

## 1. Description

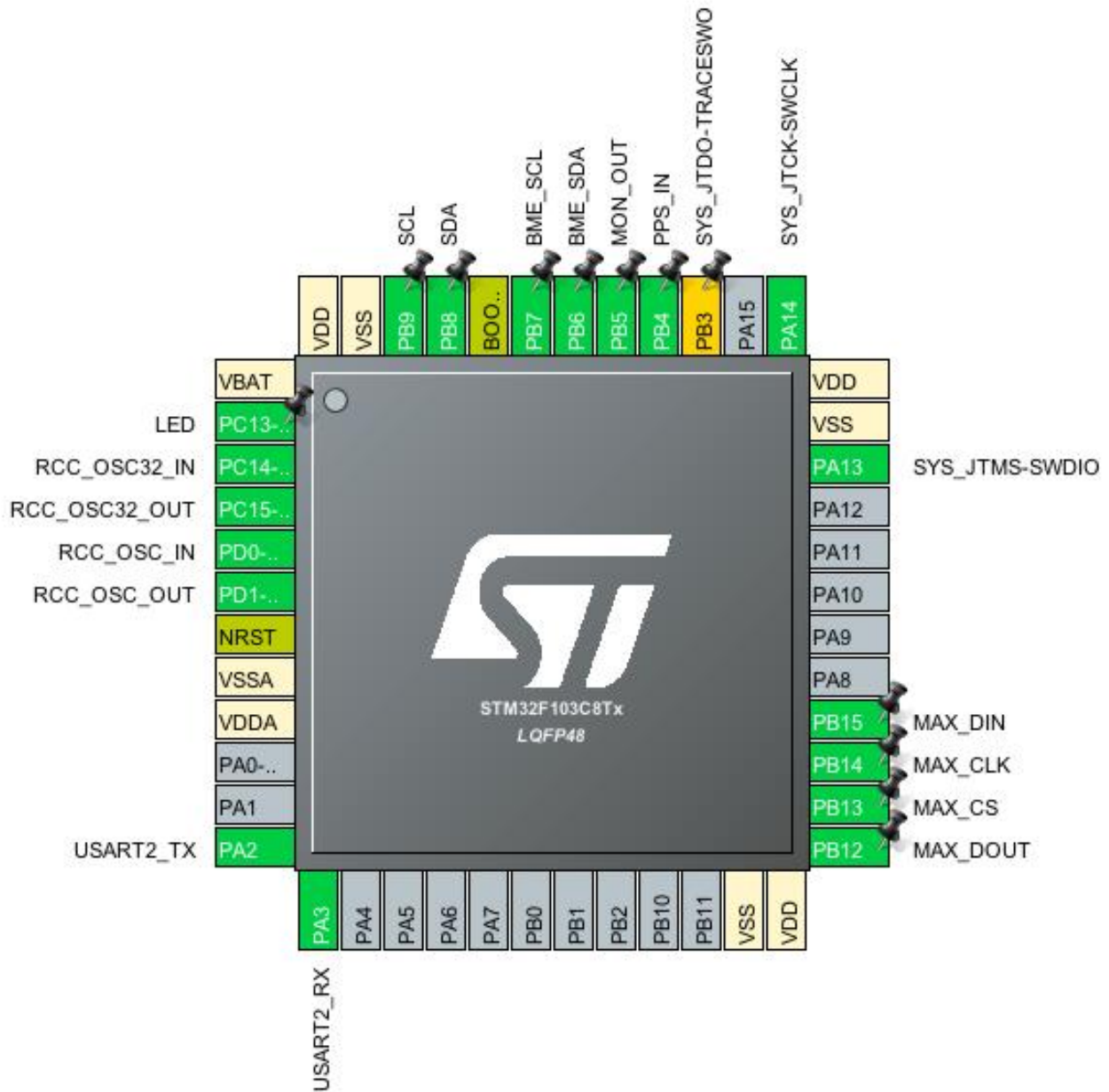
### 1.1. Project

Project Name	STM32_RTOS_SC1602_BME280_GPS
Board Name	custom
Generated with:	STM32CubeMX 5.3.0
Date	01/04/2020

