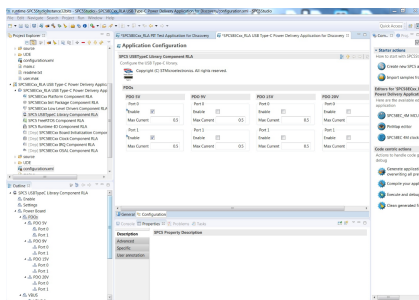


AEKD-USBTYPEC1 kit software package for automotive USB Type-C™ and Power Delivery dual port applications



Features

- Package contains the firmware flash image for the **AEKD-USBTYPEC1** kit, for a USB Power Delivery solution compliant with the 2.0 specification feature-set.
- **SPC58EC-DISP** discovery board pre-loaded with firmware (version 1.2.1).
- The firmware supports the USB Type-C dual port, provider-only role.
- The firmware defaults a PDO of 5 V 500 mA.
- Additional PDOs can be configured if a compatible power board (not supplied in the kit) is added to the **AEKD-USBTYPEC1** kit.
- The software is customizable through **SPC5-Studio** and conforms with the ST AutoDevKit initiative.



Description

The STSW-USB2TYPEC1 software package for the **AEKD-USBTYPEC1** kit contains all the software layers required to run and customize the firmware for the ASIL-B automotive grade SPC58 Chorus Power Architecture® microcontroller (4MB flash, 32-bit) on the kit discovery board (**SPC58EC-DISP**).

The firmware was built with the **SPC5-Studio** user-friendly environment based on Eclipse. **SPC5-Studio** generates hardware abstraction layer for the SPC5 microcontroller series and allows hardware configuration with intuitive GUIs.

The firmware is coded according to the ST AutoDevKit development initiative, so you can reuse and expand hardware and software building blocks in a consistent framework.

Product summary	
dual-port USB Type-C function board	AEK-USB-2TYPEC1
SPC58 Chorus discovery board	SPC58EC-DISP
automotive grade USB Type-C controller (with Tx/Rx line driver and BMC)	STUSB1702
firmware package for the AEKD-USBTYPEC1 kit	STSW-USB2TYPEC1

1 How to use the software

1.1 How to program SPC58 microcontroller present on SPC58EC-DISP:

- Step 1.** Download and install the [SPC5-UDESTK-SW](#) USB/JTAG debugger from ST.COM.
- Step 2.** Connect mini-B USB cable between your PC and the [SPC58EC-DISP](#) board.
- Step 3.** Turn-on the SPC58EC-DISP.
- Step 4.** Run the UDE application on the PC.
- Step 5.** In the UDE application, open file “st_usbpd.wsx”.
The firmware flash image hook is the .wsx file in the zip file in the UDE folder.
- Step 6.** Select [**Program All**] in the options window that appears.
The same window returns a “Succeeded” message when the firmware is installed.
- Step 7.** Click [**Exit**] to close the window.
At this point, the firmware is burned in the microcontroller flash.
- Step 8.** Reset the SPC58EC-DISP board to run the new firmware on the microcontroller.

1.2 How to download the USB Power Delivery Library

Before you download the plugin with the USB-PD library, you need to download and install the [SPC5-Studio](#) tool. Then you need to request access credentials by sending an email to credentials@spc5studio.com specifying your company name, your project, run-rate and target date.

Once the authentication credentials are received, run [SPC5-Studio](#) and follow the procedure below:

- Step 1.** Open the [**Help**] menu and select [**Install new Software**]
- Step 2.** Select [**Add**] and enter “USBPD” in the name field and “usbpd.spc5studio.com” in the location field.
After confirming, you will be prompted for your username and password.
- Step 3.** Insert the credentials received by email.
- Step 4.** Wait for the download process to complete the plugin installation.

1.3 Configuration of the component USB-PD Library through SPC5-Studio

Once the [SPC5-Studio](#) plugin with the USB-PD library is installed, you can configure several parameters in the Settings section of the graphical user interface.

You can configure the following settings:

- Enable (default) or disable Port 1. Port 0 is always enabled.
- Enable (default) or disable hardware CRC. If hardware CRC is disabled, a software version is employed.
- Enable (default) or disable LED signals.
- Enable or disable (default) hardware Test mode, which can check the hardware.
- Enable (default) or disable additional PDOs. The PDOs have to be compliant with the external Power board connected. For each PDO is possible to define the current and the port.
- You can configure the logic table for the microcontroller pin combinations that control the switching of different voltages on the power board.

Table 1. Default logic table (applicable to Port 0 and Port 1):

Vout_x [V]	Port_sig1	Port_sig2	Port_sig3
5V	L	L	L
9V	H	L	L

Vout_x [V]	Port_sig1	Port_sig2	Port_sig3
15V	H	H	L
20V	H	H	H

When Test mode is enabled, you need to connect a USB cable between the [SPC58EC-DISP](#) discovery board and your PC. Then run a terminal application on your PC and configure the appropriate COM port with 38400 bauds and N81.

1.4 Configuration of the component USB-PD Library with external power boards

If additional PDOs are enabled, you need to connect a compatible power board to the AEKD-USBTYPEC1 kit. In this case, the stack USB Power Delivery shall select the allowed PDOs and the microcontroller shall manage the power board output through GPIOs available on the male connector on top of the interface board (AEK-USB-2TYPEC1).

Note: The voltage switch on the port should occur within a given time-out (set by the USB Power Delivery protocol specification); otherwise, the STUSB1702Y will inform the microcontroller that the voltage output in the port is not actuated and cause the system to reset and re-start the power negotiation.

The power negotiation between the consumer and provider crosses through each STUSB1702Y device with a master role in SPI communication with the microcontroller. The setup of each STUSB1702Y device is performed via the microcontroller with the I2C protocol.

Revision history

Table 2. Document revision history

Date	Version	Changes
20-Jul-2018	1	Initial release.

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