1. Description

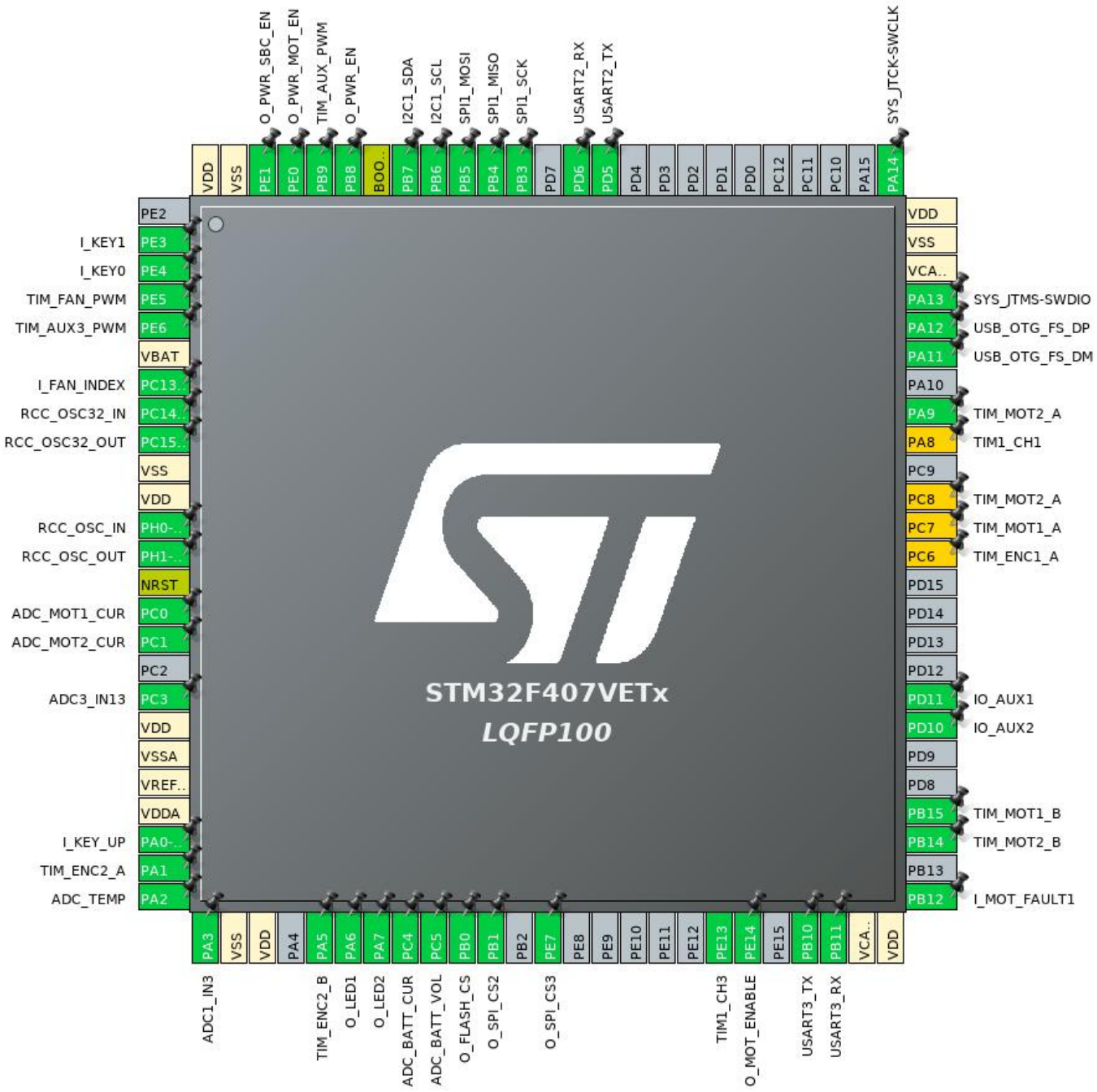
1.1. Project

Project Name	unav2
Board Name	custom
Generated with:	STM32CubeMX 5.2.0
Date	08/10/2019

