

**AVENUE**

Avenue™ signal integration system

# Model 7600 HD/SD Embedder/ Disembedder Data Pack

**ENSEMBLE**

D E S I G N S

Revision 2.1 SW v2.0.1

This data pack provides detailed installation, configuration and operation information for the **7600 HD/SD Embedder/Disembedder** module as part of the Avenue Signal Integration System.

The module information in this data pack is organized into the following sections:

- Module Overview
- Applications
- Installation
- Cabling
- Module Configuration and Control
  - Front Panel Controls and Indicators
  - Avenue PC Remote Control
  - Avenue Touch Screen Remote Control
- Troubleshooting
- Software Updating
- Warranty and Factory Service
- Specifications

## MODULE OVERVIEW

The 7600 module is an eight channel audio embedder or disembedder for 1.5 Gb/s high definition or 601 serial digital video. Four AES ports automatically configure as inputs or outputs depending on if the module is configured as a multiplexer or demultiplexer.

When configured as a multiplexer, the 7600 has one SDI video input that can accept either HD or SD video and four AES audio outputs. These four audio streams are embedded into the SDI video stream. AES inputs are sample rate converted, allowing the use of asynchronous audio. The output of the module is an SDI video stream that contains the original video signal and four AES pairs.

When configured as a demultiplexer, audio signals present in the incoming SDI video are extracted and delivered as standard AES output streams on the AES BNCs on the rear of the frame.

The 7600 includes a full-featured, eight channel audio mixer. The channel swap and shuffle capability allows complete rearranging and remixing of audio channels. It provides precise control over audio level, with up to 12 dB of gain to compensate for low level sources. All audio processing is performed at full 24 bit resolution by a digital signal processor (DSP).

Because the 7600 has simultaneous embedding and disembedding, it is an in-line processor for embedded audio. It can take embedded content, adjust levels and re-map channels, and deliver it to the output as an embedded signal.

The 7600 can be configured in one of four basic operating modes:

- 8 Channels AES Audio in, Embedded HD or SD Out
- Embedded HD or SD In, 8 Channels AES Audio Out
- Embedded HD or SD In, Embedded HD or SD Out
- 4 Channels AES Audio in, 4 Channels AES Audio Out

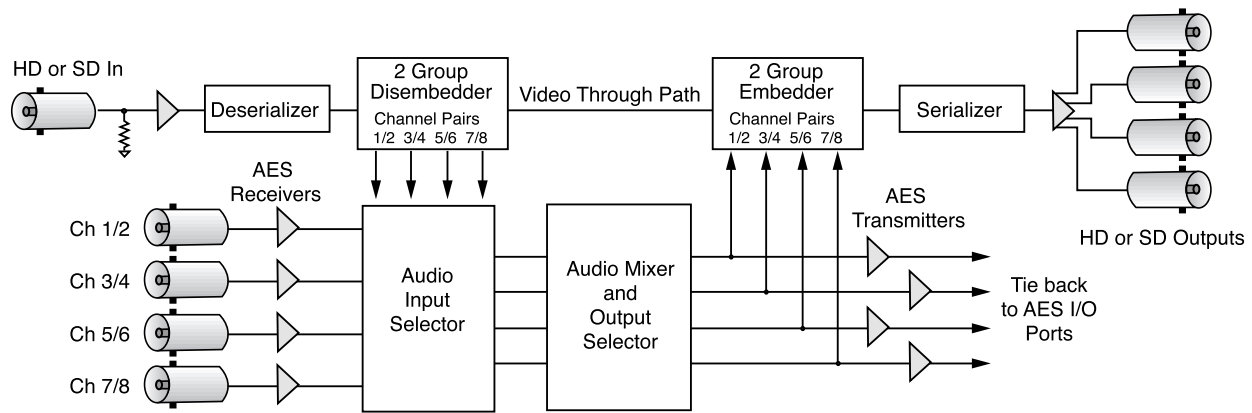
Modes are defined by how the Audio inputs are defined (AES or SDI) in the Audio In A and B menus as described later in this data pack. Refer to the Applications section for examples of each of these modes.

As shown in the block diagram on the following page, an HD or SD signal is fed to the module for embedding of audio or audio extraction, depending on the mode chosen by the user.

The module provides eight channels of digital audio processing. Digital audio inputs can come from four AES ports and/or be disembedded from the HD or SD SDI input stream. After processing, digital outputs in both AES and embedded form are possible.

There are four AES ports, consisting of the four AES BNC connectors on the rear of the chassis. These BNCs become bi-directional ports. Each of them can either be an AES input or an AES output. These four AES ports are associated with pairs of channels: Ch 1/2, Ch 3/4, Ch 5/6, and Ch 7/8. A port will become an output if it has not been chosen as an AES input in the **Aud In A** and **B** menus.

There are two disembedders on the input side referred to as A and B. These disembedders are being fed the SDI video input stream in parallel and each of them can be independently targeted to any of the four possible groups. The A disembedder will produce two pairs of audio signals, referred to as SDI 1/2 and SDI 3/4.



**7600 HD/SD AMD Functional Block Diagram**

The B disembedder will also produce two pairs of audio signals referred to as SDI 5/6 and SDI 7/8. In the B disembedder, the SDI 5/6 pair corresponds to the first and second channels in the selected group and SDI 7/8 is taken from the third and fourth channels in that same group.

The disembedded audio can be processed with level adjustment and channel mixing, and shuffling. It can then be embedded into the video output stream.

There are two embedders referred to as A and B to support the eight channels of audio, one for each group. The embedders are placed in series with the A embedder first and the B embedder second. Each embedder must be configured for operating mode and the desired group (1 – 4) in which to embed the audio.

The configuration parameters for the embedders in the Audio Out menu are not identical. There is no **Replace All** function for the B embedder as this function occurs in the upstream embedder A.

Power for the module is derived from the  $\pm 12$  volt frame power. It is regulated to the required +5 volts for the digital circuitry by on-board regulators. The required +3 volts for the multiplexer circuitry is developed in a linear regulator running off the +5 volt supply. The module is fused with a resettable fuse device. If the fuse opens due to an overcurrent condition, the module will lose power. After pulling the module, the fuse will reset automatically requiring no replacement fuse.

The on-board CPU can monitor and report module ID information (slot location, software version and board revision), and power status (+5 volts or +3 volts) to the optional frame System Control module. This information can be accessed by the user or set to register an alarm if desired using the remote control options available.

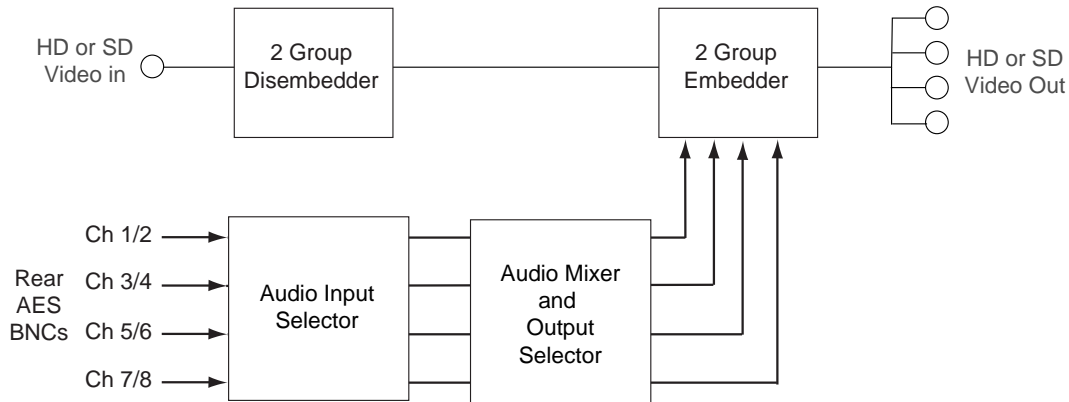
Module parameters can be adjusted through the control system with Avenue Touch Screens, Express Control Panels, or the Avenue PC Application. Individual level controls are available for all 8 channels. Memory registers can be used to save the complete configuration of the module, making it easy to change instantly between different configurations.

## APPLICATIONS

There are four basic modes for using the 7600 module. Each of the modes is described here.

