

## 1. Description

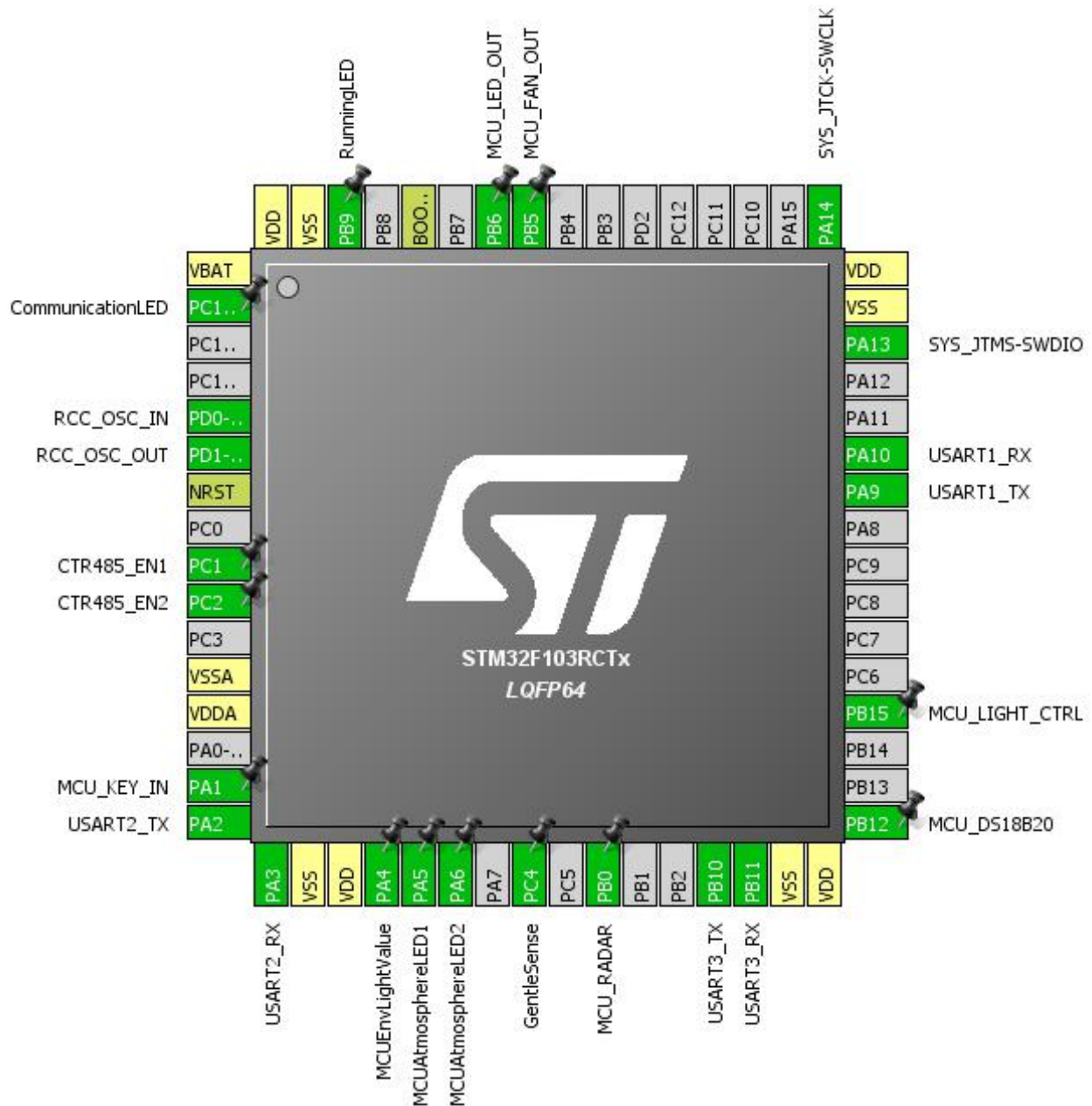
### 1.1. Project

Project Name	DSv1
Board Name	DSv1.1
Generated with:	STM32CubeMX 4.23.0
Date	11/22/2017

