1. Description

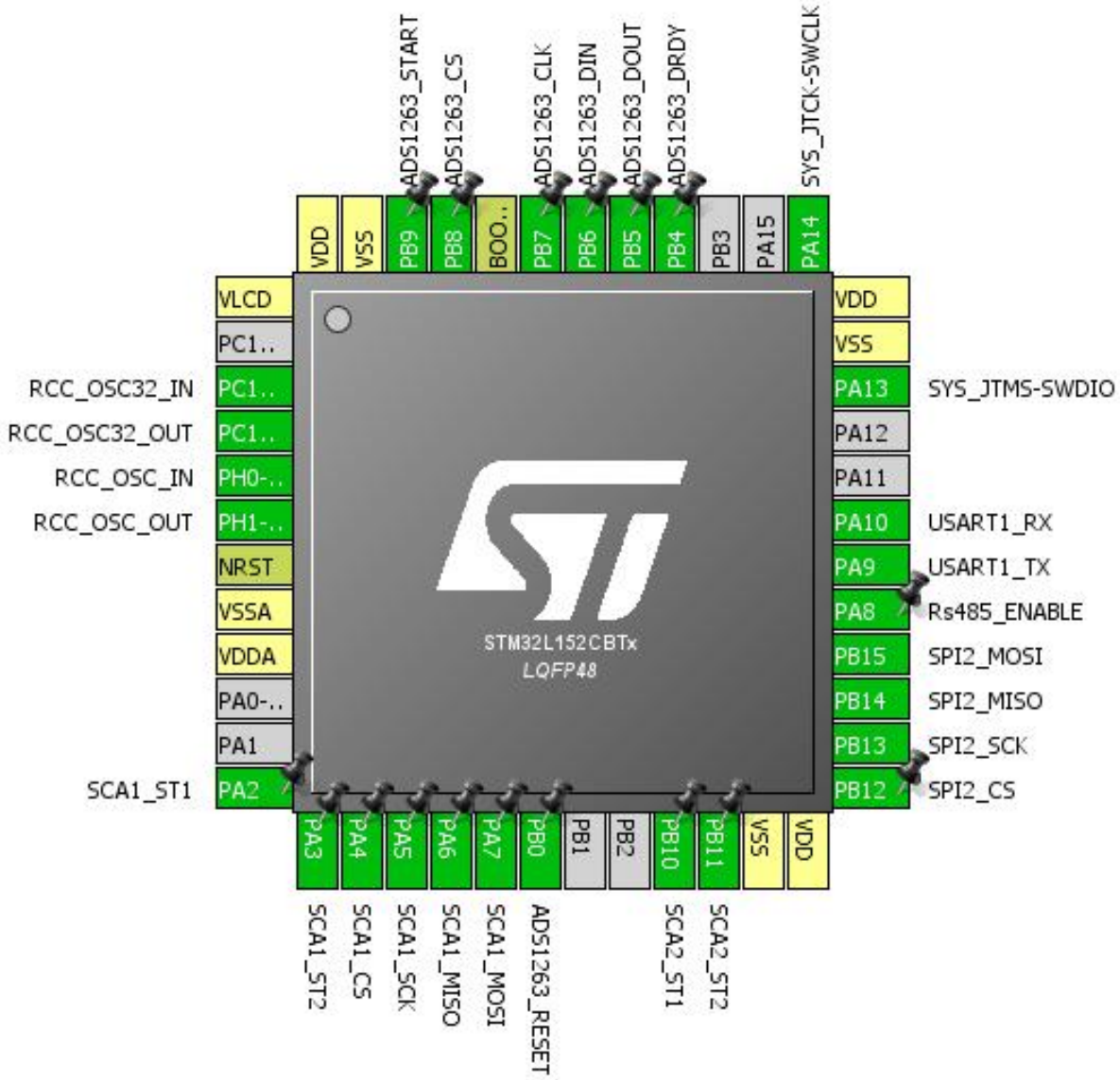
1.1. Project

Project Name	STM32L152X_FlowMeter
Board Name	STM32L152X_FlowMeter
Generated with:	STM32CubeMX 4.18.0
Date	10/21/2019

1.2. MCU

MCU Series	STM32L1
MCU Line	STM32L151/152
MCU name	STM32L152CBTx
MCU Package	LQFP48
MCU Pin number	48

