P R I M A R E

SP32 PRE-AMPLIFIER/SURROUND PROCESSOR

INTRODUCTION

The SP32 is an audiophile balanced eight channel pre-amplifier/processor featuring full RS-232 control, comprehensive video switching via 1.3 compliant HDMI and powerful custom configuration. It is the natural successor to the successful SP31, which was recognised around the world for its high performance and innovative user interface. As the first of a new generation of Primare home entertainment products however, the SP32 represents a considerable evolutionary advance in terms of design, performance, user flexibility and versatility. It is one of the first Primare products to offer a truly modular design platform, which allows for entire audio, video and control sections to be upgraded easily by superior Primare versions of the latest technologies.

MODULAR DESIGN

The SP32's comprehensively shielded heavy-duty steel chassis houses a newly developed modular design that allows for DSP, video and connections to be upgraded easily with proprietary Primare boards, incorporating thoroughly evaluated and optimised versions of the latest technologies and connectors. This makes the SP32 an ideal high-end audio and video processing platform for many years to come (for upgrade features see **inputs/outputs** section).

In every instance we have taken special care to keep signal paths short and layouts uncomplicated. Together with high performance FFC-wiring, these techniques give the unit an extremely high performance and the highest possible signal-to-noise ratio. The finest audio grade semiconductors and capacitors have been used whenever possible. All parts that are known to interfere with each other are isolated by shielding, dedicated signal paths and power supplies.

OPERATIONAL VERSATILITY

Almost every parameter in the configuration of the SP32 can be user defined. Any input can be assigned a name and associated with any audio and video source. Surround format, trigger activation and input sensitivity can be specified for the input. Individual levels, speaker types, crossover frequencies and delay configurations including bass management can be selected for each of the major surround formats. A 140mS global delay system, with dedicated DSP, is incorporated in order to achieve the best possible picture to sound synchronisation. For the highest possible installation flexibility, all the SP32's functions can be controlled in three ways: from the front panel, IR or RS232.

more…

INPUTS/OUTPUTS

The SP32 launch model has three HDMI v1.3 inputs for audio and video, incorporating a user-selectable audio processing and bypass function (see Technical Information).

HDMI v1.3 capability is significant because it carries uncompressed multi-channel PCM audio from a Blu-ray player through the SP32's DACs to the amplifiers and loudspeakers. This means that even without Primare's proprietary HD audio board upgrade, HD audio in its highest resolution can still be processed through the SP32.

Eight pairs of unbalanced and two pairs of balanced analogue audio inputs are provided together with seven digital audio inputs (incl. AES/EBU). Via the 'input settings' menu, any audio input can be assigned to any of the 3 Component, 3 S-Video and 4 Composite video inputs, for simultaneous output to the Component, S-Video and Composite analogue video outputs. 7.1 channel analogue audio inputs are also provided for the connection to older DVD-A / SACD players. Both balanced and unbalanced pre-amplified audio outputs (FL, FR, C, SUB, SR, SL, SBL, SBR) are provided for connection to any type of power amplifier. Three 12V high current DC-triggers are provided, as well as IR and RS232 inputs.

HD audio and video upgrade features for SP32

Audio Upgrade (available now and included on all new SP32s)

- Onboard decoding of Dolby TrueHD and DTS-HD Master Audio Codecs.

Video Upgrade (availability TBA)

- HDMI up-scaling to 480P/576P, 720P, 1080i, 1080P, 1080P/24 over 24/50/60Hz
- Five HDMI inputs, two HDMi outputs (not simultaneous): the user selects which output to use (1 or 2).
- Analogue video up-conversion to HDMI with OSD. Setup menu available on HDMI. HD component input signals are supported. Analogue video conversion remains the same, composite, S-video and component to composite, S-video and component outputs.

BLU-RAY DISC AND HD AUDIO

Blu-ray players can be configured to output uncompressed multi-channel PCM from any Blu-ray Disc. The SP32 will perform accurate D/A conversion on the multi-channel LPCM bit-stream.

