1. Description

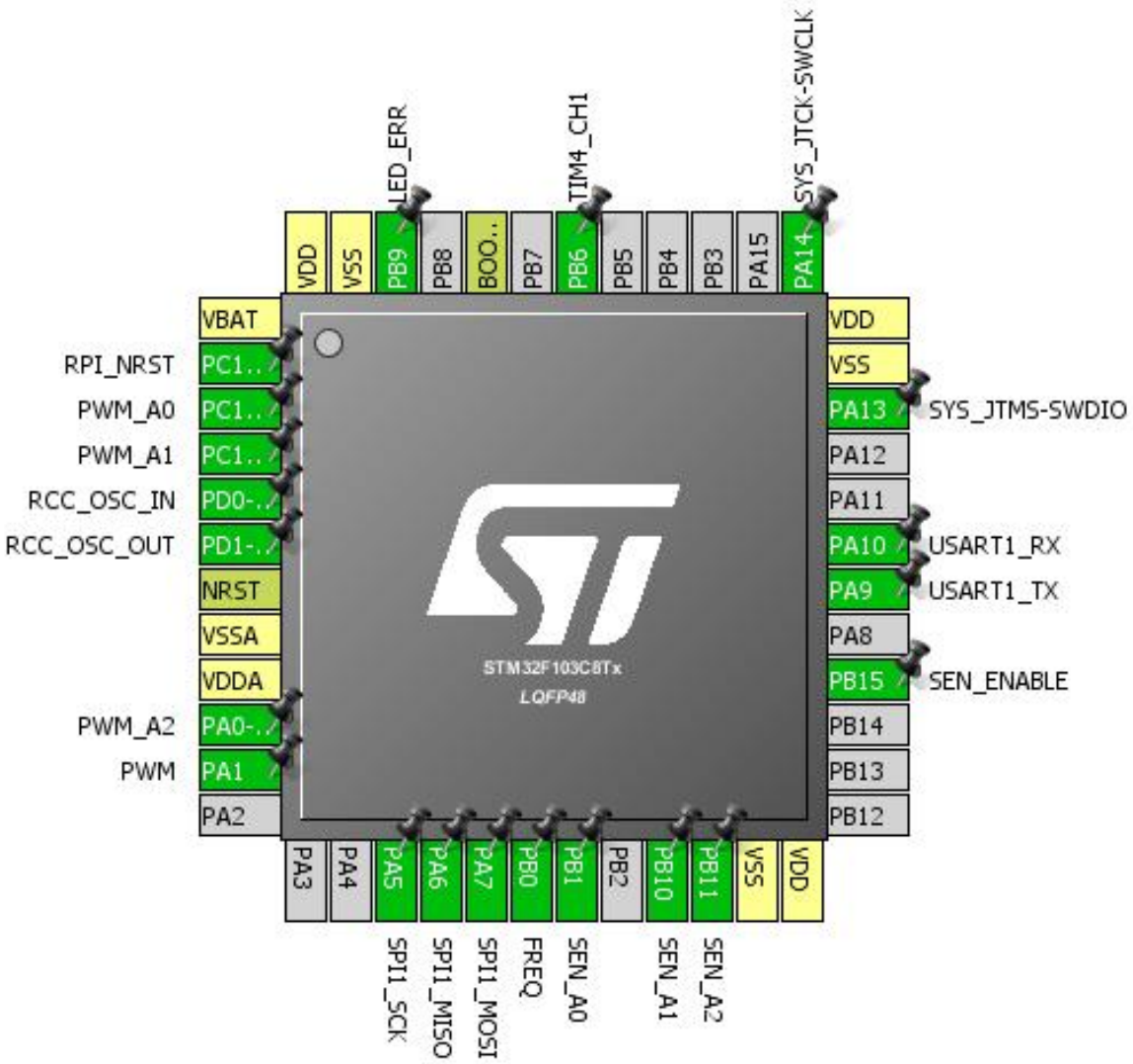
1.1. Project

Project Name	WaterCtrl_V1
Board Name	WaterCtrlV1
Generated with:	STM32CubeMX 4.9.0
Date	07/19/2015

