
STM32
CubeMX

# 1. Description

## 1.1. Project

| | |
|---|---|
| Project Name | 2024.02 |
| Board Name | NUCLEO-F746ZG |
| Generated with: | STM32CubeMX 6.10.0 |
| Date | 02/25/2024 |

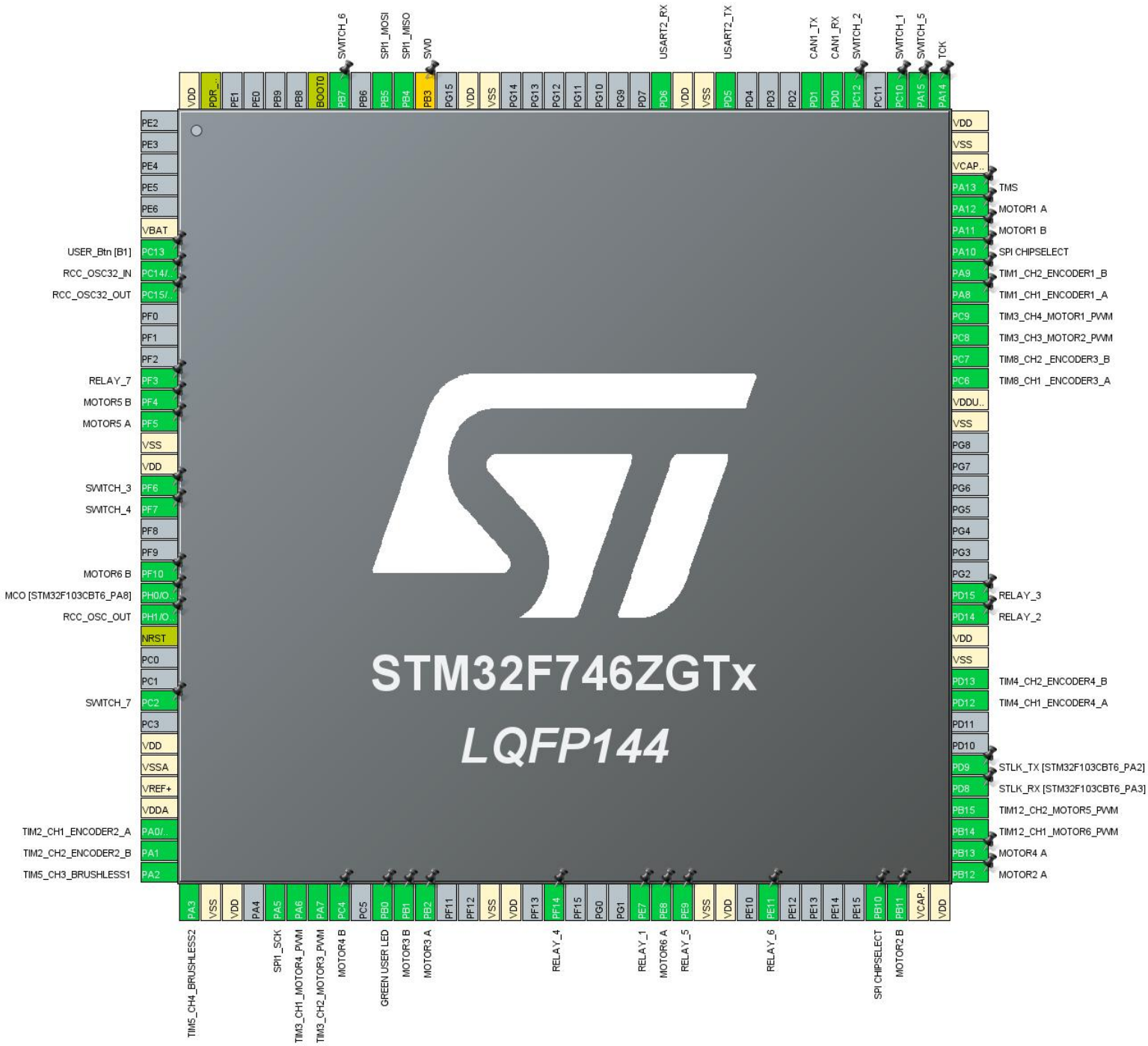
## 1.2. MCU

| | |
|---|---|
| MCU Series | STM32F7 |
| MCU Line | STM32F7x6 |
| MCU name | STM32F746ZGTx |
| MCU Package | LQFP144 |
| MCU Pin number | 144 |

## 1.3. Core(s) information

| | |
|---|---|
| Core(s) | Arm Cortex-M7 |

## 2. Pinout Configuration



# 3. Pins Configuration

| Pin Number LQFP144 | Pin Name (function after reset) | Pin Type | Alternate Function(s) | Label |
|---|---|---|---|---|
| 6 | VBAT | Power | | |
| 7 | PC13 | I/O | GPIO_EXTI13 | USER_Btn [B1] |
| 8 | PC14/OSC32_IN | I/O | RCC_OSC32_IN | |
| 9 | PC15/OSC32_OUT | I/O | RCC_OSC32_OUT | |
| 13 | PF3 * | I/O | GPIO_Output | RELAY_7 |
| 14 | PF4 * | I/O | GPIO_Output | MOTOR5 B |
| 15 | PF5 * | I/O | GPIO_Output | MOTOR5 A |
| 16 | VSS | Power | | |
| 17 | VDD | Power | | |
| 18 | PF6 * | I/O | GPIO_Input | SWITCH_3 |
| 19 | PF7 * | I/O | GPIO_Input | SWITCH_4 |
| 22 | PF10 * | I/O | GPIO_Output | MOTOR6 B |
| 23 | PH0/OSC_IN | I/O | RCC_OSC_IN | MCO [STM32F103CBT6_PA8] |
| 24 | PH1/OSC_OUT | I/O | RCC_OSC_OUT | |
| 25 | NRST | Reset | | |
| 28 | PC2 * | I/O | GPIO_Input | SWITCH_7 |
| 30 | VDD | Power | | |
| 31 | VSSA | Power | | |
| 32 | VREF+ | Power | | |
| 33 | VDDA | Power | | |
| 34 | PA0/WKUP | I/O | TIM2_CH1 | TIM2_CH1_ENCODER2_A |
| 35 | PA1 | I/O | TIM2_CH2 | TIM2_CH2_ENCODER2_B |
| 36 | PA2 | I/O | TIM5_CH3 | TIM5_CH3_BRUSHLESS1 |
| 37 | PA3 | I/O | TIM5_CH4 | TIM5_CH4_BRUSHLESS2 |
| 38 | VSS | Power | | |
| 39 | VDD | Power | | |
| 41 | PA5 | I/O | SPI1_SCK | |
| 42 | PA6 | I/O | TIM3_CH1 | TIM3_CH1_MOTOR4_PWM |
| 43 | PA7 | I/O | TIM3_CH2 | TIM3_CH2_MOTOR3_PWM |
| 44 | PC4 * | I/O | GPIO_Output | MOTOR4 B |
| 46 | PB0 * | I/O | GPIO_Output | GREEN USER LED |
| 47 | PB1 * | I/O | GPIO_Output | MOTOR3 B |
| 48 | PB2 * | I/O | GPIO_Output | MOTOR3 A |
| 51 | VSS | Power | | |
| 52 | VDD | Power | | |

