SONIFEX

**Manufacturers of Audio & Video
Products For Radio & TV Broadcasters**

Redbox Video
Embedders &
De-embedders
November 2010

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Redbox - Video Embedders & De-embedders

3G, HD & SD-SDI Embedders & De-Embedders

NEW!

Still in the familiar Redbox chassis offering rackmounting as standard and a universal AC power supply, these new video Redboxes use latest technology components to offer embedding and de-embedding for analogue and digital audio signals into and out of all 3G, HD and SD-SDI video signals, respectively.

With simple front panel controls, standard BNC connectivity and remote

operation on serial and ethernet ports, there are currently 4 products in the range:

- RB-VHEMA8 Embedder, 8 Channel Analogue Inputs

- RB-VHDMA8 De-Embedder, 8 Channel Analogue Outputs

- RB-VHCMA4 Embedder & De-Embedder, 4 Channel Analogue I/O

- RB-VHCMD16 Embedder & De-Embedder, 16 Channel Digital I/O

Common Specifications

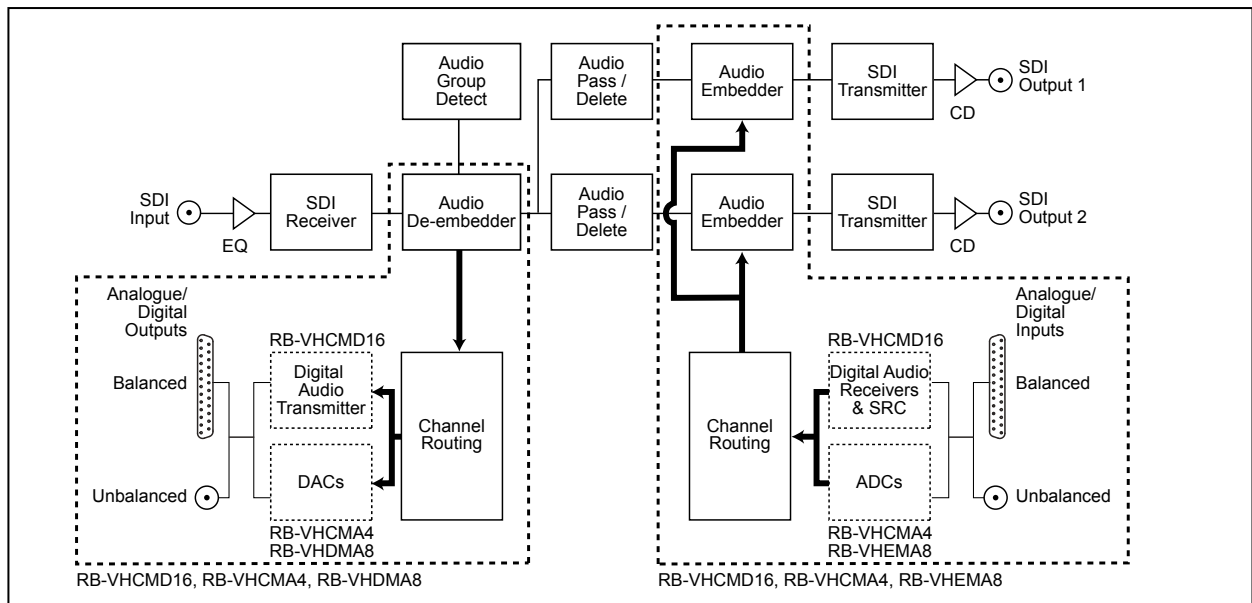| SDI Specification	
SDI Input:	1 x BNC, 3G/HD/SD-SDI
SDI Outputs:	2 x BNC, 3G/HD/SD-SDI, Re-clocked
Impedance:	75Ω
Output Alignment Jitter:	<0.2UI (3G <0.3UI)
Output Level:	800mV +/- 10%
Return Loss:	<15dB at 1500MHz
SDI Supported Standards:	270Mbps, SMPTE-259M-C (SD) 1.485 or 1.4835Gbps, SMPTE-292M (HD) 2.97 or 2.967Gbps, SMPTE-424M (3G)
Supported Video Formats:	525/59.94 (SMPTE-125M) 625/50 (ITU-R BT.656) 720p/23.98, 24, 25, 29.97, 30, 50, 59.94, 60 (SMPTE-296M) 1035i/59.94, 60 (SMPTE-260M) 1080i/50, 59.94, 60 (SMPTE-274M) 1080p/23.98, 24, 25, 50, 59.94, 60 (SMPTE-274M) 1080pSF/23.98, 24, 25, 29.97, 30 (RP-211) 1080i/50 (SMPTE-295M)1080p/50 (SMPTE-295M)
Embedded Audio:	48kHz, synchronous SMPTE-272M-ABC SMPTE-299M
Serial Port:	RS232, 9 way D-type
Ethernet Port:	10/100Mbps
Fuse Rating:	Anti-surge fuse 1A 20 x 5mm
Physical Specifications	
Dimensions (Raw):	48cm (W) x 10.8cm (D*) x 4.2cm (H) (1U) 19" (W) x 4.3" (D*) x 1.7" (H) (1U)
Dimensions (Boxed):	59cm (W) x 27.5cm (D) x 11cm (H) 23.2" (W) x 10.8" (D) x 4.3" (H)
Weight:	Nett: 1.8kg Gross: 2.3kg Nett: 4.0lb Gross: 5.1lb
Accessories	
RB-RK3:	1U Rear panel rack kit for large Redboxes

