



1. Description

1.1. Project

Project Name	subFresh
Board Name	NUCLEO-L432KC
Generated with:	STM32CubeMX 6.14.1
Date	04/18/2025

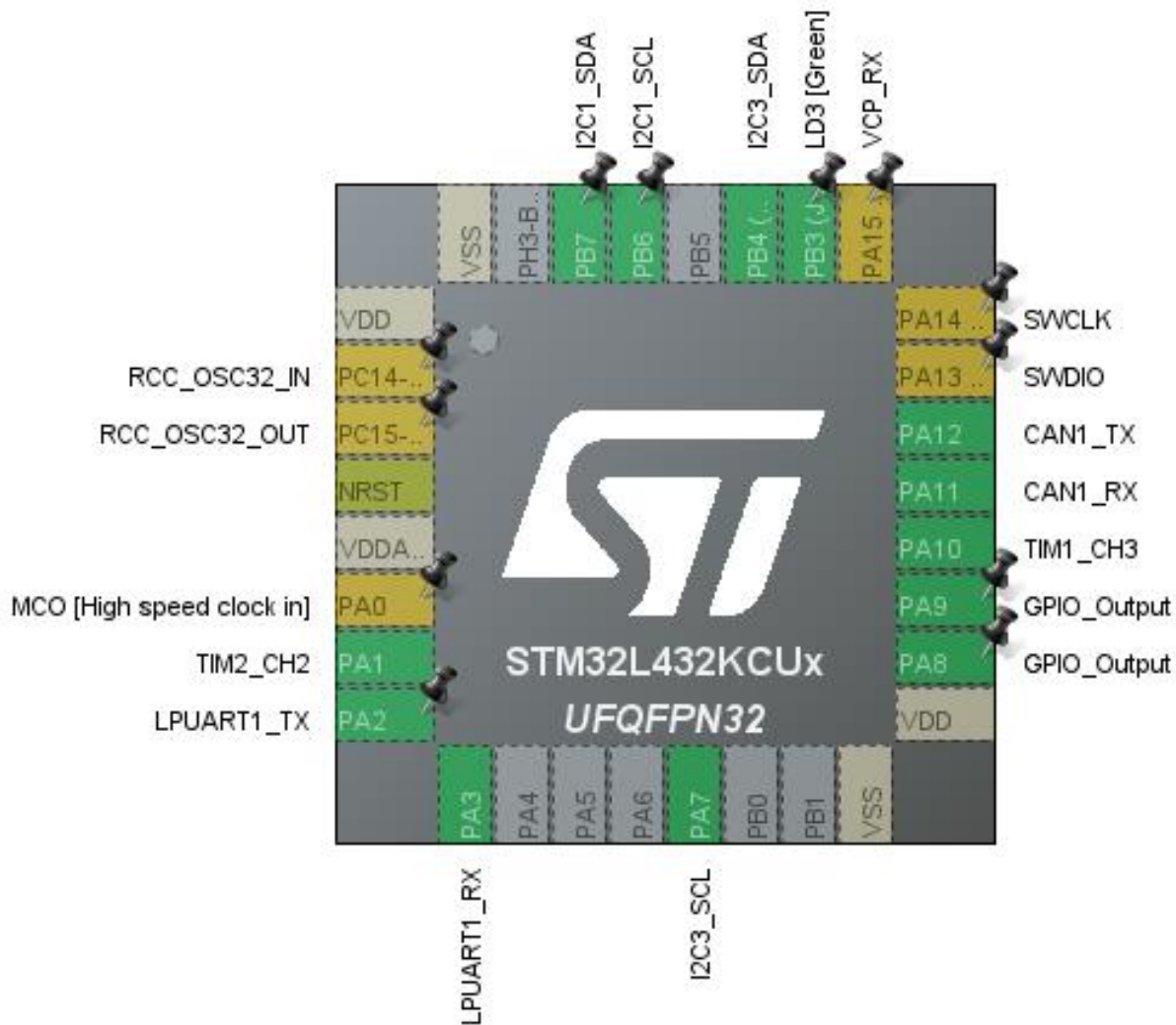
1.2. MCU

MCU Series	STM32L4
MCU Line	STM32L4x2
MCU name	STM32L432KCUx
MCU Package	UFQFPN32
MCU Pin number	32

