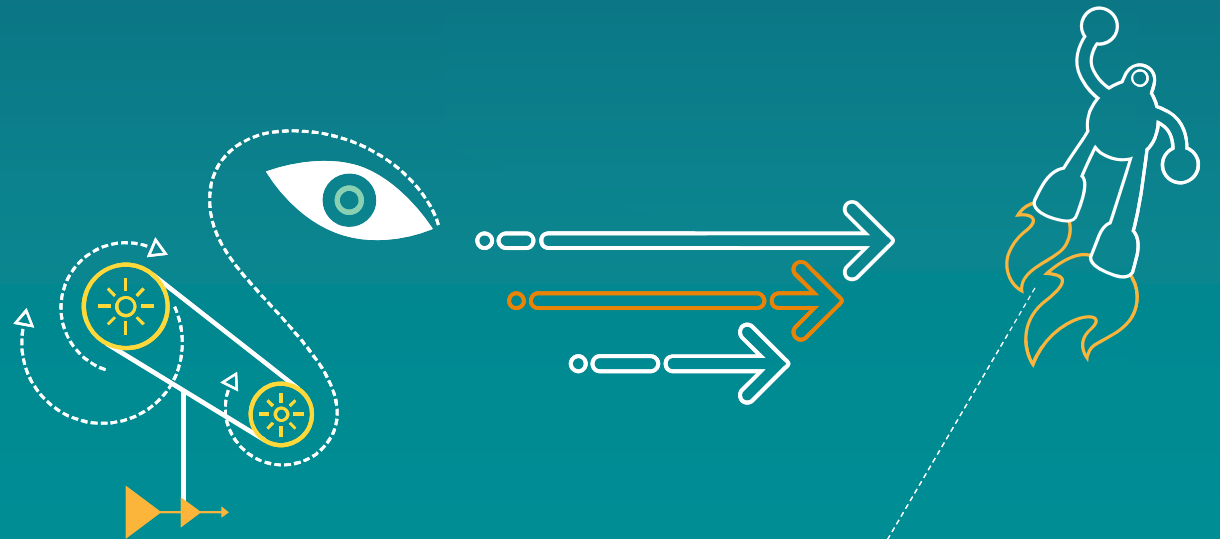
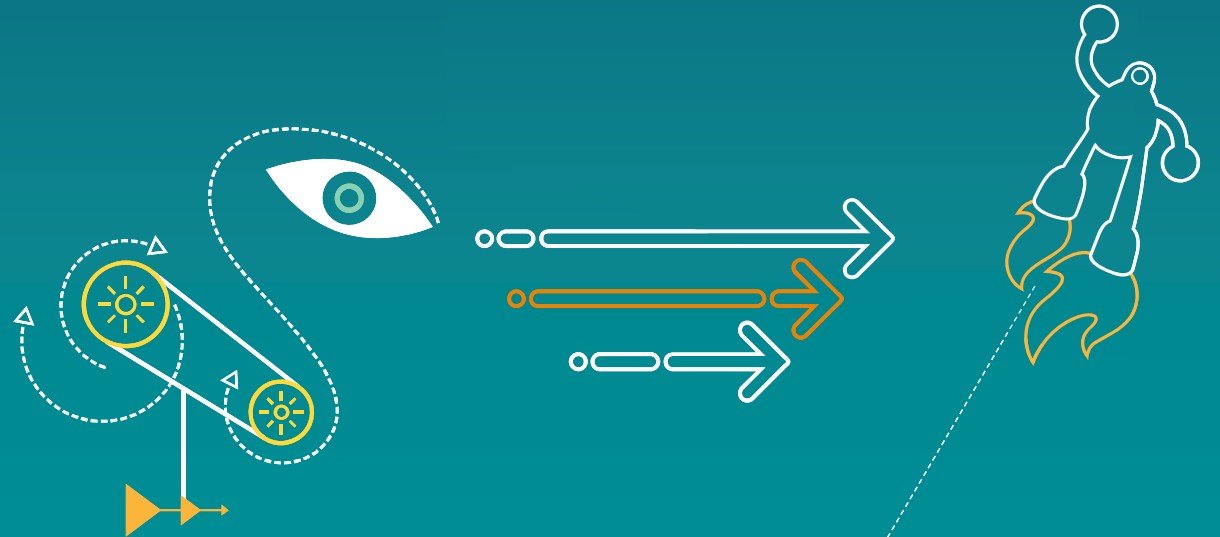

QACT v7.3 update



QACT contents

- I. QACT plugins & license package
- II. Module Discovery Wizard
- III. Custom Topology Designer
- IV. Diff/Merge Wizard
- V. Repair data collapse acdb files
- VI. Register and modify custom modules
- VII. QACT tool usage tips
 - I. Configure parameter range
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QACT plugins & license package



I. QACT plugins & license package

- Starting with QACT v7.3, QACT is now split apart into QACT_BASE and QACT_PLUGIN_* to enable mass-market distribution of QACT_BASE while enabling controlled license-based distribution of the QACT_PLUGIN_*'s, this tool product supports SM8125.LA.10 and beyond.
- Below are the relationships of each plugin, support feature and corresponding required license packet:

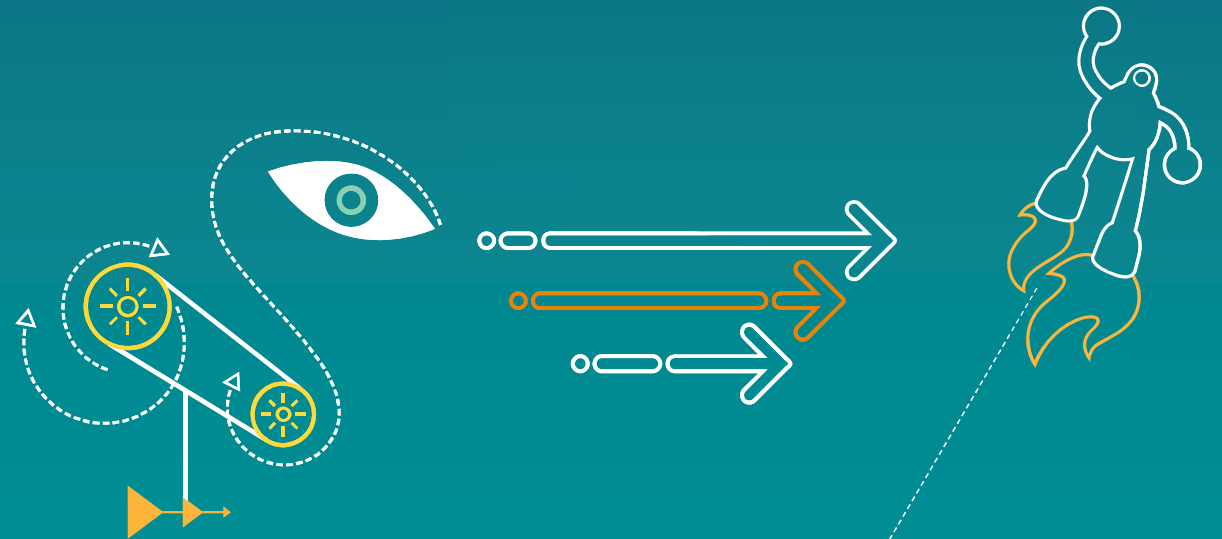
Tool Product	Content & Capability	Audio License Package (in addition to chipset)
QACT_BASE.WIN.7.3		This is not separately licensed and should be available via chipset Product Kit.
QACT_PLUGIN_WCD_WSA.WIN.7.3	ANC, SP	This is not separately licensed and should be available via chipset Product Kit.
QACT_PLUGIN_ADVANCED_VOICE.WIN.7.3	Fluence Pro	Advanced Voice Communication Package
QACT_PLUGIN_ESSENTIAL_VOICE.WIN.7.3	Fluence, Widevoice, Slowtalk, AANC (Handset), FENS	Essential Voice Communication Package
QACT_PLUGIN_VOICE_UI.WIN.7.3	SVA, MAD	Voice UI Voice Activation Package

I. QACT plugins & license package

QACT_PLUGIN_VOICE_SPEECH_ENH.WIN.7.3	LEC, MEC, FFECS	Voice UI Speech Enhancement Package
QACT_PLUGIN_THIRD_PARTY.WIN.7.3	3rd party algorithms distributed by QC (Google, Dolby, DTS)	This is not separately licensed and should be available via chipset Product Kit.
QACT_PLUGIN_OTHER.WIN.7.3	Audiosphere, Ambisonics	3D Audio Capture Package 3D Audio Ambisonic Capture Package 3D Audio Playback Package Audio Context Detection Package A

- Customer should sign or willing to sign specific license then they can get corresponding plugin and support. To apply for specific plugin, please refer to your sales for help.

Module Discovery Wizard



II. Module Discovery Wizard

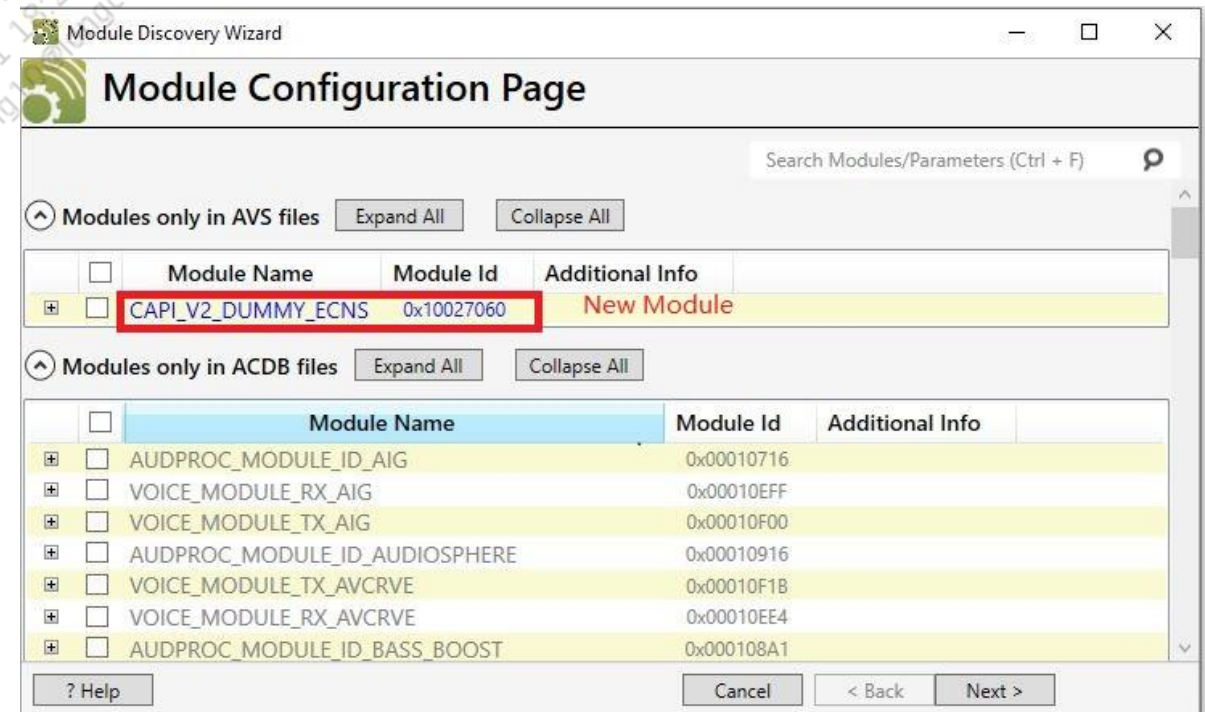
- Module Discovery Wizard provides the capability to add, delete, modify, and replace modules in ACDB files. The wizard takes the module definition files (AVS XML) as input and compares the modules with the definitions in the session to provide a summary of what modules can be changed in the ACDB files.
 - For built-in modules, the AVS XML put at <ADSP build>\adsp_proc\avs\build\h2xml_autogen\
 - For custom modules, it's generated after compiling and put at <ADSP build>\adsp_proc\avs\build\autogenerated\
- For WDSP, Module Discovery Wizard is supported for MSM8998/WCD9340 codec ACDB files and subsequent versions. For ADSP, it is supported for SDM845 v11.0.1 ACDB files and subsequent versions.



