1. Description

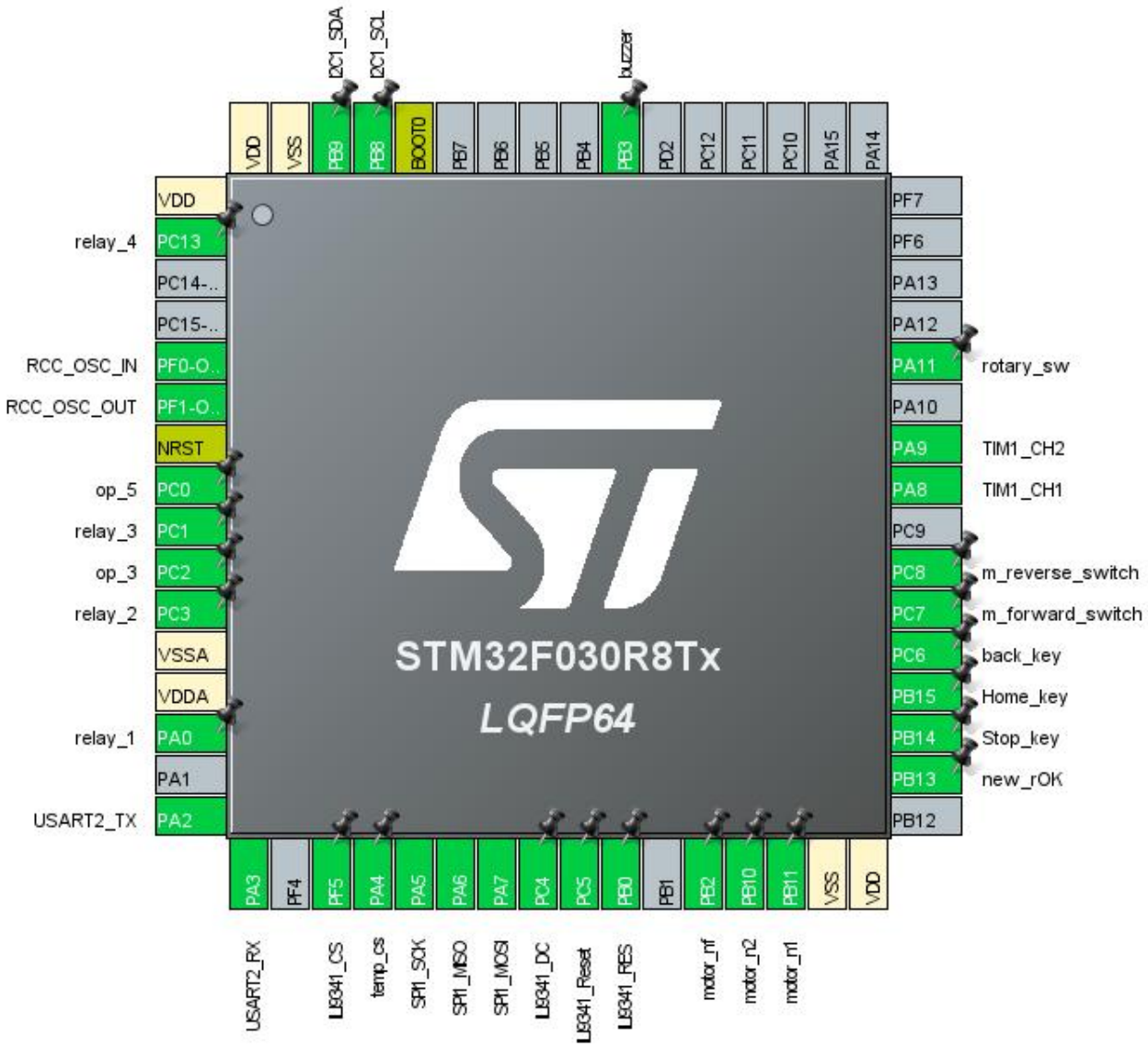
1.1. Project

Project Name	Fryer
Board Name	custom
Generated with:	STM32CubeMX 5.6.1
Date	09/30/2020

