INSTALLATION & CONFIGURATION MANUAL

GXG400 – GXG410

3GB/S, HD AND SD UP/DOWN/CROSS CONVERTER AND SYNCHRONIZER WITH OPTIONAL AUDIO SHUFFLER

SYNAPSE

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Regional Contacts

The address and phone number of the EVS headquarters are usually mentioned in the **Help > About** menu in the user interface.

You will find the full list of addresses and phone numbers of local offices either at the end of this user manual (for manuals on hardware products) or on the EVS website on the following page: http://www.evs.com/contacts.

User Manuals on EVS Website

The latest version of Media Infrastructure manuals are available at: https://mi-sftp.evs.com/
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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 EVS distributor.
● NEVER expose this product to extremely high or low temperatures.
● NEVER operate this product in an explosive atmosphere.

Warranty: EVS warrants their products according to the warranty policy as described in the general terms. That means that EVS Broadcast Equipment SA can only warrant the products as long as the serial numbers are not removed.

Date created: 24-02-2015
Date last revised: 07-09-2015

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

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

EVS Broadcast Equipment GXG400 – GXG410 FC Tested To Comply With FCC Standards FOR HOME OR OFFICE USE	This device complies with part 15 of the FCC Rules Operation is subject to the following two conditions: (1) This device may cause harmful interference, and (2) This device must accept any interference received, including interference that may cause undesired operation.

Index

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 EVS Broadcast Equipment SA Website at http://www.evs.com 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:** "EVS 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 EVS Cortex installed, as this increases the ease of use and understanding of the modules.

2 Unpacking and Placement

Unpacking

The EVS 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

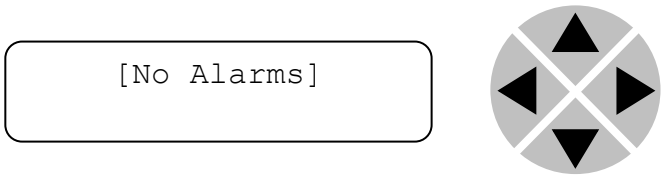
On powering up the Synapse frame, the card set will use basic data and default initialisation settings. All LED's will light during this process. After initialisation, several LED's will remain lit – the exact number and configuration is dependent upon the number of inputs connected and the status of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

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

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

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

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

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

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

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

EVS 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. EVS 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 EVS 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 GX400/GXG410 Card

Introduction

The GXG400/410 is a **high end** up/down/cross converter. Based on EVS's **M**otion **O**ptimized **Q**uality **D**e-interlacer (**MOQD)**, and extensively computer optimized scaling and filter algorithms the new 400 series of up/down/cross converters ensure the absolute best quality video conversion from any standard to any standard within the same framerate. The card allows you to simulcast any output standard in any format from any source standard.

The embedded audio is carried over to the SD, HD or 3Gb/s domain. The appropriate aspect ratio can be applied by control of VI, WSS and GPI inputs by use of 16 presets per output that can store the aspect ratio conversions.

Beside a high quality up/down/cross converter, these cards also have very powerful audio shufflers and proc-amps (410 only). Any of the 64 audio source channels (16 from SDI 1, and 32 from the quad speed audio bus) can be routed to any of the 48 output channels (16 to SDI output 1 and 32 to the quad speed audio bus)

Features

- Industry highest quality de-interlacing algorithm using EVS's MOQD
- 3Gb/s signals level A and level B compatible
- Compatible with the following formats
  - 1080p/59.94
  - 1080p/50
  - 1080i/59.94
  - 1080i/50
  - 1080p/29.97
  - 1080p/25
  - 720p/59.94
  - 720p/50
  - SD525
  - SD625
- Regardless of the conversion, every conversion will have a constant latency.
- Multiple external Inputs and Outputs
  - 4 SDI inputs and outputs
  - Up to 4 optional extra inputs/outputs by use of 2 SFP cages (fiber or coaxial, CVBS and HDMI)
  - 10Gb/s Ethernet connection for future use of Ethernet based video like AVB
  - 7 configurable GPI I/O contacts
  - Ethernet for control
  - LTC and Metadata input
- Frame synchronizer with auto-phaser and control in Frames, Lines and pixels with respect to reference.
- All ARC modes contain Anamorphic, Center Cut, V-Zoom, LBox-16:9, LBox-14:9, PBox-4:3, PBox-14:9 and Variable H and V (50-200%)

- 16 free individual programmable preset banks with settings for:
  - Down conversion, Up conversion and Cross conversion
  - Transparent pass through (with ARC function)
  - Simultaneous VI, WSS and AFD (S2016) insertion
  - Embedder shuffling, gain and phase (in GXG410 only)
  - audio delay setting (in GXG410 only)
- ARC triggers by VI, WSS, WSS-ext and S2016 (AFD)
- Transparent for 16 channels of embedded audio per video channel
- Embedded domain 64x64 routing to and from the individual in/outputs and Quad Speed Audio Bus (410 only)
- Video proc-amp (Y and C control)
- Color corrector (RGB and total gain, RGB and total black)
- Medium latency conversion process (2 frames)
- Quad Speed Embedding and de-embedding through synapse bus
- Locks to Tri-level, Bi-level or SDI input 1 or 2
- Full control and status monitoring through the front panel of the SFR04/SFR08/SFR18 frame and the Ethernet port (ACP)

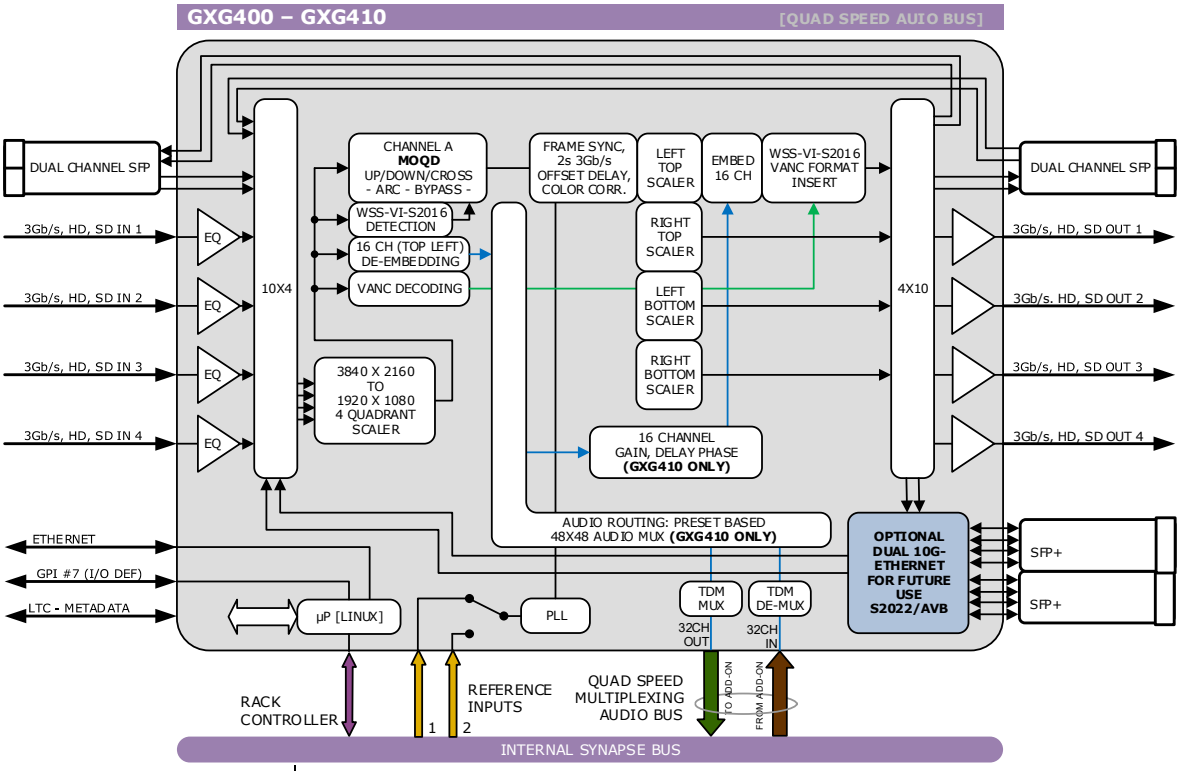
Conversion capabilities

		CONVERSION	Output													
			2160p59.94	2160p50	1080p59.94	1080p50	1080p29.97	1080p25	1080i59.94	1080i50	720p59.94	720p50	720p29.97	720p25	480i59.94(525)	576i50(625)
HDMI Input	SDII Input	2160p59.94			x		x		x		x*		x*		x*	
		2160p50				x		x		x		x*		x*		x*
		1080p59.94	x		x		x		x		x		x		x	
		1080p50		x		x		x		x		x		x		x
		1080p29.97	x		x		x		x		x		x		x	
		1080p25		x		x		x		x		x		x		x
		1080i59.94	x		x		x		x		x		x		x	
		1080i50		x		x		x		x		x		x		x
		720p59.94	x		x		x		x		x		x		x	
		720p50		x		x		x		x		x		x		x
		720p29.97	x		x		x		x		x		x		x	
		720p25		x		x		x		x		x		x		x
		480i59.94(525)	x		x		x		x		x		x		x	
		576i50(625)		x		x		x		x		x		x		x
	CVBS	480i59.94(NTSC)	x		x		x		x		x		x		x	
		576i50(PAL)		x		x		x		x		x		x		x

Applications

- High End Truck frame synchronizer and anything to anything converter
- High End Infrastructure up/down/cross conversion
- High End transmission up/cross conversion

Block schematic



Important notice about closed captions

Historically, closed captions were transmitted in NTSC line 21 according to EIA-CEA-608-B (bit rate 960b/s). This allowed two caption data bytes per field to be transmitted. With the introduction of HD and 3Gb/s the new EIA-708-B Closed Caption standard was created, which sends closed caption data in DTVCC packets. This allows sending more data per field (bit rate 9600b/s) for extended language, color support, PMT and EIT and timecode data.

