



VISTEK V1631
20/24-BIT AUDIO
ADC USER GUIDE

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VISTEK V1631 20/24-bit audio adc

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1. DESCRIPTION

The V1631A is a broadcast quality 20/24-bit audio analog to digital converter which forms part of the Vistek V1600 range of interface products. It is a 3U high card which is fitted into either a V1601 or V1603 rack, from which it receives its power. A passive rear module with either screw terminal connections, BNC connectors, or D-type connectors, is required for all signal interconnections.

The unit accepts two stereo pairs of analog audio inputs and converts these signals to two AES digital audio streams. The V1631A is fully compatible with the Vistek DART remote system, allowing status information to be read and control settings invoked by a DART compatible rack controller.

INPUTS:

- 4 x Analog differential inputs with $Z_{in} > 20k\Omega$
- Max input level: +24dBu = 0dBFS. Input sensitivity adjustable by on-card switches and by remote host from +12dBu = 0dBFS to +24dBu = 0dBFS in 1dB steps.

OUTPUTS:

- 2 x AES3-1992 balanced 110 Ω digital audio channels, $Z_{out} = 110\Omega$ (or AES3id 75 Ω unbalanced with special rear module) for each L-R pair of analog inputs.
- Sampling frequencies of 32kHz, 44.1kHz, 48kHz are provided on the standard V1631A.
- AES outputs A and B can reference-locked to an NTSC/PAL video source, a separate AES reference source, or can be free-running to the internal crystal oscillator.
- Minimum basic AES channel status output to AES3-1992

FUNCTIONS:

- Panel Selectable **Reference Source** can be external Video, external AES reference, or internal free-running crystal oscillator.
- Panel Selectable **Sample rate** can be 32kHz, 44.1kHz, 48kHz.
- Control source for Reference and Sample rate selection may be Panel switches (LOCAL mode) or DART (REMOTE mode).
- **Test Tone** of 999Hz at -18dBFS may be invoked by DART on either or both A or B channelpair analog outputs (REMOTE mode only).



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2. INSTALLATION

2.1 Rear Panel Connections

The standard 3U Screw terminal rear panel is shown below. Other 3U and 1U panel variants with screw terminal and/or BNC connectors are similarly marked. Table 2.1 describes the connections to the unit when these panels are used.

Grounds/screens (S) are connected to chassis on all outputs and inputs and should be connected to all cable screens to minimize hum and noise pickup.

Table 2.2 describes connections to the unit when D-type panels are used.

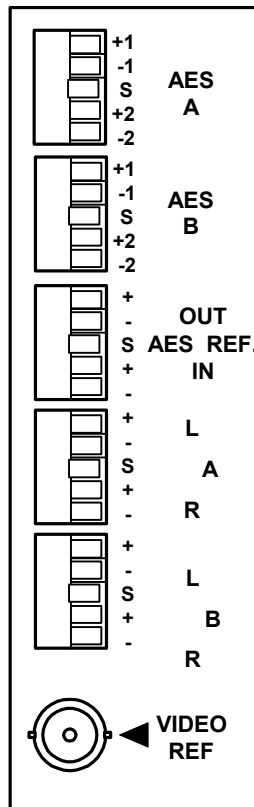


Table 2.1

Description of V1631A rear panel connections for standard rear panel assemblies

SIGNAL NAME	SOURCE	COMMENTS
POWER DART bus	Rack PWR Header Rack DART header	+15V nominal (9-35V) at 10W max Vistek DART Rack controller
A ◀ (IN) L (+/-) R (+/-)	Ext. Analog source Ext Analog source	L Analog input for channelpair A R Analog input for channelpair A
B ◀ (IN) L (+/-) R (+/-)	Ext. Analog source Ext. Analog source	L Analog input for channelpair B R Analog input for channelpair B
AES A ▶ (OUT) (+1,-1) (+2,-1)	V1631A	AES3/AES3id digital output for channelpair A Copy 1 Copy 2
AES B ▶ (OUT) (+1,-1) (+2,-2)	V1631A	AES3/AES3id digital output for channelpair B Copy 1 Copy 2
AES ◀ (IN) REF	External AES reference source	AES3/AES3id digital input for reference 75Ω/Hi-Z
AES ▶ (OUT) REF	V1631A passthru	AES3/AES3id digital output for reference Connected internally to AES REF (IN).
VIDEO ◀ (IN) REF	External video reference source	525/625 line analog studio grade black/burst reference input 75Ω/Hi-Z

