



# GLI-HLI100

3Gb/s, HD and SD preset based dual logo  
inserter/generator

## Installation and Operation manual





*Synapse*

## **TECHNICAL MANUAL**

GLI-HLI100



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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, 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.

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

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HEE230



Tested To Comply  
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FOR HOME OR OFFICE USE

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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 rack controller 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 (RRC, RRS, ERC or ERS) manual. The method of connecting to a computer using Ethernet is also described in these manuals.



**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, SFR08 and SFR Mobile 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

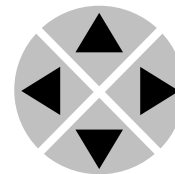
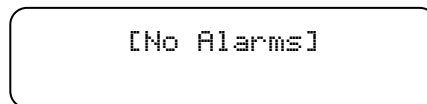
On powering up the Synapse frame, the card set will use basic data and default initialisation settings. All LED's will light during this process. After initialisation, several LED's will remain lit – the exact number and configuration is dependent upon the number of inputs connected and the status of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

#### Changing settings and parameters

The front panel controls or the Synapse 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.



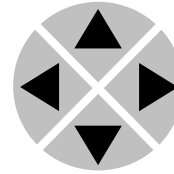
#### Note

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

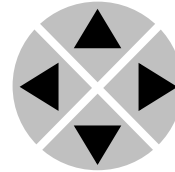
```
RRC18 [Select Card]
>S01=SFS10
```



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
```

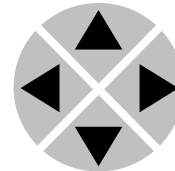


Pressing the ► selects the menu item shown, in this example Settings.

(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
```

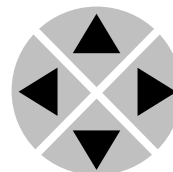


Pressing the ► selects the settings item shown, in this example SDI-Format.

(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

Synapse 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	▶ Set-tings	▶ 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, RRS, ERC and ERS operational manuals and the Cortex help files

## 4 The GLI-HLI100 card

### Introduction

The GLI-HLI100 is a dual logo inserter, with a preset based logo recall function through a flexible user interface and a local storage. Multiple logos including animated ones can be selected through the synapse menu, GPI, or triggered by VANC (SCTE104+WHP296) data contained the input. The GLI-HLI100 is capable of inserting two logos.

The GLI-HLI100 has a fully featured preview bus allowing transitions and keying levels to be previewed before the logo placed into the program stream

*Intelligent Content Allocation* ensures efficient use of image RAM. For full frames, the area of interest is automatically detected up to 20 percent of the screen surface. This increases animation duration from 100 for full frames (1920x1080) to 500 frames (20% area of 1920x1080).

### Features

The GLI-HLI100 dual logo inserter has the following features

- 3Gb/s-SDI, HD-SDI and SD-SDI compatible for GLI100
- HD-SDI and SD-SDI compatible for HLI100
- Formats: 1080p50/59.94, 1080i50/59.94, 720p50/59.94. SD625, SD525
- Two individual logo inserters
- Logos are stored in onboard non-volatile memory and accessible through FTP or WebDAV using the dedicated rear Ethernet port
- Supported logo file formats: PNG, TGA
- Supported animation control file: DOG
- Logo presets A and B:
  - 32 presets for full screen, or max 500 frames of animation
  - H+V position, Transparency, Fade in time, Fade out time
  - Macro: fade in, hold, fade out and animation one shot or loop
- Frame-synchronizer and autophaser for stable input locking
- On loss of input, show freeze, color field or recall apology preset on processed output
- Clean output from frame-synchronizer
- Optional HDMI or Fiber output on SFP cage
- 8 GPI contacts assignable to presets, with take and priority mode.
- Trigger information contained in VANC (SCTE104 + WHP296) packets on SDI input can be used to recall logos or animations
- Input format and presence can be detected and used in conjunction with GPIs, VANC (SCTE104+WHP296) information to select banks of logos, the specific logo from each range is determined by the information contained in the other trigger signals.
- Safety relay bypass when using a BHX45
- Full control and status monitoring through the front panel of the SFR04/SFR08/SFR18 frame and the Ethernet port (ACP)
- Locks to Bi-level, Tri-level syncs or SDI input

**TRI/BI-Level sync.**

The card is able to lock on to a HD sync 600mV nominal TRI-level, as described in the SMPTE 274M and 296m spec. A SD sync 300 mV nominal BI-level sync can also be used.

**Powerup note**

Power-up to video output can take a few minutes. The decompression of logo's to logo storage can take up to 2 minutes when Used-Mem reaches 100%. An additional 10 minutes may be added when the card performs the file-system integrity check. This can happen if the card was hot swapped directly after changes to files. The card is not available on the SFR front panel or through the SFR Ethernet control during this decompression and checking period.

**SD625 note on WSS**

WSS is located in the first part of line 23. Line 23 is actually the first active picture line. The logo inserter uses the full line 23, because it is the first active picture line. This also allows a complete display the commonly used 720 x 576 full frame logo format. Because if this, the logo inserter is not transparent for WSS, but transparent for all other VBI data.

It is possible to pass WSS by replacing the first 398 pixels (a bit more than half-line) of your full frame logo with transparency.

**SD note on non-square Pixel Aspect Ratio**

For SD, you'll need to adapt your PC drawn logo material to cater for a non-square pixel aspect ratio. This is because SD displays use a non-square pixel aspect-ratio (PAR), also depending on wide-screen 16:9 or 4:3 transmission.

The logo inserter will not perform the scaling operation. Thus files prepared on a PC, without horizontal pre-scaling, will appear horizontally distorted in SD. This is only an issue with SD formats, HD formats use a square pixel aspect ratio.

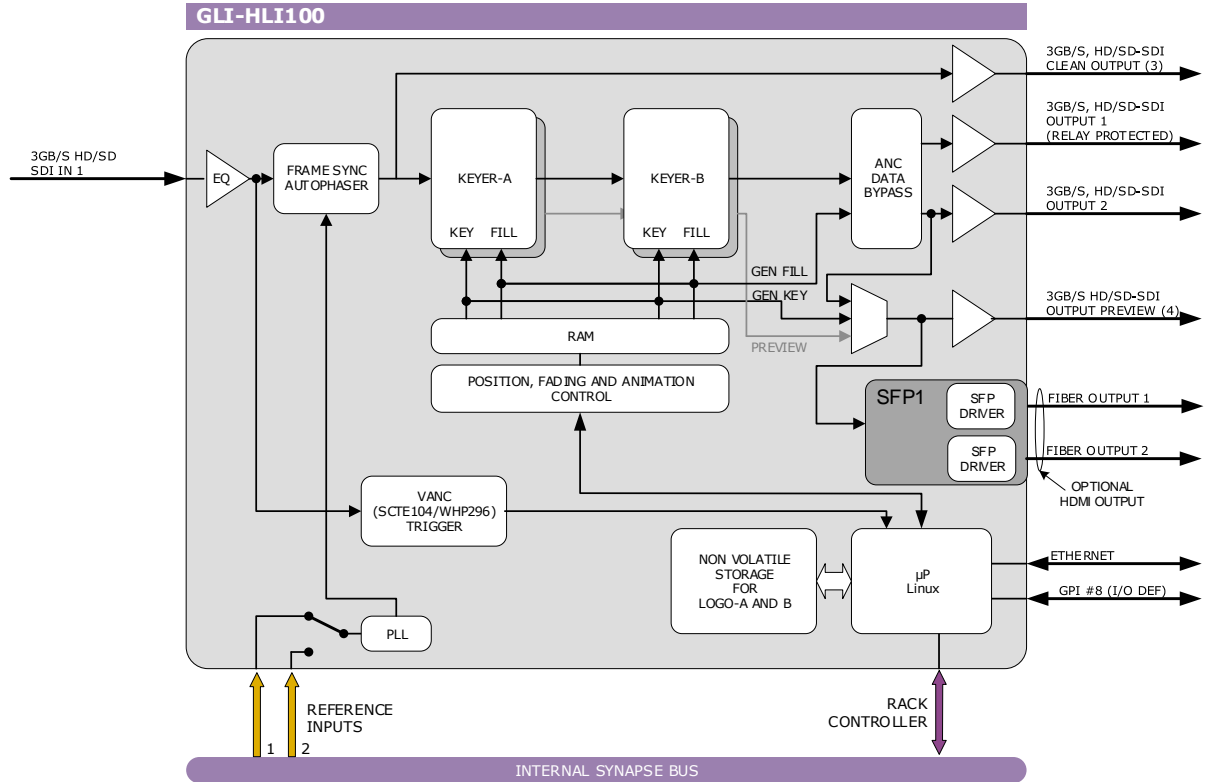
For SD625 two 4:3 display PARs are commonly used: 12/11 ("digital") and 59/54 (Rec 601). Please consult your local transmission standards to obtain your valid PAR before creation logo material.

In both SD625 and SD525 the horizontal active area of 720 pixels must also include an 8 pixel border in both the first and last parts. Thus effectively 704 pixels are available horizontally for creative use.

Example, SD625 using 4:3 "digital" PAR:

To create a full frame logo at correct aspect ratio for SD625 the original drawing must have a horizontal size of  $720 \times (12/11) = 786$ . The vertical size remains 576.

After drawing, this image must be scaled horizontally with a factor of 0.9160 ( $720/786$ ). The result will be an 720 x 576 full frame at expected aspect-ratio. Mask the first and last 8 pixel wide horizontal areas to display. Some post softening or filtering is recommended to prevent picture overshoots on the edges.



## 5 Settings Menu

### Introduction

The settings menu displays the current state of each GLI-HLI100 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. 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

#### IO-Ctrl

This setting determines the control source for the IO\_Prst\_Act. The default and only function currently is Manual.

