Product – ADC™ v11 and v12

Topic: Evertz QMC Master Control Switcher & Evertz QMC for DVE and Logo SubDev Driver

Release Date: 1-May-2014

Revision History

<table>
<thead>
<tr>
<th>Revision</th>
<th>Protocol</th>
<th>Date</th>
<th>Author</th>
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<tbody>
<tr>
<td>1.9</td>
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<td>5/1/2014</td>
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<td>Rebrand</td>
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<td>1.8</td>
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<td>6/18/2012</td>
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<td>Merge in changes from edits done to previous 1.3 and 1.5 versions that were done out of sync with the versions 1.6 and 1.7.</td>
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<tr>
<td>1.7</td>
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<td>4/10/2012</td>
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<td>ADC v12.18 added &quot;End Key Hold&quot; functionality to the Operations section. Expanded Backup config to add Input/Output mapping.</td>
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<tr>
<td>1.6</td>
<td></td>
<td>4/14/11</td>
<td>QA</td>
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<td>For clarity, the Evertz Sub Device List Assignment Note has been moved to its own sub heading (List Assignment) beneath section &quot;Configure the EvertzQMC for DVE&amp;Logo SubDev Driver&quot;, and example graphics added.</td>
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<tr>
<td>1.5</td>
<td></td>
<td>12/17/10</td>
<td>Product Marketing</td>
<td></td>
<td>Updated Audio Swap control. Added Driver Overview and Driver Limitations sections.</td>
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<tr>
<td>1.4</td>
<td></td>
<td>11/12/10</td>
<td>Product Marketing</td>
<td></td>
<td>Updated Screen captures and information throughout User Note</td>
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<tr>
<td>1.3</td>
<td></td>
<td>7/13/10</td>
<td>Jhighet</td>
<td></td>
<td>Added additional information throughout user note to make current with v11.53.18 Device</td>
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</table>
### Description

The Evertz QMC Master Control Switcher includes an integrated Logo Generator and DVE. This driver is based upon the legacy M2100 and the unique extensions added by Quartz / Evertz. Two device drivers are necessary to control all of the functionality upon the Evertz MCS device. The two drivers will use 2 Device Server channels and one Serial connection. It is not mandatory to configure the Sub Device driver if you’re only interested in basic switcher and keyer control.

The base driver is the “Evertz QMC MCS”. This driver controls the switching, keying, and audio over functionality of the device. The optional second driver “EvSub” controls the DVE, Logo generator, and audio swap functionality. Only one physical serial connection to the device is required when using both drivers.

### Driver Overview

Quartz was the first to introduce the QMC Master Control Switcher (MCS) and this driver was originally based upon the GVG M2100 control protocol. Several years later, Evertz purchased the Quartz product line and added Quartz control to their existing Evertz switcher products. ADC™ supports both of these devices with slight variations to the original Quartz QMC control. One of the main differences is the way ADC controls the Audio Swap (a.k.a. Audio Shuffle) control. This driver will work with both ADC v11.X and v12.X Device Server versions.

Audio Shuffle with channels 1 thru 8 is supported with the release of Device Server 11.57. Secondary DATA Events (sDAT) within the ADC Transmission List are used to swap Evertz MCS audio channels.

### Driver Limitations

- Manual Intervention functionality & logging is not supported with the Evertz QMC Driver
- Recall of internal audio .WAV files for Voice Over assignment is not supported.
- Users are not able to switch between using the # Field and the sSP Field for Audio and Video keyers as they can with the original Quartz QMC driver.
A configurable Communications tab does not exist with the Evertz MCS driver as it does with the Quartz QMC driver. Serial parameters are hard coded into the Evertz MCS driver.

- Only 2 video keyers can be keyed simultaneously
- Supports up to 8 heads in the driver. This allows customers to show more logos simultaneously

Requirements

An externally-powered RS-232 to RS-422 converter is required. ADC Automation offers the powered B&B Model 422CON converter.

Cable Requirements

The following cabling is required to connect the Evertz QMC MCS to the ADC system:

<table>
<thead>
<tr>
<th>ADC (RS422)</th>
<th>Evertz Quartz QMC (RJ45)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 (Rx-)</td>
<td>6 (Tx-)</td>
</tr>
<tr>
<td>3 (Tx+)</td>
<td>5 (Rx+)</td>
</tr>
<tr>
<td>7 (Rx+)</td>
<td>3 (Tx+)</td>
</tr>
<tr>
<td>8 (Tx-)</td>
<td>4 (Rx-)</td>
</tr>
</tbody>
</table>

Legacy Systems may see older QMC hardware and two custom cabling pinouts

<table>
<thead>
<tr>
<th>Cable #1 (RS-232)</th>
<th>B&amp;B Converter</th>
<th>Cable #2 (RS-422)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Evertz QMC</td>
<td>B&amp;B Converter</td>
<td>B&amp;B Converter</td>
</tr>
<tr>
<td>RJ-45 Male</td>
<td>25p D Female</td>
<td>25p D Male</td>
</tr>
<tr>
<td>3 4 5 6</td>
<td>2 5 3 4</td>
<td>2 5 14 2 17 3 8</td>
</tr>
</tbody>
</table>

Communications Parameters

The communications parameters for this device are:

- Baud Rate: 38,400
- Data Bits: 8
- Stop Bits: 1
Device Server Set-Up

The Evertz QMC Master Control Switcher is controlled using two device drivers on ADC. First, the Master Control Switcher driver should be configured as follows:

**IMPORTANT** Configuration Note: When you have finished making changes on a configuration screen, press Apply and all changes made upon the current configuration window will be applied to the driver. Press OK, and any configuration changes made upon the various tabs will be applied, however, the configuration window will close. Press Cancel and none of the configuration changes will be applied to the driver and the configuration window will close.

