 6
Q6
SH_CP
11
1Q7 7
Q7
MR
10
+3V3
8
GND
Q7'
9
74HC595D
R8
10K
+3V3
C2
100nF
GND
GND
CONN_INF/LED_MOSI
+11V1
CN2
2Q2 1
CONN_AD_CS3
VCC
2
2Q3 3
CONN_AD_CS4
VCC
4
5
CONN_AD_MOSI
CONN_AD_SCK
6
7
CONN_AD_MISO
CONN_AD_CS1
8
2Q0
GND
9
GND
CONN_AD_CS2
10
2Q1
GND
11
GND
GND
12
GND
2Q4 13
CONN_LED_LE
CONN_LED_OE
14
2Q6
15
CONN_INF/LED_SCK
CONN_INF/LED_MOSI
16
2Q5 17
CONN_INF_LE
GND
18
2Q7 19
CONN_INF_OE
GND
20
Line Sensor Connector
GND
+3V3
+3V3
U3
2Q1 1
Q1
VCC
16
2Q2 2
Q2
Q0
15
2Q0
2Q3 3
Q3
DS
14
2Q4 4
Q4
OE
13
LS_SR_OE_2
2Q5 5
Q5
ST_CP
12
LS_SR_LATCH_2
2Q6 6
Q6
SH_CP
11
2Q7 7
Q7
MR
10
+3V3
8
GND
Q7'
9
CONN_INF/LED_MOSI
74HC595D
R9
10K
+3V3
C3
100nF
GND
GND
Title Line Sensors
Size: A4
Number: 3
Revision: 1.0
Date: 2022 Fall
Sheet 3 of 14
File: LineSensors.SchDoc
Designed by:
LK Bulls
Bagoly Zoltan
Feher Daniel
G. Varga Gabor
RobonAUT 2023



Title **Displays**			
Size: A4	Number: 4	Revision: 1.0	
Date: 2022 Fall		Sheet 4 of 14	
File: Displays.SchDoc			

Designed by:
LK Bulls
Bagoly Zoltan
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G. Varga Gabor

