

1

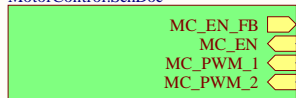
2

3

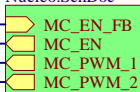
4

A

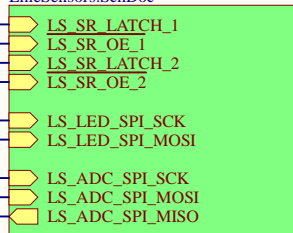
U_MotorControl
MotorControl.SchDoc



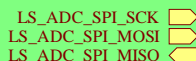
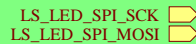
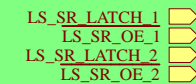
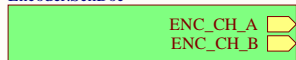
U_Nucleo
Nucleo.SchDoc



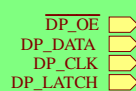
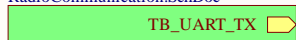
U_LineSensors
LineSensors.SchDoc



U_Encoder
Encoder.SchDoc



U_RadioCommunication
RadioCommunication.SchDoc



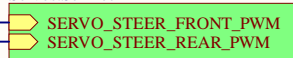
U_Displays
Displays.SchDoc



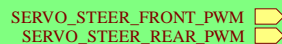
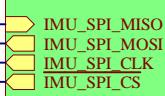
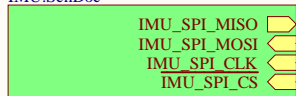
U_Bluetooth
Bluetooth.SchDoc



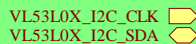
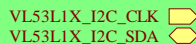
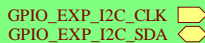
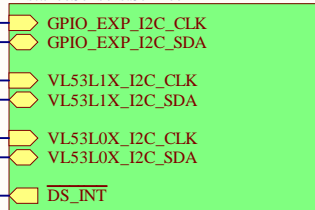
U_Servos
Servos.SchDoc



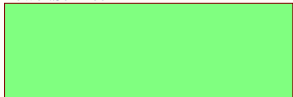
U_IMU
IMU.SchDoc



U_DistanceSensors
DistanceSensors.SchDoc



U_Power
Power.SchDoc



B

C

D

A

B

C

D

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
Fehér Daniel
G. Varga Gabor



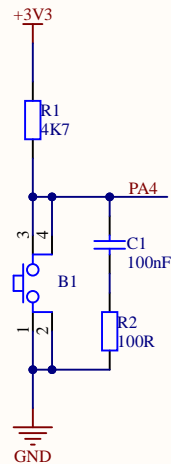
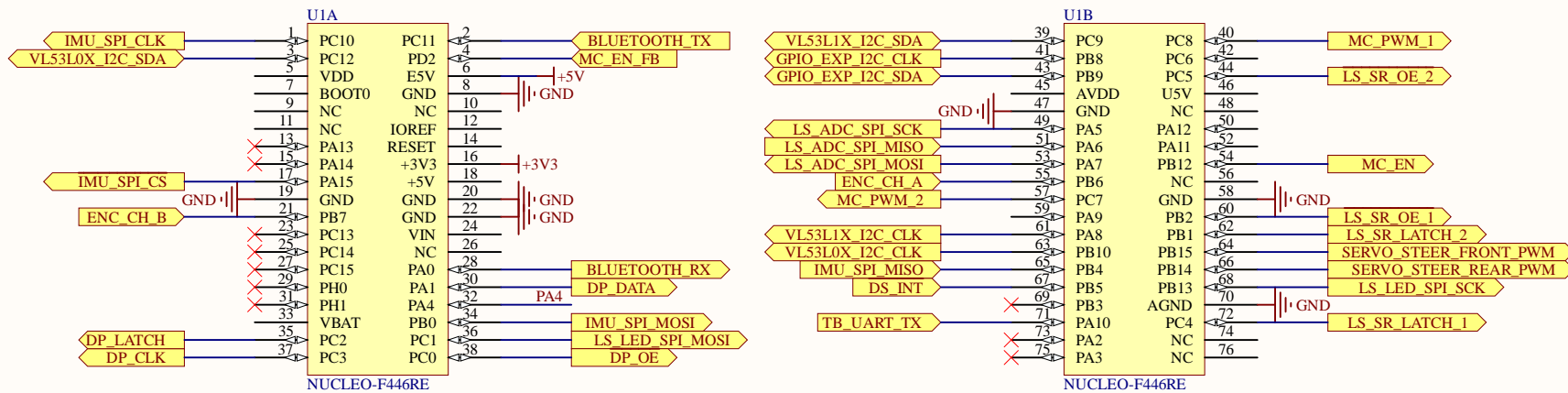
1