### 1.2. MCU

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

## 2. Pinout Configuration



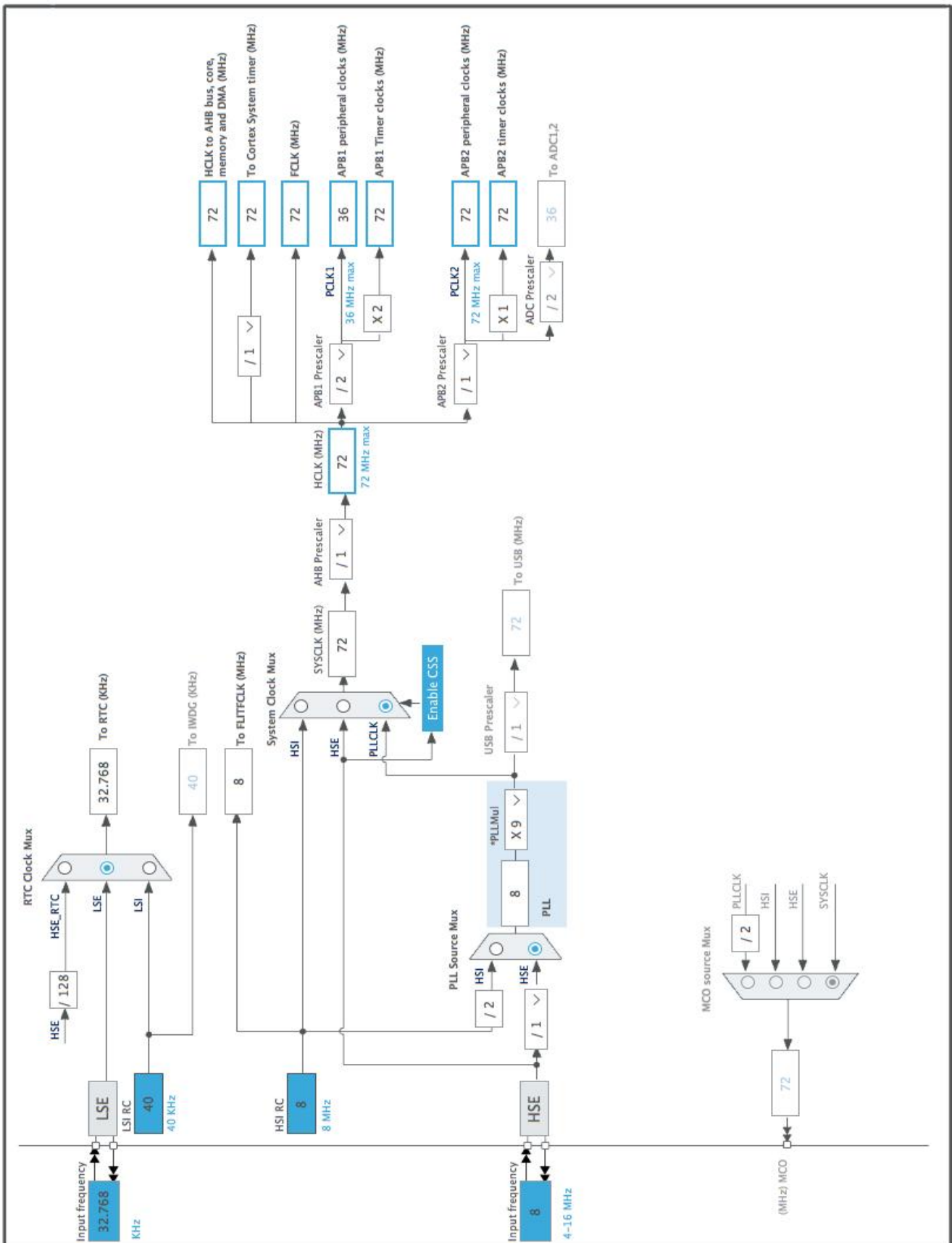
### 3. Pins Configuration

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	LED
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		
12	PA2	I/O	USART2_TX	
13	PA3	I/O	USART2_RX	
23	VSS	Power		
24	VDD	Power		
25	PB12 *	I/O	GPIO_Output	MAX_DOUT
26	PB13 *	I/O	GPIO_Output	MAX_CS
27	PB14 *	I/O	GPIO_Output	MAX_CLK
28	PB15 *	I/O	GPIO_Input	MAX_DIN
34	PA13	I/O	SYS_JTMS-SWDIO	
35	VSS	Power		
36	VDD	Power		
37	PA14	I/O	SYS_JTCK-SWCLK	
39	PB3 **	I/O	SYS_JTDO-TRACESWO	
40	PB4	I/O	GPIO_EXTI4	PPS_IN
41	PB5 *	I/O	GPIO_Output	MON_OUT
42	PB6 *	I/O	GPIO_Output	BME_SDA
43	PB7 *	I/O	GPIO_Output	BME_SCL
44	BOOT0	Boot		
45	PB8 *	I/O	GPIO_Output	SDA
46	PB9 *	I/O	GPIO_Output	SCL
47	VSS	Power		
48	VDD	Power		

\* The pin is affected with an I/O function

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

## 4. Clock Tree Configuration



## 6. Power Consumption Calculator report

### 6.1. Microcontroller Selection

Series	STM32F1
Line	STM32F103
MCU	STM32F103C8Tx
Datasheet	13587_Rev17

### 6.2. Parameter Selection

Temperature	25
Vdd	3.3

## 7. IPs and Middleware Configuration

### 7.1. RCC

**High Speed Clock (HSE): Crystal/Ceramic Resonator**

**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 Timeout Value (ms)	100
LSE Startup Timeout Value (ms)	5000

### 7.2. RTC

**mode: Activate Clock Source**

**mode: Activate Calendar**

**RTC OUT: No RTC Output**

#### 7.2.1. Parameter Settings:

##### Calendar Time:

Data Format	<b>Binary data format *</b>
Hours	0
Minutes	0
Seconds	0

##### General:

Auto Predivider Calculation	Enabled
