
STM32
CubeMX

1. Description

1.1. Project

Project Name	cmake_stm32l476
Board Name	STM32L476G-DISCO
Generated with:	STM32CubeMX 6.13.0
Date	03/25/2025

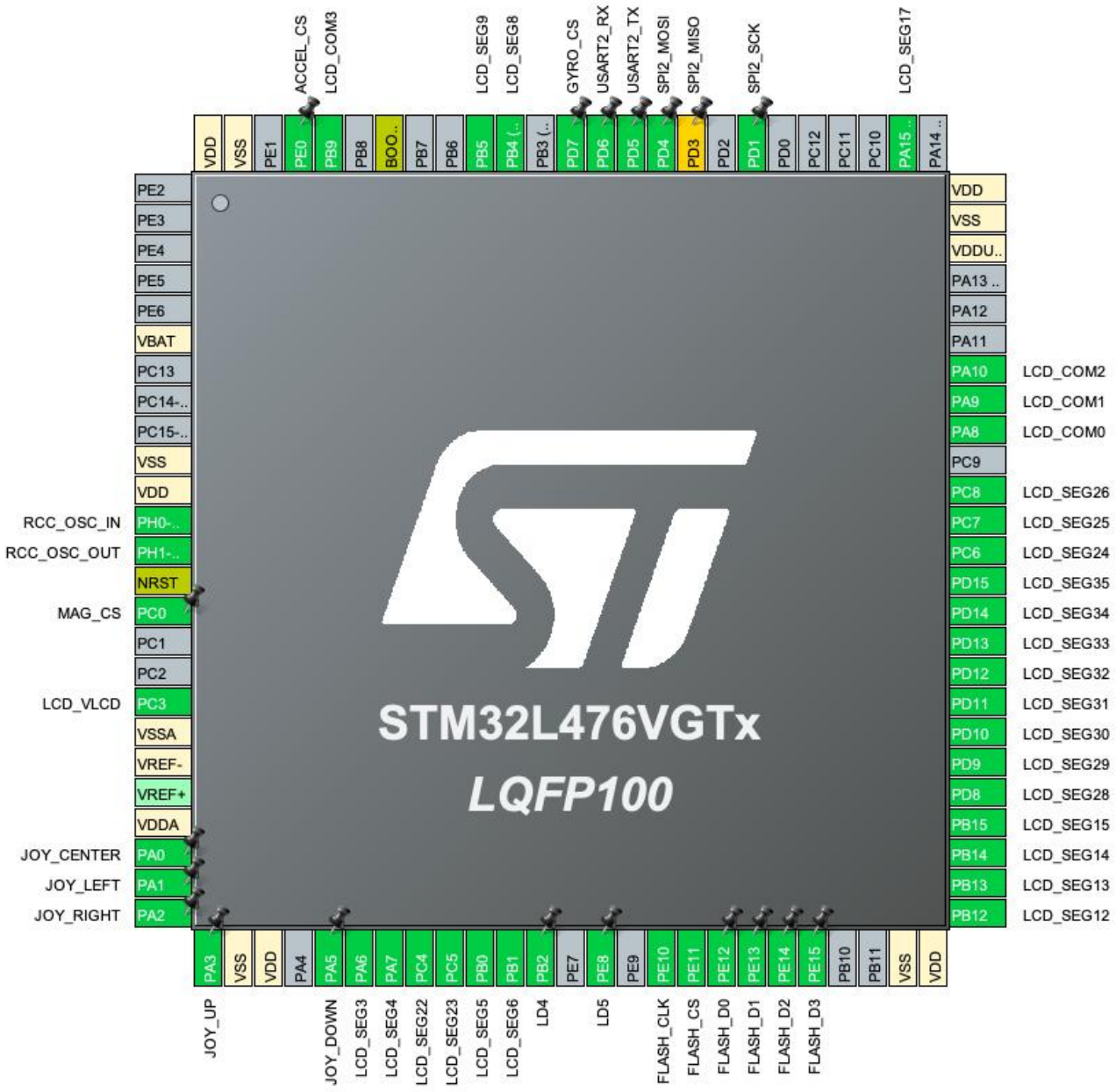
1.2. MCU

MCU Series	STM32L4
MCU Line	STM32L4x6
MCU name	STM32L476VGTx
MCU Package	LQFP100
MCU Pin number	100

