
STM32
CubeMX

1. Description

1.1. Project

Project Name	oven
Board Name	custom
Generated with:	STM32CubeMX 6.1.1
Date	01/20/2021

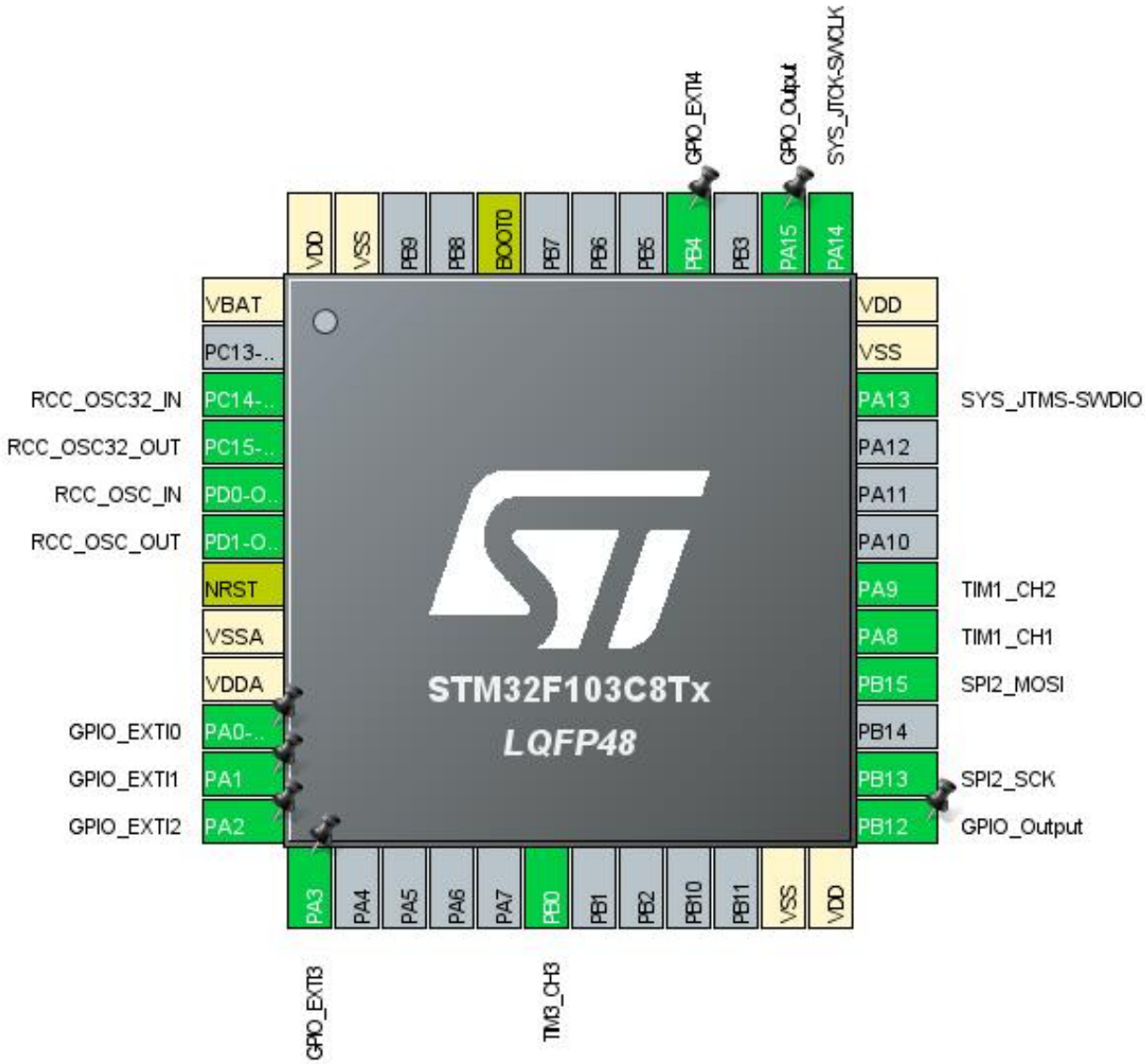
1.2. MCU

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

1.3. Core(s) information

Core(s)	Arm Cortex-M3

2. Pinout Configuration

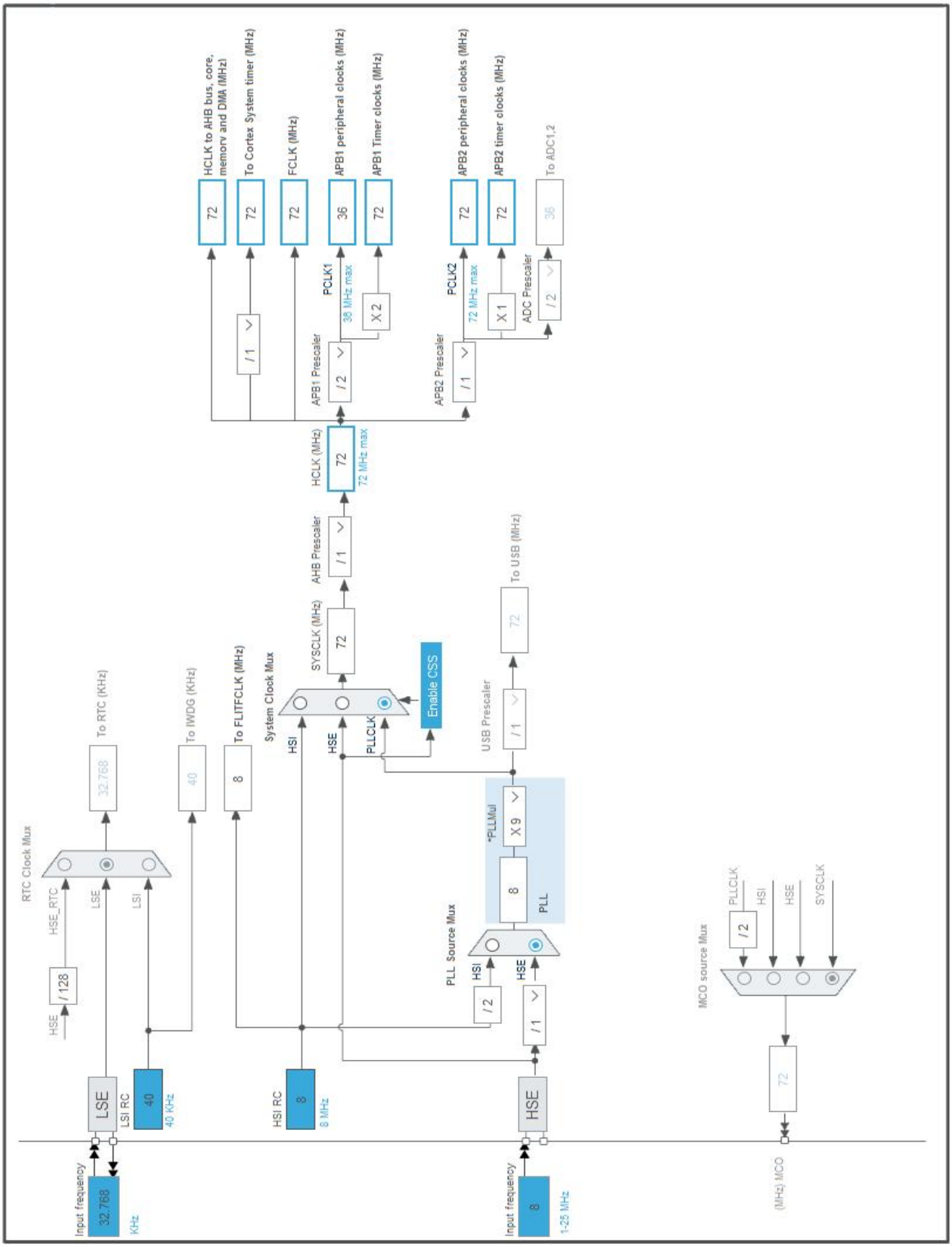


3. Pins Configuration

Pin Number LQFP48	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
1	VBAT	Power		
3	PC14-OSC32_IN	I/O	RCC_OSC32_IN	
4	PC15-OSC32_OUT	I/O	RCC_OSC32_OUT	
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	GPIO_EXTI0	
11	PA1	I/O	GPIO_EXTI1	
12	PA2	I/O	GPIO_EXTI2	
13	PA3	I/O	GPIO_EXTI3	
18	PB0	I/O	TIM3_CH3	
23	VSS	Power		
24	VDD	Power		
25	PB12 *	I/O	GPIO_Output	
26	PB13	I/O	SPI2_SCK	
28	PB15	I/O	SPI2_MOSI	
29	PA8	I/O	TIM1_CH1	
30	PA9	I/O	TIM1_CH2	
34	PA13	I/O	SYS_JTMS-SWDIO	
35	VSS	Power		
36	VDD	Power		
37	PA14	I/O	SYS_JTCK-SWCLK	
38	PA15 *	I/O	GPIO_Output	
40	PB4	I/O	GPIO_EXTI4	
44	BOOT0	Boot		
47	VSS	Power		
48	VDD	Power		

* The pin is affected with an I/O function

4. Clock Tree Configuration



5. Software Project

5.1. Project Settings

Name	Value
Project Name	oven
Project Folder	D:\Documents\STM32CubeIDE\workspace\oven
Toolchain / IDE	STM32CubeIDE
Firmware Package Name and Version	STM32Cube FW_F1 V1.8.3
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	SystemClock_Config	RCC
3	MX_SPI2_Init	SPI2
4	MX_TIM3_Init	TIM3
5	MX_TIM1_Init	TIM1

