



AMU2-GB4HD
AUDIO MONITORING
UNIT

HANDBOOK

TSL

Vanwall Road, Maidenhead, Berkshire, SL6 4UB
Telephone +44 (0)1628 676200, FAX +44 (0)1628 676299
www.tsl.co.uk



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.

This unit requires an external earth bond to the case as it offers a functional earth via the earth pin of the IEC mains input connector (Class 3). 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.

This unit is heavy and must be supported along the sides or at the rear.

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 676000

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

- 1.0 Introduction**
- 2.0 Front Panel Controls**
 - 2.1 Input and Meter Selection Buttons**
 - 2.2 Output Switching**
 - 2.3 Display Settings**
- 3.0 Configuration Switch Functions**
- 4.0 Pin-out Details**
 - 4.1 Analogue XLR Connectors**
 - 4.2 AES/EBU XLR Connectors**
 - 4.3 Audio Input Connector – D25 Socket (NOT ENABLED)**
 - 4.4 Auxiliary Connector – D25 Socket**
 - 4.5 Serial Connector - D9 Socket**
 - 4.6 External Connector - D15 Plug (NOT ENABLED)**
- 5.0 LS Output**
- 6.0 Notes**
- 7.0 AMU Alignment Procedure**
 - 7.1 Initial Set-Up**
 - 7.2 Bargraph Calibration Procedure**
- 8.0 General Notes**
- 9.0 Specifications**

This page is Blank

AMU2-GB4HD AUDIO MONITORING UNIT

1.0 Introduction

The AMU2-GB4HD is a 2RU x 338mm deep Audio Monitoring Unit offering high quality close field monitoring.

The following features are standard:

- One Bargraph Meter.
- Two switch selectable stereo analogue inputs.
- Two AES/EBU inputs.
- One HD/SDV auto sensing input.
- Decoded PAL/NTSC composite video and re-clocked output.
- Audio-present indication.
- Phase correlation indication.
- Phase reverse switch.
- Out-of-phase error indication.
- Additive output switch selection.
- 24 Watts total output power.
- Headphone outputs with LS muting.
- Fixed and variable stereo line outputs.
- RS422 remote control option
- Low frequency adjustment. (On rear panel.)

2.0 Front Panel Controls

2.1 Input and Meter Selection Buttons

ANL1/2	Analogue I/Ps. A1 (Left Channel) is fed to the upper bargraph and A2 (Right Channel) is fed to the lower bargraph.
AES1/2	Selects one of two AES signals to the meters.
HD/SDV	Selects A1/A2 or A3/A4 to the meters.
GRP SEL	Selects one of four groups from the embedded audio.
M/S	Displays the MIX (mono) signal on the upper meter and the SEPARATION (difference) on the lower meter of the selected Input.
∅ Rev	Momentary phase reverse between A1 and A2.

2.2 Output Switching

- A1/A2** These buttons select either:
- the Left or Right signals of the metered Input
- to the Left or Right Output Channels.
The buttons toggle. Additive mixing is possible if two buttons are pressed together.
- 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.
*(Remote Mute of either or both of the LS O/Ps and Variable Line O/Ps are possible via a rear connector. A ground is required on the appropriate pin to activate the **MUTE** condition.)* Not implemented with current software.
- VOLUME** This sets the acoustic level.

2.4 BARGRAPH DISPLAY SETTINGS

To Change from Bar to Dot, press Phase Rev and M/S.

To Change Brightness, press Phase Rev and A1L (+)
A2L (-)

To select marker, press Phase Rev and Cut.

To select Peak hold, press Phase Rev and A2 once.

To select Peak display, press Phase Rev and group select. (PPM version only)

3.0

Configuration Switch Functions (from S/W Release X06)

SWITCH SECTION	FUNCTION
1	Not Used
2	Digital Settings (see table below)
3	Digital Settings (see table below)
4	Digital Settings (see table below)
5	Digital Settings (see table below)
6	Not Used
7	Not Used
8	Not Used

SW2	SW3	SW4	SW5	FUNCTION
DN	UP	UP	DN	-24dBFS
UP	DN	UP	DN	-23dBFS
DN	DN	UP	DN	-22dBFS
UP	UP	DN	DN	-21dBFS
DN	UP	DN	DN	-20dBFS
UP	DN	DN	DN	-19dBFS
DN	DN	DN	DN	-18dBFS
UP	UP	UP	UP	-17dBFS
DN	UP	UP	UP	-16dBFS
UP	DN	UP	UP	-15dBFS
DN	DN	UP	UP	-14dBFS
UP	UP	DN	UP	-13dBFS
DN	UP	DN	UP	-12dBFS

