



1. Description

1.1. Project

Project Name	Solari-Cifra5-Firmware
Board Name	NUCLEO-G031K8
Generated with:	STM32CubeMX 6.16.1
Date	02/03/2026

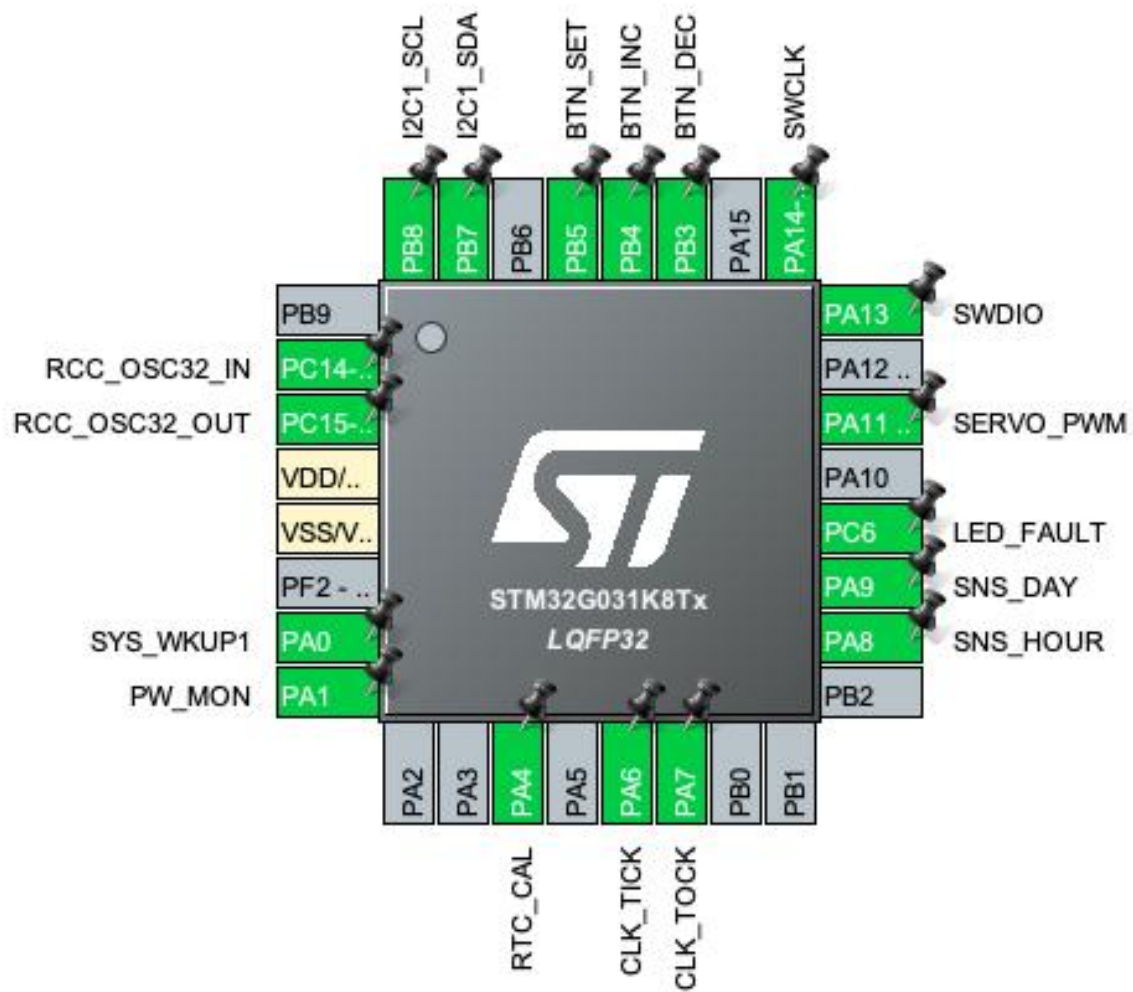
1.2. MCU

MCU Series	STM32G0
MCU Line	STM32G0x1
MCU name	STM32G031K8Tx
MCU Package	LQFP32
MCU Pin number	32

1.3. Core(s) information

Core(s)	ARM Cortex-M0+
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2. Pinout Configuration