6. Power Consumption Calculator report

6.1. Microcontroller Selection

Series	STM32F1
Line	STM32F103
MCU	STM32F103C8Tx
Datasheet	DS5319_Rev17

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

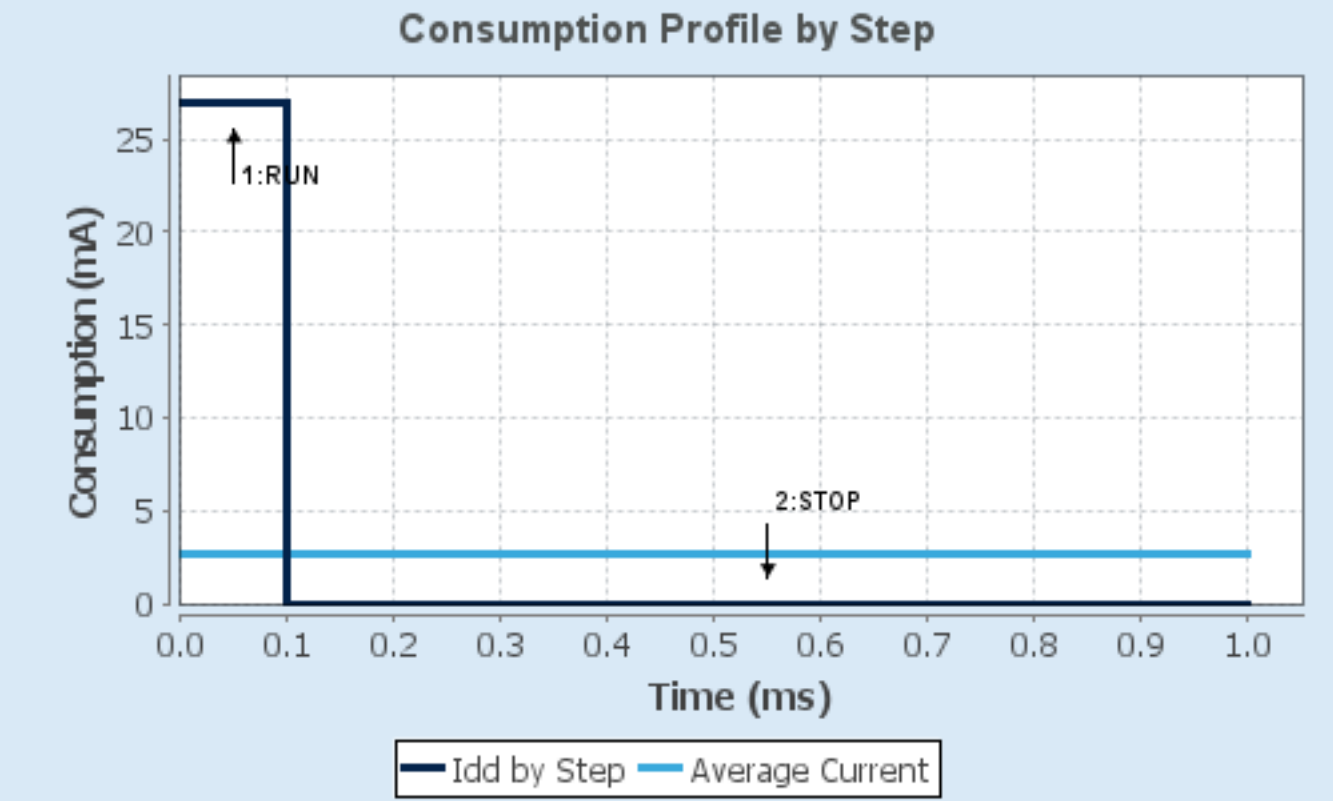
6.4. Sequence

Step	Step1	Step2
Mode	RUN	STOP
Vdd	3.3	3.3
Voltage Source	Vbus	Vbus
Range	No Scale	No Scale
Fetch Type	FLASH	n/a
CPU Frequency	72 MHz	0 Hz
Clock Configuration	HSE PLL	Regulator_LP
Clock Source Frequency	8 MHz	0 Hz
Peripherals		
Additional Cons.	0 mA	0 mA
Average Current	27 mA	14 µA
Duration	0.1 ms	0.9 ms
DMIPS	61.0	0.0
Ta Max	100.1	105
Category	In DS Table	In DS Table

6.5. Results

Sequence Time	1 ms	Average Current	2.71 mA
Battery Life	0	Average DMIPS	61.0 DMIPS

6.6. Chart


Consumption Profile by Step
Consumption (mA)
25
20
15
10
5
0
1:RUN
2:STOP
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. RCC

High Speed Clock (HSE): BYPASS Clock Source

Low Speed Clock (LSE) : Crystal/Ceramic Resonator

7.1.1. 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

7.2. SPI2

Mode: Transmit Only Master

7.2.1. Parameter Settings:

Basic Parameters:

Frame Format	Motorola
Data Size	8 Bits
First Bit	MSB First

Clock Parameters:

Prescaler (for Baud Rate)	**32 ***
Baud Rate	**1.125 MBits/s ***
Clock Polarity (CPOL)	Low
Clock Phase (CPHA)	**2 Edge ***

Advanced Parameters:

CRC Calculation	Disabled
NSS Signal Type	Software

7.3. SYS

Debug: Serial Wire

Timebase Source: SysTick

7.4. TIM1

Combined Channels: Encoder Mode

7.4.1. Parameter Settings:

Counter Settings:

Prescaler (PSC - 16 bits value)	0
Counter Mode	Up
Counter Period (AutoReload Register - 16 bits value)	**8 ***
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)

Encoder:

Encoder Mode	Encoder Mode TI1
____ Parameters for Channel 1 ____	
Polarity	**Falling Edge ***
IC Selection	Direct
Prescaler Division Ratio	No division
Input Filter	**15 ***
____ Parameters for Channel 2 ____	
Polarity	Rising Edge
IC Selection	Direct
Prescaler Division Ratio	No division
Input Filter	**5 ***

7.5. TIM3

Channel3: PWM Generation CH3

7.5.1. Parameter Settings:

Counter Settings:

Prescaler (PSC - 16 bits value)	**7199 ***
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)

PWM Generation Channel 3:

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

*** User modified value**

8. System Configuration

8.1. GPIO configuration

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
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	
	PD0-OSC_IN	RCC_OSC_IN	n/a	n/a	n/a	
	PD1-OSC_OUT	RCC_OSC_OUT	n/a	n/a	n/a	
SPI2	PB13	SPI2_SCK	Alternate Function Push Pull	n/a	**High ***	
	PB15	SPI2_MOSI	Alternate Function Push Pull	n/a	**High ***	
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	Input mode	No pull-up and no pull-down	n/a	
	PA9	TIM1_CH2	Input mode	No pull-up and no pull-down	n/a	
TIM3	PB0	TIM3_CH3	Alternate Function Push Pull	n/a	Low	
GPIO	PA0-WKUP	GPIO_EXTI0	**External Interrupt Mode with Falling edge trigger detection**	**Pull-up ***	n/a	
	PA1	GPIO_EXTI1	**External Interrupt Mode with Falling edge trigger detection**	**Pull-up ***	n/a	
	PA2	GPIO_EXTI2	**External Interrupt Mode with Falling edge trigger detection**	**Pull-up ***	n/a	
	PA3	GPIO_EXTI3	**External Interrupt Mode with Falling edge trigger detection**	**Pull-up ***	n/a	
	PB12	GPIO_Output	Output Push Pull	No pull-up and no pull-down	**High ***	
	PA15	GPIO_Output	Output Push Pull	No pull-up and no pull-down	**High ***	
	PB4	GPIO_EXTI4	**External Interrupt Mode with Rising/Falling edge**	No pull-up and no pull-down	**n/a**	

8.2. DMA configuration

nothing configured in DMA service

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
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
EXTI line0 interrupt	true	0	0
EXTI line1 interrupt	true	0	0
EXTI line2 interrupt	true	0	0
EXTI line3 interrupt	true	0	0
EXTI line4 interrupt	true	0	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		
TIM3 global interrupt	unused		
SPI2 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
Prefetch fault, memory access fault	false	true	false
Undefined instruction or illegal state	false	true	false
System service call via SWI instruction	false	true	false
Debug monitor	false	true	false
Pendable request for system service	false	true	false
System tick timer	false	true	true
EXTI line0 interrupt	false	true	true