2

3


4

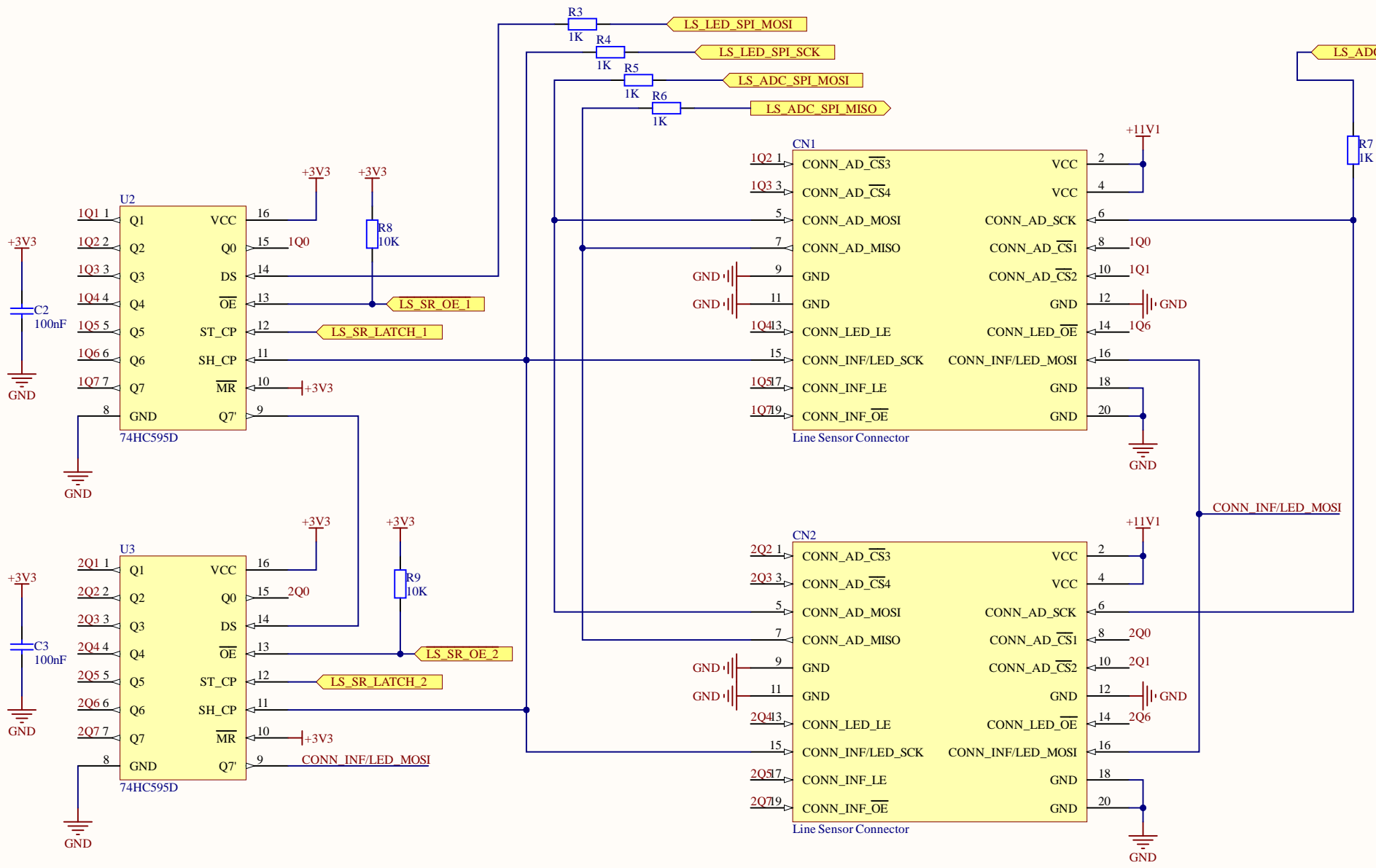
A Reserved pins (do not connect anything):
 PA2 - DBG UART TX
 PA3 - DBG UART RX
 PA5 - Green LED (?)
 PA13 - SWDIO
 PA14 - SWCLK
 PB3 - SWO (?)
 PC13 - Blue PushButton
 PC14 - OSC 32.768 kHz
 PC15 - OSC 32.768 kHz
 PH0 - OSC 8 MHz
 PH1 - OSC 8 MHz