II. Module Discovery Wizard – Add a new module to ACDB

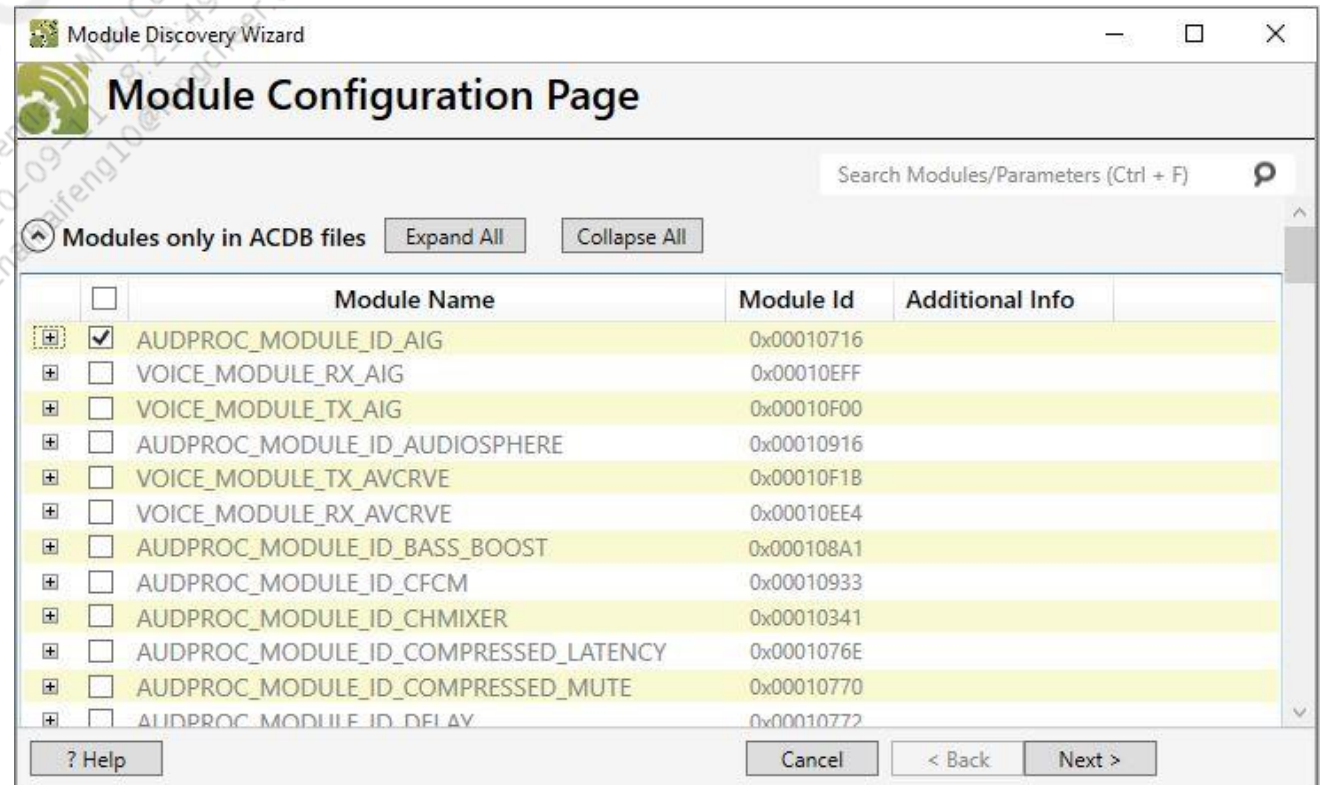
❏ To add a new module to an ACDB file:

1. Click **Tools** -> **Module Discovery Wizard**.
2. Click **Next**.
3. Click **Add**.
4. Select an AVS file and click Open. Multiple AVS files can be selected by holding **Ctrl**.
5. Click **Next**.
6. New modules (modules that are not currently in the open ACDB file) are listed under “Module only in AVS files”. Select the modules to add using checkboxes beside the module names.
7. Click **Next**.
8. The module(s) are added to the session and a summary of the updates is shown. Click **Finish** to close the wizard.



II. Module Discovery Wizard – Delete a module from ACDB

- ❑ To delete a module from ACDB
 1. Click **Tools** -> **Module Discovery Wizard**.
 2. Click **Next**.
 3. Click **Add**.
 4. Select an AVS file and click Open. Multiple AVS files can be selected by holding **Ctrl**.
 5. Click **Next**.
 6. Modules that can be deleted are listed under “Modules only in ACDB files”. Select the modules to delete using the checkboxes beside the module names.
 7. Click **Next**.
 8. The module(s) are deleted from existing topologies, use cases, and definitions and a summary of the updates is shown. Click **Finish** to close the wizard.



II. Module Discovery Wizard – Modify a module in ACDB

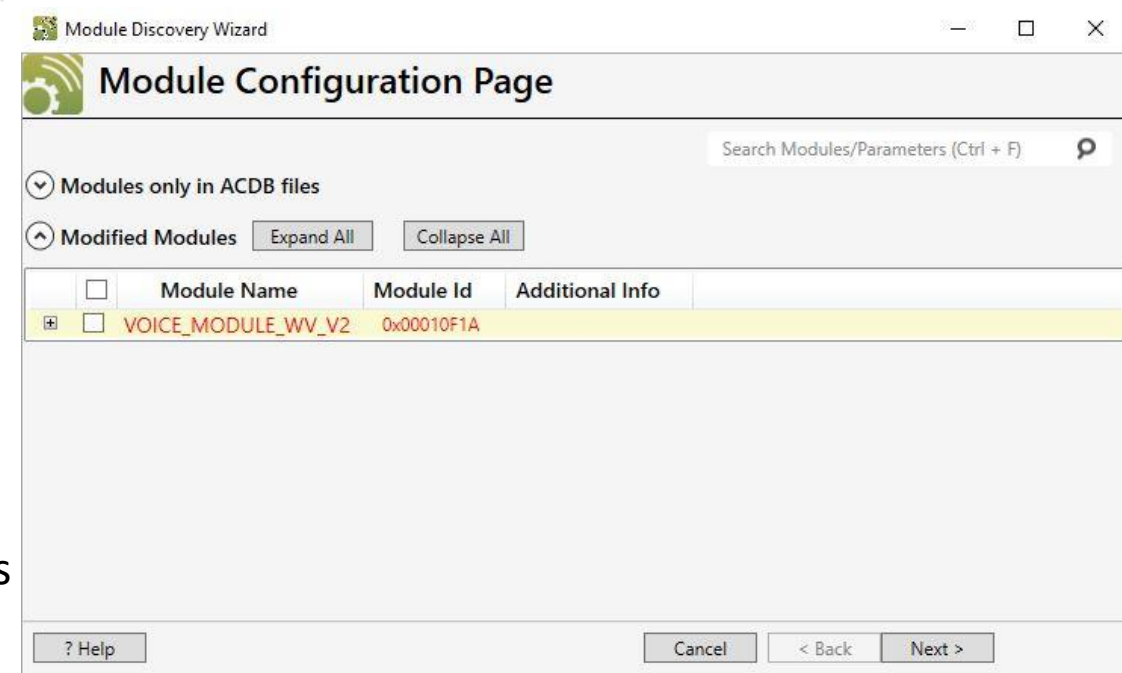
□ Modification includes the following changes to one or more parameters within a module:

- Upgrade a version
- Downgrade a version
- Add/delete parameter
- Change the default data
- Change the module name or description
- Change the tool policy of a module/parameter

II. Module Discovery Wizard – Modify a module in ACDB

□ To modify a module:

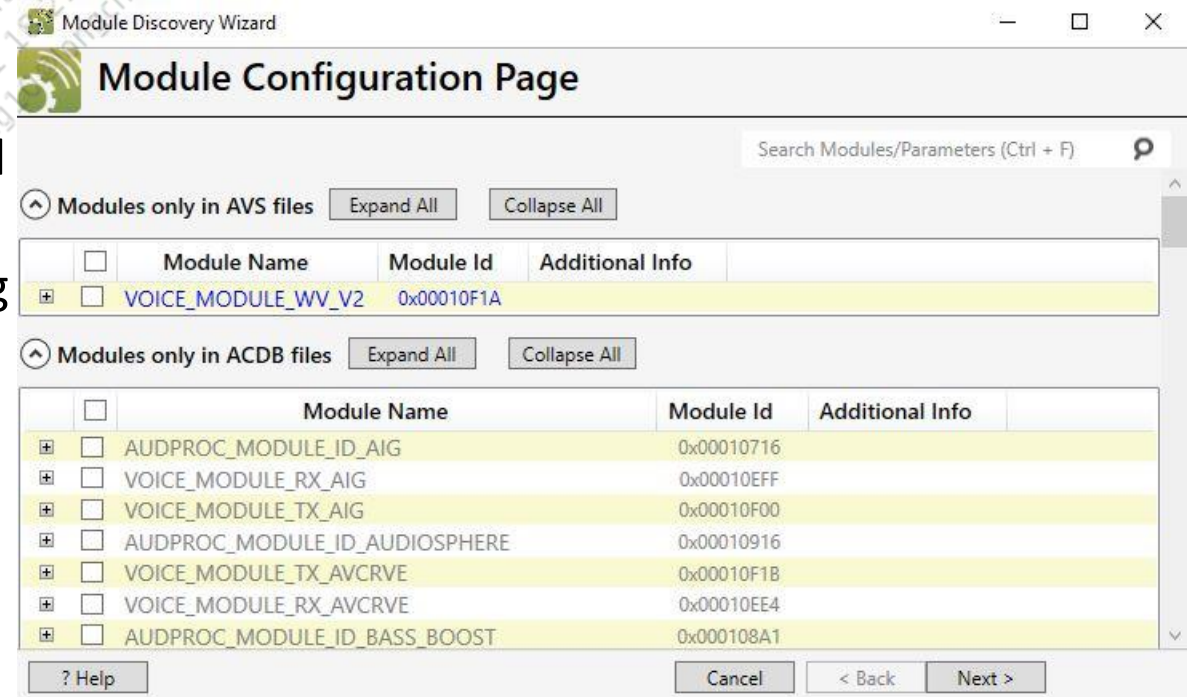
1. Click **Tools** -> **Module Discovery Wizard**.
2. Click **Next**.
3. Click **Add**.
4. Select an AVS file and click Open. Multiple AVS files can be selected by holding **Ctrl**.
5. Click **Next**.
6. Modules with available modifications are listed under “Modified Modules”.
 - Click **+** to see the parameter to be modified
 - Double click on an updated parameter to observe the differences in the UI
7. Select the modules to modify using the checkboxes beside the module names.
8. Click **Next**.
9. The module(s) are updated in all existing topologies, use cases, and definitions and a summary of the updates is shown. Click **Finish** to close the wizard.



