
STM32
CubeMX

1. Description

1.1. Project

Project Name	CurbClimbing-CodeGeneration
Board Name	custom
Generated with:	STM32CubeMX 6.3.0
Date	06/07/2022

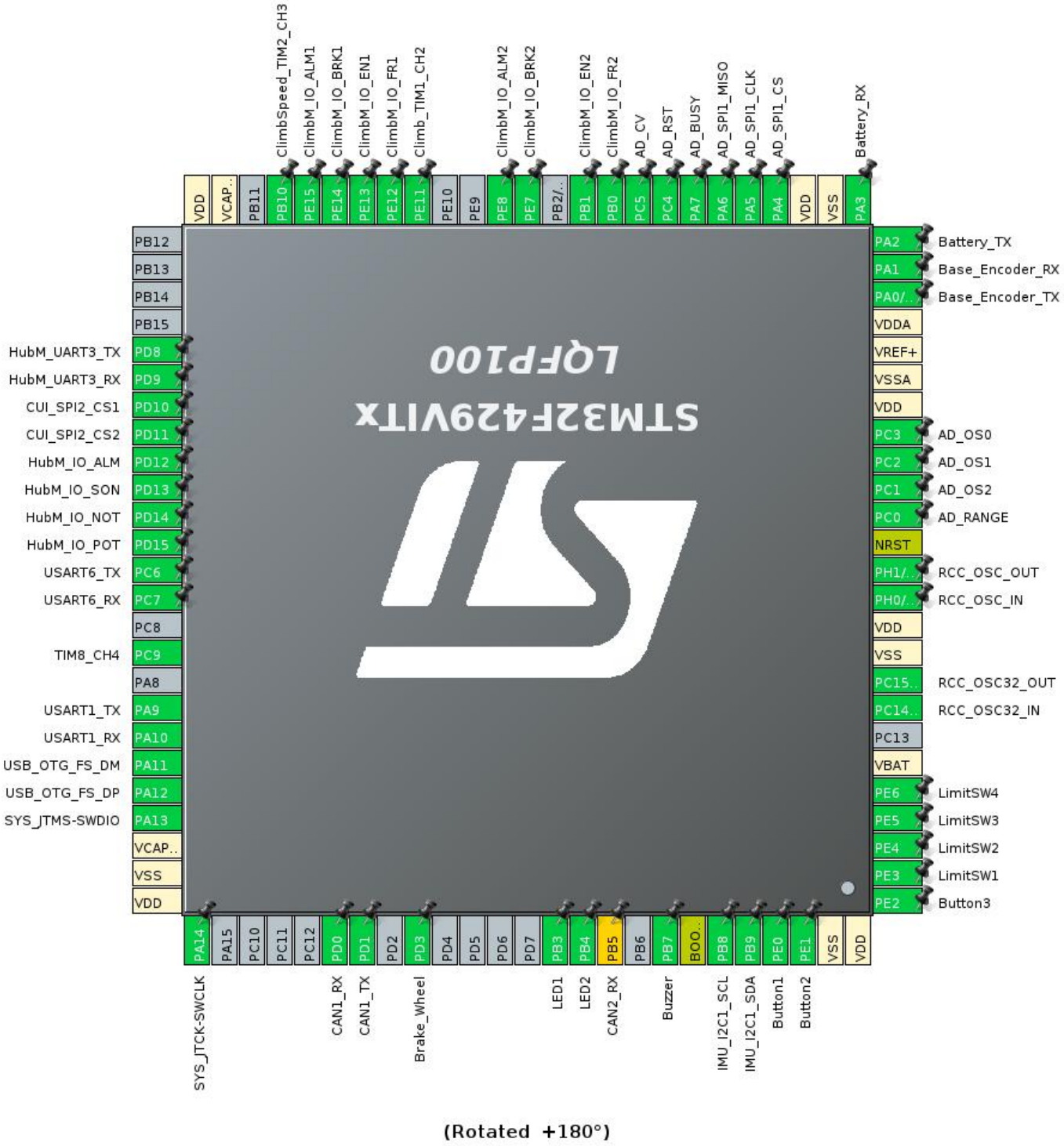
1.2. MCU

MCU Series	STM32F4
MCU Line	STM32F429/439
MCU name	STM32F429VITx
MCU Package	LQFP100
MCU Pin number	100

1.3. Core(s) information

Core(s)	Arm Cortex-M4

2. Pinout Configuration



(Rotated +180°)

3. Pins Configuration

Pin Number LQFP100	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
1	PE2 *	I/O	GPIO_Input	Button3
2	PE3 *	I/O	GPIO_Input	LimitSW1
3	PE4 *	I/O	GPIO_Input	LimitSW2
4	PE5 *	I/O	GPIO_Input	LimitSW3
5	PE6 *	I/O	GPIO_Input	LimitSW4
6	VBAT	Power		
8	PC14/OSC32_IN	I/O	RCC_OSC32_IN	
9	PC15/OSC32_OUT	I/O	RCC_OSC32_OUT	
10	VSS	Power		
11	VDD	Power		
12	PH0/OSC_IN	I/O	RCC_OSC_IN	
13	PH1/OSC_OUT	I/O	RCC_OSC_OUT	
14	NRST	Reset		
15	PC0 *	I/O	GPIO_Output	AD_RANGE
16	PC1 *	I/O	GPIO_Output	AD_OS2
17	PC2 *	I/O	GPIO_Output	AD_OS1
18	PC3 *	I/O	GPIO_Output	AD_OS0
19	VDD	Power		
20	VSSA	Power		
21	VREF+	Power		
22	VDDA	Power		
23	PA0/WKUP	I/O	UART4_TX	Base_Encoder_TX
24	PA1	I/O	UART4_RX	Base_Encoder_RX
25	PA2	I/O	USART2_TX	Battery_TX
26	PA3	I/O	USART2_RX	Battery_RX
27	VSS	Power		
28	VDD	Power		
29	PA4 *	I/O	GPIO_Output	AD_SPI1_CS
30	PA5	I/O	SPI1_SCK	AD_SPI1_CLK
31	PA6	I/O	SPI1_MISO	AD_SPI1_MISO
32	PA7	I/O	GPIO_EXTI7	AD_BUSY
33	PC4 *	I/O	GPIO_Output	AD_RST
34	PC5 *	I/O	GPIO_Output	AD_CV
35	PB0 *	I/O	GPIO_Output	ClimbM_IO_FR2
36	PB1 *	I/O	GPIO_Output	ClimbM_IO_EN2
38	PE7 *	I/O	GPIO_Output	ClimbM_IO_BRK2