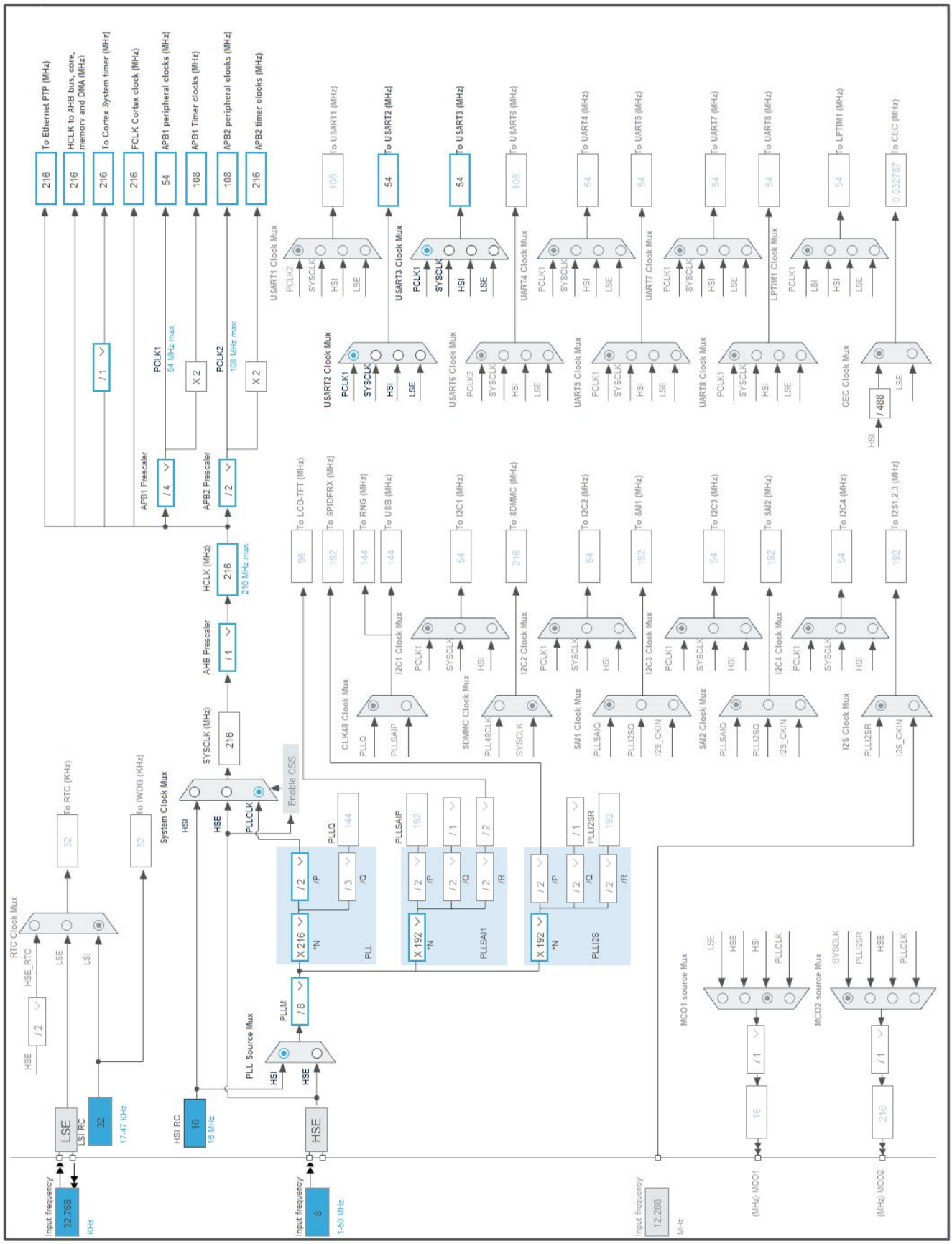
| Pin Number LQFP144 | Pin Name (function after reset) | Pin Type | Alternate Function(s) | Label |
|---|---|---|---|---|
| 54 | PF14 * | I/O | GPIO_Output | RELAY_4 |
| 58 | PE7 * | I/O | GPIO_Output | RELAY_1 |
| 59 | PE8 * | I/O | GPIO_Output | MOTOR6 A |
| 60 | PE9 * | I/O | GPIO_Output | RELAY_5 |
| 61 | VSS | Power | | |
| 62 | VDD | Power | | |
| 64 | PE11 * | I/O | GPIO_Output | RELAY_6 |
| 69 | PB10 * | I/O | GPIO_Output | SPI CHIPSELECT |
| 70 | PB11 * | I/O | GPIO_Output | MOTOR2 B |
| 71 | VCAP_1 | Power | | |
| 72 | VDD | Power | | |
| 73 | PB12 * | I/O | GPIO_Output | MOTOR2 A |
| 74 | PB13 * | I/O | GPIO_Output | MOTOR4 A |
| 75 | PB14 | I/O | TIM12_CH1 | TIM12_CH1_MOTOR6_PWM |
| 76 | PB15 | I/O | TIM12_CH2 | TIM12_CH2_MOTOR5_PWM |
| 77 | PD8 | I/O | USART3_TX | STLK_RX [STM32F103CBT6_PA3] |
| 78 | PD9 | I/O | USART3_RX | STLK_TX [STM32F103CBT6_PA2] |
| 81 | PD12 | I/O | TIM4_CH1 | TIM4_CH1_ENCODER4_A |
| 82 | PD13 | I/O | TIM4_CH2 | TIM4_CH2_ENCODER4_B |
| 83 | VSS | Power | | |
| 84 | VDD | Power | | |
| 85 | PD14 * | I/O | GPIO_Output | RELAY_2 |
| 86 | PD15 * | I/O | GPIO_Output | RELAY_3 |
| 94 | VSS | Power | | |
| 95 | VDDUSB | Power | | |
| 96 | PC6 | I/O | TIM8_CH1 | TIM8_CH1 _ENCODER3_A |
| 97 | PC7 | I/O | TIM8_CH2 | TIM8_CH2 _ENCODER3_B |
| 98 | PC8 | I/O | TIM3_CH3 | TIM3_CH3_MOTOR2_PWM |
| 99 | PC9 | I/O | TIM3_CH4 | TIM3_CH4_MOTOR1_PWM |
| 100 | PA8 | I/O | TIM1_CH1 | TIM1_CH1_ENCODER1_A |
| 101 | PA9 | I/O | TIM1_CH2 | TIM1_CH2_ENCODER1_B |
| 102 | PA10 * | I/O | GPIO_Output | SPI CHIPSELECT |
| 103 | PA11 * | I/O | GPIO_Output | MOTOR1 B |
| 104 | PA12 * | I/O | GPIO_Output | MOTOR1 A |
| 105 | PA13 | I/O | SYS_JTMS-SWDIO | TMS |
| 106 | VCAP_2 | Power | | |

| Pin Number LQFP144 | Pin Name (function after reset) | Pin Type | Alternate Function(s) | Label |
|---|---|---|---|---|
| 107 | VSS | Power | | |
| 108 | VDD | Power | | |
| 109 | PA14 | I/O | SYS_JTCK-SWCLK | TCK |
| 110 | PA15 * | I/O | GPIO_Input | SWITCH_5 |
| 111 | PC10 * | I/O | GPIO_Input | SWITCH_1 |
| 113 | PC12 * | I/O | GPIO_Input | SWITCH_2 |
| 114 | PD0 | I/O | CAN1_RX | |
| 115 | PD1 | I/O | CAN1_TX | |
| 119 | PD5 | I/O | USART2_TX | |
| 120 | VSS | Power | | |
| 121 | VDD | Power | | |
| 122 | PD6 | I/O | USART2_RX | |
| 130 | VSS | Power | | |
| 131 | VDD | Power | | |
| 133 | PB3 ** | I/O | SYS_JTDO-SWO | SW0 |
| 134 | PB4 | I/O | SPI1_MISO | |
| 135 | PB5 | I/O | SPI1_MOSI | |
| 137 | PB7 * | I/O | GPIO_Input | SWITCH_6 |
| 138 | BOOT0 | Boot | | |
| 143 | PDR_ON | Reset | | |
| 144 | VDD | Power | | |