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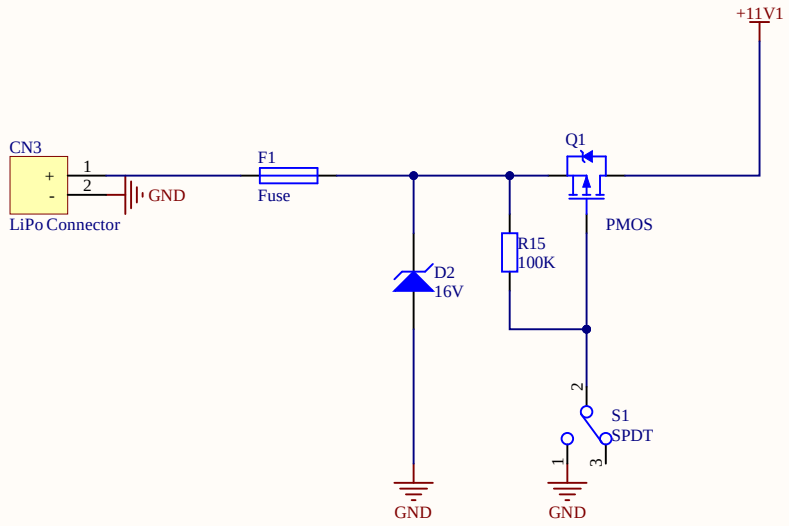
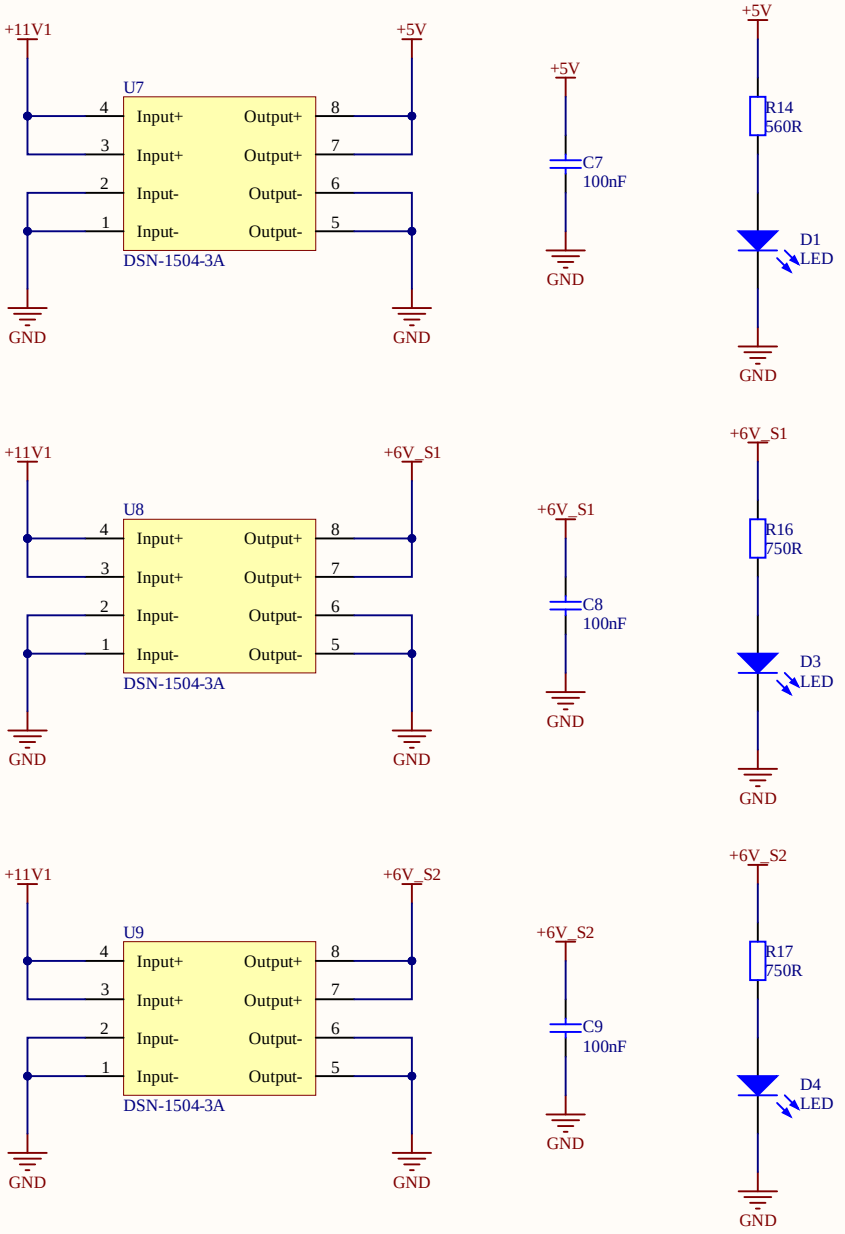
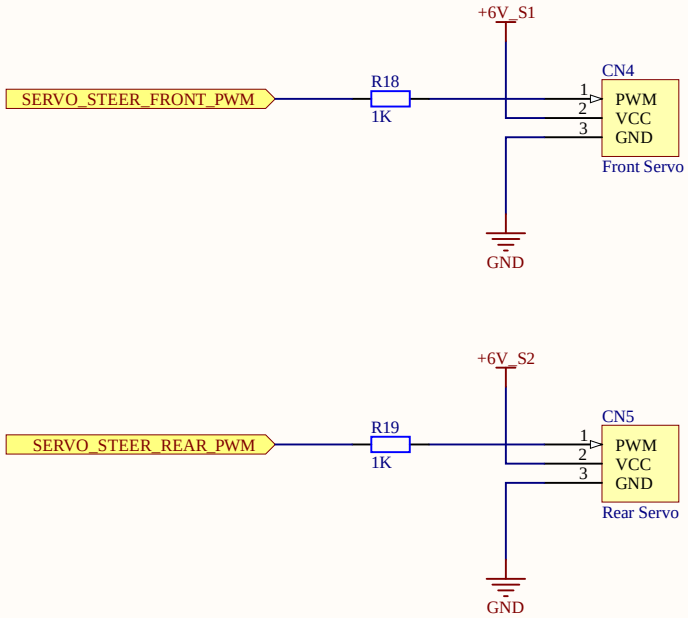




