1. Description

1.1. Project

Project Name	STMeteo_ver_1
Board Name	custom
Generated with:	STM32CubeMX 6.13.0
Date	01/28/2025

1.2. MCU

MCU Series	STM32G0
MCU Line	STM32G0x0 Value line
MCU name	STM32G070KBTx
MCU Package	LQFP32
MCU Pin number	32

1.3. Core(s) information

Core(s)	ARM Cortex-M0+

2. Pinout Configuration
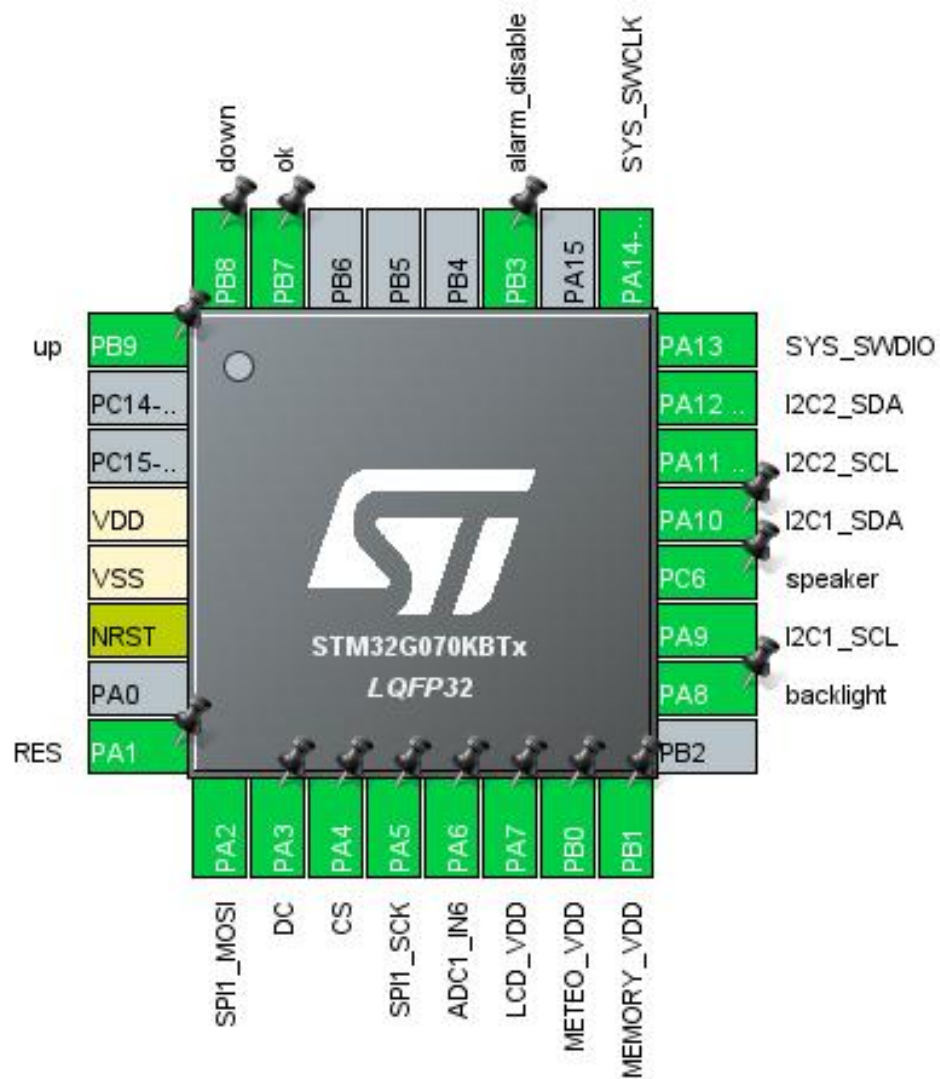
3. Pins Configuration

Pin Number LQFP32	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
1	PB9 *	I/O	GPIO_Input	up
4	VDD	Power		
5	VSS	Power		
6	NRST	Reset		
8	PA1 *	I/O	GPIO_Output	RES
9	PA2	I/O	SPI1_MOSI	
10	PA3 *	I/O	GPIO_Output	DC
11	PA4 *	I/O	GPIO_Output	CS
12	PA5	I/O	SPI1_SCK	
13	PA6	I/O	ADC1_IN6	