Configure the Evertz QMC MCS Driver

1. Launch the ADC-100 Configuration Utility and locate the icon that represents your Device Server. Right-Click on the icon, and select **Configured Devices** from the menu.

2. Locate the Evertz QMC driver in the **Available** column on the right, under the **M/C Switchers** category. Left-click and drag the Evertz QMC to one of the Channels on the **Configured** column that reads “NO DEVICE.”
3. Select the **EVERTZ QMC MCS** Driver and open the **General** tab to configure the name for the device in the **Device name** box. The **Device Name** will appear in the Device Status and configuration window on the client applications. The default name may be used but it is recommended to use unique names for easy device identification. Value for **Input/Output Crosspoints** can be increased depending on the capability of the Evertz QMC MCS. The **Switcher Latency** setting may be changed as required. Latency settings will vary at different broadcast facilities and should be verified during the commissioning process.
4. Select **Serial Port** tab. Choose a **Port Number** from the drop-down list. This port is the physical port number in which the Evertz QMC MCS device is connected to. When viewing the serial port cards on the back of the ADC Device Server, the upper left serial port is Port 1. The port numbers increase as you count down the ADC serial board. The top serial port of the next serial card will be the following port number.

5. Click on the **Sources** tab. Use this tab to create a table of source names (mnemonics) associated with router or switcher inputs that the automation may use for record events. The source names table accepts multiple names for the same input number, but does not accept duplicate names for different inputs.

   If a record event is placed on a record list, the source name may be entered in the title field. The automation compares this source name to the source names table and switches the designated input to the record device that has registered the event.
Configure the following parameters as required:

- **Add button**: Click the Add button to enter a source crosspoint name and number.
- **Crosspoint Name**: Enter a mnemonic to help the operator identify the crosspoint.
- **Number**: Enter the physical connection number of the crosspoint.
- **Edit Button**: To edit an existing entry, select an entry from the crosspoint list display and then click Edit. An edit dialog is displayed populated with the parameters currently specified for the selected entry. Make changes as required, and then click **OK**.
- **Delete button**: To delete an existing entry, select an entry from the crosspoint list display and then click **Delete**.

6. Click on the **Destinations** tab. Use this tab to create a table of destination names that the automation primarily uses for secondary crosspoint switch events. The destination names table accepts multiple names for the same output number, but does not accept duplicate names for different outputs.

   If a secondary crosspoint switch event is placed on the playlist, the source and destination names may be entered in the title field using the format: source name:destination name (the colon is required)

   The automation system compares these names to the source and destination names tables and switch the designated input to the designated output at the appropriate time.
Configure the following parameters as required:

- **Add button**: Launches the Add Destination Data dialog. Specify the CrossPoint Name, Number, and then click **OK**.
- **Crosspoint Name**: The Crosspoint Name is a mnemonic to help the operator identify the crosspoint.
- **Number**: The physical connection number of the crosspoint.
- **Edit Button**: To edit an existing entry, select an entry from the crosspoint list display and then click Edit. An edit dialog is displayed populated with the parameters currently specified for the selected entry. Make changes as required, and then click **OK**.
- **Delete button**: To delete an existing entry, select an entry from the crosspoint list display and then click **Delete**.

7. Click on the **System Inputs** tab. Use this tab to specify the switcher inputs for common sources such as Black, Colorbars, Station ID, and Initial Input. All four inputs designated here may be switched manually from the diagnostic switch panel (see Switching Tab below). In addition, the Black and Station ID inputs are used by the automation if the corresponding list settings, Switch to Black and Station ID on Skip, are enabled on the List Configuration / Properties / Options tab.
Configure the following parameters as required:

- **System Inputs**: For each parameter specify a number from 0 to 32768 to indicate which crosspoints carry the black, colorbars, station ID and initial input signals. Default is 0. These options are not used by the automation system unless the corresponding list settings are enabled for Black Input and StationID.

- **Black Input**: When the Transmission List Option “Switch to Black” is selected, and the most recent event on the list was running on a device configured to use this router, then the crosspoint listed here (if non-zero) will be switched to the output crosspoint used by that event, if the list stops because of an error, if the event ends and there is a Hard-Start delay until the next event begins, or if it ends normally and there are no more events on the list. If it is set to 0 then nothing will happen.

- **Colorbars**: This crosspoint is used only when the Colorbars button is pressed on the diagnostics control panel (Configuration Utility or Air Client). If it is set to 0 then the Colorbars button will have no action.

- **Station ID**: When the Transmission List Option “Station ID on Skip” is selected, and the most recent event on the list was running on a device configured to use this router, then this crosspoint will be switched to the output crosspoint used by that event, if an operator invokes Skip on the Air Client’s control panel. When the next event begins to play, the crosspoint is switched to whatever that event requires.