### 8 Channels AES Audio in, Embedded HD or SD Out

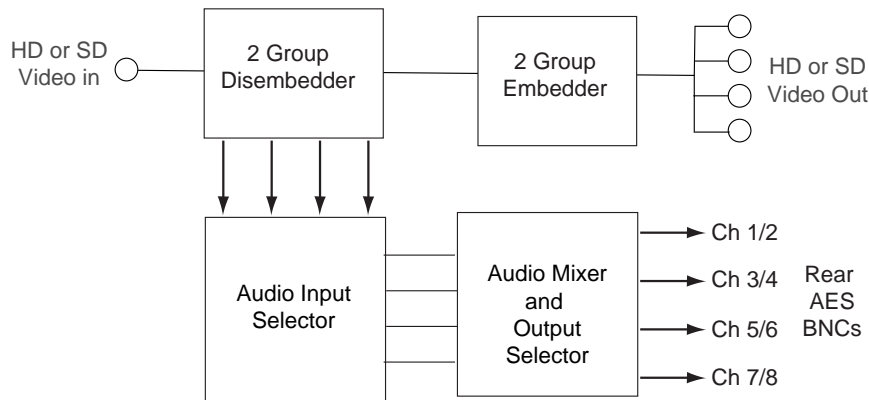
As shown in the block diagram below, the four AES audio input BNCs on the rear of the frame can be used to input external audio which is then multiplexed into the HD or SD output stream. To configure this mode, set the In 1/2, In 3/4, In 5/6, and In 7/8 controls in the Aud In A and Aud In B menus to AES inputs. Inputs can be shuffled if desired using the Aud Mix A and Aud Mix B menu. Inputs must be embedded into the output stream by selecting the type of embedding and the audio group number in the Aud Out menu.



8 Channels AES Audio In, Embedded HD or SD Out

### Embedded HD or SD Out, 8 Channels AES Audio Out

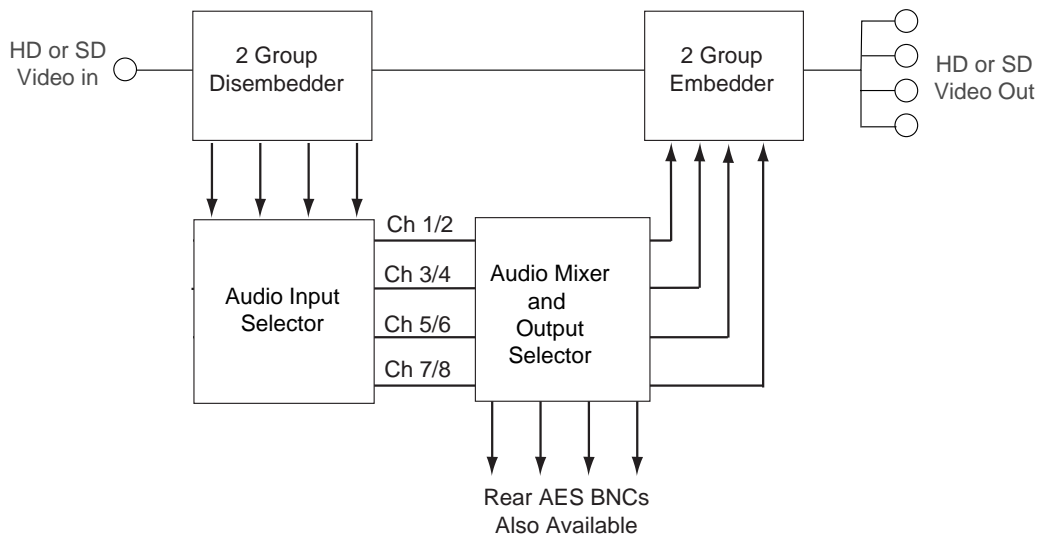
As shown in the block diagram below, the four AES audio input BNCs on the rear of the frame can be used to output AES audio which has been disembedded from the HD or SD input stream. To configure this mode, set the In 1/2, In 3/4, In 5/6, and In 7/8 controls in the Aud In A and Aud In B menus to SDI inputs. Inputs can be shuffled if desired using the Aud Mix A and Aud Mix B menus. Muxing must be set to Off in the Aud Out menu.



Embedded HD or SD Out, 8 Channels AES Audio Out

### Embedded HD or SD In, Embedded HD or SD Out

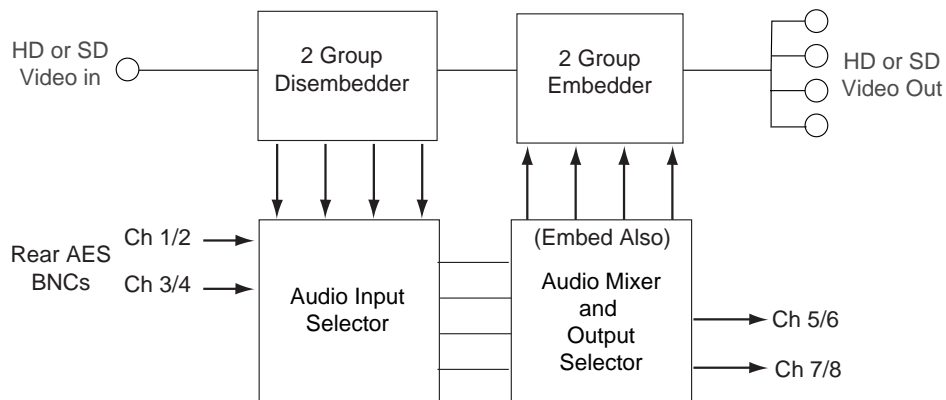
In this mode, embedded audio from the HD or SD input stream is disembedded, shuffled in the Audio Input Selector with the Aud Mix A and Aud Mix B menus if desired then re-embedded into the output video stream as shown in the block diagram below. To configure this mode, set the In 1/2, In 3/4, In 5/6, and In 7/8 controls in the Aud In A and Aud In B menus to SDI inputs. Inputs can be shuffled if desired using the Aud Mix A and Aud Mix B menus. Inputs must then be re-embedded by using the Mux controls in the Aud Output menu.



Embedded HD or SD In, Embedded HD or SD Out

### 4 Channels AES In, 4 Channels AES Out

In this mode, 2 external AES BNCs input 4 channels of AES audio into the Audio Input Selector as shown below. The 4 channels can be shuffled in the Audio Input Selector with the Aud Mix A and Aud Mix B menus if desired then sent to the other 2 external AES BNCs as outputs. To configure this mode, set the In 1/2 and In 3/4 controls to AES inputs and the In 5/6 and In 7/8 controls to SDI inputs in the Aud In A and Aud In B menus. In the Aud Output menu, turn Muxing Off.



4 Channel AES In, 4 Channels AES Out

## **INSTALLATION**

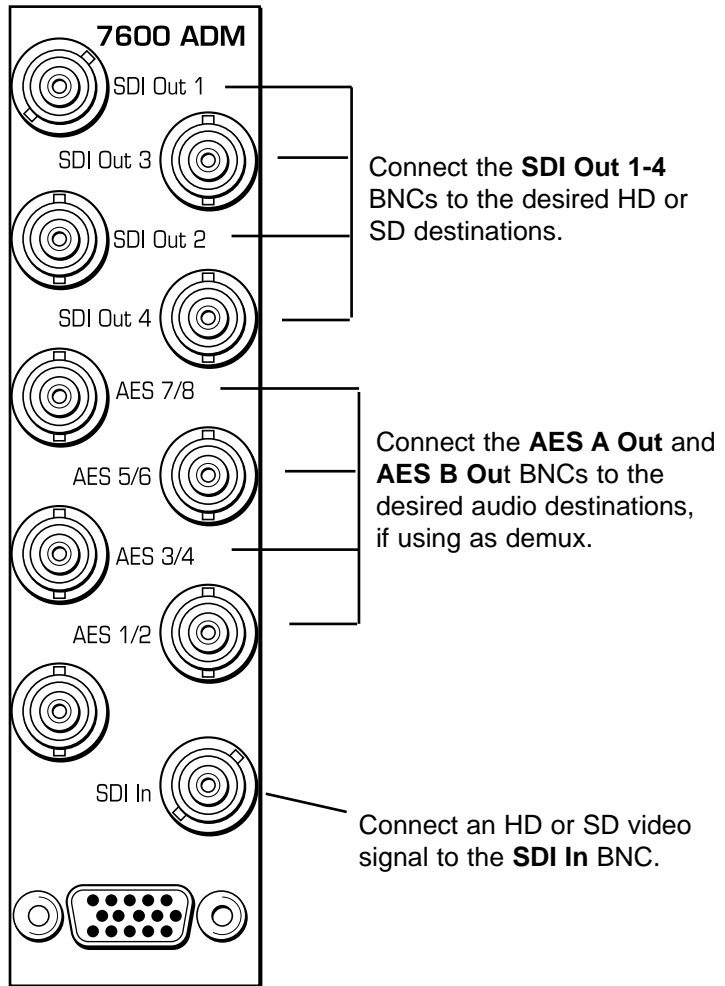
Plug the 7600 module into any slot in the 1 RU or 3 RU frame and install the plastic overlay provided onto the corresponding group of rear BNC connectors associated with the module location. Note that the plastic overlay has an optional adhesive backing for securing it to the frame. Use of the adhesive backing is only necessary if you would like the location to be permanent and is not recommended if you need to change module locations.