14	PA7 *	I/O	GPIO_Output	LCD_VDD
15	PB0 *	I/O	GPIO_Output	METEO_VDD
16	PB1 *	I/O	GPIO_Output	MEMORY_VDD
18	PA8	I/O	TIM1_CH1	backlight
19	PA9	I/O	I2C1_SCL	
20	PC6	I/O	TIM3_CH1	speaker
21	PA10	I/O	I2C1_SDA	
22	PA11 [PA9]	I/O	I2C2_SCL	
23	PA12 [PA10]	I/O	I2C2_SDA	
24	PA13	I/O	SYS_SWDIO	
25	PA14-BOOT0	I/O	SYS_SWCLK	
27	PB3 *	I/O	GPIO_Input	alarm_disable
31	PB7	I/O	GPIO_EXTI7	ok
32	PB8 *	I/O	GPIO_Input	down

* The pin is affected with an I/O function

4. Clock Tree Configuration
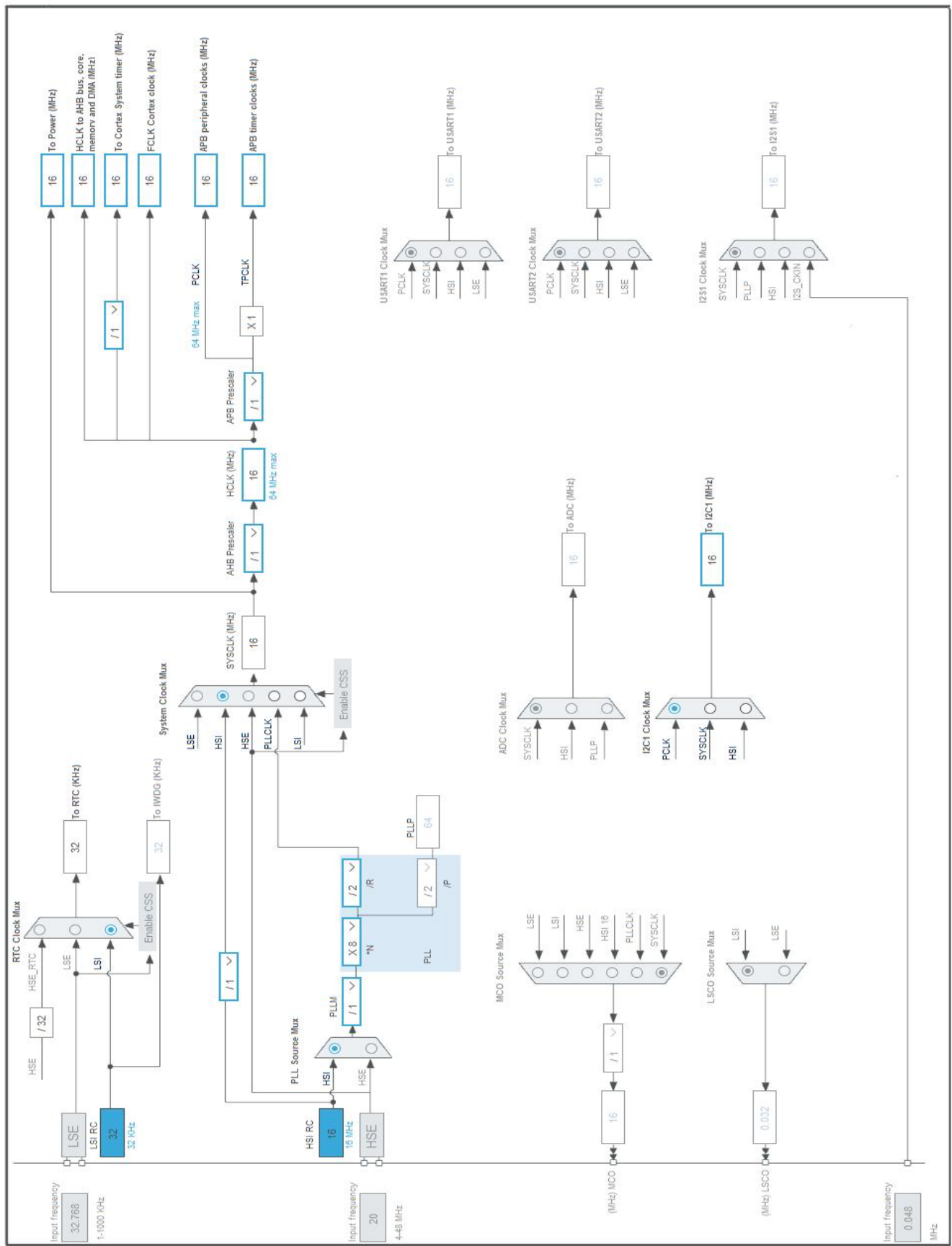
1. Power Consumption Calculator report

1.1. Microcontroller Selection

Series	STM32G0
Line	STM32G0x0 Value line
MCU	STM32G070KBTx
Datasheet	DS12766_Rev0

