



1. Description

1.1. Project

Project Name	e_lab_4_all_wires
Board Name	custom
Generated with:	STM32CubeMX 6.11.0
Date	05/24/2024

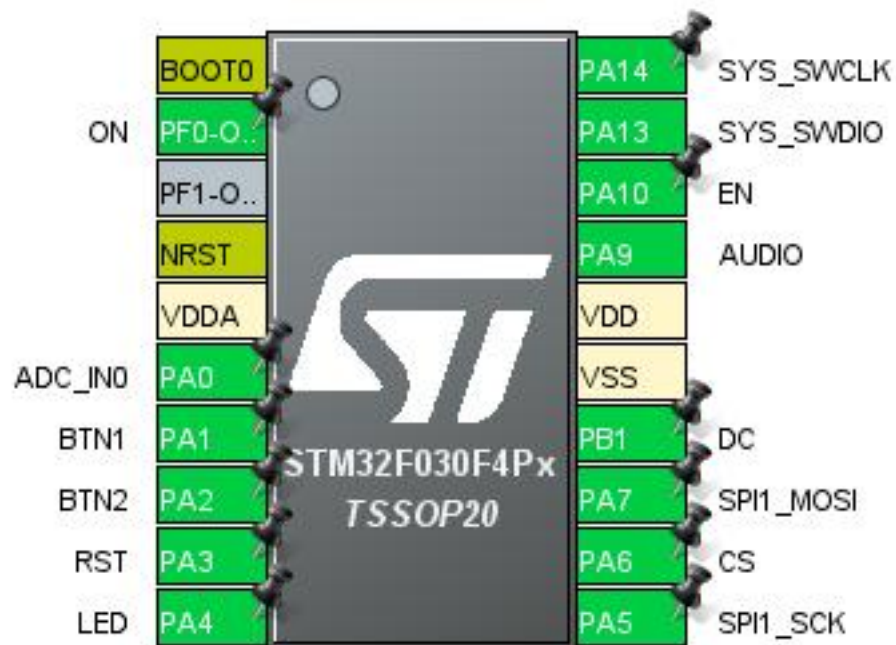
1.2. MCU

MCU Series	STM32F0
MCU Line	STM32F0x0 Value Line
MCU name	STM32F030F4Px
MCU Package	TSSOP20
MCU Pin number	20

1.3. Core(s) information

Core(s)	Arm Cortex-M0
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2. Pinout Configuration

