

USB Type-C Power Delivery sink software expansion for STM32Cube

Application	Low power and Dead Battery (using NUCLEO-G071RB)	Normal power and Dead Battery removed (using NUCLEO-G474RE)
Hardware Abstraction	STM32Cube Hardware Abstraction Layer (HAL)	
Hardware	STM32 Nucleo expansion boards X-NUCLEO-USBPDM1 (Power-Drive)	
	STM32 Nucleo development board NUCLEO-G071RB, NUCLEO-G474RE	



Features

- Binary and source application example files for the X-NUCLEO-USBPDM1 USB Type-C Power Delivery sink expansion board connected to a NUCLEO-G071RB or NUCLEO-G474RE development board
- Package compatible with STM32CubeMX
- Easy portability across different MCU families, thanks to STM32Cube
- Free user-friendly license terms

Description

The X-CUBE-USBPDM1 software package contains the binary and source files of the demo application example for the USB Type-C Power Delivery sink expansion board for STM32 Nucleo (X-NUCLEO-USBPDM1), featuring the TCPP01-M12 USB type-C port protection device.

The expansion board is plugged onto an STM32 Nucleo development board (NUCLEO-G071RB or NUCLEO-G474RE) with STM32 microcontroller that executes the code.

X-NUCLEO-USBPDM1 USB Type-C receptacle can be connected to any Type-C source. The X-CUBE-USBPDM1 selects the highest and closest power profile to the value indicated by the binary file from the power profiles available on the source.

Product summary	
USB Type-C Power Delivery sink software expansion for STM32Cube	X-CUBE-USBPDM1
USB Type-C Power Delivery sink expansion board based on TCPP01-M12 for STM32 Nucleo	X-NUCLEO-USBPDM1
STM32 Nucleo-64 development board with STM32G071RB/STM32G474RE MCUs	NUCLEO-G071RB/ NUCLEO-G474RE
USB type-C port protection	TCPP01-M12
Applications	Medical and Healthcare Power Supplies and Converters Smart Home USB Type-C and Power Delivery Wearable

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

RELATED LINKS

[STM32CubeMonUCPD: Monitoring and configuration software tool for STM32 USB-C and Power Delivery 3.0 applications](#)

[AN5225: USB Type-C™ Power Delivery using STM32xx Series MCUs and STM32xxx Series MPUs](#)

[UM2552: Managing USB power delivery systems with STM32 microcontrollers](#)

[AN5418: How to build a simple USB-PD sink application from STM32CubeMX](#)

[Youtube video STM32G0: Create a USB Power delivery sink application in less than 10 minutes](#)

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-USBPDM1** USB Type-C Power Delivery sink expansion board.

The drivers abstract low-level details of the hardware and allow the applications to access the **TCPPO1-M12** functions in a hardware-independent manner.

The software helps developers to build a very simple USB power delivery sink example, starting from **STM32CubeMX**.

Revision history

Table 1. Document revision history

Date	Version	Changes
19-Dec-2019	1	Initial release.
17-Jun-2020	2	Added Section 1.2 How does this software complement STM32Cube?. Text changes throughout the document.

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