1.2. Parameter Selection

Temperature	25
Vdd	3.0

1.3. Battery Selection

Battery	Li-SOCL2(AAA700)
Capacity	700.0 mAh
Self Discharge	0.08 %/month
Nominal Voltage	3.6 V
Max Cont Current	10.0 mA
Max Pulse Current	30.0 mA
Cells in series	1
Cells in parallel	1

1.4. Sequence

Step	Step1	Step2	Step3
Mode	RUN	STOP1	STOP1
Vdd	3.0	3.0	3.0
Voltage Source	Battery	Battery	Vbus
Range	Range1-High	NoRange	NoRange
Fetch Type	FLASH	Flash-PowerDown	FLASH
CPU Frequency	64 MHz	16 MHz	16 MHz
Clock Configuration	HSI PLL	HSI	HSI
Clock Source Frequency	16 MHz	16 MHz	16 MHz
Peripherals			
Additional Cons.	0 mA	0 mA	0 mA
Average Current	7.04 mA	3.74 µA	8.09 µA
Duration	0.1 ms	0.9 ms	1 ms
DMIPS	80.0	0.0	20.0
Ta Max	128.39	130	130
Category	In DS Table	In DS Table	In DS Table

1.5. Results

Sequence Time	2 ms	Average Current	357.73 µA
Battery Life	2 months, 21 days, 10 hours	Average DMIPS	25.454546 DMIPS

1.6. Chart

Consumption Profile by Step
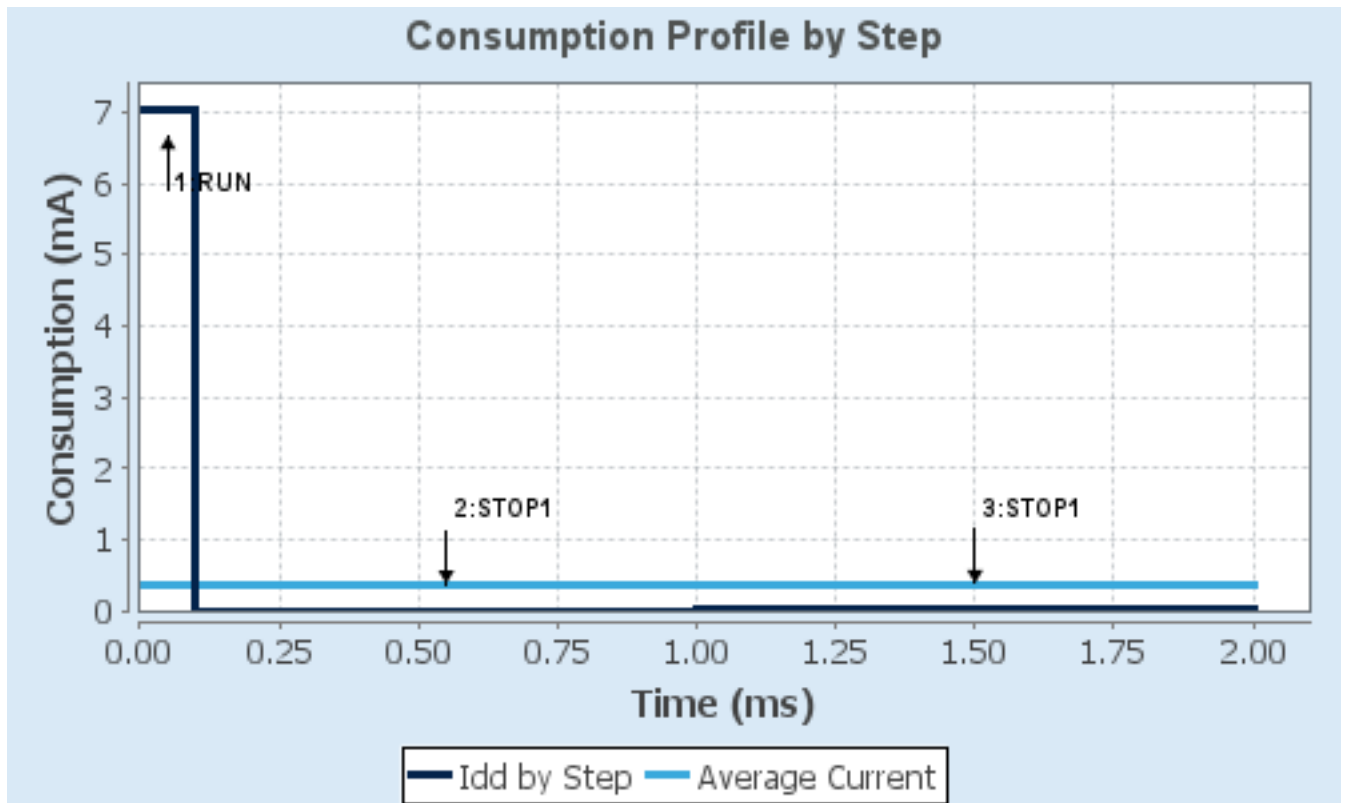
2. Software Project