1.2. MCU

MCU Series	STM32F0
MCU Line	STM32F0x0 Value Line
MCU name	STM32F030R8Tx
MCU Package	LQFP64
MCU Pin number	64

2. Pinout Configuration



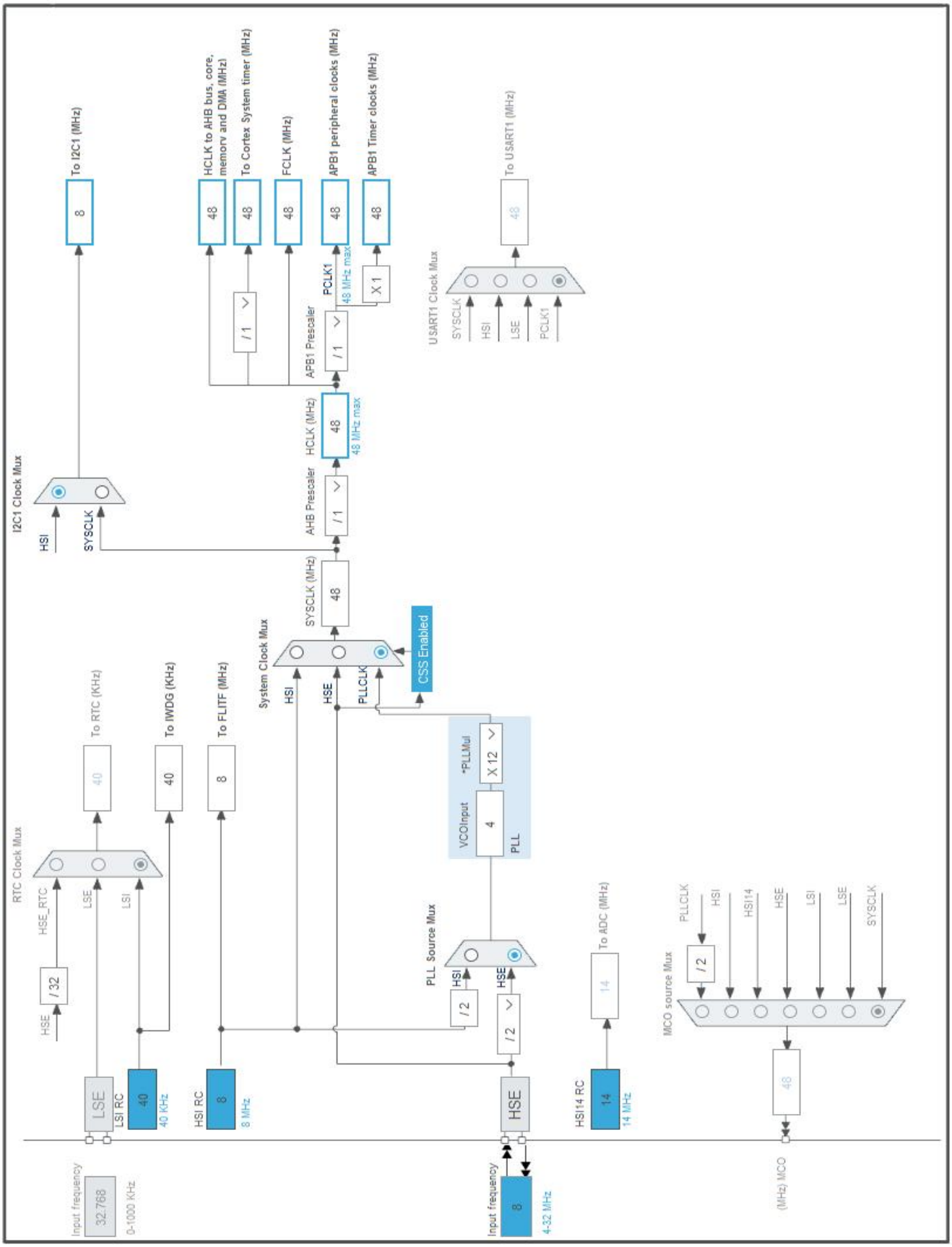
3. Pins Configuration

Pin Number LQFP64	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
1	VDD	Power		
2	PC13 *	I/O	GPIO_Output	relay_4
5	PF0-OSC_IN	I/O	RCC_OSC_IN	
6	PF1-OSC_OUT	I/O	RCC_OSC_OUT	
7	NRST	Reset		
8	PC0 *	I/O	GPIO_Output	op_5
9	PC1 *	I/O	GPIO_Output	relay_3
10	PC2 *	I/O	GPIO_Output	op_3
11	PC3 *	I/O	GPIO_Output	relay_2
12	VSSA	Power		
13	VDDA	Power		
14	PA0 *	I/O	GPIO_Output	relay_1
16	PA2	I/O	USART2_TX	
17	PA3	I/O	USART2_RX	
19	PF5 *	I/O	GPIO_Output	ILI9341_CS
20	PA4 *	I/O	GPIO_Output	temp_cs
21	PA5	I/O	SPI1_SCK	
22	PA6	I/O	SPI1_MISO	
23	PA7	I/O	SPI1_MOSI	
24	PC4 *	I/O	GPIO_Output	ILI9341_DC
25	PC5 *	I/O	GPIO_Output	ILI9341_Reset
26	PB0 *	I/O	GPIO_Output	ILI9341_RES
28	PB2 *	I/O	GPIO_Input	motor_nf
29	PB10 *	I/O	GPIO_Output	motor_n2
30	PB11 *	I/O	GPIO_Output	motor_n1
31	VSS	Power		
32	VDD	Power		
34	PB13 *	I/O	GPIO_Input	new_rOK
35	PB14 *	I/O	GPIO_Input	Stop_key