1.2. MCU

MCU Series	STM32F4
MCU Line	STM32F407/417
MCU name	STM32F407VETx
MCU Package	LQFP100
MCU Pin number	100

2. Pinout Configuration



3. Pins Configuration

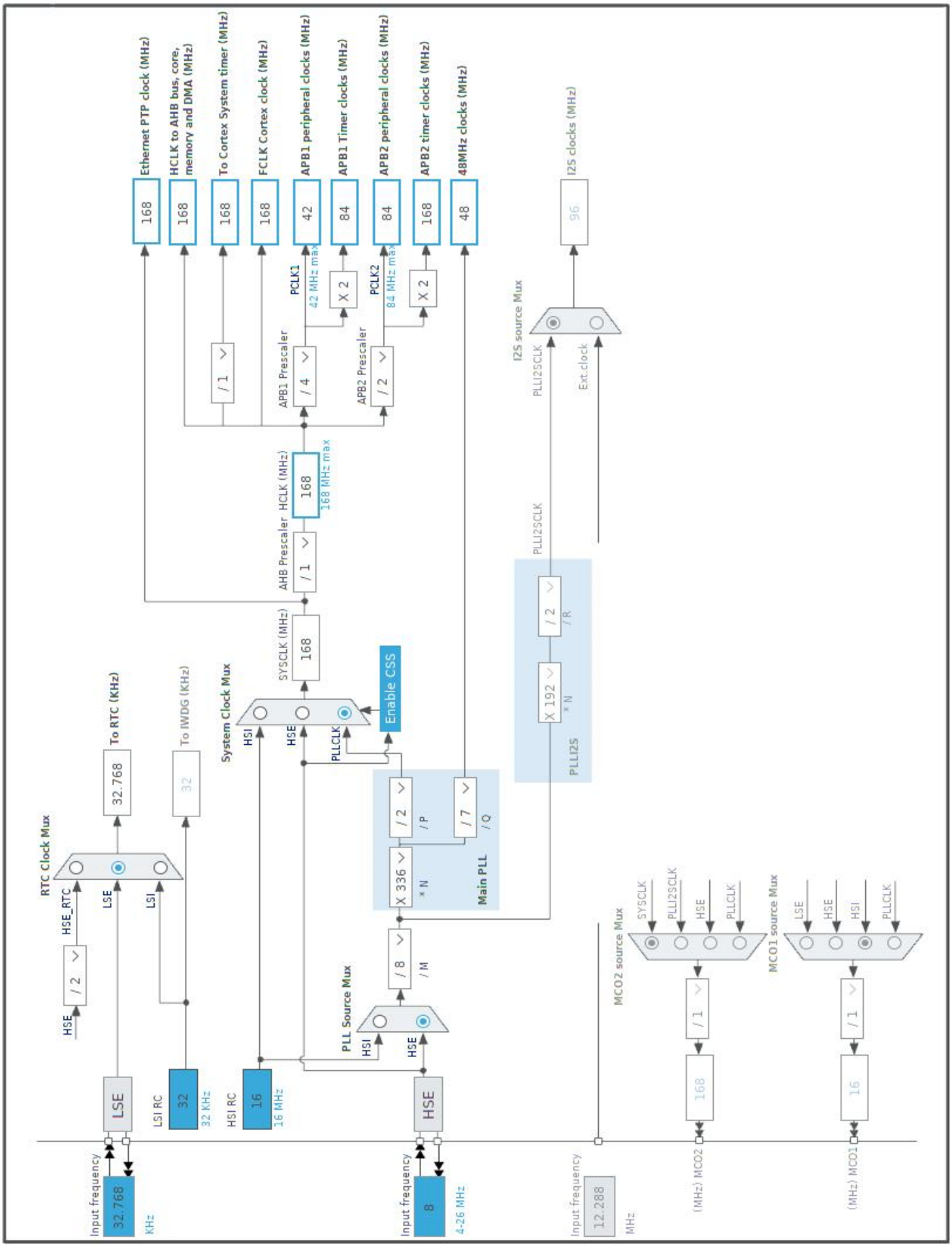
Pin Number LQFP100	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
2	PE3 *	I/O	GPIO_Input	I_KEY1
3	PE4 *	I/O	GPIO_Input	I_KEY0
4	PE5	I/O	TIM9_CH1	TIM_FAN_PWM
5	PE6	I/O	TIM9_CH2	TIM_AUX3_PWM
6	VBAT	Power		
7	PC13-ANTI_TAMP *	I/O	GPIO_Input	I_FAN_INDEX
8	PC14-OSC32_IN	I/O	RCC_OSC32_IN	
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	ADC2_IN10	ADC_MOT1_CUR
16	PC1	I/O	ADC2_IN11	ADC_MOT2_CUR
18	PC3	I/O	ADC3_IN13	
19	VDD	Power		
20	VSSA	Power		
21	VREF+	Power		
22	VDDA	Power		
23	PA0-WKUP	I/O	GPIO_EXTI0	I_KEY_UP
24	PA1	I/O	TIM2_CH2	TIM_ENC2_A
25	PA2	I/O	ADC1_IN2	ADC_TEMP
26	PA3	I/O	ADC1_IN3	
27	VSS	Power		
28	VDD	Power		
30	PA5	I/O	TIM2_CH1	TIM_ENC2_B
31	PA6	I/O	TIM13_CH1	O_LED1
32	PA7	I/O	TIM14_CH1	O_LED2
33	PC4	I/O	ADC1_IN14	ADC_BATT_CUR
34	PC5	I/O	ADC1_IN15	ADC_BATT_VOL
35	PB0 *	I/O	GPIO_Output	O_FLASH_CS
36	PB1 *	I/O	GPIO_Output	O_SPI_CS2
38	PE7 *	I/O	GPIO_Output	O_SPI_CS3
44	PE13	I/O	TIM1_CH3	
45	PE14 *	I/O	GPIO_Output	O_MOT_ENABLE

