Synapse

HIM10

HD/SDI Integrity monitor
with frame synchronizer

AXON

Synapse

TECHNICAL MANUAL

HIM10

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: 23-02-2004
Date last revised: 24-01-2011

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 Him10

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, RRS18, RRC10 RRC04 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/RRS18/RRC10/RRC04/RRS04) manual. The method of connection to a computer using Ethernet is described in the RRC 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.

SDI / HD CARDS

HD or SDI cards can be mixed and matched in the SFR18 and SFR04 frames.

REMARK: On power up all LEDs will light for a few seconds, this is the time it takes to initialize 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 LEDs will light during this process. After initialisation, several LEDs will remain lit – the exact number and configuration is dependant upon the number of inputs connected and the status of the inputs.

Default settings

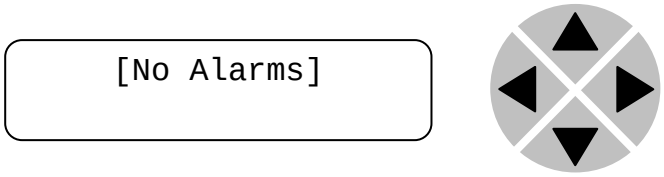
In its default condition, the HIM10 will act as a frame synchroniser and auto phase corrector. All the integrity monitor functions are not activated.

Changing settings and parameters

The front panel controls or 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.

REMARK: 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=HIM10
```

Pressing the ► selects the HIM10 in frame slot 01.

The display changes to indicate that the HIM10 has been selected. In this example the `Settings` menu item is indicated.

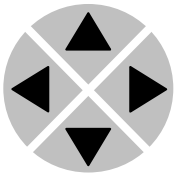
```
HIM10 [Select Menu]
>Settings
```

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 HIM10 `Settings` menu item `SDI-Format` has been selected and shows that it current setting is `Auto`.