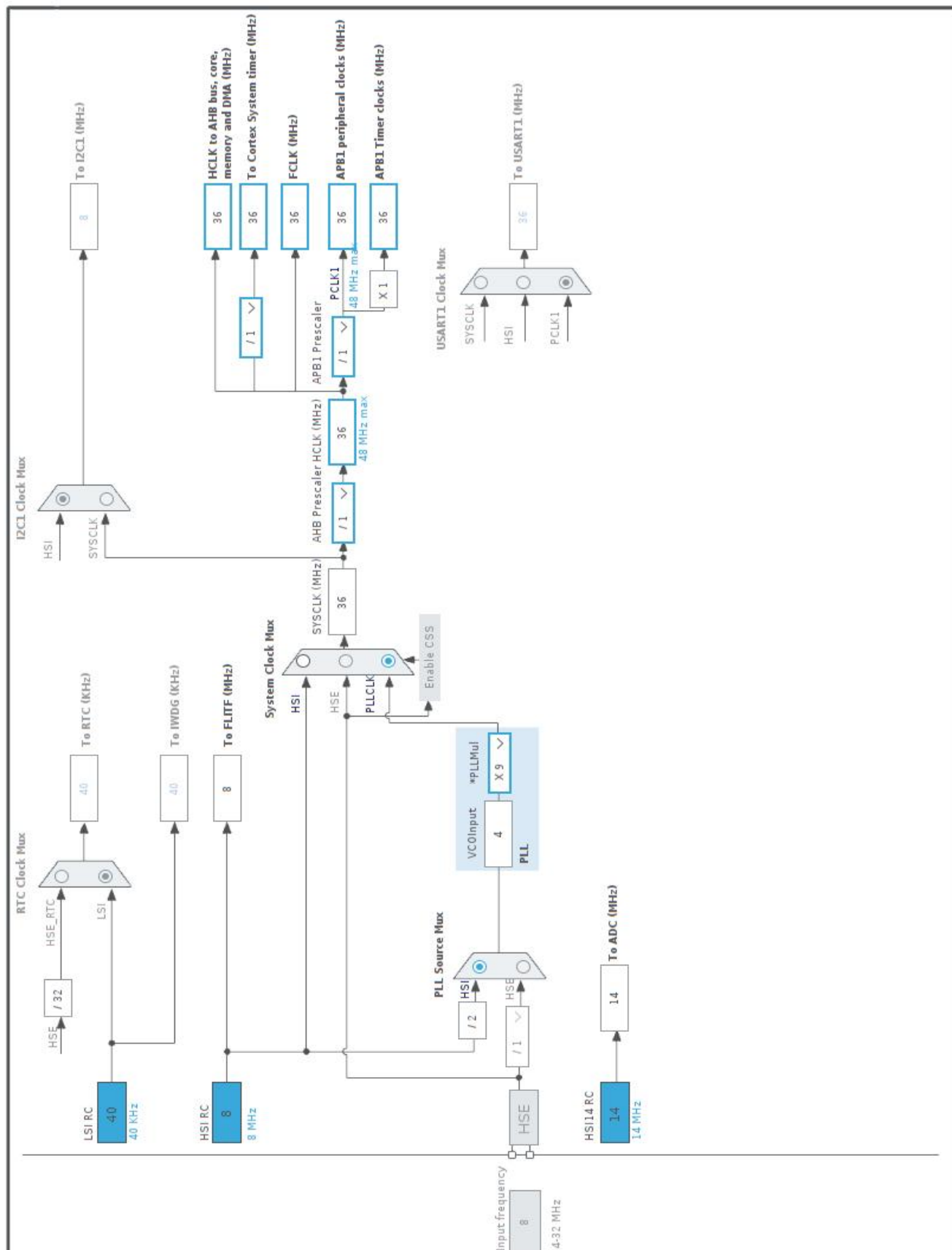


3. Pins Configuration

Pin Number TSSOP20	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
1	BOOT0	Boot		
2	PF0-OSC_IN *	I/O	GPIO_Input	ON
4	NRST	Reset		
5	VDDA	Power		
6	PA0	I/O	ADC_IN0	
7	PA1 *	I/O	GPIO_Input	BTN1
8	PA2 *	I/O	GPIO_Input	BTN2
9	PA3 *	I/O	GPIO_Output	RST
10	PA4 *	I/O	GPIO_Output	LED
11	PA5	I/O	SPI1_SCK	
12	PA6 *	I/O	GPIO_Output	CS
13	PA7	I/O	SPI1_MOSI	
14	PB1 *	I/O	GPIO_Output	DC
15	VSS	Power		
16	VDD	Power		
17	PA9	I/O	TIM1_CH2	AUDIO
18	PA10 *	I/O	GPIO_Output	EN
19	PA13	I/O	SYS_SWDIO	
20	PA14	I/O	SYS_SWCLK	

* The pin is affected with an I/O function

4. Clock Tree Configuration



5. Software Project

5.1. Project Settings

Name	Value
Project Name	e_lab_4_all_wires
Project Folder	/home/hector/STM32CubeIDE/workspace_1.15.0/e_lab_4_all_wires
Toolchain / IDE	STM32CubeIDE
Firmware Package Name and Version	STM32Cube FW_F0 V1.11.4
Application Structure	Advanced
Generate Under Root	Yes
Do not generate the main()	No
Minimum Heap Size	0x200
Minimum Stack Size	0x400

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
Keep User Code when re-generating	Yes
Delete previously generated files when not re-generated	Yes
Set all free pins as analog (to optimize the power consumption)	No
Enable Full Assert	No

5.3. Advanced Settings - Generated Function Calls

Rank	Function Name	Peripheral Instance Name
1	SystemClock_Config	RCC
2	MX_GPIO_Init	GPIO
3	MX_SPI1_Init	SPI1
4	MX_ADC_Init	ADC
5	MX_TIM1_Init	TIM1

