
STM32
CubeMX

1. Description

1.1. Project

Project Name	Cutter
Board Name	NUCLEO-F767ZI
Generated with:	STM32CubeMX 6.0.1
Date	09/20/2020

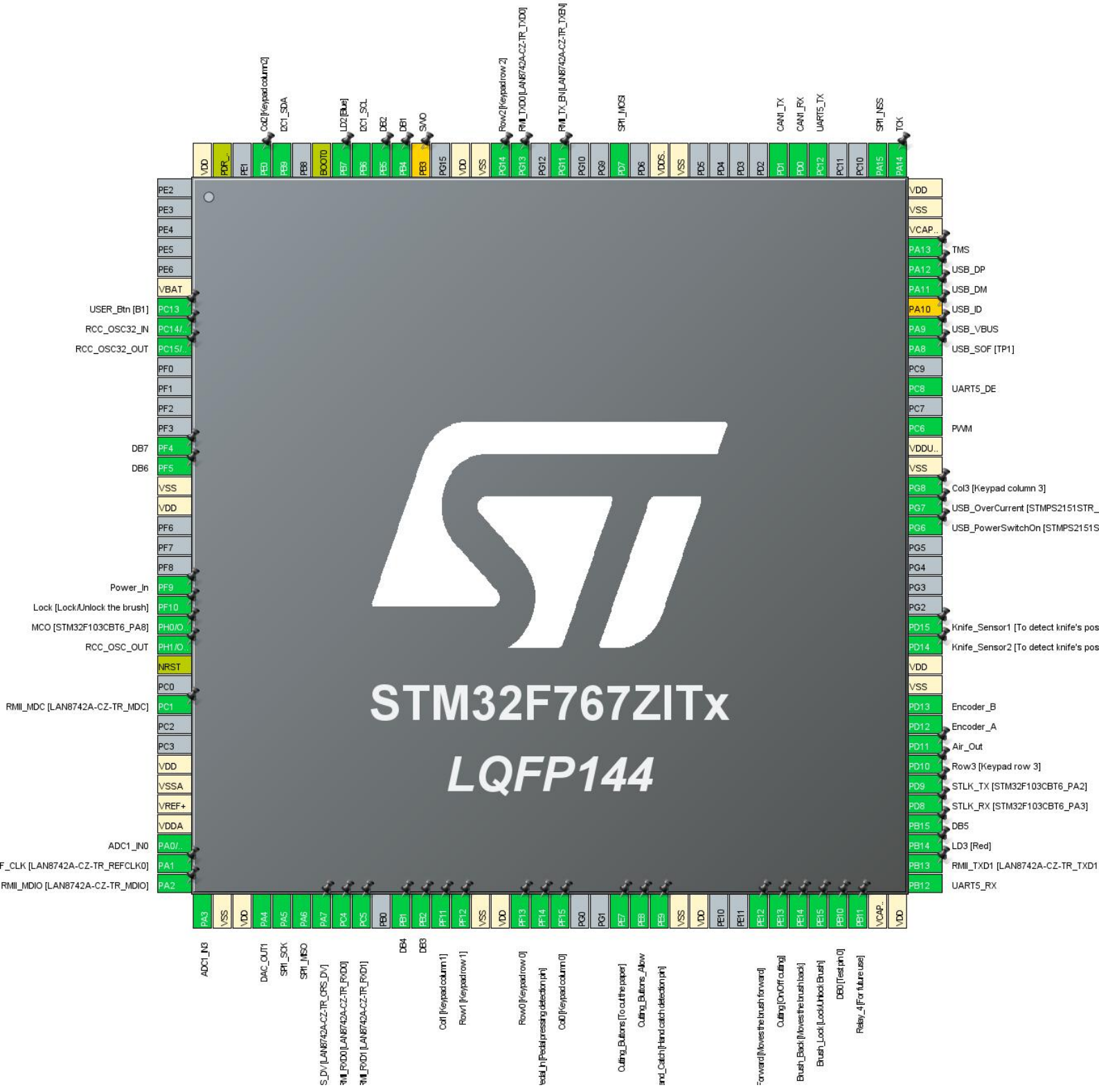
1.2. MCU

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

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 brush]
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_CRS_DV	RMII_CRS_DV [LAN8742A-CZ-TR_CRS_DV]
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