- **Initial Input**: This crosspoint will be switched to all outputs of the router when the Device Server application is launched. If it is set to 0 then nothing will happen. In most cases it is recommended to leave this function disabled (0).
  - **About Initial Input**: The Initial Input source comes into play when communication is first established with the switcher or in the event of a switcher failure.

8. Click on the **Effect Durations** tab. These settings are used to configure Transition Effect durations in frames.
Configure the following parameters as required:

- Slow: Specify a number from 0 to 999. Default is 60.
- Medium: Specify a number from 0 to 999. Default is 30.
- Fast: Specify a number from 0 to 999. Default is 15.

**IMPORTANT:** These durations, in frames, must match the effect durations configured in the switcher itself.

9. Click on the Reporting tab. Use this tab to enable reporting of the condition of the switcher to the error log.

Configure the following parameters as required:

These parameters allow the switcher to generate an error whenever the switcher does not respond to a communication request. Place a check mark in each box to enable reporting (default is disabled for all).
• **Errors**: Enables the logging of critical failures, such as the device failing to confirm that a transition command was executed, or when communication is lost with the router.

• **Warnings**: Enables the logging of other information reported by the router.

• **Crosspoint Changes**: Enables the logging of each transition with a timestamp from when it occurred.

*IMPORTANT*: Normally these settings are left disabled, but can be enabled for diagnostic purposes. If reporting for Crosspoint Changes is enabled, the error log will quickly fill up with every crosspoint switch command the automation has sent to the switcher.

10. Click on the **Log** tab.

• **Note**: Manual Intervention control and logging is not supported with the Evertz QMC MCS driver as noted in the Driver Limitations section at the beginning of this User Note.

• Parameters listed on the Log tab are not supported by ADC

11. Select the **Backup** tab. Use this tab to designate another switcher as the backup to the main switcher in case of a failure. The router that is configured here will receive all of the transition commands that are sent to the main device. For this reason the Backup router must be wired identically to the Main. There are other methods for driving a second switcher if this limitation cannot be accommodated.
Configure the following parameters as required:

- **Backup Switcher**: Select from the dropdown list of available backup switchers. Use this parameter when installing a redundant switcher to act as backup if the main switcher fails. In the Configure Backup Switcher window, enter the number of the port that has the backup switcher connected to it (i.e., the device server channel number). The main and backup switchers do not need to be the same model, but the backup should have dimensions large enough to back up all of the main switcher's crosspoints. Both switchers must receive the same inputs. During playout, the backup switcher switches whenever the main switcher switches.

  The default is None (no backup switcher configured).

  **IMPORTANT**: The backup switcher is switched simultaneously with the main switcher. The inputs on the backup switcher must match, in a one-to-one correspondence, the inputs on the main switcher.

- **Enable backup mapping**: Check this box to enable backup Input and Output mapping.
  
  - If this parameter is checked, the Input Mapping and Output Mapping tabs are displayed, and enabled for entry.
  
  - If a backup switcher is set, but “Enable backup mapping” is disabled (unchecked), the Input Mapping and Output Mapping tab their but tables are in a disabled state. This allows the user can see what mapping is used if backup mapping is enabled.

12. **Input Mapping** tab and the **Output Mapping** tab. When the user specifies backup switcher/router for the first time, the mapping tables are filled with default values, using one-to-one correspondence.
**Default Mapping:** The following default mapping is used only if the backup device is specified for the first time.

- If both Main and Backup switcher/router have the same amount of inputs/outputs, the tables are filled using one-to-one correspondence between Main and Backup inputs. If Backup switcher/router has more inputs/outputs than Main, the same order is used.

<table>
<thead>
<tr>
<th>Main Input (16 inputs)</th>
<th>Backup Input (16 or more inputs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>…</td>
<td>…</td>
</tr>
<tr>
<td>16</td>
<td>16</td>
</tr>
</tbody>
</table>

- If the Main switcher/router has more inputs/outputs than the Backup, all Main inputs/outputs whose numbers are more than the Backup inputs/outputs amount will correspond to Backup input/output 1:

<table>
<thead>
<tr>
<th>Main Input (6 inputs)</th>
<th>Backup Input (4 inputs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>3</td>
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<tr>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>6</td>
<td>1</td>
</tr>
</tbody>
</table>

**Modified Mapping:** If the backup switcher/router is already specified and mapping tables are filled by the user, but then the user changes backup device, already adjusted input and output mapping values are retained — as much as possible.

- If the first chosen backup switcher/router has more inputs/outputs than the second, all in-puts/outputs that are not in range are replaced by appropriate ones.

*For Example:* The user first chooses an IconMaster MC which has 16 inputs and specified mapping, then changes the backup switcher/router to a Sony Isara MC...
which has 12 inputs. The old input mapping is kept, but values which are not in range are replaced automatically.

(Note: This example is for reference only. The configuration dialog of your selected devices may appear different than those shown in this example.)

- If the user fills mapping tables and then changes the amount of inputs/outputs on the Main switcher/router, the number of lines in the mapping tables is automatically updated and the new lines populated with default values.

For Example: The main switcher M2100 has 16 inputs, but then the user increases the number of inputs on the M2100 to 20 and presses “Apply”.