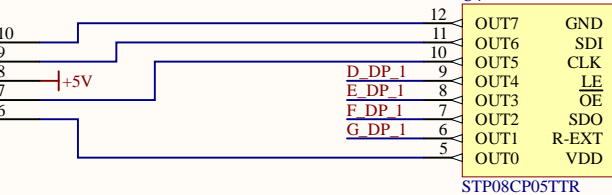
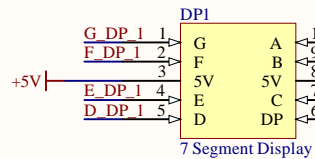
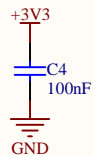
A Debounce time = RC time constant

A Nucleo Connector (2 pcs are needed):
 Supplier: Lomex
 Reference: 43-06-67
 Name: HÜVELY 20x2 PFHDH2.54-40
 (T-T) 1# h=8,5mm AU

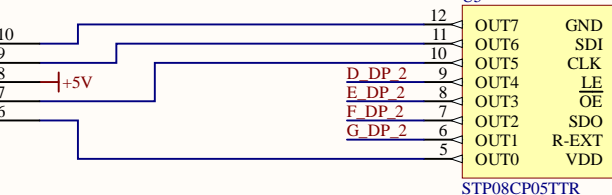
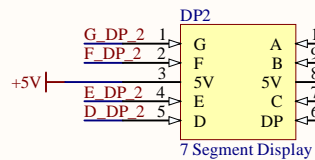
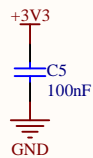
Title <i>Nucleo</i>			Designed by: <i>LK Bulls</i> <i>Bagoly Zoltan</i> <i>Féher Daniel</i> <i>G. Varga Gabor</i>	
Size: <i>A4</i>	Number: <i>2</i>	Revision: <i>1.0</i>		
Date: <i>2022 Fall</i>	Sheet <i>2</i> of <i>14</i>			
File: <i>Nucleo.SchDoc</i>				



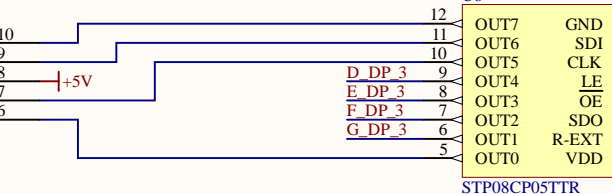
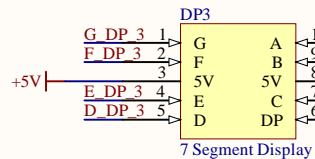
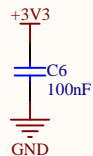
Title <i>Line Sensors</i>			Designed by: <i>LK Bulls</i> <i>Bagoly Zoltan</i> <i>Fehér Daniel</i> <i>G. Varga Gabor</i>	
Size: <i>A4</i>	Number: <i>3</i>	Revision: <i>1.0</i>		
Date: <i>2022 Fall</i>	Sheet <i>3</i> of <i>14</i>			
File: <i>LineSensors.SchDoc</i>				



