

## 1. Description

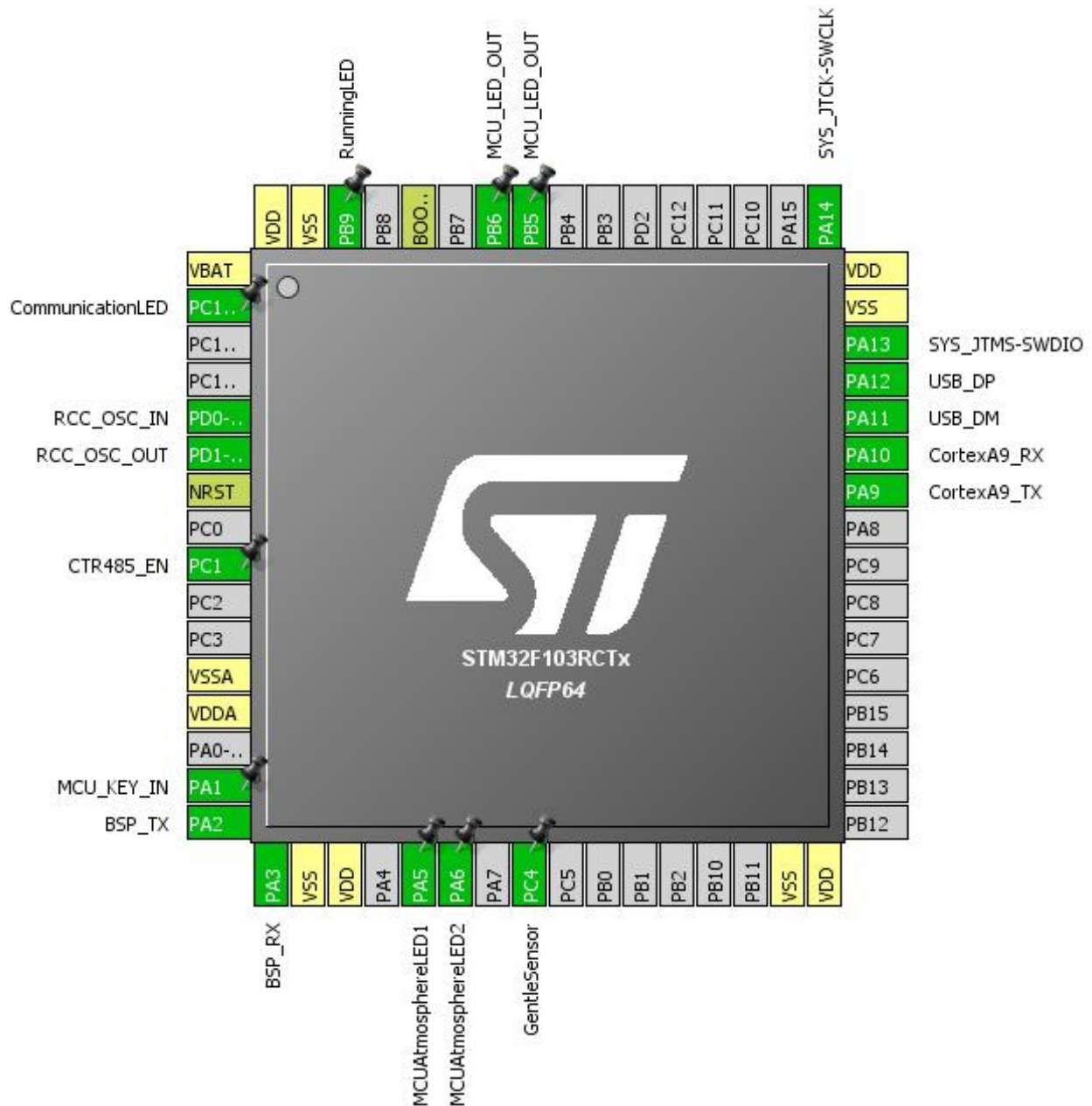
### 1.1. Project

Project Name	DSPro
Board Name	DSPro
Generated with:	STM32CubeMX 4.23.0
Date	12/07/2017

