



# HSU05

HD up-converter with color corrector

## Installation and Operation manual

SynLite

MASTER  
Card

**HD**  
High definition

COMPATIBLE WITH  
 DOLBY. E

**AFD** ready  
S2016

Committed.





*Synapse*

**TECHNICAL MANUAL**

HSU05



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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.

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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.

	EN60950 EN55103-1: 1996 EN55103-2: 1996	Safety Emission Immunity
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<p>Axon Digital Design HSU05</p> <p> Tested To Comply With FCC Standards</p> <p>FOR HOME OR OFFICE USE</p>	<p>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.</p>
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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 Digital Design Website at [www.axon.tv](http://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 Axon Cortex 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

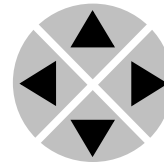
On powering up the Synapse frame, the card set will use basic data and default initialisation settings. All LED's will light during this process. After initialisation, several LED's will remain lit – the exact number and configuration is dependant upon the number of inputs connected and the status of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

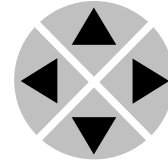
NOTE: Whilst editing a setting, pressing ► twice will reset the value to its default.



**Example of  
changing  
parameters using  
front panel control**

With the display as shown below

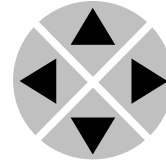
RRC18 [Select Card]  
>S01=SFS10



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

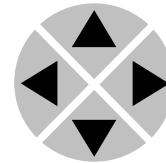


Pressing the ► selects the menu item shown, in this example Settings.

(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 its 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 help files.

### Menu Structure Example

Slot	Module	Item	Parameter	Setting
▲				
▲				
S02		Identity		
▲				
S01	SFS10	▶ Settings	▶ Standard_dig	▶ Auto
▼		▼	▼	▼
S00	RRC18	Status	Mode	625
		▼	▼	▼
		Events	Ref-Input	525
			▼	
			H-Delay	
			▼	
			▼	

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

## 4 The HSU05 Card

### Introduction

The HSU05 is high-quality up converter. The optimized scaling and filter algorithms ensure crisp broadcast ready pictures from a native SD source, by use of a 64 tap FIR filters. The HSU05 will allow you to simulcast HD signals from a native SD infrastructure. The embedded audio is carried over to the HD domain. The appropriate aspect ratio can be applied by control of S2016, VI, WSS and GPI inputs by use of 16 presets that can store the aspect ratio conversions.

### Features

- HD or SD input (auto by-pass mode with no processing)
- 625/50 to 1080i/50 or 720p/50
- 525/59.94 to 1080i/59.94 or 720p/59.94
- 625/50 to 1080p/25 or 720p/25
- 525/59.94 to 1080p/29.97 or 720p 29.97
- Single field (low latency) and 3 field de-interlacing
- Sharpness control for crisp image quality
- Low latency mode with 54 SD lines delay
- Adjustable H and V delay with respect to input or reference
- Color corrector
- Aspect ratio control:
  - Embedded WSS or WSS-extended
  - Embedded VI
  - GPI (BPH03)
- 16 presets for aspect ratio conversion
  - Anamorphic (16F16 to 16F16)
  - Pillarbox (12F12 to 12P16)
  - Pillarbox 14:9 (12F12 to 14P16)
  - Inverse pan-scan (12F12 to 16F16)
- V position control between -128 and + 127 lines (for inverse pan-scan/zoom mode)
- Jump to preset or hold at loss of WSS or VI control
- 2 group audio transparency (selectable)
- 2 group de-embedding to Synapse ADD-ON card
- Semi tracking audio delay in 1ms intervals
- Audio delay offset adjustment up to 1000 ms
- Correct color space conversion(601-709)
- VITC transparency with selectable line selection and duplication
- CC transparent
- One reclocked output (active loop)
- 2 HD-SDI processed outputs (active loop in HD by-pass mode)
- Built-in ARC for 4:3 and 14:9 pillar box and inverse pan scan output formats
- Locks to Bi-level, Tri-level sync 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 fiber input (replacing 1 SDI input) or 1 fiber output (replacing 1 SDI output) on I/O panel