1.3. Core(s) information

Core(s)	Arm Cortex-M4

2. Pinout Configuration



3. Pins Configuration

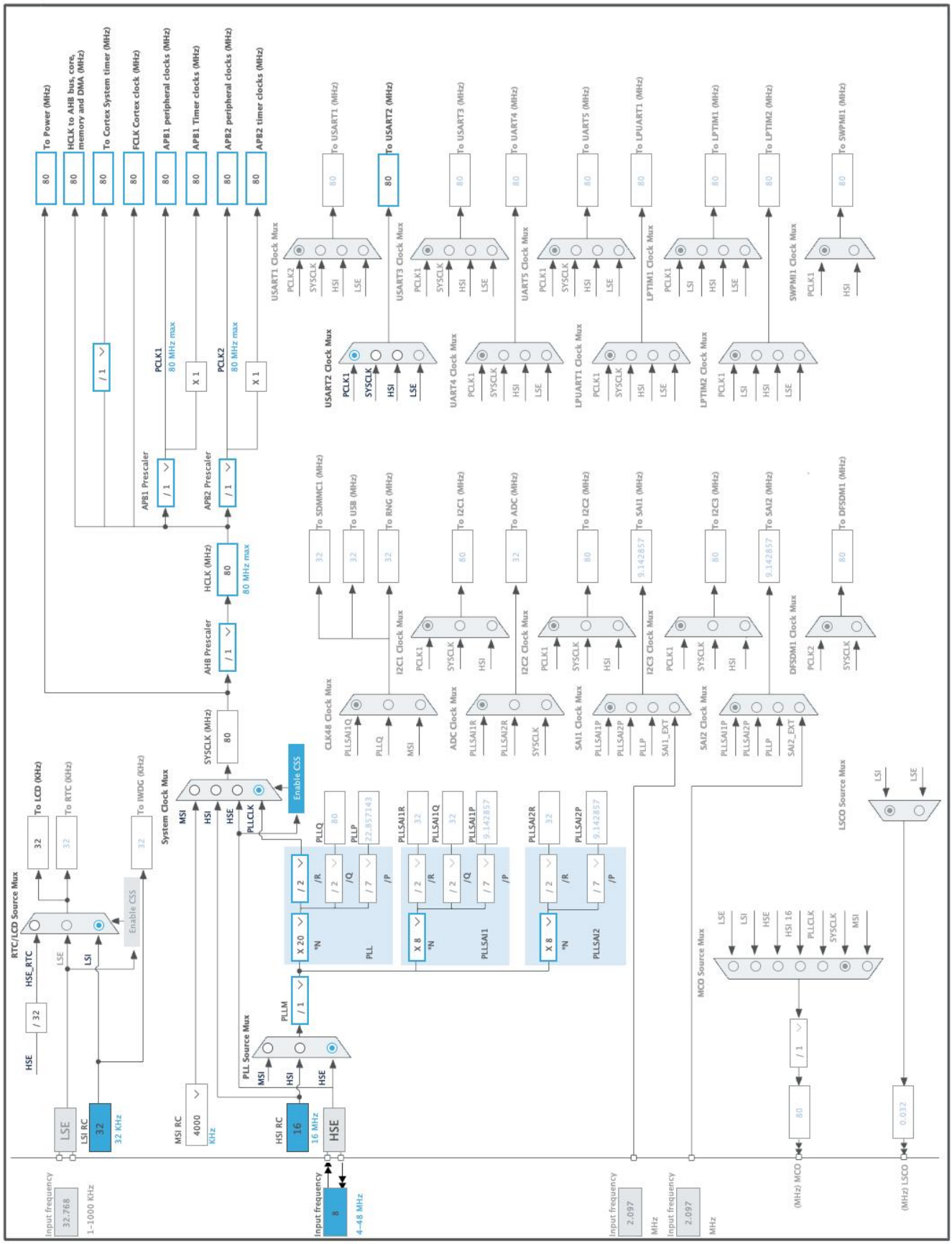
Pin Number LQFP100	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
6	VBAT	Power		
10	VSS	Power		
11	VDD	Power		
12	PH0-OSC_IN (PH0)	I/O	RCC_OSC_IN	
13	PH1-OSC_OUT (PH1)	I/O	RCC_OSC_OUT	
14	NRST	Reset		
15	PC0 *	I/O	GPIO_Output	MAG_CS
18	PC3	I/O	LCD_VLCD	
19	VSSA	Power		
20	VREF-	Power		
22	VDDA	Power		
23	PA0 *	I/O	GPIO_Input	JOY_CENTER
24	PA1 *	I/O	GPIO_Input	JOY_LEFT
25	PA2 *	I/O	GPIO_Input	JOY_RIGHT
26	PA3 *	I/O	GPIO_Input	JOY_UP
27	VSS	Power		
28	VDD	Power		
30	PA5 *	I/O	GPIO_Input	JOY_DOWN
31	PA6	I/O	LCD_SEG3	
32	PA7	I/O	LCD_SEG4	
33	PC4	I/O	LCD_SEG22	
34	PC5	I/O	LCD_SEG23	
35	PB0	I/O	LCD_SEG5	
36	PB1	I/O	LCD_SEG6	
37	PB2 *	I/O	GPIO_Output	LD4
39	PE8 *	I/O	GPIO_Output	LD5
41	PE10	I/O	QUADSPI_CLK	FLASH_CLK
42	PE11	I/O	QUADSPI_NCS	FLASH_CS
43	PE12	I/O	QUADSPI_BK1_IO0	FLASH_D0
44	PE13	I/O	QUADSPI_BK1_IO1	FLASH_D1
45	PE14	I/O	QUADSPI_BK1_IO2	FLASH_D2
46	PE15	I/O	QUADSPI_BK1_IO3	FLASH_D3
49	VSS	Power		
50	VDD	Power		
51	PB12	I/O	LCD_SEG12	
52	PB13	I/O	LCD_SEG13	