Besides the new DTVCC packets, the EIA-708-B caption stream may also include EIA-CEA-608-B data bytes which are stored as NTSC compatibility bytes for compatibility with old decoders.

EIA-CEA-608-B Transparency
This card is fully transparent to EIA-CEA-608-B caption streams.

EIA-CEA-608-B to EIA-708-B Translation
For EIA-CEA-608-B to EIA-708-B translation, the EIA-CEA-608-B bytes will be mapped on-one-on to the NTSC compatibility bytes. Furthermore, the EIA-CEA-608-B bytes will be remapped to DTVCC packets.

EIA-708-B to EIA-CEA-608-B Translations
There are EIA-708-B DTVCC captions which are not translatable to EIA-CEA-608-B. Therefore the NTSC compatibility bytes will be used for EIA-708-B to EIA-CEA-608-B translation. So the DTVCC packets from the input will be ignored.

EIA-708-B Transparency
This card is not fully transparent to EIA-708-B caption streams. The NTSC compatibility bytes are transparent, but the DTVCC packets are regenerated from the NTSC compatibility bytes. So the DTVCC packets from the input will be ignored.

Note for EIA-708-B DTVCC output caption data:
Only supports EIA-CEA-608-B translation of the primary language (CC1). So CC2 to CC4, T1 to T4 and XDS translations are not supported.

5 Settings Menu

Introduction

The settings menu displays the current state of each GXG4x0 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.

HDMI

HDMI1-Format ~ HDMI2-Format

Here you select the output format of the corresponding HDMI output module. Possible modes are

- `RGB444` (default)
- `YCrCb422`
- `YCrCb444`

HDMI1-DVI-Mode ~ HDMI2-DVI-Mode

With these settings you set the corresponding HDMI output to either `DVI-Mode` or `HDMI-Mode`. Default is `DVI-Mode`.

HDMI1-GrpA-Sel ~ HDMI2-GrpA-Sel

The HDMI outputs can contain 2 groups of audio. Here you select which input group should be in group A of the corresponding HDMI output. Can be group 1, 2 3 or 4. Default is Group 1.

HDMI1-GrpB-Sel ~ HDMI2-GrpB-Sel

The HDMI outputs can contain 2 groups of audio. Here you select which input group should be in group B of the corresponding HDMI output. Can be group 1, 2 3 or 4. Default is Group 2.

HDMI1-Mute-All ~ HDMI2-Mute-All

Here you can mute all audio on the corresponding HDMI output. Off means no audio mute. On means all audio is muted. Default is off.

	CVBS
CVBS1-In-Format ~ CVBS4-In-Format	With these settings you select the analog input format of the corresponding CVBS input. Possible formats are: ▪ `PAL-BGHID` (default) ▪ `PAL-N` ▪ `NTSC-M` ▪ `PAL-M` ▪ `NTSC-4.43` ▪ `NTSC-J` ▪ `PAL-60`
CVBS1-Input-Hue ~CVBS4-Input-Hue	Sets the Hue of the CVBS SFP input module. Can be set between -90 and 90. Default is 0.
IO-Ctrl	This function isn't currently not accessible but will be enabled in a software release in the future.
IO_Prst_Act	With this item you can manually change the currently active IO settings. Can be any preset between 1 and 8. By default it is set to 1. All menu settings that are preceded with a '`#` '-prefix under the '`SYSTEM SETTINGS`' header are part of the preset.
IO_Prst_Edit	Here you can select which of the 8 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 menu settings that are preceded with a '`#` '-prefix under the '`SYSTEM SETTINGS`' header are part of the preset.
PrstEditView	With this setting set to `Follow Active`, the edit preset settings (like for instance `UP_Prst_editA` and `UP_Prst_editB`) will follow the active preset when the active preset is changed. This to avoid confusion when changing the active. Set to `Independent` the edit preset will not automatically follow active preset changes. By default set to `Follow Active`.
#Inp_SelA	With this item you can select which input you want to use for Channel A. It is possible to select physical inputs; `SDI-1, SDI-2, SDI-3, SDI-4, SFP1-1, SFP1-1, SFP1-2, SFP2-1, SFP2-2, SFP-4K` or `SDI-4K`. You can also choose a `Zoneplate` or `Colorbar` as input. The default for this setting is `SDI-1`.

#Out-FrmtA

With `Out-Frmt` you can set what the output should be of channel A as well as channel B. Possible settings are:

- `2160p50`, `2160p60`
- `1080i60` (default), `1080i50`
- `1080p50`, `1080p60`
- `1080p30`, `1080p25`
- `720p60`, `720p50`
- `720p30`, `720p25`
- `SD525`, `SD625`

#Output_Map_A

This sets the output mapping of channel A. `Level-A` and `Level-B` are the possible settings. `Level-A` is default.

#4K_Map_A

This sets the 4K mapping. Currently the options are `4Ch-4Quadrants` or `4Ch-SI`. More options will be added in future releases.

#Out-Mode

Sets the output mode. Currently fixed to `A Only`. More options will be added in future releases.

#F-delayA

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

Input format	Output format	Maximum F-delay
i50/i60	i50/i60	25fr
i50/i60	p50/p60	50fr
i50/i60	p25/p30	25fr
p25/p30	p50/p60	50fr
p25/p30	p25/p30	50fr
p25/p30	i50/i60	50fr
p50/p60	p50/p60	50fr
p50/p60	p25/p30	25fr
p50/p60	i50/i60	25fr

#V-delayA

`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 0 to a maximum of 1124 lines (dependant on I/O format). The default setting is `0ln`. The preset master for this is `Out-Frmt`, hence the '#'-prefix.

#H-delayA

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 a maximum of 5124 pixels (dependant on I/O format). The default setting is `0px`. The preset master for this is `Out-Frmt`, hence the '#'-prefix.

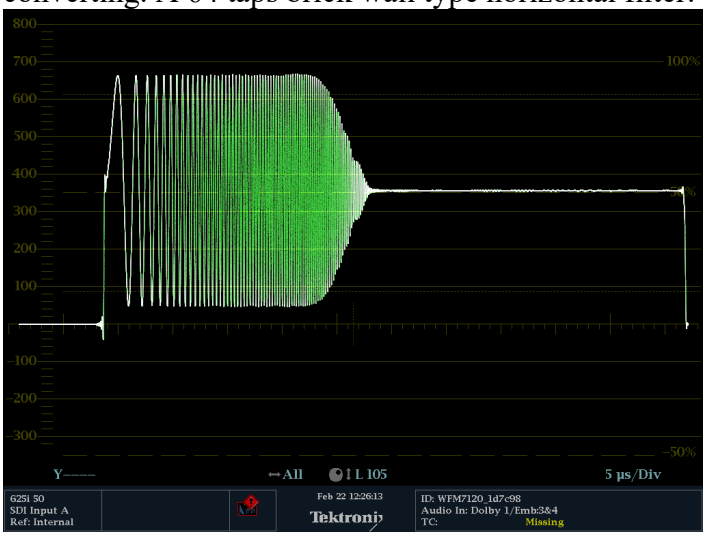
#Freeze_A

`Freeze` enables the capture of one Video Frame. The settings of `Freeze` are `On` or `Off`. The default setting is `Off`.