2. Pinout Configuration



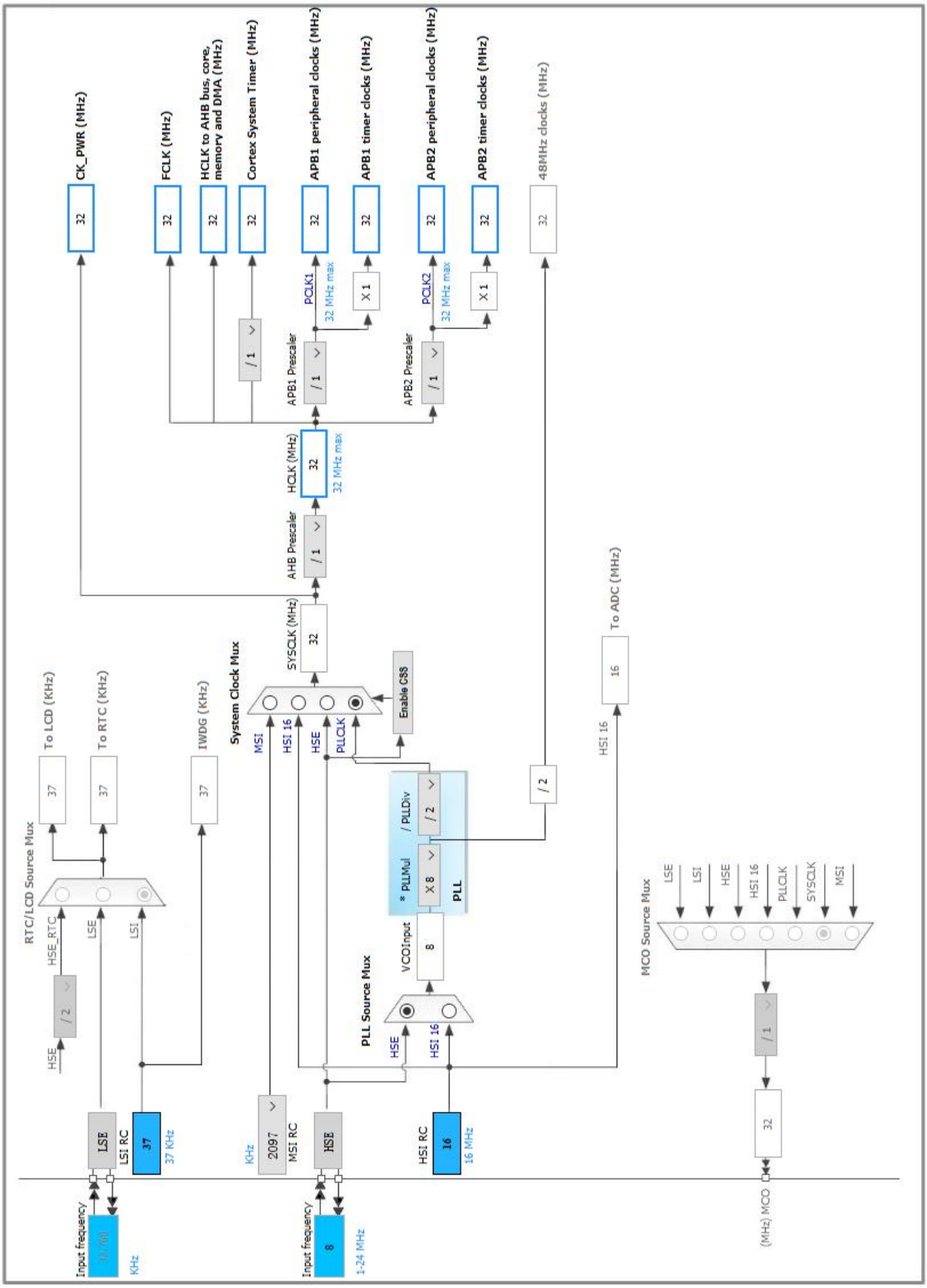
3. Pins Configuration

Pin Number LQFP48	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
1	VLCD	Power		
3	PC14-OSC32_IN	I/O	RCC_OSC32_IN	
4	PC15-OSC32_OUT	I/O	RCC_OSC32_OUT	
5	PH0-OSC_IN	I/O	RCC_OSC_IN	
6	PH1-OSC_OUT	I/O	RCC_OSC_OUT	
7	NRST	Reset		
8	VSSA	Power		
9	VDDA	Power		
12	PA2 *	I/O	GPIO_Output	SCA1_ST1
13	PA3 *	I/O	GPIO_Output	SCA1_ST2
14	PA4 *	I/O	GPIO_Output	SCA1_CS
15	PA5 *	I/O	GPIO_Output	SCA1_SCK
16	PA6 *	I/O	GPIO_Input	SCA1_MISO
17	PA7 *	I/O	GPIO_Output	SCA1_MOSI
18	PB0 *	I/O	GPIO_Output	ADS1263_RESET
21	PB10 *	I/O	GPIO_Output	SCA2_ST1
22	PB11 *	I/O	GPIO_Output	SCA2_ST2
23	VSS	Power		
24	VDD	Power		
25	PB12 *	I/O	GPIO_Output	SPI2_CS
26	PB13	I/O	SPI2_SCK	
27	PB14	I/O	SPI2_MISO	
28	PB15	I/O	SPI2_MOSI	
29	PA8 *	I/O	GPIO_Output	Rs485_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	
40	PB4 *	I/O	GPIO_Input	ADS1263_DRDY
41	PB5 *	I/O	GPIO_Input	ADS1263_DOUT
42	PB6 *	I/O	GPIO_Output	ADS1263_DIN
43	PB7 *	I/O	GPIO_Output	ADS1263_CLK
44	BOOT0	Boot		
45	PB8 *	I/O	GPIO_Output	ADS1263_CS

