1. Description

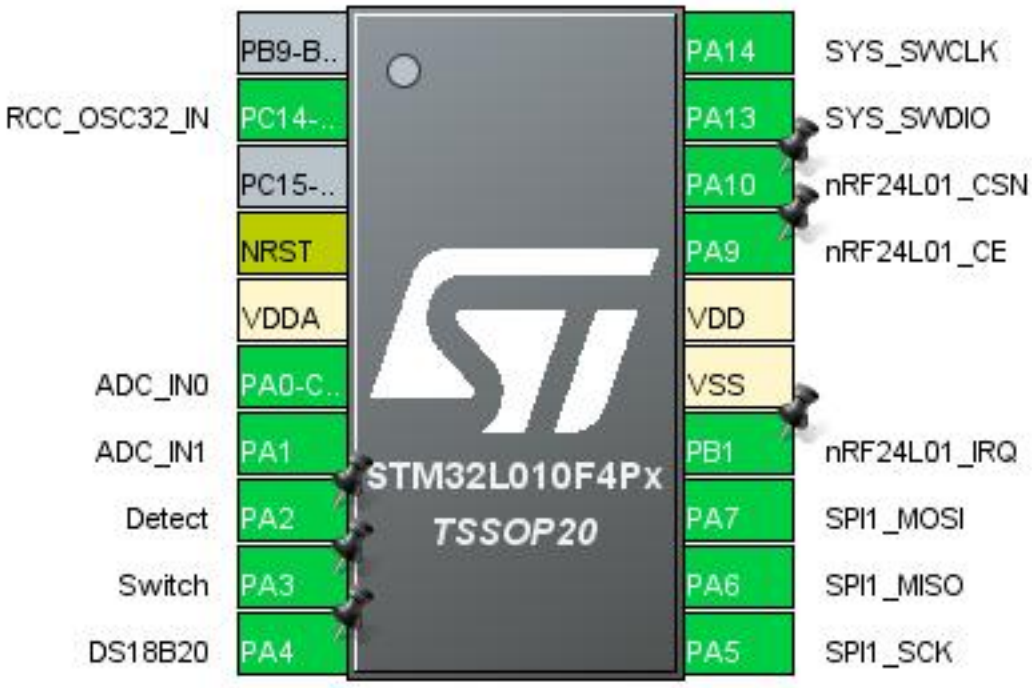
1.1. Project

Project Name	InHub_Sub
Board Name	custom
Generated with:	STM32CubeMX 5.6.0
Date	02/28/2020

1.2. MCU

MCU Series	STM32L0
MCU Line	STM32L0x0 Value Line
MCU name	STM32L010F4Px
MCU Package	TSSOP20
MCU Pin number	20

