28/08/2025

# *1. Description*

## 1.1. Project

| | |
|---|---|
| Project Name | battery |
| Board Name | custom |
| Generated with: | STM32CubeMX 6.15.0 |
| Date | 08/28/2025 |

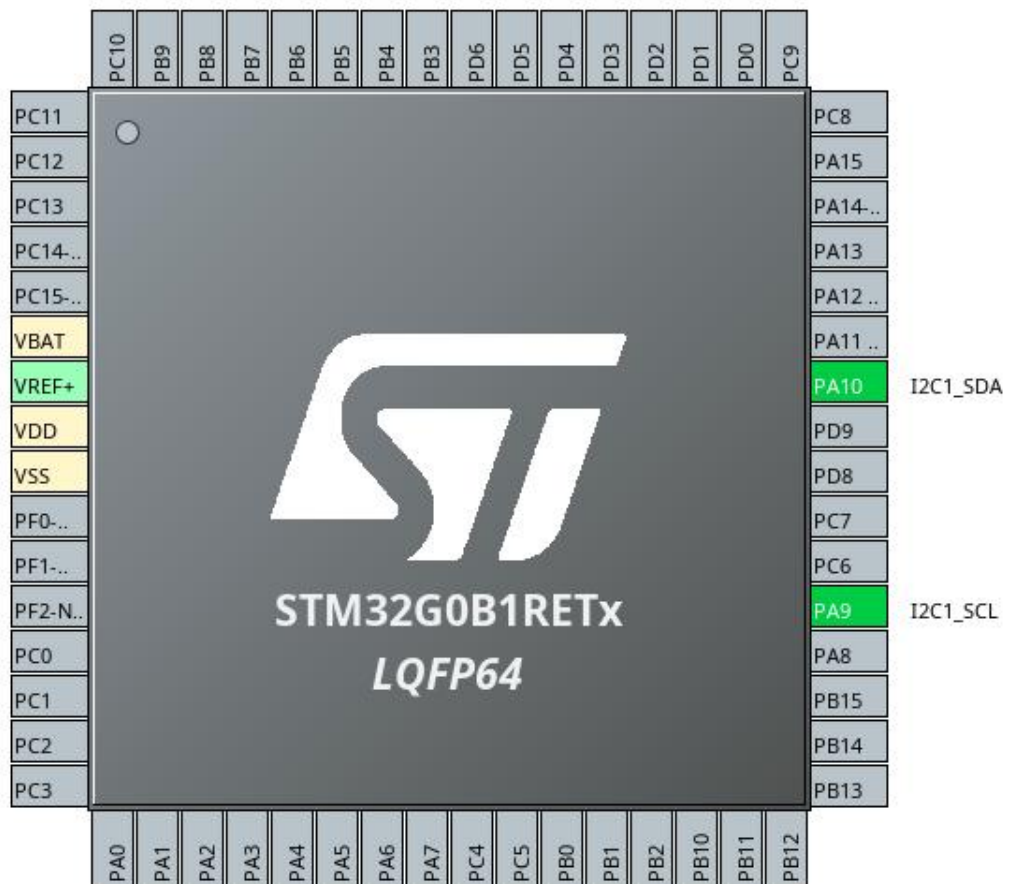## 1.2. MCU

| | |
|---|---|
| MCU Series | STM32G0 |
| MCU Line | STM32G0x1 |
| MCU name | STM32G0B1RETx |
| MCU Package | LQFP64 |
| MCU Pin number | 64 |

