1. Description

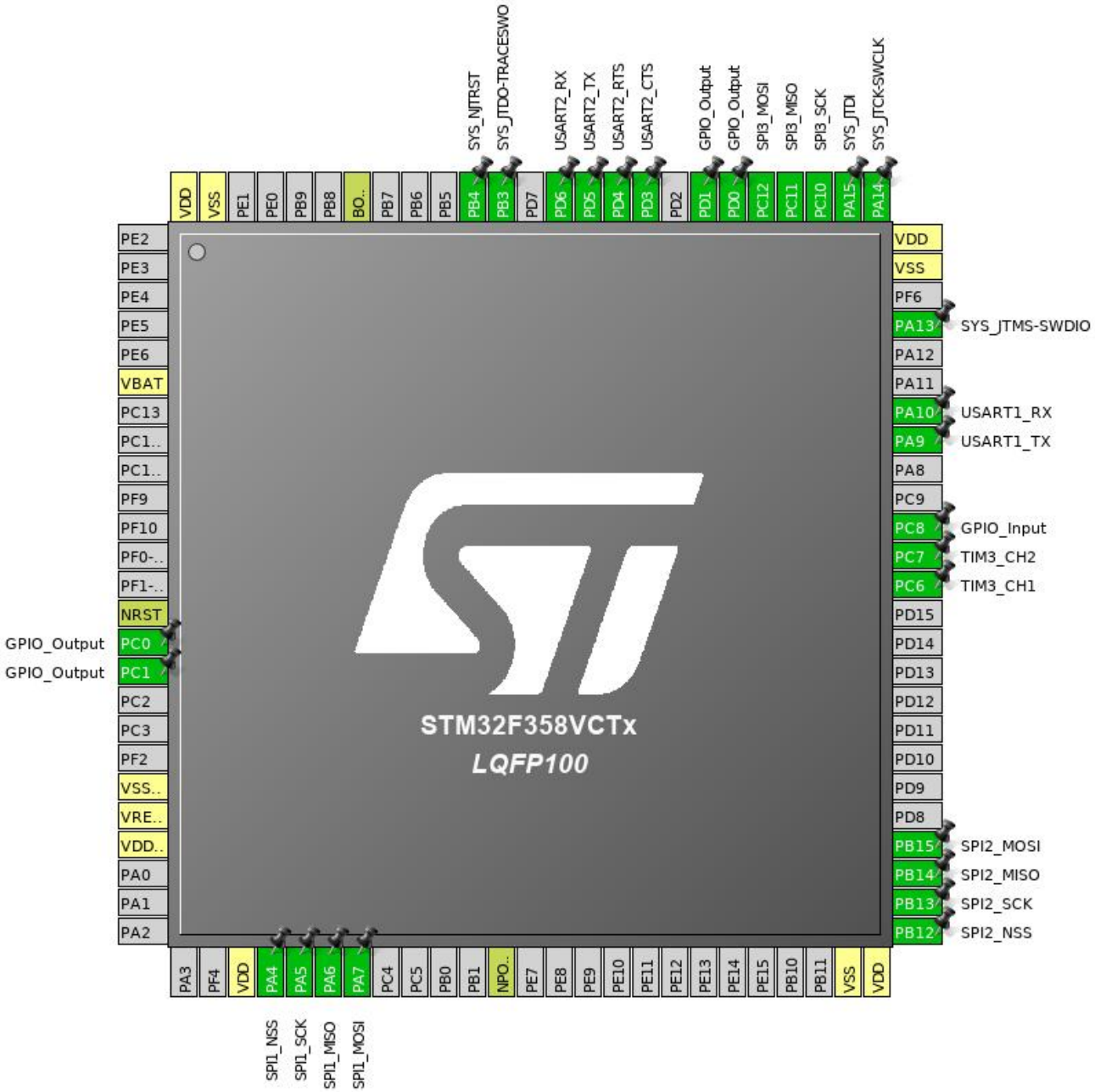
1.1. Project

Project Name	panobot-Firmware
Board Name	custom
Generated with:	STM32CubeMX 4.26.0
Date	06/23/2018

1.2. MCU

MCU Series	STM32F3
MCU Line	STM32F3x8
MCU name	STM32F358VCTx
MCU Package	LQFP100
MCU Pin number	100