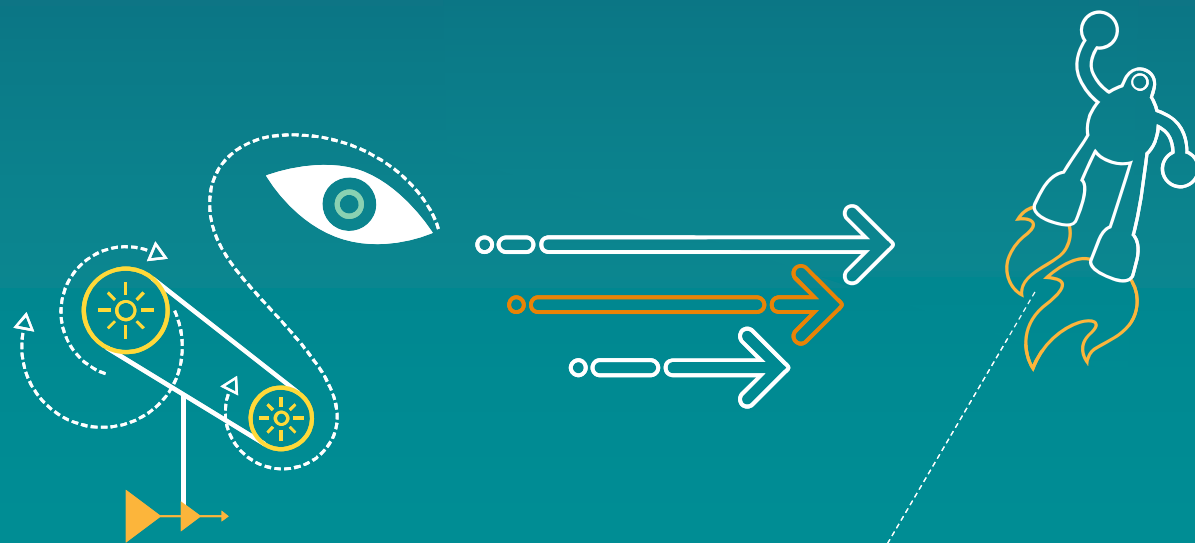
II. Module Discovery Wizard – Replace a module in ACDB

□ To replace a module:

1. Click **Tools** -> **Module Discovery Wizard**.
2. Click **Next**.
3. Click **Add**.
4. Select an AVS file and click Open. Multiple AVS files can be selected by holding **Ctrl**.
5. Click **Next**.
6. The modules that are checked under “Modules only in ACDB files” can be replaced only in AVS files”. To replace, click **Next**.
7. The module(s) are replaced in all existing topologies, use cases, and definitions and a summary of the updates is shown. Click **Finish** to close the wizard.

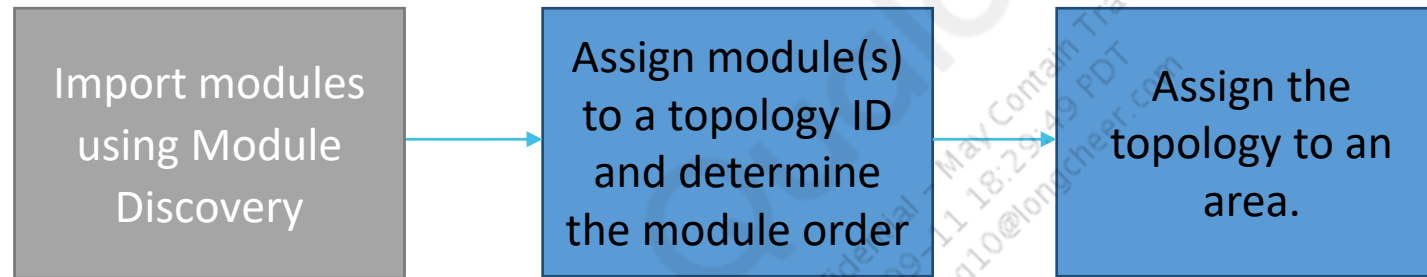


Custom Topology Designer



III. Custom Topology Designer – Workflow overview

The custom topology workflow is as follows:



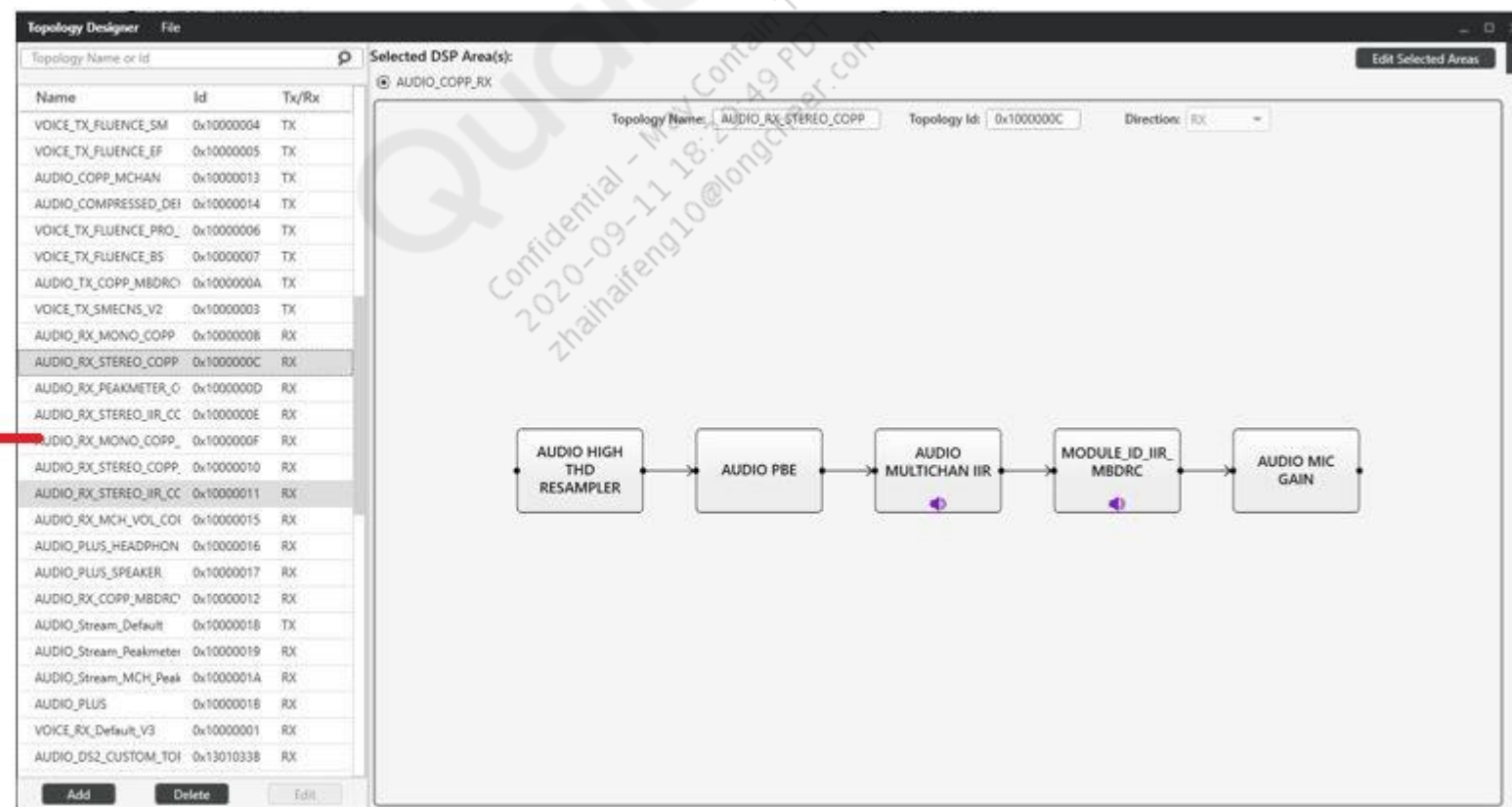
III. Custom Topology Designer - Assign a module to a topology

❏ Create a new topology

1. Select **Tools -> Topology Designer**. The Topology Designer window lists existing topologies that have been configured.

Search topology by
Name/ID

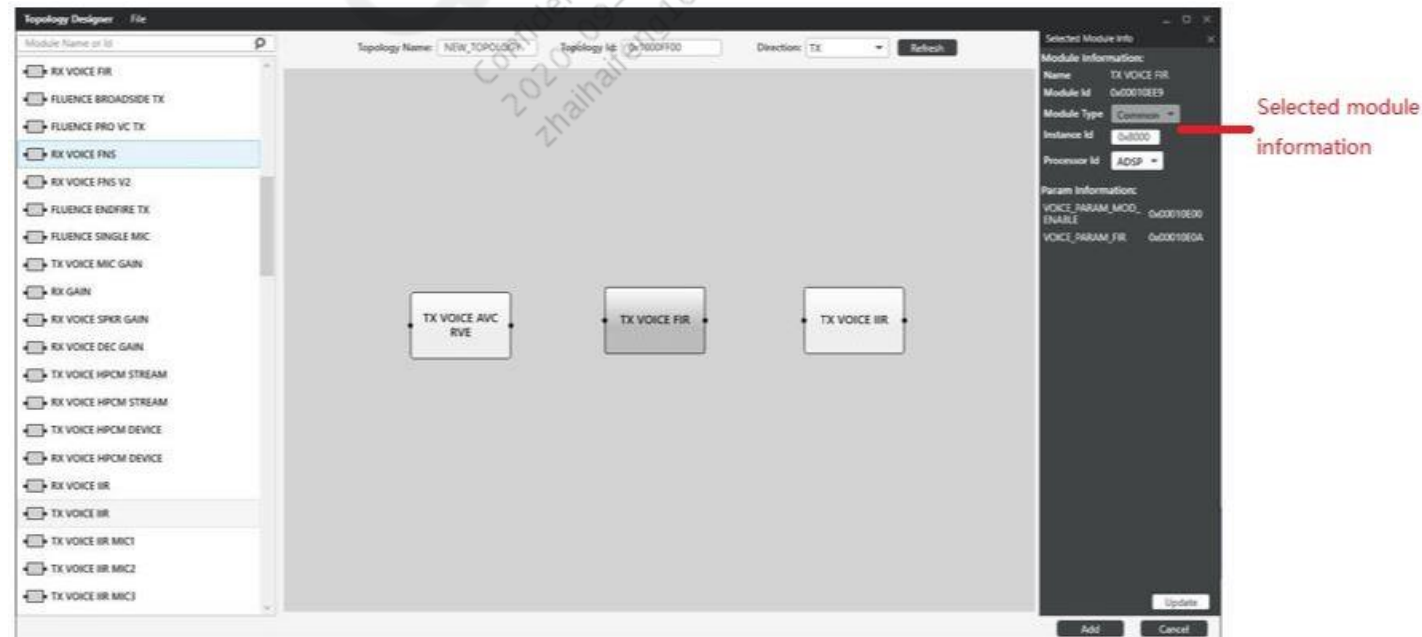
List of topologies
present in the files



III. Custom Topology Designer - Assign a module to a topology

❏ Create a new topology

2. Click **Add**.
3. Enter a name for the new topology in the **Topology Name** field.
4. Enter a hexadecimal topology ID in the **Topology ID** field.
5. Select TX or RX in the **Direction** field. The module list will provide with QTI default modules and custom modules have created.
6. Drag all required modules to the center.