### Applications

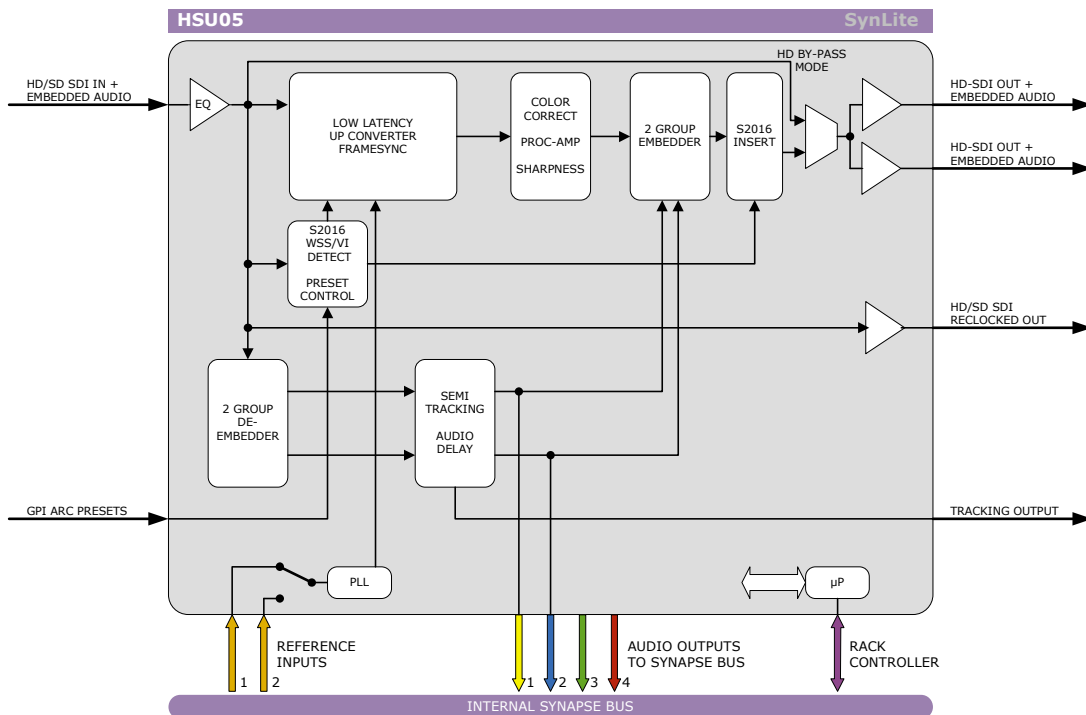
- High quality low latency up-conversion (with zero motion artifacts)
- Free running fill-in camera positions up-conversion and synchronization

### Conversion abilities

CONVERSION		Output					
		1080i59.94	1080i50	720p59.94	720p50	480i59.94(525)	576i50(625)
Input	1080i59.94	X*					
	1080i50		X*				
	720p59.94			X*			
	720p50				X*		
	480i59.94(525)	x		x		X	
	576i50(625)		x		x		X

\* = HD bypass mode

### Block schematic



## 5 Settings Menu

### Introduction

The settings menu displays the current state of each HSU05 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.

### Out-Format

The format menu item selects the input video standard.

- **Auto:** the unit recognize format is presented at the input and automatically sets that format. It will take more time for the card to lock.
- 1080i-60/50/30
- 1080p-25
- 1035i-60
- 720p-60/50/30/25
- **Transparent:** this is a by-pass mode for when you input an HD signal. In this case the HD signal is passed through unprocessed directly to the outputs.

Default is `Auto`.

### Auto-Frmt

When Out-Format is set to `Auto` this setting determines the output format. The available formats are; 1080i, 720p, 1080p and 720p30p25.

SD Format / in	Setting	HD Format / out
625/50	1080i	1080i-50
	720p	720p-50
	1080p	1080p25
	720p30p25	720p25
525/60	1080i	1080i-60
	720p	720p-60
	1080p	1080p-30
	720p30p25	720p-30

**Field-Freq**

1:1, 1:1.001 or AUTO are the values that can be selected

1:1 is the right field frequency for 1080i-50. Because the actual field frequency of 1080i-60 is 59.97 and not 60 is it necessary when 1080i-60 is selected as input format to adjust the field frequency to 1:1.001

There is also an AUTO mode, the HSU05 will detect the format and switch then to the according field-frequency. Default is AUTO.