#### IO\_Prst\_Act

With this item you can manually change the currently active IO settings. Can be any preset between 1 and 16. By default it is set to 1. All of the following menu settings that are preceded with a '#'-prefix are part of the preset.

#### IO\_Prst\_Edit

Here you can select which of the 16 selectable IO settings 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 of the menu settings that are preceded with a '#'-prefix are part of the preset.

#### #Out-Frmt

With Out-Frmt you can set what the output format should be.

Possible settings are:

- Auto (default)
- 1080p60, 1080p50
- 1080i60, 1080i50
- 720p60, 720p50
- SD525, SD625

#### #F-delay

F-Delay sets the amount of delayed Frames for each corresponding input. The available range is from 0 to 50 frames (dependent on the I/O). Default is 0F. The preset master for this is Out-Frmt, hence the '#'-prefix.

Format	Maximum F-delay
1080p50/p60	50fr
1080i50/i60	50fr
720p50/p60	100fr
SD525/625	250fr

<b>#V-delay</b>	<p>V-Delay setting allows adjustment of the vertical phase of the corresponding output signal with respect to the selected reference input.</p> <p>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 (dependent on I/O format). The default setting is 0ln. The preset master for this is Out-Frmt, hence the '#'-prefix.</p>
<b>#H-delay</b>	<p>The H-Delay setting allows adjustment of the Horizontal phase of the corresponding output signal with respect to the selected reference input.</p> <p>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 5124 pixels (dependent on I/O format). The default setting is 0px. The preset master for this is Out-Frmt, hence the '#'-prefix.</p>
<b>#Freeze</b>	<p>Freeze enables the manual frame sync capture of one Video Frame for all channels. The settings of Freeze are On or Off. The default setting is Off.</p>
<b>#Field-Freeze</b>	<p>Field-Freeze enables a field freeze instead of the default frame freeze. When off, the complete frame is displayed on a freeze event (e.g. at input loss). When on, only the field is displayed on a freeze event.</p>
<b>DolbyE_Sync_Mode</b>	<p>DolbyE-Sync-Mode must be used in combination with the P60-P50_Sync Two Frame setting to align the frame drop or repeat properly to the Embedded Dolby-E frame. This setting can be Off for no Dolby-E alignment of the drop or repeat, Ch1/2 to Ch 15/16 to manually select the embedded source for the Dolby-E, or Auto where the card will look for the first embedded channels providing Dolby-E.</p>
<b>P60-P50_Sync</b>	<p>P50-P60_Sync determines if the video drops one or two frames when out of sync in p50 and p60 formats. The P50-P60_Sync settings are One Frame and Two Frame</p>
<b>Lock-Mode</b>	<p>Lock-Mode determines whether the card is locked to his input SDI1, to the reference (Ref1 or Ref2) or Free-Run. Ref1 is default.</p>



<b>Delay-Status</b>	It is possible to display (in the status menu IODelay) 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
<b>Input_Loss</b>	Selects the output signal in case of a loss of Input. It can be Freeze, Black, Grey, Green, Colorbar, Zoneplate. No-SDI-Out, mutes all outputs. Keyer-A or Keyer-B select a logo from the Keyer A or B preset as an apology or panic logo. The Freeze-Preset setting must be used to select the preset number. The default setting is Freeze
<b>Freeze-Preset</b>	When the Input_Loss is set to Keyer-A or Keyer-B, this sets the preset number which will be used as an apology or panic logo when the SDI signal to the card is lost. The available settings are Off and 1 to 32. The default setting is Off.
<b>S352_Insert</b>	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.

## LOGO INSERTER

<b>Logo-Mode</b>	<p>With this feature you can change the cards function from a Inserter (default) to a logo-generator.</p> <ul style="list-style-type: none"> <li>▪ Inserter mode: Processed outputs 1 and 2 will contain the video input with the logo laid over the video (follows A/B_Active-Preset). A preview of either keyer A or B is available on the preview output 4 and the optional HDMI SFP module.</li> <li>▪ Gen-KF-unshaped mode: Fill output on outputs 1 and 2 will only contain the logo (fill) and Key outputs on output 4 will contain the key (alpha channel) only.</li> <li>▪ Gen-KF-shaped: Same as Gen-KF-unshaped, except that it can be used for Linear Mode Keyers (where Unshaped is used for Luma Mode keyers).</li> <li>▪ Gen-2F mode: Fill output on processed outputs 1, 2 and 4 will contain the logo (fill).</li> </ul>
------------------	---

In all generator mode cases you can use Lock-Mode to select an alternative source for timing. When using reference or freerun mode do not use #Out-Frmt in auto mode, and do set Input\_Loss to Black.

<b>ftp-access</b>	Selects Anonymous FTP log in (default) or using the fixed GLI-FTP username together with the ftp-password setting below.
<b>ftp-password</b>	This is a user selectable password for the FTP server. The password length is maximum 20 characters.
<b>Preview-Mux</b>	Selects the signal routing on the Preview output connector. This can be set to either Program to display the program signal, or Preview. The default setting is Preview. Note this setting only applies when Logo-Mode is set to Inserter.
<b>Program-keyers</b>	With this item you can switch on or off the display of both active presets A and B.
<b>Preview-keyers</b>	With this item you can switch on or off the display of both edit presets A and B. When set to Follow-Program, this setting follows the Program-Keyers setting.
<b>Top_Layer</b>	With this setting you can choose whether the image of keyer layer A or B should be displayed on top. Default setting is B.
<b>PrstEditView</b>	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. Default this is Follow Active.
<b>Layer-A-Ctrl</b>	<p>This setting lets you select how the card is triggered to insert certain logos and texts. Available are:</p> <ul style="list-style-type: none"> <li>Manual: Manually trigger logo insertions (default)</li> <li>WHP296: logo insertions are triggered by the WHP296 DOG request signal. Use A_DOGPreset-Ena to enable the DOG trigger for each preset.</li> <li>GPI-A: logo insertions are triggered by the GPI-A pool value. Value 0 sets the preset off, value 1 sets preset A to 1. More about the GPI pool value and controls can be found in the section GPI options</li> </ul>
<b>A_Active-Preset</b>	With this active preset it is possible to select presets of logo A for the processed output (32 preset available). These presets will have an instant effect on the output. If the menu item is preceded by '#A_', it is possible to add this setting to a preset. The presets are stored in memory. It is also possible to change factory presets. Changing these presets has direct effect on the processed output.

<b>A_Edit-Preset</b>	With the edit preset item it is possible to create your own presets for logo A on the preview output without the applied changes having any instant effect on the processed output. There are 32 possible offline adjustable presets. You can freely change the selected edit preset, without <code>A_active-preset</code> being set to another setting. It will have no immediate effect on the processed output, until <code>A_active-preset</code> is changed to the setting you adjusted with <code>A_edit-preset</code> .
<b>#A_Preset_Mode</b>	With this item you can switch Logo-A entirely off for the preview output (it will have no effect on the processed output, unless <code>A_active-preset</code> and <code>A_edit-preset</code> are equal to each other). When set to <code>off</code> , logo-A will not be displayed at all. Set to <code>logo</code> will use the set ' <code>#A_</code> ' preset-setting to be activated. Default is <code>Logo</code> .
<b>#A_DOG-File</b>	This setting displays the first 32 characters of the optional DOG animation control file for the current <code>A_Edit-Preset</code> logo. This is a read only item. When this file is present, the settings <code>#A_Anim</code> , <code>#A_Animate-As</code> , <code>#A_Opacity</code> , <code>#A_Fade-In</code> , <code>-Hold</code> and <code>-Out</code> are locked and the settings are taken from this file.
<b>#A_Name</b>	This setting displays the first 32 characters of the filename for the current <code>A_Edit-Preset</code> logo. This is a read only item.
<b>#A_Width</b>	This menu item indicates the width of the image currently in use by the <code>A_Edit-Preset</code> logo. This is a read only item.
<b>#A_Height</b>	This menu item indicates the height of the image currently in use by the <code>A_Edit-Preset</code> logo. This is a read only item
<b>#A_H-Pos</b>	This setting sets the desired horizontal position of logo A. The new position must be confirmed by setting <code>#A_Pos-Update</code> . Can be ranging from 0 till a maximum of 1920 pixels (in HD 1080i/p modes). Default is pixel 0.
<b>#A_V-Pos</b>	This setting sets the desired vertical position of logo A. The new position must be confirmed by setting <code>#A_Pos-Update</code> . Can be ranging from 0 till a maximum of 1080 pixels (in HD 1080i/p modes). Default is pixel 0.
<b>#A_Pos-Update</b>	When set to <code>Update</code> , the <code>#A_H-Pos</code> and <code>#A_V-Pos</code> are updated, and it will reset to <code>No_Update</code> . Note it may take some time before the new position becomes visible, indicated by the <code>Store-Progress</code> status. The default setting is <code>No_Update</code>

<b>#A_Sequence_stat</b>	This menu item shows the read status of the animation sequence currently in use by the A_Edit-Preset logo. This is a read only item.
<b>#A_Anim</b>	Disabled, One-shot, One-shot reversed, Loop, Loop reversed, PingPong, Hold. The default setting is One-shot
<b>#A_Animate-As</b>	Sets the intended rate of an animation to display in Field or Frame. The default setting is Frame.
<b>#A_Opacity</b>	This item sets the opacity of logo A, ranging from 0% to 100%. The default setting is 100%
<b>#A_Fade-In</b>	This item sets the fade-in time of logo A in frames, ranging from 0 to 500 frames. The default setting is 0F.
<b>#A_Fade-Hold</b>	This item sets the time logo A will be held until fade-out is started, ranging from 0 to 500 frames. Selecting 0 frames will hold the logo infinitely. The default setting is 0F
<b>#A_Fade-Out</b>	This item sets the fade-out time of logo A in frames, ranging from 0 to 500 frames. The default setting is 0F
<b>#A_Transition</b>	This item selects the preset switch behavior of animations, options are to <code>Finish Animation</code> which will only switch after the animation has completed, or to <code>Switch Immediately</code> . The default setting is <code>Switch Immediately</code> .
<b>Layer-B-Ctrl</b>	<p>This setting lets you select how the card is triggered to insert certain logos and texts. Available are:</p> <ul style="list-style-type: none"> <li>▪ <code>Manual</code>: Manually trigger logo and text insertions (default)</li> <li>▪ <code>WHP296</code>: logo insertions are triggered by the WHP296 DOG request signal. Use <code>A_DOGPreset-Ena</code> to enable the DOG trigger for each preset.</li> <li>▪ <code>GPI-B</code>: logo insertions are triggered by the GPI-B pool value. Value 0 sets the preset off, value 1 sets preset B to 1. More about the GPI pool value and controls can be found in the section GPI options</li> </ul>
<b>B_Active-Preset</b>	With this active preset it is possible to select presets of logo B for the processed output (32 preset available). These presets will have an instant effect on the output. If the menu item is preceded by ' <code>#B_</code> ', it is possible to add this setting to a preset. The presets are stored in memory. It is also possible to change factory presets. Changing these presets has direct effect on the processed output.

