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## How to upgrade the firmware on the STEVAL-USBC2DP USB Type-C™ to DisplayPort™ adapter

### Introduction

The STSW-USBC2DP software package contains application firmware in binary and in .dfu file formats, designed to support the STEVAL-USBC2DP functionality.

The compact USB Type-C to DisplayPort adapter reference design, with USB Type-C connector and DisplayPort connector, exploits Alternate Mode of the USB Type-C and Power Delivery specifications to offer a comprehensive VESA® DisplayPort Standard interface.

With this adapter, you can connect a monitor with a DisplayPort interface to any laptop, tablet or smartphone with a reversible USB Type-C connector that is compliant with the Type-C to DisplayPort Alternate Mode specification.

The DisplayPort Alternate Mode allows video data to be delivered through the SuperSpeed USB lines on the Type-C connector, while Auxiliary lanes (AUX) and hot plug detection (HPD) signals are sent through other Type-C lines.

The high-performance ARM® Cortex®-M0 32-bit STM32F072 microcontroller engages in DisplayPort Alt Mode negotiation through Vendor Defined Messages (VDM) according to the USB Power Delivery Specification. The messages are transmitted along configuration channel (CC), through a simple discrete analog front end (AFE) interface between the STM32 MCU and the USB Type-C connector.

The STM32 microcontroller runs the ST USB Middleware stack and the embedded USB 2.0 controller, and provides the Billboard Device Class support as required by the USB Power Delivery standard, as well as the Device Firmware Upgrade capability.

# 1 USB dongle programming overview

The STEVAL-USBC2DP dongle allows you to extend your desktop or laptop display onto a DisplayPort monitor through a USB Type-C port. It implements the DisplayPort Alternate Mode of the USB Type-C and PD specifications to manage compatibility.

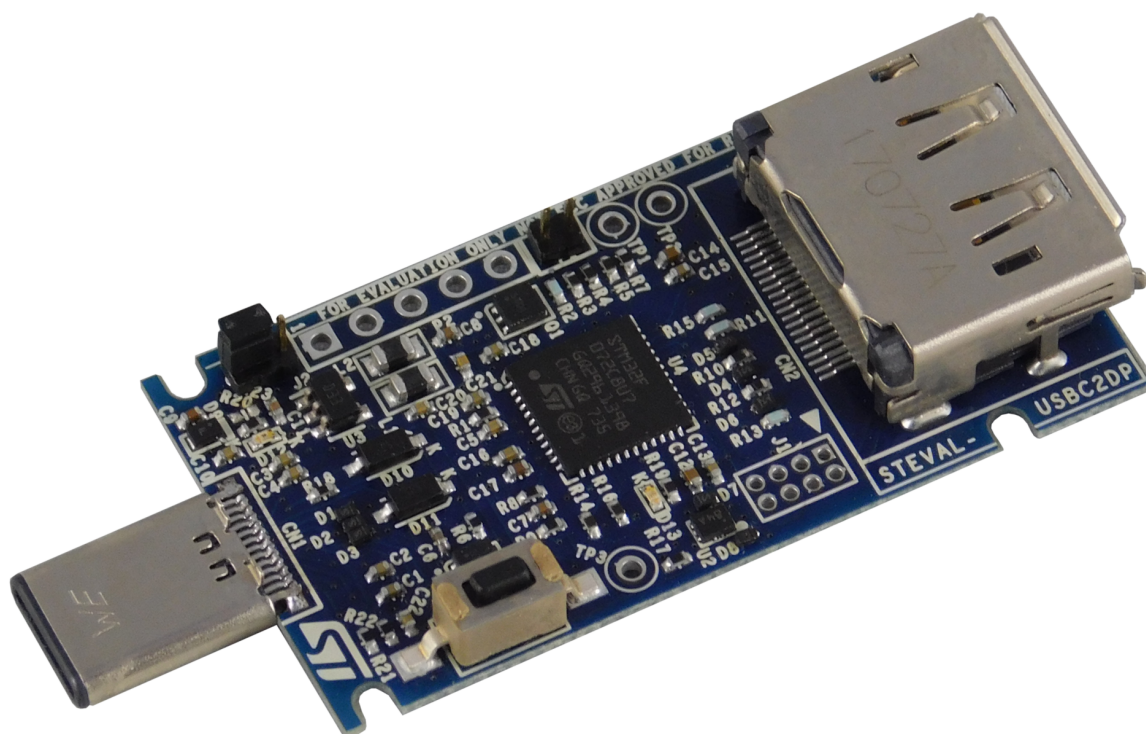
The dongle has a high performance ARM® 32-bit Cortex®-M0 STM32F072C8 MCU, which runs the certified X-CUBE-USB-PD software that negotiates DisplayPort Alternate Mode through Vendor Defined Messages (VDMs).

You can update the STM32F0 MCU firmware with an ST-LINK/V2 device and the STM32CubeProgrammer or STM32 ST-LINK Utility tool. You can also update the firmware with the Device Firmware Upgrade (DFU) feature by directly plugging the adapter to a USB Type-C port on a Windows PC or laptop.

