1. Description

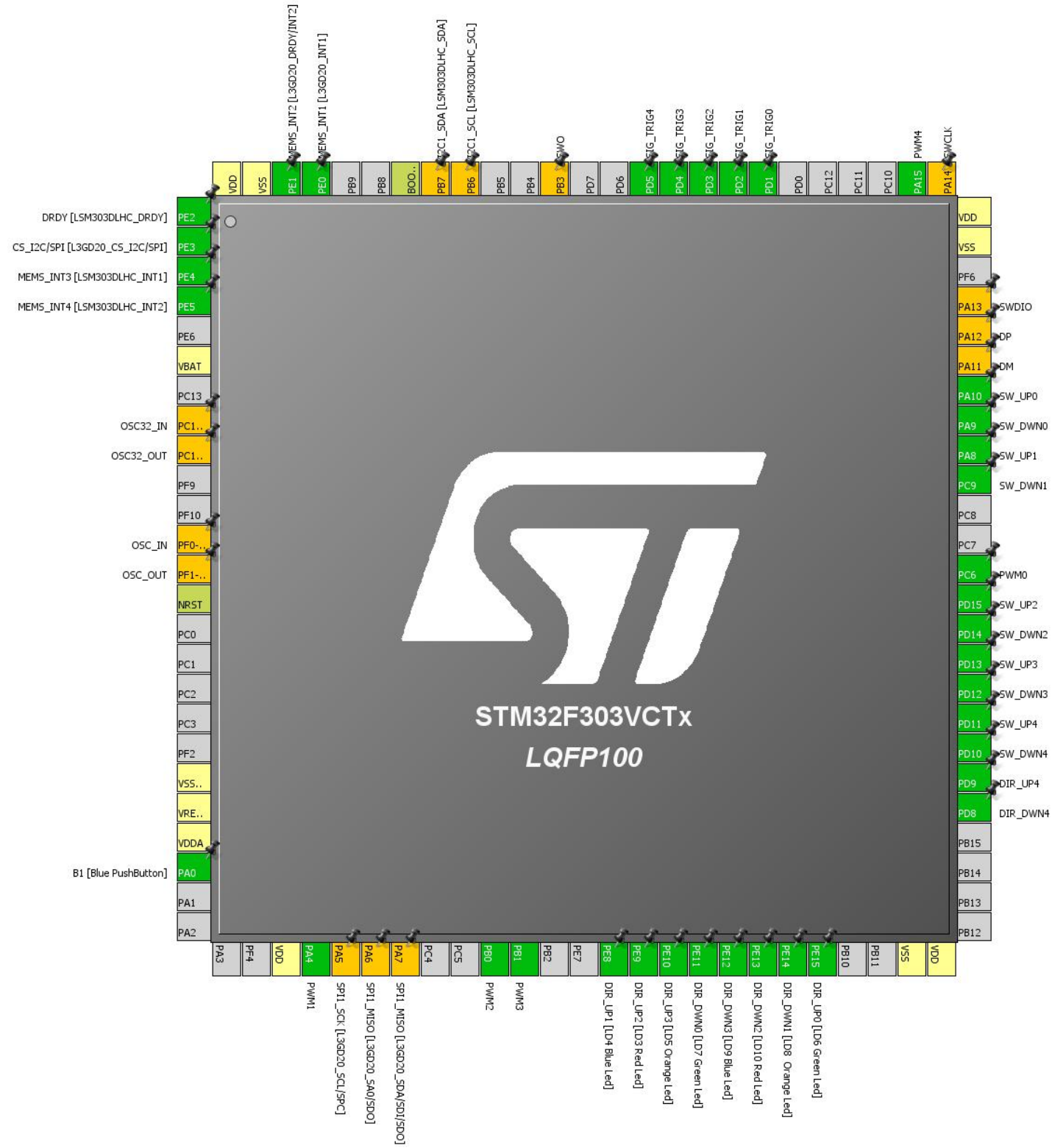
1.1. Project

Project Name	motor_ctrl
Board Name	STM32F3DISCOVERY
Generated with:	STM32CubeMX 4.16.0
Date	02/25/2017

1.2. MCU

MCU Series	STM32F3
MCU Line	STM32F303
MCU name	STM32F303VCTx
MCU Package	LQFP100
MCU Pin number	100