Pin Number LQFP100	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
53	PB14	I/O	LCD_SEG14	
54	PB15	I/O	LCD_SEG15	
55	PD8	I/O	LCD_SEG28	
56	PD9	I/O	LCD_SEG29	
57	PD10	I/O	LCD_SEG30	
58	PD11	I/O	LCD_SEG31	
59	PD12	I/O	LCD_SEG32	
60	PD13	I/O	LCD_SEG33	
61	PD14	I/O	LCD_SEG34	
62	PD15	I/O	LCD_SEG35	
63	PC6	I/O	LCD_SEG24	
64	PC7	I/O	LCD_SEG25	
65	PC8	I/O	LCD_SEG26	
67	PA8	I/O	LCD_COM0	
68	PA9	I/O	LCD_COM1	
69	PA10	I/O	LCD_COM2	
73	VDDUSB	Power		
74	VSS	Power		
75	VDD	Power		
77	PA15 (JTDI)	I/O	LCD_SEG17	
82	PD1	I/O	SPI2_SCK	
84	PD3 **	I/O	SPI2_MISO	
85	PD4	I/O	SPI2_MOSI	
86	PD5	I/O	USART2_TX	
87	PD6	I/O	USART2_RX	
88	PD7 *	I/O	GPIO_Output	GYRO_CS
90	PB4 (NJTRST)	I/O	LCD_SEG8	
91	PB5	I/O	LCD_SEG9	
94	BOOT0	Boot		
96	PB9	I/O	LCD_COM3	
97	PE0 *	I/O	GPIO_Output	ACCEL_CS
99	VSS	Power		
100	VDD	Power		

* The pin is affected with an I/O function

** The pin is affected with a peripheral function but no peripheral mode is activated

4. Clock Tree Configuration



1. Power Consumption Calculator report

1.1. Microcontroller Selection

Series	STM32L4
Line	STM32L4x6
MCU	STM32L476VGTx
Datasheet	DS10198_Rev4

1.2. Parameter Selection

Temperature	25
Vdd	3.0

1.3. Battery Selection

Battery	Li-SOCL2(A3400)
Capacity	3400.0 mAh
Self Discharge	0.08 %/month
Nominal Voltage	3.6 V
Max Cont Current	100.0 mA
Max Pulse Current	200.0 mA
Cells in series	1
Cells in parallel	1

