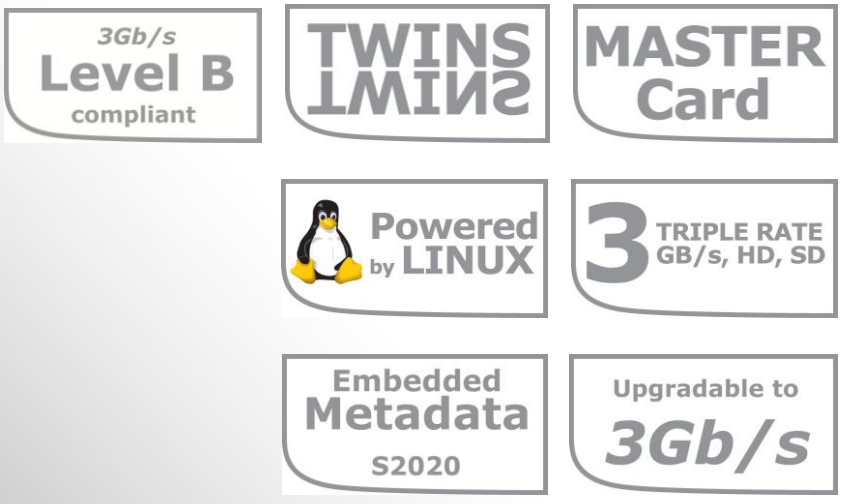
Synapse

GDB500/550
HDB500/550
GDB900/950/990
HDB900/950/990

3Gb/s, HD, SD 4, 8 or 16 channel audio de-embedder
with 'TWINS' dual channel function

Installation and Operation manual



Committed.

AXON

AXON

Synapse

TECHNICAL MANUAL

GDB500/550/900/950/990
HDB500/550/900/950/990

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WARNING: TO REDUCE THE RISK OF FIRE OR ELECTRICAL SHOCK, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE

● ALWAYS disconnect your entire system from the AC mains before cleaning any component. The product frame (SFR18 or SFR04) must be terminated with three-conductor AC mains power cord that includes an earth ground connection. To prevent shock hazard, all three connections must always be used.
● NEVER use flammable or combustible chemicals for cleaning components.
● NEVER operate this product if any cover is removed.
● NEVER wet the inside of this product with any liquid.
● NEVER pour or spill liquids directly onto this unit.
● NEVER block airflow through ventilation slots.
● NEVER bypass any fuse.
● NEVER replace any fuse with a value or type other than those specified.
● NEVER attempt to repair this product. If a problem occurs, contact your local Axon distributor.
● NEVER expose this product to extremely high or low temperatures.
● NEVER operate this product in an explosive atmosphere.

Warranty: Axon warrants their products according to the warranty policy as described in the general terms. That means that Axon Digital Design BV can only warrant the products as long as the serial numbers are not removed.

Date created: 03-12-2009
Date last revised: 21-08-2012

This product complies with the requirements of the product family standards for audio, video, audio-visual entertainment lighting control apparatus for professional use as mentioned below.

CE	EN60950	Safety
	EN55103-1: 1996	Emission
	EN55103-2: 1996	Immunity

Axon Digital Design GDB500/550/900/950/990 HDB500/550/900/950/990 FC Tested To Comply With FCC Standards FOR HOME OR OFFICE USE	This device complies with part 15 of the FCC Rules Operation is subject to the following two conditions: (1) This device may cause harmful interference, and (2) This device must accept any interference received, including interference that may cause undesired operation.

Table of Contents

1 Introduction to Synapse

An Introduction to Synapse

Synapse is a modular system designed for the broadcast industry. High density, intuitive operation and high quality processing are key features of this system. Synapse offers a full range of converters and processing modules. Please visit the AXON Digital Design Website at www.axon.tv to obtain the latest information on our new products and updates.

Local Control Panel

The local control panel gives access to all adjustable parameters and provides status information for any of the cards in the Synapse frame, including the Synapse rack controller. The local control panel is also used to back-up and restore card settings. Please refer to the RRC18, RRC10, RRC04, RRS18 and RRS04 manuals for a detailed description of the local control panel, the way to set-up remote control over IP and for frame related settings and status information.

Remote Control Capabilities

The remote control options are explained in the rack controller (RRC18/RRC10/RRC04/RRS18/RRS04) manual. The method of connection to a computer using Ethernet is described in the RRC/RRS manual.

! **CHECK-OUT:** “AXON CORTEX” SOFTWARE WILL INCREASE SYSTEM FLEXIBILITY OF ONE OR MORE SYNAPSE FRAMES

Although not required to use Cortex with a Synapse frame, you are strongly advised to use a remote personal computer or laptop PC with Synapse Cotrtex installed, as this increases the ease of use and understanding of the modules.

2 Unpacking and Placement

Unpacking

The Axon Synapse card must be unpacked in an anti-static environment. Care must be taken NOT to touch components on the card – always handle the card carefully by the edges. The card must be stored and shipped in anti-static packaging. Ensuring that these precautions are followed will prevent premature failure from components mounted on the board.

Placing the card

The Synapse card can be placed vertically in an SFR18 frame or horizontally in an SFR04 and SFR08 frame. Locate the two guide slots to be used, slide in the mounted circuit board, and push it firmly to locate the connectors.

Correct insertion of card is essential as a card that is not located properly may show valid indicators, but does not function correctly.

NOTE: On power up all LED's will light for a few seconds, this is the time it takes to initialise the card.

3 A Quick Start

When Powering-up

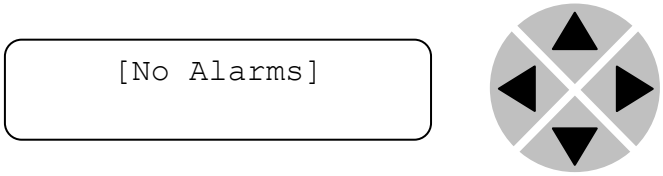
On powering up the Synapse frame, the card set will use basic data and default initialisation settings. All LED's will light during this process. After initialisation, several LED's will remain lit – the exact number and configuration is dependant upon the number of inputs connected and the status of the inputs.

Changing settings and parameters

The front panel controls or the Axon Cortex can be used to change settings. An overview of the settings can be found in chapter 5, 6 and 7 of this manual.

Front Panel Control

Front Panel Display and Cursor



Settings are displayed and changed as follows;

Use the cursor 'arrows' on the front panel to select the menu and parameter to be displayed and/or changed.

Press ►	To go forward through the menu structure.
Press ◄	To go back through the menu structure.
Press ▲	To move up within a menu or increase the value of a parameter.
Press ▼	To move down through a menu or decrease the value of a parameter.

