1. Description

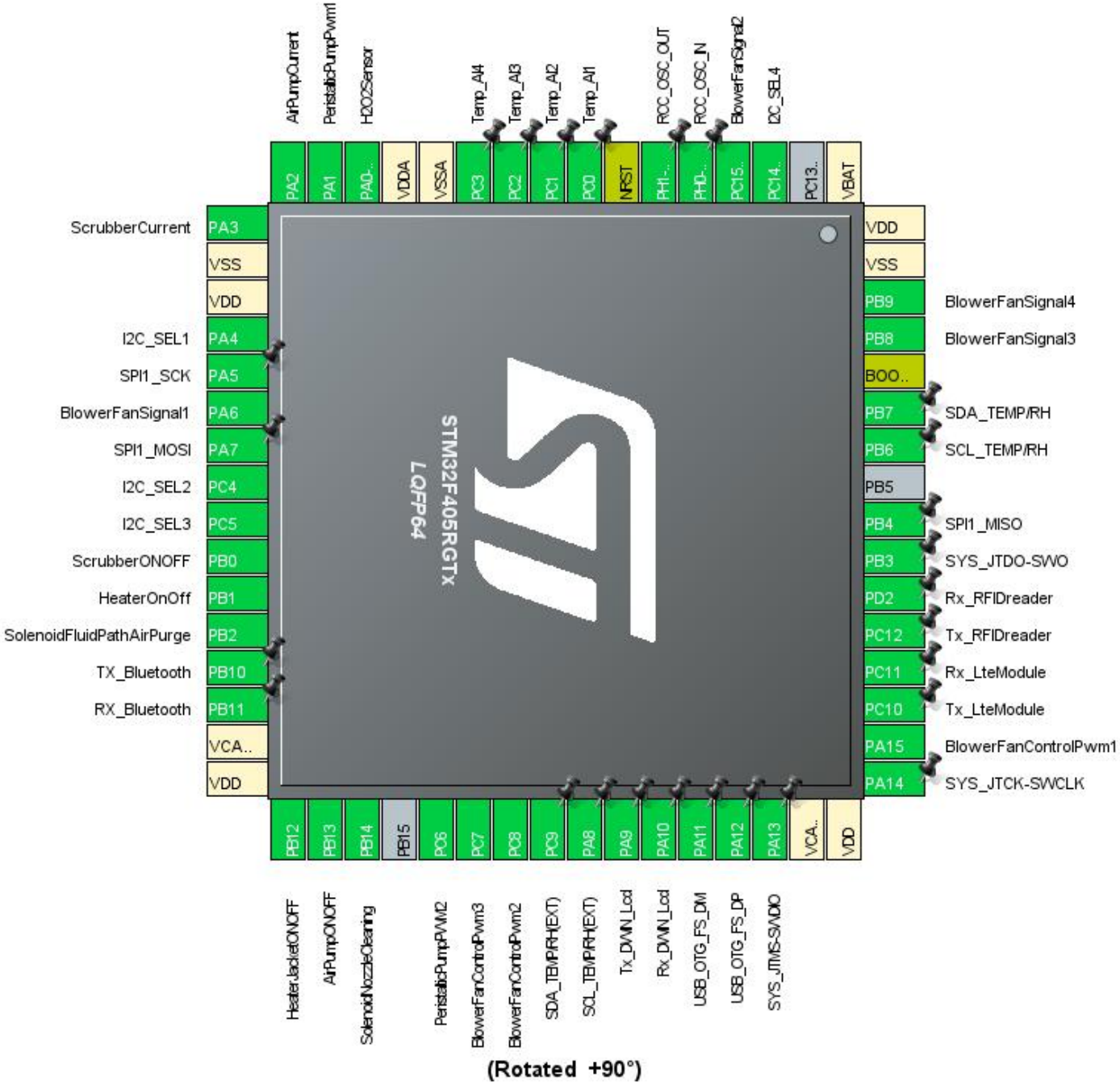
1.1. Project

Project Name	CleanBioTech
Board Name	custom
Generated with:	STM32CubeMX 5.2.0
Date	05/27/2019