```
HIM10 [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 HIM10 `Edit Setting` menu item `SDI-Format` has been selected.

```
HIM10 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.

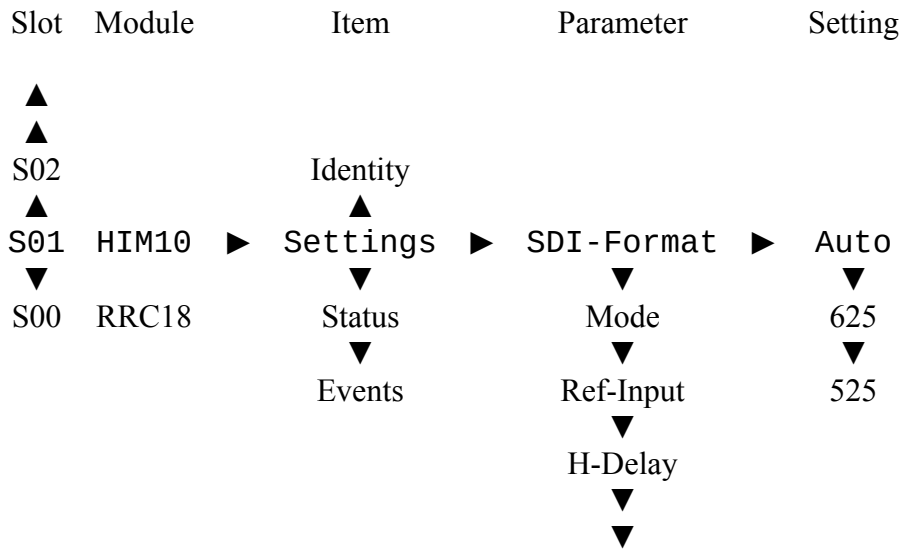
Synapse Set-Up Software

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

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

For operation of Axon Cortex, please refer to the Cortex help files.

Menu Structure Example



REMARK Further information about Front Panel Control can be obtained from the RRC18, RRC08 and RRC04 operational manuals.

4 The HIM10 Card

Introduction

The AXON HIM10 Integrity Monitor with a frame synchroniser, line synchronizer/autophazer, video delay and video proc-amp.

As an Integrity monitor the HIM10 is capable to display audio level bars and a phase bar on the HD outputs. It is also possible to probe the functions, `Freeze`, `Black`, `Silence` and announce that as an alarm on the network or display it as an alarm.

The synchroniser function can be used to synchronize a non-synchronous signal or to compensate for a delay. New sync codes (TRS) are being generated and re-inserted in the output signal.

The HIM10 has total transparent blanking, both horizontally and vertically with the possibility to blank ancillary data both horizontally and vertically.

The unit has a Serial Digital HD / SDI component input for the formats:

- 1080i-60/50
- 1080p-30/25/24
- 1035i-60
- 720p-60/50/30/25/24
- SD525
- SD626

One re-clocked outputs and two synchronised HD/SDI outputs.

The video reference is connected through the central genlock input of the SFR18 or SFR04 frames. Both TRI-LEVEL and BI-LEVEL genlock can be used.

The line synchronizer function corrects timing errors (hops) that occur due to router switching.

In addition the HIM10 can be used as a line delay , giving up to 1124 lines of delay. A video reference is not required in this case as the output clock frequency is derived from the input video clock.

When do you require a Line synchroniser/ autophaser

Analog television studios were built with inflexible distribution systems. If sources or destinations had to be changed, it was often done with so called switch boards or patch panels as electronic switcher and routers were relatively expensive. When electronic switchers were used, for example in mixers, the sources to be mixed had to be accurately timed to ensure synchronisation (typically one degree of the sub-carrier period). This level of required accuracy meant that cable lengths had to be accurate, typically less than 20 cm difference. With the breakthrough of digital technology, television system timing became very flexible and cost effective. It is now common practice to interconnect video sources and destinations via a routing switcher where cross-points can be programmed and

controlled remotely. The individual studio set-up causes input timing delays on the routing system, paths with different delay and even feedback are possible. At the output of the routing system devices need a constant input timing, for example a VTR will use the reference signal as the timing reference for all servo controls whilst in record mode. Further examples where errors may occur are PAL/NTSC encoders, they must always be an accurately timed signal. In these cases there is a demand for a digital phasing device with a timing range in the region of a video line. This device is called an autophazer or line synchroniser, and is only required in a digital environment.

The output timing of a TV studio depends heavily on the previous path of the video signal, the output will be phased to a fixed timing with the line/frame synchronizer**.** Also the input of a mixer needs phasing stages, these are already built into the device. This is easily understood as a mixer always processes the picture and inserts a new vertical blanking interval at its output. A disturbed vertical blanking interval for example will not effect the output of a mixer as long as the autophaser is locked again at the beginning of the active picture area, this is not true for the application of a line synchronizer, which must be able to handle data in the vertical blanking interval.

In short one can say that a line synchronizer should correct timing hops in its input signal immediately without any disturbance of its output. This is even true for the vertical blanking area.

