

1. Description

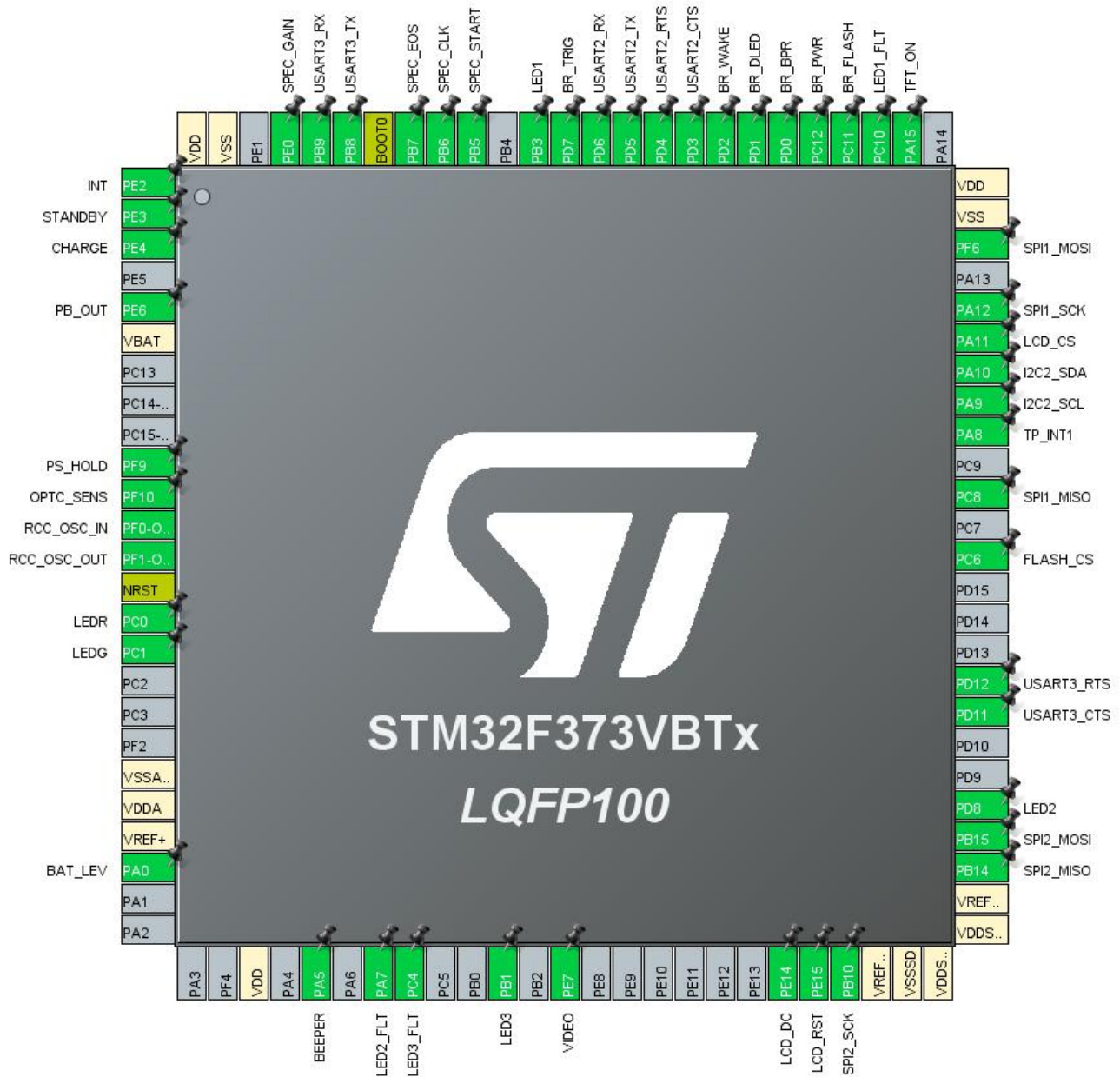
1.1. Project

Project Name	BilirubinmeterV2
Board Name	custom
Generated with:	STM32CubeMX 5.4.0
Date	12/25/2019

