

1. Description

1.1. Project

| Project Name | mech_deck_module |
|-----------------|-------------------|
| Board Name | NUCLEO-L476RG |
| Generated with: | STM32CubeMX 6.2.1 |
| Date | 04/27/2021 |

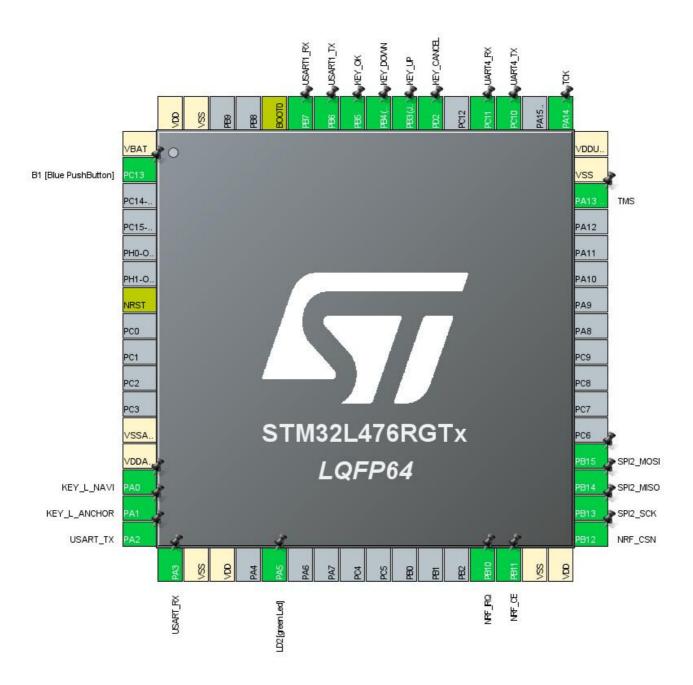
1.2. MCU

| MCU Series | STM32L4 |
|----------------|---------------|
| MCU Line | STM32L4x6 |
| MCU name | STM32L476RGTx |
| MCU Package | LQFP64 |
| MCU Pin number | 64 |