1.2. MCU

MCU Series	STM32F4
MCU Line	STM32F405/415
MCU name	STM32F405RGTx
MCU Package	LQFP64
MCU Pin number	64

2. Pinout Configuration



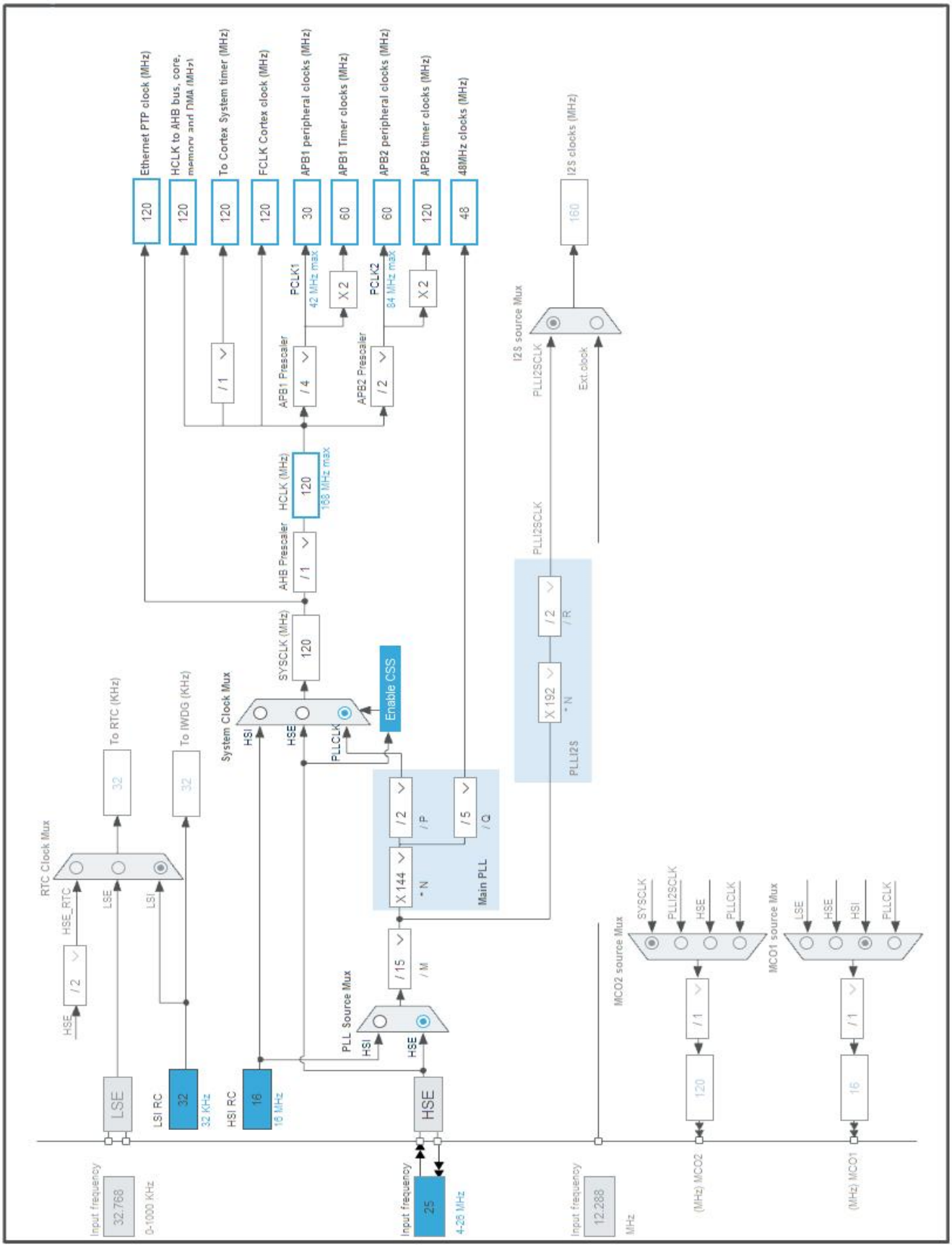
3. Pins Configuration

Pin Number LQFP64	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
1	VBAT	Power		
3	PC14-OSC32_IN *	I/O	GPIO_Output	I2C_SEL4
4	PC15-OSC32_OUT *	I/O	GPIO_Input	BlowerFanSignal2
5	PH0-OSC_IN	I/O	RCC_OSC_IN	
6	PH1-OSC_OUT	I/O	RCC_OSC_OUT	
7	NRST	Reset		
8	PC0	I/O	ADC2_IN10	Temp_AI1
9	PC1	I/O	ADC1_IN11	Temp_AI2
10	PC2	I/O	ADC1_IN12	Temp_AI3
11	PC3	I/O	ADC1_IN13	Temp_AI4
12	VSSA	Power		
13	VDDA	Power		
14	PA0-WKUP	I/O	ADC1_IN0	H2O2Sensor
15	PA1	I/O	TIM5_CH2	PeristalticPumpPwm1
16	PA2	I/O	ADC2_IN2	AirPumpCurrent
17	PA3	I/O	ADC3_IN3	ScrubberCurrent
18	VSS	Power		
19	VDD	Power		
20	PA4 *	I/O	GPIO_Output	I2C_SEL1
21	PA5	I/O	SPI1_SCK	SPI1_SCK
22	PA6 *	I/O	GPIO_Input	BlowerFanSignal1
23	PA7	I/O	SPI1_MOSI	SPI1_MOSI
24	PC4 *	I/O	GPIO_Output	I2C_SEL2
25	PC5 *	I/O	GPIO_Output	I2C_SEL3
26	PB0 *	I/O	GPIO_Output	ScrubberONOFF
27	PB1 *	I/O	GPIO_Output	HeaterOnOff
28	PB2 *	I/O	GPIO_Output	SolenoidFluidPathAirPurge