1.2. MCU

MCU Series	STM32F3
MCU Line	STM32F373
MCU name	STM32F373VBTx
MCU Package	LQFP100
MCU Pin number	100

2. Pinout Configuration



3. Pins Configuration

Pin Number LQFP100	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
1	PE2	I/O	GPIO_EXTI2	INT
2	PE3 *	I/O	GPIO_Input	STANDBY
3	PE4 *	I/O	GPIO_Input	CHARGE
5	PE6 *	I/O	GPIO_Input	PB_OUT
6	VBAT	Power		
10	PF9 *	I/O	GPIO_Output	PS_HOLD
11	PF10 *	I/O	GPIO_Input	OPTC_SENS
12	PF0-OSC_IN	I/O	RCC_OSC_IN	
13	PF1-OSC_OUT	I/O	RCC_OSC_OUT	
14	NRST	Reset		
15	PC0 *	I/O	GPIO_Output	LED_R
16	PC1 *	I/O	GPIO_Output	LED_G
20	VSSA/VREF-	Power		
21	VDDA	Power		
22	VREF+	Power		
23	PA0	I/O	ADC1_IN0	BAT_LEV
28	VDD	Power		
30	PA5 *	I/O	GPIO_Output	BEEPER
32	PA7 *	I/O	GPIO_Input	LED2_FLT
33	PC4 *	I/O	GPIO_Input	LED3_FLT
36	PB1 *	I/O	GPIO_Output	LED3
38	PE7	I/O	SDADC2_AIN5P	VIDEO
45	PE14 *	I/O	GPIO_Output	LCD_DC
46	PE15 *	I/O	GPIO_Output	LCD_RST
47	PB10	I/O	SPI2_SCK	
48	VREFSD-	Power		
49	VSSSD	Power		
50	VDDSD12	Power		
51	VDDSD3	Power		
52	VREFSD+	Power		
53	PB14	I/O	SPI2_MISO	
54	PB15	I/O	SPI2_MOSI	
55	PD8 *	I/O	GPIO_Output	LED2
58	PD11	I/O	USART3_CTS	
59	PD12	I/O	USART3_RTS	
63	PC6 *	I/O	GPIO_Output	FLASH_CS

Pin Number LQFP100	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
65	PC8	I/O	SPI1_MISO	
67	PA8	I/O	GPIO_EXTI8	TP_INT1
68	PA9	I/O	I2C2_SCL	
69	PA10	I/O	I2C2_SDA	
70	PA11 *	I/O	GPIO_Output	LCD_CS
71	PA12	I/O	SPI1_SCK	
73	PF6	I/O	SPI1_MOSI	
74	VSS	Power		
75	VDD	Power		
77	PA15 *	I/O	GPIO_Output	TFT_ON
78	PC10 *	I/O	GPIO_Input	LED1_FLT
79	PC11 *	I/O	GPIO_Output	BR_FLASH
80	PC12 *	I/O	GPIO_Input	BR_PWR
81	PD0 *	I/O	GPIO_Input	BR_BPR
82	PD1 *	I/O	GPIO_Input	BR_DLED
83	PD2 *	I/O	GPIO_Output	BR_WAKE
84	PD3	I/O	USART2_CTS	
85	PD4	I/O	USART2_RTS	
86	PD5	I/O	USART2_TX	
87	PD6	I/O	USART2_RX	
88	PD7 *	I/O	GPIO_Output	BR_TRIG
89	PB3 *	I/O	GPIO_Output	LED1
91	PB5 *	I/O	GPIO_Output	SPEC_START
92	PB6 *	I/O	GPIO_Output	SPEC_CLK
93	PB7 *	I/O	GPIO_Output	SPEC_EOS
94	BOOT0	Boot		
95	PB8	I/O	USART3_TX	
96	PB9	I/O	USART3_RX	
97	PE0 *	I/O	GPIO_Output	SPEC_GAIN
99	VSS	Power		
100	VDD	Power		

