VISTEK V1638 ANALOGUE AUDIO DISTRIBUTION AMPLIFIER USER GUIDE

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Contents

VISTEK V1638 analogue audio distribution amplifier

1. DESCRIPTION

The V1638 is a broadcast quality analog audio distribution amplifier 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. The V1638 is fully controllable by the DART remote control interface and either the V1605 remote control panel or the Vistek ViewFind PC-based host. . A passive rear module with screw terminal connections, is required for all signal interconnections. Rear assemblies with screw terminal connectors providing 8 outputs and rear modules with D-sub connectors providing 10 outputs are available.

The unit accepts two differential mono audio inputs and distributes each of these signals to 5 differential mono outputs. The card can therefore be used as a stereo 1:5 distribution amplifier. Modes whereby either input or the sum of both inputs is distributed to 10 outputs are provided and are selected by on-board DIL switches or the DART remote control interface.

The V1638 has 2 population options:
The base version has direct balanced inputs and outputs intended for local distribution applications.
The line version has transformer coupling on both inputs. On either version input impedance may be set to 600Ω or 20kΩ by means of on-board jumpers.

INPUTS:

Base version: 2 x balanced analog channels, Z_{in} = 20kΩ or 600Ω, max input 28dBu
Line version: 2 x transformer coupled channels, Zin = 20kΩ or 600Ω, max recommended input is +20dBu

OUTPUTS:

Monitoring: 3.5mm Stereo jack socket -18dBu into 600Ω w.r.t. main outputs
Main outputs: 2x5 x balanced analog channels, $Z_{out} \leq 50\Omega$, max output 28dBu into 10kΩ

Not more than two outputs per card may be used to drive 600Ω loads at +20 dBu or more

Resistor coupled expander panel:

A rear panel expander is available which is fitted with a 96Way DIN 41612 connector and comes complete with a locking, cable-mounted 96Way DIN41612 plug assembly with solder bucket terminations. The expander has 4 resistor-coupled outputs for each of the 5 main outputs for channels A and B. Using this expander panel, the V1638 can function as a 20+20 DA when driving high input impedances (≥ 10kΩ).

The resistor coupled outputs of the expander panel should not be used to drive 600Ω loads

A digitally controlled gain block allows independent user control of the gain of each input channel, over a range -95.5 to +31.5 dB. The gain is adjustable by front panel rotary switches (Local mode) or via the DART control interface (Remote mode). Standard version offers gain resolution of 0.5dB from both remote interface and panel, and hi-resolution version offers gain resolution of 0.25dB over remote interface and 0.5dB from panel controls.

The input for each output group (Aout[1..5], Bout[1..5]) may be sourced from Ain, Bin or (Ain + Bin) and is selected by on-board DIL switches (Local mode) or via the DART control interface (Remote mode).

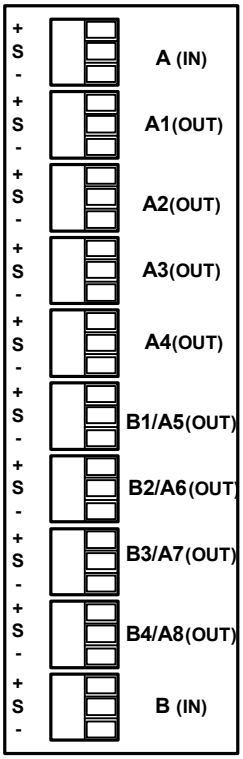
The V1638 has an active first order lowpass filter on each input channel. Rolloff point (-3dB) may be set to 60 kHz or 120kHz by jumper option. LEDs for indication of clipping and low input for each channel are provided.

The V1638 is compatible with the Vistek DART remote system, allowing card ID, status, gain and input selection to be read and gain and input selection to be set by a DART compatible rack controller.

2. INSTALLATION

2.1 Rear Panel Connections

The 3U screw terminal and DSUB rear panels are shown below. 1U panels are similarly marked. Table 2.1.1 details connections to these standard panels. Figure 2.1.2 and Table 2.1.2 describe signals and connections to the DIN41612 cable mounted plug supplied with the resistor-coupled expander panel. Note that these pin numbers refer to those stamped on the back of the supplied cable-mount connector with solder bucker terminals:



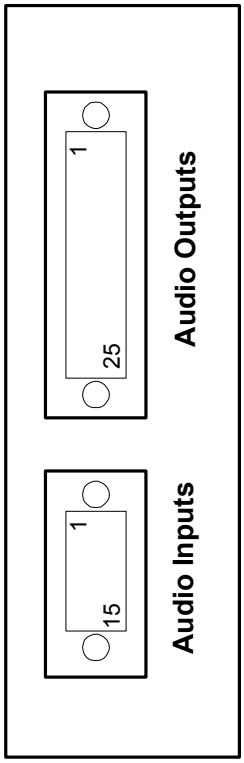


Table 2.1.1

Connections to standard rear panels

SIGNAL	DSUB pin	SOURCE	COMMENTS
Power		Rack PWR header	+15V nominal (9-35V) at 5W max
DARTbus		Rack DART header	Vistek DART rack controller
A in (+)	9		
A in (-)	1		
GND	2,3,4,5,6,8 10,11,12, 13,14	External audio source	All screens from external audio source should be grounded on the V1638 i/p connector
B In (+)	15	External audio source	Channel B differential input
B In (-)	7		Zin = 20kΩ/600Ω; max. input +28dBu
A1 out (+)	14	V1638	Group A outputs
A1 out (-)	1		Zout = 50Ω; max output +28dBu
A2 out (+)	16		
A2 out (-)	3		
A3 out (+)	17		
A3 out (-)	4		
A4 out (+)	18		
A4 out (-)	5		
A5 out (+)	19		A5 output is not available on screw terminal
A5 out (-)	6		rear modules. Only DSUB rear module has A5
GND	2,7,13,15 20	V1638	All screens from V1638 should be grounded on the V1638 o/p connector
B1 out (+)	21	V1638	Group B outputs
B1 out (-)	8		Zout = 50Ω; max output +28dBu
B2 out (+)	22		
B2 out (-)	9		
B3 out (+)	23		
B3 out (-)	10		
B4 out (+)	24		
B4 out (-)	11		
B5 out (+)	25		B5 output is not available on screw terminal
B5 out (-)	12		rear modules. Only DSUB rear module has B5

Figure 2.1.2

Structure of resistor coupled outputs on expander panel

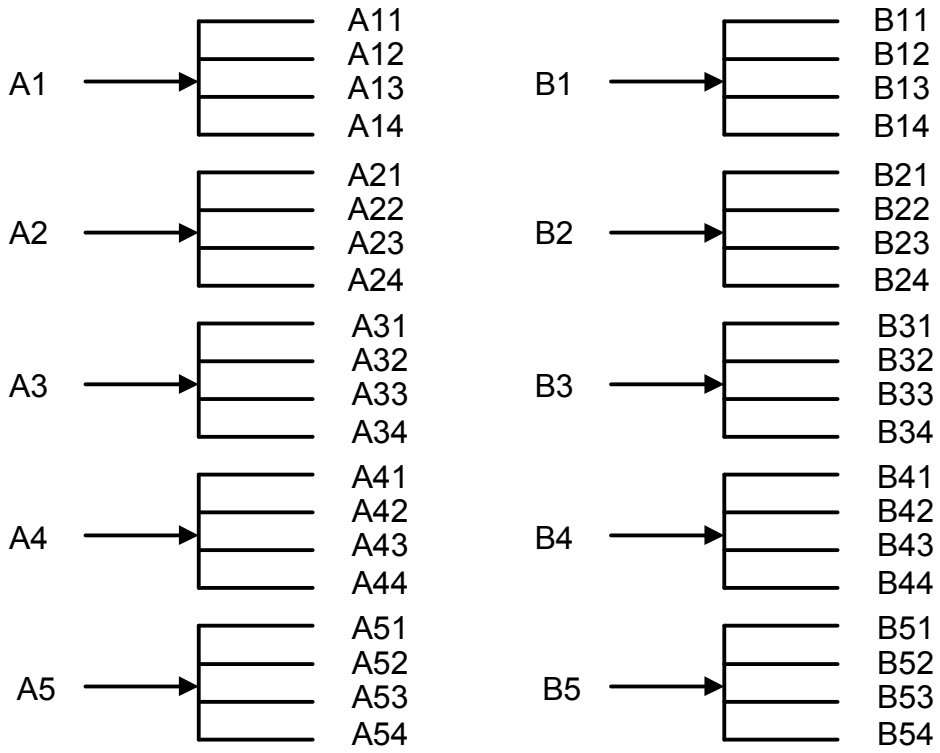


Table 2.1.2

Connector assignments on resistor-coupled expander panel

Cable mounted DIN41612 Type C connector assignments			
Pin No.	**Row a**	**Row b**	**Row c**
1	A11 out +	B51 out +	B11 out +
2	A11 out -	B51 out -	B11 out -
3	A12 out +	B52 out +	B12 out +
4	A12 out -	B52 out -	B12 out -
5	A13 out +	B53 out +	B13 out +
6	A13 out -	B53 out -	B13 out -
7	A14 out +	B54 out +	B14 out +
8	A14 out -	B54 out -	B14 out -
9	A21 out +	GND	B21 out +
10	A21 out -	GND	B21 out -
11	A22 out +	GND	B22 out +
12	A22 out -	GND	B22 out -

