ModusToolbox™ EZ-PD™ Configurator user guide

ModusToolbox™ tools package version 3.9
EZ-PD™ Configurator version 2.50.0

About this document

A newer revision of this document may be available on the web here.

Scope and purpose

The EZ-PD™ Configurator provides a user-friendly tool for selecting the features and configuring parameters of the power delivery stack (PDStack) middleware for PMG1 family of devices.

Intended audience

This document helps application developers understand how to use the EZ-PD™ Configurator as part of creating a ModusToolbox™ application.

Document conventions

Convention	Explanation
Bold	Emphasizes heading levels, column headings, menus and sub-menus
Italics	Denotes file names and paths.
`Monospace`	Denotes APIs, functions, interrupt handlers, events, data types, error handlers, file/folder names, directories, command line inputs, code snippets
File > New	Indicates that a cascading sub-menu opens when you select a menu item

Abbreviations and definitions

The following define the abbreviations and terms used in this document:

- Application – One or more projects related to each other.
- BSP – board support package
- Configurator – A GUI-based tool used to configure a resource.
- EPR – extended power range
- PDO – power data object
- PMG1 – power delivery microcontroller generation 1
- SCEDB – source capabilities extended data block
- SKEDB – sink capabilities extended data block
- SVID – standard or vendor ID
- VDO – vendor data object
- USB-PD – universal serial bus-power delivery

Reference documents

Refer to the following documents for more information, as needed:

- USB Power Deliver Specification Revision 3.2 V1.1
- PDStack middleware library
- Device Configurator user guide
- ModusToolbox™ tools package user guide
- Eclipse IDE for ModusToolbox™ user guide

About this document

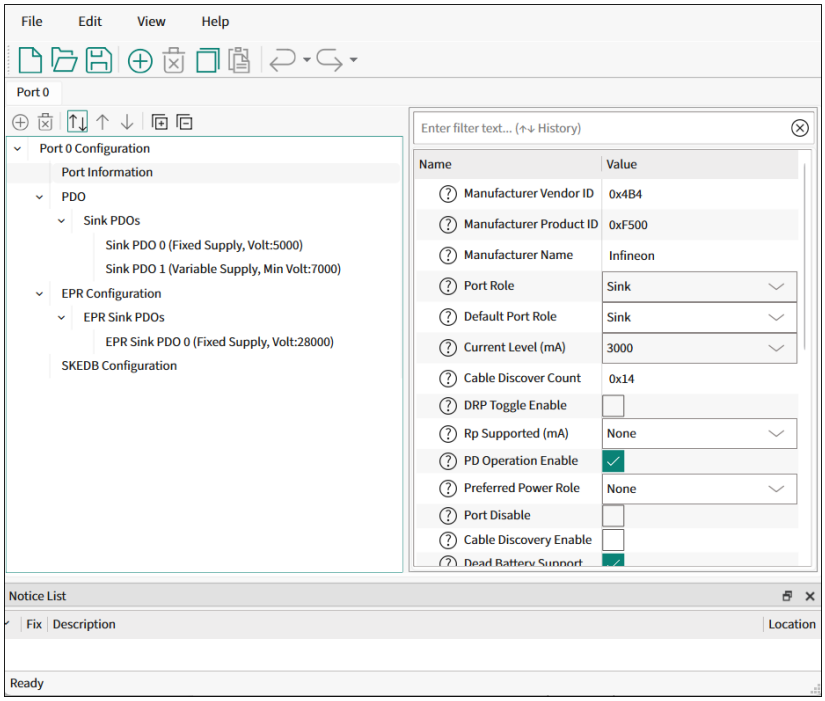
- Device datasheets
- Device technical reference manuals

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1 Overview

The EZ-PD™ Configurator provides an interface with the Port Information pane with parameter categories and parameters pane. Select a parameter category to see the category parameters and values on the parameters pane. The tool generates configuration code in the C language, which can be referenced in the PDStack middleware.



1.1 Supported middleware

Supported middleware

Name	Version	Link
PDStack Middleware Library	3.2	https://github.com/Infineon/pdstack

***Note**: This 2.00 version of the EZ-PD™ Configurator is not compatible with previous versions of the PDStack Middleware Library. Use version 3.0 or later.*

2 Launch the EZ-PD™ Configurator

There are numerous ways to launch the EZ-PD™ Configurator, and those ways depend on how you use the various tools in ModusToolbox™.

