GIX170
HIX170

Dual channel 3Gb/s, HD, SD integrity checking probe
with SCTE104 (WHP296) compatibility

Installation and Operation manual

Powered by LINUX

3 TRIPLE RATE
Gb/s, HD, SD

® AXON

THE HEART OF BROADCAST

Synapse

TECHNICAL MANUAL

GIX170
HIX170

● ALWAYS disconnect your entire system from the AC mains before cleaning any component. The product frame (SFR18, SFR08 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.

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 SLD100/120/200/220 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.

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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 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 rack controler 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 manual. The method of connection to a computer using Ethernet is also described in the ERC/ERS/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 Axon Cortex installed, as this increases the ease of use and understanding of the modules.

2 Unpacking and Placement

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.

The Synapse card can be placed vertically in an SFR18 frame or horizontally in an SFR04 or 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.

NOTE: Please check appendix 1 before connecting any I/O-panel!

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 dependent upon the number of inputs connected and the status of the inputs.

Changing settings and parameters

The front panel controls or Axon Cortex Software 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

```
[No Alarms]
```
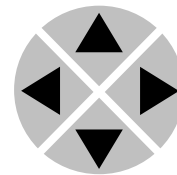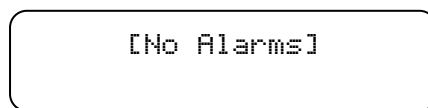
Settings are displayed and changed as follows;

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 struc ure.
Press ◄   To go ack through the menu structure.
Press ▲   To move up within a menu or increase the val e
                of a parameter.
Press ▼   To move down through a menu or ecrease the
                value of a parameter.

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

With the display as shown below

```
RRC18 [Select Card]
>S01=SFS10
```
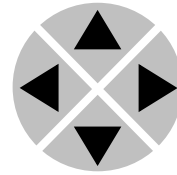
Pressing the ► selects the SFS10 in frame slot 01.

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

```
SFS10 [Select Menu]
>Settings
```
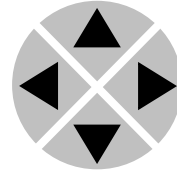
Pressing the ► selects the menu item shown, in this example Settings.

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

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

```
SFS10 [Settings]
>HD-Format=Auto
```
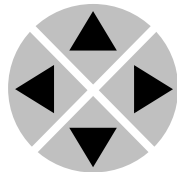
Pressing the ► selects the settings item shown, in this example HD-Format.

