

## 1. Description

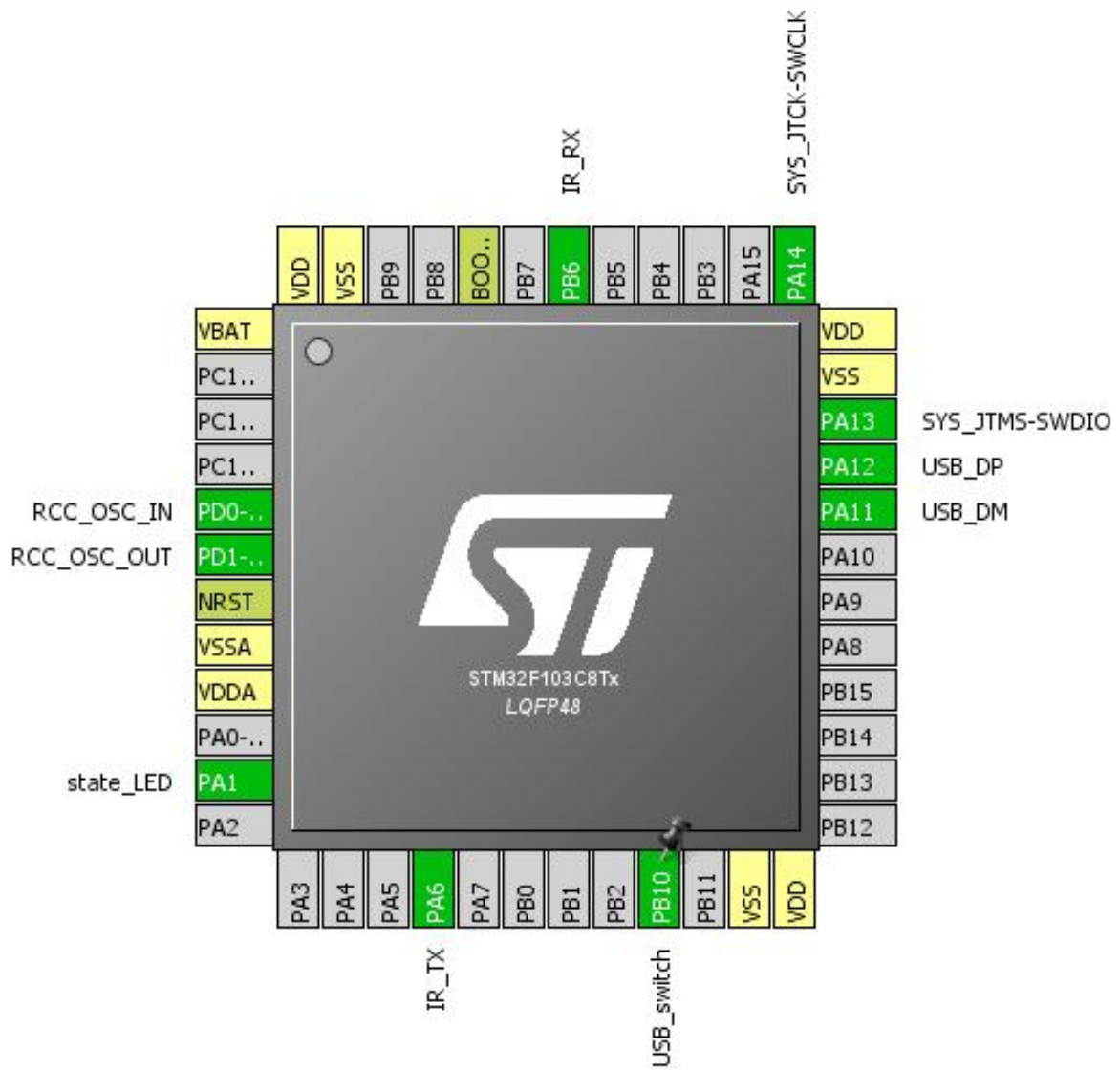
### 1.1. Project

Project Name	IR_stm32f103C8_HW0_1
Board Name	IR_stm32f103C8_HW0_1
Generated with:	STM32CubeMX 4.22.0
Date	09/01/2017