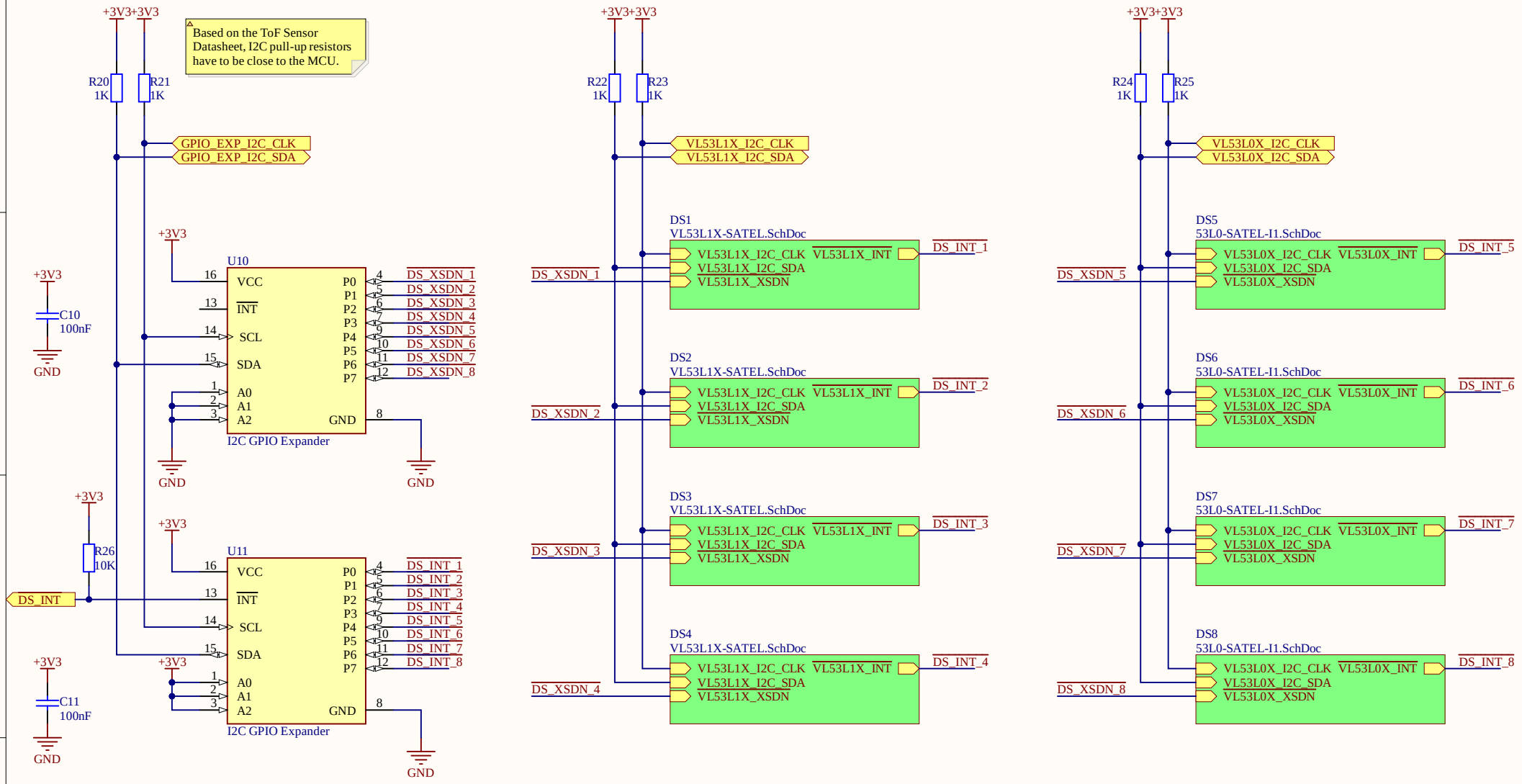
Title **Power**			Designed by: *LK Bulls, Bagoly Zoltan, Feher Daniel, G. Varga Gabor*
Size: A4	Number: 5	Revision: 1.0	RobonAUT 2023
Date: 2022 Fall		Sheet 5 of 14	
File: Power.SchDoc			



Servo type:
Name: MG-995 servo
Supplier: Hestore
Reference: 100.358.11

Title **Servos**			Designed by: *LK Bulls* *Bagoly Zoltan* *Feher Daniel* *G. Varga Gabor*
Size: A4	Number: 6	Revision: 1.0	
Date: 2022 Fall		Sheet 6 of 14	
File: Servos.SchDoc			

RobonAUT 2023



Title	***Distance Sensors***		
Size: A4	Number: 7	Revision: 1.0	
Date: 2022 Fall		Sheet 7 of 14	
File: DistanceSensors.SchDoc			

Designed by:
LK Bulls
Bagoly Zoltan
Feher Daniel
G. Varga Gabor

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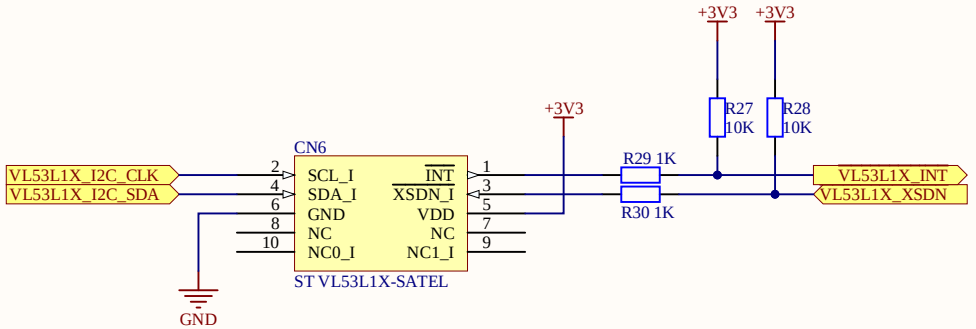

