BMA1-2SHD

HD/SD audio monitor

User's Guide

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Bel Digital Audio Ltd.
Unit 3
Horwood Court
Bletchley
Milton Keynes
Bucks
MK11RD
Tel: 01908-641063
Email: info@beldigital.com
Web: www.beldigital.com

Contents

Introduction

The BMA1-2SHD is a professional audio monitor system housed in a 1U rack.

The unit features three internal speakers, left, right and bass.

Audio input signals can be in the form of HD or SD SDI embedded data.

The BMA1-2SDH can select any pair of audio channels from the 16 possible and direct these to the speakers. The same signal is available as a line-level audio monitor output.

Main features

- 2 x HD/SD auto detect SDI inputs
- 2 x loop through outputs
- High-quality, high SPL audio reproduction with bass speaker and soft limiting
- 2 x tri-color bargraphs with six standard scales and ballistics, adjustable colour transition points and peak-hold facility
- Line level analogue audio output of sources directed to loudspeakers
- Headphone connector with speaker mute
- Individually user-calibrated analogue audio level outputs

Operation

The front panel user interface consists of 2 rotary switches, a balance control, a volume control, two 26-element tri colour bar graphs and a headphone jack. Two LED indicators are also included to show SDI lock and amplifier soft limit.

The rear panel 2 SDI BNC inputs, 2 SDI BNC loop through outputs and a pair of analogue line outputs on XLR sockets. An IEC mains inlet/fuse and off/on switch module is also on the rear panel

Selecting sources

Two SDI SD/HD auto-detecting inputs are available. The required input can be selected by using the input switch on the front panel.

One pair of audio signals from the 16 possible channels embedded in the SDI video information can be selected by using the 8 way channel switch on the front panel.

Bargraph scales

The following bargraph ballistics may be selected using internal switches.

Scale type	Range	Attack	Fallback
AES/EBU:	60dB (0 to -60dB)	1ms	1.5Sec per 20dB decay
DIN PPM:	55dB (+5 to -50dB)	10mSec	1.5Sec per 20dB decay
VU:	23dB (+3 to -20dB)	300mSec	300mSec
BBC PPM:	+12 to-12dB - mark 7 to 1	10mSec	2.85Sec - mark 7 to 1
VU EXT:	80dB (+20 to -60dB)	300mSec	300mSec
NORDIC:	54dB (+12 to -42dB)	5mSec	1.7Sec per 20dB decay

BMA1-2SHD scale ballistics

Stick-on scale graticules, which may be applied to the space between the front-panel bargraphs, are supplied with the unit.
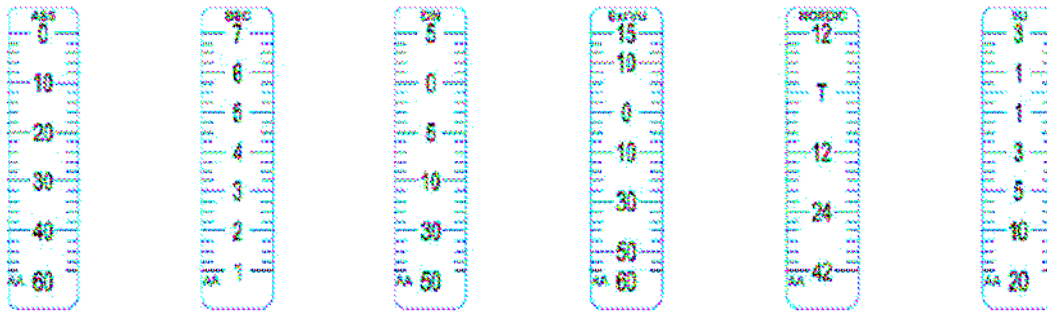
note: Bargraph color transition points and peak hold decay may also be adjusted internally.

Refer to the Configuration chapter for switch settings and graticule fitting instructions.

Installation

The BMA1-2SHD 1U frame may be installed in 19 inch bays with 327mm depth including typical cable and connector depth. The dimensions of the BMA1-2SHD are 483x283x44.3. Its weight is 5kg and the max power dissipated is 60 W.