III. Custom Topology Designer - Assign a module to a topology

❑ Create a new topology

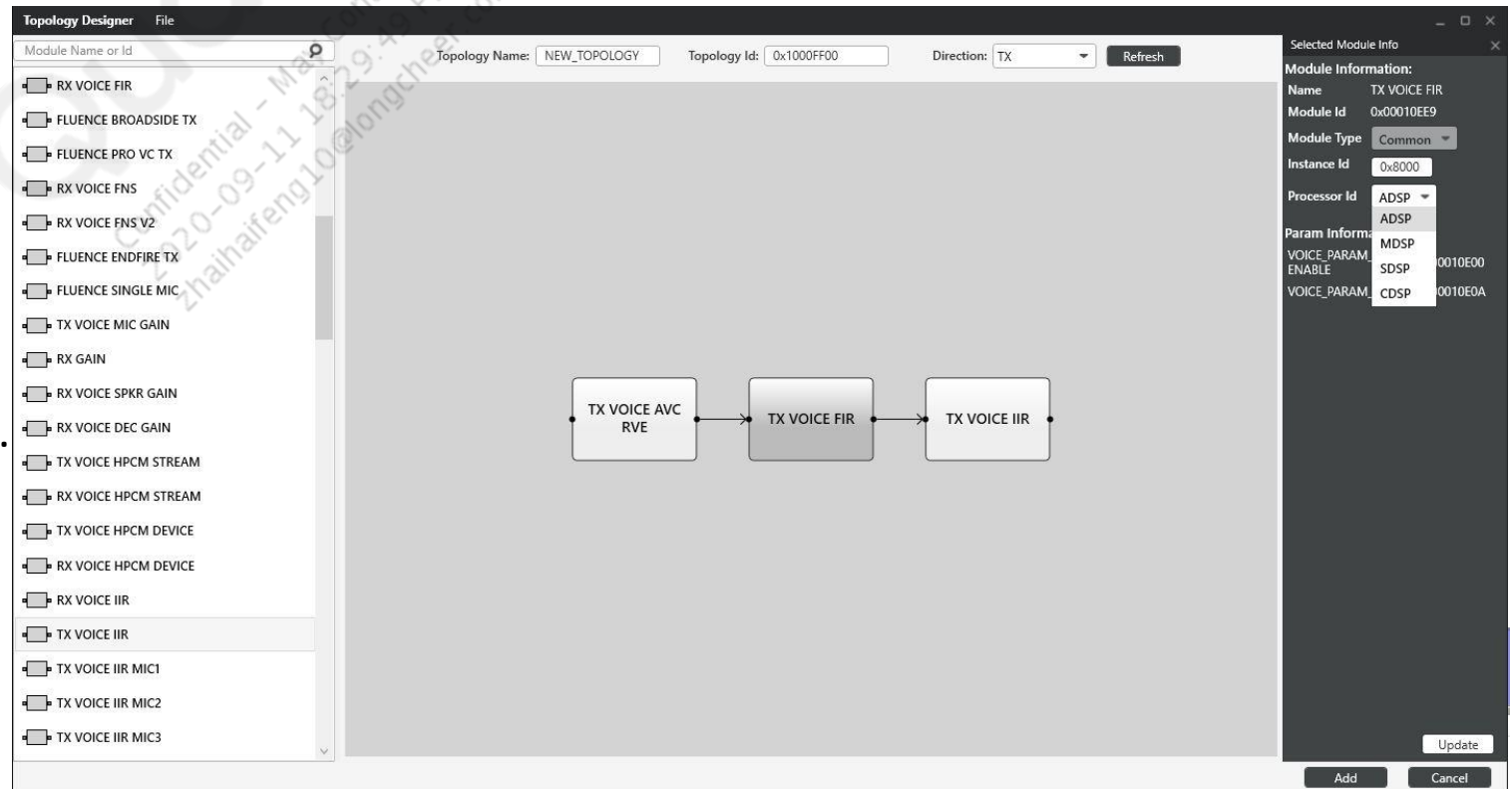
7. Associate the module sequence in the topology by dragging the output pin of one module to the input pin of another module.
8. Click **Add** to create the newly configure topology.
9. Click **File** -> **Save as** and save the new topology in the workspace .qwsp format.



III. Custom Topology Designer - Assign a module to a topology

□ Edit a topology

1. Click to select a topology that you want to edit from the left side of the topology designer window.
2. Right click on module and select **Delete Node** to delete the module.
3. Right click on connection and select **Delete Connection** to delete the connection.
4. Drag connection from one module to another to update the module sequence.
5. Select a module to edit the module type, module instance and processor ID.

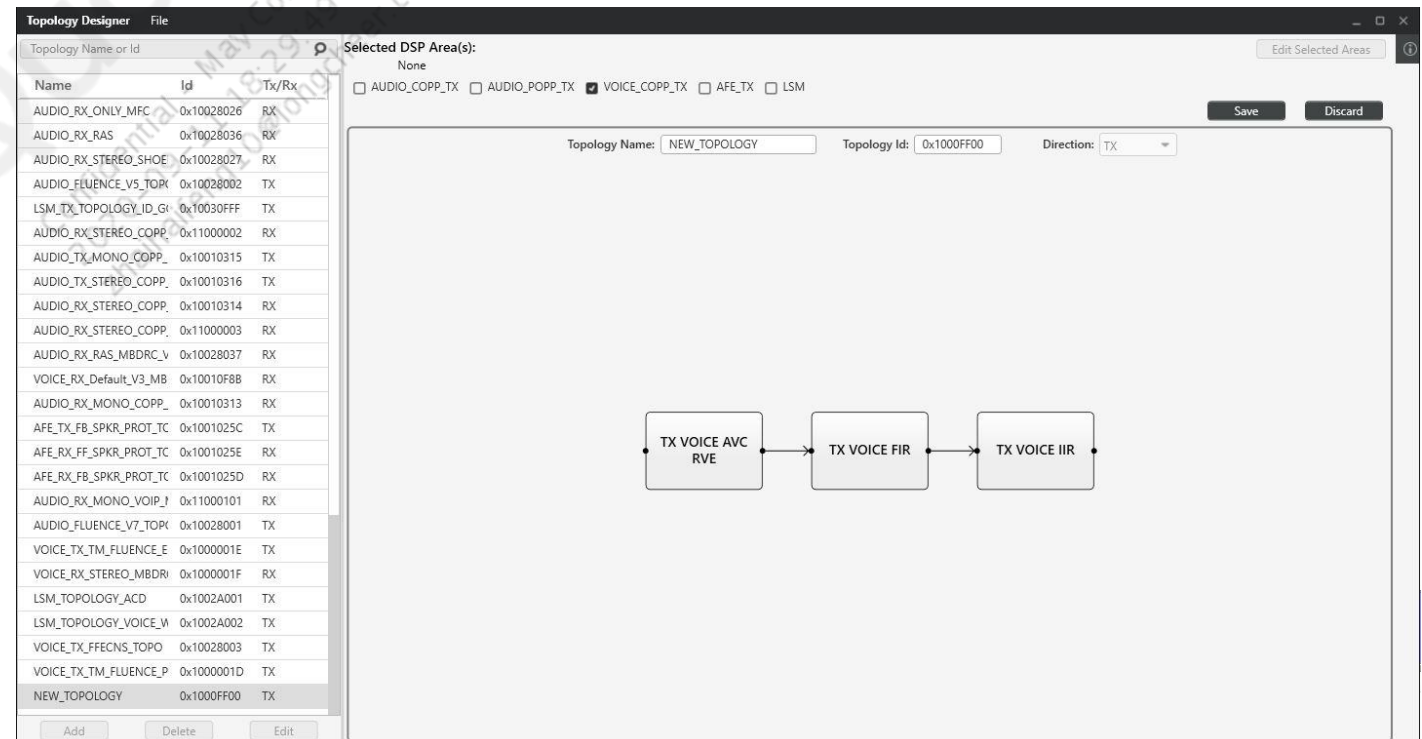


III. Custom Topology Designer - Assign a topology to an area

- ❑ Assigning a topology to an area determines what topologies are visible for each DSP area and how calibration data is placed when new devices and device pairs are created (whether data is placed in the gain-independent or gain-dependent table for each DSP area).
- ❑ Available DSP areas are:
 - AUDIO_COPP_TX
 - AUDIO_COPP_RX
 - AUDIO_POPP_TX
 - AUDIO_POPP_RX
 - VOICE_COPP_TX
 - VOICE_COPP_RX
 - AFE_TX
 - AFE_RX
 - AFE_TX_FB
 - AFE_RX_FB
 - AFE_TX_MAD
 - AFE_RX_MAD

III. Custom Topology Designer - Assign a topology to an area

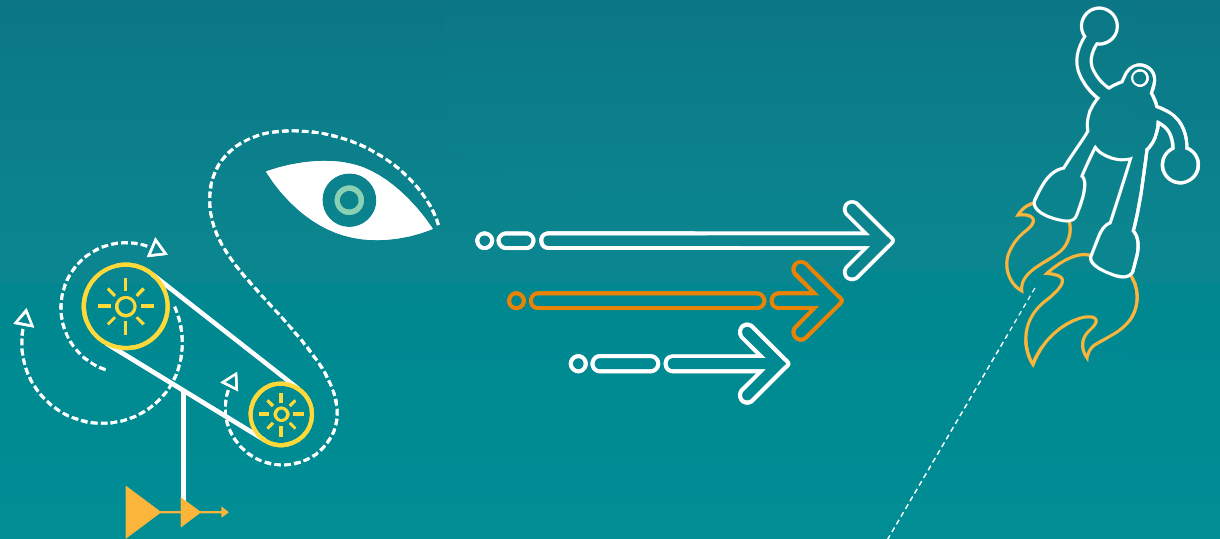
- ❑ Add a topology to a DSP area
 1. Click **Tools -> Topology Designer**.
 2. Select the topology which needs to be added to an area.
 3. Click on **Edit Selected Area** to list the available areas.
 4. Check all the required areas to be added and click **Save**.



III. Custom Topology Designer - Assign a topology to an area

- ❑ Change a module's gain dependency
 1. Click **Tools** -> **Topology Designer**.
 2. Select the topology and select the area in **Selected DSP area(s)**.
 3. Click on **Edit**.
 4. Select the module to edit the module type.
 5. Select the module type from the drop-down menu.
 6. Click **Update** to save the changes.
 7. Repeat steps 3-5 for other modules.
 8. Click **Save** to complete.

Diff/Merge Wizard



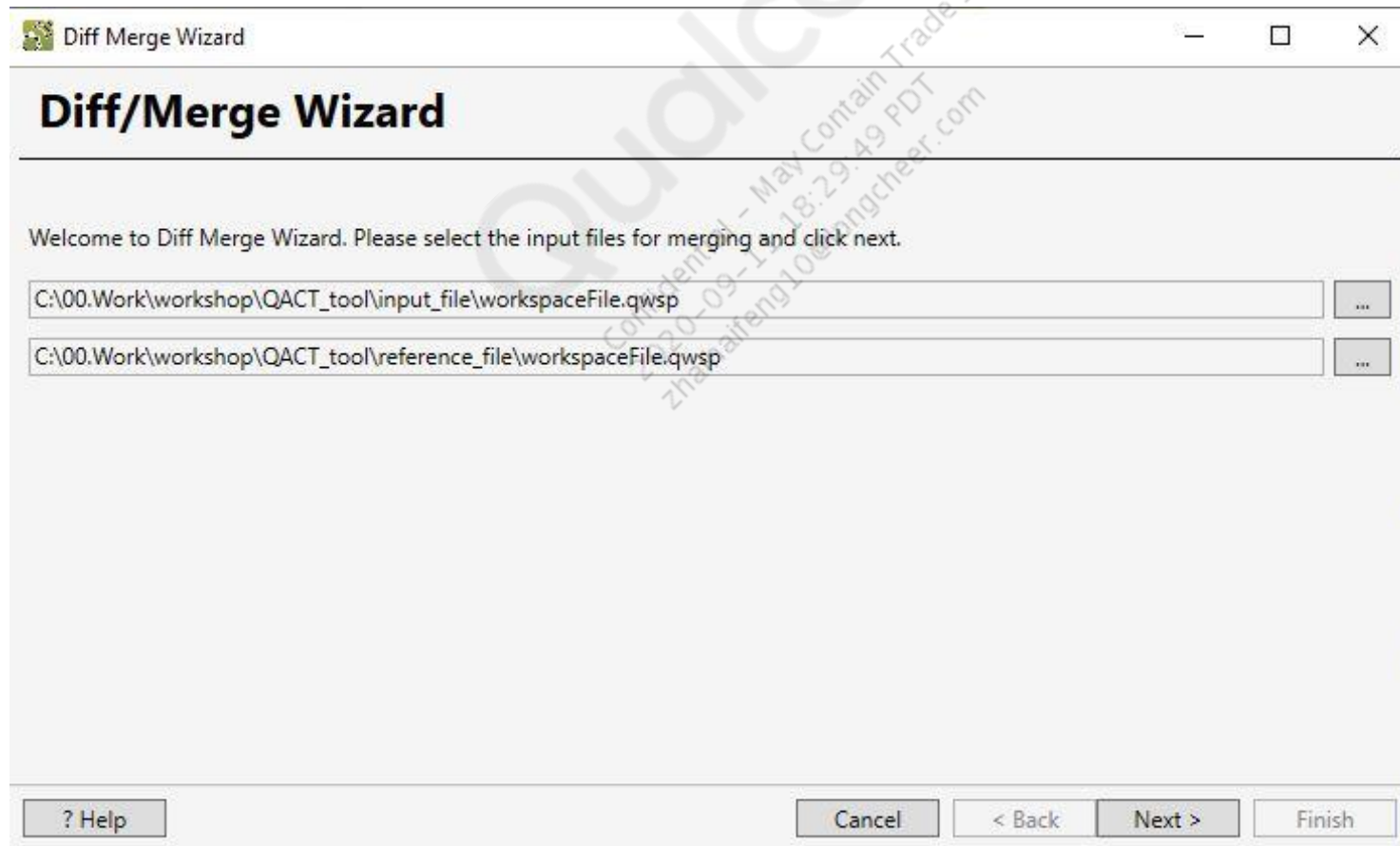
IV. Diff/Merge Wizard

- The Diff/Merge Wizard supports the capability to add, delete, and update the supported topologies in ACDB files. The wizard takes a reference workspace file and compares it with the definitions of an input file to provide a summary of the topologies that can be added/deleted/updated in the ACDB files.
- This feature is supported for SDM845 v11.0.1 ACDB files and subsequent versions.



