

## Sub-1 GHz RF communication software expansion for STM32Cube based on S2-LP

Application	Examples
Middleware	6LoWPAN
Hardware Abstraction	STM32Cube Hardware Abstraction Layer (HAL)
Hardware	STM32 Nucleo expansion boards X-NUCLEO-S2868A2/X-NUCLEO-S2915A1 (Connect) STM32 Nucleo development board



### Features

- Firmware package to start developing using [S2-LP](#) expansion boards
- Point-to-point communication sample application for simple buffer transmission and acknowledgment implementation
- CLI example to be used with [S2-LP](#) DK GUI to configure the [S2-LP](#) radio
- Multi-GPIOs usage demonstration in FIFO TX/RX examples
- Contiki-NG based applications for 6LoWPAN connectivity
- Low-power optimizations for the STM32 MCU family
- Easy portability across different MCU families thanks to [STM32Cube](#)
- Package compatible with [STM32CubeMX](#); it can be downloaded from and installed directly into [STM32CubeMX](#)
- Free user-friendly license terms
- Sample implementation available on the X-NUCLEO-S2868A1, [X-NUCLEO-S2868A2](#) or [X-NUCLEO-S2915A1](#) expansion boards when connected to a [NUCLEO-F401RE](#), [NUCLEO-L053R8](#), or [NUCLEO-L152RE](#) development board

### Description

X-CUBE-SUBG2 is an expansion software package for [STM32Cube](#). The software runs on the STM32 and includes drivers that recognize the Sub-1 GHz RF communication for [S2-LP](#).

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

The software comes with sample applications of P2P, CLI, FIFO TX/RX, and 6LoWPAN communication protocols, running on an [X-NUCLEO-S2868A2](#) or [X-NUCLEO-S2915A1](#) expansion board when connected to a compatible [STM32 Nucleo](#) development board.

The software is also available on [GitHub](#), where the users can signal bugs and propose new ideas through [\[Issues\]](#) and [\[Pull requests\]](#) tabs.

Product summary	
Sub-1 GHz RF communication software expansion for STM32Cube based on S2-LP	X-CUBE-SUBG2
Sub-1 GHz 868/915 MHz RF expansion board based on S2-LP radio for STM32 Nucleo	X-NUCLEO-S2868A2/X-NUCLEO-S2915A1
Ultra-low power, high performance, sub-1 GHz transceiver	S2-LP
Applications	Building Safety and Security Electricity Metering Factory Automation Industrial Tools ISM Radio SubGHz Sigfox



Product summary

Smart City

## 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, the hardware abstraction layer for the STM32 microcontroller. The package extends **STM32Cube** by providing a board support package (BSP) for the **X-NUCLEO-S2868A2** or **X-NUCLEO-S2915A1** expansion board for point-to-point (P2P).

The drivers abstract low-level details of the hardware and allow the applications to access the **S2-LP** RF functions in a hardware-independent manner. The package also includes sample applications (that the developer can use to start experimenting with the code) for point-to-point simple communication between two or more nodes.

## Revision history

**Table 1. Document revision history**

Date	Version	Changes
09-Dec-2019	1	Initial release.
10-Feb-2020	2	Added X-NUCLEO-S2868A2 and X-NUCLEO-S2915A1 expansion board compatibility information.
20-Nov-2020	3	Updated all content to reflect new firmware release (v3.0).
11-Jan-2022	4	Added link to GitHub in the description.
10-May-2022	5	Added information about CLI and FIFO TX/RX examples.

**IMPORTANT NOTICE – 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 acknowledgment.

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. For additional information about ST trademarks, refer to [www.st.com/trademarks](http://www.st.com/trademarks). 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.

© 2022 STMicroelectronics – All rights reserved