AVENUE

Avenue™ signal integration system

Model 6040 Tracking Audio Delay Data Pack

ENSEMBLE
D E S I G N S

Revision 2.1   SW v1.0.0

This data pack provides detailed installation, configuration and operation information for the **6040 Tracking Audio Delay** 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 6040 Tracking Audio Delay module provides both bulk and variable delay to ensure proper synchronization between picture and sound. The 6040 can track up to three video synchronizer modules in the Avenue system and will respond when a frame is dropped or replaced to provide accurate audio tracking. Delay settings are dynamically adjusted so that the 6040 will "shrink" or "stretch" the audio as required over a period of 6 seconds until the new settings are in effect.

As shown in the block diagram on the next page, two input sources, analog or digital, are available via local or remote control. The digital input is sample rate converted allowing for unlocked and/or off frequency digital sources to be used with 24-bit audio precision. The digital input can also be used for non-audio sources such as AC-3 or Dolby E. In this case the sample rate converter is by-passed allowing for full 24-bit precision data.

The module locks its audio to a Phase Lock Loop (PLL). The PLL can lock to the digital input or an external reference as long as the signals are 48 kHz. If no reference is available, or if desired by the user, the module can lock to an internal crystal.
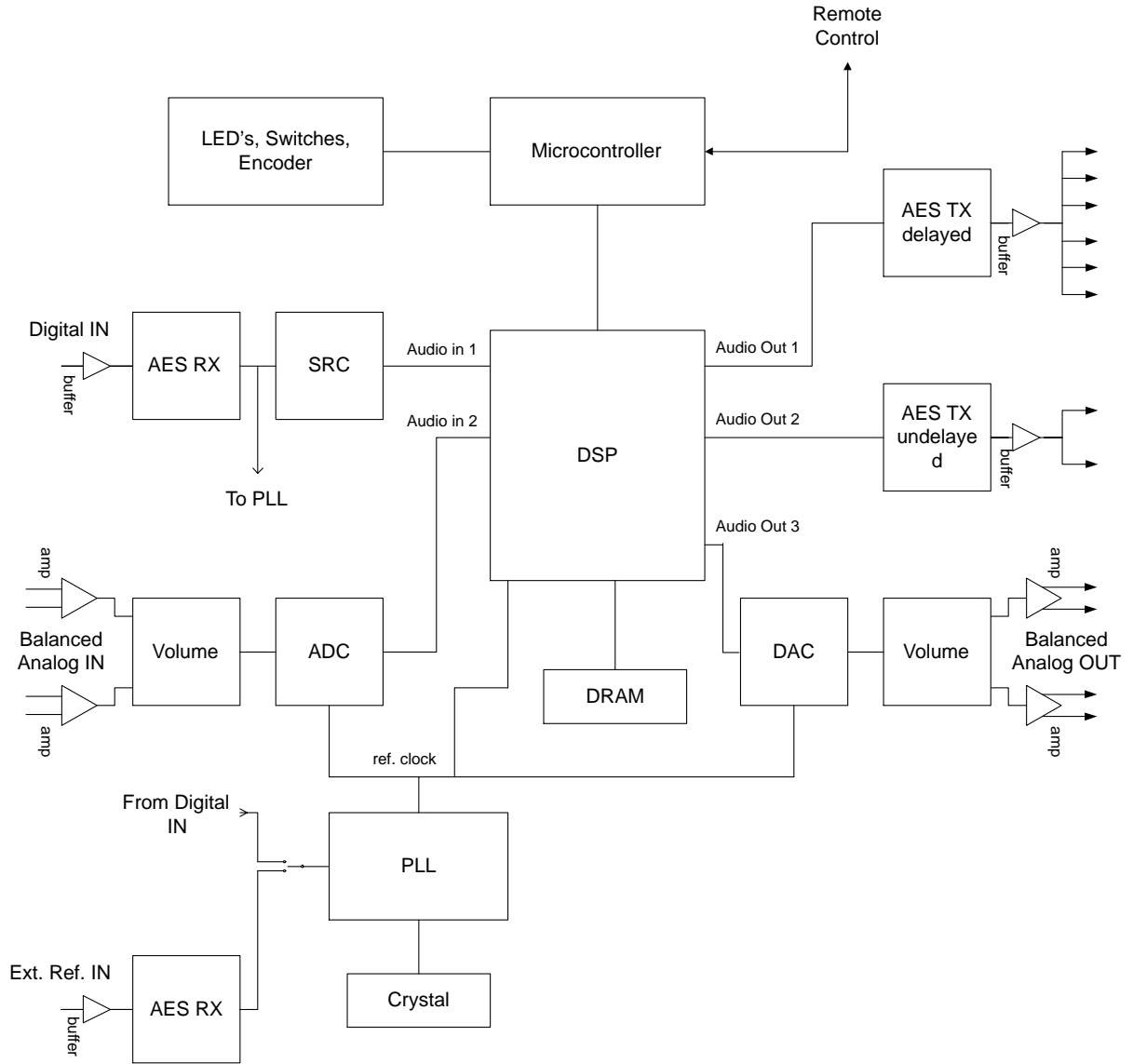
The module incorporates three outputs; an analog output that can be switched between delayed and non-delayed audio, an undelayed AES output (two outputs), and a delayed AES output (six outputs).

Status indicators include indication of a valid external reference, error detection for the AES input, error indication for any tracking errors, and indication of the bulk delay value.

Control of the module can be from one of the remote Avenue options or from the local controls located on both the front of the module and on the inside of the module. Local controls include bulk delay, input selection, analog output mode (delayed or non-delayed), reference mode, digital reference level, analog input reference level, and analog output reference level.

The on-board microprocessor communicates with the frame for remote control via the Avenue System Control module if installed. Module ID (slot location, software version and board revision) and status information can be monitored by the frame System Control module and read using the optional interfaces available. Alarms can also be enabled if desired.

Power is derived from the ± 12 volt frame power. It is regulated to the required voltages for the module by on-board regulators. The module is fused with resettable fuse devices. If a 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.