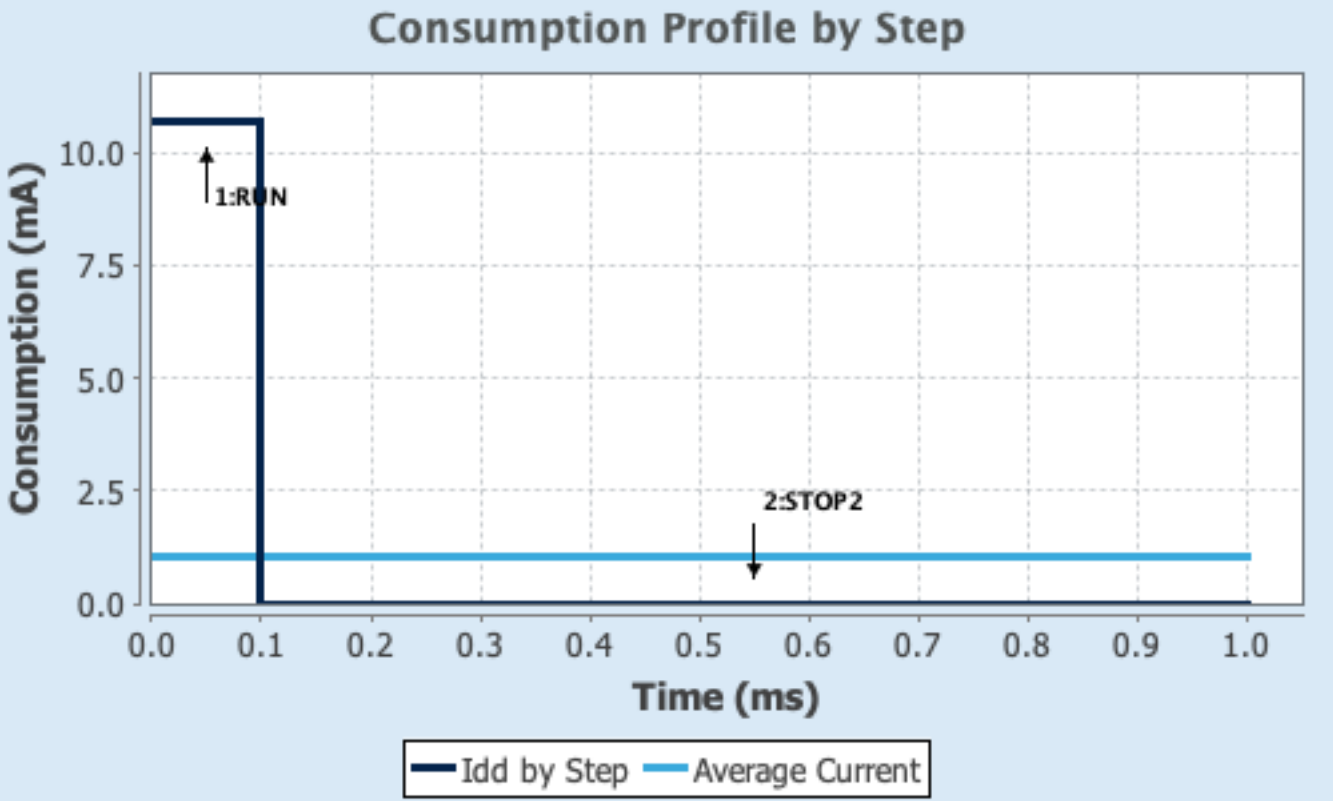
1.4. Sequence

Step	Step1	Step2
Mode	RUN	STOP2
Vdd	3.0	3.0
Voltage Source	Battery	Battery
Range	Range1-High	NoRange
Fetch Type	SRAM2	n/a
CPU Frequency	80 MHz	0 Hz
Clock Configuration	HSE PLL	ALL CLOCKS OFF
Clock Source Frequency	4 MHz	0 Hz
Peripherals		
Additional Cons.	0 mA	0 mA
Average Current	10.7 mA	1.18 µA
Duration	0.1 ms	0.9 ms
DMIPS	100.0	0.0
Ta Max	103.65	105
Category	In DS Table	In DS Table

1.5. Results

Sequence Time	1 ms	Average Current	1.07 mA
Battery Life	4 months, 10 days, 3 hours	Average DMIPS	100.0 DMIPS

1.6. Chart


Consumption Profile by Step
Consumption (mA)
10.0
7.5
5.0
2.5
0.0
1:RUN
2:STOP2
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0
Time (ms)
Idd by Step
Average Current

2. Software Project

2.1. Project Settings

Name	Value
Project Name	cmake_stm32l476
Project Folder	/Users/mateuszwojtaszek/projekty/cmake_stm32l476
Toolchain / IDE	CMake
Firmware Package Name and Version	STM32Cube FW_L4 V1.18.1
Application Structure	Advanced
Generate Under Root	No
Do not generate the main()	No
Minimum Heap Size	0x200
Minimum Stack Size	0x400

2.2. Code Generation Settings

Name	Value
STM32Cube MCU packages and embedded software	Copy all used libraries into the project folder
Generate peripheral initialization as a pair of '.c/.h' files	Yes
Backup previously generated files when re-generating	Yes
Keep User Code when re-generating	Yes
Delete previously generated files when not re-generated	No
Set all free pins as analog (to optimize the power consumption)	No
Enable Full Assert	No

2.3. Advanced Settings - Generated Function Calls

Rank	Function Name	Peripheral Instance Name
1	SystemClock_Config	RCC
2	MX_GPIO_Init	GPIO
3	MX_SPI2_Init	SPI2
4	MX_USART2_UART_Init	USART2
5	MX_QUADSPI_Init	QUADSPI
6	MX_LCD_Init	LCD

3. Peripherals and Middlewares Configuration

3.1. LCD

Mode: 1/4 Duty Cycle

mode: SEG3

mode: SEG4

mode: SEG5

mode: SEG6

mode: SEG8

mode: SEG9

mode: SEG12

mode: SEG13

mode: SEG14

mode: SEG15

mode: SEG17

mode: SEG22

mode: SEG23

mode: SEG24

mode: SEG25

mode: SEG26

mode: SEG28

mode: SEG29

mode: SEG30

mode: SEG31

mode: SEG32

mode: SEG33

mode: SEG34

mode: SEG35

3.1.1. Parameter Settings:

Clock Parameters:

Clock Prescaler	1
Clock Divider	16

Basic Parameters:

Duty Selection	1/4
Bias Selector	1/4
Multiplex mode	Disable

Advanced Parameters:

Voltage Source Selection	Internal
Contrast Control	2.60V
Dead Time Duration	No dead Time
High Drive	Disable
Pulse ON Duration	0 pulse
Blink Mode	Disabled
Blink Frequency	fLCD/8

3.2. QUADSPI

Single Bank: Quad SPI Line

3.2.1. Parameter Settings:

General Parameters:

Clock Prescaler	**0 ***
Fifo Threshold	**4 ***
Sample Shifting	No Sample Shifting
Flash Size	**23 ***
Chip Select High Time	1 Cycle
Clock Mode	Low

3.3. RCC

High Speed Clock (HSE): Crystal/Ceramic Resonator

3.3.1. Parameter Settings:

System Parameters:

VDD voltage (V)	3.3
Instruction Cache	Enabled
Prefetch Buffer	**Enabled ***
Data Cache	Enabled
Flash Latency(WS)	4 WS (5 CPU cycle)

RCC Parameters:

HSI Calibration Value	16
MSI Calibration Value	0
MSI Auto Calibration	Disabled
HSE Startup Timout Value (ms)	100
LSE Startup Timout Value (ms)	5000

Power Parameters:

Power Regulator Voltage Scale	Power Regulator Voltage Scale 1

3.4. SPI2

Mode: Half-Duplex Master

3.4.1. Parameter Settings:

Basic Parameters:

Frame Format	Motorola
Data Size	**8 Bits ***
First Bit	MSB First

Clock Parameters:

Prescaler (for Baud Rate)	**8 ***
Baud Rate	**10.0 MBits/s ***
Clock Polarity (CPOL)	Low
Clock Phase (CPHA)	1 Edge

Advanced Parameters:

CRC Calculation	Disabled
NSSP Mode	Enabled
NSS Signal Type	Software

3.5. SYS

Timebase Source: SysTick

3.6. USART2

Mode: Asynchronous

3.6.1. Parameter Settings:

Basic Parameters:

Baud Rate	115200
Word Length	8 Bits (including Parity)
Parity	None
Stop Bits	1

Advanced Parameters:

Data Direction	Receive and Transmit
Over Sampling	16 Samples

Single Sample	Disable

Advanced Features:

Auto Baudrate	Disable
TX Pin Active Level Inversion	Disable
RX Pin Active Level Inversion	Disable
Data Inversion	Disable
TX and RX Pins Swapping	Disable
Overrun	Enable
DMA on RX Error	Enable
MSB First	Disable

*** User modified value**

4. System Configuration

4.1. GPIO configuration

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
LCD	PC3	LCD_VLCD	Alternate Function Push Pull	No pull-up and no pull-down	Low	
	PA6	LCD_SEG3	Alternate Function Push Pull	No pull-up and no pull-down	Low	
	PA7	LCD_SEG4	Alternate Function Push Pull	No pull-up and no pull-down	Low	
	PC4	LCD_SEG22	Alternate Function Push Pull	No pull-up and no pull-down	Low	
	PC5	LCD_SEG23	Alternate Function Push Pull	No pull-up and no pull-down	Low	
	PB0	LCD_SEG5	Alternate Function Push Pull	No pull-up and no pull-down	Low	
	PB1	LCD_SEG6	Alternate Function Push Pull	No pull-up and no pull-down	Low	
	PB12	LCD_SEG12	Alternate Function Push Pull	No pull-up and no pull-down	Low	
	PB13	LCD_SEG13	Alternate Function Push Pull	No pull-up and no pull-down	Low	
	PB14	LCD_SEG14	Alternate Function Push Pull	No pull-up and no pull-down	Low	
	PB15	LCD_SEG15	Alternate Function Push Pull	No pull-up and no pull-down	Low	
	PD8	LCD_SEG28	Alternate Function Push Pull	No pull-up and no pull-down	Low	
	PD9	LCD_SEG29	Alternate Function Push Pull	No pull-up and no pull-down	Low	
	PD10	LCD_SEG30	Alternate Function Push Pull	No pull-up and no pull-down	Low	
	PD11	LCD_SEG31	Alternate Function Push Pull	No pull-up and no pull-down	Low	
	PD12	LCD_SEG32	Alternate Function Push Pull	No pull-up and no pull-down	Low	
	PD13	LCD_SEG33	Alternate Function Push Pull	No pull-up and no pull-down	Low	
	PD14	LCD_SEG34	Alternate Function Push Pull	No pull-up and no pull-down	Low	
	PD15	LCD_SEG35	Alternate Function Push Pull	No pull-up and no pull-down	Low	
	PC6	LCD_SEG24	Alternate Function Push Pull	No pull-up and no pull-down	Low	
	PC7	LCD_SEG25	Alternate Function Push Pull	No pull-up and no pull-down	Low	
	PC8	LCD_SEG26	Alternate Function Push Pull	No pull-up and no pull-down	Low	
	PA8	LCD_COM0	Alternate Function Push Pull	No pull-up and no pull-down	Low	
	PA9	LCD_COM1	Alternate Function Push Pull	No pull-up and no pull-down	Low	
	PA10	LCD_COM2	Alternate Function Push Pull	No pull-up and no pull-down	Low	
	PA15 (JTDI)	LCD_SEG17	Alternate Function Push Pull	No pull-up and no pull-down	Low	
	PB4 (NJTRST)	LCD_SEG8	Alternate Function Push Pull	No pull-up and no pull-down	Low	
	PB5	LCD_SEG9	Alternate Function Push Pull	No pull-up and no pull-down	Low	
	PB9	LCD_COM3	Alternate Function Push Pull	No pull-up and no pull-down	Low	
QUADSPI	PE10	QUADSPI_CLK	Alternate Function Push Pull	No pull-up and no pull-down	**Very High ***	FLASH_CLK
	PE11	QUADSPI_NCS	Alternate Function Push Pull	No pull-up and no pull-down	**Very High ***	FLASH_CS
	PE12	QUADSPI_BK1_IO0	Alternate Function Push Pull	No pull-up and no pull-down	**Very High ***	FLASH_D0

