

## 1. Description

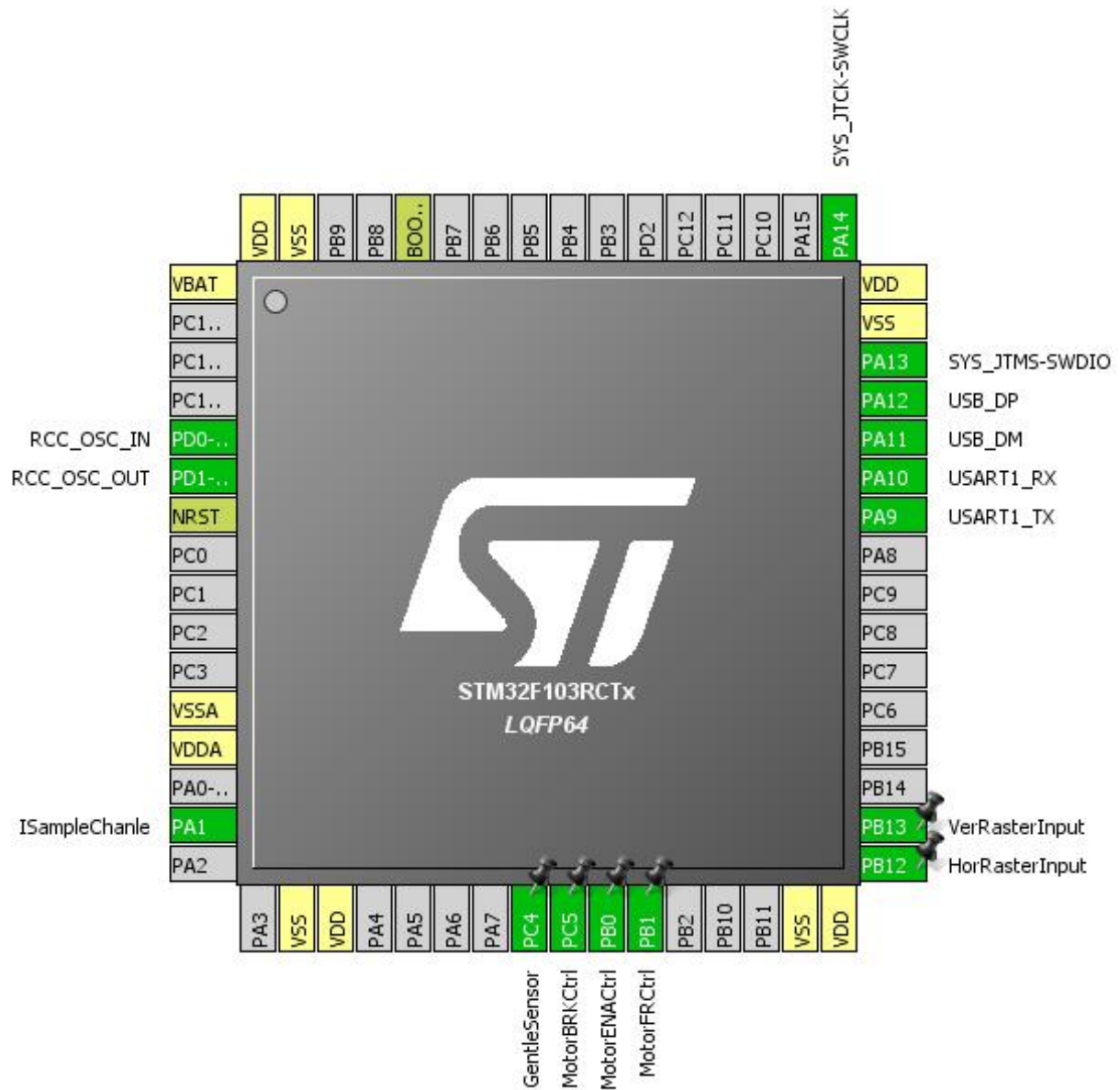
### 1.1. Project

Project Name	MCWFv1
Board Name	MCWFv1.0
Generated with:	STM32CubeMX 4.23.0
Date	12/13/2017

### 1.2. MCU

MCU Series	STM32F1
MCU Line	STM32F103
MCU name	STM32F103RCTx
MCU Package	LQFP64
MCU Pin number	64