This module may be hot-swapped (inserted or removed) without powering down or disturbing performance of the other modules in the system.

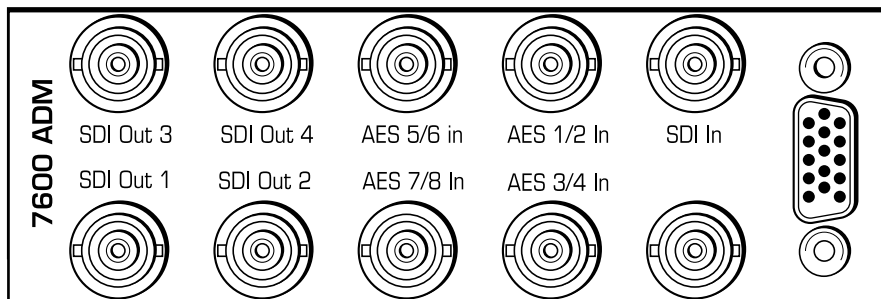
## **CABLING**

Refer to the 3 RU and 1 RU backplane diagrams of the module on the following page for cabling instructions. Note that unless stated otherwise, the 1 RU cabling explanations are identical to those given in the 3 RU diagram.

3 RU Backplane



1 RU Backplane



## MODULE CONFIGURATION AND CONTROL

The configuration parameters for each Avenue module must be selected after installation. This can be done remotely using one of the Avenue remote control options or locally using the module front panel controls. Each module has a **REMOTE/LOCAL** switch on the front edge of the circuit board which must first be set to the control mode you will be using.

The configuration parameter choices for the module will differ between **Remote** and **Local** modes. In **Remote** mode, the choices are made through software and allow more selections. The **7600 Parameter Table** on the following page summarizes and compares the various configuration parameters that can be set remotely or locally and the default/factory settings. It also provides the default User Levels for each control. These levels can be changed using the Avenue PC application.

If you are not using an remote control option, the module parameters must be configured from the front panel switches. Parameters that have no front panel control will be set to a default value. The **Local** switches are illustrated in the **Front Panel Controls and Indicators** section following the **7600 Parameter Table**.

Avenue module parameters can be configured and controlled remotely from one of the remote control options, the Avenue Touch Screens, Express Control Panels, or the Avenue PC Application. Once the module parameters have been set remotely, the information is stored on the module CPU. This allows the module be moved to a different cell in the frame at your discretion without losing the stored information. Remote configuration will override whatever the switch settings are on the front edge of the module.

For setting the parameters remotely using the Avenue PC option, refer to the **Avenue PC Remote Configuration** section of this document.

For setting the parameters remotely using the Avenue Touch Screen option, refer to the **Avenue Touch Screen Remote Configuration** section of this data pack following Avenue PC.

For setting the parameters remotely using the Avenue Express Control Panel option, refer to the **Avenue Express Control Panel** data pack that comes with the panel option.

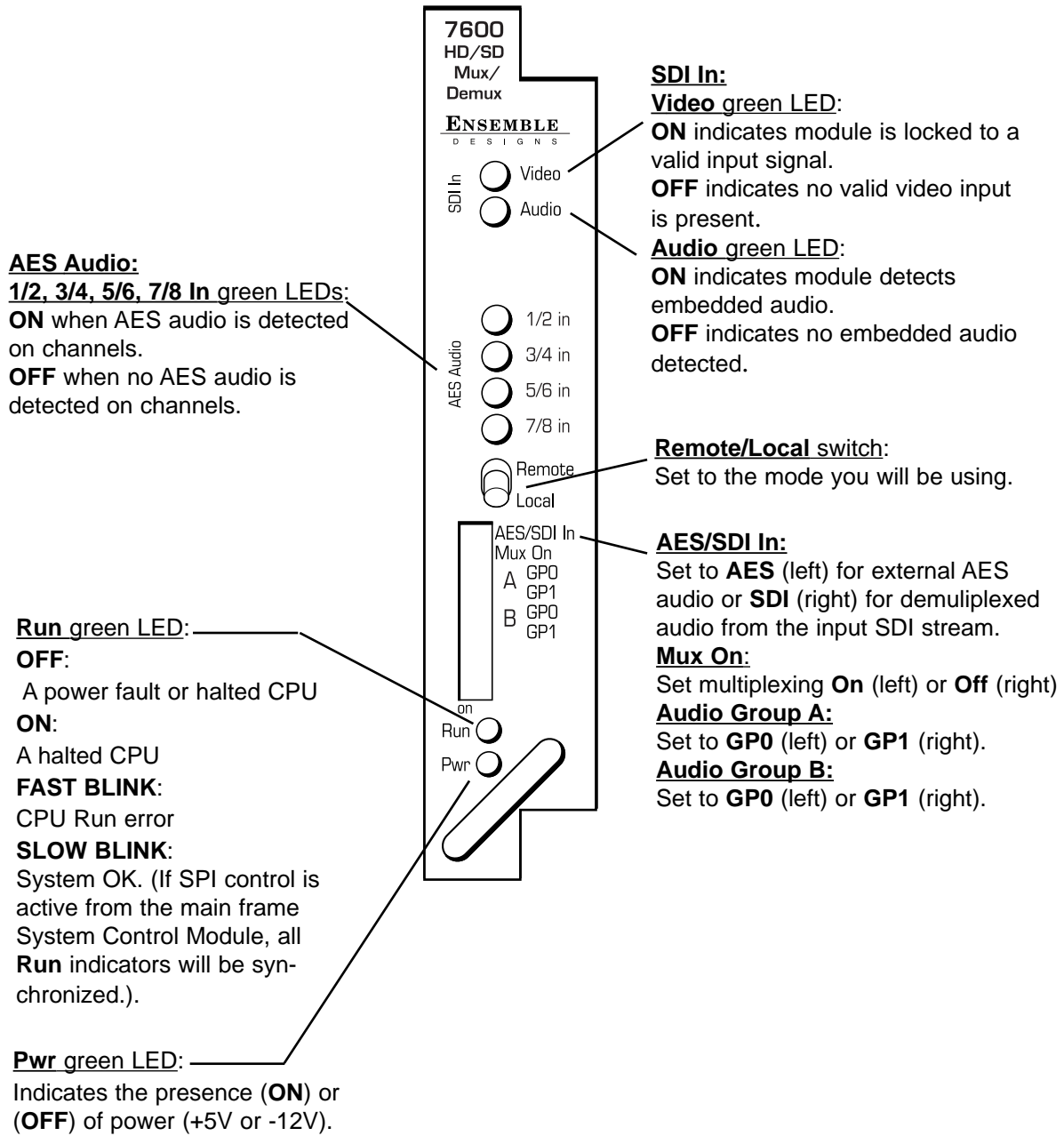


7600 Parameter Table

CONTROL	LOCAL	REMOTE	DEFAULT	DEFAULT USER LEVEL
<b>Strip Audio</b>	Off	On Off	Off	Admin
<b>Ch 1-8 In (level)</b>	0 dB	-70 to +12 dB	0 dB	Level 1
<b>Ch 1-8 Output Bus</b>	Ch 1 – Output 1 Ch 2 – Output 2 Ch 3 – Output 3 Ch 4 – Output 4 Ch 5 – Output 5 Ch 6 – Output 6 Ch 7 – Output 7 Ch 8 – Output 8	Output Bus 1 – 8 Tie Default Invert	Ch 1 – Output 1 Ch 2 – Output 2 Ch 3 – Output 3 Ch 4 – Output 4 Ch 5 – Output 5 Ch 6 – Output 6 Ch 7 – Output 7 Ch 8 – Output 8	Level 1
<b>Bulk Delay</b>	0 msec	0 – 1000 msec	0 msec	Level 1
<b>1/2 Input</b>	Switch 1: AES (left) SDI (right)	AES 1/2 AES 3/4 AES 5/6 AES 7/8 SDI 1/2 SDI 3/4 SDI 5/6 SDI 7/8	AES 1/2	Level 1
<b>3/4 Input</b>			AES 3/4	Level 1
<b>5/6 Input</b>			AES 5/6	Level 1
<b>7/8 Input</b>			AES 7/8	Level 1
<b>1/2, 3/4, 5/6, 7/8 Mode</b>	Auto	Audio Data Auto	Auto	Level 1
<b>Audio A and B DeMux Group</b>	Group 1	Group 1 Group 2 Group 3 Group 4	Group 1	Level 1
<b>Mux Disable or Position</b>	Switch 2: Mux On (left) Mux Off (right)	Off Replace Cascade Replace All	Replace All	Level 1
<b>Group Select A and B</b>	Switch 3 and 4: GP0 GP1	Group 1 Group 2 Group 3 Group 4	Group 1	Level 1
<b>Dig Ref Level</b>	-20dBFS	-20 dBFS -18 dBFS	-20 dBFS	Level 1
<b>Memory Registers</b>	N/A	1 – 5	Last Saved	Level 1

## Front Panel Controls and Indicators

Each front edge indicator and switch setting is shown in the diagram below:



## Avenue PC Remote Configuration

The Avenue PC remote control menus for this module are illustrated and explained below. Refer to the **7600 Parameter Table** shown earlier for a summary of available parameters that can be set remotely through the menus illustrated. For more information on using Avenue PC, refer to the Avenue PC Control Application Software data pack that came with the option.