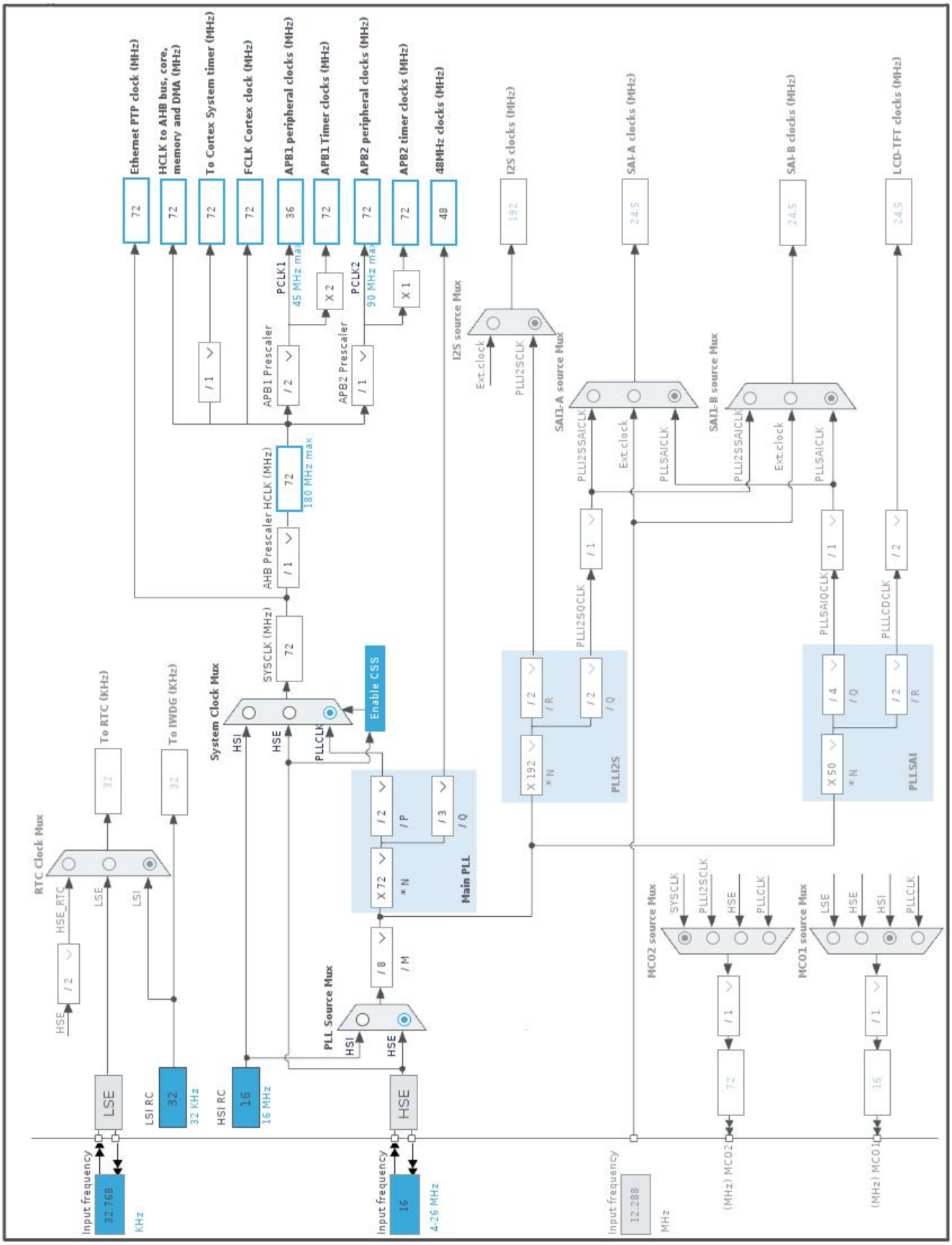
Pin Number LQFP100	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
39	PE8 *	I/O	GPIO_Input	ClimbM_IO_ALM2
42	PE11	I/O	TIM1_CH2	Climb_TIM1_CH2
43	PE12 *	I/O	GPIO_Output	ClimbM_IO_FR1
44	PE13 *	I/O	GPIO_Output	ClimbM_IO_EN1
45	PE14 *	I/O	GPIO_Output	ClimbM_IO_BRK1
46	PE15 *	I/O	GPIO_Input	ClimbM_IO_ALM1
47	PB10	I/O	TIM2_CH3	ClimbSpeed_TIM2_CH3
49	VCAP_1	Power		
50	VDD	Power		
55	PD8	I/O	USART3_TX	HubM_UART3_TX
56	PD9	I/O	USART3_RX	HubM_UART3_RX
57	PD10 *	I/O	GPIO_Output	CUI_SPI2_CS1
58	PD11 *	I/O	GPIO_Output	CUI_SPI2_CS2
59	PD12 *	I/O	GPIO_Input	HubM_IO_ALM
60	PD13 *	I/O	GPIO_Output	HubM_IO_SON
61	PD14 *	I/O	GPIO_Output	HubM_IO_NOT
62	PD15 *	I/O	GPIO_Output	HubM_IO_POT
63	PC6	I/O	USART6_TX	
64	PC7	I/O	USART6_RX	
66	PC9	I/O	TIM8_CH4	
68	PA9	I/O	USART1_TX	
69	PA10	I/O	USART1_RX	
70	PA11	I/O	USB_OTG_FS_DM	
71	PA12	I/O	USB_OTG_FS_DP	
72	PA13	I/O	SYS_JTMS-SWDIO	
73	VCAP_2	Power		
74	VSS	Power		
75	VDD	Power		
76	PA14	I/O	SYS_JTCK-SWCLK	
81	PD0	I/O	CAN1_RX	
82	PD1	I/O	CAN1_TX	
84	PD3 *	I/O	GPIO_Output	Brake_Wheel
89	PB3 *	I/O	GPIO_Output	LED1
90	PB4 *	I/O	GPIO_Output	LED2
91	PB5 **	I/O	CAN2_RX	
93	PB7 *	I/O	GPIO_Output	Buzzer
94	BOOT0	Boot		
95	PB8	I/O	I2C1_SCL	IMU_I2C1_SCL
96	PB9	I/O	I2C1_SDA	IMU_I2C1_SDA

Pin Number LQFP100	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
97	PE0 *	I/O	GPIO_Input	Button1
98	PE1 *	I/O	GPIO_Input	Button2
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



5. Software Project

5.1. Project Settings

Name	Value
Project Name	CurbClimbing-CodeGeneration
Project Folder	/home/ray/STM32CubeIDE/ccw_ws/CurbClimbing-CodeGeneration
Toolchain / IDE	STM32CubeIDE
Firmware Package Name and Version	STM32Cube FW_F4 V1.26.2
Application Structure	Advanced
Generate Under Root	Yes
Do not generate the main()	No
Minimum Heap Size	0x200
Minimum Stack Size	0x400