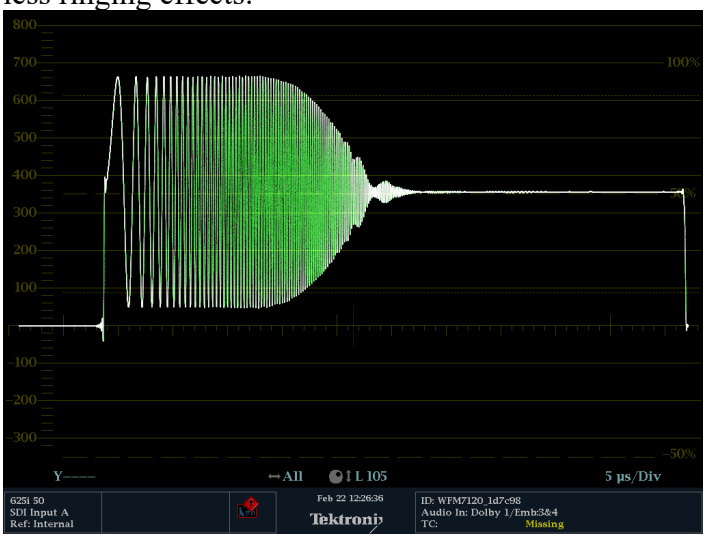
#HD_SD_LPF_A ~ #K4_down_LPF_A

Here you can set the horizontal and vertical video low-pass filter for channel A. There is a separate lowpass filter settings for 4K downconvert mode (`#K4_down_LPF_A`). These are the possible settings:

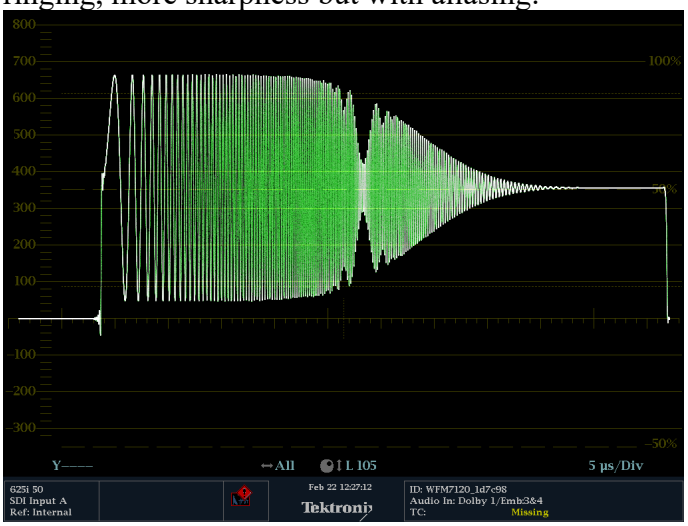
- `Off`: the normal broadband filters will be used when the card is converting. A 64 taps brick wall type horizontal filter:



- `H_only`: a less steep filter with no aliasing Y and soft for C for less ringing effects:



- `V_only`: vertical filters will be active which “soften” the image and prevents “ring”-effects in down converted content.
- `H_And_V`: same horizontal filter as described under `H_Only` will be active, together with the vertical filters described under `V_only`.
- `H2_Only`: less steep filter with aliasing and soft for C for less ringing, more sharpness but with aliasing:



- `H2_And_V`: same horizontal filter as described under `H2_Only` will be active, together with the vertical filters described under `V_only`.

Note: When the card is in **transparent** mode, the filters will be entirely bypassed.

#VANC_TransA

Enables or disables the transfer from input to output of selected Vertical Ancillary (VANC) lines. When the input format is the same as the output format, the card is able to carry up to 6 lines containing packets inserted in the Luminance Channel of the Vertical Ancillary space to the output. With settings `#VANC_Trans_Ln0` to `#VANC_Trans_Ln5` the user may select which lines to carry through to the output. The possible settings of `#VANC_Trans` are `On` or `Off`. The default setting is `Off`.

#VANC_Trans_Ln0A ~ #VANC_Trans_Ln5A

Selects a line to carry from input to output. You can choose 5 lines. Refer to `#VANC_Trans`. Can be any line from line 7 through 41. If for instance line 7 is selected, line 7 from the input is carried to line 7 at the output.

Pos-Prst_Act

This function isn't currently not accessible but will be enabled in a software release in the future.

Pos-Prst_edit

This function isn't currently not accessible but will be enabled in a software release in the future.

#H-Pos-A

This function isn't currently not accessible but will be enabled in a software release in the future.

#V-Pos-A

This function isn't currently not accessible but will be enabled in a software release in the future.

Lock-Mode

`Lock-Mode` determines whether the card is locked to his `input` (input 1), to the reference (`Ref1` or `Ref2`)

Delay-Status

It is possible to display (in the status menu `IODelayA` and `IODelayB`) the processing time of the card in the status menu. This setting allows you to switch this function `On` or `Off`. Default setting is `Off`

Dolby-E-ModeA

With this setting you can turn the Dolby-E alignment on or off. If this setting is set to `Align`, the card will correct any offset between -0,5 frame and +0,5 frame automatically. This correction will be added to the audio delay which is needed to track the video delay (IO-delay). If this setting is set to `Off`, the Dolby-E will be handled transparently.

The Dolby-E will be aligned according the Dolby-E recommended line positions, which are output format dependant.

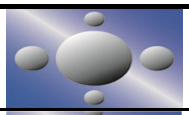
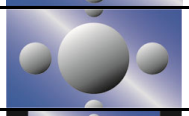
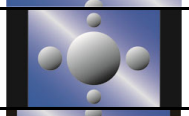
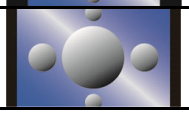
Note: Assumes all Dolby E pairs from the de-embedded SDI input are aligned with reference to each other.

PatternSpeed	Sets the speed of the test-pattern (see settings `Inp_SelA` and `Inp_SelB`) animation between 0 (still) and 15 (fast). Default 1.
WST-InsertA	Disables or Enables WST insertion in SD formats
S2031-OP47-DecA	With this setting you select which input source of channel A will be decoded. Can be set to `Auto`, `S2031` or `OP47`. When set to `Auto`, the input source which is available will be selected. Default is `Auto`. Note: When both S2031 and OP47 sources are available at the input, only S2031 will be decoded (S2031 has priority over OP47).
S2031-OP47-EncA	With this setting you select if OP47 or S2031 of channel A will be encoded for HD and 3Gb/s output formats. Can be set to `Off`, `S2031` or `OP47`. When `Off` is selected, nothing will be inserted. Default is `Off`.
S2031-EmbA	With this setting you set in which line of channel A the S2031 data should be inserted. Can be any line between line 8 (def.) and line 16.
S2031-WST-DefA	This setting is only applicable for a S2031 input source containing undefined WST lines which are translated to a WST or OP47 output. WST lines (which are packetized in S2031) are called undefined when having line number 0. For such lines it is free during translation to WST to decide in which WST line numbers they will be inserted. In our case the setting S2031-WST-defA will define the start WST line number of channel A, which will continuously be followed by other WST lines. Can be any line between line 7 and line 22. Default is line 7.
OP47-SDP-Emb_A	With this setting you set in which line the OP47 data of channel A should be inserted. Can be any line between line 8 and line 16. Default is 8.
SD_AR-Det	This card can switch between presets on the change of the aspect ratio. Aspect ratio information can be taken out of the `VI` (video index), `WSS` (widescreen signaling) or `WSS-extended` (extended form of widescreen signaling). With this setting you can select which of the above protocols should be used to detect aspect ratio changes. This settings influences the corresponding statuses eq when set to VI only the `sInpA_VI` status is updated. By default it is set to `VI`.

NoWSS/VI_prstA	With this setting you can set to which preset the card should jump channel A, when no WSS or VI information is found. Can be any preset between `1` and `16` or `Hold` (holds current active preset). By default it is set to `Hold`.
Input_Loss_A	Here you can set what the output of channel A should be when the input is lost. Can be `Freeze`, `Colorbar`, `Zoneplate`, `Black`, `Grey` or `Green`.
	UP-CONV
Up_CtrlA	With this item you select how the presets for Channel A in up converter mode are controlled: Manually (`manual`), via GPI-triggers (`GPI`, `GPI-A`, `GPI-B` or `GPI-C`) or via changes of the SD Aspect Ratio (`SD-AR`). By default it is set to `Manual`.
Up_Prst_actA	With this item you can manually change the currently active preset of channel A in up converter mode. Can be any preset between 1 and 16. By default it is set to 1. All menu settings that are preceded with a '`#Up`'-prefix are part of the preset.
UP_Prst_editA	Here you can select which of the 16 selectable presets you want to edit for Channel A in up converter mode. Changing this will not change the active preset, unless the currently active preset is the same you are going to edit. All menu settings that are preceded with a '`#Up`'-prefix are part of the preset.

#Up_ArcA

With this item you set the Aspect Ratio of the output of channel A in up converter mode. Can be `Anamorphic`, `V-Zoom`, `PBox-4:3`, `PBox-14:9` or `Variable` (custom set AR, set by H-scale and V-scale settings). The following table shows examples of the possible aspect ratios when the input source is 4:3.

Setting:	Result on 16:9 screens:
`Anamorphic`	
`V-Zoom`	
`PBox-4:3`	
`PBox-14:9`	
`Anam-702`	Anamorphic scaling based on 702 active pixels instead of 720 pixels
`Variable`	Dependant on `Up_H-scale` and `UP_V-scale` settings.

#Up_H-scaleA

The horizontal scaling of the TV picture of channel A in up converter mode is set using `#Up_H-scaleA`. `#Up_H-scaleA` can be set within the range of 50% to 200% of the input signal (only used when `#Up_ArcA` is set to `variable`). Default value is 100%.

#Up_V-scaleA

Sets the vertical scaling of the TV picture of channel A in up converter mode. Can be set within the range of 50% to 200% of the input signal (only used when `#Up_ArcA` is set to `variable`). Default value is 100%.

#Up_H-EnhA

With this item you can set the horizontal picture enhancement of channel A in up converter mode between 0 and 100%. By default set to 0%.