Table 2.2

Description of V1631A rear panel connections for D-type rear panel assemblies

D15F Analog I/O connector					
Pin	Signal		Pin	Signal	
1	A left in -		9	A left in +	
2	A right in -		10	A right in +	
3	GND		11	GND	
4	GND		12	GND	
5	B left in -		13	B left in +	
6	B right in -		14	B right in +	
7	GND		15	GND	
8	GND				

D15F Digital I/O connector					
Pin	Signal		Pin	Signal	
1	AES A1 out -		9	AES A1 out +	
2	AES A2 out -		10	AES A2 out +	
3	GND		11	GND	
4	AES B1 out -		12	AES B1 out +	
5	AES B2 out -		13	AES B2 out +	
6	GND		14	GND	
7	AES Ref in/out -		15	AES Ref in/out +	
8	GND				

2.2 Output Wordlength Setting

The digital audio output wordlength is normally 24 bits. It may be set to **20 bits** by **closing** jumper LK1.

2.3 Video Reference Input Impedance

The video reference input impedance is 75Ω when jumper LK2 is **closed**. It is high impedance when jumper LK2 is open to facilitate video reference daisy chaining.

2.4 AES Reference Input Impedance

The AES reference input impedance is **110/75Ω** when jumper LK3 is **closed**. It is high impedance when LK3 is open, facilitating reference daisy chaining. Note that AES Ref (IN) and AES Ref (OUT) are connected internally.

2.5 Maximum Input Level

The V1631A has two rotary Hex Switches for adjusting the MIL (**Maximum Input Level**) of each of the AES channelpairs A and B. These switches adjust the analog MIL corresponding to 0dBFS digital output in 1dB steps from +12dBu to +24dBu. Table 2.3 shows the correspondence between the 16 switch positions and the max output level setting for the V1632A.