2. Pinout Configuration



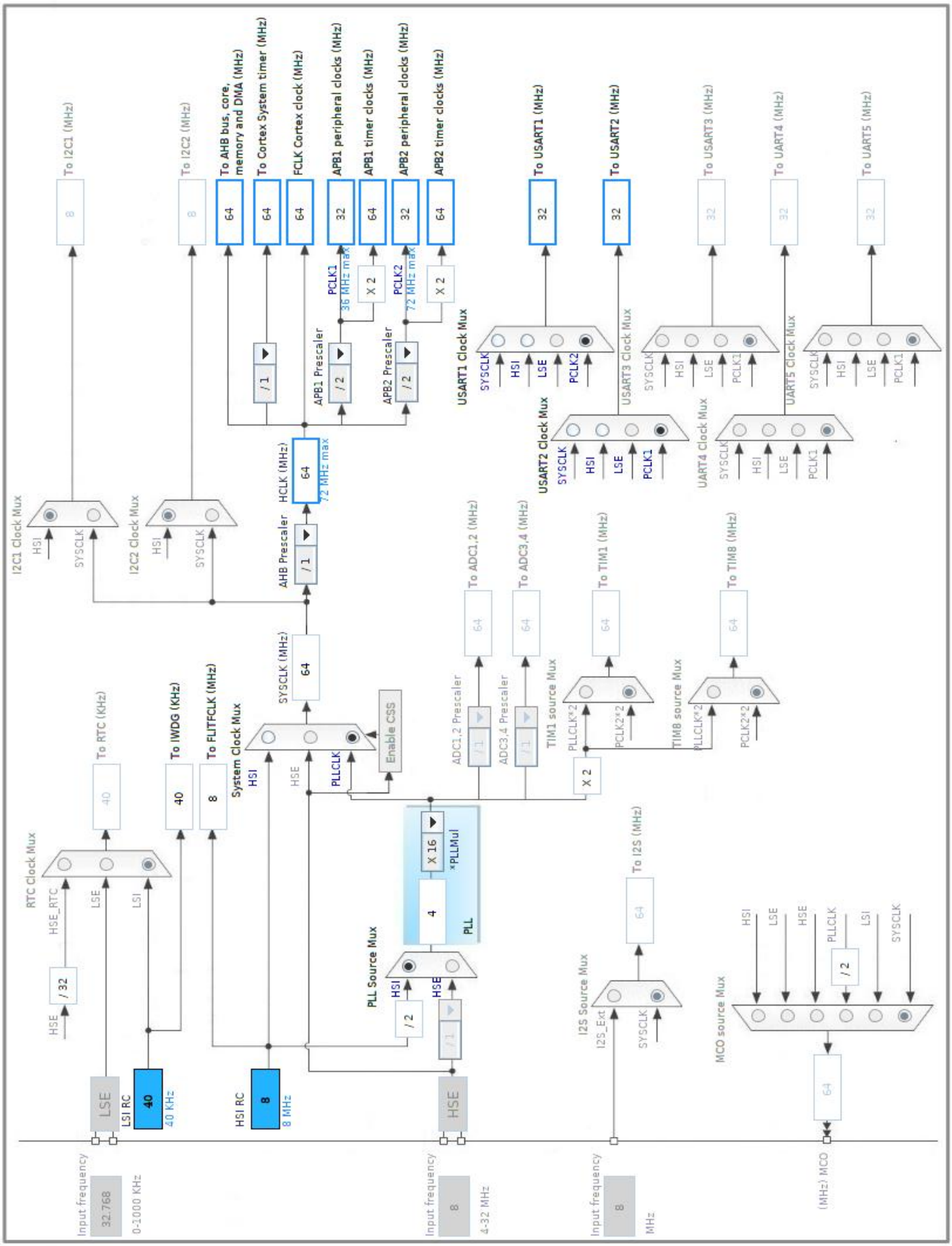
3. Pins Configuration

Pin Number LQFP100	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
6	VBAT	Power		
14	NRST	Reset		
15	PC0 *	I/O	GPIO_Output	
16	PC1 *	I/O	GPIO_Output	
20	VSSA/VREF-	Power		
21	VREF+	Power		
22	VDDA	Power		
28	VDD	Power		
29	PA4	I/O	SPI1_NSS	
30	PA5	I/O	SPI1_SCK	
31	PA6	I/O	SPI1_MISO	
32	PA7	I/O	SPI1_MOSI	
37	NPOR	Reset		
49	VSS	Power		
50	VDD	Power		
51	PB12	I/O	SPI2_NSS	
52	PB13	I/O	SPI2_SCK	
53	PB14	I/O	SPI2_MISO	
54	PB15	I/O	SPI2_MOSI	
63	PC6	I/O	TIM3_CH1	
64	PC7	I/O	TIM3_CH2	
65	PC8 *	I/O	GPIO_Input	
68	PA9	I/O	USART1_TX	
69	PA10	I/O	USART1_RX	
72	PA13	I/O	SYS_JTMS-SWDIO	
74	VSS	Power		
75	VDD	Power		
76	PA14	I/O	SYS_JTCK-SWCLK	
77	PA15	I/O	SYS_JTDI	
78	PC10	I/O	SPI3_SCK	
79	PC11	I/O	SPI3_MISO	
80	PC12	I/O	SPI3_MOSI	
81	PD0 *	I/O	GPIO_Output	
82	PD1 *	I/O	GPIO_Output	
84	PD3	I/O	USART2_CTS	
85	PD4	I/O	USART2_RTS	

