

1. Description

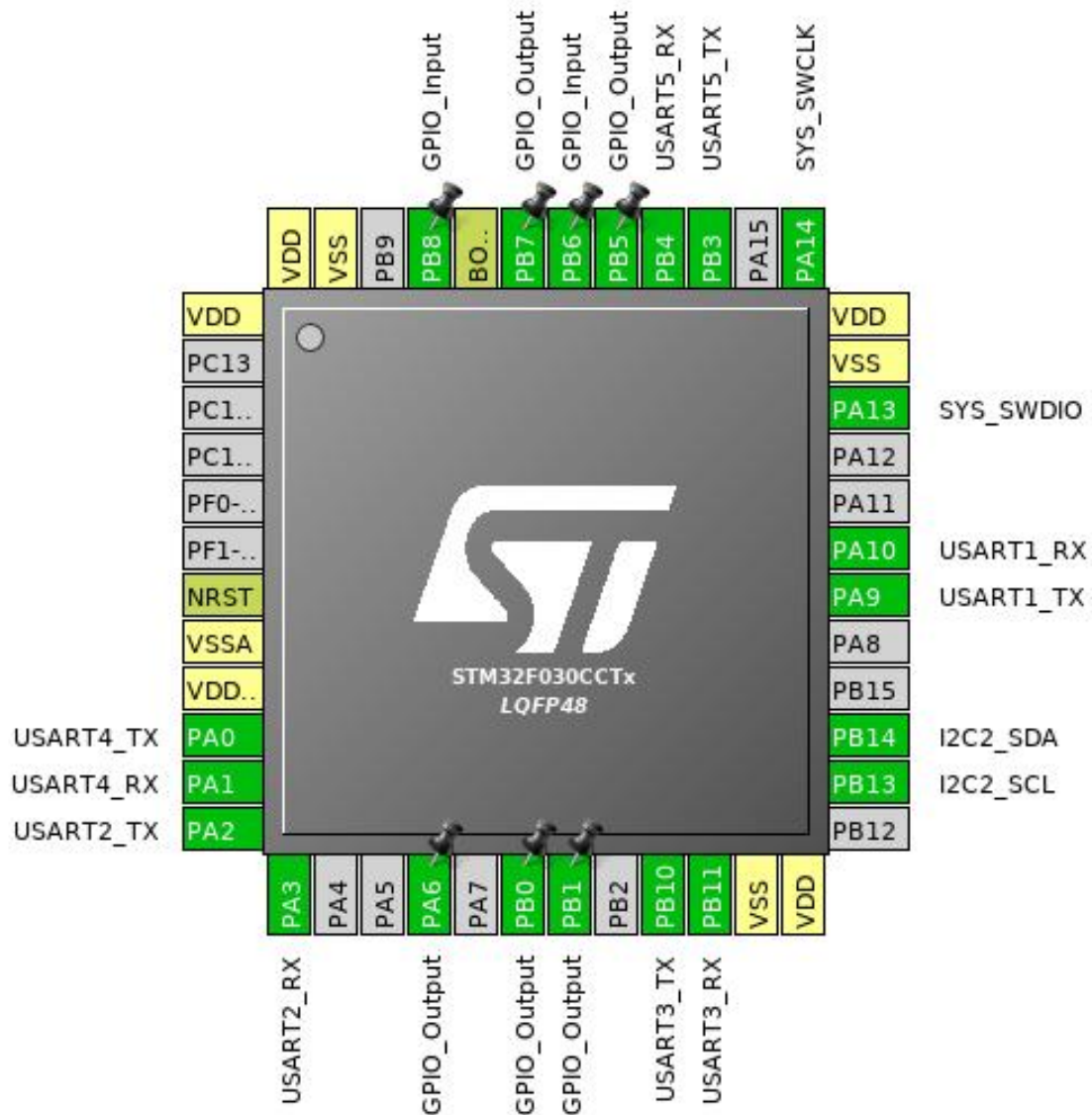
1.1. Project

Project Name	water_distance_measurement
Board Name	custom
Generated with:	STM32CubeMX 4.27.0
Date	05/14/2019

1.2. MCU

MCU Series	STM32F0
MCU Line	STM32F0x0 Value Line
MCU name	STM32F030CCTx
MCU Package	LQFP48
MCU Pin number	48