2.1 make command

As described in the ModusToolbox™ tools package user guide build system chapter, you can run numerous make commands in the application directory, such as launching the EZ-PD™ Configurator. After you have created a ModusToolbox™ application, navigate to the application directory and type the following command in the appropriate bash terminal window:

```
make ez-pd-configurator
```

This command opens the EZ-PD™ Configurator GUI for the specific application in which you are working.

2.2 VS Code and Eclipse

VS Code and Eclipse have tools to launch the BSP Assistant from within an open application. Refer to the applicable user guide for more details:

- VS Code for ModusToolbox™ user guide
- Eclipse IDE for ModusToolbox™ user guide

2.3 Executable (GUI)

If you don't have an application or if you just want to see what the configurator looks like, you can launch the EZ-PD™ Configurator GUI by running its executable as appropriate for your operating system (for example, double-click it or select it using the Windows Start menu). By default, it is installed here:

<install_dir>/ModusToolbox/tools_<version>/ez-pd-configurator-<version>

When launched this way, the EZ-PD™ Configurator opens without any settings configured. You can either open a specific configuration file or create a new one. See Menus for more information.

2.4 Executable (CLI)

The EZ-PD™ Configurator executable can be run from the command line, and it also has a "cli" version of the executable as well. Running configurator executables from the command line can be useful as part of batch files or shell scripts to re-generate the source code based on the latest configuration settings. The exit code for the executable is zero if the operation is successful, or non-zero if the operation encounters an error. For more information about the command-line options, run the executable using the `-h` option.

3 Quick start

This section provides an example workflow for how to use the EZ-PD™ Configurator with the USBPD-Sink code example (https://github.com/Infineon/mtb-example-pmg1-usbpd-sink).

1. Create a new ModusToolbox™ application. In this example, use the Project Creator tool:
   - Select the PMG1-CY7110 BSP.
   - Select the USBPD Sink application.
2. Build the application.
3. This generates *mtbcfg_ezpd.h* and *mtbcfg_ezpd.c files* in the *<application>/USBPD_CONFIG/TARGET_<kit-name>/GeneratedSource* directory. These files define the PDSTACK Middleware configuration struct `cy_stc_pdstack_port_cfg_t`, with the application's default configuration.
4. Follow the instructions in the application's *README.md* file for the correct placement of jumpers on the kit, and then program the kit.
5. Connect the kit to a power source that supports USB Power Delivery on the USB-PD port, **not** the USB-C port for KitProg) to a power source (for example, a charger or a laptop) using a USB-C-to-C cable.
6. Remember to review the *README.md* file for proper jumper placement.
7. The kit's LED (LED3 of PMG1-CY7110) should blink at 5 Hz, indicating that the USB-PD operation is working.
8. Launch the EZ-PD™ Configurator for the application that was just created.
   - Deselect the PD Operation Enable parameter under Port Information.
   - Save the configuration. This updates the *mtbcfg_ezpd.c* file with the changed configuration.
9. Disconnect the power source from the kit, re-program the application, then connect the power source to the kit.

The kit's Debug LED should blink at 1 Hz, indicating that USB-PD operation is **not** working since it was disabled in step 5.

4 GUI description

The EZ-PD™ Configurator GUI contains menus, the main toolbar, and tabs with toolbars to configure the various parameters, as well as Notice List and Status bar to provide indications

4.1 Menus

File

- **New** – Creates a new file with new configuration.
- **Open** – Opens the configuration file.
- **Close** – Closes the configuration file.
- **Save** – Saves the existing file.
- **Save As** – Saves the existing file under a different name.
- **Open in System Explorer** – Opens your computer's File Explorer browser to the directory that contains the **.mtbezpd* file.
- **Exit** – Closes the configurator.

Edit

- **Add Port** – Adds a new Port tab to configure parameters.
- **Remove Port** – Removes the selected Port tab.
- **Copy Port** – Copies port settings of the selected port to the clipboard.
- **Paste Port** – Pastes port settings from the clipboard to the selected port; replaces current settings.
- **Undo** – Undoes the previous change.
- **Redo** – Redoes the last undone change.

