



## 1. Description

### 1.1. Project

Project Name	HelmholzC
Board Name	custom
Generated with:	STM32CubeMX 6.10.0
Date	02/15/2024

### 1.2. MCU

MCU Series	STM32G0
MCU Line	STM32G0x1
MCU name	STM32G071K8Ux
MCU Package	UFQFPN32
MCU Pin number	32

### 1.3. Core(s) information

Core(s)	ARM Cortex-M0+
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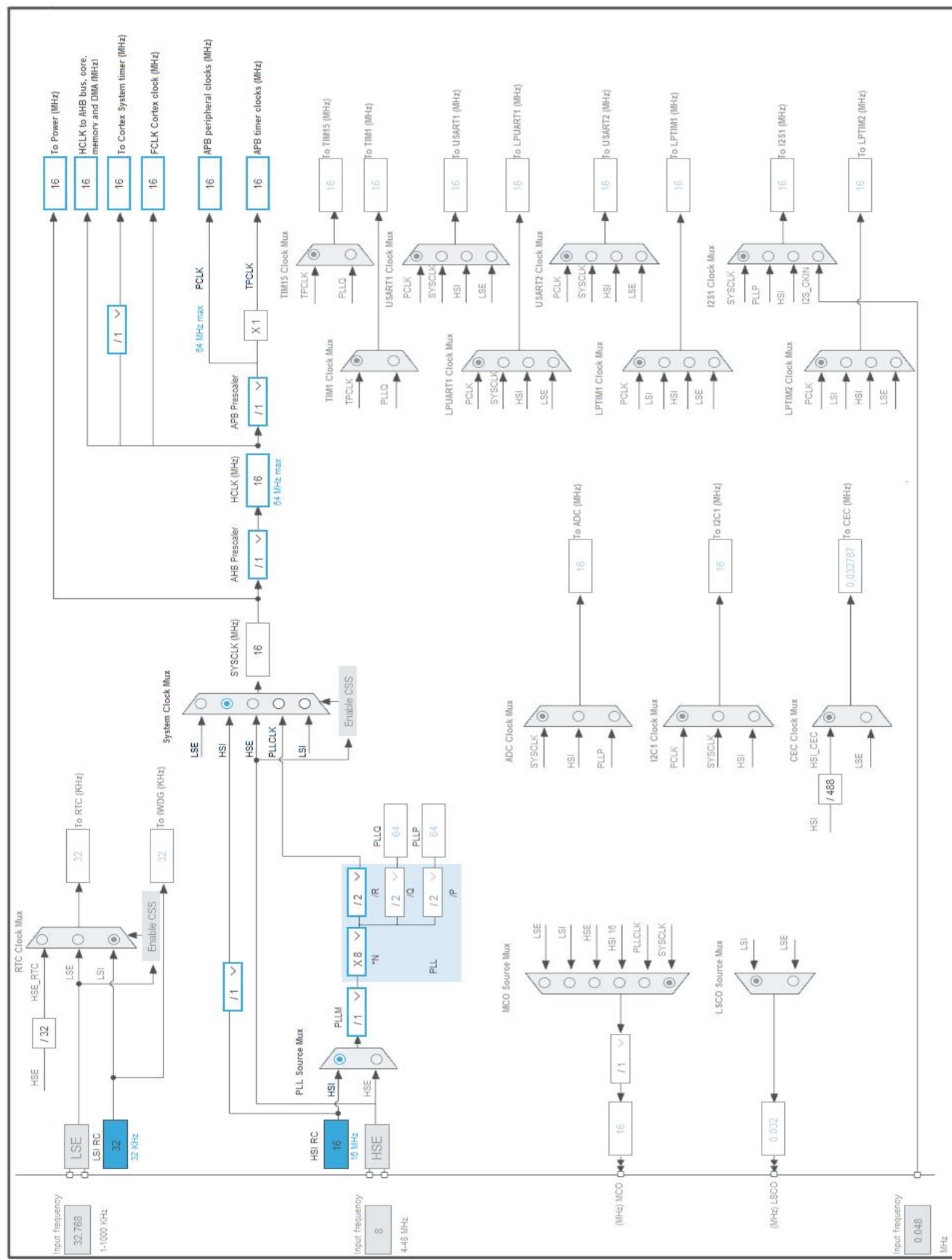
### 3. Pins Configuration