IV. Diff/Merge Wizard

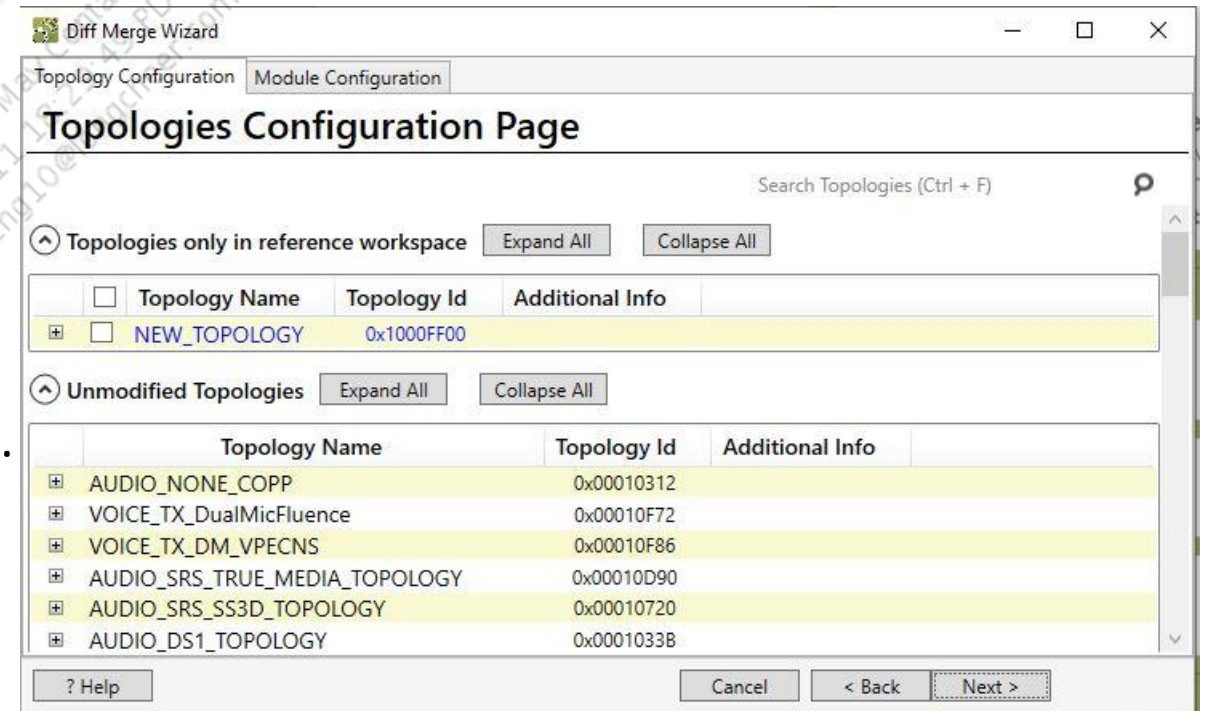
- Add a new topology to ACDB
 1. In the QACT main window, click **Diff/Merge ACDB files**.



IV. Diff/Merge Wizard

- Click ... and select the input ACDB file.
- Click ... and select the reference ACDB file.
- Click **Next**.
- Select **Merge topology/use case/module definitions**.
- Select the reference file from the dropdown menu.
- Select **ADSP**.
- Click **Next**.
- In the “Topologies only in reference workspace” section, select the topologies to add.
- Click **Next**.

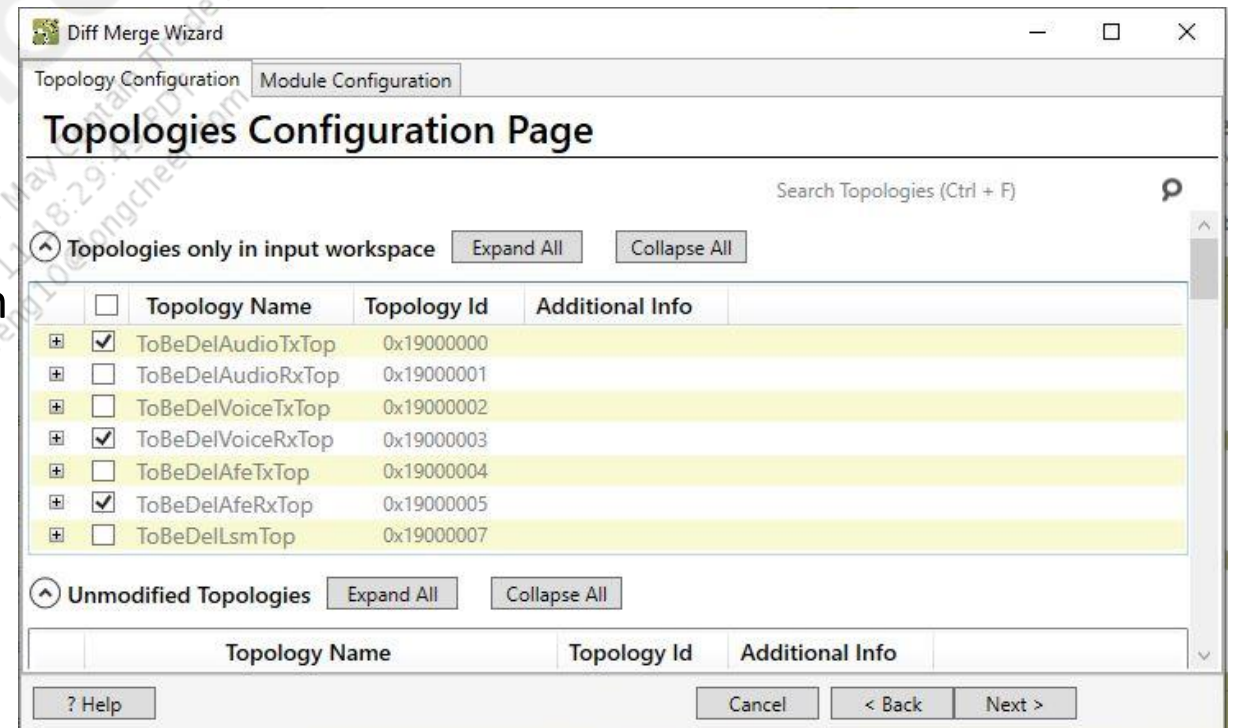
The selected topologies are added to the input workspace file and a summary of the updates is shown in the wizard.



IV. Diff/Merge Wizard

- Delete a topology from ACDB
 1. In the QACT main window, click **Diff/Merge ACDB files**.
 2. Click ... and select the input ACDB file.
 3. Click ... and select the reference ACDB file.
 4. Click **Next**.
 5. Select **Merge topology/use case/module definitions**.
 6. Select the reference file from the dropdown menu.
 7. Select **ADSP**.
 8. Click **Next**.
 9. In the “Topologies only in reference workspace” section, select the topologies to delete.
 10. Click **Next**.

The selected topologies are deleted from existing devices/areas and a summary of the update is be shown. For the displayed devices, the NONE topology is assigned as the new topology.



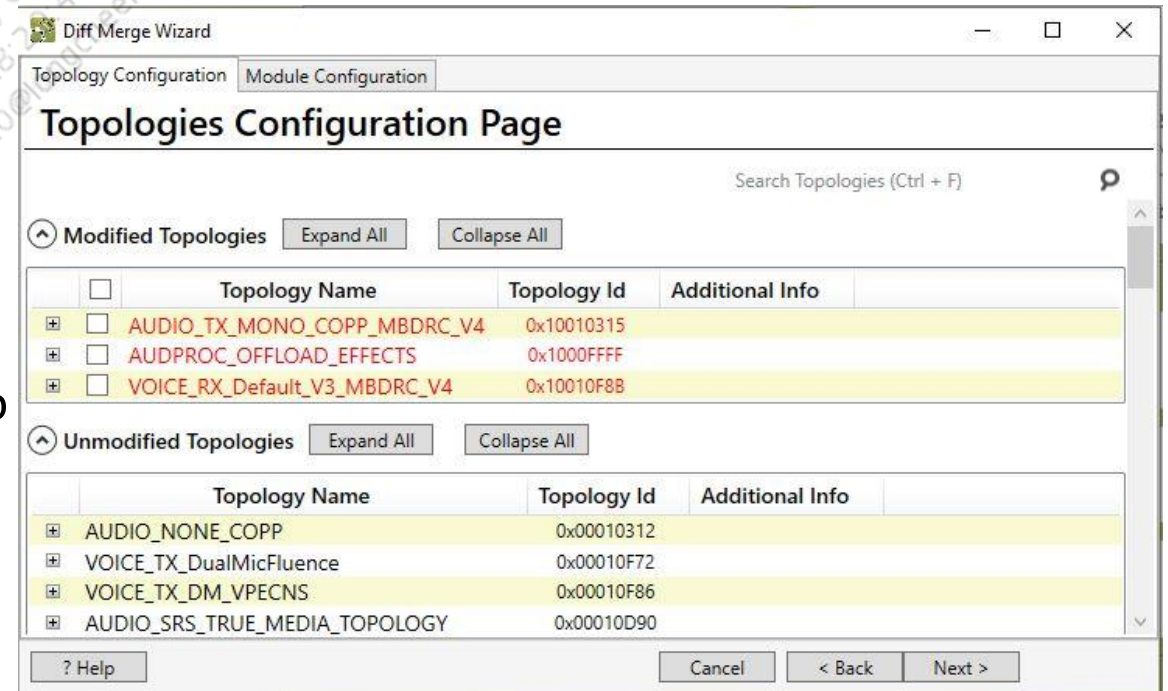
IV. Diff/Merge Wizard

- Modification includes the following changes:
 - Upgrade a module
 - Downgrade a module
 - Add/delete modules
 - Change module data (for example, the default data for parameters or the tool policy of a module/parameter)
 - Change topology information (for example, the name or description)