Remote
Control

LED's, Switches,
Encoder

Microcontroller

AES TX
delayed

buffer

Digital IN

AES RX

buffer

SRC

Audio in 1

To PLL

Audio in 2

DSP

Audio Out 1

Audio Out 2

AES TX
undelayed

buffer

Audio Out 3

amp

Balanced
Analog IN

Volume

ADC

amp

DRAM

DAC

Volume

amp

Balanced
Analog OUT

amp

ref. clock

From Digital
IN

PLL

Ext. Ref. IN

AES RX

buffer

Crystal

6040 Tracking Audio Delay Functional Block Diagram

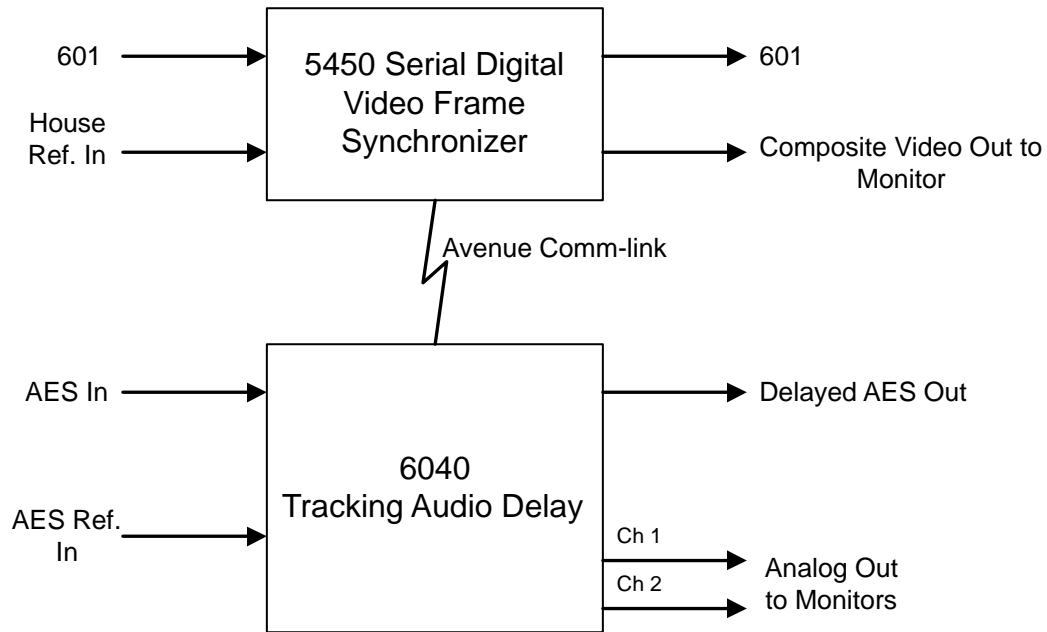## APPLICATIONS

Tracking an All Analog Path

The application shown below illustrates how the Model 6040 Tracking Audio Delay module can track a video source through a Model 5300 Analog to Digital Video Converter with the optional 5310 TBC/Frame Synchronizer installed. The 6040 can not only track the 5310, but can compensate for the video delay in the satellite path.
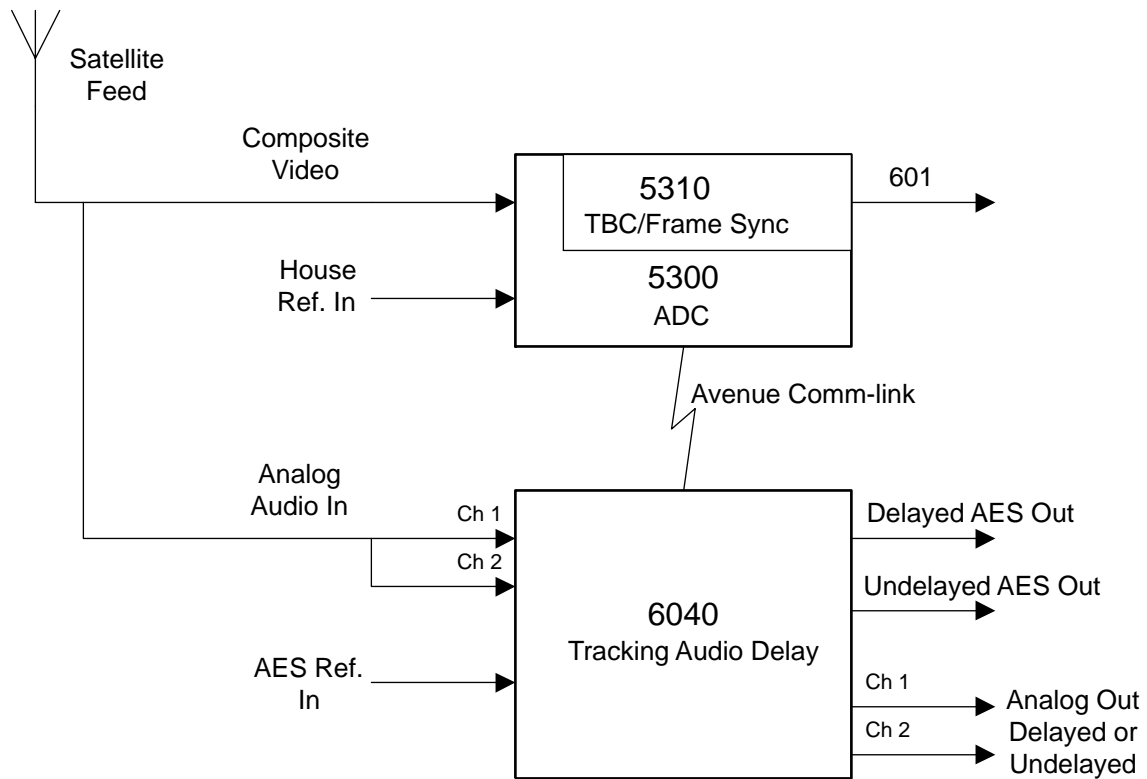
6040 Tracking an All Analog Path
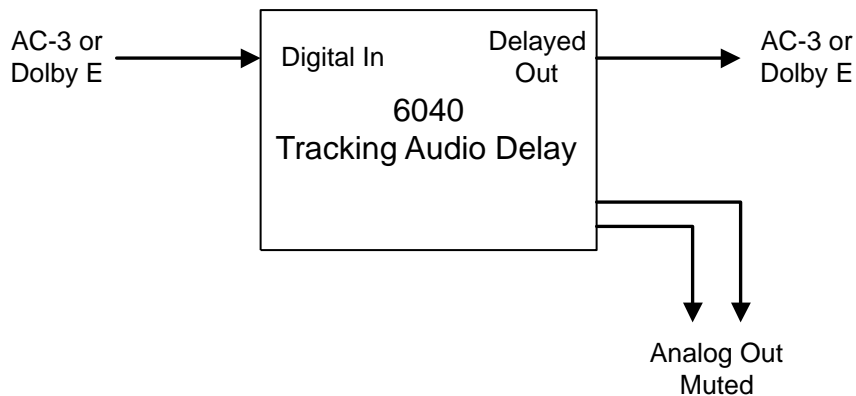
Tracking an All Digital Path

The application below shows how the 6040 can be used in a digital path. Here, the 6040 is used in conjunction with a Model 5450 Digital Video Frame Synchronizer. Both the 5450 and the 6040 can be used for monitoring.

```
601 ──────────▶ ┌──────────────────┐ ──────────▶ 601
                │  5450 Serial Digital │
House           │  Video Frame      │
Ref. In ───────▶│  Synchronizer     │ ──────────▶ Composite Video Out to
                └──────────────────┘              Monitor
                         │
                         Avenue Comm-link

AES In ────────▶ ┌──────────────────┐ ──────────▶ Delayed AES Out
                 │                    │
                 │     6040          │
AES Ref. ───────▶│  Tracking Audio Delay│ Ch 1 ──▶ Analog Out
  In             │                    │ Ch 2 ──▶ to Monitors
                 └──────────────────┘
```

6040 Tracking an All Digital Path

## Delaying Compressed Audio (non-audio) Sources

Another application for the 6040 is delaying compressed audio streams such as AC-3 or Dolby E. In the illustration shown below, the 6040 locks to the incoming data stream (48 kHz only), delays the data using only the bulk delay value (tracking delay is set to 0), and mutes the analog outputs. If the non-audio data is not at a 48 kHz sample rate, all of the outputs will be muted. Note that the 6040 will automatically enter into this mode when it detects a non-audio source on the Digital input.

```
AC-3 or ───────▶ ┌──────────────────┐ ──────────▶ AC-3 or
Dolby E          │ Digital In  Delayed│             Dolby E
                 │              Out   │
                 │     6040          │
                 │  Tracking Audio Delay│
                 └──────────────────┘
                              │    │
                              ▼    ▼
                          Analog Out
                            Muted
```

6040 Delaying Compressed Audio Sources

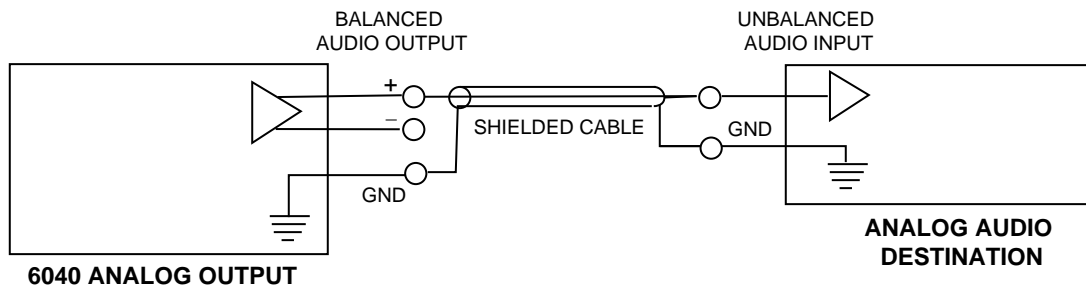## Driving a 6040 Using a Single-ended (unbalanced) Analog Source

The 6040 has balanced transformerless analog inputs. The diagram below shows how to drive a 6040 using a single-ended (unbalanced) source.
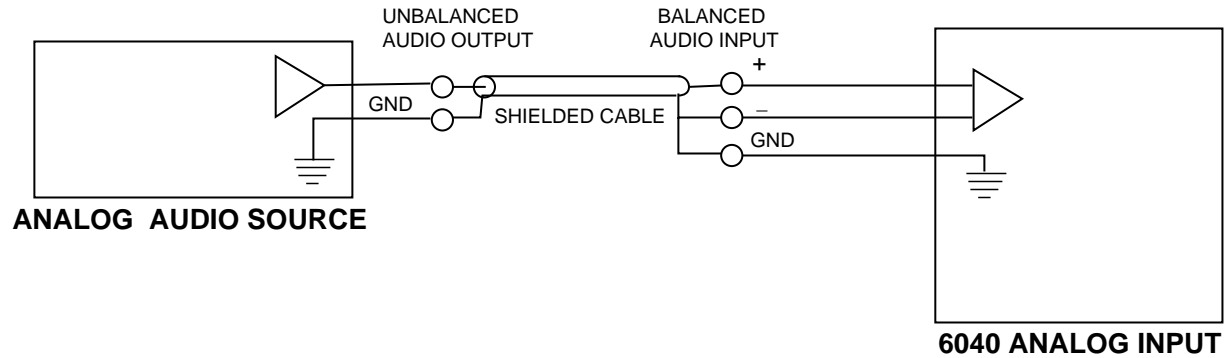
6040 Driven by Single-Ended (unbalanced) Analog Source

Driving a Singled-ended (unbalanced) Analog Source with a 6040

The 6040 has balanced transformerless analog outputs. This application shows how to drive external equipment with single-ended (unbalanced) inputs. Note that the minus (-) side of the balanced output stage is left floating; it should not be connected to ground.