Firmware versions released on the STEVAL-USBC2DP product page are available in the following file types:

- STSW-USBC2DP.bin
- STSW-USBC2DP.dfu

**Figure 1. STEVAL-USBC2DP evaluation board**



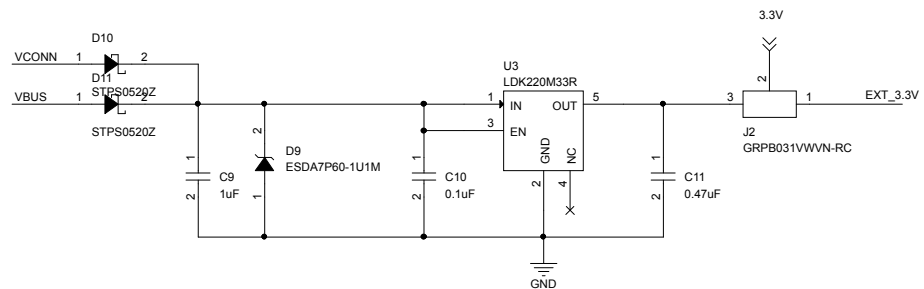
## 2 How to update the application firmware with ST-LINK/V2

To update the application firmware with the ST-LINK/V2 programmer, you must first configure the evaluation board so that it is powered through the ST-LINK/V2 programming device.

**Step 1.** Fit connector J2 with a jumper at position 1-2.

This disconnects the supply from the power management stage while the board is supplied by the ST-LINK/V2 programmer.

**Figure 2. schematic view of STEVAL-USBC2DP power management stage with jumper J2**



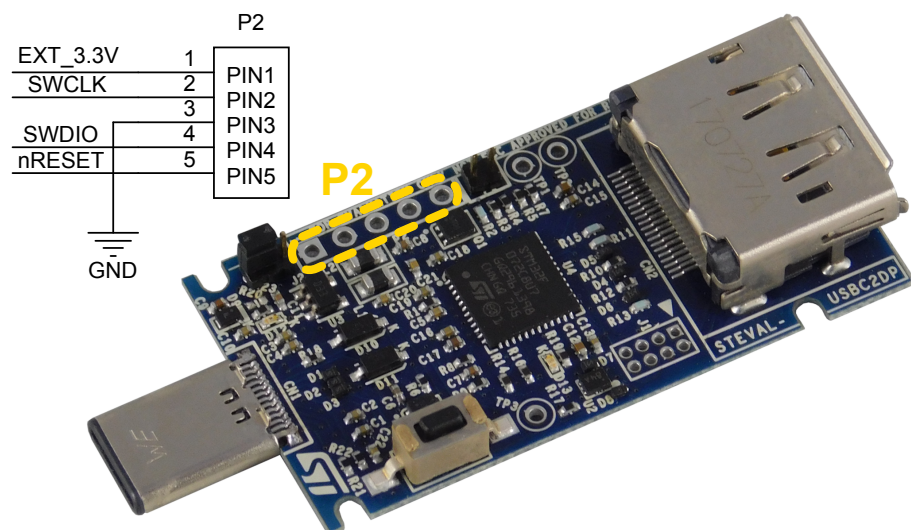
**Step 2.** Connect the ST-LINK/V2 programmer to a USB port on a PC or laptop with the STM32 ST-LINK/V2 Utility tool installed

**Step 3.** Connect the ST-LINK/V2 programmer to the STEVAL-USBC2DP P2 with external wires.

To facilitate programming, install a 5-position header 0.100" (2.54 mm) through-hole connector on P2. Then, connect the P2 pin2, pin3 and pin4 (SWD pins) to the corresponding pins on the ST-LINK CN4 connector on a STM32 Nucleo-64 board, and P2 pin1 to ST-LINK JP1 pin1.

**Note:** You must remove both jumpers on the ST-LINK CN2 connector to allow correct SWD operation. Refer to User manual UM1724 for more information.

**Figure 3. SWD connector P2 in the STEVAL-USBC2DP dongle and schematics**



**Step 4.** Update the application firmware using one of the following software tools:  
Click on the relevant link to open the product page on [www.st.com](http://www.st.com).

- [STM32CubeProgrammer](#); refer to User manual UM2237.
- [STM32 ST-LINK Utility](#); refer to User manual UM0892.

### 3 How to update the application firmware with DFU

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To update the STEVAL-USBC2DP firmware with DFU, you need a Windows computer with a USB Type-C port. The STEVAL-USBC2DP supports the STM32 device firmware upgrade DFU feature to update the firmware via USB.

- Step 1.** Close jumper P1.  
This enables the Boot option.
- Step 2.** Set jumper J2 to position 2-3.  
This allows the board to be powered through the VBUS line on the USB Type-C port.
- Step 3.** Update the application firmware using one of the following software tools:  
Click on the relevant link to open the product page on [www.st.com](http://www.st.com).
  - [STM32CubeProgrammer](#); refer to User manual UM2237
  - [DfuSe](#) ; refer to User manual UM0412
- Step 4.** Remove the jumper from P1 to run the application normally.

## Revision history

**Table 1. Document revision history**

Date	Revision	Changes
05-Mar-2018	1	Initial release

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