Cable Connector:
Lomex:
2x3 female: 43-00-12
2x5 female: 43-00-57

Connector for the Sensor:
2x5 male: 43-05-85

Title	***VL53L1X Satellite Board***		
Size: A4	Number: 8	Revision: 1.0	
Date: 2022 Fall		Sheet 8 of 14	
File: VL53L1X-SATEL.SchDoc			

Designed by:
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Bagoly Zoltan
Feher Daniel
G. Varga Gabor

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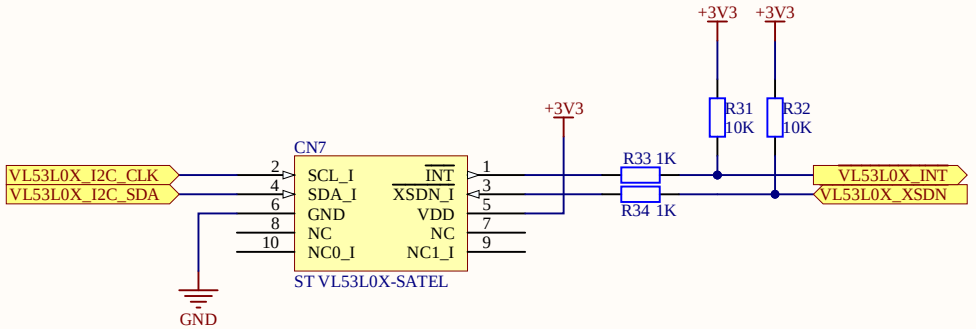

Cable Connector:
Lomex:
2x3 female: 43-00-12
2x5 female: 43-00-57

Connector for the Sensor:
2x5 male: 43-05-85

Title	***VL53L0X Satellite Board***		
Size: A4	Number: 9	Revision: 1.0	
Date: 2022 Fall		Sheet 9 of 14	
File: 53L0-SATEL-I1.SchDoc			

Designed by:
LK Bulls
Bagoly Zoltan
Feher Daniel
G. Varga Gabor

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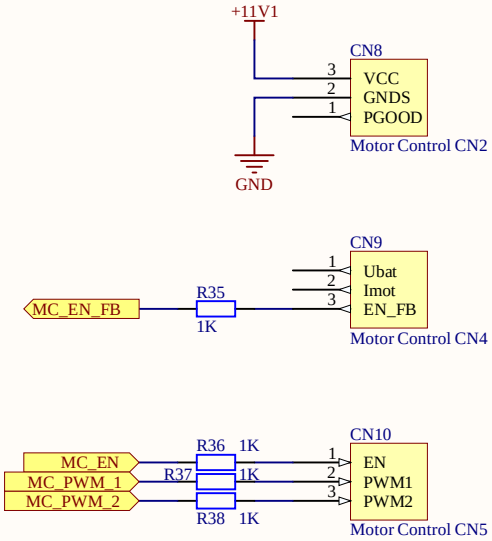

Title **Motor Control**			Designed by: *LK Bulls* *Bagoly Zoltan* *Feher Daniel* *G. Varga Gabor*
Size: A4	Number: 10	Revision: 1.0	
Date: 2022 Fall		Sheet 10 of 14	
File: MotorControl.SchDoc			

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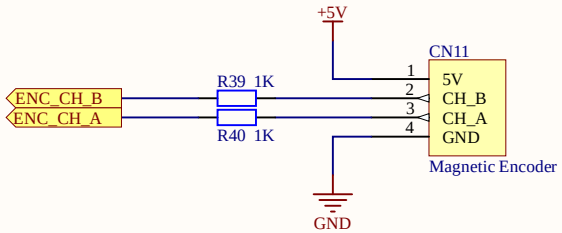
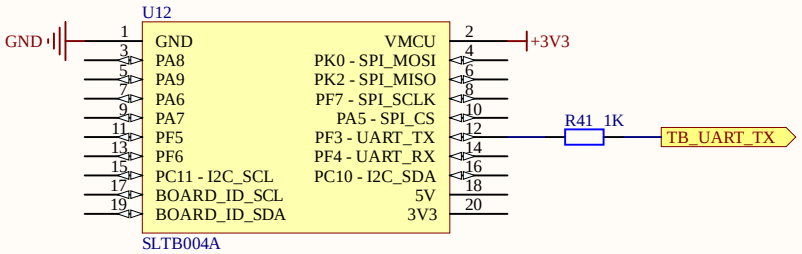


Encoder cable (2 pieces):
Supplier: Lomex
Reference: 43-09-08
Name: TÁPCSATL. 2.54mm 4P
ANYA HÁZ NCH254-04 (G-S)

Title	***Magnetic Encoder***		
Size: A4	Number: 11	Revision: 1.0	
Date: 2022 Fall		Sheet 11 of 14	
File: Encoder.SchDoc			

Designed by:
LK Bulls
Bagoly Zoltan
Feher Daniel
G. Varga Gabor

RobonAUT 2023



Purpose of the 1K resistor:
Making UART TX foolproof.