5.2. Code Generation Settings

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

5.3. Advanced Settings - Generated Function Calls

Rank	Function Name	Peripheral Instance Name
1	MX_GPIO_Init	GPIO
2	MX_DMA_Init	DMA
3	SystemClock_Config	RCC
4	MX_I2C1_Init	I2C1
5	MX_TIM1_Init	TIM1
6	MX_TIM2_Init	TIM2
7	MX_USART3_UART_Init	USART3
8	MX_TIM3_Init	TIM3
9	MX_TIM8_Init	TIM8
10	MX_CAN1_Init	CAN1
11	MX_SPI1_Init	SPI1

Rank	Function Name	Peripheral Instance Name
12	MX_USART6_UART_Init	USART6
13	MX_USART1_UART_Init	USART1
14	MX_USB_DEVICE_Init	USB_DEVICE
15	MX_CRC_Init	CRC
16	MX_UART4_Init	UART4
17	MX_USART2_UART_Init	USART2
18	MX_TIM7_Init	TIM7

6. Power Consumption Calculator report

6.1. Microcontroller Selection

Series	STM32F4
Line	STM32F429/439
MCU	STM32F429VITx
Datasheet	DS9405_Rev9

6.2. Parameter Selection

Temperature	25
Vdd	3.3

6.3. 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

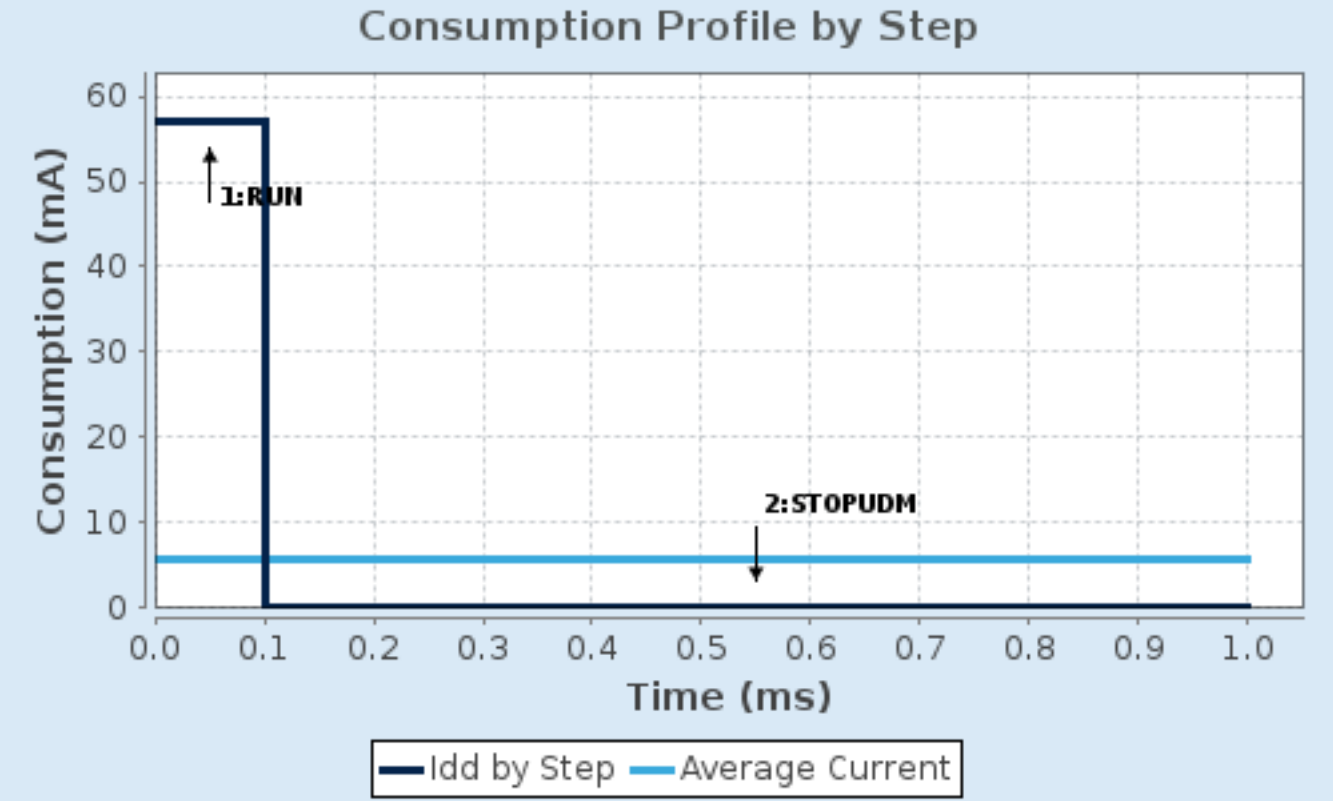
6.4. Sequence

Step	Step1	Step2
Mode	RUN	STOP_UDM (Under Drive)
Vdd	3.3	3.3
Voltage Source	Battery	Battery
Range	Scale1-High	No Scale
Fetch Type	FLASH	n/a
CPU Frequency	180 MHz	0 Hz
Clock Configuration	HSE PLL	Regulator_LP Flash-PwrDwn
Clock Source Frequency	4 MHz	0 Hz
Peripherals		
Additional Cons.	0 mA	0 mA
Average Current	57 mA	100 µA
Duration	0.1 ms	0.9 ms
DMIPS	225.0	0.0
Ta Max	96.91	104.99
Category	In DS Table	In DS Table

6.5. Results

Sequence Time	1 ms	Average Current	5.79 mA
Battery Life	24 days, 10 hours	Average DMIPS	225.0 DMIPS

6.6. Chart


Consumption Profile by Step
Consumption (mA)
60
50
40
30
20
10
0
1:RUN
2:STOPUDM
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

7. Peripherals and Middlewares Configuration

7.1. CAN1

mode: Activated

7.1.1. Parameter Settings:

Bit Timings Parameters:

Prescaler (for Time Quantum)	**9 ***
Time Quantum	**250.0 ***
Time Quanta in Bit Segment 1	**2 Times ***
Time Quanta in Bit Segment 2	1 Time
Time for one Bit	**1000.00 ***
Baud Rate	**1000000 ***
ReSynchronization Jump Width	1 Time

Basic Parameters:

Time Triggered Communication Mode	Disable
Automatic Bus-Off Management	Disable
Automatic Wake-Up Mode	Disable
Automatic Retransmission	Disable
Receive Fifo Locked Mode	Disable
Transmit Fifo Priority	Disable

