
STM32
CubeMX

1. Description

1.1. Project

Project Name	BingFSAE_BMS
Board Name	NUCLEO-G474RE
Generated with:	STM32CubeMX 6.12.1
Date	10/12/2024

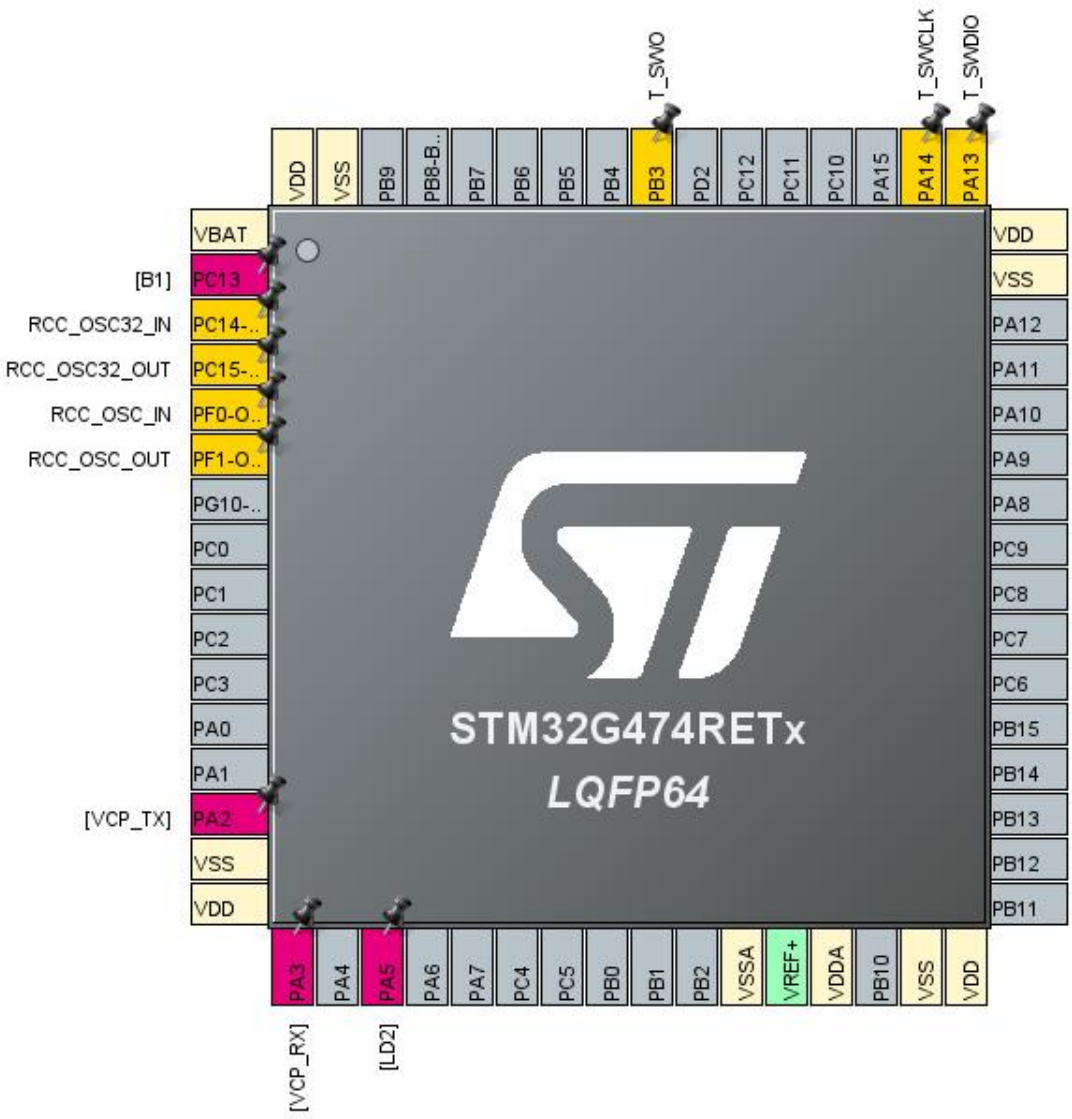
1.2. MCU

MCU Series	STM32G4
MCU Line	STM32G4x4
MCU name	STM32G474RETx
MCU Package	LQFP64
MCU Pin number	64