- Blu-ray Disc is the only source of 5.1 or 7.1 channel HD audio currently available
- Most film soundtracks are mastered in 5.1-channel, 24-bit/48kHz PCM
- LPCM has the highest bit rate of all three lossless codecs*
- Currently 26% of Blu-ray discs carry a native multichannel PCM soundtrack+
- Most Blu-ray players can be set to decompress (unpack) Dolby and DTS HD audio formats and output them as uncompressed multichannel PCM audio. Even if the Blu-ray Disc doesn't carry the PCM soundtrack, it's still available from the player.

Blu-ray lossless audio formats*

Three are available currently: multichannel LPCM, Dolby TrueHD and DTS-HD Master Audio.

Multichannel LPCM – Linear Pulse Code Modulation: LPCM (often referred to as PCM) is used for the lossless encoding of audio data in the compact disc Red Book standard; has been defined as a part of the DVD and Blu-ray standards and is used by HDMI. On Blu-ray it offers a maximum bit rate of 27.648Mbps, up to 8 channels of 24bit/96kHz audio and up to six channels of 24bit/192kHz audio. Under the standard, players must have the capability to support LPCM.

Dolby TrueHD: lossless encoding of up to 8 channels of audio, built on MLP technology. It offers a maximum bit rate of 18.64Mbps, up to 8 channels of 24bit/96kHz audio and up to six channels of 24bit/192kHz audio. Under the Blu-ray standard, support is optional.

DTS-HD Master Audio: lossless encoding of up to 8 channels of audio. It offers a maximum bit rate of 24.5Mbps, up to 8 channels of 24bit/96kHz audio and up to six channels of 24bit/192kHz audio. Under the Blu-ray standard, support is optional.

Blu-ray and LPCM+

Currently 84.36% of all Blu-ray Discs offer lossless multichannel audio, split this way: 13% LPCM, 51% DTS-HD:MA, 20% TrueHD http://www.blu-raystats.com/Stats/Stats.php

SP32 Technical information

Video circuit

All analogue video inputs are converted to digital by the Texas Instruments 10bit TVP5146 video encoder, where OSD from the Sanyo LC74763 OSD generator is added. The digital signal is then converted back to analogue by the 10bit Cirrus CS4955 decoder. By performing all the video conversion in the digital domain using 10bit processing we can maintain high quality video at all outputs and at all times regardless of the selected input source. This is a significant improvement over the SP31, which could only switch component video and convert S-video to composite, entirely in the analogue domain.

more…

HDMI

The SP32 launch model incorporates a three input HDMI repeater based around the Silicon Image SIL9135, which incorporates digital audio extraction over SPDIF or I2S format. It supports both multi-channel PCM audio from Blu-ray, SACD or DVD-players and the more commonly used Dolby D and DTS formats, which are fed over high quality FFC cable to the DSP processor. A user selectable bypass function for HDMI audio is also available, telling the SP32 either to process or forward HDMI audio to a display device. A user-configured default function addresses any other audio input source, if there is no signal on the defined HDMi input.

DSP

The SP32's DSP is performed by a Freescale DSPC56371 24bit processor, which is able to fast lock and decode all the commonly used multichannel formats (with up to 192kHz sampling frequency). A slave Freescale DSPB56367 24bit processor handles all delay functions, including the global 140mS delay used for perfect synchronising of picture and sound. Analogue signals for Dolby Pro Logic IIX or DTS NEO processing are first converted to digital by a Burr Brown PCM4202, which incorporates an automatic level sensing circuit eliminating the need for manual ADC adjustments, as used in the SP31.

DACs and analogue circuits

The audio DACs are 24bit, 192kps WM8740s from Wolfson, used in conjunction with Burr Brown OPA2134 and Texas Instruments NE5532 operational amplifiers for the analogue, semi-balanced, DC-servo controlled, buffering and filtration circuits. These feed the purified audio signal into an eight-channel low distortion, half passive volume control CS3318 from Cirrus. Lesson learned from the SP31: for the SP32 we have located all the gain stages and DC-servo circuits before the volume control in order to achieve a much better signal to noise ratio. An eight and 2-channel analogue bypass mode bypasses the DSP completely, are still available, for the analogue fans.