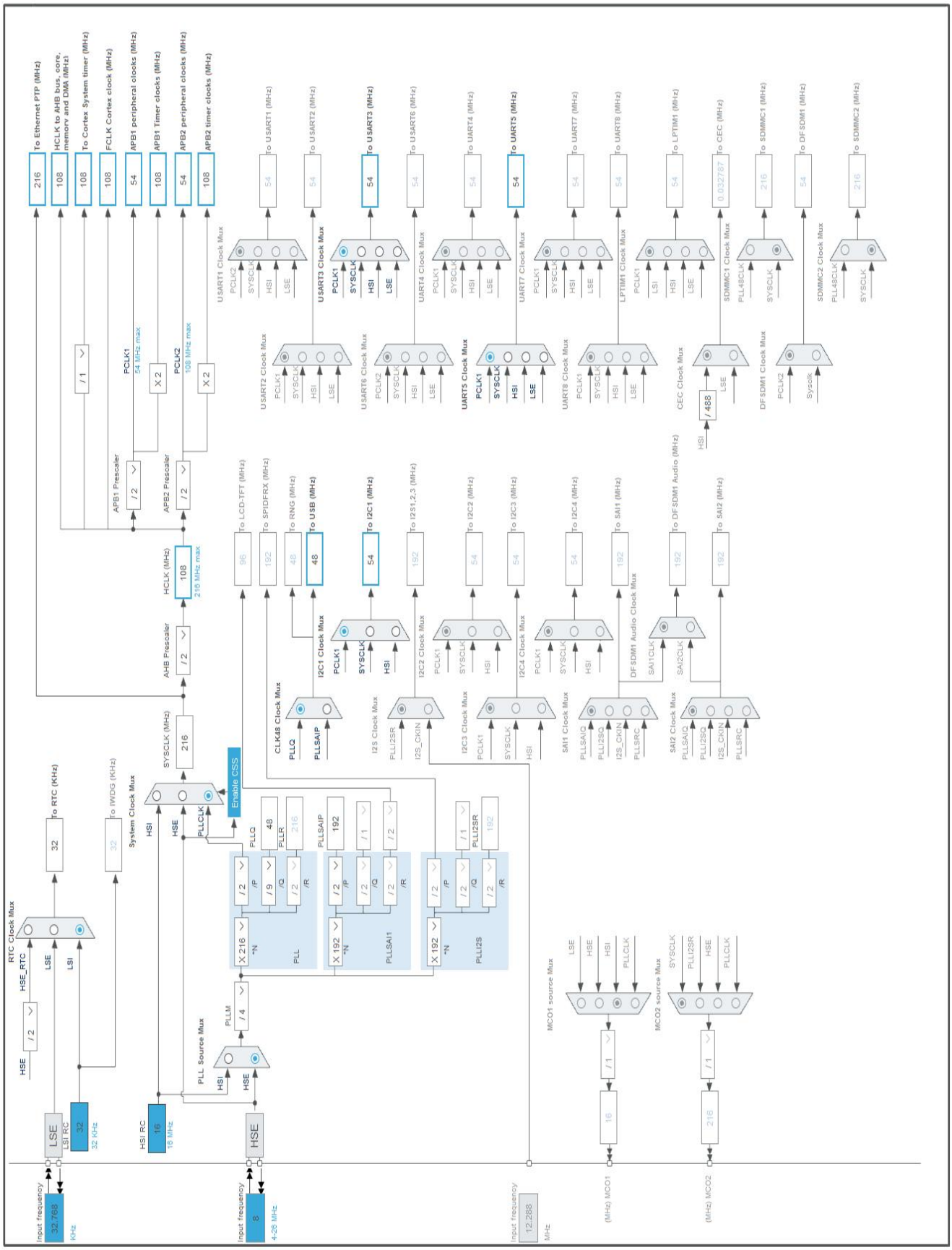
Pin Number LQFP144	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
81	PD12	I/O	TIM4_CH1	Encoder_A
82	PD13	I/O	TIM4_CH2	Encoder_B
83	VSS	Power		
84	VDD	Power		
85	PD14 *	I/O	GPIO_Input	Knife_Sensor2 [To detect knife's position]
86	PD15 *	I/O	GPIO_Input	Knife_Sensor1 [To detect knife's position]
91	PG6 *	I/O	GPIO_Output	USB_PowerSwitchOn [STMPS2151STR_EN]
92	PG7 *	I/O	GPIO_Input	USB_OverCurrent [STMPS2151STR_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	
120	VSS	Power		
121	VDDSDMMC	Power		
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]
129	PG14 *	I/O	GPIO_Input	Row2 [Keypad row 2]
130	VSS	Power		