<b>B_Edit-Preset</b>	With the edit preset item it is possible to create your own presets for logo B on the preview output without the applied changes having any instant effect on the processed output. There are 32 possible offline adjustable presets. You can freely change the selected edit preset, without <code>B_active-preset</code> being set to another setting. It will have no immediate effect on the processed output, until <code>B_active-preset</code> is changed to the setting you adjusted with <code>B_edit-preset</code> .
<b>#B_Preset_Mode</b>	With this item you can switch Logo-A entirely off for the preview output (it will have no effect on the processed output, unless <code>B_active-preset</code> and <code>B_edit-preset</code> are equal to each other). When set to <code>off</code> , logo-B will not be displayed at all. Set to <code>logo</code> will use the set ' <code>#B_</code> ' preset-setting to be activated. Default is <code>Logo</code> .
<b>#B_DOG-File</b>	This setting displays the first 32 characters of the optional DOG animation control file for the current <code>B_Edit-Preset</code> logo. This is a read only item. When this file is present, the settings <code>#B_Anim</code> , <code>#B_Animate-As</code> , <code>#B_Opacity</code> , <code>#B_Fade-In</code> , <code>-Hold</code> and <code>-Out</code> are locked and the settings are taken from this file.
<b>#B_Name</b>	This setting displays the first 32 characters of the filename for the current <code>B_Edit-Preset</code> logo. This is a read only item.
<b>#B_Width</b>	This menu item indicates the width of the image currently in use by the <code>B_Edit-Preset</code> logo. This is a read only item.
<b>#B_Height</b>	This menu item indicates the height of the image currently in use by the <code>B_Edit-Preset</code> logo. This is a read only item
<b>#B_H-Pos</b>	This setting sets the horizontal position of logo B. The new position must be confirmed by setting <code>#B_Pos-Update</code> . Can be ranging from 0 till a maximum of 1920 pixels (in HD 1080i/p modes). Default is pixel 0.
<b>#B_V-Pos</b>	This setting sets the vertical position of logo B. The new position must be confirmed by setting <code>#B_Pos-Update</code> . Can be ranging from 0 till a maximum of 1080 pixels (in HD 1080i/p modes). Default is pixel 0.
<b>#B_Pos-Update</b>	When set to <code>Update</code> , the <code>#B_H-Pos</code> and <code>#B_V-Pos</code> are updated, and it will reset back to <code>No_Update</code> . Note it may take some time before the new position becomes visible, indicated by the <code>Store-Progress</code> status. The default setting is <code>No_Update</code>
<b>#B_Sequence_stat</b>	This menu item shows the read status of the animation sequence currently in use by the <code>B_Edit-Preset</code> logo. This is a read only item.

<b>#B_Anim</b>	Disabled, One-shot, One-shot reversed, Loop, Loop reversed, PingPong, Hold. The default setting is One-shot
<b>#B_Animate-As</b>	Sets the intended rate of an animation to display in Field or Frame. The default setting is Frame.
<b>#B_Opacity</b>	This item sets the opacity of logo A, ranging from 0% to 100%. The default setting is 100%
<b>#B_Fade-In</b>	This item sets the fade-in time of logo B in frames, ranging from 0 to 500 frames. The default setting is 0F.
<b>#B_Fade-Hold</b>	This item sets the time logo B will be held until fade-out is started, ranging from 0 to 500 frames. Selecting 0 frames will hold the logo infinitely. The default setting is 0F.
<b>#B_Fade-Out</b>	This item sets the fade-out time of logo B in frames, ranging from 0 to 500 frames. The default setting is 0F.
<b>#B_Transition</b>	This item selects the preset switch behavior of animations, options are to <code>Finish Animation</code> which will only switch after the animation has completed, or to <code>Switch Immediately</code> . The default setting is <code>Switch Immediately</code> .
<b>YCK-Filter</b>	<p>This selectable lowpass filter reduces visible chroma milling on the edges of the logo.</p> <ul style="list-style-type: none"> <li>■ When set to <code>Off</code> the signal is not filtered.</li> <li>■ When set to <code>K</code>, only the Key signal is filtered.</li> <li>■ When set to <code>CK</code> both chroma and key are filtered.</li> <li>■ When set to <code>YCK</code> luma, chroma and key are filtered.</li> </ul> <p>The YCK setting gives the least aliasing after keying, but at the cost of loss of luma detail. The default is to filter CK only. The default setting is CK</p>
<b>WHP296 OPTIONS</b>	
<b>DOG-Absent-Time</b>	<ul style="list-style-type: none"> <li>• <i>The full WHP296 specification is available as the BBC Research &amp; Development White Paper WHP296.</i></li> <li>• <i>DOG = Digital On-screen Graphic</i></li> </ul> <p>When the WHP296 DOG signal (<code>psp_dog_request_data</code>) is absent for this amount of time the currently active DOG will fade out. This can be ranging from 0s to 600s. When set to zero this timer and it's detections are disabled, and the statuses will be updated by the fixed s2010 presence detection timeout of 60 seconds. The default setting is 15s.</p>

<b>DOG-FlipFlop</b>	This can be set to <i>Ignore</i> or to <i>Disable-DOG-Ctrl</i> . This is the action to perform when the WHP296DOG-FF-Det status item has detected a DOG Flip-Flop. A Flip-Flop occurs if the DOG signal or the signal presence changes more than three times a second. The action can be either to ignore this Flip-Flop or to Disable the display of the DOG. Also the <i>Layer-A/B-Ctrl</i> WHP296 setting will be set to <i>Manual</i> . The operator has to set this back to accept new WHP296 triggers.
<b>A_DOG-Range</b>	This is the range of DOG active codes in the <i>psp_dog_active</i> which map to the <i>A_Active-Preset</i> These selections are 1to32, 33to64, 65to96, 97to127. The default setting is 1to32
<b>B_DOG-Range</b>	This is the range of DOG active codes in the <i>psp_dog_active</i> which map to the <i>B_Active-Preset</i> These selections are 1to32, 33to64, 65to96, 97to127. The default setting is 33to64
<b>A_DOGPreset-Ena</b>	For each <i>A_Active-Preset</i> in range 1 to 32 this setting selects the <i>#A_DOG-Trigger</i> to disable or enable the DOG trigger. The default setting is 1
<b>#A_DOG-Trigger</b>	When set to <i>Off</i> , the DOG trigger is disabled for the preset A selected by <i>A_DOGPreset-Ena</i> . When set to <i>On</i> , the trigger is enabled. The default setting is <i>Off</i> .
<b>B_DOGPreset-Ena</b>	For each <i>B_Active-Preset</i> in range 1 to 32 this setting selects the <i>#B_DOG-Trigger</i> to disable or enable the DOG trigger. The default setting is 1
<b>#B_DOG-Trigger</b>	When set to <i>Off</i> , the DOG trigger is disabled for the preset B selected by <i>B_DOGPreset-Ena</i> . When set to <i>On</i> , the trigger is enabled. The default setting is <i>Off</i> .
<b>GPIO OPTIONS</b>	
<b>GPI-DebounceTime</b>	Only used for GPI inputs. The input contacts are debounced to assure signal stability. This value will be applied to all contacts. . Rang is 1ms to 40ms. The default setting is 10ms

**Contact\_1  
~Contact\_8**

In this card it is possible to make the 8 available GPI contacts part of a GPI pool that can control the various functions in the card separately (all `Xx_Ctrl` items of the menu). With these item you can select which pool the corresponding GPI is part of. You can also choose to not use the corresponding GPI at all by setting it to `Off`. Possible settings are:

- `GPI_A`: part of GPI-A pool, can be triggered using Take A.
- `GPI_B`: part of GPI-B pool, can be triggered using Take B.
- `GPO_C`: part of GPO-C pool, GP outputs the DOG trigger status value.

Please refer to ‘Appendix 3: GPI’s explained’ for a more elaborate explanation of the GPI settings and status items.

**GPI\_A-Take ~  
GPI\_B-Take**

Selects a take contact for the corresponding GPI pool. Possible settings are:

- `Off`: No take contact is defined, and values on the GPI contact are taken instantly.
- `Contact_1 ~ Contact_8`: The selected contact is used as a Take command for the corresponding pool. Closing the selected contact results in the card latching the value provided on the selected contacts for that pool.