Cable mounted DIN41612 Type C connector assignments			
Pin No.	**Row a**	**Row b**	**Row c**
13	A23 out +	Ain +	B23 out +
14	A23 out -	Ain -	B23 out -
15	A24 out +	GND	B24 out +
16	A24 out -	GND	B24 out -
17	A31 out +	GND	B31 out +
18	A31 out -	GND	B31 out -
19	A32 out +	B in +	B32 out +
20	A32 out -	B in -	B32 out -
21	A33 out +	GND	B33 out +
22	A33 out -	GND	B33 out -
23	A34 out +	GND	B34 out +
24	A34 out -	GND	B34 out -
25	A41 out+	A51 out +	B41 out+
26	A41 out -	A51 out -	B41 out -
27	A42 out +	A52 out +	B42 out +
28	A42 out -	A52 out -	B42 out -
28	A43 out +	A53 out +	B43 out +
30	A43 out -	A53 out -	B43 out -
31	A44 out +	A54 out +	B44 out +
32	A44 out -	A54 out -	B44 out -

2.2 Input Impedance

The standard setting of differential input impedance of Channel A and Channel B inputs on the V1638 is 20kΩ, which should be used when the inputs are driven from any direct coupled sources (electronically balanced or quasi-balanced line drivers with low output impedance.) If the inputs are driven from a 600Ω balanced line, the input impedance may be set to 600Ω by using the jumper settings shown below. Note that the input impedance of the two channels may be set independently. Figure 2.4.1 shows the location of the jumpers.

Impedance	Jumpers
Channel A Zin = 20kΩ	LK6 OPEN
Channel B Zin = 20kΩ	LK1 OPEN
Channel A Zin = 600Ω	LK6 CLOSED
Channel B Zin = 600Ω	LK1 CLOSED

2.3 Input Mode

The V1638 Output groups A[1..5] and B[1..5] may each be sourced from Ain, Bin or (Ain + Bin). DIL Switch SW4 controls the input mode as per the following table. The Ain + Bin mode for a given output group is obtained by switching on both the Ain and Bin switches. Figure 2.4.1 shows the location of the SW4 switches.

Input Mode	SW4 action
Ain => A[1..5] out	SW4 - 1 on
Bin => A[1..5] out	SW4 - 2 on
Ain => B[1..5] out	SW4 - 3 on
Bin => B[1..5] out	SW4 - 4 on

2.4 Lowpass Filter

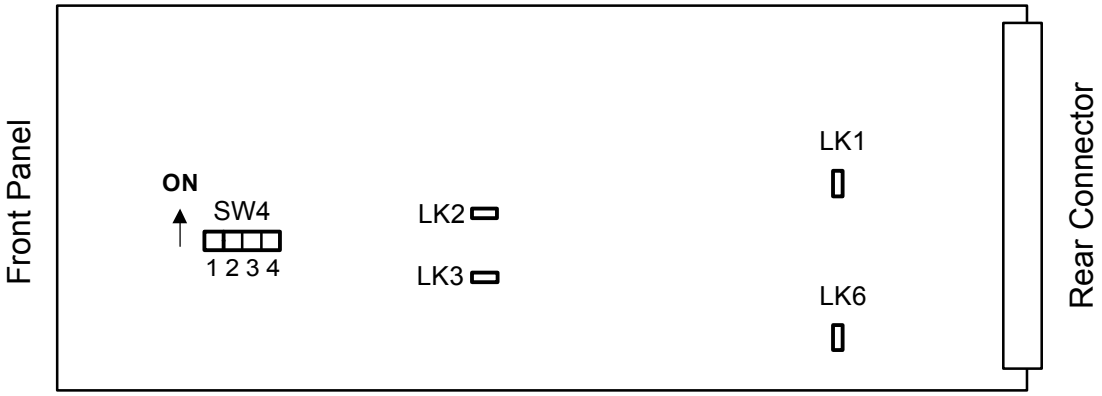
The lowpass filter -3dB rolloff point on each input channel may be set to 60kHz or 120kHz. The 120kHz position may be useful in applications where the V1638 is required to pass timecode spooling. The filter is set by jumpers, as per the table below. Note that the filters of the two channels may be set independently. Figure 2.4.1 shows the location of the jumpers.

-3dB rolloff point	**Jumpers**
Channel A f_{-3} = 60kHz	LK3 CLOSED
Channel B f_{-3} = 60kHz	LK2 CLOSED
Channel A f_{-3} = 120kHz	LK3 OPEN
Channel B f_{-3} = 120kHz	LK2 OPEN

The figure below shows the V1638 and the location of all the jumpers referred to in Section 2.2-4.