Advanced Parameters:

Operating Mode	Normal

7.2. CRC

mode: Activated

7.3. I2C1

I2C: I2C

7.3.1. Parameter Settings:

Master Features:

I2C Speed Mode	**Fast Mode ***
I2C Clock Speed (Hz)	400000
Fast Mode Duty Cycle	Duty cycle Tlow/Thigh = 2

Timing configuration:

Coefficient of Digital Filter	0

Analog Filter	Enabled

Slave Features:

Clock No Stretch Mode	Disabled
Primary Address Length selection	7-bit
Dual Address Acknowledged	Disabled
Primary slave address	0
General Call address detection	Disabled

7.4. RCC

High Speed Clock (HSE): Crystal/Ceramic Resonator

Low Speed Clock (LSE) : Crystal/Ceramic Resonator

7.4.1. Parameter Settings:

System Parameters:

VDD voltage (V)	3.3
Instruction Cache	Enabled
Prefetch Buffer	Enabled
Data Cache	Enabled
Flash Latency(WS)	2 WS (3 CPU cycle)

RCC Parameters:

HSI Calibration Value	16
TIM Prescaler Selection	Disabled
HSE Startup Timout Value (ms)	100
LSE Startup Timout Value (ms)	5000

Power Parameters:

Power Regulator Voltage Scale	Power Regulator Voltage Scale 3
Power Over Drive	Disabled

7.5. SPI1

Mode: Receive Only Master

7.5.1. Parameter Settings:

Basic Parameters:

Frame Format	Motorola
Data Size	**16 Bits ***
First Bit	MSB First

Clock Parameters:

Prescaler (for Baud Rate)	**64 ***
Baud Rate	**1.125 MBits/s ***
Clock Polarity (CPOL)	**High ***
Clock Phase (CPHA)	1 Edge

Advanced Parameters:

CRC Calculation	Disabled
NSS Signal Type	Software

7.6. SYS

Debug: Serial Wire

Timebase Source: TIM6

7.7. TIM1

Clock Source : Internal Clock

Channel2: PWM Generation CH2

7.7.1. Parameter Settings:

Counter Settings:

Prescaler (PSC - 16 bits value)	**72-1 ***
Counter Mode	Up
Counter Period (AutoReload Register - 16 bits value)	**100-1 ***
Internal Clock Division (CKD)	No Division
Repetition Counter (RCR - 8 bits value)	0
auto-reload preload	Disable

Trigger Output (TRGO) Parameters:

Master/Slave Mode (MSM bit)	Disable (Trigger input effect not delayed)
Trigger Event Selection	Reset (UG bit from TIMx_EGR)

Break And Dead Time management - BRK Configuration:

BRK State	Disable
BRK Polarity	High

Break And Dead Time management - Output Configuration:

Automatic Output State	Disable
Off State Selection for Run Mode (OSSR)	Disable
Off State Selection for Idle Mode (OSSI)	Disable
Lock Configuration	Off

PWM Generation Channel 2:

Mode	PWM mode 1
Pulse (16 bits value)	0

Output compare preload	Enable
Fast Mode	Disable
CH Polarity	High
CH Idle State	Reset

7.8. TIM2

Clock Source : Internal Clock

Channel3: PWM Generation CH3

7.8.1. Parameter Settings:

Counter Settings:

Prescaler (PSC - 16 bits value)	**72-1 ***
Counter Mode	Up
Counter Period (AutoReload Register - 32 bits value)	**100-1 ***
Internal Clock Division (CKD)	No Division
auto-reload preload	Disable

Trigger Output (TRGO) Parameters:

Master/Slave Mode (MSM bit)	Disable (Trigger input effect not delayed)
Trigger Event Selection	Reset (UG bit from TIMx_EGR)

PWM Generation Channel 3:

Mode	PWM mode 1
Pulse (32 bits value)	0
Output compare preload	Enable
Fast Mode	Disable
CH Polarity	High

7.9. TIM3

Clock Source : Internal Clock

7.9.1. Parameter Settings:

Counter Settings:

Prescaler (PSC - 16 bits value)	**90-1 ***
Counter Mode	Up
Counter Period (AutoReload Register - 16 bits value)	**20000-1 ***
Internal Clock Division (CKD)	No Division
auto-reload preload	Disable

Trigger Output (TRGO) Parameters:

Master/Slave Mode (MSM bit)	Disable (Trigger input effect not delayed)
Trigger Event Selection	Reset (UG bit from TIMx_EGR)

7.10. TIM7

mode: Activated

7.10.1. Parameter Settings:

Counter Settings:

Prescaler (PSC - 16 bits value)	**72 ***
Counter Mode	Up
Counter Period (AutoReload Register - 16 bits value)	**0xffff-1 ***
auto-reload preload	Disable

Trigger Output (TRGO) Parameters:

Trigger Event Selection	Reset (UG bit from TIMx_EGR)

7.11. TIM8

Clock Source : Internal Clock

Channel4: Input Capture direct mode

7.11.1. Parameter Settings:

Counter Settings:

Prescaler (PSC - 16 bits value)	**36-1 ***
Counter Mode	Up
Counter Period (AutoReload Register - 16 bits value)	65535
Internal Clock Division (CKD)	No Division
Repetition Counter (RCR - 8 bits value)	0
auto-reload preload	Disable

Trigger Output (TRGO) Parameters:

Master/Slave Mode (MSM bit)	Disable (Trigger input effect not delayed)
Trigger Event Selection	Reset (UG bit from TIMx_EGR)

Input Capture Channel 4:

Polarity Selection	Rising Edge
IC Selection	Direct
Prescaler Division Ratio	No division
Input Filter (4 bits value)	0

7.12. UART4

Mode: Asynchronous

7.12.1. 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

7.13. USART1

Mode: Asynchronous

7.13.1. 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

7.14. USART2

Mode: Asynchronous

7.14.1. Parameter Settings:

Basic Parameters:

Baud Rate	**9600 ***
Word Length	8 Bits (including Parity)
Parity	None

Stop Bits	1

Advanced Parameters:

Data Direction	Receive and Transmit
Over Sampling	16 Samples

7.15. USART3

Mode: Asynchronous

7.15.1. 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

7.16. USART6

Mode: Asynchronous

7.16.1. 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

7.17. USB_OTG_FS

Mode: Device_Only

7.17.1. Parameter Settings:

Speed	Device Full Speed 12MBit/s
Low power	Disabled
Link Power Management	Disabled
VBUS sensing	Disabled
Signal start of frame	Disabled

7.18. FREERTOS

Interface: CMSIS_V2

7.18.1. Config parameters:

API:

FreeRTOS API	CMSIS v2

Versions:

FreeRTOS version	10.3.1
CMSIS-RTOS version	2.00

MPU/FPU:

ENABLE_MPU	Disabled
ENABLE_FPU	Disabled

Kernel settings:

USE_PREEMPTION	Enabled
CPU_CLOCK_HZ	SystemCoreClock
TICK_RATE_HZ	1000
MAX_PRIORITIES	56
MINIMAL_STACK_SIZE	128
MAX_TASK_NAME_LEN	16
USE_16_BIT_TICKS	Disabled
IDLE_SHOULD_YIELD	Enabled
USE_MUTEXES	Enabled
USE_RECURSIVE_MUTEXES	Enabled
USE_COUNTING_SEMAPHORES	Enabled
QUEUE_REGISTRY_SIZE	8
USE_APPLICATION_TASK_TAG	Disabled
ENABLE_BACKWARD_COMPATIBILITY	Enabled
USE_PORT_OPTIMISED_TASK_SELECTION	Disabled
USE_TICKLESS_IDLE	Disabled
USE_TASK_NOTIFICATIONS	Enabled
RECORD_STACK_HIGH_ADDRESS	Disabled

Memory management settings:

Memory Allocation	Dynamic / Static

TOTAL_HEAP_SIZE	15360
Memory Management scheme	heap_4

Hook function related definitions:

USE_IDLE_HOOK	Disabled
USE_TICK_HOOK	Disabled
USE_MALLOC_FAILED_HOOK	Disabled
USE_DAEMON_TASK_STARTUP_HOOK	Disabled
CHECK_FOR_STACK_OVERFLOW	Disabled

Run time and task stats gathering related definitions:

GENERATE_RUN_TIME_STATS	Disabled
USE_TRACE_FACILITY	Enabled
USE_STATS_FORMATTING_FUNCTIONS	Disabled

Co-routine related definitions:

USE_CO_ROUTINES	Disabled
MAX_CO_ROUTINE_PRIORITIES	2

Software timer definitions:

USE_TIMERS	Enabled
TIMER_TASK_PRIORITY	2
TIMER_QUEUE_LENGTH	10
TIMER_TASK_STACK_DEPTH	256

Interrupt nesting behaviour configuration:

LIBRARY_LOWEST_INTERRUPT_PRIORITY	15
LIBRARY_MAX_SYSCALL_INTERRUPT_PRIORITY	5

Added with 10.2.1 support:

MESSAGE_BUFFER_LENGTH_TYPE	size_t
USE_POSIX_ERRNO	Disabled

CMSIS-RTOS V2 flags:

USE_OS2_THREAD_SUSPEND_RESUME	Enabled
USE_OS2_THREAD_ENUMERATE	Enabled
USE_OS2_EVENTFLAGS_FROM_ISR	Enabled
USE_OS2_THREAD_FLAGS	Enabled
USE_OS2_TIMER	Enabled
USE_OS2_MUTEX	Enabled

7.18.2. Include parameters:

Include definitions:

vTaskPrioritySet	Enabled
uxTaskPriorityGet	Enabled
vTaskDelete	Enabled
vTaskCleanUpResources	Disabled

vTaskSuspend	Enabled
vTaskDelayUntil	Enabled
vTaskDelay	Enabled
xTaskGetSchedulerState	Enabled
xTaskResumeFromISR	Enabled
xQueueGetMutexHolder	Enabled
xSemaphoreGetMutexHolder	Disabled
pcTaskGetTaskName	Disabled
uxTaskGetStackHighWaterMark	Enabled
xTaskGetCurrentTaskHandle	Enabled
eTaskGetState	Enabled
xEventGroupSetBitFromISR	Disabled
xTimerPendFunctionCall	Enabled
xTaskAbortDelay	Disabled
xTaskGetHandle	Disabled
uxTaskGetStackHighWaterMark2	Disabled

7.18.3. Advanced settings:

Newlib settings (see parameter description first):

USE_NEWLIB_REENTRANT	Disabled

Project settings (see parameter description first):

Use FW pack heap file	Enabled

7.19. USB_DEVICE

Class For FS IP: Communication Device Class (Virtual Port Com)

7.19.1. Parameter Settings:

Basic Parameters:

USBD_MAX_NUM_INTERFACES (Maximum number of supported interfaces)	1
USBD_MAX_NUM_CONFIGURATION (Maximum number of supported configuration)	1
USBD_MAX_STR_DESC_SIZ (Maximum size for the string descriptors)	512
USBD_SELF_POWERED (Enabled self power)	Enabled
USBD_DEBUG_LEVEL (USBD Debug Level)	0: No debug message

Class Parameters:

USB CDC Rx Buffer Size	2048
USB CDC Tx Buffer Size	2048

7.19.2. Device Descriptor:

Device Descriptor:

VID (Vendor IDentifier)	1155
LANGID_STRING (Language Identifier)	English(United States)
MANUFACTURER_STRING (Manufacturer Identifier)	STMicroelectronics

Device Descriptor FS:

PID (Product IDentifier)	22336
PRODUCT_STRING (Product Identifier)	STM32 Virtual ComPort
CONFIGURATION_STRING (Configuration Identifier)	CDC Config
INTERFACE_STRING (Interface Identifier)	CDC Interface

*** User modified value**

8. System Configuration

8.1. GPIO configuration

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
CAN1	PD0	CAN1_RX	Alternate Function Push Pull	No pull-up and no pull-down	**Very High ***	
	PD1	CAN1_TX	Alternate Function Push Pull	No pull-up and no pull-down	**Very High ***	
I2C1	PB8	I2C1_SCL	Alternate Function Open Drain	**Pull-up ***	**Very High ***	IMU_I2C1_SCL
	PB9	I2C1_SDA	Alternate Function Open Drain	**Pull-up ***	**Very High ***	IMU_I2C1_SDA
RCC	PC14/OSC32_IN	RCC_OSC32_IN	n/a	n/a	n/a	
	PC15/OSC32_OUT	RCC_OSC32_OUT	n/a	n/a	n/a	
	PH0/OSC_IN	RCC_OSC_IN	n/a	n/a	n/a	
	PH1/OSC_OUT	RCC_OSC_OUT	n/a	n/a	n/a	
SPI1	PA5	SPI1_SCK	Alternate Function Push Pull	No pull-up and no pull-down	**Very High ***	AD_SPI1_CLK
	PA6	SPI1_MISO	Alternate Function Push Pull	No pull-up and no pull-down	**Very High ***	AD_SPI1_MISO
SYS	PA13	SYS_JTMS-SWDIO	n/a	n/a	n/a	
	PA14	SYS_JTCK-SWCLK	n/a	n/a	n/a	
TIM1	PE11	TIM1_CH2	Alternate Function Push Pull	No pull-up and no pull-down	Low	Climb_TIM1_CH2
TIM2	PB10	TIM2_CH3	Alternate Function Push Pull	No pull-up and no pull-down	Low	ClimbSpeed_TIM2_CH3
TIM8	PC9	TIM8_CH4	Alternate Function Push Pull	No pull-up and no pull-down	Low	
UART4	PA0/WKUP	UART4_TX	Alternate Function Push Pull	No pull-up and no pull-down	**Very High ***	Base_Encoder_TX
	PA1	UART4_RX	Alternate Function Push Pull	No pull-up and no pull-down	**Very High ***	Base_Encoder_RX
USART1	PA9	USART1_TX	Alternate Function Push Pull	No pull-up and no pull-down	**Very High ***	
	PA10	USART1_RX	Alternate Function Push Pull	No pull-up and no pull-down	**Very High ***	