Pin Number LQFP100	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
86	PD5	I/O	USART2_TX	
87	PD6	I/O	USART2_RX	
89	PB3	I/O	SYS_JTDO-TRACESWO	
90	PB4	I/O	SYS_NJTRST	
94	BOOT0	Boot		
99	VSS	Power		
100	VDD	Power		

* The pin is affected with an I/O function

4. Clock Tree Configuration



5. IPs and Middleware Configuration

5.1. CRC

mode: Activated

5.1.1. Parameter Settings:

Basic Parameters:

Default Polynomial State	Enable
Default Init Value State	Enable

Advanced Parameters:

Input Data Inversion Mode	None
Output Data Inversion Mode	Disable
Input Data Format	Bytes

5.2. IWDG

mode: Activated

5.2.1. Parameter Settings:

Watchdog Clocking:

IWDG counter clock prescaler	4
IWDG window value	4095
IWDG down-counter reload value	4095

5.3. SPI1

Mode: Full-Duplex Master

Hardware NSS Signal: Hardware NSS Output Signal

5.3.1. Parameter Settings:

Basic Parameters:

Frame Format	Motorola
Data Size	4 Bits
First Bit	MSB First

Clock Parameters:

Prescaler (for Baud Rate)	2
Baud Rate	**16.0 MBits/s ***
Clock Polarity (CPOL)	Low

Clock Phase (CPHA)	1 Edge

Advanced Parameters:

CRC Calculation	Disabled
NSSP Mode	Enabled
NSS Signal Type	Output Hardware

5.4. SPI2

Mode: Full-Duplex Master

Hardware NSS Signal: Hardware NSS Output Signal

5.4.1. Parameter Settings:

Basic Parameters:

Frame Format	Motorola
Data Size	4 Bits
First Bit	MSB First

Clock Parameters:

Prescaler (for Baud Rate)	2
Baud Rate	**16.0 MBits/s ***
Clock Polarity (CPOL)	Low
Clock Phase (CPHA)	1 Edge

Advanced Parameters:

CRC Calculation	Disabled
NSSP Mode	Enabled
NSS Signal Type	Output Hardware

5.5. SPI3

Mode: Full-Duplex Master

5.5.1. Parameter Settings:

Basic Parameters:

Frame Format	Motorola
Data Size	4 Bits
First Bit	MSB First

Clock Parameters:

Prescaler (for Baud Rate)	2
Baud Rate	**16.0 MBits/s ***

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

Advanced Parameters:

CRC Calculation	Disabled
NSSP Mode	Enabled
NSS Signal Type	Software

5.6. SYS

Debug: JTAG (5 pins)

Timebase Source: SysTick

5.7. TIM3

Combined Channels: Encoder Mode

5.7.1. Parameter Settings:

Counter Settings:

Prescaler (PSC - 16 bits value)	0
Counter Mode	Up
Counter Period (AutoReload Register - 16 bits value)	0
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
____ Parameters for Channel 1 ____	
Polarity	Rising Edge
IC Selection	Direct
Prescaler Division Ratio	No division
Input Filter	0
____ Parameters for Channel 2 ____	
Polarity	Rising Edge
IC Selection	Direct
Prescaler Division Ratio	No division
Input Filter	0

5.8. USART1

Mode: Asynchronous

5.8.1. Parameter Settings:

Basic Parameters:

Baud Rate	38400
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

5.9. USART2

Mode: Asynchronous

Hardware Flow Control (RS232): CTS/RTS

5.9.1. Parameter Settings:

Basic Parameters:

Baud Rate	38400
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

5.10. WWDG

mode: Activated

5.10.1. Parameter Settings:

Watchdog Clocking:

WWDG counter clock prescaler	1
WWDG window value	64
WWDG free-running downcounter value	64