### 1.2. MCU

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

## 2. Pinout Configuration

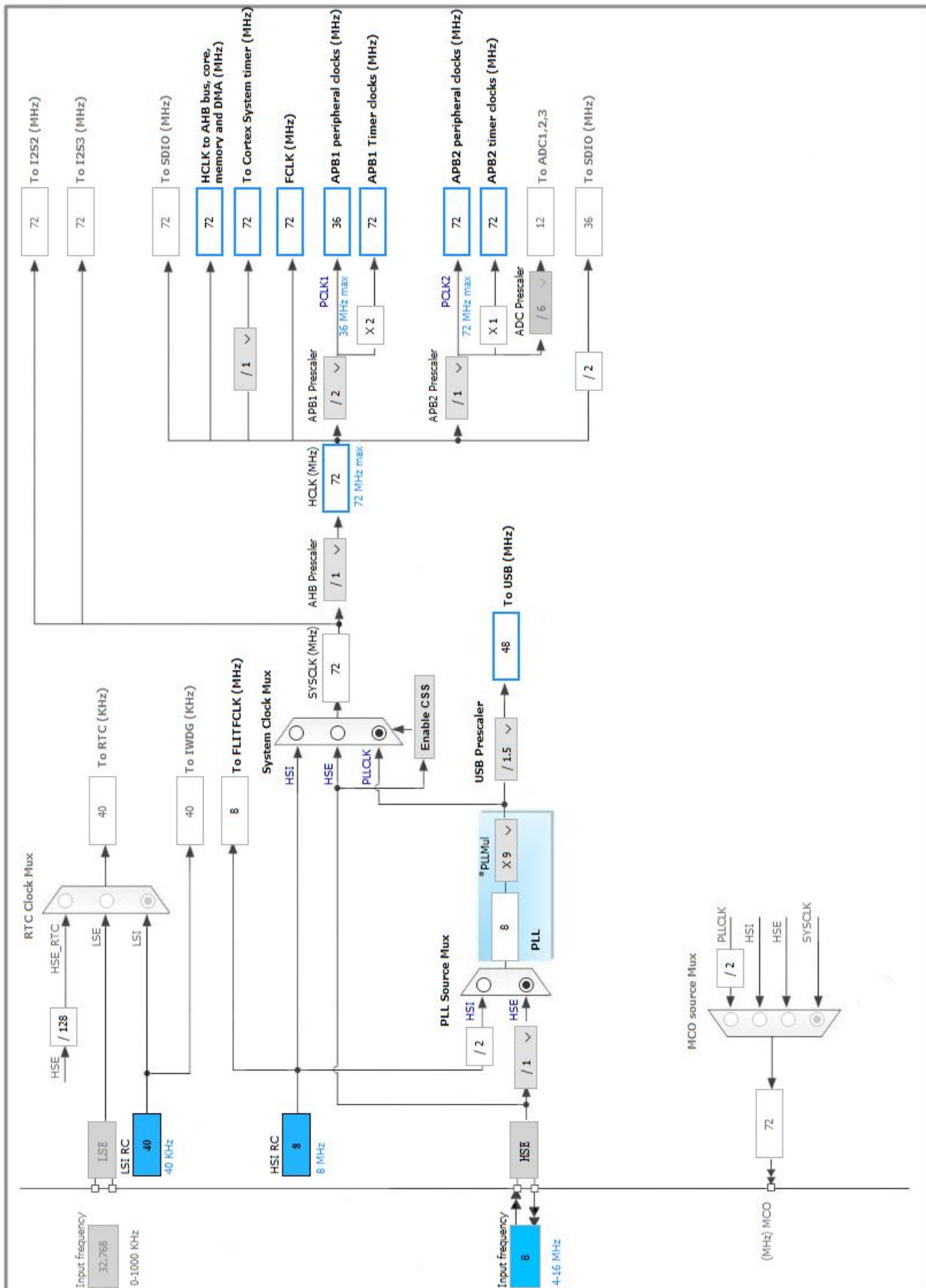


### 3. Pins Configuration

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_EN
12	VSSA	Power		
13	VDDA	Power		
15	PA1	I/O	GPIO_EXTI1	MCU_KEY_IN
16	PA2	I/O	USART2_TX	BSP_TX
17	PA3	I/O	USART2_RX	BSP_RX
18	VSS	Power		
19	VDD	Power		
21	PA5 *	I/O	GPIO_Output	MCUAtmosphereLED1
22	PA6 *	I/O	GPIO_Output	MCUAtmosphereLED2
24	PC4 *	I/O	GPIO_Input	GentleSensor
31	VSS	Power		
32	VDD	Power		
42	PA9	I/O	USART1_TX	CortexA9_TX
43	PA10	I/O	USART1_RX	CortexA9_RX
44	PA11	I/O	USB_DM	
45	PA12	I/O	USB_DP	
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_LED_OUT
58	PB6 *	I/O	GPIO_Output	MCU_LED_OUT
60	BOOT0	Boot		
62	PB9 *	I/O	GPIO_Output	RunningLED
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. RCC

