1. Description

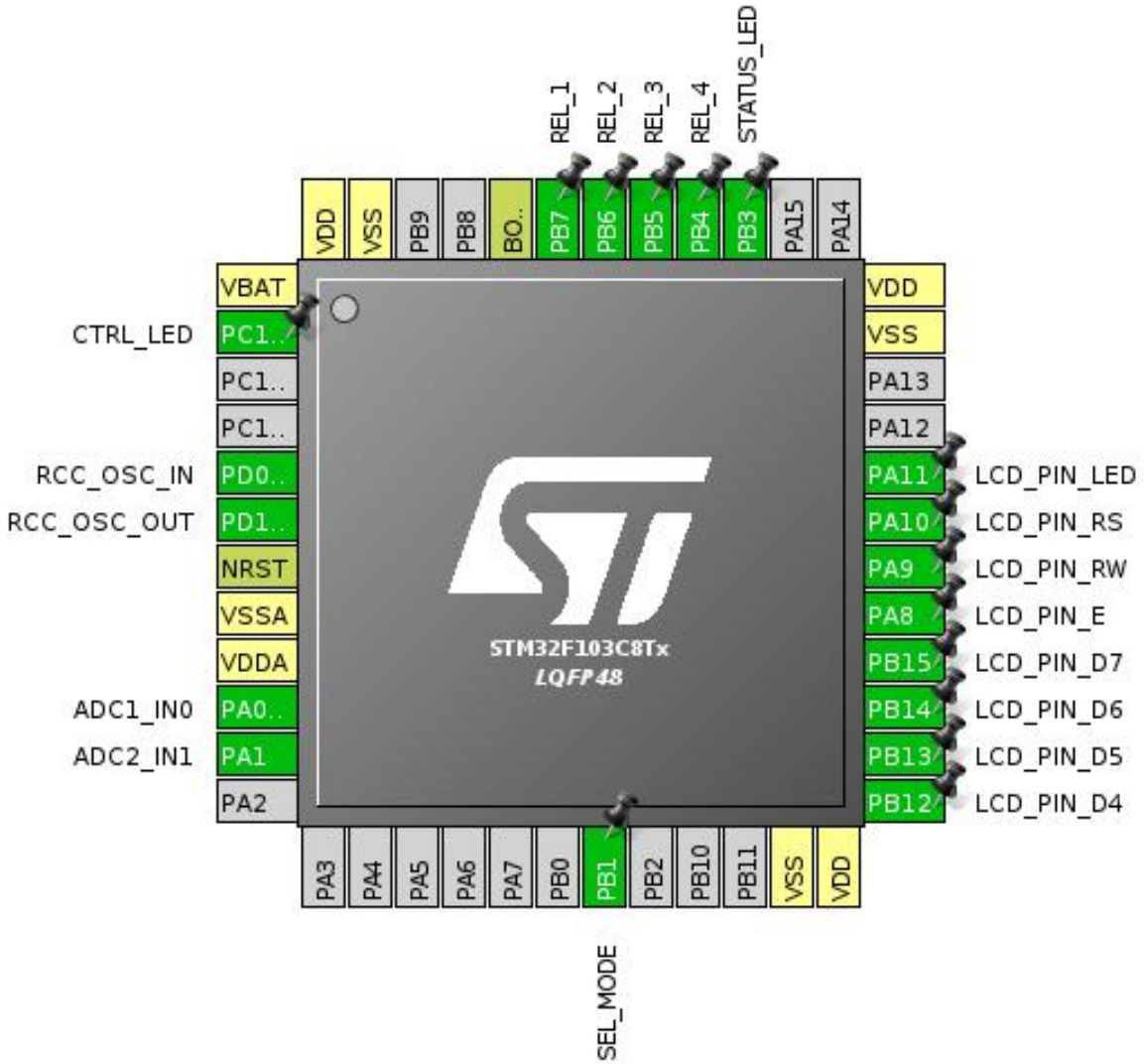
1.1. Project

Project Name	impedance_meter
Board Name	impedance_meter
Generated with:	STM32CubeMX 4.25.0
Date	04/04/2018

