



AMU2-8HD MK3
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 frame of the equipment must be earthed on installation.

The earth pin on the IEC mains inlet connector is connected to the metal frame of the equipment, to 0 volts on the internal DC PSU and to signal ground, unless otherwise stated. All metal panels are bonded together.

Due consideration for cooling requirements must be given when mounting the equipment. Ideally 1RU of rack space 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@televisionssystemsltd.uk

Telephone Support Number for the UK and Europe: +44 (0) 1628 670000

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.

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AMU2-8HD MK3 AUDIO MONITORING UNIT

1.0 Introduction

The AMU2-8HD MK3 is a full rack 2RU x 280mm deep Audio Monitoring Unit with eight TSL 53 segment bargraphs.

The following features are standard:

- Eight channel simultaneous monitoring.
- Four simultaneously displayed stereo analogue inputs.
- Four AES/EBU inputs.
- One HD/SDV auto sensing input.
- Phase reverse switch.
- Out-of-phase error indication.
- Re clocked output of either HD or SDV.
- Down converted re clocked output (option)
- Decoded PAL/NTSC composite.
- Additive output switch selection.
- Composite output.
- Headphone outputs with LS muting.
- Fixed and variable stereo line outputs of selected pair.
- Four simultaneous line outputs.
- Dolby compatible D and E.
- Metadata display.
- EBU digital UK PPM, EBU PPM and DIN PPM scales.
- Internal amplifier.

2.0 Front Panel Controls

2.1 Input and Meter Selection Buttons

Analogue 1, 2, 3 & 4	Analogue inputs. These are monitored simultaneously by pressing the ANALOGUE input select button, and displayed on the bargraphs, A(1/2), B(3/4), C(5/6), D(7/8) respectively.
AES1, 2, 3 & 4	AES inputs. These are selected by first pressing the AES select button, then selecting A(1/2),B(3/4), C(5/6), D(7/8) respectively on the LS monitoring panel. NB: These switches do not illuminate when selected as these sources are automatically displayed on the bargraphs when a signal is present. The level can also be read in the LCD display.
S/HD (Auto sensing)	This is selected by pressing the S/HD button and then selecting GP1 to GP4. The de-embedded SDV or HD is then displayed on the bargraphs A(1/2),B(3/4), C(5/6), D(7/8) respectively. Selecting group 1 and 2 together allows all eight channels to be monitored.
Dolby (Auto sensing)	Encoded Dolby can either be carried on an AES bit stream or as embedded HD or SD. To select the Dolby function press the DOLBY button after selecting either AES or S/HD buttons. If a valid Dolby signal is present the Dolby button will illuminate steady red. If a Dolby signal is not present or is lost the button will flash. To select one pair from one group containing two Dolby signals on each pair, select the group (1, 2, 3 or 4) from the H/SDV input and then either A, B, C, or D from the input selector to chose pair.
Letterbox	Shows the composite output as 16:9 aspect ratio on a 4:3 monitor. Operates on HD source only.
Ø Rev (Function)	Momentary phase reverse between A1 and A2 on variable and fixed line also on the loudspeaker output.
Brightness	To increase the brightness of the bargraph display Press phase reverse and monitoring select A. To decrease the Brightness press phase reverse and monitoring select B.
Reference Marker	To turn the reverence marker on and off press phase Reverse and the CUT button.

Meta Data Display

This window indicates:
Channel coding (Rate/non PCM/Dolby D/Dolby)
Channel format (e.g. 8x1/2+2+2+2 etc)
Digital peak read out of selected pair.
Dialogue normalisation value where set

N.B. To reset/refresh display press Dolby and Phase Reverse select switches simultaneously.

2.2 Output Switching and monitoring

A, B, C & D

These buttons select the audio from pairs 1/2 (A) through to 7/8 (D)
The buttons toggle. Additive mixing is possible if two or more buttons are selected together and are fed only to the fixed and variable line outputs.

ALL

Enables a raw post Dolby multi channel signal to be monitored on the fixed line outputs. (Outputs not muted.)

L

Enables the left hand channel to be monitored by both outputs. (Outputs muted)

R

Enables the right hand channel to be monitored by both outputs. (Outputs muted)

M

A mono signal of the left and right hand channels is applied to both outputs. (Outputs muted)

Lt Rt

Allows a multi channel signal to be monitored and is a stereo 'down mix 'of a Dolby decoded signal. (Mutes multi channel fixed outputs)

5.1

Enables a Dolby digital emulation to be monitored on the fixed line outputs. (Outputs not muted.)

Dim

Approximately 16dB of attenuation is switched into the audio path.

Cut/Mute

The front panel button Cut(s) the signal to all O/Ps. Variable Line O/Ps are possible via a rear connector. A ground is required on the appropriate pin to activate the **MUTE** condition.

Volume

The Headphones O/P and the Variable Line O/P may be varied. (N.B. This control also acts on the main line outputs if the option has been selected on the AMU2-8HDmk3 specification sheet.)