HD FORMATS

The HD terminology is represented as

- P, which stands for progressive
- I, which stands for interlaced

The frame rate is expressed as 60, 50, 30, 25 and 24 fps.

For progressive content the frame rate indicates *frames* per second.

For interlaced content it indicates *fields* per second.

The frame size is displayed as 1080, 1035 and 720.

The resolution for:

- 1080 is 1920 x 1080
- 1035 is 1920 x 1035
- 720 is 1280 x 720

	Pixels per line	Lines per frame	Frame rate	Active samples per line	Active lines per frame
1080i-60	2200	1125	30	1920	1080
1080i-50	2640	1125	25	1920	1080
1080i-30	2200	1125	30	1920	1080
1080p-25	2640	1125	25	1920	1080
1080p-24	2750	1125	24	1920	1080
1035i-60	2200	1125	30	1920	1035
720p-60	1650	750	60	1280	720
720p-50	1980	750	50	1280	720
720p-30	3300	750	30	1280	720
720p-25	3960	750	25	1280	720
720p-24	4124	750	24	1280	720

The aspect ratio is 16:9

TRI/BI-Level sync.

The card is able to lock on to a HD sync 600mV nominal TRI-level. as described in the SMPTE 274M and 296m spec.

A SD sync 300 mV nominal BI-level sync can also be used.

5 Settings Menu

Introduction

The settings menu displays the current state of each HIM10 setting and allows you to change these.

Settings can be changed by using the front panel of the Synapse frame (SFR18, SFR08 or SFR04) or Axon Cortex. The SCP08 control can also be used.

Please refer to chapter 3 for information on Synapse front panel control and Axon Cortex.

SDI-Format

The `format` menu item selects the input video standard.

`AUTO`: the unit recognize format is presented at the input and automatically sets that format. It will take more time for the card to lock.

- 1080i-60/50
- 1080p-30/25/24
- 1035i-60,
- 720p-60/50/30/25/24
- SD525
- SD625

SD is standard definition.

The default setting is set to `AUTO`.

Field-Freq

`1:1` or `1:1.001` are the values that can be selected

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

There is also an `AUTO` mode, the HIM10 will detect the format and switch then to the according field-frequency.

Default is `AUTO`.

Mode

`Synchronize` and `Delay` mode can be selected within the `Mode` menu. In `Synchronize` mode, the Autophaser/Line synchroniser is active. In `Delay` mode a reference is not required, the output timing is derived from the input signal. The default setting is `Synchronize`.

`Synchronize` Mode: When `Mode` is set to `Synchronize` and the card is locked to a reference, the card is in synchronizing mode, and the following timing is of importance. The minimum delay between input and output signal (output advanced) is 5 lines. (NOTE that it is referred to the output signal so it takes the H-V-delay into account) The maximum delay between input and output signal (output advanced) is '1frame' + 5 lines. Due to a hysteresis, when the timing between in- and output is from 4 lines to 5 lines, it is not say whether the card is in a frame delay or not. The maximum delay between the input and output signal (output advanced) to ensure that the card has a frame delay are '1frame' + 4 lines.

`Delay` Mode: When `Mode` is set to `Delay`, the card is in Delay Mode. In this mode the delay between input and output is 4 lines The H-Delay and V-Delay settings give a delay in addition of this. `Synchronize` and `Delay` mode can be selected within the mode menu. In `Synchronize` mode, the Autophaser/Line synchroniser is active. In `Delay` mode a reference is not required, the output timing is derived from the Input

Ref-Input

This setting allows the user to determine which reference input is used to lock the HIM10. Input 1 is the uppermost input of the RRC18 rack controller connector panel at the back of the SFR18. The SFR04 has one reference input.

The available settings for `Ref-Input` are `1`, `2` and `Auto`. The default setting of `Ref-Input` is `1.`

`Auto`: automatically selects the reference of the selected standard.

`Ref_1` is the 50Hz standard,

`REF_2` is the 60 Hz standard.

The default setting is `1`.

Ref-Type

`REF-TYPE` sets the type of reference `TRI-level` or `BI-level`.

The default setting is BI-`level`

H-Delay

The `H-Delay` setting allows adjustment of the horizontal phase of the output signal with respect to the selected reference input.