#Up_V-EnhA

With this item you can set the vertical picture enhancement of channel A in up converter mode between 0 and 100%. By default set to 0%.

#Up_ColorConvA

`ColorConvA` optimizes the color conversion for Channel A in up converter mode. As the color coding of HD (709) and SD(601) are different, it is necessary to convert these when Channel A is up-converting. The best result is generated when the up-converter is active and the `601to709` setting is selected. It is also possible to switch the filter `off`. The default setting is `601to709`.

DOWN-CONV

Dn_CtrlA

With this item you select how the presets for Channel A are controlled in down converter mode: Manually (`manual`), via GPI-triggers (`GPI`, `GPI-A`, `GPI-B` or `GPI-C`) or via changes of the HD Aspect Ratio (`S2016`). By default it is set to `Manual`.

Dn_Prst_actA

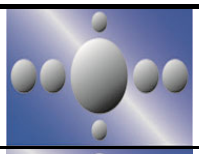
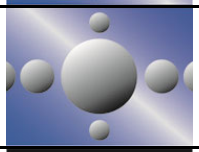
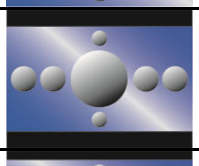
With this item you can manually change the currently active preset of channel A in down converter mode. Can be any preset between 1 and 16. By default it is set to 1. All menu settings that are preceded with a '`#Dn`'-prefix are part of the preset.

Dn_Prst_editA

Here you can select which of the 16 selectable presets you want to edit for Channel A in down converter mode. Changing this will not change the active preset, unless the currently active preset is the same you are going to edit. All menu settings that are preceded with a '`#Dn`'-prefix are part of the preset.

#Dn_ArcA

With this item you set the Aspect Ratio of the output of channel A in down converter mode. Can be `Anamorphic`, `CenterCut`, `LBox-16:9`, `LBox-14:9` or `Variable` (custom set AR, set by H-scale and V-scale settings). The following table (next page) shows examples of the possible aspect ratios when the input source is 16:9.

Setting:	Result on 4:3 screens:
`Anamorphic`	
`CenterCut`	
`LBox-16:9`	
`LBox-14:9`	
`Anam-702`	Anamorphic scaling based on 702 active pixels instead of 720 pixels
`Variable`	Dependant on `Dn_H-scale` and `Dn_V-scale` settings.

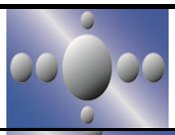
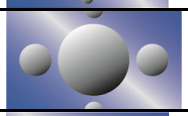
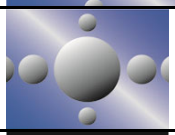
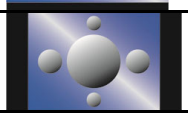
#Dn_H-scaleA	The horizontal scaling of the TV picture of channel A in down converter mode is set using `#Dn_H-scaleA`. `#Dn_H-scaleA` can be set within the range of 50% to 200% of the input signal (only used when `#Dn_ArcA` is set to `variable`). Default value is 100%.
#Dn_V-scaleA	Sets the vertical scaling of the TV picture of channel A in down converter mode. Can be set within the range of 50% to 200% of the input signal (only used when `#Dn_ArcA` is set to `variable`). Default value is 100%.
#Dn_H-EnhA	With this item you can set the horizontal picture enhancement of channel A in down converter mode between 0 and 100%. By default set to 0%.
#Dn_V-EnhA	With this item you can set the vertical picture enhancement of channel A in down converter mode between 0 and 100%. By default set to 0%.
# Dn_ColorConvA	`ColorConvA` optimizes the color conversion of channel A in down converter mode. As the color coding of HD (709) and SD (601) are different, it is necessary to convert these when Channel A is up-converting. The best result is generated when the up-converter is active and the `709to601` setting is selected. It is also possible to switch the filter `off`. The default setting is `Off`.
	CROSS-CONV
Cr_CtrlA	With this item you select how the presets for Channel A are controlled in cross converter mode: Manually (`manual`), via GPI-triggers (`GPI`, `GPI-A`, `GPI-B` or `GPI-C`), the SD aspect ratio (`SD-AR`) or via changes of the HD Aspect Ratio (`S2016`). By default it is set to `Manual`.
Cr_Prst_actA	With this item you can manually change the currently active preset of channel A in cross converter mode. Can be any preset between 1 and 16. By default it is set to 1. All menu settings that are preceded with a '`#Cr`'-prefix are part of the preset.

Cr_Prst_editA

Here you can select which of the 16 selectable presets you want to edit for Channel A in cross converter mode. Changing this will not change the active preset, unless the currently active preset is the same you are going to edit. All menu settings that are preceded with a '`#Cr`'-prefix are part of the preset.

#Cr_ArcA

With this item you set the Aspect Ratio of the output of channel A in cross converter mode. Can be `Anamorphic`, `V-Zoom`, `CenterCut`, `LBox-16:9`, `LBox-14:9`, `PBox-4:3` or `Variable` (custom set AR, set by H-scale and V-scale settings). The following table shows the possible aspect ratios.

Setting:	Result:	
`Anamorphic`		With 16:9 source on 4:3 screens
`V-Zoom`		With 4:3 source on 16:9 screens
`CenterCut`		With 16:9 source on 4:3 screens
`LBox-16:9`		With 16:9 source on 4:3 screens
`LBox-14:9`		With 16:9 source on 4:3 screens
`PBox-4:3`		With 4:3 source on 16:9 screens
`Variable`	Dependant on `Cr_H-scale` and `Cr_V-scale` settings.	

#Cr_H-scaleA

The horizontal scaling of the TV picture of channel A in cross converter mode is set using `#Cr_H-scaleA`. `#Cr_H-scaleA` can be set within the range of 67% to 133% of the input signal (only used when `#Cr_ArcA` is set to `variable`). Default value is 100%.

#Cr_V-scaleA

Sets the vertical scaling of the TV picture of channel A in cross converter mode. Can be set within the range of 67% to 133% of the input signal (only used when `#Up_ArcA` is set to `variable`). Default value is 100%.

#Cr_H-EnhA

With this item you can set the horizontal picture enhancement of channel A in cross converter mode between 0 and 100%. Default is0%.

#Cr_V-EnhA

With this item you can set the vertical picture enhancement of channel A in cross converter mode between 0 and 100%. By default set to 0%.

TRANSPARENT

Note: In transparent mode (no conversion) the card is not transparent for horizontal and vertical blanking, except for audio.

Tr_CtrlA

With this item you select how the presets for Channel A are controlled in Transparent mode: Manually (`manual`), via GPI-triggers (`GPI`, `GPI-A`, `GPI-B` or `GPI-C`) or via changes of the HD Aspect Ratio (`S2016`). By default it is set to `Manual`.

Tr_Prst_ActA

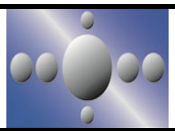
With this item you can manually change the currently active preset of channel A in Transparent mode. Can be any preset between 1 and 16. By default it is set to 1. All menu settings that are preceded with a '`#Tr`'-prefix are part of the preset.

Tr_Prst_EditA

Here you can select which of the 16 selectable presets you want to edit for Channel A in Transparent mode. Changing this will not change the active preset, unless the currently active preset is the same as the one you are going to edit. All menu settings that are preceded with a '`#Tr`'-prefix are part of the preset.

#Tr_ArcA

With this item you set the Aspect Ratio of the output of channel A in Transparent mode. Can be `Anamorphic` or `Variable` (custom set AR, set by H-scale and V-scale settings). The following table shows examples of the possible aspect ratios.

Setting:	Result:	
`Anamorphic`		With 16:9 source on 4:3 screens
`Variable`	Dependant on `Tr_H-scale` and `Tr_V-scale` settings.	

#Tr_H-scaleA

The horizontal scaling of the TV picture of channel A in Transparent mode is set using `#Tr_H-scaleA`. `#Tr_H-scaleA` can be set within the range of 67% to 133% of the input signal (only used when `#Tr_ArcA` is set to `variable`). Default value is 100%.

#Tr_V-scaleA	Sets the vertical scaling of the TV picture of channel A in Transparent mode. Can be set within the range of 50% to 200% of the input signal (only used when `#Up_ArcA` is set to `variable`). Default value is 100%.
#Tr_H-EnhA	With this item you can set the horizontal picture enhancement of channel A in Transparent mode between 0 and 100%. Default is 0%.
#Tr_V-EnhA	With this item you can set the vertical picture enhancement of channel A in Transparent mode between 0 and 100%. By default set to 0%.
	INSERTER This card can insert several data values in the VBI of the outputs. With the following settings you can choose what you want to insert.
Timecode_insA	Enables or disables the encoding or transcoding of Timecode
VITC_Ln_InA	With this setting you can select what line of the input you want to copy the VITC data from (only when input is SD). Can be any line between line 7 and line 22. Default is line 19.
VITC_Ln_CtrlA	Here you can choose whether you want to select the line, to where you want to copy the timecode data to, manually (`manual`) or use the information in the `ATC_DBB` package to select the lines (ATC_DBB package contains information about the line duplication as well). Default is `Manual`.
VITC_Ln_625A	When `VITC_Ln_Ctrl` is set to `Manual`, with this setting you can select a line between 7 and 22 when the output is SD625. Default is line 19.
VITC_Ln_525A	When `VITC_Ln_Ctrl` is set to `Manual`, with this setting you can select a line between 7 and 22 when the output is SD525. Default is line 10.
VITC_Ln_DupA	When set to `On`, the VITC line is duplicated to the above selected line + 2 lines.
ATC_Dem_SelA	ATC source de-embed selection. Previously, the first ATC found in a field would be transcoded to the output. Now, the user can select whether to de-embed LTC, VITC or the first ATC found.

