1. Description

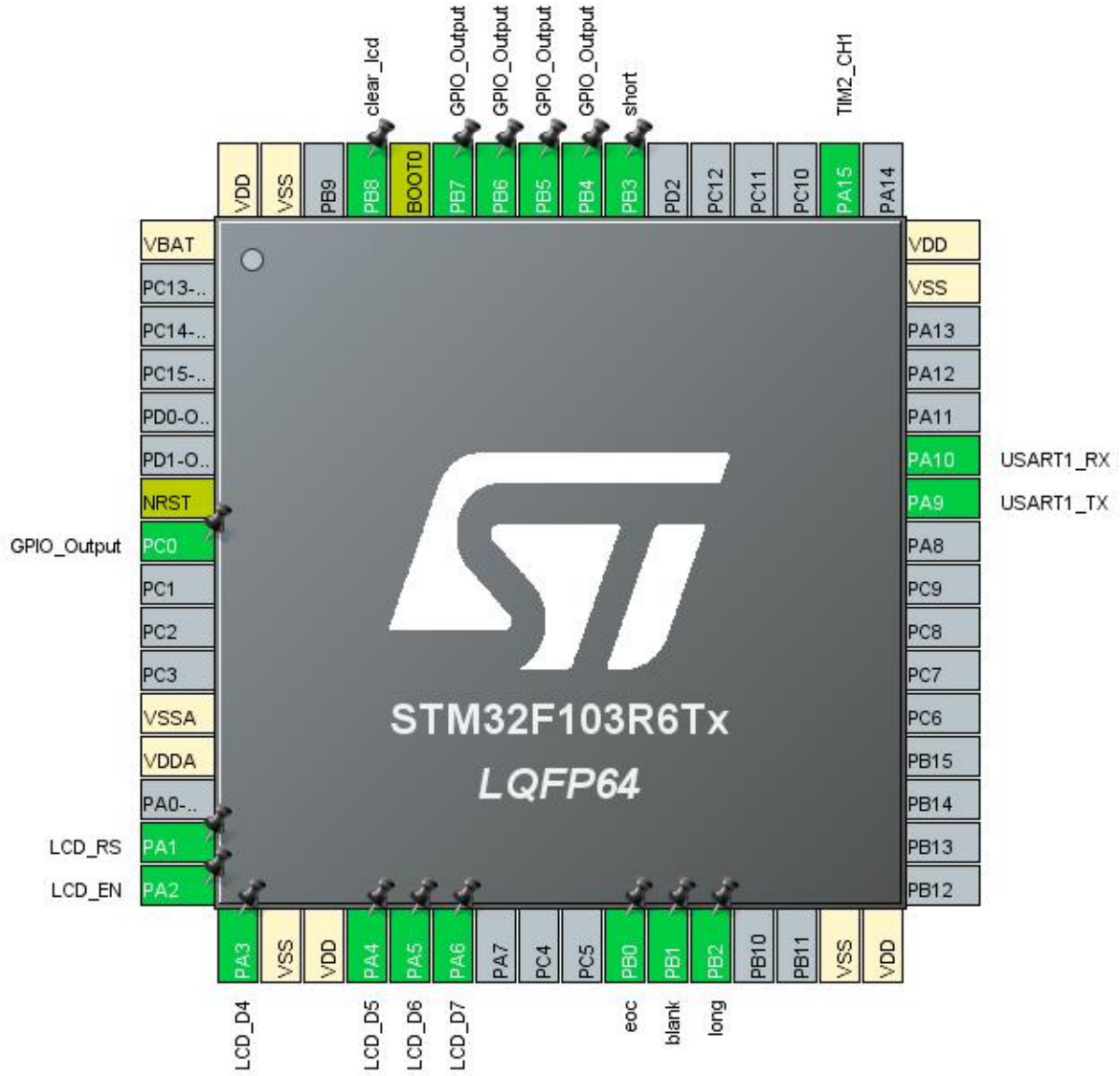
1.1. Project

Project Name	Telegraph Machine
Board Name	custom
Generated with:	STM32CubeMX 5.6.0
Date	06/08/2020

1.2. MCU

MCU Series	STM32F1
MCU Line	STM32F103
MCU name	STM32F103R6Tx
MCU Package	LQFP64
MCU Pin number	64