Title **Radio Communication**			Designed by: *LK Bulls* *Bagoly Zoltan* *Feher Daniel* *G. Varga Gabor*
Size: A4	Number: 12	Revision: 1.0	
Date: 2022 Fall		Sheet 12 of 14	
File: RadioCommunication.SchDoc			

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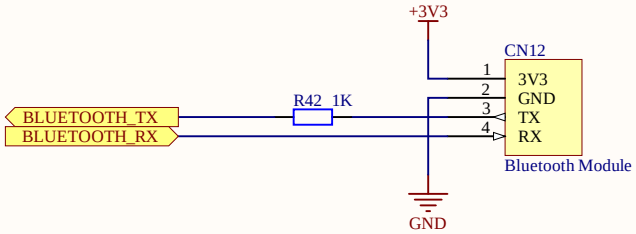

Purpose of the 1K resistor:
Making UART TX foolproof.

Bluetooth cable (2 pieces):
Supplier: Lomex
Reference: 43-09-08
Name: TÁPCSATL. 2.54mm 4P
ANYA HÁZ NCH254-04 (G-S)

Title	***Bluetooth Communication***		
Size: A4	Number: 13	Revision: 1.0	
Date: 2022 Fall		Sheet 13 of 14	
File: Bluetooth.SchDoc			

Designed by:
LK Bulls
Bagoly Zoltan
Feher Daniel
G. Varga Gabor

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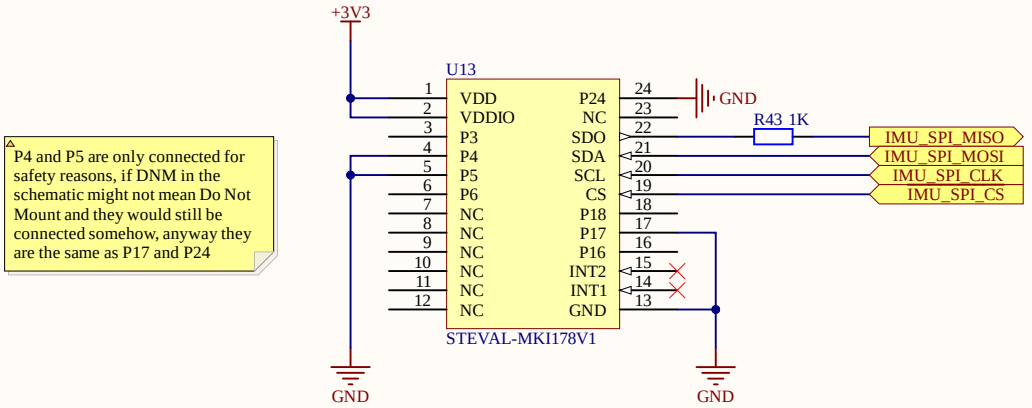

P4 and P5 are only connected for safety reasons, if DNM in the schematic might not mean Do Not Mount and they would still be connected somehow, anyway they are the same as P17 and P24

Purpose of the 1K resistor:
Making SPI MISO foolproof.

Title	***Inertial Measurement Unit***		
Size: A4	Number: 14	Revision: 1.0	
Date: 2022 Fall		Sheet 14 of 14	
File: IMU.SchDoc			

Designed by:
LK Bulls
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Feher Daniel
G. Varga Gabor