* The pin is affected with an I/O function



5. Software Project

5.1. Project Settings

Name	Value
Project Name	BilirubinmeterV2
Project Folder	E:\projeler\vishne\BilirubinmeterV2
Toolchain / IDE	MDK-ARM V5.27
Firmware Package Name and Version	STM32Cube FW_F3 V1.11.0

5.2. Code Generation Settings

Name	Value
STM32Cube MCU packages and embedded software	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

6. Power Consumption Calculator report

6.1. Microcontroller Selection

Series	STM32F3
Line	STM32F373
MCU	STM32F373VBTx
Datasheet	022691_Rev7

6.2. Parameter Selection

Temperature	25
Vdd	3.6

7. IPs and Middleware Configuration

7.1. ADC1

mode: IN0

7.1.1. Parameter Settings:

ADC_Settings:

Data Alignment	Right alignment
Scan Conversion Mode	Disabled
Continuous Conversion Mode	Enabled *
Discontinuous Conversion Mode	Disabled

ADC_Regular_ConversionMode:

Enable Regular Conversions	Enable
Number Of Conversion	1
External Trigger Conversion Source	Regular Conversion launched by software
Rank	1
Channel	Channel 0
Sampling Time	1.5 Cycles

ADC_Injected_ConversionMode:

Number Of Conversions	0
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WatchDog:

Enable Analog WatchDog Mode	false
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7.2. GPIO

7.3. I2C2

I2C: I2C

7.3.1. 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

7.4. RCC

High Speed Clock (HSE): Crystal/Ceramic Resonator

7.4.1. Parameter Settings:

System Parameters:

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

RCC Parameters:

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

7.5. RTC

mode: Activate Clock Source

mode: Activate Calendar

7.5.1. Parameter Settings:

General:

Hour Format	Hourformat 24
Asynchronous Predivider value	127
Synchronous Predivider value	255

Calendar Time:

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

Calendar Date:

Week Day	Monday
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Month	January
Date	1
Year	0

7.6. SDADC2

IN5: IN5-Single-Ended zero reference

mode: Conversion Configuration 0

7.6.1. Parameter Settings:

General Settings:

Low Power Mode	None
Fast Conversion Mode	Disable
Slow Clock Mode	Disable
Reference Voltage	Forced externally using VREF pin

Conversion Configuration 0:

Input Mode	Single-ended zero-volt reference mode *
Gain	equal to 1
Common Mode	SDADC VSSA
Offset	0

SDADC Regular Conversions Settings:

Enable Regular Conversion	Disable
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SDADC Injected Conversions Settings:

Enable Injected Conversion	Enable *
Number of Channels To be converted	1 *
Trigger type	Software trigger
Injected Delay	Disable
Continuous Mode	Enabled *
Channel Configuration	1
Channel	Channel 5
Configuration Index	Configuration 0

7.7. SPI1

Mode: Full-Duplex Master

7.7.1. Parameter Settings:

Basic Parameters:

Frame Format	Motorola
Data Size	8 Bits *
First Bit	MSB First
Clock Parameters:	
Prescaler (for Baud Rate)	4 *
Baud Rate	18.0 MBits/s *
Clock Polarity (CPOL)	Low
Clock Phase (CPHA)	1 Edge
Advanced Parameters:	
CRC Calculation	Disabled
NSSP Mode	Enabled
NSS Signal Type	Software

7.8. SPI2

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	18.0 MBits/s *
Clock Polarity (CPOL)	Low
Clock Phase (CPHA)	1 Edge
Advanced Parameters:	
CRC Calculation	Disabled
NSSP Mode	Enabled
NSS Signal Type	Software

7.9. SYS

Timebase Source: SysTick

7.10. TIM6

mode: Activated

7.10.1. Parameter Settings:

Counter Settings:

Prescaler (PSC - 16 bits value)	14400 *
Counter Mode	Up
Counter Period (AutoReload Register - 16 bits value)	10000 *
auto-reload preload	Disable

