

## Industrial digital output software expansion for STM32Cube

Application	Examples
Hardware Abstraction	STM32Cube Hardware Abstraction Layer (HAL)
Hardware	STM32 Nucleo expansion boards X-NUCLEO-OUT02A1
	STM32 Nucleo development board



### Features

- Complete software to build applications for the [ISO8200AQ](#) galvanic isolated octal high-side smart power solid state-relay
- GPIOs, SPI, PWMs and IRQs configuration
- Fault and power good interrupt handling
- Daisy chaining support
- Sample implementation available on the [X-NUCLEO-OUT02A1](#) expansion board when connected to a [NUCLEO-F401RE](#) or [NUCLEO-F334R8](#) development board
- Easy portability across different MCU families, thanks to [STM32Cube](#)
- Free, user-friendly license terms

### Description

The [X-CUBE-OUT2](#) expansion software package for [STM32Cube](#) runs on the STM32 and includes a driver for the [ISO8200AQ](#).

The software provides an affordable and easy-to-use solution for the development of 8-channel digital output modules, letting you easily evaluate the [ISO8200AQ](#) communication and industrial load driving features.

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

The software comes with a sample implementation of the driver running on the [X-NUCLEO-OUT02A1](#) expansion board connected to a [NUCLEO-F401RE](#) or [NUCLEO-F334R8](#) development board.

You can also perform evaluation of 16-channel digital output modules by connecting two [X-NUCLEO-OUT02A1](#) and activating the daisy chaining feature.

Product summary	
Industrial digital output software expansion for STM32Cube	<a href="#">X-CUBE-OUT2</a>
Industrial digital output expansion board based on <a href="#">ISO8200AQ</a> for STM32 Nucleo	<a href="#">X-NUCLEO-OUT02A1</a>
Galvanic isolated octal high-side smart power solid state-relay	<a href="#">ISO8200AQ</a>
STM32 Nucleo-64 development board with STM32F401RE MCU	<a href="#">NUCLEO-F401RE</a>
STM32 Nucleo-64 development board with STM32F334R8 MCU	<a href="#">NUCLEO-F334R8</a>

## 1 Detailed description

---

### 1.1 What is STM32Cube?

STM32Cube™ is an STMicroelectronics initiative that helps you reduce development effort, time and cost. STM32Cube covers the STM32 portfolio.

STM32Cube version 1.x includes:

- STM32CubeMX, a graphical software configuration tool that allows the generation of C initialization code using graphical wizards.
- A comprehensive embedded software platform specific to each series (such as the STM32CubeF4 for the STM32F4 series), which includes:
  - the STM32Cube HAL embedded abstraction-layer software, ensuring maximized portability across the STM32 portfolio
  - a consistent set of middleware components such as RTOS, USB, TCP/IP and graphics
  - all embedded software utilities with a full set of examples

### 1.2 How does this software complement STM32Cube?

The proposed software is based on the STM32CubeHAL, the hardware abstraction layer for the STM32 microcontroller. The package extends STM32Cube by providing a Board Support Package (BSP) for the STM32 Nucleo expansion board based on the ISO8200AQ.

The drivers abstract low-level details of the hardware to access the ISO8200AQ device data in a hardware independent manner.

The software package includes a set of examples that the developer can use to start experimenting with the code. The 8 output channels are managed through SPI peripheral and application debugging is supported on the X-NUCLEO-OUT02A1 through LEDs for activity and diagnostics.

## Revision history

**Table 1. Document revision history**

Date	Version	Changes
12-Nov-2018	1	Initial release.

**IMPORTANT NOTICE – PLEASE READ CAREFULLY**

STMicroelectronics NV and its subsidiaries (“ST”) reserve the right to make changes, corrections, enhancements, modifications, and improvements to ST products and/or to this document at any time without notice. Purchasers should obtain the latest relevant information on ST products before placing orders. ST products are sold pursuant to ST’s terms and conditions of sale in place at the time of order acknowledgement.

Purchasers are solely responsible for the choice, selection, and use of ST products and ST assumes no liability for application assistance or the design of Purchasers’ products.

No license, express or implied, to any intellectual property right is granted by ST herein.

Resale of ST products with provisions different from the information set forth herein shall void any warranty granted by ST for such product.

ST and the ST logo are trademarks of ST. All other product or service names are the property of their respective owners.

Information in this document supersedes and replaces information previously supplied in any prior versions of this document.

© 2018 STMicroelectronics – All rights reserved