## 2. Pinout Configuration

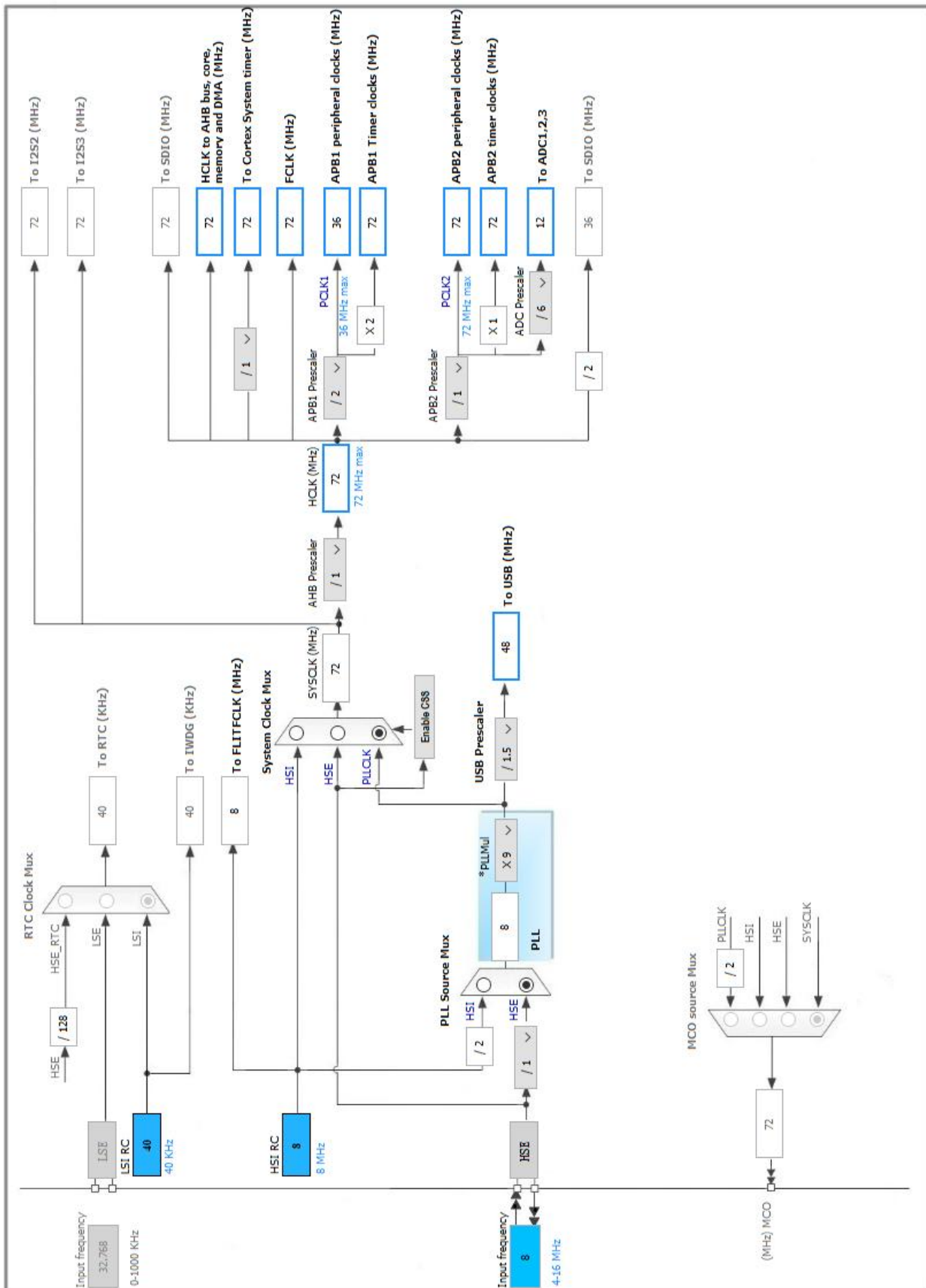


### 3. Pins Configuration

Pin Number LQFP64	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
1	VBAT	Power		
5	PD0-OSC_IN	I/O	RCC_OSC_IN	
6	PD1-OSC_OUT	I/O	RCC_OSC_OUT	
7	NRST	Reset		
12	VSSA	Power		
13	VDDA	Power		
15	PA1	I/O	ADC1_IN1	ISampleChanle
18	VSS	Power		
19	VDD	Power		
24	PC4 *	I/O	GPIO_Input	GentleSensor
25	PC5 *	I/O	GPIO_Output	MotorBRKCtrl
26	PB0 *	I/O	GPIO_Output	MotorENACtrl
27	PB1 *	I/O	GPIO_Output	MotorFRCtrl
31	VSS	Power		
32	VDD	Power		
33	PB12 *	I/O	GPIO_Input	HorRasterInput
34	PB13 *	I/O	GPIO_Input	VerRasterInput
42	PA9	I/O	USART1_TX	
43	PA10	I/O	USART1_RX	
44	PA11	I/O	USB_DM	
45	PA12	I/O	USB_DP	
46	PA13	I/O	SYS_JTMS-SWDIO	
47	VSS	Power		
48	VDD	Power		
49	PA14	I/O	SYS_JTCK-SWCLK	
60	BOOT0	Boot		
63	VSS	Power		
64	VDD	Power		