29	PB10	I/O	USART3_TX	TX_Bluetooth
30	PB11	I/O	USART3_RX	RX_Bluetooth
31	VCAP_1	Power		
32	VDD	Power		
33	PB12 *	I/O	GPIO_Output	HeaterJacketONOFF
34	PB13 *	I/O	GPIO_Output	AirPumpONOFF
35	PB14 *	I/O	GPIO_Output	SolenoidNozzleCleaning
37	PC6	I/O	TIM8_CH1	PeristalticPumpPWM2
38	PC7	I/O	TIM3_CH2	BlowerFanControlPwm3

Pin Number LQFP64	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
39	PC8	I/O	TIM3_CH3	BlowerFanControlPwm2
40	PC9	I/O	I2C3_SDA	SDA_TEMP/RH(EXT)
41	PA8	I/O	I2C3_SCL	SCL_TEMP/RH(EXT)
42	PA9	I/O	USART1_TX	Tx_DWIN_Lcd
43	PA10	I/O	USART1_RX	Rx_DWIN_Lcd
44	PA11	I/O	USB_OTG_FS_DM	
45	PA12	I/O	USB_OTG_FS_DP	
46	PA13	I/O	SYS_JTMS-SWDIO	
47	VCAP_2	Power		
48	VDD	Power		
49	PA14	I/O	SYS_JTCK-SWCLK	
50	PA15	I/O	TIM2_CH1	BlowerFanControlPwm1
51	PC10	I/O	UART4_TX	Tx_LteModule
52	PC11	I/O	UART4_RX	Rx_LteModule
53	PC12	I/O	UART5_TX	Tx_RFIDreader
54	PD2	I/O	UART5_RX	Rx_RFIDreader
55	PB3	I/O	SYS_JTDO-SWO	
56	PB4	I/O	SPI1_MISO	SPI1_MISO
58	PB6	I/O	I2C1_SCL	SCL_TEMP/RH
59	PB7	I/O	I2C1_SDA	SDA_TEMP/RH
60	BOOT0	Boot		
61	PB8 *	I/O	GPIO_Input	BlowerFanSignal3
62	PB9 *	I/O	GPIO_Input	BlowerFanSignal4
63	VSS	Power		
64	VDD	Power		