Asynchronous Predivider value	Automatic Predivider Calculation Enabled
Output	No output on the TAMPER pin

##### Calendar Date:

Week Day	Monday
Month	January
Date	1
Year	0

## 7.3. SYS

**Debug: Serial Wire**

**Timebase Source: TIM4**

## 7.4. USART2

**Mode: Asynchronous**

### 7.4.1. Parameter Settings:

#### Basic Parameters:

Baud Rate	<b>9600 *</b>
Word Length	8 Bits (including Parity)
Parity	None
Stop Bits	1

#### Advanced Parameters:

Data Direction	Receive and Transmit
Over Sampling	16 Samples

## 7.5. FREERTOS

**Interface: CMSIS\_V1**

### 7.5.1. Config parameters:

#### API:

FreeRTOS API	CMSIS v1
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#### Versions:

FreeRTOS version	10.0.1
CMSIS-RTOS version	1.02

#### Kernel settings:

USE_PREEMPTION	Enabled
CPU_CLOCK_HZ	SystemCoreClock
TICK_RATE_HZ	1000
MAX_PRIORITIES	7
MINIMAL_STACK_SIZE	128
MAX_TASK_NAME_LEN	16
USE_16_BIT_TICKS	Disabled
IDLE_SHOULD_YIELD	Enabled
USE_MUTEXES	Enabled

USE_RECURSIVE_MUTEXES	Disabled
USE_COUNTING_SEMAPHORES	Disabled
QUEUE_REGISTRY_SIZE	8
USE_APPLICATION_TASK_TAG	Disabled
ENABLE_BACKWARD_COMPATIBILITY	Enabled
USE_PORT_OPTIMISED_TASK_SELECTION	Enabled
USE_TICKLESS_IDLE	Disabled
USE_TASK_NOTIFICATIONS	Enabled
RECORD_STACK_HIGH_ADDRESS	Disabled

**Memory management settings:**

Memory Allocation	Dynamic
TOTAL_HEAP_SIZE	<b>15256 *</b>
Memory Management scheme	heap_4

**Hook function related definitions:**

USE_IDLE_HOOK	Disabled
USE_TICK_HOOK	Disabled
USE_MALLOC_FAILED_HOOK	Disabled
USE_DAEMON_TASK_STARTUP_HOOK	Disabled
CHECK_FOR_STACK_OVERFLOW	Disabled

**Run time and task stats gathering related definitions:**

GENERATE_RUN_TIME_STATS	Disabled
USE_TRACE_FACILITY	Disabled
USE_STATS_FORMATTING_FUNCTIONS	Disabled