2. Pinout Configuration

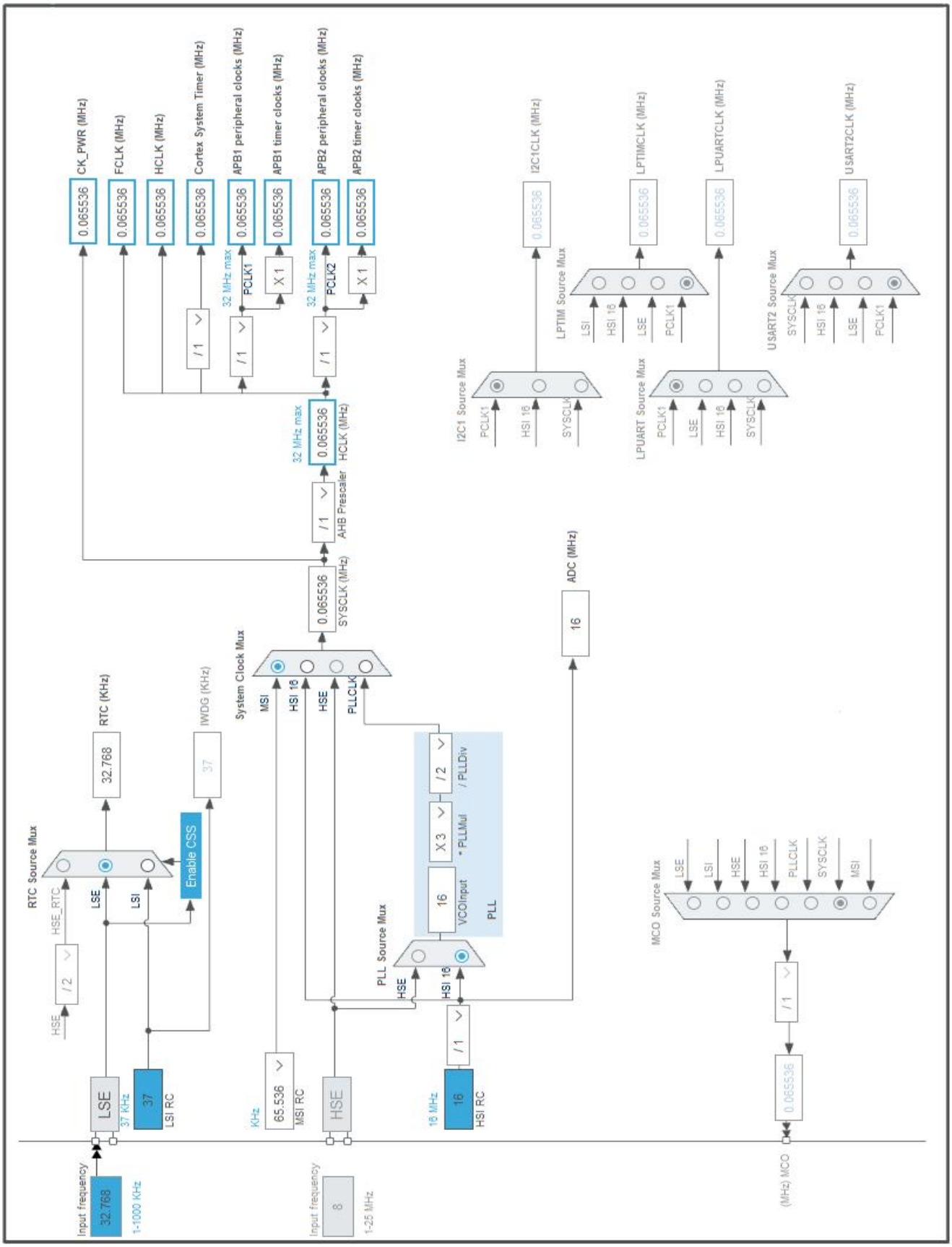


3. Pins Configuration

Pin Number TSSOP20	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
2	PC14-OSC32_IN	I/O	RCC_OSC32_IN	
4	NRST	Reset		
5	VDDA	Power		
6	PA0-CK_IN	I/O	ADC_IN0	
7	PA1	I/O	ADC_IN1	
8	PA2 *	I/O	GPIO_Input	Detect
9	PA3 *	I/O	GPIO_Output	Switch
10	PA4 *	I/O	GPIO_Input	DS18B20
11	PA5	I/O	SPI1_SCK	
12	PA6	I/O	SPI1_MISO	
13	PA7	I/O	SPI1_MOSI	
14	PB1	I/O	GPIO_EXTI1	nRF24L01_IRQ
15	VSS	Power		
16	VDD	Power		
17	PA9 *	I/O	GPIO_Output	nRF24L01_CE
18	PA10 *	I/O	GPIO_Output	nRF24L01_CSN
19	PA13	I/O	SYS_SWDIO	
20	PA14	I/O	SYS_SWCLK	

* The pin is affected with an I/O function

4. Clock Tree Configuration



5. Software Project

5.1. Project Settings

Name	Value
Project Name	InHub_Sub
Project Folder	W:\WZC\Project\InHub\InHub_Sub
Toolchain / IDE	MDK-ARM V5.27
Firmware Package Name and Version	STM32Cube FW_L0 V1.11.2

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	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)	Yes

6. Power Consumption Calculator report

6.1. Microcontroller Selection

Series	STM32L0
Line	STM32L0x0 Value Line
MCU	STM32L010F4Px
Datasheet	DS12323_Rev1

6.2. Parameter Selection

Temperature	25
Vdd	3.0

6.3. Battery Selection

Battery	Li-SOCL2(AAA700)
Capacity	700.0 mAh
Self Discharge	0.08 %/month
Nominal Voltage	3.6 V
Max Cont Current	10.0 mA
Max Pulse Current	30.0 mA
Cells in series	1
Cells in parallel	1