1.3. Core(s) information

Core(s)	ARM Cortex-M4

2. Pinout Configuration

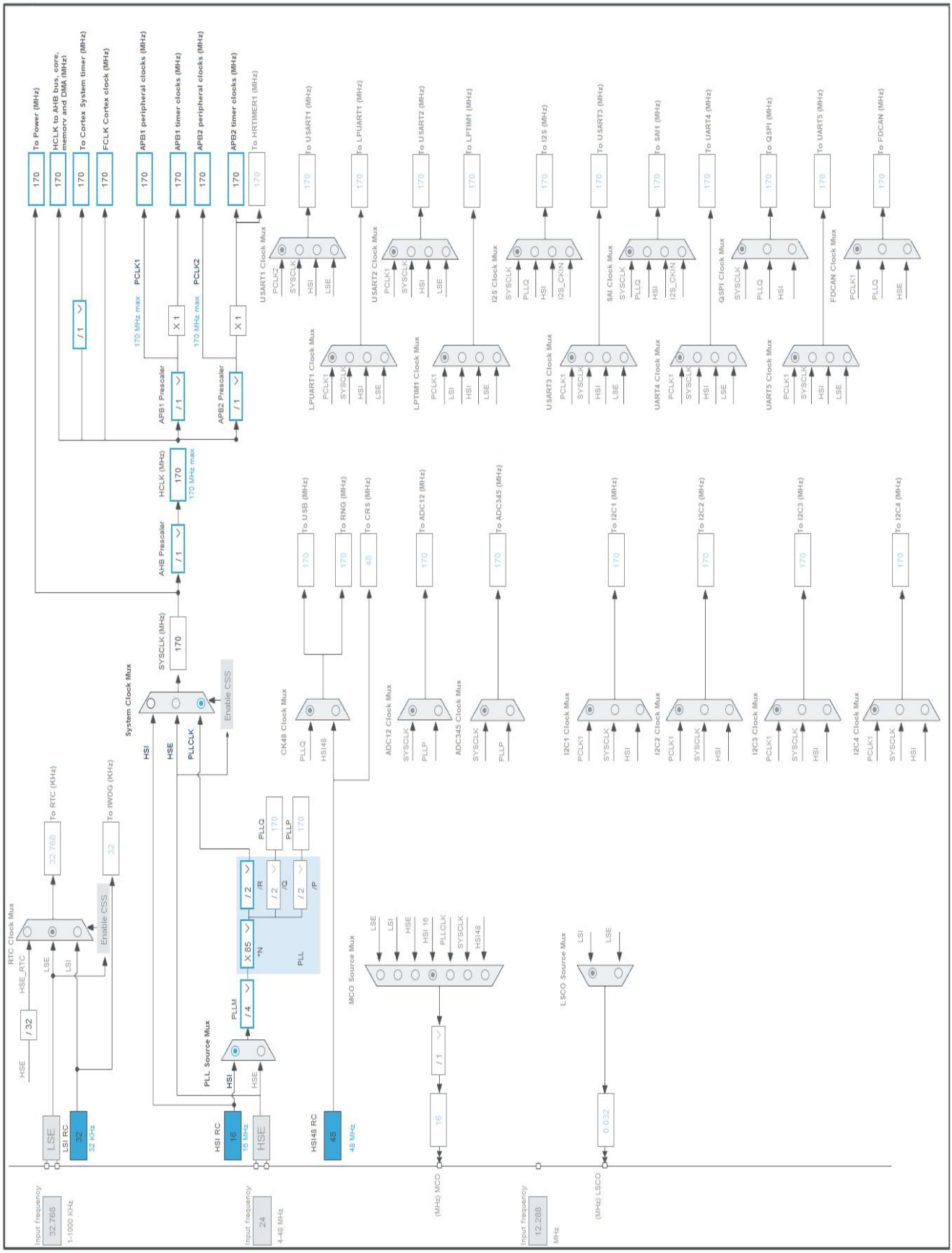


3. Pins Configuration

Pin Number LQFP64	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
1	VBAT	Power		
2	PC13	I/O		
3	PC14-OSC32_IN *	I/O	RCC_OSC32_IN	RCC_OSC32_IN
4	PC15-OSC32_OUT *	I/O	RCC_OSC32_OUT	RCC_OSC32_OUT
5	PF0-OSC_IN *	I/O	RCC_OSC_IN	RCC_OSC_IN
6	PF1-OSC_OUT *	I/O	RCC_OSC_OUT	RCC_OSC_OUT
14	PA2	I/O		
15	VSS	Power		
16	VDD	Power		
17	PA3	I/O		
19	PA5	I/O		
27	VSSA	Power		
29	VDDA	Power		
31	VSS	Power		
32	VDD	Power		
47	VSS	Power		
48	VDD	Power		
49	PA13 *	I/O	SYS_JTMS-SWDIO	T_SWDIO
50	PA14 *	I/O	SYS_JTCK-SWCLK	T_SWCLK
56	PB3 *	I/O	SYS_JTDO-SWO	T_SWO
63	VSS	Power		
64	VDD	Power		

* The pin is affected with a peripheral function but no peripheral mode is activated