ATC_Emb_SelA

ATC_Emb_Sel: ATC destination embed selection. Previously, timecode was transcoded into VITC. Now the user can select whether to transcode to VITC or LTC.

Ins_CtrlA

With this item you select how the inserter presets for Channel A are controlled: Manually (`manual`), via GPI-triggers (`GPI`, `GPI-A`, `GPI-B` or `GPI-C`), via changes of the SD Aspect Ratio (`SD_AR`) or the HD aspect ratio (`S2016)` (AFD)). Default is `Manual`.

Ins_Prst_ActA

With this item you can manually change the currently active preset of channel A when in transparent mode. Can be any preset between 1 and 16. By default it is set to 1. All menu settings that are preceded with a '`#Ins`'-prefix are part of the preset.

Ins_Prst_EditA

Here you can select which of the 16 selectable presets you want to edit for Channel A when in a transparent mode. Changing this will not change the active preset, unless the currently active preset is the same you are going to edit. All menu settings that are preceded with a '`#Ins`'-prefix are part of the preset.

#VI-InsertA

You can turn VI insertion `on` or `off` for channel A. Default is `Off`.

#VI-DataA

With the `#VI-InsertA` setting set to `on`, you can select VI values with this setting, which you want to be inserted in Channel A. possible are all VI values between `4:3_0` and `4:3_7` and the settings between `16:9_0` and `16:9_7`. Default is `4:3_0`.

#WSS-InsertA

You can choose which type of WSS data you want to insert in Channel A with this setting, or switch WSS insertion entirely `off` (default value). You can set it to `Standard` or `Extended`.

#WSS-StndA

With the `#WSS-InsertA` setting set to `Standard`, you can select WSS standard values with this setting, which you want to be inserted in Channel A. possible are all WSS values between `1_vid` and `8_vid` and the settings between `1_flm` and `8_flm`. Default is `1_vid`.

#WSS-ExtndA

With the `#VI-InsertA` setting set to `on`, you can select VI values with this setting, which you want to be inserted in Channel A. possible are all WSS values between `4:3_0` and `4:3_7` and the settings between `16:9_0` and `16:9_7`. Default is `4:3_0`.

#VI-DataA	With the `#WSS-InsertA` setting set to `extended`, you can select WSS extended values with this setting, which you want to be inserted in Channel A. possible are all VI settings between `4:3_0` and `4:3_7` and the settings between `16:9_0` and `16:9_7`. Default is `4:3_0`.
#S2016-InsertA	You can turn S2016 (AFD) insertion `on` or `off` for channel A. Default is `Off`.
#S2016-LineA	With this setting you select a line in the VBI to where the AFD (SMPTE 2016) data should be written. Lines 0 till 31 are selectable. By default it is set to line 17.
#S2016-DataA	With thise setting you can select which AFD you want to insert. Default is `AFD0`.
#CC_Ena_A	This setting sets the Closed Captioning insertion for channel A `On` or `Off`. Default is `Off`.
	VIDEO PROC
GainA	With this setting you control the overall gain of the video of channel A between 50 and 150%. Default is 100%.
R-GainA	`R-GainA` controls the Red gain of channel A. The control range is between 50% and 150%. The default setting is 100%.
G-GainA	`G-GainA` controls the Green gain of channel A. The control range is between 50% and 150%. The default setting is 100%.
B-GainA	`B-GainA` controls the Blue gain of channel A. The control range is between 50% and 150%. The default setting is 100%.
BlackA	`BlackA` controls the total R-G-B Black gain of channel A. The control range is between –128bit and 127bit. The default setting is 0bit.
R-BlackA	`R-BlackA` controls the Red-Black of channel A. The control range is between –128bits and 127 bits in steps of 1 bit The default setting is 0 bit.

G-BlackA	G-BlackA controls the Green-Black of channel A. The control range is between –128bits and 127 bits in steps of 1 bit The default setting is 0 bit.
B-BlackA	B-BlackA controls the Blue-Black of channel A. The control range is between –128bits and 127 bits in steps of 1 bit The default setting is 0 bit.
Note	This function isn't currently not accessible but will be enabled in a software release in the future.
Y_Gain	This function isn't currently not accessible but will be enabled in a software release in the future.
C_Gain	This function isn't currently not accessible but will be enabled in a software release in the future.
	EMBEDDER
Audio_CtrlA	With this item you select how audio proc amp presets for Channel A are controlled: Manually (Manual) or via GPI-triggers (GPI, GPI-A, GPI-B or GPI-C). Default is Manual
Audio_Prst_ActA	With this item you can manually change the currently active preset of channel. Can be any preset between 1 and 16. By default it is set to 1. All menu settings that are preceded with a '#Ins'-prefix are part of the preset.
Audio_Prst_EditA	Here you can select which of the 16 selectable presets you want to edit for Channel A. Changing this will not change the active preset, unless the currently active preset is the same you are going to edit. All menu settings that are preceded with a '#Ins'-prefix are part of the preset.
#Silence-TimeA	If the embedded audio contains silence, this can be reported by the card. This setting allows you to determine how many seconds it takes before the card reports the silence. This setting can be set in a range from 1 sec to 255 sec. The default setting is 10sec.
#Silence-LevelA	With this setting you set a loudness threshold for the silence detection. Can be set between -100 and -20 dBFS. When the audio goes below this value, a silence alert is triggered. Default is -60dBFS.

#Emb1_GrpSel

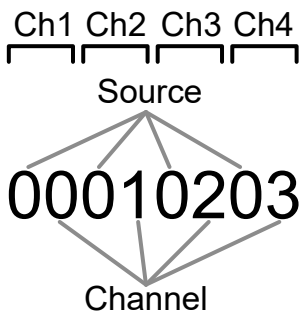
With this setting you can turn on or off the audio embedder groups individually. An embedder group can be turned off (muted) by setting the corresponding group to '_'.
Can be set to one of the following values (default is `1234`):

```
____
1___
_2__
12__
__3_
1_3_
_23_
123_
___4
1__4
_2_4
12_4
__34
1_34
_234
1234
```

#Emb1_Ch01/04
~
#Emb1_Ch13/16
(channel selection available in GXG410 only)

These settings allow you to select the source of the audio channels which need to be embedded into the SDI output.
You can choose between the following values:

- Source: SDI_Input_1 (value '`0`'), channel: Ch1 (value '`0`') to Ch16 (value '`f`')
- Source: SDI_Input_2 (value '`1`'), channel: Ch1 (value '`0`') to Ch16 (value '`f`')
- Source: Quadspeed bus (value '`2`'), channel: Ch1 (value '`0`') to Ch16 (value '`f`')
- Source: Quadspeed bus (value '`3`'), channel: Ch17 (value '`0`') to Ch32 (value '`f`')
- Source: Off (value '`f`'), channel: N/A. Mutes the corresponding output channel.



Defaults are (source: SDI_Input_1, channels: straight):

- #Emb1_Ch01/04 = 00010203
- #Emb1_Ch05/08 = 04050607
- #Emb1_Ch09/12 = 08090a0b
- #Emb1_Ch13/16 = 0c0d0e0f

#Emb1_Gain01 ~ #Emb1_Gain16 (GXG410 only)	Adjusts the gain for the corresponding audio channel between -60 and 12dB. Everything below -999 dB means the audio will be muted. Default is 0dB Note: This setting is only available at the GXG410, which has an audio shuffler option.
#Emb1_Delay01 ~ #Emb1_Delay16 (GXG410 only)	Adjusts the delay of the corresponding audio channel between -5000ms and 5000ms. Default is 0ms. Note: This setting is only available at the GXG410, which has an audio shuffler option.
#Emb1_Phase01/16 (GXG410 only)	Adjusts the audio phase of the corresponding individual audio channel to 0 deg (‘`0`’) or 180 deg (‘`1`’). Default is `0000000000000000` (channel number is counting up from left to right). Note: This setting is only available at the GXG410, which has an audio shuffler option.
	AUDIO PROC AMP
Audio-PhaseA	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 does not ensure audio-phase alignment and *eats-all* audio including errors. Even if there are DBN/ANC/ECC or channel-sequence errors, the de-embedder will pass them. Default is `Align`. **Note:** This setting can be helpful to solve problems in the field using equipment which doesn’t follow the standards correctly.
	GPI-CTRL
	This function isn’t currently not accessible but will be enabled in a software release in the future.