NOTE: Whilst editing a setting, pressing ► twice will reset the value to its default.

Example of changing parameters using front panel control

With the display as shown below

```
RRC18 [Select Card]
>S01=SFS10
```

Pressing the ► selects the SFS10 in frame slot 01.

The display changes to indicate that the SFS10 has been selected. In this example the `Settings` menu item is indicated.

```
SFS10 [Select Menu]
>Settings
```

Pressing the ► selects the menu item shown, in this example `Settings`.

(Pressing ▲ or ▼ will change to a different menu eg `Status, Events).`

The display changes to indicate that the SFS10 `Settings` menu item `SDI-Format` has been selected and shows that it current setting is `Auto`.

```
SFS10 [Settings]
>SDI-Format=Auto
```

Pressing the ► selects the settings item shown, in this example `SDI-Format.`

(Pressing ▲ or ▼ will change to a different setting, eg `Mode, H-Delay).`

The display changes to indicate that the SFS10 `Edit Setting` menu item `SDI-Format` has been selected.

```
SFS10 Edit Setting]
SDI-Format>Auto
```

To edit the setting of the menu item press ▲ or ▼.

All menu items can be monitored and/or changed in this way. Changing a setting has an immediate effect.

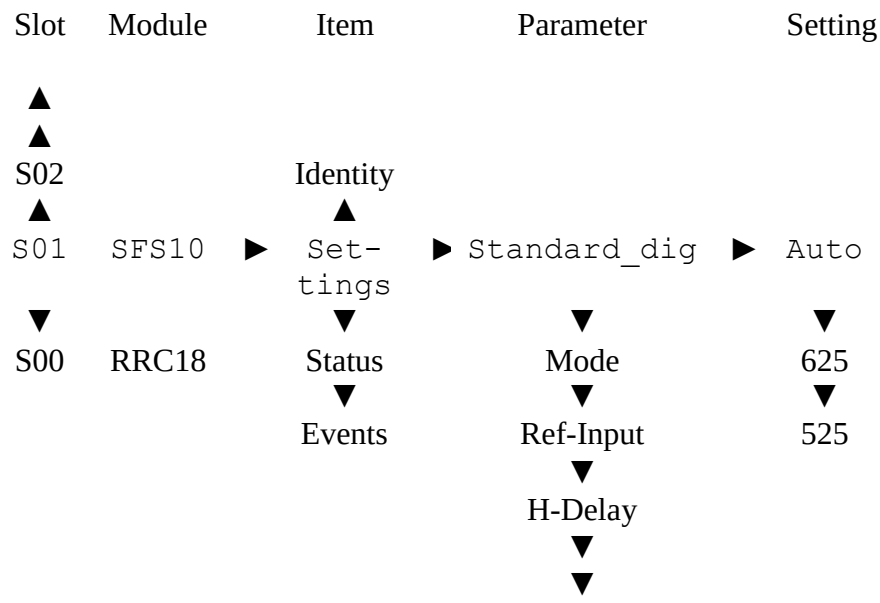
Axon Cortex Software

Axon Cortex can be used to change the settings of Synapse modules from a PC, either locally or remotely. The software enables communication based on TCP/IP between the Setup PC and Synapse frames/modules.

Each Synapse frame is addressed through its rack controller's unique IP address, giving access to each module, its menus and adjustment items. Axon Cortex has access to data contained within the Synapse module and displays it on a GUI. The software has an intuitive structure following that of the module that it is controlling.

For operation of Axon Cortex, please refer to the Cortex manual.

Menu Structure Example



NOTE: Further information about Front Panel Control and Axon Cortex can be obtained from the RRC and RRS operational manuals and the Cortex help files.

4 The GDB990/950/900/550/500

Introduction

The GDB990-950-900-550-500 is a 3GB/s,HD SDI and SD SDI audio de-embedder. It is capable of extracting AES/EBU digital audio channels or analog audio channels. The card has 2 option output boards: 4 mono analog audio outputs (4ch total) per board, or 4 stereo AES/EBU outputs (8ch total) per board.

The core consists of four de-embedder-blocks DeEmb_A, DeEmb_B, DeEmb_C and DeEmb_D. In front of these de-embedders are SDI channel selection muxes which allow for individual de-embedding out of the two SDI inputs. The delay blocks can be used in series for a single SDI 4 group de-embedder with up to 1 sec of video offset delay, or in parallel for 2 individual channels with each 2 group de-embedders and individual 500ms offset delay in a fully separate channel TWINS function. Each block is capable of de-embedding 4 audio selectable out of 16 channels from each input. The TWINS mode is a single command operation and controls 2 individual selection switches as can be seen in the block diagram.

In addition, four ADD-ON cards can be connected to create a routing matrix. The architecture of DeEmb_A to DeEmb_D blocks is identical. The local AES/EBU or analog outputs can be controlled to adjust Phase, Gain and delay (on the fly).

Future upgrades are possible, like for instance the HDB900 can be future upgraded to HDB990, GDB900 or GDB990. This allows for staged implementation of HD infrastructures and spread the cost over multiple budget years.

Features

- Dual (TWINS*) or single channel SDI mode
- 8 (4) AES/EBU outputs (available with 110 Ohm and 75 Ohm connectors)
- 4 analog outputs (GDB/HDB950 only)
- 8 extra AES/EBU inputs through the Synapse bus
- 2 SDI inputs (with auto switch on carrier loss and switch back function)
- 2 SDI + embedded audio outputs
- Pre and post delay de-embedding
- 7 presets that configure all 16 output channels at once. controlled by GPI or ACP (Cortex)
- Audio level and phase control
- Audio offset delay up to 5000 ms
- Video offset delay up to one second (or 2x 500ms)
- 16 extra audio channels (4 groups) with ADD-ON card for additional audio outputs
- Peak detection at 0 dBFS
- Transparent for ATC time code RP188, RP196, RP215
- Locks to Tri-level, Bi-level syncs and SDI input
- Full control and status monitoring through the front panel of the SFR04/SFR08/SFR18 frame and the Ethernet port (ACP)
- Optional 1 or 2 fiber inputs, 1 or 2 fiber outputs or a fiber in and output (replacing 1 SDI in and output) on the I/O panel
- Optional relay bypass (BHX18 or BHX18D)

* (In dual mode, or 2-SDI shuffle mode the sources need to be running on the same clock, the phase is not critical)