Pin Number LQFP100	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
47	PB10	I/O	USART3_TX	
48	PB11	I/O	USART3_RX	
49	VCAP_1	Power		
50	VDD	Power		
51	PB12	I/O	GPIO_EXTI12	I_MOT_FAULT1
53	PB14	I/O	TIM1_CH2N	TIM_MOT2_B
54	PB15	I/O	TIM1_CH3N	TIM_MOT1_B
57	PD10 *	I/O	GPIO_Input	IO_AUX2
58	PD11 *	I/O	GPIO_Output	IO_AUX1
63	PC6 **	I/O	TIM3_CH1	TIM_ENC1_A
64	PC7 **	I/O	TIM8_CH2	TIM_MOT1_A
65	PC8 **	I/O	TIM8_CH3	TIM_MOT2_A
67	PA8 **	I/O	TIM1_CH1	
68	PA9	I/O	TIM1_CH2	TIM_MOT2_A
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	
86	PD5	I/O	USART2_TX	
87	PD6	I/O	USART2_RX	
89	PB3	I/O	SPI1_SCK	
90	PB4	I/O	SPI1_MISO	
91	PB5	I/O	SPI1_MOSI	
92	PB6	I/O	I2C1_SCL	
93	PB7	I/O	I2C1_SDA	
94	BOOT0	Boot		
95	PB8 *	I/O	GPIO_Output	O_PWR_EN
96	PB9	I/O	TIM11_CH1	TIM_AUX_PWM
97	PE0 *	I/O	GPIO_Output	O_PWR_MOT_EN
98	PE1 *	I/O	GPIO_Output	O_PWR_SBC_EN
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	unav2
Project Folder	/home/alessio/code/hardware/unav2/baseboard/unav2
Toolchain / IDE	Makefile
Firmware Package Name and Version	STM32Cube FW_F4 V1.24.1