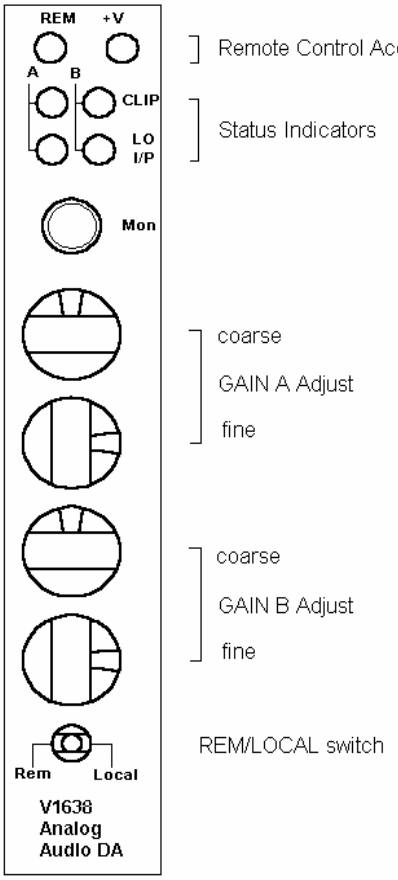
Figure 2.4.1

Jumper and Switch locations



3. OPERATION

3.1 Front Panel



Remote Control Access and Power indicators

Status Indicators

coarse
GAIN A Adjust
fine

coarse
GAIN B Adjust
fine

REM/LOCAL switch

3.2 LED Indications

The green **V+** LED is lit whenever power is applied and the V1630's internal power supply is operating correctly.

The yellow **REM** LED flashes briefly to indicate a DARTbus access is in progress.

A red **CLIP** LED is provided for each channel. These indicators have a fast attack and 0.8s retriggerable hold characteristic. The output signal is monitored and the LEDs will trigger at +28dBu, just before the onset of clipping. The LED will be on continuously of sustained clipping occurs.

A yellow **LO I/P** LED is provided for each channel. These have a slow attack, 0.8s, and fast decay characteristic. The input signal is monitored and the LEDs will trigger when the signal level falls below approx -40dBu for longer than 0.8s. The LED will be on continuously if there is no input or the input has very quiet passages of long duration.

3.3 Gain Adjustment

The V1638 has two rotary panel switches for adjusting the gain of each channel. These panel switches only have effect when the **REM/LOCAL** switch is in the **LOCAL** position. The **COARSE** switch adjusts the gain in 8dB steps from -96dB (mute) to +24dB. The **FINE** switch adjusts the gain in 0.5 dB steps from coarse setting dB to coarse setting + 7.5dB. The table below shows the correspondence between the 16 switch positions and the gain setting for both coarse and fine controls.

Coarse switch		Fine switch	
Switch setting	**Gain value (dB)**	**Switch setting**	**Gain value (dB)**
0	-96 (mute)	0	0
1	-88	1	+0.5
2	-80	2	+1.0
3	-72	3	+1.5
4	-64	4	+2.0
5	-56	5	+2.5
6	-48	6	+3.0
7	-40	7	+3.5
8	-32	8	+4.0
9	-24	9	+4.5
A	-16	A	+5.0
B	-8	B	+5.5
C	0	C	+6.0
D	+8	D	+6.5
E	+16	E	+7.0
F	+24	F	+7.5

It can be seen from the table that the gain applied is the sum of the settings of the **COARSE** switch and the **FINE** switch. Care should be taken when setting the gains in an application to allow sufficient headroom so that the V1638 does not clip on peaks. Remember that the maximum output of the V1638 is +28dBu. The V1638 circuitry updates the gain setting from the panel switches every 50 ms. When the rem/local switch is set to the rem position, the gain set on the front panel switches is ignored and the gain is set from the DART interface. On the standard version, gain resolution from the remote interface is 0.5dB, and on the high resolution version it is 0.25dB.

3.4 Monitoring Jack

The V1638 DA provides a standard 3.5mm stereo headphone jack socket on the front panel, enabling quick checks to be made and monitoring done without having to go to a jack field. The monitoring output provides a fixed signal level approx 10dB lower than the direct coupled main outputs . Thus a +28dBu signal on the V1638 base version output corresponds to a +18dBu level on the monitoring output, which is designed to be used with professional quality headphones of 300-600Ω impedance, (eg Sennheiser HD520).

Small commercial headphones of 32Ω impedance as used in portable consumer equipment may also be used but they may be damaged at the high of the signal levels possible with the V1638 DA base version.

3.5 Dart Interface

The V1638 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 which will be discussed. Details of the DART interface may be found in document ***Scms1638.doc***.