AMU1-BHD+
Audio monitoring Unit

Handbook

TSL
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SAFETY

Installation.

Unless otherwise stated TSL equipment may be installed at any angle or position within an operating temperature range of 5° - 30° C .

All TSL equipment conforms to the EC Low Voltage Directive:

EC Low Voltage Directive (73/23/EEC)(OJ L76 26.3.73)(LVD). Amendment: (93/68/EEC) (OJ L220 30.8.93).

In all cases the chassis of the equipment must be earthed on installation.

The external power supply provided with this product may be one of two types:

1. A Class 2 double insulated type with a 'figure of eight' mains input connector.
2. A Class or Level 3 type with an IEC mains input connector. This type offers a functional earth and **NOT A SAFETY EARTH** via the earth pin of the IEC mains input connector to the outer of the of the co axial power connector.

All metal panels are bonded together.

Due consideration for cooling requirements must be given when mounting the equipment. It is recommended that a 1RU of rack space, or a vent panel, should be left above and below the unit.

Check that the fuse rating is correct for the local power (mains) supply. Replacement fuses must be of the same rating and type for continued protection against fire risk.

Do not switch on until all connections are made.

WARRANTY, MAINTENANCE AND REPAIR

All TSL equipment is guaranteed for one year from the date of delivery to the customer's premises. If the equipment is to be stored for a significant period, please contact TSL concerning a possible extended warranty period.

Failure during warranty

If any TSL product should fail or become faulty within the warranty period, first please check the PSU fuses.
All maintenance work must be carried out by trained and competent personnel.

Technical support information

E-Mail address: support@tsl.co.uk
Telephone Support Number for the UK and Europe: +44 (0) 1628 676200
Telephone Support Number for the USA only: 1 877 591 2108

TSL Returns Procedure

Please telephone +44 (0)1628 676200 (Fax: +44 (0)1682 676299) and ask for Sales who will provide a Returns Number. This will enable us to track the unit effectively and will provide some information prior to the unit arriving.

For each item, this unique Returns Number must be included with the Fault Report sent with the unit.

A contact name and telephone number are also required with the Fault Report sent with the unit.

Fault report details required.

- Company:
- Name:
- Address:
- Contact Name:
- Telephone No:
- Returns Number:
- Symptoms of the fault (to include switch setting positions, input signals etc):

Packing

Please ensure that the unit is well packed as all mechanical damage is chargeable. TSL recommends that you insure your equipment for transit damage.

The original packaging, when available, should always be used when returning equipment..

If returned equipment is received in a damaged condition, the damage should be reported both to TSL and the carrier immediately.

Contents

AMU1-BHD+ AUDIO MONITORING UNIT

1.0 Introduction

The AMU1-BHD+ is a full rack 1RU x 285mm deep Audio Monitoring Unit with a TSL Bargraph.

The following features are standard:

- Two HD/SDV auto sensing input.
- Four AES/EBU inputs.
- Two switch selectable stereo analogue inputs.
- One TSL Stereo High resolution 106 segment Bargraph Meter.
- Phase correlation bargraph.
- Re clocked output of either HD or SDV
- Decoded PAL/NTSC composite (SDV only)
- Optional additive output switch selection.
- Additional SDV output if SDV is used on input
- Headphone outputs with LS muting.
- Variable stereo line output.

2.0 Front Panel Controls

2.1 Input and Meter Selection Buttons

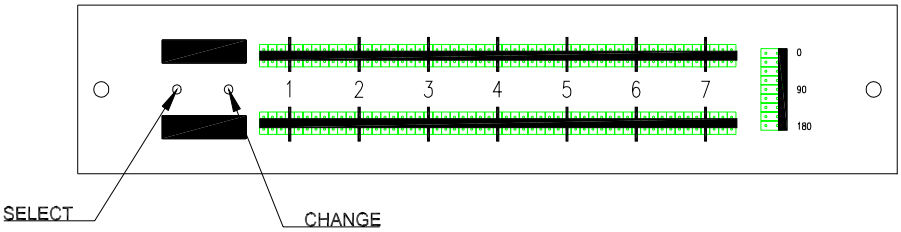
Input and Output Monitoring Select Panel Layout

H/SDV 1 Pair 1	**H/SDV 2 Pair 1**	**Group 1**	**Group 3**	**AES 1**	**AES 3**	**Anl 1**	**A1 L**	**A2 L**	**Dim**
H/SDV 1 Pair 2	**H/SDV 2 Pair 2**	**Group 2**	**Group 4**	**AES 2**	**AES 4**	**Anl 2**	**A1 R**	**A2 R**	**Cut**

Analogue 1 & 2 Analogue I/Ps. A1 (Left Channel) is fed to the top bargraph and A2 (Right Channel) is fed to the bottom bargraph.