* Note that this product is deeper than standard Redboxes

Redbox Embedders & De-Embedders System Block Diagram.

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Redbox - Video Embedders & De-embedders

RB-VHDMA8

3G/HD/SD-SDI De-Embedder, 8 Channel Analogue Outputs

NEW!

RK3

The RB-VHDMA8 is an 8 channel analogue de-embedder contained in a single 19-inch rack unit. The unit can selectively de-embed up to 8 channels within any audio group of an SDI video signal, to any of the analogue outputs. After which, the video becomes two independent paths, where the audio groups can be selectively deleted or passed through and then sent to the re-clocked SDI outputs.

The de-embedding channel routing is controlled via the front panel buttons and indicators. There is also LED indication for SDI input status and audio group presence.

The unit can be remote controlled via Ethernet or serial port connections using the Sonifex SCi software.

It has a triple rate SDI receiver with automatic input rate detection and equalisation along with two re-clocked and individually buffered SDI outputs. It supports the full range of 3G, HD and SD standards from NTSC and PAL up to 1080p 60Hz. There is independent level control for each analogue output channel, which can be adjusted from -24dB through to +24dB in 0.5dB steps.

The analogue outputs have three full-scale gain settings which can be set via jumpers inside the unit. Allowable settings are +12dBu, +18dBu and +24dBu reference FSD. The balanced and unbalanced output connections are paralleled, allowing one type to be used per output.

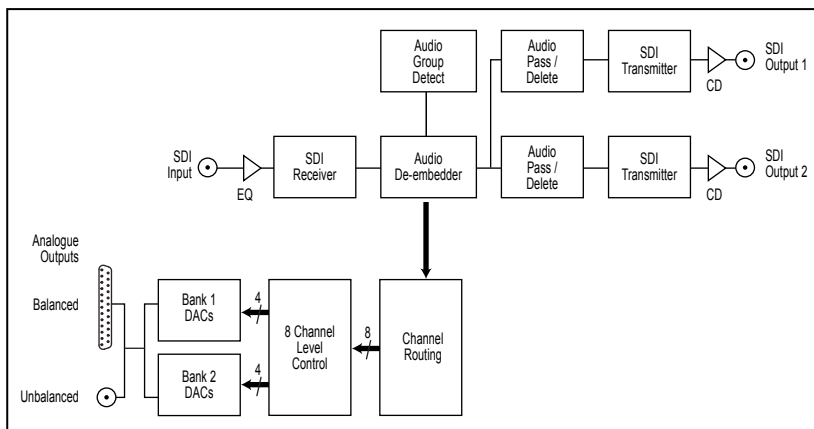| Audio Specification For RB-VHDMA8	
Front Panel Controls & Indicators	
De-embed Bank Select:	Bank 1 or 2
Bank Channel Select:	Channels 1,2,3 or 4
Group Select:	Groups 1,2,3 or 4
Group Channel Select:	Group channels 1,2,3 or 4
Status:	1 x SDI input status LED 2 x SDI output LEDs 4 x Audio group status LEDs
Audio Specifications	
Max Output Level:	+24dBu (balanced)
Output Impedance:	<50Ω (balanced)
Gain Range:	12dBu, 18dBu or 24dBu ref FSD (jumper selectable)
Signal to Noise:	Better than -106dB (RMS A-weighted at 24-bit, balanced)
Distortion and Noise:	Better than -85dB THD+N at 1kHz (balanced)
Connections	
Analogue Audio Outputs:	8 output channels via BNC (unbalanced) or D-type socket (balanced)
Analogue Audio Connectors:	8 x BNC 2 x 25-way D-type
Power Supply:	Universal filtered IEC, continuously rated 85-264VAC @47-63Hz, fused, max 14W
Equipment Type	
RB-VHDMA8	3G/HD/SD-SDI De-embedder, 8 channel analogue outputs

