

1. Description

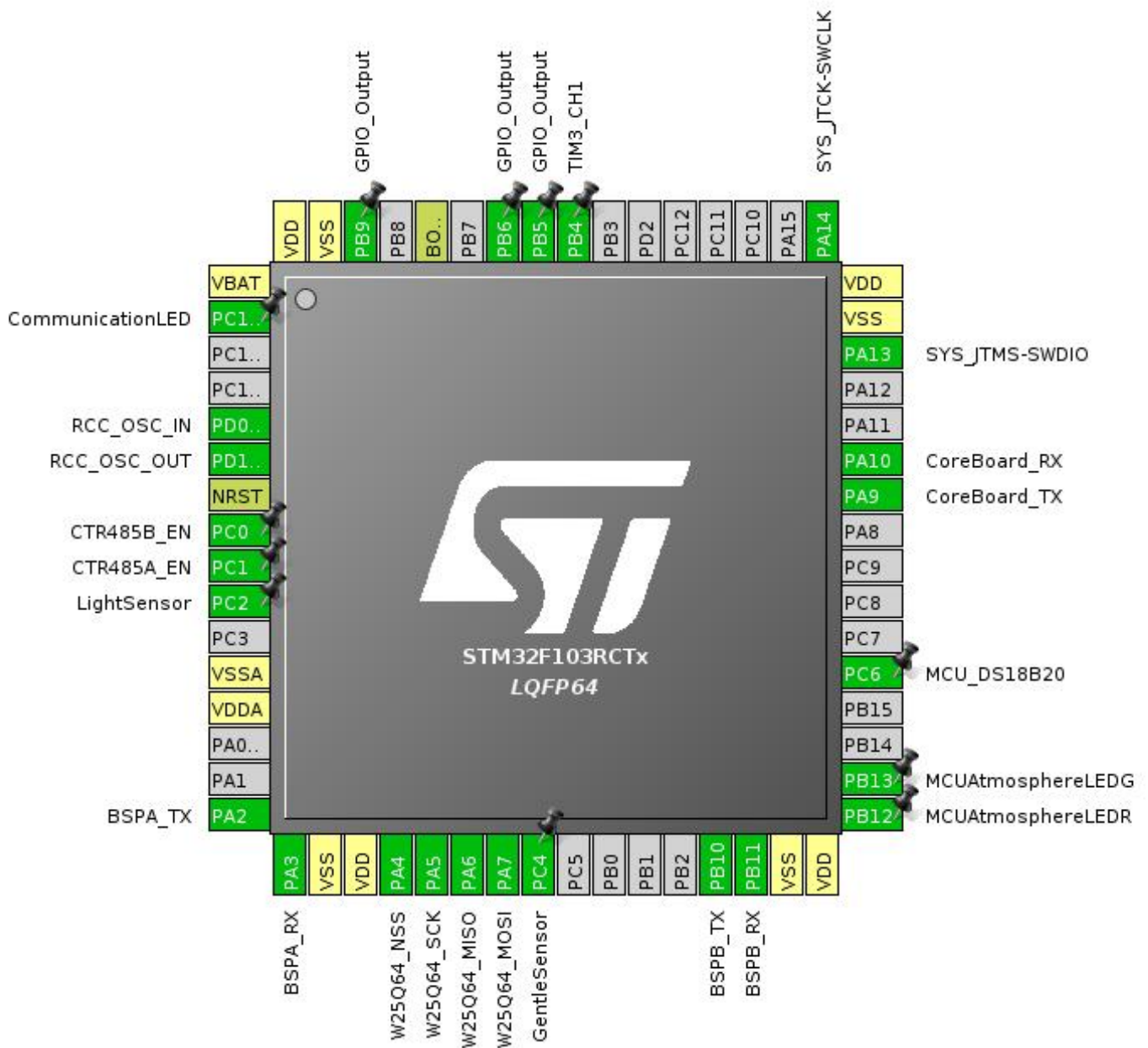
1.1. Project

Project Name	Pro
Board Name	custom
Generated with:	STM32CubeMX 4.26.0
Date	07/16/2018

1.2. MCU

MCU Series	STM32F1
MCU Line	STM32F103
MCU name	STM32F103RCTx
MCU Package	LQFP64
MCU Pin number	64