### 1.2. MCU

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

## 2. Pinout Configuration



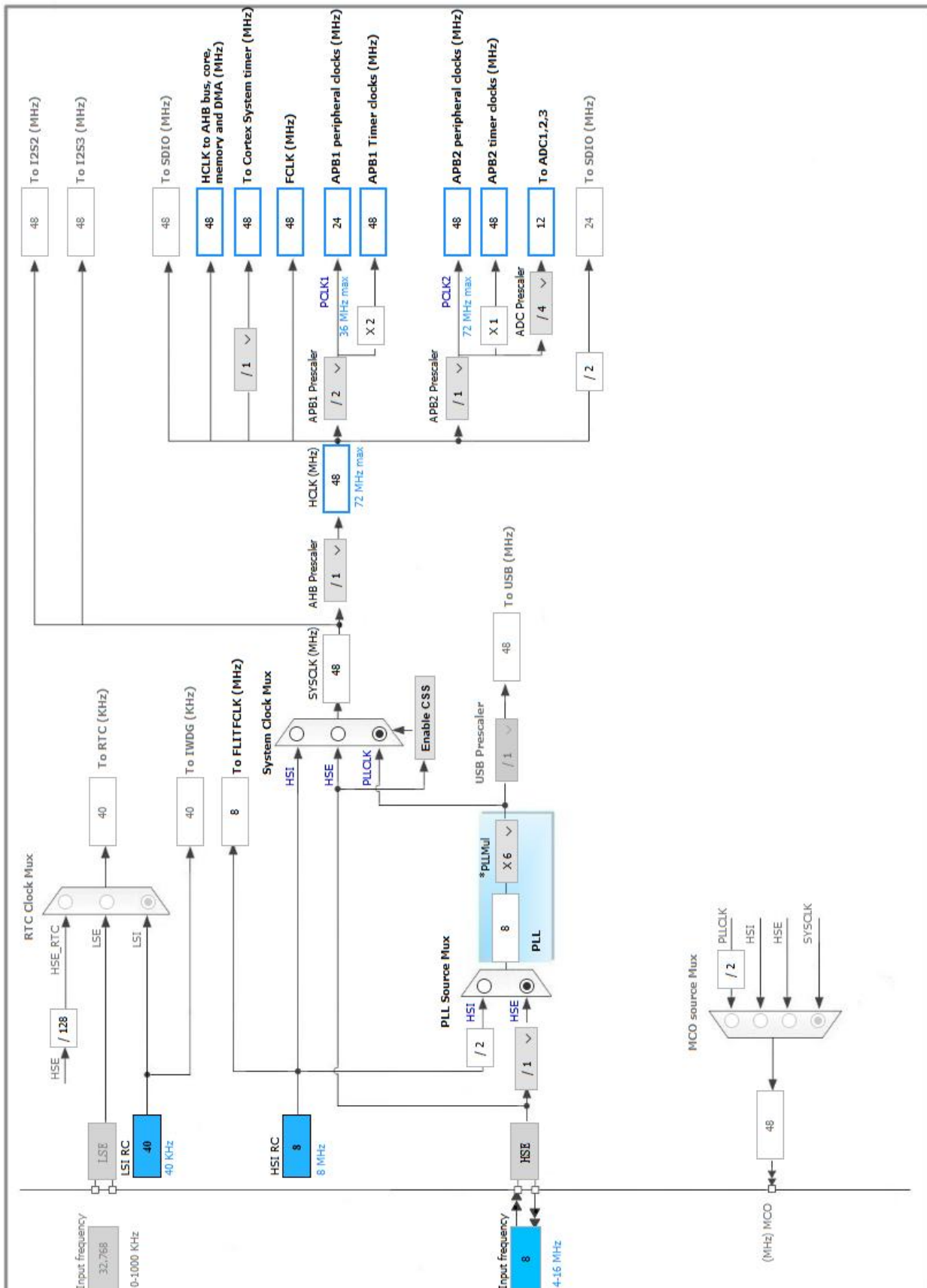
### 3. Pins Configuration

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		
9	PC1 *	I/O	GPIO_Output	CTR485_EN1
10	PC2 *	I/O	GPIO_Output	CTR485_EN2
12	VSSA	Power		
13	VDDA	Power		
15	PA1	I/O	GPIO_EXTI1	MCU_KEY_IN
16	PA2	I/O	USART2_TX	
17	PA3	I/O	USART2_RX	
18	VSS	Power		
19	VDD	Power		
20	PA4	I/O	ADC1_IN4	MCUEnvLightValue
21	PA5 *	I/O	GPIO_Output	MCUAtmosphereLED1
22	PA6 *	I/O	GPIO_Output	MCUAtmosphereLED2
24	PC4	I/O	GPIO_EXTI4	GentleSense
26	PB0 *	I/O	GPIO_Input	MCU_RADAR
29	PB10	I/O	USART3_TX	
30	PB11	I/O	USART3_RX	
31	VSS	Power		
32	VDD	Power		
33	PB12 *	I/O	GPIO_Output	MCU_DS18B20
36	PB15 *	I/O	GPIO_Input	MCU_LIGHT_CTRL
42	PA9	I/O	USART1_TX	
43	PA10	I/O	USART1_RX	
46	PA13	I/O	SYS_JTMS-SWDIO	
47	VSS	Power		
48	VDD	Power		
49	PA14	I/O	SYS_JTCK-SWCLK	
57	PB5 *	I/O	GPIO_Output	MCU_FAN_OUT
58	PB6 *	I/O	GPIO_Output	MCU_LED_OUT
60	BOOT0	Boot		
62	PB9 *	I/O	GPIO_Output	RunningLED
63	VSS	Power		

Pin Number LQFP64	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
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: IN4