**Co-routine related definitions:**

USE_CO_ROUTINES	Disabled
MAX_CO_ROUTINE_PRIORITIES	2

**Software timer definitions:**

USE_TIMERS	<b>Enabled *</b>
TIMER_TASK_PRIORITY	2
TIMER_QUEUE_LENGTH	10
TIMER_TASK_STACK_DEPTH	256

**Interrupt nesting behaviour configuration:**

LIBRARY_LOWEST_INTERRUPT_PRIORITY	15
LIBRARY_MAX_SYSCALL_INTERRUPT_PRIORITY	5

**7.5.2. Include parameters:**

**Include definitions:**

vTaskPrioritySet	Enabled
uxTaskPriorityGet	Enabled
vTaskDelete	Enabled



vTaskCleanUpResources	Disabled
vTaskSuspend	Enabled
vTaskDelayUntil	<b>Enabled *</b>
vTaskDelay	Enabled
xTaskGetSchedulerState	Enabled
xTaskResumeFromISR	Enabled
xQueueGetMutexHolder	Disabled
xSemaphoreGetMutexHolder	Disabled
pcTaskGetTaskName	Disabled
uxTaskGetStackHighWaterMark	Disabled
xTaskGetCurrentTaskHandle	Disabled
eTaskGetState	Disabled
xEventGroupSetBitFromISR	Disabled
xTimerPendFunctionCall	Disabled
xTaskAbortDelay	Disabled
xTaskGetHandle	Disabled

\* **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	
SYS	PA13	SYS_JTMS-SWDIO	n/a	n/a	n/a	
	PA14	SYS_JTCK-SWCLK	n/a	n/a	n/a	
USART2	PA2	USART2_TX	Alternate Function Push Pull	n/a	<b>High *</b>	
	PA3	USART2_RX	Input mode	No pull-up and no pull-down	<b>n/a</b>	
Single Mapped Signals	PB3	SYS_JTDO-TRACESWO	n/a	n/a	n/a	
GPIO	PC13-TAMPER-RTC	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	LED
	PB12	GPIO_Output	Output Push Pull	No pull-up and no pull-down	<b>High *</b>	MAX_DOUT
	PB13	GPIO_Output	Output Push Pull	No pull-up and no pull-down	<b>High *</b>	MAX_CS
	PB14	GPIO_Output	Output Push Pull	No pull-up and no pull-down	<b>High *</b>	MAX_CLK
	PB15	GPIO_Input	Input mode	No pull-up and no pull-down	<b>n/a</b>	MAX_DIN
	PB4	GPIO_EXTI4	External Interrupt Mode with Rising edge trigger detection	No pull-up and no pull-down	<b>n/a</b>	PPS_IN
	PB5	GPIO_Output	Output Push Pull	No pull-up and no pull-down	<b>High *</b>	MON_OUT
	PB6	GPIO_Output	<b>Output Open Drain *</b>	No pull-up and no pull-down	<b>High *</b>	BME_SDA
	PB7	GPIO_Output	Output Push Pull	No pull-up and no pull-down	<b>High *</b>	BME_SCL
	PB8	GPIO_Output	<b>Output Open Drain *</b>	No pull-up and no pull-down	<b>High *</b>	SDA
	PB9	GPIO_Output	<b>Output Open Drain *</b>	No pull-up and no pull-down	<b>High *</b>	SCL

## 8.2. DMA configuration

DMA request	Stream	Direction	Priority
USART2_RX	DMA1_Channel6	Peripheral To Memory	Low

### USART2\_RX: DMA1\_Channel6 DMA request Settings:

Mode: **Circular \***  
Peripheral Increment: Disable  
Memory Increment: **Enable \***  
Peripheral Data Width: Byte  
Memory Data Width: Byte

### 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	15	0
System tick timer	true	15	0
EXTI line4 interrupt	true	5	0
DMA1 channel6 global interrupt	true	5	0
TIM4 global interrupt	true	0	0
USART2 global interrupt	true	5	0
PVD interrupt through EXTI line 16		unused	
RTC global interrupt		unused	
Flash global interrupt		unused	
RCC global interrupt		unused	
RTC alarm interrupt through EXTI line 17		unused	

\* User modified value

## ***9. Software Pack Report***