Please refer to ‘Appendix 3: GPI’s explained’ for a more elaborate explanation of the GPI settings and status

**GPI\_A-Mode ~  
GPI\_B-Mode**

Selects the mode for the corresponding GPI pool. Possible settings are:

- `Prio`: Each contact triggers another value, so values are one-hot encoded.
- `Prio_latched`: This mode functions like `Prio` Mode, but the card latches the value. Each contact triggers another value, so values are one-hot encoded. Use this mode when using pushbuttons.
- `Binary`: Values are coded in a binary fashion, with code “00000000” coding for a starting value of 1, as can be seen in the GPI status items.

Please refer to ‘Appendix 3: GPI’s explained’ for a more elaborate explanation of the GPI settings and status items.

**IP\_Conf0**

With this setting you can let the card obtain an IP address automatically via DHCP, or set a `Manual IP` address. The default setting is DHCP

**mIPO**

When `IP_Conf0` is set to `Manual`, you can enter the preferred IP address here. The default setting is 0.0.0.0



<b>mNM0</b>	When <code>IP_Conf0</code> is set to <code>Manual</code> , you can enter the required Netmask <code>0.0.0.0..255.255.255.255</code> . Changing <code>NetwPrefix0</code> will update this value as well. The default setting is <code>0.0.0.0</code>
<b>NetwPrefix0</b>	With <code>IP_Conf0</code> set to <code>Manual</code> , this item lets you set a network prefix varying from 0 to 30 bit. This is an alternate entry for the actual netmask. Changing <code>mNM0</code> will update this value as well. The default setting is 0bit
<b>mGW0</b>	With <code>IP_Conf0</code> set to <code>Manual</code> , this setting let you set a Standard Gateway. The default setting is <code>0.0.0.0</code>
<b>DNS-Addr</b>	E.g. when using NTP server names, instead of IP-addresses, you need to assign your network's DNS-server address here. When <code>IP_Conf0</code> set to <code>DHCP</code> , the DNS server address is usually automatically assigned.

## 6

## Status Menu

<b>Introduction</b>	The status menu indicates the current status of each item listed below.
<b>sInp1</b>	<p>This status item indicates the presence and format of a valid signal in input 1. This is displayed as</p> <ul style="list-style-type: none"> <li>▪ 1080i60</li> <li>▪ 1080i50</li> <li>▪ 1080p24sf</li> <li>▪ 1080p30</li> <li>▪ 1080p25</li> <li>▪ 1080p24</li> <li>▪ 720p60</li> <li>▪ 720p50</li> <li>▪ 720p30</li> <li>▪ 720p25</li> <li>▪ 720p24</li> <li>▪ SD525</li> <li>▪ SD625</li> <li>▪ 1080p60</li> <li>▪ 1080p50</li> <li>▪ NA</li> </ul>
<b>sInp1_CRC_EDH</b>	Displays if there are CRC or EDH errors on input 1
<b>Ref-Format</b>	<p>Displays the reference format. Can be one of the following:</p> <ul style="list-style-type: none"> <li>▪ NA</li> <li>▪ SD525</li> <li>▪ SD625</li> <li>▪ 720p60/50</li> <li>▪ 1080i60/50</li> <li>▪ 1080p60/50</li> </ul>
<b>IO-Delay</b>	Displays the total delay in ms of outputs. Only indicated when Delay-Status is set to on.
<b>SDI1S2010Stat</b>	This indicates the status of the S2010 data on the SDI input. Can be OK, error or NA. This detection uses a fixed 60 seconds timeout because some s2010 SCTE104 sources may send packets with an interval up to one minute.
<b>SDI1S2010LineSt</b>	If S2010 data is detected on the SDI input, this indicates the video line where the S2010 data was last detected. Range is from 0 to 1125

<b>WHP296-Present</b>	This indicates the presence of the WHP296 psp_dog_request_data or DOG trigger. Can be NA, Ok or Frame-Drop. psp_dog_request_data must be present each frame, Frame-Drop indicates if there was a missing message.
<b>WHP296DOG-FF-Det</b>	If the DOG trigger is stable this is shown as Ok, when it changes more than three times a second the status will show Flip-Flop.
<b>WHP296-DOG-Stat</b>	This indicates the current value of the WHP296 psp_dog_active field. max. length 8. It shows _____ when no DOG trigger is received before. Currently it keeps showing the last received DOG trigger.
<b>PSPDOGActvStat</b>	This indicates the current DOG in decimal representation.
<b>PSPDOGActvBit</b>	This indicates the current DOG activation bit as Off (0) or On (1) enumeration.
<b>Contact-Dir</b>	Shows the direction of the physical contacts. The value is presented as a concatenated string containing one character per pin: I for Input, O for output and _ (underscore) for unassigned contacts
<b>Contact-Status</b>	Displays the currently closed GPI contacts. This is displayed as for instance 10100000 when contacts 1 and 3 are closed and for instance 01110000 when contacts 2, 3 and 4 are closed.
<b>GPI_A ~ GPI_C</b>	Displays the current value of GPI pool A, B and C respectively. Can be in range 0..255
<b>A_File-Stat</b>	Displays the currently selected name of logo A on the program keyer. When the embedded-USB storage module is not available it will display "Could not access USB device" and the red error LED on the card will be on.
<b>A_Width-Stat</b>	Indicates the width in pixels of the logo shown on program keyer A
<b>A_Height-Stat</b>	Indicates the height in pixels of the logo shown on program keyer A
<b>A_Raster-Detect</b>	Displays the currently active video output raster for Keyer A. Values can be NA, 720x480, 720x576, 1280x720, 1920x1080
<b>A_Res-Match</b>	Indicates the current size match between the Logo file raster and the A_Raster-Detect. Can be NA, OK, Failed

<b>A_Format-Match</b>	Indicates the match between animation type in frames or fields, and the actual video format in use. Can be NA, OK, Failed
<b>A_Opacity-Stat</b>	Indicates the currently used opacity in percentages of the logo used in program keyer A
<b>A_H-pos-Stat</b>	Indicates the horizontal position in pixels of the logo shown on program keyer A
<b>A_V-pos-Stat</b>	Indicates the vertical position in pixels of the logo shown on program keyer A
<b>B_File-Stat</b>	Displays the currently selected name of logo B on the program keyer. When the embedded-USB storage module is not available it will display "Could not access USB device" and the red error LED on the card will be on.
<b>B_Width-Stat</b>	Indicates the width in pixels of the logo shown on program keyer B
<b>B_Height-Stat</b>	Indicates the height in pixels of the logo shown on program keyer B
<b>B_Raster-Detect</b>	Displays the currently active video output raster for Keyer B. Values can be NA, 720x480, 720x576, 1280x720, 1920x1080
<b>B_Res-Match</b>	Indicates the current size match between the Logo file raster and the B_Raster-Detect. Can be NA, OK, Failed
<b>B_Format-Match</b>	Indicates the match between animation type in frames or fields, and the actual video format in use. Can be NA, OK, Failed
<b>B_Opacity-Stat</b>	Indicates the currently used opacity in percentages of the logo used in program keyer B
<b>B_H-pos-Stat</b>	Indicates the horizontal position in pixels of the logo shown on program keyer B
<b>B_V-pos-Stat</b>	Indicates the vertical position in pixels of the logo shown on program keyer B

**Used-GfxMem**

Displays the current usage percentage of the Graphics memory. This storage contains all of the decompressed still and animated images which are part of preset A and B. When files are added to the preset folders on the file-system, these will be automatically analysed and stored into this Graphics memory. When deleting files, the associated data in the Graphics memory will be freed and this status will display the new memory usage percentage.

**Store-Progress**

After uploading files to the file-system, the card will automatically analyse and store non-transparent areas of the image to graphics memory. This store progress shows for each animation frame the processing progress.

**Store-Report**

Report storage related errors. If all is ok, it will show the text 'Loading preset files successful In the exceptional case the Preset backup was corrupted at boot this status shows 'Error loading presets.' In runtime other messages could be displayed in case of exceptions and out of memory conditions. Example could be 'Error create preset #20' or 'No Errors' if all is ok.

**DIR-Anim-Report**

Reports parse and load errors of the Directory Animation files.

**DOG-Anim-Report**

Reports parse and load errors of the DOG Animation files

**NETWORK STATUS**
**IP\_Addr0**

This item displays the status of the IP address. It can be Manual, DHCP Asking, DHCP Leased, DHCP Infin.

**MAC0**

This item displays the MAC address of the card.

**IPO**

This item displays the current IP address of the card.

**NMO**

This item displays the current Netmask of the card.

**GW0**

This item displays the current Standard Gateway of the card.

**SFP1-Vendor**

Displays the vendor name of the SFP1 module when detected.

**SFP2-Vendor**

Displays the vendor name of the SFP2 module when detected.

<b>SFP1-Type</b>	Displays the module type of the SFP1 module when detected. Only transmit modules are supported for this firmware!
<b>SFP2-Type</b>	Displays the module type of the SFP2 module when detected. Only transmit modules are supported for this firmware!
<b>Port1-1-Enabled</b>	Displays the port status of port 1 of SFP module 1
<b>Port1-2-Enabled</b>	Displays the port status of port 2 of SFP module 1
<b>Port2-1-Enabled</b>	Displays the port status of port 1 of SFP module 2
<b>Port2-2-Enabled</b>	Displays the port status of port 2 of SFP module 2

# 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 card 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>	Ref-Status can be selected between 0 .. 255. 0= no event, 1..255 is the priority setting.
<b>Keyer-Status</b>	Keyer-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>
<b>The Message String</b>	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> =INPA_LOSS	81 <sub>hex</sub> =INPA_RETURN	input A lost or returned
Ref-Status	02 <sub>hex</sub> =REF_LOSS	82 <sub>hex</sub> =REF_RETURN	Reference lost or returned
Keyer_Status	5F <sub>hex</sub> =KEYER_ON	DF <sub>hex</sub> =KEYER_OFF	Keyers enabled or disabled.

