Synapse

GEB400/440
HEB400/440
GEB800/840/880
HEB800/840/880

3Gb/s, HD, SD 4, 8 or 16 channel basic audio embedder

Installation and Operation manual

Committed.

AXON®

AXON

Synapse

TECHNICAL MANUAL

GEB400/440/800/840/880
HEB400/440/800/840/880

Lange Wagenstraat 55
NL-5126 BB Gilze
The Netherlands
Phone: +31 161 850 450
Fax: +31 161 850 499
E-mail: Info@axon.tv
Web: www.axon.tv

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

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

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

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

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

CE

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

Axon Digital Design
GEB400/440/800/840/880
HEB400/440/800/840/880

FC Tested To Comply With FCC Standards

FOR HOME OR OFFICE USE

This device complies with part 15 of the FCC Rules
Operation is subject to the following two conditions:
(1) This device may cause harmful interference, and
(2) This device must accept any interference received, including interference that may cause undesired operation.

Table of Contents

1 Introduction to Synapse

An Introduction to Synapse

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

Local Control Panel

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

Remote Control Capabilities

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

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

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

2 Unpacking and Placement

Unpacking

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

Placing the card

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

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

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

3 A Quick Start

When Powering-up

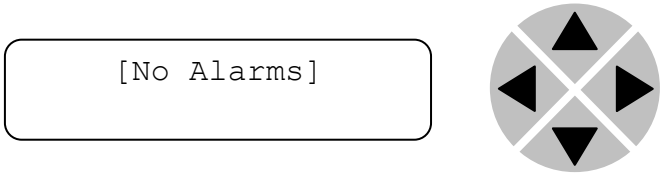
On powering up the Synapse frame, the card set will use basic data and default initialisation settings. All LED's will light during this process. After initialisation, several LED's will remain lit – the exact number and configuration is dependant upon the number of inputs connected and the status of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

Changing settings and parameters

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

Front Panel Control

Front Panel Display and Cursor



Settings are displayed and changed as follows;

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

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

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

Example of changing parameters using front panel control

With the display as shown below

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

Pressing the ► selects the SFS10 in frame slot 01.

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

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

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

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

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

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

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

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

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

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

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

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

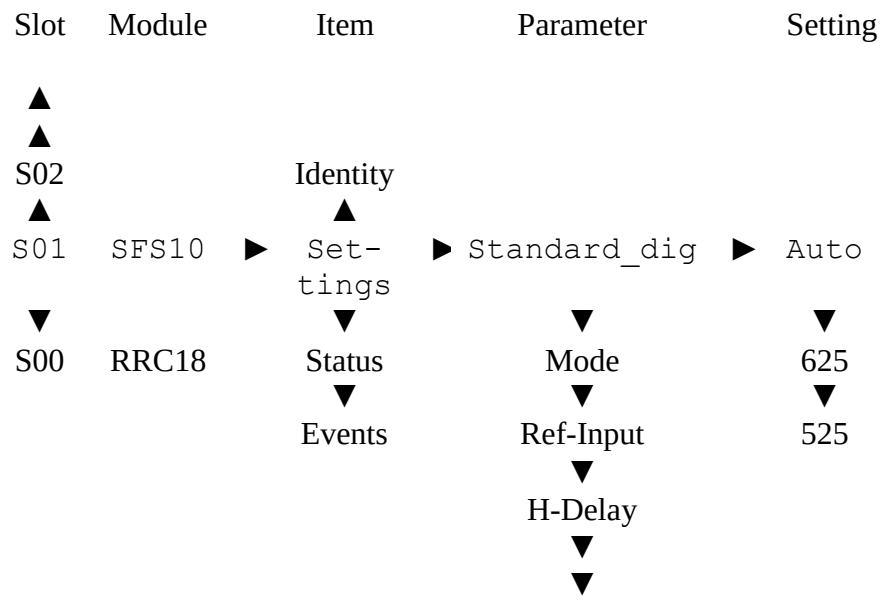
Axon Cortex Software

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

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

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

Menu Structure Example



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

4 The GEB880/800/840/440/400

Introduction

The G-HEB880-840-800-440-400 is a 3GB/s,HD SDI and SD SDI audio embedder. It is capable of inserting or appending up free-running AES/EBU digital audio channels or analog audio channels. The card has 2 option input boards: 4 mono analog audio inputs (4ch total) per board, or 4 stereo AES/EBU inputs (8ch total) per board.

In addition, four ADD-ON cards can be connected to create a routing matrix. The architecture of Emb_A to Emb_D blocks is identical. The local AES inputs can be controlled to adjust Phase, Gain and delay (on the fly).

Future upgrades are possible, like for instance the HEB400 can be future upgraded to HEB880, GEB800 or GEB840, etc. This allows for staged implementation of HD infrastructures and spread the cost over multiple budget years.