36	PB15 *	I/O	GPIO_Input	Home_key
37	PC6 *	I/O	GPIO_Input	back_key
38	PC7	I/O	GPIO_EXTI7	m_forward_switch
39	PC8	I/O	GPIO_EXTI8	m_reverse_switch
41	PA8	I/O	TIM1_CH1	
42	PA9	I/O	TIM1_CH2	
44	PA11 *	I/O	GPIO_Input	rotary_sw

Pin Number LQFP64	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
55	PB3 *	I/O	GPIO_Output	buzzer
60	BOOT0	Boot		
61	PB8	I/O	I2C1_SCL	
62	PB9	I/O	I2C1_SDA	
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	Fryer
Project Folder	C:\Users\CEPL\STM32CubeIDE\Fryer\Fryer
Toolchain / IDE	STM32CubeIDE
Firmware Package Name and Version	STM32Cube FW_F0 V1.11.0

5.2. Code Generation Settings

Name	Value
STM32Cube MCU packages and embedded software	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	STM32F0
Line	STM32F0x0 Value Line
MCU	STM32F030R8Tx
Datasheet	024849_Rev2

6.2. Parameter Selection

Temperature	25
Vdd	3.6

6.3. Battery Selection

Battery	Li-SOCL2(A3400)
Capacity	3400.0 mAh
Self Discharge	0.08 %/month
Nominal Voltage	3.6 V
Max Cont Current	100.0 mA
Max Pulse Current	200.0 mA
Cells in series	1
Cells in parallel	1