Applications

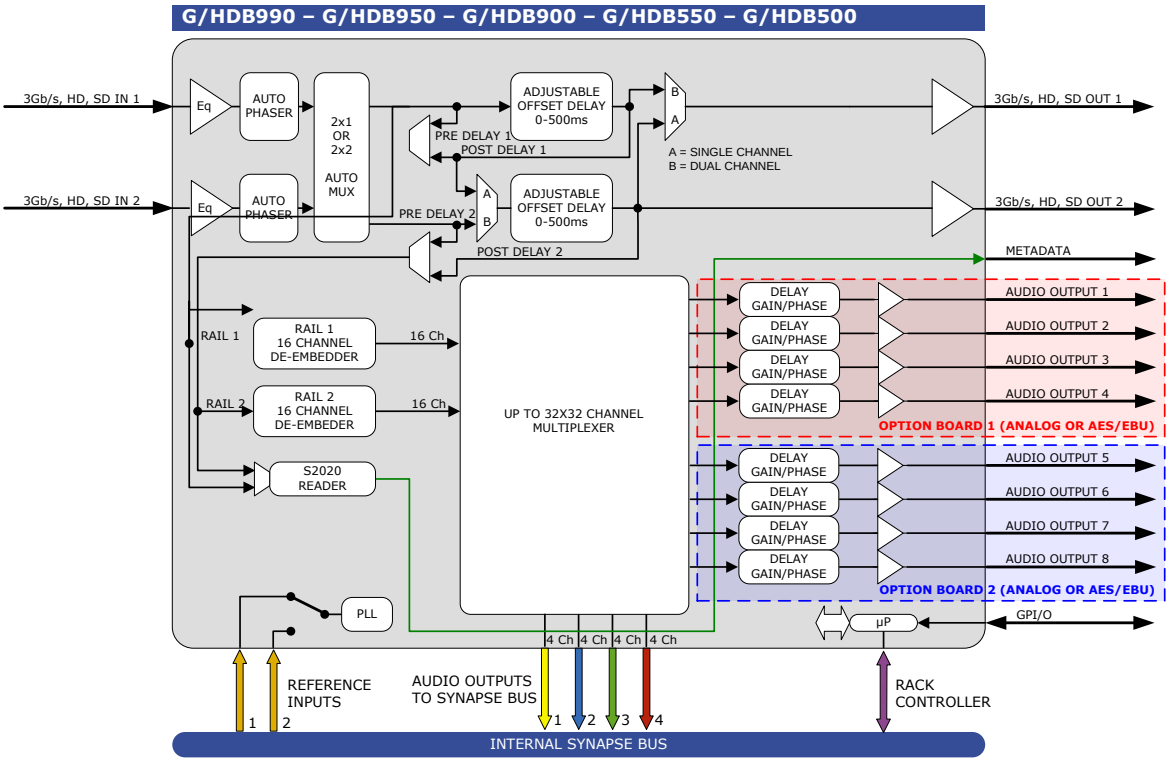
- 3Gb/s, HD and SD audio de-embedding
- Preset based 16 channel audio de-embedding
- High density studio de-embedding functions where minimal space is required (36 3Gb/s SDI de-embedders in 4RU)
- On the fly audio routing from two SD, HD and 3Gb/s SDI video streams.
- Fiber I/O embedding with an optical and electrical switchable input and a simultaneous powered optical and electrical SDI output.

Output options

This platform has 2 option boards which define the outputs of the card. Refer to the block schematic for the position of the option boards. These are the options:

Card model	Option board 1	Option board 2
GDB990	4 AES/EBU outputs (8 channels)	4 AES/EBU outputs (8 channels)
HDB990	4 AES/EBU outputs (8 channels)	4 AES/EBU outputs (8 channels)
GDB950	4 AES/EBU outputs (8 channels)	4 analog outputs (4 channels)
HDB950	4 AES/EBU outputs (8 channels)	4 analog outputs (4 channels)
GDB900	4 AES/EBU outputs (8 channels)	None
HDB900	4 AES/EBU outputs (8 channels)	None
GDB550	4 analog outputs (4 channels)	4 analog outputs (4 channels)
HDB550	4 analog outputs (4 channels)	4 analog outputs (4 channels)
GDB500	4 analog outputs (4 channels)	None
HDB500	4 analog outputs (4 channels)	None

Block schematic



5 Settings Menu

Introduction

The settings menu displays the current state of each GDB-HDB setting and allows you to change or adjust it. Settings can be changed using the front panel of the Synapse frame (SFR18, SFR08 or SFR04) or with Cortex. Also the SCP08 control can be used. Please refer to chapter 3 for information on the Synapse front panel control and Cortex.

Note: All items preceded with a #-sign are part of the presets.

VIDEO

Inp_Select

With this item you can decide which of the 2 inputs is used and how the card will switch between the 2 inputs. Choices are:

- `Auto`: The card chooses input 1 if there is a source. If there is no input 1, the card will automatically switch to input 2.
- `TWINS`: The card will process both input 1 as well as input 2 as separate processed circuits.
- `SDI-1`: only input 1 is used (Detection of SDI2 is disabled)
- `SDI-2`: only input 2 is used (Detection of SDI1 is disabled)

Switch-Back

With `Inp_Select` set to Auto, the card will automatically switch to the other input when the first input was lost. With `Switch-Back` set to `On`, the card will switch back to the first input if this it is back up again. Set to `Off` the card will keep using the other input even if the first input is back up again.

Lock-Mode

`Lock-Mode` determines whether the card is locked to input 1 (`SDI1`), input 2 (`SDI2`) or to the reference (`Ref1` or `Ref2`). Can also be set to `Auto-SDI`, automatically selecting the currently active SDI input to lock to. By default it is set to `SDI1`.

Phaser1-Offset

Sets the offset of the auto phaser of input 1 (see block schematic) between 0 and 4124px. Default is 0px.

Phaser2-Offset

Sets the offset of the auto phaser of input 2 (see block schematic) between 0 and 4124px. Default is 0px.

F-delay1

`F-Delay1` sets the amount of delayed Frames for output 1. The available range is from 0 to 125 fields (dependant on the I/O). Default is `0F`.

V-delay1

`V-Delay1` setting allows adjustment of the vertical phase of the output signal for output 1 with respect to the selected reference input.

The `V-Delay` setting gives a delay in addition to the reference timing. For example: if the `V-Delay` is set to 10 TV HD lines, the output signal will be delayed by reference timing + 10 TV HD lines. The signal is delayed (advanced) with respect to the phase of the reference signal. The available range is from 0 to a maximum of 1124 lines (dependant on I/O format). The default setting is `0ln`.

H-delay1

The `H-Delay1` setting allows adjustment of the Horizontal phase of the output signal for output 1 with respect to the selected reference input.