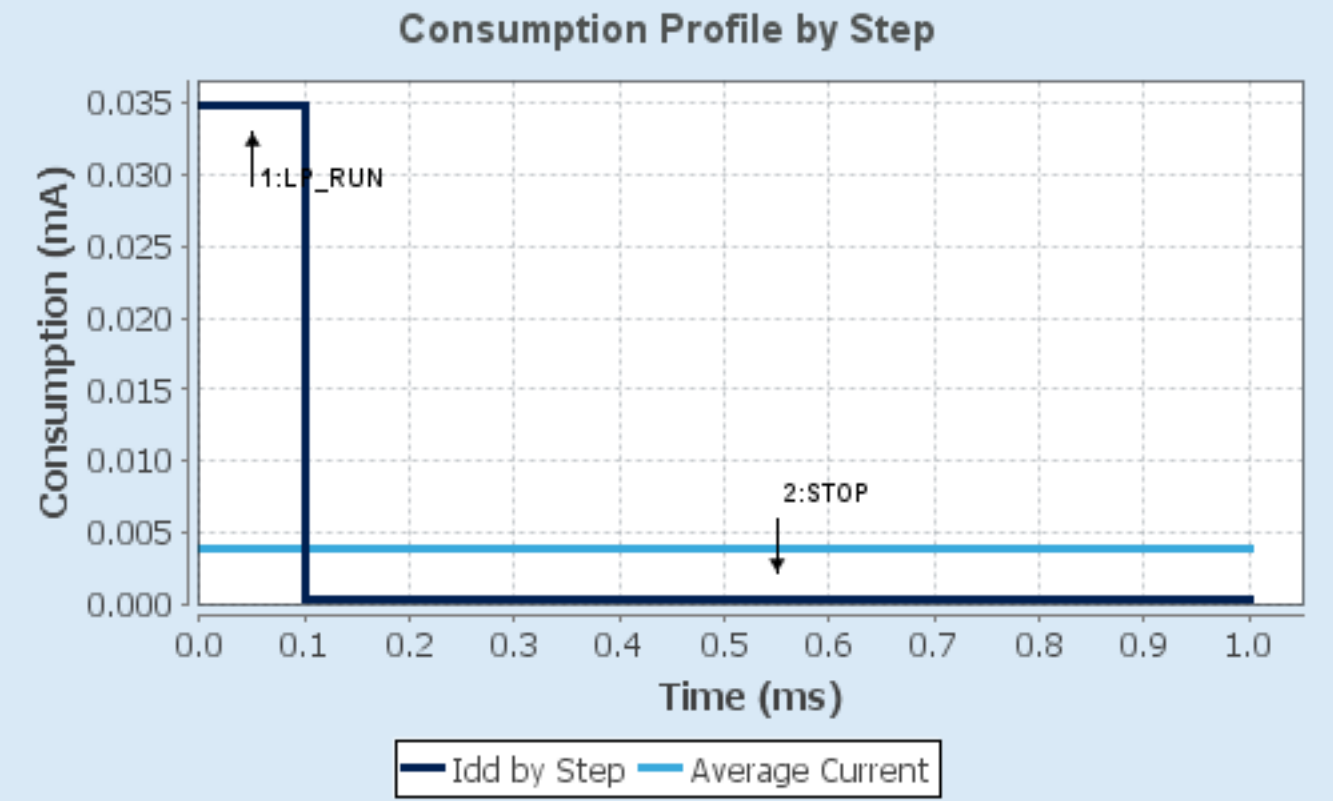
6.4. Sequence

Step	Step1	Step2
Mode	LOWPOWER_RUN	STOP
Vdd	3.0	3.0
Voltage Source	Battery	Battery
Range	NoRange	NoRange
Fetch Type	FLASH	FLASH
CPU Frequency	131 kHz	0 Hz
Clock Configuration	MSI Flash-ON	ALL CLOCKS OFF
Clock Source Frequency	131 kHz	0 Hz
Peripherals		
Additional Cons.	0 mA	0 mA
Average Current	34.8 µA	344 nA
Duration	0.1 ms	0.9 ms
DMIPS	0.0	0.0
Ta Max	104.99	105
Category	In DS Table	In DS Table

6.5. RESULTS

Sequence Time	1 ms	Average Current	3.79 µA
Battery Life	17 years, 5 months, 28 days, 18 hours	Average DMIPS	0.01 DMIPS

6.6. Chart


Consumption Profile by Step
Consumption (mA)
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
1:LP_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. IPs and Middleware Configuration