## 1.3. Core(s) information

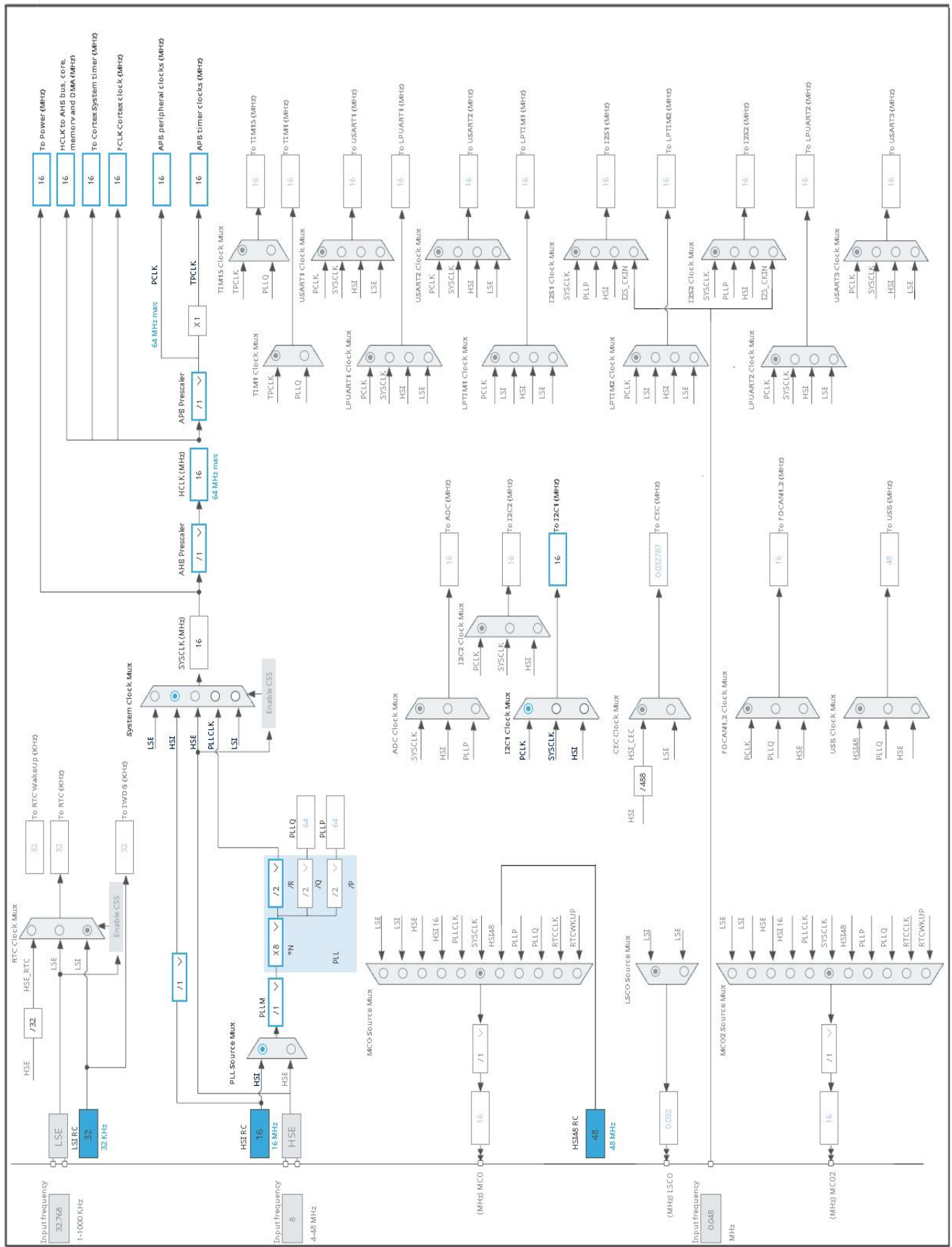| | |
|---|---|
| Core(s) | ARM Cortex-M0+ |

# 2. Pinout Configuration

# *3. Pins Configuration*

| Pin Number LQFP64 | Pin Name (function after reset) | Pin Type | Alternate Function(s) | Label |
|---|---|---|---|---|
| 6 | VBAT | Power | | |
| 8 | VDD | Power | | |
| 9 | VSS | Power | | |
| 37 | PA9 | I/O | I2C1_SCL | |
| 42 | PA10 | I/O | I2C1_SDA | |

# 4. Clock Tree Configuration

# *1. Power Consumption Calculator report*

## 1.1. Microcontroller Selection

| | |
|---|---|
| Series | STM32G0 |
| Line | STM32G0x1 |
| MCU | STM32G0B1RETx |
| Datasheet | DS13560_Rev0 |

## 1.2. Parameter Selection

| | |
|---|---|
| Temperature | 25 |
| Vdd | 3.0 |

## 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 | STOP1 |
| Vdd | 3.0 | 3.0 |
| Voltage Source | Battery | Battery |
| Range | Range1-High | Range1-High |
| Fetch Type | SRAM1/Flash-PowerDown/D_SRAM1 | Flash-PowerDown/D_SRAM1/Cache |
| CPU Frequency | 64 MHz | 16 MHz |
| Clock Configuration | HSI PLL | HSI |
| Clock Source Frequency | 16 MHz | 16 MHz |
| Peripherals | | |
| Additional Cons. | 0 mA | 0 mA |
| Average Current | 8.85 mA | 7.05 µA |
| Duration | 0.1 ms | 0.9 ms |
| DMIPS | 80.0 | 20.0 |
| Ta Max | 127.77 | 130 |
| Category | In DS Table | In DS Table |

## 1.5. Results

| Sequence Time | 1 ms | Average Current | 891.34 µA |
|---|---|---|---|
| Battery Life | 5 months, 6 days, 4 hours | Average DMIPS | 26.0 DMIPS |