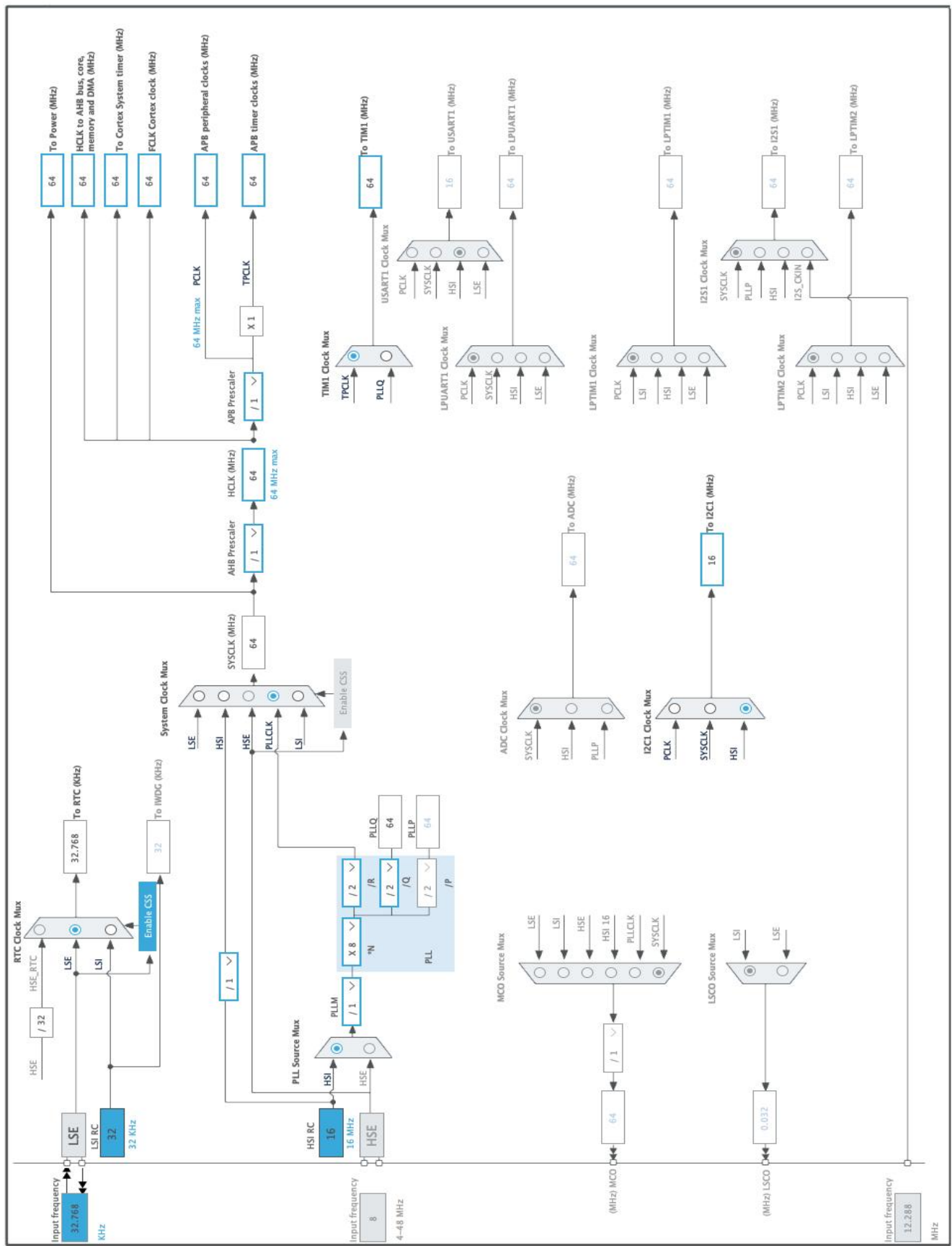


3. Pins Configuration

Pin Number LQFP32	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
2	PC14-OSC32_IN (PC14)	I/O	RCC_OSC32_IN	
3	PC15-OSC32_OUT (PC15)	I/O	RCC_OSC32_OUT	
4	VDD/VDDA	Power		
5	VSS/VSSA	Power		
7	PA0	I/O	SYS_WKUP1	
8	PA1	I/O	GPIO_EXTI1	PW_MON
11	PA4	I/O	RTC_OUT_CALIB	RTC_CAL
13	PA6 *	I/O	GPIO_Output	CLK_TICK
14	PA7 *	I/O	GPIO_Output	CLK_TOCK
18	PA8 *	I/O	GPIO_Input	SNS_HOUR
19	PA9 *	I/O	GPIO_Input	SNS_DAY
20	PC6 *	I/O	GPIO_Output	LED_FAULT
22	PA11 [PA9]	I/O	TIM1_CH4	SERVO_PWM
24	PA13	I/O	SYS_SWDIO	SWDIO
25	PA14-BOOT0	I/O	SYS_SWCLK	SWCLK
27	PB3 *	I/O	GPIO_Input	BTN_DEC
28	PB4 *	I/O	GPIO_Input	BTN_INC
29	PB5 *	I/O	GPIO_Input	BTN_SET
31	PB7	I/O	I2C1_SDA	
32	PB8	I/O	I2C1_SCL	

* The pin is affected with an I/O function

4. Clock Tree Configuration



1. Power Consumption Calculator report

1.1. Microcontroller Selection

Series	STM32G0
Line	STM32G0x1
MCU	STM32G031K8Tx
Datasheet	DS12992_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

