



1. Description

1.1. Project

Project Name	Cutter
Board Name	NUCLEO-F767ZI
Generated with:	STM32CubeMX 6.2.1
Date	03/19/2022

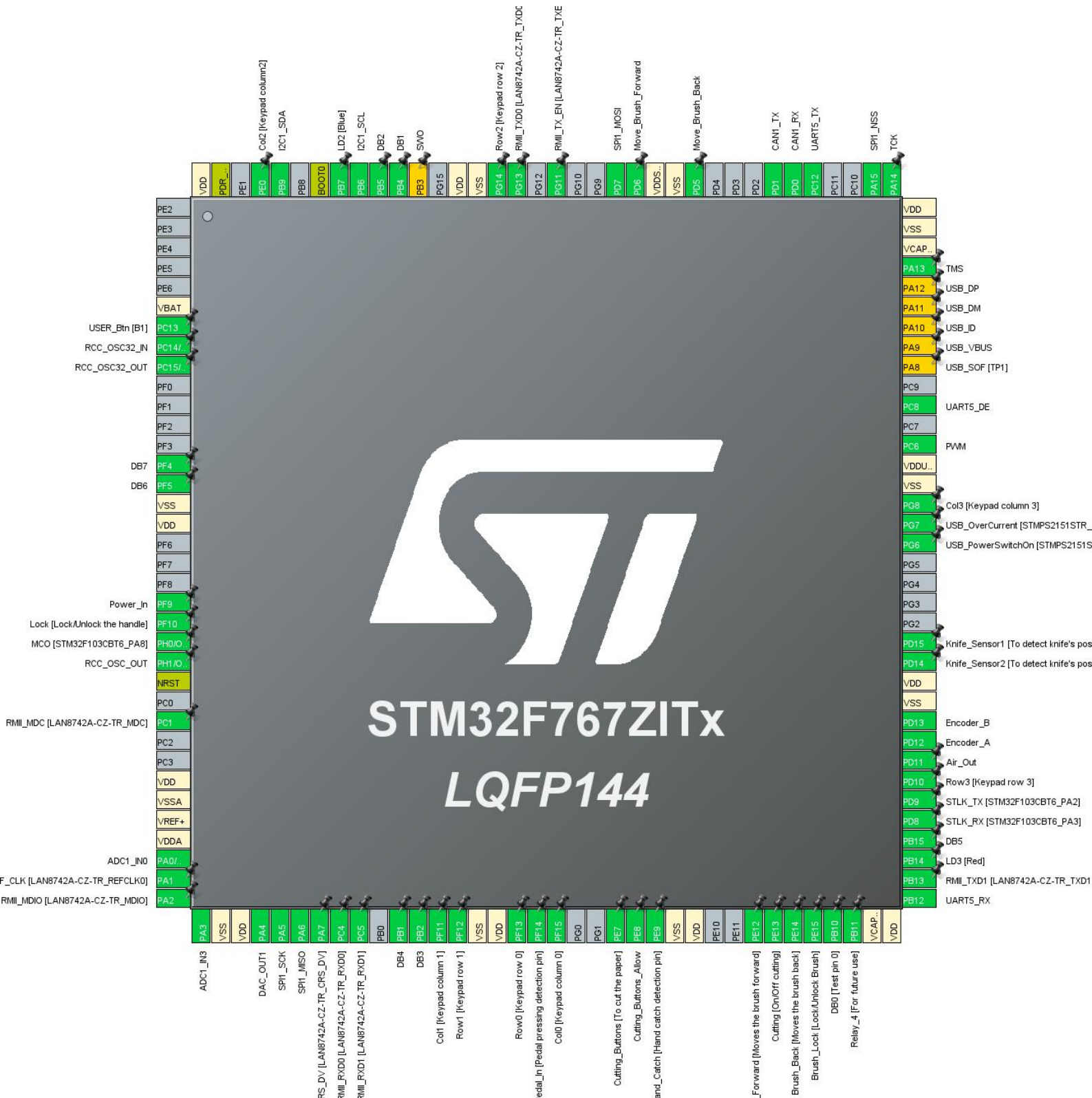
1.2. MCU

MCU Series	STM32F7
MCU Line	STM32F7x7
MCU name	STM32F767ZITx
MCU Package	LQFP144
MCU Pin number	144