The H-Delay setting gives a delay in addition to the reference timing. For example: if the H-Delay is set to 10 pixels, the output signal will be delayed by reference timing + 10 pixels. The signal is delayed (advanced) with respect to the phase of the reference signal. The available range is from 0 to a maximum of 4124 pixels (dependant on I/O format). The default setting is `0px`.

F-delay2

`F-Delay2` sets the amount of delayed Frames for output 2. The available range is from 0 to 125 fields (dependant on the I/O). Default is `0F`.

V-delay2

`V-Delay2` setting allows adjustment of the vertical phase of the output signal for output 2 with respect to the selected reference input.

The `V-Delay` setting gives a delay in addition to the reference timing. For example: if the `V-Delay` is set to 10 TV HD lines, the output signal will be delayed by reference timing + 10 TV HD lines. The signal is delayed (advanced) with respect to the phase of the reference signal. The available range is from 0 to a maximum of 1124 lines (dependant on I/O format). The default setting is `0ln`.

H-delay2

The `H-Delay2` setting allows adjustment of the Horizontal phase of the output signal for output 2 with respect to the selected reference input.

The H-Delay setting gives a delay in addition to the reference timing. For example: if the H-Delay is set to 10 pixels, the output signal will be delayed by reference timing + 10 pixels. The signal is delayed (advanced) with respect to the phase of the reference signal. The available range is from 0 to a maximum of 4124 pixels (dependant on I/O format). The default setting is `0px`.

	PRESET
Control	With this setting you decide whether the presets are controlled `manually` (using cortex of the front controls of the frame), or by use of the `GPI` inputs.
GPI-Ctrl	The GDB/HDB500/550/900/950/990 has several physical GPI contacts to control the card's presets (if presets are set to be GPI controlled) `Latch`: Latching GPI mode. When a contact is closed momentarily (edge triggered). `Non-Latch`: Non-latching GPI mode. When a contact is closed all the time (level triggered).
ExtMode	With this item you set the purpose of pins 5 till 8 of the RJ45 connector on the backpanel. The pupose can be either additional `GPIO` contacts (resulting in 7 GPI contacts instead of 3) or to use those pins for a dolby `metadata` input. Default is `GPIO`.
Active-Preset	With this item you can manually change the currently active preset . Can be any preset between 1 and 7. By default it is set to 1. All menu settings that are preceded with a '#'-prefix are part of the preset.
Edit-Preset	Here you can select which of the 7 selectable presets you want to edit. Changing this will not change the active preset, unless the currently active preset is the same you are going to edit. All menu settings that are preceded with a '#'-prefix are part of the preset.
PrstEditView	With this setting set to `Follow Active`, the edit preset settings will follow the active preset when the active preset is changed. This to avoid confusion when changing the active. Set to `Independent` the edit preset will not automatically follow active preset changes. By default set to `Follow Active`.
#Preset_Name	Sets/displays the name of the currently displayed preset.

	DE-EMBEDDING
#Rail1	The audio on rail 1 (see block schematic) can be forwarded to the (de)embedding blocks before (`pre-delay`) or after (`post-delay`) the video-delay processing blocks. Default is `pre-delay`.
#Rail1	The audio on rail 2 (see block schematic) can also be forwarded to the (de)embedding blocks before (`pre-delay`) or after (`post-delay`) the video-delay processing blocks. Default is `pre-delay`.
	LOCAL AUDIO OUT
#SourceLocA1 ~ #SourceLocA4	These settings let you decide what the source should be for audio of outputs A1 till A4 (AES/EBU outputs 1 and 2 in case of the 900/950/990 models and analog outputs 1 till 4 in case of the 500/550 models). Audio can come from `Rail1` or `Rail2` (see block schematic).
#SourceLocA5 ~ #SourceLocA8	Only available in GDB/HDB 900/950/990. These settings let you decide what the source should be for audio of outputs A5 till A8 (AES/EBU outputs 3 and 4 in case of the 900/950/990 models). Audio can come from `Rail1` or `Rail2` (see block schematic).
#LocOutA1 ~ #LocOutA4	With these settings you can select one of the available embedded 16 channels of the above chosen rail input which should de-embedded to the corresponding output channel. A1 till A4 indicate AES/EBU outputs 1 and 2 in case of the 900/950/990 models and analog outputs 1 till 4 in case of the 500/550 models. Can also be set to off, resulting in no audio on the corresponding output channel.
#LocOutA5 ~ #LocOutA8	Only available in the GDB/HDB 900/950/990 models. With these settings you can select one of the available embedded 16 channels of the above chosen rail input which should de-embedded to the corresponding output channel. A5 till A8 indicate AES/EBU outputs 3 and 4 of the 900/950/990 models. Can also be set to off, resulting in no audio on the corresponding output channel.

#SourceLocB1 ~ #SourceLocB4	Only available in the GDB/HDB 550, 950 and 990 models. These settings let you decide what the source should be for audio of outputs B1 till B4 (AES/EBU outputs 5 and 6 in case of the 990 models, analog outputs 1 till 4 in case of the 950 models and analog outputs 5 till 8 in case of the 550 model). Audio can come from `Rail1` or `Rail2` (see block schematic).
#SourceLocB5 ~ #SourceLocB8	Only available in the GDB/HDB 990 models. These settings let you decide what the source should be for audio of outputs B5 till B8 (AES/EBU outputs 7 and 8 of the 990. Audio can come from `Rail1` or `Rail2` (see block schematic).
#LocOutB1 ~ #LocOutB4	Only available in the GDB/HDB 550/950/990 models. With these settings you can select one of the available embedded 16 channels of the above chosen rail input which should de-embedded to the corresponding output channel. B1 till B4 indicate AES/EBU outputs 5 and 6 of the 990 models, analog outputs 1 till 4 of the 950 models and analog outputs 5 till 8 of the 550 models. Can also be set to off, resulting in no audio on the corresponding output channel.
#LocOutB5 ~ #LocOutB8	Only available in the GDB/HDB 990 models. With these settings you can select one of the available embedded 16 channels of the above chosen rail input which should de-embedded to the corresponding output channel. B5 till B8 indicate AES/EBU outputs 7 and 8 of the 990 models. Can also be set to off, resulting in no audio on the corresponding output channel.
#LocGainOutA1 ~ #LocGainOutA4	Adjusts the gain for the corresponding audio output (Analog outputs 1 till 4 in case of the 500/550 models; AES/EBU outputs 1 and 2 in case of the 900/950/990 models) between -144 and 12dB. -144dB means the audio will be muted.
#LocGainOutA5 ~ #LocGainOutA8	Only available in GDB/HDB 900/990 models. Adjusts the gain for the corresponding audio output (AES/EBU outputs 3 and 4 in case of de 900/950/990 models) between -144 and 12dB. -144dB means the audio will be muted.
#LocGainOutB1 ~ #LocGainOutB4	Only available in GDB/HDB 550/950/990 models. Adjusts the gain for the corresponding audio output (Analog outputs 5 till 8 in case of the 550 model; Analog outputs 1 till 4 in case of the 950 models; AES/EBU outputs 5 and 6 in case of the 990 model) between -144 and 12dB. -144dB means the audio will be muted.