Parameter fields that are grayed out can indicate one of the following conditions:

- An option is not installed.
- The function is not active.
- The module is locked.
- The User Level set with Avenue PC is not accessible from the current User Level.

### 7600 Avenue PC Menus

The **Vid In** menu below provides the following read-only status reports on the input video:

- **Input** – reports the type of video input to the module as one of the following:
  - No Input
  - 720p/50
  - 720p/59.94
  - 1080i/50
  - 1080i/59.94
  - 1080p/25
  - 1080p/23.98
  - 1080sF/25
  - 1080sf/23.98
  - SD 525
  - SD 625
  - Unknown Std
- **Input Error** – reports any input errors to the module as one of the following:
  - No Error
  - No Lock
  - EDH/CRC
  - TRS Error
- **Error Seconds** – reports how long the input error has been occurring.

The **Vid In** menu below provides the controls for setting parameters on the video input:

- **Strip Audio** – check the **Strip** checkbox to strip audio off so it is not fed through to the SDI output.

The screenshot shows the 'Vid In' menu interface. At the top, there is a navigation bar with tabs: Vid In, Aud Mix A, Aud Mix B, Aud Delay, Aud In A, Aud In B, Aud Out, and Memory. The 'Vid In' tab is selected. Below the navigation bar, there are three main sections:

- Input:** A dropdown menu showing 'SD 525'.
- Input Error:** A dropdown menu showing 'No Error'.
- Error Seconds:** A numeric input field showing '2' followed by the label 'Cnt'.

Below these sections, there is a **Strip Audio** section with a checkbox labeled 'Strip' which is currently unchecked.

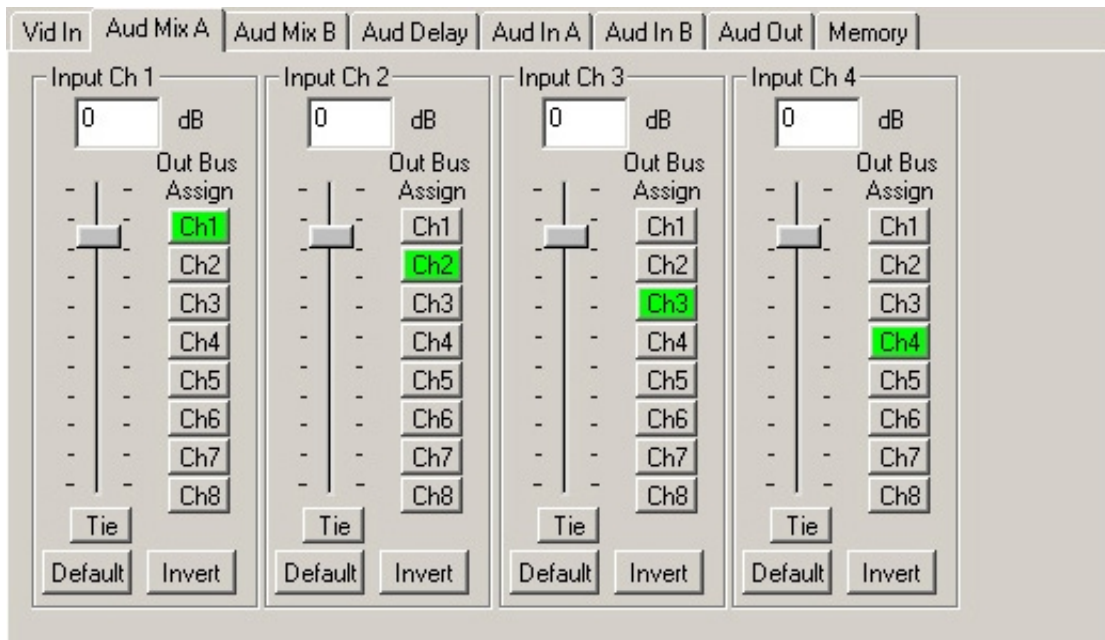
Use the **Aud Mix A** menu below to control the audio mixing and shuffling of Input Channels 1 through 4. Each output bus assignment will be indicated by a green box.

- **Input Ch 1** – assign Input Channel 1 to the desired output bus or tie to Channel 2 and set the input level using the slider control or by entering a number (-70 to +12 dB) in the window and pressing the **Enter** key.
- **Input Ch 2** – assign Input Channel 2 to the desired output bus or tie to Channel 1 and set the input level using the slider control or by entering a number (-70 to +12 dB) in the window and pressing the **Enter** key on your PC.
- **Input Ch 3** – assign Input Channel 3 to the desired output bus or tie to Channel 4 and set the input level using the slider control or by entering a number (-70 to +12 dB) in the window and pressing the **Enter** key on your PC.
- **Input Ch 4** – assign Input Channel 4 to the desired output bus or tie to Channel 3 and set the input level using the slider control or by entering a number (-70 to +12 dB) in the window and pressing the **Enter** key on your PC.

Selecting the **Tie** button in Input Ch 1 or Input Ch 2 will tie the two controls together. Selecting the **Tie** button in Input Ch 3 or Input Ch 4 will tie the controls for these channels together.

Select the **Default** button to return to the default value.

Select the **Invert** button to invert the phase of the audio input.



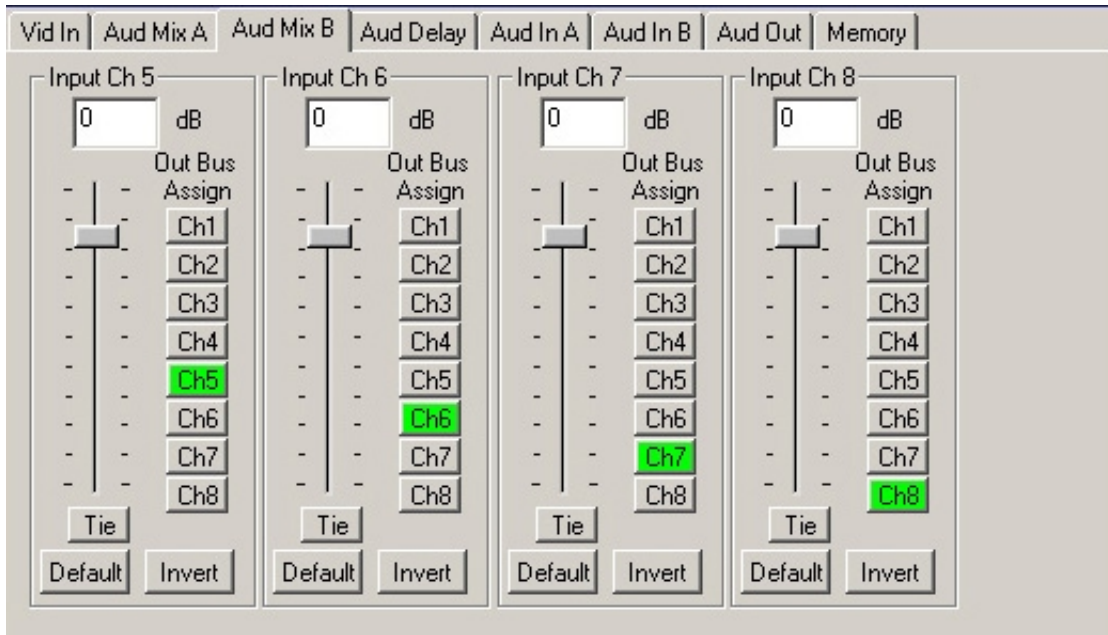
For Channels 5 –8, use the **Audio Mix B** menu shown below to set the following

- **Input Ch 5** – assign Input Channel 5 to the desired output bus or tie to Channel 6. Set the input level using the slider control or by entering a number (-70 to + 12 dB) in the window and pressing the **Enter** key on your PC.
- **Input Ch 6** – assign Input Channel 6 to the desired output bus or tie to Channel 5. Set the input level using the slider control or by entering a number (-70 to + 12 dB) in the window and pressing the **Enter** key on your PC.
- **Input Ch 7** – assign Input Channel 7 to the desired output bus or tie to Channel 8. Set the input level using the slider control or by entering a number (-70 to + 12 dB) in the window and pressing the **Enter** key on your PC.
- **Input Ch 8** – assign Input Channel 8 to the desired output bus or tie to Channel 7. Set the input level using the slider control or by entering a number (-70 to + 12 dB) in the window and pressing the **Enter** key on your PC.