View

- **Notice List** – Shows/hides Notice List. The pane displays by default.
- **Toolbar** – Shows/hides the toolbar.
- **Reset View** – Resets the view to the default.

Help

- **View Help** – Opens this document.
- **About EZ-PD™ Configurator** – Opens the About box for version information, with links to open https://www.infineon.com and the current session log file.

Notice List

The **Notice List** pane combines notices (errors, warnings, tasks, and infos) from many places in the configuration into a centralized list. You can double-click a notice location to show the parameter causing the error or warning. For more information about the Notice List, refer to Device Configurator user guide.

Status bar

The status bar displays various information, including a file operation status, hints, input field ranges, etc. On the right side, it displays the selected device.

4.2 Toolbar

The toolbar contains common commands from the **File** and **Edit** menus, such as **New**, **Open**, and **Save**. Use the check box under the **View** menu to show or hide the toolbar.



4.3 Port tabs

This area contains one or two tabs to configure various parameters. Each tab includes a toolbar with the following commands:



- **Add/Remove PDO** – Adds or removes a PDO from the selected list.
- **Sort PDOs** – Toggles Sort on and off. When enabled, this reorders the PDOs by type and voltage.
- **Move Up/Down** – When Sort is disabled, these move the selected PDO up or down in the list.
- **Expand/Collapse All** – Expands or collapses the entire tree of items in the **Port** tab.

4.4 Parameter categories

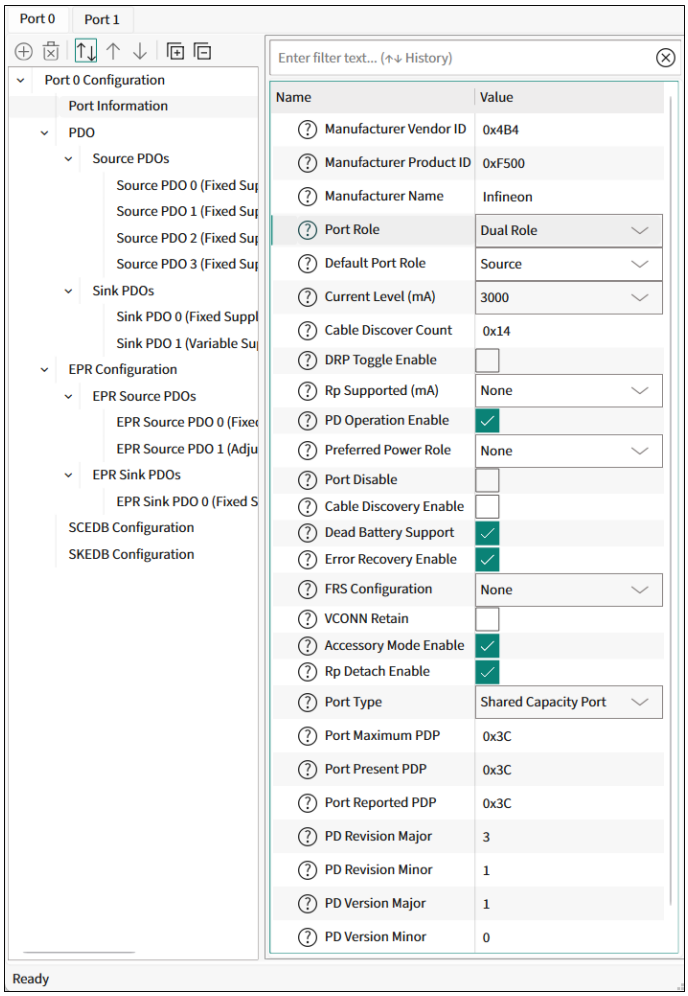
The left pane of the EZ-PD™ Configurator shows the following parameter categories:

- Port Information
- Source PDOs
- Sink PDOs
- EPR Configuration
- SCEDB Configuration
- SKEDB Configuration

4.5 Parameters and values

The following sections describe the parameters available for each category. Select a parameter category to see that category individual parameters and values as appropriate on the right pane of the EZ-PD™ Configurator.