* The pin is affected with an I/O function

** The pin is affected with a peripheral function but no peripheral mode is activated

# 4. Clock Tree Configuration



# 5. Software Project

## 5.1. Project Settings

| Name | Value |
|---|---|
| Project Name | 2024.02.24 manual robot code |
| Project Folder | C:\Users\urtna\STM32CubeIDE\workspace_1.14.0\2024.02.24 manual robot |
| Toolchain / IDE | STM32CubeIDE |
| Firmware Package Name and Version | STM32Cube FW_F7 V1.17.1 |
| 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_DMA_Init | DMA |
| 4 | MX_CAN1_Init | CAN1 |
| 5 | MX_TIM1_Init | TIM1 |
| 6 | MX_TIM2_Init | TIM2 |
| 7 | MX_TIM4_Init | TIM4 |
| 8 | MX_TIM5_Init | TIM5 |
| 9 | MX_TIM8_Init | TIM8 |
| 10 | MX_TIM12_Init | TIM12 |
| 11 | MX_USART3_UART_Init | USART3 |

| Rank | Function Name | Peripheral Instance Name |
|---|---|---|
| 12 | MX_SPI1_Init | SPI1 |
| 13 | MX_USART2_UART_Init | USART2 |
| 14 | MX_TIM6_Init | TIM6 |
| 15 | MX_TIM3_Init | TIM3 |

# 1. Power Consumption Calculator report

## 1.1. Microcontroller Selection

| | |
|---|---|
| Series | STM32F7 |
| Line | STM32F7x6 |
| MCU | STM32F746ZGTx |
| Datasheet | DS10916_Rev4 |

## 1.2. Parameter Selection

| | |
|---|---|
| Temperature | 25 |
| Vdd | 3.3 |

## 1.3. Battery Selection

| | |
|---|---|
| Battery | Alkaline(9V) |
| Capacity | 625.0 mAh |
| Self Discharge | 0.3 %/month |
| Nominal Voltage | 9.0 V |
| Max Cont Current | 200.0 mA |
| Max Pulse Current | 0.0 mA |
| Cells in series | 1 |
| Cells in parallel | 1 |

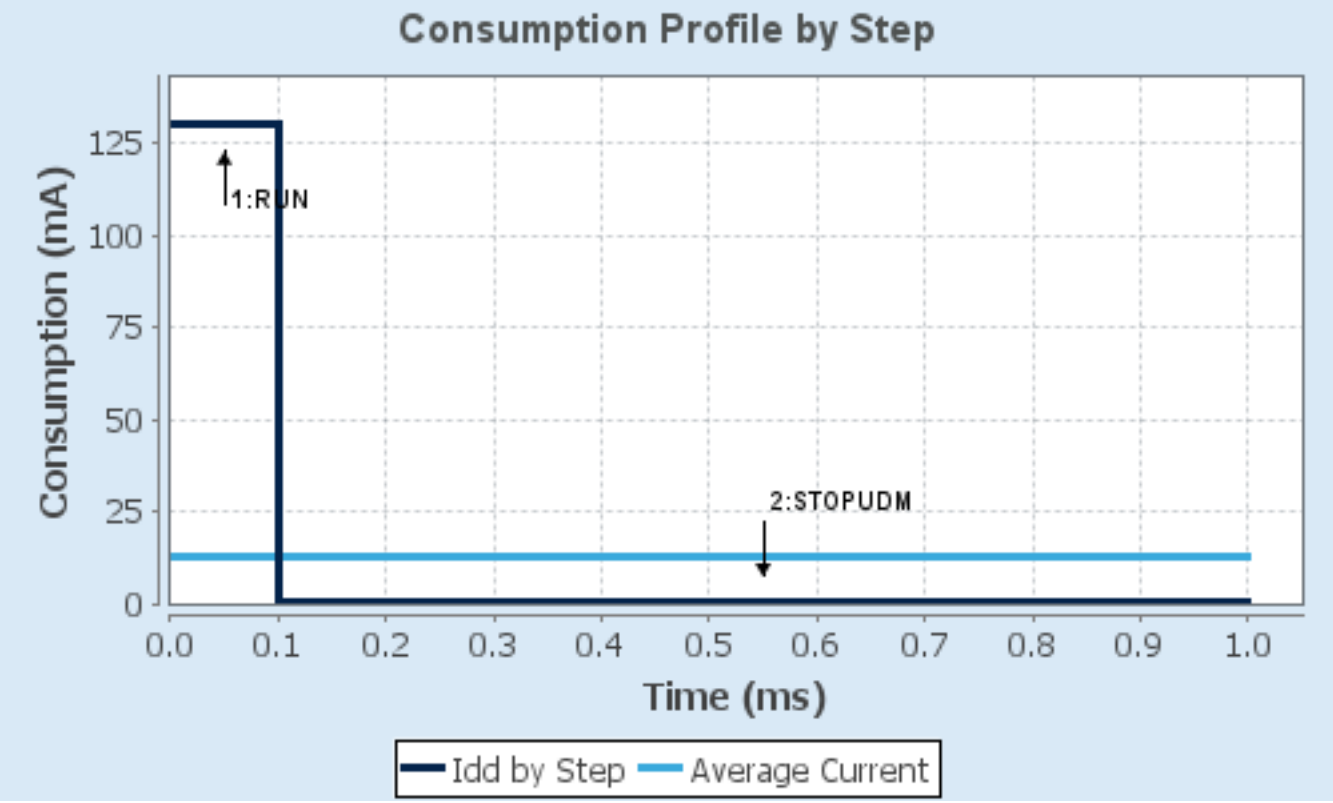
## 1.4. Sequence

| ***Step*** | Step1 | Step2 |
|---|---|---|
| ***Mode*** | RUN | STOP_UDM (Under Drive) |
| ***Vdd*** | 3.3 | 3.3 |
| ***Voltage Source*** | Battery | Battery |
| ***Range*** | Scale1-High | No Scale |
| ***Fetch Type*** | ITCM/FLASH/REGON | n/a |
| ***CPU Frequency*** | 216 MHz | 0 Hz |
| ***Clock Configuration*** | HSE PLL | Regulator_LP Flash-PwrDwn |
| ***Clock Source Frequency*** | 4 MHz | 0 Hz |
| ***Peripherals*** | | |
| ***Additional Cons.*** | 0 mA | 0 mA |
| ***Average Current*** | 130 mA | 100 µA |
| ***Duration*** | 0.1 ms | 0.9 ms |
| ***DMIPS*** | 462.0 | 0.0 |
| ***Ta Max*** | 87.84 | 104.99 |
| ***Category*** | In DS Table | In DS Table |

## 1.5. Results

| Sequence Time | 1 ms | Average Current | 13.09 mA |
|---|---|---|---|
| Battery Life | 1 day, 23 hours | Average DMIPS | 462.24005 DMIPS |