2. Pinout Configuration



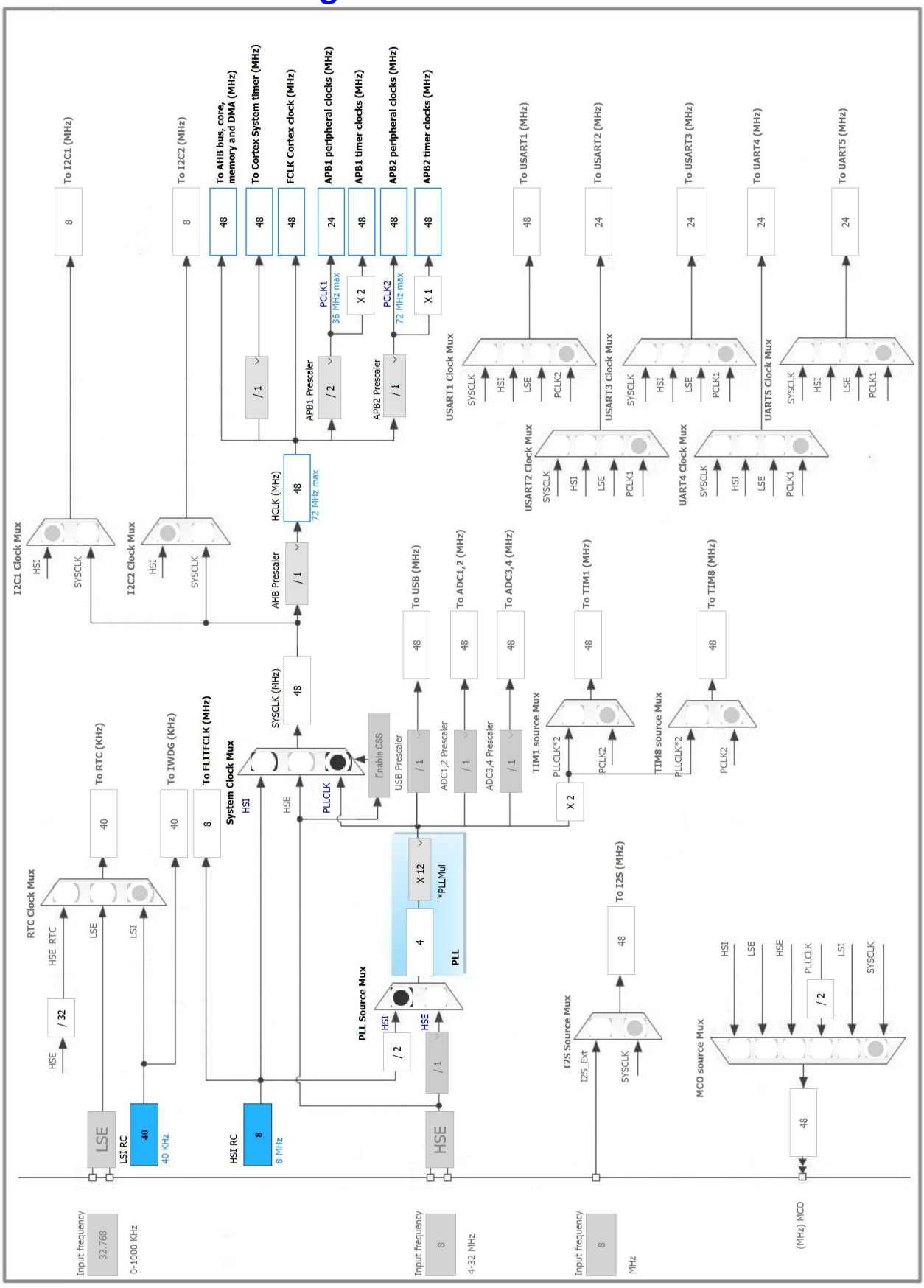
3. Pins Configuration

Pin Number LQFP100	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
1	PE2	I/O	GPIO_EXTI2	DRDY [LSM303DLHC_DRDY]
2	PE3 *	I/O	GPIO_Output	CS_I2C/SPI [L3GD20_CS_I2C/SPI]
3	PE4	I/O	GPIO_EXTI4	MEMS_INT3 [LSM303DLHC_INT1]
4	PE5	I/O	GPIO_EXTI5	MEMS_INT4 [LSM303DLHC_INT2]
6	VBAT	Power		
8	PC14-OSC32_IN **	I/O	RCC_OSC32_IN	OSC32_IN
9	PC15-OSC32_OUT **	I/O	RCC_OSC32_OUT	OSC32_OUT
12	PF0-OSC_IN **	I/O	RCC_OSC_IN	OSC_IN
13	PF1-OSC_OUT **	I/O	RCC_OSC_OUT	OSC_OUT
14	NRST	Reset		
20	VSSA/VREF-	Power		
21	VREF+	Power		
22	VDDA	Power		
23	PA0 *	I/O	GPIO_Input	B1 [Blue PushButton]
28	VDD	Power		
29	PA4	I/O	TIM3_CH2	PWM1
30	PA5 **	I/O	SPI1_SCK	SPI1_SCK [L3GD20_SCL/SPC]
31	PA6 **	I/O	SPI1_MISO	SPI1_MISO [L3GD20_SA0/SDO]
32	PA7 **	I/O	SPI1_MOSI	SPI1_MISO [L3GD20_SDA/SDI/SDO]
35	PB0	I/O	TIM3_CH3	PWM2
36	PB1	I/O	TIM3_CH4	PWM3
39	PE8 *	I/O	GPIO_Output	DIR_UP1 [LD4 Blue Led]
40	PE9 *	I/O	GPIO_Output	DIR_UP2 [LD3 Red Led]
41	PE10 *	I/O	GPIO_Output	DIR_UP3 [LD5 Orange Led]
42	PE11 *	I/O	GPIO_Output	DIR_DWN0 [LD7 Green Led]
43	PE12 *	I/O	GPIO_Output	DIR_DWN3 [LD9 Blue Led]
44	PE13 *	I/O	GPIO_Output	DIR_DWN2 [LD10 Red Led]
45	PE14 *	I/O	GPIO_Output	DIR_DWN1 [LD8 Orange Led]

Pin Number LQFP100	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