6040 Driving a Single-ended (unbalanced) Source

INSTALLATION

Plug the 6040 module into any one of the ten slots in the 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 next page for cabling instructions. Note that unless stated otherwise, the 1 RU cabling explanations are identical to those given in the 3 RU diagram.
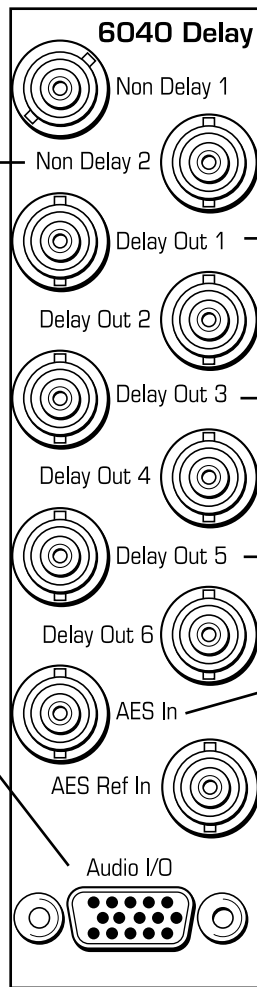
3 RU Backplane

6040 Delay

Connect output destinations to the **Non Delay 1** and **2** BNCs.

Non Delay 1
Non Delay 2
Delay Out 1
Delay Out 2
Delay Out 3
Delay Out 4
Delay Out 5
Delay Out 6
AES In
AES Ref In
Audio I/O

Connect output destinations to the **Delay Out 1-6** BNCs (delayed AES outputs).

Connect analog audio inputs and outputs to the 15-pin high-density Audio I/O connector as shown in the drawing below.
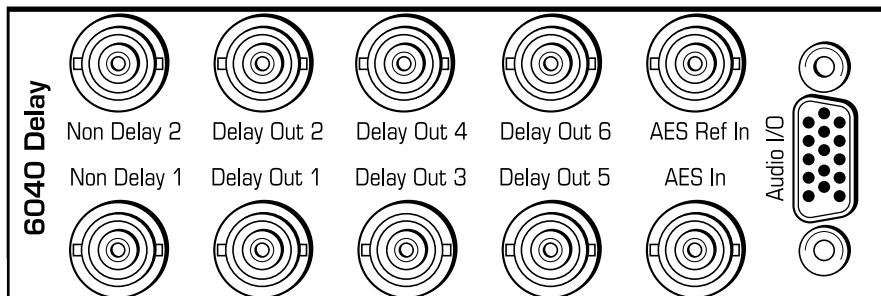
6040 Wiring to Frame
15-pin D Male Connector

AUDIO IN

CH 2   CH 1

+   -   -   +

1
6
11

+   -   -   +

CH 2   CH 1

AUDIO OUT

Wiring Side-Male Plug

Connect an AES digital input signal to the **AES In** BNC.

If using an external reference, connect an AES reference input to the **AES Ref In** BNC.

1 RU Backplane

6040 Delay

| Non Delay 2 | Delay Out 2 | Delay Out 4 | Delay Out 6 | AES Ref In | Audio I/O |
| Non Delay 1 | Delay Out 1 | Delay Out 3 | Delay Out 5 | AES In | |

MODULE CONFIGURATION AND CONTROL

The parameters for each Avenue module must be configured 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 that 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 **6040 Parameter Table** shown on the next page summarizes and compares the various configuration parameters that can be set remotely or locally and the default/factory settings.

If you are not using a remote control option, the module parameters must be configured locally from the front panel encoder and both front panel and internal switches on the module. Parameters that have no local control will be set to a default value. The Local switches and internal on-board switches are illustrated in the **Front Panel Controls** and **Indicators** and **Internal Jumpers, Switches and Indicators** sections following the **6040 Parameter Table**.

Avenue module parameters can be configured and controlled remotely from one or both of the remote control options, the Avenue Touch Screen 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 the Avenue PC section.

6040 Parameter Table

CONTROL	LOCAL	REMOTE/FACTORY	DEFAULT
Bulk Delay Value	Shaft Encoder: 0 – 1000ms 10mS steps	0 – 1000 ms	0 ms
Track Delay (1 – 3)	Disabled	Disabled Connected No Module	Disabled
Track Frame (1 – 3)	1	1 – 1000	1
Track Slot # (1 – 3)	1	1 – 10	1
Bulk Delay Mode	**Front Switch**: In Out	In Out	Out
Input Source	**Front Switch**: In Out	Analog Digital	Digital
Analog Output Mode	**Front Switch**: Delayed Undelayed	Delayed Undelayed	Delayed
Reference Mode	**Front Switch**: Auto Select External Select	Auto Select External Select	Auto Select
Digital Reference Level	**Internal Switches**: – 20 dBFS – 18 dBFS – 16 dBFS	– 20 dBFS – 18 dBFS – 16 dBFS	– 20 dBFS
Input Mode	Stereo	Stereo 2 Channel	Stereo
Analog Input Reference Level	**Internal Switches**: + 4 dBu 0 dBu – 8 dBu	+ 4 to –10 dBu	+ 4 dBu
Output Mode	Stereo	Stereo 2 Channel	Stereo
Analog Output Reference Level	**Internal Switches**: + 4 dBu 0 dBu – 8 dBu – 2 dBu	+ 4 to –10 dBu	+ 4 dBu

Front Panel Controls and Indicators

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

I/P ERR red LED:
With EXT REF switch set as follows:
External Mode:
ON for no signal at AES digital input.
OFF when valid AES signal present at input at standard rate (48kHz, 44.1kHz or 32kHz).
Auto Select Mode:
OFF when valid AES signal present at digital input at 48kHz sample rate.
ON if no valid input signal present or valid AES signal present at rate other than 48kHz.

Bulk Delay green LEDs:
Show bulk delay value.
(200 ms per LED.)

Remote/Local switch:
Set to the mode you
will be using.

(4) IN SEL: Selects input source.
Left: Digital Input (default)
Right: Analog input
(3) BLK I/O: Bulk delay in or out.
Left: Bulk out (default)
Right: Bulk in.
(2) OUT I/O: Sets analog delay.
Left: Undelayed (default)
Right: Delayed
(1) EXT REF: Selects source of external reference.
Left: **Auto Select mode**. Module will scan in order, AES Digital Input, External Ref Input or Internal clock for PLL lock source.
Right: External Reference mode. Module will lock to valid AES 48kHz signal on external reference. If no valid signal present, will default to Internal clock.

6040
Tracking
Audio Delay

E N S E M B L E
D E S I G N S

I/P ERR
EXT REF
TRK ERR
DELAY
REMOTE
LOCAL
DELAY

4 IN   SEL
3 BLK I/O
2 OUT I/O
1 EXT REF

CPU
PWR

EXT REF green LED:
With EXT REF switch
set as follows:
External Mode:
ON for valid AES signal at external reference input at 48KHz sample rate.
OFF when no signal or signal other than 48kHz sample rate.
Auto Select Mode:
ON when module is locked to external input (valid AES signal at 48kHz sample rate).
OFF when not locked to external reference input.
(Note that Auto Select checks AES digital input first, then external input.)

TRK ERR red LED:
ON when a Track (-1 - 3) has lost communication with module it was tracking. (Tracking delay value for this module is set to 0.)
OFF when no tracking errors.

DELAY Adjustment:
Adjusts bulk delay
value in 10 mS steps

CPU green LED:
OFF:
A power fault or halted CPU
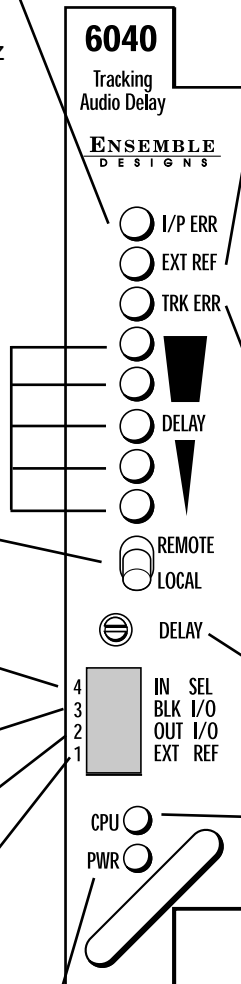**ON**:
A halted CPU
FAST BLINK:
CPU Run error
SLOW BLINK:
System OK. (If SPI control is active from the main frame System Control Module, all **Run** indicators will be synchronized.).

Pwr green LED:
Indicates the presence (**ON**)
or (**OFF**) of power (+5V).

Internal Switches

When using the 6040 in Local mode, several switches must be set on the circuit board as detailed in this section.