2. Pinout Configuration

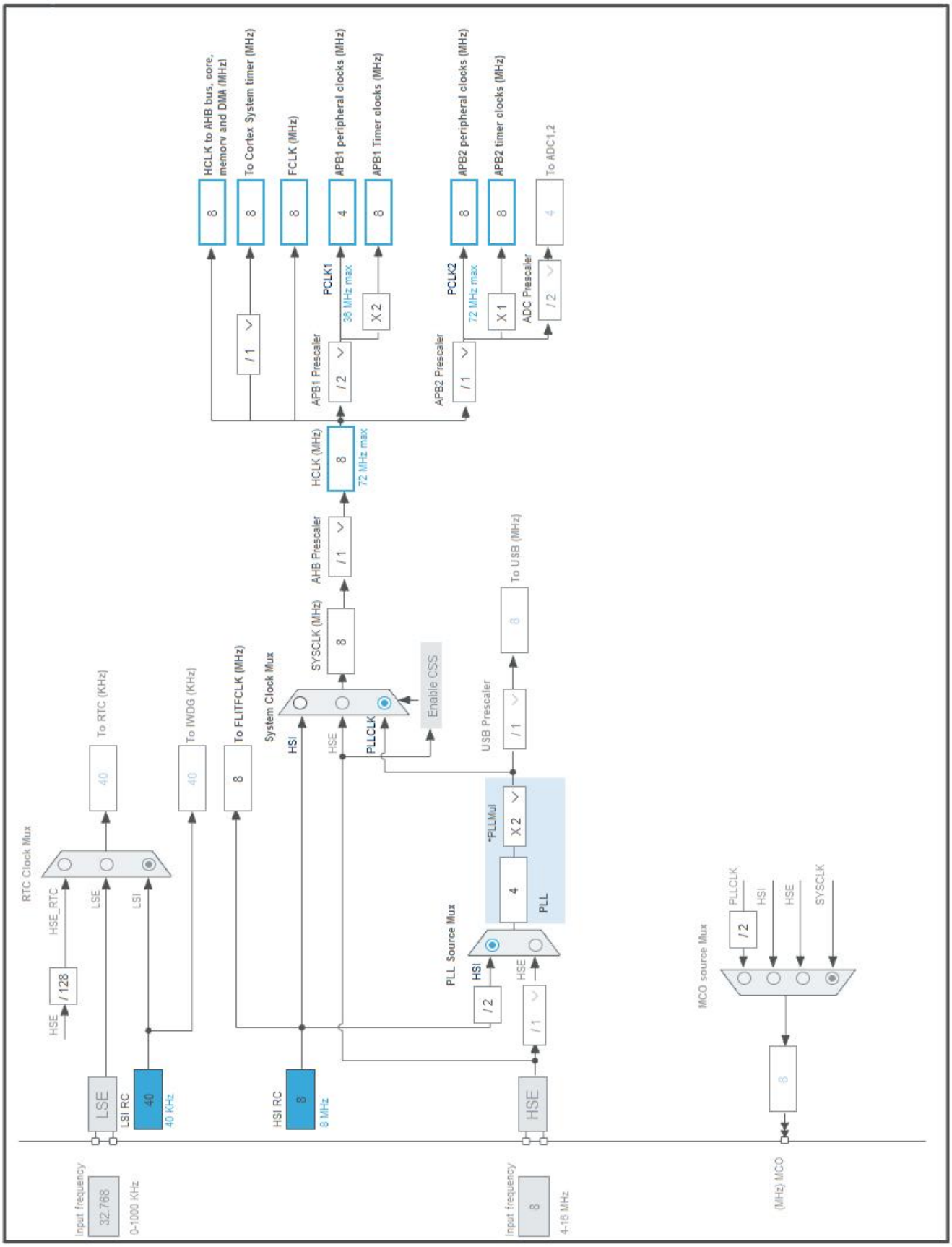


3. Pins Configuration

Pin Number LQFP64	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
1	VBAT	Power		
7	NRST	Reset		
8	PC0 *	I/O	GPIO_Output	
12	VSSA	Power		
13	VDDA	Power		
15	PA1 *	I/O	GPIO_Output	LCD_RS
16	PA2 *	I/O	GPIO_Output	LCD_EN
17	PA3 *	I/O	GPIO_Output	LCD_D4
18	VSS	Power		
19	VDD	Power		
20	PA4 *	I/O	GPIO_Output	LCD_D5
21	PA5 *	I/O	GPIO_Output	LCD_D6
22	PA6 *	I/O	GPIO_Output	LCD_D7
26	PB0 *	I/O	GPIO_Input	eoc
27	PB1 *	I/O	GPIO_Input	blank
28	PB2 *	I/O	GPIO_Input	long
31	VSS	Power		
32	VDD	Power		
42	PA9	I/O	USART1_TX	
43	PA10	I/O	USART1_RX	
47	VSS	Power		
48	VDD	Power		
50	PA15	I/O	TIM2_CH1	
55	PB3 *	I/O	GPIO_Input	short
56	PB4 *	I/O	GPIO_Output	
57	PB5 *	I/O	GPIO_Output	
58	PB6 *	I/O	GPIO_Output	
59	PB7 *	I/O	GPIO_Output	
60	BOOT0	Boot		
61	PB8 *	I/O	GPIO_Input	clear_lcd
63	VSS	Power		
64	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	Telegraph Machine
Project Folder	C:\Users\fatih\Documents\CubeMxProjects\Telegraph Machine
Toolchain / IDE	MDK-ARM V5.27
Firmware Package Name and Version	STM32Cube FW_F1 V1.8.0

5.2. Code Generation Settings

Name	Value
STM32Cube MCU packages and embedded software	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 consumption)	No