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

##### 5.1.1. 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

### 5.2. SYS

#### Debug: Serial Wire

#### Timebase Source: SysTick

### 5.3. TIM4

#### mode: Clock Source

##### 5.3.1. Parameter Settings:

###### Counter Settings:

Prescaler (PSC - 16 bits value)	<b>72-1 *</b>
Counter Mode	Up
Counter Period (AutoReload Register - 16 bits value )	<b>1000-1 *</b>
Internal Clock Division (CKD)	No Division
auto-reload preload	<b>Enable *</b>

###### 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)

## 5.4. TIM5

mode: Clock Source

### 5.4.1. Parameter Settings:

#### Counter Settings:

Prescaler (PSC - 16 bits value)	72-1 *
Counter Mode	Up
Counter Period (AutoReload Register - 16 bits value )	100-1 *
Internal Clock Division (CKD)	No Division
auto-reload preload	Enable *

#### 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. USART1

Mode: Asynchronous

### 5.5.1. 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

## 5.6. USART2

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. USB

### mode: Device (FS)

### 5.7.1. Parameter Settings:

#### Basic Parameters:

Speed	Full Speed 12MBit/s
Endpoint 0 Max Packet size	8 Bytes

#### Power Parameters:

Low Power	Disabled
Link Power Management	Disabled
Battery Charging	Disabled

## 5.8. USB\_DEVICE

### Class For FS IP: Communication Device Class (Virtual Port Com)

### 5.8.1. Parameter Settings:

#### Basic Parameters:

USBD_MAX_NUM_INTERFACES (Maximum number of supported interfaces)	1
USBD_MAX_NUM_CONFIGURATION (Maximum number of supported configuration)	1
USBD_MAX_STR_DESC_SIZ (Maximum size for the string descriptors)	512
USBD_SUPPORT_USER_STRING (Enable user string descriptor)	Disabled
USBD_SELF_POWERED (Enabled self power)	Enabled
USBD_DEBUG_LEVEL (USBD Debug Level)	0: No debug message

**Class Parameters:**

USB CDC Rx Buffer Size	2048
USB CDC Tx Buffer Size	2048

**5.8.2. Device Descriptor:**

**Device Descriptor:**

VID (Vendor Identifier)	1155
LANGID_STRING (Language Identifier)	English(United States)
MANUFACTURER_STRING (Manufacturer Identifier)	STMicroelectronics

**Device Descriptor FS:**

PID (Product Identifier)	22336
PRODUCT_STRING (Product Identifier)	STM32 Virtual ComPort
SERIALNUMBER_STRING (Serial number)	00000000001A
CONFIGURATION_STRING (Configuration Identifier)	CDC Config
INTERFACE_STRING (Interface Identifier)	CDC Interface

\* User modified value



## 6. System Configuration

### 6.1. GPIO configuration

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
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	<b>High *</b>	CortexA9_TX
	PA10	USART1_RX	Input mode	No pull-up and no pull-down	<b>n/a</b>	CortexA9_RX
USART2	PA2	USART2_TX	Alternate Function Push Pull	n/a	<b>High *</b>	BSP_TX
	PA3	USART2_RX	Input mode	No pull-up and no pull-down	<b>n/a</b>	BSP_RX
USB	PA11	USB_DM	n/a	n/a	n/a	
	PA12	USB_DP	n/a	n/a	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_EN
	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_Input	Input mode	<b>Pull-up *</b>	n/a	GentleSensor
	PB5	GPIO_Output	Output Push Pull	<b>n/a</b>	Low	MCU_LED_OUT
	PB6	GPIO_Output	Output Push Pull	<b>n/a</b>	Low	MCU_LED_OUT
	PB9	GPIO_Output	Output Push Pull	<b>n/a</b>	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
USART2_RX	DMA1_Channel6	Peripheral To Memory	Low
USART2_TX	DMA1_Channel7	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

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

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

### USART2\_TX: DMA1\_Channel7 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
EXTI line1 interrupt	true	0	0
DMA1 channel4 global interrupt	true	0	0
DMA1 channel5 global interrupt	true	0	0
DMA1 channel6 global interrupt	true	0	0
DMA1 channel7 global interrupt	true	0	0
USB low priority or CAN RX0 interrupts	true	0	0
TIM4 global interrupt	true	0	0
USART1 global interrupt	true	0	0
USART2 global interrupt	true	0	0
TIM5 global interrupt	true	0	0
PVD interrupt through EXTI line 16	unused		
Flash global interrupt	unused		
RCC global interrupt	unused		
USB high priority or CAN TX interrupts	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	DSPro
Project Folder	C:\Users\17657\Desktop\DSv1.3\DSPro
Toolchain / IDE	EWARM
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