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		
2	PC13-TAMPER-RTC *	I/O	GPIO_Output	RPI_NRST
3	PC14-OSC32_IN *	I/O	GPIO_Output	PWM_A0
4	PC15-OSC32_OUT *	I/O	GPIO_Output	PWM_A1
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		
10	PA0-WKUP *	I/O	GPIO_Output	PWM_A2
11	PA1	I/O	TIM2_CH2	PWM
15	PA5	I/O	SPI1_SCK	
16	PA6	I/O	SPI1_MISO	
17	PA7	I/O	SPI1_MOSI	
18	PB0	I/O	TIM3_CH3	FREQ
19	PB1 *	I/O	GPIO_Output	SEN_A0
21	PB10 *	I/O	GPIO_Output	SEN_A1
22	PB11 *	I/O	GPIO_Output	SEN_A2
23	VSS	Power		
24	VDD	Power		
28	PB15 *	I/O	GPIO_Output	SEN_ENABLE
30	PA9	I/O	USART1_TX	
31	PA10	I/O	USART1_RX	
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	
44	BOOT0	Boot		
46	PB9 *	I/O	GPIO_Output	LED_ERR
47	VSS	Power		
48	VDD	Power		

* The pin is affected with an I/O function

4. IPs and Middleware Configuration

4.1. RCC

High Speed Clock (HSE): Crystal/Ceramic Resonator

System Parameters:

VDD voltage (V)	3.3
Prefetch Buffer	Enabled
Flash Latency(WS)	2 WS (3 CPU cycle)

RCC Parameters:

HSI Calibration Value	16

4.2. SPI1

Mode: Full-Duplex Slave

Basic Parameters:

Frame Format	Motorola
Data Size	8 Bits
First Bit	MSB First

Clock Parameters:

Prescaler (for Baud Rate)	**256 ***
Baud Rate	**281.25 KBits/s ***
Clock Polarity (CPOL)	Low
Clock Phase (CPHA)	1 Edge

Advanced Parameters:

CRC Calculation	Disabled
NSS Signal Type	Software

4.3. SYS

Debug: Serial-Wire

4.4. TIM2

Clock Source : Internal Clock

Channel2: PWM Generation CH2

Counter Settings:

Prescaler (PSC - 16 bits value)	0
Counter Mode	Up
Counter Period (AutoReload Register - 16 bits value)	0
Internal Clock Division (CKD)	No Division

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)	0
Fast Mode	Disable
CH Polarity	High

4.5. TIM3

Channel3: Input Capture direct mode

Counter Settings:

Prescaler (PSC - 16 bits value)	0
Counter Mode	Up
Counter Period (AutoReload Register - 16 bits value)	0
Internal Clock Division (CKD)	No Division

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 3:

Polarity Selection	Rising Edge
IC Selection	Direct
Prescaler Division Ratio	No division
Input Filter (4 bits value)	0

4.6. TIM4

Channel1: Input Capture direct mode

Counter Settings:

Prescaler (PSC - 16 bits value)	0

Counter Mode	Up
Counter Period (AutoReload Register - 16 bits value)	0
Internal Clock Division (CKD)	No Division

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	Rising Edge
IC Selection	Direct
Prescaler Division Ratio	No division
Input Filter (4 bits value)	0

4.7. USART1

Mode: Asynchronous

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

5. System Configuration

5.1. 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	
SPI1	PA5	SPI1_SCK	Input mode	No pull-up and no pull-down	n/a	
	PA6	SPI1_MISO	Alternate Function Push Pull	n/a	**High ***	
	PA7	SPI1_MOSI	Input mode	No pull-up and no pull-down	**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	PWM
TIM3	PB0	TIM3_CH3	Input mode	No pull-up and no pull-down	n/a	FREQ
TIM4	PB6	TIM4_CH1	Input mode	No pull-up and no pull-down	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**	
GPIO	PC13-TAMPER-RTC	GPIO_Output	**Output Open Drain ***	n/a	Low	RPI_NRST
	PC14-OSC32_IN	GPIO_Output	Output Push Pull	n/a	Low	PWM_A0
	PC15-OSC32_OUT	GPIO_Output	Output Push Pull	n/a	Low	PWM_A1
	PA0-WKUP	GPIO_Output	Output Push Pull	n/a	Low	PWM_A2
	PB1	GPIO_Output	Output Push Pull	n/a	Low	SEN_A0
	PB10	GPIO_Output	Output Push Pull	n/a	Low	SEN_A1
	PB11	GPIO_Output	Output Push Pull	n/a	Low	SEN_A2
	PB15	GPIO_Output	Output Push Pull	n/a	Low	SEN_ENABLE
	PB9	GPIO_Output	Output Push Pull	n/a	Low	LED_ERR