**Control**

The Control menu item selects the way in which the HSU11 is controlled for selecting the right aspect ratio. The settings of Control are, Manual, Video Index, WSS-std, WSSext, GPI-BPH01, GPI-BPH03, BPH01-LATCH, BPH03-LATCH, GPI-PRIORITY or GPI-PRIO-LATCH.

- In GPI-BPH01 mode preset 1 or 2 may be selected by opening or closing the GPI input.
- In GPI-BPH03 mode the preset is encoded binary on GPI's 1 through 4.
- In BPH03-LATCH mode and BPH01-LATCH mode you may cycle through presets by closing any contact to increase the preset number.
- In GPI-PRIORITY (only for use with BPH03), holding down GPI 1 selects preset 1, GPI 2 selects preset 2 and so on.
- GPI-PRIO-LATCH mode works in the same fashion, with the difference that you may release the GPI line again after selecting a preset.

The default setting is Manual.

**Preset**

With this item it is possible to select presets (16 preset available), there are factory preset and it is possible to put together your own preset. If the menu item is preceded by a '#' sign, it is possible to add this setting to a preset. The presets are stored in memory. It is also possible to change factory presets.

Preset Number	Mode	V-pos
#1	Anamorphic	0Ln
#2	PBox_14:9	0Ln
#3	Pbox_14:9	-18Ln
#4	i-PanScan	0Ln
#5	i-PanScan	-31Ln
#6	i-PanScan	0Ln
#7	Pbox_14:9	0Ln
#8 ~ #16	Anamorphic	0Ln

<b>#Mode</b>	<p>To achieve the correct output aspect ratio, it is necessary to select the correct aspect ratio conversion. There are several conversions possible, namely Anamorphic, PillarBox, Pbox-14:9, I-panscan, 1.17V-0.90H, 1.17V-0.93H, 1.17-0.96H and 1.17V-1.00H</p> <p>The default setting is Anamorphic.</p>
<b>#V-Pos</b>	<p>It is possible to adjust the vertical position of the output signal in steps of 1 line and with a range from -128 to 127 lines for I-Panscan conversions. The default setting is 0 lines.</p>
<b>#S2016_AFD</b>	<p>With this item you can set an AFD value to insert into the up converted output. Can be any of the available AFD settings between AFD_0 and AFD_15. Can also be set to off, in which case no AFD will be inserted. Off is default.</p>
<b>No-Control</b>	<p>The NO-Control item allows you, when no VI or WSS data is present, to switch back to a selectable preset value. Can be set to preset #1 till #16 or set to Hold. When set to Hold, the latest VLI or WSS is maintained.</p>
<b>V-Filter</b>	<p>The card has 3 filter modes to reduce the motional effects.</p> <ul style="list-style-type: none"> <li>■ Still: the picture is sharper but more motional effects are visible. Still is recommended for stills.</li> <li>■ Field: the picture is less sharp but the motional effects are none. This mode is recommended for moving images.</li> <li>■ Norm is a compromise between STILL and FIELD.</li> </ul> <p>The default setting is NORM</p>
<b>LockMode</b>	<p>LockMode determines whether the card is locked to his input signal or to the reference. The default setting is Input.</p>
<b>Ref-Input</b>	<p>This settings allows the user to determine which reference input is used to lock the HSU05. Ref1 , ref2 or Auto. Input 1 is the uppermost input at the rear of the SFR18 and SFR08; 2 is the bottom input. The SFR04 has only one reference input.</p> <p>When AUTO is selected then the card selects the reference according to its input signal.</p> <p>The default setting is 1.</p>
<b>Ref-Typ</b>	<p>Ref-Type sets the type of reference; Tri-Level or Bi Level.</p> <p>The default setting is Tri-Level.</p>

**H-delay** 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 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 2199 HD pixels. The default setting is 0 HD pixels.