### 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

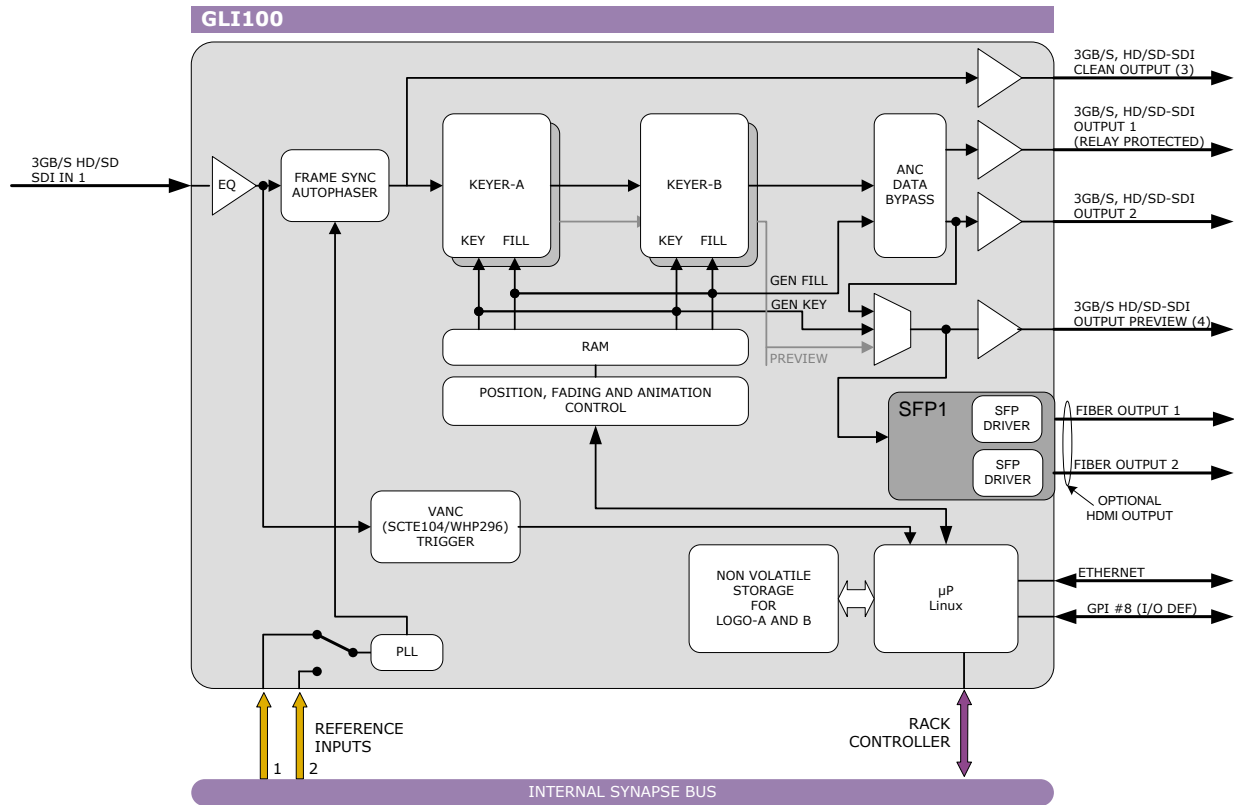
Together with the message string or the tag, the slot number or address of the card is relevant to be able to assign the event to a certain card.



## 8 LED Indication

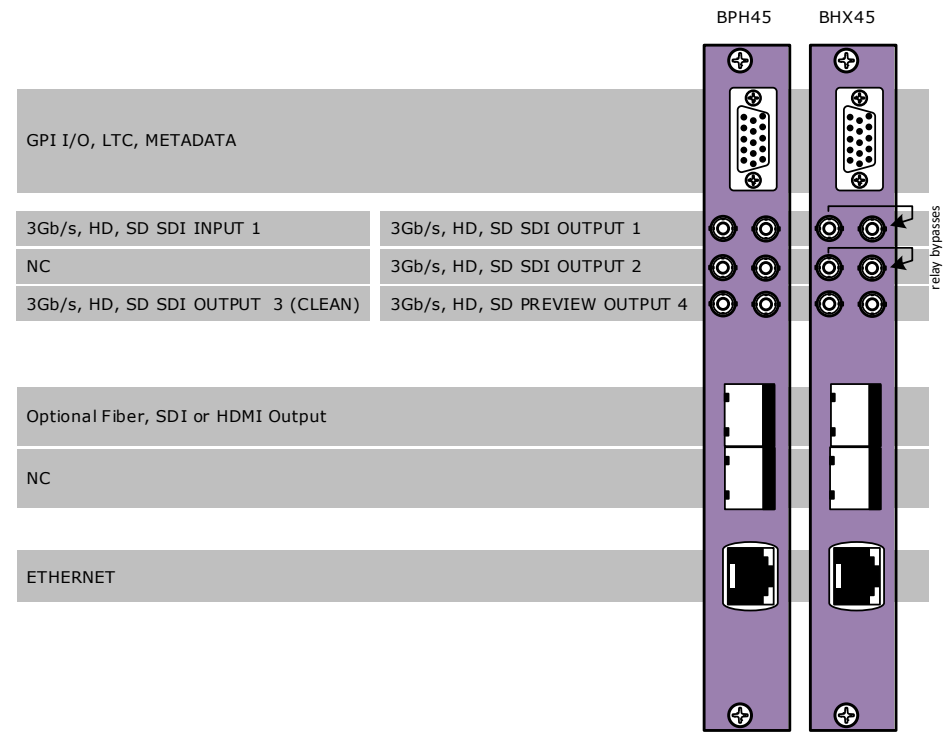
<b>Reserved LED</b>	Not used in GLI-HLI100.
<b>eUSB Err LED</b>	This LED indicates failure of the embedded-USB storage module, e.g. the module is not present or not usable by the GLI-HLI100.
<b>Error LED</b>	The error LED indicates an error if the internal logic of the card is not configured correctly or has a hardware failure.
<b>Input_1 ~ 4 LED</b>	This LED indicated the presence of a valid SDI video signal on input 1. SDI Inputs 2, 3 and 4 are not available in GLI-HLI100, thus these LEDs stay unused and are off.
<b>Reference LED</b>	Indicated the presence of a valid reference signal on the selected reference input connector (ref-1 or ref-2).
<b>ANC Data_1 ~ 4 LED</b>	Indicates the presence of embedded audio within signal on input 1. SDI Inputs 2, 3 and 4 are not available in GLI-HLI100, thus these LEDs stay unused and are off.
<b>Data Error LED</b>	This LED indicates a CRC or EDH error on any SDI input.
<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 GLI-HLI100 can be used with the BPH45 or the bypass relay equivalent BHX45. The following diagram displays the pinout of these backpanels in combination with the card.

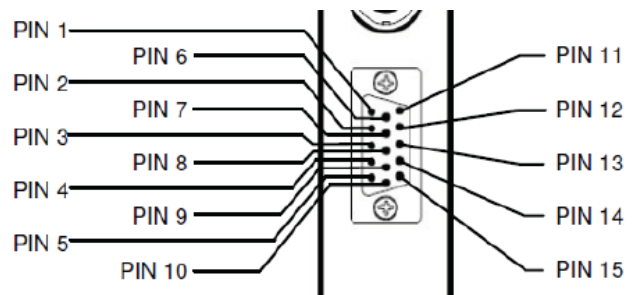


**Note** Unused inputs and outputs must be terminated with the correct impedance

### D-sub pinning

15-pin connector:

pin 01 = RX2B  
pin 02 = TX2A  
pin 03 = GPIO\_1  
pin 04 = GPIO\_3  
pin 05 = GPIO\_2  
pin 06 = RX2A  
pin 07 = GND  
pin 08 = LTC-  
pin 09 = GPIO\_4  
pin 10 = GPIO\_7  
pin 11 = TX2B  
pin 12 = LTC+  
pin 13 = GPIO\_5  
pin 14 = GPIO\_8  
pin 15 = GPIO\_6



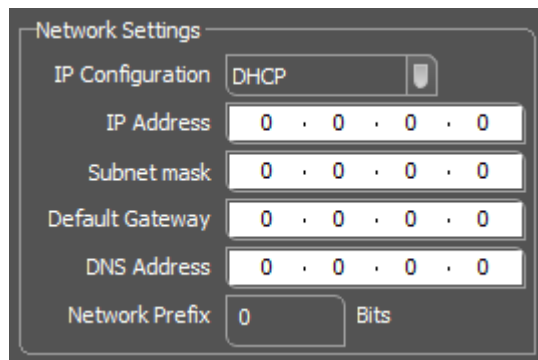
## Appendix 1 Uploading files to GLI-HLI100 card using Cortex or Cerebrum

**Introduction** The most common and easy way to upload logo or fonts is to use Cortex, which provides a GUI view to upload logos. Alternatively, FTP uploads can be used.

**Precautions** File management activities like deleting and uploading should only be performed when the card is brought off service, off air. Before the card is brought back into service, the user should verify:

1. The card started to process the new files after uploading the last file, after a **20 second time out period**. The actual process duration depends highly on the exact file contents and the amount of files and **can take several minutes to 15 minutes or longer** if lots of files are uploaded.
2. Observe the Store-progress status is at **100%** The user should not interrupt the Store-progress by reseating the card. The card enters a recovery procedure when this happens, and slows down the start-up of the card with a similar long delay as in step 1.
3. Observe the Store-report status. It should display Loading preset files successful. If an error message is displayed, it will display the preset number for the error. Those preset files must be corrected before reloading
4. Verify the Active-Preset can be changed, and the expected logo becomes visible on the processed outputs of the card.