1.3. Core(s) information

Core(s)	Arm Cortex-M4
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2. Pinout Configuration



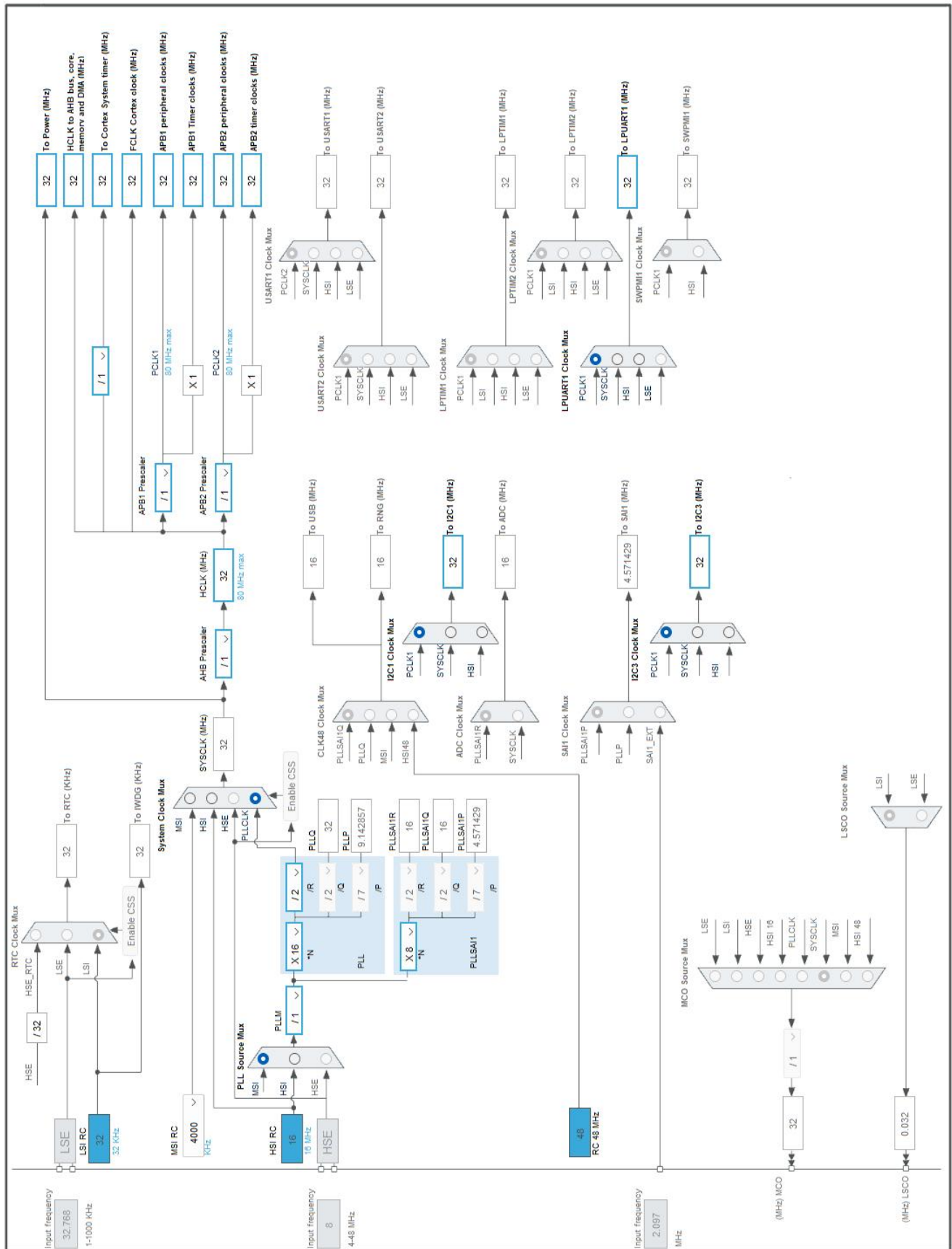
3. Pins Configuration

Pin Number UFQFPN32	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
1	VDD	Power		
2	PC14-OSC32_IN (PC14) *	I/O	RCC_OSC32_IN	
3	PC15-OSC32_OUT (PC15) *	I/O	RCC_OSC32_OUT	
4	NRST	Reset		
5	VDDA/VREF+	Power		
6	PA0 *	I/O	RCC_CK_IN	MCO [High speed clock in]
7	PA1	I/O	TIM2_CH2	
8	PA2	I/O	LPUART1_TX	
9	PA3	I/O	LPUART1_RX	
13	PA7	I/O	I2C3_SCL	
16	VSS	Power		
17	VDD	Power		
18	PA8 **	I/O	GPIO_Output	
19	PA9 **	I/O	GPIO_Output	
20	PA10	I/O	TIM1_CH3	
21	PA11	I/O	CAN1_RX	
22	PA12	I/O	CAN1_TX	
23	PA13 (JTMS-SWDIO) *	I/O	SYS_JTMS-SWDIO	SWDIO
24	PA14 (JTCK-SWCLK) *	I/O	SYS_JTCK-SWCLK	SWCLK
25	PA15 (JTDI) *	I/O	USART2_RX	VCP_RX
26	PB3 (JTDO-TRACESWO) **	I/O	GPIO_Output	LD3 [Green]
27	PB4 (NJTRST)	I/O	I2C3_SDA	
29	PB6	I/O	I2C1_SCL	
30	PB7	I/O	I2C1_SDA	
32	VSS	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



