

## Micro-PLC software expansion for STM32Cube

Application	Examples
Hardware Abstraction	STM32Cube Hardware Abstraction Layer (HAL)
Hardware	STM32 Nucleo expansion boards <b>X-NUCLEO-ISO1A1</b> STM32 Nucleo development board <b>NUCLEO-G071RB</b>



### Features

- Firmware to use the industrial isolated input/output expansion board, X-NUCLEO-ISO1A1, based on [STISO620](#), [STIS0621](#), [CLT03-2Q3](#) and [IPS1025HQ](#)
- Simple user APIs to
  - monitor industrial digital inputs via GPIO
  - control high side digital outputs individually or collectively, or alternatively, configure and start PWM signals on outputs
  - monitor output faults and board status through UART present on the NUCLEO board
  - control LEDs on the board
- Functionality to support stacking of two X-NUCLEO-ISO1A1 boards
- Pre-compiled binaries available on the X-NUCLEO-ISO1A1 board connected to a [NUCLEO-G071RB](#) development board (other compatible development boards are [NUCLEO-G0B1RE](#) and [NUCLEO-G070RB](#))
- Easy portability across different MCU families, thanks to STM32Cube
- Free, user-friendly license terms

### Description

Product summary	
Micro-PLC software expansion for STM32Cube	<a href="#">X-CUBE-ISO1</a>
Industrial isolated input/output expansion board based on <a href="#">STISO620/621</a> , <a href="#">CLT03-2Q3</a> and <a href="#">IPS1025HQ</a> for STM32 Nucleo	<a href="#">X-NUCLEO-ISO1A1</a>
STM32 Nucleo-64 development board with STM32G071RB MCU, supports Arduino and ST morpho connectivity	<a href="#">NUCLEO-G071RB</a>
STM32 Nucleo-64 development board with STM32G0B1RE MCU, supports Arduino and ST morpho connectivity	<a href="#">NUCLEO-G0B1RE</a>
STM32 Nucleo-64 development board with STM32G070RB MCU, supports Arduino and ST morpho connectivity	<a href="#">NUCLEO-G070RB</a>

The [X-CUBE-ISO1](#) expansion software package for [STM32Cube](#) runs on the STM32 and includes APIs and sample applications in order to perform tasks such as digital input to output mirroring, PWM generation through timers, output fault detection, board test case and other input output functions.

The expansion is built on [STM32Cube](#) software technology to ease portability across different STM32 microcontrollers.

The software comes with a sample implementation of the drivers running on the [X-NUCLEO-ISO1A1](#) expansion boards connected to a [NUCLEO-G071RB](#) development board (or either a [NUCLEO-G0B1RE](#) or a [NUCLEO-G070RB](#)).

Product summary	
Applications	Digital Input to output mirroring PWM generation Test case and fault detection Board monitoring through UART

## 1 Detailed description

### 1.1 What is STM32Cube?

**STM32Cube** is a combination of a full set of PC software tools and embedded software blocks running on STM32 microcontrollers and microprocessors:

- **STM32CubeMX** configuration tool for any STM32 device; it generates initialization C code for Cortex-M cores and the Linux device tree source for Cortex-A cores
- **STM32CubeIDE** integrated development environment based on open-source solutions like Eclipse or the GNU C/C++ toolchain, including compilation reporting features and advanced debug features
- **STM32CubeProgrammer** programming tool that provides an easy-to-use and efficient environment for reading, writing and verifying devices and external memories via a wide variety of available communication media (JTAG, SWD, UART, USB DFU, I2C, SPI, CAN, etc.)
- **STM32CubeMonitor** family of tools (**STM32CubeMonRF**, **STM32CubeMonUCPD**, **STM32CubeMonPwr**) to help developers customize their applications in real-time
- **STM32Cube MCU and MPU packages** specific to each STM32 series with drivers (HAL, low-layer, etc.), middleware, and lots of example code used in a wide variety of real-world use cases
- **STM32Cube expansion packages** for application-oriented solutions.

### 1.2 How does this software complement STM32Cube?

This software is based on the STM32CubeHAL hardware abstraction layer for the STM32 microcontroller.

The package extends **STM32Cube** by providing a board support package (BSP) for the **X-NUCLEO-ISO1A1** board.

The package includes several sample applications that the developer can use to start experimenting with the code. The various user APIs can be used to obtain the desired functionality.

## Revision history

**Table 1. Document revision history**

Date	Revision	Changes
04-Apr-2025	1	Initial release.
25-Jun-2025	2	Updated Title and Product summary.

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