## 1.6. Chart


Consumption Profile by Step
Consumption (mA)
125
100
75
50
25
0
1:RUN
2:STOPUDM
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

# 2. Peripherals and Middlewares Configuration

## 2.1. CAN1

**mode: Activated**

### 2.1.1. Parameter Settings:

**Bit Timings Parameters:**

| | |
|---|---|
| Prescaler (for Time Quantum) | 16 |
| Time Quantum | **296.2962962962963 *** |
| Time Quanta in Bit Segment 1 | 1 Time |
| Time Quanta in Bit Segment 2 | 1 Time |
| Time for one Bit | **888 *** |
| Baud Rate | **1125000 *** |
| ReSynchronization Jump Width | 1 Time |

**Basic Parameters:**

| | |
|---|---|
| Time Triggered Communication Mode | Disable |
| Automatic Bus-Off Management | Disable |
| Automatic Wake-Up Mode | Disable |
| Automatic Retransmission | Disable |
| Receive Fifo Locked Mode | Disable |
| Transmit Fifo Priority | Disable |

**Advanced Parameters:**

| | |
|---|---|
| Operating Mode | Normal |

## 2.2. RCC

**High Speed Clock (HSE): BYPASS Clock Source**

**Low Speed Clock (LSE) : Crystal/Ceramic Resonator**

### 2.2.1. Parameter Settings:

**System Parameters:**

| | |
|---|---|
| VDD voltage (V) | 3.3 |
| Flash Latency(WS) | 7 WS (8 CPU cycle) |

**RCC Parameters:**

| | |
|---|---|
| HSI Calibration Value | 16 |
| TIM Prescaler Selection | Disabled |
| HSE Startup Timout Value (ms) | 100 |
| LSE Startup Timout Value (ms) | 5000 |

**Power Parameters:**

| | |
|---|---|
| Power Over Drive | Enabled |
| Power Regulator Voltage Scale | Power Regulator Voltage Scale 1 |

## 2.3. SPI1

## Mode: Full-Duplex Master

### 2.3.1. Parameter Settings:

**Basic Parameters:**

| | |
|---|---|
| Frame Format | Motorola |
| Data Size | **8 Bits *** |
| First Bit | **LSB First *** |

**Clock Parameters:**

| | |
|---|---|
| Prescaler (for Baud Rate) | **128 *** |
| Baud Rate | **843.75 KBits/s *** |
| Clock Polarity (CPOL) | **High *** |
| Clock Phase (CPHA) | **2 Edge *** |

**Advanced Parameters:**

| | |
|---|---|
| CRC Calculation | Disabled |
| NSS Signal Type | Software |

## 2.4. SYS

## Debug: Serial Wire

## Timebase Source: SysTick

## 2.5. TIM1

## Combined Channels: Encoder Mode

### 2.5.1. Parameter Settings:

**Counter Settings:**

| | |
|---|---|
| Prescaler (PSC - 16 bits value) | 0 |
| Counter Mode | Up |
| Counter Period (AutoReload Register - 16 bits value ) | 65535 |
| Internal Clock Division (CKD) | No Division |
| Repetition Counter (RCR - 16 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 TRGO | Reset (UG bit from TIMx_EGR) |
| Trigger Event Selection TRGO2 | Reset (UG bit from TIMx_EGR) |

**Encoder:**

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

## 2.6. TIM2

## Combined Channels: Encoder Mode

### 2.6.1. Parameter Settings:

**Counter Settings:**

| | |
|---|---|
| Prescaler (PSC - 16 bits value) | 0 |
| Counter Mode | Up |
| Counter Period (AutoReload Register - 32 bits value ) | **65535 *** |
| 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 TRGO | Reset (UG bit from TIMx_EGR) |

**Encoder:**

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

| | |
|---|---|
| Prescaler Division Ratio | No division |
| Input Filter | 0 |

## 2.7. TIM3

## Channel1: PWM Generation CH1

## Channel2: PWM Generation CH2

## Channel3: PWM Generation CH3

## Channel4: PWM Generation CH4

### 2.7.1. Parameter Settings:

**Counter Settings:**

| | |
|---|---|
| Prescaler (PSC - 16 bits value) | **1686 *** |
| Counter Mode | Up |
| Counter Period (AutoReload Register - 16 bits value ) | **127 *** |
| 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 TRGO | Reset (UG bit from TIMx_EGR) |

**PWM Generation Channel 1:**

| | |
|---|---|
| Mode | PWM mode 1 |
| Pulse (16 bits value) | 0 |
| Output compare preload | Enable |
| Fast Mode | Disable |
| CH Polarity | High |

**PWM Generation Channel 2:**

| | |
|---|---|
| Mode | PWM mode 1 |
| Pulse (16 bits value) | 0 |
| Output compare preload | Enable |
| Fast Mode | Disable |
| CH Polarity | High |

**PWM Generation Channel 3:**

| | |
|---|---|
| Mode | PWM mode 1 |
| Pulse (16 bits value) | 0 |
| Output compare preload | Enable |
| Fast Mode | Disable |
| CH Polarity | High |

**PWM Generation Channel 4:**

| | |
|---|---|
| Mode | PWM mode 1 |

| | |
|---|---|
| Pulse (16 bits value) | 0 |
| Output compare preload | Enable |
| Fast Mode | Disable |
| CH Polarity | High |

## 2.8. TIM4

## Combined Channels: Encoder Mode

### 2.8.1. Parameter Settings:

**Counter Settings:**

| | |
|---|---|
| Prescaler (PSC - 16 bits value) | 0 |
| Counter Mode | Up |
| Counter Period (AutoReload Register - 16 bits value ) | 65535 |
| 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 TRGO | Reset (UG bit from TIMx_EGR) |

**Encoder:**

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

## 2.9. TIM5

## Channel3: PWM Generation CH3

## Channel4: PWM Generation CH4

### 2.9.1. Parameter Settings:

**Counter Settings:**

| | |
|---|---|
| Prescaler (PSC - 16 bits value) | **21600-1 *** |
| Counter Mode | Up |
| Counter Period (AutoReload Register - 32 bits value ) | **100-1 *** |
| 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 TRGO | Reset (UG bit from TIMx_EGR) |

**PWM Generation Channel 3:**

| | |
|---|---|
| Mode | PWM mode 1 |
| Pulse (32 bits value) | 0 |
| Output compare preload | Enable |
| Fast Mode | Disable |
| CH Polarity | High |

**PWM Generation Channel 4:**

| | |
|---|---|
| Mode | PWM mode 1 |
| Pulse (32 bits value) | 0 |
| Output compare preload | Enable |
| Fast Mode | Disable |
| CH Polarity | High |

## 2.10. TIM6

## mode: Activated

### 2.10.1. Parameter Settings:

**Counter Settings:**

| | |
|---|---|
| Prescaler (PSC - 16 bits value) | **1000-1 *** |
| Counter Mode | Up |
| Counter Period (AutoReload Register - 16 bits value ) | **840-1 *** |
| auto-reload preload | Disable |

