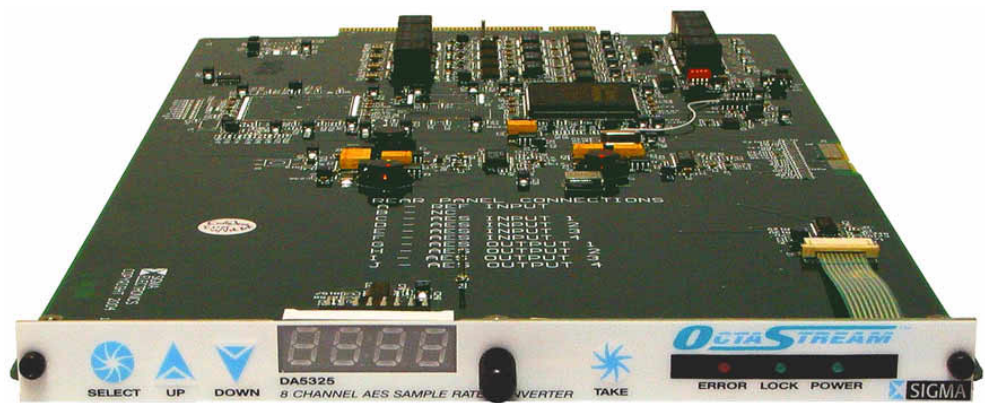


# DA5325 8-Channel Audio Sample Rate Converter



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## INTRODUCTION/OVERVIEW

The DA5325 8 Channel Audio-Sample Rate Converter Module is a member of the Sigma 5000 series OCTASTREAM™ product line. The DA5325 is to be used in facilities utilizing AES digital audio signals that must be retimed to match a reference signal while maintaining a perfect phase relationship.

## PRODUCT SCOPE

This module has the capability to have its output sample rate steered by an internal reference provided by the S5000 Signal Management Frame or an external reference attached to the reference input on the DA5325 or the Video Reference BNC on the S5000. The reference provided may be any valid NTSC or PAL video signal or an AES digital audio signal.

Additionally, when a signal is supplied to the frame via the Video Reference BNC, the CI5705 Communications Interface generates an Internal AES Clock Reference pulse that is distributed to every module. This pulse may also be used to steer the output sample rate.

## RECEIVING INSPECTION AND UNPACKING

By the time you have found and opened this manual, you have already begun to unpack the shipping container. Since damage may have occurred in shipping it is important to perform the following checks immediately:

- Inspect the shipping container(s) for damage.
- If you find any damage to the containers, carefully inspect the product for damage.
- If any damage is discovered, notify the shipping carrier immediately.

Compare what you received against the packing slip. If anything is missing or has suffered damage unrelated to shipping, contact SIGMA ELECTRONICS Technical Support immediately. Contact information is located at the front of this manual.

## SYSTEM COMPONENTS

### Frame

The DA5325 module is engineered to operate in a Sigma S5000 Signal Management Frame. This frame provides all the necessary interface components and power for opera-

tion of the DA5325 module. The Sigma S5000 frame is 100% compatible with the NVision NV500 frame which will also accept the DA5325.

## **Interface Components**

To accommodate a variety of connector requirements necessary for the signal formats accepted by the S5000 Signal Management System, a number of backplanes are available. The DA5325 requires either an RP302 Twisted Pair I/O or RP303 BNC I/O Backplane.

Each S5000 Signal Management System frame is supplied with two (2) backplanes. The required backplane(s) is specified at the time of order. If an existing frame does not have the required backplane, replacement backplanes are available from Sigma Electronics and can easily be installed in the field.

## **Power**

The S5000 Signal Management System frame provides the required power to operate the DA5325 via the backplane adapter. Dual power supplies are available for redundant applications.

## **Modules**

The DA5325 consists of a single-slot card containing a front panel interface of switches, indicator LED's and a four-digit, seven-segment LED display. Via this interface all configuration settings and status indications are available to the user.

Optionally, if a CI5705 Communications Interface Adapter is installed in the S5000 Signal Management System frame, the DA5325 may have its sample rate steered by reference video or audio signals introduced into the frame. This reference is provided to the CI5705 via the BNC labelled "VIDEO REF" on the rear of the S5000 frame.