4.5.1 Port Information



The **Port Information** node consists of the following parameters:

Field name	Description	Valid range
Manufacturer Vendor ID (0x)	Vendor ID assigned to manufacturer by USB-IF	0x0000 – 0xFFFF
Manufacturer Product ID (0x)	16-bit Product ID that identifies the product	0x0000 – 0xFFFF
Manufacturer Name	Manufacturer name string	Maximum 21 ASCII Characters
Port Role	Power handling role of the device	0 -> Sink 1 ->Source 2 -> Dual Role
Default Port Role	Default power handling role of the device	0 -> Sink 1 -> Source

Field name	Description	Valid range
Current Level (mA)	Operating current range for the device	0 -> 900 mA 1 -> 1.5 A 2 -> 3 A
Cable Discover Count	Number of cable discovery attempts to be made	0x00 – 0x14
DRP Toggle Enable	Whether Rp-Rd toggle is enabled in unattached state	Check box enabled or not.
Rp Supported (mA)	Rp values supported by the device	Bit Mask Bit 0 -> 900 mA Rp Bit 1 -> 1.5 A Rp Bit 2 -> 3 A Rp
PD Operation Enable	Whether USB-PD operation is supported on the port	0 -> No 1 -> Yes
Preferred Power Role	Whether Try.Src or Try.Sink is enabled for the port	0 -> No Try.Src or Try.Sink supported 1 -> Try.Src supported 2 -> Try.Sink supported
Port Disable	Whether the PD port is to be disabled at start-up	Check box enabled or not.
Cable Discovery Enable	Whether cable discovery is enabled as part of the source state machine	Check box enabled or not.
Dead Battery Support	Whether dead battery operation is supported	Check box enabled or not.
Error Recovery Enable	Whether Type-C error recovery is enabled for this port	Check box enabled or not.
FRS Config	Fast Role Swap feature enabled flags	0 -> None 1 -> FRS receive enable 2 -> FRS transmit enable
VCONN Retain	Whether Vconn supply should be left enabled even if the EMCA's cable VDO indicates that Vconn is not required.	Check box enabled or not.
Accessory Mode Enable	Whether accessory mode is to be enabled	Check box enabled or not.
Rp Detach Enable	Option to enable/disable disconnect detect mechanism using Rp in Sink role	Check box enabled or not.
Port Type	Port type in Source_Info data object. Indicates whether the amount of power the port can provide is fixed or can change dynamically	0 -> Shared Capacity Port 1 -> Assured Capacity Port
Port Maximum PDP	The maximum amount of power the port is designed to deliver	0x00 – 0xFF
Port Present PDP	The amount of power the port is presently capable of offering	0x00 – 0xFF

Field name	Description	Valid range
Port Reported PDP	The amount of power the port offering in its Source_Capabilities or EPR_Source_Capabilities message.	0x00 – 0xFF
PD Revision Major	PD revision major	0x0 – 0xF
PD Revision Minor	PD revision minor	0x0 – 0xF
PD Version Major	PD version major	0x0 – 0xF
PD Version Minor	PD version minor	0x0 – 0xF

4.5.2 PDO

This node represents the set of Power Data Objects (**PDOs**) for the selected device. The **PDOs** supported by the device are arranged hierarchically. **PDOs** can be **Source PDOs** or **Sink PDOs**, depending on whether they describe the power sourcing or sinking capabilities of the USB-PD device. All fields listed under the **Source PDOs** and **Sink PDOs** nodes are defined in the USB-PD specification, revision 3 classified as follows:

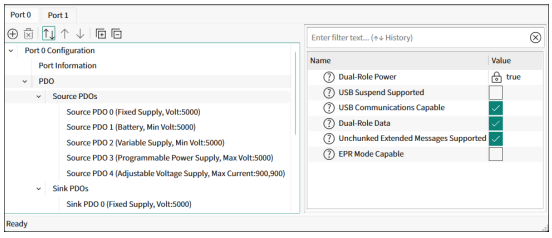
- **Fixed Supply**
- **Battery**
- **Variable Supply**
- **Programmable Power Supply**
- **Adjustable Voltage Supply**

You can add or remove **PDOs** using **Add/Remove PDO** buttons available in Port tabs. Each **PDO** contains an **Enable** check box, which specifies whether the **PDO** is enabled at system start-up.

