1. Description

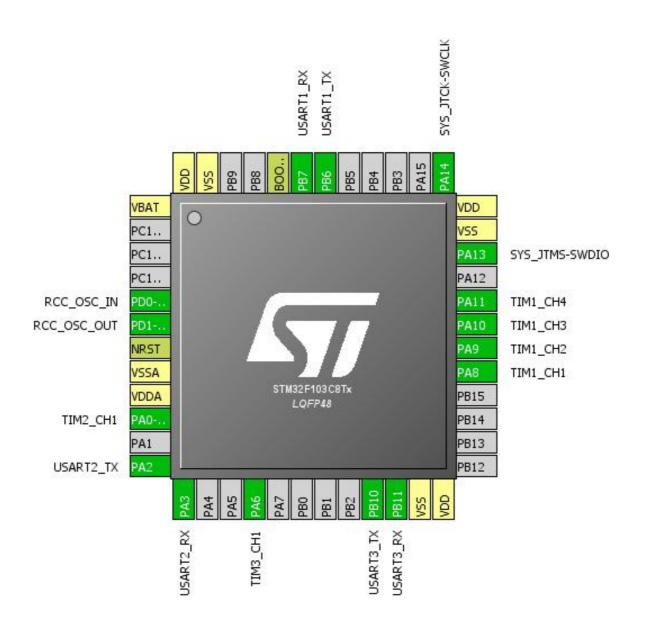
1.1. Project

Project Name	MotorController
Board Name	MotorController
Generated with:	STM32CubeMX 4.25.0
Date	05/11/2018

1.2. MCU

MCU Series	STM32F1
MCU Line	STM32F103
MCU name	STM32F103C8Tx
MCU Package	LQFP48
MCU Pin number	48

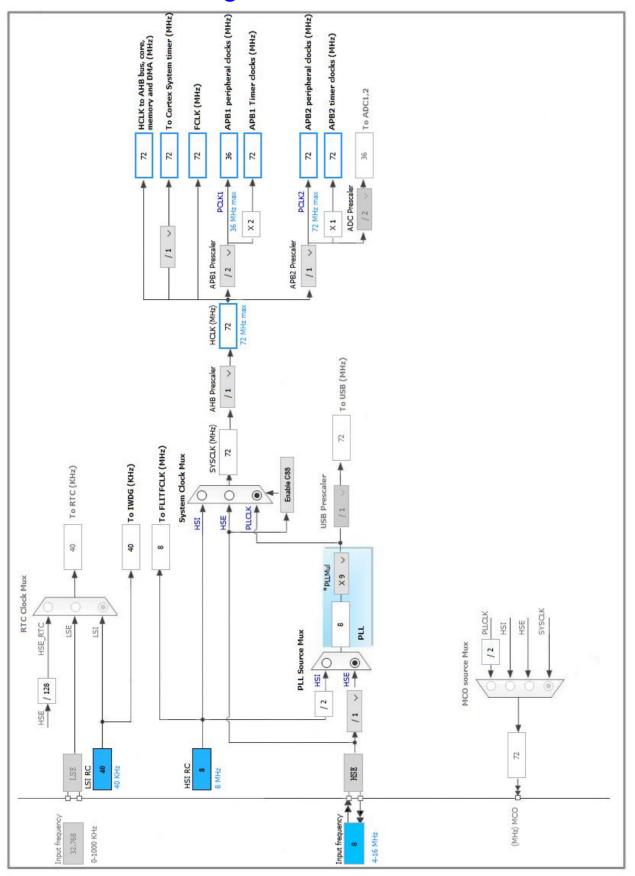
2. Pinout Configuration



3. Pins Configuration

Pin Number LQFP48	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
1	VBAT	Power		
5	PD0-OSC_IN	I/O	RCC_OSC_IN	
6	PD1-OSC_OUT	I/O	RCC_OSC_OUT	
7	NRST	Reset		
8	VSSA	Power		
9	VDDA	Power		
10	PA0-WKUP	I/O	TIM2_CH1	
12	PA2	I/O	USART2_TX	
13	PA3	I/O	USART2_RX	
16	PA6	I/O	TIM3_CH1	
21	PB10	I/O	USART3_TX	
22	PB11	I/O	USART3_RX	
23	VSS	Power		
24	VDD	Power		
29	PA8	I/O	TIM1_CH1	
30	PA9	I/O	TIM1_CH2	
31	PA10	I/O	TIM1_CH3	
32	PA11	I/O	TIM1_CH4	
34	PA13	I/O	SYS_JTMS-SWDIO	
35	VSS	Power		
36	VDD	Power		
37	PA14	I/O	SYS_JTCK-SWCLK	
42	PB6	I/O	USART1_TX	
43	PB7	I/O	USART1_RX	
44	воото	Boot		
47	VSS	Power		
48	VDD	Power		

4. Clock Tree Configuration



5. IPs and Middleware Configuration

5.1. IWDG

mode: Activated

5.1.1. Parameter Settings:

Clocking:

IWDG counter clock prescaler
8 *
IWDG down-counter reload value
4095

5.2. RCC

High Speed Clock (HSE): Crystal/Ceramic Resonator

5.2.1. Parameter Settings:

System Parameters:

VDD voltage (V) 3.3
Prefetch Buffer Enabled

Flash Latency(WS) 2 WS (3 CPU cycle)

RCC Parameters:

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

5.3. SYS

Debug: Serial Wire

Timebase Source: SysTick

5.4. TIM1

Channel1: PWM Generation CH1 Channel2: PWM Generation CH2

Channel3: PWM Generation CH3
Channel4: PWM Generation CH4

5.4.1. Parameter Settings:

Counter Settings:

Prescaler (PSC - 16 bits value) 0
Counter Mode Up

Counter Period (AutoReload Register - 16 bits value) 9000-1 *
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)

Reset

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 1:

Mode PWM mode 1

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

PWM Generation Channel 2:

CH Idle State

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

5.5. TIM2

Channel1: Input Capture direct mode

5.5.1. Parameter Settings:

Counter Settings:

Prescaler (PSC - 16 bits value) 17 *
Counter Mode Up

Counter Period (AutoReload Register - 16 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)

Input Capture Channel 1:

Polarity Selection Falling Edge *

IC Selection Direct
Prescaler Division Ratio No division

Input Filter (4 bits value)

5.6. TIM3

Channel1: Input Capture direct mode

5.6.1. Parameter Settings:

Counter Settings:

Prescaler (PSC - 16 bits value) 17 *
Counter Mode Up

Counter Period (AutoReload Register - 16 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)

Input Capture Channel 1:

Polarity Selection Falling Edge *

IC Selection Direct
Prescaler Division Ratio No division

Input Filter (4 bits value) 4 *

5.7. TIM4

mode: Clock Source

5.7.1. Parameter Settings:

Counter Settings:

Prescaler (PSC - 16 bits value) 72-1 *

Counter Mode Up

Counter Period (AutoReload Register - 16 bits value) 1000-1 *

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)

5.8. **USART1**

Mode: Asynchronous

5.8.1. Parameter Settings:

Basic Parameters:

Baud Rate 500000 *

Word Length 8 Bits (including Parity)

Parity None

Stop Bits 1

Advanced Parameters:

Data Direction Receive and Transmit

Over Sampling 16 Samples

5.9. **USART2**

Mode: Asynchronous

5.9.1. Parameter Settings:

Basic Parameters:

Baud Rate **57600** *

Word Length 8 Bits (including Parity)

Parity None Stop Bits 1

Advanced Parameters:

Data Direction Receive and Transmit

Over Sampling 16 Samples

5.10. USART3

Mode: Asynchronous

5.10.1. Parameter Settings:

Basic Parameters:

Baud Rate 2000000 *

Word Length 8 Bits (including Parity)

Parity None Stop Bits 1

Advanced Parameters:

Data Direction Receive and Transmit

Over Sampling 16 Samples

^{*} User modified value

6. System Configuration

6.1. GPIO configuration

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
RCC	PD0- OSC_IN	RCC_OSC_IN	n/a	n/a	n/a	
	PD1- OSC_OUT	RCC_OSC_OUT	n/a	n/a	n/a	
SYS	PA13	SYS_JTMS- SWDIO	n/a	n/a	n/a	
	PA14	SYS_JTCK- SWCLK	n/a	n/a	n/a	
TIM1	PA8	TIM1_CH1	Alternate Function Push Pull	n/a	High *	
	PA9	TIM1_CH2	Alternate Function Push Pull	n/a	High *	
	PA10	TIM1_CH3	Alternate Function Push Pull	n/a	High *	
	PA11	TIM1_CH4	Alternate Function Push Pull	n/a	High *	
TIM2	PA0-WKUP	TIM2_CH1	Input mode	No pull-up and no pull-down	n/a	
TIM3	PA6	TIM3_CH1	Input mode	No pull-up and no pull-down	n/a	
USART1	PB6	USART1_TX	Alternate Function Push Pull	n/a	High *	
	PB7	USART1_RX	Input mode	No pull-up and no pull-down	n/a	
USART2	PA2	USART2_TX	Alternate Function Push Pull	n/a	High *	
	PA3	USART2_RX	Input mode	No pull-up and no pull-down	n/a	
USART3	PB10	USART3_TX	Alternate Function Push Pull	n/a	High *	
	PB11	USART3_RX	Input mode	No pull-up and no pull-down	n/a	

6.2. DMA configuration

DMA request	Stream	Direction	Priority
USART2_TX	DMA1_Channel7	Memory To Peripheral	High *
USART3_TX	DMA1_Channel2	Memory To Peripheral	Medium *

USART2_TX: DMA1_Channel7 DMA request Settings:

Mode: Normal
Peripheral Increment: Disable
Memory Increment: Enable *

Peripheral Data Width: Byte Memory Data Width: Byte

USART3_TX: DMA1_Channel2 DMA request Settings:

Mode: Normal
Peripheral Increment: Disable
Memory Increment: Enable *

Peripheral Data Width: Byte
Memory Data Width: Byte

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
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
DMA1 channel2 global interrupt	true	0	0
DMA1 channel7 global interrupt	true	0	0
TIM2 global interrupt	true	3	0
TIM3 global interrupt	true	3	0
TIM4 global interrupt	true	10	0
USART1 global interrupt	true	4	0
USART2 global interrupt	true	5	0
USART3 global interrupt	true	6	0
PVD interrupt through EXTI line 16		unused	
Flash global interrupt	unused		
RCC global interrupt	unused		
TIM1 break interrupt		unused	
TIM1 update interrupt		unused	
TIM1 trigger and commutation interrupts		unused	
TIM1 capture compare interrupt		unused	

^{*} User modified value

7. Power Consumption Calculator report

7.1. Microcontroller Selection

Series	STM32F1
Line	STM32F103
MCU	STM32F103C8Tx
Datasheet	13587 Rev17

7.2. Parameter Selection

Temperature	25
Vdd	3.3

8. Software Project

8.1. Project Settings

Name	Value
Project Name	MotorController
Project Folder	D:\\MotorController
Toolchain / IDE	MDK-ARM V5
Firmware Package Name and Version	STM32Cube FW_F1 V1.6.1

8.2. 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	No
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	No
consumption)	

9. Software Pack Report