46	PE15 *	I/O	GPIO_Output	DIR_UP0 [LD6 Green Led]
49	VSS	Power		
50	VDD	Power		
55	PD8 *	I/O	GPIO_Output	DIR_DWN4
56	PD9 *	I/O	GPIO_Output	DIR_UP4
57	PD10 *	I/O	GPIO_Input	SW_DWN4
58	PD11 *	I/O	GPIO_Input	SW_UP4
59	PD12 *	I/O	GPIO_Output	SW_DWN3
60	PD13 *	I/O	GPIO_Output	SW_UP3
61	PD14 *	I/O	GPIO_Input	SW_DWN2
62	PD15 *	I/O	GPIO_Input	SW_UP2
63	PC6	I/O	TIM3_CH1	PWM0
66	PC9 *	I/O	GPIO_Output	SW_DWN1
67	PA8 *	I/O	GPIO_Output	SW_UP1
68	PA9 *	I/O	GPIO_Input	SW_DWN0
69	PA10 *	I/O	GPIO_Input	SW_UP0
70	PA11 **	I/O	USB_DM	DM
71	PA12 **	I/O	USB_DP	DP
72	PA13 **	I/O	SYS_JTMS-SWDIO	SWDIO
74	VSS	Power		
75	VDD	Power		
76	PA14 **	I/O	SYS_JTCK-SWCLK	SWCLK
77	PA15	I/O	TIM2_CH1	PWM4
82	PD1 *	I/O	GPIO_Output	SIG_TRIG0
83	PD2 *	I/O	GPIO_Output	SIG_TRIG1
84	PD3 *	I/O	GPIO_Output	SIG_TRIG2
85	PD4 *	I/O	GPIO_Output	SIG_TRIG3
86	PD5 *	I/O	GPIO_Output	SIG_TRIG4
89	PB3 **	I/O	SYS_JTDO-TRACESWO	SWO
92	PB6 **	I/O	I2C1_SCL	I2C1_SCL [LSM303DLHC_SCL]
93	PB7 **	I/O	I2C1_SDA	I2C1_SDA [LSM303DLHC_SDA]
94	BOOT0	Boot		
97	PE0	I/O	GPIO_EXTI0	MEMS_INT1 [L3GD20_INT1]
98	PE1	I/O	GPIO_EXTI1	MEMS_INT2 [L3GD20_DRDY/INT2]
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. IPs and Middleware Configuration

5.1. SYS

Timebase Source: SysTick

5.2. TIM2

Clock Source : Internal Clock

Channel1: PWM Generation CH1

5.2.1. Parameter Settings:

Counter Settings:

Prescaler (PSC - 16 bits value)	**24 ***
Counter Mode	Up
Counter Period (AutoReload Register - 32 bits value)	**200 ***
Internal Clock Division (CKD)	No Division

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)

Clear Input:

Clear Input Source	Disable

PWM Generation Channel 1:

Mode	PWM mode 1
Pulse (32 bits value)	**200 ***
Fast Mode	Disable
CH Polarity	High

5.3. TIM3

Clock Source : Internal Clock

Channel1: PWM Generation CH1

Channel2: PWM Generation CH2

Channel3: PWM Generation CH3

Channel4: PWM Generation CH4

5.3.1. Parameter Settings:

Counter Settings:

Prescaler (PSC - 16 bits value)	**24 ***
Counter Mode	Up
Counter Period (AutoReload Register - 16 bits value)	**200 ***
Internal Clock Division (CKD)	No Division

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)

Clear Input:

Clear Input Source	Disable

PWM Generation Channel 1:

Mode	PWM mode 1
Pulse (16 bits value)	**200 ***
Fast Mode	Disable
CH Polarity	High

PWM Generation Channel 2:

Mode	PWM mode 1
Pulse (16 bits value)	**200 ***
Fast Mode	Disable
CH Polarity	High

PWM Generation Channel 3:

Mode	PWM mode 1
Pulse (16 bits value)	**200 ***
Fast Mode	Disable
CH Polarity	High

PWM Generation Channel 4:

Mode	PWM mode 1
Pulse (16 bits value)	**200 ***
Fast Mode	Disable
CH Polarity	High

*** User modified value**

6. System Configuration

6.1. GPIO configuration

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
TIM2	PA15	TIM2_CH1	Alternate Function Push Pull	**Pull down ***	Low	PWM4
TIM3	PA4	TIM3_CH2	Alternate Function Push Pull	**Pull down ***	Low	PWM1
	PB0	TIM3_CH3	Alternate Function Push Pull	**Pull down ***	Low	PWM2
	PB1	TIM3_CH4	Alternate Function Push Pull	**Pull down ***	Low	PWM3
	PC6	TIM3_CH1	Alternate Function Push Pull	**Pull down ***	Low	PWM0
Single Mapped Signals	PC14-OSC32_IN	RCC_OSC32_IN	n/a	n/a	n/a	OSC32_IN
	PC15-OSC32_OUT	RCC_OSC32_OUT	n/a	n/a	n/a	OSC32_OUT
	PF0-OSC_IN	RCC_OSC_IN	n/a	n/a	n/a	OSC_IN
	PF1-OSC_OUT	RCC_OSC_OUT	n/a	n/a	n/a	OSC_OUT
	PA5	SPI1_SCK	Alternate Function Push Pull	No pull up pull down	Low	SPI1_SCK [L3GD20_SCL/SPC]
	PA6	SPI1_MISO	Alternate Function Push Pull	No pull up pull down	Low	SPI1_MISO [L3GD20_SA0/SDO]
	PA7	SPI1_MOSI	Alternate Function Push Pull	No pull up pull down	Low	SPI1_MISO [L3GD20_SDA/SDI/SDO]
	PA11	USB_DM	Alternate Function Push Pull	No pull up pull down	**High ***	DM
	PA12	USB_DP	Alternate Function Push Pull	No pull up pull down	**High ***	DP
	PA13	SYS_JTMS-SWDIO	n/a	n/a	**n/a**	SWDIO
	PA14	SYS_JTCK-SWCLK	n/a	n/a	**n/a**	SWCLK
	PB3	SYS_JTDO-TRACESWO	n/a	n/a	**n/a**	SWO
	PB6	I2C1_SCL	Alternate Function Open Drain	Pull up	Low	I2C1_SCL [LSM303DLHC_SCL]
	PB7	I2C1_SDA	Alternate Function Open Drain	Pull up	Low	I2C1_SDA [LSM303DLHC_SDA]
GPIO	PE2	GPIO_EXTI2	**External Event Mode with Rising edge trigger detection ***	No pull up pull down	n/a	DRDY [LSM303DLHC_DRDY]
	PE3	GPIO_Output	Output Push Pull	No pull up pull down	Low	CS_I2C/SPI