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
	PE13	QUADSPI_BK1_IO1	Alternate Function Push Pull	No pull-up and no pull-down	**Very High ***	FLASH_D1
	PE14	QUADSPI_BK1_IO2	Alternate Function Push Pull	No pull-up and no pull-down	**Very High ***	FLASH_D2
	PE15	QUADSPI_BK1_IO3	Alternate Function Push Pull	No pull-up and no pull-down	**Very High ***	FLASH_D3
RCC	PH0-OSC_IN (PH0)	RCC_OSC_IN	n/a	n/a	n/a	
	PH1-OSC_OUT (PH1)	RCC_OSC_OUT	n/a	n/a	n/a	
SPI2	PD1	SPI2_SCK	Alternate Function Push Pull	No pull-up and no pull-down	**Very High ***	
	PD4	SPI2_MOSI	Alternate Function Push Pull	No pull-up and no pull-down	**Very High ***	
USART2	PD5	USART2_TX	Alternate Function Push Pull	No pull-up and no pull-down	**Very High ***	
	PD6	USART2_RX	Alternate Function Push Pull	No pull-up and no pull-down	**Very High ***	
Single Mapped Signals	PD3	SPI2_MISO	Alternate Function Push Pull	No pull-up and no pull-down	**Very High ***	
GPIO	PC0	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	MAG_CS
	PA0	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	JOY_CENTER
	PA1	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	JOY_LEFT
	PA2	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	JOY_RIGHT
	PA3	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	JOY_UP
	PA5	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	JOY_DOWN
	PB2	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	LD4
	PE8	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	LD5
	PD7	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	GYRO_CS
	PE0	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	ACCEL_CS

4.2. DMA configuration

nothing configured in DMA service

4.3. NVIC configuration

4.3.1. NVIC

Interrupt Table	Enable	Preenmption Priority	SubPriority
Non maskable interrupt	true	0	0
Hard fault interrupt	true	0	0
Memory management fault	true	0	0
Prefetch fault, memory access fault	true	0	0
Undefined instruction or illegal state	true	0	0
System service call via SWI instruction	true	0	0
Debug monitor	true	0	0
Pendable request for system service	true	0	0
System tick timer	true	0	0
PVD/PVM1/PVM2/PVM3/PVM4 interrupts through EXTI lines 16/35/36/37/38	unused		
Flash global interrupt	unused		
RCC global interrupt	unused		
SPI2 global interrupt	unused		
USART2 global interrupt	unused		
QUADSPI global interrupt	unused		
LCD global interrupt	unused		
FPU global interrupt	unused		