4. Clock Tree Configuration



1. Power Consumption Calculator report

1.1. Microcontroller Selection

Series	STM32G4
Line	STM32G4x4
MCU	STM32G474RETx
Datasheet	DS12288_Rev0

1.2. Parameter Selection

Temperature	25
Vdd	3.0

1.3. 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

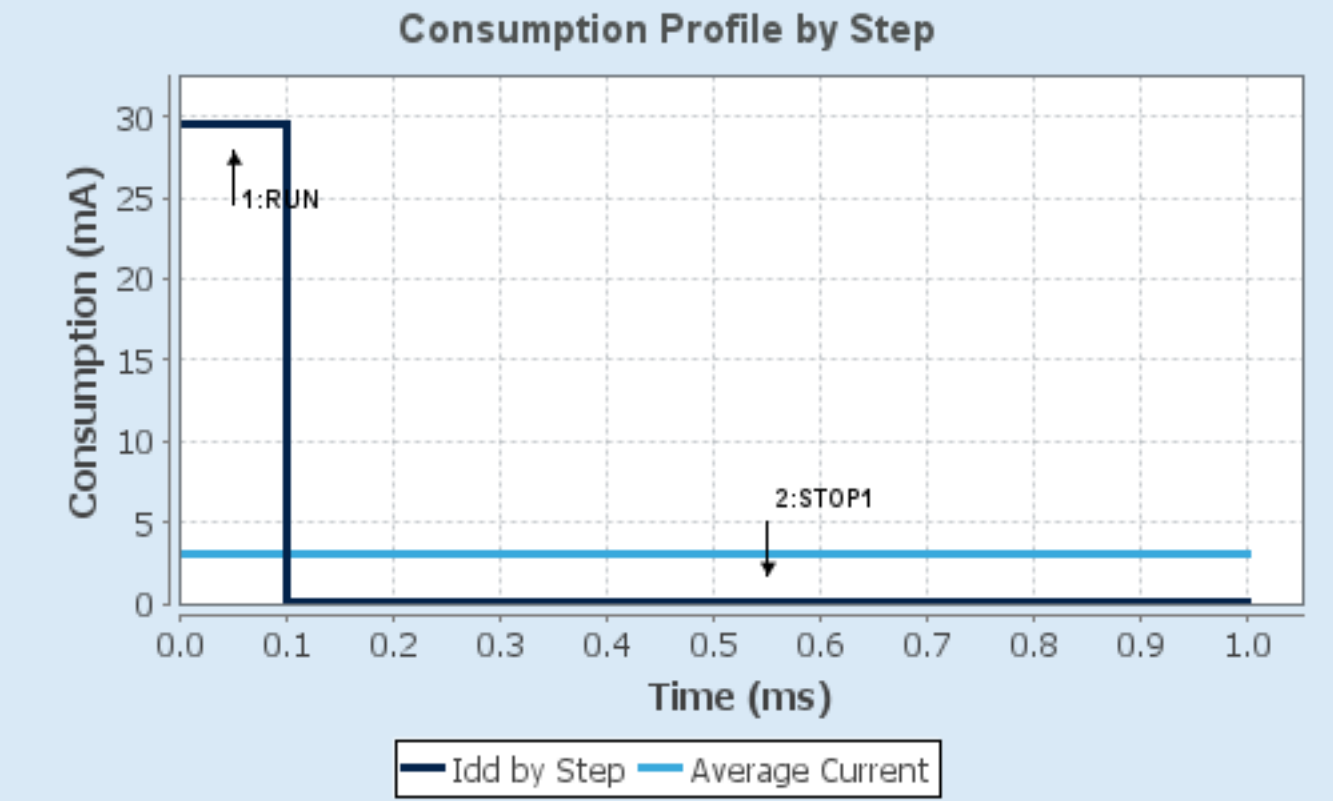
1.4. Sequence

Step	Step1	Step2
Mode	RUN	STOP1
Vdd	3.0	3.0
Voltage Source	Battery	Battery
Range	Range1-Boost	NoRange
Fetch Type	FLASH/DualBank/ART	NA
CPU Frequency	170 MHz	0 Hz
Clock Configuration	HSE BYP PLL	ALL CLOCKS OFF
Clock Source Frequency	4 MHz	0 Hz
Peripherals		
Additional Cons.	0 mA	0 mA
Average Current	29.5 mA	80.5 µA
Duration	0.1 ms	0.9 ms
DMIPS	213.0	0.0
Ta Max	124.25	129.98
Category	In DS Table	In DS Table

1.5. Results

Sequence Time	1 ms	Average Current	3.02 mA
Battery Life	1 month, 16 days, 9 hours	Average DMIPS	212.5 DMIPS

1.6. Chart


Consumption Profile by Step
Consumption (mA)
30
25
20
15
10
5
0
1:RUN
2:STOP1
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

2. Software Project

2.1. Project Settings

Name	Value
Project Name	BingFSAE_BMS
Project Folder	C:\Users\kevin\STM32CubeIDE\workspace_1.16.1\BingFSAE_BMS
Toolchain / IDE	STM32CubeIDE
Firmware Package Name and Version	STM32Cube FW_G4 V1.6.0
Application Structure	Advanced