Ventilation is by natural convection and there are vents at each side and on the top and bottom covers of the unit. Frames may be installed into bays, providing airflow through these vents is not impeded.

Adjusting audio monitor output level.

In the following tables, ON is obtained with a switch lever in the DOWN position. The adjustments are located on the main board.
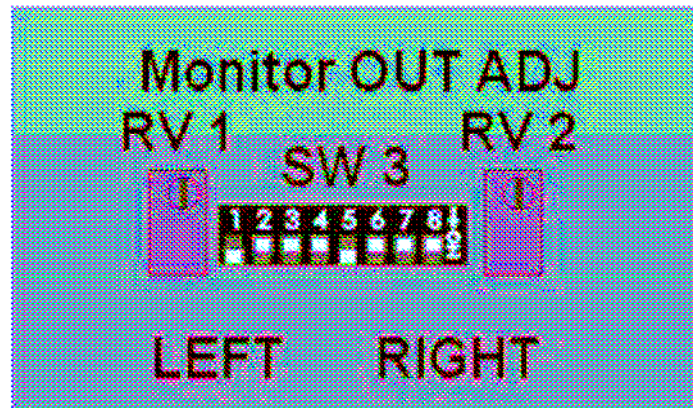
Analog monitor output adjustments – 0dB setting shown

SW3	Monitor Output	Setting when ON
1	Left	0 dB (0 on analog scale = 0dBu on output)
2	Left	4 dB (0 on analog scale = +4dBu on output)
3	Left	8 dB(0 on analog scale = +8dBu on output)
4	Left	Variable – adjacent pot* 0 to +12 dB
5	Right	0 dB (0 on analog scale = 0dBu on output)
6	Right	4 dB (0 on analog scale = +4dBu on output)
7	Right	8 dB(0 on analog scale = +8dBu on output)
8	Right	Variable – adjacent pot* 0 to +12 dB

Note: It is intended that only one switch lever is set to ON for each monitor output. The ON position is obtained with a switch lever in the direction of the arrow (downward in the above drawing).

*Clockwise rotation increases gain.

The adjustments, SW2 and SW6 are located near the power supply.
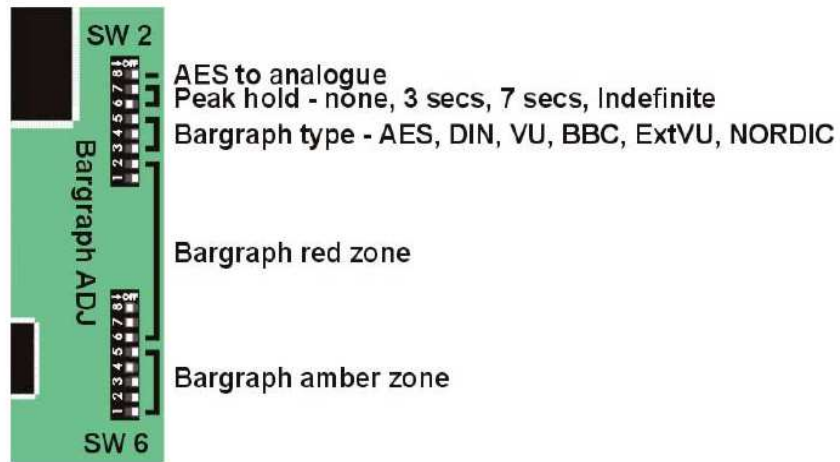
BM-A1-SD bargraph adjustments

SW2-8	AES to analog adjust
OFF	-18dBFS = 0 on analog scale
ON	-20dBFS = 0 on analog scale

SW2-7	SW2-6	Peak hold decay
OFF	OFF	None (Off)
OFF	ON	3 seconds
ON	OFF	7 seconds
ON	ON	Indefinite

SW2-5	SW2-4	SW2-3	Scale type
OFF	OFF	OFF	AES
OFF	OFF	ON	DIN
OFF	ON	OFF	VU
OFF	ON	ON	BBC
ON	OFF	OFF	Extended VU
ON	OFF	ON	NORDIC
ON	ON	OFF	No scale
ON	ON	ON	No scale

Note: The OFF position is obtained with a switch lever in the direction of the arrow, (to the right in the above drawing).