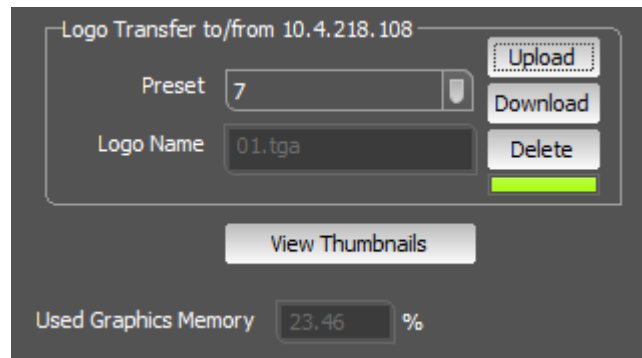
**Uploading files** Configure the IP address of the GLI-HLI100 network interface using Cortex or Cerebrum. Use DHCP or fixed IP address on your network and also configure the subnet mask. Note the GLI-HLI100 card may be on the same network as the rack controller. The IP addresses shown here are just examples, replace these addresses with others if needed. See picture below.



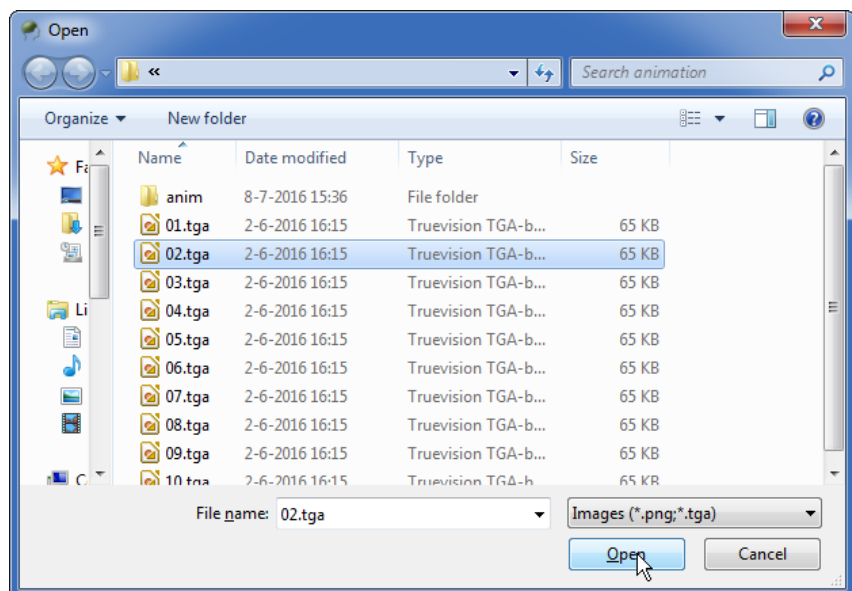
The screenshot shows a 'Network Settings' window with the following fields and values:

Field	Value
IP Configuration	DHCP
IP Address	0 . 0 . 0 . 0
Subnet mask	0 . 0 . 0 . 0
Default Gateway	0 . 0 . 0 . 0
DNS Address	0 . 0 . 0 . 0
Network Prefix	0 Bits

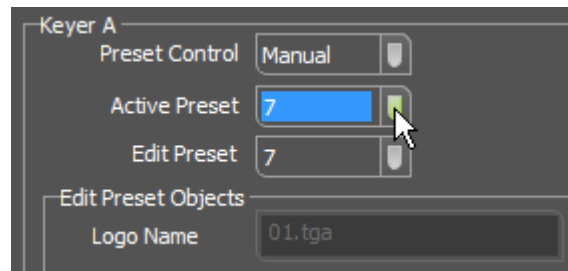
Select the “upload preset” from the drop down list, and press the Upload button.



Select a PNG or TGA file and click the Open button. The logo files must be of the PNG or TGA type, RGB plus alpha channel. Interlaced PNG files with “Adam 7” coding are not supported. Other file formats are not supported and recognized. This is by design.



The Upload will start. Observe the Store-Progress as mentioned with the Precautions. Now you only need to set the Active-Preset.



You can use the Edit-Preset to change the position, fade and animation playback.

## Appendix 2 Reprogramming the GLI-HLI100 module

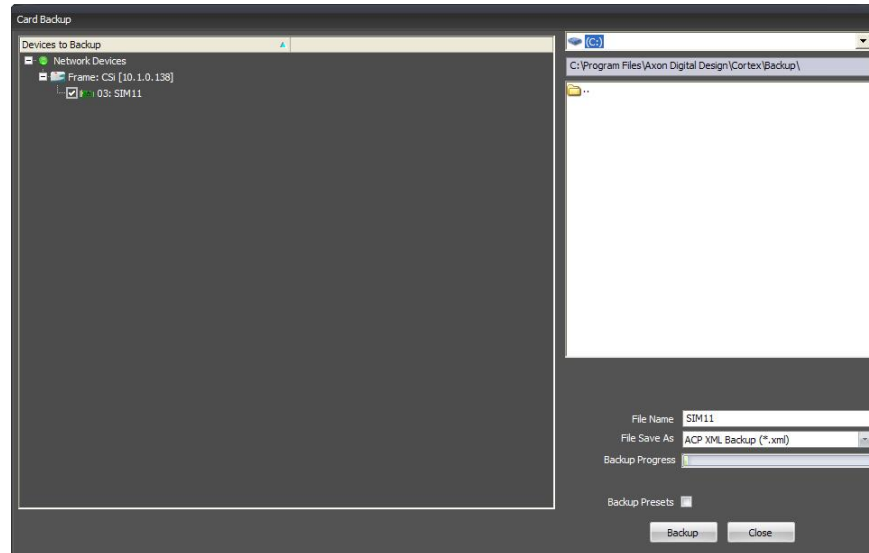
### Before you start

<b>Functionality explanation</b>	<p>A Synapse card's functionality is decided by 2 parts: the hardware platform and the software (a.k.a. firmware) that resides on the hardware platform. Changing the firmware of the cards means changing the way the card functions. To keep improving quality and to answer our customer's demands, Axon sometimes releases new software revisions of Synapse cards. These software revisions are formatted in 1 file per revision, with a .spf extension. Customers can download these .spf files from our website, or receive them via e-mail from our support so they can upgrade or reprogram their own cards.</p>
<b>Choosing .spf files</b>	<p>Not all .spf files are compatible with all hardware platforms. To know for certain that you are choosing a compatible .spf file you have to know the hardware revision of your card. This revision number can be found in the menu of the card via the control panel on the frames (select card, select 'about', check HW number) or via Cortex (Axon's control software) (select frame, select card, select 'Identity', check 'hardware rev').</p> <p>Knowing the hardware revision number, you can go to our website (<a href="http://www.axon.tv">www.axon.tv</a>) and go to our download firmware section. Here you select the card you wish to upgrade. You will see a list of available firmware upgrades of this particular card. The firmware files that are compatible with your card should display your card's hardware revision number in table next to "Hardware versions". If this is not the case you will not be able to upgrade your card with that file.</p>
<b>Requirements</b>	<p>For reprogramming or upgrading cards, you need the Cortex program installed on a PC or laptop which is connected to the same network to which the card is connected also. You can download the program free of charge from our website. For this this card you need to use Cortex version v1.091 or later. Updating the card must be done locally (direct connection) through the Ethernet of the backplane. The bottom Ethernet connection must be used.</p>
<b>Using Cortex help files</b>	<p>This manual describes how to upgrade cards using Cortex. When you are using Cortex and require card further instructions, please refer to the Cortex help files (select 'Card' in the menu &gt; select 'Upload Firmware' (the firmware uploading window will open) &gt; press F1).</p>

## Precautions

### Backup your settings

It is advised to back up the settings before upgrading the card. To do this, select the frame and card you want to upgrade. Then choose “Card” in the menu and select “Backup card”. An exact copy of the card’s menu can be stored as .xml file in the following window. The next image displays the window where this is done.



### At your own risk

During the upgrade process, the card will stop functioning for a period of time. Make sure the card you are going to upgrade is currently **not** being used by anyone in your company.



**Note** Use cortex version 1.09.01 or later. This software can be downloaded from our website. [www.axon.tv](http://www.axon.tv)

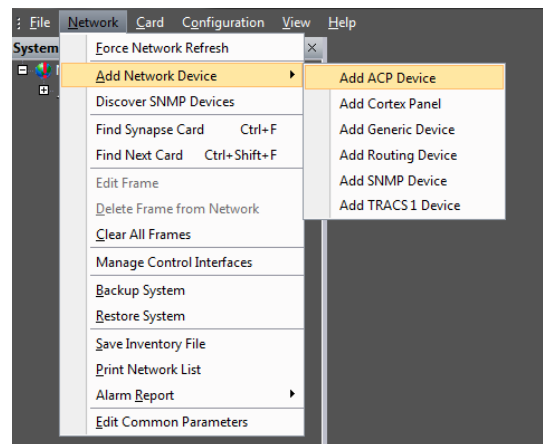


**Setting up card**

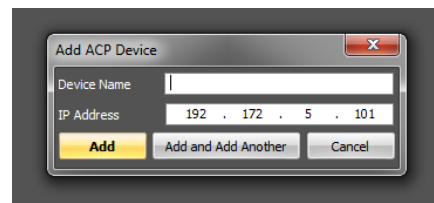
To be able to program the card direct we need to perform two steps. One is setting up of the IP address of the card and second will be making the board recognized as stand alone entity.

To set-up the IP address of the card goto the system view within the Cortex program. Select the GLI-HLI100 and goto the device view tab. Within the device tab you will be able to setup the IP address, netmask and gateway.