### 1.2. MCU

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

## 2. Pinout Configuration

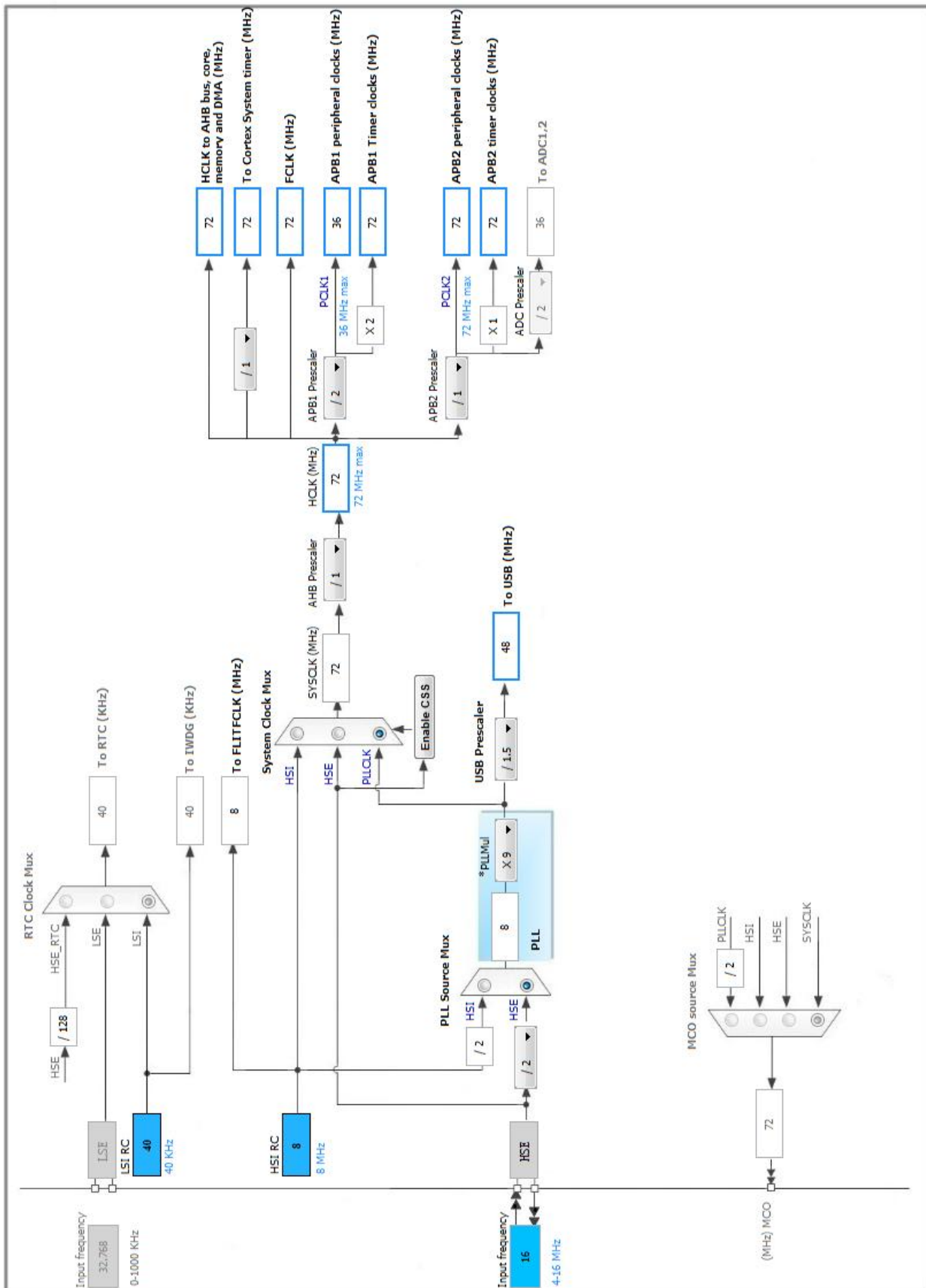


### 3. Pins Configuration

Pin Number LQFP48	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
1	VBAT	Power		
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		
11	PA1	I/O	TIM2_CH2	state_LED
16	PA6	I/O	TIM3_CH1	IR_TX
21	PB10 *	I/O	GPIO_Output	USB_switch
23	VSS	Power		
24	VDD	Power		
32	PA11	I/O	USB_DM	
33	PA12	I/O	USB_DP	
34	PA13	I/O	SYS_JTMS-SWDIO	
35	VSS	Power		
36	VDD	Power		
37	PA14	I/O	SYS_JTCK-SWCLK	
42	PB6	I/O	TIM4_CH1	IR_RX
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. CRC