2.1. Project Settings

Name	Value
Project Name	STMeteo_ver_1.1
Project Folder	D:\STM32Proj\STMeteo_ver_1.1
Toolchain / IDE	STM32CubeIDE
Firmware Package Name and Version	STM32Cube FW_G0 V1.6.2
Application Structure	Advanced
Generate Under Root	Yes
Do not generate the main()	No
Minimum Heap Size	0x200
Minimum Stack Size	0x400

2.2. Code Generation Settings

Name	Value
STM32Cube MCU packages and embedded software	Copy only the necessary library files
Generate peripheral initialization as a pair of '.c/.h' files	Yes
Backup previously generated files when re-generating	No
Keep User Code when re-generating	Yes
Delete previously generated files when not re-generated	Yes
Set all free pins as analog (to optimize the power consumption)	No
Enable Full Assert	No

2.3. Advanced Settings - Generated Function Calls

Rank	Function Name	Peripheral Instance Name
1	SystemClock_Config	RCC
2	MX_GPIO_Init	GPIO
3	MX_ADC1_Init	ADC1
4	MX_CRC_Init	CRC
5	MX_I2C1_Init	I2C1
6	MX_I2C2_Init	I2C2
7	MX_SPI1_Init	SPI1
8	MX_TIM1_Init	TIM1
9	MX_TIM3_Init	TIM3
10	MX_RTC_Init	RTC

3. Peripherals and Middlewares Configuration

3.1. ADC1

mode: IN6

3.1.1. Parameter Settings:

ADC_Settings:

Clock Prescaler	Synchronous clock mode divided by 2
Resolution	ADC 12-bit resolution
Data Alignment	Right alignment
Sequencer	Sequencer set to fully configurable
Scan Conversion Mode	Disabled
Continuous Conversion Mode	Disabled
Discontinuous Conversion Mode	Disabled
DMA Continuous Requests	Disabled
End Of Conversion Selection	End of single conversion
Overrun behaviour	Overrun data preserved
Low Power Auto Wait	**Enabled ***
Auto Off	**Enabled ***
Oversampling Mode	Disabled

ADC_Regular_ConversionMode:

SamplingTime Common 1	**160.5 Cycles ***
SamplingTime Common 2	**160.5 Cycles ***
Number Of Conversion	1
External Trigger Conversion Source	Regular Conversion launched by software
External Trigger Conversion Edge	None
Trigger Frequency	High frequency
Rank	1
Channel	Channel 6
Sampling Time	Sampling time common 1

Analog Watchdog 1:

Enable Analog WatchDog1 Mode	false

Analog Watchdog 2:

Enable Analog WatchDog2 Mode	false

Analog Watchdog 3:

Enable Analog WatchDog3 Mode	false

3.2. CRC

mode: Activated

3.2.1. Parameter Settings:

Basic Parameters:

Default Polynomial State	Enable
Default Init Value State	Enable

Advanced Parameters:

Input Data Inversion Mode	None
Output Data Inversion Mode	Disable
Input Data Format	Bytes

3.3. I2C1

I2C: I2C

3.3.1. Parameter Settings:

Timing configuration:

Custom Timing	Disabled
I2C Speed Mode	Standard Mode
I2C Speed Frequency (KHz)	100
Rise Time (ns)	100
Fall Time (ns)	100
Coefficient of Digital Filter	0
Analog Filter	Enabled
Timing	**0x00503D58 ***

Slave Features:

Clock No Stretch Mode	Disabled
General Call Address Detection	Disabled
Primary Address Length selection	7-bit
Dual Address Acknowledged	Disabled
Primary slave address	0