## MODULE INSTALLATION/REMOVAL

The DA5325 may be installed in any module slot in a S5000 Signal Management System Frame. Up to ten (10) modules of any type may be installed in the same frame. Modules may be hot-swapped eliminating the need to power down the entire frame during replacement.

Modules are held in place by a combination of the retention force of the cardedge connector pins and the motion restriction afforded by the proper installation of the frame front door.



**Caution:** *For proper cooling, the frame door must remain closed. The door may be opened for a short time, but irregular performance may occur. The temperature and performance will stabilize again within 5 minutes after the door is closed.*

### Module Installation

1. Verify that the appropriate backplane is installed in the frame.
2. Remove front door from frame.
3. Insert module into any slot.
4. Holding knurled knob, push until module is completely seated in cardedge connector on backplane.
5. Reinstall front door (required for proper operation of S5000 Signal Management System frame).

### Module Removal

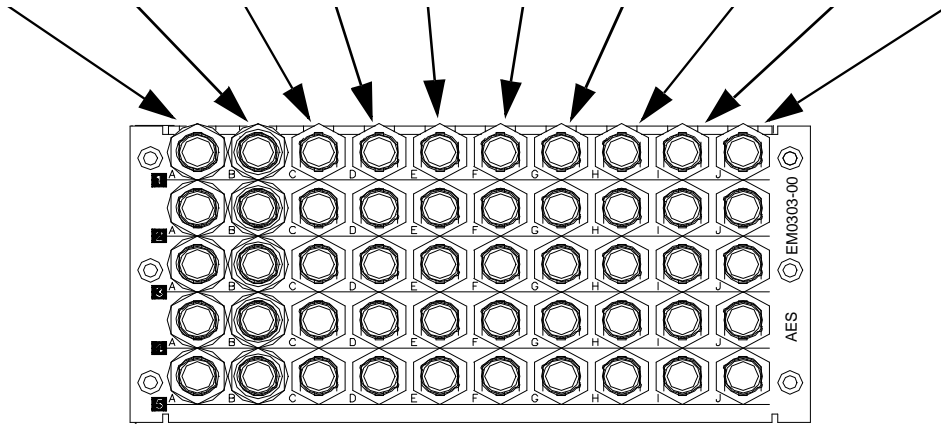
1. Remove frame front panel.
2. Firmly grasp knurled knob on front of module.
3. Pull module out of slot.

## CONNECTOR ASSIGNMENT

Because the flexibility of the S5000 Signal Management System frame allows a module to be inserted into any slot position of an appropriate back plane (see Interface Components above), the function of the back plane connectors will vary depending upon the module inserted. The connector assignments for the DA5325 are shown in the following figure.

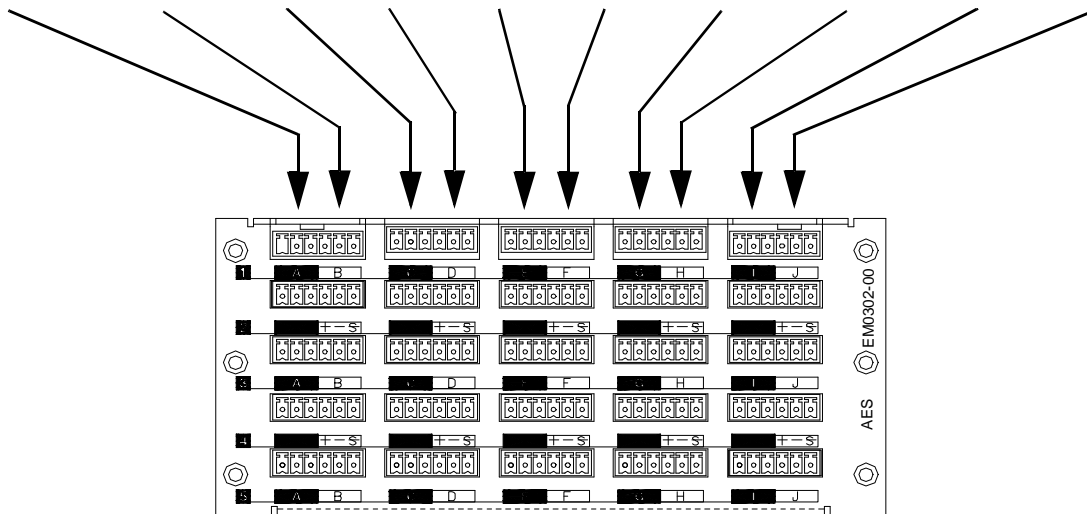
### RP303 BACKPLANE CONNECTOR ASSIGNMENTS - DA5325