2. Pinout Configuration



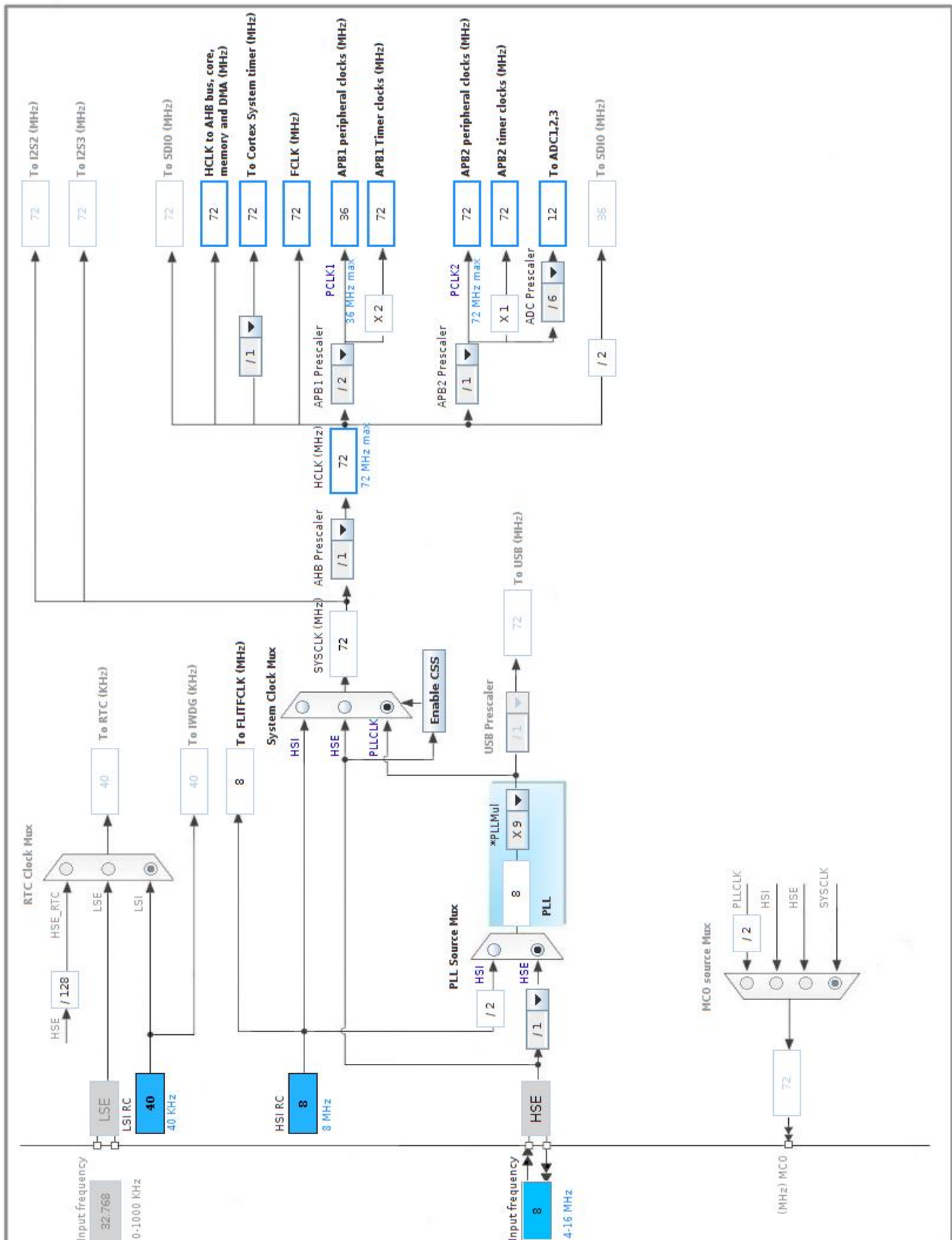
3. Pins Configuration

Pin Number LQFP64	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
1	VBAT	Power		
2	PC13-TAMPER-RTC *	I/O	GPIO_Output	CommunicationLED
5	PD0-OSC_IN	I/O	RCC_OSC_IN	
6	PD1-OSC_OUT	I/O	RCC_OSC_OUT	
7	NRST	Reset		
8	PC0 *	I/O	GPIO_Output	CTR485B_EN
9	PC1 *	I/O	GPIO_Output	CTR485A_EN
10	PC2	I/O	ADC1_IN12	LightSensor
12	VSSA	Power		
13	VDDA	Power		
16	PA2	I/O	USART2_TX	BSPA_TX
17	PA3	I/O	USART2_RX	BSPA_RX
18	VSS	Power		
19	VDD	Power		
20	PA4	I/O	SPI1_NSS	W25Q64_NSS
21	PA5	I/O	SPI1_SCK	W25Q64_SCK
22	PA6	I/O	SPI1_MISO	W25Q64_MISO
23	PA7	I/O	SPI1_MOSI	W25Q64_MOSI
24	PC4	I/O	GPIO_EXTI4	GentleSensor
29	PB10	I/O	USART3_TX	BSPB_TX
30	PB11	I/O	USART3_RX	BSPB_RX
31	VSS	Power		
32	VDD	Power		
33	PB12 *	I/O	GPIO_Output	MCUAtmosphereLEDR
34	PB13 *	I/O	GPIO_Output	MCUAtmosphereLEDG
37	PC6 *	I/O	GPIO_Output	MCU_DS18B20
42	PA9	I/O	USART1_TX	CoreBoard_TX
43	PA10	I/O	USART1_RX	CoreBoard_RX
46	PA13	I/O	SYS_JTMS-SWDIO	
47	VSS	Power		
48	VDD	Power		
49	PA14	I/O	SYS_JTCK-SWCLK	
56	PB4	I/O	TIM3_CH1	
57	PB5 *	I/O	GPIO_Output	
58	PB6 *	I/O	GPIO_Output	
60	BOOT0	Boot		