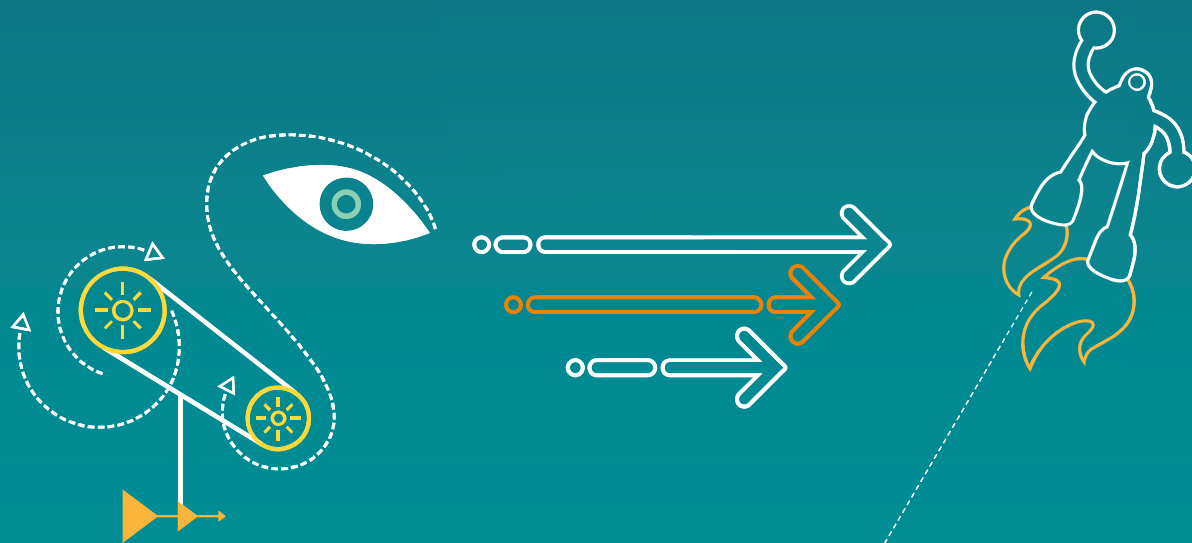
IV. Diff/Merge Wizard

- To modify a topology:
 1. In the QACT main window, click **Diff/Merge ACDB files**.
 2. Click ... and select the input ACDB file.
 3. Click ... and select the reference ACDB file.
 4. Click **Next**.
 5. Select **Merge topology/use case/module definitions**.
 6. Select the reference file from the dropdown menu.
 7. Select **ADSP**.
 8. Click **Next**.
 9. In the “Modified Topologies” section, click + to expand the list of topologies. Differences between the input and reference are marked in red.
 10. Select the topologies to modify.
 11. Click **Next**.

The topologies are modified from existing devices and a summary of the update is be shown.



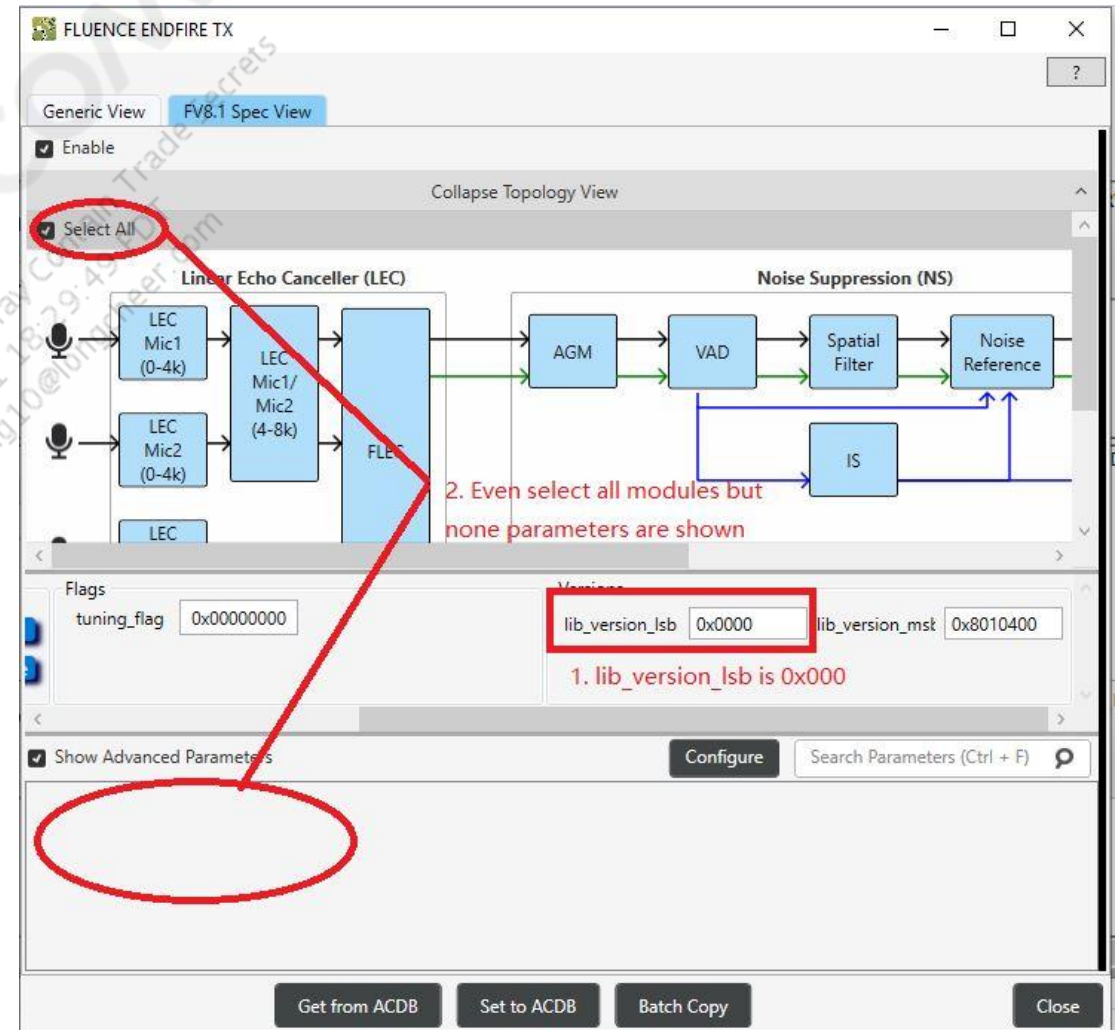
Repair data collapse acdb files



V. Repair data collapse acdb files

Sometimes due to incorrect operation the data in acdb files will collapse and cause the module abnormal.

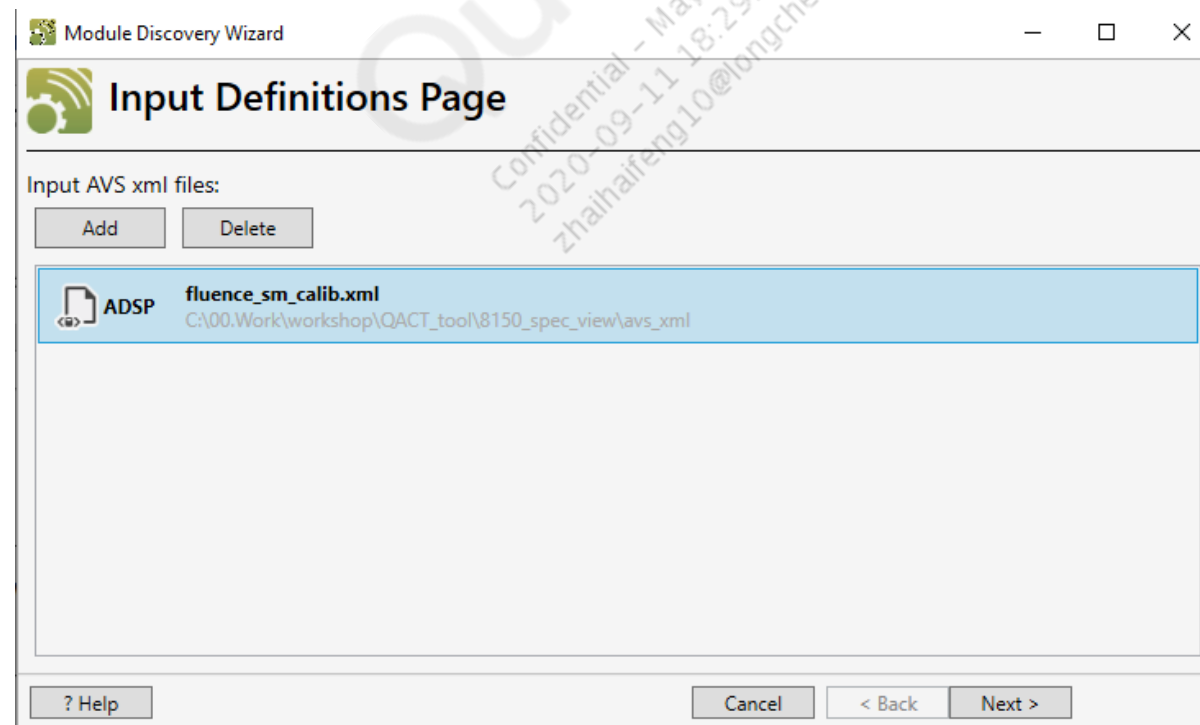
- For example:
See picture on the right
- In this situation we need to repair data collapse acdb files by loading AVS files.



V. Repair data collapse acdb files

□ Repair by loading AVS files

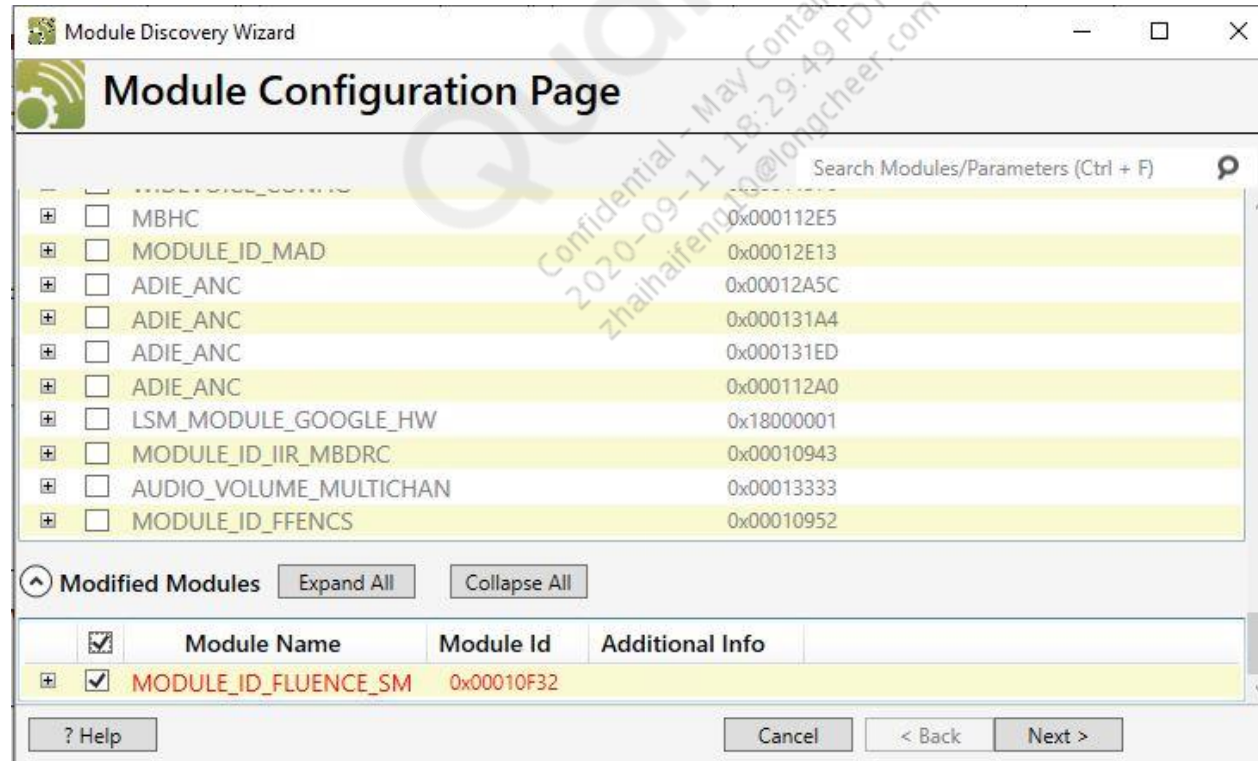
- Follow the steps of “add a new module to ACDB file” in “Module Discovery Wizard” chapter.
- In step#4, load the corresponding AVS files got from <ADSP build>\adsp_proc\avs\build\h2xml_autogen\.