The following parameters must be set on the circuit board in **Local** mode:

- **Digital Reference** (Internal DIP switch S2, positions 1 and 2)
- **Analog In** (Internal DIP switch S2, positions 3 and 4)
- **Analog Out** (Internal DIP switch S2, positions 5 and 6)

Refer to the module circuit board layout illustration below to locate each jumper and switch. The settings for each switch are given in the corresponding tables below.
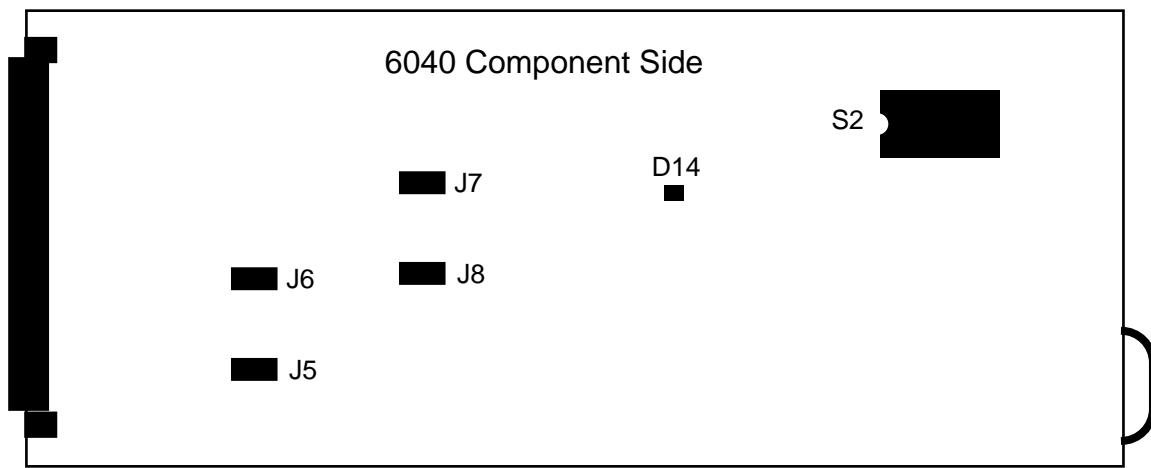
Internal Jumpers and Switches

The 6040 uses an eight position DIP switch, S2, for setting various local levels. The switch function is shown below:
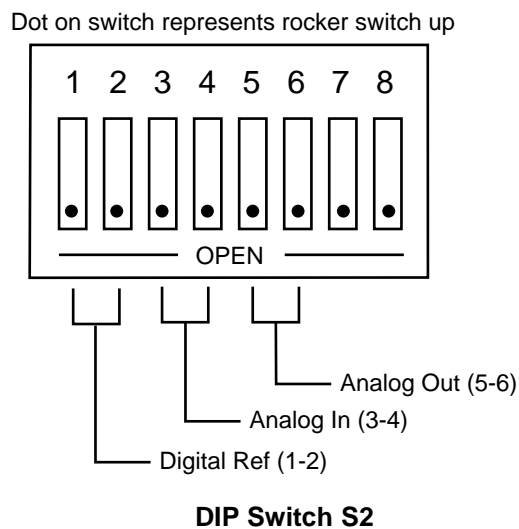
DIP Switch S2

Digital Ref:
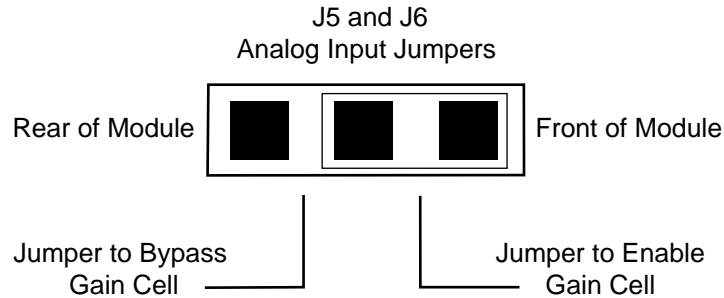
Positions 1 and 2 of Switch S2 are used to set the local Digital Reference level. The following table shows the possible selections:

1	2	Digital Reference
0	0	− 20 dBFS
1	0	− 18 dBFS
0	1	− 16 dBFS
1	1	− 20 dBFS

Analog In:

Positions 3 and 4 of Switch S2 are used to set the local Analog Input Reference level. The following table shows the possible selections:

3	4	Analog Input Reference Level
0	0	+ 4 dBu
1	0	0 dBu
0	1	− 8 dBu
1	1	− 8 dBu

Analog Out:

Positions 5 and 6 of Switch S2 are used to set the local Analog Output Reference level. The following table shows the possible selections:

5	6	Analog Output Reference Level
0	0	+ 4 dBu
1	0	0 dBu
0	1	− 8 dBu
1	1	− 2 dBu

Internal Jumper and Indicators

Analog Input Gain Bypass Jumpers:

Jumpers J5 and J6 are set at the factory but can be used to bypass the module's analog input gain cell if needed for troubleshooting purposes. J5 is used for channel 1 and J6 is used for channel 2. The following diagram shows the two possible selections
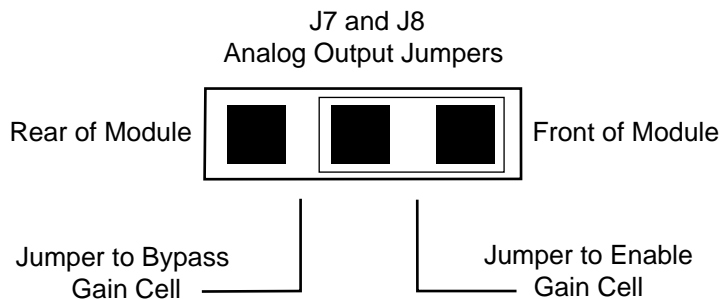
J5 and J6
Analog Input Jumpers

Rear of Module | | | | | Front of Module

Jumper to Bypass
Gain Cell

Jumper to Enable
Gain Cell

Analog Input Jumpers J5 and J6

When gain cells are bypassed the reference level is set to a nominal level of +4 dBu. Make sure the Analog Input jumpers are always set to Enable for normal operation.

Analog Output Jumpers:

Jumpers J7 and J8 are set at the factory but can be used to bypass the modules analog output gain cells for troubleshooting purposes if needed. J7 is used for channel 2 and J8 is used for channel 1. The following diagram shows the two possible selections.

J7 and J8
Analog Output Jumpers

Rear of Module | | | | | Front of Module

Jumper to Bypass
Gain Cell

Jumper to Enable
Gain Cell

Analog Output Jumpers J7 and J8

When gain cells are bypassed the reference level is set to a nominal level of +4 dBu. Make sure the Analog Output jumpers are always set to Enable for normal operation.

DSP LED

The 6040 has an internal LED (D14) that is used to indicate the state of the DSP. The two indicated states are as follows:

- **Steady State** – If the LED is at a steady state of either ON or OFF then the DSP is not running. Reset the module to if this has occurred to try to get the DSP running. If resetting the module will not fix the problem, contact customer support.
- **Flashing State** – Indicates that the DSP is running normally. Refer to the Ref/Stat heading in the Avenue PC or Touch Screen sections for more information regarding the DSP.

Avenue PC Remote Configuration

The Avenue PC remote control menus for this module are illustrated and explained in this section. Refer to the **6040 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.

6040 Avenue PC Menus

In the **Delay** menu shown below, set the following parameters:
- **Bulk Delay** – set the delay in pulldown to In to delay the signal path with the bulk delay value or Out to not delay the signal path.
- **Bulk Delay Adj** – set the amount of bulk delay from 0 to 1000 mS with the slider by clicking on the left and right arrows. Select the Default button to enable the default value. The bulk delay value is given in the box to the right of the slider.

In this menu, the following indicators are available:
- **Total Delay** – displays the total delay offset in milliseconds in the signal path. The total value includes bulk delay, Track 1, Track 2 and Track 3 delay values if enabled.
- **Track 1 Delay** – displays the amount of delay that is currently being added to the signal path from the Track 1 module.
- **Track 2 Delay** – displays the amount of delay that is currently being added to the signal path from the Track 2 module.
- **Track 3 Delay** – displays the amount of delay that is currently being added to the signal path from the Track 3 module.
- **Track Error** – will display a message indicating tracking errors present.

In the **Track 1** menu shown below, set the following parameters:

- **Frame #** – set frame number (AveNet Number) containing the module you wish to track. You may have from 1 to 1000 frames. The AveNet frame number is defined in the frame list on the Avenue PC Main screen.
- **Slot #** – selects the slot number of the module you wish to track in the frame chosen above.

In this menu, the following indicators are available:

- **Trk 1 En** – box displays one of two states when pressed:
    - Gray (Tracking 1 is not enabled)
    - Gray/Green (Tracking 1 is enabled)
- **Status 1** – displays the current state of Tracking 1 as one of the following:
    - Disabled (tracking is disabled)
    - No Module (Tracking 1 is not communicating with the module selected to track causing a tracking error)
    - Connected (Tracking 1 is communicating with the module selected to track).
- **Track 1 Delay** – displays the amount of delay that is currently being added to the signal path from the Track 1 module.

In the Track 2 menu (refer to the Track 1 menu shown on the proceeding page), set the following parameters:

- **Frame #** – set frame number (AveNet number) containing the module you wish to track. You may have form 1 to 1000 frames. The frame Avenet number is defined in the frame list on the Avenue PC Main screen.
- **Slot #** – selects the slot number of the module you wish to track in the frame chosen above.

In this menu, the following indicators are available:

- **Trk 2 En** – box displays one of two states when pressed:
    - Gray (Tracking 2 is not enabled)
    - Gray/Green (Tracking 2 is enabled)
- **Status 2** – displays the current state of Tracking 2 as one of the following:
    - Disabled (tracking is disabled)
    - No Module (Tracking 2 is not communicating with the module selected to track causing a tracking error)
    - Connected (Tracking 2 is communicating with the module selected to track)
- **Track 2 Delay** – displays the amount of delay that is currently being added to the signal path from the Track 2 module.