mode: Activated

### 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. SYS

Debug: Serial Wire

Timebase Source: SysTick

### 5.4. TIM1

Clock Source : Internal Clock

#### 5.4.1. Parameter Settings:

##### Counter Settings:

Prescaler (PSC - 16 bits value)	0
Counter Mode	Up
Counter Period (AutoReload Register - 16 bits value )	<b>7200 *</b>
Internal Clock Division (CKD)	No Division
Repetition Counter (RCR - 8 bits value)	0
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. TIM2

### Channel2: PWM Generation CH2

#### 5.5.1. Parameter Settings:

##### Counter Settings:

Prescaler (PSC - 16 bits value)	<b>20000-1 *</b>
Counter Mode	Up
Counter Period (AutoReload Register - 16 bits value )	<b>600 *</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)

##### PWM Generation Channel 2:

Mode	PWM mode 1
Pulse (16 bits value)	<b>300 *</b>
Fast Mode	Disable
CH Polarity	High

## 5.6. TIM3

### Channel1: PWM Generation CH1

#### 5.6.1. Parameter Settings:

##### Counter Settings:

Prescaler (PSC - 16 bits value)	0
Counter Mode	Up
Counter Period (AutoReload Register - 16 bits value )	<b>1800 *</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)
<b>PWM Generation Channel 1:</b>	
Mode	PWM mode 1
Pulse (16 bits value)	<b>600 *</b>
Fast Mode	Disable
CH Polarity	High

## 5.7. TIM4

### Channel1: Input Capture direct mode

#### 5.7.1. Parameter Settings:

##### Counter Settings:

Prescaler (PSC - 16 bits value)	<b>7200-1 *</b>
Counter Mode	Up
Counter Period (AutoReload Register - 16 bits value )	<b>100 *</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)

##### Input Capture Channel 1:

Polarity Selection	<b>Falling Edge *</b>
IC Selection	Direct
Prescaler Division Ratio	No division
Input Filter (4 bits value)	0

## 5.8. USB

### mode: Device (FS)

#### 5.8.1. Parameter Settings:

##### Basic Parameters:

Speed	Full Speed 12MBit/s
Endpoint 0 Max Packet size	<b>64 Bytes *</b>

**Power Parameters:**

Low Power	Disabled
Link Power Management	Disabled
Battery Charging	Disabled

## 5.9. USB\_DEVICE

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

#### 5.9.1. 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

#### 5.9.2. 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	
TIM2	PA1	TIM2_CH2	Alternate Function Push Pull	n/a	Low	state_LED
TIM3	PA6	TIM3_CH1	Alternate Function Push Pull	n/a	Low	IR_TX
TIM4	PB6	TIM4_CH1	Input mode	No pull-up and no pull-down	n/a	IR_RX
USB	PA11	USB_DM	n/a	n/a	n/a	
	PA12	USB_DP	n/a	n/a	n/a	
GPIO	PB10	GPIO_Output	Output Push Pull	n/a	Low	USB_switch

### 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	2	0
USB low priority or CAN RX0 interrupts	true	0	0
TIM4 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		
TIM1 break interrupt	unused		
TIM1 update interrupt	unused		
TIM1 trigger and commutation interrupts	unused		
TIM1 capture compare interrupt	unused		
TIM2 global interrupt	unused		
TIM3 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

## 8. Software Project

### 8.1. Project Settings

Name	Value
Project Name	IR_stm32f103C8_HW0_1
Project Folder	G:\learn\barry_code\stm32\IR_stm32f103C8_HW0_1
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