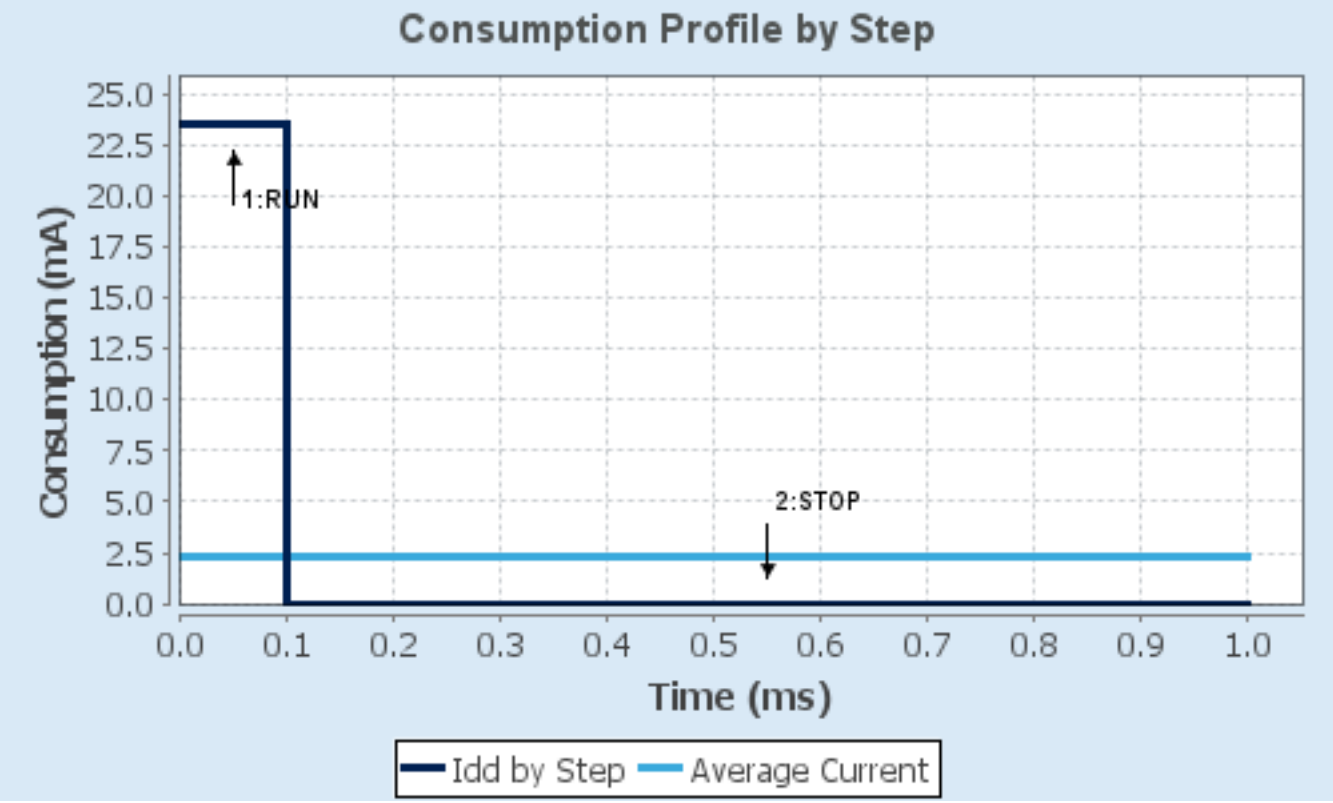
6.4. Sequence

Step	Step1	Step2
Mode	RUN	STOP
Vdd	3.6	3.6
Voltage Source	Battery	Battery
Range	No Scale	No Scale
Fetch Type	FLASH	n/a
CPU Frequency	48 MHz	0 Hz
Clock Configuration	HSE PLL All IPs ON	Regulator_LP
Clock Source Frequency	8 MHz	0 Hz
Peripherals		
Additional Cons.	0 mA	0 mA
Average Current	23.46 mA	7.9 µA
Duration	0.1 ms	0.9 ms
DMIPS	0.0	0.0
Ta Max	101.28	105
Category	In DS Table	In DS Table

6.5. RESULTS

Sequence Time	1 ms	Average Current	2.35 mA
Battery Life	1 month, 29 days, 16 hours	Average DMIPS	0.0 DMIPS

6.6. Chart


Consumption Profile by Step
Consumption (mA)
25.0
22.5
20.0
17.5
15.0
12.5
10.0
7.5
5.0
2.5
0.0
1:RUN
2:STOP
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0
Time (ms)
Idd by Step
Average Current

7. IPs and Middleware Configuration

7.1. GPIO

7.2. I2C1

I2C: I2C

7.2.1. 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

7.3. IWDG

mode: Activated

7.3.1. Parameter Settings:

Watchdog Clocking:

IWDG counter clock prescaler	4
IWDG window value	4095
IWDG down-counter reload value	4095

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)	1 WS (2 CPU cycle)

RCC Parameters:

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

7.5. SPI1

Mode: Full-Duplex Master

7.5.1. Parameter Settings:

Basic Parameters:

Frame Format	Motorola
Data Size	**8 Bits ***
First Bit	MSB First

Clock Parameters:

Prescaler (for Baud Rate)	**4 ***
Baud Rate	**12.0 MBits/s ***
Clock Polarity (CPOL)	Low
Clock Phase (CPHA)	1 Edge

Advanced Parameters:

CRC Calculation	Disabled
NSSP Mode	Enabled
NSS Signal Type	Software

7.6. SYS

Timebase Source: SysTick

7.7. TIM1

Combined Channels: Encoder Mode

7.7.1. Parameter Settings:

Counter Settings:

Prescaler (PSC - 16 bits value)	**4 ***
Counter Mode	Up
Counter Period (AutoReload Register - 16 bits value)	**65535 ***
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)

Encoder:

Encoder Mode	**Encoder Mode TI1 and TI2 ***
____ Parameters for Channel 1 ____	
Polarity	Rising Edge
IC Selection	Direct
Prescaler Division Ratio	No division
Input Filter	0
____ Parameters for Channel 2 ____	
Polarity	Rising Edge
IC Selection	Direct
Prescaler Division Ratio	No division
Input Filter	0

7.8. TIM3

Clock Source : Internal Clock

7.8.1. Parameter Settings:

Counter Settings:

Prescaler (PSC - 16 bits value)	**999 ***
Counter Mode	Up
Counter Period (AutoReload Register - 16 bits value)	**47999 ***
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)

7.9. TIM15

mode: Clock Source

7.9.1. Parameter Settings:

Counter Settings:

Prescaler (PSC - 16 bits value)	**999 ***
Counter Mode	Up
Counter Period (AutoReload Register - 16 bits value)	**959 ***
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)

7.10. USART2

Mode: Asynchronous

7.10.1. 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
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**

8. System Configuration

8.1. GPIO configuration

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
I2C1	PB8	I2C1_SCL	Alternate Function Open Drain	Pull-up	**High ***	
	PB9	I2C1_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	
SPI1	PA5	SPI1_SCK	Alternate Function Push Pull	No pull-up and no pull-down	**High ***	
	PA6	SPI1_MISO	Alternate Function Push Pull	No pull-up and no pull-down	**High ***	
	PA7	SPI1_MOSI	Alternate Function Push Pull	No pull-up and no pull-down	**High ***	
TIM1	PA8	TIM1_CH1	Alternate Function Push Pull	No pull-up and no pull-down	Low	
	PA9	TIM1_CH2	Alternate Function Push Pull	No pull-up and no pull-down	Low	
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 ***	
GPIO	PC13	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	relay_4
	PC0	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	op_5
	PC1	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	relay_3
	PC2	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	op_3
	PC3	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	relay_2
	PA0	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	relay_1
	PF5	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	ILI9341_CS
	PA4	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	temp_cs
	PC4	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	ILI9341_DC
	PC5	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	ILI9341_Reset
	PB0	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	ILI9341_RES
	PB2	GPIO_Input	Input mode	**Pull-up ***	n/a	motor_nf
	PB10	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	motor_n2
	PB11	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	motor_n1
	PB13	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	new_rOK
	PB14	GPIO_Input	Input mode	**Pull-down ***	n/a	Stop_key
	PB15	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	Home_key
	PC6	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	back_key
	PC7	GPIO_EXTI7	**External Interrupt Mode with Falling edge trigger detection**	No pull-up and no pull-down	n/a	m_forward_switch

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
	PC8	GPIO_EXTI8	**External Interrupt Mode with Falling edge trigger detection**	No pull-up and no pull-down	n/a	m_reverse_switch
	PA11	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	rotary_sw
	PB3	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	buzzer

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
System service call via SWI instruction	true	0	0
Pendable request for system service	true	0	0
System tick timer	true	0	0
EXTI line 4 to 15 interrupts	true	0	0
TIM1 break, update, trigger and commutation interrupts	true	0	0
TIM1 capture compare interrupt	true	0	0
TIM3 global interrupt	true	0	0
TIM15 global interrupt	true	0	0
USART2 global interrupt	true	0	0
Flash global interrupt	unused		
RCC global interrupt	unused		
I2C1 global interrupt	unused		
SPI1 global interrupt	unused		

*** User modified value**

9. Predefined Views - Category view : Current

10. Software Pack Report