Pin Number UFQFPN32	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
1	PB9 *	I/O	GPIO_Output	MUX_1
4	VDD	Power		
5	VSS	Power		
7	PA0 *	I/O	GPIO_Output	MUX_3
8	PA1 *	I/O	GPIO_Output	MUX_4
9	PA2	I/O	ADC1_IN2	TEMP_1
10	PA3	I/O	ADC1_IN3	TEMP_2
11	PA4	I/O	ADC1_IN4	TEMP_3
12	PA5 **	I/O	SPI1_SCK	FLASH_SCK
13	PA6 **	I/O	SPI1_MISO	FLASH_MISO
14	PA7 **	I/O	SPI1_MOSI	FLASH_MOSI
15	PB0 *	I/O	GPIO_Output	CHIP_SELECT_FLASH
19	PA9 **	I/O	USART1_TX	
21	PA10 **	I/O	USART1_RX	
23	PA12 [PA10] **	I/O	USART1_DE	
24	PA13	I/O	SYS_SWDIO	
25	PA14-BOOT0	I/O	SYS_SWCLK	
32	PB8 *	I/O	GPIO_Output	MUX_2

\* 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	HelmholzC
Project Folder	C:\Code\Sensor\HelmholzC
Toolchain / IDE	STM32CubeIDE
Firmware Package Name and Version	STM32Cube FW_G0 V1.6.2
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	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

### 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

## 1. Power Consumption Calculator report

### 1.1. Microcontroller Selection

Series	STM32G0
Line	STM32G0x1
MCU	STM32G071K8Ux
Datasheet	DS12232_Rev0

### 1.2. Parameter Selection

Temperature	25
Vdd	3.0

### 1.3. Battery Selection

Battery	Li-SOCL2(AAA700)
Capacity	700.0 mAh
Self Discharge	0.08 %/month
Nominal Voltage	3.6 V
Max Cont Current	10.0 mA
Max Pulse Current	30.0 mA
Cells in series	1
Cells in parallel	1