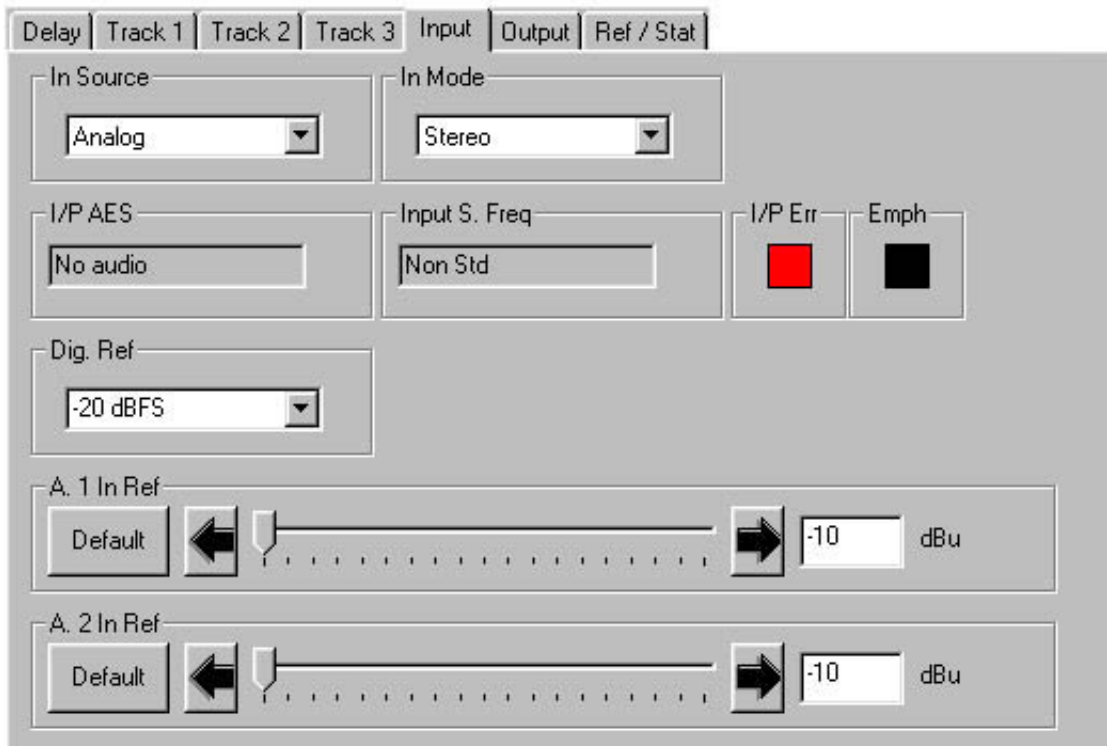In the Track 3 menu (refer to the Track 1 menu shown on the proceeding page), set the following parameters:

- **Frame #** – set frame number (AveNet number) containing the module you wish to track. You may have from 1 to 1000 frames. The frame AveNet number is defined in the frame list on the Avenue PC Main screen.
- **Slot #** – selects the slot number of the module you wish to track in the frame chosen above.

In this menu, the following indicators are available:

- **Trk 3 En** – box displays one of two states when pressed:
    - Gray (Tracking 3 is not enabled)
    - Gray/Green (Tracking 3 is enabled)
- **Status 3** – displays the current state of Tracking 3 as one of the following:
    - Disabled (tracking is disabled)
    - No Module (Tracking 3 is not communicating with the module selected to track causing a tracking error)
    - Connected (Tracking 3 is communicating with the module selected to track).
- **Track 3 Delay** – displays the amount of delay that is currently being added to the signal path from the Track 3 module.

In the **Input** menu shown, set the following input parameters:

- **In Source** – select from two possible input sources:
    - Digital (AES input, two channels, are used as the input source)
    - Analog (analog inputs are used as the input source)
- **In Mode** – select from the following modes:
    - 2-Channel (analog reference levels for these two channels may be set independently)
    - Stereo (analog reference levels for these two channels track each other)
- **Dig. Ref** – select from one of three selections as follows:
    - -20 dBFS (analog audio reference is set to -20 dBFS in the digital domain, the most common standard)
    - -18 dBFS (analog audio reference is set to -18 dBFS in the digital domain, the new SMPTE and EBU standard)
    - -16 dBFS (analog audio reference is set to -16 dBFS in the digital domain, the CBC standard)
- **A. 1 In Ref** – set the analog audio input channel 1 reference level to between
    - -10 dBu and +8 dBu with the slider arrows. The selected value will appear in the box to the right of the slider. Click Default to enable the default value of +4 dBu.
- **A. 2 In Ref** – set the analog audio input channel 2 reference level to between
    - -10 dBu and +8 dBu with the slider arrows. The selected value will appear in the box to the right of the slider. Click Default to enable the default value of +4 dBu.

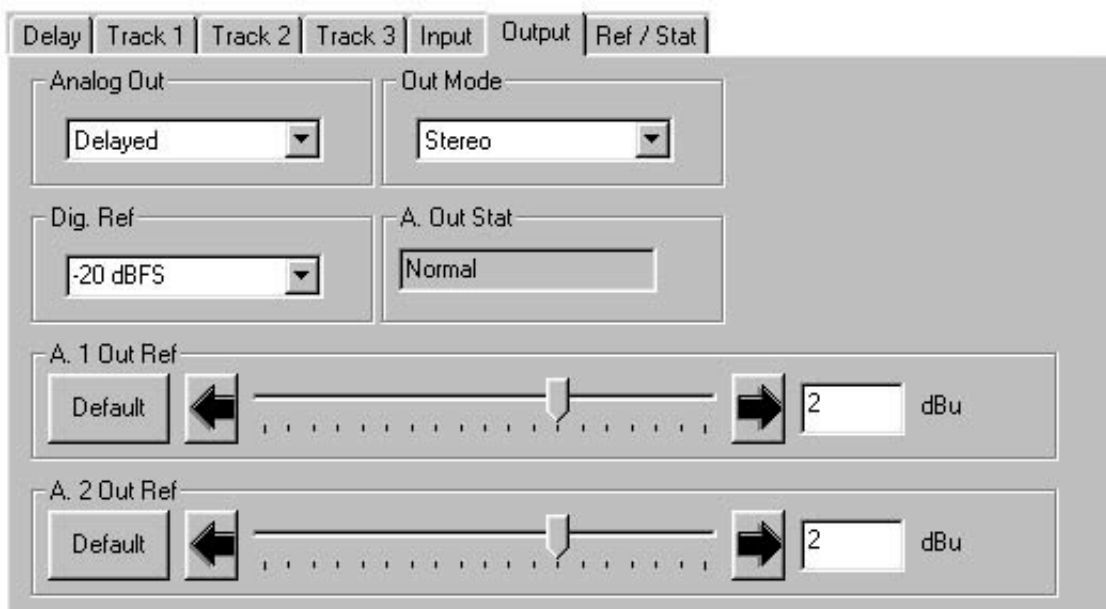The following indicator and error boxes are available in the Input menu:

- **I/P AES** – displays information about the input AES signal that is decoded from the channel status information as one of the following:
  - No audio (signal not present)
  - Pro audio (Professional format, stream contains audio data)
  - Pro non-audio (Professional format, stream contains non-audio data)
  - Cons audio (Consumer format, stream contains audio data)
  - Cons non-audio (Consumer format, stream contains non-audio data)
- **Sampling Freq** – displays the sampling frequency of the input signal pair from one of the following values:
  - 48 kHz
  - 44.1 kHz
  - 32 kHz
  - Non-standard (sampling frequency is not any of the above frequencies)
- **I/P Error** – one of two colors will display to indicate the AES input status:
  - Black (signal is present)
  - Red (no valid input present)
- **Emph** – one of two colors will display to indicate the AES emphasis state:
  - Black (no emphasis detected)
  - Yellow (50/15 µS emphasis detected. If emphasis is detected, the 6040 will set the emphasis bits on the AES outputs and apply de-emphasis on the analog outputs.)

In the **Output** menu shown, set the following output parameters:
- **Analog Out** – select from two of the following possible output states:
  - Delayed (analog outputs follow the delayed signal path)
  - No Delay (analog outputs follow the undelayed signal path)
- **Out Mode** – select from the following modes:
  - 2-Channel (analog reference levels for these two channels may be set independently)
  - Stereo (analog reference levels for these two channels track each other)
- **Dig. Ref** – select from one of three selections as follows:
  - -20 dBFS (analog audio reference is set to -20 dBFS in the digital domain, the most common standard)
  - -18 dBFS (analog audio reference is set to -18 dBFS in the digital domain, the new SMPTE and EBU standard)
  - -16 dBFS (analog audio reference is set to -16 dBFS in the digital domain, the CBC standard)
- **A. 1 Out Ref** – set the analog audio output channel 1 reference level to between
  - -10 dBu and +8 dBu with the slider arrows. The selected value will appear in the box to the right of the slider. Click Default to enable the default value of +4 dBu.
- **A. 2 Out Ref** – set the analog audio input channel 2 reference level to between
  - -10 dBu and +8 dBu with the slider arrows. The selected value will appear in the box to the right of the slider. Click Default to enable the default value of +4 dBu.