## 1.6. Chart

Consumption Profile by Step
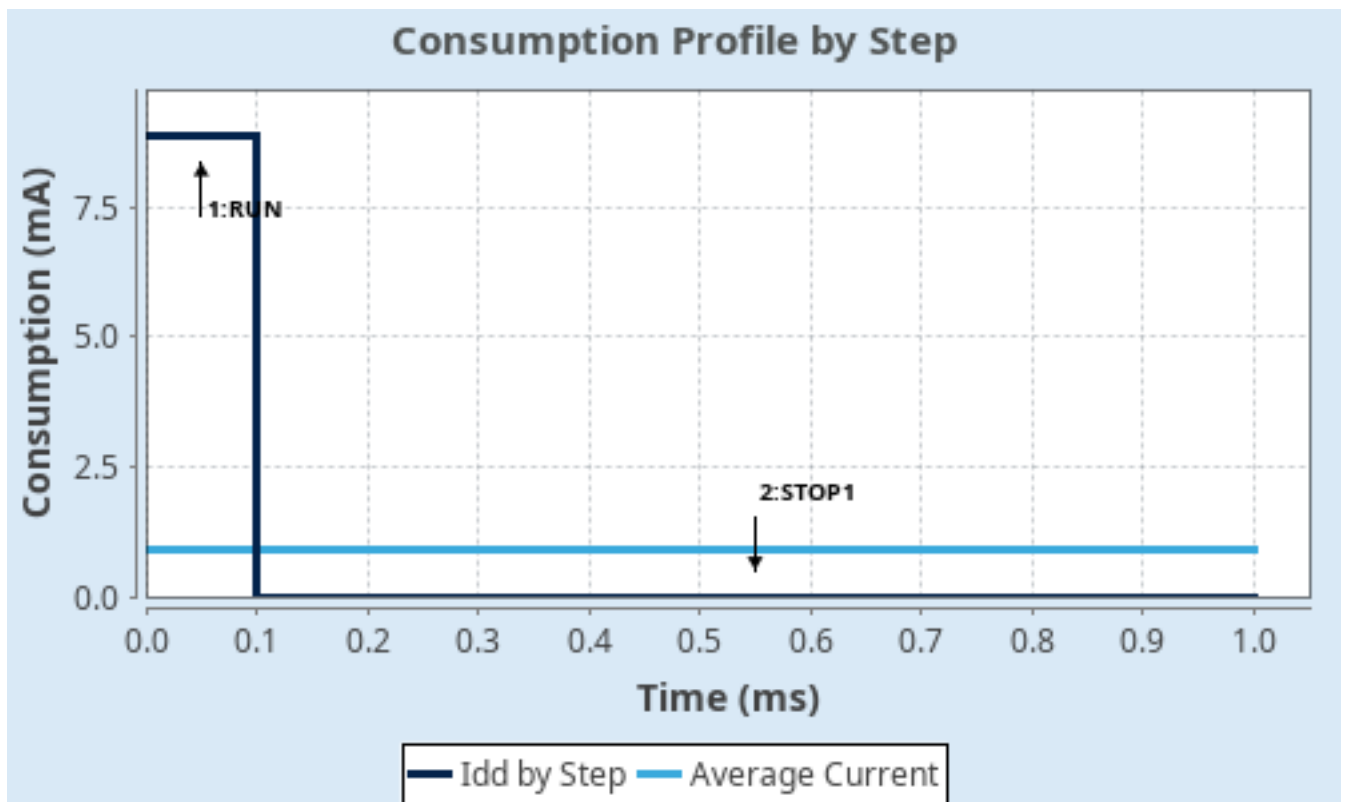
# *2. Software Project*

## 2.1. Project Settings

| Name | Value |
|---|---|
| Project Name | battery |
| Project Folder | /home/shawal/GitHub/anfa_battery_management/battery |
| Toolchain / IDE | STM32CubeIDE |
| Firmware Package Name and Version | STM32Cube FW_G0 V1.6.2 |
| Application Structure | Advanced |
| Generate Under Root | Yes |
| Do not generate the main() | No |
| Minimum Heap Size | 0x200 |
| Minimum Stack Size | 0x400 |

## 2.2. Code Generation Settings

| Name | Value |
|---|---|
| STM32Cube MCU packages and embedded software | Add necessary library files as reference in the toolchain project configuration file |
| Generate peripheral initialization as a pair of '.c/.h' files | Yes |
| Backup previously generated files when re-generating | Yes |
| Keep User Code when re-generating | Yes |
| Delete previously generated files when not re-generated | No |
| Set all free pins as analog (to optimize the power consumption) | No |
| Enable Full Assert | No |