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

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

```
SFS10 [Edit etting]
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 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 downloading Axon Cortex, please refer to our website: www.axon.tv. For instruction about how to use Axon Cortex, please check the Axon Cortex help files for details (press F1 in any window)

Menu Structure Example

Slot	Module		Item		Parameter		Setting
▲							
▲							
S02			Identity				
▲			▲				
S01	SFS10	▶	Settings	▶	SDI-Format	▶	Auto
▼			▼		▼		▼
S00	RRC18		Status		Mode		625
			▼		▼		▼
			Events		Ref-Input		525
					▼		
					H-Delay		
					▼		
					▼		
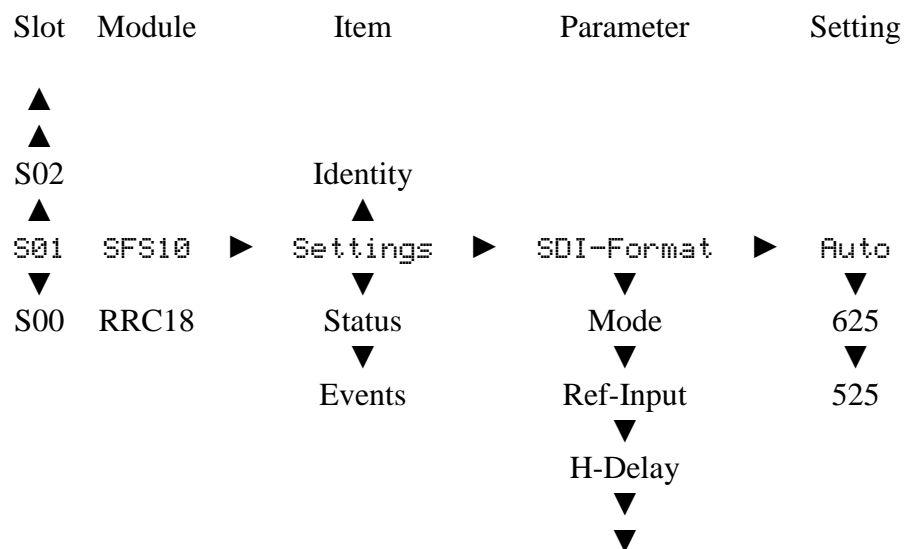
4 The GIX-HIX170 Card

The GIX170 and HIX170 are dual channel high performance 3Gb/s, HD and SD SDI video and SCTE104 probes (signal integrity monitor) with opting, blanking or backup video switch-over function.

The switch function can be triggered by any of the integrity controls. Besides the extensive probe functions, the cards also provide full line and frame synchronization on both inputs.

An interesting feature is the ability to apply 4 individual sources and pre-route these signals to any of the main channels. This enables a backup functionality beyond two channels and can be used for adding a third or fourth backup channel.

The core capacity of the GIX/HIX170 is the ability to switch on SCTE104 (WHP296) triggers or the absence of them. When not used as SCTE104 switch, the card reverts to a 2x1 backup function without SCTE probing.

Features

- 4 free selectable inputs per probe input
- Clean backup switching through built-in frame synchronizers
  - Input formats need to be equal
- Output configuration of 4 x main
- Probe functions:
  - SCTE104 triggers (see explanation below)
  - SDI carrier detect
  - TRS validation
  - ANC checksum validation
- An extensive probing matrix allows adjustment of individual classes of importance of the channels next to the main and backup channels.
- Test pattern generator as 5th source for emergency and test.
- Quad Speed Audio Add-On bus, monitoring only
- Locks to Bi-level, Tri-level or SDI input
- Full control and status monitoring through the front panel of the SFR04/SFR08/SFR18 frame and the Ethernet port (ACP)
- Optional 2 fiber inputs (replacing 2 SDI inputs) or 2 fiber outputs (replacing 2 SDI outputs) on I/O panel

Applications

- The GIX170 can be used as station output card, and ingest quality control card or a generic 2 x 1 switch
- WHP296 controlled blanking and opting.
- The integrity checking can also be performed for alarm monitoring purposes with the switch function disabled.
- Generic probing with automatic back-up switching
- Multi input backup capability allows for complex backup routing in multi platform environments

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Block schematic

GIX-HIX170

3Gb/s, HD, SD IN 1 → EQ

3Gb/s, HD, SD IN 2 → EQ

3Gb/s, HD, SD IN 3 → EQ

3Gb/s, HD, SD IN 4 → EQ

MAIN
FRAME-SYNC
TEST PATTERN
AUTOPHASER
&
OFFSET DELAY

BACKUP
FRAME-SYNC
TEST PATTERN
AUTOPHASER
&
OFFSET DELAY

2X1
OPTING /
BLANKING
OR
BACKUP
SWITCH

MAIN
VIDEO PROBE

BACKUP
VIDEO PROBE

PROBE LOGIC

TRIGGER
LOGIC

PLL

Communication
Controller

REFERENCE
INPUTS

1   2

RACK
CONTROLLER

INTERNAL SYNAPSE BUS

3Gb/s, HD, SD OUT 1

3Gb/s. HD, SD OUT 2

3Gb/s, HD, SD OUT 3

3Gb/s, HD, SD OUT 4

5 Settings Menu

Format

Allows you to set what the input format is on inputs A and B. Both inputs need to have the same format. Possible settings are:
- `1080p60`, `1080p50` (GIX only)
- `1080i60`, `1080i50`
- `1080p30`, `1080p25`
- `1080p24`, `1080p24sf`
- `720p60`, `720p50`
- `SD525`, `SD625`
- `Auto` (default, selects the input format automatically conform what has been detected)

IO-Map

With this setting you can select the 3Gb/s mapping in case the input format is 1080p50 or 1080p60. Can be manually set to Level A or `Level B`. You can also choose to set it to `Auto` (default), in which case the card will automatically detect whether the input is Level A or Level B

Input-Sel

With this setting you select automatic or manual switch position. Can be set to `Chan A`, `Chan B` or `Auto` (default). In `Auto` mode the card automatically switches, either based on the WHP296 `#Cue-Det` options for `Input-A` or `B`, or simply automatically switch to the other input when errors are detected in the currently active input when `#Cue-Det` is set to `Off`.. The `Chan A` or `Chan B` selections disable the automatic switching.

Switch-Back

When `Input-Sel` is set to `Auto` and `#Cue-Det` is set to `Off`, this menu item decides on whether or not the input selection should switch back when the failed input is back to OK status. Set to `On` the input will switch back immediate when the failed input returned Ok.