4.3.2. NVIC Code generation

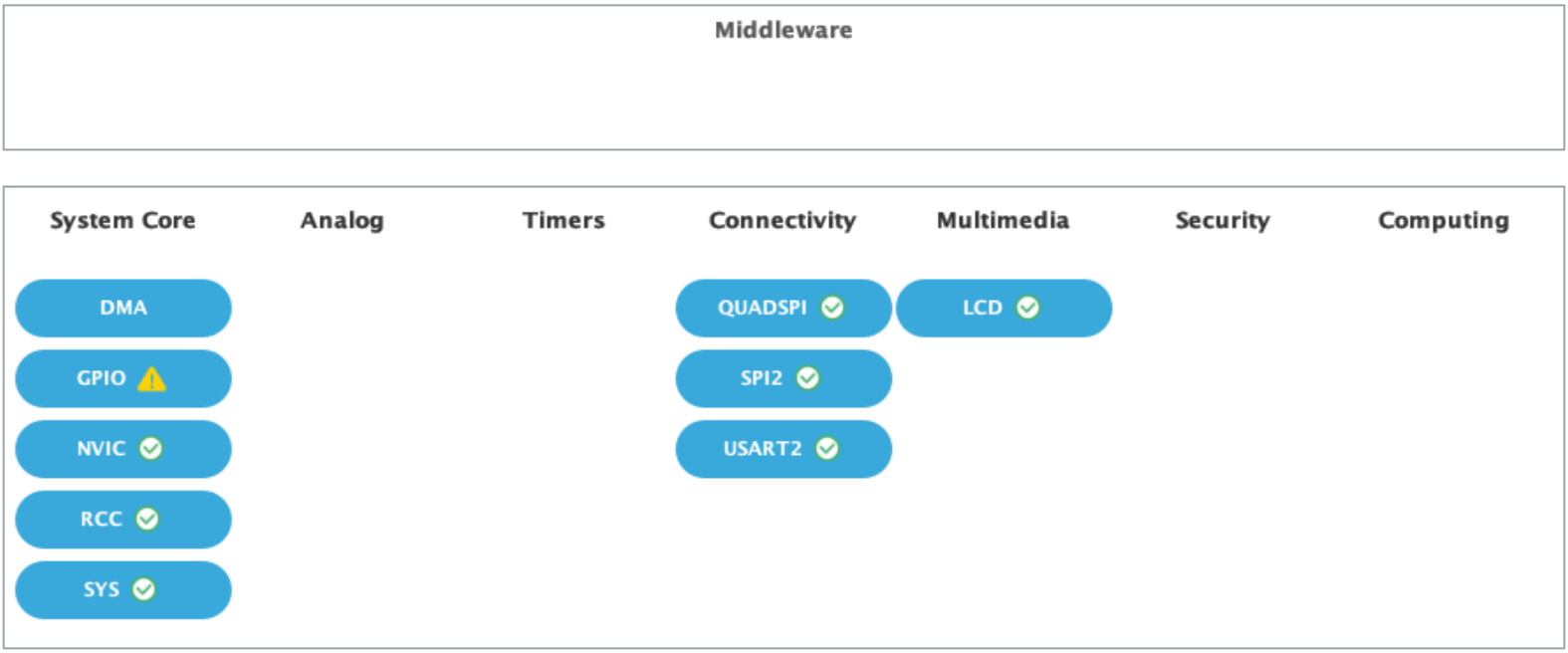
Enabled interrupt Table	Select for init sequence ordering	Generate IRQ handler	Call HAL handler
Non maskable interrupt	false	true	false
Hard fault interrupt	false	true	false
Memory management fault	false	true	false
Prefetch fault, memory access fault	false	true	false
Undefined instruction or illegal state	false	true	false
System service call via SWI instruction	false	true	false
Debug monitor	false	true	false
Pendable request for system service	false	true	false
System tick timer	false	true	true

*** User modified value**

5. System Views

5.1. Category view

5.1.1. Current



6. Docs & Resources

Type	Link
BSDL files	https://www.st.com/resource/en/bsdl_model/stm32l4_bsdl.zip
IBIS models	https://www.st.com/resource/en/ibis_model/stm32l4_ibis.zip
System View Description	https://www.st.com/resource/en/svd/stm32l4_svd.zip
Presentations	https://www.st.com/resource/en/product_presentation/stm32-stm8_embedded_software_solutions.pdf
Presentations	https://www.st.com/resource/en/product_presentation/stm32_eval-tools_portfolio.pdf
Presentations	https://www.st.com/resource/en/product_presentation/stm32_stm8_functional-safety-packages.pdf
Presentations	https://www.st.com/resource/en/product_presentation/stm32-stm8_software_development_tools.pdf
Presentations	https://www.st.com/resource/en/product_presentation/microcontrollers-stm32-family-overview.pdf
Presentations	https://www.st.com/resource/en/product_presentation/microcontrollers-stm32l4-series-product-overview.pdf
Brochures	https://www.st.com/resource/en/brochure/brstm32ulp.pdf
Flyers	https://www.st.com/resource/en/flyer/flstm32l4.pdf
Flyers	https://www.st.com/resource/en/flyer/flstm32nucleo.pdf
Flyers	https://www.st.com/resource/en/flyer/flstm32trust.pdf
Flyers	https://www.st.com/resource/en/flyer/flstm32gui.pdf
Magazine Articles	https://www.st.com/resource/en/magazine/design-elektronik_august2017.pdf
Magazine Articles	https://www.st.com/resource/en/magazine/design-elektronik_october2016.pdf
Product Certifications	https://www.st.com/resource/en/certification_document/sesip-2000002-01-cert.pdf
Product Certifications	https://www.st.com/resource/en/certification_document/sesip-2000002-01-st2.pdf