	NETWORK
IP_Conf0	With this setting you can let the card obtain an IP address automatically via `DHCP`, or appoint a `manual` set IP address. By default this setting is set to `Manual`.
mIP0	When `IP_Conf0` is set to `manual`, you can type in the preferred IP address here. By default it is set to 172.16.1.2
mNM0	With `IP_Conf0` set to `manual`, with this setting you can set a Netmask. Default is 255.255.0.0
mGW0	With `IP_Conf0` set to `manual`, this setting let you set a Standard Gateway. Default is set to 172.16.0.1
NetwPrefix0	Here you can set the proper network prefix if required.

6 Status Menu

Introduction	The status menu indicates the current status of each item listed below.
	SFP STATUS
SFP1-Vendor	These status item display the name of the vendor of the SFP input/output module A.
SFP1-Type	These status items display the type name/number of SFP input/output module A.
SFP1-Temp-Stat	These indicate whether the temperature of SFP input/output module A is `Too_High`, `High`, `OK`, `Low` or `Too_Low`. Can also be `NA` in case Temperature monitoring is not available or the module is not inserted.
SFP1-Volt-Stat	These indicate whether the voltage usage of SFP input/output module A is `Too_High`, `High`, `OK`, `Low` or `Too_Low`. Can also be `NA` in case Voltage monitoring is not available or the module is not inserted.
Port1/2-Enabled	These item indicate whether the corresponding output port on SFP output module A is `enabled`, `disabled` or `NA` (Not available, when no input signal is available or an input module is inserted.)
Port1/2-Power	These status items indicate the current transmitter power of the specified port on SFP output module A between 0mW and 6.55mW. When a receiver is installed or no SFP module is inserted this value is 0.
Port1/2-Power-Stat	These indicate whether the output power of the specified port on SFP output module A is `Too_High`, `High`, `OK`, `Low` or `Too_Low`. Can also be `NA` in case of an input module or no module is inserted.
Port1/2-Bias	These status items indicate the current laser bias of the specified port on SFP module A is between 0mA and 300mA. When there is a non fiber SFP or an input module is inserted, this value will be 0.
Port1/2-Bias-Stat	These indicate whether the laser bias of the specified port on SFP output module A is `Too_High`, `High`, `OK`, `Low` or `Too_Low`. This can also be `NA` in case laser bias monitoring is not available or no output module is inserted.

Port1/2-Wavelength	Indicates the current wave length of the corresponding output port on the SFP output module A between 0nm and 2000nm. When there is a non fiber SFP or RX module installed, this value will be 0.
SFP2-Vendor	These status item display the name of the vendor of the SFP input/output module B.
SFP2-Type	These status items display the type name/number of SFP input/output module B.
SFP2-Temp-Stat	These indicate whether the above indicated temperature of SFP input/output module B is `Too_High`, `High`, `OK`, `Low` or `Too_Low`. This can also be `NA` in case Temperature monitoring is not available or the module is not inserted.
SFP2-Volt-Stat	These indicate whether the above indicated voltage usage of SFP input/output module B is `Too_High`, `High`, `OK`, `Low` or `Too_Low`. This can also be `NA` in case Voltage monitoring is not available or the module is not inserted.
Port3/4-Enabled	These item indicate whether the corresponding output on SFP output module is `enabled`, `disabled` or `NA` (Not available, when no input signal is available or an input module is inserted)
Port3/4-Power	These status items indicate the current transmitter power of the specified port on SFP output module B between 0mW and 6.55mW. When an input module is inserted or no SFP module is inserted this value is 0.
Port3/4-Power-Stat	These indicate whether the output power of the specified port on SFP output module B is `Too_High`, `High`, `OK`, `Low` or `Too_Low`. Can also be `NA` in case of an input module or no module is inserted.
Port3/4-Bias	These status items indicate the current laser bias of the specified port on SFP output module B is between 0mA and 300mA. When there is a non fiber SFP or RX SFP installed, this value will be 0.
Port3/4-Bias-Stat	These indicate whether the laser bias of the specified port on SFP output module B is `Too_High`, `High`, `OK`, `Low` or `Too_Low`. This can also be `NA` in case laser bias monitoring is not available or no module is inserted.
Port3/4-Wavelength	Indicates the current wave length of the corresponding output port on SFP output module B between 0nm and 2000nm. When there is a non fiber SFP or RX module installed, this value will be 0.

HDMI1-Vid-Std ~ HDMI2-Vid-Std

These indicate the output format of each corresponding HDMI output. Possible output formats are:

- 1080p60, 1080p50
- 1080i60, 1080i50
- 1080p30, 1080p25, 1080p24
- 720p60, 720p50, 720p30, 720p25, 720p24
- SD625, SD525

HDMI1-GrpInUse ~ HDMI2-GrpInUse

These status items indicate which the audio groups are in use on the corresponding HDMI output. Indicated as for instance 1_3_ when groups 1 and 3 are in use, and groups 2 and 4 are not; or for instance as __34 when only groups 3 and 4 are in use and groups 1 and 2 are not.

HDMI1-EDH-Stat ~ HDMI2-EDH-Stat

These items indicate when EDH errors occur on the corresponding HDMI output.

sInp1 ~ sInp2

This status item indicates the presence and the format of a valid signal on physical input 1 to 8. This is displayed as:

- 1080P60
- 1080p50
- 1080i60
- 1080i50
- 1080p30
- 1080p25
- 1080p24
- 1080psf24
- 720p60
- 720p50
- 720p30
- 720p25
- 720p24
- SD525
- SD625

sInpA

This status item indicates the presence and the format of a valid signal on processing channel. This is displayed the same as sInp1 ~ sInp2.

sInpA_VI

Displays the detected VI value found in processing channel A. This is displayed as follows:

- `4:3_0`
- `4:3_1`
- `4:3_2`
- `4:3_3`
- `4:3_4`
- `4:3_5`
- `4:3_6`
- `4:3_7`
- `16:9_0`
- `16:9_1`
- `16:9_2`
- `16:9_3`
- `16:9_4`
- `16:9_5`
- `16:9_6`
- `16:9_7`
- `NA` (no VI detected)

sInpA_WSS-Stnd

This status item displays the detected standard WSS value of processing channel A. this is displayed as follows:

- `1_vid`
- `2_vid`
- `3_vid`
- `4_vid`
- `5_vid`
- `6_vid`
- `7_vid`
- `8_vid`
- `1_flm`
- `2_flm`
- `3_flm`
- `4_flm`
- `5_flm`
- `6_flm`
- `7_flm`
- `8_flm`
- `NA` (no standard WSS detected)

sInpA_WSS-Extd

This item displays the detected extended WSS value of processing channel A. This is displayed as follows:

- 4:3_0
- 4:3_1
- 4:3_2
- 4:3_3
- 4:3_4
- 4:3_5
- 4:3_6
- 4:3_7
- 16:9_0
- 16:9_1
- 16:9_2
- 16:9_3
- 16:9_4
- 16:9_5
- 16:9_6
- 16:9_7
- NA (no WSS extended detected)

sInpA_S2016

This item displays the detected SMPTE 2016 (AFD) values of processing channel A. This is displayed as AFD0 till AFD15 or NA in case no S2016 is detected.:

sInpA_CRC_EDH

This item indicates CRC and EDH errors on processing channel A. Can be:

- Off
- OK
- Error
- NA
- NoPCM

sInpA_Map

This item indicates what the mapping of the signal is on processing channel A. Can be:

- Level A
- Level B
- NA

sInpA_VITC

This item indicates the presence of VITC in processing channelA. Can be NA or OK.

sInpA_ATC

This item indicates the presence of VITC in processing channelA. Can be:

- `RP188 LTC`
- `RP188 VITC#1`
- `RP188 VITC#2`
- `RP196 LTC`
- `RP196 VITC`
- `RP215`
- `NA`

S2031-WST-DetA

This item indicates the presence of S2031 packets which hold WST information in processing channel A. Can be `NA` or `OK`.

S2031-OverflowA

This status item indicates if there is a WST line number overflow of channel A, when it exceeds the range from line 7 to line 22. This may happen for a S2031 input source containing undefined WST lines which are translated to a WST or OP47 output. An overflow will occur for instance when setting S2031-WST-defA to line 22 and several WST lines are to follow. Then the value of this status item will be Error. Can be `NA`, `OK` or `Error`.

S2031-WST-LineA

This status item indicates the type of WST lines which are packetized by S2031. It will display Error, when containing both undefined and defined lines. Can be:

- `NA`
- `Defined`
- `Undefined`
- `Error`

WST-DetA

This item indicates the presence of WST information in processing channel A. Can be `NA` or `OK`.

OP47-Det-A

This item indicates the presence of OP47 packets in processing channel A. Can be `NA` or `OK`

CC_Det_A

Displays whether or not there's Closed Captioning detected on channel A

IODelayA

Displays the total delay in ms of outputs A1 and A2. Can be a value between `0ms` and `16383ms`.

FunctionA

Displays the current mode/function of processing channel A. Can be:

- Up
- Down
- Cross
- Trans
- Na
- TestPattern

Ref-Format

Displays whether there is a correct reference and what the connected reference format is: Can be.