Set to `Off`, the channels will not switch back after input recovers from an error, even when input B (the backup) has an error. The switch stays switched infinite, and is only reset if the configuration is changed manually.

Can also be set to `BackUp_Fail` in which case the input will switch back when input B (Backup) fails and the input A (Main) is Ok. This mode avoids the immediate switch-back of the `Switch-Back On` mode, until it really has to switch back to the Ok main channel. Default is `Off`. See appendix 1 for the exact switch behavior.

Inp_SelA

Here you select which of the four SDI inputs will be used for the channel A probe (before the automatic backup switch function). Choices are `SDI-1`, `SDI-2`, `SDI-3` or `SDI-4`. Default is `SDI-1`.

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Inp_SelB	Here you select which of the four SDI inputs will be used for the channel B probe (before the automatic backup switch function). Choices are SDI-1, SDI-2, SDI-3 or SDI-4. Default is SDI-2
TestPatternA	With this setting you can enable a test pattern as frame synchronizer output on channel A. Can be a Colorbar or a Zoneplate.
TestPatternB	With this setting you can enable a test pattern as frame synchronizer output on channel B. Can be a Colorbar or a Zoneplate.
FS_Gen-Speed	This sets the speed of the colorbar or zoneplate generator on a scale from 0 (still) to 15 (fast). By default it is set to 1.

INTEGRITY CHECK

Carrier-Det	Carrier-Det allows the card to detect an SDI carrier loss. ▪ Off: the functionality is switched OFF. ▪ Probe: the card will detect a loss of carriers, but will only give this as a status item. The card will not switch to the other channel. ▪ A: the card will detect a loss of SDI carrier on channel A and switch to the other channel when a loss is detected. ▪ B: the card will detect a loss of SDI carrier on channel B and switch to the other channel when a loss is detected. ▪ A+B: the card will detect a loss of SDI carrier on both channel A and B and switch to the other channel when a loss is detected. The default setting is A+B.
CRC_EDH-Det	CRC_EDH-Det allows the card to detect EDH/CRC errors. ▪ Off: the functionality is switched OFF. ▪ Probe: the card will detect an EDH/CRC error, but will only give this as a status item. The card will not switch to the other channel. ▪ A: the card will detect EDH/CRC errors on channel A and switch to the other channel when an error is detected. ▪ B: the card will detect EDH/CRC errors on channel B and switch to the other channel when an error is detected. ▪ A+B: the card will detect EDH/CRC errors on both channel A and B and switch to the other channel when an error is detected. The default setting is A+B.
EDH-Mode	EDH-Mode determines whether the EDH is monitored over the full field (FF) or the Active picture (AP). In case of FF, the vertical and horizontal blank interval is also included. The default setting is AP.

TRS-Error-Det	`TRS-Error-Det` allows the card to detect if the TRS signals are in the right place. When the amount of misplaced or missing TRS signals have reached the threshold set with `TRC_CRC_Thres` further down the settings menu an alarm is generated. TRS= Timing Reference Signal.

- `Off`: the functionality is switched `OFF`.
- `Probe`: the card will detect a TRS error, but will only give this as a status item. The card will not switch to the other channel.
- `A`: the card will detect TRS errors on channel A and switch to the other channel when an error is detected.
- `B`: the card will detect TRS errors on channel B and switch to the other channel when an error is detected.
- `A+B`: the card will detect TRS errors on both channel A and B and switch to the other channel when an error is detected.

The default setting is `A+B`.

TRS_CRC_Thresh	Here you set a threshold when TRS errors should be alerted by the card. Can be set in any value between #1 and #1125. Default is #2

ANC-Error-Det	`ANC-Error-Det` allows the card to detect ancillary data errors. In case of errors in the checksum over the horizontal interval (embedded audio) an alarm is generated.

- `Off`: the functionality is switched `OFF`.
- `Probe`: the card will detect a ANC error, but will only give this as a status item. The card will not switch to the other channel.
- `A`: the card will detect ANC errors on channel A and switch to the other channel when an error is detected.
- `B`: the card will detect ANC errors on channel B and switch to the other channel when an error is detected.
- `A+B`: the card will detect ANC errors on both channel A and B and switch to the other channel when an error is detected.

The default setting is `A+B`.

S352_Insert	`S352_Insert` enables (on) the Video Payload Identifier insertion in the HANC space. Default is `on`. This packet is required for 3G standards. In HD 1080i for ATC-LTC transparency the user may switch it off to pass the ATC-LTC HANC packet on line 10.