**V-delay** 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 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 100ln to 2000 HD ln. The default setting is 1124 HD lines

**H-sharpness** The amplitude of the mid-high luminance frequencies can increase the apparent sharpness of a picture. H-sharpness is used for the Horizontal information. The range is from 0% to 100%. The default setting is 0%.

**Emb-A-Sel** The HSU05 has the capability to re-insert the Standard Definition embedded audio in the High Definition output. To avoid lip sync problems, the correct delay has to be set in `AudioDelay`. The `delay-status` setting should be set to ON, and the status `IO_delay` is to display the video delay, which is to match the audio delay.

When the card is locked to a reference, the video delay is variable. In this case, it is not recommended to use this feature, as the audio delay is fixed.

This setting selects to which embedded audio group audio should be embedded by embedder A. The selectable settings are `Group1`, `Group2`, `Group3`, `Group4` and `Off`. When `Off` is selected, the embedded audio is blanked. The default setting is `Group1`.

**Emb-B-Sel** This setting selects to which embedded audio group audio should be embedded by embedder B. The selectable settings are `Group1`, `Group2`, `Group3`, `Group4` and `Off`. When `Off` is selected, the embedded audio is blanked. The default setting is `Group2`.



**AudioDelay**

AudioDelay allows setting the delay of the embedded audio to a Fixed number (following AudioDelay\_fixed setting) or to auto.

Default is Fixed.

**AudioDelay\_fixed**

AudioDelay\_fixed allows setting the delay of the embedded audio in order to match the video delay (see setting Emb-A-sel on proceedings). AudioDelay setting should be switched to Fixed in order for this setting to be used. The available range is from 0 to 1000 ms. The default setting is 40 ms.

**ColorConv**

ColorConv optimises the color conversion. As the color coding of HD (709) and SDI (601) are different, it is necessary to convert these. The best result is generated when the up-converter is active and the 601 to 709 setting is selected.

It is also possible to switch the filter off by setting it to None.

The default setting is 601 to 709.

**Y-Gain**

Y-Gain controls the total Y-gain (Luma) The control range is between 50% and 150% in steps of 0.20%. The default setting of Y-Gain is 100%.

**C-Gain**

C-Gain controls the total C-gain. (Chroma) The control range is between 50% and 150% in steps of 0.20%. The default setting of C-Gain is 100%.

**R-Gain**

R-Gain controls the RED gain. The control range is between 50% and 150% in steps of 0.20%. The default setting of is 100%.

**G-Gain**

G-Gain controls the total GREEN gain. The control range is between 50% and 150% in steps of 0.20%. The default setting of is 100%.

**B-Gain**

B-Gain controls the total GREEN gain. The control range is between 50% and 150% in steps of 0.20%. The default setting is 100%.

**Black**

Black controls the total R-G-B BLACK gain. The control range is between -128bit and 127bit in steps of 1 bit. The default setting is 0bit.

<b>R-Black</b>	R-Black controls the RED-BLACK. The control range is between -128bits and 127 bits in steps of 1 bit. The default setting is 0 bit.
<b>G-Black</b>	G-Black controls the GREEN-BLACK. The control range is between -128bits and 127 bits in steps of 1 bit. The default setting is 0 bit.
<b>B-Black</b>	B-BLACK controls the BLUE-BLACK. The control range is between -128bits and 127 bits in steps of 1 bit. The default setting is 0 bit.
<b>Delay-Status</b>	It is possible to display the processing time of the HSU05 in the status menu (in the status item IO_delay). This setting allows you to switch this function ON or OFF.  Default setting is OFF
<b>VITC-Read-Ln</b>	The vertical time code VITC, is read from the vertical interval of the SDI and convert to ATC and that is inserted in the horizontal interval off the HD signal. With the setting VITC-Read-Ln is it possible to specify in which line the VITC is read from. Selection between 7 and 20. Default is 7
<b>ATC-Insert.</b>	ATC-insert allows you to switch this function OFF, VITC (to convert VITC to ATC), or VITC-dup (to convert VITC duplicated to ATC). The default setting is OFF.
<b>CC708-Insert</b>	This setting lets you choose whether you want to pass through the Closed Captioning to the HD processed outputs. Default setting is OFF.  Please note the following concerning Closed Captioning with the HSU05: <ul style="list-style-type: none"> <li>• Transcodes only service CC1(608) to DTVCC Service1(708).</li> <li>• All 608 data is transported in the SMPTE334 packet.</li> <li>• SMPTE334 Packets only output in 720p59 and 1080i59. (24p, 50i, 50p formats are NOT supported.)</li> <li>• Some window features will appear different because of the different memory usage between 608 and 708 methods, but all caption data will be viewable. (This is most noticeable when overlays are invoked, which is not often).</li> <li>• All font styles and pen colors are transcoded.</li> <li>• All special characters are re-mapped accordingly with one exception; the full block character cannot be remapped, so instead it has been substituted with a ‘ꠔ’.</li> </ul>