1. Power Consumption Calculator report

1.1. Microcontroller Selection

Series	STM32F0
Line	STM32F0x0 Value Line
MCU	STM32F030F4Px
Datasheet	DS9773_Rev2

1.2. Parameter Selection

Temperature	25
Vdd	3.6

1.3. 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

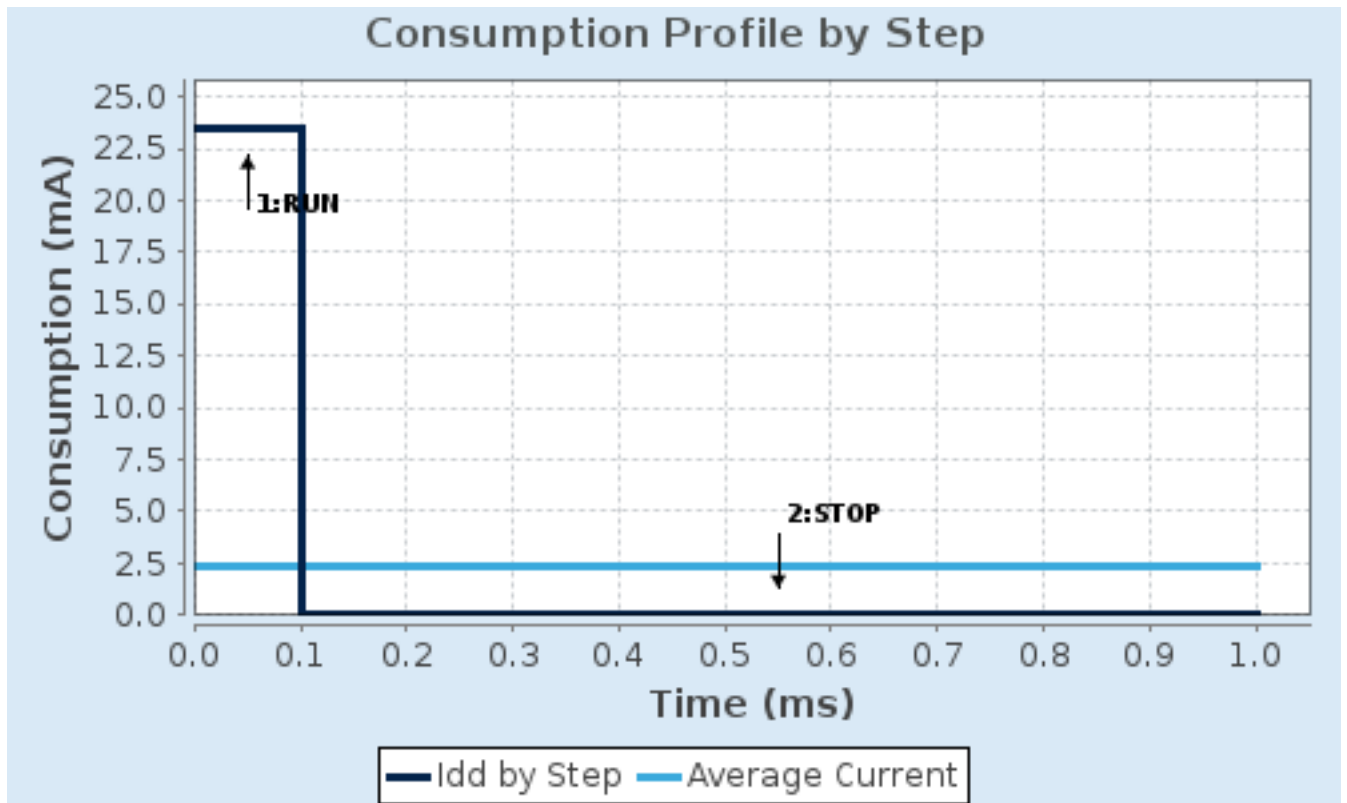
1.4. Sequence

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 μ A
Duration	0.1 ms	0.9 ms
DMIPS	0.0	0.0
Ta Max	98.58	105
Category	In DS Table	In DS Table