**Trigger Output (TRGO) Parameters:**

| | |
|---|---|
| Trigger Event Selection | Reset (UG bit from TIMx_EGR) |

## 2.11. TIM8

## Combined Channels: Encoder Mode

### 2.11.1. Parameter Settings:

**Counter Settings:**

| | |
|---|---|
| Prescaler (PSC - 16 bits value) | 0 |
| Counter Mode | Up |
| Counter Period (AutoReload Register - 16 bits value ) | 65535 |
| Internal Clock Division (CKD) | No Division |
| Repetition Counter (RCR - 16 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 TRGO | Reset (UG bit from TIMx_EGR) |
| Trigger Event Selection TRGO2 | Reset (UG bit from TIMx_EGR) |

**Encoder:**

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

## 2.12. TIM12

## Channel1: PWM Generation CH1

## Channel2: PWM Generation CH2

### 2.12.1. Parameter Settings:

**Counter Settings:**

| | |
|---|---|
| Prescaler (PSC - 16 bits value) | **1686 *** |
| Counter Mode | Up |
| Counter Period (AutoReload Register - 16 bits value ) | **127 *** |
| Internal Clock Division (CKD) | No Division |
| auto-reload preload | Disable |

**PWM Generation Channel 1:**

| | |
|---|---|
| Mode | PWM mode 1 |

| | |
|---|---|
| Pulse (16 bits value) | 0 |
| Output compare preload | Enable |
| Fast Mode | Disable |
| CH Polarity | High |

**PWM Generation Channel 2:**

| | |
|---|---|
| Mode | PWM mode 1 |
| Pulse (16 bits value) | 0 |
| Output compare preload | Enable |
| Fast Mode | Disable |
| CH Polarity | High |

## 2.13. USART2

## Mode: Asynchronous

### 2.13.1. 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:**

| | |
|---|---|
| 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 |

## 2.14. USART3

## Mode: Asynchronous

### 2.14.1. 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:

| | |
|---|---|
| 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**

# 3. System Configuration

## 3.1. GPIO configuration

| IP | Pin | Signal | GPIO mode | GPIO pull/up pull down | Max Speed | User Label |
|---|---|---|---|---|---|---|
| CAN1 | PD0 | CAN1_RX | Alternate Function Push Pull | No pull-up and no pull-down | **Very High *** | |
| | PD1 | CAN1_TX | Alternate Function Push Pull | No pull-up and no pull-down | **Very High *** | |
| 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 | MCO [STM32F103CBT6_PA8] |
| | PH1/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 | **Very High *** | |
| | PB4 | SPI1_MISO | Alternate Function Push Pull | **Pull-up *** | **Very High *** | |
| | PB5 | SPI1_MOSI | Alternate Function Push Pull | No pull-up and no pull-down | **Very High *** | |
| SYS | PA13 | SYS_JTMS-SWDIO | n/a | n/a | n/a | TMS |
| | PA14 | SYS_JTCK-SWCLK | n/a | n/a | n/a | TCK |
| TIM1 | PA8 | TIM1_CH1 | Alternate Function Push Pull | No pull-up and no pull-down | Low | TIM1_CH1_ENCODER1_A |
| | PA9 | TIM1_CH2 | Alternate Function Push Pull | No pull-up and no pull-down | Low | TIM1_CH2_ENCODER1_B |
| TIM2 | PA0/WKUP | TIM2_CH1 | Alternate Function Push Pull | No pull-up and no pull-down | Low | TIM2_CH1_ENCODER2_A |
| | PA1 | TIM2_CH2 | Alternate Function Push Pull | No pull-up and no pull-down | Low | TIM2_CH2_ENCODER2_B |
| TIM3 | PA6 | TIM3_CH1 | Alternate Function Push Pull | No pull-up and no pull-down | Low | TIM3_CH1_MOTOR4_PWM |
| | PA7 | TIM3_CH2 | Alternate Function Push Pull | No pull-up and no pull-down | Low | TIM3_CH2_MOTOR3_PWM |
| | PC8 | TIM3_CH3 | Alternate Function Push Pull | No pull-up and no pull-down | Low | TIM3_CH3_MOTOR2_PWM |
| | PC9 | TIM3_CH4 | Alternate Function Push Pull | No pull-up and no pull-down | Low | TIM3_CH4_MOTOR1_PWM |

| IP | Pin | Signal | GPIO mode | GPIO pull/up pull down | Max Speed | User Label |
|---|---|---|---|---|---|---|
| TIM4 | PD12 | TIM4_CH1 | Alternate Function Push Pull | No pull-up and no pull-down | Low | TIM4_CH1_ENCODER4_A |
| | PD13 | TIM4_CH2 | Alternate Function Push Pull | No pull-up and no pull-down | Low | TIM4_CH2_ENCODER4_B |
| TIM5 | PA2 | TIM5_CH3 | Alternate Function Push Pull | No pull-up and no pull-down | Low | TIM5_CH3_BRUSHLESS1 |
| | PA3 | TIM5_CH4 | Alternate Function Push Pull | No pull-up and no pull-down | Low | TIM5_CH4_BRUSHLESS2 |
| TIM8 | PC6 | TIM8_CH1 | Alternate Function Push Pull | No pull-up and no pull-down | Low | TIM8_CH1_ENCODER3_A |
| | PC7 | TIM8_CH2 | Alternate Function Push Pull | No pull-up and no pull-down | Low | TIM8_CH2_ENCODER3_B |
| TIM12 | PB14 | TIM12_CH1 | Alternate Function Push Pull | No pull-up and no pull-down | Low | TIM12_CH1_MOTOR6_PWM |
| | PB15 | TIM12_CH2 | Alternate Function Push Pull | No pull-up and no pull-down | Low | TIM12_CH2_MOTOR5_PWM |
| USART2 | PD5 | USART2_TX | Alternate Function Push Pull | No pull-up and no pull-down | **Very High *** | |
| | PD6 | USART2_RX | Alternate Function Push Pull | No pull-up and no pull-down | **Very High *** | |
| USART3 | PD8 | USART3_TX | Alternate Function Push Pull | **Pull-up *** | **Very High *** | STLK_RX [STM32F103CBT6_PA3] |
| | PD9 | USART3_RX | Alternate Function Push Pull | **Pull-up *** | **Very High *** | STLK_TX [STM32F103CBT6_PA2] |
| Single Mapped Signals | PB3 | SYS_JTDO-SWO | n/a | n/a | n/a | SW0 |
| GPIO | PC13 | GPIO_EXTI13 | External Interrupt Mode with Rising edge trigger detection | No pull-up and no pull-down | n/a | USER_Btn [B1] |
| | PF3 | GPIO_Output | Output Push Pull | No pull-up and no pull-down | Low | RELAY_7 |
| | PF4 | GPIO_Output | Output Push Pull | No pull-up and no pull-down | Low | MOTOR5 B |
| | PF5 | GPIO_Output | Output Push Pull | No pull-up and no pull-down | Low | MOTOR5 A |
| | PF6 | GPIO_Input | Input mode | No pull-up and no pull-down | n/a | SWITCH_3 |
| | PF7 | GPIO_Input | Input mode | No pull-up and no pull-down | n/a | SWITCH_4 |
| | PF10 | GPIO_Output | Output Push Pull | No pull-up and no pull-down | Low | MOTOR6 B |
| | PC2 | GPIO_Input | Input mode | No pull-up and no pull-down | n/a | SWITCH_7 |
| | PC4 | GPIO_Output | Output Push Pull | No pull-up and no pull-down | Low | MOTOR4 B |
| | PB0 | GPIO_Output | Output Push Pull | No pull-up and no pull-down | Low | GREEN USER LED |
| | PB1 | GPIO_Output | Output Push Pull | No pull-up and no pull-down | Low | MOTOR3 B |
| | PB2 | GPIO_Output | Output Push Pull | No pull-up and no pull-down | Low | MOTOR3 A |
| | PF14 | GPIO_Output | Output Push Pull | No pull-up and no pull-down | Low | RELAY_4 |
| | PE7 | GPIO_Output | Output Push Pull | No pull-up and no pull-down | Low | RELAY_1 |
| | PE8 | GPIO_Output | Output Push Pull | No pull-up and no pull-down | Low | MOTOR6 A |
| | | | | | | |