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
						[L3GD20_CS_I2C/SPI]
	PE4	GPIO_EXTI4	**External Event Mode with Rising edge trigger detection ***	No pull up pull down	n/a	MEMS_INT3 [LSM303DLHC_INT1]
	PE5	GPIO_EXTI5	**External Event Mode with Rising edge trigger detection ***	No pull up pull down	n/a	MEMS_INT4 [LSM303DLHC_INT2]
	PA0	GPIO_Input	Input mode	No pull up pull down	n/a	B1 [Blue PushButton]
	PE8	GPIO_Output	Output Push Pull	No pull up pull down	Low	DIR_UP1 [LD4 Blue Led]
	PE9	GPIO_Output	Output Push Pull	No pull up pull down	Low	DIR_UP2 [LD3 Red Led]
	PE10	GPIO_Output	Output Push Pull	No pull up pull down	Low	DIR_UP3 [LD5 Orange Led]
	PE11	GPIO_Output	Output Push Pull	No pull up pull down	Low	DIR_DWN0 [LD7 Green Led]
	PE12	GPIO_Output	Output Push Pull	No pull up pull down	Low	DIR_DWN3 [LD9 Blue Led]
	PE13	GPIO_Output	Output Push Pull	No pull up pull down	Low	DIR_DWN2 [LD10 Red Led]
	PE14	GPIO_Output	Output Push Pull	No pull up pull down	Low	DIR_DWN1 [LD8 Orange Led]
	PE15	GPIO_Output	Output Push Pull	No pull up pull down	Low	DIR_UP0 [LD6 Green Led]
	PD8	GPIO_Output	Output Push Pull	No pull up pull down	Low	DIR_DWN4
	PD9	GPIO_Output	Output Push Pull	No pull up pull down	Low	DIR_UP4
	PD10	GPIO_Input	Input mode	**Pull down ***	n/a	SW_DWN4
	PD11	GPIO_Input	Input mode	**Pull down ***	n/a	SW_UP4
	PD12	GPIO_Output	Output Push Pull	**Pull down ***	Low	SW_DWN3
	PD13	GPIO_Output	Output Push Pull	**Pull down ***	Low	SW_UP3
	PD14	GPIO_Input	Input mode	**Pull down ***	n/a	SW_DWN2
	PD15	GPIO_Input	Input mode	**Pull down ***	n/a	SW_UP2
	PC9	GPIO_Output	Output Push Pull	**Pull down ***	Low	SW_DWN1
	PA8	GPIO_Output	Output Push Pull	**Pull down ***	Low	SW_UP1
	PA9	GPIO_Input	Input mode	**Pull down ***	n/a	SW_DWN0
	PA10	GPIO_Input	Input mode	**Pull down ***	n/a	SW_UP0
	PD1	GPIO_Output	Output Push Pull	No pull up pull down	Low	SIG_TRIG0
	PD2	GPIO_Output	Output Push Pull	No pull up pull down	Low	SIG_TRIG1
	PD3	GPIO_Output	Output Push Pull	No pull up pull down	Low	SIG_TRIG2
	PD4	GPIO_Output	Output Push Pull	No pull up pull down	Low	SIG_TRIG3
	PD5	GPIO_Output	Output Push Pull	No pull up pull down	Low	SIG_TRIG4
	PE0	GPIO_EXTI0	**External Event Mode with Rising edge**	No pull up pull down	n/a	MEMS_INT1 [L3GD20_INT1]

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
			trigger detection *			
	PE1	GPIO_EXTI1	**External Event Mode with Rising edge trigger detection ***	No pull up pull down	n/a	MEMS_INT2 [L3GD20_DRDY/INT2]

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
PVD interrupt through EXTI line16	unused		
Flash global interrupt	unused		
RCC global interrupt	unused		
TIM2 global interrupt	unused		
TIM3 global interrupt	unused		
Floating point unit interrupt	unused		

*** User modified value**

7. Power Consumption Calculator report

7.1. Microcontroller Selection

Series	STM32F3
Line	STM32F303
MCU	STM32F303VCTx
Datasheet	023353_Rev13

7.2. Parameter Selection

Temperature	25
Vdd	3.6

8. Software Project

8.1. Project Settings

Name	Value
Project Name	motor_ctrl
Project Folder	C:\Users\AW-ZenBook\Documents\GitHub\STM_Projects\motor_ctrl
Toolchain / IDE	MDK-ARM V5
Firmware Package Name and Version	STM32Cube FW_F3 V1.6.0

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	No
Backup previously generated files 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