#### 1.4. Sequence

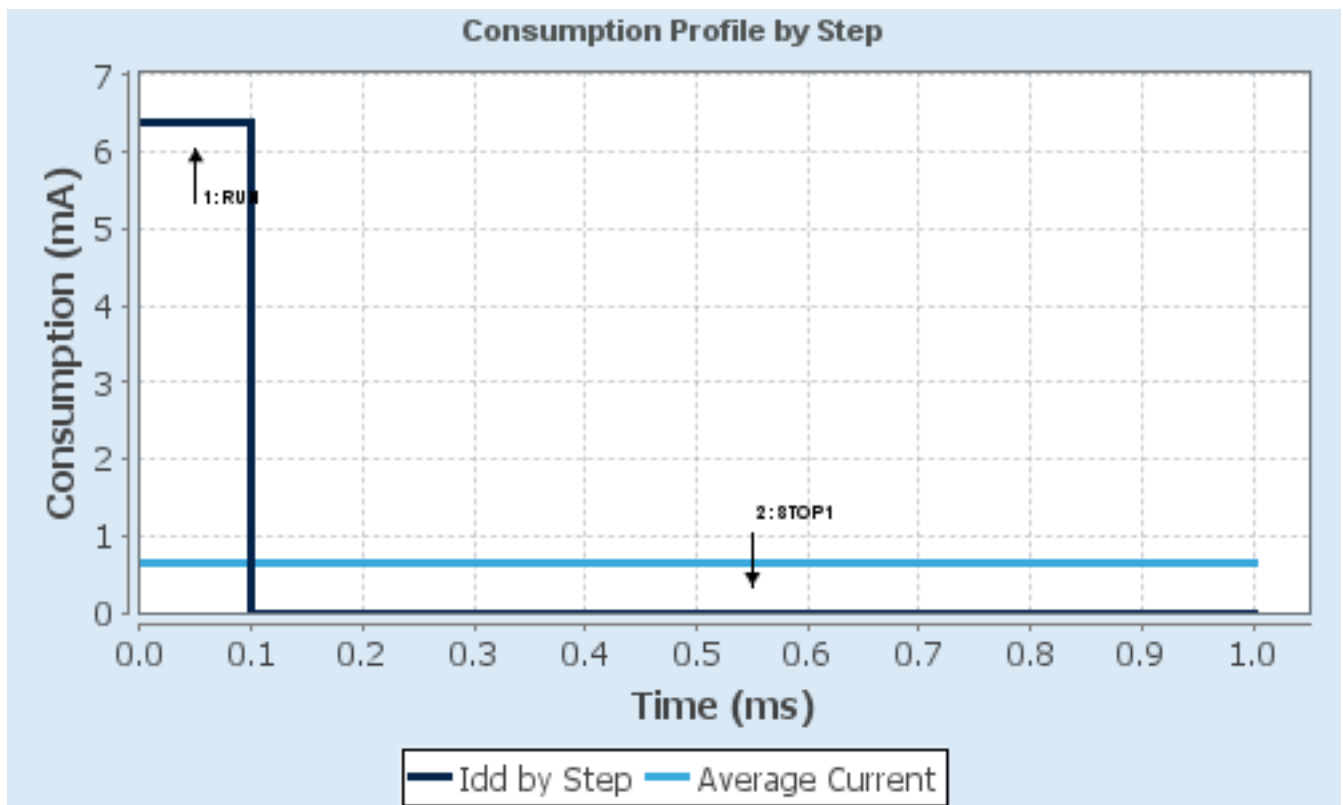
<b>Step</b>	Step1	Step2
<b>Mode</b>	RUN	STOP1
<b>Vdd</b>	3.0	3.0
<b>Voltage Source</b>	Battery	Battery
<b>Range</b>	Range1-High	NoRange
<b>Fetch Type</b>	FLASH	Flash-PowerDown
<b>CPU Frequency</b>	64 MHz	16 MHz
<b>Clock Configuration</b>	HSI PLL	HSI
<b>Clock Source Frequency</b>	16 MHz	16 MHz
<b>Peripherals</b>		
<b>Additional Cons.</b>	0 mA	0 mA
<b>Average Current</b>	6.4 mA	3.4 $\mu$ A
<b>Duration</b>	0.1 ms	0.9 ms
<b>DMIPS</b>	80.0	0.0
<b>Ta Max</b>	129.35	130
<b>Category</b>	In DS Table	In DS Table

#### 1.5. Results

Sequence Time	1 ms	Average Current	643.06 $\mu$ A
Battery Life	1 month, 14 days, 21 hours	Average DMIPS	80.0 DMIPS

#### 1.6. Chart





## 2. Peripherals and Middlewares Configuration

### 2.1. ADC1

mode: IN2

mode: IN3

mode: IN4

#### 2.1.1. Parameter Settings:

##### **ADC\_Settings:**

Clock Prescaler	Synchronous clock mode divided by 2
Resolution	ADC 12-bit resolution
Data Alignment	Right alignment
Sequencer	Sequencer set to fully configurable
Scan Conversion Mode	Disabled
Continuous Conversion Mode	Disabled
Discontinuous Conversion Mode	Disabled
DMA Continuous Requests	Disabled
End Of Conversion Selection	End of single conversion
Overrun behaviour	Overrun data preserved
Low Power Auto Wait	Disabled
Auto Off	Disabled
Oversampling Mode	Disabled

##### **ADC\_Regular\_ConversionMode:**

SamplingTime Common 1	1.5 Cycles
SamplingTime Common 2	1.5 Cycles
Number Of Conversion	1
External Trigger Conversion Source	Regular Conversion launched by software
External Trigger Conversion Edge	None
Trigger Frequency	High frequency
<u>Rank</u>	1
Channel	Channel 2
Sampling Time	Sampling time common 1