1.2. MCU

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

2. Pinout Configuration

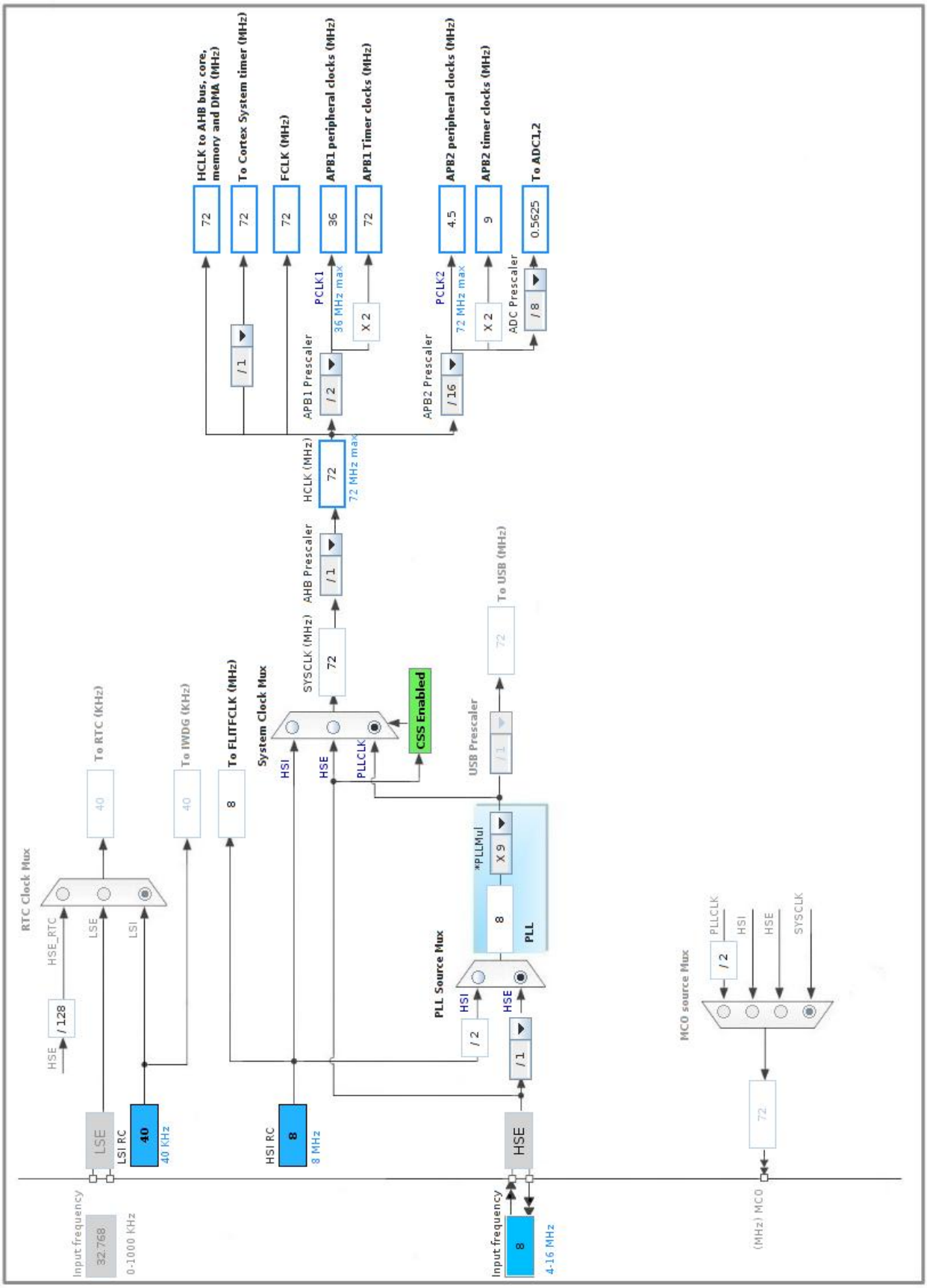


3. Pins Configuration

Pin Number LQFP48	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
1	VBAT	Power		
2	PC13-TAMPER-RTC *	I/O	GPIO_Output	CTRL_LED
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	ADC1_IN0	
11	PA1	I/O	ADC2_IN1	
19	PB1 *	I/O	GPIO_Input	SEL_MODE
23	VSS	Power		
24	VDD	Power		
25	PB12 *	I/O	GPIO_Output	LCD_PIN_D4
26	PB13 *	I/O	GPIO_Output	LCD_PIN_D5
27	PB14 *	I/O	GPIO_Output	LCD_PIN_D6
28	PB15 *	I/O	GPIO_Output	LCD_PIN_D7
29	PA8 *	I/O	GPIO_Output	LCD_PIN_E
30	PA9 *	I/O	GPIO_Output	LCD_PIN_RW
31	PA10 *	I/O	GPIO_Output	LCD_PIN_RS
32	PA11 *	I/O	GPIO_Output	LCD_PIN_LED
35	VSS	Power		
36	VDD	Power		
39	PB3 *	I/O	GPIO_Output	STATUS_LED
40	PB4 *	I/O	GPIO_Output	REL_4
41	PB5 *	I/O	GPIO_Output	REL_3
42	PB6 *	I/O	GPIO_Output	REL_2
43	PB7 *	I/O	GPIO_Output	REL_1
44	BOOT0	Boot		
47	VSS	Power		
48	VDD	Power		