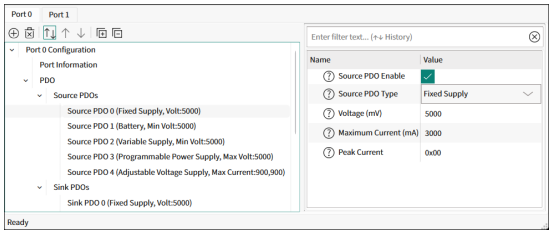
4.5.2.1 Source PDOs

The **Source PDOs** node displays only when the value of **Port Role** parameter is set to **Source** or **Dual Role** in Port Information node.

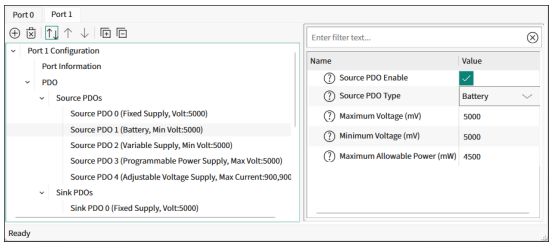
The parent **Source PDOs** node contains the following parameters from **5V Fixed Supply Source PDO**.



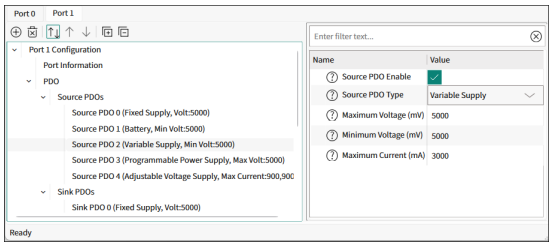
Fixed Supply Source PDO configuration parameters



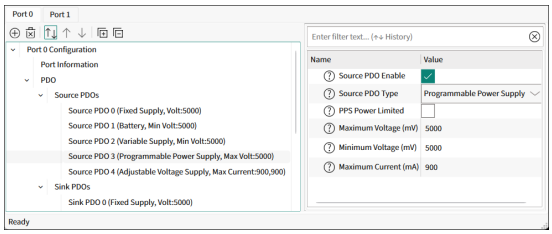
Battery Source PDO configuration parameters



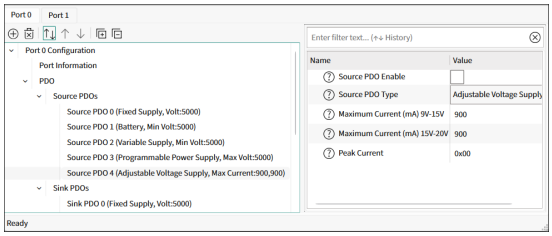
Variable Supply Source PDO configuration parameters



Programmable Power Supply Source PDO configuration parameters



Adjustable Voltage Supply Source PDO configuration parameters



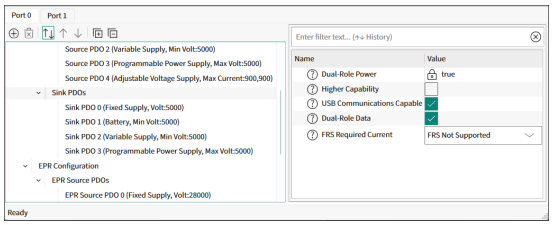
4.5.2.2 Sink PDOs

The **Sink PDOs** node displays only when the value of the **Port Role** parameter is set to **Sink** or **Dual Role** in the Port Information node. **Sink PDO** configuration includes two additional parameters:

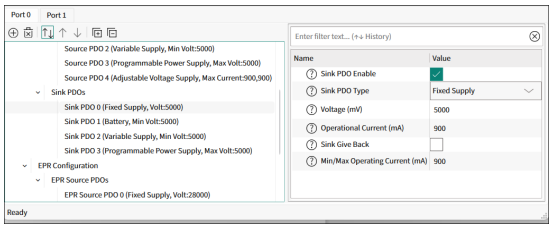
- The **Sink Give Back** parameter specifies whether the feature is enabled for this PDO.
- The **Min/Max Operating Current** parameter specifies the minimum current required for device operation if give back is enabled. If give back is disabled, this field specifies the maximum operating current that may be required.