1.3. Core(s) information

Core(s)	Arm Cortex-M7
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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	
14	PF4 *	I/O	GPIO_Output	DB7
15	PF5 *	I/O	GPIO_Output	DB6
16	VSS	Power		
17	VDD	Power		
21	PF9 *	I/O	GPIO_Input	Power_In
22	PF10 *	I/O	GPIO_Output	Lock [Lock/Unlock the handle]
23	PH0/OSC_IN	I/O	RCC_OSC_IN	MCO [STM32F103CBT6_PA8]
24	PH1/OSC_OUT	I/O	RCC_OSC_OUT	
25	NRST	Reset		
27	PC1	I/O	ETH_MDC	RMII_MDC [LAN8742A-CZ- TR_MDC]
30	VDD	Power		
31	VSSA	Power		
32	VREF+	Power		
33	VDDA	Power		
34	PA0/WKUP	I/O	ADC1_IN0	
35	PA1	I/O	ETH_REF_CLK	RMII_REF_CLK [LAN8742A-CZ- TR_REFCLK0]
36	PA2	I/O	ETH_MDIO	RMII_MDIO [LAN8742A-CZ- TR_MDIO]
37	PA3	I/O	ADC1_IN3	
38	VSS	Power		
39	VDD	Power		
40	PA4	I/O	DAC_OUT1	
41	PA5	I/O	SPI1_SCK	
42	PA6	I/O	SPI1_MISO	
43	PA7	I/O	ETH_CRSDV	RMII_CRSDV [LAN8742A- CZ-TR_CRSDV]
44	PC4	I/O	ETH_RXD0	RMII_RXD0 [LAN8742A-CZ- TR_RXD0]

Pin Number LQFP144	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
45	PC5	I/O	ETH_RXD1	RMII_RXD1 [LAN8742A-CZ- TR_RXD1]
47	PB1 *	I/O	GPIO_Output	DB4
48	PB2 *	I/O	GPIO_Output	DB3
49	PF11 *	I/O	GPIO_Input	Col1 [Keypad column 1]
50	PF12 *	I/O	GPIO_Input	Row1 [Keypad row 1]
51	VSS	Power		
52	VDD	Power		
53	PF13 *	I/O	GPIO_Input	Row0 [Keypad row 0]
54	PF14 *	I/O	GPIO_Input	Pedal_In [Pedal pressing detection pin]
55	PF15 *	I/O	GPIO_Input	Col0 [Keypad column 0]
58	PE7 *	I/O	GPIO_Input	Cutting_Buttons [To cut the paper]
59	PE8 *	I/O	GPIO_Output	Cutting_Buttons_Allow
60	PE9 *	I/O	GPIO_Input	Hand_Catch [Hand catch detection pin]
61	VSS	Power		
62	VDD	Power		
65	PE12 *	I/O	GPIO_Output	Brush_Forward [Moves the brush forward]
66	PE13 *	I/O	GPIO_Output	Cutting [On/Off cutting]
67	PE14 *	I/O	GPIO_Output	Brush_Back [Moves the brush back]
68	PE15 *	I/O	GPIO_Output	Brush_Lock [Lock/Unlock Brush]
69	PB10 *	I/O	GPIO_Output	DB0 [Test pin 0]
70	PB11 *	I/O	GPIO_Output	Relay_4 [For future use]
71	VCAP_1	Power		
72	VDD	Power		
73	PB12	I/O	UART5_RX	
74	PB13	I/O	ETH_TXD1	RMII_TXD1 [LAN8742A-CZ- TR_TXD1]
75	PB14 *	I/O	GPIO_Output	LD3 [Red]
76	PB15 *	I/O	GPIO_Output	DB5
77	PD8	I/O	USART3_TX	STLK_RX [STM32F103CBT6_PA3]
78	PD9	I/O	USART3_RX	STLK_TX [STM32F103CBT6_PA2]
79	PD10 *	I/O	GPIO_Input	Row3 [Keypad row 3]
80	PD11 *	I/O	GPIO_Output	Air_Out