\* The pin is affected with an I/O function

## 4. Clock Tree Configuration



## 5. IPs and Middleware Configuration

### 5.1. ADC1

mode: IN1

mode: Temperature Sensor Channel

#### 5.1.1. Parameter Settings:

##### ADCs\_Common\_Settings:

Mode Independent mode

##### ADC\_Settings:

Data Alignment Right alignment

Scan Conversion Mode Enabled

Continuous Conversion Mode **Enabled \***

Discontinuous Conversion Mode Disabled

##### ADC\_Regular\_ConversionMode:

Enable Regular Conversions Enable

Number Of Conversion **2 \***

External Trigger Conversion Source Regular Conversion launched by software

Rank 1

Channel Channel 1

Sampling Time **28.5 Cycles \***

Rank **2 \***

Channel **Channel Temperature Sensor \***

Sampling Time **28.5 Cycles \***

##### ADC\_Injected\_ConversionMode:

Number Of Conversions 0

##### WatchDog:

Enable Analog WatchDog Mode false

### 5.2. RCC

High Speed Clock (HSE): Crystal/Ceramic Resonator

#### 5.2.1. Parameter Settings:

**System Parameters:**

VDD voltage (V)	3.3
Prefetch Buffer	Enabled
Flash Latency(WS)	2 WS (3 CPU cycle)

**RCC Parameters:**

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

### 5.3. SYS

**Debug: Serial Wire**

**Timebase Source: SysTick**

### 5.4. TIM4

**mode: Clock Source**

#### 5.4.1. Parameter Settings:

**Counter Settings:**

Prescaler (PSC - 16 bits value)	<b>72-1 *</b>
Counter Mode	Up
Counter Period (AutoReload Register - 16 bits value )	<b>100-1 *</b>
Internal Clock Division (CKD)	No Division
auto-reload preload	<b>Enable *</b>

**Trigger Output (TRGO) Parameters:**

Master/Slave Mode	Disable (no sync between this TIM (Master) and its Slaves)
Trigger Event Selection	Reset (UG bit from TIMx_EGR)

### 5.5. TIM5

**mode: Clock Source**

#### 5.5.1. Parameter Settings:

**Counter Settings:**

Prescaler (PSC - 16 bits value)	<b>72-1 *</b>
Counter Mode	Up
Counter Period (AutoReload Register - 16 bits value )	<b>100-1 *</b>
Internal Clock Division (CKD)	No Division
auto-reload preload	<b>Enable *</b>

**Trigger Output (TRGO) Parameters:**

Master/Slave Mode	Disable (no sync between this TIM (Master) and its Slaves
Trigger Event Selection	Reset (UG bit from TIMx_EGR)

## 5.6. USART1

**Mode: Asynchronous**

### 5.6.1. 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

## 5.7. USB

**mode: Device (FS)**

### 5.7.1. Parameter Settings:

**Basic Parameters:**

Speed	Full Speed 12MBit/s
Endpoint 0 Max Packet size	8 Bytes

**Power Parameters:**

Low Power	Disabled
Link Power Management	Disabled
Battery Charging	Disabled

## 5.8. USB\_DEVICE

### Class For FS IP: Communication Device Class (Virtual Port Com)

#### 5.8.1. Parameter Settings:

##### Basic Parameters:

USBD_MAX_NUM_INTERFACES (Maximum number of supported interfaces)	1
USBD_MAX_NUM_CONFIGURATION (Maximum number of supported configuration)	1
USBD_MAX_STR_DESC_SIZ (Maximum size for the string descriptors)	512
USBD_SUPPORT_USER_STRING (Enable user string descriptor)	Disabled
USBD_SELF_POWERED (Enabled self power)	Enabled
USBD_DEBUG_LEVEL (USBD Debug Level)	0: No debug message

##### Class Parameters:

USB CDC Rx Buffer Size	2048
USB CDC Tx Buffer Size	2048

#### 5.8.2. Device Descriptor:

##### Device Descriptor:

VID (Vendor Identifier)	1155
LANGID_STRING (Language Identifier)	English(United States)
MANUFACTURER_STRING (Manufacturer Identifier)	STMicroelectronics