* The pin is affected with an I/O function

4. Clock Tree Configuration



5. Software Project

5.1. Project Settings

Name	Value
Project Name	CleanBioTech
Project Folder	D:\Users\monster\CleanBio\STM32
Toolchain / IDE	STM32CubeIDE
Firmware Package Name and Version	STM32Cube FW_F4 V1.24.1

5.2. Code Generation Settings

Name	Value
STM32Cube Firmware Library Package	Copy only the necessary library files
Generate peripheral initialization as a pair of '.c/.h' files	No
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

6. Power Consumption Calculator report

6.1. Microcontroller Selection

Series	STM32F4
Line	STM32F405/415
MCU	STM32F405RGTx
Datasheet	022152_Rev8

6.2. Parameter Selection

Temperature	25
Vdd	3.3

7. IPs and Middleware Configuration

7.1. ADC1

mode: IN0

mode: IN11

mode: IN12

mode: IN13

7.1.1. Parameter Settings:

ADCs_Common_Settings:

Mode	Independent mode

ADC_Settings:

Clock Prescaler	**PCLK2 divided by 4 ***
Resolution	12 bits (15 ADC Clock cycles)
Data Alignment	Right alignment
Scan Conversion Mode	Disabled
Continuous Conversion Mode	Disabled
Discontinuous Conversion Mode	Disabled
DMA Continuous Requests	Disabled
End Of Conversion Selection	EOC flag at the end of single channel conversion

ADC_Regular_ConversionMode:

Number Of Conversion	1
External Trigger Conversion Source	Regular Conversion launched by software
External Trigger Conversion Edge	None
Rank	1
Channel	Channel 0
Sampling Time	3 Cycles

ADC_Injected_ConversionMode:

Number Of Conversions	0

WatchDog:

Enable Analog WatchDog Mode	false

7.2. ADC2

mode: IN2

mode: IN10

7.2.1. Parameter Settings:

ADCs_Common_Settings:

Mode	Independent mode

ADC_Settings:

Clock Prescaler	**PCLK2 divided by 4 ***
Resolution	12 bits (15 ADC Clock cycles)
Data Alignment	Right alignment
Scan Conversion Mode	Disabled
Continuous Conversion Mode	Disabled
Discontinuous Conversion Mode	Disabled
DMA Continuous Requests	Disabled
End Of Conversion Selection	EOC flag at the end of single channel conversion

ADC_Regular_ConversionMode:

Number Of Conversion	1
External Trigger Conversion Source	Regular Conversion launched by software
External Trigger Conversion Edge	None
Rank	1
Channel	Channel 2
Sampling Time	3 Cycles

ADC_Injected_ConversionMode:

Number Of Conversions	0

WatchDog:

Enable Analog WatchDog Mode	false

7.3. ADC3

mode: IN3

7.3.1. Parameter Settings:

ADCs_Common_Settings:

Mode	Independent mode

ADC_Settings:

Clock Prescaler	**PCLK2 divided by 4 ***
Resolution	12 bits (15 ADC Clock cycles)
Data Alignment	Right alignment
Scan Conversion Mode	Disabled
Continuous Conversion Mode	Disabled
Discontinuous Conversion Mode	Disabled
DMA Continuous Requests	Disabled
End Of Conversion Selection	EOC flag at the end of single channel conversion

ADC_Regular_ConversionMode:

Number Of Conversion	1

External Trigger Conversion Source	Regular Conversion launched by software
External Trigger Conversion Edge	None
Rank	1
Channel	Channel 3
Sampling Time	3 Cycles