The `H-Delay` setting gives a delay in addition to the reference timing. For example in 625/50: if the H-Delay is set to 10 samples, the output signal will be delayed by the reference timing + 10 samples of 37ns. Therefore the delay = Ref timing+ 37ns x10. The signal is delayed (advanced) with respect to the phase of the reference signal.

In 625/50 the adjustment range of H-Delay is 0-863 samples, 0..64 µs (one PAL TV line).

In 525/60 the adjustment range of H-Delay is 0-857 samples, 0...63.556 µs (one NTSC TV line).

The default setting is `0` samples.

The delay of the card is indicated by the tracking pulse on the BNC output. This can be used, for example, to track an audio delay.

Note: Please refer to the following description of Ref input for synchronization and timing information.

HD resolutions 1 pix = 13.5nsec

1080i-60	Range 0-2199 pix
1080i-50	Range 0-2639 pix
1080p-30	Range 0-2199 pix
1080p-25	Range 0-2199 pix
1080p-24	Range 0-2749 pix
1035i-60	Range 0-2199 pix
720p-60	Range 0-1649pix
720p-50	Range 0-1979 pix
720p-30	Range 0-3299 pix
720p-25	Range 0-3959 pix
720p-24	Range 0-4124 pix

SD resolution

525i-60	Range 0-857
625i-60	Range 0-863

V-Delay

The `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 lines, the output signal will be delayed by the reference timing + 10 TV lines. The signal is delayed (advanced) with respect to the phase of the reference signal.

In 625/50 the adjustment range of V-Delay is 0-624 lines

(one TV frame).

In 525/60 the adjustment range is 0-524 lines (one TV frame).

The default setting is 0 lines.

The delay of the card is indicated by the tracking pulse on the BNC output. This can be used, for example, to track an audio delay.

Note: Please refer to the description of Ref input for synchronization and timing information.

525i60	Range 0-524 lines
625i60	Range 0-624
720p	Range 0-749
1080i	Range 0-1124
1080p	Range 0-1124

Freeze

`Frz` enables the capture of one Video Field or Frame (depending onthe setting of `Frz-Mode`). The settings of Freeze are `On` or `Off`.

The default setting is OFF.

Frz-Mode

`Frz-mode` allows you to choose between storing a complete Video Frame or Field (double written) for the above `Freeze` Menu and the external freeze input.

The default setting is Field

Input-Loss

`Input-Loss` enables the capture of the last video information when the input signal is lost. `Panic freeze` always uses Field mode, irrespective of the settings of the `Freeze-mode` menu item. `BLACK`, in case of a lost of input the output is black, `GREY`, in case of a lost of input the output is Grey. `GREEN,` in case of a lost of input the output is green.

The settings of `Input-Loss` are, `Freeze`, `Black`, `Grey` AND `Green`

The default setting is `Freeze`.

Ext-Frz

`Ext-Freeze` enables the external freeze input (GPI contact closure J9 of the BPH01.)

Disabled means that this feature is not active.

Enabled means that this feature is active.

The default setting is `Disabled`.

Y-Gain

`Y-Gain` controls the Luminance gain of the built-in processing amplifier. The control range is between `0%` and `199.8%**`.

The default setting of `Y-Gain` is `100%`.

Cb-Gain

`Cb-Gain` controls the Colour Difference gain of the built-in processing amplifier. The control range is between `0%` and `199.8%**`.

The default setting of `Cb-Gain` is `100%`.

Cr-Gain

`Cr-Gain` controls the Colour Difference gain of the built-in processing amplifier. The control range is between `0%` and `199.8%**`.

The default setting of `Cb-Gain` is `100%`.

Y-Black

This item controls the Luminance black level adjustment between -128……..+127 (10 bit digital value)

The black level can be aligned by +/– 100mV(analog video)

64 (10 bit digital value) represents the nominal black level value for all digital video standards

Cb-Black

This item controls the Colour Difference (Cb) black level adjustment.

Cr-Black

This item controls the Colour Difference (Cr) black level adjustment.

Line-lock

`Line lock` is only available in HD.

In the line data, a line number is interwoven. The line number can be locked to the reference.

`Enabled` indicates that it is active.

`Disabled` indicates that it is not active.

The default setting is `Disabled`.

This function is de-activated for SD formats.

ANC-Blank

ANC-Blank allows you to blank the ancillary data in the horizontal and/or in the vertical interval.