##### **Analog Watchdog 1:**

Enable Analog WatchDog1 Mode	false
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##### **Analog Watchdog 2:**

Enable Analog WatchDog2 Mode	false
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##### **Analog Watchdog 3:**

Enable Analog WatchDog3 Mode	false
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## 2.2. RCC

### 2.2.1. Parameter Settings:

#### **System Parameters:**

VDD voltage (V)	3.3
Instruction Cache	Enabled
Prefetch Buffer	Enabled
Data Cache	Enabled
Flash Latency(WS)	0 WS (1 CPU cycle)

#### **RCC Parameters:**

HSI Calibration Value	64
HSE Startup Timeout Value (ms)	100
LSE Startup Timeout Value (ms)	5000

#### **Power Parameters:**

Power Regulator Voltage Scale	Power Regulator Voltage Scale 1
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#### **Peripherals Clock Configuration:**

Generate the peripherals clock configuration	TRUE
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## 2.3. SYS

**mode: Debug**

**Timebase Source: SysTick**

**mode: save power of non-active UCPD - deactive Dead Battery pull-up**

**\* User modified value**

## 3. System Configuration

### 3.1. GPIO configuration

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
ADC1	PA2	ADC1_IN2	Analog mode	No pull-up and no pull-down	n/a	TEMP_1
	PA3	ADC1_IN3	Analog mode	No pull-up and no pull-down	n/a	TEMP_2
	PA4	ADC1_IN4	Analog mode	No pull-up and no pull-down	n/a	TEMP_3
SYS	PA13	SYS_SWDIO	n/a	n/a	n/a	
	PA14-BOOT0	SYS_SWCLK	n/a	n/a	n/a	
Single Mapped Signals	PA5	SPI1_SCK	Alternate Function Push Pull	No pull-up and no pull-down	Low	FLASH_SCK
	PA6	SPI1_MISO	Alternate Function Push Pull	No pull-up and no pull-down	Low	FLASH_MISO
	PA7	SPI1_MOSI	Alternate Function Push Pull	No pull-up and no pull-down	Low	FLASH_MOSI
	PA9	USART1_TX	Alternate Function Push Pull	No pull-up and no pull-down	Low	
	PA10	USART1_RX	Alternate Function Push Pull	No pull-up and no pull-down	Low	
	PA12 [PA10]	USART1_DE	Alternate Function Push Pull	No pull-up and no pull-down	Low	
GPIO	PB9	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	MUX_1
	PA0	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	MUX_3
	PA1	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	MUX_4
	PB0	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	CHIP_SELECT_FLASH
	PB8	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	MUX_2

### 3.2. DMA configuration

nothing configured in DMA service

### 3.3. NVIC configuration

#### 3.3.1. NVIC

Interrupt Table	Enable	Preenmption Priority	SubPriority
Non maskable interrupt	true	0	0
Hard fault interrupt	true	0	0
System service call via SWI instruction	true	0	0
Pendable request for system service	true	0	0
System tick timer	true	3	0
PVD interrupt through EXTI line 16	unused		
Flash global interrupt	unused		
RCC global interrupt	unused		
ADC1, COMP1 and COMP2 interrupts (COMP interrupts through EXTI lines 17 and 18)	unused		

#### 3.3.2. 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
System service call via SWI instruction	false	true	false
Pendable request for system service	false	true	false
System tick timer	false	true	true

