1. Description

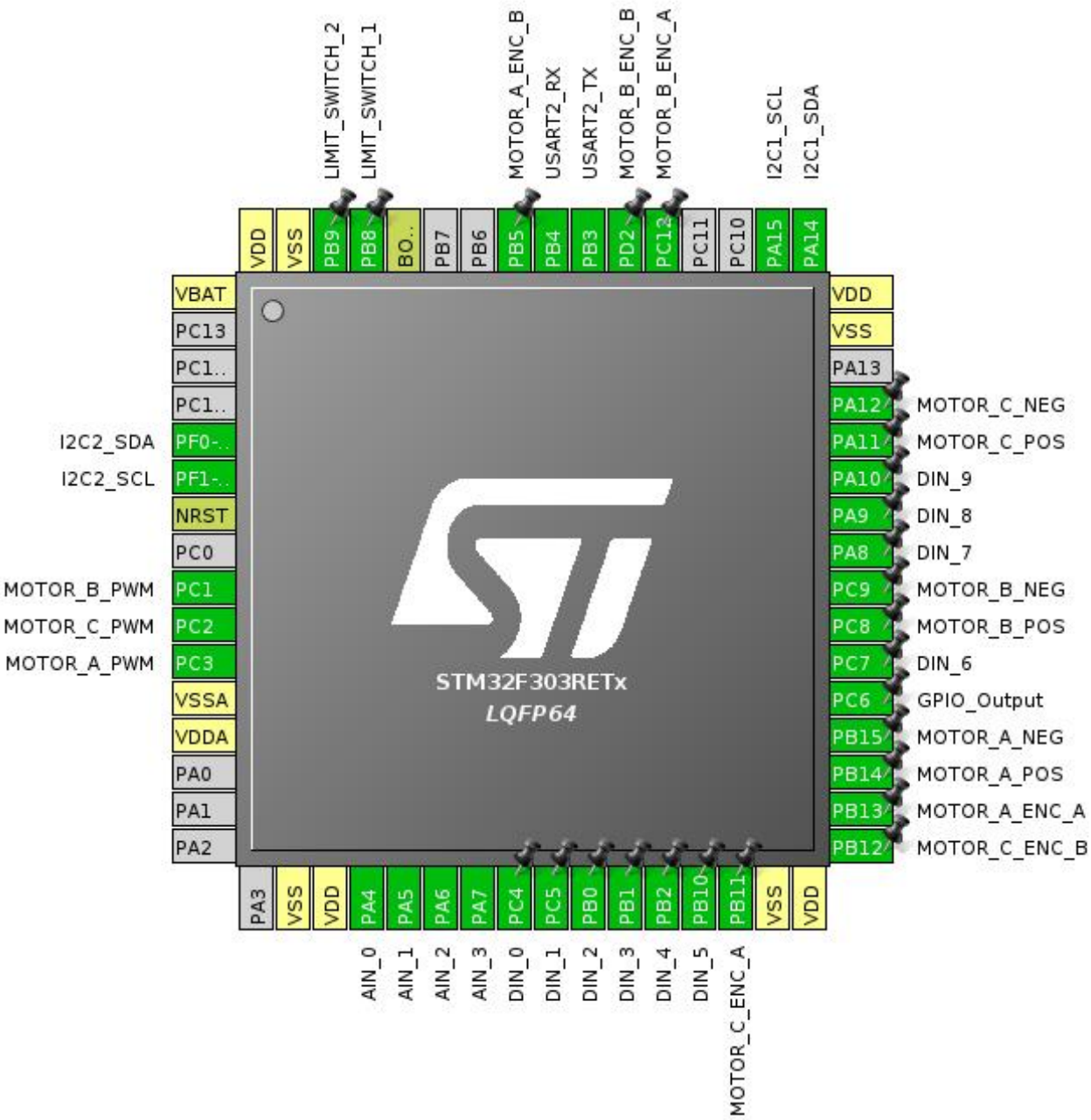
1.1. Project

Project Name	monti_main
Board Name	monti_main
Generated with:	STM32CubeMX 4.22.1
Date	11/28/2017

1.2. MCU

MCU Series	STM32F3
MCU Line	STM32F303
MCU name	STM32F303RETx
MCU Package	LQFP64
MCU Pin number	64