## 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.

## Clip-Video

With this item the Y,Pr,Pb values that are out of the official reach of the Y,Pr,Pb protocol can be brought back to the maximum allowed values. Can be switched *On* or *Off*. By default it is switched *Off*.

## 6 Status Menu

<b>Introduction</b>	The status menu indicates the current status of each item listed below.
<b>SDI-input</b>	<p>This status item indicates the presence and format of a valid HD/SD serial in input_1.</p> <p>This is displayed as:</p> <ul style="list-style-type: none"> <li>■ 1080i/60/50</li> <li>■ 1080p/30/25</li> <li>■ 1035i/60</li> <li>■ 720p/60/50/30/25</li> <li>■ SD525</li> <li>■ SD625</li> </ul> <p>NA is used when no valid input signal is available or if the selected format doesn't match the input signal.</p>
<b>Ref-Det</b>	<p>This status item recognizes a valid reference in the genlock input. NA indicates that no valid reference is present. (both bi and tri level can be detected). Present indicates that a valid reference is present. No status feedback indicates that there is no SDI input</p>
<b>CRC-STAT</b>	<p>CRC Stat gives the status of the incoming HD/SDI signal CRC Error. Possible are Luma_CRC and Chroma_CRC.</p>
<b>Lock-Det</b>	<p>Displays if there is a valid clock presented to the output. Indicates if right ref-type is selected and if the internal PLL is locked to signal.</p>
<b>IO-Delay</b>	<p>IO-Delay displays the processing time of the card in milli seconds (ms) , it is necessary to enable this function in the settings menu under Delay status.</p>
<b>VI Detect</b>	<p>This item displays the VI format that has been detected. 4:3_0 to 4:3_7 and 16:9_0 to 16:9_7 and NA are the modes that can be detected</p>
<b>WSS-STD-DET</b>	<p>This item displays the WSS STANDARD that has been detected. 1_VID..8_VID , 1_FLM..8_FLM and NA are the modes that can be detected</p>



<b>WSS-EXT-DET</b>	This item displays the WSS EXTENDED that has been detected. 4:3_0 ..4:3_7 , 16:9_0..16:9_7 and NA are the modes that can be detected
<b>GrpInUse</b>	Detects the embedded audio groups that are used within the SDI data stream. If no groups are detected the display represents ----. If a single group is detected the display represents 1---. If all groups are detected, the display represents 1234. When for instance group 2 and 4 are detected, this is displayed as -2-4.
<b>GPI-in</b>	GPI displays what GPI contact is active, Displayed as #1 till # 16.
<b>VITC-Det</b>	VITC-Det displays if there is a VITC time code signal present in the selected line ( VITC-Read-Ln) in the vertical interval. Possible statuses are Present or NA.
<b>CC608-Det</b>	Detects whether there is Closed Captioning Present in the input signal or not (NA)
<b>S2016_AFD-Det</b>	Indicates what AFD value has been detected on the input of de HSU card. Can be any of the AFD values between AFD_0 and AFD_15 or NA (not available, when no AFD has been found).