1. Power Consumption Calculator report

1.1. Microcontroller Selection

Series	STM32L4
Line	STM32L4x2
MCU	STM32L432KCUx
Datasheet	DS11451_Rev2

1.2. Parameter Selection

Temperature	25
Vdd	3.0

1.3. 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

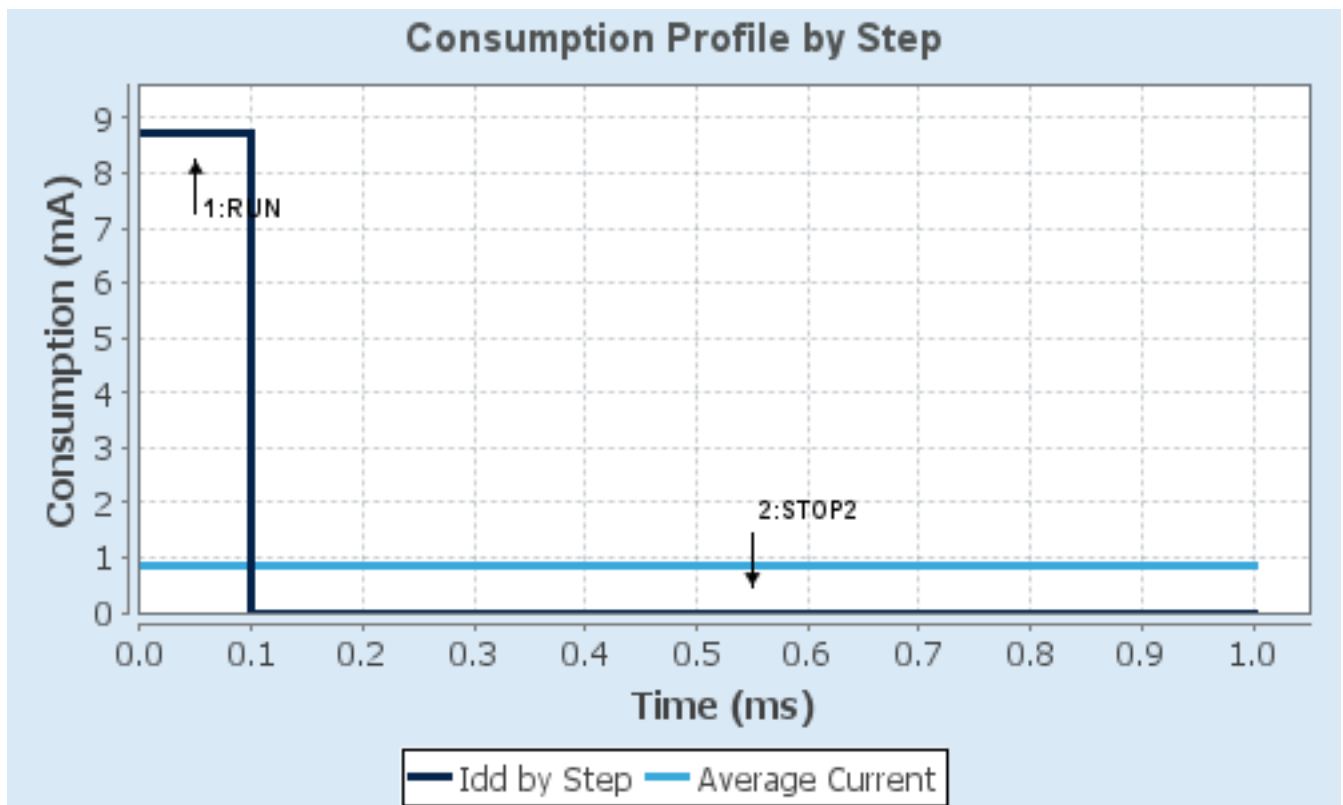
1.4. Sequence

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 BYP PLL	ALL CLOCKS OFF
Clock Source Frequency	4 MHz	0 Hz
Peripherals		
Additional Cons.	0 mA	0 mA
Average Current	8.71 mA	1.06 μ A
Duration	0.1 ms	0.9 ms
DMIPS	100.0	0.0
Ta Max	103.98	105
Category	In DS Table	In DS Table

1.5. Results

Sequence Time	1 ms	Average Current	871.95 μ A
Battery Life	5 months, 9 days, 16 hours	Average DMIPS	100.0 DMIPS

1.6. Chart



2. Software Project

2.1. Project Settings

Name	Value
Project Name	subFresh
Project Folder	N:\sub_418\subFresh
Toolchain / IDE	STM32CubeIDE
Firmware Package Name and Version	STM32Cube FW_L4 V1.18.1
Application Structure	Advanced
Generate Under Root	Yes
Do not generate the main()	No
Minimum Heap Size	0x200
Minimum Stack Size	0x400

2.2. 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	No
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)	No
Enable Full Assert	No

2.3. Advanced Settings - Generated Function Calls

Rank	Function Name	Peripheral Instance Name
1	SystemClock_Config	RCC
2	MX_GPIO_Init	GPIO
3	MX_TIM1_Init	TIM1