Selecting the **Tie** button in Input Ch 5 or Input Ch 6 will tie the two controls together. Selecting the **Tie** button in Input Ch 7 or Input Ch 8 will tie the controls for these channels together.

Select the **Default** button to return to the default value.

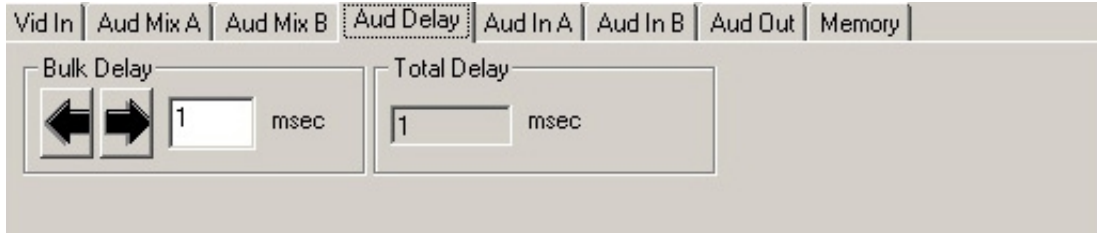
Select the **Invert** button to invert the phase of the audio input.



Use the **Aud Delay** menu shown below to adjust the amount of audio delay on the output:

- **Bulk Delay** – set the amount of bulk delay using the left and right arrows or enter a value in the **msec** field and press the **Enter** key on your PC.

The amount of total delay will be reported in nsec in the **Total Delay** window.



Use the **Aud In A** menu shown on the next page adjust the following parameters:

- **1/2 Input** – select the input audio source for Input 1/2.
- **3/4 Input** – select the input audio source for Input 3/4.

When an AES input pair is selected as an input, the corresponding AES BNC on the rear of the module will become an input. If an AES input is not selected, the corresponding BNC on the rear of the module will automatically become an output. Refer to the Applications section for an illustration of configuring the input/output BNCs.

- **1/2 Mode** – for a Serial input with embedded audio, select the type of audio in the stream:
  - **Audio** – the embedded stream is standard audio.
  - **Data** – the embedded stream is a non-audio signal.
  - **Auto** – the module will detect the type of signal embedded in the stream, audio or data.
- **3/4 Mode** – select the type of audio in the serial stream as described above.
- **DeMux Group** – select the embedded audio group to demultiplex from the selections. The status of embedded audio is shown in the **Embed In** view.

The status of the corresponding audio inputs are shown next to the control. Status is reported as one of the following:

- **No Input** – no serial digital embedded audio is detected.
- **Audio Sync** – the audio embedded in the stream is synchronous with the timing reference.
- **Data Sync** – the data embedded in the stream is synchronous with the timing reference.
- **Audio Async** – the audio embedded in the stream is non-synchronous with the timing reference.

The screenshot shows the 'Aud In A' control panel with the following settings:

Control	Value
1/2 Input	SDI 1/2
1/2 Status	Audio Sync
1/2 Mode	Audio
3/4 Input	SDI 3/4
3/4 Status	Audio Sync
3/4 Mode	Audio
DeMux Group	Group 1
Embed In A	Present

Use the **Aud In B** menu shown below to adjust the following parameters:

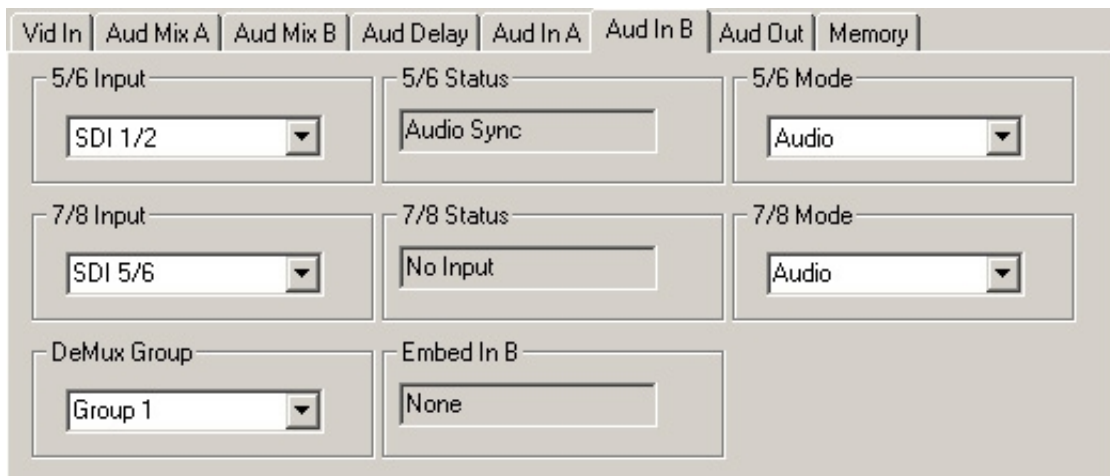
- **5/6 Input** – select the input audio source for Input 5/6.
- **7/8 Input** – select the input audio source for Input 7/8.

When an AES input pair is selected as an input, the corresponding AES BNC on the rear of the module will become an input. If an AES input is not selected, the corresponding BNC on the rear of the module will automatically become an output. Refer to the block diagram on page 4 for an illustration of the input/output BNCs.

- **5/6 Mode** – for a Serial input with embedded audio, select the type of audio in the stream:
  - **Audio** – the embedded stream is standard audio.
  - **Data** – the embedded stream is a non-audio signal.
  - **Auto** – the module will detect the type of signal embedded in the stream, audio or data.
- **7/8 Mode** – select the type of audio in the serial stream as described above.
- **DeMux Group** – select the embedded audio group to demultiplex from the selections. The status of embedded audio is shown in the **Embed In** view.

The status of the corresponding audio inputs are shown next to the control. Status is reported as one of the following:

- **No Input** – no serial digital embedded audio is detected.
- **Audio Sync** – the audio embedded in the stream is synchronous with the timing reference.
- **Data Sync** – the data embedded in the stream is synchronous with the timing reference.
- **Audio Async** – the audio embedded in the stream is non-synchronous with the timing reference.





Use the **Aud Out** menu shown below to adjust the following audio output parameters:

- **Audio Embed A** – turn embedding **Off** for no embedding to take place in the output signal. Select **Replace** to replace the targeted group in the stream with new content. If there is no such group already present, the new content will be placed in the horizontal interval in normal cascade, following any other content already there. When **Cascade** is selected, the audio channels are placed after any existing content. **Replace All** will strip all of the original content and the new content is placed at the beginning of the horizontal interval.
- **Audio Embed B** – identical to **Audio Embed A** but no **Replace All** function is required as this will occur upstream in the A embedder.
- **Mux Group A** – select the multiplexed group to be embedded in embedder A in the output.
- **Mux Group B** – select the multiplexed group to be embedded in embedder B in the output.
- **Dig Ref Level** – set the digital reference level for the audio output.

The screenshot shows the 'Aud Out' menu with the following settings:

Parameter	Value
Audio Embed A	Replace
Mux Group A	Group 1
Audio Embed B	Off
Mux Group B	Group 4
Dig Ref Level	-20dBFS

The **Memory** menu shown below allows you to save overall module setups to five memory registers as follows:

- Select **Save**, then one of the five memory registers **Reg 1 – 5**. The box will turn green. The entire module setup is now saved in the selected register.
- To recall a register, select the register box. If there is information saved, the box will turn green. The saved setup will now be loaded to the module. Up to five different module setups can be saved and recalled using the individual registers.

The screenshot shows the 'Memory' menu with the following options:

Option	Status
Save	Black
Reg 1	Black
Reg 2	Black
Reg 3	Black
Reg 4	Black
Reg 5	Green

## AVENUE TOUCH SCREEN REMOTE CONFIGURATION

Avenue Touch Screen remote control menus for this module are illustrated and explained below. Refer to the **7600 Parameter Table** earlier in this section for a summary of available parameters that can be set remotely through the menus illustrated. For more information on using Avenue Touch Screen, refer to the Avenue System Overview that is included in the Avenue manual.

Parameter fields that are grayed out can indicate one of the following conditions:

- An option is not installed.
- The function is not active.
- The module is locked.
- The User Level set with Avenue PC is not accessible from the current User Level.

