

TECHNICAL NOTE

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DiGiCo HD-SDi Card

The DiGiCo HD-SDi card is an 8 channel IO card which allows the user to de-embed and then re-embed any 8 of the 16 channels of AES3 audio contained with an SDI Video stream. The card can be used in the SD Rack, SD MiniRack or SD Nanorack with any SD Series console running software Version 573 or higher. The card contains SRC's between the IO and the Embedder/De-embedder so can be used in systems running at either 48K or 96K.

The SDI standard allows up to four groups, each of four mono audio channels with 48 kHz synchronous sampling. Synchronous means that the audio clock is genlocked to the associated video.

The card is compatible with the following Audio Standards:-

SMPTE 272M-A, C (SD)

SMPTE 299M (3G, HD)

The card is transparent for Dolby E/D data

The HDSDi card processing latency (Emb.+ De-Emb.) are defined as:-

3G: < 600µsec

HD: < 600µsec

SD: < 2,0 msec

These values are in addition to the standard SD console latency

The card supports the following Video Standards:-

SMPTE 424M/425M 2.97/2.967 Gbit (3G-SDI, level A and B)

SMPTE 292M 1.485/1.483 Gbit (HD-SDI)

SMPTE 259M 270 Mbit (SD-SDI)

Automatic video format detection

If power to the card is switched off, the input signal is hardware bypassed to output 1.

Front Panel

The card has 5 BNC connections;

- In
- Thru – re-clocked SDI In
- Out 1 & Out 2 – The output from the embedder (same signal)
- Word Clock – 48K clock from the SDI stream.

There are also 3 LED's indicating either an SD or HD format and that the card has locked to the incoming clock. In the event of no incoming signal, the HD/SD LEDs will show the last detected source.



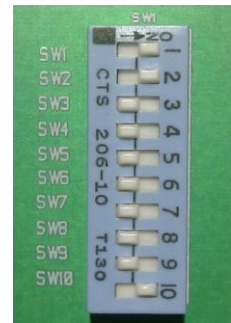
Default Settings

Using the dip switches on the card, you can set the default embedder settings and test video output for the card on power up. The default embedder settings will be overwritten by any HD-SDi card settings contained within a session once the rack receives control data from the console.

The HD-SDi card test video output can be set to either Black or Colour Bars. Once the card detects a valid incoming clock source, the test pattern will be disabled and any video contained within the SDI stream will pass.

The dip switch settings are as follows:-

SW1	off=Embedder 1 is ENABLED	on=Embedder 1 is DISABLED
SW2	off=Embedder 2 is ENABLED	on=Embedder 2 is DISABLED
SW3	off=Embedder 3 is ENABLED	on=Embedder 3 is DISABLED
SW4	off=Embedder 4 is ENABLED	on=Embedder 4 is DISABLED
SW5	x	
SW6	x	
SW7	x	
SW8	x	
SW9	x	
SW10	off=Test Output is all Black	on=Test Output is Colour Bars



With the dip switches set as shown in the above picture, the default settings for the card on power up would be:-

Embedder 1+2 set to DISABLED
Embedder 3+4 set to ENABLED
Video test pattern set for Colour Bars

The factory default for the card is Embedders 1-4 DISABLED (SW 1-4 = on) off and Colour bars test pattern selected (SW 10 = on)