Trigger Output (TRGO) Parameters:

Trigger Event Selection	Reset (UG bit from TIMx_EGR)
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7.11. USART2

Mode: Asynchronous

Hardware Flow Control (RS232): CTS/RTS

7.11.1. 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

7.12. USART3

Mode: Asynchronous

Hardware Flow Control (RS232): CTS/RTS

7.12.1. Parameter Settings:

Basic Parameters:

Baud Rate	38400
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

*** 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	PA0	ADC1_IN0	Analog mode	No pull up pull down	n/a	BAT_LEV
I2C2	PA9	I2C2_SCL	Alternate Function Open Drain	Pull-up	High *	
	PA10	I2C2_SDA	Alternate Function Open Drain	Pull-up	High *	
RCC	PF0-OSC_IN	RCC_OSC_IN	n/a	n/a	n/a	
	PF1-OSC_OUT	RCC_OSC_OUT	n/a	n/a	n/a	
SDADC2	PE7	SDADC2_AIN5P	Analog mode	No pull up pull down	n/a	VIDEO
SPI1	PC8	SPI1_MISO	Alternate Function Push Pull	No pull up pull down	High *	
	PA12	SPI1_SCK	Alternate Function Push Pull	No pull up pull down	High *	
	PF6	SPI1_MOSI	Alternate Function Push Pull	No pull up pull down	High *	
SPI2	PB10	SPI2_SCK	Alternate Function Push Pull	No pull up pull down	High *	
	PB14	SPI2_MISO	Alternate Function Push Pull	No pull up pull down	High *	
	PB15	SPI2_MOSI	Alternate Function Push Pull	No pull up pull down	High *	
USART2	PD3	USART2_CTS	Alternate Function Push Pull	No pull up pull down	High *	
	PD4	USART2_RTS	Alternate Function Push Pull	No pull up pull down	High *	
	PD5	USART2_TX	Alternate Function Push Pull	No pull up pull down	High *	
	PD6	USART2_RX	Alternate Function Push Pull	No pull up pull down	High *	
USART3	PD11	USART3_CTS	Alternate Function Push Pull	No pull up pull down	High *	
	PD12	USART3_RTS	Alternate Function Push Pull	No pull up pull down	High *	
	PB8	USART3_TX	Alternate Function Push Pull	No pull up pull down	High *	
	PB9	USART3_RX	Alternate Function Push Pull	No pull up pull down	High *	
GPIO	PE2	GPIO_EXTI2	External Interrupt Mode with Rising edge trigger detection	No pull up pull down	n/a	INT
	PE3	GPIO_Input	Input mode	No pull up pull down	n/a	STANDBY
	PE4	GPIO_Input	Input mode	No pull up pull down	n/a	CHARGE
	PE6	GPIO_Input	Input mode	No pull up pull down	n/a	PB_OUT
	PF9	GPIO_Output	Output Push Pull	No pull up pull down	Low	PS_HOLD
	PF10	GPIO_Input	Input mode	No pull up pull down	n/a	OPTC_SENS
	PC0	GPIO_Output	Output Push Pull	No pull up pull down	Low	LEDR
	PC1	GPIO_Output	Output Push Pull	No pull up pull down	Low	LEDG
	PA5	GPIO_Output	Output Push Pull	No pull up pull down	Low	BEEPER
	PA7	GPIO_Input	Input mode	No pull up pull down	n/a	LED2_FLT