4 GUI description

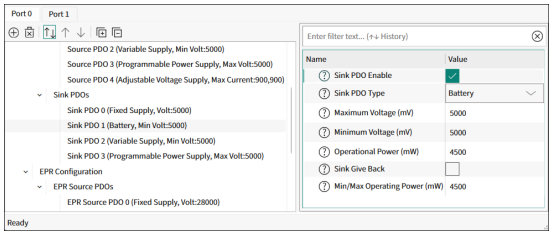
The parent **Sink PDOs** node contains the following parameters from **5V Fixed Supply Sink PDO**.



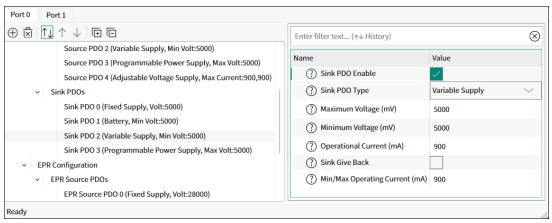
Fixed Supply Sink PDO configuration parameters



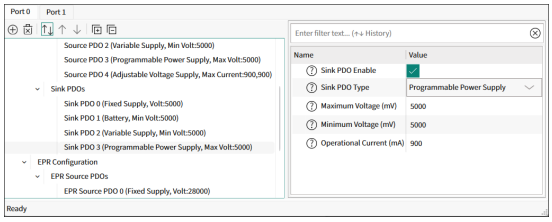
Battery Sink PDO configuration parameters



Variable Supply Sink PDO configuration parameters

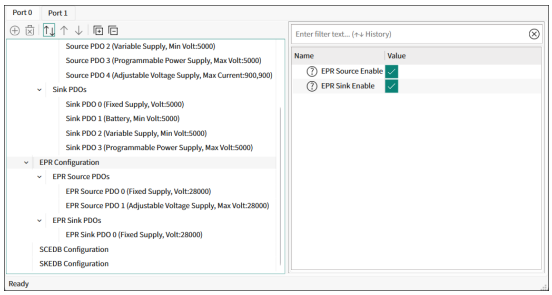


Programmable Power Supply Sink PDO configuration parameters



4.5.3 EPR Configuration

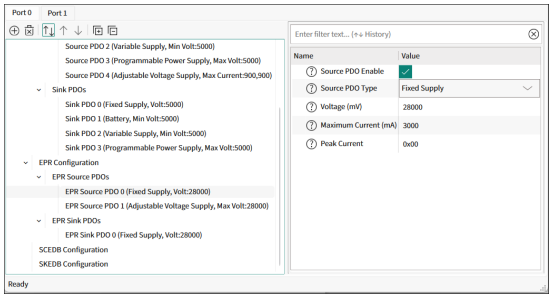
This contains a check box to enable or disable **Extended Power Range** (**EPR**) **configuration**.



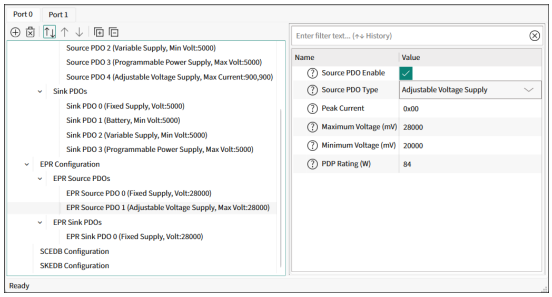
4.5.3.1 EPR Source PDOs

Enable **EPR Source** to display one or more **EPR Source PDOs**.