Generate Under Root	Yes
Do not generate the main()	No
Minimum Heap Size	0x200
Minimum Stack Size	0x400

2.2. 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

2.3. Advanced Settings - Generated Function Calls

Rank	Function Name	Peripheral Instance Name
1	SystemClock_Config	RCC
2	MX_GPIO_Init	GPIO

3. Peripherals and Middlewares Configuration

3.1. NUCLEO-G474RE

mode: Human Machine Interface

3.1.1. Human Machine Interface:

Led:	
USER LED GREEN (LD2)	**true ***
Button:	
USER B1	**Mode EXTI ***
VCOM:	
Virtual Com Port	**true ***
Demonstration code:	
Generate demonstration code	Disabled

3.2. NUCLEO-G474RE

mode: Human Machine Interface

3.2.1. Human Machine Interface:

Led:	
USER LED GREEN (LD2)	**true ***
Button:	
USER B1	**Mode EXTI ***
VCOM:	
Virtual Com Port	**true ***
Demonstration code:	
Generate demonstration code	Disabled

3.3. RCC

3.3.1. Parameter Settings:

System Parameters:	
VDD voltage (V)	3.3
Instruction Cache	Enabled
Prefetch Buffer	Disabled

Data Cache	Enabled
Flash Latency(WS)	4 WS (5 CPU cycle)

RCC Parameters:

HSI Calibration Value	64
HSE Startup Timout Value (ms)	100
LSE Startup Timout Value (ms)	5000

Power Parameters:

Power Regulator Voltage Scale	Power Regulator Voltage Scale 1 boost

Peripherals Clock Configuration:

Generate the peripherals clock configuration	TRUE

3.4. SYS

Timebase Source: SysTick

mode: save power of non-active UCPD - deactive Dead Battery pull-up

*** User modified value**

4. System Configuration

4.1. GPIO configuration

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
Single Mapped Signals	PC14-OSC32_IN	RCC_OSC32_IN	n/a	n/a	n/a	RCC_OSC32_IN
	PC15-OSC32_OUT	RCC_OSC32_OUT	n/a	n/a	n/a	RCC_OSC32_OUT
	PF0-OSC_IN	RCC_OSC_IN	n/a	n/a	n/a	RCC_OSC_IN
	PF1-OSC_OUT	RCC_OSC_OUT	n/a	n/a	n/a	RCC_OSC_OUT
	PA13	SYS_JTMS-SWDIO	n/a	n/a	n/a	T_SWDIO
	PA14	SYS_JTCK-SWCLK	n/a	n/a	n/a	T_SWCLK
	PB3	SYS_JTDO-SWO	n/a	n/a	n/a	T_SWO

4.2. DMA configuration

nothing configured in DMA service

4.3. NVIC configuration

4.3.1. 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 line[15:10] interrupts	true	0	0
PVD/PVM1/PVM2/PVM3/PVM4 interrupts through EXTI lines 16/38/39/40/41	unused		
Flash global interrupt	unused		
RCC global interrupt	unused		
FPU global interrupt	unused		

4.3.2. NVIC Code generation

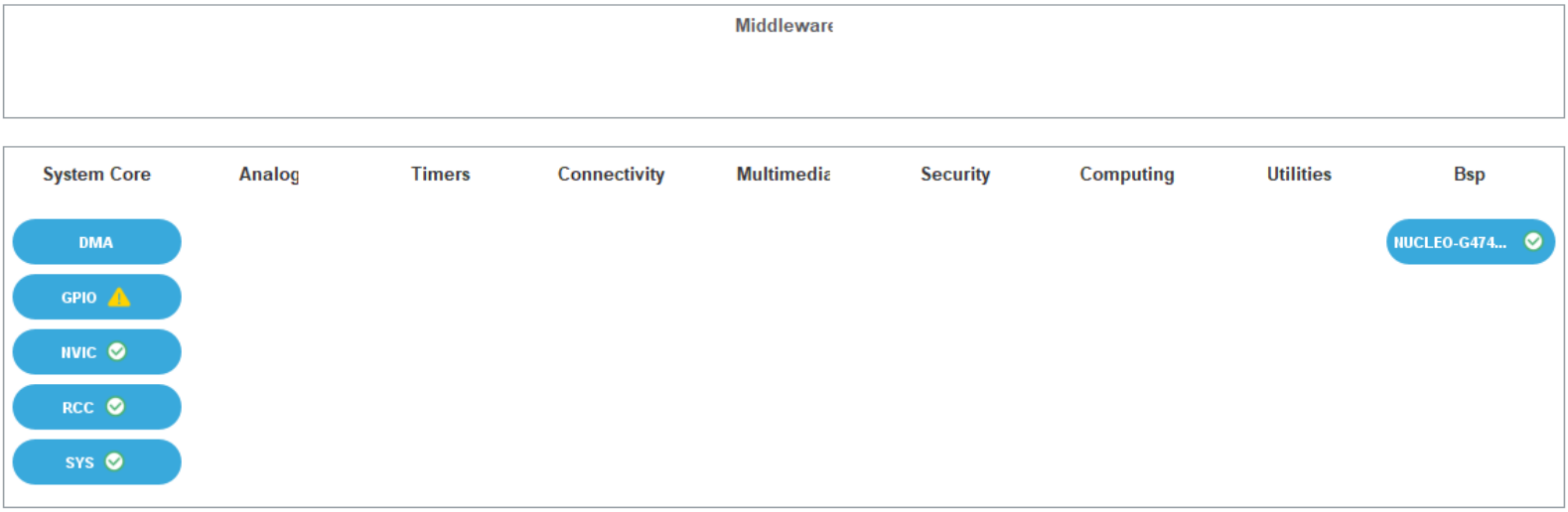
Enabled interrupt Table	Select for init sequence ordering	Generate IRQ handler	Call HAL handler
Non maskable interrupt	false	true	false
Hard fault interrupt	false	true	false
Memory management fault	false	true	false
Prefetch fault, memory access fault	false	true	false
Undefined instruction or illegal 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 line[15:10] interrupts	false	true	true

*** User modified value**

5. System Views

5.1. Category view

5.1.1. Current



6. Docs & Resources

Type	Link