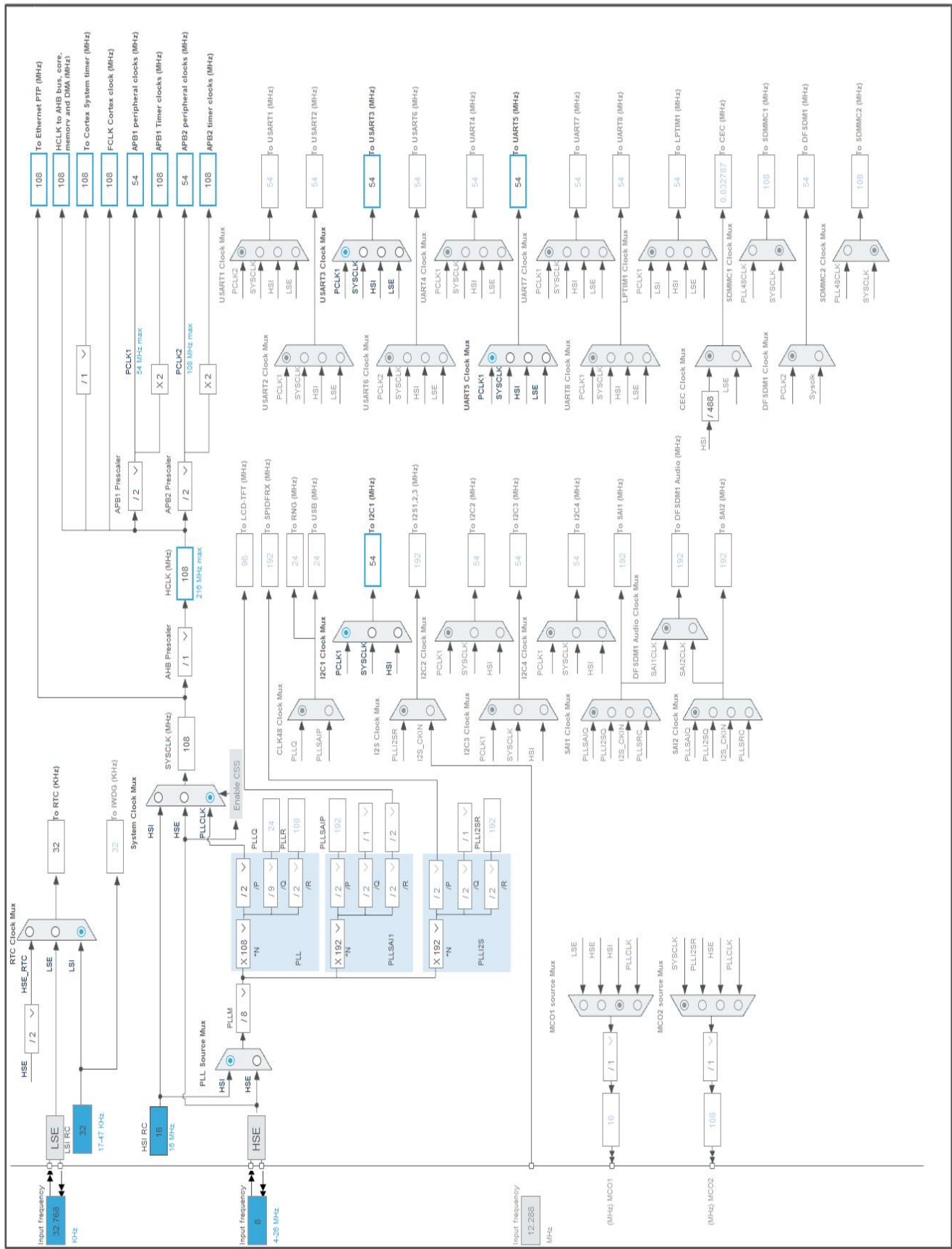
Pin Number LQFP144	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
81	PD12	I/O	TIM4_CH1	Encoder_A
82	PD13	I/O	TIM4_CH2	Encoder_B
83	VSS	Power		
84	VDD	Power		
85	PD14 *	I/O	GPIO_Input	Knife_Sensor2 [To detect knife's position]
86	PD15 *	I/O	GPIO_Input	Knife_Sensor1 [To detect knife's position]
91	PG6 *	I/O	GPIO_Output	USB_PowerSwitchOn [STMP2151STR_EN]
92	PG7 *	I/O	GPIO_Input	USB_OverCurrent [STMP2151STR_FAULT]
93	PG8 *	I/O	GPIO_Input	Col3 [Keypad column 3]
94	VSS	Power		
95	VDDUSB	Power		
96	PC6	I/O	TIM3_CH1	PWM
98	PC8	I/O	UART5_DE	
100	PA8 **	I/O	USB_OTG_FS_SOF	USB_SOF [TP1]
101	PA9 **	I/O	USB_OTG_FS_VBUS	USB_VBUS
102	PA10 **	I/O	USB_OTG_FS_ID	USB_ID
103	PA11 **	I/O	USB_OTG_FS_DM	USB_DM
104	PA12 **	I/O	USB_OTG_FS_DP	USB_DP
105	PA13	I/O	SYS_JTMS-SWDIO	TMS
106	VCAP_2	Power		
107	VSS	Power		
108	VDD	Power		
109	PA14	I/O	SYS_JTCK-SWCLK	TCK
110	PA15	I/O	SPI1_NSS	
113	PC12	I/O	UART5_TX	
114	PD0	I/O	CAN1_RX	
115	PD1	I/O	CAN1_TX	
119	PD5 *	I/O	GPIO_Input	Move_Brush_Back
120	VSS	Power		
121	VDDSDMMC	Power		
122	PD6 *	I/O	GPIO_Input	Move_Brush_Forward
123	PD7	I/O	SPI1_MOSI	
126	PG11	I/O	ETH_TX_EN	RMII_TX_EN [LAN8742A- CZ-TR_TXEN]
128	PG13	I/O	ETH_TXD0	RMII_TXD0 [LAN8742A-CZ- TR_TXD0]

Pin Number LQFP144	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
129	PG14 *	I/O	GPIO_Input	Row2 [Keypad row 2]
130	VSS	Power		
131	VDD	Power		
133	PB3 **	I/O	SYS_JTDO-SWO	SWO
134	PB4 *	I/O	GPIO_Output	DB1
135	PB5 *	I/O	GPIO_Output	DB2
136	PB6	I/O	I2C1_SCL	
137	PB7 *	I/O	GPIO_Output	LD2 [Blue]
138	BOOT0	Boot		
140	PB9	I/O	I2C1_SDA	
141	PE0 *	I/O	GPIO_Input	Col2 [Keypad column2]
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	Cutter
Project Folder	C:\anna\Cutter\ProjectsSW
Toolchain / IDE	STM32CubeIDE
Firmware Package Name and Version	STM32Cube FW_F7 V1.16.0
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	Yes
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_ADC1_Init	ADC1
4	MX_CAN1_Init	CAN1
5	MX_ETH_Init	ETH
6	MX_SPI1_Init	SPI1
7	MX_TIM3_Init	TIM3
8	MX_TIM4_Init	TIM4
9	MX_UART5_Init	UART5
10	MX_USART3_UART_Init	USART3
11	MX_I2C1_Init	I2C1