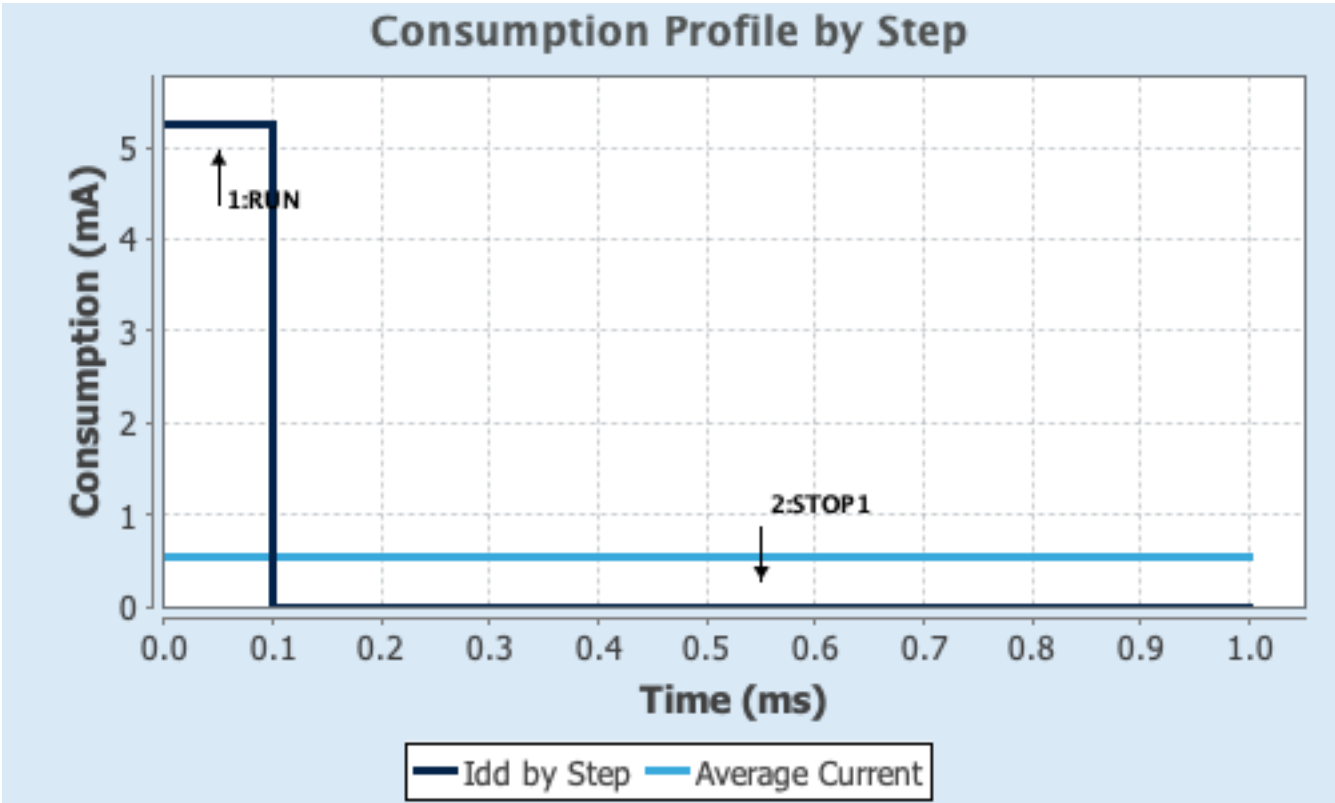
1.4. Sequence

Step	Step1	Step2
Mode	RUN	STOP1
Vdd	3.0	3.0
Voltage Source	Battery	Battery
Range	Range1-High	Range1-High
Fetch Type	FLASH	Flash-PowerDown
CPU Frequency	64 MHz	16 MHz
Clock Configuration	HSI PLL	HSI
Clock Source Frequency	16 MHz	16 MHz
Peripherals		
Additional Cons.	0 mA	0 mA
Average Current	5.25 mA	3.36 μ A
Duration	0.1 ms	0.9 ms
DMIPS	80.0	0.0
Ta Max	128.8	130
Category	In DS Table	In DS Table

1.5. Results

Sequence Time	1 ms	Average Current	528.02 μ A
Battery Life	1 month, 24 days, 17 hours	Average DMIPS	80.0 DMIPS

1.6. Chart



2. Software Project

2.1. Project Settings

Name	Value
Project Name	Solari-Cifra5-Firmware
Project Folder	/Users/alfredo/SoftwareDev/STM32/Solari-Cifra5-Firmware
Toolchain / IDE	CMake
Firmware Package Name and Version	STM32Cube FW_G0 V1.6.2
Application Structure	Advanced
Generate Under Root	No
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	MX_GPIO_Init	GPIO
2	SystemClock_Config	RCC
3	MX_I2C1_Init	I2C1
4	MX_TIM1_Init	TIM1
5	MX_RTC_Init	RTC

3. Peripherals and Middlewares Configuration

3.1. I2C1

I2C: I2C

3.1.1. 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	0x00503D58 *

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

3.2. RCC

Low Speed Clock (LSE) : Crystal/Ceramic Resonator

3.2.1. Parameter Settings:

System Parameters:

VDD voltage (V)	3.3
Instruction Cache	Enabled
Prefetch Buffer	Enabled