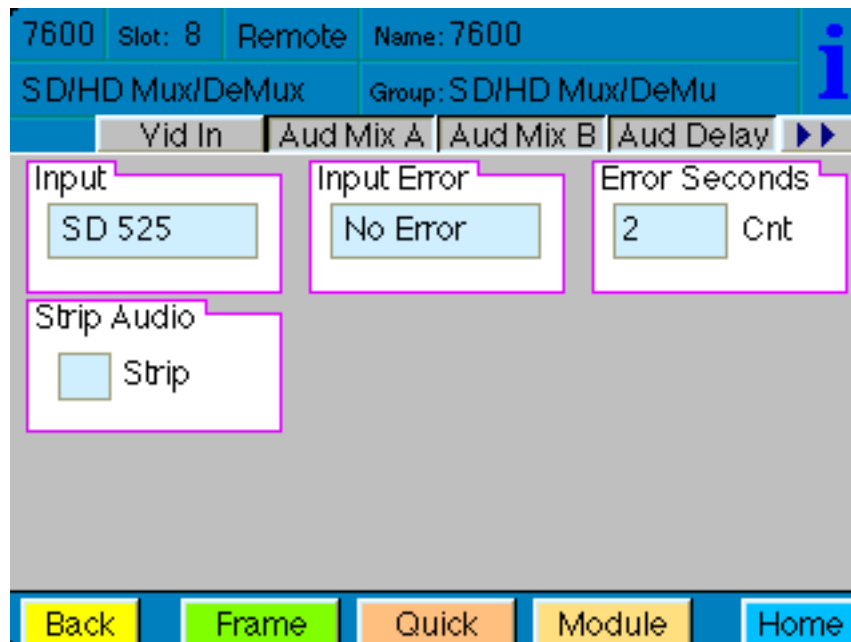
## 7600 Avenue Touch Screen Menus

The **Vid In** menu below provides the following read-only status reports for the input video:

- **Input** – reports the type of video input to the module as one of the following:
  - No Input
  - 720p/50
  - 720p/59.94
  - 1080i/50
  - 1080i/59.94
  - 1080p/25
  - 1080p/23.98
  - 1080sF/25
  - 1080sf/23.98
  - SD 525
  - SD 625
  - Unknown Std
- **Input Error** – reports any input errors to the module as one of the following:
  - No Error
  - No Lock
  - EDH/CRC
  - TRS Error
- **Error Seconds** – reports how long the input error has been occurring.

The **Vid In** menu below provides the controls for setting parameters on the video input:

- **Strip Audio** – check the **Strip** checkbox to strip audio off so it is not fed through to the SDI output.



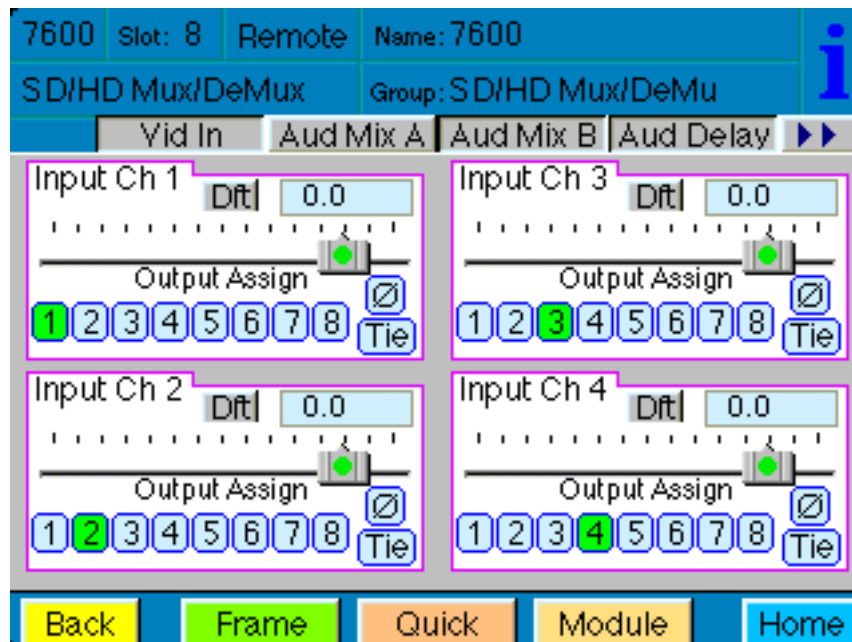
Use the **Aud Mix A** menu below to control the audio mixing and shuffling of Input Channels 1 through 4. Each output bus assignment will be indicated by a green box.

- **Input Ch 1** – assign Input Channel 1 to the desired output bus or tie to Channel 2 and set the input level using the slider control or by entering a number (-70 to +12 dB) using the pop-up key pad and pressing **Enter**.
- **Input Ch 2** – assign Input Channel 2 to the desired output bus or tie to Channel 1 and set the input level using the slider control or by entering a number (-70 to +12 dB) using the pop-up key pad and pressing **Enter**.
- **Input Ch 3** – assign Input Channel 3 to the desired output bus or tie to Channel 4 and set the input level using the slider control or by entering a number (-70 to +12 dB) using the pop-up key pad and pressing **Enter**.
- **Input Ch 4** – assign Input Channel 4 to the desired output bus or tie to Channel 3 and set the input level using the slider control or by entering a number (-70 to +12 dB) using the pop-up key pad and pressing **Enter**.

Selecting the **Tie** button in Input Ch 1 or Input Ch 2 will tie the two controls together. Selecting the **Tie** button in Input Ch 3 or Input Ch 4 will tie the controls for these channels together.

Select the **Default** button to return to the default value.

Select the **Invert** button to invert the phase of the audio input.



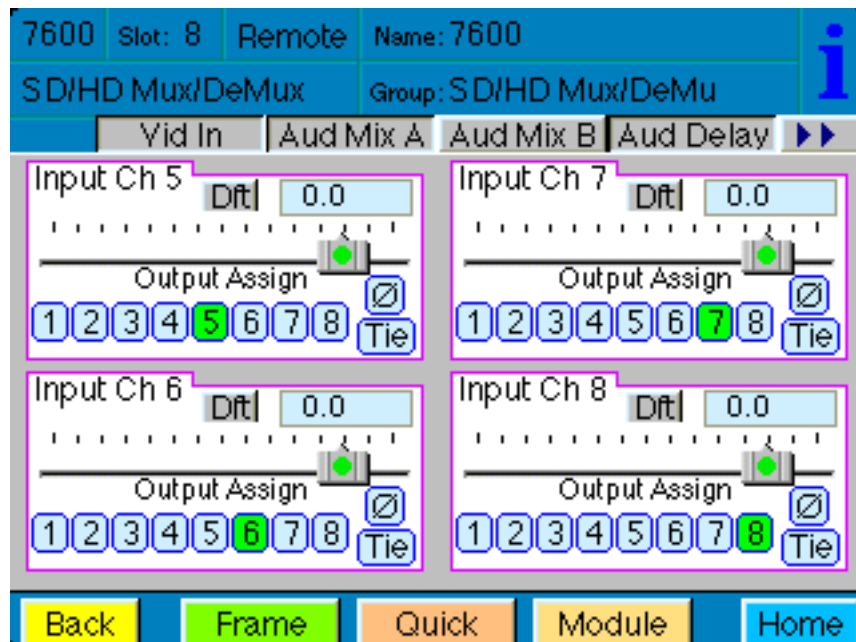
For Channels 5 –8, use the **Audio Mix B** menu shown below to set the following

- **Input Ch 5** – assign Input Channel 5 to the desired output bus or tie to Channel 6. Set the input level using the slider control or by entering a number (-70 to + 12 dB) using the pop-up key pad and pressing **Enter**.
- **Input Ch 6** – assign Input Channel 6 to the desired output bus or tie to Channel 5. Set the input level using the slider control or by entering a number (-70 to + 12 dB) using the pop-up key pad and pressing **Enter**.
- **Input Ch 7** – assign Input Channel 7 to the desired output bus or tie to Channel 8. Set the input level using the slider control or by entering a number (-70 to + 12 dB) using the pop-up key pad and pressing **Enter**.
- **Input Ch 8** – assign Input Channel 8 to the desired output bus or tie to Channel 7. Set the input level using the slider control or by entering a number (-70 to + 12 dB) using the pop-up key pad and pressing **Enter**.

Selecting the **Tie** button in Input Ch 5 or Input Ch 6 will tie the two controls together. Selecting the **Tie** button in Input Ch 7 or Input Ch 8 will tie the controls for these channels together.

Select the **Default** button to return to the default value.