2. Pinout Configuration

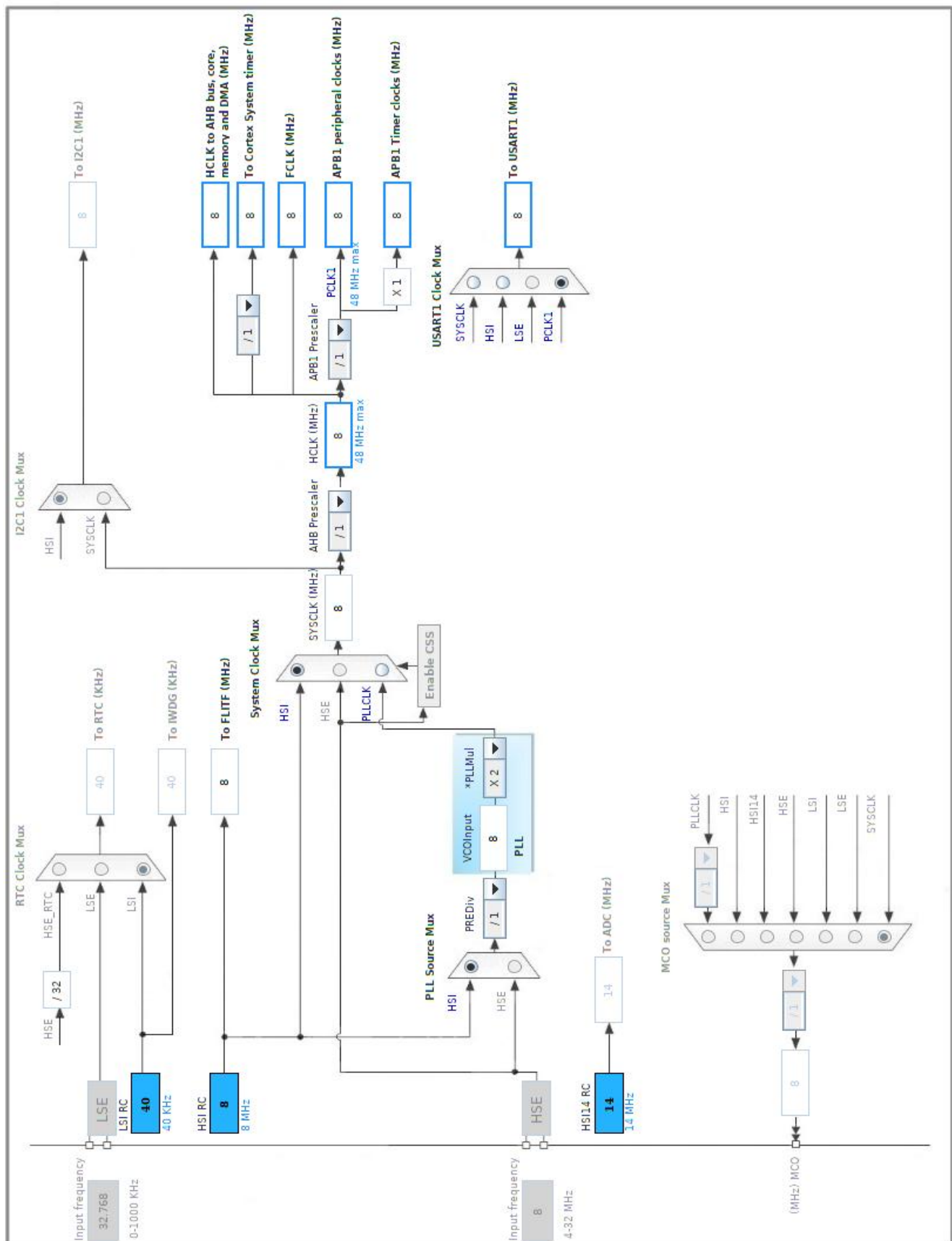


3. Pins Configuration

Pin Number LQFP48	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
1	VDD	Power		
7	NRST	Reset		
8	VSSA	Power		
9	VDDA	Power		
10	PA0	I/O	USART4_TX	
11	PA1	I/O	USART4_RX	
12	PA2	I/O	USART2_TX	
13	PA3	I/O	USART2_RX	
16	PA6 *	I/O	GPIO_Output	SSR
18	PB0 *	I/O	GPIO_Output	LED1
19	PB1 *	I/O	GPIO_Output	LED2
21	PB10	I/O	USART3_TX	
22	PB11	I/O	USART3_RX	
23	VSS	Power		
24	VDD	Power		
26	PB13	I/O	I2C2_SCL	
27	PB14	I/O	I2C2_SDA	
30	PA9	I/O	USART1_TX	
31	PA10	I/O	USART1_RX	
34	PA13	I/O	SYS_SWDIO	
35	VSS	Power		
36	VDD	Power		
37	PA14	I/O	SYS_SWCLK	
39	PB3	I/O	USART5_TX	
40	PB4	I/O	USART5_RX	
41	PB5 *	I/O	GPIO_Output	Matrix_X1
42	PB6 *	I/O	GPIO_Input	Matrix_Y1
43	PB7 *	I/O	GPIO_Output	Matrix_X2
44	BOOT0	Boot		
45	PB8 *	I/O	GPIO_Input	Matrix_Y2
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. I2C2

mode: I2C

5.1.1. Parameter Settings:

Timing configuration:

I2C Speed Mode	Standard Mode
I2C Speed Frequency (KHz)	100
Rise Time (ns)	0
Fall Time (ns)	0
Coefficient of Digital Filter	0
Analog Filter	Enabled
Timing	0x2000090E