3.0 Pin-out Details**3.1 Analogue XLR Connectors**

XLRS	PIN	FUNCTION
ANALOG 1	1	GND
ANALOG 1	2	1 IN+
ANALOG 1	3	1 IN-
ANALOG 2	1	GND
ANALOG 2	2	2 IN+
ANALOG 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-
AES 3	1	AES GND
AES 3	2	AES 3 IN+
AES 3	3	AES 3 IN-
AES 4	1	AES GND
AES 4	2	AES 4 IN+
AES 4	3	AES 4 IN-

3.3 D37 Socket, Input connector (lower)

D 37 CONNECTOR ON AMU			AUDIO INPUTS	FUNCTION
PIN NO	PIN NO			
HOT +	COLD -			
1	20		1	A1L (A1)
2	21		1	A1R (A2)
3	22		2	A2L (A3)
4	23		2	A2R (A4)
5	24		3	A3L (A5)
6	25		3	A3R (A6)
7	26		4	A4L (A7)
8	27		4	A4R (A8)
19			Screen	A Ground

D37 Plug, Output connector (Upper)

D 37 CONNECTOR ON AMU			AUDIO OUTPUTS	FUNCTION
PIN NO	PIN NO			
HOT +	COLD -			
1	20		A1	VAR MON O/P
2	21		A2	VAR MON O/P
3	22		A1	FIXED MON O/P
4	23		A2	FIXED MON O/P
5	24		A1(Left)	DIGITAL CH
6	25		A2(Right)	DIGITAL CH
7	26		A3(Centre)	DIGITAL CH
8	27		A4(Lfe)	DIGITAL CH
9	28		A5(Ls)	DIGITAL CH
10	29		A6(Rs)	DIGITAL CH
11	30		A7(Lt)	DIGITAL CH
12	31		A8(Rt)	DIGITAL CH
19			Screen	A Ground

3.4 Control Connector - 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

3.5 External Connector – D15 Plug

D15 PIN	EXTERNAL FUNCTION
1	GPI
2	GPI
3	GPI
4	GPI
5	GPI
6	GPI
7	N/C
8	N/C
9	N/C
10	N/C
11	N/C
12	N/C
13	N/C
14	+5V
15	0V

3.6 S/HD connector

This input auto detects HD or SDV signals.

3.7 Re clocked connector

This connector gives a re clocked output of the input signal.

3.8 Down converted output connector (Option)

This gives a down converted SD output of HD (Vision only). This also gives A re clocked output if SD is used on the input.

3.9 Composite output connector

This gives a composite output of the S/HD input.

4.0 LS Output

This is a single ended amplifier therefore one 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 lineup: -20 dBu

All audio monitoring Calibration procedures are factory Set.

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

TSL product is wired to the European standard

The Dolby (CAT522) card can be reset by pressing the phase reverse and the Dolby select buttons simultaneously.

5.1 Fixed or variable line output option.

This option is available but will be set to 'fixed' unless the option for 'variable' is checked on the specification sheet at the time of ordering. Please contact support@tsl.c.uk if variable line output is required after that time.

5.2 One frame Delay in Dolby mode option.

This operates on the down converted outputs, that is the re-clocked SDV and composite outputs.

If this option is required to be changed after the time of ordering please contact support@tsl.c.uk

6.0 AMU2-8HD mk3 Technical Specifications

Power Supply

Supply Voltage	100 -240V AC @ 50Hz/60Hz +/- 10%
Power Consumption	60 Watts.

Physical Dimensions

Height	88mm (2RU)
Width	483mm (19")
Depth	280mm
Weight	3500gm

Input 1

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	>20k Ω

Analogue Inputs 1 - 4

Connector Type	D37 (XLR Input 1, in parallel)
Signal	Balanced line level audio.
Frequency Response	30Hz to 25kHz \pm 1dB
Impedance	>20k Ω

Inputs AES 1, AES2, AES3 and AES4

Connector Type	XLR (F) 3 pin. Pin 1 Gnd, Pin 2 hot, Pin 3 cold
Standard	AES3 (1994) 32, 44.1, 48, 96 KHz
Impedance	Balanced 110 Ohm.

Input, HD/SDV (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

Dolby

Dolby Digital or Dolby E decoding from selected AES input or selected embedded audio.

Note: The Dolby (CAT522) card can be reset by pressing the phase reverse and the Dolby select buttons simultaneously.

Display indicates:	Channel coding (rate/non pcm/dolby D/dolby) Channel format (e.g. 8x1/2+2+2+2 etc) Digital peak readout of selected pair. Dial norm value where set
Down converted Output	
Return Loss	>= 8bit processing. <-16.5dB to 1.5GHz
Connector	BNC Note: This is a video monitoring point only. This connector also gives re clocked SDV out when SDV is applied to the input.
Re clocked Output	
Return Loss	< -15dB up to 1.5GHz
Connector	BNC
Video Output	
Connector	BNC
Impedance	75 Ohm
Output	Composite
Line Output.	
Connector	XLR 3 pin Male (variable line out A1 &A2)
Impedance	50Ω
Output Levels	Through level control with 0dB gain.
Connector	D37
Impedance	>20kΩ
Output Levels	Fixed (+ and – 1dB) and Variable.
Noise	Better than -70 dB (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 15W 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