V. Repair data collapse acdb files

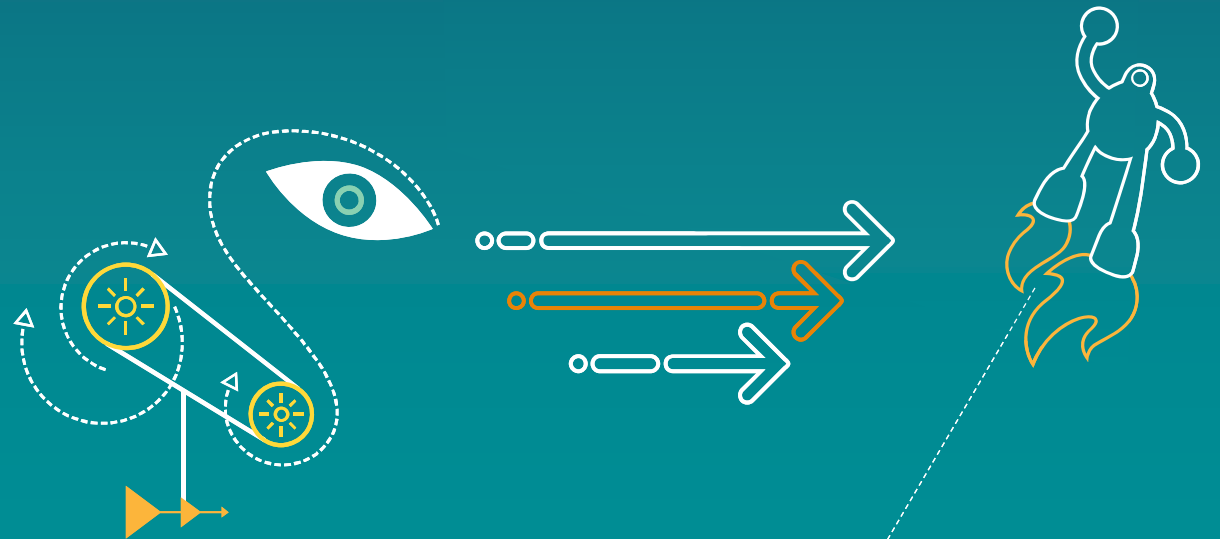
□ Repair by loading AVS files

- Click **Next**.
- In the “Modified Modules” session, select the module you want to Repair.



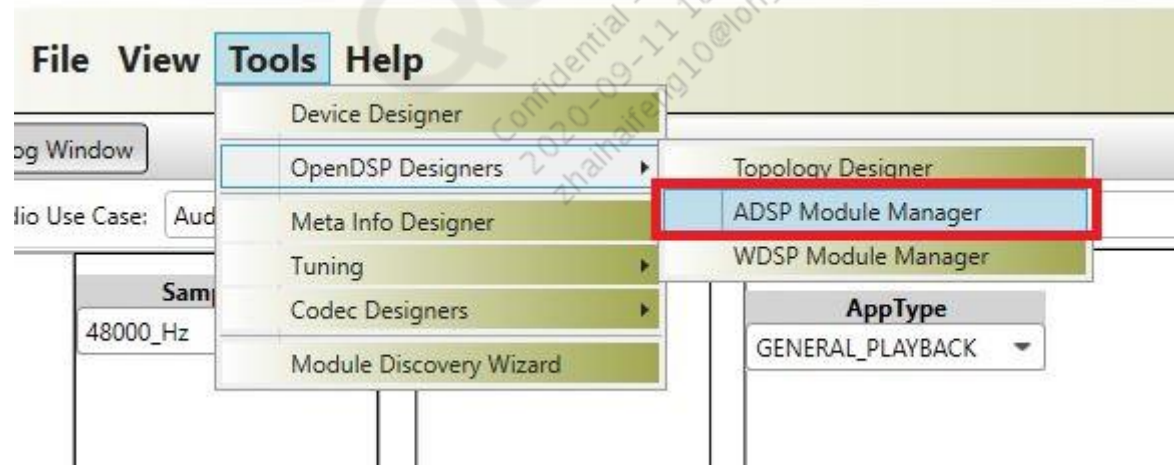
- Click **Next** and the collapse module is repaired.

Register and modify custom modules



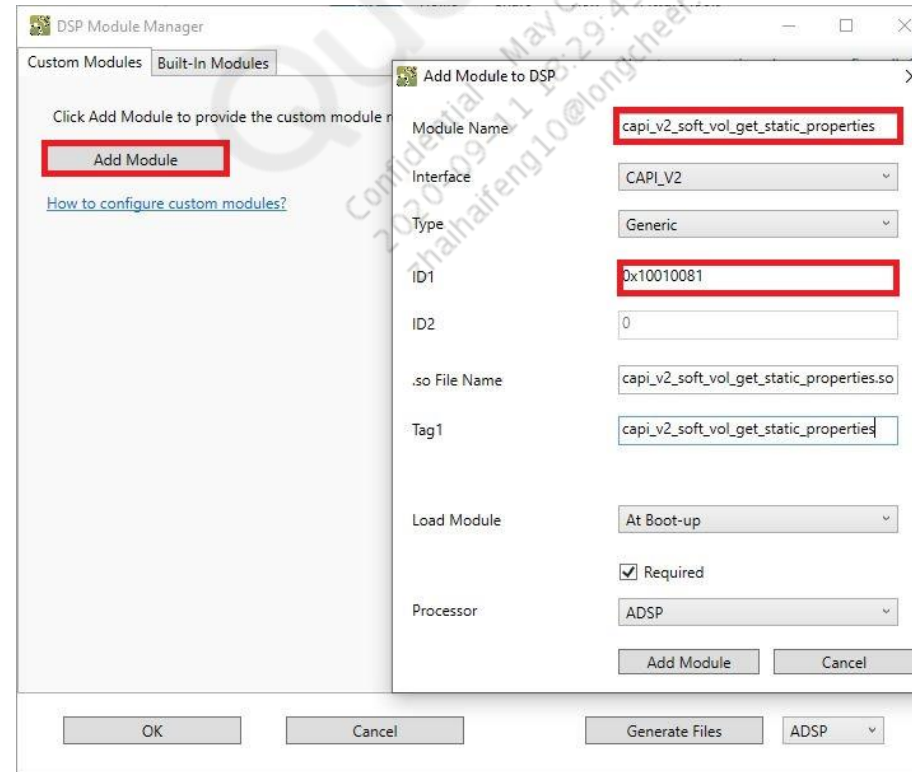
VI. Register and modify custom modules

- ❑ Please follow 80-nf774-43 to integrate 3rd party algorithm into DSP and generate XML file.
- ❑ To register and modify custom modules
 1. Click **Tools** -> **OpenDSP Designers** -> **ADSP Module Manager** to open the ADSP Module Manager.



VI. Register and modify custom modules

- ❑ To register and modify custom modules
 2. Select the **Custom Modules** tab.
 3. Click **Add Module**.
 4. Enter a unique name in the Module Name field.
 5. Select one of the following interfaces (see subsections below for more information on each interface):
 - APPI
 - CAPI
 - CAPI_v2



VI. Register and modify custom modules

❑ To register and modify custom modules

6. Follow below guidance in below subsections to configure other interfaces and click **Add Module**. The new module will be added to the module list.

```
38 /**
39  * Get static properties of soft_vol module such as
40  * memory, stack requirements etc.
41  * See Elite_CAPI_V2.h for more details.
42  */
43 capi_v2_err_t capi_v2_soft_vol_get_static_properties(
44     capi_v2_proplist_t *init_set_properties,
45     capi_v2_proplist_t *static_properties);
46
47 /**
48  * Instantiates(and allocates) the module memory.
49  * See Elite_CAPI_V2.h for more details.
50  */
51 capi_v2_err_t capi_v2_soft_vol_init(
52     capi_v2_t *pif,
53     capi_v2_proplist_t *init_set_properties);
54
```

The 'Add Module to DSP' dialog box is shown with the following fields and values:

- Module Name: <Enter module name>
- Interface: CAPI_V2
- Type: Generic
- ID1: <Enter module ID>
- ID2: 0
- .so File Name: <Enter .so file name>
- Tag1: <Enter Tag>
- Load Module: On Demand
- Required: ☒
- Processor: ADSP

Red boxes highlight the 'Type' dropdown and the 'capi_v2_soft_vol_get_static_properties' function name in the code. Red arrows point from these boxes to the 'Type' dropdown and the 'Tag1' field in the dialog box.

The 'Add Module to DSP' dialog box is shown with the following fields and values:

- Module Name: capi_v2_soft_vol_get_static_properties
- Interface: CAPI_V2
- Type: Generic (dropdown menu is open showing options: Generic, Encoder, Decoder, Converter, Packetizer)
- ID1: <Enter module ID>
- ID2: 0
- .so File Name: capi_v2_soft_vol_get_static_properties.so
- Tag1: capi_v2_soft_vol_get_static_properties
- Load Module: At Boot-up
- Required: ☒
- Processor: ADSP

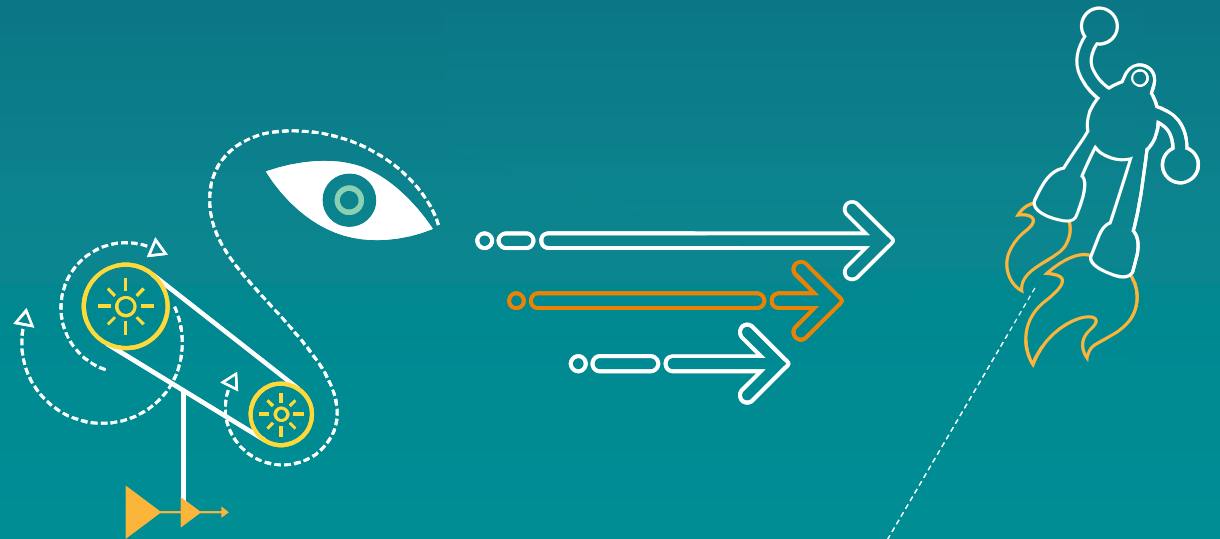
The 'Type' dropdown menu is open, showing the following options: Generic, Encoder, Decoder, Converter, and Packetizer. The 'Generic' option is selected.

VI. Register and modify custom modules

- ❑ To register and modify custom modules
 - 7. Click **File** -> **Save** or **File** -> **Save as** to save as the acdb files. QACT will generate the new adsp_avs_config.acdb file and add it to the workspace file.
 - 8. Push the file to **/etc/acdbdata/** on the target. The file must be stored in this location.