The bargraph displays have 25 LEDs. The level segments may be assigned to three colored zones, red, amber and green. Up to 25 of the top most segments may be colored red. Up to 25 segments from the end of the red zone downward may be colored amber and the remaining segments (if any) are always green.

Choosing how many segments are colored **red** from the top of the bargraph sets the .red zone.. Select from none to 25 using SW2-2, SW2-1, SW6-8, SW6-7 and SW6-6 as follows:

| SW2-2	SW2-1	SW6-8	SW6-7	SW6-6	Segment from bargraph top
OFF	OFF	OFF	OFF	OFF	None
OFF	OFF	OFF	OFF	ON	1
OFF	OFF	OFF	ON	OFF	2
OFF	OFF	OFF	ON	ON	3
OFF	OFF	ON	OFF	OFF	4
OFF	OFF	ON	OFF	ON	5
OFF	OFF	ON	ON	OFF	6
OFF	OFF	ON	ON	ON	7
OFF	ON	OFF	OFF	OFF	8
OFF	ON	OFF	OFF	ON	9
OFF	ON	OFF	ON	OFF	10
OFF	ON	OFF	ON	ON	11
OFF	ON	ON	OFF	OFF	12
OFF	ON	ON	OFF	ON	13
OFF	ON	ON	ON	OFF	14
OFF	ON	ON	ON	ON	15
ON	OFF	OFF	OFF	OFF	16
ON	OFF	OFF	OFF	ON	17
ON	OFF	OFF	ON	OFF	18
ON	OFF	OFF	ON	ON	19
ON	OFF	ON	OFF	OFF	20
ON	OFF	ON	OFF	ON	21
ON	OFF	ON	ON	OFF	22
ON	OFF	ON	ON	ON	23
ON	ON	OFF	OFF	OFF	24
ON	ON	OFF	OFF	ON	25
ON	ON	OFF	ON	OFF	25
ON	ON	OFF	ON	ON	25
ON	ON	ON	OFF	OFF	25
ON	ON	ON	OFF	ON	25
ON	ON	ON	ON	OFF	25
ON	ON	ON	ON	ON	25

Choosing how many segments are colored **amber** from the end of .red zone. sets the .amber zone.. Select from none to 25 using SW6-5, SW6-4, SW6-3, SW6-2 and SW6-1 as follows:

SW6-5	SW6-4	SW6-3	SW6-2	SW6-1	Segment from last RED ZONE
OFF	OFF	OFF	OFF	OFF	None
OFF	OFF	OFF	OFF	ON	1
OFF	OFF	OFF	ON	OFF	2
OFF	OFF	OFF	ON	ON	3
OFF	OFF	ON	OFF	OFF	4
OFF	OFF	ON	OFF	ON	5
OFF	OFF	ON	ON	OFF	6
OFF	OFF	ON	ON	ON	7
OFF	ON	OFF	OFF	OFF	8
OFF	ON	OFF	OFF	ON	9
OFF	ON	OFF	ON	OFF	10
OFF	ON	OFF	ON	ON	11
OFF	ON	ON	OFF	OFF	12
OFF	ON	ON	OFF	ON	13
OFF	ON	ON	ON	OFF	14
OFF	ON	ON	ON	ON	15
ON	OFF	OFF	OFF	OFF	16
ON	OFF	OFF	OFF	ON	17
ON	OFF	OFF	ON	OFF	18
ON	OFF	OFF	ON	ON	19
ON	OFF	ON	OFF	OFF	20
ON	OFF	ON	OFF	ON	21
ON	OFF	ON	ON	OFF	22
ON	OFF	ON	ON	ON	23
ON	ON	OFF	OFF	OFF	24
ON	ON	OFF	OFF	ON	25
ON	ON	OFF	ON	OFF	25
ON	ON	OFF	ON	ON	25
ON	ON	ON	OFF	OFF	25
ON	ON	ON	OFF	ON	25
ON	ON	ON	ON	OFF	25
ON	ON	ON	ON	ON	25

Note: Any remaining unassigned segments will be green.