1.3. Core(s) information

| Core(s) | Arm Cortex-M4 |
|---------|---------------|

2. Pinout Configuration



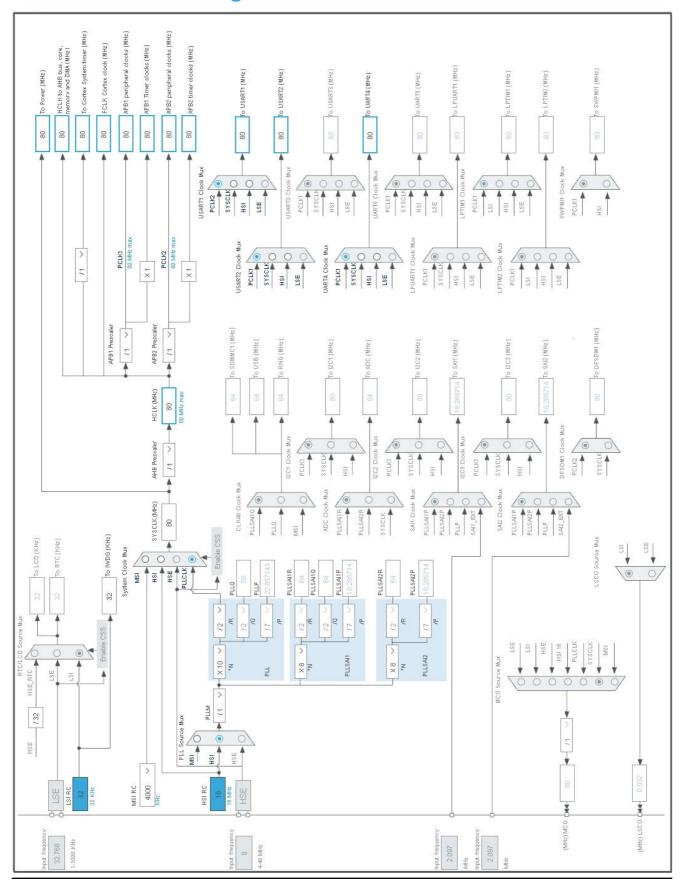
3. Pins Configuration

| Pin Number | Pin Name | Pin Type | Alternate | Label |
|------------|-----------------------|----------|----------------|----------------------|
| LQFP64 | (function after | | Function(s) | |
| | reset) | | | |
| 1 | VBAT | Power | | |
| 2 | PC13 | I/O | GPIO_EXTI13 | B1 [Blue PushButton] |
| 7 | NRST | Reset | | |
| 12 | VSSA/VREF- | Power | | |
| 13 | VDDA/VREF+ | Power | | |
| 14 | PA0 * | I/O | GPIO_Input | KEY_L_NAVI |
| 15 | PA1 * | I/O | GPIO_Input | KEY_L_ANCHOR |
| 16 | PA2 | I/O | USART2_TX | USART_TX |
| 17 | PA3 | I/O | USART2_RX | USART_RX |
| 18 | VSS | Power | | |
| 19 | VDD | Power | | |
| 21 | PA5 * | I/O | GPIO_Output | LD2 [green Led] |
| 29 | PB10 | I/O | GPIO_EXTI10 | NRF_IRQ |
| 30 | PB11 * | I/O | GPIO_Output | NRF_CE |
| 31 | VSS | Power | | |
| 32 | VDD | Power | | |
| 33 | PB12 * | I/O | GPIO_Output | NRF_CSN |
| 34 | PB13 | I/O | SPI2_SCK | |
| 35 | PB14 | I/O | SPI2_MISO | |
| 36 | PB15 | I/O | SPI2_MOSI | |
| 46 | PA13 (JTMS-SWDIO) | I/O | SYS_JTMS-SWDIO | TMS |
| 47 | VSS | Power | | |
| 48 | VDDUSB | Power | | |
| 49 | PA14 (JTCK-SWCLK) | I/O | SYS_JTCK-SWCLK | TCK |
| 51 | PC10 | I/O | UART4_TX | |
| 52 | PC11 | I/O | UART4_RX | |
| 54 | PD2 * | I/O | GPIO_Input | KEY_CANCEL |
| 55 | PB3 (JTDO-TRACESWO) * | I/O | GPIO_Input | KEY_UP |
| 56 | PB4 (NJTRST) * | I/O | GPIO_Input | KEY_DOWN |
| 57 | PB5 * | I/O | GPIO_Input | KEY_OK |
| 58 | PB6 | I/O | USART1_TX | |
| 59 | PB7 | I/O | USART1_RX | |
| 60 | воото | Boot | | |
| 63 | VSS | Power | | |
| 64 | VDD | Power | | |

| mech_ | _deck_ | _module | Project |
|-------|--------|----------|---------|
| | Confi | guration | Report |

| The pin is affected with an I/O function | |
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4. Clock Tree Configuration



5. Software Project

5.1. Project Settings

| Name | Value | |
|-----------------------------------|---|--|
| Project Name | mech_deck_module | |
| Project Folder | D:\projects\windsensor\mech_deck_module | |
| Toolchain / IDE | STM32CubeIDE | |
| Firmware Package Name and Version | STM32Cube FW_L4 V1.17.0 | |
| 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 | Yes |
| 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) | Yes |
| Enable Full Assert | No |

5.3. Advanced Settings - Generated Function Calls

| Rank | Function Name | Peripheral Instance Name | |
|------|--------------------------|--------------------------|--|
| 1 | MX_GPIO_Init | GPIO | |
| 2 | 2 SystemClock_Config RCC | | |
| 3 | MX_UART4_Init | UART4 | |
| 4 | MX_USART2_UART_Init | USART2 | |
| 5 | MX_SPI2_Init | SPI2 | |
| 6 | MX_USART1_UART_Init | USART1 | |
| 7 | MX_IWDG_Init | IWDG | |

6. Power Consumption Calculator report

6.1. Microcontroller Selection

| Series | STM32L4 |
|-----------|---------------|
| Line | STM32L4x6 |
| мси | STM32L476RGTx |
| Datasheet | DS10198_Rev4 |