Features

- Up to 8 AES/EBU inputs with sample rate converter (available with 110 Ohm and 75 Ohm inputs)
- Up to 8 analog audio inputs (available with balanced or unbalanced connectors)
- 8 extra AES/EBU inputs through the Synapse bus
- 2 SDI + embedded audio outputs
- 8 presets that configure all 16 input channels at once. controlled by GPI or ACP (Cortex)
- Audio level and phase control
- Audio offset delay up to 1300 ms
- AES/EBU inputs accept synchronous streams like Dolby E and asynchronous up to 96kHz sampling via the built in Sample Rate Converters.
- 16 extra audio channels (4 groups) with ADD-ON card for input multiplexing
- Peak detection 0, -6, -12 and -18dBFS
- Silence detection with threshold (-100 to -20dBFS) and time control (1 to 255 sec)
- Transparent for ATC time code RP188, RP196, RP215
- Locks to SDI input
- Full control and status monitoring through the front panel of the SFR04/SFR08/SFR18 frame and the Ethernet port (ACP)
- Optional 1 input, 1 or 2 fiber outputs or a fiber in and output (replacing 1 SDI in and output) on the I/O panel
- Optional relay bypass (BHX18 or BHX18D)

Applications

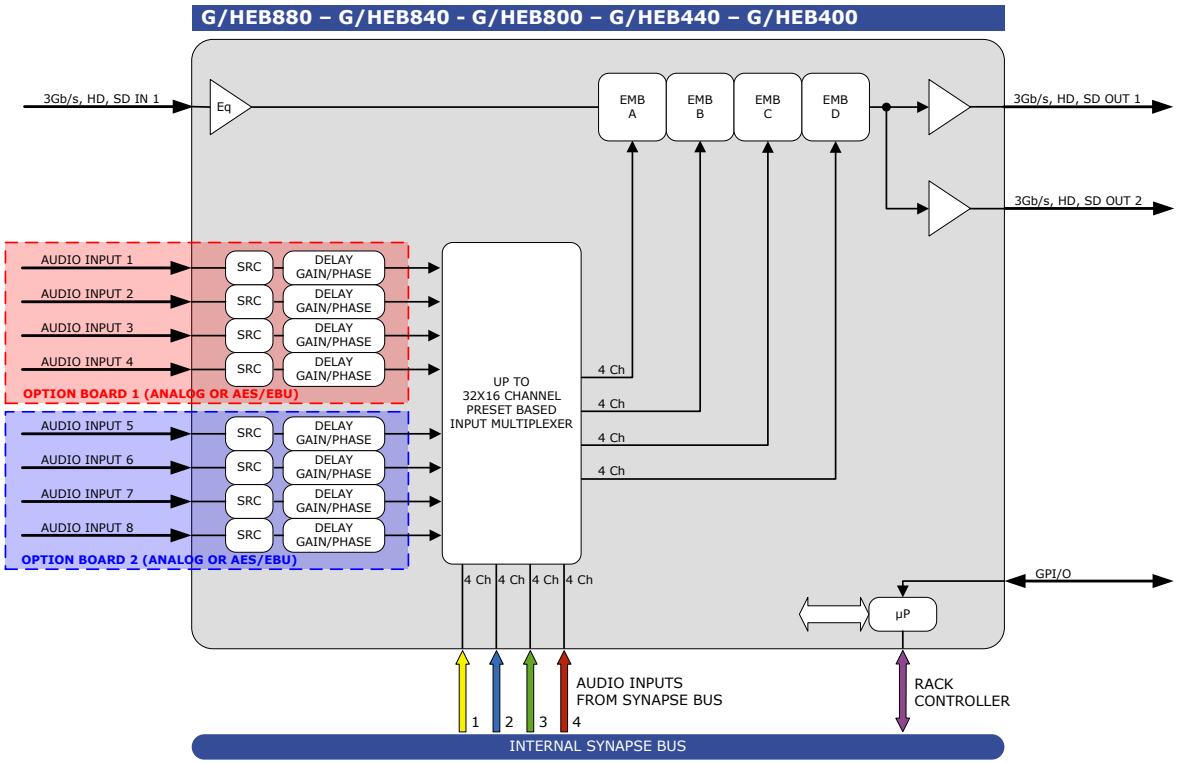
- 3Gb/s, HD and SD audio embedding
- Preset based 16 channel audio embedding

Input options

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

Card model	Option board 1	Option board 2
GEB880	4 AES/EBU inputs (8 channels)	4 AES/EBU inputs (8 channels)
HEB880	4 AES/EBU inputs (8 channels)	4 AES/EBU inputs (8 channels)
GEB840	4 AES/EBU inputs (8 channels)	4 analog inputs (4 channels)
HEB840	4 AES/EBU inputs (8 channels)	4 analog inputs (4 channels)
GEB800	4 AES/EBU inputs (8 channels)	None
HEB900	4 AES/EBU inputs (8 channels)	None
GEB440	4 analog inputs (4 channels)	4 analog inputs (4 channels)
HEB440	4 analog inputs (4 channels)	4 analog inputs (4 channels)
GEB400	4 analog inputs (4 channels)	None
HEB400	4 analog inputs (4 channels)	None

Block schematic



5 Settings Menu

Introduction

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

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

VIDEO

Out-Frmt

With this setting you select what the output format will be. Please note that this is not a video conversion setting. This setting is only used to correctly set the delay. Default is `Auto`.

PRESET

Control

With this setting you decide whether the presets are controlled `manually` (using cortex of the front controls of the frame), or by use of the `GPI` inputs.

GPI-Ctrl

The GEB/HEB400/440/800/840/880 has several physical GPI contacts to control the card's presets (if presets are set to be GPI controlled)

`Latch`: Latching GPI mode. When a contact is closed momentarily (edge triggered).

`Non-Latch`: Non-latching GPI mode. When a contact is closed all the time (level triggered).

ExtMode

With this item you set the purpose of pins 5 till 8 of the RJ45 connector on the backpanel. The purpose can be additional `GPIO` contacts only.

Active-Preset

With this item you can manually change the currently active preset . Can be any preset between 1 and 7. By default it is set to 1. All menu settings that are preceded with a '#'-prefix are part of the preset.