#### 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 4

Sampling Time 1.5 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) 1 WS (2 CPU cycle)

##### RCC Parameters:

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

### 5.3. SYS

Debug: Serial Wire

Timebase Source: SysTick

### 5.4. TIM4

mode: Clock Source

#### 5.4.1. Parameter Settings:

##### Counter Settings:

Prescaler (PSC - 16 bits value)	<b>48-1 *</b>
Counter Mode	Up
Counter Period (AutoReload Register - 16 bits value )	<b>1000-1 *</b>
Internal Clock Division (CKD)	No Division
auto-reload preload	Disable

##### Trigger Output (TRGO) Parameters:

Master/Slave Mode	Disable (no sync between this TIM (Master) and its Slaves)
Trigger Event Selection	Reset (UG bit from TIMx_EGR)

### 5.5. TIM5

mode: Clock Source

#### 5.5.1. Parameter Settings:

##### Counter Settings:

Prescaler (PSC - 16 bits value)	<b>48-1 *</b>
Counter Mode	Up
Counter Period (AutoReload Register - 16 bits value )	<b>1000-1 *</b>
Internal Clock Division (CKD)	No Division
auto-reload preload	Disable

##### Trigger Output (TRGO) Parameters:

Master/Slave Mode  
Trigger Event Selection

Disable (no sync between this TIM (Master) and its Slaves  
Reset (UG bit from TIMx\_EGR)

## 5.6. USART1

**Mode: Asynchronous**

### 5.6.1. 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

## 5.7. USART2

**Mode: Asynchronous**

### 5.7.1. 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

## 5.8. USART3

**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

\* 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	PA4	ADC1_IN4	Analog mode	n/a	n/a	MCUEnvLightValue
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	
SYS	PA13	SYS_JTMS-SWDIO	n/a	n/a	n/a	
	PA14	SYS_JTCK-SWCLK	n/a	n/a	n/a	
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	
USART2	PA2	USART2_TX	Alternate Function Push Pull	n/a	High *	
	PA3	USART2_RX	Input mode	No pull-up and no pull-down	n/a	
USART3	PB10	USART3_TX	Alternate Function Push Pull	n/a	High *	
	PB11	USART3_RX	Input mode	No pull-up and no pull-down	n/a	
GPIO	PC13-TAMPER-RTC	GPIO_Output	Output Push Pull	n/a	Low	CommunicationLED
	PC1	GPIO_Output	Output Push Pull	n/a	Low	CTR485_EN1
	PC2	GPIO_Output	Output Push Pull	n/a	Low	CTR485_EN2
	PA1	GPIO_EXTI1	External Interrupt Mode with Rising edge trigger detection	No pull-up and no pull-down	n/a	MCU_KEY_IN
	PA5	GPIO_Output	Output Push Pull	n/a	Low	MCUAtmosphereLED1
	PA6	GPIO_Output	Output Push Pull	n/a	Low	MCUAtmosphereLED2
	PC4	GPIO_EXTI4	<b>External Interrupt Mode with Falling edge trigger detection</b>	<b>Pull-up *</b>	n/a	GentleSense
	PB0	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	MCU_RADAR
	PB12	GPIO_Output	Output Push Pull	n/a	Low	MCU_DS18B20
	PB15	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	MCU_LIGHT_CTRL
	PB5	GPIO_Output	Output Push Pull	n/a	Low	MCU_FAN_OUT
	PB6	GPIO_Output	Output Push Pull	n/a	Low	MCU_LED_OUT
	PB9	GPIO_Output	Output Push Pull	n/a	Low	RunningLED



## 6.2. DMA configuration

DMA request	Stream	Direction	Priority
USART1_RX	DMA1_Channel5	Peripheral To Memory	Low
USART1_TX	DMA1_Channel4	Memory To Peripheral	Low

### USART1\_RX: DMA1\_Channel5 DMA request Settings:

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

### USART1\_TX: DMA1\_Channel4 DMA request Settings:

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

### 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
PVD interrupt through EXTI line 16	true	0	0
EXTI line1 interrupt	true	0	0
EXTI line4 interrupt	true	0	0
DMA1 channel4 global interrupt	true	0	0
DMA1 channel5 global interrupt	true	0	0
ADC1 and ADC2 global interrupts	true	0	0
TIM4 global interrupt	true	0	0
USART1 global interrupt	true	0	0
USART2 global interrupt	true	0	0
USART3 global interrupt	true	0	0
TIM5 global interrupt	true	0	0
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	STM32F103RCTx
Datasheet	14611_Rev12

### 7.2. Parameter Selection

Temperature	25
Vdd	3.3

## 8. Software Project

### 8.1. Project Settings

Name	Value
Project Name	DSv1.1
Project Folder	E:\DSDome\DSv1.1
Toolchain / IDE	MDK-ARM V5
Firmware Package Name and Version	STM32Cube FW_F1 V1.6.0

### 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