##### Device Descriptor FS:

PID (Product Identifier)	22336
PRODUCT_STRING (Product Identifier)	STM32 Virtual ComPort
SERIALNUMBER_STRING (Serial number)	00000000001A
CONFIGURATION_STRING (Configuration Identifier)	CDC Config
INTERFACE_STRING (Interface Identifier)	CDC Interface

\* User modified value



## 6. System Configuration

### 6.1. GPIO configuration

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
ADC1	PA1	ADC1_IN1	Analog mode	n/a	n/a	ISampleChanle
RCC	PD0-OSC_IN	RCC_OSC_IN	n/a	n/a	n/a	
	PD1-OSC_OUT	RCC_OSC_OUT	n/a	n/a	n/a	
SYS	PA13	SYS_JTMS-SWDIO	n/a	n/a	n/a	
	PA14	SYS_JTCK-SWCLK	n/a	n/a	n/a	
USART1	PA9	USART1_TX	Alternate Function Push Pull	n/a	<b>High *</b>	
	PA10	USART1_RX	Input mode	No pull-up and no pull-down	<b>n/a</b>	
USB	PA11	USB_DM	n/a	n/a	n/a	
	PA12	USB_DP	n/a	n/a	n/a	
GPIO	PC4	GPIO_Input	Input mode	<b>Pull-up *</b>	n/a	GentleSensor
	PC5	GPIO_Output	Output Push Pull	<b>n/a</b>	Low	MotorBRKCtrl
	PB0	GPIO_Output	Output Push Pull	<b>n/a</b>	Low	MotorENACtrl
	PB1	GPIO_Output	Output Push Pull	<b>n/a</b>	Low	MotorFRCtrl
	PB12	GPIO_Input	Input mode	<b>Pull-down *</b>	n/a	HorRasterInput
	PB13	GPIO_Input	Input mode	<b>Pull-down *</b>	n/a	VerRasterInput

## 6.2. DMA configuration

DMA request	Stream	Direction	Priority
ADC1	DMA1_Channel1	Peripheral To Memory	Low
USART1_RX	DMA1_Channel5	Peripheral To Memory	Low
USART1_TX	DMA1_Channel4	Memory To Peripheral	Low

### ADC1: DMA1\_Channel1 DMA request Settings:

Mode: **Circular \***  
 Peripheral Increment: Disable  
 Memory Increment: **Enable \***  
 Peripheral Data Width: **Word \***  
 Memory Data Width: **Word \***

### USART1\_RX: DMA1\_Channel5 DMA request Settings:

Mode: **Circular \***  
 Peripheral Increment: Disable  
 Memory Increment: **Enable \***  
 Peripheral Data Width: Byte  
 Memory Data Width: Byte

### USART1\_TX: DMA1\_Channel4 DMA request Settings:

Mode: Normal  
 Peripheral Increment: Disable  
 Memory Increment: **Enable \***  
 Peripheral Data Width: Byte  
 Memory Data Width: Byte

### 6.3. NVIC configuration

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
DMA1 channel1 global interrupt	true	0	0
DMA1 channel4 global interrupt	true	0	0
DMA1 channel5 global interrupt	true	0	0
ADC1 and ADC2 global interrupts	true	0	0
USB low priority or CAN RX0 interrupts	true	0	0
TIM4 global interrupt	true	0	0
USART1 global interrupt	true	0	0
TIM5 global interrupt	true	0	0
PVD interrupt through EXTI line 16	unused		
Flash global interrupt	unused		
RCC global interrupt	unused		
USB high priority or CAN TX interrupts	unused		