A	B	C	D	E	F	G	H	I	J
REFERENCE INPUT	N / C	AES INPUT 1	AES INPUT 2	AES INPUT 3	AES INPUT 4	AES OUTPUT 1	AES OUTPUT 2	AES OUTPUT 3	AES OUTPUT 4



### RP302 BACKPLANE CONNECTOR ASSIGNMENTS - DA5325

A	B	C	D	E	F	G	H	I	J
REFERENCE INPUT	N / C	AES INPUT 1	AES INPUT 2	AES INPUT 3	AES INPUT 4	AES OUTPUT 1	AES OUTPUT 2	AES OUTPUT 3	AES OUTPUT 4



## REFERENCE SIGNALS

As a sample rate converter, the DA5325 is dependant upon a reference signal which is used to set the rate to which the data from the inputs will be converted.

The DA5325 has two modes of operation which determine from where the reference is selected. The two modes are identified as External Reference and Internal Reference.

External References are any video or AES audio signal provided to the DA5325 module to be used as the reference to set the data rate. A DA5325 which is operating with an External Reference must have been properly configured prior to installation in the S5000 frame (see **REFERENCE SIGNAL FORMAT SETUP- SWITCH CONFIGURATION** below). These signals may be provided to the modules through the backplane connector into which the DA5325 module is installed or, in the special case of a video reference signal connected to the Video Reference BNC on the rear of the S5000 frame, by the CI5705 which distributes the signal throughout the frame for use by any installed DA5325 module.

Internal Reference is an internally generated reference pulse distributed through the S5000 frame by the CI5705 module for use by any OctaStream module installed in the frame. The timing for this signal will be based upon the signal connected to the Video Reference BNC on the rear of the S5000 frame

## REFERENCE SIGNAL FORMAT SETUP- SWITCH CONFIGURATION

**Note: Any DA5325 installed into an S5000 frame, or has power cycled to it, automatically defaults to the External Reference mode. The DA5325 must be configured prior to installation in the frame identifying the source of the signal used to steer the sample rate output. The following procedure details the switch setting needed for each type of valid reference signal.**

The DA5325 can accept a wide variety of reference signal formats. Signals adhering to any of the following formats are acceptable reference signals-

- a. NTSC Video
- b. PAL Video
- c. AES digital audio

These reference signals can be introduced into the DA5325 through a number of different interfaces. The reference signal can come from -

- a. The Video Reference BNC on the rear of the S5000 frame (requires CI5705).  
**Note: Any time a video reference signal is distributed throughout the S5000 frame, all modules in the frame should be configured to have Hi-Z**

**inputs except one, which should be terminated (see Table 1 below).**

- b. The reference input on the backplane into which the DA5325 is plugged. There are two rear backplanes that accept the DA5325 - the RP302 Twisted Pair I/O or RP303 BNC I/O Backplane.

## External Reference Setup

Reference signals to be used as an External Reference are supplied to the module via the edgcard connector at the back of the module. Because they are sourced from different locations, the module must be configured to accept the signal from the appropriate location. This is done by setting a DIP switch on the module. The switch (S2) is located towards the rear of the module. The ON position is when the switch is pushed toward the front panel.

Table 1 below, indicates the switch setting necessary to configure the DA5325 for proper operation with the External Reference signal being used.