ADC_Injected_ConversionMode:

Number Of Conversions	0

WatchDog:

Enable Analog WatchDog Mode	false

7.4. CRC

mode: Activated

7.5. I2C1

I2C: I2C

7.5.1. Parameter Settings:

Master Features:

I2C Speed Mode	Standard Mode
I2C Clock Speed (Hz)	100000

Slave Features:

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

7.6. I2C3

I2C: I2C

7.6.1. Parameter Settings:

Master Features:

I2C Speed Mode	Standard Mode
I2C Clock Speed (Hz)	100000

Slave Features:

Clock No Stretch Mode	Disabled

Primary Address Length selection	7-bit
Dual Address Acknowledged	Disabled
Primary slave address	0
General Call address detection	Disabled

7.7. RCC

High Speed Clock (HSE): Crystal/Ceramic Resonator

7.7.1. Parameter Settings:

System Parameters:

VDD voltage (V)	3.3
Instruction Cache	Enabled
Prefetch Buffer	Enabled
Data Cache	Enabled
Flash Latency(WS)	3 WS (4 CPU cycle)

RCC Parameters:

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

Power Parameters:

Power Regulatror Voltage Scale	Power Regulator Voltage Scale 1

7.8. SPI1

Mode: Full-Duplex Master

7.8.1. Parameter Settings:

Basic Parameters:

Frame Format	Motorola
Data Size	8 Bits
First Bit	MSB First

Clock Parameters:

Prescaler (for Baud Rate)	2
Baud Rate	**30.0 MBits/s ***
Clock Polarity (CPOL)	Low
Clock Phase (CPHA)	1 Edge

Advanced Parameters:

CRC Calculation	Disabled

NSS Signal Type	Software

7.9. SYS

Debug: Trace Asynchronous Sw

Timebase Source: SysTick

7.10. TIM2

Clock Source : Internal Clock

Channel1: PWM Generation CH1

7.10.1. Parameter Settings:

Counter Settings:

Prescaler (PSC - 16 bits value)	**1 ***
Counter Mode	Up
Counter Period (AutoReload Register - 32 bits value)	**3360-1 ***
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 (32 bits value)	**1680-1 ***
Fast Mode	Disable
CH Polarity	High

7.11. TIM3

Clock Source : Internal Clock

Channel2: PWM Generation CH2

Channel3: PWM Generation CH3

7.11.1. Parameter Settings:

Counter Settings:

Prescaler (PSC - 16 bits value)	**1 ***
Counter Mode	Up

Counter Period (AutoReload Register - 16 bits value)	**3360-1 ***
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 2:

Mode	PWM mode 1
Pulse (16 bits value)	**1680-1 ***
Fast Mode	Disable
CH Polarity	High

PWM Generation Channel 3:

Mode	PWM mode 1
Pulse (16 bits value)	**1680-1 ***
Fast Mode	Disable
CH Polarity	High

7.12. TIM5

mode: Clock Source

Channel2: PWM Generation CH2

7.12.1. Parameter Settings:

Counter Settings:

Prescaler (PSC - 16 bits value)	**1 ***
Counter Mode	Up
Counter Period (AutoReload Register - 32 bits value)	**3360-1 ***
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 2:

Mode	PWM mode 1
Pulse (32 bits value)	**1680-1 ***
Fast Mode	Disable
CH Polarity	High

7.13. TIM7

mode: Activated

7.13.1. Parameter Settings:

Counter Settings:

Prescaler (PSC - 16 bits value)	**10000-1 ***
Counter Mode	Up
Counter Period (AutoReload Register - 16 bits value)	**8400-1 ***
auto-reload preload	Disable

Trigger Output (TRGO) Parameters:

Trigger Event Selection	Reset (UG bit from TIMx_EGR)

7.14. TIM8

Clock Source : Internal Clock

Channel1: PWM Generation CH1

7.14.1. Parameter Settings:

Counter Settings:

Prescaler (PSC - 16 bits value)	0
Counter Mode	Up
Counter Period (AutoReload Register - 16 bits value)	**3360-1 ***
Internal Clock Division (CKD)	No Division
Repetition Counter (RCR - 8 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	Reset (UG bit from TIMx_EGR)

Break And Dead Time management - BRK Configuration:

BRK State	Disable
BRK Polarity	High

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

PWM Generation Channel 1:

Mode	PWM mode 1
Pulse (16 bits value)	**1680-1 ***
Fast Mode	Disable
CH Polarity	High
CH Idle State	Reset

7.15. UART4

Mode: Asynchronous

7.15.1. Parameter Settings:

Basic Parameters:

Baud Rate	**9600 ***
Word Length	8 Bits (including Parity)
Parity	None
Stop Bits	1

Advanced Parameters:

Data Direction	Receive and Transmit
Over Sampling	16 Samples

7.16. UART5

Mode: Asynchronous

7.16.1. Parameter Settings:

Basic Parameters:

Baud Rate	**9600 ***
Word Length	8 Bits (including Parity)
Parity	None
Stop Bits	1

Advanced Parameters:

Data Direction	Receive and Transmit
Over Sampling	16 Samples

7.17. USART1

Mode: Asynchronous

7.17.1. 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

7.18. USART3

Mode: Asynchronous

7.18.1. Parameter Settings:

Basic Parameters:

Baud Rate	**9600 ***
Word Length	8 Bits (including Parity)
Parity	None
Stop Bits	1

Advanced Parameters:

Data Direction	Receive and Transmit
Over Sampling	16 Samples

7.19. USB_OTG_FS

Mode: Host_Only

7.19.1. Parameter Settings:

Speed	Host Full Speed 12MBit/s
Signal start of frame	Disabled

7.20. FATFS

mode: USB Disk

7.20.1. Set Defines:

Version:

FATFS version	R0.12c

Function Parameters:

FS_READONLY (Read-only mode)	Disabled
FS_MINIMIZE (Minimization level)	Disabled
USE_STRFUNC (String functions)	Enabled with LF -> CRLF conversion
USE_FIND (Find functions)	Disabled
USE_MKFS (Make filesystem function)	Enabled
USE_FASTSEEK (Fast seek function)	Enabled
USE_EXPAND (Use f_expand function)	Disabled
USE_CHMOD (Change attributes function)	Disabled
USE_LABEL (Volume label functions)	Disabled
USE_FORWARD (Forward function)	Disabled

Locale and Namespace Parameters:

CODE_PAGE (Code page on target)	Latin 1
USE_LFN (Use Long Filename)	Disabled
MAX_LFN (Max Long Filename)	255
LFN_UNICODE (Enable Unicode)	ANSI/OEM
STRF_ENCODE (Character encoding)	UTF-8
FS_RPATH (Relative Path)	Disabled

Physical Drive Parameters:

VOLUMES (Logical drives)	1
MAX_SS (Maximum Sector Size)	512
MIN_SS (Minimum Sector Size)	512
MULTI_PARTITION (Volume partitions feature)	Disabled
USE_TRIM (Erase feature)	Disabled
FS_NOFSINFO (Force full FAT scan)	0

System Parameters:

FS_TINY (Tiny mode)	Disabled
FS_EXFAT (Support of exFAT file system)	Disabled
FS_NORTC (Timestamp feature)	Dynamic timestamp
NORTC_YEAR (Year for timestamp)	2015
NORTC_MON (Month for timestamp)	6
NORTC_MDAY (Day for timestamp)	4
FS_REENTRANT (Re-Entrancy)	Disabled
FS_TIMEOUT (Timeout ticks)	1000
SYNC_t (O/S sync object)	osSemaphoreId
FS_LOCK (Number of files opened simultaneously)	2

7.20.2. Advanced Settings:

USBH:

USBH instance	USB Host MSC FS
Use dma template	Disabled

7.21. USB_HOST

Class for FS IP: Mass Storage Host Class

7.21.1. Parameter Settings:

Host Configuration:

USBH_MAX_NUM_ENDPOINTS (Maximum number of endpoints)	2
USBH_MAX_NUM_INTERFACES (Maximun number of interfaces)	2
USBH_MAX_NUM_SUPPORTED_CLASS (Maximun number of supported class)	1
USBH_MAX_NUM_CONFIGURATION (Maximun number of supported configuration)	1
USBH_KEEP_CFG_DESCRIPTOR (Keep the configuration into RAM)	Enabled
USBH_MAX_SIZE_CONFIGURATION (Maximun size in bytes for the Configuration Descriptor)	256
USBH_MAX_DATA_BUFFER (Maximun size of temporary data)	512
USBH_DEBUG_LEVEL (USBH Debug Level)	0: No debug message

CMSIS_RTOS:

USBH_USE_OS (Enable the support of an RTOS)	Disabled

*** User modified value**

8. System Configuration

8.1. GPIO configuration

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
ADC1	PC1	ADC1_IN11	Analog mode	No pull-up and no pull-down	n/a	Temp_AI2
	PC2	ADC1_IN12	Analog mode	No pull-up and no pull-down	n/a	Temp_AI3
	PC3	ADC1_IN13	Analog mode	No pull-up and no pull-down	n/a	Temp_AI4
	PA0-WKUP	ADC1_IN0	Analog mode	No pull-up and no pull-down	n/a	H2O2Sensor
ADC2	PC0	ADC2_IN10	Analog mode	No pull-up and no pull-down	n/a	Temp_AI1
	PA2	ADC2_IN2	Analog mode	No pull-up and no pull-down	n/a	AirPumpCurrent
ADC3	PA3	ADC3_IN3	Analog mode	No pull-up and no pull-down	n/a	ScrubberCurrent
I2C1	PB6	I2C1_SCL	Alternate Function Open Drain	Pull-up	**Very High ***	SCL_TEMP/RH
	PB7	I2C1_SDA	Alternate Function Open Drain	Pull-up	**Very High ***	SDA_TEMP/RH
I2C3	PC9	I2C3_SDA	Alternate Function Open Drain	Pull-up	**Very High ***	SDA_TEMP/RH(EXT)
	PA8	I2C3_SCL	Alternate Function Open Drain	Pull-up	**Very High ***	SCL_TEMP/RH(EXT)
RCC	PH0-OSC_IN	RCC_OSC_IN	n/a	n/a	n/a	
	PH1-OSC_OUT	RCC_OSC_OUT	n/a	n/a	n/a	
SPI1	PA5	SPI1_SCK	Alternate Function Push Pull	No pull-up and no pull-down	**Very High ***	SPI1_SCK
	PA7	SPI1_MOSI	Alternate Function Push Pull	No pull-up and no pull-down	**Very High ***	SPI1_MOSI
	PB4	SPI1_MISO	Alternate Function Push Pull	No pull-up and no pull-down	**Very High ***	SPI1_MISO
SYS	PA13	SYS_JTMS-SWDIO	n/a	n/a	n/a	
	PA14	SYS_JTCK-SWCLK	n/a	n/a	n/a	
	PB3	SYS_JTDO-SWO	n/a	n/a	n/a	
TIM2	PA15	TIM2_CH1	Alternate Function Push Pull	**Pull-up ***	Low	BlowerFanControlPwm1
TIM3	PC7	TIM3_CH2	Alternate Function Push Pull	**Pull-up ***	Low	BlowerFanControlPwm3
	PC8	TIM3_CH3	Alternate Function Push Pull	**Pull-up ***	Low	BlowerFanControlPwm2
TIM5	PA1	TIM5_CH2	Alternate Function Push Pull	**Pull-up ***	Low	PeristalticPumpPwm1