Edit-Preset	Here you can select which of the 7 selectable presets you want to edit. Changing this will not change the active preset, unless the currently active preset is the same you are going to edit. All menu settings that are preceded with a '#'-prefix are part of the preset.
PrstEditView	With this setting set to `Follow Active`, the edit preset settings will follow the active preset when the active preset is changed. This to avoid confusion when changing the active. Set to `Independent` the edit preset will not automatically follow active preset changes. By default set to `Follow Active`.
#Preset_Name	Sets/displays the name of the currently displayed preset.
	EMBEDDING
#Emb-AB-Mode	With `Emb-AB-Mode` you select how the audio in groups A and B should be embedded into the video: `overwrite` the exsisting audio, or `Append`. Can also be set to `off` (switching off embedding for groups A and B entirely). Default is `overwrite`.
#Emb-CD-Mode	With `Emb-CD-Mode` you select how the audio in groups C and D should be embedded into the video: `overwrite` the exsisting audio, or `Append`. Can also be set to `off` (switching off embedding for groups C and D entirely). Default is `overwrite`.
#Emb_A_Sel ~ #Emb_D_Sel	With these setting you select in to which audio group (= 4 audio channels) of the outputs you want embedders A to D to embed the forwarded audio channels coming from the audio inputs/add-on bus. Can be `group1`, `group2`, `group3` or `group4`. You can also choose to not use the forwarded audio channels for anything by setting this item to `off`. By default it is set to `Group1`.

	AUDIO IN
#SourceEmb-A1 ~ #SourceEmb-A4	With these settings you can select where the corresponding audio channels (channel A1 till channel A4) of embedder A are coming from: ■ `LocalA`: Audio comes from audio inputs 1 till 4 ■ `LocalB`: Audio comes from audio inputs 5 till 8 (only available in the GEB/HEB 440/840/880 models) ■ `AddOnA`: Audio comes from addon bus group A ■ `AddOnB`: Audio comes from addon bus group B ■ `AddOnC`: Audio comes from addon bus group C ■ `AddOnD`: Audio comes from addon bus group D
#Emb-A1 ~ #EmbA4	With this setting you decide which audio channel of the above selected source is used for embedder A, respectively channel 1 till 4. Can be any of the available 8 channels or set to `off`.
#SourceEmb-B1 ~ #SourceEmb-B4	With these settings you can select where the corresponding audio channels (channel B1 till channel B4) of embedder B are coming from: ■ `LocalA`: Audio comes from audio inputs 1 till 4 ■ `LocalB`: Audio comes from audio inputs 5 till 8 (only available in the GEB/HEB 440/840/880 models) ■ `AddOnA`: Audio comes from addon bus group A ■ `AddOnB`: Audio comes from addon bus group B ■ `AddOnC`: Audio comes from addon bus group C ■ `AddOnD`: Audio comes from addon bus group D
#Emb-B1 ~ #EmbB4	With this setting you decide which audio channel of the above selected source is used for embedder B, respectively channel 1 till 4. Can be any of the available 8 channels or set to `off`.
#SourceEmb-C1 ~ #SourceEmb-C4	With these settings you can select where the corresponding audio channels (channel C1 till channel C4) of embedder C are coming from: ■ `LocalA`: Audio comes from audio inputs 1 till 4 ■ `LocalB`: Audio comes from audio inputs 5 till 8 (only available in the GEB/HEB 440/840/880 models) ■ `AddOnA`: Audio comes from addon bus group A ■ `AddOnB`: Audio comes from addon bus group B ■ `AddOnC`: Audio comes from addon bus group C ■ `AddOnD`: Audio comes from addon bus group D

#Emb-C1 ~ #EmbC4	With this setting you decide which audio channel of the above selected source is used for embedder C, respectively channel 1 till 4. Can be any of the available 8 channels or set to `off`.
#SourceEmb-D1 ~ #SourceEmb-D4	With these settings you can select where the corresponding audio channels (channel D1 till channel D4) of embedder D are coming from: ■ `LocalA`: Audio comes from audio inputs 1 till 4 ■ `LocalB`: Audio comes from audio inputs 5 till 8 (only available in the GEB/HEB 440/840/880 models) ■ `AddOnA`: Audio comes from addon bus group A ■ `AddOnB`: Audio comes from addon bus group B ■ `AddOnC`: Audio comes from addon bus group C ■ `AddOnD`: Audio comes from addon bus group D
#Emb-D1 ~ #EmbD4	With this setting you decide which audio channel of the above selected source is used for embedder D, respectively channel 1 till 4. Can be any of the available 8 channels or set to `off`.
#LocGainInA1 ~ #LocGainInA4	Adjusts the gain for the corresponding incoming audio input (Analog inputs 1 till 4 in case of the 400/440 models; AES/EBU inputs 1 and 2 in case of the 800/840/880 models) between -144 and 12dB. -144dB means the audio will be muted.
#LocGainInA5 ~ #LocGainInA8	Only available in GEB/HEB 800/840/880 models. Adjusts the gain for the corresponding incoming audio input (AES/EBU inputs 3 and 4) between -144 and 12dB. -144dB means the audio will be muted.
#LocGainInB1 ~ #LocGainInB4	Only available in GEB/HEB 440/840/880 models. Adjusts the gain for the corresponding incoming audio input (Analog inputs 5 till 8 in case of the 440 model; analog inputs 1 till 4 in case of the 840 models; AES/EBU inputs 5 and 6 in case of the 880 model) between -144 and 12dB. -144dB means the audio will be muted. This is only available for the GEB/HEB880 models.
#LocGainInB5 ~ #LocGainInB8	Only available in GEB/HEB 880 models. Adjusts the gain for the corresponding incoming audio input (AES/EBU inputs 7 and 8) between -144 and 12dB. -144dB means the audio will be muted. This is only available for the GEB/HEB880 models.
#LocPhaseInA1 ~ #LocPhaseInA4	Adjusts the audio phase of the corresponding individual input (Analog inputs 1 till 4 in case of the 400/440 models, AES/EBU inputs 1 and 2 in case of the 800/840/880 models) to 0 deg or 180 deg.