* The pin is affected with an I/O function

4. Clock Tree Configuration



5. IPs and Middleware Configuration

5.1. ADC1

mode: IN0

5.1.1. Parameter Settings:

ADCs_Common_Settings:

Mode	Independent mode

ADC_Settings:

Data Alignment	Right alignment
Scan Conversion Mode	Disabled
Continuous Conversion Mode	Disabled
Discontinuous Conversion Mode	Disabled

ADC_Regular_ConversionMode:

Enable Regular Conversions	Enable
Number Of Conversion	1
External Trigger Conversion Source	Regular Conversion launched by software
Rank	1
Channel	Channel 0
Sampling Time	1.5 Cycles

ADC_Injected_ConversionMode:

Number Of Conversions	0

WatchDog:

Enable Analog WatchDog Mode	false

5.2. ADC2

mode: IN1

5.2.1. Parameter Settings:

ADCs_Common_Settings:

Mode	Independent mode

ADC_Settings:

Data Alignment	Right alignment
Scan Conversion Mode	Disabled

Continuous Conversion Mode	Disabled
Discontinuous Conversion Mode	Disabled

ADC_Regular_ConversionMode:

Enable Regular Conversions	Enable
Number Of Conversion	1
External Trigger Conversion Source	Regular Conversion launched by software
Rank	1
Channel	Channel 1
Sampling Time	1.5 Cycles

ADC_Injected_ConversionMode:

Number Of Conversions	0

WatchDog:

Enable Analog WatchDog Mode	false

5.3. RCC

High Speed Clock (HSE): Crystal/Ceramic Resonator

5.3.1. 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

5.4. SYS

Debug: No Debug

Timebase Source: SysTick

*** User modified value**

6. System Configuration

6.1. GPIO configuration

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
ADC1	PA0-WKUP	ADC1_IN0	Analog mode	n/a	n/a	
ADC2	PA1	ADC2_IN1	Analog mode	n/a	n/a	
RCC	PD0-OSC_IN	RCC_OSC_IN	n/a	n/a	n/a	
	PD1-OSC_OUT	RCC_OSC_OUT	n/a	n/a	n/a	
GPIO	PC13-TAMPER-RTC	GPIO_Output	Output Push Pull	n/a	Low	CTRL_LED
	PB1	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	SEL_MODE
	PB12	GPIO_Output	Output Push Pull	n/a	Low	LCD_PIN_D4
	PB13	GPIO_Output	Output Push Pull	n/a	Low	LCD_PIN_D5
	PB14	GPIO_Output	Output Push Pull	n/a	Low	LCD_PIN_D6
	PB15	GPIO_Output	Output Push Pull	n/a	Low	LCD_PIN_D7
	PA8	GPIO_Output	Output Push Pull	n/a	Low	LCD_PIN_E
	PA9	GPIO_Output	Output Push Pull	n/a	Low	LCD_PIN_RW
	PA10	GPIO_Output	Output Push Pull	n/a	Low	LCD_PIN_RS
	PA11	GPIO_Output	Output Push Pull	n/a	Low	LCD_PIN_LED
	PB3	GPIO_Output	Output Push Pull	n/a	Low	STATUS_LED
	PB4	GPIO_Output	Output Push Pull	n/a	Low	REL_4
	PB5	GPIO_Output	Output Push Pull	n/a	Low	REL_3
	PB6	GPIO_Output	Output Push Pull	n/a	Low	REL_2
	PB7	GPIO_Output	Output Push Pull	n/a	Low	REL_1

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
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
ADC1 and ADC2 global interrupts	true	0	0
PVD interrupt through EXTI line 16	unused		
Flash global interrupt	unused		
RCC global interrupt	unused		

*** User modified value**

7. Power Consumption Calculator report

7.1. Microcontroller Selection

Series	STM32F1
Line	STM32F103
MCU	STM32F103C8Tx
Datasheet	13587_Rev17

7.2. Parameter Selection

Temperature	25
Vdd	3.3

7.3. Battery Selection

Battery	Alkaline(9V)
Capacity	625.0 mAh
Self Discharge	0.3 %/month
Nominal Voltage	9.0 V
Max Cont Current	200.0 mA
Max Pulse Current	0.0 mA
Cells in series	1
Cells in parallel	1

8. Software Project

8.1. Project Settings

Name	Value
Project Name	impedance_meter
Project Folder	/home/rr/dev/impedance_meter/cube/impedance_meter
Toolchain / IDE	Makefile
Firmware Package Name and Version	STM32Cube FW_F1 V1.6.1

8.2. Code Generation Settings

Name	Value
STM32Cube Firmware Library Package	Copy all used libraries into the project folder
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)	No

9. Software Pack Report