`H` – ancillary data in the Horizontal interval blanked.

`V` – ancillary data in the Vertical interval blanked.

`H+V` – ancillary data in the Horizontal and Vertical interval blanked.

`Off` – The ancillary data is passed.

The default setting is `OFF`.

Pattern

The HIM10 also includes a test pattern generator. A reference is required to generate a test pattern.

There are two test patterns, namely `Colorbar` and `Sweep`.

`Colorbar` – colorbar output on the processed outputs

`Sweep` – Sweep output on the processed outputs.

`Off` – No test pattern is generated from the processed outputs.

The default setting is `OFF`

Delay-Status

In the status menu it is possible to display (`IO_delay` item) the processing time of the HIM10. This setting enables you to switch this function `ON` or `OFF`.

Default setting is `OFF`.

Switch-Status

In the status menu it is possible to display (`switch-Det`) the switching time in the selected line (7 for 50Hz) of the HIM10. This setting enables you to switch this function `ON` or `OFF`.

Default setting is `OFF`.

HD-AudioLock

HD-SYNC is the default setting and assumes that all audio present in the video stream is synchronously embedded. The setting HD-AudioLock can be useful if audio is asynchronously embedded into the HD video stream. The HIM10 can be locked to embedded Audio-Clk_A or Audio-Clk_B.

HD-AudioLock determines whether the card locks to the HD input (HD-SYNC) or to the AUDIO CLOCK as is present in embedded audio group_1 (Audio-Clk_A) or embedded audio group_2 (Audio-Clk_B).

The default setting is HD-SYNC

Note:

We consider the level bars positioned on the left as A. And the level bars on the right as B.

Meter_A-L

METER-A-L is used to allocate a channel to the on screen meter A. Meter_A is the left meter on the left peak meter.

You are able to select all 16 channels of the 4 groups.

Default is channel 1

Meter_A-R

METER-B-R is used to allocate a channel to the on screen meter B. Meter_A is the right meter on the left peak meter.

You are able to select all 16 channels of the 4 groups.

Default is channel 2

Meter_B-L

METER-B-L is used to allocate a channel to the on screen meter C. Meter_C is the left meter on the right peak meter.

You are able to select all 16 channels of the 4 groups.

Default is channel 3.

Meter_B-R

METER-B-R is used to allocate a channel to the on screen meter D. Meter_D is the right meter on the right peak meter.

You are able to select all 16 channels of the 4 groups.

Default is channel 4.

Scales

The on screen peak meters can handle several scales. And these scales are free selectable.

AES_EBU with an overall dynamic range 60 dB : 0 dBu to –60 dBu .

BBC with an overall dynamic range 28 dB : +12dB to –16 dB.

Nordic with an overall dynamic range 60 dB : +12dB to –48 dB.

VU with an overall dynamic range 23 dB : + 3 dB to –20 dB.

Default setting is AES_EBU.

OSD_Level-A

With OSD-Level-A it is possible to switch the On Screen Level detection OFF or to display the OSD with a filled outline Masked.

Transp, the OSD is displayed transparent.

A is the left OSD_level

Default is OFF

OSD_Level-B

With OSD-Level-B it is possible to switch the On Screen Level detection OFF, or to display the OSD with a filled outline Masked.

Transp, the OSD is displayed transparent.

B is the right OSD_level

Default is OFF

OSD_Phase-A

With OSD_Phase-A it is possible to switch the On Screen Display Phase detection OFF, or to display the OSD with a filled outline Masked.

Transp, the OSD is displayed transparent.

Phase A are the two channels as selected in Meter_A_L and Meter_A_R.

The default setting is OFF.

OSD_Phase-B

With OSD_Phase-B it is possible to switch the On Screen Display Phase detection OFF, or to display the OSD with a filled outline Masked.

Transp, the OSD is displayed transparent.

Phase B are the two channels as selected in Meter_B_L and Meter_B_R.

The default setting is OFF.

OSD_Text-A

With OSD-Text-A it is possible to display the scale values of the left level bar (A). Off the values are not displayed, On the values are displayed.

The default setting is OFF

OSD_Text-B

With OSD-Text-B it is possible to display the scale values of the left level bar (B) Off the values are not displayed, On the values are displayed.

The default setting is OFF.

Phase-Stat