5.2. Code Generation Settings

Name	Value
STM32Cube Firmware Library Package	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	No
Delete previously generated files when not re-generated	No
Set all free pins as analog (to optimize the power consumption)	No

6. Power Consumption Calculator report

6.1. Microcontroller Selection

Series	STM32F4
Line	STM32F407/417
MCU	STM32F407VETx
Datasheet	022152_Rev8

6.2. Parameter Selection

Temperature	25
Vdd	3.3

7. IPs and Middleware Configuration

7.1. ADC1

mode: IN2

mode: IN3

mode: IN14

mode: IN15

mode: Temperature Sensor Channel

mode: Vrefint Channel

mode: Vbat Channel

7.1.1. Parameter Settings:

ADCs_Common_Settings:

Mode	Independent mode

ADC_Settings:

Clock Prescaler	**PCLK2 divided by 6 ***
Resolution	12 bits (15 ADC Clock cycles)
Data Alignment	Right alignment
Scan Conversion Mode	Disabled
Continuous Conversion Mode	Disabled
Discontinuous Conversion Mode	Disabled
DMA Continuous Requests	Disabled
End Of Conversion Selection	EOC flag at the end of single channel conversion

ADC_Regular_ConversionMode:

Number Of Conversion	1
External Trigger Conversion Source	Regular Conversion launched by software
External Trigger Conversion Edge	None
Rank	1
Channel	**Channel Vbat ***
Sampling Time	3 Cycles

ADC_Injected_ConversionMode:

Number Of Conversions	0

WatchDog:

Enable Analog WatchDog Mode	false

7.2. ADC2

mode: IN10

mode: IN11

7.2.1. Parameter Settings:

ADCs_Common_Settings:

Mode	Independent mode

ADC_Settings:

Clock Prescaler	**PCLK2 divided by 6 ***
Resolution	12 bits (15 ADC Clock cycles)
Data Alignment	Right alignment
Scan Conversion Mode	Enabled
Continuous Conversion Mode	Disabled
Discontinuous Conversion Mode	**Enabled ***
Number Of Discontinuous Conversions	1
DMA Continuous Requests	**Enabled ***
End Of Conversion Selection	**EOC flag at the end of all conversions ***

ADC_Regular_ConversionMode:

Number Of Conversion	**4 ***
External Trigger Conversion Source	**Timer 8 Trigger Out event ***
External Trigger Conversion Edge	Trigger detection on the rising edge
Rank	1
Channel	Channel 10
Sampling Time	**28 Cycles ***
Rank	**2 ***
Channel	**Channel 11 ***
Sampling Time	**28 Cycles ***
Rank	**3 ***
Channel	Channel 10
Sampling Time	**28 Cycles ***
Rank	**4 ***
Channel	**Channel 11 ***
Sampling Time	**28 Cycles ***

ADC_Injected_ConversionMode:

Number Of Conversions	0

WatchDog:

Enable Analog WatchDog Mode	false

7.3. ADC3

mode: IN13

7.3.1. Parameter Settings:

ADCs_Common_Settings:

Mode	Independent mode

ADC_Settings:

Clock Prescaler	**PCLK2 divided by 6 ***
Resolution	12 bits (15 ADC Clock cycles)
Data Alignment	Right alignment
Scan Conversion Mode	Disabled
Continuous Conversion Mode	Disabled
Discontinuous Conversion Mode	Disabled
DMA Continuous Requests	Disabled
End Of Conversion Selection	EOC flag at the end of single channel conversion

ADC_Regular_ConversionMode:

Number Of Conversion	1
External Trigger Conversion Source	Regular Conversion launched by software
External Trigger Conversion Edge	None
Rank	1
Channel	Channel 13
Sampling Time	3 Cycles

ADC_Injected_ConversionMode:

Number Of Conversions	0

WatchDog:

Enable Analog WatchDog Mode	false

7.4. I2C1

I2C: I2C

7.4.1. Parameter Settings:

Master Features:

I2C Speed Mode	Standard Mode
I2C Clock Speed (Hz)	100000

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

7.5. RCC

High Speed Clock (HSE): Crystal/Ceramic Resonator

Low Speed Clock (LSE) : Crystal/Ceramic Resonator

7.5.1. Parameter Settings:

System Parameters:

VDD voltage (V)	3.3
Instruction Cache	Enabled
Prefetch Buffer	Enabled
Data Cache	Enabled
Flash Latency(WS)	5 WS (6 CPU cycle)

RCC Parameters:

HSI Calibration Value	16
HSE Startup Timout Value (ms)	100
LSE Startup Timout Value (ms)	5000

Power Parameters:

Power Regulatror Voltage Scale	Power Regulator Voltage Scale 1

7.6. RTC

mode: Activate Clock Source

mode: Activate Calendar

7.6.1. Parameter Settings:

General:

Hour Format	Hourformat 24
Asynchronous Predivider value	127
Synchronous Predivider value	255

Calendar Time:

Data Format	BCD data format
Hours	0
Minutes	0
Seconds	0
Day Light Saving: value of hour adjustment	Daylightsaving None

Store Operation	Storeoperation Reset

Calendar Date:

Week Day	**Thursday ***
Month	**July ***
Date	**7 ***
Year	**18 ***

7.7. SPI1

Mode: Full-Duplex Master

7.7.1. Parameter Settings:

Basic Parameters:

Frame Format	Motorola
Data Size	8 Bits
First Bit	MSB First

Clock Parameters:

Prescaler (for Baud Rate)	2
Baud Rate	**42.0 MBits/s ***
Clock Polarity (CPOL)	Low
Clock Phase (CPHA)	1 Edge

Advanced Parameters:

CRC Calculation	Disabled
NSS Signal Type	Software

7.8. SYS

Debug: Serial Wire

Timebase Source: TIM10

7.9. TIM1

Clock Source : Internal Clock

Channel2: PWM Generation CH2 CH2N

Channel3: Output Compare CH3 CH3N

7.9.1. Parameter Settings:

Counter Settings:

Prescaler (PSC - 16 bits value)	**7 ***
Counter Mode	Up
Counter Period (AutoReload Register - 16 bits value)	**1024 ***
Internal Clock Division (CKD)	No Division
Repetition Counter (RCR - 8 bits value)	0
auto-reload preload	**Enable ***

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
Dead Time	**2 ***

PWM Generation Channel 2 and 2N:

Mode	PWM mode 1
Pulse (16 bits value)	**512 ***
Fast Mode	Disable
CH Polarity	High
CHN Polarity	High
CH Idle State	Reset
CHN Idle State	Reset

Output Compare Channel 3 and 3N:

Mode	Frozen (used for Timing base)
Pulse (16 bits value)	0
CH Polarity	High
CHN Polarity	High
CH Idle State	Reset
CHN Idle State	Reset

7.10. TIM2

Combined Channels: Encoder Mode

7.10.1. Parameter Settings:

Counter Settings:

Prescaler (PSC - 16 bits value)	0
Counter Mode	Up
Counter Period (AutoReload Register - 32 bits value)	**65535 ***
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)

Encoder:

Encoder Mode	**Encoder Mode TI1 and TI2 ***
____ Parameters for Channel 1 ____	
Polarity	Rising Edge
IC Selection	Direct
Prescaler Division Ratio	No division
Input Filter	0
____ Parameters for Channel 2 ____	
Polarity	Rising Edge
IC Selection	Direct
Prescaler Division Ratio	No division
Input Filter	0

7.11. TIM8

Clock Source : Internal Clock

Channel1: Output Compare No Output

7.11.1. Parameter Settings:

Counter Settings:

Prescaler (PSC - 16 bits value)	**168 ***
Counter Mode	Up
Counter Period (AutoReload Register - 16 bits value)	**1000 ***
Internal Clock Division (CKD)	No Division
Repetition Counter (RCR - 8 bits value)	0
auto-reload preload	**Enable ***

Trigger Output (TRGO) Parameters:

Master/Slave Mode (MSM bit)	Disable (Trigger input effect not delayed)
Trigger Event Selection	**Update Event ***

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

Output Compare No Output Channel 1:

Mode	**Active Level on match ***
Pulse (16 bits value)	0
CH Polarity	High
CH Idle State	Reset

7.12. TIM9

mode: Clock Source

Channel1: PWM Generation CH1

Channel2: PWM Generation CH2

7.12.1. Parameter Settings:

Counter Settings:

Prescaler (PSC - 16 bits value)	**15 ***
Counter Mode	Up
Counter Period (AutoReload Register - 16 bits value)	**4096 ***
Internal Clock Division (CKD)	No Division
auto-reload preload	**Enable ***

PWM Generation Channel 1:

Mode	PWM mode 1
Pulse (16 bits value)	0
Fast Mode	Disable
CH Polarity	High

PWM Generation Channel 2:

Mode	PWM mode 1
Pulse (16 bits value)	0
Fast Mode	Disable
CH Polarity	High

7.13. TIM11

mode: Activated

Channel1: PWM Generation CH1

7.13.1. Parameter Settings:

Counter Settings:

Prescaler (PSC - 16 bits value)	0
Counter Mode	Up
Counter Period (AutoReload Register - 16 bits value)	0
Internal Clock Division (CKD)	No Division
auto-reload preload	Disable

PWM Generation Channel 1:

Mode	PWM mode 1
Pulse (16 bits value)	0
Fast Mode	Disable
CH Polarity	High

7.14. TIM13

mode: Activated

Channel1: PWM Generation CH1

7.14.1. Parameter Settings:

Counter Settings:

Prescaler (PSC - 16 bits value)	**15 ***
Counter Mode	Up
Counter Period (AutoReload Register - 16 bits value)	**1024 ***
Internal Clock Division (CKD)	No Division
auto-reload preload	**Enable ***

PWM Generation Channel 1:

Mode	PWM mode 1
Pulse (16 bits value)	0
Fast Mode	Disable
CH Polarity	High

7.15. TIM14

mode: Activated

Channel1: PWM Generation CH1

7.15.1. Parameter Settings:

Counter Settings:

Prescaler (PSC - 16 bits value)	**15 ***
Counter Mode	Up
Counter Period (AutoReload Register - 16 bits value)	**1024 ***
Internal Clock Division (CKD)	No Division
auto-reload preload	**Enable ***

PWM Generation Channel 1:

Mode	PWM mode 1
Pulse (16 bits value)	0
Fast Mode	Disable
CH Polarity	High

7.16. USART2

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. USART3

Mode: Asynchronous

7.17.1. 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

7.18. USB_OTG_FS

Mode: Device_Only

7.18.1. Parameter Settings:

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

7.19. FREERTOS

Interface: CMSIS_V1

7.19.1. Config parameters:

API:

FreeRTOS API	CMSIS v1

Versions:

FreeRTOS version	10.0.1
CMSIS-RTOS version	1.02

Kernel settings:

USE_PREEMPTION	Enabled
CPU_CLOCK_HZ	SystemCoreClock
TICK_RATE_HZ	1000
MAX_PRIORITIES	7
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	Disabled
QUEUE_REGISTRY_SIZE	8
USE_APPLICATION_TASK_TAG	Disabled
ENABLE_BACKWARD_COMPATIBILITY	Enabled
USE_PORT_OPTIMISED_TASK_SELECTION	Enabled
USE_TICKLESS_IDLE	Disabled
USE_TASK_NOTIFICATIONS	Enabled
RECORD_STACK_HIGH_ADDRESS	Disabled

Memory management settings:

Memory Allocation	Dynamic / Static
TOTAL_HEAP_SIZE	**65535 ***
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	**Enabled ***
USE_TRACE_FACILITY	Disabled
USE_STATS_FORMATTING_FUNCTIONS	Disabled

Co-routine related definitions:

USE_CO_ROUTINES	Disabled
MAX_CO_ROUTINE_PRIORITIES	2

Software timer definitions:

USE_TIMERS	Disabled

Interrupt nesting behaviour configuration:

LIBRARY_LOWEST_INTERRUPT_PRIORITY	15
LIBRARY_MAX_SYSCALL_INTERRUPT_PRIORITY	5

7.19.2. Include parameters:

Include definitions:

vTaskPrioritySet	Enabled
uxTaskPriorityGet	Enabled
vTaskDelete	Enabled
vTaskCleanUpResources	Disabled
vTaskSuspend	Enabled

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

7.20. USB_DEVICE

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

7.20.1. Parameter Settings:

Basic Parameters:

USBD_MAX_NUM_INTERFACES (Maximum number of supported interfaces)	**8 ***
USBD_MAX_NUM_CONFIGURATION (Maximum number of supported configuration)	1
USBD_MAX_STR_DESC_SIZ (Maximum size for the string descriptors)	0x200
USBD_SUPPORT_USER_STRING (Enable user string descriptor)	Disabled
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

7.20.2. 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)	

	UNAVng *
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
ADC1	PA2	ADC1_IN2	Analog mode	No pull-up and no pull-down	n/a	ADC_TEMP
	PA3	ADC1_IN3	Analog mode	No pull-up and no pull-down	n/a	
	PC4	ADC1_IN14	Analog mode	No pull-up and no pull-down	n/a	ADC_BATT_CUR
	PC5	ADC1_IN15	Analog mode	No pull-up and no pull-down	n/a	ADC_BATT_VOL
ADC2	PC0	ADC2_IN10	Analog mode	No pull-up and no pull-down	n/a	ADC_MOT1_CUR
	PC1	ADC2_IN11	Analog mode	No pull-up and no pull-down	n/a	ADC_MOT2_CUR
ADC3	PC3	ADC3_IN13	Analog mode	No pull-up and no pull-down	n/a	
I2C1	PB6	I2C1_SCL	Alternate Function Open Drain	Pull-up	**Very High ***	
	PB7	I2C1_SDA	Alternate Function Open Drain	Pull-up	**Very High ***	
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	PB3	SPI1_SCK	Alternate Function Push Pull	No pull-up and no pull-down	**Very High ***	
	PB4	SPI1_MISO	Alternate Function Push Pull	No pull-up and no pull-down	**Very High ***	
	PB5	SPI1_MOSI	Alternate Function Push Pull	No pull-up and no pull-down	**Very High ***	
SYS	PA13	SYS_JTMS-SWDIO	n/a	n/a	n/a	
	PA14	SYS_JTCK-SWCLK	n/a	n/a	n/a	
TIM1	PE13	TIM1_CH3	Alternate Function Push Pull	No pull-up and no pull-down	Low	
	PB14	TIM1_CH2N	Alternate Function Push Pull	No pull-up and no pull-down	Low	TIM_MOT2_B
	PB15	TIM1_CH3N	Alternate Function Push Pull	No pull-up and no pull-down	Low	TIM_MOT1_B
	PA9	TIM1_CH2	Alternate Function Push Pull	No pull-up and no pull-down	Low	TIM_MOT2_A
TIM2	PA1	TIM2_CH2	Alternate Function Push Pull	No pull-up and no pull-down	Low	TIM_ENC2_A
	PA5	TIM2_CH1	Alternate Function Push Pull	No pull-up and no pull-down	Low	TIM_ENC2_B