**Table 1. External Reference Configuration Settings**

	<b>SWITCH S2 POSITION</b>	<b>S2-1</b>	<b>S2-2</b>	<b>S2-3</b>	<b>S2-4</b>
<b>SIGNAL FORMAT</b>	<b>INTERFACE</b>	<b>X= ON</b>	<b>O= OFF</b>		
*VIDEO - NTSC or PAL	S5000 Video Ref BNC- Terminated	X	X	O	O
	S5000 Video Ref BNC- HiZ (default)	O	X	O	O
	RP303 Backplane - BNC	O	O	X	X
	RP302 Backplane - 3-Pin Terminal Blk	X	O	X	O
AES Digital Audio	RP303 Backplane - BNC	O	O	O	X
	RP302 Backplane - 3-Pin Terminal Blk	O	O	O	X

\* Sample rate of all outputs defaults to 48kHz when video signal is used as a reference.

## Internal Reference Setup

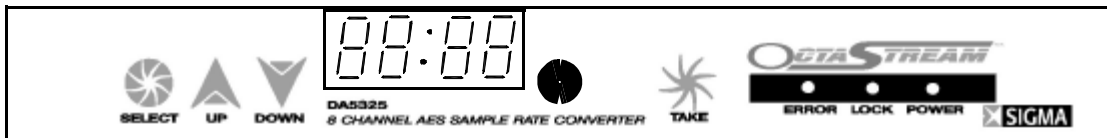
Internal Reference mode uses the internally generated reference pulse from the CI5705 which is based on the signal connected to the Video Reference BNC on the rear of the S5000 frame. The Internal Reference mode is only available when selected via the front panel of the DA5325 after installation. To select Internal Reference, press the SELECT button and then the TAKE button.

In this mode, all settings on S2 are ignored and the termination status of all modules should be Hi-Z.

## OPERATION

### Front Panel Controls/Displays

The front panel, shown below, has three distinct functional areas - the Indicator LED's under the OctaStream logo on the right side; the switch controls, mostly on the left side and the 7-segment display in the middle.



### INDICATOR LED'S

LED's are visible from the exterior of the frame when the front door is installed to accommodate checking the status of the modules without affecting the operating conditions within the frame. The LED's provide information about the status of three operating conditions - Reference Error status, Reference Lock status and power bus status.

1. **ERROR** - When this red LED is illuminated, there is no valid reference signal being detected by the DA5325.
2. **LOCK** - This green LED indicates the DA5325 is locked to the reference signal, whether internal or external reference has been applied.
3. **POWER** - This green LED indicates the presence of suitable power being supplied to the module by the power supply in the S5000 frame.

### CONTROLS



#### SELECT BUTTON

The Select button is used to toggle between the Internal and External Reference modes. If the display is showing the source of a reference signal to which the DA5325 is not currently locked, the display will have dots displayed on all characters. The DA5325 switches to the new reference only after the TAKE button is pressed and the dots are extinguished.



### UP & DOWN BUTTON

These are non-functioning in the current version of this product.



### TAKE BUTTON

The Take button is used to change the reference to the source indicated on the display.

## 7-SEGMENT DISPLAY

The 7-segment display is used to display the source of the reference signal. If the display is showing the source of a reference signal to which the DA5325 is not currently locked, the display will have dots displayed on all characters. When the source of the reference signal is switched, by pressing the TAKE button, the dots are extinguished.

This display only has two outputs  $\boxed{I_r E F F}$  and  $\boxed{E_r E F F}$ . The  $\boxed{I_r E F F}$  display indicates that the DA5325 is currently using the internal AES clock reference distributed throughout the frame by the CI5705 Communications Interface. To access any other reference source the display should be set to  $\boxed{E_r E F F}$  (and the appropriate switch selection should have been made prior to insertion of the module into the frame).

If power is cycled to the unit, the module will always come up in the external reference mode  $\boxed{E_r E F F}$ . To restore the module to the internal reference mode, press SELECT, then press the TAKE button which will extinguish the surrounding dots which were indicating that the mode change was pending.

## TECHNICAL SPECIFICATIONS

Frequency Response .....	+/-0.01dB 20Hz to 20kHz
Dynamic Range.....	128dB
THD&N.....	-121dB 20Hz to 20kHz
Converter Resolution .....	24 bits
Propagation Delay.....	1.125ms