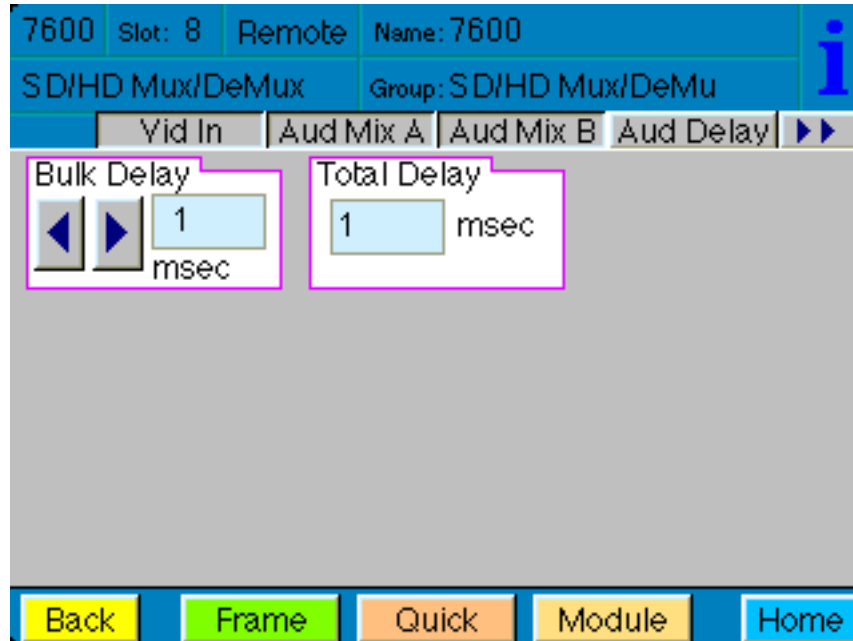
Select the **Invert** button to invert the phase of the audio input.



Use the **Aud Delay** menu shown below to adjust the amount of audio delay on the output:

- **Bulk Delay** – set the amount of bulk delay using the left and right arrows or enter a value in the **msec** field and press the **Enter** key on your PC.

The amount of total delay will be reported in nsec in the **Total Delay** window.



Use the **Aud In A** menu shown on the next page adjust the following parameters:

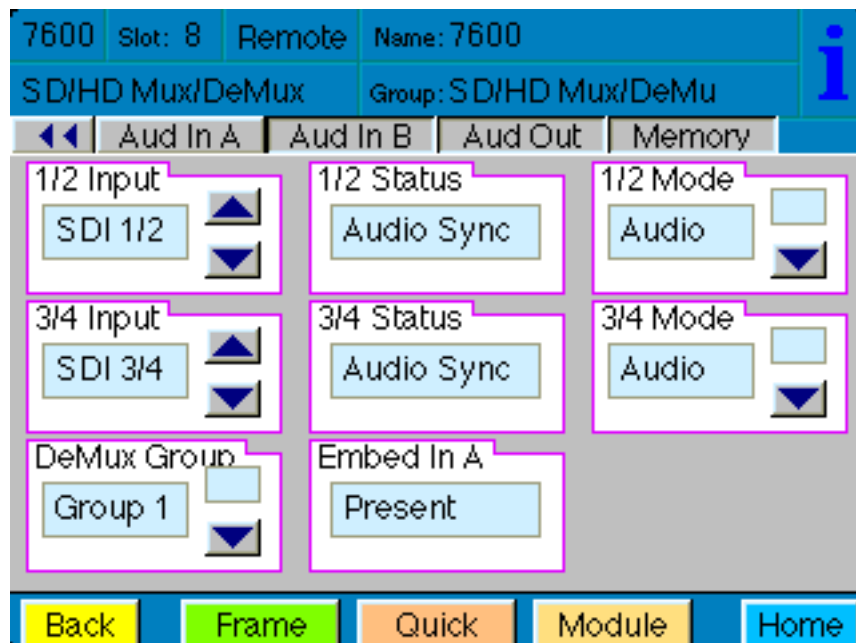
- **1/2 Input** – select the input audio source for Input 1/2.
- **3/4 Input** – select the input audio source for Input 3/4.

When an AES input pair is selected as an input, the corresponding AES BNC on the rear of the module will become an input. If an AES input is not selected, the corresponding BNC on the rear of the module will automatically become an output. Refer to the block diagram on page 4 for an illustration of the input/output BNCs.

- **1/2 Mode** – for a Serial input with embedded audio, select the type of audio in the stream:
  - **Audio** – the embedded stream is standard audio.
  - **Data** – the embedded stream is a non-audio signal.
  - **Auto** – the module will detect the type of signal embedded in the stream, audio or data.
- **3/4 Mode** – select the type of audio in the serial stream as described above.
- **DeMux Group** – select the embedded audio group to demultiplex from the selections. The status of embedded audio is shown in the **Embed In** view.

The status of the corresponding audio inputs are shown next to the control. Status is reported as one of the following:

- **No Input** – no serial digital embedded audio is detected.
- **Audio Sync** – the audio embedded in the stream is synchronous with the timing reference.
- **Data Sync** – the data embedded in the stream is synchronous with the timing reference.
- **Audio Async** – the audio embedded in the stream is non-synchronous with the timing reference.



Use the **Aud In B** menu shown below to adjust the following parameters:

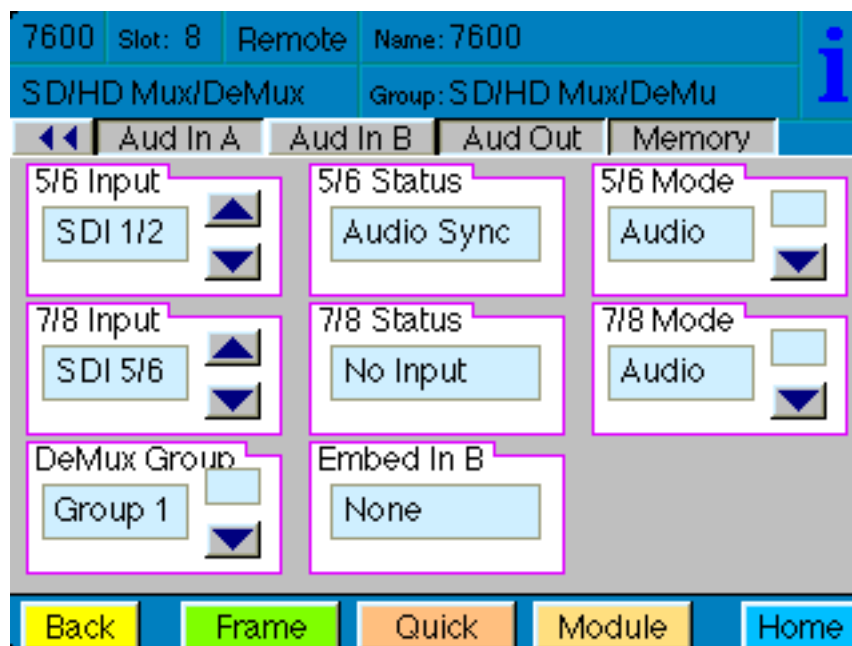
- **5/6 Input** – select the input audio source for Input 5/6.
- **7/8 Input** – select the input audio source for Input 7/8.

When an AES input pair is selected as an input, the corresponding AES BNC on the rear of the module will become an input. If an AES input is not selected, the corresponding BNC on the rear of the module will automatically become an output. Refer to the block diagram on page 4 for an illustration of the input/output BNCs.

- **5/6 Mode** – for a Serial input with embedded audio, select the type of audio in the stream:
  - **Audio** – the embedded stream is standard audio.
  - **Data** – the embedded stream is a non-audio signal.
  - **Auto** – the module will detect the type of signal embedded in the stream, audio or data.
- **7/8 Mode** – select the type of audio in the serial stream as described above.
- **DeMux Group** – select the embedded audio group to demultiplex from the selections. The status of embedded audio is shown in the **Embed In** view.

The status of the corresponding audio inputs are shown next to the control. Status is reported as one of the following:

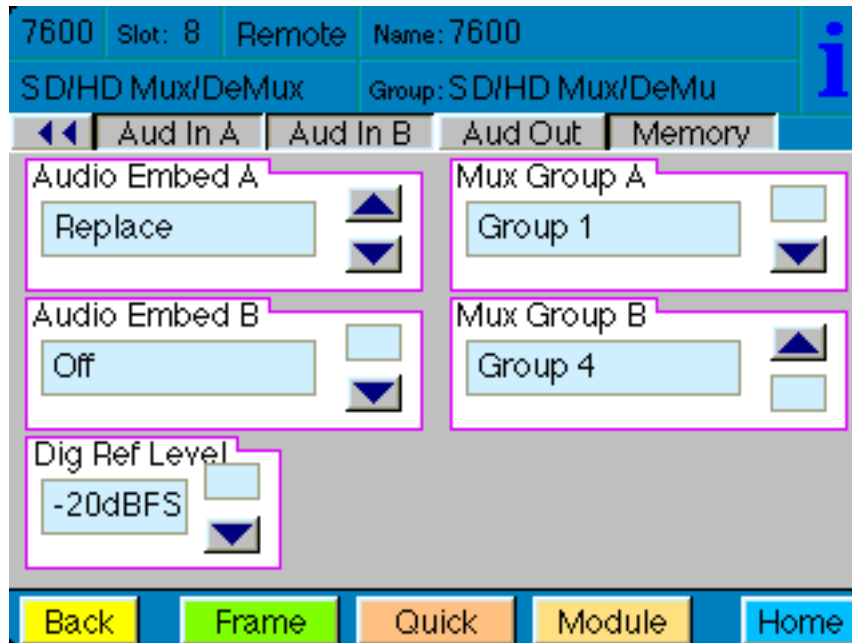
- **No Input** – no serial digital embedded audio is detected.
- **Audio Sync** – the audio embedded in the stream is synchronous with the timing reference.
- **Data Sync** – the data embedded in the stream is synchronous with the timing reference.
- **Audio Async** – the audio embedded in the stream is non-synchronous with the timing reference.