The following indicator and error boxes are available in the Output menu:
- **A. Out Stat** – indicates the current state of the analog outputs as one of the following:
  - Normal (analog outputs are operating normally)
  - Muted (analog outputs are muted when a non-audio source is being used on the digital input)
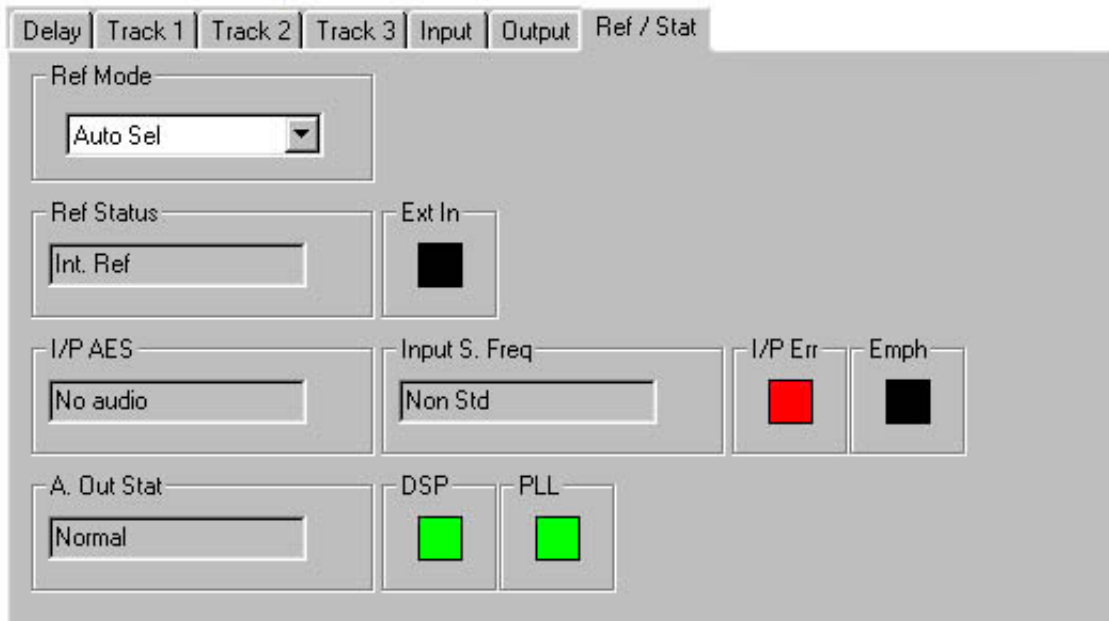
In the **Ref/Stat** menu shown, set the following output parameters:

- **Ref Mode** – select from three of the following possible reference modes:
    - Auto Sel (module will automatically select the reference from the following sources, in this order: AES input reference signal if present with sample rate of 48 kHz, external reference is signal is present with sample rate of 48 kHz, or internal, free run, reference)
    - External (module will lock to the external reference unless the signal is missing or is the wrong sample rate, in which case it will go to the internal reference)
    - Internal (module will use internal reference)

In the **Ref/Stat** menu shown, the following status indicator boxes are available:

- **Ref Status** – displays the current reference source the module is using from one of the following four states:
    - AES IN Ref (reference source is AES input)
    - Ext. Ref (reference source is external reference input)
    - Int. Ref (reference source is internal reference)
- **I/P AES** – displays information about the input AES signal that is decoded from the channel status information as one of the following:
    - No audio (signal not present)
    - Pro audio (Professional format, stream contains audio data
    - Pro non-audio (Professional format, stream contains non-audio data)
    - Cons audio (Consumer format, stream contains audio data)
    - Cons non-audio (Consumer format, stream contains non-audio data)

- **Sampling Freq** – displays the sampling frequency of the input signal pair from one of the following values:
  - 48 kHz
  - 44.1 kHz
  - 32 kHz
  - Non-std (sampling frequency is not any of the above frequencies)•   A. Out Stat – indicates the current state of the analog outputs as one of the following:
  - Normal (analog outputs are operating normally)
  - Muted (analog outputs are muted when a non-audio source is being used on the digital input)
- **Ext In** – box indicates the external input status from one of two colors:
  - Black (no signal present)
  - Green (valid signal present)
- **I/P Error** – one of two colors will display to indicate the AES input status:
  - Black (signal is present)
  - Red (no valid input present)
- **Emph** – one of two colors will display to indicate the AES emphasis state:
  - Black (no emphasis detected)
  - Yellow (50/15 µS emphasis detected. If emphasis is detected, the 6040 will set the emphasis bits on the AES outputs and apply de-emphasis on the analog outputs.)
- **DSP** – box will display one of the following three colors to indicate the operating state of the Digital Signal Processor:
  - Black (DSP is running but not ready, should only occur at start-up)
  - Green (DSP is running normally)
  - Red (DSP error)
- **PLL** – box will indicate one of the following two colors to indicate the operating state of the Phase Lock Loop:
  - Green (PLL is operating correctly)
  - Red (flashing indicates PLL error)

Avenue Touch Screen Remote Configuration

Avenue Touch Screen remote control menus for this module are illustrated and explained below. Refer to the **6040Parameter 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 the Avenue Touch Screen, refer to the Avenue System Overview.
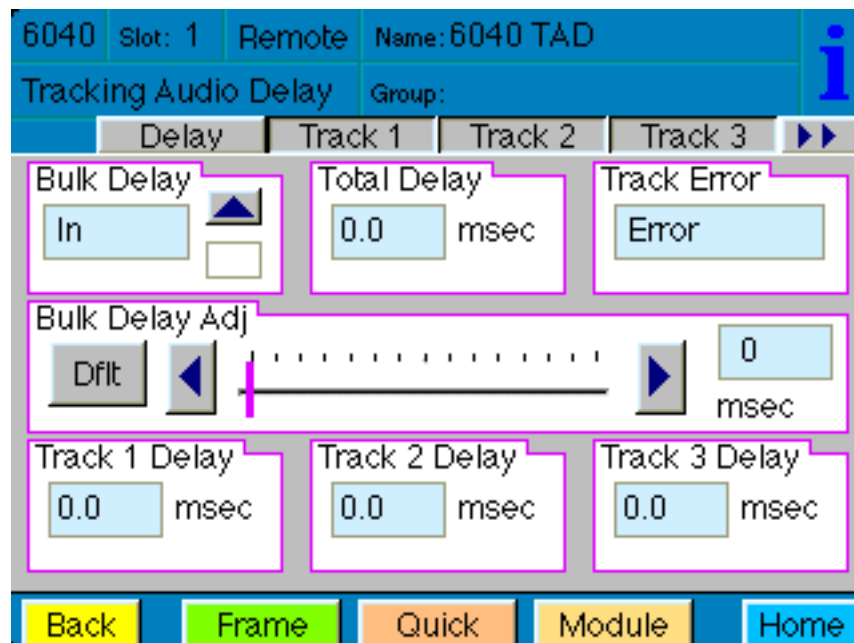
6040 Avenue Touch Screen Menus

In the **Delay** menu shown below, set the following parameters:

- **Bulk Delay** – set the delay in pulldown to In to delay the signal path with the bulk delay value or Out to not delay the signal path.
- **Bulk Delay Adj** – set the amount of bulk delay from 0 to 1000 mS with the slider by clicking on the left and right arrows. Select the Default button to enable the default value. The bulk delay value is given in the box to the right of the slider.