| IP | Pin | Signal | GPIO mode | GPIO pull/up pull down | Max Speed | User Label |
|---|---|---|---|---|---|---|
| | PE9 | GPIO_Output | Output Push Pull | No pull-up and no pull-down | Low | RELAY_5 |
| | PE11 | GPIO_Output | Output Push Pull | No pull-up and no pull-down | Low | RELAY_6 |
| | PB10 | GPIO_Output | Output Push Pull | No pull-up and no pull-down | Low | SPI CHIPSELECT |
| | PB11 | GPIO_Output | Output Push Pull | No pull-up and no pull-down | Low | MOTOR2 B |
| | PB12 | GPIO_Output | Output Push Pull | No pull-up and no pull-down | Low | MOTOR2 A |
| | PB13 | GPIO_Output | Output Push Pull | No pull-up and no pull-down | Low | MOTOR4 A |
| | PD14 | GPIO_Output | Output Push Pull | No pull-up and no pull-down | Low | RELAY_2 |
| | PD15 | GPIO_Output | Output Push Pull | No pull-up and no pull-down | Low | RELAY_3 |
| | PA10 | GPIO_Output | Output Push Pull | No pull-up and no pull-down | Low | SPI CHIPSELECT |
| | PA11 | GPIO_Output | Output Push Pull | No pull-up and no pull-down | Low | MOTOR1 B |
| | PA12 | GPIO_Output | Output Push Pull | No pull-up and no pull-down | Low | MOTOR1 A |
| | PA15 | GPIO_Input | Input mode | No pull-up and no pull-down | n/a | SWITCH_5 |
| | PC10 | GPIO_Input | Input mode | No pull-up and no pull-down | n/a | SWITCH_1 |
| | PC12 | GPIO_Input | Input mode | No pull-up and no pull-down | n/a | SWITCH_2 |
| | PB7 | GPIO_Input | Input mode | No pull-up and no pull-down | n/a | SWITCH_6 |

## 3.2. DMA configuration

| DMA request | Stream | Direction | Priority |
|---|---|---|---|
| USART3_RX | DMA1_Stream1 | Peripheral To Memory | **High *** |
| USART3_TX | DMA1_Stream3 | Memory To Peripheral | **High *** |
| USART2_RX | DMA1_Stream5 | Peripheral To Memory | **High *** |
| USART2_TX | DMA1_Stream6 | Memory To Peripheral | **High *** |

*USART3_RX: DMA1_Stream1 DMA request Settings:*

| | |
|---|---|
| Mode: | **Circular *** |
| Use fifo: | Disable |
| Peripheral Increment: | Disable |
| Memory Increment: | **Enable *** |
| Peripheral Data Width: | Byte |
| Memory Data Width: | Byte |

*USART3_TX: DMA1_Stream3 DMA request Settings:*

| | |
|---|---|
| Mode: | Normal |
| Use fifo: | Disable |
| Peripheral Increment: | Disable |
| Memory Increment: | **Enable *** |
| Peripheral Data Width: | Byte |
| Memory Data Width: | Byte |

*USART2_RX: DMA1_Stream5 DMA request Settings:*

| | |
|---|---|
| Mode: | **Circular *** |
| Use fifo: | Disable |
| Peripheral Increment: | Disable |
| Memory Increment: | **Enable *** |
| Peripheral Data Width: | Byte |
| Memory Data Width: | Byte |

*USART2_TX: DMA1_Stream6 DMA request Settings:*

| | |
|---|---|
| Mode: | Normal |

| | |
|---|---|
| Use fifo: | Disable |
| Peripheral Increment: | Disable |
| Memory Increment: | **Enable *** |
| Peripheral Data Width: | Byte |
| Memory Data Width: | Byte |

## 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 |
| 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 | 0 | 0 |
| System tick timer | true | 0 | 0 |
| DMA1 stream1 global interrupt | true | 0 | 0 |
| DMA1 stream3 global interrupt | true | 0 | 0 |
| DMA1 stream5 global interrupt | true | 0 | 0 |
| DMA1 stream6 global interrupt | true | 0 | 0 |
| TIM1 capture compare interrupt | true | 0 | 0 |
| TIM2 global interrupt | true | 0 | 0 |
| TIM4 global interrupt | true | 0 | 0 |
| USART2 global interrupt | true | 0 | 0 |
| USART3 global interrupt | true | 0 | 0 |
| TIM6 global interrupt, DAC1 and DAC2 underrun error interrupts | true | 0 | 0 |
| PVD interrupt through EXTI line 16 | unused | | |
| Flash global interrupt | unused | | |
| RCC global interrupt | unused | | |
| CAN1 TX interrupts | unused | | |
| CAN1 RX0 interrupts | unused | | |
| CAN1 RX1 interrupt | unused | | |
| CAN1 SCE interrupt | unused | | |
| TIM1 break interrupt and TIM9 global interrupt | unused | | |
| TIM1 update interrupt and TIM10 global interrupt | unused | | |
| TIM1 trigger and commutation interrupts and TIM11 global interrupt | unused | | |
| TIM3 global interrupt | unused | | |
| SPI1 global interrupt | unused | | |
| EXTI line[15:10] interrupts | unused | | |
| TIM8 break interrupt and TIM12 global interrupt | unused | | |
| TIM8 update interrupt and TIM13 global interrupt | unused | | |
| TIM8 trigger and commutation interrupts and | unused | | |

| Interrupt Table | Enable | Preenmption Priority | SubPriority |
|---|---|---|---|
| TIM14 global interrupt | | | |
| TIM8 capture compare interrupt | unused | | |
| TIM5 global interrupt | unused | | |
| FPU global interrupt | unused | | |