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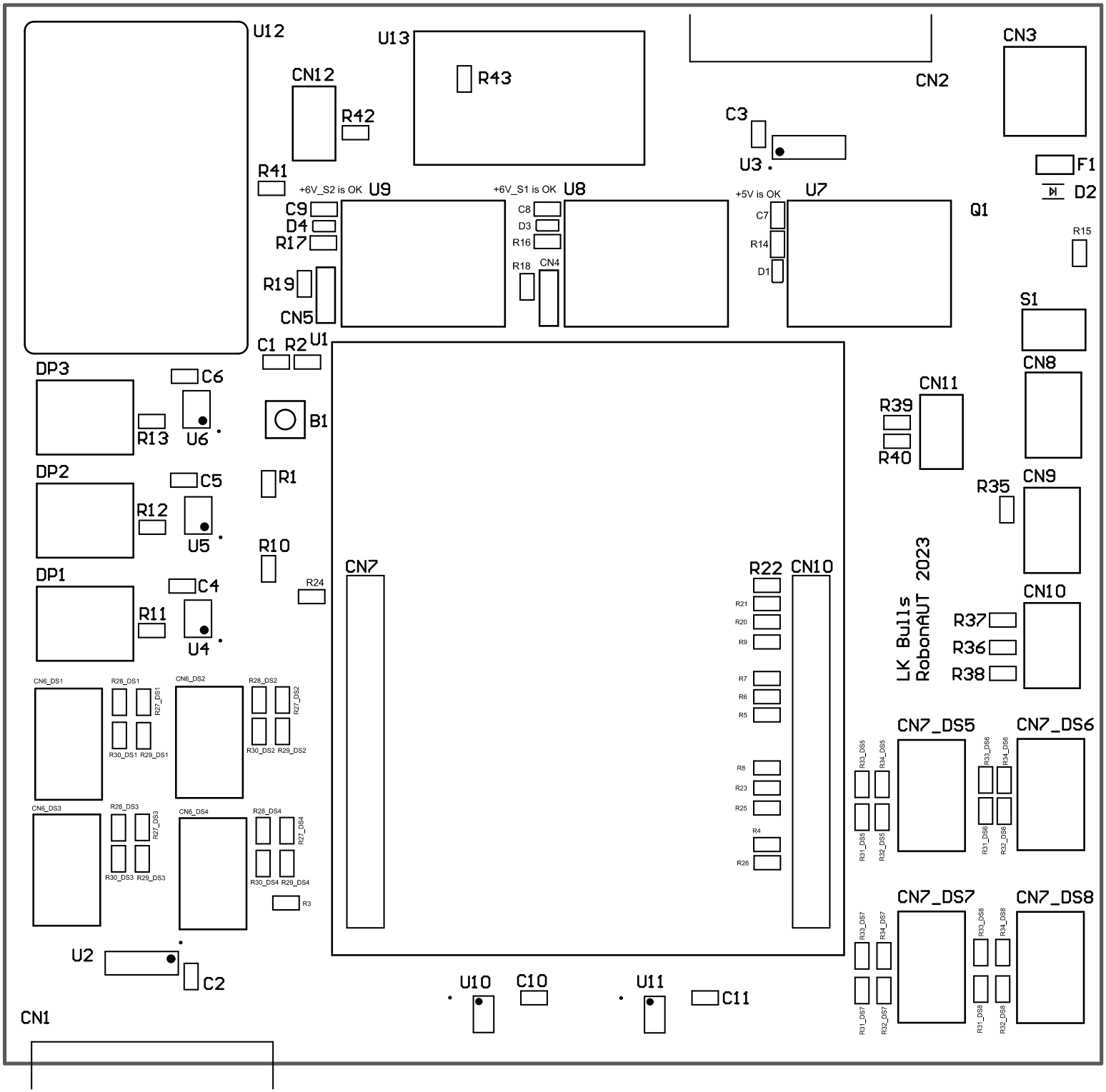
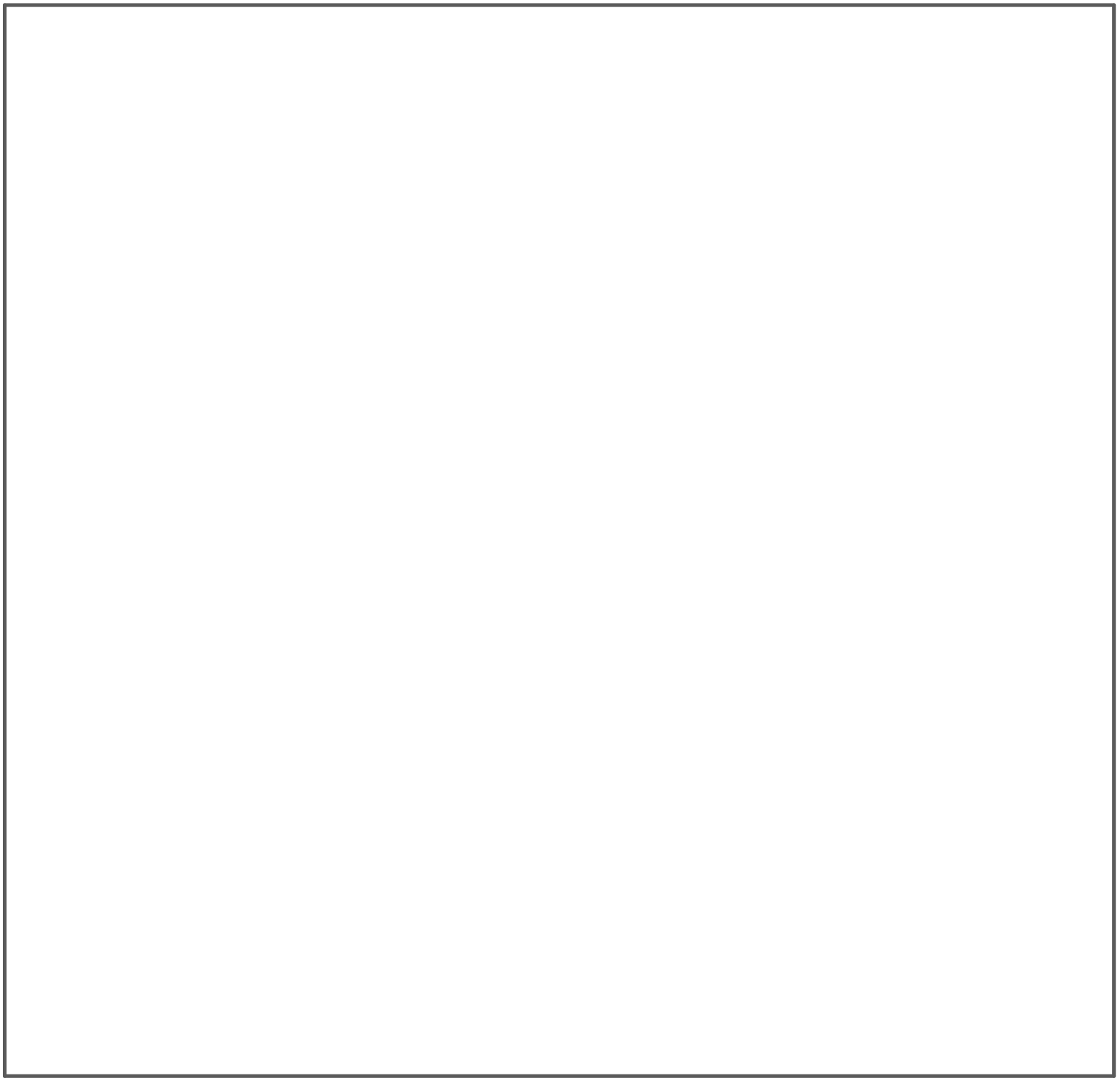