AES1, 2, 3 & 4 Selects one of four AES signals to the bargraph.

H/SDV pair 1&2 From the two inputs Selects A1/A2 from the de-embedded HD or SD to the bargraph when pair 1 is selected and A3 and A4 when pair 2 is selected. From either H/SDV input, selecting pair 1 in any group will give A1 and A2 and when pair 2 is pressed A3 and A4 will be automatically selected.



2.1.1 TSL Bargraph

Set-up Menus.

These are accessed via the select & change buttons located between the two alphanumeric displays to the left of the unit (see diagram above). The top display shows the function & the bottom gives the state.

These are accessed via the select & change buttons located between the two alphanumeric displays to the left of the unit (see diagram above). The top display shows the function & the bottom gives the state.

1) Pressing select once gives:

P	E	A	K
H	D		0

The zero toggles between 0 , 1 and 2 when the change button is pressed. 0 is off, and 1 is on and the highest level point is displayed. HD 2 operates only in the PPM mode and displays the level numerically with the reference marker. With HD 0 selected the alphanumeric display is off.

2) Pressing select a second time gives:

D	I	S	P
B	A	R	

All the LEDs are lit up to the highest level displayed.

Pressing the change button gives:

D	I	S	P
D	O	T	

Only the highest level LED is lit.

3) Pressing select a third time gives:

R	S	P	N
1ms			

Pressing the change button gives:

.1ms			

This changes the response for the relevant scales.
(0.1ms, 1ms, 5ms 10ms, and VU integration times.)

4) Pressing select a fourth time gives:

I	D		0
O	N		

This enables the unit to display the reference markers which are nominally set to 0dB. These are set as follows for the appropriate scales fitted: PPM 4 for UK, TEST for EBU, - 4 for VU, - 6 for DIN, 0 or Test for Nordic, -18dB or - 20 dB for Digital.
When the change button is depressed the markers are not displayed and an OFF indication is displayed in the lower display.

5) Pressing select for a fifth time gives:

B	R	G	T

Depressing the change button changes the brightness or intensity of the display. Successive presses decrease brightness.

6) Pressing select for a sixth time gives:

I	/	P	:
A	n	l	g

Depressing the change button changes the input from Analogue to digital (AES).

7) Pressing select for a seventh time gives:

S	C	L	E
E	B	U	

Depressing the change button defines which scale is in use. (EBU, DIN, PPM, Nordic or VU.)

8) Pressing select for a eighth time gives:

0	R	E	F
	-	1	8

Depressing the change button selects the digital reference. (- 18 or –20)

9) Pressing select for a ninth time gives:

L	O	U	D
O	N		

Depressing the change button turns the loudness indication on or off.

2.2 Output Switching

A1, A2

These buttons select either:
- the Analogue Left or Right signals of the metered Input,
- the AES/EBU Input 1 Left or Right signals or
- the selected H/SDV group A1 & A2 decoded outputs to the Left or Right Output Channels. (Note A3 and A4 may be monitored if H/SD pair 2 is selected.)

The buttons toggle. Additive mixing is possible if two or more buttons are selected together.

DIM

Approximately 16dB of attenuation is switched into the audio path and is effective on the loudspeaker and variable line outputs. The fixed line outputs are unaffected.

CUT

The front panel button cuts the signal to the loudspeaker and variable line outputs. The fixed line outputs are unaffected.

VOLUME

The Headphones O/P and the Variable Line O/P may be varied.

3.0 Pin-out Details

3.1 Analogue XLR Connectors

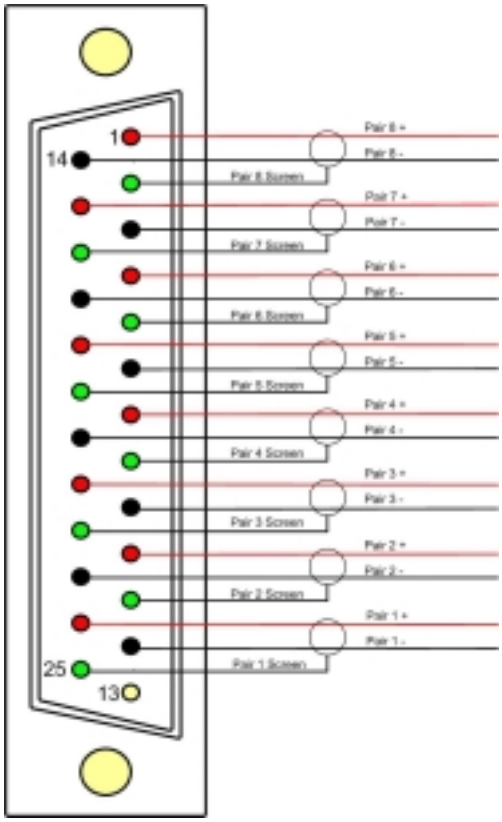
XLRS	PIN	FUNCTION
ANALOGUE 1	1	GND
ANALOGUE 1	2	1 IN+
ANALOGUE 1	3	1 IN-
ANALOGUE 2	1	GND
ANALOGUE 2	2	2 IN+
ANALOGUE 2	3	2 IN-