The next step is to make the card available as a stand alone card within the system. To add this card you need to go to the network tab at the top of the cortex program. Then go to add network device and choose add ACP device.

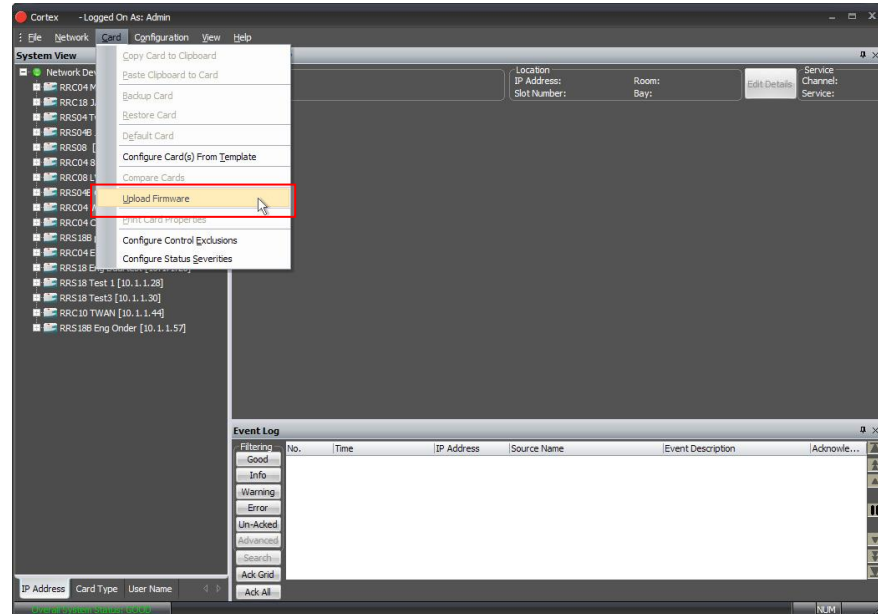


Fill out the name of the card and also the ip address.

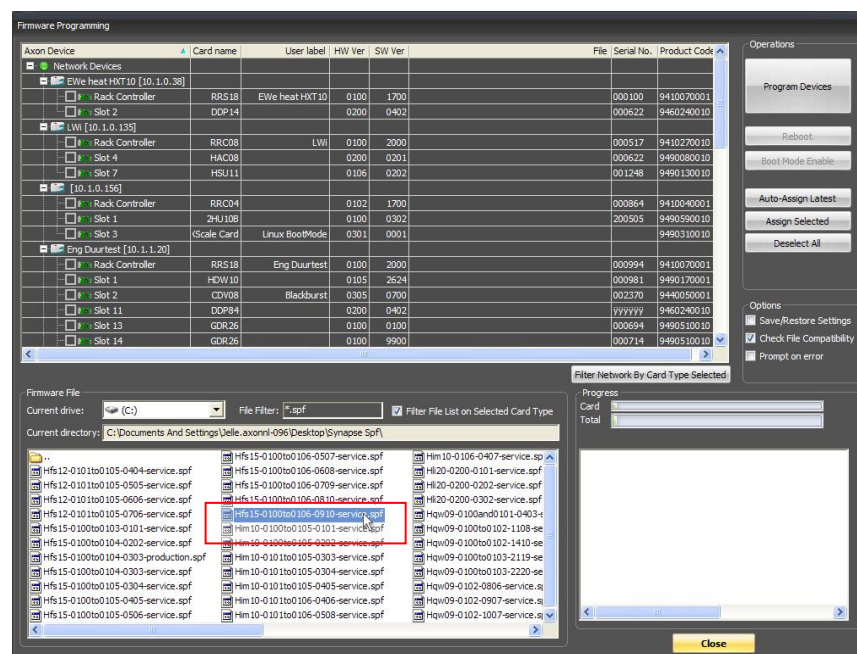


## Upload firmware

You can start upgrading the card. To do this, click ‘Card’ in the top menu and select ‘Upload Firmware’ from the dropdown box as displayed below.

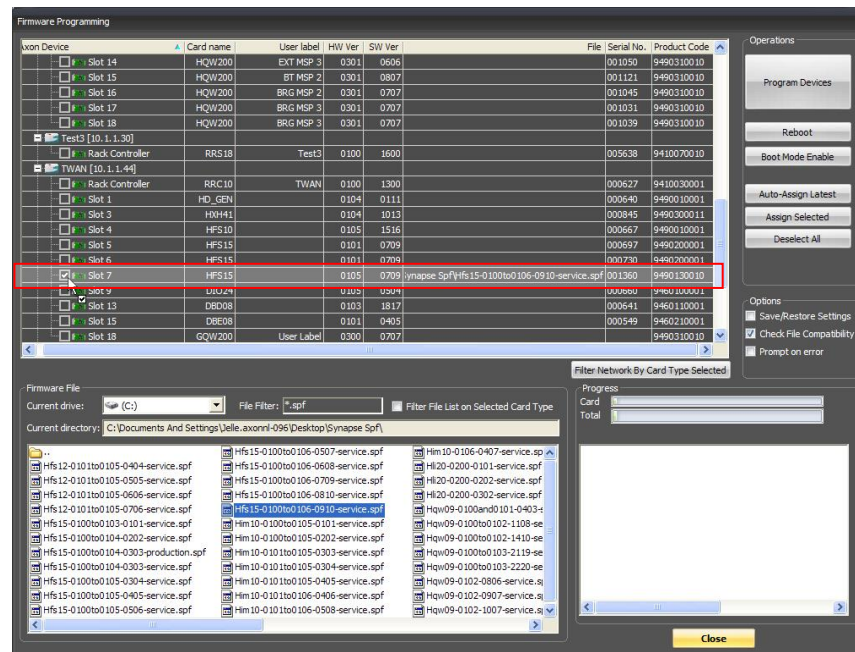


A new window will open, showing you the firmware upload functions. ***At first you must select which .spf file you want to load.*** You do this in the bottom dialog as shown below.



To select which .spf you would like to upload into the card, you click the ‘Current drive’ button and select the folder which holds your .spf files.

When you selected the .spf file, check the card(s) in which you want to load this .spf file. You can load multiple cards with the same .spf file at the same time. When the selected .spf file can not be loaded in the card you try to check an error message will appear in the bottom right box. Selecting a card is done as displayed on the next page.



## Testing

When all previous instructions have been completed the card should be functioning properly. We advise however to test the card's functionality before you are going to put it into real on-air use.

## Appendix 3 GPI's explained

### Introduction

This appendix describes the functionality of the GPI's generally used within the Synapse based products.

### General functionality

The physical contacts of a General Purpose Interface can be assigned by the user. In our cards the General Purpose Interface contacts (GPI contacts) will be named as General Purpose Input (GPI) or General Purpose Output (GPO). The GPI inputs and outputs are assignable to different preset banks. These preset banks (GPI pools) can be used to switch multiple settings at once.

Some examples of these functions:

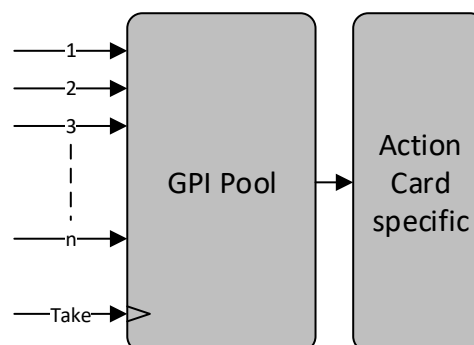
- Input selection
- Output mode
- Up conversion aspect ratio for channel A and B
- Down conversion aspect ratio for channel A and B
- Cross conversion aspect ratio for channel A and B
- Transparent aspect ratio (equal in-output) for channel A and B
- Insertion of VI, WSS, AFD (S2016) for channel A and B
- Audio shuffling, gain and phase

### Contact assignment

The physical contacts can be assigned as input or output. In the menu of a card, these will be called `Contact_N` depending on the amount of contacts available. Contacts could be Inputs, outputs or bi-directional I/O. The `Contact_N` menu item will be used to assign this specific contact to input or output pools. The choices are `Off`, `GPI_A`, `GPI_B`, `GPI_C`, ..., `GPI_N`, `GPO_A`, `GPO_B`, `GPO_C`, ..., `GPO_N` depending on the amount of contacts and pools.

### Pools

A GPI/GPO pool is a place where contacts are collected to form an output trigger.



## Take

The GPI contacts not only can be used as GPI contact but also can be assigned as Take contact. The menu item is called GPI\_n-Take. Where n is the amount of GPI pools in the product. Every pool can only have one Take contact. There will be no restrictions in assigning the contact to a GPI pool and Take function at the same time. The values will be 1 to x. When assigning a take pin to a pool set to Prio\_Latched mode, the pool will behave the same as when set to Prio mode with a take pin assigned. This is because the take pin overrules the latched functionality of the Prio\_Latched mode.

## Debounce time

The input contacts need to be debounced to assure signal stability. The debounce time can be set in the GPI-DebounceTime object in a range of 1-40 ms. This value will be applied to all contacts. In software implementations setting a custom debounce time is not supported due to technical limitations.

## Pool Mode: GPI

Every GPI pool can be set up to process the input contacts in three ways. This setting is called GPI\_n-Mode and can be set into priority (Prio), priority latched (Prio\_Latched) and Binary mode. N is defined as a character in the range from A-Z depending on the number of pools. The default output value of a pool is always 0. In some cards there is an option to choose Off, Preset1 etc. in other cards you will have the option to choose from Preset 1, Preset 2 etc. Depending on this the functionality will respond differently. In cards where there is no Preset off functionality translates to preset 1 in Axon products. In cards where there is a Preset off functionality, it translates to Preset Off. In priority mode, the contact, which has the highest priority, defines the pool value. Priority is defined as ranging from the least significant bit (low priority) to the most significant bit (high priority). This is essentially a one-hot coding of preset values.