#LocPhaseInA5 ~ #LocPhaseInA8	Only available in GEB/HEB 800/840/880 models. Adjusts the audio phase of the corresponding individual input (AES/EBU inputs 3 and 4) to 0 deg or 180 deg.
#LocPhaseInB1 ~ #LocPhaseInB4	Only available in GEB/HEB 440/840/880 models. Adjusts the audio phase of the corresponding individual input (Analog inputs 5 till 8 in case of the 440 model; analog inputs 1 till 4 in case of the 840 models; AES/EBU inputs 5 and 6 in case of the 880 model) to 0 deg or 180 deg.
#LocPhaseInB5 ~ #LocPhaseInB8	Only available in GEB/HEB 880 models. Adjusts the audio phase of the corresponding individual input (AES/EBU inputs 7 and 8) to 0 deg or 180 deg.
#LocDelayInA1 ~ #LocDelayInA4	Adjusts the delay of the corresponding audio channel (Analog inputs 1 till 4 in case of the 400/440 models, AES/EBU inputs 1 and 2 in case of the 800/840/880 models) between 0 and 4000ms.
#LocDelayInA5 ~ #LocDelayInA8	Only available in GEB/HEB 800/840/880 models. Adjusts the delay of the corresponding audio (AES/EBU inputs 3 and 4) between 0 and 4000ms.
#LocDelayInB1 ~ #LocDelayInB4	Only available in GEB/HEB 440/840/880 models. Adjusts the delay of the corresponding audio channel (Analog inputs 5 till 8 in case of the 440 model; analog inputs 1 till 4 in case of the 840 models; AES/EBU inputs 5 and 6 in case of the 880 model) between 0 and 4000ms.
#LocDelayInB5 ~ #LocDelayInB8	Only available in GEB/HEB 880 models. Adjusts the delay of the corresponding audio channel (AES/EBU input 7 and 8) between 0 and 4000ms.
	MISC
SRC_AES-A1/2 ~ SRC_AES-A7/8	Only available in GEB/HEB 800/840/880 models. These settings adjust the sample rate converter of AES/EBU inputs 1 till 4. Can be set to `Transparent` (no sample rate conversion), `On` (always converting) or `Auto` (automatically switch to transparent in case dolby is detected).

SRC_AES-B1/2 ~ SRC_AES-B7/8	Only available for the GEB/HEB880 models. These settings adjust the sample rate converter of AES/EBU inputs 5 till 8. Can be set to `Transparent` (no sample rate conversion), `On` (always converting) or `Auto` (automatically switch to transparent in case dolby is detected).
NonPCM-Bypass	With this setting you can switch the bypass for all non-PCM audio `on` or `off`.
0dBFS-IN	The setting 0dBFs-In sets the analog audio level that gives a full-scale digital input. The available settings are +12 dBu, +15dBu, +18dBu and 24dBu.
Fade-Time	Fade/time is locked to 2 parameters: channel-switch and gain-change. It is used as the fade-in/out time of the channel-switch of embedded/local-audio channels. The old channel will be fade-out and the new channel will be fade in according to the time chosen with fade-time. Fade-Time is also used for smooth transitions when gain-values or presets are changed. These smooth transitions are triggered by a change in Dem-Gain_, Loc_Gain_ or a Preset change. With this setting you can manually set this fade time between `100ms` and `10.000ms`. The default is `500ms`.
AudioStatusBits	With this setting you select whether the audio status bits should be `Transparant` (same status bit on the outputs as on the inputs) or to `overwrite` them with new status bits.
Silence-Time	If the audio contains silence, it can be reported (in Cortex and SNMP). This setting allows you to determine how many seconds it takes before the card reports the silence by the audio status items. This setting can be set in a range from 1 sec to 60 sec. The default setting is 10sec.
Silence-Level	`Silence-level` determines the value that triggers a silence alarm. The silence threshold can be set between –100 and -20 dBFS. Default is –60 dBFS .

6 Status Menu

Introduction

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

SDI-Input_1

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

- 1080P60
- 1080p50
- 1080i60
- 1080i50
- 1080p30
- 1080p25
- 1080p24
- 1035i60
- 720p60
- 720p50
- 720p30
- 720p25
- 720p24
- SD525
- SD625
- NA

SDI-Map_1

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

SDI-Freq_1

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

CRC-Stat_1

Displays if there are CRC errors on input 1.

Locked-To

Displays to what the card is locked: `SDI1` or `Not Locked`.

GrpInUse_AB

Displays which groups are in use of embedders A and B combined. Displayed as for instance 1_3_ when groups 1 and 3 contain audio and for instance _234 when groups 2, 3 and 4 contain audio.