### 3.3.2. NVIC Code generation

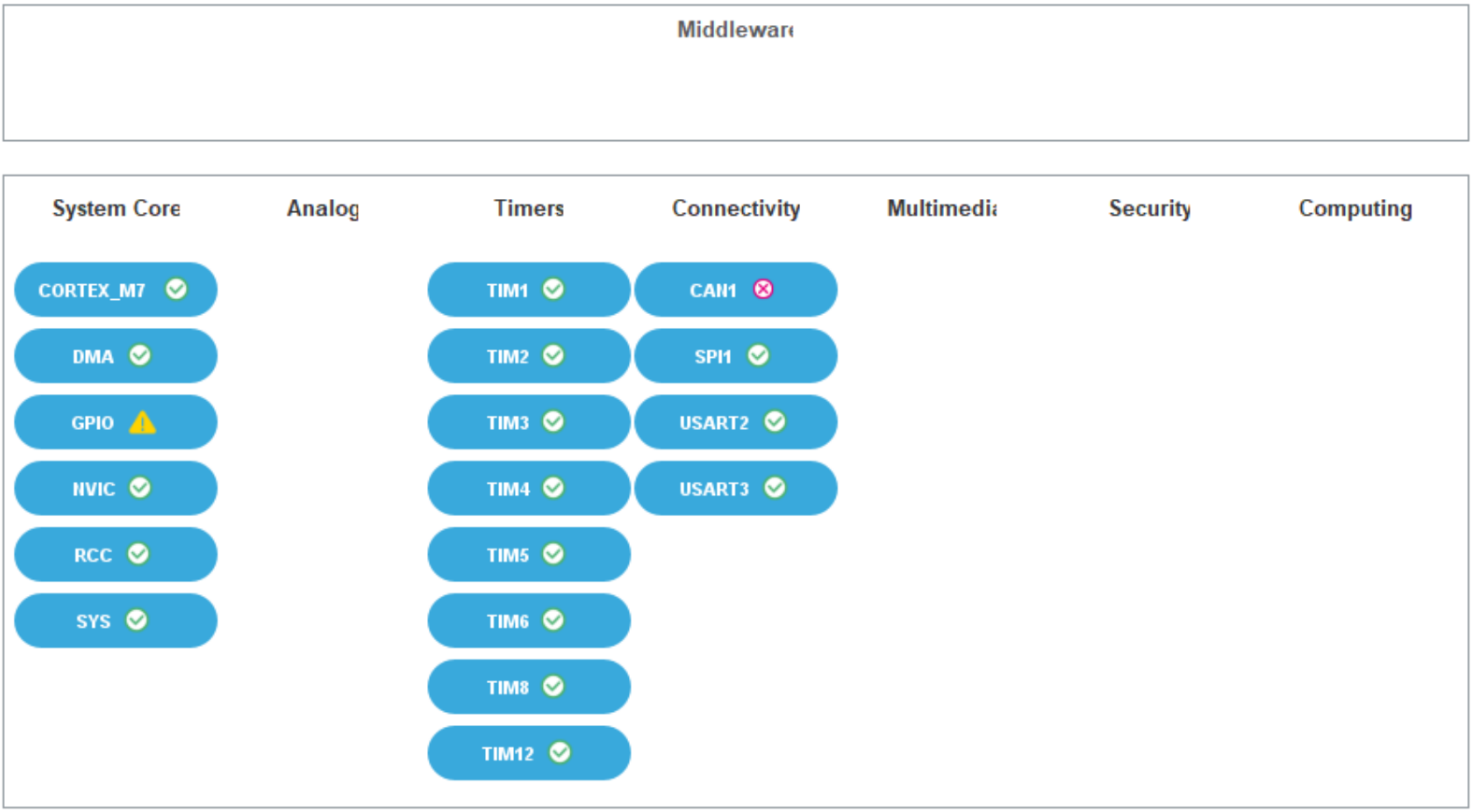
| Enabled interrupt Table | Select for init sequence ordering | Generate IRQ handler | Call HAL handler |
|---|---|---|---|
| Non maskable interrupt | false | true | false |
| Hard fault interrupt | false | true | false |
| Memory management fault | false | true | false |
| Pre-fetch fault, memory access fault | false | true | false |
| Undefined instruction or illegal state | false | true | false |
| System service call via SWI instruction | false | true | false |
| Debug monitor | false | true | false |
| Pendable request for system service | false | true | false |
| System tick timer | false | true | true |
| DMA1 stream1 global interrupt | false | true | true |
| DMA1 stream3 global interrupt | false | true | true |
| DMA1 stream5 global interrupt | false | true | true |
| DMA1 stream6 global interrupt | false | true | true |
| TIM1 capture compare interrupt | false | true | true |
| TIM2 global interrupt | false | true | true |
| TIM4 global interrupt | false | true | true |
| USART2 global interrupt | false | true | true |
| USART3 global interrupt | false | true | true |
| TIM6 global interrupt, DAC1 and DAC2 underrun error interrupts | false | true | true |

*** User modified value**

# 4. System Views

4.1. Category view

*4.1.1. Current*



# 5. Docs & Resources

| Type | Link |
|---|---|
| BSDL files | https://www.st.com/resource/en/bsdl_model/stm32f7_bsdl.zip |
| IBIS models | https://www.st.com/resource/en/ibis_model/stm32f7_ibis.zip |
| System View Description | https://www.st.com/resource/en/svd/stm32f7-svd.zip |
| Presentations | https://www.st.com/resource/en/product_presentation/stm32-stm8_embedded_software_solutions.pdf |
| Presentations | https://www.st.com/resource/en/product_presentation/stm32_eval-tools_portfolio.pdf |
| Presentations | https://www.st.com/resource/en/product_presentation/stm32_stm8_functional-safety-packages.pdf |
| Presentations | https://www.st.com/resource/en/product_presentation/stm32-stm8_software_development_tools.pdf |
| Presentations | https://www.st.com/resource/en/product_presentation/microcontrollers-stm32-family-overview.pdf |
| Brochures | https://www.st.com/resource/en/brochure/brstm32f7.pdf |
| Brochures | https://www.st.com/resource/en/brochure/products-and-solutions-for-plcs-and-smart-i-os.pdf |
| Flyers | https://www.st.com/resource/en/flyer/flstm32nucleo.pdf |
| Flyers | https://www.st.com/resource/en/flyer/flstmcsuite.pdf |
| Flyers | https://www.st.com/resource/en/flyer/flstm32trust.pdf |
| Flyers | https://www.st.com/resource/en/flyer/flstm32gui.pdf |
| Application Notes | https://www.st.com/resource/en/application_note/an1181-electrostatic-discharge-sensitivity-measurement-stmicroelectronics.pdf |
| Application Notes | https://www.st.com/resource/en/application_note/an1709-emc-design-guide-for-stm8-stm32-and-legacy-mcus-stmicroelectronics.pdf |
| Application Notes | https://www.st.com/resource/en/application_note/an2606-stm32-microcontroller-system-memory-boot-mode-stmicroelectronics.pdf |
| Application Notes | https://www.st.com/resource/en/application_note/an2639-soldering-recommendations-and-package-information-for-leadfree-ecopack-mcus- |

| | |
|---|---|
| | and-mpus-stmicroelectronics.pdf |
| Application Notes | https://www.st.com/resource/en/application_note/an2867-oscillator-design-guide-for-stm8afals-stm32-mcus-and-mpus-stmicroelectronics.pdf |
| Application Notes | https://www.st.com/resource/en/application_note/an3126-audio-and-waveform-generation-using-the-dac-in-stm32-products-stmicroelectronics.pdf |
| Application Notes | https://www.st.com/resource/en/application_note/an3154-can-protocol-used-in-the-stm32-bootloader-stmicroelectronics.pdf |
| Application Notes | https://www.st.com/resource/en/application_note/an3155-usart-protocol-used-in-the-stm32-bootloader-stmicroelectronics.pdf |
| Application Notes | https://www.st.com/resource/en/application_note/an3156-usb-dfu-protocol-used-in-the-stm32-bootloader-stmicroelectronics.pdf |
| Application Notes | https://www.st.com/resource/en/application_note/an4013-stm32-crossseries-timer-overview-stmicroelectronics.pdf |
| Application Notes | https://www.st.com/resource/en/application_note/an4031-using-the-stm32f2-stm32f4-and-stm32f7-series-dma-controller-stmicroelectronics.pdf |
| Application Notes | https://www.st.com/resource/en/application_note/an4221-i2c-protocol-used-in-the-stm32-bootloader-stmicroelectronics.pdf |
| Application Notes | https://www.st.com/resource/en/application_note/an4229-how-to-implement-a-vocoder-solution-using-stm32-microcontrollers-stmicroelectronics.pdf |
| Application Notes | https://www.st.com/resource/en/application_note/an4277-using-stm32-device-pwm-shutdown-features-for-motor-control-and-digital-power-conversion-stmicroelectronics.pdf |
| Application Notes | https://www.st.com/resource/en/application_note/an4286-spi-protocol-used-in-the-stm32-bootloader-stmicroelectronics.pdf |
| Application Notes | https://www.st.com/resource/en/application_note/an4566-extending-the-dac-performance-of-stm32-microcontrollers-stmicroelectronics.pdf |
| Application Notes | https://www.st.com/resource/en/application_note/an4655-virtually-increasing-the-number-of-serial-communication-peripherals-in-stm32-applications-stmicroelectronics.pdf |
| Application Notes | https://www.st.com/resource/en/application_note/an4660-migration-of- |