3.4. I2C2

mode: I2C

3.4.1. Parameter Settings:

Timing configuration:

Custom Timing	Disabled

I2C Speed Mode	Standard Mode
I2C Speed Frequency (KHz)	100
Rise Time (ns)	100
Fall Time (ns)	100
Coefficient of Digital Filter	0
Analog Filter	Enabled
Timing	**0x00503D58 ***

Slave Features:

Clock No Stretch Mode	Disabled
General Call Address Detection	Disabled
Primary Address Length selection	7-bit
Dual Address Acknowledged	Disabled
Primary slave address	0

3.5. RCC

3.5.1. Parameter Settings:

System Parameters:

VDD voltage (V)	3.3
Instruction Cache	Enabled
Prefetch Buffer	Enabled
Data Cache	Enabled
Flash Latency(WS)	0 WS (1 CPU cycle)

RCC Parameters:

HSI Calibration Value	64
HSE Startup Timout Value (ms)	100
LSE Startup Timout Value (ms)	5000

Power Parameters:

Power Regulator Voltage Scale	Power Regulator Voltage Scale 1

Peripherals Clock Configuration:

Generate the peripherals clock configuration	TRUE

3.6. RTC
mode: Activate Clock Source
mode: Activate Calendar
Alarm A: Internal Alarm A

3.6.1. Parameter Settings:

General:

Hour Format	Hourformat 24
Asynchronous Predivider value	**31 ***
Synchronous Predivider value	**999 ***

Calendar Time:

Data Format	**Binary data format ***
Hours	0
Minutes	0
Seconds	**10 ***
SubSeconds	0
Day Light Saving: value of hour adjustment	Daylightsaving None
Store Operation	Storeoperation Reset

Calendar Date:

Week Day	Monday
Month	January
Date	1
Year	0

Alarm A:

Hours	0
Minutes	0
Seconds	**10 ***
Sub Seconds	0
Alarm Mask Date Week day	**Enable ***
Alarm Mask Hours	**Enable ***
Alarm Mask Minutes	**Enable ***
Alarm Mask Seconds	Disable
Alarm Sub Second Mask	All Alarm SS fields are masked.
Alarm Date Week Day Sel	Date
Alarm Date	1

3.7. SPI1
Mode: Transmit Only Master
3.7.1. Parameter Settings:

Basic Parameters:

Frame Format	Motorola

Data Size	**8 Bits ***
First Bit	MSB First

Clock Parameters:

Prescaler (for Baud Rate)	2
Baud Rate	**8.0 MBits/s ***
Clock Polarity (CPOL)	Low
Clock Phase (CPHA)	1 Edge

Advanced Parameters:

CRC Calculation	Disabled
NSSP Mode	Enabled
NSS Signal Type	Software

3.8. SYS
mode: Debug
Timebase Source: SysTick
mode: save power of non-active UCPD - deactive Dead Battery pull-up

3.9. TIM1
Channel1: PWM Generation CH1
3.9.1. Parameter Settings:

Counter Settings:

Prescaler (PSC - 16 bits value)	0
Counter Mode	Up
Counter Period (AutoReload Register - 16 bits value)	**1023 ***
Internal Clock Division (CKD)	No Division
Repetition Counter (RCR - 16 bits value)	0
auto-reload preload	Disable

Trigger Output (TRGO) Parameters:

Master/Slave Mode (MSM bit)	Disable (Trigger input effect not delayed)
Trigger Event Selection TRGO	Reset (UG bit from TIMx_EGR)
Trigger Event Selection TRGO2	Reset (UG bit from TIMx_EGR)

Break And Dead Time management - BRK Configuration:

BRK State	Disable
BRK Polarity	High
BRK Filter (4 bits value)	0
BRK Sources Configuration	
- Digital Input	Disable

Break And Dead Time management - BRK2 Configuration:

BRK2 State	Disable
BRK2 Polarity	High
BRK2 Filter (4 bits value)	0
BRK2 Sources Configuration	
- Digital Input	Disable

Break And Dead Time management - Output Configuration:

Automatic Output State	Disable
Off State Selection for Run Mode (OSSR)	Disable
Off State Selection for Idle Mode (OSSI)	Disable
Lock Configuration	Off

Clear Input:

Clear Input Source	Disable

PWM Generation Channel 1:

Mode	PWM mode 1
Pulse (16 bits value)	0
Output compare preload	Enable
Fast Mode	Disable
CH Polarity	High
CH Idle State	Reset