U12
U13
R43
CN12
R42
CN2
CN3
C3
U3
F1
D2
R41
+6V_S2 is OK
U9
+6V_S1 is OK
U8
+5V is OK
U7
Q1
C9
D4
R17
C8
D3
R16
R18
CN4
C7
R14
D1
R15
R19
CN5
S1
C1
R2
U1
CN8
DP3
C6
B1
R13
U6
CN11
R39
R40
DP2
C5
R1
R12
U5
R35
CN9
R10
R24
CN7
R22
CN10
DP1
C4
R11
U4
LK Bulls
RobonAUT 2023
CN10
R37
R36
R38
CN6_DS1
R28_DS1
R27_DS1
R30_DS1
R29_DS1
CN6_DS2
R28_DS2
R27_DS2
R30_DS2
R29_DS2
CN7_DS5
CN7_DS6
CN6_DS3
R28_DS3
R27_DS3
R30_DS3
R29_DS3
CN6_DS4
R28_DS4
R27_DS4
R30_DS4
R29_DS4
R3
U2
C2
U10
C10
U11
C11
CN1
CN7_DS7
CN7_DS8



Designator	Reference	Quantity	Footprint	Supplier	Name
R3, R4, R5, R6, R7, R18, R19, R20, R21, R22, R23, R24, R25, R29_DS1, R29_DS2, R29_DS3, R29_DS4, R30_DS1, R30_DS2, R30_DS3, R30_DS4, R33_DS5, R33_DS6, R33_DS7, R33_DS8, R34_DS5, R34_DS6, R34_DS7, R34_DS8, R35, R36, R37, R38, R39, R40, R41, R42, R43	81-10-87	38	FP_0805_RES	Lomex	1K00 0805 5% CR-05JL7----1K 0.125W (VIK)
R11, R12, R13	81-10-94	3	FP_0805_RES	Lomex	3K90 0805 5% CR-05JL7---3K9 0.125W (VIK)
R1	81-10-95	1	FP_0805_RES	Lomex	4K70 0805 5% CR-05JL7---4K7 0.125W (VIK)
F1	44-03-11	1	FP_CONN2_TUSKE_254 MM	Lomex	6A 30V 30R600UF POLYFUSE 16.5x16.5mm (LFS)
R8, R9, R10, R26, R27_DS1, R27_DS2, R27_DS3, R27_DS4, R28_DS1, R28_DS2, R28_DS3, R28_DS4, R31_DS5, R31_DS6, R31_DS7, R31_DS8, R32_DS5, R32_DS6, R32_DS7, R32_DS8	81-10-99	20	FP_0805_RES	Lomex	10K0 0805 5% CR-05JL7---10K 0.125W (VIK)
D2	85-00-88	1	FP_SOD-123	Lomex	16V 0.5W SMSZ1600-35 (MOT) MMSZ5246BT1 SOD-123 ˝J1˝
U2, U3	87-01-20	2	SO16	Lomex	74HC595D,118 (NXP) 8-BIT SHIFT-REGISTER WITH OUTPUT LATCH SO-16
R15	81-11-11	1	FP_0805_RES	Lomex	100K 0805 5% CR-05JL7--100K 0.125W (VIK)
C1, C2, C3, C4, C5, C6, C7, C8, C9, C10, C11	82-13-46	11	FP_0805_CAP_085	Lomex	100nF 0805 10% 50V X7R 0805B104K500NT (FNG)
R2	81-34-71	1	FP_0805_RES	Lomex	100R 0805 5% RC0805JR-10100RL 0.125W (YAG
R14	81-10-84	1	FP_0805_RES	Lomex	560R 0805 5% CR-05JL7--560R 0.125W (VIK)
R16, R17	81-12-65	2	FP_0805_RES	Lomex	750R 0805 5% CR-05JL7--750R 0.125W (VIK)
D1, D3, D4	95-00-57	3	FP_0805_LED_GREEN	Lomex	2012 GREEN 568nm 70mcd KP-2012MGC (KIN) W.CLEAR 2x1.2x1.1mm 0805 120°