2. Pinout Configuration



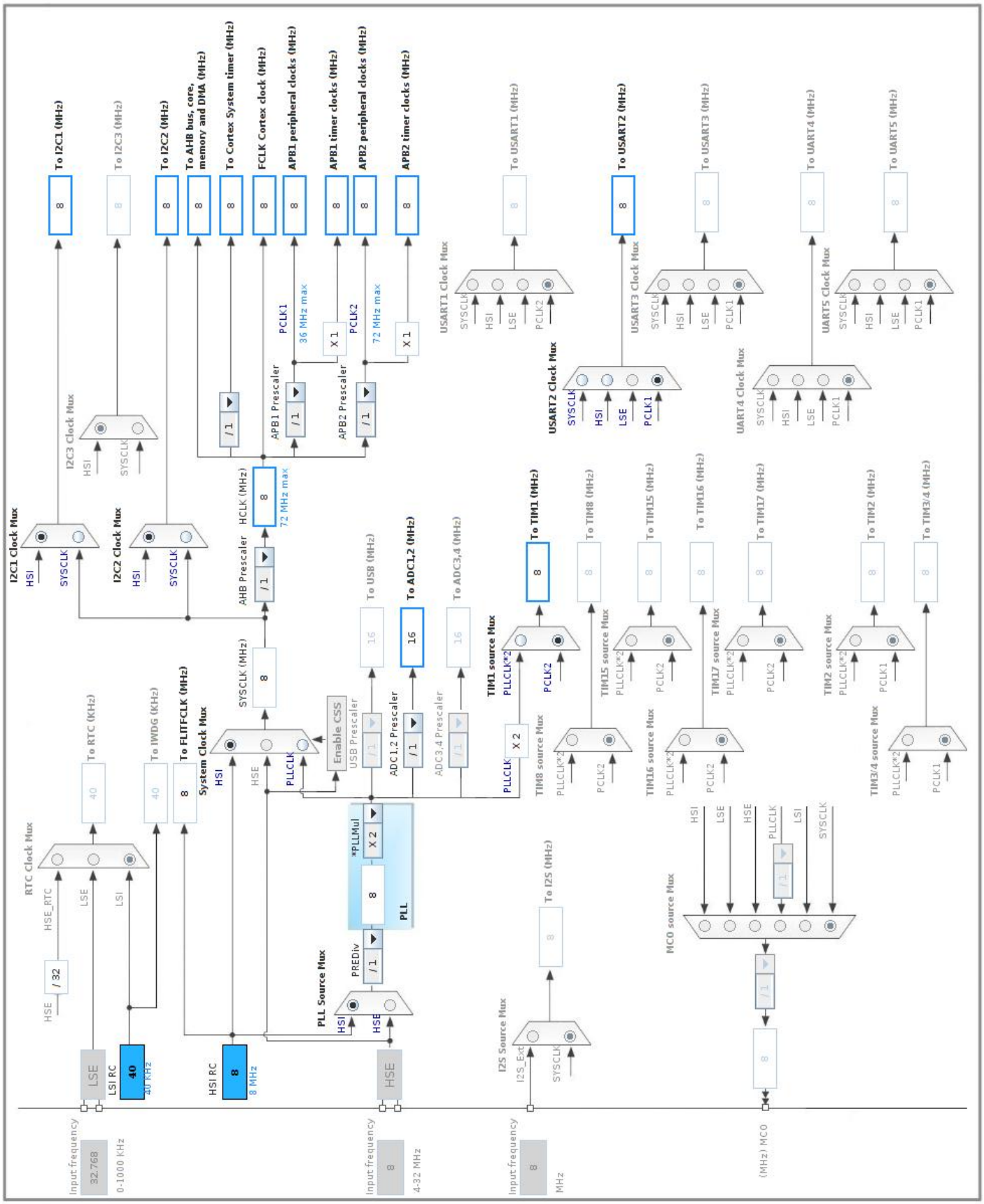
3. Pins Configuration

Pin Number LQFP64	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
1	VBAT	Power		
5	PF0-OSC_IN	I/O	I2C2_SDA	
6	PF1-OSC_OUT	I/O	I2C2_SCL	
7	NRST	Reset		
9	PC1	I/O	TIM1_CH2	MOTOR_B_PWM
10	PC2	I/O	TIM1_CH3	MOTOR_C_PWM
11	PC3	I/O	TIM1_CH4	MOTOR_A_PWM
12	VSSA	Power		
13	VDDA	Power		
18	VSS	Power		
19	VDD	Power		
20	PA4	I/O	ADC2_IN1	AIN_0
21	PA5	I/O	ADC2_IN2	AIN_1
22	PA6	I/O	ADC2_IN3	AIN_2
23	PA7	I/O	ADC2_IN4	AIN_3
24	PC4 *	I/O	GPIO_Input	DIN_0
25	PC5 *	I/O	GPIO_Input	DIN_1
26	PB0 *	I/O	GPIO_Input	DIN_2
27	PB1 *	I/O	GPIO_Input	DIN_3
28	PB2 *	I/O	GPIO_Input	DIN_4
29	PB10 *	I/O	GPIO_Input	DIN_5
30	PB11	I/O	GPIO_EXTI11	MOTOR_C_ENC_A
31	VSS	Power		
32	VDD	Power		
33	PB12 *	I/O	GPIO_Input	MOTOR_C_ENC_B
34	PB13	I/O	GPIO_EXTI13	MOTOR_A_ENC_A
35	PB14 *	I/O	GPIO_Output	MOTOR_A_POS
36	PB15 *	I/O	GPIO_Output	MOTOR_A_NEG
37	PC6 *	I/O	GPIO_Output	
38	PC7 *	I/O	GPIO_Input	DIN_6
39	PC8 *	I/O	GPIO_Output	MOTOR_B_POS
40	PC9 *	I/O	GPIO_Output	MOTOR_B_NEG
41	PA8 *	I/O	GPIO_Input	DIN_7
42	PA9 *	I/O	GPIO_Input	DIN_8
43	PA10 *	I/O	GPIO_Input	DIN_9
44	PA11 *	I/O	GPIO_Output	MOTOR_C_POS

Pin Number LQFP64	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
45	PA12 *	I/O	GPIO_Output	MOTOR_C_NEG
47	VSS	Power		
48	VDD	Power		
49	PA14	I/O	I2C1_SDA	
50	PA15	I/O	I2C1_SCL	
53	PC12	I/O	GPIO_EXTI12	MOTOR_B_ENC_A