Input_Loss_A	`Input_Loss_A` determines what the output of outputs A is in case of lost input:

- `Freeze:` a capture of the last good field or frame.
- `Colorbar:` a color bar
- `Zoneplate:` a zone plate
- `Black:` a black output.
- `Grey:` a grey output.
- `Green:` a green output.
- `No-SDI-Out:` no SDI carrier (completely mute output)

The default setting is `freeze`.

Input_Loss_B	`Input_Loss_B` determines what the output of outputs B is in case of lost input:

- `Freeze:` a capture of the last good field or frame.
- `Colorbar:` a color bar
- `Zoneplate:` a zone plate
- `Black:` a black output.
- `Grey:` a grey output.
- `Green:` a green output.
- `No-SDI-Out:` no SDI carrier (completely mute output)

The default setting is `freeze`.

S2010Timeout	Sets the S2010 (SCTE104) presence detection timeout in seconds. If set to a value greater then `0s` a loss detection will take the amount of seconds set. Maximum timeout value is `255s`. When `0s` (default), the detection is immediate.

WHP296 OPTIONS

The full WHP296 specification is available as the BBC Research & Development White Paper WHP296.

Cue-Preset	This preset selection determines the currently active configuration of the blanking or opting switch. A total of `32` presets are available. The items below starting with #Cue are the members of each preset.
#Cue-Det	Selects the currently active probing engine for the WHP296 cue. This can be `Off,` `Input-A` or `Input-B.` When set Off the card will return to a basic 2x1 switch operation, ignoring the WHP296 cues.

#Cue-Type	The Cue Type being monitored on the selected input. Can be one out of the following `BlankingPlatform1, BlaningPlatform2, OptOut, Reserved14 or Reserved15`. These correspond to the cues from the WHP296 "psp_flags_prog" field:
	- Blanking Platform 1, bit 4 - Blanking Platform 2, bit 5 - Opt-Out bit 11 - Reserved bit 14 - Reserved bit 15
#Cue-Set	Action to perform when the received cue matching the Cue-Type is set, logic '1'. Possible actions are `No-Switch, SwitchToA, SwitchToB, No-SDI-Out`
#Cue-Unset	Action to perform when the received cue matching the Cue-Type is unset, logic '0'. Possible actions are `No-Switch, SwitchToA, SwitchToB, No-SDI-Out`
#Cue-Missing	Action to perform when no cue is received on the monitored input. Possible actions are `No-Switch, SwitchToA, SwitchToB, No-SDI-Out`
#Cue-Set-LM	Action to perform when the SDI input is **l**ost on the **m**onitored input when the previously received cue matching the Cue-Type was set, logic '1'. Possible actions are `No-Switch, SwitchToA, SwitchToB, No-SDI-Out`
#Cue-Unset-LM	Action to perform when the SDI input is **l**ost on the **m**onitored input when the previously received cue matching the Cue-Type was unset, logic '0'. Possible actions are `No-Switch, SwitchToA, SwitchToB, No-SDI-Out`
#Cue-Missing-LM	Action to perform when the SDI input is **l**ost on the **m**onitored input when the Cue was absent before. Possible actions are `No-Switch, SwitchToA, SwitchToB, No-SDI-Out`
#Cue-Set-LO	Action to perform when the SDI input is **l**ost on the **o**ther, non-monitored input when the received cue matching the Cue-Type is set, logic '1'. Possible actions are `No-Switch, SwitchToA, SwitchToB, No-SDI-Out`

#Cue-Unset-LO	Action to perform when the SDI input is **l**ost on the **o**ther, non-monitored input when the received cue matching the Cue-Type is unset, logic '0'. Possible actions are `No-Switch`, `SwitchToA`, `SwitchToB`, `No-SDI-Out`
#Cue-Missing-LO	Action to perform when the SDI input is **l**ost on the **o**ther, non-monitored input no cue is received on the monitored input. Possible actions are `No-Switch`, `SwitchToA`, `SwitchToB`, `No-SDI-Out`

SYNCHRONIZE

Dly_Frmt_Prst	With `Dly_Frmt_Prst` you can edit the delay values for the various video formats. This works as presets. All settings with a #-prefix are part of the preset. Set this to the video format for which you want to adjust the delay of the synchronizer. This setting is only used to display the correct delay settings. Possible settings are: • `1080p60, 1080p50` (GIX only) • `1080i60, 1080i50` • `1080p30, 1080p25` • `1080p24, 1080p24sf` • `720p60, 720p50` • `SD525, SD625`
#F-delay_1	`F-Delay` sets the amount of delayed Frames. The available range is from 0 to 125 frames (dependant on the video format). Default is `0F`. The preset master for this is `Dly_Frmt_Prst`, hence the '#'-prefix.
#V-Delay_1	`V-Delay` setting allows adjustment of the vertical phase of the output signal with respect to the selected reference input. The `V-Delay` setting gives a delay in addition to the reference timing. For example: if `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 1125 lines (dependant on the video format). The default setting is `0ln`. The preset master for this is `Dly_Frmt_Prst`, hence the '#'-prefix.