Rank	Function Name	Peripheral Instance Name
12	MX_DAC_Init	DAC
13	MX_RTC_Init	RTC

6. Power Consumption Calculator report

6.1. Microcontroller Selection

Series	STM32F7
Line	STM32F7x7
MCU	STM32F767ZITx
Datasheet	DS11532_Rev4

6.2. Parameter Selection

Temperature	25
Vdd	3.3

6.3. 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

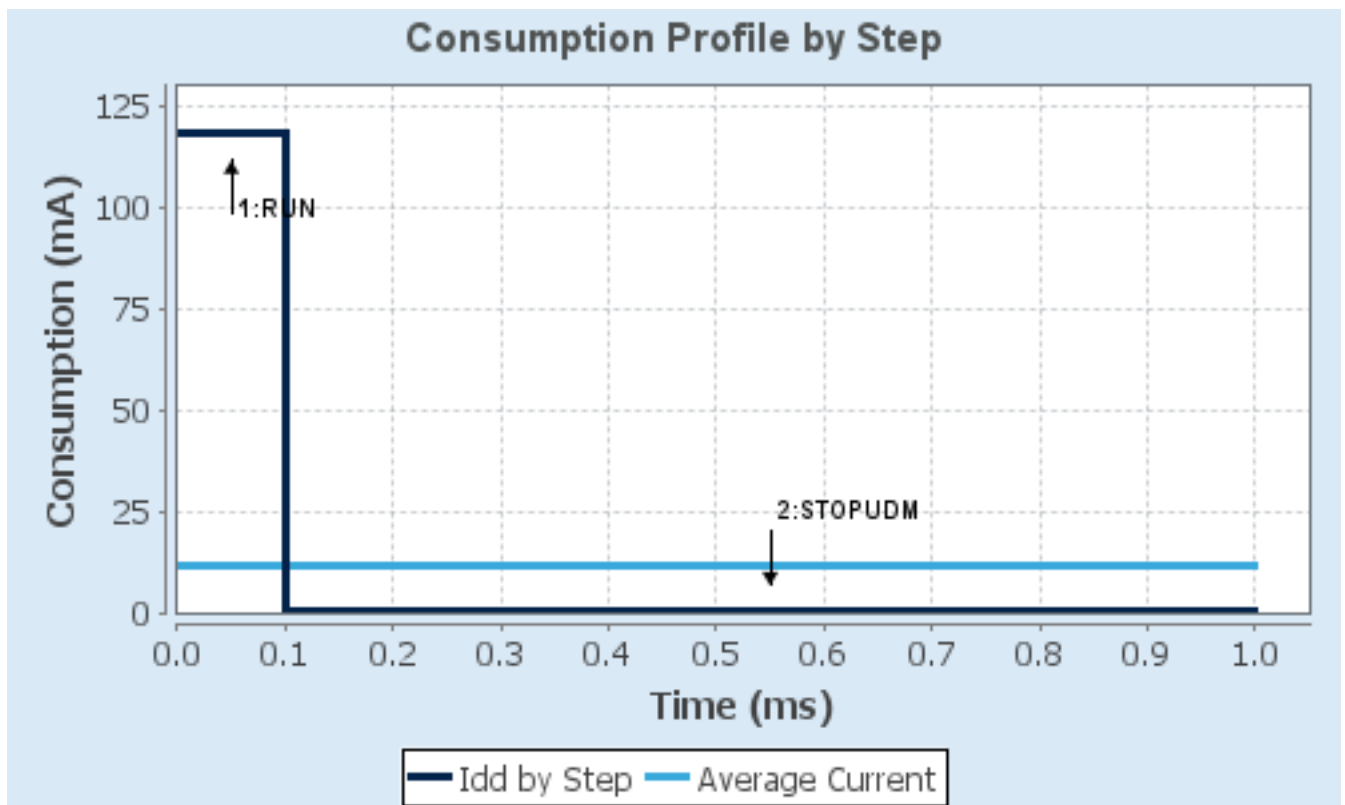
6.4. Sequence

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	ICTM FLASH-SingleBank 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	118 mA	130 μ A
Duration	0.1 ms	0.9 ms
DMIPS	462.0	0.0
Ta Max	89.42	104.98
Category	In DS Table	In DS Table

6.5. Results

Sequence Time	1 ms	Average Current	11.92 mA
Battery Life	2 days, 4 hours	Average DMIPS	462.24005 DMIPS