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
	PC4	GPIO_Input	Input mode	No pull up pull down	n/a	LED3_FLT
	PB1	GPIO_Output	Output Push Pull	No pull up pull down	Low	LED3
	PE14	GPIO_Output	Output Push Pull	No pull up pull down	Low	LCD_DC
	PE15	GPIO_Output	Output Push Pull	No pull up pull down	Low	LCD_RST
	PD8	GPIO_Output	Output Push Pull	No pull up pull down	Low	LED2
	PC6	GPIO_Output	Output Push Pull	No pull up pull down	Low	FLASH_CS
	PA8	GPIO_EXTI8	External Interrupt Mode with Rising edge trigger detection	No pull up pull down	n/a	TP_INT1
	PA11	GPIO_Output	Output Push Pull	No pull up pull down	Low	LCD_CS
	PA15	GPIO_Output	Output Push Pull	No pull up pull down	Low	TFT_ON
	PC10	GPIO_Input	Input mode	No pull up pull down	n/a	LED1_FLT
	PC11	GPIO_Output	Output Push Pull	No pull up pull down	Low	BR_FLASH
	PC12	GPIO_Input	Input mode	No pull up pull down	n/a	BR_PWR
	PD0	GPIO_Input	Input mode	No pull up pull down	n/a	BR_BPR
	PD1	GPIO_Input	Input mode	No pull up pull down	n/a	BR_DLED
	PD2	GPIO_Output	Output Push Pull	No pull up pull down	Low	BR_WAKE
	PD7	GPIO_Output	Output Push Pull	No pull up pull down	Low	BR_TRIG
	PB3	GPIO_Output	Output Push Pull	No pull up pull down	High *	LED1
	PB5	GPIO_Output	Output Push Pull	No pull up pull down	High *	SPEC_START
	PB6	GPIO_Output	Output Push Pull	No pull up pull down	High *	SPEC_CLK
	PB7	GPIO_Output	Output Push Pull	No pull up pull down	High *	SPEC_EOS
	PE0	GPIO_Output	Output Push Pull	No pull up pull down	Low	SPEC_GAIN

8.2. DMA configuration

DMA request	Stream	Direction	Priority
USART2_RX	DMA1_Channel6	Peripheral To Memory	Low
USART3_RX	DMA1_Channel3	Peripheral To Memory	Low
USART3_TX	DMA1_Channel2	Memory To Peripheral	Low
ADC1	DMA1_Channel1	Peripheral To Memory	Low

USART2_RX: DMA1_Channel6 DMA request Settings:

Mode: **Circular ***
 Peripheral Increment: Disable
 Memory Increment: **Enable ***
 Peripheral Data Width: Byte
 Memory Data Width: Byte

USART3_RX: DMA1_Channel3 DMA request Settings:

Mode: **Circular ***
 Peripheral Increment: Disable
 Memory Increment: **Enable ***
 Peripheral Data Width: Byte
 Memory Data Width: Byte

USART3_TX: DMA1_Channel2 DMA request Settings:

Mode: **Circular ***
 Peripheral Increment: Disable
 Memory Increment: **Enable ***
 Peripheral Data Width: Byte
 Memory Data Width: Byte

ADC1: DMA1_Channel1 DMA request Settings:

Mode: **Circular ***
 Peripheral Increment: Disable
 Memory Increment: **Enable ***
 Peripheral Data Width: Half Word

Memory Data Width: Half Word

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
Prefetch 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
DMA1 channel1 global interrupt	true	0	0
DMA1 channel2 global interrupt	true	0	0
DMA1 channel3 global interrupt	true	0	0
DMA1 channel6 global interrupt	true	0	0
USART2 global interrupt / USART2 wake-up interrupt through EXTI line 26	true	0	0
USART3 global interrupt / USART3 wake-up interrupt through EXTI line 28	true	0	0
SDADC2 global interrupt	true	0	0
PVD interrupt through EXTI line16	unused		
Flash global interrupt	unused		
RCC global interrupt	unused		
EXTI line2 interrupt and touch sense controller interrupt	unused		
ADC1 interrupt	unused		
EXTI line[9:5] interrupts	unused		
I2C2 event global interrupt / I2C2 wake-up interrupt through EXTI line 24	unused		
I2C2 error interrupt	unused		
SPI1 global interrupt	unused		
SPI2 global interrupt	unused		
TIM6 global interrupt and DAC1 underrun error interrupts	unused		
Floating point unit interrupt	unused		

* User modified value

9. Software Pack Report