## 7 Events Menu

<b>Introduction</b>	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.
<b>What is the Goal of an event?</b>	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.
<b>Events</b>	The events reported by the HSU05 are as follows;
<b>Announcements</b>	Announcements is not an event. This item is only used for switching the announcement of status changes on/off. 0=off, other =on
<b>Input</b>	Input can be selected between 0 .. 255. 0= no event, 1..255 is the priority setting.
<b>Ref-Status</b>	Reference can be selected between 0 .. 255. 0= no event, 1..255 is the priority setting.
<b>Lock-Status</b>	If the card is locked can be selected between 0 .. 255. 0= no event, 1..255 is the priority setting.
<b>CRC-Status</b>	EDH status can be selected between 0 .. 255. 0= no event, 1..255 is the priority setting.
<b>What information is available in an event?</b>	<p>The message consists of the following items;</p> <ol style="list-style-type: none"> <li>1) A message string to show what has happened in text, for example: “INP_LOSS”, “REF_LOSS”, “INP_RETURN”.</li> <li>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.</li> <li>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.</li> <li>4) A slot number of the source of this event.</li> </ol>

**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<sub>hex</sub>) (e.g. 129 (81<sub>hex</sub>) 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
Input	01 <sub>hex</sub> =INP_LOSS	81 <sub>hex</sub> =INP_RETURN	primary input lost or returned
Reference	02 <sub>hex</sub> =REF_LOSS	82 <sub>hex</sub> =REF_RETURN	reference lost or returned
CRC-Status	03 <sub>hex</sub> =CRC_ERROR	83 <sub>hex</sub> =CRC_OK	CRC error occurred

**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**

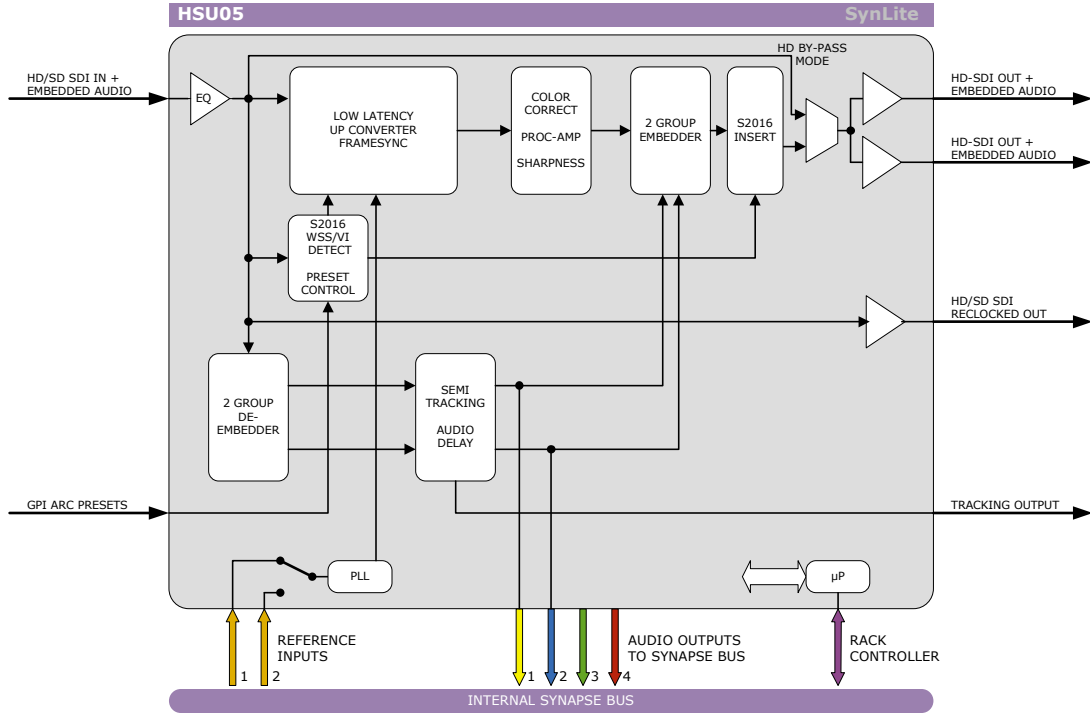
Together with the message string or the tag, the slot number or address of the card is relevant to be able to assign the event to a certain card.