#LocGainOutB5 ~ #LocGainOutB8	Only available in GDB/HDB 990 models. Adjusts the gain for the corresponding audio output (AES/EBU outputs 7 and 8) between -144 and 12dB. -144dB means the audio will be muted.
#LocPhaseOutA1 ~ #LocPhaseOutA4	Adjusts the audio phase of the corresponding individual output (Analog outputs 1 till 4 in case of the 500/550 models, AES/EBU outputs 1 and 2 in case of the 900/950/990 models) to 0 deg or 180 deg.
#LocPhaseOutA5 ~ #LocPhaseOutA8	Only available in GDB/HDB 900/950/990 models. Adjusts the audio phase of the corresponding individual output (AES/EBU outputs 3 and 4) to 0 deg or 180 deg.
#LocPhaseOutB1 ~ #LocPhaseOutB4	Only available in GDB/HDB 550/950/990 models. Adjusts the audio phase of the corresponding individual output (Analog outputs 5 till 8 in case of the 550 model; analog outputs 1 till 4 in case of the 950 models; AES/EBU outputs 5 and 6 in case of the 990 model) to 0 deg or 180 deg.
#LocPhaseOutB5 ~ #LocPhaseOutB8	Only available in GDB/HDB 990 models. Adjusts the audio phase of the corresponding individual output (AES/EBU outputs 7 and 8) to 0 deg or 180 deg.
#LocDelayOutA1 ~ #LocDelayOutA4	Adjusts the delay of the corresponding audio channel (Analog outputs 1 till 4 in case of the 500/550 models, AES/EBU outputs 1 and 2 in case of the 900/950/990 models) between 0 and 5000ms.
#LocDelayOutA5 ~ #LocDelayOutA8	Only available in GDB/HDB 900/950/990 models. Adjusts the delay of the corresponding audio (AES/EBU outputs 3 and 4) between 0 and 5000ms.
#LocDelayOutB1 ~ #LocDelayOutB4	Only available in GDB/HDB 550/950/990 models. Adjusts the delay of the corresponding audio channel (Analog outputs 5 till 8 in case of the 550 model; Analog outputs 1 till 4 in case of the 950 models; AES/EBU outputs 5 and 6 in case of the 990 model) between 0 and 5000ms.
#LocDelayOutB5 ~ #LocDelayOutB8	Only available in GDB/HDB 990 models. Adjusts the delay of the corresponding audio channel (AES/EBU output 7 and 8) between 0 and 5000ms.

	ADDON AUDIO OUT
SourceAddonA1 ~ SourceAddonD4	These settings let you decide what the source should be for audio of outputs A1 till D4 to the add-on bus. Audio can come from `Rail1` or `Rail2` (see block schematic).
AddonOutA1 ~ AddonOutD4	With these settings you can select one of the available embedded 16 channels of the above chosen rail input which should de-embedded to the corresponding add-on bus output channel. Can also be set to off, resulting in no audio on the corresponding output channel.
	MISC
NonPCM-Bypass	With this setting you can switch to bypass audio processing for all non-PCM audio `on` or `off`.
0dBFS-OUT	The setting 0dBFs-Out sets the analog audio output level for a digital full-scale output signal. The available settings are +12 dBu, +15dBu, +18dBu and 24dBu.
Fade-Time	Fade/time is locked to 2 parameters: channel-switch and gain-change. It is used as the fade-in/out time of the channel-switch of audio channels. The old channel will be fade-out and the new channel will be fade in according to the time chosen with fade-time. Fade-Time is also used for smooth transitions when gain-values are changed. These smooth transitions are triggered by a change in Gain settings or a Preset change. With this setting you can manually set this fade time between `100ms` and `10.000ms`. The default is `500ms`.
Audio-Phase	If this setting is set to *Align*, the card ensures audio-phase alignment between multiple audio channels and audio groups, which is necessary for multi-channel (surround) purposes. If errors in the signal-chain occur the de-embedder blocks reset synchronously to maintain audio-phase-alignment. If this setting is set to *Off*, the card *eats-all* audio including errors. Even if there are DBN/ANC/ECC or channel-sequence errors, the de-embedder will pass them. Be aware that audio-phase-alignment between multiple audio channels and audio groups can not be maintained if this setting is set to *Off*. **Note:** This setting can be helpful to solve problems in the field using equipment which doesn't follow the standards correctly.

AudioStatusBits	With this setting you select whether the audio status bits should be `Transparant` (same status bit on the outputs as on the inputs) or to `overwrite` them with new status bits.
	METADATA
S2020-Source	With this setting you select whether metadata should come from input 1 (`Rail1`) input 2 (`Rail2`) or if it is coming from the `Local` RJ45 input (requires the setting `ExtMode` to be set to `Metadata`). Default is `Rail1`.
Extract_Line	With this item you can fix metadata extraction from a line a line between line 0 and line 1125 from where you want to extract the metadata from the input when `S2020-Soucre` is set to `Rail1` or `Rail2`. By default set to line 0. Set to line 0 = automatic extraction from the last available line.
Extract_Ass_Ch	One attribute of the S2020 metadata is the association channel. The association channel is the channel to which the metadata is connected. You can select the S2020 metadata to be extracted from one of the possible associated channel pairs ranging from `Ch01/02` to `Ch15/16`. Can also be set to `None` (in case there is no association set in the S2020 source or to `Auto` (in which case the S2020 is extracted from the first available associated channel).

6 Status Menu

Introduction

The status menu indicates the current status of each item listed below.

SDI-Input_1

This status item indicates the presence and format of a valid signal in input 1. This is displayed as:

- 1080P59.94
- 1080p50
- 1080i59.94
- 1080i50
- 1080p30
- 1080p25
- 1080p24
- 720p59.94
- 720p50
- SD525
- SD625
- NA

SDI-Input_2

This status item indicates the presence and format of a valid signal in input 2. This is displayed as listed under SDI-Input1.