(Note: This example is for reference only. The configuration dialog of your selected devices may appear different than those shown in this example.)
13. Select the **Audio Control** tab. For controlling Stereo/Mono audio selections with the Evertz MCS the **Control Audio Mode** setting must be enabled (checked). User can change the Mono or Stereo settings from the ADC Transmission List whenever this setting is enabled. Please refer to the Air Client Operations manual for more information on Stereo / Mono control within the Transmission list.

**Note:** The Switcher Audio Crosspoint selection is not implemented with the Evertz MCS driver and it is only mentioned here for informational purposes. See the **Operation Notes: Audio Shuffling** section below to see how Audio Swap control is achieved with Secondary Data Events (sDAT).

14. Select the **Cascade** tab. Use this tab to set up Cascade routing.

Cascading (sometimes called “chaining”) allows the user to route audio and video through multiple switchers and routers simultaneously.
Example: a customer has ten VTRs, each with a designated output on their router. They have only one input on their master control switcher that must be shared among all ten VTRs. Each VTR output on the router may be cascaded to the single input on the master control switcher to switch it to air. This particular arrangement negates the possibility of using transition effects on the master control switcher between two back-to-back VTR events – the switcher cannot transition between events on the same input.

- Click the Add button to enter cascade data for the switcher:

- Configure the following parameters as required, then click OK when finished.
  - **Output Active Line**: This setting specifies which of the switcher's crosspoints the cascaded switcher is connected to. The valid range is 0 to 32768.
  - **Cascade Device**: Select a cascade device from the dropdown list.
  - **Cascade Crosspoint In**: The crosspoint on the cascaded switcher to which the Output Active Line setting (above) is connected. The valid range is 0 to 32768.
  - **Cascade Crosspoint Out**: The out crosspoint on the cascaded switcher to which the signal is to be routed. The valid range is 0 to 32768.

  **Caution**: While these parameters the user can specify a value between 0 and 32768, please note that such great values may not be supported by the driver or physical devices. Also, while on tab “General” the user can specify amount of output crosspoints in range 0-32768, please note that this MCS (as all MCSs) has only 1 output crosspoint.
15. Click on **Switching** tab. Use this tab to manually switch inputs and outputs for diagnostic purposes.

This utility is not intended as an on-line substitute for the switcher’s own control panels. The source and destination names tables must be completed before any sources or destinations will appear in the drop-down boxes.

Configure the following parameters as required:

- **Black, Colorbars, Station ID, Initial Input** buttons: These selections refer to the sources designated on the System Inputs tab above. If a source and destination are selected in the drop-down boxes, clicking the “Switch” button will cause the switch to occur.

### Configure the EvertzQMC for DVE&Logo SubDev Driver

If you have the optional **EvertzQMC for DVE&Logo** sub-device, it should be configured after the Evertz MCS driver is configured:

1. Launch the ADC Configuration Tool and locate the icon that represents your Device Server. Right-Click on the icon, and select **Configured Devices** from the menu.

2. Locate the **EvertzQMC for DVE&Logo** Subdev driver in the Available column on the right, under the **Still Stores** category. Left-click and drag the **EvertzQMC for DVE&Logo** Subdev to an available Channel on the Configured column that reads “NO DEVICE.”
3. Double-click on the LGQMC driver that was just created.

4. General tab:

   ![General Tab Image]

   Configure the following parameters as required:
   
   - The **Device Name** will appear in the Device Status and configuration windows on the client applications. The default name may be used but it is recommended to use unique names for easy identification later.
The ID Match Name will be used in the Transmission List’s ID Field to let the system know that the event is intended for the Evertz QMC device.

The Back-Time value in frames determines when commands should be sent to the Evertz. A non-zero value in this field indicates the number of frames that commands will be sent early (during preroll, before the play counter actually starts). This value is set at 1 by default, it shouldn’t need to be changed. However if the timing of the Evertz Logo and DVE commands are off with respect to the switcher, this parameter may be changed to adjust the output timing. This parameter does not change the timing for secondary data commands, only A/V events.

5. The **Diagnostics** tab is used to trouble shoot loss of communication errors between the EvertzQMC for DVE&Logo Sub Device driver and the Evertz MCS.

When the Reinitialize button is pressed, the sub device driver resets different statuses (current status, media status) and variables. No commands are sent to the device in this time.

If Loss of Comms continue to persist after pressing the Reinitialize button, check serial cables between ADC Device Server and Evertz Switcher. Pin out or Baud rate settings should also be checked to help re-establish communications.

**Note:** The EvertzQMC for DVE&Logo Subdev does not have a configuration for a serial port. Instead, it sends its commands to the Evertz MCS driver, which maintains the serial connection.

![EvertzQMC for DVE&Logo Sub Device driver](image)

6. The final tab on the Sub Device driver is the **EvertzQMC Channel**. This is where you assign the EvertzQMC for DVE&Logo Sub Device Driver to the Evertz master control switcher driver object. There may be multiple Evertz switchers configured upon the Device Server so ensure you select the correct Evertz master control switcher driver object.

Configure the EvertzQMC for DVE&Logo SubDev Driver **Note:** You cannot use the EvertzQMC for DVE&Logo sub device driver as a standalone driver. It must be configured with the QMC MCS device driver before use.
SubDev List Assignment

**IMPORTANT**: Both heads of the Evertz Logo DVE Subdev driver must be assigned to the ADC Transmission List the Evertz Switcher is configured to control.