#H-Delay_1	The H-Delay setting allows adjustment of the Horizontal phase of the output signal with respect to the selected reference input. The H-Delay setting gives a delay in addition to the reference timing. For example: if 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 5124 pixels (dependant on the video format). The default setting is 0px. The preset master for this is Dly_Frmt_prst, hence the '#'-prefix.
Delay-Status	It is possible to display (in the status menu IODelayA and IODelayB) the processing time of the card in the status menu. This setting allows you to switch this function ON or OFF. Default setting is OFF
LockMode	Lock-Mode determines whether the card is locked to his input (input 1), to the reference (Ref1 or Ref2) or freerun (not locked). By default it is set to Ref1. Can also be set to RefAuto. Ref1 is default.
	When set to RefAuto the card chooses ref1 as its source. Whenever ref1 fails, it will switch to ref 2 (only for SFR08 and SFR18 frames and only when ref2 offers the same ref format as ref 1). When ref 1 is back up again, it will only automatically switch back to ref 1 when ref 2 fails.
Ref-Type	Sets the type of incoming reference. Can be either Bi-Level or Tri-Level. Default is Bi-Level.
P60-P50_Sync	With this setting you can choose to synchronize each one frame or each two frames. Default is One Frame. The two-frame-synchronize mode only works for 720p60, 720p50, 1080p50 and 1080p60 standards.
NETWORK	
IP_Conf0	With this setting you can let the card obtain an IP address automatically via DHCP, or appoint a manual set IP address. When set to Disabled, the Ethernet port will be disabled. By default this setting is set to DHCP.
mIP0	When IP_Conf0 is set to manual, you can type in the preferred IP address here. By default it is set to 0.0.0.0

mNM0 | With `IP_Conf0` set to `manual`, with this setting you can set a Netmask.

Default is 255.255.0.0

mGW0 | With `IP_Conf0` set to `manual`, this setting let you set a Standard Gateway. Default is set to 172.16.0.1

NetwPrefix0 | With `IP_Conf` set to `manual`, this item lets you set a network mask prefix varying from 0 to 30 bit. The `mNM0` network mask changes accordingly.

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6 Status Menu

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

sInp1 ~ sInp4

These items display whether an input is present on inputs 1 to 4. Can be either Present or NA.

Ref

Displays whether a correct reference is found (Present) or not (NA)

INP_FORMAT_A

This status item indicates the presence and format of a valid signal for input channel A. This is displayed as:
- 1080i60
- 1080i50
- 1080p30
- 1080p25
- 1080p24
- 1080p24sf
- 720p60
- 720p50
- 720p30
- SD525
- SD625
- 1080p60 (GIX only)
- 1080p50 (GIX only)
- NA

Inp-Map_A
(GIX only)

This indicates the mapping of input channel A when the input format is 3Gb/s (1080p50 or 1080p60). Can be Level A or Level B. When the input format is not 1080p60 or 1080p50, this item indicates NA.

INP_FORMAT_B

This status item indicates the presence and format of a valid signal for input channel B. This is displayed the same as with status item INP_FORMAT_A.

Inp-Map_B
(GIX only)

This indicates the mapping of input channel B when the input format is 3Gb/s (1080p50 or 1080p60). Can be Level A or Level B. When the input format is not 1080p60 or 1080p50, this item indicates NA.

Output

Displays the (last known) output format of the card. Displayed as listed under INP_FORMAT_A.

Output-Map	This indicates the mapping of the (last known) output when the output format is 3Gb/s (1080p50 or 1080p60). Can be `Level A` or `Level B`. When the output format is not 1080p60 or 1080p50, this item indicates `NA`.
CRC_EDH_A	Indicates CRC and EDH errors on input A, whenever CRC errors reached the threshold set with `TRS_CRC_Thres`. Whether the EDH is checked on Full field or Active Picture is set with `EDH-mode`.
CRC_EDH_B	Indicates CRC and EDH errors on input B whenever CRC errors reached the threshold set with `TRS_CRC_Thres`. Whether the EDH is checked on Full field or Active Picture is set with `EDH-mode`.
TRS-A	`TRS-A` detects the amount of TRS in the signal in probe A. When this reaches the threshold set with `TRS_CRC_Thres`, an error is displayed. TRS = Timing Reference Signal. For more information see SMPTE standard 259m. `Error` indicates that the input of probe A is producing an error. `OK` indicates that the TRS in the signal is OK. `No_Input` indicates that there is no signal input at all and `Off` indicates that TRS-detection is switched off.
TRS-B	Same as `TRS-A`, but then for probe B.
ANC-A	`ANC-A` detects the state of the horizontal ancillary data in probe-A, which contains the embedded audio. ▪ `OK`: no error ▪ `Error:` input of probe-A has ANC errors ▪ `No_input:` there no input at all on probe-A ▪ `Off:` ANC detection is switched off.