Pin Number LQFP144	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
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:\Users\stanok\Desktop\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	IP 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_USB_OTG_FS_PCD_Init	USB_OTG_FS

Rank	Function Name	IP Instance Name
12	MX_I2C1_Init	I2C1
13	MX_DAC_Init	DAC
14	MX_RTC_Init	RTC
0	MX_CORTEX_M7_Init	CORTEX_M7

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

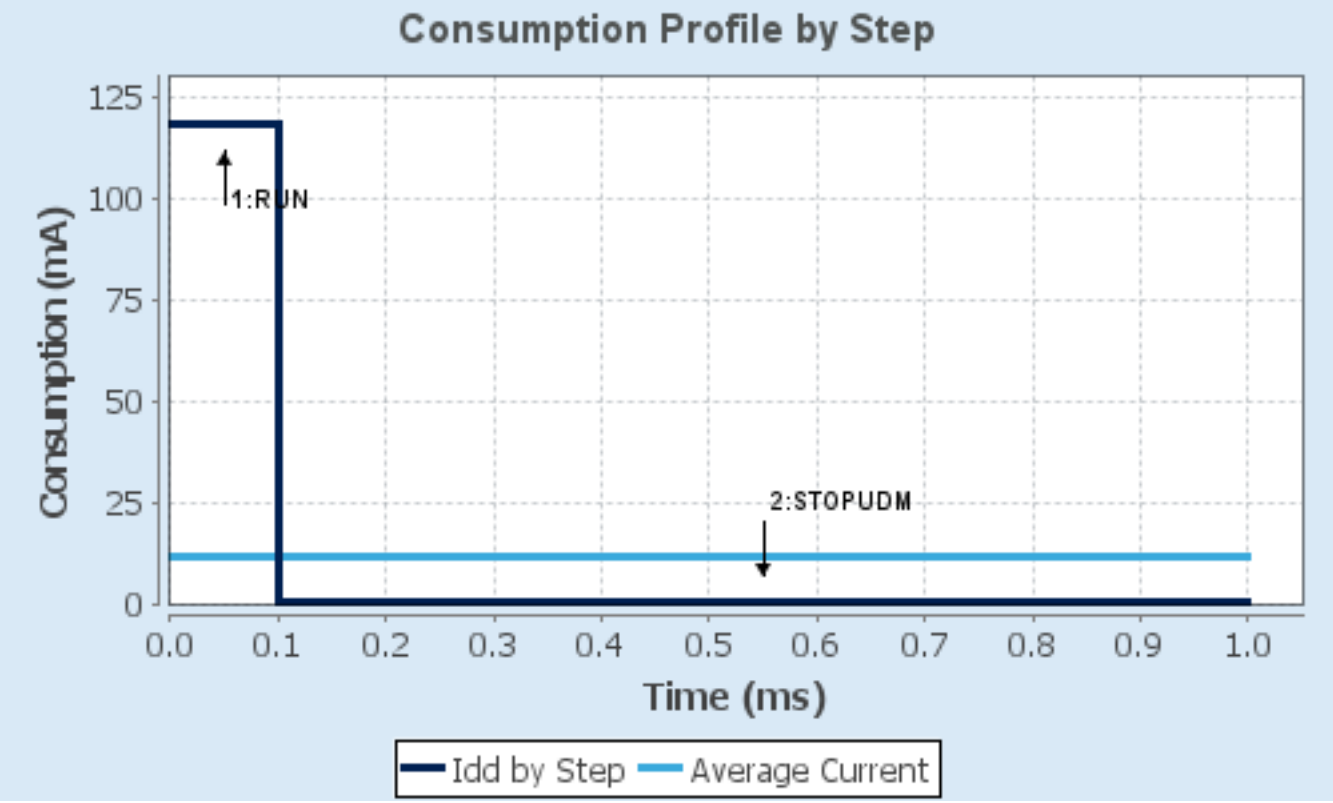
6.4. Sequence

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 µA
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