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
TIM8	PC6	TIM8_CH1	Alternate Function Push Pull	No pull-up and no pull-down	Low	PeristalticPumpPWM2
UART4	PC10	UART4_TX	Alternate Function Push Pull	Pull-up	**Very High ***	Tx_LteModule
	PC11	UART4_RX	Alternate Function Push Pull	Pull-up	**Very High ***	Rx_LteModule
UART5	PC12	UART5_TX	Alternate Function Push Pull	Pull-up	**Very High ***	Tx_RFIDreader
	PD2	UART5_RX	Alternate Function Push Pull	Pull-up	**Very High ***	Rx_RFIDreader
USART1	PA9	USART1_TX	Alternate Function Push Pull	Pull-up	**High ***	Tx_DWIN_Lcd
	PA10	USART1_RX	Alternate Function Push Pull	Pull-up	**Very High ***	Rx_DWIN_Lcd
USART3	PB10	USART3_TX	Alternate Function Push Pull	Pull-up	**High ***	TX_Bluetooth
	PB11	USART3_RX	Alternate Function Push Pull	Pull-up	**Very High ***	RX_Bluetooth
USB_OTG_FS	PA11	USB_OTG_FS_DM	Alternate Function Push Pull	**Pull-up ***	**High ***	
	PA12	USB_OTG_FS_DP	Alternate Function Push Pull	**Pull-up ***	**High ***	
GPIO	PC14-OSC32_IN	GPIO_Output	Output Push Pull	**Pull-up ***	Low	I2C_SEL4
	PC15-OSC32_OUT	GPIO_Input	Input mode	**Pull-up ***	n/a	BlowerFanSignal2
	PA4	GPIO_Output	Output Push Pull	**Pull-up ***	Low	I2C_SEL1
	PA6	GPIO_Input	Input mode	**Pull-up ***	n/a	BlowerFanSignal1
	PC4	GPIO_Output	Output Push Pull	**Pull-up ***	Low	I2C_SEL2
	PC5	GPIO_Output	Output Push Pull	**Pull-up ***	Low	I2C_SEL3
	PB0	GPIO_Output	Output Push Pull	**Pull-down ***	Low	ScrubberONOFF
	PB1	GPIO_Output	Output Push Pull	**Pull-down ***	Low	HeaterOnOff
	PB2	GPIO_Output	Output Push Pull	**Pull-up ***	Low	SolenoidFluidPathAirPurge
	PB12	GPIO_Output	Output Push Pull	**Pull-down ***	Low	HeaterJacketONOFF
	PB13	GPIO_Output	Output Push Pull	**Pull-down ***	Low	AirPumpONOFF
	PB14	GPIO_Output	Output Push Pull	**Pull-up ***	Low	SolenoidNozzleCleaning
	PB8	GPIO_Input	Input mode	**Pull-up ***	n/a	BlowerFanSignal3
	PB9	GPIO_Input	Input mode	**Pull-up ***	n/a	BlowerFanSignal4

8.2. DMA configuration

nothing configured in DMA service

8.3. 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
Pre-fetch 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
USART1 global interrupt	true	0	0
TIM7 global interrupt	true	0	0
USB On The Go FS global interrupt	true	0	0
PVD interrupt through EXTI line 16	unused		
Flash global interrupt	unused		
RCC global interrupt	unused		
ADC1, ADC2 and ADC3 global interrupts	unused		
TIM2 global interrupt	unused		
TIM3 global interrupt	unused		
I2C1 event interrupt	unused		
I2C1 error interrupt	unused		
SPI1 global interrupt	unused		
USART3 global interrupt	unused		
TIM8 break interrupt and TIM12 global interrupt	unused		
TIM8 update interrupt and TIM13 global interrupt	unused		
TIM8 trigger and commutation interrupts and TIM14 global interrupt	unused		
TIM8 capture compare interrupt	unused		
TIM5 global interrupt	unused		
UART4 global interrupt	unused		
UART5 global interrupt	unused		
I2C3 event interrupt	unused		
I2C3 error interrupt	unused		
FPU global interrupt	unused		

*** User modified value**

9. Software Pack Report