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
TIM9	PE5	TIM9_CH1	Alternate Function Push Pull	No pull-up and no pull-down	Low	TIM_FAN_PWM
	PE6	TIM9_CH2	Alternate Function Push Pull	No pull-up and no pull-down	Low	TIM_AUX3_PWM
TIM11	PB9	TIM11_CH1	Alternate Function Push Pull	No pull-up and no pull-down	Low	TIM_AUX_PWM
TIM13	PA6	TIM13_CH1	Alternate Function Push Pull	No pull-up and no pull-down	Low	O_LED1
TIM14	PA7	TIM14_CH1	Alternate Function Push Pull	No pull-up and no pull-down	Low	O_LED2
USART2	PD5	USART2_TX	Alternate Function Push Pull	Pull-up	**Very High ***	
	PD6	USART2_RX	Alternate Function Push Pull	Pull-up	**Very High ***	
USART3	PB10	USART3_TX	Alternate Function Push Pull	Pull-up	**Very High ***	
	PB11	USART3_RX	Alternate Function Push Pull	Pull-up	**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	PC6	TIM3_CH1	Alternate Function Push Pull	No pull-up and no pull-down	Low	TIM_ENC1_A
	PC7	TIM8_CH2	Alternate Function Push Pull	No pull-up and no pull-down	Low	TIM_MOT1_A
	PC8	TIM8_CH3	Alternate Function Push Pull	No pull-up and no pull-down	Low	TIM_MOT2_A
	PA8	TIM1_CH1	Alternate Function Push Pull	No pull-up and no pull-down	Low	
GPIO	PE3	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	I_KEY1
	PE4	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	I_KEY0
	PC13-ANTI_TAMP	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	I_FAN_INDEX
	PA0-WKUP	GPIO_EXTI0	External Interrupt Mode with Rising edge trigger detection	No pull-up and no pull-down	n/a	I_KEY_UP
	PB0	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	O_FLASH_CS
	PB1	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	O_SPI_CS2
	PE7	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	O_SPI_CS3
	PE14	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	O_MOT_ENABLE
	PB12	GPIO_EXTI12	External Interrupt Mode with Rising edge trigger detection	No pull-up and no pull-down	n/a	I_MOT_FAULT1
	PD10	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	IO_AUX2
	PD11	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	IO_AUX1
	PB8	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	O_PWR_EN
	PE0	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	O_PWR_MOT_EN
	PE1	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	O_PWR_SBC_EN

8.2. DMA configuration

DMA request	Stream	Direction	Priority
USART2_RX	DMA1_Stream5	Peripheral To Memory	**Medium ***
USART2_TX	DMA1_Stream6	Memory To Peripheral	**Medium ***
USART3_RX	DMA1_Stream1	Peripheral To Memory	**Medium ***
USART3_TX	DMA1_Stream3	Memory To Peripheral	**Medium ***
ADC2	DMA2_Stream2	Peripheral To Memory	**High ***

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

USART2_TX: DMA1_Stream6 DMA request Settings:

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

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

ADC2: DMA2_Stream2 DMA request Settings:

Mode:	**Circular ***
Use fifo:	Disable
Peripheral Increment:	Disable
Memory Increment:	**Enable ***
Peripheral Data Width:	Half Word
Memory Data Width:	Half Word

8.3. NVIC configuration

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 stream3 global interrupt	true	5	0
DMA1 stream5 global interrupt	true	5	0
DMA1 stream6 global interrupt	true	5	0
TIM1 update interrupt and TIM10 global interrupt	true	0	0
DMA2 stream2 global interrupt	true	5	0
USB On The Go FS global interrupt	true	5	0
PVD interrupt through EXTI line 16	unused		
Flash global interrupt	unused		
RCC global interrupt	unused		
EXTI line0 interrupt	unused		
ADC1, ADC2 and ADC3 global interrupts	unused		
TIM1 break interrupt and TIM9 global interrupt	unused		
TIM1 trigger and commutation interrupts and TIM11 global interrupt	unused		
TIM1 capture compare interrupt	unused		
TIM2 global interrupt	unused		
I2C1 event interrupt	unused		
I2C1 error interrupt	unused		
SPI1 global interrupt	unused		
USART2 global interrupt	unused		
USART3 global interrupt	unused		
EXTI line[15:10] interrupts	unused		
TIM8 break interrupt and TIM12 global interrupt	unused		
TIM8 update interrupt and TIM13 global interrupt	unused		
TIM8 trigger and commutation interrupts and TIM14 global interrupt	unused		
TIM8 capture compare interrupt	unused		
FPU global interrupt	unused		

*** User modified value**

9. Software Pack Report