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|---|---|
| | microcontroller-applications-from-stm32f42xxxf43xxx-devices-to-stm32f7-series-devices-stmicroelectronics.pdf |
| Application Notes | https://www.st.com/resource/en/application_note/an4661-getting-started-with-stm32f7-series-mcu-hardware-development-stmicroelectronics.pdf |
| Application Notes | https://www.st.com/resource/en/application_note/an4676-stm32f7-series-peripheral-interconnections-stmicroelectronics.pdf |
| Application Notes | https://www.st.com/resource/en/application_note/an4731-stm32cube-mcu-package-examples-for-stm32f7-series-stmicroelectronics.pdf |
| Application Notes | https://www.st.com/resource/en/application_note/an4750-handling-of-soft-errors-in-stm32-applications-stmicroelectronics.pdf |
| Application Notes | https://www.st.com/resource/en/application_note/an4759-using-the-hardware-realtime-clock-rtc-and-the-tamper-management-unit-tamp-with-stm32-microcontrollers-stmicroelectronics.pdf |
| Application Notes | https://www.st.com/resource/en/application_note/an4776-generalpurpose-timer-cookbook-for-stm32-microcontrollers-stmicroelectronics.pdf |
| Application Notes | https://www.st.com/resource/en/application_note/an4803-highspeed-si-simulations-using-ibis-and-boardlevel-simulations-using-hyperlynx-si-on-stm32-mcus-and-mpus-stmicroelectronics.pdf |
| Application Notes | https://www.st.com/resource/en/application_note/an4839-level-1-cache-on-stm32f7-series-and-stm32h7-series-stmicroelectronics.pdf |
| Application Notes | https://www.st.com/resource/en/application_note/an4850-stm32-mcus-spreadspectrum-clock-generation-principles-properties-and-implementation-stmicroelectronics.pdf |
| Application Notes | https://www.st.com/resource/en/application_note/an4861-lcdtft-display-controller-ltdc-on-stm32-mcus-stmicroelectronics.pdf |
| Application Notes | https://www.st.com/resource/en/application_note/an4908-stm32-usart-automatic-baud-rate-detection-stmicroelectronics.pdf |
| Application Notes | https://www.st.com/resource/en/application_note/an4936-migration-of-microcontroller-applications-from-stm32f7-series-to-stm32h743753-line-stmicroelectronics.pdf |
| Application Notes | https://www.st.com/resource/en/application_note/an4946-migration-of-microcontroller-applications-between-stm32f72xxxf73xxx-and-stm32f74xxxf75xxx-microcontrollers-stmicroelectronics.pdf |

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| Application Notes | https://www.st.com/resource/en/application_note/an4989-stm32-microcontroller-debug-toolbox-stmicroelectronics.pdf |
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| Application Notes | https://www.st.com/resource/en/application_note/an5027-interfacing-pdm-digital-microphones-using-stm32-mcus-and-mpus-stmicroelectronics.pdf |
| Application Notes | https://www.st.com/resource/en/application_note/an5036-thermal-management-guidelines-for-stm32-applications-stmicroelectronics.pdf |
| Application Notes | https://www.st.com/resource/en/application_note/an5073-receiving-spdif-audio-stream-with-the-stm32f4f7h7-series-stmicroelectronics.pdf |
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| Application Notes | https://www.st.com/resource/en/application_note/an5156-introduction-to-stm32-microcontrollers-security-stmicroelectronics.pdf |
| Application Notes | https://www.st.com/resource/en/application_note/an4838-introduction-to-memory-protection-unit-management-on-stm32-mcus-stmicroelectronics.pdf |
| Application Notes | https://www.st.com/resource/en/application_note/an4230-random-number-generation-validation-using-nist-statistical-test-suite-for-stm32-microcontrollers-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/an2834-how-to-optimize-the-adc-accuracy-in-the-stm32-mcus-stmicroelectronics.pdf |
| Application Notes | https://www.st.com/resource/en/application_note/an5816-how-to-build-stm32-lpbam-application-using-stm32cubemx-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 for related Tools & Software | https://www.st.com/resource/en/application_note/an1202_freertos_guide-freertos-guide-stmicroelectronics.pdf |
| Application Notes for related Tools & Software | https://www.st.com/resource/en/application_note/an1602_semihosting_in_truestudio-how-to-do-semihosting-in-truestudio-stmicroelectronics.pdf |
| Application Notes for related Tools & Software | https://www.st.com/resource/en/application_note/an1801_stm32cubeprogrammer_in_truestudio-installing-stm32cubeprogrammer-in-truestudio-stmicroelectronics.pdf |
| Application Notes for related Tools & Software | https://www.st.com/resource/en/application_note/atollic_editing_keyboard_shortcuts-atollic-editing-keyboard-shortcuts-stmicroelectronics.pdf |
| Application Notes for related Tools & Software | https://www.st.com/resource/en/application_note/iar_to_atollic_truestudio_migration_guide-truestudio-for-arm-migration-guide-iar-embedded-workbench-to-truestudio-stmicroelectronics.pdf |
| Application Notes for related Tools & Software | https://www.st.com/resource/en/application_note/stm32cubemx_installation_in_truestudio-stm32cubemx-installation-in-truestudio-stmicroelectronics.pdf |
| Application Notes for related Tools & Software | https://www.st.com/resource/en/application_note/an4044-floating-point-unit-demonstration-on-stm32-microcontrollers-stmicroelectronics.pdf |
| Application Notes | https://www.st.com/resource/en/application_note/an4323-getting-started- |

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| for related Tools & Software | with-stemwin-library-stmicroelectronics.pdf |
| Application Notes for related Tools & Software | https://www.st.com/resource/en/application_note/an4435-guidelines-for-obtaining-ulcsaiec-607301603351-class-b-certification-in-any-stm32-application-stmicroelectronics.pdf |
| Application Notes for related Tools & Software | https://www.st.com/resource/en/application_note/an4657-stm32-inapplication-programming-iap-using-the-usart-stmicroelectronics.pdf |
| Application Notes for related Tools & Software | https://www.st.com/resource/en/application_note/an4667-stm32f7-series-system-architecture-and-performance-stmicroelectronics.pdf |
| Application Notes for related Tools & Software | https://www.st.com/resource/en/application_note/an4731-stm32cube-mcu-package-examples-for-stm32f7-series-stmicroelectronics.pdf |
| Application Notes for related Tools & Software | https://www.st.com/resource/en/application_note/an4749-managing-lowpower-consumption-on-stm32f7-series-microcontrollers-stmicroelectronics.pdf |
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