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

7. IPs and Middleware 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
Rank	1
Channel	Channel 0
Sampling Time	3 Cycles

ADC_Injected_ConversionMode:

Number Of Conversions	0

WatchDog:

Enable Analog WatchDog Mode	false

7.2. CAN1

mode: Mode

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 ***
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

7.3. CORTEX_M7

7.3.1. Parameter Settings:

Cortex Interface Settings:

Flash Interface	AXI Interface
ART ACCLERATOR	Disabled
Instruction Prefetch	Disabled
CPU ICache	Disabled
CPU DCache	Disabled

Cortex Memory Protection Unit Control Settings:

MPU Control Mode	MPU NOT USED

7.4. DAC

mode: OUT1 Configuration

7.4.1. Parameter Settings:

DAC Out1 Settings:

Output Buffer	Enable
Trigger	None

7.5. ETH

Mode: RMII

7.5.1. Parameter Settings:

Advanced : Ethernet Media Configuration:

Auto Negotiation	Enabled

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

7.5.2. 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	**0x1F ***
PHY Speed mask	**0x0004 ***
PHY Duplex mask	**0x0010 ***
PHY Interrupt Source Flag register Offset	**0x001D ***
PHY Link down inturrupt	**0x000B ***

7.6. GPIO

7.7. I2C1

I2C: I2C

7.7.1. 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

7.8. RCC

High Speed Clock (HSE): Crystal/Ceramic Resonator

Low Speed Clock (LSE) : Crystal/Ceramic Resonator

7.8.1. 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 Timout Value (ms)	100
LSE Startup Timout Value (ms)	5000

Power Parameters:

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

7.9. RTC

mode: Activate Clock Source

7.9.1. Parameter Settings:

General:

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

7.10. SPI1

Mode: Full-Duplex Master

Hardware NSS Signal: Hardware NSS Input Signal

7.10.1. 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

7.11. SYS

Debug: Serial Wire

Timebase Source: SysTick

7.12. TIM3

Clock Source : Internal Clock

Channel1: PWM Generation CH1

7.12.1. 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)

PWM Generation Channel 1:

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

7.13. TIM4

Combined Channels: Encoder Mode

7.13.1. 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 ***

7.14. UART5

Mode: Asynchronous

mode: Hardware Flow Control (RS485)

7.14.1. 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
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

7.15. USART3

Mode: Asynchronous

7.15.1. 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

7.16. USB_OTG_FS

Mode: Device_Only

mode: Activate_SOF

mode: Activate_VBUS

7.16.1. Parameter Settings:

Speed	Device Full Speed 12MBit/s
Low power	Disabled
Link Power Management	Disabled
VBUS sensing	Enabled
Signal start of frame	Enabled

*** 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]
USB_OTG_FS	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
	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
Single Mapped	PA10	USB_OTG_FS_ID	Alternate Function Push Pull	No pull-up and no pull-down	**Very High ***	USB_ID

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
Signals	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 brush]
	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]

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
	PG7	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	USB_OverCurrent [STMPS2151STR_FAULT]
	PG8	GPIO_Input	Input mode	**Pull-down ***	n/a	Col3 [Keypad column 3]
	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	0	0
System tick timer	true	0	0
TIM4 global interrupt	true	0	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		
USB On The Go FS global interrupt	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	true	true	false
Hard fault interrupt	true	true	false