Product Certifications	https://www.st.com/resource/en/certification_document/psa-certificate_stm32l4.pdf
Application Notes	https://www.st.com/resource/en/application_note/an1709-emc-design-guide-for-stm8-stm32-and-legacy-mcus-stmicroelectronics.pdf
Application Notes	https://www.st.com/resource/en/application_note/an2606-stm32-microcontroller-system-memory-boot-mode-stmicroelectronics.pdf
Application Notes	https://www.st.com/resource/en/application_note/an3126-audio-and-waveform-generation-using-the-dac-in-stm32-products-stmicroelectronics.pdf
Application Notes	https://www.st.com/resource/en/application_note/an3154-can-protocol-used-in-the-stm32-bootloader-stmicroelectronics.pdf
Application Notes	https://www.st.com/resource/en/application_note/an3155-usart-protocol-used-in-the-stm32-bootloader-stmicroelectronics.pdf
Application Notes	https://www.st.com/resource/en/application_note/an3156-usb-dfu-protocol-used-in-the-stm32-bootloader-stmicroelectronics.pdf
Application Notes	https://www.st.com/resource/en/application_note/an4221-i2c-protocol-used-in-the-stm32-bootloader-stmicroelectronics.pdf
Application Notes	https://www.st.com/resource/en/application_note/an4286-spi-protocol-used-in-the-stm32-bootloader-stmicroelectronics.pdf
Application Notes	https://www.st.com/resource/en/application_note/an4555-getting-started-with-stm32l4-series-and-stm32l4-series-hardware-development-stmicroelectronics.pdf
Application Notes	https://www.st.com/resource/en/application_note/an4566-extending-the-dac-performance-of-stm32-microcontrollers-stmicroelectronics.pdf
Application Notes	https://www.st.com/resource/en/application_note/an4612-migrating-from-stm32l1-series-to-stm32l4-series-and-stm32l4-series-microcontrollers-stmicroelectronics.pdf
Application Notes	https://www.st.com/resource/en/application_note/an4616-migrating-from-stm32f401-and-stm32f411-lines-to-stm32l4-series-and-stm32l4-series-microcontrollers-stmicroelectronics.pdf
Application Notes	https://www.st.com/resource/en/application_note/an4621-stm32l4-and-stm32l4-ultralowpower-features-overview-stmicroelectronics.pdf
Application Notes	https://www.st.com/resource/en/application_note/an4629-adc-hardware-

	oversampling-for-microcontrollers-of-the-stm32-l0-and-l4-series-stmicroelectronics.pdf
Application Notes	https://www.st.com/resource/en/application_note/an4649-migrating-from-stm32f1-series-to-stm32l4-series--stm32l4-series-microntrollers-stmicroelectronics.pdf
Application Notes	https://www.st.com/resource/en/application_note/an4655-virtually-increasing-the-number-of-serial-communication-peripherals-in-stm32-applications-stmicroelectronics.pdf
Application Notes	https://www.st.com/resource/en/application_note/an4726-stm32cube-firmware-examples-for-stm32l4-series-and-stm32l4-series-stmicroelectronics.pdf
Application Notes	https://www.st.com/resource/en/application_note/an4729-stm32l0l4-firewall-overview-stmicroelectronics.pdf
Application Notes	https://www.st.com/resource/en/application_note/an4730-using-the-firewall-embedded-in-stm32l0l4l4-series-mcus-for-secure-access-to-sensitive-parts-of-code-and-data-stmicroelectronics.pdf
Application Notes	https://www.st.com/resource/en/application_note/an4746-optimizing-power-and-performance-with-stm32l4-and-stm32l4-series-microcontrollers-stmicroelectronics.pdf
Application Notes	https://www.st.com/resource/en/application_note/an4750-handling-of-soft-errors-in-stm32-applications-stmicroelectronics.pdf
Application Notes	https://www.st.com/resource/en/application_note/an4754-migrating-between-stm32l486xx476xx-and-stm32l443xx433xx-microcontrollers-stmicroelectronics.pdf
Application Notes	https://www.st.com/resource/en/application_note/an4761-using-stm32l476486-fsmc-peripheral-to-drive-external-memories--stmicroelectronics.pdf
Application Notes	https://www.st.com/resource/en/application_note/an4776-generalpurpose-timer-cookbook-for-stm32-microcontrollers-stmicroelectronics.pdf
Application Notes	https://www.st.com/resource/en/application_note/an4803-highspeed-si-simulations-using-ibis-and-boardlevel-simulations-using-hyperlynx-si-on-stm32-mcus-and-mpus-stmicroelectronics.pdf
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