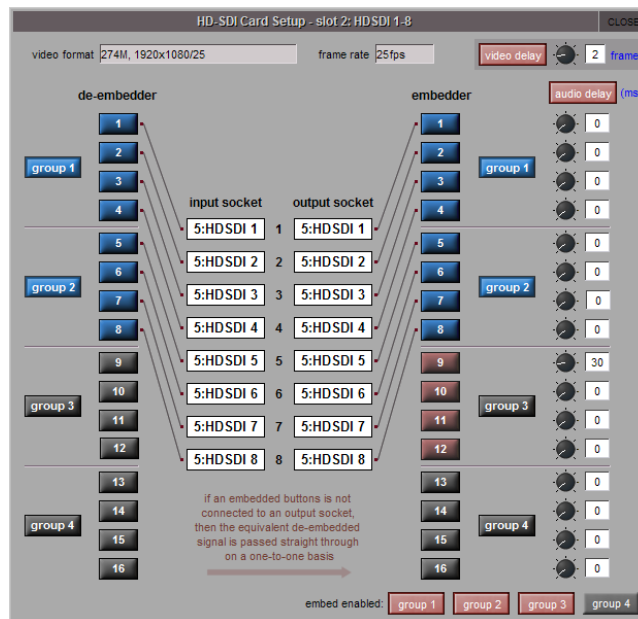
Card Setup

The HD-SDi Card is an IO card and therefore occupies both an input and an output card slot in the rack.

The HD-SDi setup panel is accessed in **Setup>Audio IO>cards and sockets**. Touch the required HD-SDi card as displayed in the rack and **HD-SDi Setup** button will appear in the Card Setup box.



Press the button and the set up panel will be displayed.



HD-SDi Setup Panel

The Video format and Frame rate is auto detected by the card and displayed. These settings are not user adjustable.

The Video delay applies frame delay to the video within the SDI stream with a range of 0-15 frames, in steps of 1 frame. The delay value is adjusted using the Touch Turn control once the delay rotary has been selected. The delay is applied when the **video delay** button is pressed.

Audio delay can be applied independently to each of the 16 audio channel contained within the SDI stream. Up to 255ms of delay can be added in steps of 1ms. This delay is added by embedder card and is in addition to any delay added by the console. The amount of delay is adjusted by using the Touch Turn control once the rotary has been selected and is applied once the **audio delay** button is pressed

De-Embedder Control.

On the left hand side of the panel are the de-embedder controls. Any 8 of the 16 AES3 audio channels can be de-embedded from the SDI stream either individually, or by Group, allowing the SD console access to the audio. The above picture shows audio channels 1-8 (Groups 1&2) patched to the 8 input sockets of the IO card.

Touching twice on any of the 8 input sockets will open the socket labelling panel.

De-embedder routing is adjusted by first touching one of 16 de-embedder buttons, which will then highlight with a yellow border, then touching one of the 8 input sockets. A connecting line will then be shown. If a group button selected rather than one of the individual de-embedder buttons, then the members of that group will be patched to the next 4 input sockets. The routing can also be achieved by first touching the required input socket and then touching either an individual de-embedder button or one of the 4 group buttons

De-embedding the audio does not remove it from the SDI stream.

Embedder Control

On the right side of the SDI panel are the embedder controls. This allows the 8 signals that have been routed to the IO card from the console to be embedded on to any of the 16 audio channels in the SDI stream.

Touching twice on any of the 8 output sockets will open the socket labelling panel

The embedder has four groups, each containing four channels. Each output socket can be routed to one embedder channel. In order for the audio to be embedded into the SDI stream, the embedder must be enabled. The embedders are enabled on a per group basis using the 4 buttons in the bottom right corner of the panel.

There are 3 possible states for an embedder group and its channels.

1. *Group X embedder Disabled* – The audio contained within the SDI stream will pass through unprocessed.
2. *Group X embedder Enabled, nothing patched* - The audio contained within Group X of the SDI stream has been de-embedded and then re-embedded on a 1:1 basis. This is a pass through state for the audio. However, the audio within the group has been subject to the processing latency of the card.
3. *Group X embedder Enabled, Output socket patched to the embedder* – the audio processed by the console will be embedded into to the SDI stream replacing the original content.

Embedder routing is adjusted by first touching one of the 8 card output sockets which will highlight with a yellow border, then touching on one of the 16 embedder buttons. A connecting line will then be shown. If a group button selected rather than one of the individual embedder buttons, then the members of that group will be patched from the next 4 output sockets.