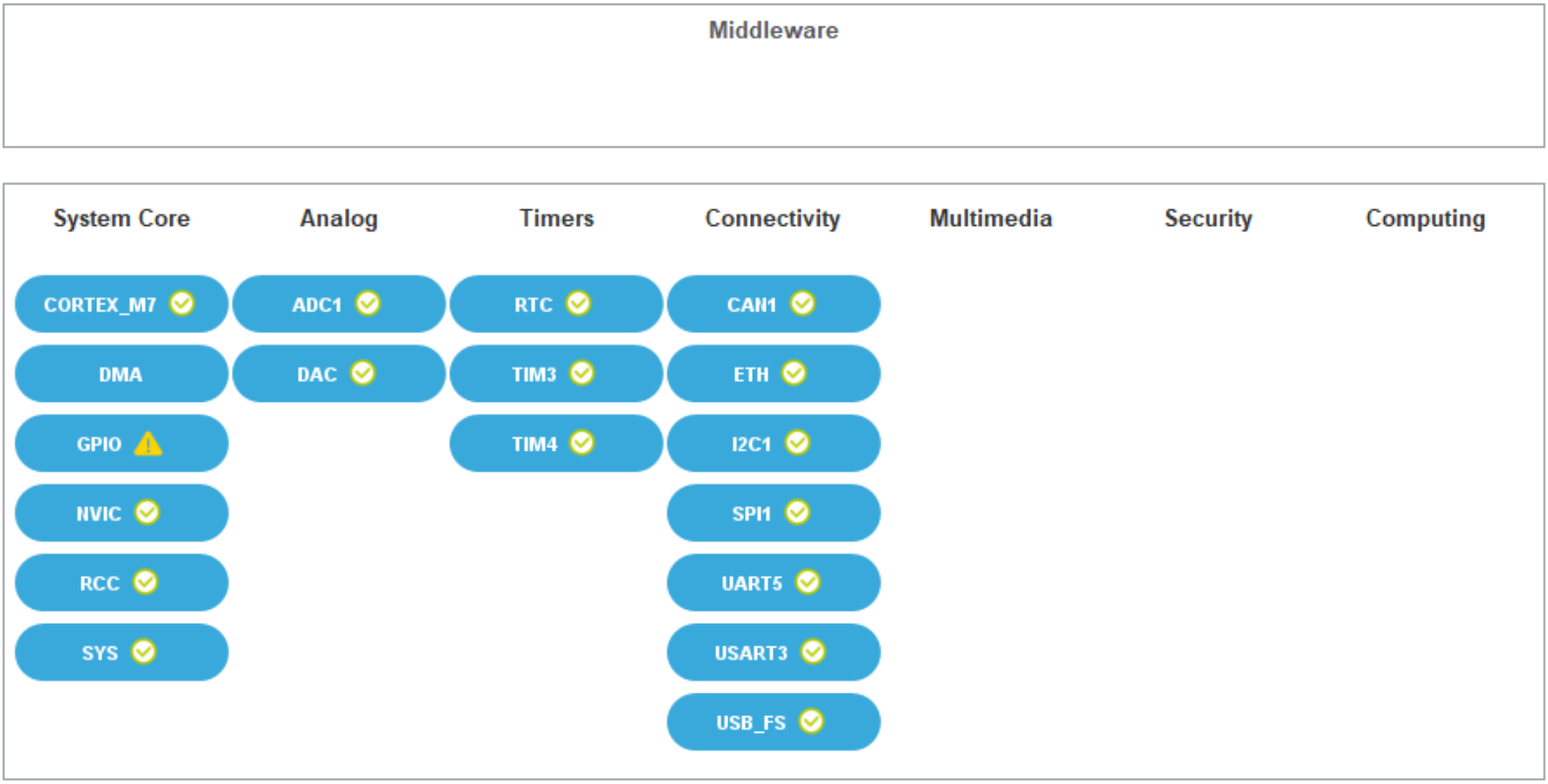
Enabled interrupt Table	Select for init sequence ordering	Generate IRQ handler	Call HAL handler
Memory management fault	true	true	false
Pre-fetch fault, memory access fault	true	true	false
Undefined instruction or illegal state	true	true	false
System service call via SWI instruction	true	true	false
Debug monitor	true	true	false
Pendable request for system service	true	true	false
System tick timer	true	true	true
TIM4 global interrupt	true	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