GrpInUse_CD	Displays which groups are in use of embedders C and D combined. Displayed as for instance 1_3_ when groups 1 and 3 contain audio and for instance _234 when groups 2, 3 and 4 contain audio.
LocStatInA1 ~ LocStatInA8	Display the status of the individual audio channels of inputs 1 till 4. Can be `OK`, `NA`, `Silence` or `Clipped` (meaning the audio is clipping)
LocStatInB1 ~ LocStatInB8	Display the status of the individual audio channels of inputs 5 till 8. Can be `OK`, `NA`, `Silence` or `Clipped` (meaning the audio is clipping). This is only available for the GEB/HEB880 models.
LocFrmtInA1/2 ~ LocFrmtInA7/8	Display the input format of channels A1/2 till A7/8 (400/440 models only go to until channels A3/4). Can be one of the following: ■ `NA` ■ `PCM` ■ `Null` ■ `AC-3` ■ `TimeStmp` ■ `MPEG-1` ■ `MPEG-2` ■ `SMPTE-KLV` ■ `Dolby E` ■ `Caption data` ■ `UserDef` ■ `Rsvd`
LocFrmtInB1/2 ~ LocFrmtInB7/8	Display the input format of channels B1/2 till B7/8 (440 models only got until channel B3/4). This is only available for the GEB/HEB 440/880 models. Can be one of the formats listed under `LocFrmtInA1/2`.
AddOnStatInA1 ~ AddOnStatInD4	Display the status of each individual add-on buss audio channel. Can be `OK`, `NA` or `Clipped` (meaning the audio is clipping).
AddOnFrmtInA1 ~ AddOnFrmtInD4	Display the format of each individual add-on buss audio channel. Can be one of the formats listed under `LocFrmtInA1/2`.
FPGA-Stat	Displays the status of the onboard FPGA. Can be either `OK` or `Error`.

DM-A_Type	Displays which type of input or output board is currently detected on circuit A. Can be Digital input or output, Analog input or output or NA. For the GEB/HEB800/880 this should always be Digital input.
DM-A_Status	Indicates the status of I/O board A, can be OK, NA or Error.
DM-B_Type	Displays which type of input or output board is currently detected on circuit B. Can be Digital input or output, Analog input or output or NA. For the GEB/HEB880 this should always be Digital input. For the GEB/HEB800 this should always be NA.
DM-B_Status	Inidcates the status of I/O board B, can be OK, NA or Error.

7 Events Menu

Introduction

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

What is the Goal of an event?

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

Events

The events reported by the card are as follows;

Announcements

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

Input_1

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

CRC-Status_1

CRC-Status_1 can be selected between 0 .. 255. 0= no event, 1..255 is the priority setting.

Ref-Status

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

What information is available in an event?

The message consists of the following items;

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

The Message String

The message string is defined in the card and is therefore fixed. It may be used in controlling software like 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
Input1	01_{hex}=INP1_LOSS	81_{hex}=INP1_RETURN	input 1 lost or returned
CRC-Status1	03_{hex}=CRC1_ERROR	83_{hex}=CRC1_OK	CRC on input 1 error or OK
Reference	02_{hex}=REF_LOSS	82_{hex}=REF_RETURN	reference lost or returned
Silence_LocInA1	05_{hex}=LOC_A1_SILENCE	85_{hex}=LOC_A1_OK	Audio channel A1 silence or OK
Silence_LocInA2	05_{hex}=LOC_A2_SILENCE	85_{hex}=LOC_A2_OK	Audio channel A2 silence or OK
Silence_LocInA3	05_{hex}=LOC_A3_SILENCE	85_{hex}=LOC_A3_OK	Audio channel A3 silence or OK
Silence_LocInA4	05_{hex}=LOC_A4_SILENCE	85_{hex}=LOC_A4_OK	Audio channel A4 silence or OK
Silence_LocInA5	05_{hex}=LOC_A5_SILENCE	85_{hex}=LOC_A5_OK	Audio channel A5 silence or OK
Silence_LocInA6	05_{hex}=LOC_A6_SILENCE	85_{hex}=LOC_A6_OK	Audio channel A6 silence or OK
Silence_LocInA7	05_{hex}=LOC_A7_SILENCE	85_{hex}=LOC_A7_OK	Audio channel A7 silence or OK
Silence_LocInA8	05_{hex}=LOC_A8_SILENCE	85_{hex}=LOC_A8_OK	Audio channel A8 silence or OK

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.