1.5. Results

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

1.6. Chart



2. Peripherals and Middlewares Configuration

2.1. ADC

mode: IN0

2.1.1. Parameter Settings:

ADC_Settings:

Clock Prescaler	Asynchronous clock mode
Resolution	ADC 12-bit resolution
Data Alignment	Right alignment
Scan Conversion Mode	Forward
Continuous Conversion Mode	Disabled
Discontinuous Conversion Mode	Disabled
DMA Continuous Requests	Disabled
End Of Conversion Selection	End of single conversion
Overrun behaviour	Overrun data preserved
Low Power Auto Wait	Disabled
Low Power Auto Power Off	Disabled

ADC_Regular_ConversionMode:

Sampling Time	1.5 Cycles
External Trigger Conversion Source	Regular Conversion launched by software
External Trigger Conversion Edge	None

WatchDog:

Enable Analog WatchDog Mode	false
Low Threshold	0

2.2. RCC

2.2.1. 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
HSI14 Calibration Value	16
HSE Startup Timeout Value (ms)	100
LSE Startup Timeout Value (ms)	5000

2.3. SPI1

Mode: Half-Duplex Master

2.3.1. 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

2.4. SYS

mode: Debug Serial Wire

Timebase Source: SysTick

2.5. TIM1

Channel2: PWM Generation CH2

2.5.1. Parameter Settings:

Counter Settings:

Prescaler (PSC - 16 bits value)	1000 *
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)
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Trigger Event Selection Reset (UG bit from TIMx_EGR)

Break And Dead Time management - BRK Configuration:

BRK State Disable

BRK Polarity High

Break And Dead Time management - Output Configuration:

Automatic Output State Disable

Off State Selection for Run Mode (OSSR) Disable

Off State Selection for Idle Mode (OSSI) Disable

Lock Configuration Off

PWM Generation Channel 2:

Mode PWM mode 1

Pulse (16 bits value) **32000 ***

Output compare preload Enable

Fast Mode Disable

CH Polarity High

CH Idle State Reset

*** User modified value**

3. System Configuration

3.1. GPIO configuration

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
ADC	PA0	ADC_IN0	Analog mode	No pull-up and no pull-down	n/a	
SPI1	PA5	SPI1_SCK	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 *	
SYS	PA13	SYS_SWDIO	n/a	n/a	n/a	
	PA14	SYS_SWCLK	n/a	n/a	n/a	
TIM1	PA9	TIM1_CH2	Alternate Function Push Pull	No pull-up and no pull-down	Low	AUDIO
GPIO	PF0-OSC_IN	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	ON
	PA1	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	BTN1
	PA2	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	BTN2
	PA3	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	RST
	PA4	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	LED
	PA6	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	CS
	PB1	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	DC
	PA10	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	EN

3.2. DMA configuration

nothing configured in DMA service

3.3. NVIC configuration

3.3.1. NVIC

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	3	0
Flash global interrupt	unused		
RCC global interrupt	unused		
ADC interrupt	unused		
TIM1 break, update, trigger and commutation interrupts	unused		
TIM1 capture compare interrupt	unused		
SPI1 global interrupt	unused		

3.3.2. NVIC Code generation

Enabled interrupt Table	Select for init sequence ordering	Generate IRQ handler	Call HAL handler
Non maskable interrupt	false	true	false
Hard fault interrupt	false	true	false
System service call via SWI instruction	false	true	false
Pendable request for system service	false	true	false
System tick timer	false	true	true

* User modified value

4. System Views

4.1. Category view

4.1.1. Current

Middleware

System Core

DMA

GPIO

NVIC

RCC

SYS

Analog

ADC

Timers

TIM1

Connectivity

SPI1

Computing

5. Docs & Resources

Type	Link
IBIS models	https://www.st.com/resource/en/ibis_model/stm32f0_ibis.zip
System View Description	https://www.st.com/resource/en/svd/stm32f0_svd.zip
Presentations	https://www.st.com/resource/en/product_presentation/gt_stm32f0-io.pdf
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Application Notes [---

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