ANC-B	Same as `ANC-A`, but for probe-B.
S2010Stat_A	This item indicates the status of the S2010 data on the SDI input A. Can be `OK`, `error` or `NA`.
S2010Stat_B	Same as S2010Stat_A, but for probe-B
S2010LineSt_A	If S2010 data is detected on the SDI input, this item indicates the video line where the S2010 data is detected. Range is from 0 to 1125. Line 0 indicates that there is no S2010 line-detection possible or no S2010 data present on the SDI input.

S2010LineSt_B	Same as S2010LineSt_A, but for probe-B
PSPFlagsReq_A	This status item indicates the status of a PSP Flags Request message, when detected on probe-A. Can be `Ok`, `Error`, or `NA`. The PSP Flags Request is always wrapped in a MOM
PSPFlagsReq_B	Same as PSPFlagsReq_A, but for probe-B
PSPFlagsTypeSt_A	When a PSP Flags Request message is detected, `PSPFlagsTypeStat` contains flags to identify item type. Can be `Undefined`, `Programme`, `Trail`, `Interstitial`, `Commercial`, or `Reserved`.
PSPFlagsTypeSt_B	When a PSP Flags Request message is detected, `PSPFlagsTypeStat` contains flags to identify item type. Can be `Undefined`, `Programme`, `Trail`, `Interstitial`, `Commercial`, or `Reserved`.
PSPFlagsProgSt_A	When a PSP Flags Request message is detected, `PSPFlagsProgSt_A` contains a number of programme related indicators. Each bit of the 16-bit word can be 0 or 1. Below is a description of every bit.

- b0(LSB)   1 = up-converted programme
- b1   1 = audio translation indicator
- b2   1 = live programme
- b3   1 = end credit squeeze active
- b4   1 = blanking platform 1 active
- b5   1 = blanking platform 2 active
- b6   1 = audio watermark present
- b7   1 = video watermark present
- b8   1 = audio has been processed
- b9   1 = trailer selection trigger present
- b10   1 = network indicator
- b11   1 = opt-out flag
- b12   1 = audio description present
- b13   1 = second audio present
- b14   reserved
- b15   reserved

PSPFlagsProgSt_B	Same as PSPFlagsReq_A, but for probe-B
InpSel-Stat	Shows whether the card is currently using automatic (`Auto`) or a `Manual` switch configuration.
Mon-Cue-Input	Shows the current Input being probed for a WHP296 cue. This can be `Off` when none of the inputs are monitored, `Input-A` or `Input-B` when one of the respective inputs are monitored for the WHP296 cue

Mon-Cue	Shows the current Cue-Type being monitored. Can be one out of the following `BlankingPlatform1, BlaningPlatform2, OptOut, Reserved14 or Reserved15`
Format-Match	Indicates the match between the actual video format in use on probe A and B. If both formats match `OK` is shown, otherwise it is `Failed`. If a mismatch cannot be determined, `NA` is shown.
Active_A	`Active-A` shows which channel is being output from main output A of the backup switch function. Can be either `Input_A` or `Input_B`
Active_B	`Active-B` shows which channel is being output from main output B of the backup switch function. Can be either `Input_A` or `Input_B`
Routing_A	`Routing-A` shows which SDI input is being output from main output A of the backup switch function. This primarily depends on the input mux and the backup switch function. Can be `SDI-1, SDI-2, SDI-3` or `SDI-4`.
Routing_B	`Routing-B` shows which SDI input is being output from main output B of the backup switch function. This primarily depends on the input mux and the backup switch function. Can be `SDI-1, SDI-2, SDI-3` or `SDI-4`.
IODelayA	Displays the total delay in ms of framesync output A. Can be a value between 0ms and 15000ms.
IODelayB	Displays the total delay in ms of framesync output B. Can be a value between 0ms and 15000ms.
InpStat_SelA	Displays input multiplexer status for input A. Can be `SDI-1, SDI-2, SDI-3` or `SDI-4`.
InpStat_SelB	Displays input multiplexer status for input B. Can be `SDI-1, SDI-2, SDI-3` or `SDI-4`.
InputA-Error	This is the overall Error status of Input A. It's a gathering of all possible errors. When this is in error, the card has switched to input B.
InputB-Error	This is the overall Error status of Input B. It's a gathering of all possible errors. When this is in error, the card has switched to input A.

InputA-Probe	This is the overall Probe status of Input A. It's a gathering of all possible probes.
InputB-Probe	This is the overall Probe status of Input B. It's a gathering of all possible probes.

	NETWORK
IP_Addr0	This item displays the status of the IP address. It can be `manual`, `DHCP asking`, `DHCP Leased`, `DHCP Infin`, `Disabled` or `No Cable`.
MAC0	This item displays the MAC address of the card.
IP0	This item displays the current IP address of the card.
NM0	This item displays the current Netmask of the card.
GW0	This item displays the current Standard Gateway of the card.

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.