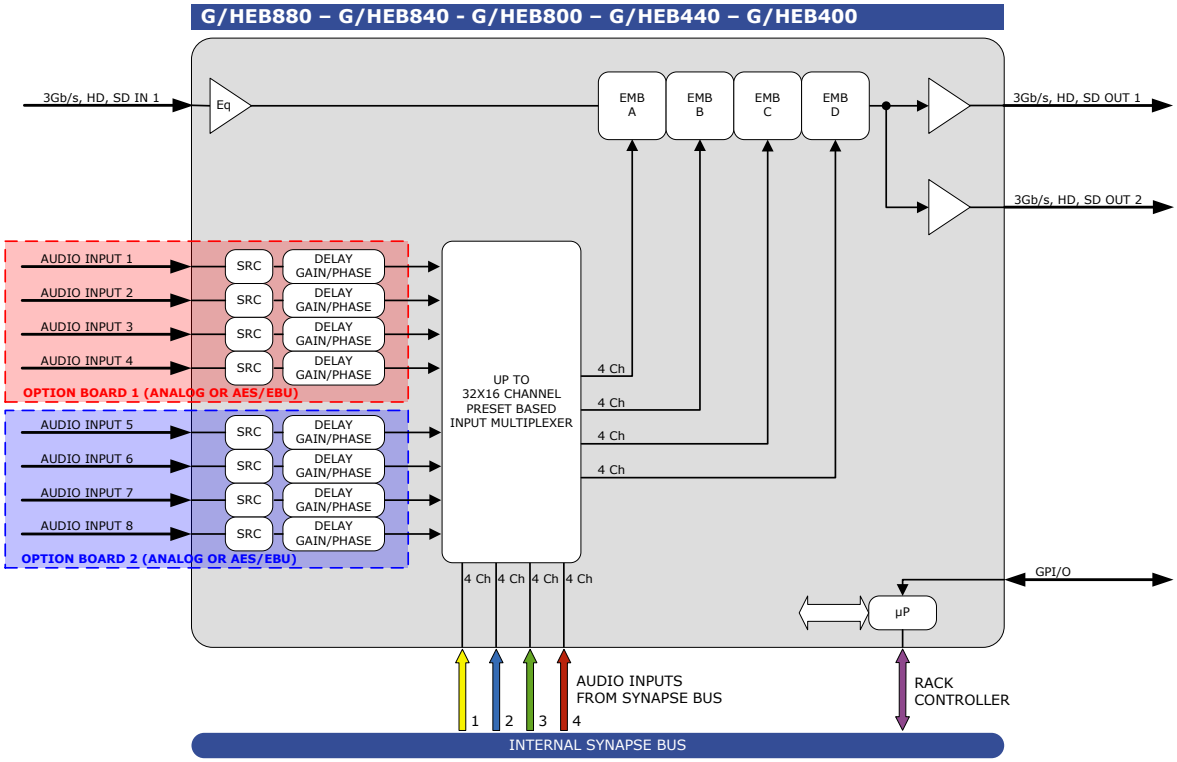
The Address

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

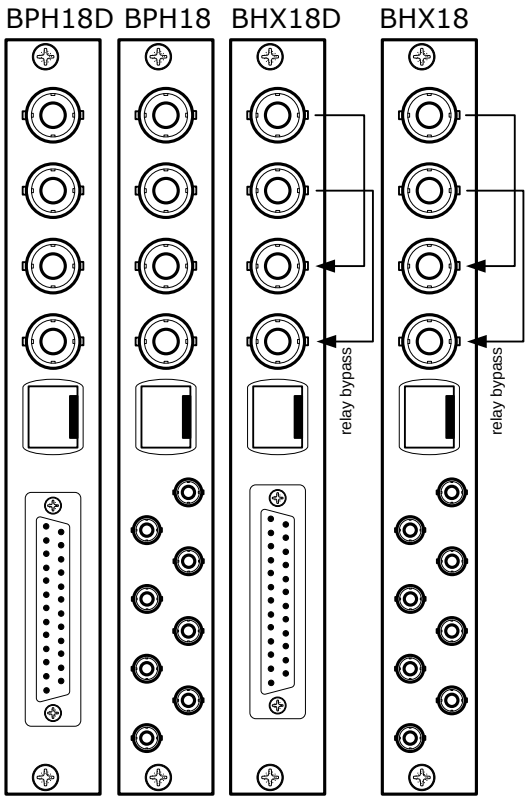
Error LED	The error LED indicates an error if the internal logic of the GEB/HEB card is not configured correctly or has a hardware failure.
Input_1 LED	This LED indicated the presence of a valid SDI video signal on input 1.
Input_2 LED	This LED indicated the presence of a valid SDI video signal on input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

9 Block Schematic



10 Connector Panels

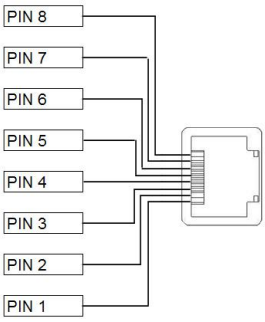
The GEB/HEB 400/440/800/840/880 can be used with the BPH18 or the BHX18b and the relay bypass equivalents. The following table displays the pinout of these backpanels in combination with the card.



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

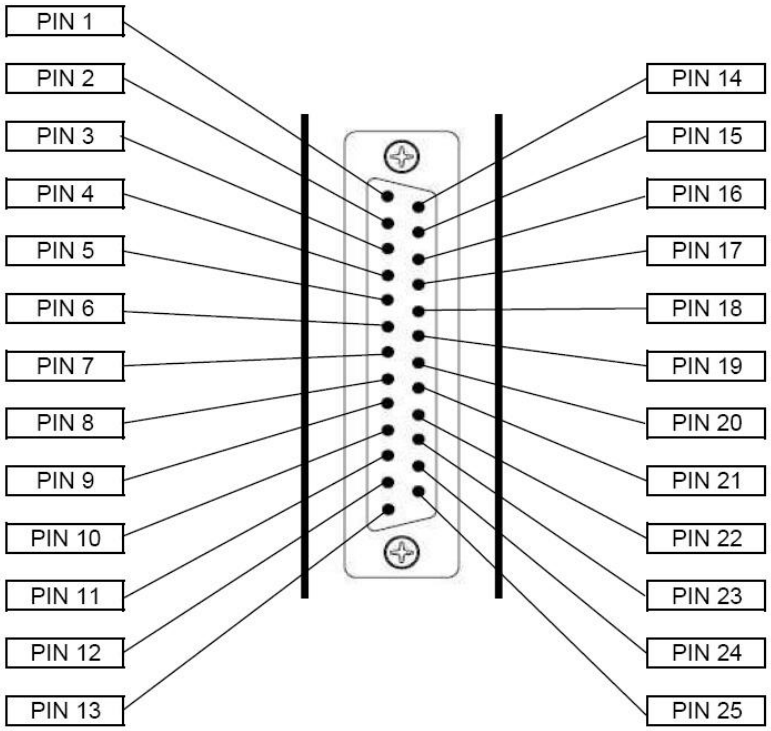
!Unused inputs and outputs must be terminated with the correct impedance!