7.1. ADC

mode: IN0

mode: IN1

7.1.1. Parameter Settings:

ADC_Settings:

Clock Prescaler	Asynchronous clock mode divided by 1
Resolution	ADC 12-bit resolution
Data Alignment	Right alignment
Scan Direction	Forward
Continuous Conversion Mode	Disabled
Discontinuous Conversion Mode	Disabled
DMA Continuous Requests	Disabled
End Of Conversion Selection	End of single conversion
Overrun behaviour	Overrun data preserved
Low Power Auto Wait	Disabled
Low Frequency Mode	Disabled
Auto Off	Disabled
Oversampling Mode	Disabled

ADC_Regular_ConversionMode:

Sampling Time	1.5 Cycles
External Trigger Conversion Source	Regular Conversion launched by software
External Trigger Conversion Edge	None

WatchDog:

Enable Analog WatchDog Mode	false

7.2. GPIO

7.3. RCC

Low Speed Clock (LSE) : BYPASS Clock Source

7.3.1. Parameter Settings:

System Parameters:

VDD voltage (V)	3.3
Buffer Cache	Enabled
Prefetch	Disabled

Preread	Enabled
Flash Latency(WS)	0 WS (1 CPU cycle)

RCC Parameters:

HSI Calibration Value	16
MSI Calibration Value	0
HSE Startup Timout Value (ms)	100
LSE Startup Timout Value (ms)	5000

Power Parameters:

Power Regulator Voltage Scale	Power Regulator Voltage Scale 1

7.4. RTC

mode: Activate Clock Source

mode: Activate Calendar

WakeUp: Internal WakeUp

7.4.1. Parameter Settings:

General:

Hour Format	Hourformat 24
Asynchronous Predivider value	127
Synchronous Predivider value	255

Calendar Time:

Data Format	BCD data format
Hours	0
Minutes	0
Seconds	0
Day Light Saving: value of hour adjustment	Daylightsaving None
Store Operation	Storeoperation Reset

Calendar Date:

Week Day	Monday
Month	January
Date	1
Year	0

Wake UP:

Wake Up Clock	**1 Hz ***
Wake Up Counter	**60 ***

7.5. SPI1

Mode: Full-Duplex Master

7.5.1. Parameter Settings:

Basic Parameters:

Frame Format	Motorola
Data Size	8 Bits
First Bit	MSB First

Clock Parameters:

Prescaler (for Baud Rate)	2
Baud Rate	**32.768 KBits/s ***
Clock Polarity (CPOL)	Low
Clock Phase (CPHA)	1 Edge

Advanced Parameters:

CRC Calculation	Disabled
NSS Signal Type	Software

7.6. SYS

mode: Debug Serial Wire

Timebase Source: SysTick

*** User modified value**

8. System Configuration

8.1. GPIO configuration

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
ADC	PA0-CK_IN	ADC_IN0	Analog mode	No pull-up and no pull-down	n/a	
	PA1	ADC_IN1	Analog mode	No pull-up and no pull-down	n/a	
RCC	PC14-OSC32_IN	RCC_OSC32_IN	n/a	n/a	n/a	
SPI1	PA5	SPI1_SCK	Alternate Function Push Pull	No pull-up and no pull-down	**Very High ***	
	PA6	SPI1_MISO	Alternate Function Push Pull	No pull-up and no pull-down	**Very High ***	
	PA7	SPI1_MOSI	Alternate Function Push Pull	No pull-up and no pull-down	**Very High ***	
SYS	PA13	SYS_SWDIO	n/a	n/a	n/a	
	PA14	SYS_SWCLK	n/a	n/a	n/a	
GPIO	PA2	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	Detect
	PA3	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	Switch
	PA4	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	DS18B20
	PB1	GPIO_EXTI1	**External Interrupt Mode with Falling edge trigger detection**	No pull-up and no pull-down	n/a	nRF24L01_IRQ
	PA9	GPIO_Output	Output Push Pull	**Pull-down ***	Low	nRF24L01_CE
	PA10	GPIO_Output	Output Push Pull	**Pull-up ***	Low	nRF24L01_CSN