In the following example, the Evertz Switcher has been configured to control the Transmission List: K-T (Play List).

1. From the List Assignments configuration, select the **Evertz Logo DVE Subdev** driver in the Available Media pane (e.g. EvSub).

2. Drag the **Evertz Logo DVE Subdev** driver to the target Transmission List in the Lists pane.
Operation Notes

In addition to the standard master control switcher functionality, the “Evertz QMC MCS“ Master Control Switcher has additional DVE and Logo recall capabilities. For this reason, two ADC-100 device drivers are required for control. The Switcher functionality is derived from GVG M2100.

The Logo and DVE Subdevice Secondary Data Events to execute the loading and playout of Logos, as well as the triggering of DVE functions.

The Evertz MCS driver functions in a similar manner to the other ADC-100 master control switcher drivers, which includes the Backup Switcher, Cascade and other related MCS functionality. The Evertz QMC also supports Audio Over and Keyer functions See the ADC-100 User Guide for details about any functionality not listed in this document.

The Evertz Logo DVE must also be assigned to a Transmission List to be schedule to air.

The Evertz LogoAndDve allow a lot of Secondary Data and A/V events. Secondary Data events just send one command from the protocol to device. A/V events usually send sequence of the commands to decide some task. Below we give detail description all Data and A/V events (Syntax of Title field and descriptions of parameters) divided by functionality. Then we will give some advices about using Secondary Data and A/V events for Logo recalling.

Description of Secondary Data and A/V events

This section describes the syntax of the available A/V and Secondary Data events on the QMC. The A/V events are designed to encapsulate a frequently used combination of commands for the DVE into a single event, while the Data Events provide maximum flexibility to control the commands sent to the QMC. Some of these events can also be used in combination with Secondary Keyer Events, for more control over the behavior.

**AV Events**

A/V or Sec A/V Secondary Data Event.

- **A/V:** DVE:num1[,num2[,num3]]
- **Sec A/V:** DVE:num1[,num2[,num3]]

Description of Parameters:
num1: (Required) The DVE move number triggered when the event plays. Range: 1..128
num2: Optional (Required if num3 is provided). The DVE move number triggered at the end of the event. Range: 1..128
num3: Optional (num2 is Required). The crosspoint number on the QMC that should be switched to fill the DVE background before the effect starts. Range: 1..240

Audio Shuffling

To perform Audio Shuffling using sDAT event, assign the Evertz Quartz SubDev to a transmission list using Config Tool. The sDAT event’s ID should be equal to sub device name. And Title field should be specified with such syntax as described below:

**Note:** The configuration Audio Control tab doesn’t affect Audio Shuffling. Audio Shuffling works even if option “Control Audio Mode” is disabled. If the syntax of Title field of sDAT event is incorrect, this event will be red in Transmission list and won’t be played at all.

AS Secondary Data Event

**Syntax of Title field:**

- **AS**: <Bus>,A1,A2,A3,A4,A5,A6,A7,A8

**Description of Parameters:**

- `<Bus>` The bus (Preset or Program) where the audio shuffle is executed
  1: Program Bus
  2: Preset Bus
  3: For both Preset and Program Bus.
- `<A1>,<A2>,<A3>,<A4>,<A5>,<A6>,<A7>,<A8>`
  The input channel on Evertz QMC that is selected for output channel A1, A2,…A8.
  Each audio output selection is set to one of the following values (in range 0..15) that point to which Input is selected for a given Output.
  0 – A1, 1 – A2, 2 – A3, 3 – A4, … 15 – A16

**Example Transmission List w/ Secondary Data Event:**

- Event Lines 2, 4, and 6 are correct (light blue color), event lines 8 and 10 are incorrect (red color).
- For example: In Line 4, Title is “AS: 3,8,9,10,11,12,13,14,15”. It means: 3 – both buses (PROGRAM and PRESET), Audio Input 9 is assigned to Audio Output 1, Audio Input 10 to Audio Output 2, 11 to 3, 12 to 4, 13 to 5, 14 to 6, 15 to 7 and 16 to 8 (in Title field Audio Inputs are zero-based)
- Line 8 is incorrect because the user tried to specify more than 8 audio outputs (tried to assign correct audio input 8 to incorrect audio output 9).
- Line 10 is incorrect because the user tried to specify wrong number of audio input (number 16 is wrong, audio input range is 0-15)
- Note: Title field should have 32 chars instead of usual 16

**NOTE:** One Input may be assigned for more than one Output. For long format programs where Audio Swap control is needed, then a separate Audio Swap sDAT event will be need for each segment of the program.
DVE Recalling

SecondaryData Events

- **DVE_MOVE** – Move a DVE
  Syntax of Title field:
  
  \[ \text{DVE-MOVE:<bus>,<dveNum>} \]
  Description of Parameters:
  
  \(<\text{bus}>\) The bus (Preset or Program) where the DVE move will be selected.
  1: Program Bus
  2: Preset Bus
  3: For both Preset and Program Bus.
  