### Normal Preset encoding

If a pool has three contacts connected and all inputs are high, the output value of the pool will be 3. Another example is when three contacts are connected to a pool with the first and third contact are low and the second contact is high the output value is 2.

Contact 3	Contact 2	Contact 1	Pool value	Preset nr
0	0	0	0*	1
0	0	1	1	1
0	1	X	2	2
1	X	X	3	3

*\*Can't occur in prio\_latched mode*

Table 1 Pool value in prio and prio\_latched mode

In binary mode, the contacts are interpreted as a binary value of concatenated contacts available in a pool. E.g. assigning two contacts to a GPI pool translates to the following output values.

Contact 2	Contact 1	Pool value	Preset nr
0	0	0	1
0	1	1	2
1	0	2	3
1	1	3	4

Table 2 Pool value in binary mode

### Preset encoding with Off

If a pool has three contacts connected and all inputs are high, the output value of the pool will be 3. Another example is when three contacts are connected to a pool with the first and third contact are low and the second contact is high the output value is 2.

Contact 3	Contact 2	Contact 1	Pool value	Preset nr
0	0	0	0*	Off
0	0	1	1	Off
0	1	X	2	1
1	X	X	3	2

\*Can't occur in prio\_latched mode

Table 3 Pool value in prio and mode

In binary mode, the contacts are interpreted as a binary value of concatenated contacts available in a pool. E.g. assigning two contacts to a GPI pool translates to the following output values.

Contact 2	Contact 1	Pool value	Preset nr
0	0	0	Off
0	1	1	1
1	0	2	2
1	1	3	3

Table 5 Pool value in binary mode

## Pool Mode: GPO

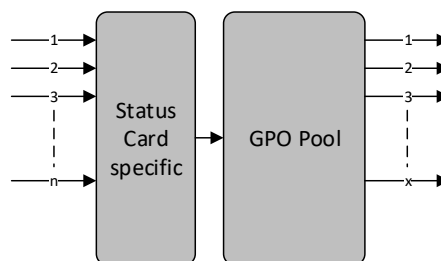


Figure 1 GPO pool

Every GPO pool can be set up to process the input values in two ways. This setting is called GPO\_n-Mode and can be set into Priority (Prio) or Binary mode. N is defined as a character in the range from A-Z depending on the number of pools. The default output value of a pool is always 0.

In priority mode, the value is translated to one-hot encoding on the output contacts. See table below.

## Normal Preset Encoding

Preset nr	Pool value	Contact 3	Contact 2	Contact 1
1	0	0	0	0
1	1	0	0	1
2	2	0	1	0
3	3	1	0	0

Table 6 Pool value in priority mode

In binary mode the input value is exposed on the output contacts as binary value.

Preset nr	Pool value	Contact 2	Contact 1
1	0	0	0
2	1	0	1
3	2	1	0
4	3	1	1

Table 7 Pool value in binary mode

## Preset Encoding with Off

Preset nr	Pool value	Contact 3	Contact 2	Contact 1
Off	0	0	0	0
Off	1	0	0	1
1	2	0	1	0
2	3	1	0	0

Table 8 Pool value in priority mode

In binary mode the input value is exposed on the output contacts as binary value.

Preset nr	Pool value	Contact 2	Contact 1
Off	0	0	0
1	1	0	1
2	2	1	0
3	3	1	1

Table 9 Pool value in binary mode

GPO\_n-Source is the setting with which a function is assigned to a GPO pool. E.g. when the output format needs to be reflected on the output contacts, this setting may be set to something like Output\_Format. The contents of the enumeration are product specific.

**Statuses:  
Contact  
direction**

This status `Contact-Dir` shows the direction of the physical contacts. The value will be presented as a concatenated string containing one character per pin: `I` for Input, `O` for output and `_` for unassigned contacts.

**Statuses:  
Contact status**

`Contact-Status` shows the current logical value of the physical contacts, formatted as a concatenated string containing one character per pin: `1` for asserted, `0` for non-asserted and `_` for unassigned.

**Statuses: GPI  
status**

`GPI_n` is an integer which reflects the value of the pool.

**Statuses: GPO  
status**

`GPO_n` is an integer which reflects the value of the pool.

**Example 4: Two  
pools in binary  
mode**

We are controlling the up-converter presets using Pool A (`Up_CtrlA` set to `GPI_A`) and the output mode setting using Pool B (`Out-mode-Ctrl` set to `GPI_B`). Both pools are working in priority mode. The GPI's need to be set-up in the following way:

- Set `GPI_A-Mode` to `Prio`
- Set `Contact_1` to `GPI_A`
- Set `Contact_2` to `GPI_A`
- Set `Contact_3` to `GPI_A`
- Set `Contact_4` to `GPI_A`
- Set `GPI_B-Mode` to `Prio`
- Set `Contact_5` to `GPI_B`

Pool A now consists of GPI 1, GPI 2, GPI 3 and GPI 4 in a priority mode, controlling the up-converter preset. Pool B consists only of GPI 5 (also in priority mode), controlling the output mode setting.

Pool A now works as follows:

Contact_4 status	Contact_3 status	Contact_2 status	Contact_1 status	GPI_A value
0	0	0	0	Logo inserter Preset Off
0	0	0	1	Logo inserter Preset Off
0	0	1	0	Logo inserter Preset 1
0	1	0	0	Logo inserter Preset 2
1	0	0	0	Logo inserter Preset 3
0	1	1	0	Logo inserter 2 (because highest gets priority)
1	1	1	1	Logo inserter Preset 3 (because highest gets priority)

Table 16 Pool value in priority mode



Contact_4 status	Contact_3 status	Contact_2 status	Contact_1 status	GPI_A value
0	0	0	1	Logo inserter Preset Off
0	0	1	0	Logo inserter Preset Off
0	1	0	0	Logo inserter Preset 1
1	0	0	0	Logo inserter Preset 2
0	1	1	0	Logo inserter 1 (because highest gets priority)
1	1	1	1	Logo inserter Preset 2 (because highest gets priority)

Table 17 Pool value in priority latched mode

Pool B now works as follows:

Contact_5 status	GPI_B value
0	A out only
1	B out only

Table 18 Pool value in priority mode

### Example 5: One pool in binary mode and one in priority mode

Let's say we would like to control the GXG up-converter presets using Pool A (Up\_CtrlA set to GPI\_A) in binary mode and the audio presets using Pool B (Audio\_Ctrl set to GPI\_B) in priority mode. We could do the following:

- Set GPI\_A-Mode to binary
- Set Contact\_1 to GPI\_A
- Set Contact\_2 to GPI\_A
- Set GPI\_A-Take to Contact\_3
- Set GPI\_B-Mode to Prio
- Set Contact\_4 to GPI\_B
- Set Contact\_5 to GPI\_B

Pool A now consists of GPI 1, GPI 2 and GPI 3 (as take) in binary mode, controlling the up-converter preset. Pool B now consists of GPI 4 and GPI 5 in priority mode, controlling the audio presets.

Pool A now works as follows:

Contact_2 status	Contact_1 status	Preset value (when Contact_3 (take) is closed)
0	0	Logo inserter Preset Off
0	1	Logo inserter Preset Off
1	0	Logo inserter Preset 1
1	1	Logo inserter Preset 2

Table 19 Pool value in priority mode

Pool B now works as follows:

Contact_5 status	Contact_4 status	Preset value
0	0	Audio Preset Off
0	1	Audio Preset Off
1	0	Audio Preset 1
1	1	Audio Preset 2 (because highest gets priority)

Table 20 Pool value in priority mode

Contact_5 status	Contact_4 status	Preset value
0	1	Audio Preset Off
1	0	Audio Preset 1
1	1	Audio Preset 1 (because highest gets priority)

Table 21 Pool value in priority latched mode

## Example 6: Two pools in priority mode

Let's say we would like to control the up-converter presets using Pool A (Up\_CtrlA set to GPI\_A) in priority mode and the audio presets using Pool B (Audio\_Ctrl set to GPI\_B) in priority mode. We could do the following settings:

- Set GPI\_A-Mode to Prio
- Set Contact\_1 to GPI\_A
- Set Contact\_2 to GPI\_A
- Set GPI\_B-Mode to Prio
- Set Contact\_3 to GPI\_B
- Set Contact\_4 to GPI\_B

Pool A now consists of GPI 1 and GPI 2 in a priority mode, controlling the Up converter preset. Pool B now consists of GPI 3 and GPI 4 in a priority mode, controlling the audio presets.

Pool A now works as follows:

Contact_2 status	Contact_1 status	Preset value
0	0	Logo inserter Preset Off
0	1	Logo inserter Preset Off
1	0	Logo inserter Preset 1
1	1	Logo inserter Preset 1 (because highest gets priority)

Table 22 Pool value in priority mode

Contact_2 status	Contact_1 status	Preset value
0	1	Logo inserter Preset Off
1	0	Logo inserter Preset 1
1	1	Logo inserter Preset 1 (because highest gets priority)

Table 23 Pool value in priority latched mode

Pool B now works as follows:

Contact_4 status	Contact_3 status	Preset value
0	0	Audio Preset Off
0	1	Audio Preset Off
1	0	Audio Preset 1
1	1	Audio Preset 1 (because highest gets priority)

Table 24 Pool value in priority mode

Contact_4 status	Contact_3 status	Preset value
0	1	Audio Preset Off
1	0	Audio Preset 1
1	1	Audio Preset 1 (because highest gets priority)

Table 25 Pool value in priority mode



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