- NA
- NTSC/480i
- PAL/576i
- 720p
- 1080i
- 1080p

GPI

Displays the currently closed GPI contacts. This is displayed as for instance 1_3_ when contacts 1 and 3 are closed and for instance _234 when contacts 2, 3 and 4 are closed.

GPIA

Displays the current value of GPI pool A

GPIB

Displays the current value of GPI pool B

GPIC

Displays the current value of GPI pool C

SDIADemFrmt01/02 ~ SDIADemFrmt15/16

These status items indicate the detected audio format of each audio pair in the de-embedder of SDI input 1. Can be one of the following formats:

- N/A
- PCM
- Null
- AC-3
- TimeStmp
- MPEG-1
- MPEG-2
- SMPTE-KLV
- Dolby E
- Caption data
- UserDef
- Rsvd
- Enh Ac-3

EmbStat_A	Displays the status of the individual audio channels of the embedder output. Displayed as for instance SC_PPPPPPPPPPPPP, when channel 1 is Silence, channel 2 is Clipped, channel 3 is NA (not available) and channel 4 to 16 are Present
AddOnFrmtInA1/2 ~ AddOnFrmtInD3/D4	These status items indicate the detected audio format of each audio pair in the add-on bus. Can be one of the following formats: ▪ N/A ▪ PCM ▪ Null ▪ AC-3 ▪ TimeStmp ▪ MPEG-1 ▪ MPEG-2 ▪ SMPTE-KLV ▪ Dolby E ▪ Caption data ▪ UserDef ▪ Rsvd ▪ Enh Ac-3
AddOnFrmtIn01/02 ~ AddOnFrmtIn31/32	These status items indicate the detected audio format of each audio pair from the quad speed addon bus. Can be one of the following formats: ▪ N/A ▪ PCM ▪ Null ▪ AC-3 ▪ TimeStmp ▪ MPEG-1 ▪ MPEG-2 ▪ SMPTE-KLV ▪ Dolby E ▪ Caption data ▪ UserDef ▪ Rsvd ▪ Enh Ac-3
SOF-E_A1/2A ~ SOF-E_D3/4A	Displays the start line of a Dolby E frame. Can be a value between 0 and 1124 (dependant on input and output format).
FPGA_Core_Temp	Indicates the current FPGA core temperature. Can be between -40 and 125 deg.
	NET STATUS
IP_Addr0	This item displays the status of the IP address. It can be manual, DHCP asking, DHCP Leased or DHCP Infin.

MAC0	This item displays the MAC address of the card.
IP0	This item displays the current IP address of the card.
NM0	This item displays the current Netmask of the card.
GW0	This item displays the current Standard Gateway of the card.

7 Events Menu

Introduction

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

What is the Goal of an event?

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

Events

The events reported by the GXG-HXH400-410 are as follows;

Announcements

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

Input_A

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

Input_B

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

Ref-Status

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

Active_Out_A

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

What information is available in an event?

The message consists of the following items;

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

The Message String

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

The Tag

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

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

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_A	01_{hex}=INPA_LOSS	81_{hex}=INPA_RETURN	input A lost or returned
Input_B	02_{hex}=INPB_LOSS	82_{hex}= INPB_RETURN	input B lost or returned
Reference	03_{hex}=REF_LOSS	83_{hex}=REF_RETURN	reference lost or returned
Acive_Out_A	19_{hex}=IN_B->OUT_A	99_{hex}= IN_A->OUT_A	Input B or input A on outputs A

The Priority

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

The Address

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

8 LED Indication

Error LED

The error LED indicates an error if the internal logic of the card is not configured correctly or has a hardware failure.

Input_x LED

This LED indicated the presence of a valid SDI video signal on input x.

ANC Data LED

Indicates the presence of embedded audio within the input signal.

Reference LED

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

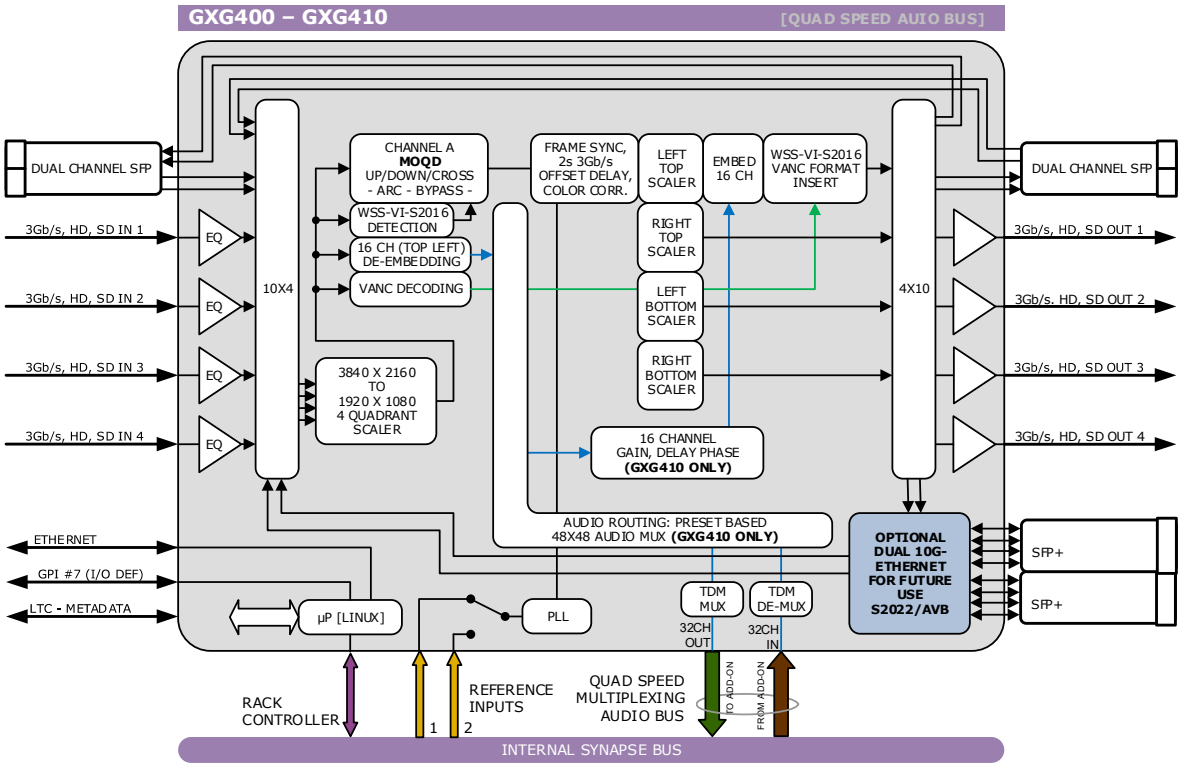
Data Error LED

This LED indicates a CRC error.

Connection LED

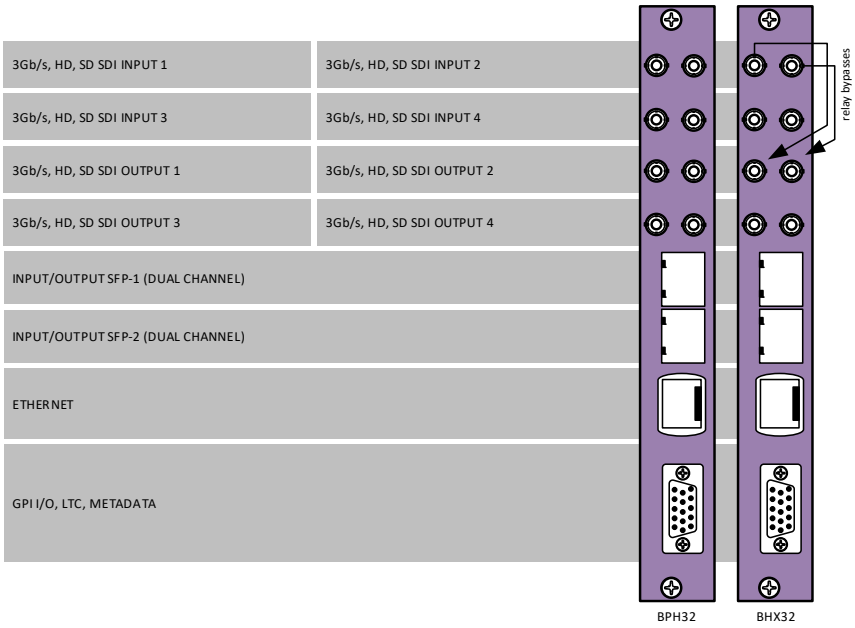
This LED illuminates after the card has initialized. The LED lights for 0.5 seconds every time a connection is made to the card.

9 Block Schematic



10 Connector Panels

The GXG400-GXG410 can be used with the BPH32 or the BHX32. The following table displays the pinout of these backpanels in combination with the card.



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

Appendix 1 GPI Interface

This function isn't currently not accessible but will be enabled in a software release in the future.

Appendix 2 Reprogramming GXGxxx modules

Before you start

Functionality explanation

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, EVS 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.

Choosing .spf files

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 (EVS's control software) (select frame, select card, select 'Identity', check 'hardware rev').

Knowing the hardware revision number, you can go to https://mi-sftp.evs.com/. 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.