  \(<\text{dve}>\) The DVE move number that is to be selected. DVE Move number in range 1 through 128

- **DVE_START** - Starts a DVE move or reverses the current move if called with the same move number
  Syntax of Title field:
  
  \[ \text{DVE-START:<bus>,<dveNUM>} \]
  Description of Parameters:
  
  \(<\text{bus}>\) The bus (Preset or Program) where the DVE move will be started.
  1: Program Bus
  2: Preset Bus
  3: For both Preset and Program Bus.
  
  \(<\text{dve}>\) The DVE move number that is to be started (DVE-MOVE should be used prior to this). DVE Move number in range 1 through 128

- **DVE_STOP** - Stop a DVE move
  Syntax of Title field:
  
  \[ \text{DVE-STOP:<bus>,<dveNUM>} \]
  Description of Parameters:
  
  \(<\text{bus}>\) The bus (Preset or Program) where the DVE move will be stopped.
  1: Program Bus
  2: Preset Bus
  3: For both Preset and Program Bus.
<dve> The DVE move number that is to be stopped. DVE Move number in range 1 through 128

- **DVE_BKGD** – Send DVE_BACKGROUND command. See in the Protocol document full description of this command.
  
  Syntax of Title field:

  **DVE-BKGD:<Bus>,<XPT>**

  Description of Parameters:

  - **<bus>** The bus (Preset or Program) where the DVE background crosspoint is changed.
    1: Program Bus
    2: Preset Bus
    3: For both Preset and Program Bus.
  
  - **<XPT>** The crosspoint number on the QMC that should be switched to fill the DVE background on the specified before the effect starts.
    0 No change
    1 – 240 Upstream router source number

**Secondary A/V Events**

- 1) **DVE** - To start a DVE move at beginning of the duration and reverse the current move at end of duration

  Syntax of Title field:

  **DVE:<DveNum>**

  Description of Parameters:

  - **<DveNum>** DVE Move number in the range 1 through 128

**List Examples**

If the event has wrong title, it's shown in red and can't be played.

**Example DVE:**

The range for 1<sup>st</sup> parameter is 1-240, for 2<sup>nd</sup> and 3<sup>rd</sup> 0-240.

<table>
<thead>
<tr>
<th>Event</th>
<th>Time</th>
<th>Device</th>
<th>Status</th>
<th>Protect</th>
<th>PStatus</th>
<th>Soc</th>
<th>Type</th>
<th>ID</th>
<th>Seg</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>15:15:47:18</td>
<td>D0xk2</td>
<td>AV</td>
<td>PT</td>
<td>LV001</td>
<td>A</td>
<td>Demo0001</td>
<td>test</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>00:00:00:00</td>
<td>LV001</td>
<td>AV</td>
<td>PT</td>
<td>LV001</td>
<td>A</td>
<td>Demo0001</td>
<td>test</td>
<td>DVE 119</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>15:15:47:18</td>
<td>D0xk2</td>
<td>AV</td>
<td>PT</td>
<td>LV001</td>
<td>A</td>
<td>Demo0001</td>
<td>test</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>00:00:00:00</td>
<td>LV001</td>
<td>AV</td>
<td>PT</td>
<td>LV001</td>
<td>A</td>
<td>Demo0001</td>
<td>test</td>
<td>0.78</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>15:15:47:18</td>
<td>D0xk2</td>
<td>AV</td>
<td>PT</td>
<td>LV001</td>
<td>A</td>
<td>Demo0001</td>
<td>test</td>
<td>DVE 121</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>00:00:00:00</td>
<td>LV001</td>
<td>AV</td>
<td>PT</td>
<td>LV001</td>
<td>A</td>
<td>Demo0001</td>
<td>test</td>
<td>DVE 122</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>15:15:47:18</td>
<td>D0xk2</td>
<td>AV</td>
<td>PT</td>
<td>LV001</td>
<td>A</td>
<td>Demo0001</td>
<td>test</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>00:00:00:00</td>
<td>LV001</td>
<td>AV</td>
<td>PT</td>
<td>LV001</td>
<td>A</td>
<td>Demo0001</td>
<td>test</td>
<td>DVE 240, 240, 240</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>15:15:47:18</td>
<td>D0xk2</td>
<td>AV</td>
<td>PT</td>
<td>LV001</td>
<td>A</td>
<td>Demo0001</td>
<td>test</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>00:00:00:00</td>
<td>LV001</td>
<td>uAV</td>
<td>PT</td>
<td>LV001</td>
<td>A</td>
<td>Demo0001</td>
<td>test</td>
<td>DVE 241</td>
<td></td>
</tr>
</tbody>
</table>

**Example DVE-MOVE:**
**Example DVE-START:**

<table>
<thead>
<tr>
<th>Event</th>
<th>Time</th>
<th>Device</th>
<th>Status</th>
<th>Protect</th>
<th>PStatus</th>
<th>Sec</th>
<th>Type</th>
<th>ID</th>
<th>Seg</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>15:15:47:18</td>
<td>Dsk2</td>
<td>A</td>
<td>Demo0001</td>
<td>test</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>00:00:00:00</td>
<td>LOG01</td>
<td>B</td>
<td>Demo0001</td>
<td>test</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>15:15:47:18</td>
<td>Dsk2</td>
<td>A</td>
<td>Demo0001</td>
<td>test</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>00:00:00:00</td>
<td>LOG01</td>
<td>B</td>
<td>Demo0001</td>
<td>test</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>15:15:47:18</td>
<td>Dsk2</td>
<td>A</td>
<td>Demo0001</td>
<td>test</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>00:00:00:00</td>
<td>dAT</td>
<td>PT</td>
<td>LOG01</td>
<td>DVE-MOVE: 0.176</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>15:15:47:18</td>
<td>Dsk2</td>
<td>A</td>
<td>Demo0001</td>
<td>test</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>00:00:00:00</td>
<td>dAT</td>
<td>PT</td>
<td>LOG01</td>
<td>DVE-MOVE: 0.333</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Example DVE-BKGD:**