Pin Number LQFP64	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
62	PB9 *	I/O	GPIO_Output	
63	VSS	Power		
64	VDD	Power		

* The pin is affected with an I/O function

4. Clock Tree Configuration



5. IPs and Middleware Configuration

5.1. ADC1

mode: IN12

mode: Temperature Sensor Channel

5.1.1. Parameter Settings:

ADCs_Common_Settings:

Mode Independent mode

ADC_Settings:

Data Alignment Right alignment

Scan Conversion Mode Enabled

Continuous Conversion Mode Disabled

Discontinuous Conversion Mode Disabled

ADC_Regular_ConversionMode:

Enable Regular Conversions Enable

Number Of Conversion 2 *

External Trigger Conversion Source Regular Conversion launched by software

Rank 1

Channel Channel 12

Sampling Time 239.5 Cycles *

Rank 2 *

Channel Channel Temperature Sensor *

Sampling Time 239.5 Cycles *

ADC_Injected_ConversionMode:

Number Of Conversions 0

WatchDog:

Enable Analog WatchDog Mode false

5.2. RCC

High Speed Clock (HSE): Crystal/Ceramic Resonator

5.2.1. 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

5.3. SPI1

Mode: Full-Duplex Master

Hardware NSS Signal: Hardware NSS Input Signal

5.3.1. Parameter Settings:

Basic Parameters:

Frame Format	Motorola
Data Size	8 Bits
First Bit	MSB First

Clock Parameters:

Prescaler (for Baud Rate)	8 *
Baud Rate	9.0 MBits/s *
Clock Polarity (CPOL)	Low
Clock Phase (CPHA)	1 Edge

Advanced Parameters:

CRC Calculation	Disabled
NSS Signal Type	Input Hardware

5.4. SYS

Debug: Serial Wire

Timebase Source: TIM1

5.5. TIM3

Clock Source : Internal Clock

Channel1: PWM Generation CH1

5.5.1. Parameter Settings:

Counter Settings:

Prescaler (PSC - 16 bits value)	0
Counter Mode	Up

Counter Period (AutoReload Register - 16 bits value) 0

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

Fast Mode Disable

CH Polarity High

5.6. TIM4

mode: Clock Source

5.6.1. Parameter Settings:

Counter Settings:

Prescaler (PSC - 16 bits value) 0

Counter Mode Up

Counter Period (AutoReload Register - 16 bits value) 0

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)

5.7. TIM5

mode: Clock Source

5.7.1. Parameter Settings:

Counter Settings:

Prescaler (PSC - 16 bits value) 0

Counter Mode Up

Counter Period (AutoReload Register - 16 bits value) 0

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)

5.8. USART1

Mode: Asynchronous

5.8.1. 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

5.9. USART2

Mode: Asynchronous

5.9.1. 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

5.10. USART3

Mode: Asynchronous

5.10.1. Parameter Settings:

Basic Parameters:

Baud Rate	115200
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Word Length	8 Bits (including Parity)
Parity	None
Stop Bits	1

Advanced Parameters:

Data Direction	Receive and Transmit
Over Sampling	16 Samples

5.11. FREERTOS

mode: Enabled

5.11.1. Config parameters:

Versions:

FreeRTOS version	9.0.0
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

Memory management settings:

Memory Allocation	Dynamic
TOTAL_HEAP_SIZE	3072
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	Disabled
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Interrupt nesting behaviour configuration:

LIBRARY_LOWEST_INTERRUPT_PRIORITY	15
LIBRARY_MAX_SYSCALL_INTERRUPT_PRIORITY	5

5.11.2. Include parameters:

Include definitions:

vTaskPrioritySet	Enabled
uxTaskPriorityGet	Enabled
vTaskDelete	Enabled
vTaskCleanUpResources	Disabled
vTaskSuspend	Enabled
vTaskDelayUntil	Disabled
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