SDI-Map_1

Displays whether the 3Gb/s input on input 1 is mapped as Level A or Level B. If the input is not 3Gb/s (1080p50 or 1080p60) this item indicates NA.

SDI-Map_2

Displays whether the 3Gb/s input on input 2 is mapped as Level A or Level B. If the input is not 3Gb/s (1080p50 or 1080p60) this item indicates NA.

SDI-Freq_1

Inidcates the frequency of SDI input 1. Can be 1:1, 1:1.001 or NA.

SDI-Freq_2

Inidcates the frequency of SDI input 2. Can be 1:1, 1:1.001 or NA.

CRC-Stat_1

Displays if there are CRC errors on input 1.

CRC-Stat_2

Displays if there are CRC errors on input 2.

Ref-Format	Displays the reference format. Can be one of the following: ■ NA ■ NTSC/480i ■ PAL/576i ■ 480p ■ 576p ■ 720p ■ 1080i ■ 1080p
Locked-To	Displays to what the card is locked: Ref, SDI1, SDI2 or Not Locked.
Active-Out1	Indicates what the current source is of output 1, can be SDI1 or SDI2.
Active-Out2	Indicates what the current source is of output 2, can be SDI1 or SDI2.
GrpInUse-Rl1	Displays which groups are in use in rail 1 (see block schematic). Displayed as for instance 1_3_ when groups 1 and 3 contain audio and for instance _234 when groups 2, 3 and 4 contain audio.
GrpInUse-Rl2	Displays which groups are in use in rail 2 (see block schematic). Displayed as for instance 1_3_ when groups 1 and 3 contain audio and for instance _234 when groups 2, 3 and 4 contain audio.
ANC_Rl1	Shows the status of the ancillary data in rail 1. Can be NA, OK or error.
ANC_Rl2	Shows the status of the ancillary data in rail 2. Can be NA, OK or error.
LocStatOutA1 ~ LocStatOutA8	Display the status of the individual audio channels of outputs 1 till 4. Can be OK, NA or Clipped (meaning the audio is clipping)

LocStatOutB1 ~ LocStatOutB8

Display the status of the individual audio channels of outputs 5 till 8. Can be `OK`, `NA` or `Clipped` (meaning the audio is clipping). This is only available for the GDB/HDB 550/990 models.

LocFrmtOutA1/2

Displays the format of outputs 1 and 2 in case of a 500/550 and output 1 in case of a 900/990. Can be one of the following:

- `NA`
- `PCM`
- `Null`
- `AC-3`
- `TimeStmp`
- `MPEG-1`
- `MPEG-2`
- `SMPTE-KLV`
- `Dolby E`
- `Caption data`
- `UserDef`
- `Rsvd`

LocFrmtOutA3/4

Displays the format of outputs 3 and 4 in case of a 500/550 and output 2 in case of a 900/990. Can be one of the formats listed under `LocFrmtOutA1/2`.

LocFrmtOutA5/6

Displays the format of output 3 in case of a 900/990. Can be one of the formats listed under `LocFrmtOutA1/2`. Only available in 900/990 models

LocFrmtOutA7/8

Displays the format of output 4 in case of a 900/990. Can be one of the formats listed under `LocFrmtOutA1/2`. Only available in 900/990 models

LocFrmtOutB1/2

Displays the format of outputs 5 and 6 in case of a 550 and output 5 in case of a 990. Can be one of the formats listed under `LocFrmtOutA1/2`. This status is only available in the 550 and 990 models.

LocFrmtOutB3/4

Displays the format of outputs 7 and 8 in case of a 550 and output 6 in case of a 990. Can be one of the formats listed under `LocFrmtOutA1/2`. This status is only available in the 550 and 990 models.

LocFrmtOutB5/6	Displays the format of output 7 in case of a 990. Can be one of the formats listed under `LocFrmtOutA1/2`. This status is only available in the 990 models.
LocFrmtOutB7/8	Displays the format of output 8 in case of a 990. Can be one of the formats listed under `LocFrmtOutA1/2`. This status is only available in the 990 models.
AddOnStatOutA1 ~ AddOnStatOutD4	Display the status of each individual add-on buss audio output channel. Can be `OK`, `NA` or `Clipped` (meaning the audio is clipping).
AddOnFrmtOutA1/2 ~ AddOnFrmtOutD3/4	Display the format of each add-on buss audio output channel pair. Can be one of the formats listed under `LocFrmtInA1/2`.
S2020-Detect	This status indicates whether or not S2020 is `present` or not (`NA` or `Error`). Depends on the S2020 source setting in the settings menu.
S2020-Src_Line	This status indicates in what line the source S2020 metadata was detected.
S2020-Src_Ass_Ch	Indicates the value of the Associated Channel item in the currently present S2020 signal.
S2020-Src_Method	Indicates the insert method of the currently present S2020 signal.
Progr_Config	This status indicates the program config as present on the current S2020 source. Can be one of the following values: ■ `5.1+2` ■ `5.1+1+1` ■ `4+4` ■ `4x2` ■ `8x1` ■ `5.1` ■ `3x2` ■ `6x1` ■ `2+2` ■ `7.1` ■ `Other` ■ `NA`

FPGA-Stat	Displays the status of the FPGA chip. Can be error or OK.
DM-A_Type	Displays which type of input or output board is currently detected on circuit A. Can be Digital input or output, Analog input or output or NA. For the GDB/HDB900/990 this should always be Digital output.
DM-A_Status	Inidcates the status of I/O board A, can be OK, NA or Error.
DM-B_Type	Displays which type of input or output board is currently detected on circuit B. Can be Digital input or output, Analog input or output or NA. For the GDB/HDB990 this should always be Digital output. For the GDB/HDB900 this should always be NA.
DM-B_Status	Inidcates the status of I/O board B, can be OK, NA or Error.

7 Events Menu

Introduction

An event is a special message that is generated on the card asynchronously. This means that it is not the response to a request to the card, but a spontaneous message.

What is the Goal of an event?

The goal of events is to inform the environment about a changing condition on the card. A message may be broadcast to mark the change in status. The message is volatile and cannot be retrieved from the system after it has been broadcast. There are several means by which the message can be filtered.

Events

The events reported by the card are as follows;

Announcements

`Announcements` is not an event. This item is only used for switching the announcement of status changes on/off. 0=off, other =on

Input_1

Input_1 can be selected between 0 .. 255. 0= no event, 1..255 is the priority setting.

Input_2

Input_2 can be selected between 0 .. 255. 0= no event, 1..255 is the priority setting.

CRC-Status1

CRC-Status1 can be selected between 0 .. 255. 0= no event, 1..255 is the priority setting.