**IMPORTANT:** It is necessary to use DVE-BKGD instead of DVE-BKGR.

<table>
<thead>
<tr>
<th>Event</th>
<th>Time</th>
<th>Device</th>
<th>Status</th>
<th>Protect</th>
<th>PStatus</th>
<th>Sec</th>
<th>Type</th>
<th>ID</th>
<th>Seg</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>16:45:40:22</td>
<td>Dsk2</td>
<td>A</td>
<td>Demo0001</td>
<td>test</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>00:00:00:00</td>
<td>LOG01</td>
<td>B</td>
<td>Demo0001</td>
<td>test</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>16:46:00:24</td>
<td>Dsk2</td>
<td>A</td>
<td>Demo0001</td>
<td>test</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>00:00:00:00</td>
<td>LOG01</td>
<td>B</td>
<td>Demo0001</td>
<td>test</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>16:46:36:24</td>
<td>Dsk2</td>
<td>A</td>
<td>Demo0001</td>
<td>test</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>00:00:00:00</td>
<td>dAT</td>
<td>PT</td>
<td>LOG01</td>
<td>DVE-BKGD: 0.241</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>16:47:04:26</td>
<td>Dsk2</td>
<td>A</td>
<td>Demo0001</td>
<td>test</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>00:00:00:00</td>
<td>dAT</td>
<td>PT</td>
<td>LOG01</td>
<td>DVE-BKGD: 2.1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**LOGO Recalling**

**Secondary Data Events**

- **NEXT_LOGO** – Send NEXT_LOGO command
  Syntax of Title field:

  \[ \text{NEXT-LOGO:<LogoNum>} \]

  Description of Parameters:

  
  \[ \text{<LogoNum>} \] The number assigned to the stored Logo on the QMC to be displayed when the next transition occurs. Logo number in range from 1 through 64.

- **LOGO_SELECT** – Send LOGO_SELECT command
  Syntax of Title field:
LOGO-SELECT:<LogoNum>
Description of Parameters:

<LogoNum> The number assigned to the stored Logo on the QMC to be selected for immediate display. Logo number in range from 1 through 64.

- **CUE** – Loads Logo in Active memory and Cues Logo to Preview Bus
Syntax of Title field:

  CUE:<LogoName>
Description of Parameters:

  <LogoName> Alphanumeric Logo Name(up to 16 characters).

- **IN** – Loads Logo in Active memory and Cues Logo to Program Bus
Syntax of Title field:

  IN:<LogoName>
Description of Parameters:

  <LogoName> Alphanumeric Logo Name(up to 16 characters).

- **OUT** – Removes Logo from Preview and Program Bus
Syntax of Title field:

  OUT:<LogoName>
Description of Parameters:

  <LogoName> Alphanumeric Logo Name(up to 16 characters).

- **KEY-ENABLE** – Selects the keyers/DVE to be on or off air after the next transition.
Syntax of Title field:

  KEY-ENABLE:b0b1b2b3b4
Description of Parameters:

  Each bi = 0|1. If bi =1 that means some keyer or DVE is selected.
  b0 Keyer 1
  b1 Keyer 2
  b2 Keyer 3
  b3 Keyer 4
  b4 DVE option

  **NOTE**: See protocol document for full description this command.

**Secondary A/V Events**

- **LOGO-SELECT** - To start a LOGO recalling at beginning of the duration and reverse the current Logo at end of duration (ONLY for numeric Logos)
Syntax of Title field:

  LOGO-SELECT:<LogoNumber>
Description of Parameters:

  <LogoNumber> Logo Number in the range from 1 through 64
- **LOGO** - To start a LOGO recalling at beginning of the duration and reverse the current Logo at end of duration (ONLY for alphanumeric Logos)

  Syntax of Title field:
  
  `LOGO:<LogoName>`

  Description of Parameters:
  
  `<LogoName>` Alphanumeric Logo Name (up to 16 characters).

  **List Examples**

  If the event has wrong title, it’s shown in red and can’t be played.