54	PD2	I/O	GPIO_EXTI2	MOTOR_B_ENC_B
55	PB3	I/O	USART2_TX	
56	PB4	I/O	USART2_RX	
57	PB5	I/O	GPIO_EXTI5	MOTOR_A_ENC_B
60	BOOT0	Boot		
61	PB8 *	I/O	GPIO_Input	LIMIT_SWITCH_1
62	PB9 *	I/O	GPIO_Input	LIMIT_SWITCH_2
63	VSS	Power		
64	VDD	Power		

* The pin is affected with an I/O function

4. Clock Tree Configuration



5. IPs and Middleware Configuration

5.1. ADC2

IN1: IN1 Single-ended

IN2: IN2 Single-ended

IN3: IN3 Single-ended

IN4: IN4 Single-ended

5.1.1. Parameter Settings:

ADCs_Common_Settings:

Mode	Independent mode

ADC_Settings:

Clock Prescaler	ADC Asynchronous clock mode
Resolution	ADC 12-bit resolution
Data Alignment	Right alignment
Scan Conversion Mode	Disabled
Continuous Conversion Mode	Disabled
Discontinuous Conversion Mode	Disabled
DMA Continuous Requests	Disabled
End Of Conversion Selection	End of single conversion
Overrun behaviour	Overrun data overwritten
Low Power Auto Wait	Disabled

ADC_Regular_ConversionMode:

Enable Regular Conversions	Enable
Number Of Conversion	1
External Trigger Conversion Source	Regular Conversion launched by software
External Trigger Conversion Edge	None
Rank	1
Channel	Channel 1
Sampling Time	1.5 Cycles
Offset Number	No offset
Offset	0

ADC_Injected_ConversionMode:

Enable Injected Conversions	Enable
Number Of Conversions	0

Analog Watchdog 1:

Enable Analog WatchDog1 Mode	false

Analog Watchdog 2:

Enable Analog WatchDog2 Mode	false

Analog Watchdog 3:

Enable Analog WatchDog3 Mode	false

5.2. I2C1

I2C: I2C

5.2.1. Parameter Settings:

Timing configuration:

I2C Speed Mode	Standard Mode
I2C Speed Frequency (KHz)	100
Rise Time (ns)	0
Fall Time (ns)	0
Coefficient of Digital Filter	0
Analog Filter	Enabled
Timing	0x2000090E

Slave Features:

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

5.3. I2C2

I2C: I2C

5.3.1. Parameter Settings:

Timing configuration:

I2C Speed Mode	Standard Mode
I2C Speed Frequency (KHz)	100
Rise Time (ns)	0
Fall Time (ns)	0
Coefficient of Digital Filter	0
Analog Filter	Enabled

Timing	0x2000090E

Slave Features:

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

5.4. SYS

Timebase Source: SysTick

5.5. TIM1

Channel2: PWM Generation CH2
Channel3: PWM Generation CH3
Channel4: PWM Generation CH4

5.5.1. Parameter Settings:

Counter Settings:

Prescaler (PSC - 16 bits value)	**720 ***
Counter Mode	Up
Counter Period (AutoReload Register - 16 bits value)	**100 ***
Internal Clock Division (CKD)	No Division
Repetition Counter (RCR - 16 bits value)	0
auto-reload preload	Disable

Trigger Output (TRGO) Parameters:

Master/Slave Mode	Disable (no sync between this TIM (Master) and its Slaves
Trigger Event Selection TRGO	Reset (UG bit from TIMx_EGR)
Trigger Event Selection TRGO2	Reset (UG bit from TIMx_EGR)

Break And Dead Time management - BRK Configuration:

BRK State	Disable
BRK Polarity	High
BRK Filter (4 bits value)	0

Break And Dead Time management - BRK2 Configuration:

BRK2 State	Disable
BRK2 Polarity	High
BRK2 Filter (4 bits value)	0

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

Clear Input:

Clear Input Source	Disable

PWM Generation Channel 2:

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

PWM Generation Channel 3:

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

PWM Generation Channel 4:

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

5.6. USART2

Mode: Asynchronous

5.6.1. Parameter Settings:

Basic Parameters:

Baud Rate	**9600 ***
Word Length	**8 Bits (including Parity) ***
Parity	**Odd ***
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**

6. System Configuration

6.1. GPIO configuration

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
ADC2	PA4	ADC2_IN1	Analog mode	No pull up pull down	n/a	AIN_0
	PA5	ADC2_IN2	Analog mode	No pull up pull down	n/a	AIN_1
	PA6	ADC2_IN3	Analog mode	No pull up pull down	n/a	AIN_2
	PA7	ADC2_IN4	Analog mode	No pull up pull down	n/a	AIN_3
I2C1	PA14	I2C1_SDA	Alternate Function Open Drain	Pull up	**High ***	
	PA15	I2C1_SCL	Alternate Function Open Drain	Pull up	**High ***	
I2C2	PF0-OSC_IN	I2C2_SDA	Alternate Function Open Drain	Pull up	**High ***	
	PF1-OSC_OUT	I2C2_SCL	Alternate Function Open Drain	Pull up	**High ***	
TIM1	PC1	TIM1_CH2	Alternate Function Push Pull	No pull up pull down	Low	MOTOR_B_PWM
	PC2	TIM1_CH3	Alternate Function Push Pull	No pull up pull down	Low	MOTOR_C_PWM
	PC3	TIM1_CH4	Alternate Function Push Pull	No pull up pull down	Low	MOTOR_A_PWM
USART2	PB3	USART2_TX	Alternate Function Push Pull	Pull up	**High ***	
	PB4	USART2_RX	Alternate Function Push Pull	Pull up	**High ***	
GPIO	PC4	GPIO_Input	Input mode	No pull up pull down	n/a	DIN_0
	PC5	GPIO_Input	Input mode	No pull up pull down	n/a	DIN_1
	PB0	GPIO_Input	Input mode	No pull up pull down	n/a	DIN_2
	PB1	GPIO_Input	Input mode	No pull up pull down	n/a	DIN_3
	PB2	GPIO_Input	Input mode	No pull up pull down	n/a	DIN_4
	PB10	GPIO_Input	Input mode	No pull up pull down	n/a	DIN_5
	PB11	GPIO_EXTI11	External Interrupt Mode with Rising edge trigger detection	No pull up pull down	n/a	MOTOR_C_ENC_A
	PB12	GPIO_Input	Input mode	No pull up pull down	n/a	MOTOR_C_ENC_B
	PB13	GPIO_EXTI13	External Interrupt Mode with Rising edge trigger detection	No pull up pull down	n/a	MOTOR_A_ENC_A
	PB14	GPIO_Output	Output Push Pull	No pull up pull down	Low	MOTOR_A_POS
	PB15	GPIO_Output	Output Push Pull	No pull up pull down	Low	MOTOR_A_NEG
	PC6	GPIO_Output	Output Push Pull	No pull up pull down	Low	
	PC7	GPIO_Input	Input mode	No pull up pull down	n/a	DIN_6
	PC8	GPIO_Output	Output Push Pull	No pull up pull down	Low	MOTOR_B_POS
	PC9	GPIO_Output	Output Push Pull	No pull up pull down	Low	MOTOR_B_NEG
	PA8	GPIO_Input	Input mode	No pull up pull down	n/a	DIN_7

