

STM32 power consumption optimization software expansion for STM32Cube

Control-console menu	Fibonacci and while loop
Dhrystone benchmark	Assembly benchmark
Application examples	
Flash	UART
PWR	Other
HAL drivers	
STM32G0Bx/0Cx	STM32L073/083
STM32L151/152	STM32L476/486
Supported MCUs	
NUCLEO-G0B1RE	NUCLEO-L073RZ
NUCLEO-L152RE	NUCLEO-L476RG
Hardware boards	

Features

- Power consumption and power balance computing for microcontrollers in various STM32 series
- Reference examples reproducing the power consumption measurements described in AN4777 and MCU datasheets
- Easy configuration of runtime parameters
- Console control through Virtual COM port
- Code accessible for tweaking and customization

Description

The low-power STM32 microcontrollers are intended for applications with demanding requirements on power efficiency. The X-CUBE-REF-PM Expansion Package consists of reference examples to assess easily the performance and power consumption of such MCUs. X-CUBE-REF-PM covers various settings and test conditions, hence providing guidelines to optimize the application configuration.

For the selected MCUs in the STM32G0 series, X-CUBE-REF-PM also addresses the impact of the limitation in the use of the instruction prefetch.

For more details, refer to the *How to optimize power consumption on STM32 MCUs* application note (AN4777), available from the www.st.com website.

Product status link

X-CUBE-REF-PM



1 General information

The X-CUBE-REF-PM Expansion Package runs on STM32 microcontrollers based on Arm® cores.

Note: Arm is a registered trademark of Arm Limited (or its subsidiaries) in the US and/or elsewhere.



1.1 Ordering information

X-CUBE-REF-PM is available for free download from the www.st.com website.

1.2 What is STM32Cube?

STM32Cube is an STMicroelectronics original initiative to improve designer productivity significantly by reducing development effort, time, and cost. STM32Cube covers the whole STM32 portfolio.

STM32Cube includes:

- A set of user-friendly software development tools to cover project development from conception to realization, among which are:
 - [STM32CubeMX](#), a graphical software configuration tool that allows the automatic generation of C initialization code using graphical wizards
 - [STM32CubeIDE](#), an all-in-one development tool with peripheral configuration, code generation, code compilation, and debug features
 - [STM32CubeCLT](#), an all-in-one command-line development toolset with code compilation, board programming, and debug features
 - STM32CubeProgrammer ([STM32CubeProg](#)), a programming tool available in graphical and command-line versions
 - STM32CubeMonitor ([STM32CubeMonitor](#), [STM32CubeMonPwr](#), [STM32CubeMonRF](#), [STM32CubeMonUCPD](#)), powerful monitoring tools to fine-tune the behavior and performance of STM32 applications in real time
- [STM32Cube MCU and MPU Packages](#), comprehensive embedded-software platforms specific to each microcontroller and microprocessor series (such as STM32CubeG0 for the STM32G0 series), which include:
 - STM32Cube hardware abstraction layer (HAL), ensuring maximized portability across the STM32 portfolio
 - STM32Cube low-layer APIs, ensuring the best performance and footprints with a high degree of user control over hardware
 - A consistent set of middleware components such as RTOS, USB, UCPD library, graphics, and FAT file system
 - All embedded software utilities with full sets of peripheral and applicative examples
- [STM32Cube Expansion Packages](#), which contain embedded software components that complement the functionalities of the STM32Cube MCU and MPU Packages with:
 - Middleware extensions and applicative layers
 - Examples running on some specific STMicroelectronics development boards



2 License

X-CUBE-REF-PM is delivered under the [SLA0048](#) software license agreement and its Additional License Terms.

Revision history

Table 1. Document revision history

Date	Revision	Changes
29-Aug-2019	1	Initial release.
24-Jul-2023	2	Extended the document scope to selected microcontrollers in the STM32G0 series: <ul style="list-style-type: none">Updated the document title and the cover imageUpdated Features and Description Updated License and What is STM32Cube?

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