RB-VHDMA8 System Block Diagram.

VIDEO EMBEDDERS & DE-EMBEDDERS

Redbox - Video Embedders & De-embedders

RB-VHEMA8

3G/HD/SD-SDI Embedder, 8 Channel Analogue Inputs

NEW!

RK3

The RB-VHEMA8 is an 8 channel analogue embedder contained in a single 19-inch rack unit. The unit can selectively embed up to 8 analogue channels onto either of the two output video paths which are sent to the re-clocked SDI outputs. It also has the capability to allow audio groups to be deleted or passed through on each of the two video paths prior to the embedding process.

The embedding channel routing is controlled via the front panel buttons and indicators. There is also LED indication for SDI input status and audio group presence.

The unit can be remote controlled via Ethernet or serial port connections using the Sonifex SCi software.

It has a triple rate SDI receiver with automatic input rate detection and equalisation along with two re-clocked and individually buffered SDI outputs. It supports the full range of 3G, SD and HD standards from NTSC and PAL up to 1080p 60Hz.

There is independent level control for each analogue input channel, which can be adjusted from -24dB through to +24dB in 0.5dB steps. The analogue inputs have three full-scale gain settings which can be set via jumpers situated inside the unit. Allowable settings are +12dBu, +18dBu and +24dBu for FSD. The balanced and unbalanced input connections are paralleled, allowing one type to be used per input.

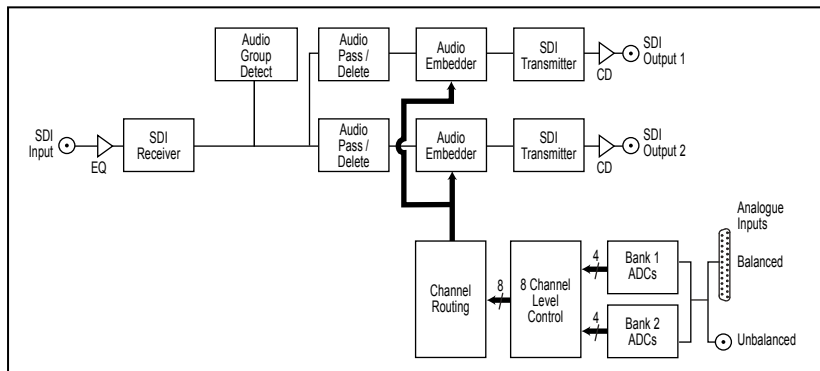| Audio Specification For RB-VHEMA8	
Front Panel Controls & Indicators	
Embed Bank Select:	Bank 1 or 2
Bank Channel Select:	Channels 1, 2, 3 or 4
Group Select:	Groups 1, 2, 3 or 4
Group Channel Select:	Group channels 1,2,3 or 4
Status:	1 x SDI input status LED 2 x SDI output LEDs 4 x Audio group status LEDs
Audio Specifications	
Maximum Input Level:	+27dBu (balanced)
Input Impedance:	>10kΩ bridging (balanced)
Input Levels:	+12dBu, +18dBu or +24dBu for FSD (jumper selectable)
Signal to Noise:	Better than -113dBFS (RMS A-weighted at 24-bit, balanced)
Distortion and Noise:	Better than -100dB THD+N at 1kHz (balanced)
Connections	
Analogue Audio Inputs:	8 input channels via BNC (unbalanced) or D-type socket (balanced)
Analogue Audio Connectors:	8 x BNC 2 x 25-way D-type
Power Supply:	Universal filtered IEC, continuously rated 85-264VAC @47-63Hz, fused, max 18W
Equipment Type	
RB-VHEMA8	3G/HD/SD-SDI embedder, 8 channel analogue inputs

RB-VHEMA8 System Block Diagram.