6.6. Chart



7. Peripherals and Middlewares Configuration

7.1. ADC1

mode: IN0

mode: IN3

7.1.1. Parameter Settings:

ADCs_Common_Settings:

Mode	Independent mode
ADC_Settings:	
Clock Prescaler	PCLK2 divided by 2
Resolution	12 bits (15 ADC Clock cycles)
Data Alignment	Right alignment
Scan Conversion Mode	Disabled
Continuous Conversion Mode	Disabled
Discontinuous Conversion Mode	Disabled
DMA Continuous Requests	Disabled
End Of Conversion Selection	EOC flag at the end of single channel conversion

ADC_Regular_ConversionMode:

Number Of Conversion	1
External Trigger Conversion Source	Regular Conversion launched by software
External Trigger Conversion Edge	None
<u>Rank</u>	1
Channel	Channel 0
Sampling Time	3 Cycles

ADC_Injected_ConversionMode:

Number Of Conversions	0
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WatchDog:

Enable Analog WatchDog Mode	false
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7.2. CAN1

mode: Activated

7.2.1. Parameter Settings:

Bit Timings Parameters:

Prescaler (for Time Quantum)	16
Time Quantum	296.2962962962963 *
Time Quanta in Bit Segment 1	4 Times *

Time Quanta in Bit Segment 2	4 Times *
Time for one Bit	2666.66 *
Baud Rate	375000 *
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
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7.3. DAC

mode: OUT1 Configuration

7.3.1. Parameter Settings:

DAC Out1 Settings:

Output Buffer	Enable
Trigger	None

7.4. ETH

Mode: RMII

7.4.1. Parameter Settings:

Advanced : Ethernet Media Configuration:

Auto Negotiation	Enabled
Speed	100 MBits/s
Duplex Mode	Full Duplex

General : Ethernet Configuration:

Ethernet MAC Address	00:80:E1:00:00:00
PHY Address	0 *

Ethernet Basic Configuration:

Rx Mode	Polling Mode
TX IP Header Checksum Computation	By hardware

7.4.2. Advanced Parameters:

External PHY Configuration:

PHY	LAN8742A_PHY_ADDRESS
PHY Address Value	0
PHY Reset delay these values are based on a 1 ms Systick interrupt	0x000000FF *
PHY Configuration delay	0x00000FFF *
PHY Read TimeOut	0x0000FFFF *
PHY Write TimeOut	0x0000FFFF *

Common : External PHY Configuration:

Transceiver Basic Control Register	0x00 *
Transceiver Basic Status Register	0x01 *
PHY Reset	0x8000 *
Select loop-back mode	0x4000 *
Set the full-duplex mode at 100 Mb/s	0x2100 *
Set the half-duplex mode at 100 Mb/s	0x2000 *
Set the full-duplex mode at 10 Mb/s	0x0100 *
Set the half-duplex mode at 10 Mb/s	0x0000 *
Enable auto-negotiation function	0x1000 *
Restart auto-negotiation function	0x0200 *
Select the power down mode	0x0800 *
Isolate PHY from MII	0x0400 *
Auto-Negotiation process completed	0x0020 *
Valid link established	0x0004 *
Jabber condition detected	0x0002 *

Extended : External PHY Configuration:

PHY special control/status register Offset	0x10 *
PHY Speed mask	0x0002 *
PHY Duplex mask	0x0004 *
PHY Interrupt Source Flag register Offset	0x001D *
PHY Link down interrupt	0x000B *

7.5. I2C1

I2C: I2C

7.5.1. Parameter Settings:

Timing configuration:

I2C Speed Mode	Standard Mode
I2C Speed Frequency (KHz)	100
Rise Time (ns)	0
Fall Time (ns)	0
Coefficient of Digital Filter	0
Analog Filter	Enabled
Timing	0x20404768 *

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

7.6. RCC

High Speed Clock (HSE): Crystal/Ceramic Resonator

Low Speed Clock (LSE) : Crystal/Ceramic Resonator

7.6.1. Parameter Settings:

System Parameters:

VDD voltage (V)	3.3
Flash Latency(WS)	3 WS (4 CPU cycle)

RCC Parameters:

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

Power Parameters:

Power Over Drive	Enabled
Power Regulator Voltage Scale	Power Regulator Voltage Scale 3

7.7. RTC

mode: Activate Clock Source

7.7.1. Parameter Settings:

General:

Hour Format	Hourformat 24
Asynchronous Predivider value	127
Synchronous Predivider value	255

7.8. SPI1

Mode: Full-Duplex Master

Hardware NSS Signal: Hardware NSS Input Signal

7.8.1. Parameter Settings:

Basic Parameters:

Frame Format	Motorola
Data Size	4 Bits
First Bit	MSB First

Clock Parameters:

Prescaler (for Baud Rate)	2
Baud Rate	27.0 MBits/s *
Clock Polarity (CPOL)	Low
Clock Phase (CPHA)	1 Edge

Advanced Parameters:

CRC Calculation	Disabled
NSSP Mode	Enabled
NSS Signal Type	Input Hardware

7.9. SYS

Debug: Serial Wire

Timebase Source: TIM2

7.10. TIM3

Clock Source : Internal Clock

Channel1: PWM Generation CH1

7.10.1. 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)

PWM Generation Channel 1:

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

7.11. TIM4

Combined Channels: Encoder Mode

7.11.1. Parameter Settings:

Counter Settings:

Prescaler (PSC - 16 bits value)	1 *
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
____ Parameters for Channel 1 ____	
Polarity	Rising Edge
IC Selection	Direct
Prescaler Division Ratio	No division
Input Filter	10 *
____ Parameters for Channel 2 ____	
Polarity	Rising Edge

IC Selection	Direct
Prescaler Division Ratio	No division
Input Filter	10 *

7.12. UART5

Mode: Asynchronous

mode: Hardware Flow Control (RS485)

7.12.1. 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
Polarity	High
Assertion Time	0
Deassertion Time	0

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

7.13. USART3

Mode: Asynchronous

7.13.1. Parameter Settings:

Basic Parameters:

Baud Rate	115200
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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

7.14. FREERTOS

Interface: CMSIS_V2

7.14.1. Config parameters:

API:

FreeRTOS API	CMSIS v2
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Versions:

FreeRTOS version	10.2.1
CMSIS-RTOS version	2.00

MPU/FPU:

ENABLE_MPU	Disabled
ENABLE_FPU	Disabled

Kernel settings:

USE_PREEMPTION	Enabled
CPU_CLOCK_HZ	SystemCoreClock
TICK_RATE_HZ	1000
MAX_PRIORITIES	56
MINIMAL_STACK_SIZE	128
MAX_TASK_NAME_LEN	16
USE_16_BIT_TICKS	Disabled
IDLE_SHOULD_YIELD	Enabled
USE_MUTEXES	Enabled
USE_RECURSIVE_MUTEXES	Enabled

USE_COUNTING_SEMAPHORES	Enabled
QUEUE_REGISTRY_SIZE	8
USE_APPLICATION_TASK_TAG	Disabled
ENABLE_BACKWARD_COMPATIBILITY	Enabled
USE_PORT_OPTIMISED_TASK_SELECTION	Disabled
USE_TICKLESS_IDLE	Disabled
USE_TASK_NOTIFICATIONS	Enabled
RECORD_STACK_HIGH_ADDRESS	Disabled

Memory management settings:

Memory Allocation	Dynamic / Static
TOTAL_HEAP_SIZE	15360
Memory Management scheme	heap_4

Hook function related definitions:

USE_IDLE_HOOK	Disabled
USE_TICK_HOOK	Disabled
USE_MALLOC_FAILED_HOOK	Disabled
USE_DAEMON_TASK_STARTUP_HOOK	Disabled
CHECK_FOR_STACK_OVERFLOW	Disabled

Run time and task stats gathering related definitions:

GENERATE_RUN_TIME_STATS	Disabled
USE_TRACE_FACILITY	Enabled
USE_STATS_FORMATTING_FUNCTIONS	Disabled

Co-routine related definitions:

USE_CO_ROUTINES	Disabled
MAX_CO_ROUTINE_PRIORITIES	2

Software timer definitions:

USE_TIMERS	Enabled
TIMER_TASK_PRIORITY	2
TIMER_QUEUE_LENGTH	10
TIMER_TASK_STACK_DEPTH	256

Interrupt nesting behaviour configuration:

LIBRARY_LOWEST_INTERRUPT_PRIORITY	15
LIBRARY_MAX_SYSCALL_INTERRUPT_PRIORITY	5

Added with 10.2.1 support:

MESSAGE_BUFFER_LENGTH_TYPE	size_t
USE_POSIX_ERRNO	Disabled

7.14.2. Include parameters:

Include definitions:

vTaskPrioritySet	Enabled
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uxTaskPriorityGet	Enabled
vTaskDelete	Enabled
vTaskCleanUpResources	Disabled
vTaskSuspend	Enabled
vTaskDelayUntil	Enabled
vTaskDelay	Enabled
xTaskGetSchedulerState	Enabled
xTaskResumeFromISR	Enabled
xQueueGetMutexHolder	Enabled
xSemaphoreGetMutexHolder	Disabled
pcTaskGetTaskName	Disabled
uxTaskGetStackHighWaterMark	Enabled
xTaskGetCurrentTaskHandle	Disabled
eTaskGetState	Enabled
xEventGroupSetBitFromISR	Disabled
xTimerPendFunctionCall	Enabled
xTaskAbortDelay	Disabled
xTaskGetHandle	Disabled
uxTaskGetStackHighWaterMark2	Disabled

7.14.3. Advanced settings:

Newlib settings (see parameter description first):

USE_NEWLIB_REENTRANT	Disabled
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Project settings (see parameter description first):

Use FW pack heap file	Enabled
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*** User modified value**