Data Cache	Enabled
Flash Latency(WS)	2 WS (3 CPU cycle)

RCC Parameters:

HSI Calibration Value	64
HSE Startup Timeout Value (ms)	100
LSE Startup Timeout Value (ms)	5000
LSE Drive Capability	LSE oscillator low drive capability

Power Parameters:

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

Generate the peripherals clock configuration TRUE

3.3. RTC

mode: Activate Clock Source

Calibration: Calibration 1Hz

3.3.1. Parameter Settings:

General:

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

Calibration:

Calibration signal has a regular waveform at 1Hz

3.4. SYS

mode: Debug

mode: System Wake-Up 1

Timebase Source: TIM17

3.5. TIM1

Clock Source : Internal Clock

Channel4: PWM Generation CH4

3.5.1. Parameter Settings:

Counter Settings:

Prescaler (PSC - 16 bits value) **1280-1 ***
Counter Mode Up
Counter Period (AutoReload Register - 16 bits value) **1000-1 ***
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

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

Break And Dead Time management - Output Configuration:

Automatic Output State	Disable
Off State Selection for Idle Mode (OSSl)	Disable
Lock Configuration	Off

Clear Input:

Clear Input Source	Disable
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PWM Generation Channel 4:

Mode	PWM mode 1
Pulse (16 bits value)	0
Output compare preload	Enable
Fast Mode	Disable
CH Polarity	Low *
CH Idle State	Set *