Redbox - Video Embedders & De-embedders

RB-VHCMA4

3G/HD/SD-SDI Embedder & De-Embedder 4 Channel Analogue I/O

NEW!

The RB-VHCMA4 is a 4-channel analogue de-embedder and a 4-channel analogue embedder combined into a single 19-inch rack unit. The unit can selectively de-embed up to 4 channels within any audio group of an SDI video signal, to any of the analogue outputs. After which, the video becomes two independent paths where the audio groups can be selectively deleted or passed through. The unit then embeds any of the 4 analogue input channels to available groups within each of the two video paths, which are then sent to the re-clocked SDI outputs. The de-embedding and embedding channel routing is controlled via the front panel buttons and indicators. There is also LED indication for SDI input status and audio group presence.

The unit can be remote controlled via Ethernet or serial port connections using the Sonifex SCi software.

It has a triple rate SDI receiver with automatic input rate detection and equalisation along with two re-clocked and individually buffered SDI outputs. It supports the full range of 3G, SD and HD standards from NTSC and PAL up to 1080p 60Hz.

There is independent level control for each analogue input and output channel, which can be adjusted from -24dB through to +24dB in 0.5dB steps. The analogue outputs have three full-scale gain settings which can be set via jumpers situated inside the unit. Allowable settings are +12dBu, +18dBu and +24dBu reference FSD Similarly, the analogue inputs full-scale gain settings can be set via jumpers inside the unit. Allowable settings are +12dBu, +18dBu and +24dBu for FSD. The balanced and unbalanced connections are paralleled, allowing one type to be used per input or output.

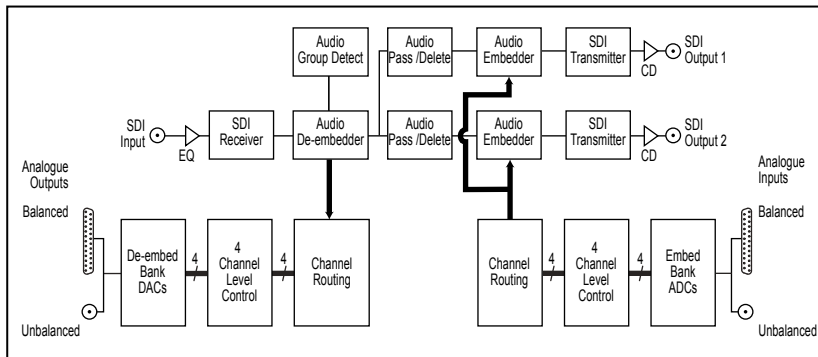| Audio Specification For RB-VHCMA4	
Front Panel Controls & Indicators	
Bank Select:	De-embed bank or embed bank
Bank Channel Select:	Channels 1,2,3 or 4
Group Select:	Groups 1,2,3 or 4
Group Channel Select:	Group channels 1,2,3 or 4
Status:	1 x SDI input status LED 2 x SDI output LEDs 4 x Audio group status LEDs
Audio Specifications	
Analogue Inputs	
Maximum Input Level:	+27dBu (balanced)
Input Impedance:	>10kΩ bridging (balanced)
Input Levels:	+12dBu, +18dBu or +24dBu for FSD (jumper selectable)
Signal to Noise:	Better than -113dBFS (RMS A-weighted at 24-bit, balanced)
Distortion and Impedance:	Better than -100dB THD+N at 1kHz (balanced)
Analogue Outputs	
Max Output Level:	+24dBu (balanced)
Output Impedance:	<50Ω (balanced)
Gain Range:	12dBu, 18dBu or 24dBu ref FSD (jumper selectable)
Signal to Noise:	Better than -106dB (RMS A-weighted at 24-bit, balanced)
Distortion and Noise:	Better than -85dB THD+N at 1kHz (balanced)
Connections	
Analogue Audio Inputs:	4 input channels via BNC (unbalanced) or D-type (balanced)
Analogue Audio Outputs:	4 output channels via BNC (unbalanced or D-type (balanced)
Analogue Audio Connectors:	8 x BNC 2 x 25-way D-type socket
Power Supply:	Universal filtered IEC, continuously rated 85-264VAC @47-63Hz, fused, max 16W
Equipment Type	
RB-VHCMA4	3G/HD/SD-SDI embedder & de-embedder, 4 channel analogue I/O

RB-VHCMA4 System Block Diagram.