4.0 Pin-out Details

4.1 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-

4.2 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-

4.3 Audio Input connector, D25 (NOT ENABLED ON DIGITAL UNITS)

D 25 SOCKET ON AMU	AUDIO INPUTS	D 25 SOCKET ON AMU	AUDIO INPUTS
PIN NO		PIN NO	
1	Chassis		
2	Aux Ch3 Left +	14	Aux Ch3 Left -
3	Aux Ch3 Right -	15	Aux Ch3 Left Scrn
4	Aux Ch3 Right Scrn	16	Aux Ch3 Right +
5	Aux Ch4 Left +	17	Aux Ch4 Left -
6	Aux Ch4 Right -	18	Aux Ch4 Left Scrn
7	Aux Ch4 Right Scrn	19	Aux Ch4 Right +
8	Aux Ch5 Left +	20	Aux Ch5 Left -
9	Aux Ch5 Right -	21	Aux Ch5 Left Scrn
10	Aux Ch5 Right Scrn	22	Aux Ch5 Right +
11	Aux Ch6 Left +	23	Aux Ch6 Left -
12	Aux Ch6 Right -	24	Aux Ch6 Left Scrn
13	Aux Ch6 Right Scrn	25	Aux Ch6 Right +

4.4 Auxiliary Connector - D25 Plug

D 25 SOCKET ON AMU	AUDIO OUTPUTS	D 25 SOCKET ON AMU	AUDIO OUTPUTS
PIN NO		PIN NO	
1	GND		
2	Dig Ch1+	14	Dig Ch1 -
3	Dig Ch2 -	15	GND
4	GND	16	Dig Ch2 +
5	Dig Ch3+	17	Dig Ch3 -
6	Dig Ch4 -	18	GND
7	GND	19	Dig Ch4 +
8	NC	20	NC
9	RS232 Rx	21	NC
10	RS232 Tx	22	NC
11	Dig Aes1+	23	Dig Aes1 -
12	DigAes2-	24	GND
13	GND	25	Dig Aes2 +

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

4.5 Serial Connector –D9

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

4.6 External Connector – D15 (Not enabled)

5.0 Amplifier

Total output power 24 Watts.

6.0 Notes

Output analogue levels are adjustable over the following range:

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

0 dBu = 0.775V rms = PPM 4.

Nominally -18 dB ref OFS = 0 dBu output.

European line up: -18 dBu

N. American line up: -20 dBu

Adjustment of ± 6 dB about the -20 dBfs line up level is possible.

7.0 AMU Alignment Procedure

This procedure assumes that the user is familiar with precision audio equipment alignment. All model variants are covered here so the user will understand the function of the various controls.

It is recommended that an exchange card is obtained from TSL in the event of a fault. Due to the complexity of these circuit cards TSL does not recommend repair be undertaken by the user.

7.1 Initial Set-Up

Connect 1kHz Tone at 0dB to Analogue I/P 1 L & R.

Set front panel switches to Analogue I/P 1, check for audio presence indication on front panel LEDs and deflection on both meters.

7.2 Bargraph Calibration Procedure

Factory set.

8.0 General Notes

1. Please note that some N. American equipment has the function of the XLR pins 2 & 3 reversed.
(TSL products are wired to the European standard.)
2. Mute 1 – Mutes the loudspeaker only. (NOT ENABLED)
Mute 2 – Mutes the loudspeaker plus the Line output. (NOT ENABLED)
3. LF Adjust- This alters the slope of the low frequency response and may be adjusted to suit the acoustic properties of the installation.
(Located on the rear panel.)
4. The bargraph has an effective range of – 30dB to +12dB and the response conforms to BS6480 part 10.

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

9.0 AMU2-GB4D Technical Specifications

Power Supply

Supply Voltage	90 -240V AC @ 50Hz/60Hz +/- 10% or 12 DC
Power Consumption	Class 3 (Functional earth) 35W

Physical Dimensions

Height	88mm (2RU)
Width	483mm (19")
Depth	338mm
Weight	8.5 Kgm

Inputs 1&2

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

Inputs AES 1, AES2

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	75 ohm unbalanced or 110 ohm – balanced.

Input, HDV/SDV (auto sensing)

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

Line Output.

Connector	XLR 3 pin Male
Impedance	50 Ω
Output Levels	Through level control with 0dB gain.

Connector	D25
Impedance	<50 Ω
Output Levels	Fixed and Variable

Headphone Output.

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

Performance

Response	70Hz to 20KHz
Electrical Distortion	Better than 0.1%
Hum and noise	Better than -80dB
SPL	>98dB at 0.6 m
Amplifier Output	24 watts total power output
Digital Sample Rate	32 to 44.1(AES), 48KHz auto select