6. Power Consumption Calculator report

6.1. Microcontroller Selection

Series	STM32F1
Line	STM32F103
MCU	STM32F103R6Tx
Datasheet	15060_Rev7

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

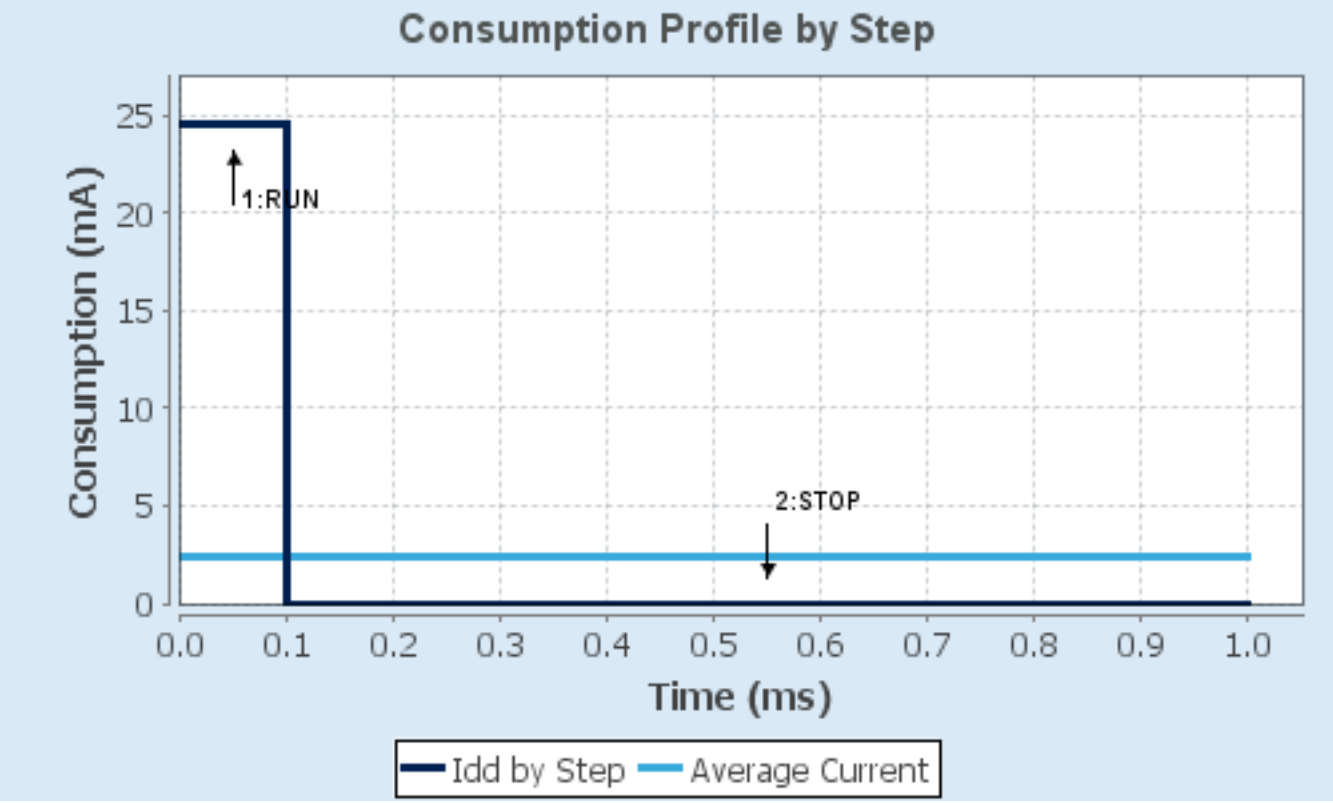
6.4. Sequence

Step	Step1	Step2
Mode	RUN	STOP
Vdd	3.3	3.3
Voltage Source	Battery	Battery
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	24.5 mA	11.7 µA
Duration	0.1 ms	0.9 ms
DMIPS	90.0	0.0
Ta Max	101.36	105
Category	In DS Table	In DS Table

6.5. RESULTS

Sequence Time	1 ms	Average Current	2.46 mA
Battery Life	1 month, 27 days, 1 hour	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. IPs and Middleware Configuration

7.1. GPIO

7.2. RCC

7.2.1. Parameter Settings:

System Parameters:

VDD voltage (V)	3.3
Prefetch Buffer	Enabled
Flash Latency(WS)	0 WS (1 CPU cycle)

RCC Parameters:

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

7.3. SYS

Debug: No Debug

Timebase Source: SysTick

7.4. TIM2

Clock Source : Internal Clock

Channel1: PWM Generation CH1

7.4.1. Parameter Settings:

Counter Settings:

Prescaler (PSC - 16 bits value)	**799 ***
Counter Mode	Up
Counter Period (AutoReload Register - 16 bits value)	**99 ***
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 1:

Mode	PWM mode 1
Pulse (16 bits value)	0

Output compare preload	Enable
Fast Mode	Disable
CH Polarity	High

7.5. USART1

Mode: Asynchronous

7.5.1. Parameter Settings:

Basic Parameters:

Baud Rate	115200
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**

8. System Configuration

8.1. GPIO configuration

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
TIM2	PA15	TIM2_CH1	**Alternate Function Open Drain ***	n/a	**High ***	
USART1	PA9	USART1_TX	Alternate Function Push Pull	n/a	**High ***	
	PA10	USART1_RX	Input mode	No pull-up and no pull-down	**n/a**	
GPIO	PC0	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	
	PA1	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	LCD_RS
	PA2	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	LCD_EN
	PA3	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	LCD_D4
	PA4	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	LCD_D5
	PA5	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	LCD_D6
	PA6	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	LCD_D7
	PB0	GPIO_Input	Input mode	**Pull-down ***	n/a	eoc
	PB1	GPIO_Input	Input mode	**Pull-down ***	n/a	blank
	PB2	GPIO_Input	Input mode	**Pull-down ***	n/a	long
	PB3	GPIO_Input	Input mode	**Pull-down ***	n/a	short
	PB4	GPIO_Output	**Output Open Drain ***	No pull-up and no pull-down	Low	
	PB5	GPIO_Output	**Output Open Drain ***	No pull-up and no pull-down	Low	
	PB6	GPIO_Output	**Output Open Drain ***	No pull-up and no pull-down	Low	
	PB7	GPIO_Output	**Output Open Drain ***	No pull-up and no pull-down	Low	
	PB8	GPIO_Input	Input mode	**Pull-down ***	n/a	clear_lcd