4	MX_TIM2_Init	TIM2
5	MX_CAN1_Init	CAN1
6	MX_LPUART1_UART_Init	LPUART1
7	MX_I2C1_Init	I2C1
8	MX_TIM6_Init	TIM6
9	MX_I2C3_Init	I2C3

3. *Peripherals and Middlewares Configuration*

3.1. CAN1

mode: Activated

3.1.1. Parameter Settings:

Bit Timings Parameters:

Prescaler (for Time Quantum)	240 *
Time Quantum	7500.0 *
Time Quanta in Bit Segment 1	2 Times *
Time Quanta in Bit Segment 2	3 Times *
Time for one Bit	45000 *
Baud Rate	22222 *
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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3.2. I2C1

I2C: I2C

3.2.1. Parameter Settings:

Timing configuration:

Custom Timing	Disabled
I2C Speed Mode	Standard Mode
I2C Speed Frequency (KHz)	100
Rise Time (ns)	100
Fall Time (ns)	100
Coefficient of Digital Filter	0
Analog Filter	Enabled
Timing	0x00B07CB4 *

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

3.3. I2C3

I2C: I2C

3.3.1. Parameter Settings:

Timing configuration:

Custom Timing	Disabled
I2C Speed Mode	Standard Mode
I2C Speed Frequency (KHz)	100
Rise Time (ns)	100
Fall Time (ns)	100
Coefficient of Digital Filter	0
Analog Filter	Enabled
Timing	0x00B07CB4 *

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

3.4. LPUART1

Mode: Asynchronous

3.4.1. 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
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Single Sample Disable