Inserting bargraph graticules

The following bargraph scale graticules are supplied with each BM-A1:
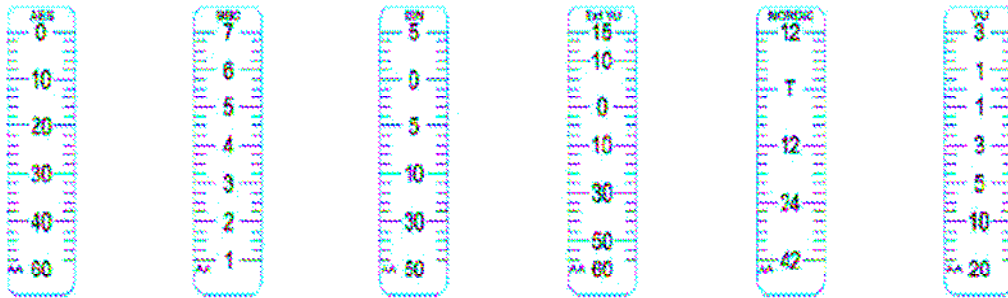
BM-A1 scale graticules

To apply a graticule proceed as follows:

- peel back the protective backing from the chosen graticule
- apply the graticule to the space between a pair of bargraphs
- repeat the process for the other bargraph graticule position
- ensure that the bargraph setting matches the graticule
- adjust the color transitions and peak hold decay as desired

BMA1-2SHD Front panel

BMA1-2SHD Rear panel

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Specification

SDI I/O
Inputs   2 BNC SD/HD auto detect

Loop through outputs   2 BNC.

Video modes:

SD

625 PAL
525 NTSC

HD

1035i(30 &30/1..1)
1080i/1080sF (30 &30/1.001)
1080i/1080sF(25)
1080sF(24 & 24/1.001)
1080p(25)
1080p(24 &24/1.001)
720p(60 & 60/1.001)
720p (30 & 30/1.001)
720p (50)
720p (25)
720p (24 &24/1.001)

Analog monitor outputs

Max output level Noise +THD   -105dB

Frequency response

Analogue outputs   20 Hz to 20kHz ±1dB

Main drive amps   Noise +THD -80dB w.r.t. maximum output

Speaker driver units

Total peak acoustic level (@2ft)   100dB SPL
Shielding   Magnetic

Meters

Level meters 2 x hi-resolution tri-color bargraphs
(All audio measurements made using Audio Precision un-wtd 22Hz to 22kHz

Scales and Ballistics

NORDIC: Overall dynamic range: 54dB (+12 to -42dB)
                    Attack time: 5mSec
                    Fallback: 1.7Sec per 20dB decay

DIN PPM: Overall dynamic range: 55dB (+5 to -50dB)
                    Attack time: 10mSec
                    Fallback: 1.5Sec per 20dB decay

BBC PPM: Overall dynamic range: (+12 to-12dB from mark 7 to mark 1)
                    Attack time: 10mSec
                    Fallback: 2.85Sec (from mark 7 to mark 1)

VU: Overall dynamic range: 23dB (+3 to -20dB)
                    Attack time: 300mSec
                    Fallback: 300mSec

VU EXT: Overall dynamic range: 80dB (+20 to -60dB)
                    Attack time: 300mSec
                    Fallback: 300mSec

AES/EBU: Overall dynamic range: 60dB (0 to -60dB)
                    Attack time: 1mSec
                    Fallback: 1.5Sec per 20dB decay

Housing   19. Rack Mount: 1U high.
Outline Dimensions: 483mm(W) x 283mm(D) x 44.3mm(H)
                            19inch(W) x 11.1inch(D) x 1.75inch(H)

Power   60W (max) 90-264 VAC 50-60Hz
                            Autoselect, Fuse 2A HAC

Environmental Temperature   0°C to 30°C Humidity 70% max (non-
                            condensing)

Weight   11.6lbs (5kg)

EMC COMPLIANCE

The BMA1-2SHD was designed and tested to comply with the EMC directive numbers EN55103, EN55022, EN55082-1 and EN60950 when used as directed.

$$C\mathcal{E}$$

Please ensure that wherever possible a 1U space is provided above and below the Bel BMA1-2SHD to ensure that the unit is properly ventilated, unless forced air-cooling is employed in the rack.