Watchdog Interrupt:

Early wakeup interrupt	Disable

*** User modified value**

6. System Configuration

6.1. GPIO configuration

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
SPI1	PA4	SPI1_NSS	Alternate Function Push Pull	No pull up pull down	**High ***	
	PA5	SPI1_SCK	Alternate Function Push Pull	No pull up pull down	**High ***	
	PA6	SPI1_MISO	Alternate Function Push Pull	No pull up pull down	**High ***	
	PA7	SPI1_MOSI	Alternate Function Push Pull	No pull up pull down	**High ***	
SPI2	PB12	SPI2_NSS	Alternate Function Push Pull	No pull up pull down	**High ***	
	PB13	SPI2_SCK	Alternate Function Push Pull	No pull up pull down	**High ***	
	PB14	SPI2_MISO	Alternate Function Push Pull	No pull up pull down	**High ***	
	PB15	SPI2_MOSI	Alternate Function Push Pull	No pull up pull down	**High ***	
SPI3	PC10	SPI3_SCK	Alternate Function Push Pull	No pull up pull down	**High ***	
	PC11	SPI3_MISO	Alternate Function Push Pull	No pull up pull down	**High ***	
	PC12	SPI3_MOSI	Alternate Function Push Pull	No pull up pull down	**High ***	
SYS	PA13	SYS_JTMS-SWDIO	n/a	n/a	n/a	
	PA14	SYS_JTCK-SWCLK	n/a	n/a	n/a	
	PA15	SYS_JTDI	n/a	n/a	n/a	
	PB3	SYS_JTDO-TRACESWO	n/a	n/a	n/a	
	PB4	SYS_NJTRST	n/a	n/a	n/a	
TIM3	PC6	TIM3_CH1	Alternate Function Push Pull	No pull up pull down	Low	
	PC7	TIM3_CH2	Alternate Function Push Pull	No pull up pull down	Low	
USART1	PA9	USART1_TX	Alternate Function Push Pull	No pull up pull down	**High ***	
	PA10	USART1_RX	Alternate Function Push Pull	No pull up pull down	**High ***	
USART2	PD3	USART2_CTS	Alternate Function Push Pull	No pull up pull down	**High ***	
	PD4	USART2_RTS	Alternate Function Push Pull	No pull up pull down	**High ***	
	PD5	USART2_TX	Alternate Function Push Pull	No pull up pull down	**High ***	
	PD6	USART2_RX	Alternate Function Push Pull	No pull up pull down	**High ***	
GPIO	PC0	GPIO_Output	Output Push Pull	No pull up pull down	Low	
	PC1	GPIO_Output	Output Push Pull	No pull up pull down	Low	
	PC8	GPIO_Input	Input mode	No pull up pull down	n/a	
	PD0	GPIO_Output	Output Push Pull	No pull up pull down	Low	
	PD1	GPIO_Output	Output Push Pull	No pull up pull down	Low	

6.2. DMA configuration

nothing configured in DMA service

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
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
Window watchdog interrupt	unused		
Flash global interrupt	unused		
RCC global interrupt	unused		
TIM3 global interrupt	unused		
SPI1 global interrupt	unused		
SPI2 global interrupt	unused		
USART1 global interrupt / USART1 wake-up interrupt through EXTI line 25	unused		
USART2 global interrupt / USART2 wake-up interrupt through EXTI line 26	unused		
SPI3 global interrupt	unused		
Floating point unit interrupt	unused		

*** User modified value**

7. Power Consumption Calculator report

7.1. Microcontroller Selection

Series	STM32F3
Line	STM32F3x8
MCU	STM32F358VCTx
Datasheet	025540_Rev4

7.2. Parameter Selection

Temperature	25
Vdd	1.8

7.3. Battery Selection

Battery	Battery_29
Capacity	3000.0 mAh
Self Discharge	0.0 %/month
Nominal Voltage	9.2 V
Max Cont Current	10000.0 mA
Max Pulse Current	0.0 mA
Cells in series	1
Cells in parallel	1