Advanced Features:

Auto Baudrate Mode	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

3.5. RCC

3.5.1. Parameter Settings:

System Parameters:

VDD voltage (V)	3.3
Instruction Cache	Enabled
Prefetch Buffer	Disabled
Data Cache	Enabled
Flash Latency(WS)	1 WS (2 CPU cycle)

RCC Parameters:

HSI Calibration Value	16
MSI Calibration Value	0
MSI Auto Calibration	Disabled
HSE Startup Timeout Value (ms)	100
LSE Startup Timeout Value (ms)	5000

Power Parameters:

Power Regulator Voltage Scale Power Regulator Voltage Scale 1

3.6. SYS

Timebase Source: SysTick

3.7. TIM1

Clock Source : Internal Clock

Channel3: PWM Generation CH3

3.7.1. Parameter Settings:

Counter Settings:

Prescaler (PSC - 16 bits value)	399 *
Counter Mode	Up
Counter Period (AutoReload Register - 16 bits value)	1599 *
Internal Clock Division (CKD)	No Division
Repetition Counter (RCR - 16 bits value)	0
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)
Trigger Event Selection TRGO2	Reset (UG bit from TIMx_EGR)

Break And Dead Time management - BRK Configuration:

BRK State	Disable
BRK Polarity	High
BRK Filter (4 bits value)	0
BRK Sources Configuration	
- Digital Input	Disable
- COMP1	Disable
- COMP2	Disable

Break And Dead Time management - BRK2 Configuration:

BRK2 State	Disable
BRK2 Polarity	High
BRK2 Filter (4 bits value)	0
BRK2 Sources Configuration	
- Digital Input	Disable
- COMP1	Disable
- COMP2	Disable

Break And Dead Time management - Output Configuration:

Automatic Output State	Disable
Off State Selection for Run Mode (OSSR)	Disable
Off State Selection for Idle Mode (OSSI)	Disable
Lock Configuration	Off

Clear Input:

Clear Input Source	Disable
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PWM Generation Channel 3:

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

CH Idle State

Reset

3.8. TIM2

Clock Source : Internal Clock

Channel2: PWM Generation CH2

3.8.1. Parameter Settings:

Counter Settings:

Prescaler (PSC - 16 bits value)	399 *
Counter Mode	Up
Counter Period (AutoReload Register - 32 bits value)	1599 *
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)

Clear Input:

Clear Input Source	Disable
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PWM Generation Channel 2:

Mode	PWM mode 1
Pulse (32 bits value)	0
Output compare preload	Enable
Fast Mode	Disable
CH Polarity	High

3.9. TIM6

mode: Activated

3.9.1. Parameter Settings:

Counter Settings:

Prescaler (PSC - 16 bits value)	16999 *
Counter Mode	Up
Counter Period (AutoReload Register - 16 bits value)	1599 *
auto-reload preload	Disable

Trigger Output (TRGO) Parameters:

Trigger Event Selection	Reset (UG bit from TIMx_EGR)
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*** User modified value**

4. System Configuration

4.1. GPIO configuration

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
CAN1	PA11	CAN1_RX	Alternate Function Push Pull	Pull-up *	Very High *	
	PA12	CAN1_TX	Alternate Function Push Pull	No pull-up and no pull-down	Very High *	
I2C1	PB6	I2C1_SCL	Alternate Function Open Drain	No pull-up and no pull-down	Very High *	
	PB7	I2C1_SDA	Alternate Function Open Drain	No pull-up and no pull-down	Very High *	
I2C3	PA7	I2C3_SCL	Alternate Function Open Drain	No pull-up and no pull-down	Very High *	
	PB4 (NJTRST)	I2C3_SDA	Alternate Function Open Drain	No pull-up and no pull-down	Very High *	
LPUART1	PA2	LPUART1_TX	Alternate Function Push Pull	No pull-up and no pull-down	Very High *	
	PA3	LPUART1_RX	Alternate Function Push Pull	No pull-up and no pull-down	Very High *	
TIM1	PA10	TIM1_CH3	Alternate Function Push Pull	No pull-up and no pull-down	Low	
TIM2	PA1	TIM2_CH2	Alternate Function Push Pull	No pull-up and no pull-down	Low	
Single Mapped Signals	PC14-OSC32_IN (PC14)	RCC_OSC32_IN	n/a	n/a	n/a	
	PC15-OSC32_OUT (PC15)	RCC_OSC32_OUT	n/a	n/a	n/a	
	PA0	RCC_CLK_IN	n/a	n/a	n/a	MCO [High speed clock in]
	PA13 (JTMS-SWDIO)	SYS_JTMS-SWDIO	n/a	n/a	n/a	SWDIO
	PA14 (JTCK-SWCLK)	SYS_JTCK-SWCLK	n/a	n/a	n/a	SWCLK
	PA15 (JTDI)	USART2_RX	Alternate Function Push Pull	No pull-up and no pull-down	Very High *	VCP_RX
GPIO	PA8	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	
	PA9	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	
	PB3 (JTDO-TRACESWO)	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	LD3 [Green]