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
USART2	PA2	USART2_TX	Alternate Function Push Pull	No pull-up and no pull-down	**Very High ***	Battery_TX
	PA3	USART2_RX	Alternate Function Push Pull	No pull-up and no pull-down	**Very High ***	Battery_RX
USART3	PD8	USART3_TX	Alternate Function Push Pull	No pull-up and no pull-down	**Very High ***	HubM_UART3_TX
	PD9	USART3_RX	Alternate Function Push Pull	No pull-up and no pull-down	**Very High ***	HubM_UART3_RX
USART6	PC6	USART6_TX	Alternate Function Push Pull	No pull-up and no pull-down	**Very High ***	
	PC7	USART6_RX	Alternate Function Push Pull	No pull-up and no pull-down	**Very High ***	
USB_OTG_FS	PA11	USB_OTG_FS_DM	Alternate Function Push Pull	No pull-up and no pull-down	**Very High ***	
	PA12	USB_OTG_FS_DP	Alternate Function Push Pull	No pull-up and no pull-down	**Very High ***	
Single Mapped Signals	PB5	CAN2_RX	Alternate Function Push Pull	No pull-up and no pull-down	**Very High ***	
GPIO	PE2	GPIO_Input	Input mode	**Pull-down ***	n/a	Button3
	PE3	GPIO_Input	Input mode	**Pull-up ***	n/a	LimitSW1
	PE4	GPIO_Input	Input mode	**Pull-up ***	n/a	LimitSW2
	PE5	GPIO_Input	Input mode	**Pull-up ***	n/a	LimitSW3
	PE6	GPIO_Input	Input mode	**Pull-up ***	n/a	LimitSW4
	PC0	GPIO_Output	Output Push Pull	**Pull-up ***	Low	AD_RANGE
	PC1	GPIO_Output	Output Push Pull	**Pull-up ***	Low	AD_OS2
	PC2	GPIO_Output	Output Push Pull	**Pull-up ***	Low	AD_OS1
	PC3	GPIO_Output	Output Push Pull	**Pull-up ***	Low	AD_OS0
	PA4	GPIO_Output	Output Push Pull	**Pull-up ***	Low	AD_SPI1_CS
	PA7	GPIO_EXTI7	**External Interrupt Mode with Falling edge trigger detection**	No pull-up and no pull-down	n/a	AD_BUSY
	PC4	GPIO_Output	Output Push Pull	**Pull-up ***	Low	AD_RST
	PC5	GPIO_Output	Output Push Pull	**Pull-up ***	Low	AD_CV
	PB0	GPIO_Output	Output Push Pull	**Pull-up ***	Low	ClimbM_IO_FR2
	PB1	GPIO_Output	Output Push Pull	**Pull-up ***	Low	ClimbM_IO_EN2

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
	PE7	GPIO_Output	Output Push Pull	**Pull-up ***	Low	ClimbM_IO_BRK2
	PE8	GPIO_Input	Input mode	**Pull-up ***	n/a	ClimbM_IO_ALM2
	PE12	GPIO_Output	Output Push Pull	**Pull-up ***	Low	ClimbM_IO_FR1
	PE13	GPIO_Output	Output Push Pull	**Pull-up ***	Low	ClimbM_IO_EN1
	PE14	GPIO_Output	Output Push Pull	**Pull-up ***	Low	ClimbM_IO_BRK1
	PE15	GPIO_Input	Input mode	**Pull-up ***	n/a	ClimbM_IO_ALM1
	PD10	GPIO_Output	Output Push Pull	**Pull-up ***	Low	CUI_SPI2_CS1
	PD11	GPIO_Output	Output Push Pull	**Pull-up ***	Low	CUI_SPI2_CS2
	PD12	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	HubM_IO_ALM
	PD13	GPIO_Output	Output Push Pull	**Pull-up ***	Low	HubM_IO_SON
	PD14	GPIO_Output	Output Push Pull	**Pull-up ***	Low	HubM_IO_NOT
	PD15	GPIO_Output	Output Push Pull	**Pull-up ***	Low	HubM_IO_POT
	PD3	GPIO_Output	Output Push Pull	**Pull-up ***	Low	Brake_Wheel
	PB3	GPIO_Output	Output Push Pull	**Pull-up ***	Low	LED1
	PB4	GPIO_Output	Output Push Pull	**Pull-up ***	Low	LED2
	PB7	GPIO_Output	Output Push Pull	**Pull-up ***	Low	Buzzer
	PE0	GPIO_Input	Input mode	**Pull-down ***	n/a	Button1
	PE1	GPIO_Input	Input mode	**Pull-down ***	n/a	Button2

8.2. DMA configuration

DMA request	Stream	Direction	Priority
USART3_RX	DMA1_Stream1	Peripheral To Memory	Low
USART3_TX	DMA1_Stream3	Memory To Peripheral	Low
USART6_RX	DMA2_Stream1	Peripheral To Memory	Low
USART6_TX	DMA2_Stream6	Memory To Peripheral	Low
USART1_RX	DMA2_Stream2	Peripheral To Memory	Low
USART1_TX	DMA2_Stream7	Memory To Peripheral	Low
UART4_RX	DMA1_Stream2	Peripheral To Memory	Low
UART4_TX	DMA1_Stream4	Memory To Peripheral	Low
USART2_RX	DMA1_Stream5	Peripheral To Memory	Low

USART3_RX: DMA1_Stream1 DMA request Settings:

Mode: Normal
Use fifo: Disable
Peripheral Increment: Disable
Memory Increment: **Enable ***
Peripheral Data Width: Byte
Memory Data Width: Byte

USART3_TX: DMA1_Stream3 DMA request Settings:

Mode: Normal
Use fifo: Disable
Peripheral Increment: Disable
Memory Increment: **Enable ***
Peripheral Data Width: Byte
Memory Data Width: Byte

USART6_RX: DMA2_Stream1 DMA request Settings:

Mode: Normal
Use fifo: Disable
Peripheral Increment: Disable
Memory Increment: **Enable ***
Peripheral Data Width: Byte
Memory Data Width: Byte

USART6_TX: DMA2_Stream6 DMA request Settings:

Mode:	Normal
Use fifo:	Disable
Peripheral Increment:	Disable
Memory Increment:	**Enable ***
Peripheral Data Width:	Byte
Memory Data Width:	Byte

USART1_RX: DMA2_Stream2 DMA request Settings:

Mode:	Normal
Use fifo:	Disable
Peripheral Increment:	Disable
Memory Increment:	**Enable ***
Peripheral Data Width:	Byte
Memory Data Width:	Byte

USART1_TX: DMA2_Stream7 DMA request Settings:

Mode:	Normal
Use fifo:	Disable
Peripheral Increment:	Disable
Memory Increment:	**Enable ***
Peripheral Data Width:	Byte
Memory Data Width:	Byte

UART4_RX: DMA1_Stream2 DMA request Settings:

Mode:	Normal
Use fifo:	Disable
Peripheral Increment:	Disable
Memory Increment:	**Enable ***
Peripheral Data Width:	Byte
Memory Data Width:	Byte

UART4_TX: DMA1_Stream4 DMA request Settings:

Mode:	Normal
Use fifo:	Disable
Peripheral Increment:	Disable
Memory Increment:	**Enable ***
Peripheral Data Width:	Byte
Memory Data Width:	Byte

USART2_RX: DMA1_Stream5 DMA request Settings:

Mode:	Normal
Use fifo:	Disable
Peripheral Increment:	Disable
Memory Increment:	**Enable ***
Peripheral Data Width:	Byte
Memory Data Width:	Byte

8.3. NVIC configuration

8.3.1. 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
Pre-fetch 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	15	0
System tick timer	true	15	0
DMA1 stream1 global interrupt	true	5	0
DMA1 stream2 global interrupt	true	5	0
DMA1 stream3 global interrupt	true	5	0
DMA1 stream4 global interrupt	true	5	0
DMA1 stream5 global interrupt	true	5	0
CAN1 RX0 interrupts	true	5	0
EXTI line[9:5] interrupts	true	5	0
USART1 global interrupt	true	5	0
USART2 global interrupt	true	5	0
USART3 global interrupt	true	5	0
TIM8 break interrupt and TIM12 global interrupt	true	5	0
TIM8 update interrupt and TIM13 global interrupt	true	5	0
TIM8 trigger and commutation interrupts and TIM14 global interrupt	true	5	0
TIM8 capture compare interrupt	true	5	0
UART4 global interrupt	true	5	0
TIM6 global interrupt, DAC1 and DAC2 underrun error interrupts	true	15	0
DMA2 stream1 global interrupt	true	5	0
DMA2 stream2 global interrupt	true	5	0
USB On The Go FS global interrupt	true	5	0
DMA2 stream6 global interrupt	true	5	0
DMA2 stream7 global interrupt	true	5	0
USART6 global interrupt	true	5	0
PVD interrupt through EXTI line 16	unused		
Flash global interrupt	unused		
RCC global interrupt	unused		
CAN1 TX interrupts	unused		
CAN1 RX1 interrupt	unused		

Interrupt Table	Enable	Preenmption Priority	SubPriority
CAN1 SCE interrupt	unused		
TIM1 break interrupt and TIM9 global interrupt	unused		
TIM1 update interrupt and TIM10 global interrupt	unused		
TIM1 trigger and commutation interrupts and TIM11 global interrupt	unused		
TIM1 capture compare interrupt	unused		
TIM2 global interrupt	unused		
TIM3 global interrupt	unused		
I2C1 event interrupt	unused		
I2C1 error interrupt	unused		
SPI1 global interrupt	unused		
TIM7 global interrupt	unused		
FPU global interrupt	unused		

8.3.2. 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
Pre-fetch fault, memory access fault	false	true	false
Undefined instruction or illegal state	false	true	false
System service call via SWI instruction	false	false	false
Debug monitor	false	true	false
Pendable request for system service	false	false	false
System tick timer	false	false	true
DMA1 stream1 global interrupt	false	true	true
DMA1 stream2 global interrupt	false	true	true
DMA1 stream3 global interrupt	false	true	true
DMA1 stream4 global interrupt	false	true	true
DMA1 stream5 global interrupt	false	true	true
CAN1 RX0 interrupts	false	true	true
EXTI line[9:5] interrupts	false	true	true
USART1 global interrupt	false	true	true
USART2 global interrupt	false	true	true
USART3 global interrupt	false	true	true
TIM8 break interrupt and TIM12 global interrupt	false	true	true
TIM8 update interrupt and TIM13 global interrupt	false	true	true