3.2 AES/EBU XLR Connectors

XLRS	PIN	AES FUNCTION
AES 1	1	AES GND
AES 1	2	AES 1 IN+
AES 1	3	AES 1 IN-
AES 2	1	AES GND
AES 2	2	AES 2 IN+
AES 2	3	AES 2 IN-

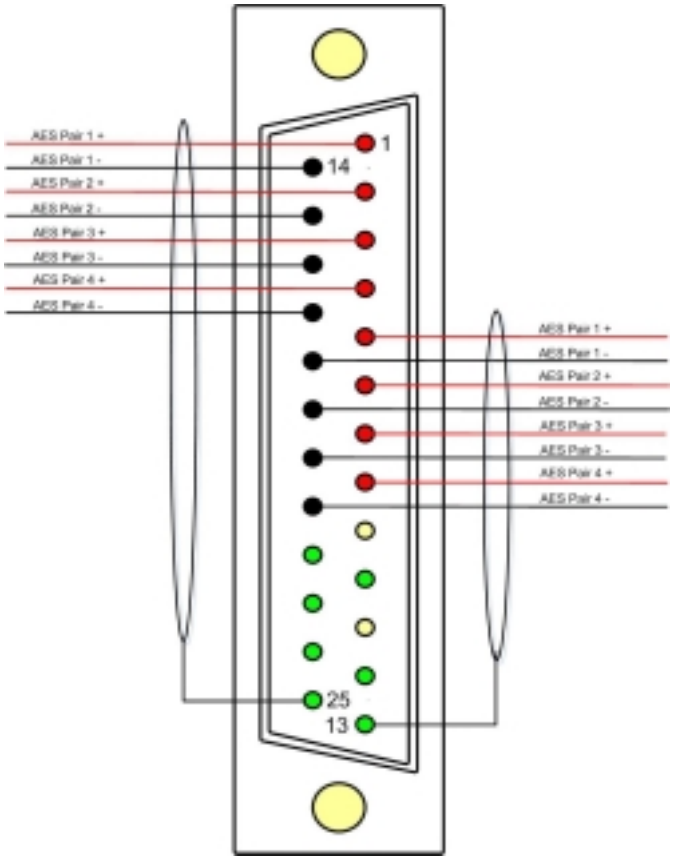
3.3 Analogue Output Connector – D25 Socket Pinout

D 25 SOCKET ON AMU	AUDIO OUTPUTS
PIN NO	**FUNCTION**
1	
14	
2	
15	
3	
16	
4	
17	
5	
18	
6	
19	
7	
20	
8	
21	
9	
22	
10	A2+
23	A2-
11	Ground
24	A1+
12	A1-
25	Ground
13	N/C



3.4 AES Input/Output connector - D25 socket pinout

D 25 SOCKET ON AMU	AES INPUTS/OUTPUTS
PIN NO	**FUNCTION**
1	Ch1&2 Input 1+
14	Ch1&2 Input 1-
2	Ch3&4 Input 2+
15	Ch3&4 Input 2-
3	Ch5&6 Input 3+
16	Ch5&6 Input 3-
4	Ch7&8 Input 4+
17	Ch7&8 Input 4-
5	Ch1&2 Output 1+
18	Ch1&2 Output 1-
6	Ch3&4 Output 2+
19	Ch3&4 Output 2-
7	N/C
20	N/C
8	N/C
21	N/C
9	N/C
22	Ground
10	Ground
23	Ground
11	N/C
24	Ground
12	Ground
25	Ground
13	Ground



N.B. The digital channel outputs referred to are converted analogue outputs of the digital channel.

3.4.1 RS 422 - D9 Socket

This is wired for RS422.

D9	CONTROL
1	0V
6	0V
2	TX-
7	TX+
3	RX+
8	RX-
4	0V
9	0V
5	N/C

3.4.2 Aux – D9 Socket

Not activated.