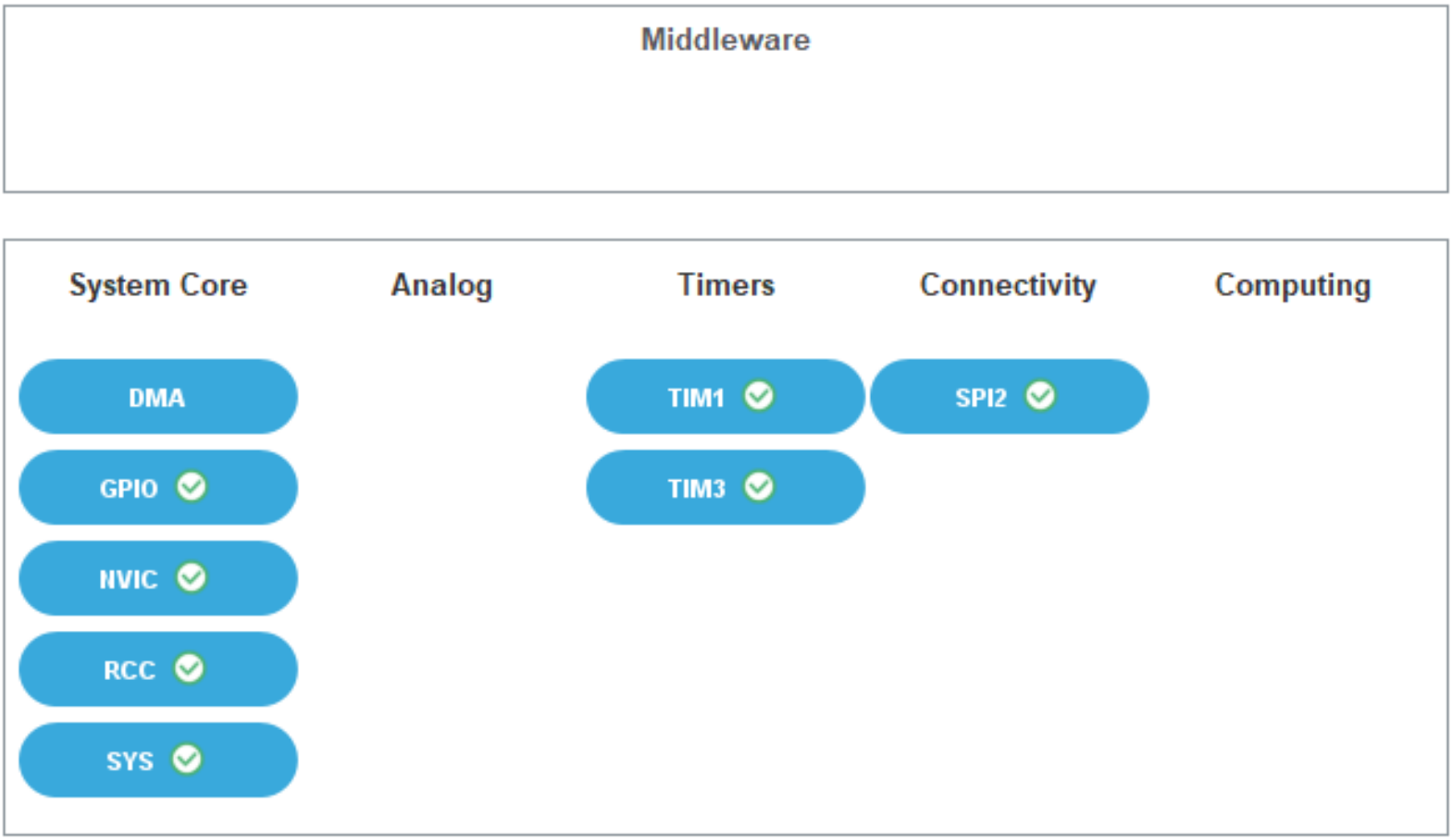
Enabled interrupt Table	Select for init sequence ordering	Generate IRQ handler	Call HAL handler
EXTI line1 interrupt	false	true	true
EXTI line2 interrupt	false	true	true
EXTI line3 interrupt	false	true	true
EXTI line4 interrupt	false	true	true

*** 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/CD00161566.pdf
Reference manual	http://www.st.com/resource/en/reference_manual/CD00171190.pdf
Programming manual	http://www.st.com/resource/en/programming_manual/CD00228163.pdf
Programming manual	http://www.st.com/resource/en/programming_manual/CD00283419.pdf
Errata sheet	http://www.st.com/resource/en/errata_sheet/CD00190234.pdf
Application note	http://www.st.com/resource/en/application_note/CD00160362.pdf
Application note	http://www.st.com/resource/en/application_note/CD00164185.pdf
Application note	http://www.st.com/resource/en/application_note/CD00167326.pdf
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Application note	http://www.st.com/resource/en/application_note/DM00052530.pdf
Application note	http://www.st.com/resource/en/application_note/DM00073742.pdf
Application note	http://www.st.com/resource/en/application_note/DM00080497.pdf
Application note	http://www.st.com/resource/en/application_note/DM00129215.pdf

Application note	http://www.st.com/resource/en/application_note/DM00160482.pdf
Application note	http://www.st.com/resource/en/application_note/DM00156964.pdf
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Application note	http://www.st.com/resource/en/application_note/DM00272912.pdf
Application note	http://www.st.com/resource/en/application_note/DM00236305.pdf
Application note	http://www.st.com/resource/en/application_note/DM00296349.pdf
Application note	http://www.st.com/resource/en/application_note/DM00325582.pdf
Application note	http://www.st.com/resource/en/application_note/DM00327191.pdf
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Application note	http://www.st.com/resource/en/application_note/DM00315319.pdf
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Application note	http://www.st.com/resource/en/application_note/DM00536349.pdf