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
	PA9	GPIO_Input	Input mode	No pull up pull down	n/a	DIN_8
	PA10	GPIO_Input	Input mode	No pull up pull down	n/a	DIN_9
	PA11	GPIO_Output	Output Push Pull	No pull up pull down	Low	MOTOR_C_POS
	PA12	GPIO_Output	Output Push Pull	No pull up pull down	Low	MOTOR_C_NEG
	PC12	GPIO_EXTI12	External Interrupt Mode with Rising edge trigger detection	No pull up pull down	n/a	MOTOR_B_ENC_A
	PD2	GPIO_EXTI2	External Interrupt Mode with Rising edge trigger detection	No pull up pull down	n/a	MOTOR_B_ENC_B
	PB5	GPIO_EXTI5	External Interrupt Mode with Rising edge trigger detection	No pull up pull down	n/a	MOTOR_A_ENC_B
	PB8	GPIO_Input	Input mode	No pull up pull down	n/a	LIMIT_SWITCH_1
	PB9	GPIO_Input	Input mode	No pull up pull down	n/a	LIMIT_SWITCH_2

6.2. DMA configuration

nothing configured in DMA service

6.3. 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	0	0
System tick timer	true	0	0
EXTI line2 and Touch Sense controller interrupts	true	0	0
EXTI line[9:5] interrupts	true	0	0
USART2 global interrupt / USART2 wake-up interrupt through EXTI line 26	true	0	0
EXTI line[15:10] interrupts	true	0	0
PVD interrupt through EXTI line 16	unused		
Flash global interrupt	unused		
RCC global interrupt	unused		
ADC1 and ADC2 interrupts	unused		
TIM1 break and TIM15 interrupts	unused		
TIM1 update and TIM16 interrupts	unused		
TIM1 trigger, commutation and TIM17 interrupts	unused		
TIM1 capture compare interrupt	unused		
I2C1 event global interrupt / I2C1 wake-up interrupt through EXTI line 23	unused		
I2C1 error interrupt	unused		
I2C2 event global interrupt / I2C2 wake-up interrupt through EXTI line 24	unused		
I2C2 error interrupt	unused		
Floating point unit interrupt	unused		

*** User modified value**

7. Power Consumption Calculator report

7.1. Microcontroller Selection

Series	STM32F3
Line	STM32F303
MCU	STM32F303RETx
Datasheet	026415_Rev5

7.2. Parameter Selection

Temperature	25
Vdd	3.6

8. Software Project

8.1. Project Settings

Name	Value
Project Name	monti_main
Project Folder	/home/michaeljanov/NU-electric-canary/firmware/workspace/monti_main
Toolchain / IDE	SW4STM32
Firmware Package Name and Version	STM32Cube FW_F3 V1.9.0

8.2. Code Generation Settings

Name	Value
STM32Cube Firmware Library Package	Copy only the necessary library files
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	Yes
Set all free pins as analog (to optimize the power consumption)	No