6.2. Parameter Selection

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

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 |

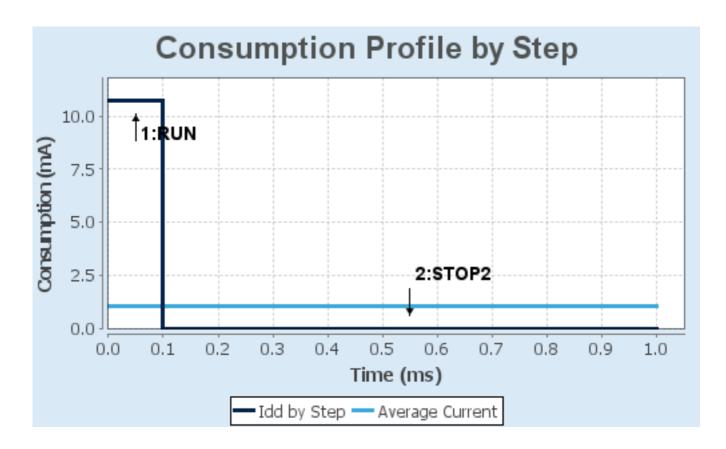
6.4. Sequence

| Step | Step1 | Step2 |
|------------------------|-------------|----------------|
| Mode | RUN | STOP2 |
| Vdd | 3.0 | 3.0 |
| Voltage Source | Battery | Battery |
| Range | Range1-High | NoRange |
| Fetch Type | SRAM2 | n/a |
| CPU Frequency | 80 MHz | 0 Hz |
| Clock Configuration | HSE PLL | ALL CLOCKS OFF |
| Clock Source Frequency | 4 MHz | 0 Hz |
| Peripherals | | |
| Additional Cons. | 0 mA | 0 mA |
| Average Current | 10.7 mA | 1.18 µA |
| Duration | 0.1 ms | 0.9 ms |
| DMIPS | 100.0 | 0.0 |
| Ta Max | 103.56 | 105 |
| Category | In DS Table | In DS Table |

6.5. Results

| Sequence Time | 1 ms | Average Current | 1.07 mA |
|---------------|---------------|-----------------|-------------|
| Battery Life | 4 months, 10 | Average DMIPS | 100.0 DMIPS |
| | days, 3 hours | _ | |

6.6. Chart



7. Peripherals and Middlewares Configuration

7.1. IWDG

mode: Activated

7.1.1. Parameter Settings:

Watchdog Clocking:

IWDG counter clock prescalerIWDG window valueIWDG down-counter reload value4095

7.2. RCC

7.2.1. Parameter Settings:

System Parameters:

VDD voltage (V) 3.3
Instruction Cache Enabled
Prefetch Buffer Enabled *
Data Cache Enabled

Flash Latency(WS) 4 WS (5 CPU cycle)

RCC Parameters:

HSI Calibration Value 16
MSI Calibration Value 0

MSI Auto Calibration Disabled
HSE Startup Timout Value (ms) 100
LSE Startup Timout Value (ms) 5000

Power Parameters:

Power Regulator Voltage Scale Power Regulator Voltage Scale 1

7.3. SPI2

Mode: Full-Duplex Master 7.3.1. Parameter Settings:

Basic Parameters:

Frame Format Motorola

Data Size 8 Bits *

First Bit MSB First

Clock Parameters:

Prescaler (for Baud Rate) 32 *

Baud Rate 2.5 MBits/s *

Clock Polarity (CPOL) Low
Clock Phase (CPHA) 1 Edge

Advanced Parameters:

CRC Calculation Disabled

NSSP Mode Enabled

NSS Signal Type Software

7.4. SYS

Debug: Serial Wire

Timebase Source: SysTick

7.5. UART4

Mode: Asynchronous

7.5.1. Parameter Settings:

Basic Parameters:

Baud Rate **625000** *

Word Length 8 Bits (including Parity)

Parity None Stop Bits 1

Advanced Parameters:

Data Direction Transmit Only *

Over Sampling 16 Samples
Single Sample Disable

Advanced Features:

Disable Auto Baudrate Disable TX Pin Active Level Inversion **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