8.2. DMA configuration

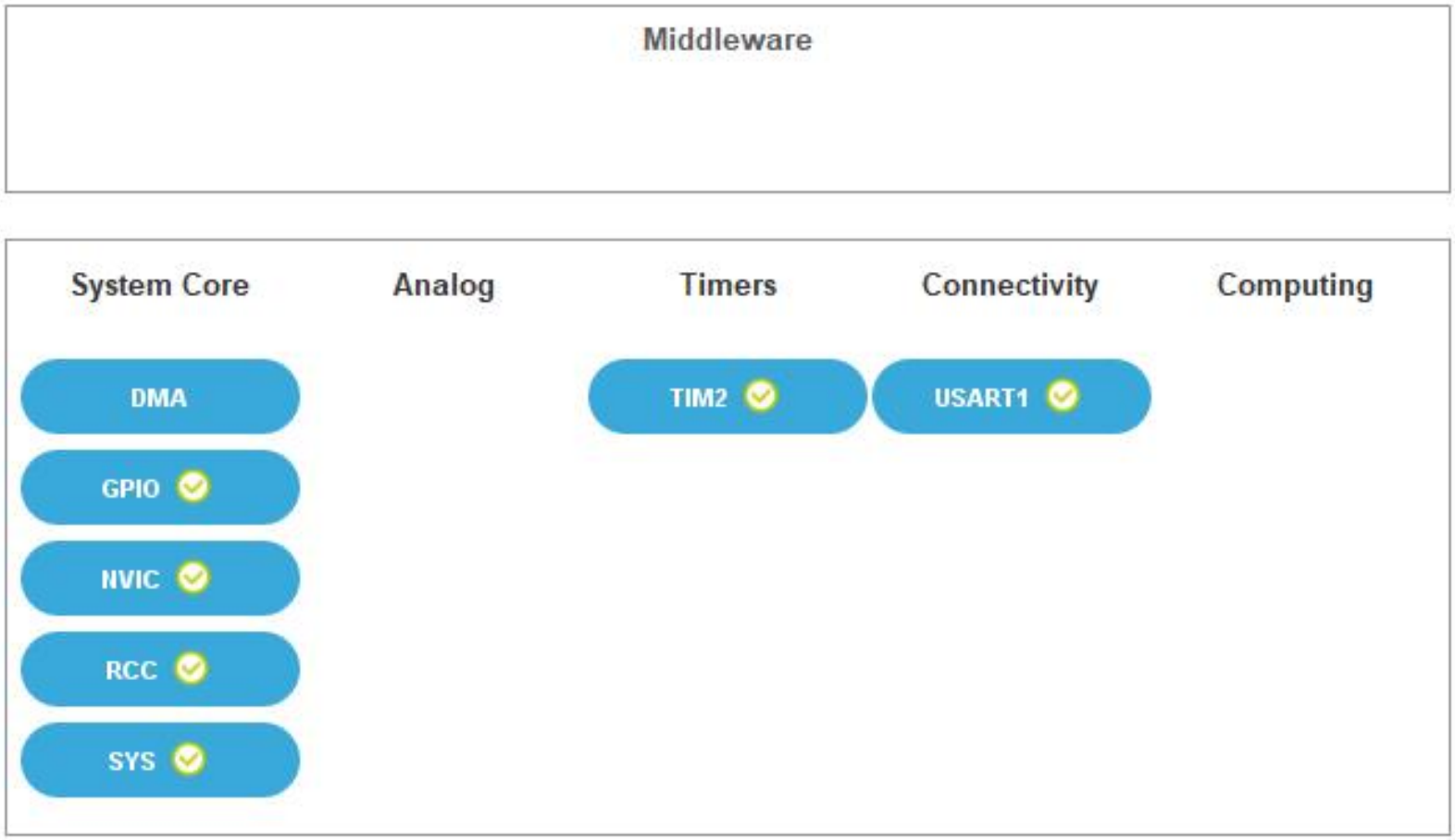
nothing configured in DMA service

8.3. NVIC configuration

Interrupt Table	Enable	Preenmption Priority	SubPriority
Non maskable interrupt	true	0	0
Hard fault interrupt	true	0	0
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
USART1 global interrupt	true	0	0
PVD interrupt through EXTI line 16	unused		
Flash global interrupt	unused		
RCC global interrupt	unused		
TIM2 global interrupt	unused		

*** User modified value**

9. Predefined Views - Category view : Current



10. Software Pack Report