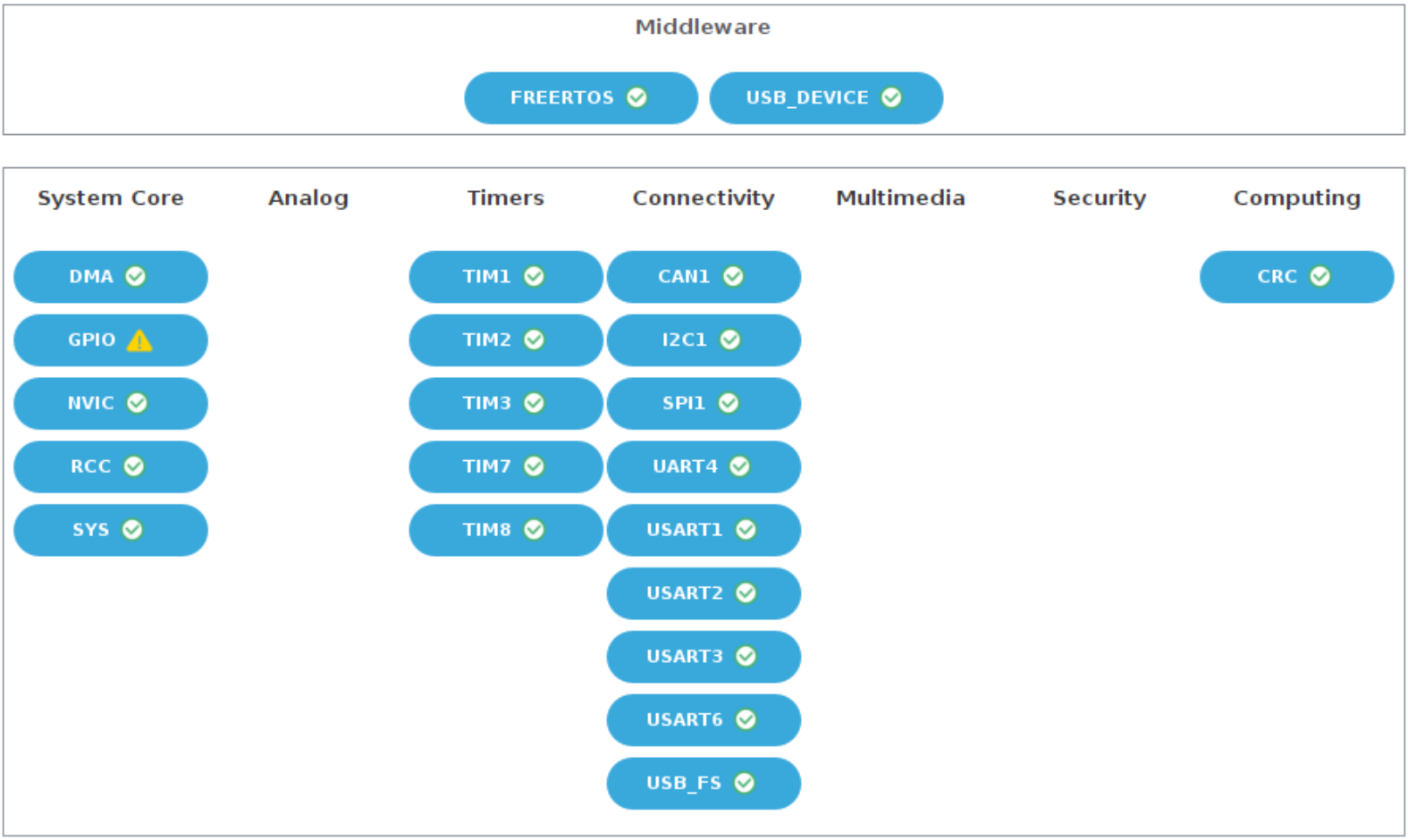
Enabled interrupt Table	Select for init sequence ordering	Generate IRQ handler	Call HAL handler
TIM8 trigger and commutation interrupts and TIM14 global interrupt	false	true	true
TIM8 capture compare interrupt	false	true	true
UART4 global interrupt	false	true	true
TIM6 global interrupt, DAC1 and DAC2 underrun error interrupts	false	true	true
DMA2 stream1 global interrupt	false	true	true
DMA2 stream2 global interrupt	false	true	true
USB On The Go FS global interrupt	false	true	true
DMA2 stream6 global interrupt	false	true	true
DMA2 stream7 global interrupt	false	true	true
USART6 global interrupt	false	true	true

*** User modified value**

9. System Views

9.1. Category view

9.1.1. Current



10. Docs & Resources

Type	Link
Datasheet	http://www.st.com/resource/en/datasheet/DM00071990.pdf
Reference manual	http://www.st.com/resource/en/reference_manual/DM00031020.pdf
Programming manual	http://www.st.com/resource/en/programming_manual/DM00046982.pdf
Errata sheet	http://www.st.com/resource/en/errata_sheet/DM00068628.pdf
Application note	http://www.st.com/resource/en/application_note/CD00167594.pdf
Application note	http://www.st.com/resource/en/application_note/CD00211314.pdf
Application note	http://www.st.com/resource/en/application_note/CD00249778.pdf
Application note	http://www.st.com/resource/en/application_note/CD00259245.pdf
Application note	http://www.st.com/resource/en/application_note/CD00264321.pdf
Application note	http://www.st.com/resource/en/application_note/CD00264342.pdf
Application note	http://www.st.com/resource/en/application_note/CD00264379.pdf
Application note	http://www.st.com/resource/en/application_note/DM00024853.pdf
Application note	http://www.st.com/resource/en/application_note/DM00040802.pdf
Application note	http://www.st.com/resource/en/application_note/DM00040808.pdf
Application note	http://www.st.com/resource/en/application_note/DM00042534.pdf
Application note	http://www.st.com/resource/en/application_note/DM00046011.pdf
Application note	http://www.st.com/resource/en/application_note/DM00050879.pdf
Application note	http://www.st.com/resource/en/application_note/DM00072315.pdf
Application note	http://www.st.com/resource/en/application_note/DM00073742.pdf
Application note	http://www.st.com/resource/en/application_note/DM00073853.pdf
Application note	http://www.st.com/resource/en/application_note/DM00080497.pdf
Application note	http://www.st.com/resource/en/application_note/DM00081379.pdf
Application note	http://www.st.com/resource/en/application_note/DM00115714.pdf
Application note	http://www.st.com/resource/en/application_note/DM00123028.pdf
Application note	http://www.st.com/resource/en/application_note/DM00129215.pdf

Application note	http://www.st.com/resource/en/application_note/DM00154959.pdf
Application note	http://www.st.com/resource/en/application_note/DM00160482.pdf
Application note	http://www.st.com/resource/en/application_note/DM00161778.pdf
Application note	http://www.st.com/resource/en/application_note/DM00164538.pdf
Application note	http://www.st.com/resource/en/application_note/DM00172465.pdf
Application note	http://www.st.com/resource/en/application_note/DM00213525.pdf
Application note	http://www.st.com/resource/en/application_note/DM00220769.pdf
Application note	http://www.st.com/resource/en/application_note/DM00226326.pdf
Application note	http://www.st.com/resource/en/application_note/DM00236305.pdf
Application note	http://www.st.com/resource/en/application_note/DM00257177.pdf
Application note	http://www.st.com/resource/en/application_note/DM00272912.pdf
Application note	http://www.st.com/resource/en/application_note/DM00281138.pdf
Application note	http://www.st.com/resource/en/application_note/DM00287603.pdf
Application note	http://www.st.com/resource/en/application_note/DM00296349.pdf
Application note	http://www.st.com/resource/en/application_note/DM00315319.pdf
Application note	http://www.st.com/resource/en/application_note/DM00327191.pdf
Application note	http://www.st.com/resource/en/application_note/DM00354244.pdf
Application note	http://www.st.com/resource/en/application_note/DM00373474.pdf
Application note	http://www.st.com/resource/en/application_note/DM00380469.pdf
Application note	http://www.st.com/resource/en/application_note/DM00395696.pdf
Application note	http://www.st.com/resource/en/application_note/DM00431633.pdf
Application note	http://www.st.com/resource/en/application_note/DM00493651.pdf
Application note	http://www.st.com/resource/en/application_note/DM00536349.pdf
Application note	http://www.st.com/resource/en/application_note/DM00725181.pdf