7.6. USART1

Mode: Asynchronous

7.6.1. 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

7.7. USART2

Mode: Asynchronous

7.7.1. 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 |
|----------------------------------|---------|
| 1 A FIII ACTIVE LEVEL IIIVEISION | 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 |
|--------|--------------------------|--------------------|---|-----------------------------|----------------|----------------------|
| SPI2 | PB13 | SPI2_SCK | Alternate Function Push Pull | No pull-up and no pull-down | Very High | |
| | PB14 | SPI2_MISO | Alternate Function Push Pull | No pull-up and no pull-down | Very High | |
| | PB15 | SPI2_MOSI | Alternate Function Push Pull | No pull-up and no pull-down | Very High | |
| SYS | PA13 (JTMS- SWDIO) | SYS_JTMS- SWDIO | n/a | n/a | n/a | TMS |
| | PA14 (JTCK- SWCLK) | SYS_JTCK- SWCLK | n/a | n/a | n/a | тск |
| UART4 | PC10 | UART4_TX | Alternate Function Push Pull | No pull-up and no pull-down | Very High * | |
| | PC11 | UART4_RX | Alternate Function Push Pull | No pull-up and no pull-down | Very High * | |
| USART1 | PB6 | USART1_TX | Alternate Function Push Pull | No pull-up and no pull-down | Very High | |
| | PB7 | USART1_RX | Alternate Function Push Pull | No pull-up and no pull-down | Very High | |
| USART2 | PA2 | USART2_TX | Alternate Function Push Pull | No pull-up and no pull-down | Very High | USART_TX |
| | PA3 | USART2_RX | Alternate Function Push Pull | No pull-up and no pull-down | Very High | USART_RX |
| GPIO | PC13 | GPIO_EXTI13 | External Interrupt Mode with Falling edge trigger detection | No pull-up and no pull-down | n/a | B1 [Blue PushButton] |
| | PA0 | GPIO_Input | Input mode | Pull-up * | n/a | KEY_L_NAVI |
| | PA1 | GPIO_Input | Input mode | Pull-up * | n/a | KEY_L_ANCHOR |
| | PA5 | GPIO_Output | Output Push Pull | No pull-up and no pull-down | Very High | LD2 [green Led] |
| | PB10 | GPIO_EXTI10 | External Interrupt Mode with Rising edge trigger detection | No pull-up and no pull-down | n/a | NRF_IRQ |
| | PB11 | GPIO_Output | Output Push Pull | No pull-up and no pull-down | Very High | NRF_CE |

| IP | Pin | Signal | GPIO mode | GPIO pull/up pull down | Max Speed | User Label |
|----|------------------------|-------------|------------------|-----------------------------|--------------|------------|
| | PB12 | GPIO_Output | Output Push Pull | No pull-up and no pull-down | Very High | NRF_CSN |
| | PD2 | GPIO_Input | Input mode | Pull-up * | n/a | KEY_CANCEL |
| | PB3 (JTDO- TRACESWO | GPIO_Input | Input mode | Pull-up * | n/a | KEY_UP |
| | PB4 (NJTRST) | GPIO_Input | Input mode | Pull-up * | n/a | KEY_DOWN |
| | PB5 | GPIO_Input | Input mode | Pull-up * | n/a | KEY_OK |

8.2. DMA configuration

nothing configured in DMA service

8.3. NVIC configuration

8.3.1. 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 |
| 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 |
| PVD/PVM1/PVM2/PVM3/PVM4 interrupts through EXTI lines 16/35/36/37/38 | | unused | |
| Flash global interrupt | | unused | |
| RCC global interrupt | | unused | |
| SPI2 global interrupt | | unused | |
| USART1 global interrupt | | unused | |
| USART2 global interrupt | | unused | |
| EXTI line[15:10] interrupts | | unused | |
| UART4 global interrupt | | unused | |
| FPU global interrupt | | unused | |

8.3.2. NVIC Code generation

| Enabled interrupt Table | Select for init | Generate IRQ | Call HAL handler |
|---|-------------------|--------------|------------------|
| | sequence ordering | handler | |
| Non maskable interrupt | false | true | false |
| Hard fault interrupt | false | true | false |
| Memory management fault | false | true | false |
| Prefetch 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 |