GPI pinning



Pin	Function
1	Ground
2	GPI 1
3	GPI 2
4	GPI 3
5	GPI 4
6	GPI 5
7	GPI 6
8	GPI 7

D-sub pinning



Pin	G/HEB400	G/HEB440	G/HEB800	G/HEB840	G/HEB880
1	A1neg IN	A1neg IN	D1neg IN	D1neg IN	D1neg IN
2	A1pos IN	A1pos IN	D1pos IN	D1pos IN	D1pos IN
3	GND	GND	GND	GND	GND
4	A3neg IN	A3neg IN	D3neg IN	D3neg IN	D3neg IN
5	A3pos IN	A3pos IN	D3pos IN	D3pos IN	D3pos IN
6	GND	GND	GND	GND	GND
7	Not used	A5neg IN	Not used	A1neg IN	D5neg IN
8	Not used	A5pos IN	Not used	A1pos IN	D5pos IN
9	GND	GND	GND	GND	GND
10	Not used	A7neg IN	Not used	A3neg IN	D7neg IN
11	Not used	A7pos IN	Not used	A3pos IN	D7pos IN
12	GND	GND	GND	GND	GND
13	Not used	Not used	Not used	Not used	Not used
14	GND	GND	GND	GND	GND
15	A2neg IN	A2neg IN	D2neg IN	D2neg IN	D2neg IN
16	A2pos IN	A2pos IN	D2pos IN	D2pos IN	D2pos IN
17	GND	GND	GND	GND	GND
18	A4neg IN	A4neg IN	D4neg IN	D4neg IN	D4neg IN
19	A4pos IN	A4pos IN	D4pos IN	D4pos IN	D4pos IN
20	GND	GND	GND	GND	GND
21	Not used	A6neg IN	Not used	A2neg IN	D6neg IN
22	Not used	A6pos IN	Not used	A2pos IN	D6pos IN
23	GND	GND	GND	GND	GND
24	Not used	A8neg IN	Not used	A4neg IN	D8neg IN
25	Not used	A8pos IN	Not used	A4pos IN	D8pos IN

This product contains open-source software

This product contains open-source software licensed under the GNU Public License (GPL). A copy of the GNU Public License is included below. Under this license you are eligible to receive a copy of the source code of this software including any changes.

Axon Digital Design shall provide the source code on request either through physical distribution or electronic communication. For physical distribution you may be charged a fee that covers distribution costs. This offer is valid up to three years after date of purchase. Please direct your request to the support department of Axon Digital Design.

Axon Digital Design supports open-source software by participating in the development of open-source projects or submitting improvements to these projects. For more information see http://opensource.axon.tv/

GNU Public License version 2

TERMS AND CONDITIONS FOR COPYING, DISTRIBUTION AND MODIFICATION

0. This License applies to any program or other work which contains a notice placed by the copyright holder saying it may be distributed under the terms of this General Public License. The “Program”, below, refers to any such program or work, and a “work based on the Program” means either the Program or any derivative work under copyright law: that is to say, a work containing the Program or a portion of it, either verbatim or with modifi cations and/or translated into another language. (Hereinafter, translation is included without limitation in the term “modifi cation”.) Each licensee is addressed as “you”.

Activities other than copying, distribution and modifi cation are not covered by this License; they are outside its scope. The act of running the Program is not restricted, and the output from the Program is covered only if its contents constitute a work based on the Program (independent of having been made by running the Program). Whether that is true depends on what the Program does.

1. You may copy and distribute verbatim copies of the Program’s source code as you receive it, in any medium, provided that you conspicuously and appropriately publish on each copy an appropriate copyright notice and disclaimer of warranty; keep intact all the notices that refer to this License and to the absence of any warranty; and give any other recipients of the Program a copy of this License along with the Program.

You may charge a fee for the physical act of transferring a copy, and you may at your option offer warranty protection in exchange for a fee.

2. You may modify your copy or copies of the Program or any portion of it, thus forming a work based on the Program, and copy and distribute such modifications or work under the terms of Section 1 above, provided that you also meet all of these conditions:

a) You must cause the modified files to carry prominent notices stating that you changed the fi les and the date of any change.
b) You must cause any work that you distribute or publish, that in whole or in part contains or is derived from the Program or any part thereof, to be licensed as a whole at no charge to all third parties under the terms of this License.
c) If the modified program normally reads commands interactively when run, you must cause it, when started running for such interactive use in the most ordinary way, to print or display an announcement including an appropriate copyright notice and a notice that there is no warranty (or else, saying that you provide a warranty) and that users may redistribute the program under these conditions, and telling the user how to view a copy of this License. (Exception: if the Program itself is interactive but does not normally print such an announcement, your work based on the Program is not required to print an announcement.)

These requirements apply to the modified work as a whole. If identifiable sections of that work are not derived from the Program, and can be reasonably considered independent and separate works in themselves, then this License, and its terms, do not apply to those sections when you distribute them as separate works. But when you distribute the same sections as part of a whole which is a work based on the Program, the distribution of the whole must be on the terms of this License, whose permissions for other licensees extend to the entire whole, and thus to each and every part regardless of who wrote it.

Thus, it is not the intent of this section to claim rights or contest your rights to work written entirely by you; rather, the intent is to exercise the right to control the distribution of derivative or collective works based on the Program.

In addition, mere aggregation of another work not based on the Program with the Program (or with a work based on the Program) on a volume of a storage or distribution medium does not bring the other work under the scope of this License.

3. You may copy and distribute the Program (or a work based on it, under Section 2) in object code or executable form under the terms of Sections 1 and 2 above provided that you also do one of the following:

a) Accompany it with the complete corresponding machine-readable source code, which must be distributed under the terms of Sections 1 and 2 above on a medium customarily used for software interchange; or,
b) Accompany it with a written offer, valid for at least three years, to give any third party, for a charge no more than your cost of physically performing source distribution, a complete machine-readable copy of the corresponding source code, to be distributed under the terms of Sections 1 and 2 above on a medium customarily used for software interchange; or,

c) Accompany it with the information you received as to the offer to distribute corresponding source code. (This alternative is allowed only for noncommercial distribution and only if you received the program in objects code or executable form with such an offer, in accord with Subsection b above.)