Figure 2.1

Location of the on-board switches and jumpers

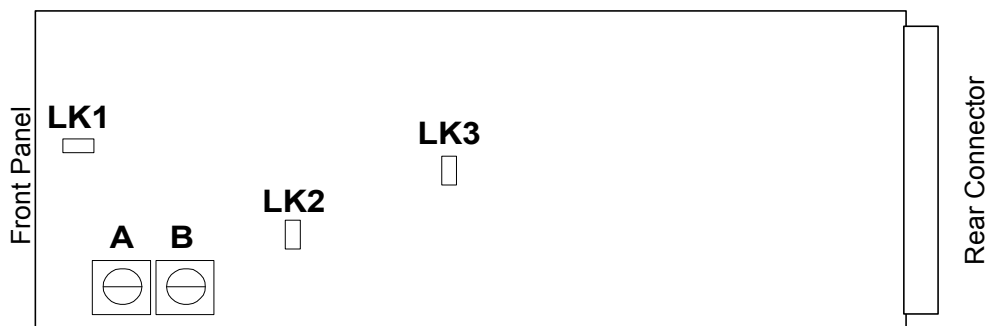


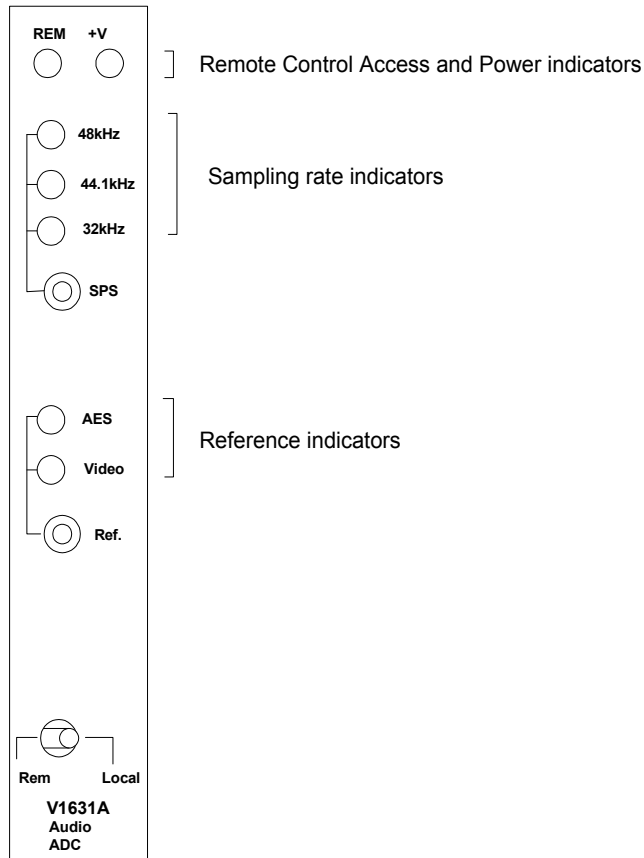
Table 2.3

MIL Adjustment

Switch setting	MIL (dBu)
0	+12
1	+13
2	+14
3	+15
4	+16
5	+17
6	+18
7	+19
8	+20
9	+21
A	+22
B	+23
C	+24
D..F	reserved

3. OPERATION

3.1 Front Panel Controls and Indicators



3.1.1 Remote Control Access and Power Indicators

The green V+ LED is lit when the unit's on-board power supply is delivering voltage. The yellow REM LED is lit whenever the unit is accessed by the Rack Controller for the DART remote system.

3.1.2 Sampling Rate Indicators and Pushbutton

These LEDs indicate the sampling rate of the AES digital outputs, as selected by the **SPS** pushbutton. The pushbutton is only operative when the V1631A is set to LOCAL mode with the REM/LOCAL switch and on power-up will recall the last setting made.

3.1.3 Reference Indicators and Pushbutton

These LEDs indicate the present reference source, as selected by the **Ref.** pushbutton. When Free-Running (internal crystal oscillator) is selected, none of the LEDs are lit. The pushbutton is only operative when the V1631A is set to LOCAL mode with the REM/LOCAL switch and on power up will recall the last setting made.

3.1.4 Rem/Local Switch

The REM/LOCAL switch selects between the Panel controls (LOCAL) and the DART interface (REMOTE). When switching from REMOTE to LOCAL, the last settings made on the panel are recalled.

3.2 Adjustment of Operating Parameters

3.2.1 Reference Setting

- The reference source may be selected by pressing the **Ref.** pushbutton and scrolling through the options which are displayed on the Ref LEDs. Holding in the pushbutton effects continuous scroll.
- On power-up the V1631A recalls the last setting made.
- The reference may be set to **Free Run**, **AES** or **Video** which correspond to Ref LEDs none, AES and Video being lit respectively. The Video option is not available if the sample rate has been set to 32kHz or 44.1kHz.
- If an external reference fails, the appropriate LED will flash and the V1631A will default to Free run mode with reference from the internal crystal oscillator.

3.2.2 Sample Rate Select

- The sample rate of the output AES STREAMS may be selected by pressing the SPS pushbutton and scrolling through the options displayed on the SPS LEDs. Holding in the pushbutton effects continuous scroll.
- On power-up the V1631A recalls the last setting made.
- The sample rate may be set to **32kHz**, **44.1kHz** or **48kHz** which corresponds to SPS LEDs 32k, 44k1, 48k being lit respectively. If the sample rate is set to 32kHz and 44.1kHz after the reference has been set to video, the V1631 will default the reference to Free Run.

3.2.3 Test Tone

- A test tone of 1kHz -18dBFS may be invoked on the L/R channels of either or both A and B channel pair outputs. This function is only available through the DART remote control interface and cannot be set from the front panel.

4. DART INTERFACE

4.1 General

The V1631A is a Class 4 DART module which has a serial EEPROM for reading and writing card details through the DARTbus in the same manner as other V1600 range cards. In addition the unit has several read and write registers, details of which may be found in document **scsm1631.doc**.