CRC-Status2

CRC-Status2 can be selected between 0 .. 255. 0= no event, 1..255 is the priority setting.

Ref-Status

Reference can be selected between 0 .. 255. 0= no event, 1..255 is the priority setting.

What information is available in an event?

The message consists of the following items;

1) A message string to show what has happened in text, for example: “INP_LOSS”, “REF_LOSS”, “INP_RETURN”.
2) A tag that also shows what happens, but with a predefined number: e.g. 1 (= loss of input), 2 (= loss of reference), 129(= 1+128 = return of input). For a list of these predefined tags see the table on the next page.
3) A priority that marks the importance of an event. This value is defined by the user and can have any value between 1 and 255, or 0 when disabled.
4) A slot number of the source of this event.

The Message String

The message string is defined in the card and is therefore fixed. It may be used in controlling software like Cortex to show the event.

The Tag

The tag is also defined in the card. The tag has a fixed meaning. When controlling or monitoring software should make decisions based on events, it is easier to use the tag instead of interpreting a string. The first implementation is the tag controlled switch in the GPI16.

In cases where the event marks a change to fault status (e.g. 1 for Loss of Input) the complement is marked by the tag increased by 128 (80_{hex}) (e.g. 129 (81_{hex}) for Return of Input).

Defining Tags

The tags defined for the card are:

Event Menu Item	Tag		Description
Announcements	0 or NA	0 or NA	Announcement of report and control values
Input1	01_{hex}=INP1_LOSS	81_{hex}=INP1_RETURN	input 1 lost or returned
Input2	12_{hex}=INP2_LOSS	92_{hex}= INP2_RETURN	input 2 lost or returned
CRC-Status1	03_{hex}=CRC1_ERROR	83_{hex}=CRC1_OK	CRC on input 1 error or OK
CRC-Status2	43_{hex}=CRC2_ERROR	$C3_{hex}$=CRC2_OK	CRC on input 2 error or OK
Reference	02_{hex}=REF_LOSS	82_{hex}=REF_RETURN	reference lost or returned

The Priority

The priority is a user-defined value. The higher the priority of the alarm, the higher this value. Setting the priority to Zero disables the announcement of this alarm. Alarms with priorities equal or higher than the Error Threshold setting of the RRC will cause the error LED on the Synapse rack front panel to light.

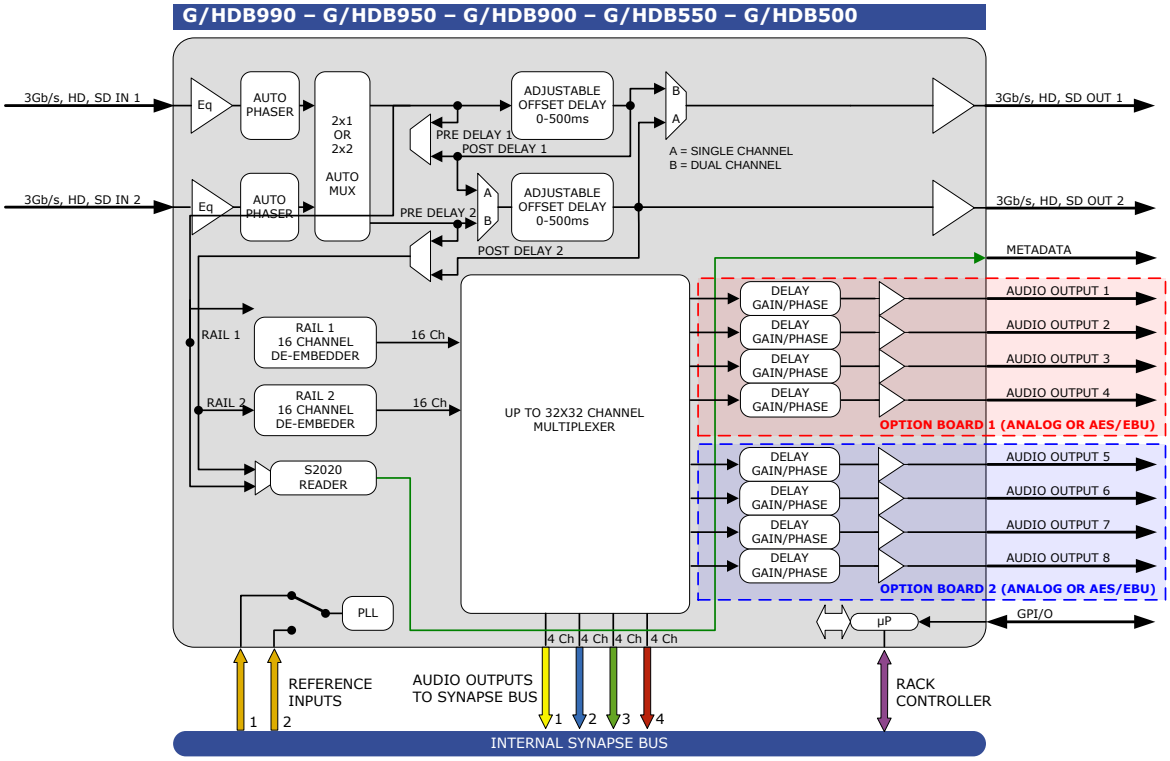
The Address

Together with the message string or the tag, the slot number or address of the card is relevant to be able to assign the event to a certain card.