The source code for a work means the preferred form of the work for making modifi cations to it. For an executable work, complete source code means all the source code for all modules it contains, plus any associated interface defi nition fi les, plus the scripts used to control compilation and installation of the executable. However, as a special exception, the source code distributed need not include anything that is normally distributed (in either source or binary form) with the major components (compiler, kernel, and so on) of the operating system on which the executable runs, unless that component itself accompanies the executable.

If distribution of executable or object code is made by offering access to copy from a designated place, then offering equivalent access to copy the source code from the same place counts as distribution of the source code, even though third parties are not compelled to copy the source along with the object code.

4. You may not copy, modify, sublicense, or distribute the Program except as expressly provided under this License. Any attempt otherwise to copy, modify, sublicense or distribute the Program is void, and will automatically terminate your rights under this License. However, parties who have received copies, or rights, from you under this License will not have their licenses terminated so long as such parties remain in full compliance.

5. You are not required to accept this License, since you have not signed it. However, nothing else grants you permission to modify or distribute the Program or its derivative works. These actions are prohibited by law if you do not accept this License. Therefore, by modifying or distributing the Program (or any work based on the Program), you indicate your acceptance of this License to do so, and all its terms and conditions for copying, distributing or modifying the Program or works based on it.

6. Each time you redistribute the Program (or any work based on the Program), the recipient automatically receives a license from the original licensor to copy, distribute or modify the Program subject to these terms and conditions. You may not impose any further restrictions on the recipients' exercise of the rights granted herein. You are not responsible for enforcing compliance by third parties to this License.

7. If, as a consequence of a court judgment or allegation of patent infringement or for any other reason (not limited to patent issues), conditions are imposed on you (whether by court order, agreement or otherwise) that contradict the conditions of this License, they do not excuse you from the conditions of this License. If you cannot distribute so as to satisfy simultaneously your obligations under this License and any other pertinent obligations, then as a consequence you may not distribute the Program at all. For example, if a patent license would not permit royalty-free redistribution of the Program by all those who receive copies directly or indirectly through you, then the only way you could satisfy both it and this License would be to refrain entirely from distribution of the Program.

If any portion of this section is held invalid or unenforceable under any particular circumstance, the balance of the section is intended to apply and the section as a whole is intended to apply in other circumstances.

It is not the purpose of this section to induce you to infringe any patents or other property right claims or to contest validity of any such claims; this section has the sole purpose of protecting the integrity of the free software distribution system, which is implemented by public license practices. Many people have made generous contributions to the wide range of software distributed through that system in reliance on consistent application of that system; it is up to the author/donor to decide if he or she is willing to distribute software through any other system and a licensee cannot impose that choice.

This section is intended to make thoroughly clear what is believed to be a consequence of the rest of this License.

8. If the distribution and/or use of the Program is restricted in certain countries either by patents or by copyrighted interfaces, the original copyright holder who places the Program under this License may add an explicit geographical distribution limitation excluding those countries, so that distribution is permitted only in or among countries not thus excluded. In such case, this License incorporates the limitation as if written in the body of this License.

9. The Free Software Foundation may publish revised and/or new versions of the General Public License from time to time. Such new versions will be similar in spirit to the present version, but may differ in detail to address new problems or concerns.

Each version is given a distinguishing version number. If the Program specifies a version number of this License which applies to it and "any later version", you have the option of following the terms and conditions either of that version or of any later version published by the Free Software Foundation. If the Program does not specify a version number of this License, you may choose any version ever published by the Free Software Foundation.

10. If you wish to incorporate parts of the Program into other free programs whose distribution conditions are different, write to the author to ask for permission. For software which is copyrighted by the Free Software Foundation, write to the Free Software Foundation; we sometimes make exceptions for this. Our decision will be guided by the two goals of preserving the free status of all derivatives of our free software and of promoting the sharing and reuse of software generally.

NO WARRANTY

11. BECAUSE THE PROGRAM IS LICENSED FREE OF CHARGE, THERE IS NO WARRANTY FOR THE PROGRAM, TO THE EXTENT PERMITTED BY APPLICABLE LAW. EXCEPT WHEN OTHERWISE STATED IN WRITING THE COPYRIGHT HOLDERS AND/OR OTHER PARTIES PROVIDE THE PROGRAM "AS IS" WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESSED OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. THE ENTIRE RISK AS TO THE QUALITY AND PERFORMANCE OF THE PROGRAM IS WITH YOU. SHOULD THE PROGRAM PROVE DEFECTIVE, YOU ASSUME THE COST OF ALL NECESSARY SERVICING, REPAIR OR CORRECTION.

12. IN NO EVENT UNLESS REQUIRED BY APPLICABLE LAW OR AGREED TO IN WRITING WILL ANY COPYRIGHT HOLDER, OR ANY OTHER PARTY WHO MAY MODIFY AND/OR REDISTRIBUTE THE PROGRAM AS PERMITTED ABOVE, BE LIABLE TO YOU FOR DAMAGES, INCLUDING ANY GENERAL, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES ARISING OUT OF THE USE OR INABILITY TO USE THE PROGRAM (INCLUDING BUT NOT LIMITED TO LOSS OF DATA OR DATA BEING RENDERED INACCURATE OR LOSSES SUSTAINED BY YOU OR THIRD PARTIES OR A FAILURE OF THE PROGRAM TO OPERATE WITH ANY OTHER PROGRAMS), EVEN IF SUCH HOLDER OR OTHER PARTY HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.