* User modified value

4. System Configuration

4.1. GPIO configuration

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
I2C1	PB7	I2C1_SDA	Alternate Function Open Drain	No pull-up and no pull-down	Low	
	PB8	I2C1_SCL	Alternate Function Open Drain	Pull-up *	Low	
RCC	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	
RTC	PA4	RTC_OUT_CALIB	n/a	n/a	n/a	RTC_CAL
SYS	PA0	SYS_WKUP1	n/a	n/a	n/a	
	PA13	SYS_SWDIO	n/a	n/a	n/a	SWDIO
	PA14-BOOT0	SYS_SWCLK	n/a	n/a	n/a	SWCLK
TIM1	PA11 [PA9]	TIM1_CH4	Alternate Function Push Pull	No pull-up and no pull-down	Low	SERVO_PWM
GPIO	PA1	GPIO_EXTI1	External Interrupt Mode with Falling edge trigger detection	No pull-up and no pull-down	n/a	PW_MON
	PA6	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	CLK_TICK
	PA7	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	CLK_TOCK
	PA8	GPIO_Input	Input mode	Pull-up *	n/a	SNS_HOUR
	PA9	GPIO_Input	Input mode	Pull-up *	n/a	SNS_DAY
	PC6	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	LED_FAULT
	PB3	GPIO_Input	Input mode	Pull-up *	n/a	BTN_DEC
	PB4	GPIO_Input	Input mode	Pull-up *	n/a	BTN_INC
	PB5	GPIO_Input	Input mode	Pull-up *	n/a	BTN_SET

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
System service call via SWI instruction	true	0	0
Pendable request for system service	true	0	0
System tick timer	true	0	0
EXTI line 0 and line 1 interrupts	true	0	0
TIM17 global interrupt	true	0	0
PVD interrupt through EXTI line 16	unused		
Flash global interrupt	unused		
RCC global interrupt	unused		
TIM1 break, update, trigger and commutation interrupts	unused		
TIM1 capture compare interrupt	unused		
I2C1 event global interrupt / I2C1 wake-up interrupt through EXTI line 23	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
System service call via SWI instruction	false	false	false
Pendable request for system service	false	false	false
System tick timer	false	false	true
EXTI line 0 and line 1 interrupts	false	true	true
TIM17 global interrupt	false	true	true

* User modified value

5. System Views

5.1. Category view

5.1.1. Current

Middleware					
System Core	Analog	Timers	Connectivity	Multimedia	Computing
DMA		RTC ✓	I2C1 ✓		
GPIO ✓		TIM1 ✓			
NVIC ✓					
RCC ✓					
SYS ✓					

6. Docs & Resources

Type	Link
IBIS models	https://www.st.com/resource/en/ibis_model/stm32g0_ibis.zip
System View Description	https://www.st.com/resource/en/svd/stm32g0-svd.zip
Presentations	https://www.st.com/resource/en/product_presentation/stm32-stm8_embedded_software_solutions.pdf
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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-stm32-family-overview.pdf
Presentations	https://www.st.com/resource/en/product_presentation/microcontrollers-stm32-entry-level-graphics.pdf
Brochures	https://www.st.com/resource/en/brochure/products-and-solutions-for-plcs-and-smart-i-os.pdf
Brochures	https://www.st.com/resource/en/brochure/expansion-boards-for-intelligent-power-switches.pdf
Flyers	https://www.st.com/resource/en/flyer/flstm32g0.pdf
Flyers	https://www.st.com/resource/en/flyer/flstm32nucleo.pdf
Flyers	https://www.st.com/resource/en/flyer/flstm32trust.pdf
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Security Bulletin	https://www.st.com/resource/en/technical_note/tn1489-security-bulletin-tn1489stpsirt-physical-attacks-on-stm32-and-stm32cube-firmware-

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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/an4989-stm32-microcontroller-debug-toolbox-stmicroelectronics.pdf

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

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applications-from-stm32f0-series-to-stm32g0-series--
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[dma-controller-for-stm32-mcus-stmicroelectronics.pdf](#)

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Datasheet	https://www.st.com/resource/en/datasheet/dm00613879.pdf
Programming	https://www.st.com/resource/en/programming_manual/pm0223-stm32-

Manuals	cortexm0-mcus-programming-manual-stmicroelectronics.pdf
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Technical Notes & Articles	https://www.st.com/resource/en/technical_note/tn1204-tape-and-reel-shipping-media-for-stm32-microcontrollers-in-bga-packages-stmicroelectronics.pdf
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