STP08CP05TTR



STP08CP05TTR



STP08CP05TTR

+3V3



Title **Displays**

Size: **A4**

Number: **4**

Revision: **1.0**

Date: **2022 Fall**

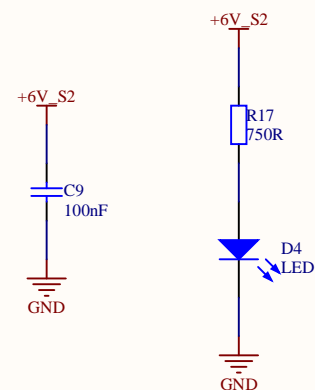
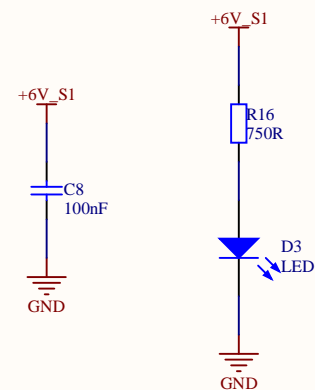
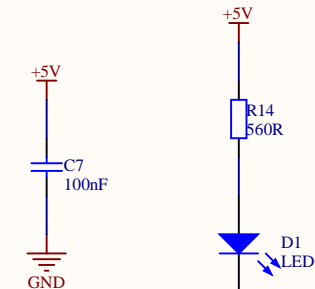
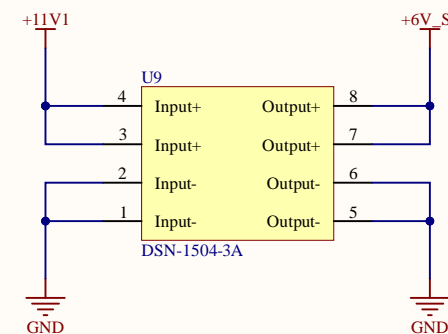
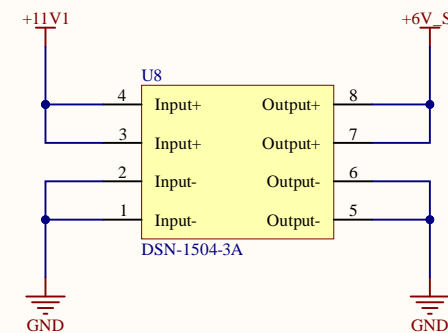
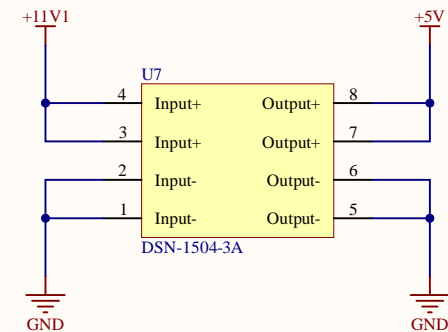
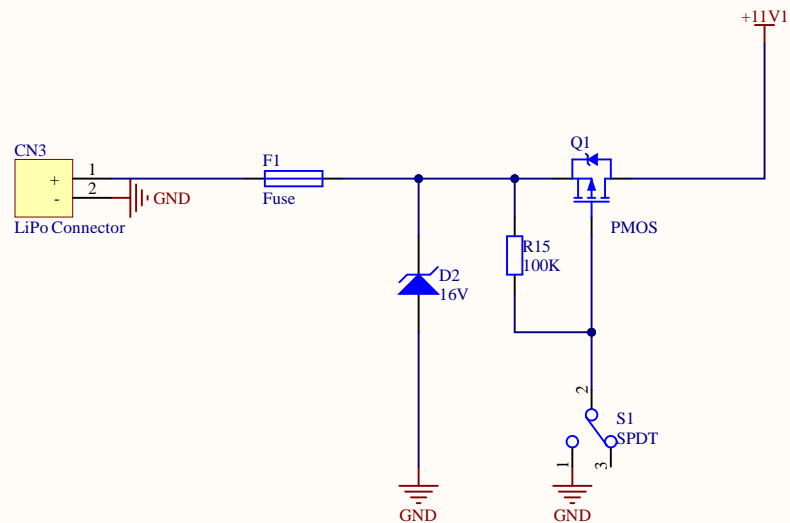
Sheet **4** of **14**

File: **Displays.SchDoc**

Designed by:

LK Bulls
Bagoly Zoltan
Fehér Daniel
G. Varga Gabor





Title **Power**

Size: **A4**

Number: **5**

Revision: **1.0**

Date: **2022 Fall**

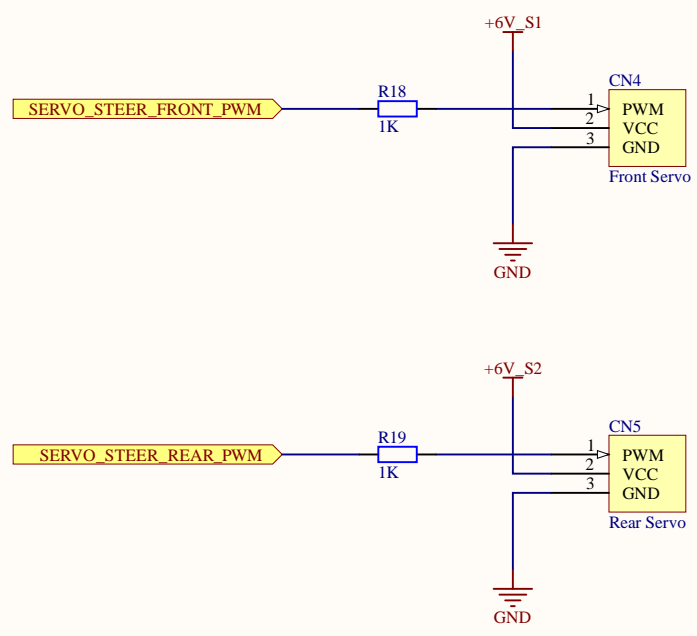
Sheet **5** of **14**

File: **Power.SchDoc**


Designed by:

LK Bulls
Bagoly Zoltan
Fehér Daniel
G. Varga Gabor

RoboAUT
2023



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

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

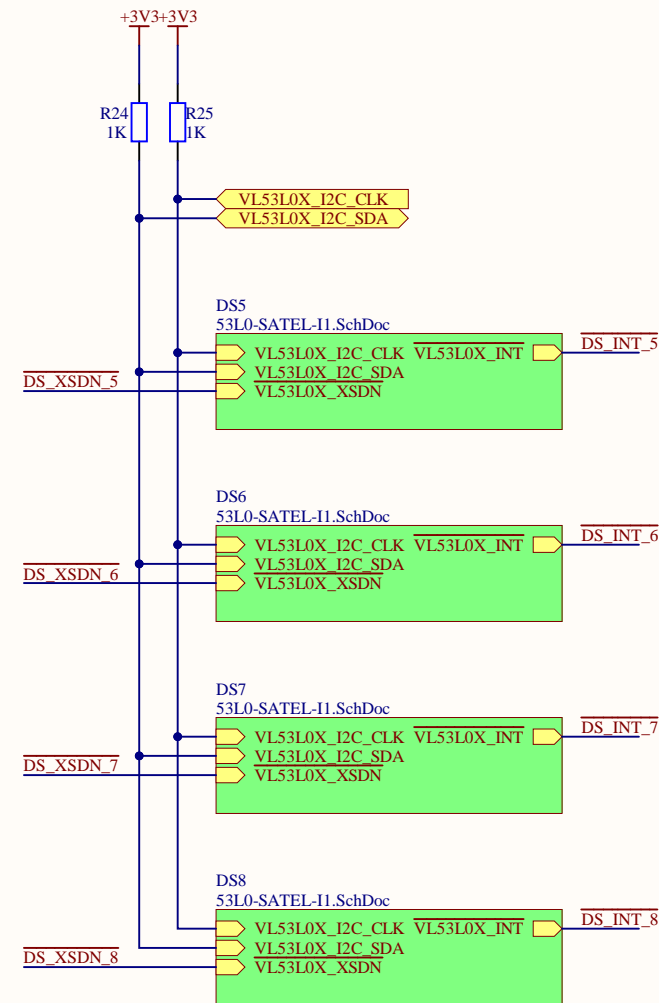
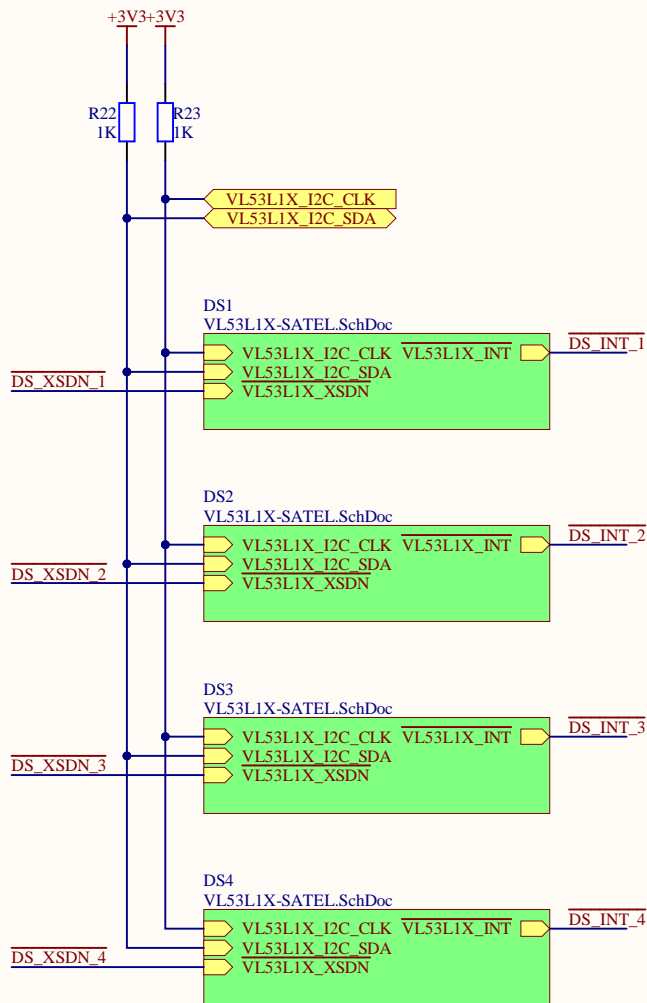
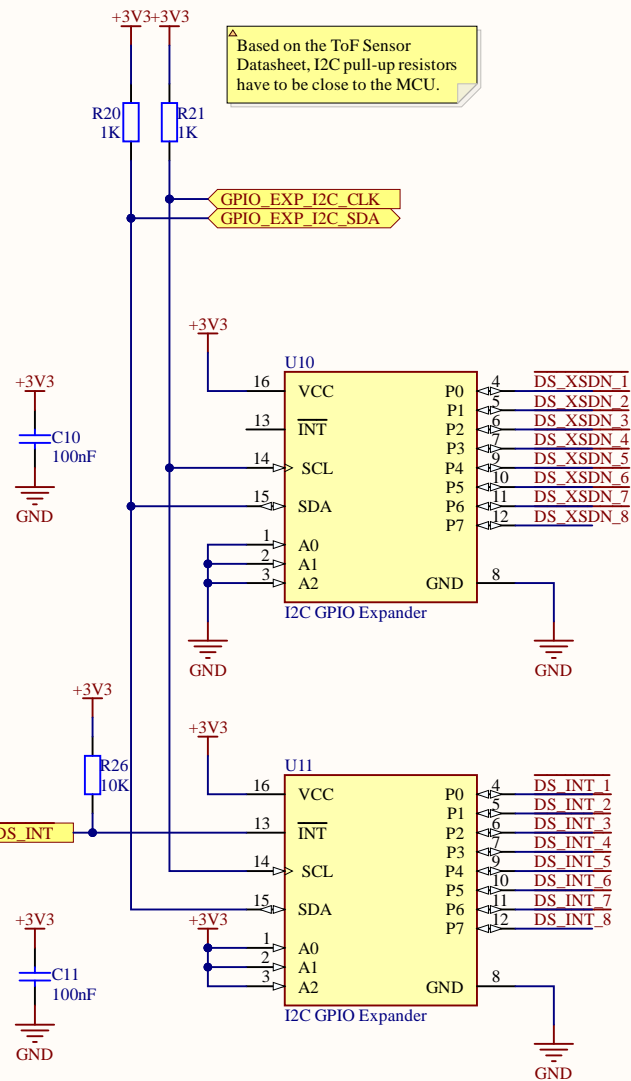
1

2

3

4

Based on the ToF Sensor Datasheet, I2C pull-up resistors have to be close to the MCU.