6. System Configuration

6.1. GPIO configuration

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
ADC1	PC2	ADC1_IN12	Analog mode	n/a	n/a	LightSensor
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	
SPI1	PA4	SPI1_NSS	Input mode	No pull-up and no pull-down	n/a	W25Q64_NSS
	PA5	SPI1_SCK	Alternate Function Push Pull	n/a	High *	W25Q64_SCK
	PA6	SPI1_MISO	Input mode	No pull-up and no pull-down	n/a	W25Q64_MISO
	PA7	SPI1_MOSI	Alternate Function Push Pull	n/a	High *	W25Q64_MOSI
SYS	PA13	SYS_JTMS-SWDIO	n/a	n/a	n/a	
	PA14	SYS_JTCK-SWCLK	n/a	n/a	n/a	
TIM3	PB4	TIM3_CH1	Alternate Function Push Pull	n/a	Low	
USART1	PA9	USART1_TX	Alternate Function Push Pull	n/a	High *	CoreBoard_TX
	PA10	USART1_RX	Input mode	No pull-up and no pull-down	n/a	CoreBoard_RX
USART2	PA2	USART2_TX	Alternate Function Push Pull	n/a	High *	BSPA_TX
	PA3	USART2_RX	Input mode	No pull-up and no pull-down	n/a	BSPA_RX
USART3	PB10	USART3_TX	Alternate Function Push Pull	n/a	High *	BSPB_TX
	PB11	USART3_RX	Input mode	No pull-up and no pull-down	n/a	BSPB_RX
GPIO	PC13-TAMPER-RTC	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	CommunicationLED
	PC0	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	CTR485B_EN
	PC1	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	CTR485A_EN
	PC4	GPIO_EXTI4	External Interrupt Mode with Rising edge trigger detection	No pull-up and no pull-down	n/a	GentleSensor
	PB12	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	MCUAtmosphereLEDR
	PB13	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	MCUAtmosphereLEDG
	PC6	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	MCU_DS18B20
	PB5	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	
	PB6	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	
	PB9	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	

6.2. DMA configuration

DMA request	Stream	Direction	Priority
USART1_RX	DMA1_Channel5	Peripheral To Memory	Low
USART2_RX	DMA1_Channel6	Peripheral To Memory	Low
USART3_RX	DMA1_Channel3	Peripheral To Memory	Low
ADC1	DMA1_Channel1	Peripheral To Memory	Low

USART1_RX: DMA1_Channel5 DMA request Settings:

Mode: Normal
 Peripheral Increment: Disable
 Memory Increment: **Enable ***
 Peripheral Data Width: Byte
 Memory Data Width: Byte

USART2_RX: DMA1_Channel6 DMA request Settings:

Mode: Normal
 Peripheral Increment: Disable
 Memory Increment: **Enable ***
 Peripheral Data Width: Byte
 Memory Data Width: Byte

USART3_RX: DMA1_Channel3 DMA request Settings:

Mode: Normal
 Peripheral Increment: Disable
 Memory Increment: **Enable ***
 Peripheral Data Width: Byte
 Memory Data Width: Byte

ADC1: DMA1_Channel1 DMA request Settings:

Mode: Normal
 Peripheral Increment: Disable
 Memory Increment: **Enable ***
 Peripheral Data Width: **Word ***

Memory Data Width: **Word ***

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	15	0
System tick timer	true	15	0
EXTI line4 interrupt	true	5	0
DMA1 channel1 global interrupt	true	5	0
DMA1 channel3 global interrupt	true	5	0
DMA1 channel5 global interrupt	true	5	0
DMA1 channel6 global interrupt	true	5	0
TIM1 update interrupt	true	0	0
TIM4 global interrupt	true	5	0
USART1 global interrupt	true	5	0
USART2 global interrupt	true	5	0
USART3 global interrupt	true	5	0
TIM5 global interrupt	true	5	0
PVD interrupt through EXTI line 16	unused		
Flash global interrupt	unused		
RCC global interrupt	unused		
ADC1 and ADC2 global interrupts	unused		
TIM3 global interrupt	unused		
SPI1 global interrupt	unused		

* User modified value

7. Power Consumption Calculator report

7.1. Microcontroller Selection

Series	STM32F1
Line	STM32F103
MCU	STM32F103RCTx
Datasheet	14611_Rev12

7.2. Parameter Selection

Temperature	25
Vdd	3.3

8. Software Project

8.1. Project Settings

Name	Value
Project Name	Pro
Project Folder	/home/yuan/Documents/STM32CubeMXPro/DriverProject
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