8 LED Indication

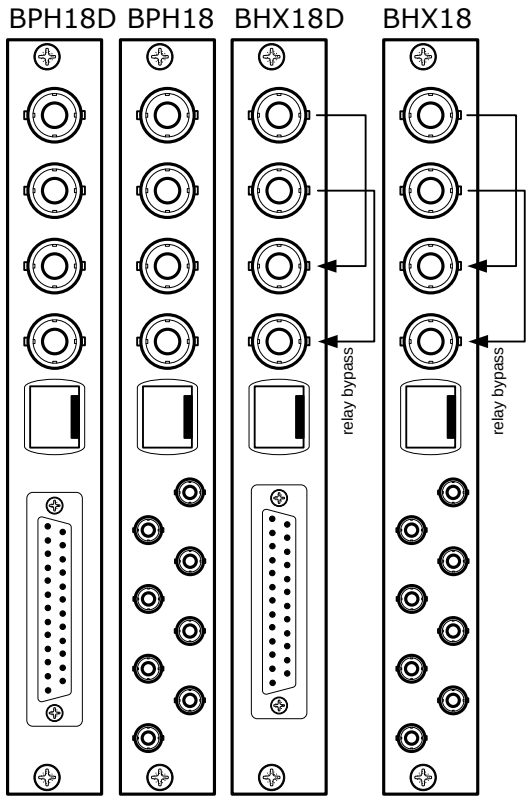
Error LED	The error LED indicates an error if the internal logic of the GDB/HDB500/550/900/990 card is not configured correctly or has a hardware failure.
Input_1 LED	This LED indicated the presence of a valid SDI video signal on input 1.
Input_2 LED	This LED indicated the presence of a valid SDI video signal on input 2.
ANC Data_1 LED	Indicates the presence of embedded audio within input 1.
ANC Data_2 LED	Indicates the presence of embedded audio within input 2.
Reference LED	Indicated the presence of a valid reference signal on the selected reference input connector (ref-1 or ref-2).
Data Error_1 LED	This LED indicates a CRC error in input 1.
Data Error_2 LED	This LED indicates a CRC error in input 2.
Connection LED	This LED illuminates after the card has initialized. The LED lights for 0.5 seconds every time a connection is made to the card.
Error LED	The error LED indicates an error if the internal logic of the card is not configured correctly or has a hardware failure.
DM_Pres_A	This LED illuminates when a I/O board is present on position A
DM_Pres_B	This LED illuminates when a I/O board is present on position B
DM_Error_A	Indicates an error on the I/O board on position A
DM_Error_B	Indicates an error on the I/O board on position B

9 Block Schematic



10 Connector Panels

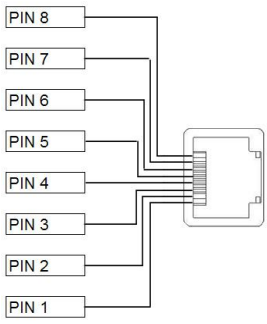
The GDB-HDB500/550/900/950/990 can be used with the BPH18, the BHX18D or the bypass relay equivallents. The following table displays the pinout of these backpanels in combination with the card.



3Gb/s, HD, SD SDI INPUT 1 (OPTIONAL FIBER INPUT)
3Gb/s, HD, SD SDI INPUT 2 (OPTIONAL FIBER INPUT)
3Gb/s, HD, SD SDI OUT 1 (OPTIONAL FIBER OUTPUT)
3Gb/s, HD, SD SDI OUT 2 (OPTIONAL FIBER OUTPUT)
GPI INPUT/OUTPUT
AES/EBU DIGITAL AUDIO OUTPUTS

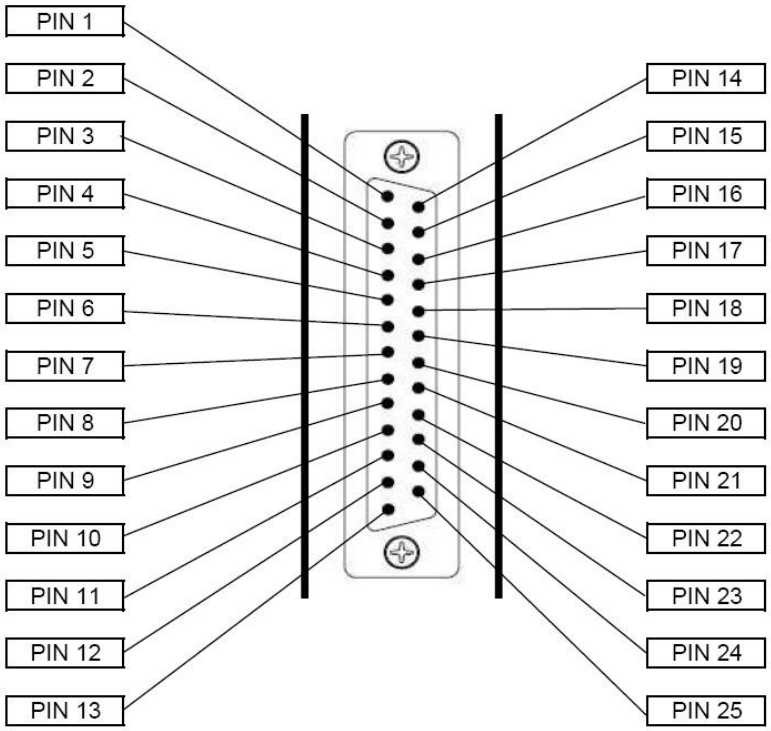
!Unused inputs and outputs must be terminated with the correct impedance!

GPI pinning



Pin	Function
1	Ground
2	GPI 1
3	GPI 2
4	GPI 3
5	GPI 4 / TXA(+)
6	GPI 5 / TXB(-)
7	GPI 6 / RXA(+)
8	GPI 7 / RXB(-)

D-sub pinning



Pin	G/HDB500	G/HDB550	G/HDB900	G/HDB950	G/HDB990
1	A1neg OUT	A1neg OUT	D1neg OUT	D1neg OUT	D1neg OUT
2	A1pos OUT	A1pos OUT	D1pos OUT	D1pos OUT	D1pos OUT
3	GND	GND	GND	GND	GND
4	A3neg OUT	A3neg OUT	D3neg OUT	D3neg OUT	D3neg OUT
5	A3pos OUT	A3pos OUT	D3pos OUT	D3pos OUT	D3pos OUT
6	GND	GND	GND	GND	GND
7	Not used	A5neg OUT	Not used	A1neg OUT	D5neg OUT
8	Not used	A5pos OUT	Not used	A1pos OUT	D5pos OUT
9	GND	GND	GND	GND	GND
10	Not used	A7neg OUT	Not used	A3neg OUT	D7neg OUT
11	Not used	A7pos OUT	Not used	A3pos OUT	D7pos OUT
12	GND	GND	GND	GND	GND
13	Not used	Not used	Not used	Not used	Not used
14	GND	GND	GND	GND	GND
15	A2neg OUT	A2neg OUT	D2neg OUT	D2neg OUT	D2neg OUT
16	A2pos OUT	A2pos OUT	D2pos OUT	D2pos OUT	D2pos OUT
17	GND	GND	GND	GND	GND
18	A4neg OUT	A4neg OUT	D4neg OUT	D4neg OUT	D4neg OUT
19	A4pos OUT	A4pos OUT	D4pos OUT	D4pos OUT	D4pos OUT
20	GND	GND	GND	GND	GND
21	Not used	A6neg OUT	Not used	A2neg OUT	D6neg OUT
22	Not used	A6pos OUT	Not used	A2pos OUT	D6pos OUT
23	GND	GND	GND	GND	GND
24	Not used	A8neg OUT	Not used	A4neg OUT	D8neg OUT
25	Not used	A8pos OUT	Not used	A4pos OUT	D8pos OUT

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