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
Fehér Daniel
G. Varga Gabor


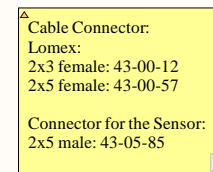


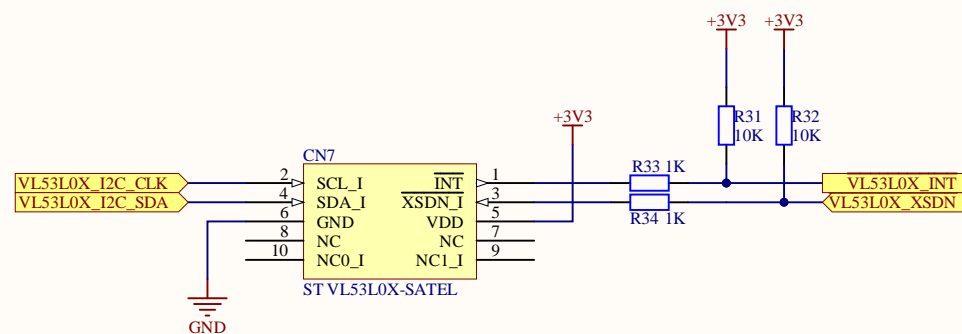
1

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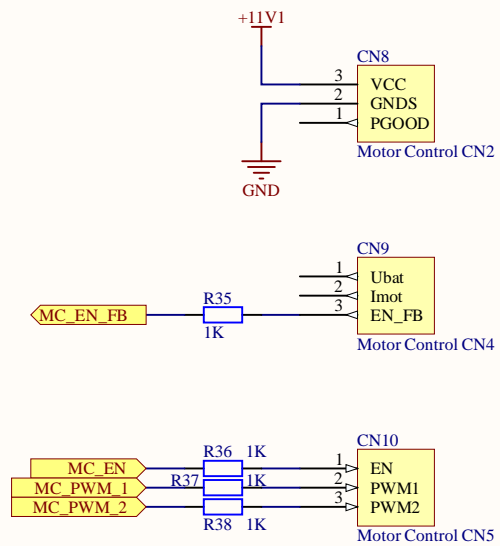


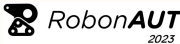


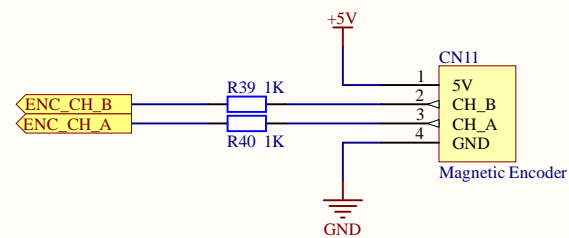
Cable Connector:
 Lomex:
 2x3 female: 43-00-12
 2x5 female: 43-00-57

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


Title <i>VL53L0X Satellite Board</i>			Designed by: <i>LK Bulls</i> <i>Bagoly Zoltan</i> <i>Fehér Daniel</i> <i>G. Varga Gabor</i>	
Size: A4	Number: 9	Revision: 1.0		
Date: 2022 Fall		Sheet 9 of 14		
File: 53L0-SATEL-II.SchDoc				

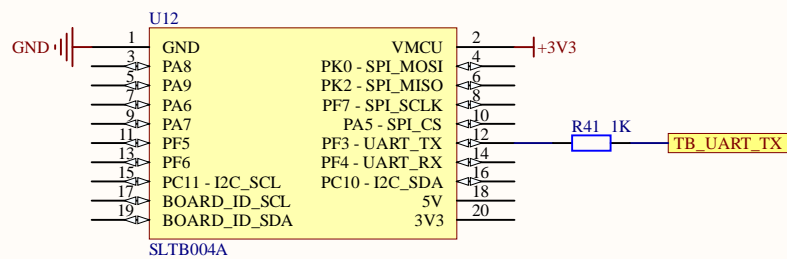


Title <i>Motor Control</i>			Designed by: <i>LK Bulls</i> <i>Bagoly Zoltan</i> <i>Fehér Daniel</i> <i>G. Varga Gabor</i>	
Size: A4	Number: 10	Revision: 1.0		
Date: 2022 Fall		Sheet 10 of 14		
File: MotorControl.SchDoc				