GIX-HIX170 Events

Each event item can be set between 0 .. 255. 0= no event, 1..255 are the priority setting. If set to 0 no events will be generated. This information is only needed when the GPI16 card is used or when (Cortex) software is implemented. The events reported by this 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.

Ref-Status

`Ref-Status` If the reference is lost an Event will be generated at the set priority.

Input_A

If input A is lost, an Event will be generated at the set priority.

Input_B

If input B is lost, an Event will be generated at the set priority.

TRS-Status_A

If probe A detects TRS errors, an Event will be generated at the set priority.

TRS-Status_B

If probe B detects TRS errors, an Event will be generated at the set priority.

Active_Out_A

If probe A detects a change on the active output, an event is generated at the set priority.

Active_Out_B

If probe B detects a change on the active output, an event is generated at the set priority.

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Freeze-Status_A	If probe A detects a freeze, an Event will be generated at the set priority.
Freeze-Status_B	If probe B detects a freeze, an Event will be generated at the set priority.
Black-Status_A	If probe A detects a black, an Event will be generated at the set priority.
Black-Status_B	If probe B detects a black, an Event will be generated at the set priority.
Audio-Data_A	If probe A detects audio silence or data errors, an Event will be generated at the set priority.
Audio-Data_B	If probe B detects audio silence or data errors, an Event will be generated at the set priority.
GENERIC_1	If probe A detects CRC errors, an Event will be generated at the set priority.
GENERIC_2	If probe B detects CRC errors, an Event will be generated at the set priority.
GENERIC_3	If probe A detects TC presence errors (when `TC-Pres-Det` is switched on) or a TC freeze is detected (when `TC-freeze-Det` is switched on), an Event will be generated at the set priority.
GENERIC_4	If probe B detects TC presence errors (when `TC-Pres-Det` is switched on) or a TC freeze is detected (when `TC-freeze-Det` is switched on), an Event will be generated at the set priority.
GENERIC_5	Probe A Total sum of errors. When there's 1or more errors detected, an event is generated at the set priority.
GENERIC_6	Probe B Total sum of errors. When there's 1or more errors detected, an event is generated at the set priority.
GENERIC_7	If probe A detects clipping audio, an Event will be generated at the set priority.
GENERIC_8	If probe B detects clipping audio, an Event will be generated at the set priority.

GENERIC_9	Probe A Total sum of probed errors. When there's 1or more errors detected, an event is generated at the set priority.
GENERIC_10	Probe B Total sum of probed errors. When there's 1or more errors detected, an event is generated at the set priority
GENERIC_11	Probe A and B format mismatch error. When the SDI format for probe A and B are not matching, an event is generated at the set priority

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 Synapse Set-up 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).

The tags defined for the GIX-HIX170 are:

Event Menu Item	Tag		Description
Announcements	01_{hex}=NA	81_{hex}= 1	Announcing of report and control values
Ref-Status	02_{hex}=REF_LOSS	82_{hex}=REF_RETURN	Reference lost or returned
Input_A	01_{hex}=INP_LOSS	81_{hex}=INP_RETURN	Input A lost or returned
Input_B	41_{hex}=INP_LOSS	$c1_{hex}$=INP_RETURN	Input B lost or returned
TRS-Status_A	17_{hex}= TRS_ERROR_A	97_{hex}= TRS_OK_A	TRS A in error or OK
TRS-Status_B	48_{hex}= TRS_ERROR_B	$c8_{hex}$= TRS_OK_B	TRS B in error or OK
Active_Out_A	19_{hex}= IN_B_->_OUT_A	99_{hex}= IN_A_->_OUT_A	Output A is input B or A
Active_Out_B	$1a_{hex}$= IN_B_->_OUT_B	$9a_{hex}$= IN_A_->_OUT_B	Output B is input B or A
Freeze-Status_A	$0e_{hex}$=FREEZE_ERROR_A	$8e_{hex}$=FREEZE_OK_A	Probe A freeze error/OK
Freeze-Status_B	$4e_{hex}$=FREEZE_ERROR_B	ce_{hex}=FREEZE_OK_B	Probe B freeze error/OK
Black-Status_A	$0f_{hex}$=BLACK_ERROR_A	$8f_{hex}$=BLACK_OK_A	Probe A black error/OK
Black-Status_B	$4f_{hex}$=BLACK_ERROR_B	cf_{hex}=BLACK_OK_B	Probe B black error/OK
Audio-Data-A	05_{hex}=AUDIO_ERROR_A	85_{hex}=AUDIO_OK_A	Probe A audio sil-err/OK
Audio-Data-B	45_{hex}=AUDIO_ERROR_B	$c5_{hex}$=AUDIO_OK_B	Probe B audio sil-err/OK
GENERIC_1	$3a_{hex}$=GENERIC_1_ON	ba_{hex}=GENERIC_1_OFF	CRC error/ok on probe A
GENERIC_2	$3b_{hex}$=GENERIC_2_ON	bb_{hex}=GENERIC_2_OFF	CRC error/ok on probe B
GENERIC_3	$3c_{hex}$=GENERIC_3_ON	bc_{hex}=GENERIC_3_OFF	TC error/ok on probe A
GENERIC_4	$3d_{hex}$=GENERIC_4_ON	bd_{hex}=GENERIC_4_OFF	TC error/ok on probe B
GENERIC_5	$3e_{hex}$=GENERIC_5_ON	be_{hex}=GENERIC_5_OFF	sum error/ok on probe A
GENERIC_6	$3f_{hex}$=GENERIC_6_ON	bf_{hex}=GENERIC_6_OFF	sum error/ok on probe B