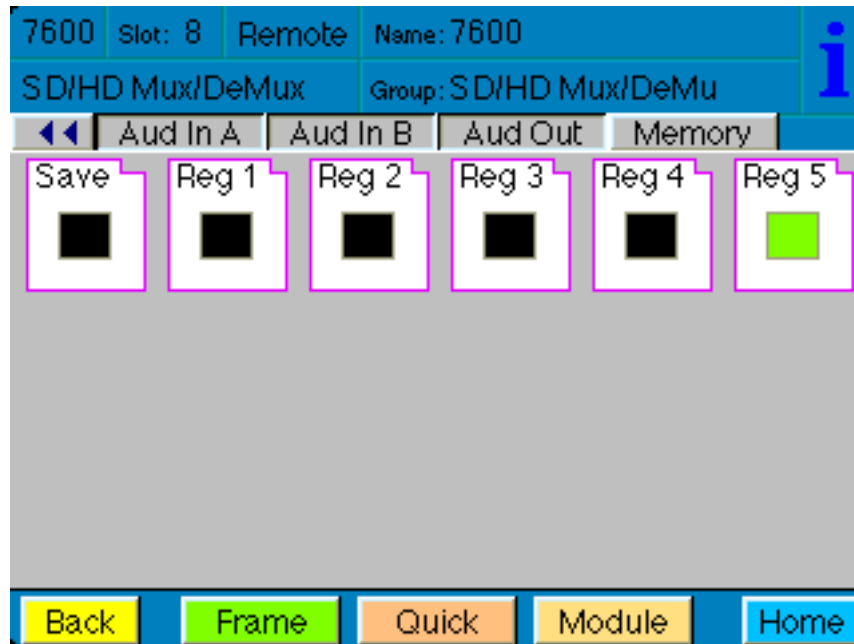
Use the **Aud Out** menu shown below to adjust the following audio output parameters:

- **Audio Embed A** – turn embedding **Off** for no embedding to take place in the output signal. Select **Replace** to replace the targeted group in the stream with new content. If there is no such group already present, the new content will be placed in the horizontal interval in normal cascade, following any other content already there. When **Cascade** is selected, the audio channels are placed after any existing content. **Replace All** will strip all of the original content and the new content is placed at the beginning of the horizontal interval.
- **Audio Embed B** – identical to **Audio Embed A** but no **Replace All** function is required as this will occur upstream in the A embedder.
- **Mux Group A** – select the multiplexed group to be embedded in embedder A in the output.
- **Mux Group B** – select the multiplexed group to be embedded in embedder B in the output.
- **Dig Ref Level** – set the digital reference level for the audio output.



The **Memory** menu allows you to save overall module setups to five memory registers as follows:

- Select **Save** (it will light red), then select one of the five memory registers **Reg 1 – 5**. The selected box will turn green. The entire module setup is now saved in the selected register.
- To recall a register, select the register box. If there is information saved, the box will turn green. The saved setup will now be loaded to the module. Up to five different module setups can be saved and recalled using the individual registers.



## TROUBLESHOOTING

To aid in troubleshooting, the LED indicators can be easily monitored from the front panel of this module to show module status.

If using the **Remote** mode, status items can also be monitored using the Avenue Touch Screen Control Panel or PC Application:

Refer to the overall troubleshooting tips given below for the module:

### **No status lights are lit on front panel:**

- Check that frame power is present (green LED{s} on frame power supplies).
- Check that module is firmly seated in frame. Try removing it and plugging it in again.

### **Can't control module:**

- Check status of CPU **Run** green LED. Should be blinking slowly and in unison with other modules if System module is present. If not, try removing it and plugging it in again.
- System module may not be working properly if installed.

### **Module controls are grayed out:**

- Module is locked or access to module controls is restricted by User Level.
- Local/Remote switch on module is in the **Local** position.

### **No signal out of module:**

- Check status of **Video** and **AES 1/2, 3/4, 5/6, 7/8** green LEDs. Should be lit. If not, check the input signal for presence and quality.
- Check correct mode (Mux or Demux) assignment has been made using Audio In menus.
- Check cabling to input of module.

You may also refer to the technical support section of the Ensemble web site for the latest information on your equipment at the URL below:

<http://www.ensembledesigns.com/support>

## SOFTWARE UPDATING

Software upgrades for each module can be downloaded remotely if the optional System Control module is installed. These can be downloaded onto your PC and then Avenue PC will distribute the update to the individual module. (Refer to the Avenue PC documentation for more information) Periodically updates will be posted on our web site. If you do not have the required System Control Module and Avenue PC, modules can be sent back to the factory for software upgrades.

## **WARRANTY AND FACTORY SERVICE**

### **Warranty**

This Module is covered by a five year limited warranty, as stated in the main Preface of this manual. If you require service (under warranty or not), please contact Ensemble Designs and ask for customer service before you return the unit. This will allow the service technician to provide any other suggestions for identifying the problem and recommend possible solutions.

### **Factory Service**

If you return equipment for repair, please get a Return Material Authorization Number (RMA) from the factory first.

Ship the product and a written description of the problem to:

Ensemble Designs, Inc.

Attention: Customer Service RMA #####

870 Gold Flat Rd.

Nevada City, CA. 95959 USA

(530) 478-1830

Fax: (530) 478-1832

[service@ensembledesigns.com](mailto:service@ensembledesigns.com)

<http://www.ensembledesigns.com>

Be sure to put your RMA number on the outside of the box.

## SPECIFICATIONS

### 7600 HD/SD AMD

#### SD Video Input Signal

Number	One
Signal Type:	Serial Digital (SMPTE 259M)
Impedance:	75 $\Omega$ BNC
Return Loss:	>15 dB
Maximum Cable Length:	300 meters

#### HD Video Input Signal

Number	One
Signal Type:	HD Serial Digital 1.485 Gb/s (SMPTE 274M or 296M)
Impedance:	75 $\Omega$ BNC
Return Loss:	>15 dB
Maximum Cable Length:	100 meters (Belden 1694A or equivalent)
HD Standards Supported:	
1080i (SMPTE 274M-4, 5, 6)	50, 59.94 or 60 Hz
720p (SMPTE 296M-1,2,3)	59.94 or 60 Hz
1080p (SMPTE 274M-9, 10, 11)	23.98, 24, 25 Hz
1080sF (RP 211 -14, 15, 16)	23.98, 24, 25 Hz

#### Serial Digital Output

Number:	Four
Signal Type:	Same as input, Serial Digital (SMPTE 259M) or HD Serial Digital 1.485 Gb/s (SMPTE 274M or 296M)
Impedance:	75 $\Omega$ BNC
Return Loss:	>15 dB
Output DC:	None (ac coupled)

#### AES/EBU Digital Inputs

Number	Four (total of eight channels)
Type:	AES3id
Connectorization	Coaxial, 75 $\Omega$ BNC
Bit Depth	20 or 24 bit
Sample Rate	30 kHz to 100 kHz (sample rate converted internally to 48 kHz)
Crosstalk	<144 dB
Dynamic Range	>144 dB
Reference Level	-18 or -20 dBFS (selectable)
AC-3, Dolby-E	Supported when inputs are synchronous

**Embedded Inputs**

Number Four AES Streams (from video input)  
Eight channels from any two of four groups  
Channels: Eight  
Bit Depth: 20 or 24 bit

**AES/EBU Digital Outputs**

Number Four (total of 8 channels)  
Type: AES3id  
Connectorization Coaxial, 75  $\Omega$  BNC  
Bit Depth 20 or 24 bit  
Sample Rate 48 kHz  
Synchronous to video input  
Crosstalk >144 dB  
Dynamic Range >144 dB  
Reference Level -18 or -20 dBFS (selectable)

**Embedded Outputs**

Group Assign: Cascade or Replace any two of four groups  
Channels: Eight  
Bit Depth: 24 bit

**General Specifications**

Power Consumption: 10.0 watts  
Temperature Range: 0 to 40 degrees C ambient (all specs met)  
Relative Humidity: 0 to 95% noncondensing  
Altitude: 0 to 10,000 ft

Due to ongoing product development, all specifications subject to change.