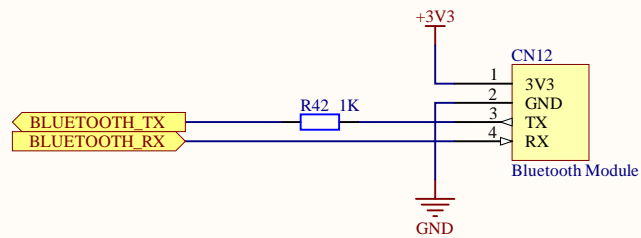
Encoder cable (2 pieces):
 Supplier: Lomex
 Reference: 43-09-08
 Name: TÁPCSATL. 2.54mm 4P
 ANYA HÁZ NCH254-04 (G-S)

Title <i>Magnetic Encoder</i>			Designed by: <i>LK Bulls</i> <i>Bagoly Zoltan</i> <i>Féher Daniel</i> <i>G. Varga Gabor</i>	
Size: A4	Number: 11	Revision: 1.0		
Date: 2022 Fall		Sheet 11 of 14		
File: Encoder.SchDoc				




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

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

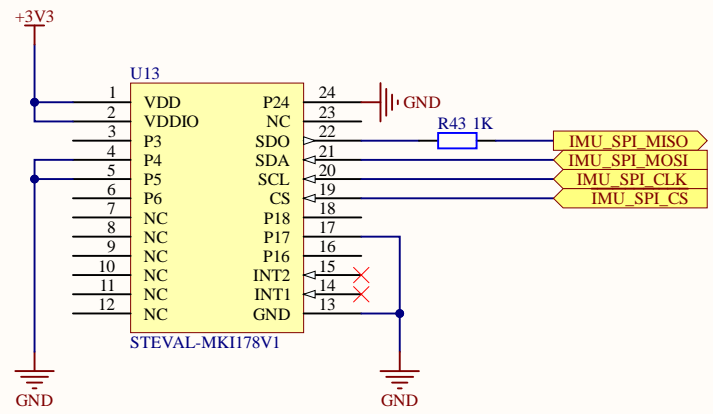


▲ Purpose of the 1K resistor:
Making UART TX foolproof.


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

Title <i>Bluetooth Communication</i>			Designed by: <i>LK Bulls</i> <i>Bagoly Zoltan</i> <i>Féher Daniel</i> <i>G. Varga Gabor</i>	
Size: <i>A4</i>	Number: <i>13</i>	Revision: <i>1.0</i>		
Date: <i>2022 Fall</i>	Sheet <i>13</i> of <i>14</i>			
File: <i>Bluetooth.SchDoc</i>				

⚠ 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 <i>Inertial Measurement Unit</i>			Designed by: <i>LK Bulls</i> <i>Bagoly Zoltan</i> <i>Fehér Daniel</i> <i>G. Varga Gabor</i>	
Size: A4	Number: 14	Revision: 1.0		
Date: 2022 Fall		Sheet 14 of 14		
File: IMU.SchDoc				

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 FHS-2.54-20 (T-T) 1# h=8,5mm AU
U13	43-03-71	1	FP_STEVAL_IMU	Lomex	HÜVELY 40 P FHS-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 1mm ² 10A
CN9	43-09-55	1	DC_Drive_CN_Stelvio	Lomex	SORKAPOCS 3 P RM3.81 CPP3.81/3 (STE) LIFTES 1mm ² 10A
CN10	43-09-55	1	DC_Drive_CN_Stelvio	Lomex	SORKAPOCS 3 P RM3.81 CPP3.81/3 (STE) LIFTES 1mm ² 10A
U4, U5, U6	Tanszék	3	SOP127P600-sajat_0095-015	Tanszék	STP08CP05TTR, Counter Shift Registers Lo Vltg 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, nyelvs, 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 TÖRDELHETŐ
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 TÖRDELHETŐ
CN3	FD-W115M	1	FP_BATTERY	https://shop.modell.hu/kabel-amass-xt60-cap-apa-csatlakozoval-szerelve	XT60 + CAP Apa