Power Supplies

In order to achieve the best possible signal-to-noise ratio for both audio and video circuits, the power supplies in the SP32 are designed entirely in the linear domain. To save power, the SP32 uses two separate power supply circuits: a small perfectly-tuned supply is used in standby mode to drive the standby functions while in operation we use a large 300VA toroid transformer, which incorporates separate windings for all the different sections of the SP32, such as video, digital and analogue. For the video and digital sections we use dedicated, custom-designed linear regulation technologies. For the delicate analogue section we use rectification and regulation in two steps: voltages are first regulated down to a moderate level and then down to perfection by a fast-acting half discrete circuit. For the low voltage/high current supplies used by the DSP engine, HDMI circuits and other digital parts, we use local regulation techniques in order to achieve fastest possible regulation while keeping disturbance levels at an absolute minimum.

SP32 Features

- **Modular Architecture.**
- **Fully Balanced Analogue AV Preamplifier & Digital Controller**
- **Dolby® True HD, DTS Master Audio, Dolby® Digital, Prologic IIX, EX 7.1, dts®, dts-ES 6.1, Neo6**
- **1080p HDMI Switching (3in/1out)**
- **Component / Composite / S-Video**
- **DVD-A & SACD 5.1 Input,**
- **Multi Channel PCM Compatible**
- **Fully Configurable & Format independent Bass Management**
- **Two Balanced Source Inputs,**
- **7.1 Balanced Outputs**
- **Discrete IR & Full RS232 Operation,**
- **Programmable Triggers**
- **Upgradeable Architecture.**
- **Available in Black or Titanium**
- **Dimensions W x D x H mm: 430 x 385 x 180**
- **Weight: 12 kg**

more…

Technical Specifications

General				
Analogue Inputs	**2 Balanced, 8 RCA, incl 7.1 inputs**		**Video**	**10 bit digital video conversion system supporting NTSC/PAL, Component, S-video and Composite, with OSD.**
Digital Inputs	**1 Balanced, 3 RCA, 3 TOS-Link**			
Video Inputs	**3 HDMI, 3 Component, 3 S-Video, 4 Composite**		**Other out-/inputs**	**1 IR Input 3 12v outputs (triggers) 1 RS232**
Balanced Analogue outputs	**Front (left and right) Center, Sub, Surr (left and right) Surr back (left and right)**		**Power Consumption operate:**	**<60W**
Analogue Outputs	**Front (left and right) Center, Sub, Surr (left and right) Surr back (left and right)**		**Power consumption Standby:**	**<5W**
			Analog Data	
Analogue Record Output	**1 RCA (left and right)**		**THD**	**<0.005%, 20 Hz-20kHz**
Analog Zone2 Output	**1 RCA (left and right)**		**Signal-to-Noise**	**-110 dB**
			Frequency Response	**10 Hz-100 kHz, 1dB**
Digital Output	**1 RCA, 1TOS-Link**		**Input Impedance**	**47 KΩ, unbalanced**
Video Output	**1 HDMI, 1 Component, 1 S-Video, 1 Composite**		**Input Impedance**	**3 KΩ, balanced**
Video Output Zone2	**1 S-Video,1 Composite**		**Output Impedance**	**47 R unbalanced**
Modes	**Stereo Bypass Party Dolby Prologic IIx Music Dolby Prologic IIx Movie DTS NEO:6 MUSIC DTS NEO:6 CINEMA**			**47R Balanced**
			Digital Data	
			Frequency Response	**20 Hz-20 kHz± 0.2dB**
			THD+Noise	**0,005% @1 kHz(AES17 filter)**
Decoding Formats	**Dolby TrueHD Dolby Digital Dolby Digital EX Dolby Prologic II Dolby Prologic IIx DTS-HD Master Audio DTS DTS ES DTS Neo:6 DTS 96/24 MULTI/2 CH PCM/LPCM**		**Dimensions (WxDxH)**	**430 x 385 x 180 mm**
			Weight	**12 Kg**
Samping rates	**32KHz,44.1KHz,48KHz, 88.2KHz,96KHz,192KHz (AES/EBU)**			

Ends 17 March 2011