In this menu, the following indicators are available:

- **Total Delay** – displays the total delay offset in milliseconds in the signal path. The total value includes bulk delay, Track 1, Track 2 and Track 3 delay values if enabled.
- **Track 1 Delay** – displays the amount of delay that is currently being added to the signal path from the Track 1 module.
- **Track 2 Delay** – displays the amount of delay that is currently being added to the signal path from the Track 2 module.
- **Track 3 Delay** – displays the amount of delay that is currently being added to the signal path from the Track 3 module.
- **Track Error** – will display a message indicating tracking errors present.The **Decode** menu below allows you to set the following parameters:
- **Comb Filter** – select the desired Y/C separation filter. **NOTE**: The best performance for general input video with motion is usually the **3 Line Optimum**.
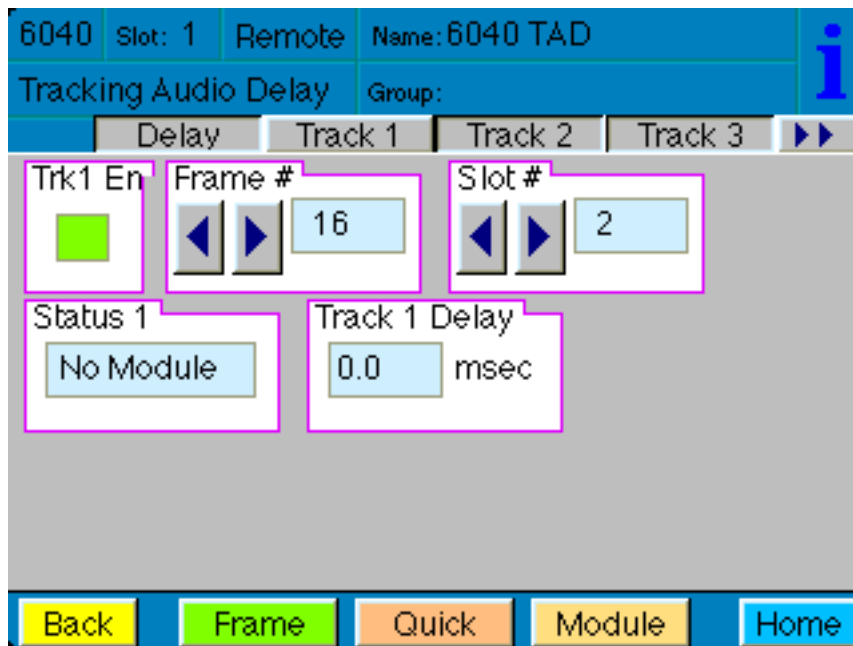
In the **Track 1** menu shown below, set the following parameters:

- **Frame #** – set frame number (AveNet Number) containing the module you wish to track. You may have from 1 to 1000 frames. The AveNet frame number is defined in the frame list on the Avenue PC Main screen.
- **Slot #** – selects the slot number of the module you wish to track in the frame chosen above.

In this menu, the following indicators are available:

- **Trk 1 En** – box displays one of two states when pressed:
    - Gray (Tracking 1 is not enabled)
    - Gray/Green (Tracking 1 is enabled)
- **Status 1** – displays the current state of Tracking 1 as one of the following:
    - Disabled (tracking is disabled)
    - No Module (Tracking 1 is not communicating with the module selected to track causing a tracking error)
    - Connected (Tracking 1 is communicating with the module selected to track).
- **Track 1 Delay** – displays the amount of delay that is currently being added to the signal path from the Track 1 module.

In the Track 2 menu (refer to the Track 1 menu shown on the proceeding page), set the following parameters:

- **Frame #** – set frame number (AveNet number) containing the module you wish to track. You may have form 1 to 1000 frames. The frame Avenet number is defined in the frame list on the Avenue PC Main screen.
- **Slot #** – selects the slot number of the module you wish to track in the frame chosen above.

In this menu, the following indicators are available:

- **Trk 2 En** – box displays one of two states when pressed:
  - Gray (Tracking 2 is not enabled)
  - Gray/Green (Tracking 2 is enabled)
- **Status 2** – displays the current state of Tracking 2 as one of the following:
  - Disabled (tracking is disabled)
  - No Module (Tracking 2 is not communicating with the module selected to track causing a tracking error)
  - Connected (Tracking 2 is communicating with the module selected to track)
- **Track 2 Delay** – displays the amount of delay that is currently being added to the signal path from the Track 2 module.

In the Track 3 menu (refer to the Track 1 menu shown on the proceeding page), set the following parameters:
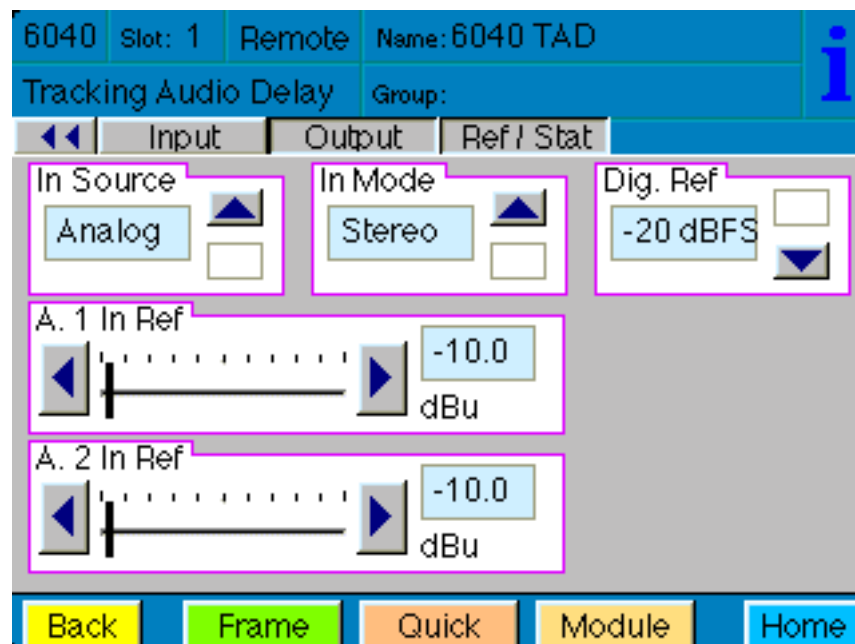
- **Frame #** – set frame number (AveNet number) containing the module you wish to track. You may have from 1 to 1000 frames. The frame AveNet number is defined in the frame list on the Avenue PC Main screen.
- **Slot #** – selects the slot number of the module you wish to track in the frame chosen above.

In this menu, the following indicators are available:

- **Trk 3 En** – box displays one of two states when pressed:
  - Gray (Tracking 3 is not enabled)
  - Gray/Green (Tracking 3 is enabled)
- **Status 3** – displays the current state of Tracking 3 as one of the following:
  - Disabled (tracking is disabled)
  - No Module (Tracking 3 is not communicating with the module selected to track causing a tracking error)
  - Connected (Tracking 3 is communicating with the module selected to track).
- **Track 3 Delay** – displays the amount of delay that is currently being added to the signal path from the Track 3 module.

In the **Input** menu shown, set the following input parameters:

- **In Source** – select from two possible input sources:
  - Digital (AES input, two channels, are used as the input source)
  - Analog (analog inputs are used as the input source)
- **In Mode** – select from the following modes:
  - 2-Channel (analog reference levels for these two channels may be set independently)
  - Stereo (analog reference levels for these two channels track each other)
- **Dig. Ref** – select from one of three selections as follows:
  - -20 dBFS (analog audio reference is set to -20 dBFS in the digital domain, the most common standard)
  - -18 dBFS (analog audio reference is set to -18 dBFS in the digital domain, the new SMPTE and EBU standard)
  - -16 dBFS (analog audio reference is set to -16 dBFS in the digital domain, the CBC standard)
- **A. 1 In Ref** – set the analog audio input channel 1 reference level to between
  - -10 dBu and +8 dBu with the slider arrows. The selected value will appear in the box to the right of the slider. Click Default to enable the default value of +4 dBu.
- **A. 2 In Ref** – set the analog audio input channel 2 reference level to between
  - -10 dBu and +8 dBu with the slider arrows. The selected value will appear in the box to the right of the slider. Click Default to enable the default value of +4 dBu.

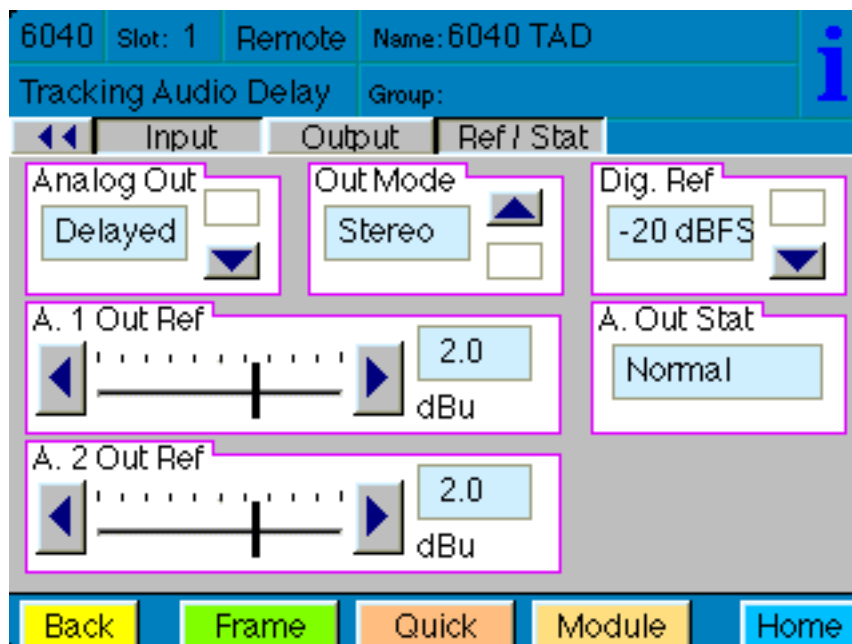The following indicator and error boxes are available in the Input menu:

- **I/P AES** – displays information about the input AES signal that is decoded from the channel status information as one of the following:
    - No audio (signal not present)
    - Pro audio (Professional format, stream contains audio data)
    - Pro non-audio (Professional format, stream contains non-audio data)
    - Cons audio (Consumer format, stream contains audio data)
    - Cons non-audio (Consumer format, stream contains non-audio data)
- **Sampling Freq** – displays the sampling frequency of the input signal pair from one of the following values:
    - 48 kHz
    - 44.1 kHz
    - 32 kHz
    - Non-standard (sampling frequency is not any of the above frequencies)
- **I/P Error** – one of two colors will display to indicate the AES input status:
    - Black (signal is present)
    - Red (no valid input present)
- **Emph** – one of two colors will display to indicate the AES emphasis state:
    - Black (no emphasis detected)
    - Yellow (50/15 μS emphasis detected. If emphasis is detected, the 6040 will set the emphasis bits on the AES outputs and apply de-emphasis on the analog outputs.)