  **Example LOGO-SELECT:**

  ```
  Event   Time   Device  Status  Protect PStatus  Sec Type ID   Seg   Title   Dur
  1 15:15:47:18  ODxk2  A     Demo0001 test test 06:6
  2 15:15:47:18  ODxk2  A     Demo0001 test LOGO-SELECT: 11 test 06:6
  3 15:15:47:18  ODxk2  A     Demo0001 test LOGO-SELECT: 65 test 06:6
  4 06:00:00:00  sDAT  PT     LOGO1 LOGO-SELECT: 65 test 06:6
  ```

  **Example NEXT-LOGO:**

  ```
  Event   Time   Device  Status  Protect PStatus  Sec Type ID   Seg   Title   Dur
  1 15:15:47:18  ODxk2  A     Demo0001 test test 06:6
  2 15:15:47:18  ODxk2  A     Demo0001 test NEXT-LOGO: 15 test 06:6
  3 15:15:47:18  ODxk2  A     Demo0001 test LOGO1 LOGO-SELECT: 65 test 06:6
  4 06:00:00:00  sDAT  PT     LOGO1 NEXT-LOGO: 65 test 06:6
  ```

**Using Secondary Data and A/V events for Logo recalling**

Logos are stored both in QMC and in QMG. Different commands are used for these cases.

- Use the Logo_Select command for logos stored in QMC. This does not support Alphanumeric file names.
- Use Media_Status /Media related commands for logos stored in QMG.

**Logo Stored in Evertz QMG**

Evertz QMG device supports the keying of up to 16 Logos simultaneously, however, the ADC Evertz QMC driver only allows the playing of two A/V events simultaneously. Therefore we can show only two logos simultaneously with using A/V Logo event. If someone want to see more than two logos, it needs to use Secondary Data Events (CUE, IN, OUT).

We can use or IN at the beginning and OUT at the end , or CUE first and then IN and OUT. What is the difference? In the first case using (IN, OUT) for large Logos may cause a delay between the sending of the IN command and when the logo appears on Program monitor (up to 30 sec for very large Logo). In the second case (CUE, IN OUT) you will see the logo first on preview monitor and after IN command you will see the logo on Program monitor without any delay.

**“End Key Hold" functionality**
ADC v12.18 and higher extends "End Key Hold" functionality of the Evertz QMC driver to allow more than 1 keyer to turn off on the same primary event. The number of keyers to be ended is specified in field # of the primary event. The number in this field should be equal to decimal value of the keyer's bit mask.

**Calculating the # value**

Use the # as a combination of a direct numeric value and a bit mask. The most significant bit controls the mode in which the value is interpreted.

- A # value of 0 (0000 0000) turns off all the keyers.
- Any value in the range of 1 (0000 0001) to 127 (0111 1111) turns off an individual keyer.
- When the most significant bit (MSB) is set to one, value in the range of 128 (1000 0000) to 255 (1111 1111), the seven other bits are interpreted as a bit mask and used to control seven individual keyers in any combination.

<table>
<thead>
<tr>
<th>Bit 8 (MSB)</th>
<th>Bit 7</th>
<th>Bit 6</th>
<th>Bit 5</th>
<th>Bit 4</th>
<th>Bit 3</th>
<th>Bit 2</th>
<th>Bit 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Keyer 7</td>
<td>Keyer 6</td>
<td>Keyer 5</td>
<td>Keyer 4</td>
<td>Keyer 3</td>
<td>Keyer 2</td>
<td>Keyer 1</td>
</tr>
</tbody>
</table>

**Decimal Values**

| 128 | 0 | 0 | 16 | 8 | 4 | 2 | 1 |

**Example Calculation:**

To turn off keyers 1 and 3, use bit mask: 10000101, which is equal to 133 (128+4+1). Enter 133 in field # of the primary event.

**Cheat Sheet for Keyers on a PresMaster**

The following table shows most possible combinations of using End Key Hold option with the four keyers on a PresMaster device.

<table>
<thead>
<tr>
<th>Keyers, that should be turned off</th>
<th>#</th>
<th>Keyers, that should be turned off</th>
<th>#</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,2</td>
<td>131</td>
<td>1,3,4,5</td>
<td>157</td>
</tr>
<tr>
<td>1,3</td>
<td>133</td>
<td>1,4,5</td>
<td>153</td>
</tr>
<tr>
<td>1,4</td>
<td>137</td>
<td>2,3</td>
<td>134</td>
</tr>
<tr>
<td>1,5</td>
<td>145</td>
<td>2,4</td>
<td>138</td>
</tr>
<tr>
<td>1,2,3</td>
<td>135</td>
<td>2,5</td>
<td>146</td>
</tr>
<tr>
<td>1,2,3,4</td>
<td>143</td>
<td>2,3,4</td>
<td>142</td>
</tr>
<tr>
<td>1,2,3,5</td>
<td>151</td>
<td>2,4,5</td>
<td>152</td>
</tr>
<tr>
<td>1,2,4</td>
<td>139</td>
<td>2,3,4,5</td>
<td>156</td>
</tr>
<tr>
<td>1,2,4,5</td>
<td>155</td>
<td>3,4</td>
<td>140</td>
</tr>
<tr>
<td>1,2,3,4,5</td>
<td>159</td>
<td>3,5</td>
<td>148</td>
</tr>
<tr>
<td>Keyers, that should be turned off</td>
<td>#</td>
<td>Keyers, that should be turned off</td>
<td>#</td>
</tr>
<tr>
<td>----------------------------------</td>
<td>-----</td>
<td>----------------------------------</td>
<td>-----</td>
</tr>
<tr>
<td>1,3,4</td>
<td>141</td>
<td>3,4,5</td>
<td>156</td>
</tr>
</tbody>
</table>

### Test Procedures

### Error Conditions and Recovery

**Internal Document #**

xxxxx

**File**

xxxxx