\* User modified value

## 4. System Views

### 4.1. Category view

#### 4.1.1. Current

## 5. Docs & Resources

Type	Link
IBIS models	<a href="https://www.st.com/resource/en/ibis_model/stm32g0_ibis.zip">https://www.st.com/resource/en/ibis_model/stm32g0_ibis.zip</a>
System View Description	<a href="https://www.st.com/resource/en/svd/stm32g0_svd.zip">https://www.st.com/resource/en/svd/stm32g0_svd.zip</a>
Presentations	<a href="https://www.st.com/resource/en/product_presentation/stm32-stm8_embedded_software_solutions.pdf">https://www.st.com/resource/en/product_presentation/stm32-stm8_embedded_software_solutions.pdf</a>
Presentations	<a href="https://www.st.com/resource/en/product_presentation/stm32_eval-tools_portfolio.pdf">https://www.st.com/resource/en/product_presentation/stm32_eval-tools_portfolio.pdf</a>
Presentations	<a href="https://www.st.com/resource/en/product_presentation/stm32_stm8_functional-safety-packages.pdf">https://www.st.com/resource/en/product_presentation/stm32_stm8_functional-safety-packages.pdf</a>
Presentations	<a href="https://www.st.com/resource/en/product_presentation/stm32g0_marketing_pres.pdf">https://www.st.com/resource/en/product_presentation/stm32g0_marketing_pres.pdf</a>
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Presentations	<a href="https://www.st.com/resource/en/product_presentation/microcontrollers-stm32-family-overview.pdf">https://www.st.com/resource/en/product_presentation/microcontrollers-stm32-family-overview.pdf</a>
Brochures	<a href="https://www.st.com/resource/en/brochure/products-and-solutions-for-plcs-and-smart-i-os.pdf">https://www.st.com/resource/en/brochure/products-and-solutions-for-plcs-and-smart-i-os.pdf</a>
Flyers	<a href="https://www.st.com/resource/en/flyer/flstm32g0.pdf">https://www.st.com/resource/en/flyer/flstm32g0.pdf</a>
Flyers	<a href="https://www.st.com/resource/en/flyer/flstm32nucleo.pdf">https://www.st.com/resource/en/flyer/flstm32nucleo.pdf</a>
Flyers	<a href="https://www.st.com/resource/en/flyer/flstmcsuite.pdf">https://www.st.com/resource/en/flyer/flstmcsuite.pdf</a>
Flyers	<a href="https://www.st.com/resource/en/flyer/flstm32trust.pdf">https://www.st.com/resource/en/flyer/flstm32trust.pdf</a>
Flyers	<a href="https://www.st.com/resource/en/flyer/flstpfc11120.pdf">https://www.st.com/resource/en/flyer/flstpfc11120.pdf</a>
Application Notes	<a href="https://www.st.com/resource/en/application_note/an1181-electrostatic-discharge-sensitivity-measurement-stmicroelectronics.pdf">https://www.st.com/resource/en/application_note/an1181-electrostatic-discharge-sensitivity-measurement-stmicroelectronics.pdf</a>
Application Notes	<a href="https://www.st.com/resource/en/application_note/an1709-emc-design-guide-for-stm8-stm32-and-legacy-mcus-stmicroelectronics.pdf">https://www.st.com/resource/en/application_note/an1709-emc-design-guide-for-stm8-stm32-and-legacy-mcus-stmicroelectronics.pdf</a>
Application Notes	<a href="https://www.st.com/resource/en/application_note/an2606-stm32-">https://www.st.com/resource/en/application_note/an2606-stm32-</a>

microcontroller-system-memory-boot-mode-stmicroelectronics.pdf

- Application Notes [https://www.st.com/resource/en/application\\_note/an2639-soldering-recommendations-and-package-information-for-leadfree-ecopack-mcus-and-mpus-stmicroelectronics.pdf](https://www.st.com/resource/en/application_note/an2639-soldering-recommendations-and-package-information-for-leadfree-ecopack-mcus-and-mpus-stmicroelectronics.pdf)
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- Application Notes [https://www.st.com/resource/en/application\\_note/an4277-using-stm32-device-pwm-shutdown-features-for-motor-control-and-digital-power-conversion-stmicroelectronics.pdf](https://www.st.com/resource/en/application_note/an4277-using-stm32-device-pwm-shutdown-features-for-motor-control-and-digital-power-conversion-stmicroelectronics.pdf)
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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](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)

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