8. System Configuration

8.1. GPIO configuration

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
ADC1	PA0/WKUP	ADC1_IN0	Analog mode	No pull-up and no pull-down	n/a	
	PA3	ADC1_IN3	Analog mode	No pull-up and no pull-down	n/a	
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 *	
DAC	PA4	DAC_OUT1	Analog mode	No pull-up and no pull-down	n/a	
ETH	PC1	ETH_MDC	Alternate Function Push Pull	No pull-up and no pull-down	Very High *	RMII_MDC [LAN8742A-CZ-TR_MDC]
	PA1	ETH_REF_CLK	Alternate Function Push Pull	No pull-up and no pull-down	Very High *	RMII_REF_CLK [LAN8742A-CZ-TR_REFCLK0]
	PA2	ETH_MDIO	Alternate Function Push Pull	No pull-up and no pull-down	Very High *	RMII_MDIO [LAN8742A-CZ-TR_MDIO]
	PA7	ETH_CRS_DV	Alternate Function Push Pull	No pull-up and no pull-down	Very High *	RMII_CRS_DV [LAN8742A-CZ-TR_CRS_DV]
	PC4	ETH_RXD0	Alternate Function Push Pull	No pull-up and no pull-down	Very High *	RMII_RXD0 [LAN8742A-CZ-TR_RXD0]
	PC5	ETH_RXD1	Alternate Function Push Pull	No pull-up and no pull-down	Very High *	RMII_RXD1 [LAN8742A-CZ-TR_RXD1]
	PB13	ETH_TXD1	Alternate Function Push Pull	No pull-up and no pull-down	Very High *	RMII_TXD1 [LAN8742A-CZ-TR_TXD1]
	PG11	ETH_TX_EN	Alternate Function Push Pull	No pull-up and no pull-down	Very High *	RMII_TX_EN [LAN8742A-CZ-TR_TXEN]
	PG13	ETH_TXD0	Alternate Function Push Pull	No pull-up and no pull-down	Very High *	RMII_TXD0 [LAN8742A-CZ-TR_TXD0]
I2C1	PB6	I2C1_SCL	Alternate Function Open Drain	Pull-up	Very High *	
	PB9	I2C1_SDA	Alternate Function Open Drain	Pull-up	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	

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
	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 *	
	PA6	SPI1_MISO	Alternate Function Push Pull	No pull-up and no pull-down	Very High *	
	PA15	SPI1_NSS	Alternate Function Push Pull	No pull-up and no pull-down	Very High *	
	PD7	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
TIM3	PC6	TIM3_CH1	Alternate Function Push Pull	No pull-up and no pull-down	Low	PWM
TIM4	PD12	TIM4_CH1	Alternate Function Push Pull	No pull-up and no pull-down	Low	Encoder_A
	PD13	TIM4_CH2	Alternate Function Push Pull	No pull-up and no pull-down	Low	Encoder_B
UART5	PB12	UART5_RX	Alternate Function Push Pull	No pull-up and no pull-down	Very High *	
	PC8	UART5_DE	Alternate Function Push Pull	No pull-up and no pull-down	Very High *	
	PC12	UART5_TX	Alternate Function Push Pull	No pull-up and no pull-down	Very High *	
USART3	PD8	USART3_TX	Alternate Function Push Pull	No pull-up and no pull-down	Very High *	STLK_RX [STM32F103CBT6_PA3]
	PD9	USART3_RX	Alternate Function Push Pull	No pull-up and no pull-down	Very High *	STLK_TX [STM32F103CBT6_PA2]
Single Mapped Signals	PA8	USB_OTG_FS_SOF	Alternate Function Push Pull	No pull-up and no pull-down	Very High *	USB_SOF [TP1]
	PA9	USB_OTG_FS_VBUS	Input mode	No pull-up and no pull-down	n/a	USB_VBUS
	PA10	USB_OTG_FS_ID	Alternate Function Push Pull	No pull-up and no pull-down	Very High *	USB_ID
	PA11	USB_OTG_FS_DM	Alternate Function Push Pull	No pull-up and no pull-down	Very High *	USB_DM
	PA12	USB_OTG_FS_DP	Alternate Function Push Pull	No pull-up and no pull-down	Very High *	USB_DP