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
)					

4.2. DMA configuration

nothing configured in DMA service

4.3. NVIC configuration

4.3.1. 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
CAN1 TX interrupt	true	0	0
CAN1 RX0 interrupt	true	0	0
CAN1 RX1 interrupt	true	0	0
TIM6 global interrupt, DAC channel1 and channel2 underrun error interrupts	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		
CAN1 SCE interrupt	unused		
TIM1 break interrupt and TIM15 global interrupt	unused		
TIM1 update interrupt and TIM16 global interrupt	unused		
TIM1 trigger and commutation interrupts	unused		
TIM1 capture compare interrupt	unused		
TIM2 global interrupt	unused		
I2C1 event interrupt	unused		
I2C1 error interrupt	unused		
LPUART1 global interrupt	unused		
I2C3 event interrupt	unused		
I2C3 error interrupt	unused		
FPU global interrupt	unused		

4.3.2. 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
Memory management fault	false	true	false

Enabled interrupt Table	Select for init sequence ordering	Generate IRQ handler	Call HAL handler
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
CAN1 TX interrupt	false	true	true
CAN1 RX0 interrupt	false	true	true
CAN1 RX1 interrupt	false	true	true
TIM6 global interrupt, DAC channel1 and channel2 underrun error interrupts	false	true	true

* User modified value

5. System Views

5.1. Category view

5.1.1. Current

Middleware

System Core

Analog

Timers

Connectivity


Multimedia

Security


Computing


DMA

TIM1 

CAN1 


GPIO 


TIM2 

I2C1 

NVIC 

TIM6 

I2C3 

RCC 

LPUART1 

SYS 

6. Docs & Resources

Type	Link
BSDL files	https://www.st.com/resource/en/bsdl_model/stm32l4_bsd.zip
IBIS models	https://www.st.com/resource/en/ibis_model/stm32l4_ibis.zip
System View Description	https://www.st.com/resource/en/svd/stm32l4_svd.zip
Presentations	https://www.st.com/resource/en/product_presentation/stm32-stm8_embedded_software_solutions.pdf
Presentations	https://www.st.com/resource/en/product_presentation/stm32_eval_tools_portfolio.pdf
Presentations	https://www.st.com/resource/en/product_presentation/stm32_stm8_functional-safety-packages.pdf
Presentations	https://www.st.com/resource/en/product_presentation/stm32-stm8_software_development_tools.pdf
Presentations	https://www.st.com/resource/en/product_presentation/microcontrollers_b-l462e-cell1_discovery_cellular_kit_product_overview.pdf
Presentations	https://www.st.com/resource/en/product_presentation/microcontrollers-stm32-family-overview.pdf
Presentations	https://www.st.com/resource/en/product_presentation/microcontrollers-stm32l4-series-product-overview.pdf
Brochures	https://www.st.com/resource/en/brochure/brstm32ulp.pdf
Flyers	https://www.st.com/resource/en/flyer/flstm32l4.pdf
Flyers	https://www.st.com/resource/en/flyer/flstm32nucleo.pdf
Flyers	https://www.st.com/resource/en/flyer/flstm32trust.pdf
Magazine Articles	https://www.st.com/resource/en/magazine/design-elektronik_august2017.pdf
Magazine Articles	https://www.st.com/resource/en/magazine/design-elektronik_october2016.pdf
Product Certifications	https://www.st.com/resource/en/certification_document/sesip-2000002-01-cert.pdf
Product	https://www.st.com/resource/en/certification_document/sesip-2000002-