8.2. DMA configuration

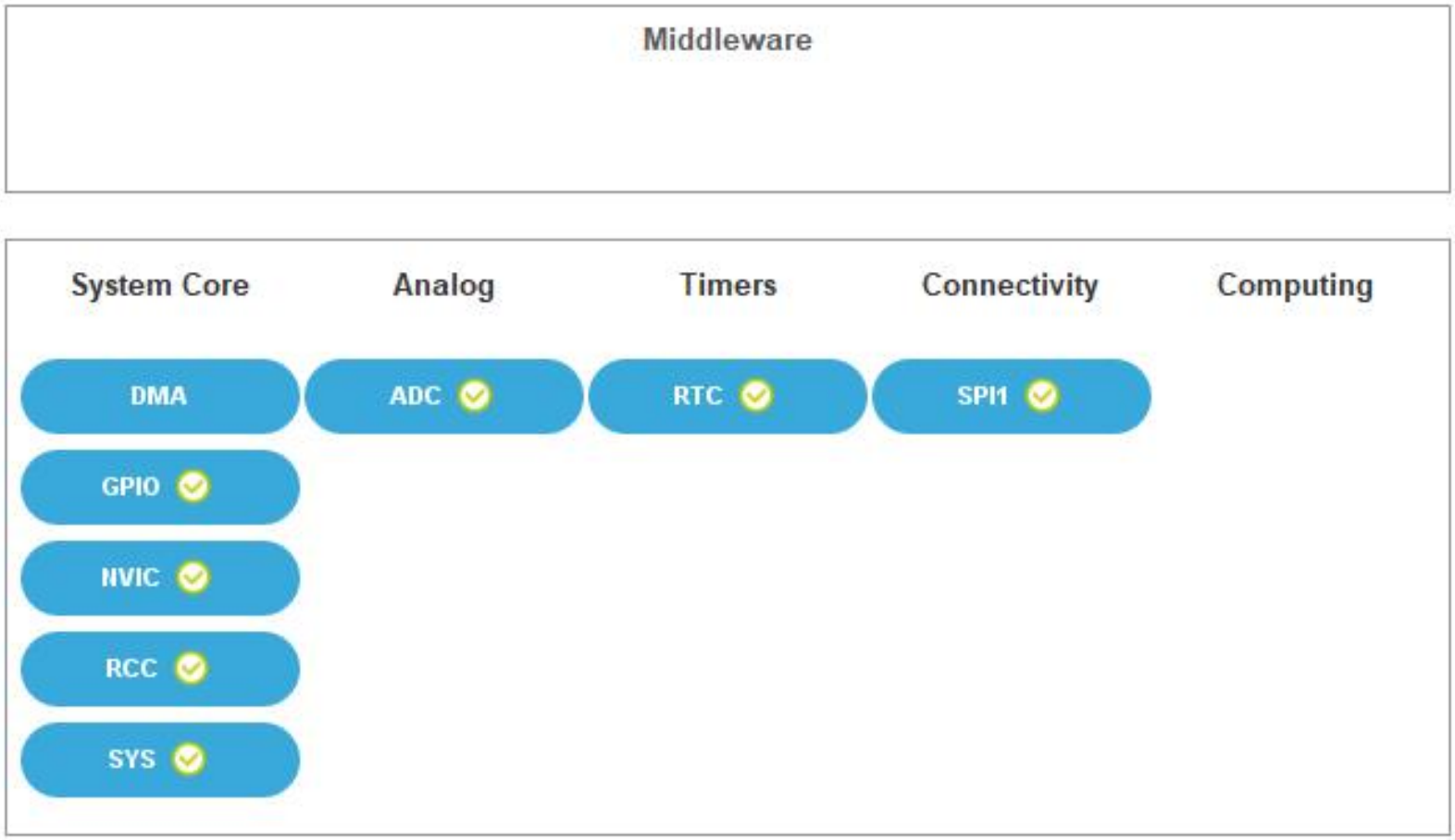
nothing configured in DMA service

8.3. NVIC configuration

Interrupt Table	Enable	Preenmption Priority	SubPriority
Non maskable interrupt	true	0	0
Hard fault interrupt	true	0	0
System service call via SWI instruction	true	0	0
Pendable request for system service	true	0	0
System tick timer	true	0	0
RTC global interrupt through EXTI lines 17, 19 and 20 and LSE CSS interrupt through EXTI line 19	true	0	0
Flash and EEPROM global interrupt	unused		
RCC global interrupt	unused		
EXTI line 0 and line 1 interrupts	unused		
ADC global interrupt	unused		
SPI1 global interrupt	unused		

*** User modified value**

9. Predefined Views - Category view : Current



10. Software Pack Report