* User modified value

9. System Views

9.1. Category view

9.1.1. Current

10. Docs & Resources

Type Link

Datasheet http://www.st.com/resource/en/datasheet/DM00108832.pdf

Reference http://www.st.com/resource/en/reference_manual/DM00083560.pdf

manual

Programming http://www.st.com/resource/en/programming_manual/DM00046982.pdf

manual

Errata sheet http://www.st.com/resource/en/errata_sheet/DM00111498.pdf

Application note http://www.st.com/resource/en/application_note/CD00160362.pdf

Application note http://www.st.com/resource/en/application_note/CD00167594.pdf

Application note http://www.st.com/resource/en/application_note/CD00211314.pdf

Application note http://www.st.com/resource/en/application_note/CD00259245.pdf

Application note http://www.st.com/resource/en/application_note/CD00264321.pdf

Application note http://www.st.com/resource/en/application_note/CD00264342.pdf

Application note http://www.st.com/resource/en/application_note/CD00264379.pdf

Application note http://www.st.com/resource/en/application_note/DM00042534.pdf

Application note http://www.st.com/resource/en/application_note/DM00072315.pdf

Application note http://www.st.com/resource/en/application_note/DM00073742.pdf

Application note http://www.st.com/resource/en/application_note/DM00073853.pdf

Application note http://www.st.com/resource/en/application_note/DM00080497.pdf

Application note http://www.st.com/resource/en/application_note/DM00081379.pdf

Application note http://www.st.com/resource/en/application_note/DM00085385.pdf

Application note http://www.st.com/resource/en/application_note/DM00087593.pdf

Application note http://www.st.com/resource/en/application_note/DM00129215.pdf

Application note http://www.st.com/resource/en/application_note/DM00151811.pdf

Application note http://www.st.com/resource/en/application_note/DM00160482.pdf

Application note http://www.st.com/resource/en/application_note/DM00156964.pdf

Application note http://www.st.com/resource/en/application_note/DM00150423.pdf

Application note http://www.st.com/resource/en/application_note/DM00209748.pdf

Application note http://www.st.com/resource/en/application_note/DM00125306.pdf http://www.st.com/resource/en/application_note/DM00141025.pdf Application note Application note http://www.st.com/resource/en/application_note/DM00144612.pdf Application note http://www.st.com/resource/en/application_note/DM00148033.pdf Application note http://www.st.com/resource/en/application_note/DM00209768.pdf http://www.st.com/resource/en/application_note/DM00216518.pdf Application note http://www.st.com/resource/en/application_note/DM00220769.pdf Application note Application note http://www.st.com/resource/en/application_note/DM00227538.pdf http://www.st.com/resource/en/application note/DM00257177.pdf Application note Application note http://www.st.com/resource/en/application note/DM00269143.pdf Application note http://www.st.com/resource/en/application_note/DM00272912.pdf Application note http://www.st.com/resource/en/application_note/DM00223574.pdf Application note http://www.st.com/resource/en/application_note/DM00226326.pdf Application note http://www.st.com/resource/en/application_note/DM00236305.pdf Application note http://www.st.com/resource/en/application_note/DM00260952.pdf Application note http://www.st.com/resource/en/application_note/DM00263732.pdf http://www.st.com/resource/en/application_note/DM00269146.pdf Application note Application note http://www.st.com/resource/en/application_note/DM00296349.pdf Application note http://www.st.com/resource/en/application_note/DM00327191.pdf http://www.st.com/resource/en/application_note/DM00264868.pdf Application note Application note http://www.st.com/resource/en/application_note/DM00355687.pdf http://www.st.com/resource/en/application note/DM00311483.pdf Application note Application note http://www.st.com/resource/en/application_note/DM00354244.pdf Application note http://www.st.com/resource/en/application_note/DM00367673.pdf Application note http://www.st.com/resource/en/application_note/DM00373474.pdf Application note http://www.st.com/resource/en/application_note/DM00315319.pdf Application note http://www.st.com/resource/en/application_note/DM00371863.pdf http://www.st.com/resource/en/application_note/DM00380469.pdf Application note http://www.st.com/resource/en/application_note/DM00354333.pdf Application note http://www.st.com/resource/en/application_note/DM00395696.pdf Application note Application note http://www.st.com/resource/en/application_note/DM00445657.pdf

| Application note | http://www.st.com/resource/en/application_note/DM00493651.pdf |
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| Application note | http://www.st.com/resource/en/application_note/DM00536349.pdf |
| Application note | http://www.st.com/resource/en/application_note/DM00209772.pdf |
| Application note | http://www.st.com/resource/en/application_note/DM00476869.pdf |
| Application note | http://www.st.com/resource/en/application_note/DM00660597.pdf |
| Application note | http://www.st.com/resource/en/application_note/DM00725181.pdf |