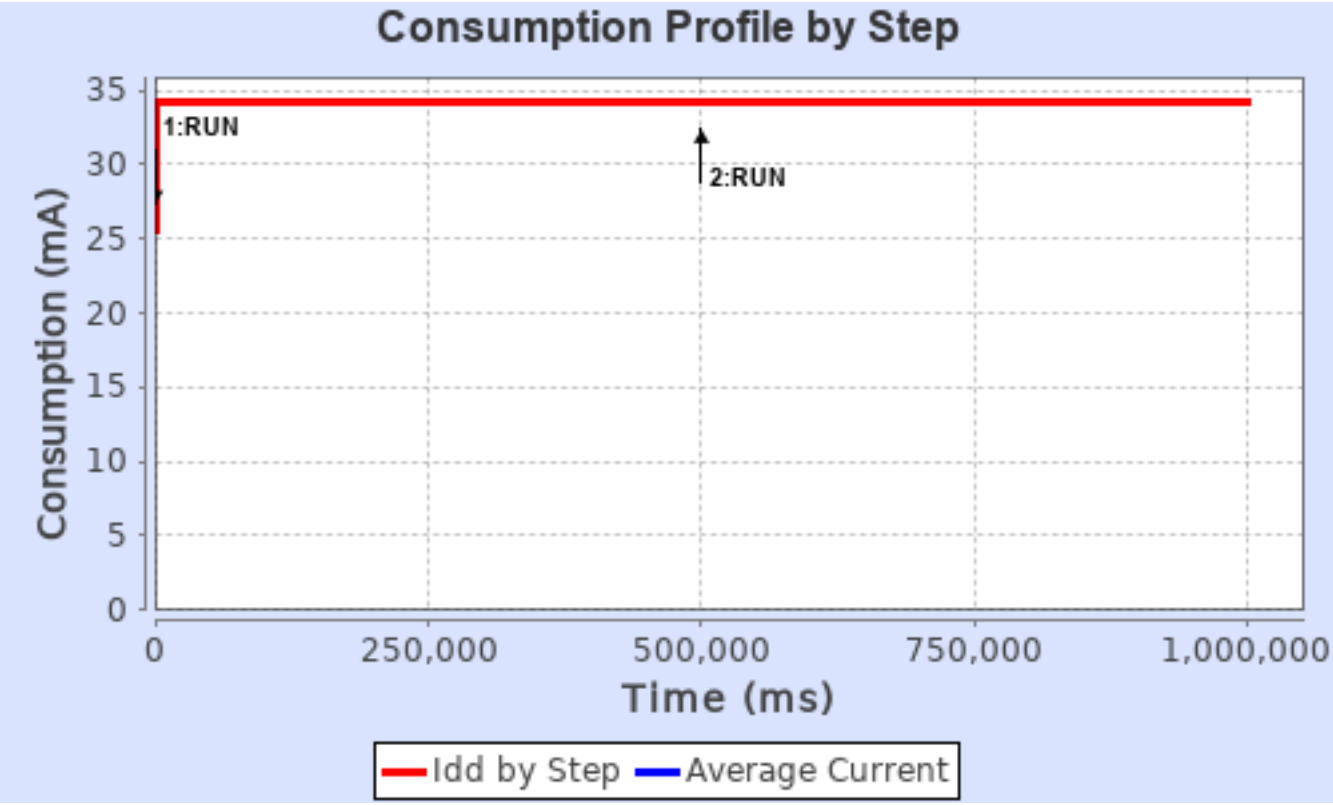
7.4. Sequence

Step	Step1	Step2
Mode	RUN	RUN
Vdd	1.8	1.8
Voltage Source	Battery	Battery
Range	No Scale	No Scale
Fetch Type	FLASH	RAM
Clock Configuration	HSI PLL	HSI PLL
Clock Source Frequency	8 MHz	8 MHz
CPU Frequency	64 MHz	64 MHz
Peripherals	Bus-Matrix IWDG PWR RTC	DMA1 DMA2 GPIOC GPIOD IWDG PWR RTC SPI1 SPI2 SPI3 TIM3 USART1 USART2
Additional Cons.	0 mA	0 mA
Average Current	25.56 mA	34.14 mA
Duration	100 ms	1000 s
DMIPS	56.0	80.0
Ta Max	103.11	102.48
Category	In DS Table	In DS Table

7.5. RESULTS

Sequence Time	1,000.1 s	Average Current	34.14 mA
Battery Life	3 days, 15 hours	Average DMIPS	80.0 DMIPS

7.6. Chart


Consumption Profile by Step
Consumption (mA)
35
30
25
20
15
10
5
0
1:RUN
2:RUN
0
250,000
500,000
750,000
1,000,000
Time (ms)
Idd by Step
Average Current

8. Software Pack Report

9. Software Project

9.1. Project Settings

Name	Value
Project Name	panobot-Firmware
Project Folder	/home/mel/workspace/panobot-Firmware
Toolchain / IDE	Makefile
Firmware Package Name and Version	STM32Cube FW_F3 V1.9.1

9.2. 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