## 2.3. Advanced Settings - Generated Function Calls

| Rank | Function Name | Peripheral Instance Name |
|---|---|---|
| 1 | SystemClock_Config | RCC |
| 2 | MX_GPIO_Init | GPIO |
| 3 | MX_I2C1_Init | I2C1 |

# 3. Peripherals and Middlewares Configuration

## 3.1. I2C1

**I2C: I2C**

### 3.1.1. Parameter Settings:

**Timing configuration:**

| | |
|---|---|
| Custom Timing | Disabled |
| I2C Speed Mode | Standard Mode |
| I2C Speed Frequency (KHz) | 100 |
| Rise Time (ns) | 100 |
| Fall Time (ns) | 100 |
| Coefficient of Digital Filter | 0 |
| Analog Filter | Enabled |
| Timing | **0x00503D58 *** |

**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 |

## 3.2. RCC

### 3.2.1. Parameter Settings:

**System Parameters:**

| | |
|---|---|
| VDD voltage (V) | 3.3 |
| Instruction Cache | Enabled |
| Prefetch Buffer | Enabled |
| Data Cache | Enabled |
| Flash Latency(WS) | 0 WS (1 CPU cycle) |

**RCC Parameters:**

| | |
|---|---|
| HSI Calibration Value | 64 |
| HSE Startup Timout Value (ms) | 100 |
| LSE Startup Timout Value (ms) | 5000 |

**Power Parameters:**

| | |
|---|---|
| Power Regulator Voltage Scale | Power Regulator Voltage Scale 1 |

**Peripherals Clock Configuration:**

| | |
|---|---|
| Generate the peripherals clock configuration | TRUE |

**3.3. SYS**
**Timebase Source: SysTick**
**mode: save power of non-active UCPD - deactive Dead Battery pull-up**


**\* User modified value**

# *4. System Configuration*

## 4.1. GPIO configuration

| IP | Pin | Signal | GPIO mode | GPIO pull/up pull down | Max Speed | User Label |
|----|-----|--------|-----------|------------------------|-----------|------------|
| I2C1 | PA9 | I2C1_SCL | Alternate Function Open Drain | No pull-up and no pull-down | Low | |
| | PA10 | I2C1_SDA | Alternate Function Open Drain | No pull-up and no pull-down | Low | |

## 4.2. DMA configuration

nothing configured in DMA service

## 4.3. NVIC configuration

### 4.3.1. 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 |
| PVD through EXTI line 16, PVM (monit. VDDIO2) through EXTI line 34 | unused | | |
| Flash global interrupt | unused | | |
| RCC global Interrupt | unused | | |
| I2C1 event global interrupt / I2C1 wake-up interrupt through EXTI line 23 | unused | | |

### 4.3.2. 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**

# 5. System Views

5.1. Category view

## 5.1.1. Current

# 6. Docs  & Resources

| Type | Link |
|---|---|
| IBIS models | https://www.st.com/resource/en/ibis_model/stm32g0_ibis.zip |
| System View Description | https://www.st.com/resource/en/svd/stm32g0-svd.zip |
| Presentations | https://www.st.com/resource/en/product_presentation/stm32-stm8_embedded_software_solutions.pdf |
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| Security Bulletin | https://www.st.com/resource/en/technical_note/tn1489-security-bulletin-tn1489stpsirt-physical-attacks-on-stm32-and-stm32cube-firmware- |

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Application Notes https://www.st.com/resource/en/application_note/an4991-how-to-wake-up-an-stm32-microcontroller-from-lowpower-mode-with-the-usart-or-the-lpuart-stmicroelectronics.pdf

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Application Notes https://www.st.com/resource/en/application_note/an5225-introduction-to-usb-typec-power-delivery-for-stm32-mcus-and-mpus-stmicroelectronics.pdf

Application Notes https://www.st.com/resource/en/application_note/an4777-how-to-optimize-power-consumption-on-stm32-mcus-stmicroelectronics.pdf

Application Notes https://www.st.com/resource/en/application_note/an4894-how-to-use-eeprom-emulation-on-stm32-mcus-stmicroelectronics.pdf

Application Notes https://www.st.com/resource/en/application_note/an5537-how-to-use-adc-oversampling-techniques-to-improve-signaltonoise-ratio-on-stm32-mcus-stmicroelectronics.pdf

Application Notes https://www.st.com/resource/en/application_note/an5036-guidelines-for-thermal-management-on-stm32-applications-stmicroelectronics.pdf

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| Errata Sheets | https://www.st.com/resource/en/errata_sheet/es0548-stm32g0b1xbxcxe-device-errata-stmicroelectronics.pdf |
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