Cutter Project Configuration Report

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
	PB3	SYS_JTDO-SWO	n/a	n/a	n/a	SWO
GPIO	PC13	GPIO_EXTI13	External Interrupt Mode with Rising edge trigger detection	No pull-up and no pull-down	n/a	USER_Btn [B1]
	PF4	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	DB7
	PF5	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	DB6
	PF9	GPIO_Input	Input mode	Pull-up *	n/a	Power_In
	PF10	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	Lock [Lock/Unlock the handle]
	PB1	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	DB4
	PB2	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	DB3
	PF11	GPIO_Input	Input mode	Pull-down *	n/a	Col1 [Keypad column 1]
	PF12	GPIO_Input	Input mode	Pull-down *	n/a	Row1 [Keypad row 1]
	PF13	GPIO_Input	Input mode	Pull-down *	n/a	Row0 [Keypad row 0]
	PF14	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	Pedal_In [Pedal pressing detection pin]
	PF15	GPIO_Input	Input mode	Pull-down *	n/a	Col0 [Keypad column 0]
	PE7	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	Cutting_Buttons [To cut the paper]
	PE8	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	Cutting_Buttons_Allow
	PE9	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	Hand_Catch [Hand catch detection pin]
	PE12	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	Brush_Forward [Moves the brush forward]
	PE13	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	Cutting [On/Off cutting]
	PE14	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	Brush_Back [Moves the brush back]
	PE15	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	Brush_Lock [Lock/Unlock Brush]
	PB10	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	DB0 [Test pin 0]
	PB11	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	Relay_4 [For future use]
	PB14	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	LD3 [Red]
	PB15	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	DB5
	PD10	GPIO_Input	Input mode	Pull-down *	n/a	Row3 [Keypad row 3]
	PD11	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	Air_Out
	PD14	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	Knife_Sensor2 [To detect knife's position]
	PD15	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	Knife_Sensor1 [To detect knife's position]
	PG6	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	USB_PowerSwitchOn [STMPS2151STR_EN]
	PG7	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	USB_OverCurrent

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
						[STMP2151STR_FAULT]
	PG8	GPIO_Input	Input mode	Pull-down *	n/a	Col3 [Keypad column 3]
	PD5	GPIO_Input	Input mode	Pull-up *	n/a	Move_Brush_Back
	PD6	GPIO_Input	Input mode	Pull-up *	n/a	Move_Brush_Forward
	PG14	GPIO_Input	Input mode	Pull-down *	n/a	Row2 [Keypad row 2]
	PB4	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	DB1
	PB5	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	DB2
	PB7	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	LD2 [Blue]
	PE0	GPIO_Input	Input mode	Pull-down *	n/a	Col2 [Keypad column2]

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
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	15	0
System tick timer	true	15	0
TIM2 global interrupt	true	0	0
TIM4 global interrupt	true	5	0
PVD interrupt through EXTI line 16	unused		
Flash global interrupt	unused		
RCC global interrupt	unused		
ADC1, ADC2 and ADC3 global interrupts	unused		
CAN1 TX interrupts	unused		
CAN1 RX0 interrupts	unused		
CAN1 RX1 interrupt	unused		
CAN1 SCE interrupt	unused		
TIM3 global interrupt	unused		
I2C1 event interrupt	unused		
I2C1 error interrupt	unused		
SPI1 global interrupt	unused		
USART3 global interrupt	unused		
EXTI line[15:10] interrupts	unused		
UART5 global interrupt	unused		
TIM6 global interrupt, DAC1 and DAC2 underrun error interrupts	unused		
Ethernet global interrupt	unused		
Ethernet wake-up interrupt through EXTI line 19	unused		
FPU global interrupt	unused		

8.3.2. 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

Enabled interrupt Table	Select for init sequence ordering	Generate IRQ handler	Call HAL handler
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	false	false
Debug monitor	false	true	false
Pendable request for system service	false	false	false
System tick timer	false	false	true
TIM2 global interrupt	false	true	true
TIM4 global interrupt	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/DM00273119.pdf
Reference manual	http://www.st.com/resource/en/reference_manual/DM00224583.pdf
Programming manual	http://www.st.com/resource/en/programming_manual/DM00237416.pdf
Errata sheet	http://www.st.com/resource/en/errata_sheet/DM00257543.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/DM00046011.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/DM00129215.pdf
Application note	http://www.st.com/resource/en/application_note/DM00160482.pdf
Application note	http://www.st.com/resource/en/application_note/DM00164538.pdf
Application note	http://www.st.com/resource/en/application_note/DM00164549.pdf
Application note	http://www.st.com/resource/en/application_note/DM00173083.pdf
Application note	http://www.st.com/resource/en/application_note/DM00210367.pdf
Application note	http://www.st.com/resource/en/application_note/DM00220769.pdf
Application note	http://www.st.com/resource/en/application_note/DM00227538.pdf

Application note http://www.st.com/resource/en/application_note/DM00257177.pdf

Application note http://www.st.com/resource/en/application_note/DM00272912.pdf

Application note http://www.st.com/resource/en/application_note/DM00272913.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/DM00281138.pdf

Application note http://www.st.com/resource/en/application_note/DM00296349.pdf

Application note http://www.st.com/resource/en/application_note/DM00327191.pdf

Application note http://www.st.com/resource/en/application_note/DM00287603.pdf

Application note http://www.st.com/resource/en/application_note/DM00337702.pdf

Application note http://www.st.com/resource/en/application_note/DM00354244.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/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 http://www.st.com/resource/en/application_note/DM00431633.pdf

Application note http://www.st.com/resource/en/application_note/DM00493651.pdf

Application note http://www.st.com/resource/en/application_note/DM00536349.pdf

Application note http://www.st.com/resource/en/application_note/DM00600614.pdf

Application note http://www.st.com/resource/en/application_note/DM00725181.pdf