In the **Output** menu shown, set the following output parameters:

- **Analog Out** – select from two of the following possible output states:
  - Delayed (analog outputs follow the delayed signal path)
  - No Delay (analog outputs follow the undelayed signal path)
- **Out Mode** – select from the following modes:
  - 2-Channel (analog reference levels for these two channels may be set independently)
  - Stereo (analog reference levels for these two channels track each other)
- **Dig. Ref** – select from one of three selections as follows:
  - -20 dBFS (analog audio reference is set to -20 dBFS in the digital domain, the most common standard)
  - -18 dBFS (analog audio reference is set to -18 dBFS in the digital domain, the new SMPTE and EBU standard)
  - -16 dBFS (analog audio reference is set to -16 dBFS in the digital domain, the CBC standard)
- **A. 1 Out Ref** – set the analog audio output channel 1 reference level to between
  - -10 dBu and +8 dBu with the slider arrows. The selected value will appear in the box to the right of the slider. Click Default to enable the default value of +4 dBu.
- **A. 2 Out Ref** – set the analog audio input channel 2 reference level to between
  - -10 dBu and +8 dBu with the slider arrows. The selected value will appear in the box to the right of the slider. Click Default to enable the default value of +4 dBu.

The following indicator and error boxes are available in the Output menu:

- **A. Out Stat** – indicates the current state of the analog outputs as one of the following:
  - Normal (analog outputs are operating normally)
  - Muted (analog outputs are muted when a non-audio source is being used on the digital input)
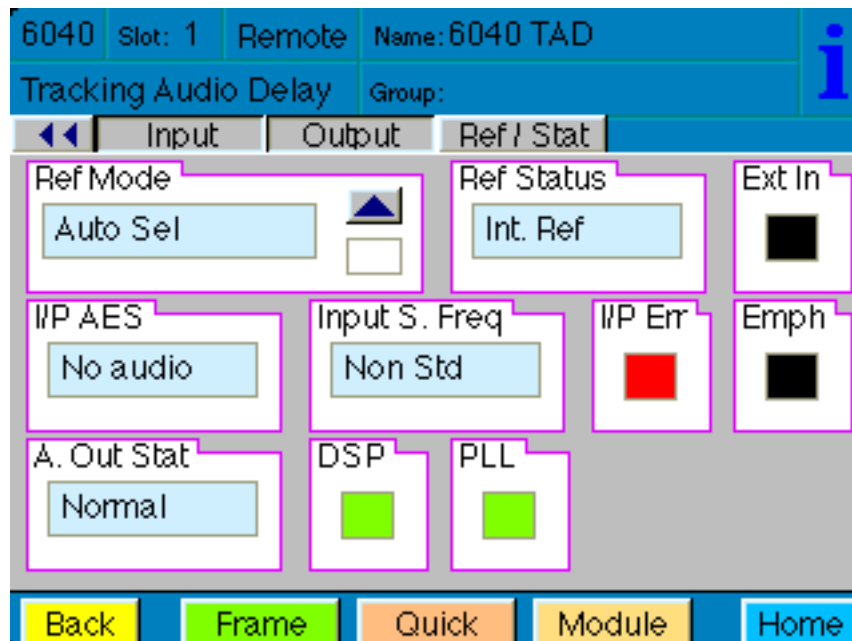
In the **Ref/Stat** menu shown, set the following output parameters:

- **Ref Mode** – select from three of the following possible reference modes:
    - Auto Sel (module will automatically select the reference from the following sources, in this order: AES input reference signal if present with sample rate of 48 kHz, external reference is signal is present with sample rate of 48 kHz, or internal, free run, reference)
    - External (module will lock to the external reference unless the signal is missing or is the wrong sample rate, in which case it will go to the internal reference)
    - Internal (module will use internal reference)

In the **Ref/Stat** menu shown, the following status indicator boxes are available:

- **Ref Status** – displays the current reference source the module is using from one of the following four states:
    - AES IN Ref (reference source is AES input)
    - Ext. Ref (reference source is external reference input)
    - Int. Ref (reference source is internal reference)
- **I/P AES** – displays information about the input AES signal that is decoded from the channel status information as one of the following:
    - No audio (signal not present)
    - Pro audio (Professional format, stream contains audio data
    - Pro non-audio (Professional format, stream contains non-audio data)
    - Cons audio (Consumer format, stream contains audio data)
    - Cons non-audio (Consumer format, stream contains non-audio data)

- **Sampling Freq** – displays the sampling frequency of the input signal pair from one of the following values:
    - 48 kHz
    - 44.1 kHz
    - 32 kHz
    - Non-std (sampling frequency is not any of the above frequencies) • A. Out Stat – indicates the current state of the analog outputs as one of the following:
    - Normal (analog outputs are operating normally)
    - Muted (analog outputs are muted when a non-audio source is being used on the digital input)
- **Ext In** – box indicates the external input status from one of two colors:
    - Black (no signal present)
    - Green (valid signal present)
- **I/P Error** – one of two colors will display to indicate the AES input status:
    - Black (signal is present)
    - Red (no valid input present)
- **Emph** – one of two colors will display to indicate the AES emphasis state:
    - Black (no emphasis detected)
    - Yellow (50/15 µS emphasis detected. If emphasis is detected, the 6040 will set the emphasis bits on the AES outputs and apply de-emphasis on the analog outputs.)
- **DSP** – box will display one of the following three colors to indicate the operating state of the Digital Signal Processor:
    - Black (DSP is running but not ready, should only occur at start-up)
    - Green (DSP is running normally)
    - Red (DSP error)
- **PLL** – box will indicate one of the following two colors to indicate the operating state of the Phase Lock Loop:
    - Green (PLL is operating correctly)
    - Red (flashing indicates PLL error)

TROUBLESHOOTING

To aid in troubleshooting, signal reference levels and presence, power and CPU status can be easily monitored from the front panel of this module using the indicators explained in the previous section.

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

- Tracking errors
- Reference status
- AES input error
- Emphasis flag set on AES input
- AES input format and content
- DSP status
- PLL status
- Analog Output status
- Power status
- Slot ID, Software Version and Board Revision

Refer to the overall troubleshooting tips given below for the 6040 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 LED. Should be blinking slowly and in unison with other modules if System Control module is present. If not, try removing it and plugging it in again.
- System Control module may not be working properly if installed.

No audio delay and/or cannot control audio:
- Check for DSP status. If status is not green, try removing module and plugging it in again.

Digital audio is muted:
- Check digital audio status. If audio source is non-audio at a sample rate other than 48kHz the module will mute the audio. Try a different source.
- Check cabling to input module.
- Check for a valid AES signal input.

No tracking delay values:
- Check to make sure tracking is enabled and communicating with the selected module.
- Check to make sure the module has a valid audio source (no tracking with non-audio sources).

No analog signal out of module:
- Check cabling from the output of module.
- Check for valid AES signal input or analog input source.
- If using the AES input, check to make sure the AES signal is a audio source.

No analog input:
- Check cabling to the module.
- Check to make sure the analog input is selected as an input source.

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@endes.com
http://www.ensembledesigns.com

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

SPECIFICATIONS

6040 Tracking Audio Delay

Inputs:

AES Input:	1 Volt p-p, terminated in 75 ohms
Sample Rate:	32 kHz - 96 kHz
AES Reference:	1 Volt p-p, terminated in 75 ohms
Sample Rate:	48 kHz, ± 3 Hz
Analog Input Z:	> 15 k ohms, balanced, transformerless
CMRR:	> 60 dB, 20Hz to 10kHz
Input gain range:	–10 dBu to +8 dBu for –20, –18, or –16 dBFS input

Outputs:

AES Outputs:	1 Volt p-p, 75 ohms source terminated
Sample Rate:	48 kHz
Analog Output Z:	30 ohms, balanced, transformerless
Output Level:	– 10 dBu to +8 dBu for -20, -18 or -16 dBFS input
Max Output Level:	@ 86 dB THD+N
	+24 dBu (bridging load), +22 dBu (600 ohm load)
Frequency Response:	+0/-0.2 dB, 20 Hz - 20 kHz
Crosstalk:	< – 84 dB, 20 Hz - 20 kHz
Dynamic Range:	95 dB

Delay:

Bulk Delay:	0 to 1 second, 10 mS steps
Tracking Delay:	Up to 3 modules at one time, maximum delay per module 100 mS
Max Audio Delay:	1.3 seconds per channel
Delay Response Time:	6 seconds for both bulk and tracking values, 0 for non-audio sources

General Specifications

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.