Certifications	01-st2.pdf
Product	https://www.st.com/resource/en/certification_document/psa-
Certifications	certificate_stm32l4.pdf
Application Notes	https://www.st.com/resource/en/application_note/an1709-emc-design- guide-for-stm8-stm32-and-legacy-mcus-stmicroelectronics.pdf
Application Notes	https://www.st.com/resource/en/application_note/an2606-stm32- microcontroller-system-memory-boot-mode-stmicroelectronics.pdf
Application Notes	https://www.st.com/resource/en/application_note/an3126-audio-and- waveform-generation-using-the-dac-in-stm32-products- stmicroelectronics.pdf
Application Notes	https://www.st.com/resource/en/application_note/an3154-can-protocol- used-in-the-stm32-bootloader-stmicroelectronics.pdf
Application Notes	https://www.st.com/resource/en/application_note/an3155-usart-protocol- used-in-the-stm32-bootloader-stmicroelectronics.pdf
Application Notes	https://www.st.com/resource/en/application_note/an3156-usb-dfu- protocol-used-in-the-stm32-bootloader-stmicroelectronics.pdf
Application Notes	https://www.st.com/resource/en/application_note/an4221-i2c-protocol- used-in-the-stm32-bootloader-stmicroelectronics.pdf
Application Notes	https://www.st.com/resource/en/application_note/an4286-spi-protocol- used-in-the-stm32-bootloader-stmicroelectronics.pdf
Application Notes	https://www.st.com/resource/en/application_note/an4555-getting-started- with-stm32l4-series-and-stm32l4-series-hardware-development- stmicroelectronics.pdf
Application Notes	https://www.st.com/resource/en/application_note/an4566-extending-the- dac-performance-of-stm32-microcontrollers-stmicroelectronics.pdf
Application Notes	https://www.st.com/resource/en/application_note/an4612-migrating-from- stm32l1-series-to-stm32l4-series-and-stm32l4-series-microcontrollers- stmicroelectronics.pdf
Application Notes	https://www.st.com/resource/en/application_note/an4616-migrating-from- stm32f401-and-stm32f411-lines-to-stm32l4-series-and-stm32l4-series- microcontrollers-stmicroelectronics.pdf
Application Notes	https://www.st.com/resource/en/application_note/an4621-stm32l4-and- stm32l4-ultralowpower-features-overview-stmicroelectronics.pdf

- Application Notes https://www.st.com/resource/en/application_note/an4629-adc-hardware-oversampling-for-microcontrollers-of-the-stm32-l0-and-l4-series-stmicroelectronics.pdf
- Application Notes https://www.st.com/resource/en/application_note/an4649-migrating-from-stm32f1-series-to-stm32l4-series--stm32l4-series-microcontrollers-stmicroelectronics.pdf
- Application Notes https://www.st.com/resource/en/application_note/an4655-virtually-increasing-the-number-of-serial-communication-peripherals-in-stm32-applications-stmicroelectronics.pdf
- Application Notes https://www.st.com/resource/en/application_note/an4726-stm32cube-firmware-examples-for-stm32l4-series-and-stm32l4-series-stmicroelectronics.pdf
- Application Notes https://www.st.com/resource/en/application_note/an4729-stm32l0l4-firewall-overview-stmicroelectronics.pdf
- Application Notes https://www.st.com/resource/en/application_note/an4730-using-the-firewall-embedded-in-stm32l0l4l4-series-mcus-for-secure-access-to-sensitive-parts-of-code-and-data-stmicroelectronics.pdf
- Application Notes https://www.st.com/resource/en/application_note/an4746-optimizing-power-and-performance-with-stm32l4-and-stm32l4-series-microcontrollers-stmicroelectronics.pdf
- Application Notes https://www.st.com/resource/en/application_note/an4750-handling-of-soft-errors-in-stm32-applications-stmicroelectronics.pdf
- Application Notes https://www.st.com/resource/en/application_note/an4776-generalpurpose-timer-cookbook-for-stm32-microcontrollers-stmicroelectronics.pdf
- Application Notes https://www.st.com/resource/en/application_note/an4803-highspeed-si-simulations-using-ibis-and-boardlevel-simulations-using-hyperlynx-si-on-stm32-mcus-and-mpus-stmicroelectronics.pdf
- Application Notes https://www.st.com/resource/en/application_note/an4809-migrating-between-stm32l0-series-and-stm32l4-series--stm32l4-series-microcontrollers-stmicroelectronics.pdf
- Application Notes https://www.st.com/resource/en/application_note/an4821-migrating-from-stm32f405415-line-and-stm32f407417-line-to-stm32l4-series-and-stm32l4-series-microcontrollers-stmicroelectronics.pdf
- Application Notes https://www.st.com/resource/en/application_note/an4831-migrating-from-