3.5 Configuration Switch Functions (Y05 s/w)

SWITCH SECTION	FUNCTION
1 N/A	PPM – Up/ EBU Digital – Down
2 N/A	Peak Hold OFF-Up
3 N/A	Internal speaker Mute- Up
4	Calibration Level – see below
5	Calibration Level – see below
6	Calibration Level – see below
7 N/A	Stereo Mix Lo Ro – Up/Lt Rt Down
8	Composite out-Up/SDI \Down

The level configuration switches on the HDC2 board operates in a “2’s complement” manner the relationship between the dBfs level setting in the digital domain and the dBm level setting in the analogue domain. The “zero” position with all switches in the down position is designed to give 0dBm out for a level of -18dBfs in digital space. See below for configuration

SW4	SW5	SW6	FUNCTION
UP	**UP**	DN	-24dBFS
DN	**UP**	DN	-22dBFS
UP	DN	DN	-20dBFS
DN	DN	DN	-18dBFS
UP	**UP**	**UP**	-15dBFS
DN	**UP**	**UP**	TBD
UP	DN	**UP**	TBD
DN	DN	**UP**	TBD

4.0 LS Output

This is a bridged amplifier therefore neither side may be connected to ground.

5.0 Notes

0 dBm = 0.775V into 600Ω i.e. 1mW power dissipation.

0 dBu = 0.775V rms = PPM 4.

Nominally, -18 dB ref 0FS = 0 dBu output.

European line up: -18 dBu

American line up: -20 dBu

All audio monitoring Calibration procedures are factory Set.

5.1 Please note that some American equipment has the function of the XLR pins 2 & 3 reversed.

TSL product is wired to the European standard

N.B The analogue settings follow the digital settings which are selected by use of the dip switches and both are referenced to 0dBu.

6.0 AMU1-BHD+ Technical Specifications

Power Supply

Supply Voltage	12 Volts DC
Power Consumption	35 watts Max.

Physical Dimensions

Height	88mm (2RU)
Width	483mm
Depth	285mm
Weight	3.5Kg

Analogue Input 1 & 2

Connector Type	XLR 3 pin. Pin 1 Gnd, Pin 2 hot, Pin 3 cold.
Signal	Balanced line level audio.
Frequency Response	30Hz to 25kHz
Impedance	>20kΩ

Inputs AES 1 & 2

Connector Type	XLR Female 3 pin. Pin 1 Gnd, Pin 2 hot, Pin 3 cold.
Standard	AES3 (1994) at 48kHz, 44.1kHz or 32kHz
Impedance	110 ohm (balanced.)

Inputs AES 1, 2, 3 & 4 AES I/O, 25 way D type (See section 3.4 for details)

Input, HDV/SDV 1 & 2 (auto sensing)

Connector Type	BNC.
Standard	SMPTE 259M 4:2:2 component 525/60 or 625/50 with embedded 48kHz audio. HDSDI (SMPTE 292M) – 720P & 1080i @ 50, 59.94 & 60Hz
Impedance	75ohm
Return Loss	<-20dB to 1.5GHz

Re clocked Output

Return Loss	< -15dB up to 1.5GHz
Connector	BNC

Variable Line Output.

Connector	XLR 3 pin Male (variable line out A1 &A2)
Impedance	50Ω
Output Levels	Through level control with 0dB gain.
Connector	D25
Impedance	>20kΩ

AES Output

Connector	AES I/O, 25 way D type (See section 3.4 for details)
Impedance	110 Ohm
Output	Selected SDI group.

Noise Better than -60dB (22Hz to 22 KHz)

Headphone Output.

Connector	Stereo Jack socket type A
Impedance	50Ω
Output Levels	Through level control with 0dB gain.

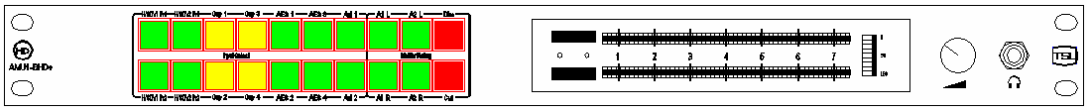
Loudspeaker Outputs.

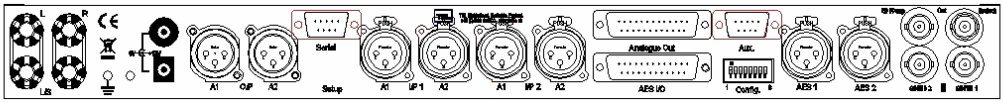
Connectors	4mm Binding Posts
Output rating	Max 10 watt RMS /Ch into 4Ω,

HD Standards Supported

1080i/50
1080i/59.94
1080i/60
720p/50
720p/59.94
720p/60

7.0 Front and rear view





7.0 Block Schematic