GENERIC_7	40_{hex}=GENERIC_7_ON	$c0_{hex}$=GENERIC_7_OFF	FS error/ok on probe A
GENERIC_8	65_{hex}=GENERIC_8_ON	$e5_{hex}$=GENERIC_8_OFF	FS error/ok on probe B
GENERIC_9	66_{hex}=GENERIC_9_ON	$E6_{hex}$=GENERIC_9_OFF	Sum probe error/ok on probe A
GENERIC_10	67_{hex}=GENERIC_10_ON	$E7_{hex}$=GENERIC_10_OFF	Sum probe error/ok on probe B
GENERIC_11	68_{hex}=GENERIC_11_ON	$E8_{hex}$=GENERIC_11_OFF	SDI format match error/ok on probe A and B

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.
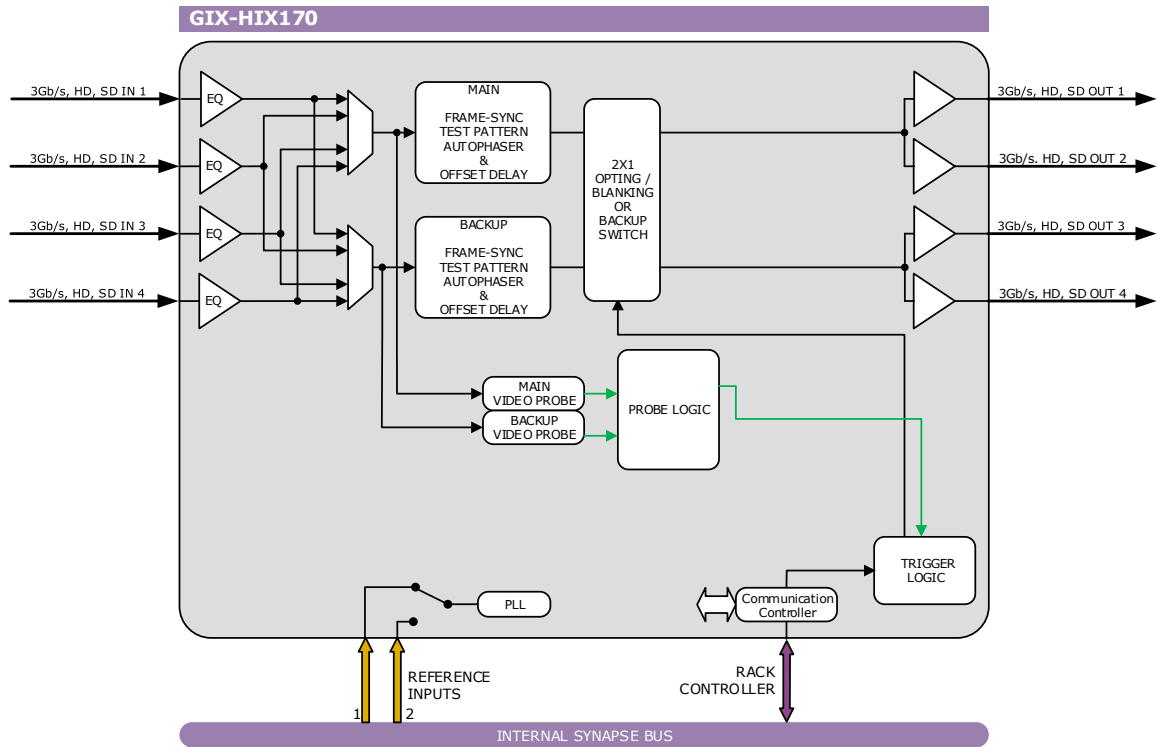
The Address

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 card is not configured properly, or when there is a hardware failure.

Input_1 LED ~ Input_4 LED

These LEDs indicate the presence of a valid SDI (SD or HD) video input signal on each input.

ANC Data Probe A LED

This LED indicates the presence of embedded audio on Probe-A.

ANC Data Probe B LED

This LED indicates the presence of embedded audio on Probe-B.

Reference LED

Indicates the presence of a valid reference signal on the selected reference input connector (ref-1 or ref-2).

Data Error LED

This LED indicates an HD CRC error or SD EDH error.

Connection LED

This LED illuminates after the card has initialized. The LED lights for 0.5 seconds each time a card is connected.

All LED's will illuminate several seconds during start-up.

9 Block Schematic

10 Connector Panel

The GIX-HIX170 can be used with the following backplanes: BPH17, BPH17b

BPH17 BHX17b

3Gb/s, HD, SD INPUT 1 (OPTIONAL FIBER IN)

3Gb/s, HD, SD INPUT 2 (OPTIONAL FIBER IN)

3Gb/s, HD, SD OUTPUT 1 (OPTIONAL FIBER OUT)

3Gb/s, HD, SD OUTPUT 2

RESERVED I/O

3Gb/s, HD, SD OUTPUT 3 (OPTIONAL FIBER OUT)

3Gb/s, HD, SD OUTPUT 4

3Gb/s, HD, SD INPUT 3

3Gb/s, HD, SD INPUT 4

relay bypass

relay bypass

GPI pinning

BNC1 BNC2 BNC3 BNC4 RJ45 BNC5 BNC6 BNC7 BNC8

PIN 8 PIN 7 PIN 6 PIN 5 PIN 4 PIN 3 PIN 2 PIN 1
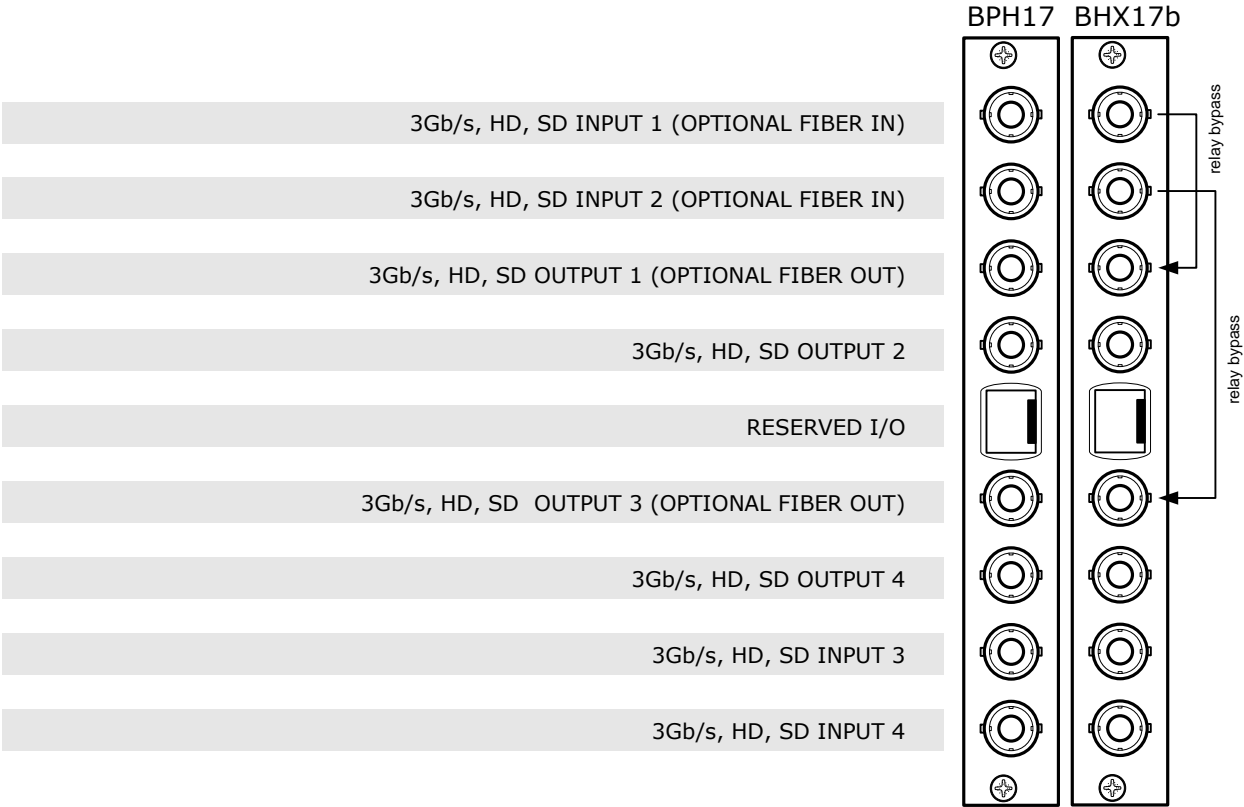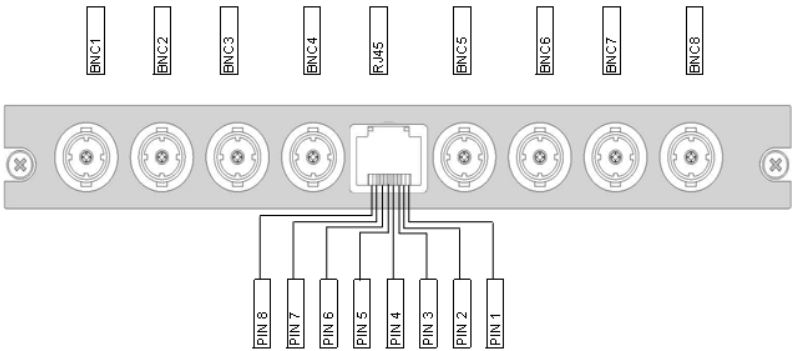
Pin 1	Reserved
Pin 2	Reserved
Pin 3	Reserved
Pin 4	Reserved
Pin 5	Reserved
Pin 6	Reserved
Pin 7	Reserved
Pin 8	Ground

When using the backpanel with bypass relay (BHX17b), you must first set the **bottom-side** dip-switch **on the card** to 'on'. This will pass 5 volt to the backpanel. If this is not done, the relays won't work at all.

On the BHX17b itself there are also 2 dipswitches (see picture on the next page). The bottom dipswitch is not connected. With the top switch you can choose the Bypass function. There are 2 possible function indications "on" (printed on the dip switch itself) and "off":

"**Direct Backpanel Switchover**" dipswitch set to **ON**:
Will make the BHX-backpanel switch over to the processed signal as soon as it detects the trigger signal from the connected synapse card. This setting will minimize the bypass time and ensures fast recovery of processed signals.
The **ON** setting is recommended if the BHX-backpanel is used in combination with synapse cards:
  ▪ which have a short initialization time, or
 ▪ which have a delayed trigger-signal onboard.

"**Direct Backpanel Switchover**" dipswitch set to **OFF** (**default**):
Will make the BHX-backpanel switch after about 15 seconds from the moment the BHX-backpanel detects the trigger signal from the connected synapse card. This setting will allow more time for complex synapse cards to finish initialization and stabilize proper signal processing before the backpanel switches over to the processed signal.
The **OFF** setting is recommended if the BHX-backpanel is used in combination with synapse cards:
  ▪ which are more complex and thus need longer initialization time and do NOT have a delayed trigger-signal onboard.

Note: In case of power failure or when the synapse board is extracted from the frame the bypass is immediately active.
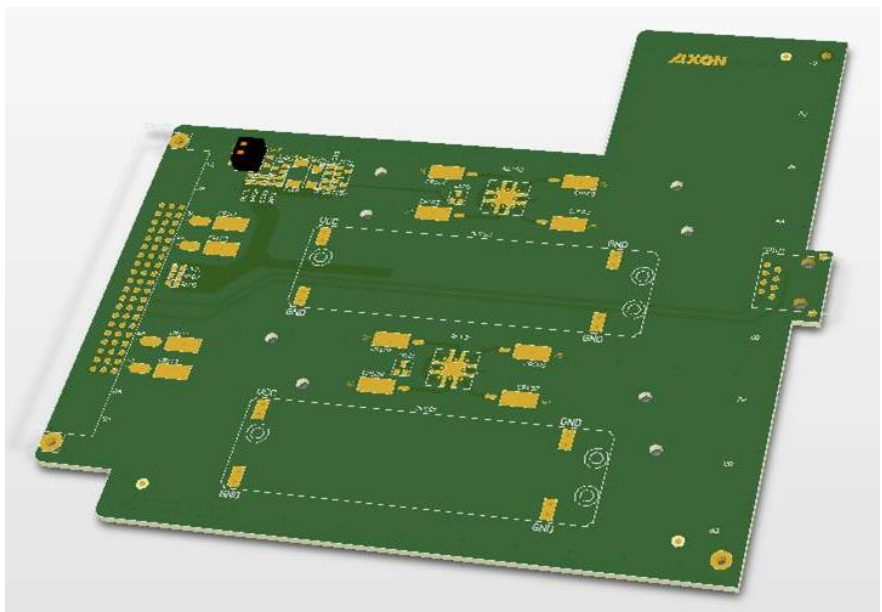
Appendix 1: Switching mechanism

Switching in 2x1 mode

The following three tables apply when the switch is configured for Auto switching. The `Inp-sel` setting is `auto`, the `Output-Config` is `2x1` and `Switch-Back` setting is varied for each of these tables. Please read the table from top to bottom, this is the order of the events that occur on the inputs.

Switch-Back = Off

A Input	B Input	A output	B Output
Good	Good	Input A	Input A
Fail	Good	Input B	Input B
Good	Good	Input B	Input B
Good	Fail	Input B	Input B
Good	Good	Input B	input B

Switch-Back = On

A Input	B Input	A output	B Output
Good	Good	Input A	Input A
Fail	Good	Input B	Input B
Good	Good	Input A	Input A
Good	Fail	Input A	Input A
Good	Good	Input A	Input A

Switch-Back = BackUp_Fail

A Input	B Input	A output	B Output
Good	Good	Input A	Input A
Fail	Good	Input B	Input B
Good	Good	Input B	Input B
Good	Fail	Input A	Input A
Good	Good	Input A	Input A

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