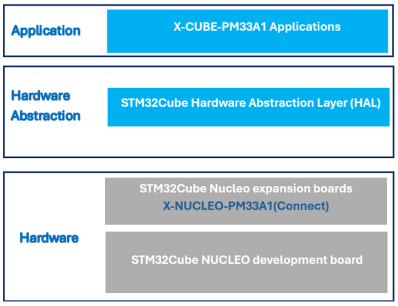
X-CUBE-PM33A1

Data brief

Electricity metering IC software expansion for STM32Cube



Features

- Complete firmware package to build applications using electricity metering IC (STPM33)
- Easy portability across different MCU families, thanks to STM32Cube
- Example application included in the package:
  - Electricity metering
- Free, user-friendly license terms
- Sample implementation is available on the X-NUCLEO-PM33A1 expansion board, plugged into a NUCLEO-L476RG or NUCLEO-G0B1RE board
- Package compatible with STM32CubeMX, can be downloaded from and installed directly into STM32CubeMX
- Separate examples for UART and SPI interfacing of STPM33 with MCU
- Calibration routine included
- All metering parameters are available to the user

Product summary	
Electricity metering IC software expansion for STM32Cube	X-CUBE-PM33A1
Electricity metering IC expansion board based on STPM33 for STM32 NUCLEO	X-NUCLEO-PM33A1
ASSP for metering applications	STPM33
Dual channel digital isolator	STISO620/ STISO621
STM32 Nucleo-64 development board with STM32L476RG MCU	NUCLEO-L476RG
STM32 Nucleo-64 development board with STM32G0B1RE MCU	NUCLEO-G0B1RE
Applications	Metrological computation

Description

The X-CUBE-STPM33 software expansion for STM32Cube provides a complete middleware for STM32 to build applications using NFC/HF RFID reader IC (STPM33 device).

The software is based on STM32Cube technology and expands STM32Cube based packages. It is built on top of STM32Cube software technology to ease portability across different STM32 microcontrollers.

The software comes with sample implementations of the drivers running on the X-NUCLEO-PM33A1 expansion board plugged on top of a NUCLEO-L476RG or NUCLEO-G0B1RE board.

The X-CUBE-STPM33 measures metering parameters (voltage, current, power, energy, frequency) for the input voltage and load applied. It also sends the same over any terminal utility on a PC.

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?

The package 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-PM33A1 expansion board for the STM32 Nucleo and the middleware components for STPM33 library and metrology drivers. The drivers abstract low-level details of the hardware and allow the components and applications to read current, voltage, and power values. The package also includes an example that developers can use to start experimenting with the code.

Example included in the project is:

- Electricity metering

Revision history

Table 1. **Document revision history**

Date	Revision	Changes
03-Apr-2025	1	Initial release.