3.10. TIM3

Channel1: PWM Generation CH1

3.10.1. Parameter Settings:

Counter Settings:

Prescaler (PSC - 16 bits value)	**16 ***
Counter Mode	Up
Counter Period (AutoReload Register - 16 bits value)	**460 ***
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 TRGO	Reset (UG bit from TIMx_EGR)

Clear Input:

Clear Input Source	Disable

PWM Generation Channel 1:

Mode	PWM mode 1
Pulse (16 bits value)	0

Output compare preload   Enable
Fast Mode   Disable
CH Polarity   High

* User modified value

4. System Configuration

4.1. GPIO configuration

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
ADC1	PA6	ADC1_IN6	Analog mode	No pull-up and no pull-down	n/a	
I2C1	PA9	I2C1_SCL	Alternate Function Open Drain	No pull-up and no pull-down	**Very High ***	
	PA10	I2C1_SDA	Alternate Function Open Drain	No pull-up and no pull-down	**Very High ***	
I2C2	PA11 [PA9]	I2C2_SCL	Alternate Function Open Drain	No pull-up and no pull-down	**Very High ***	
	PA12 [PA10]	I2C2_SDA	Alternate Function Open Drain	No pull-up and no pull-down	**Very High ***	
SPI1	PA2	SPI1_MOSI	Alternate Function Push Pull	No pull-up and no pull-down	**Very High ***	
	PA5	SPI1_SCK	Alternate Function Push Pull	No pull-up and no pull-down	**Very High ***	
SYS	PA13	SYS_SWDIO	n/a	n/a	n/a	
	PA14-BOOT0	SYS_SWCLK	n/a	n/a	n/a	
TIM1	PA8	TIM1_CH1	Alternate Function Push Pull	No pull-up and no pull-down	**Very High ***	backlight
TIM3	PC6	TIM3_CH1	Alternate Function Push Pull	No pull-up and no pull-down	**Very High ***	speaker
GPIO	PB9	GPIO_Input	Input mode	**Pull-up ***	n/a	up
	PA1	GPIO_Output	Output Push Pull	No pull-up and no pull-down	**Very High ***	RES
	PA3	GPIO_Output	Output Push Pull	No pull-up and no pull-down	**Very High ***	DC
	PA4	GPIO_Output	Output Push Pull	No pull-up and no pull-down	**Very High ***	CS
	PA7	GPIO_Output	Output Push Pull	No pull-up and no pull-down	**High ***	LCD_VDD
	PB0	GPIO_Output	Output Push Pull	No pull-up and no pull-down	**High ***	METEO_VDD
	PB1	GPIO_Output	Output Push Pull	No pull-up and no pull-down	**High ***	MEMORY_VDD
	PB3	GPIO_Input	Input mode	**Pull-up ***	**n/a**	alarm_disable
	PB7	GPIO_EXTI7	**External Interrupt Mode with Falling**	**Pull-up ***	**n/a**	ok

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
			edge trigger detection			
	PB8	GPIO_Input	Input mode	**Pull-up ***	**n/a**	down

4.2. DMA configuration

nothing configured in DMA service

4.3. NVIC configuration

4.3.1. NVIC

Interrupt Table	Enable	Preenmption Priority	SubPriority
Non maskable interrupt	true	0	0
Hard fault interrupt	true	0	0
System service call via SWI instruction	true	0	0
Pendable request for system service	true	0	0
System tick timer	true	3	0
RTC and TAMP interrupts through EXTI lines 19 and 21	true	0	0
EXTI line 4 to 15 interrupts	true	0	0
Flash global interrupt	unused		
RCC global interrupt	unused		
ADC1 interrupt	unused		
TIM1 break, update, trigger and commutation interrupts	unused		
TIM1 capture compare interrupt	unused		
TIM3 global interrupt	unused		
I2C1 event global interrupt / I2C1 wake-up interrupt through EXTI line 23	unused		
I2C2 global interrupt	unused		
SPI1 global interrupt	unused		

4.3.2. NVIC Code generation

Enabled interrupt Table	Select for init sequence ordering	Generate IRQ handler	Call HAL handler
Non maskable interrupt	false	true	false
Hard fault interrupt	false	true	false
System service call via SWI instruction	false	true	false
Pendable request for system service	false	true	false
System tick timer	false	true	true
RTC and TAMP interrupts through EXTI lines 19 and 21	false	true	true
EXTI line 4 to 15 interrupts	false	true	true

* User modified value

5. System Views

5.1. Category view

5.1.1. Current

6. Docs & Resources

Type   Link