Pin Number LQFP48	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
46	PB9 *	I/O	GPIO_Output	ADS1263_START
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. RCC

High Speed Clock (HSE): Crystal/Ceramic Resonator

Low Speed Clock (LSE) : Crystal/Ceramic Resonator

5.1.1. Parameter Settings:

System Parameters:

VDD voltage (V)	3.3
Instruction Cache	Enabled
Prefetch Buffer	Disabled
Data Cache	Enabled
Flash Latency(WS)	1 WS (2 CPU cycle)

RCC Parameters:

HSI Calibration Value	16
MSI Calibration Value	0
HSE Startup Timout Value (ms)	100
LSE Startup Timout Value (ms)	5000

Power Parameters:

Power Regulator Voltage Scale	Power Regulator Voltage Scale 1

5.2. SPI2

Mode: Full-Duplex Master

5.2.1. Parameter Settings:

Basic Parameters:

Frame Format	Motorola
Data Size	8 Bits
First Bit	MSB First

Clock Parameters:

Prescaler (for Baud Rate)	**64 ***
Baud Rate	**500.0 KBits/s ***
Clock Polarity (CPOL)	Low
Clock Phase (CPHA)	1 Edge

Advanced Parameters:

CRC Calculation	Disabled
NSS Signal Type	Software

5.3. SYS

Debug: Serial Wire

Timebase Source: TIM2

5.4. USART1

Mode: Asynchronous

5.4.1. 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

5.5. FREERTOS

mode: Enabled

5.5.1. Config parameters:

Versions:

CMSIS-RTOS version	1.02
FreeRTOS version	8.2.3

Kernel settings:

USE_PREEMPTION	Enabled
CPU_CLOCK_HZ	SystemCoreClock
TICK_RATE_HZ	1000
MAX_PRIORITIES	7
MINIMAL_STACK_SIZE	128

MAX_TASK_NAME_LEN	16
USE_16_BIT_TICKS	Disabled
IDLE_SHOULD_YIELD	Enabled
USE_MUTEXES	Enabled
USE_RECURSIVE_MUTEXES	Disabled
USE_COUNTING_SEMAPHORES	Disabled
QUEUE_REGISTRY_SIZE	8
USE_APPLICATION_TASK_TAG	Disabled
TOTAL_HEAP_SIZE	3072
Memory Management scheme	heap_4
USE_ALTERNATIVE_API	Disabled
ENABLE_BACKWARD_COMPATIBILITY	Enabled
USE_PORT_OPTIMISED_TASK_SELECTION	Disabled
USE_TICKLESS_IDLE	Disabled
USE_TASK_NOTIFICATIONS	Enabled

Hook function related definitions:

USE_IDLE_HOOK	Disabled
USE_TICK_HOOK	Disabled
USE_MALLOC_FAILED_HOOK	Disabled
CHECK_FOR_STACK_OVERFLOW	Disabled

Run time and task stats gathering related definitions:

USE_TRACE_FACILITY	Enabled
GENERATE_RUN_TIME_STATS	Disabled

Co-routine related definitions:

USE_CO_ROUTINES	Disabled
MAX_CO_ROUTINE_PRIORITIES	2

Software timer definitions:

USE_TIMERS	Disabled
TIMER_TASK_PRIORITY	2
TIMER_QUEUE_LENGTH	10
TIMER_TASK_STACK_DEPTH	256

Interrupt nesting behaviour configuration:

LIBRARY_LOWEST_INTERRUPT_PRIORITY	15
LIBRARY_MAX_SYSCALL_INTERRUPT_PRIORITY	5

5.5.2. Include parameters:

Include definitions:

vTaskPrioritySet	Enabled
uxTaskPriorityGet	Enabled
vTaskDelete	Enabled

vTaskCleanUpResources	Disabled
vTaskSuspend	Enabled
vTaskDelayUntil	Disabled
vTaskDelay	Enabled
xTaskGetSchedulerState	Enabled
xTaskResumeFromISR	Enabled
xQueueGetMutexHolder	Disabled
xSemaphoreGetMutexHolder	Disabled
pcTaskGetTaskName	Disabled
uxTaskGetStackHighWaterMark	Disabled
xTaskGetCurrentTaskHandle	Disabled
eTaskGetState	Disabled
xEventGroupSetBitFromISR	Disabled
xTimerPendFunctionCall	Disabled

*** 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	PC14-OSC32_IN	RCC_OSC32_IN	n/a	n/a	n/a	
	PC15-OSC32_OUT	RCC_OSC32_OUT	n/a	n/a	n/a	
	PH0-OSC_IN	RCC_OSC_IN	n/a	n/a	n/a	
	PH1-OSC_OUT	RCC_OSC_OUT	n/a	n/a	n/a	
SPI2	PB13	SPI2_SCK	Alternate Function Push Pull	No pull-up and no pull-down	**High ***	
	PB14	SPI2_MISO	Alternate Function Push Pull	No pull-up and no pull-down	**High ***	
	PB15	SPI2_MOSI	Alternate Function Push Pull	No pull-up and no pull-down	**High ***	
SYS	PA13	SYS_JTMS-SWDIO	n/a	n/a	n/a	
	PA14	SYS_JTCK-SWCLK	n/a	n/a	n/a	
USART1	PA9	USART1_TX	Alternate Function Push Pull	Pull-up	**High ***	
	PA10	USART1_RX	Alternate Function Push Pull	Pull-up	**High ***	
GPIO	PA2	GPIO_Output	Output Push Pull	No pull-up and no pull-down	**Low ***	SCA1_ST1
	PA3	GPIO_Output	Output Push Pull	No pull-up and no pull-down	**Low ***	SCA1_ST2
	PA4	GPIO_Output	Output Push Pull	No pull-up and no pull-down	**Low ***	SCA1_CS
	PA5	GPIO_Output	Output Push Pull	No pull-up and no pull-down	**Low ***	SCA1_SCK
	PA6	GPIO_Input	Input mode	No pull-up and no pull-down	**n/a**	SCA1_MISO
	PA7	GPIO_Output	Output Push Pull	No pull-up and no pull-down	**Low ***	SCA1_MOSI
	PB0	GPIO_Output	Output Push Pull	No pull-up and no pull-down	**Low ***	ADS1263_RESET
	PB10	GPIO_Output	Output Push Pull	No pull-up and no pull-down	**Low ***	SCA2_ST1
	PB11	GPIO_Output	Output Push Pull	No pull-up and no pull-down	**Low ***	SCA2_ST2
	PB12	GPIO_Output	Output Push Pull	No pull-up and no pull-down	**Low ***	SPI2_CS
	PA8	GPIO_Output	Output Push Pull	No pull-up and no pull-down	**Medium ***	Rs485_ENABLE
	PB4	GPIO_Input	Input mode	No pull-up and no pull-down	**n/a**	ADS1263_DRDY
	PB5	GPIO_Input	Input mode	No pull-up and no pull-down	**n/a**	ADS1263_DOUT
	PB6	GPIO_Output	Output Push Pull	No pull-up and no pull-down	**Low ***	ADS1263_DIN

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
	PB7	GPIO_Output	Output Push Pull	No pull-up and no pull-down	**Low ***	ADS1263_CLK
	PB8	GPIO_Output	Output Push Pull	No pull-up and no pull-down	**Low ***	ADS1263_CS
	PB9	GPIO_Output	Output Push Pull	No pull-up and no pull-down	**Low ***	ADS1263_START

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
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	15	0
System tick timer	true	15	0
TIM2 global interrupt	true	0	0
SPI2 global interrupt	true	5	0
USART1 global interrupt	true	5	0
Flash global interrupt	unused		
RCC global interrupt	unused		

*** User modified value**

7. Power Consumption Calculator report

7.1. Microcontroller Selection

Series	STM32L1
Line	STM32L151/152
MCU	STM32L152CBTx
Datasheet	17659_Rev12

7.2. Parameter Selection

Temperature	25
Vdd	3.6

8. Software Project

8.1. Project Settings

Name	Value
Project Name	STM32L152X_FlowMeter
Project Folder	E:\3. stm32+FlowMeter\3.
Toolchain / IDE	MDK-ARM V5
Firmware Package Name and Version	STM32Cube FW_L1 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