5.2. DMA configuration

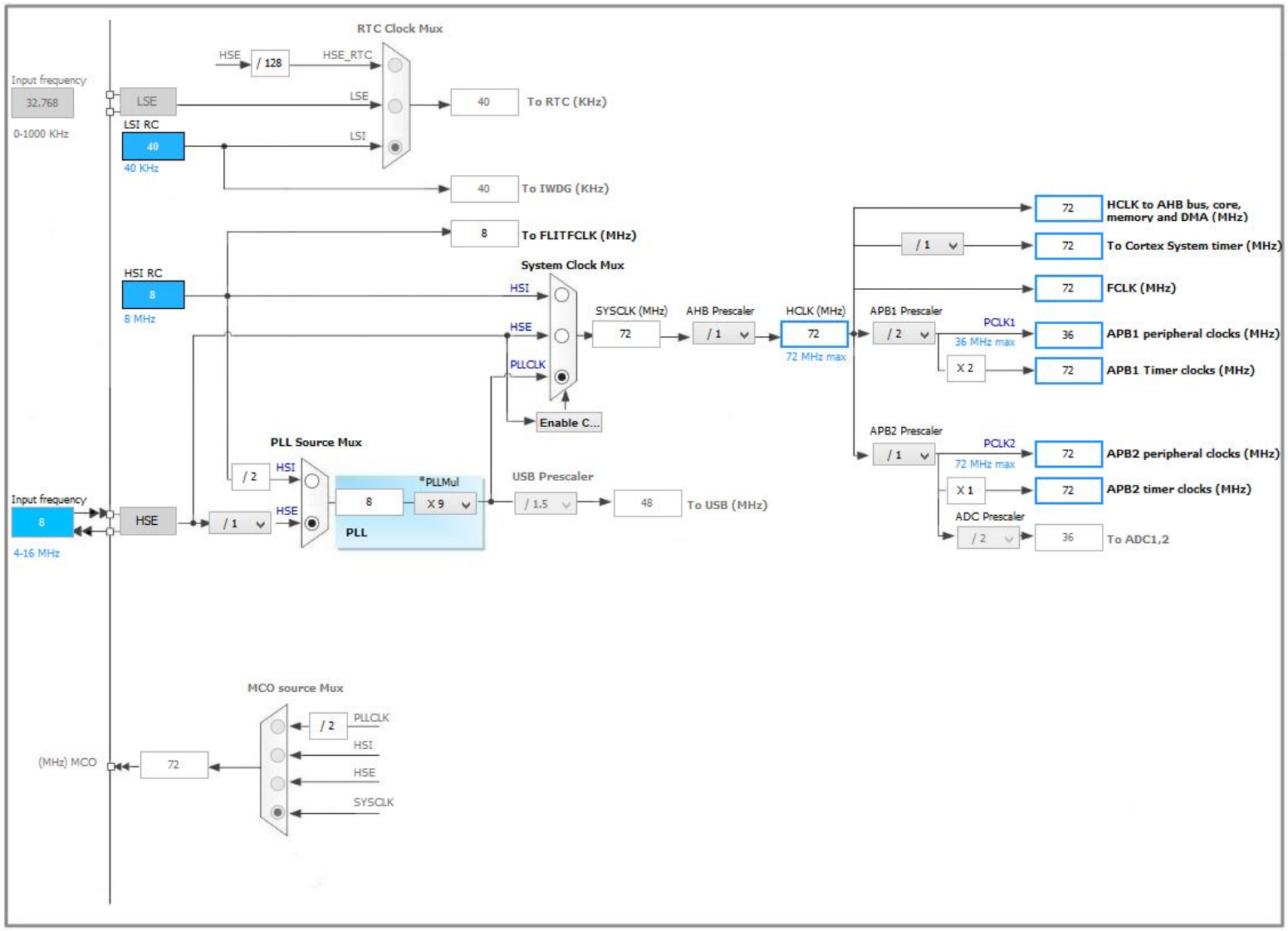
nothing configured in DMA service

5.3. NVIC configuration

Interrupt Table	Enable	Preenmption Priority	SubPriority
System tick timer	true	0	0
SPI1 global interrupt	true	0	0
USART1 global interrupt	true	0	0
Non maskable interrupt	unused		
Memory management fault	unused		
Prefetch fault, memory access fault	unused		
Undefined instruction or illegal state	unused		
Debug monitor	unused		
PVD interrupt through EXTI line 16	unused		
RCC global interrupt	unused		
TIM2 global interrupt	unused		
TIM3 global interrupt	unused		
TIM4 global interrupt	unused		

*** User modified value**

6. Clock Tree Configuration



7. Power Plugin report

7.1. Microcontroller Selection

Series	STM32F1
Line	STM32F103
MCU	STM32F103C8Tx
Datasheet	13587_Rev16

7.2. Parameter Selection

Temperature	25
Vdd	3.3

8. Software Project

8.1. Project Settings

Name	Value
Project Name	WaterCtrl_V1
Project Folder	E:\WaterCtrl\firmware\WaterCtrl_V1
Toolchain / IDE	SW4STM32
Firmware Package Name and Version	STM32Cube FW_F1 V1.1.0

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	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

8.3. Toolchains Settings

Name	Value
Compiler Optimizations	Balanced Size/Speed