VIDEO EMBEDDERS & DE-EMBEDDERS

Redbox - Video Embedders & De-embedders
RB-VHCMD16

3G/HD/SD-SDI Embedder & De-Embedder 16 Channel Digital I/O

NEW!

RK3

The RB-VHCMD16 is a 16-channel de-embedder and 16 channel embedder combined into a single 19-inch rack unit. The unit can selectively de-embed any channel within any audio group of an SDI video signal, to any of the digital outputs. After which, the video becomes two independent paths where the audio groups can be selectively deleted or passed through. The unit then embeds any of the digital input channels to available groups within each of the two video paths, which are then sent to the re-clocked SDI outputs.

The de-embedding and embedding channel routing is controlled via the front panel buttons and indicators. There is also LED indication for SDI input status and audio group presence.
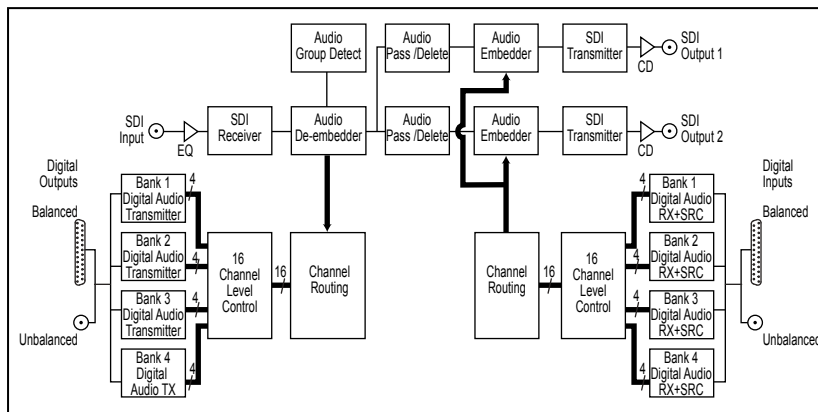
The unit can be remote controlled via Ethernet or serial port connections using the Sonifex SCi software.

It has a triple rate SDI receiver with automatic input rate detection and

equalisation along with two re-clocked and individually buffered SDI outputs. It supports the full range of 3G, HD and SD standards from NTSC and PAL up to 1080p 60Hz.

Each digital input is normally sample rate converted to 48kHz before embedding, so that it is synchronous to the video input. Though sample rate conversion can be bypassed on a per input basis allowing SMPTE-337M data to be embedded. All digital outputs are output at 48kHz, synchronous to the video input. There is independent level control for each digital input and output channel, which can be adjusted from -24dB through to +24dB in 0.5dB steps. The digital inputs and outputs are unbalanced AES specification, and can be connected through either BNC or D-Type connectors. These I/O connections are paralleled, allowing one type to be used per input or output.

Audio Specification For RB-VHCMD16	
Front Panel Controls & Indicators	
Bank Select:	Bank 1, 2, 3 or 4
Bank Channel Select:	Channels 1,2,3 or 4
Function Select:	De-embed or embed
Group Select:	Groups 1,2,3 or 4
Group Channel Select:	Group channels 1,2,3 or 4
Status:	1 x SDI input status LED 2 x SDI output LEDs 4 x Audio group status LEDs
Audio Specifications	
Output Sample Rate:	48kHz
Input Sample Rates:	32-192kHz, sample rate converted to 48kHz
Input & Output Impedance:	110Ω or 75Ω (jumper selectable)
Signal Level (un-terminated):	Balanced: 3Vp-p +/- 20% Unbalanced: 2Vp-p +/- 20%
Dynamic Range:	138dB
Distortion and Noise:	<-137dB THD+N at 997Hz, ref 0dBFS
Connections	
Digital Audio Outputs:	16 outputs via 8 BNCs (S/PDIF) or D-type (AES/EBU)
Digital Audio Inputs:	16 inputs via 8 BNCs (S/PDIF) or D-type (AES/EBU)
Digital Audio Connectors:	16 x BNC 2 x 25-way D-type socket
Power Supply:	Universal filtered IEC, continuously rated 85-264VAC @47-63Hz, fused, max 13W
Equipment Type	
RB-VHCMD16	3G/HD/SD-SDI embedder & de-embedder 16 channel digital I/O

RB-VHCMD16 System Block Diagram.