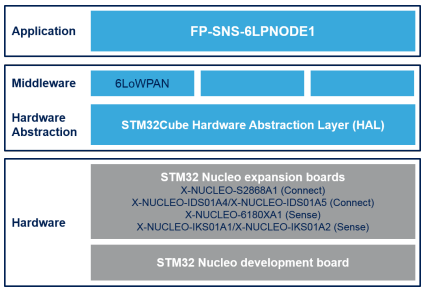
FP-SNS-6LPNODE1

Data brief

STM32Cube function pack for IoT sensor node connection to 6LoWPAN networks through sub-1GHz RF communication



STM32 Open Development Environment

Features

- Complete firmware to connect an IoT node with sensors and actuators to a 6LoWPAN network, using sub-1GHz RF communication technology
- Middleware library with Contiki OS and Contiki 6LoWPAN protocol stack 3.0
- Support for mesh networking technology through the standard RPL protocol
- IPSO Smart Object data representation of the node resources (sensors and actuators) with the OMA Lightweight M2M (LWM2M) standard
- Sample implementation available for X-NUCLEO-S2868A1, X-NUCLEO-IDS01A4 or X-NUCLEO-IDS01A5 boards, X-NUCLEO-IKS01A1 or X-NUCLEO-IKS01A2, and X-NUCLEO-6180X1 sensor boards, when connected to a NUCLEO-F401RE or a NUCLEO-L152RE board
- Easy portability across different MCU families, thanks to STM32Cube
- Free, user-friendly license terms

Description

FP-SNS-6LPNODE1 is an STM32Cube function pack which lets you connect your IoT node to a 6LoWPAN Wireless Sensor Network and expose the sensor and actuator resources using standard application layer protocols.

This software together with the suggested combination of STM32 and ST devices can be used, for example, to develop smart home, building or lighting applications. The package contains sample applications to implement sensor data reading and LED control from a local or a remote device on the Internet.

The software runs on the STM32 microcontroller and includes drivers for the S2-LP Sub-1 GHz RF radio, the SPIRIT1-based sub-1 GHz RF communication modules (SPSGRF-868 and SPSGRF-915), as well as the motion, environmental, and time-of-flight sensors.

Product summary	
STM32Cube function pack for IoT sensor node connection to 6LoWPAN networks through sub-1GHz RF communication	FP-SNS-6LPNODE1
Sub-1 GHz RF expansion board based on the SPSGRF-868 module for STM32 Nucleo	X-NUCLEO-IDS01A4
Sub-1 GHz RF expansion board based on the SPSGRF-915 module for STM32 Nucleo	X-NUCLEO-IDS01A5
Sub-1 GHz 868 MHz RF expansion board based on S2-LP radio for STM32 Nucleo	X-NUCLEO-S2868A1
Motion MEMS and environmental sensor expansion board	X-NUCLEO-IKS01A2

1 Detailed description

1.1 What can you do with STM32Cube function packs?

The STM32Cube function packs leverage the modularity and interoperability of STM32 Nucleo and X-NUCLEO boards, and STM32Cube and X-CUBE software, to create function examples, embodying some of the most common use cases, for each application area.

These software function packs are designed to exploit as much as possible the underlying STM32 ODE hardware and software components to best fit the requirements of final users' applications.

Moreover, function packs may include additional libraries and frameworks which do not present the original X-CUBE packages, thus enabling new functionalities and creating a real and usable system for developers.

1.2 What is STM32Cube?

STMCube™ 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

1.3 How does this software complement STM32Cube?

The proposed 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 sub-1GHz RF communication expansion boards, the environmental and motion MEMS sensor expansion board, and the proximity, ranging and light sensing sensor expansion board. The drivers abstract low-level details of the hardware and allow the middleware components and applications to access sensor data in a hardware-independent manner, and to access and control the S2-LP sub-1 GHz radio and the SPIRIT1-based sub-1GHz RF communication modules (SPSGRF-868 or SPSGRF-915).

The package also includes some middleware libraries to support a 6LoWPAN communication stack, along with a sample application for accessing sensor and actuator resources on the 6LoWPAN nodes using standard protocols such as LWM2M and CoAP over UDP. The node resources are exposed according to the IPSO Smart Object Guidelines. Developers can use it to prototype end-to-end IoT applications.

Revision history

Table 1. Document revision history

Date	Version	Changes
17-Oct-2016	1	Initial release.
21-Feb-2017	2	Updated cover page features.
24-Jul-2017	3	Updated cover page image, features and description.
02-Aug-2018	4	Updated board compatibility information.