U7, U8, U9	100.381.18	3	FP_DCDC_DSN	Hestore	DSN-1504-3A, Kapcsolóüzemű step-down feszültségszabályzó, 4.5-28V/0.8-20V, 3A
DP1, DP2, DP3	35-03-94	3	FP_7_Segment_Display	Lomex	FYS-3911BUHR-21 (FYL) 7 SEG SRED COM.AN. 10mm 30mcd 10x13x7mm 640nm
CN12	43-08-97	1	FP_CONN4_TAP_254MM	Hestore	HC-05 bluetooth modul 4P, master-slave, gombbal
U12	43-00-08	1	SLTB004A	Lomex	HÜVELY 20 P FHSH-2.54-20 (T-T) 1# h=8,5mm AU
U13	43-03-71	1	FP_STEVAL_IMU	Lomex	HÜVELY 40 P FHSH-2.54-40 (T-T) 1# h=8,5mm AU
Q1	86-01-67	1	FP_DPAK-TO252	Lomex	IRFR9024NTRPBF (INF) P-POWERFET 55V 11A 38W Rds<0.175R DPAK
U1	NUCLEO	1	FP_NUCLEO-64	Tanszék	Nucleo F446RE
CN8	43-09-55	1	DC_Drive_CN_Stelvio	Lomex	SORKAPOCS 3 P RM3.81 CPP3.81/3 (STE) LIFTES 1mmř 10A
CN9	43-09-55	1	DC_Drive_CN_Stelvio	Lomex	SORKAPOCS 3 P RM3.81 CPP3.81/3 (STE) LIFTES 1mmř 10A
CN10	43-09-55	1	DC_Drive_CN_Stelvio	Lomex	SORKAPOCS 3 P RM3.81 CPP3.81/3 (STE) LIFTES 1mmř 10A
U4, U5, U6	Tanszék	3	SOP127P600-sajat_0095-015	Tanszék	STP08CP05TTR, Counter Shift Registers Lo VItg LoCurent Pwr 8B shift register
CN6_DS1, CN6_DS2, CN6_DS3, CN6_DS4	43-26-63	4	FP_DISTANCE_SENSOR	Lomex	SZAL.KABEL 6 P APA BH-06 (T-T)
CN7_DS5, CN7_DS6, CN7_DS7, CN7_DS8	43-26-63	4	FP_DISTANCE_SENSOR	Lomex	SZAL.KABEL 6 P APA BH-06 (T-T)
CN1, CN2	43-01-11	2	CONNECTOR-20P	Lomex	SZAL.KABEL 20 P APA 90° BHR-20 (T-T)
B1	100.224.61	1	FP_BTN_SMD	Hestore	TACT-64N-F, Nyomógomb, mikrokapcsoló TACT, SPST-NO, THT, 4.3mm, 6x6mm
CN11	43-08-97	1	FP_CONN4_TAP_254MM	Lomex	TÁPCSATL. 2.54mm 4P APA 180° NCW254-04S (G-S) FORR.
U10, U11	595-TCA9534PWR	2	FP_TCA9534PWR	Mouser	TCA9534PWR 8 Bit I2C I/O Expander
S1	100.264.66	1	FP_SPDT	Hestore	TSSM-1022-A2, Kapcsoló, nyelves, 1A/250V AC, M5, SPDT, ON-ON
CN4	43-00-73	1	FP_CONN3_TUSKE_254 MM	Lomex	TÜSKESOR 40 P PHSS-40- 6/3 (T-T) 2.54mm PIN 0.64x0.64 TÖRDELHETÖ
CN5	43-00-73	1	FP_CONN3_TUSKE_254 MM	Lomex	TÜSKESOR 40 P PHSS-40- 6/3 (T-T) 2.54mm PIN 0.64x0.64 TÖRDELHETÖ
CN3	FD-W115M	1	FP_BATTERY	https://shop.modell.hu/kabel-amass-xt60-cap-apa-csatlakozoval-szerelve	XT60 + CAP Apa