

STM32Cube function pack for IoT sensor node with telemetry and device management applications for Microsoft Azure cloud

Applications	Azure_Sns_DM Azure_IoTCentral
Middleware	mbedTLS Azure IoT SDK LibNDEF Meta Data Mgr
Hardware Abstraction	STM32Cube Hardware Abstraction Layer (HAL)
Hardware	STM32 Nucleo development board B-L475E-IOT01A discovery kit



Features

- Complete firmware to safely connect an IoT node with sensors to Microsoft Azure IoT using Wi-Fi communication technology
- Middleware libraries featuring the Microsoft Azure IoT software development kit, NFC connectivity, transport-level security (mbedTLS), and meta-data management
- Ready-to-use binary to connect the IoT node to ST web dashboard running on Microsoft Azure for sensor data visualization and device management (FOTA)
- Ready-to-use binary to connect the IoT node to a personal subscription on Azure IoT Central solution with "sample contoso" template
- Sample implementations available for STM32L4 Discovery Kit for IoT node (B-L475E-IOT01A) development board
- Easy portability across different MCU families, thanks to [STM32Cube](#)
- Free, user-friendly license terms

Description

FP-CLD-AZURE1 is an [STM32Cube](#) function pack which lets you safely connect your IoT node to Microsoft Azure IoT, transmit sensor data and receive commands from Azure cloud applications.

It fully supports Azure device management primitives and includes a sample implementation for firmware update over the air (FOTA). By using a mobile device with NFC, Wi-Fi connectivity link is easily configured.

This software, together with the suggested combination of STM32 and ST devices, can be used, for example, to develop sensor-to-cloud applications for a broad range of use cases, such as smart home or smart industry.

The software runs on the STM32 microcontroller and includes drivers for the Wi-Fi connectivity, dynamic NFC/RFID tag and motion and environmental sensors.

Product summary	
STM32Cube function pack for IoT sensor node with telemetry and device management applications for Microsoft Azure cloud	FP-CLD-AZURE1
STM32L4 Discovery kit IoT node	B-L475E-IOT01A

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?

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

1.3 How does this STM32Cube function pack 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 Wi-Fi and sensors.

The package integrates the Azure IoT device SDK middleware with APIs to simplify interaction between Discovery Kit for IoT node and the Microsoft Azure IoT services. You can use it to prototype end-to-end sensors-to-cloud IoT applications by registering your board to Microsoft Azure IoT and begin exchanging real-time sensor data and commands.

A web dashboard based on Microsoft Azure is also provided free of charge to facilitate the evaluation of the function pack.

It is possible to use the package with a personal subscription to Azure IoT Central solution with the "sample contoso" template.

For Azure license terms, visit <https://azure.microsoft.com>.

Revision history

Table 1. Document revision history

Date	Version	Changes
23-Mar-2016	1	Initial release.
29-Apr-2016	2	Minor text edits
13-Dec-2016	3	Updated for v2.0 firmware. Added companion web application information. Added X-NUCLEO-IKS01A2 support information.
22-May-2017	4	Updated all content to reflect v3.0 firmware.
19-Oct-2017	5	Updated all content to reflect v3.2 firmware. Added references to STM32L4 Discovery Kit.
07-May-2018	6	Updated all content to reflect v3.3 firmware version.
09-Jan-2019	7	Updated all content to reflect v4.0 firmware version.

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