\* User modified value

## 7. Power Consumption Calculator report

### 7.1. Microcontroller Selection

Series	STM32F1
Line	STM32F103
MCU	STM32F103RCTx
Datasheet	14611_Rev12

### 7.2. Parameter Selection

Temperature	25
Vdd	3.3

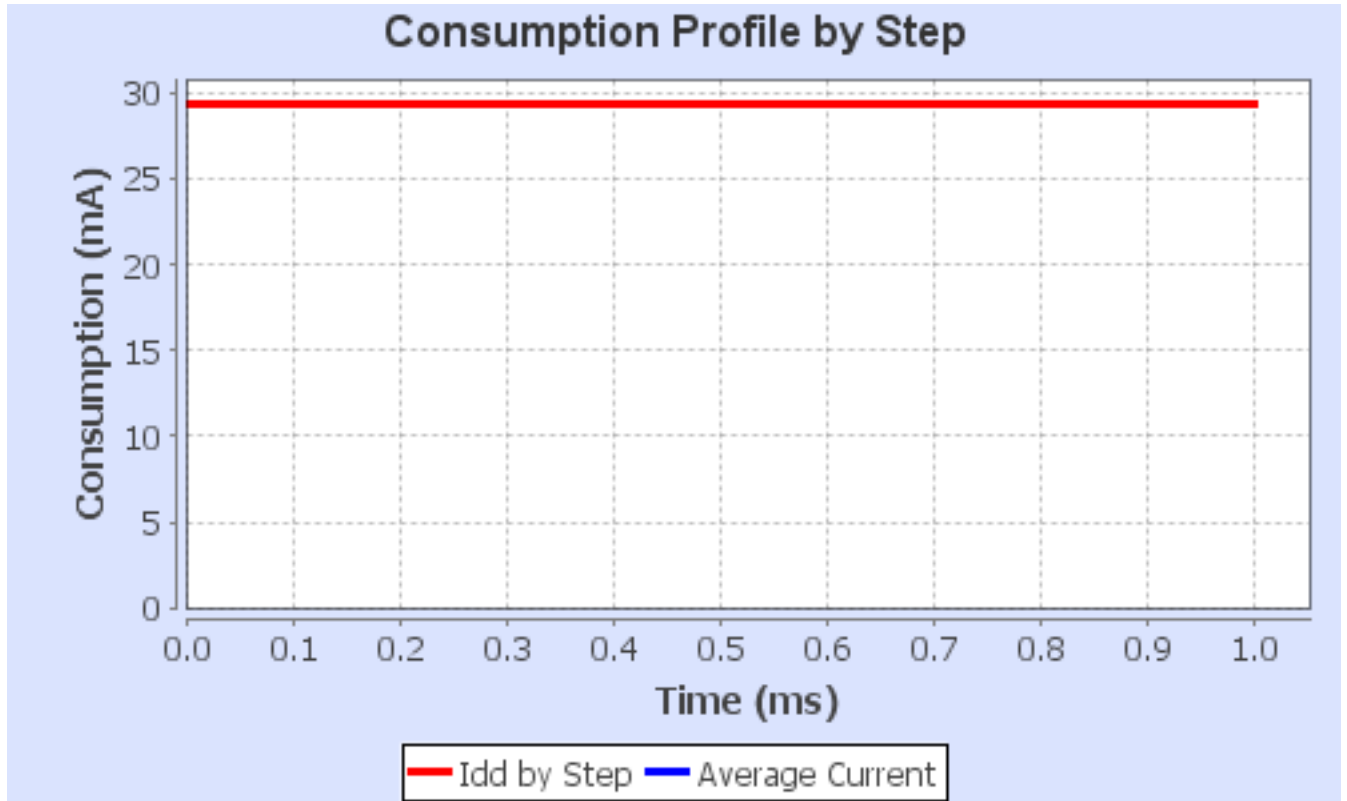
### 7.3. Sequence

<b>Step</b>	Step1
<b>Mode</b>	RUN
<b>Vdd</b>	3.3
<b>Voltage Source</b>	Battery
<b>Range</b>	No Scale
<b>Fetch Type</b>	FLASH
<b>Clock Configuration</b>	HSE PLL
<b>Clock Source Frequency</b>	8 MHz
<b>CPU Frequency</b>	48 MHz
<b>Peripherals</b>	ADC1 APB1-Bridge APB2-Bridge DAC:OUT1 DMA1 I2C1 TIM4 TIM5 USART1 USB
<b>Additional Cons.</b>	0 mA
<b>Average Current</b>	29.35 mA
<b>Duration</b>	1 ms
<b>DMIPS</b>	0.0
<b>Ta Max</b>	100.64
<b>Category</b>	In DS Table

#### 7.4. RESULTS

Sequence Time	1 ms	Average Current	29.35 mA
Battery Life	0	Average DMIPS	60.0 DMIPS

#### 7.5. Chart



## 8. Software Project

### 8.1. Project Settings

Name	Value
Project Name	MCWFv1.0
Project Folder	E:\Users\bertz\Documents\GitHub\MotorContorl\WithFilter\MCWFv1.0
Toolchain / IDE	EWARM
Firmware Package Name and Version	STM32Cube FW_F1 V1.6.0

### 8.2. Code Generation Settings

Name	Value
STM32Cube Firmware Library Package	Copy all used libraries into the project folder
Generate peripheral initialization as a pair of '.c/.h' files	Yes
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