## 8 LED Indication

<b>Error LED</b>	The error LED indicates an error if the internal logic of the HSU05 card is not configured correctly or has a hardware failure.
<b>Input LED</b>	This LED indicated the presence of a valid SDI video signal on the input.
<b>ANC Data LED</b>	Indicates the presence of embedded audio within the input signal.
<b>Reference LED</b>	Indicated the presence of a valid reference signal on the selected reference input connector (ref-1 or ref-2).
<b>Data Error LED</b>	This LED indicates a CRC error.
<b>Connection LED</b>	This LED illuminates after the card has initialized. The LED lights for 0.5 seconds every time a connection is made to the card.

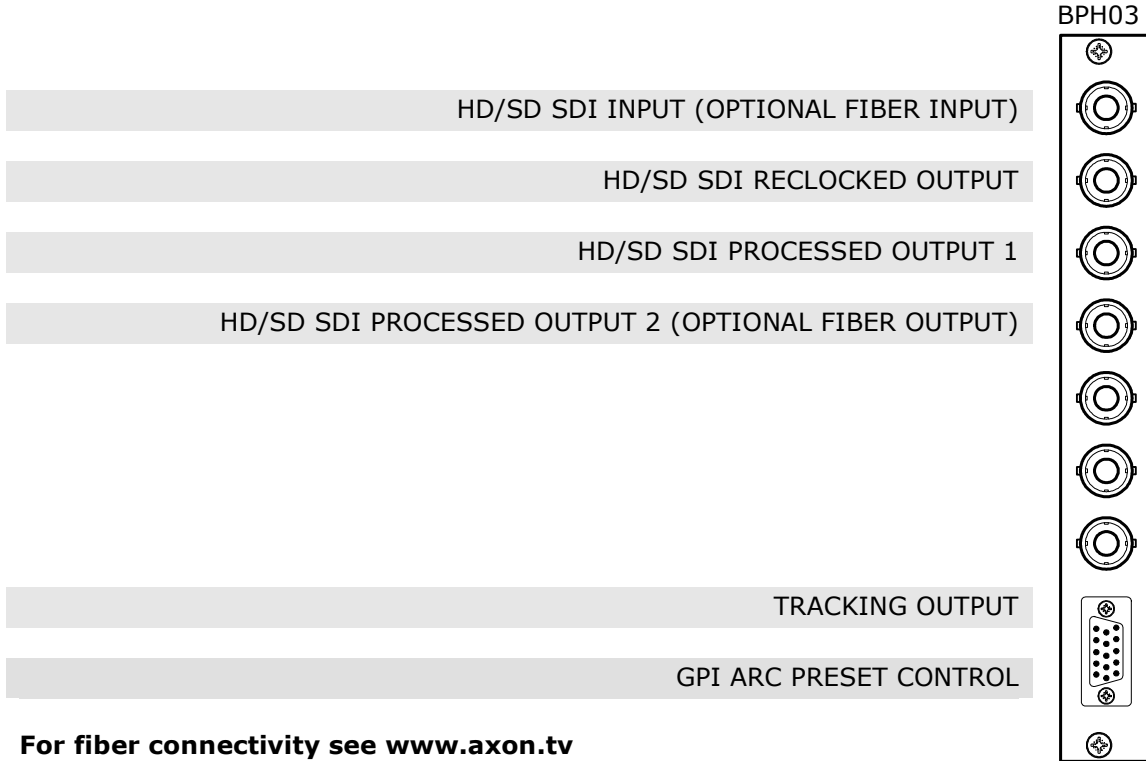


# 9 Block Schematic



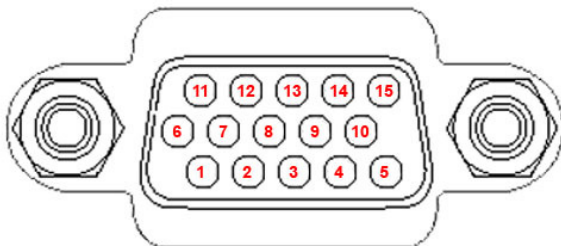
## 10 Connector Panels

The HSU05 can be used with the BPH03. The following table displays the pinout of these backpanels.



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

D-Sub pinout:



GPI 1	Pin 3
GPI 2	Pin 5
GPI 3	Pin 4
GPI 4	Pin 9
GPI 5	Pin 13
GPI 6	Pin 15
GPI 7	Pin 10
GPI 8	Pin 14
Ground	Pin 7, 8, 12