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

5.2. SYS

mode: Debug Serial Wire

Timebase Source: SysTick

5.3. USART1

Mode: Asynchronous

5.3.1. 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
Single Sample	Disable

Advanced Features:

Auto Baudrate	Disable
TX Pin Active Level Inversion	Disable
RX Pin Active Level Inversion	Disable
Data Inversion	Disable
TX and RX Pins Swapping	Disable
Overrun	Enable
DMA on RX Error	Enable
MSB First	Disable

5.4. USART2

Mode: Asynchronous

5.4.1. 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
Single Sample	Disable

Advanced Features:

Auto Baudrate	Disable
TX Pin Active Level Inversion	Disable
RX Pin Active Level Inversion	Disable
Data Inversion	Disable
TX and RX Pins Swapping	Disable
Overrun	Enable
DMA on RX Error	Enable
MSB First	Disable

5.5. USART3

Mode: Asynchronous

5.5.1. 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
Single Sample	Disable

Advanced Features:

Auto Baudrate	Disable
TX Pin Active Level Inversion	Disable
RX Pin Active Level Inversion	Disable
Data Inversion	Disable
TX and RX Pins Swapping	Disable
Overrun	Enable
DMA on RX Error	Enable
MSB First	Disable

5.6. USART4

Mode: Asynchronous

5.6.1. 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
Single Sample	Disable

Advanced Features:

TX Pin Active Level Inversion	Disable
RX Pin Active Level Inversion	Disable
Data Inversion	Disable
TX and RX Pins Swapping	Disable
Overrun	Enable

DMA on RX Error	Enable
MSB First	Disable

5.7. USART5

Mode: Asynchronous

5.7.1. 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
Single Sample	Disable

Advanced Features:

TX Pin Active Level Inversion	Disable
RX Pin Active Level Inversion	Disable
Data Inversion	Disable
TX and RX Pins Swapping	Disable
Overrun	Enable
DMA on RX Error	Enable
MSB First	Disable

*** User modified value**

6. System Configuration

6.1. GPIO configuration

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
I2C2	PB13	I2C2_SCL	Alternate Function Open Drain	No pull-up and no pull-down *	High *	
	PB14	I2C2_SDA	Alternate Function Open Drain	No pull-up and no pull-down *	High *	
SYS	PA13	SYS_SWDIO	n/a	n/a	n/a	
	PA14	SYS_SWCLK	n/a	n/a	n/a	
USART1	PA9	USART1_TX	Alternate Function Push Pull	No pull-up and no pull-down	High *	
	PA10	USART1_RX	Alternate Function Push Pull	No pull-up and no pull-down	High *	
USART2	PA2	USART2_TX	Alternate Function Push Pull	No pull-up and no pull-down	High *	
	PA3	USART2_RX	Alternate Function Push Pull	No pull-up and no pull-down	High *	
USART3	PB10	USART3_TX	Alternate Function Push Pull	No pull-up and no pull-down	High *	
	PB11	USART3_RX	Alternate Function Push Pull	No pull-up and no pull-down	High *	
USART4	PA0	USART4_TX	Alternate Function Push Pull	No pull-up and no pull-down	High *	
	PA1	USART4_RX	Alternate Function Push Pull	No pull-up and no pull-down	High *	
USART5	PB3	USART5_TX	Alternate Function Push Pull	No pull-up and no pull-down	High *	
	PB4	USART5_RX	Alternate Function Push Pull	No pull-up and no pull-down	High *	
GPIO	PA6	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	SSR
	PB0	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	LED1
	PB1	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	LED2
	PB5	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	Matrix_X1
	PB6	GPIO_Input	Input mode	Pull-down *	n/a	Matrix_Y1
	PB7	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	Matrix_X2
	PB8	GPIO_Input	Input mode	Pull-down *	n/a	Matrix_Y2

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
System service call via SWI instruction	true	0	0
Pendable request for system service	true	0	0
System tick timer	true	0	0
Flash global interrupt	true	0	0
I2C2 global interrupt	true	0	0
USART1 global interrupt	true	0	0
USART2 global interrupt	true	0	0
USART3 to USART6 global interrupts	true	0	0
RCC global interrupt	unused		

* User modified value

7. Power Consumption Calculator report

7.1. Microcontroller Selection

Series	STM32F0
Line	STM32F0x0 Value Line
MCU	STM32F030CCTx
Datasheet	024849_Rev2

7.2. Parameter Selection

Temperature	25
Vdd	3.6

8. Software Project

8.1. Project Settings

Name	Value
Project Name	water_distance_measurement
Project Folder	/mnt/sda6/fit/bp/bachelors_thesis/firmware
Toolchain / IDE	Makefile
Firmware Package Name and Version	STM32Cube FW_F0 V1.9.0

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)	Yes

9. Software Pack Report