	Linux
ADSP_LIBRARY_PATH(path to where all .so files are pushed)	/system/vendor/lib/rfsa/adsp
ADSP_AVS_CFG_PATH(path to where adsp_avs_config.acdb is pushed)	/etc/acdbdata

QACT usage Tips



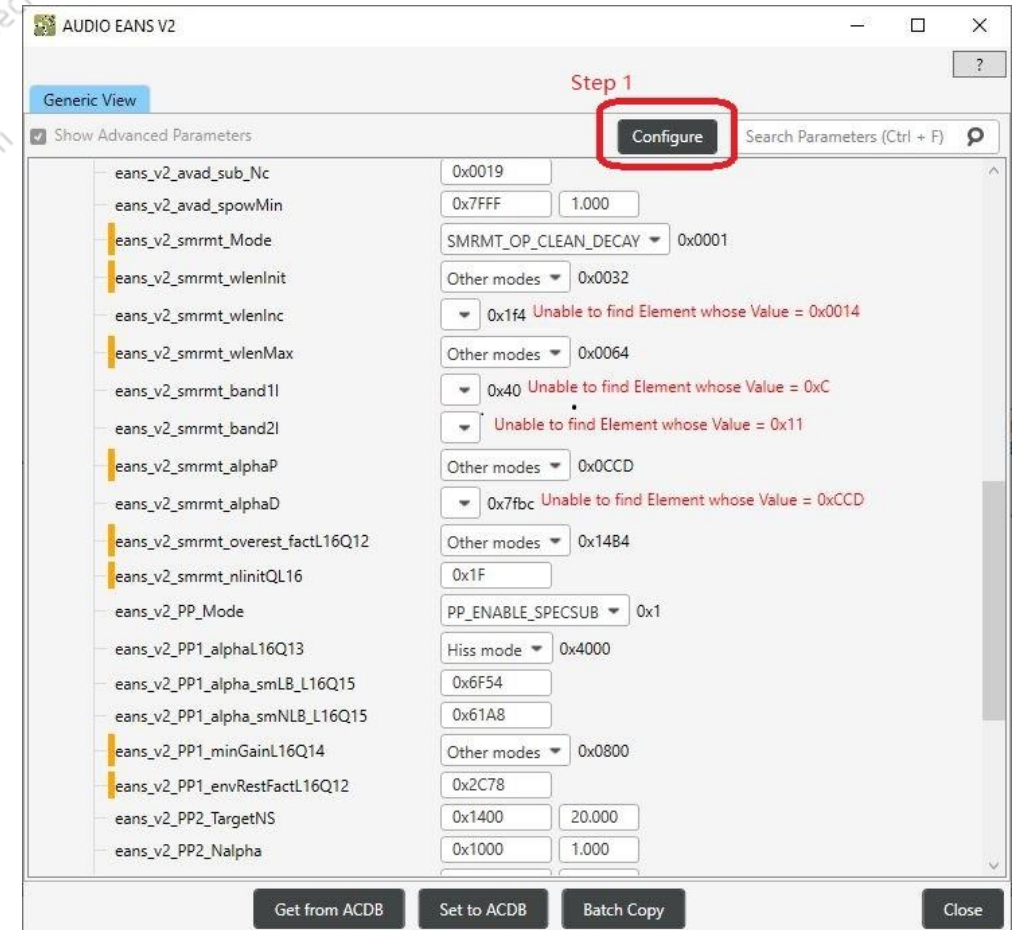
VII. QACT usage Tips

- Configure parameter range
- Quickly find the device by search ID
- Search parameter within module

Qualcomm
Confidential - May Contain Trade Secrets
2020-09-11 18:29:49 PDT
zhaihaifeng10@longcheer.com

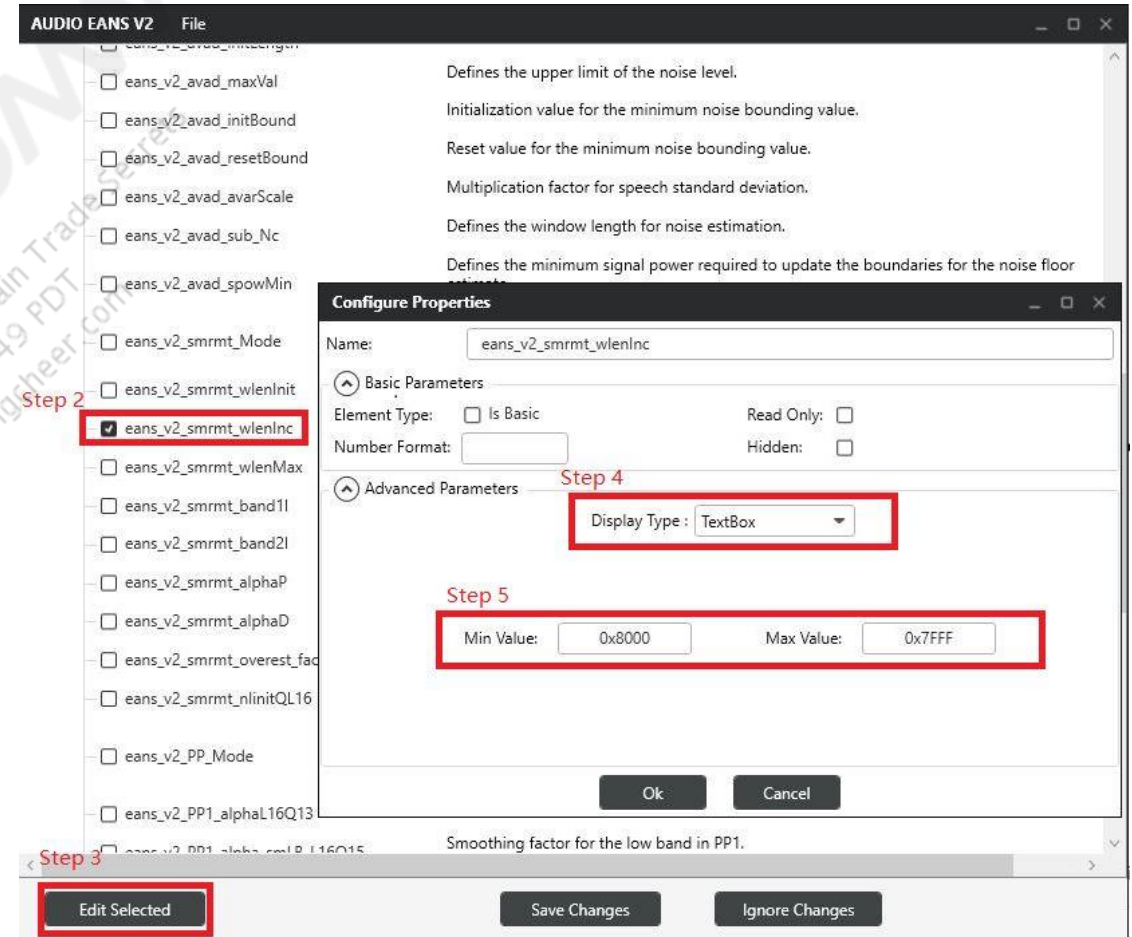
VII. QACT usage Tips – Configure parameter range

- Sometimes when we copy golden defaults to modules it fails due to exceed parameter range, in this case we need to re-configure parameter range.
 - Click **Configure** to open configuration table



VII. QACT usage Tips – Configure parameter range

- Select the parameter you want to edit
- Click **Edit Selected**
- In the open window, you can edit the property of parameter, to change the range of the parameter, you should select **TextBox** in the dropdown menu and change the **Min Value** or **Max Value** to your expectation.



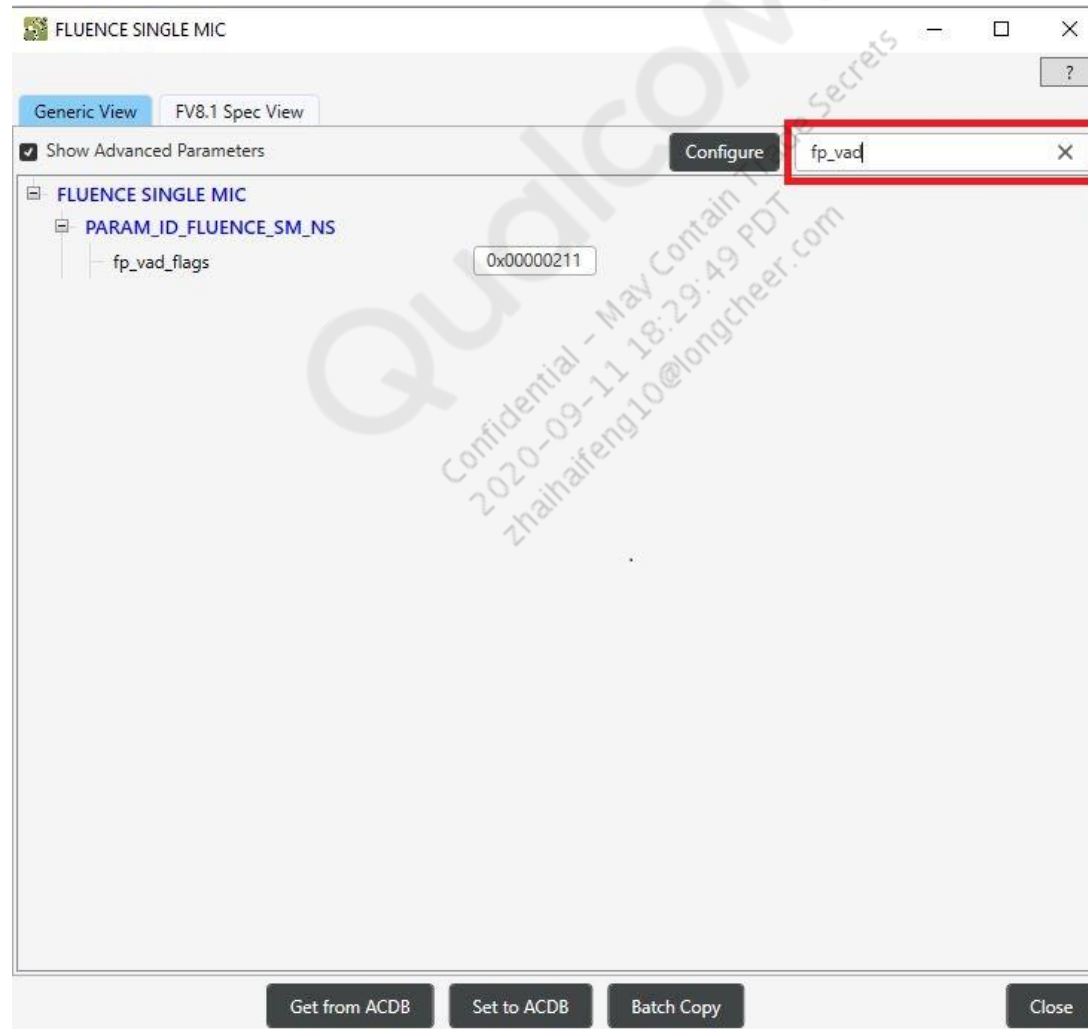
VII. QACT usage Tips – Quickly find device by search ID

- In the Device Designer, you can quickly find the device in device list by search its id.

The screenshot displays the 'DeviceDesigner' application window. At the top, a tabbed interface includes 'Device Designer', 'DevicePair Designer', 'ANCDevicePair Designer', 'AdaptiveANC DevicePair Designer', 'Audio EC DevicePair Designer', 'AFE SpkrFeedback Pair Designer', 'APQ-MDM Device Mapping', 'Volume Levels', 'Config', and 'Audio F'. The 'Device Designer' tab is active. On the left, a 'Search Device:' text box contains the number '4' and is highlighted with a red border. Below it, a tree view shows 'Device_List' expanded, with 'HANDSET_MIC' selected. The main panel on the right is divided into several sections: 'Device Category' (set to 'Handset'), 'Common Device Information' (with 'Device ID' set to '0x00000004' and 'Device Type' set to 'SIMPLE_DEVICE_TYPE'), 'Target Specific Information' (containing checkboxes for sample rates and channel configurations), 'Support WDSP' (with a 'WDSP Configuration' button), 'Support Listen' (with 'Low Power Listen' and 'High Power Listen' checkboxes), 'Support Spkr Prot FB' (with a checkbox), and 'Topology Information' (with 'Voice COPPT TopologyID' set to 'VOICE TX SM ECNS V2'). At the bottom right, 'OK' and 'Cancel' buttons are visible.

VII. QACT usage Tips – Search parameter within module

- You can search specific parameter within module to quickly find it.



Thank you

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