stm32f2x5-line-to-stm32l4-series-and-stm32l4-series-microcontrollers-stmicroelectronics.pdf

Application Notes https://www.st.com/resource/en/application_note/an4832-migrating-from-stm32f303-line-to-stm32l4-series-and-stm32l4-series-microcontrollers-stmicroelectronics.pdf

Application Notes https://www.st.com/resource/en/application_note/an4989-stm32-microcontroller-debug-toolbox-stmicroelectronics.pdf

Application Notes https://www.st.com/resource/en/application_note/an4990-getting-started-with-sigmadelta-digital-interface-on-applicable-stm32-microcontrollers-stmicroelectronics.pdf

Application Notes https://www.st.com/resource/en/application_note/an4995-using-an-electromyogram-technique-to-detect-muscle-activity-stmicroelectronics.pdf

Application Notes https://www.st.com/resource/en/application_note/an5012-analogtodigital-audio-conversion-example-using-stm32l4-series-microcontroller-peripherals-stmicroelectronics.pdf

Application Notes https://www.st.com/resource/en/application_note/an5027-interfacing-pdm-digital-microphones-using-stm32-mcus-and-mpus-stmicroelectronics.pdf

Application Notes https://www.st.com/resource/en/application_note/an5105-getting-started-with-touch-sensing-control-on-stm32-microcontrollers-stmicroelectronics.pdf

Application Notes https://www.st.com/resource/en/application_note/an5138-migrating-from-stm32l4-and-stm32l4-to-stm32l5-series-microcontrollers-stmicroelectronics.pdf

Application Notes https://www.st.com/resource/en/application_note/an5408-migrating-from-stm32l0-stm32l1-and-stm32l4-series-associated-with-sx12xx-transceivers-to-stm32wl-series-microcontrollers-stmicroelectronics.pdf

Application Notes https://www.st.com/resource/en/application_note/an4760-quadspi-interface-on-stm32-microcontrollers-and-microprocessors-stmicroelectronics.pdf

Application Notes https://www.st.com/resource/en/application_note/an4899-stm32-microcontroller-gpio-hardware-settings-and-lowpower-consumption-stmicroelectronics.pdf

Application Notes https://www.st.com/resource/en/application_note/an5612-esd-protection-

of-stm32-mcus-and-mpus-stmicroelectronics.pdf

- Application Notes https://www.st.com/resource/en/application_note/an4991-how-to-wake-up-an-stm32-microcontroller-from-lowpower-mode-with-the-usart-or-the-lpuart-stmicroelectronics.pdf
- Application Notes https://www.st.com/resource/en/application_note/an4838-introduction-to-memory-protection-unit-management-on-stm32-mcus-stmicroelectronics.pdf
- Application Notes https://www.st.com/resource/en/application_note/an4879-introduction-to-usb-hardware-and-pcb-guidelines-using-stm32-mcus-stmicroelectronics.pdf
- Application Notes https://www.st.com/resource/en/application_note/an5372-migrating-from-stm32l4-and-stm32l4--to-stm32u5-mcus-stmicroelectronics.pdf
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