Requirements

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.

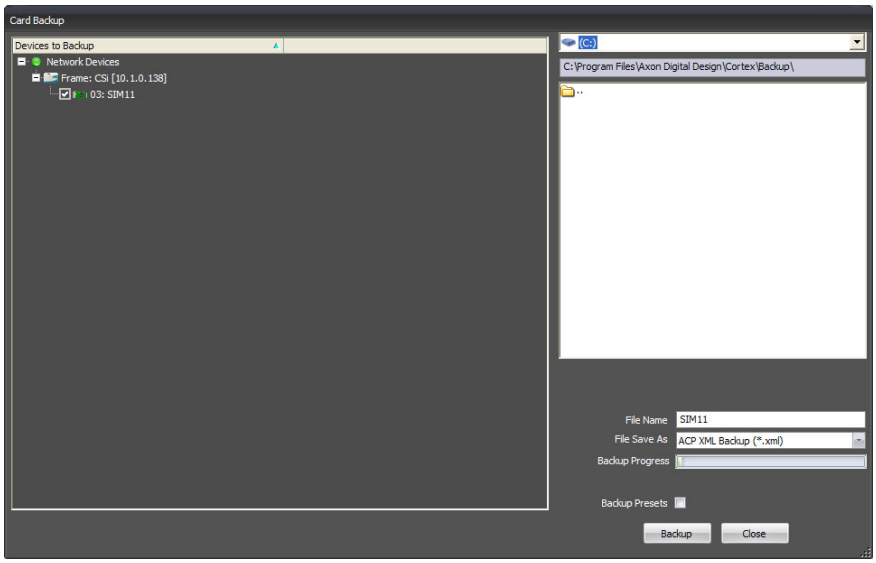
Using Cortex help files

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 > select 'Upload Firmware' (the firmware uploading window will open) > press F1).

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

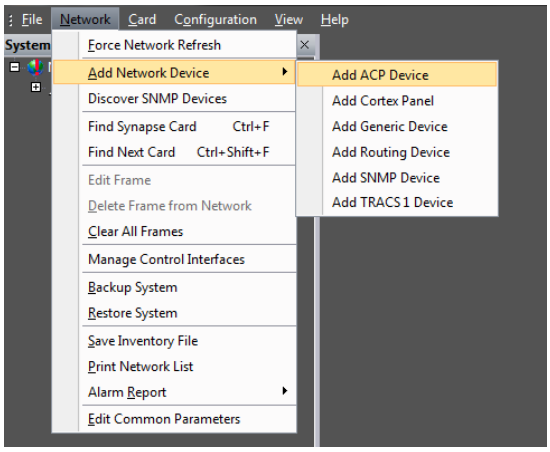
Use cortex version 1.09.01 or later. This software can be downloaded from https://mi-sftp.evs.com/.

Setting up card

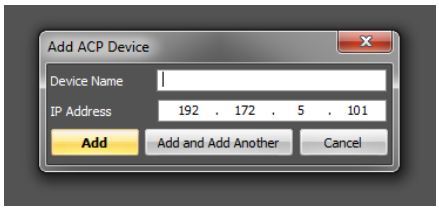
To be able to program the card direct we need to perform two steps. One is setting up of the IP address of the card and second will be making the board recognized as stand alone entity.

To set-up the IP address of the card goto the system view within the Cortex program. Select the HLDxxx 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.

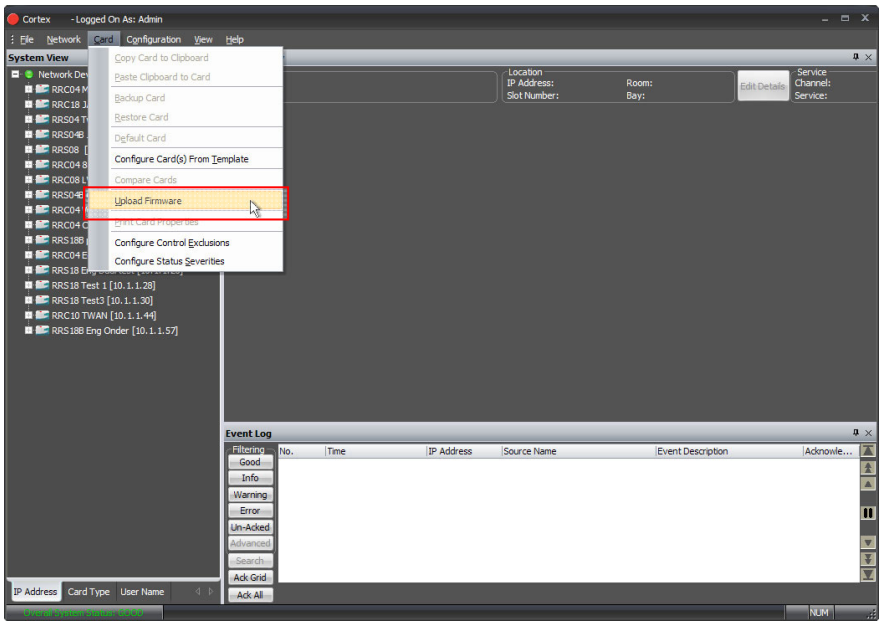


Fill out the name of the card and also the ip address.

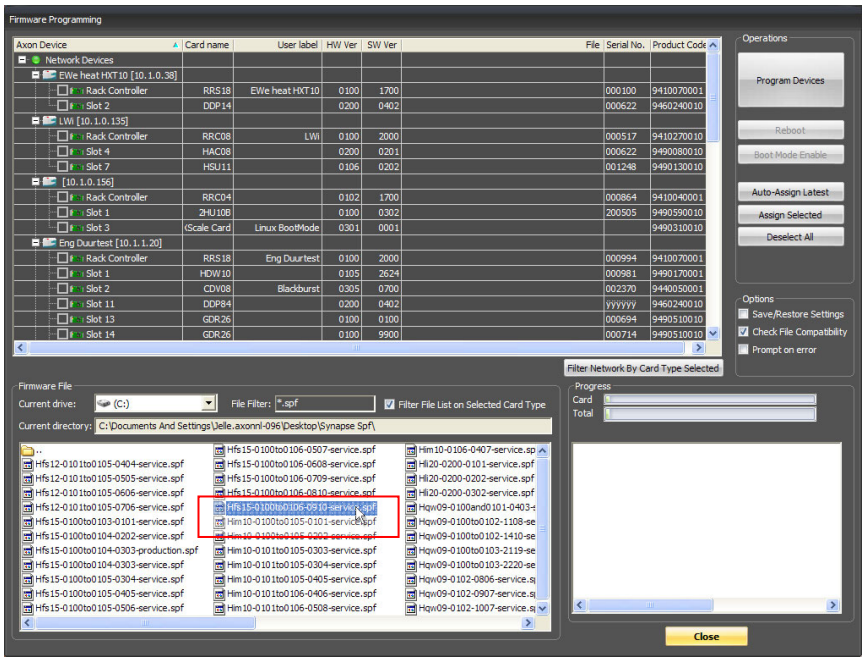


Upload firmware

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.

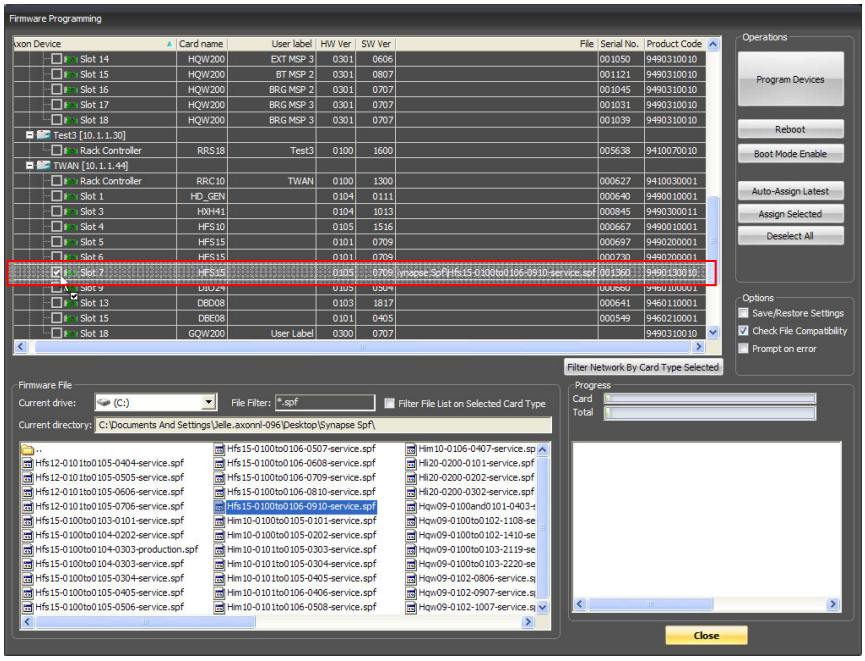


A new window will open, showing you the firmware upload functions. ***At first you must select which .spf file you want to load***. You do this in the buttom dialog as shown below.



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 functionallity before you are going to put it into real on-air use.

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