Fixed Supply

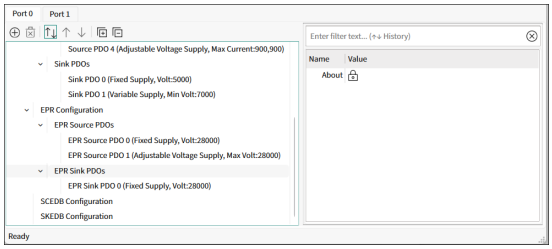


Adjustable Voltage Supply



4.5.3.2 EPR Sink PDOs

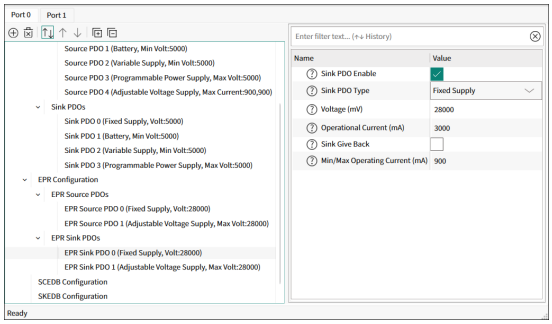
Enable **EPR Sink** to display one or more **EPR Sink PDOs**.



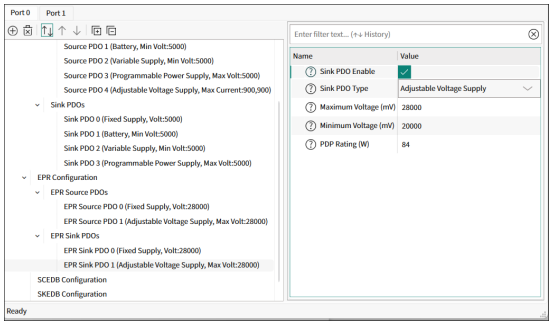
4 GUI description

The **EPR Sink PDOs** configuration parameters:

Fixed Supply

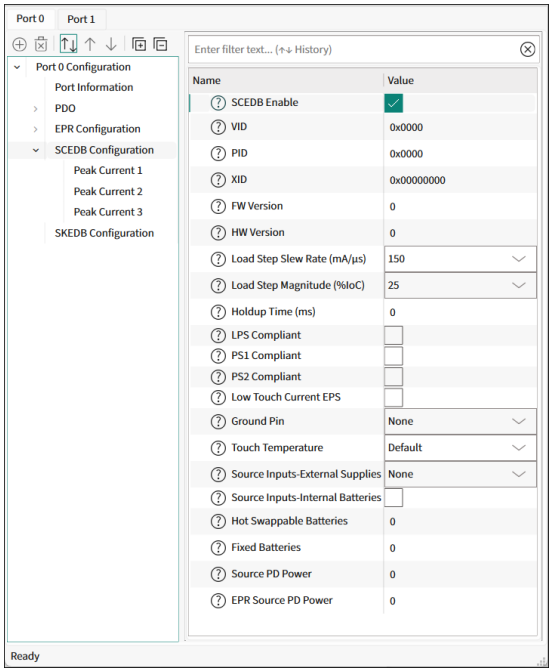


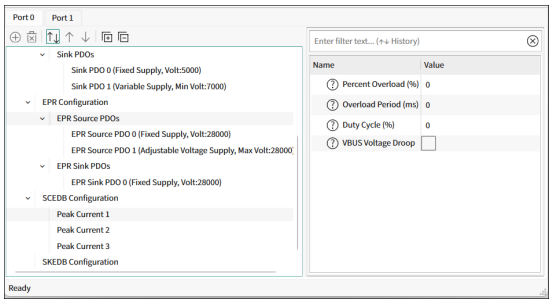
Adjustable Voltage Supply



4.5.4 SCEDB Configuration

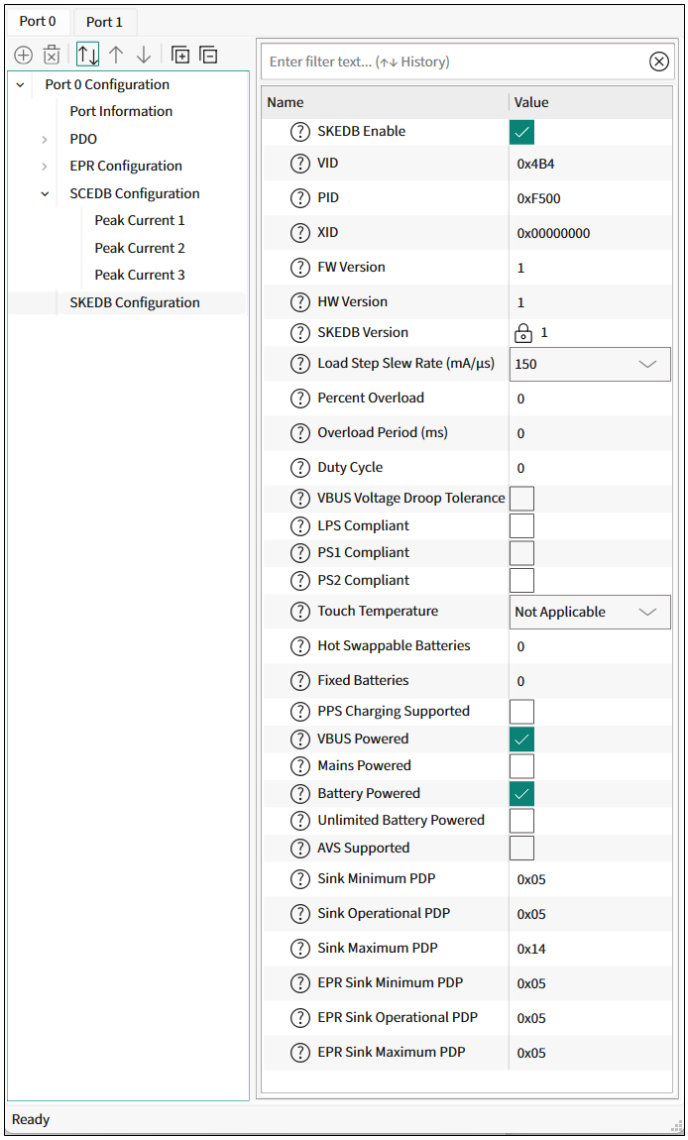
This pane contains a check box to enable or disable the **SCEDB** parameters based on the USB-PD specification, revision 3, section 6.5.1.





4.5.5 SKEDB Configuration

This contains a check box to enable or disable the **SKEDB** parameters based on the USB-PD specification, revision 3, Section 6.5.13.



5 Version changes

This section lists and describes the changes for each version of this tool.

Version	Change Descriptions
1.0	New tool. Compatible with PDStack Middleware Library 1.10.
1.10	Added open in **System Explorer** command to **File** menu. Added **Add/Remove Port** commands. Added **Copy/Paste Port** commands. Added separate **Port** tabs. Added **Port** tab toolbar. Reorganized parameter settings based on Source PDO versus Sink PDO. Compatible with PDStack Middleware Library version 1.20 and older.
1.20	Changed the device library file from xml to *props.json*. Compatible with PDStack Middleware Library version 3.0. This version of the EZ-PD™ Configurator is not compatible with older versions of PDStack Middleware Library.
1.21	Minor update.
1.30	Back-end updates and bug fixes.
2.00	• Changes in this version are not backward compatible with previous versions • Added PDO type "Adjustable Voltage Supply" • Added "EPR Min/Max Operating Current" and "Sink Give Back" fields for the EPR sink PDO for "Fixed Supply" PDO type • Renamed "Min/Max Operating Current" to "Min/Max Operating Power" • Removed "Min/Max Operating Current" field in sink PDO for "Programmable Power Supply" PDO type
2.10	Minor update.
2.11	Minor update.
2.20	Minor update.
2.30	Minor update.
2.40	Minor update.
2.50	Minor update. GUI style update.

Revision history

Revision	Date	Description
**	2021-02-12	New document.
*A	2021-09-20	Updated to version 1.10. Updated the Quick start section with information from the USBPD-Sink code example.
*B	2022-09-22	Updated to version 1.20.
*C	2023-05-08	Updated to version 1.21.
*D	2024-01-19	Updated to version 1.30.
*E	2024-10-04	Updated to version 2.00.
*F	2024-12-05	Updated to version 2.10.
*G	2025-03-21	Updated to version 2.11.
*H	2025-08-19	Updated to version 2.20.
*I	2025-12-11	Updated to version 2.30.
*J	2026-03-21	Updated to version 2.40.
*K	2026-08-14	Updated to version 2.50.

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