Phase-Stat switches the Phase detection on. The values are displayed real time under the status item, PHASE-A and PHASE-B. In steps of 1 degree.

OFF, this function is not activated. ON the function is activated.

The default setting is OFF.

Level Detect

Phase Detect switches the Level detection on. The values are displayed real time under the status item, Level_A-L, Level_A-R, Level_B-L and Level_B-R. In steps of 1 dBfs.

OFF; this function is not activated. ON; the function is activated.

Default is OFF.

Freeze-Time

When a picture freezes then can this be reported by the HIM10. With this item it is possible to determine the sensitivity.

Freeze-Time sets the number of frozen frames before the status item FREEZE-Stat reports this.

This can be set in a range from 10 to 4000 frames.

Default is 0.

Freeze-Trsh

`FREEZE-Trsh` determines the level of sensitivity of the `Freeze-DET`.

`NONE` for no threshold and `LOW`, `MIDDLE`, `HIGH`. `None` is the default setting.

Black-Time

When a picture is black, this can be reported by the HIM10. This item allows you to determine the sensitivity.

`Black-Time` sets the number of black frames before the status item BLACK-Stat reports this.

This can be set in a range from 1 to 1000 frames. Default is `10 frms`.

Black-Trsh

`Black-Trsh` determines the level of sensitivity of the `Black-det`.

`NONE` for no threshold or `LOW`, `MIDDLE`, `HIGH`. `None` is the default setting.

Silence-Time

If the embedded audio contains silence, this can be reported by the HIM10. This setting allows you to determine how many seconds it takes before the card reports the silence by the status items `Audio_A-L`, `Audio_A-R`, `Audio_B-L` and `Audio_B-R.`

This setting can be set in a range from 1 sec to 255 sec. The default setting is 10sec.

Silence-Level

`Silence-level` determines the value that triggers a silent alarm. The silence threshold can be set as –80 , -60 or 40 dBFS .

Default is –60 dBFS .

Audio-Phase

If this setting is set to *Align*, the card ensures audio-phase alignment between multiple audio channels and audio groups, which is necessary for multi-channel (surround) purposes. If errors in the signal-chain occur the de-embedder blocks reset synchronously to maintain audio-phase-alignment.

If this setting is set to *Off*, the card *eats-all* audio including errors. Even if there are DBN/ANC/ECC or channel-sequence errors, the de-embedder will pass them. Be aware that audio-phase-alignment between multiple audio channels and audio groups can not be maintained if this setting is set to *Off*.

Note: This setting can be helpful to solve problems in the field using equipment which doesn't follow the standards correctly.

ROI_H-start	ROI stand for ‘Region Of Interest’. With these settings you can define a specific region in de video in which the HIM10 should perform its (video) integrity checking. With the H-start setting you define the horizontal start position of the region of interest between 0 and 100% of the total picture width. Default is 0%.
ROI_H-stop	With the H-stop setting you define the horizontal end position of the region of interest between 0 and 100% of the total picture width. Default is 100%
ROI_V-start	With the V-start setting you define the vertical start position of the region of interest between 0 and 100% of the total picture height. Default is 0%
ROI_V-stop	With the V-end setting you define the vertical end position of the region of interest between 0 and 100% of the total picture height. Default is 100%

6 Status Menu

Introduction

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

SDI-Input

This status item indicates the presence and format of a valid HD/SD serial in input_1.

This is displayed as:

- 1080i/60/50
- 1080p/30/25/24
- 1035i/60
- 720p/60/50/30/25/24
- SD525
- SD625

NA is used when no valid input signal is available or if the selected format doesn't match the input signal.

Ref-Det

This status item recognizes a valid reference in the genlock input. NA indicates that no valid reference is present.

Present indicates that a valid reference is present.

No status feedback indicates that there is no SD/HD input.

Lock-Det

`Lock-Det` indicates if there is a valid clock presented in the output. It shows whether the right ref-type is selected, and whether the internal PLL is locked to the signal. This is displayed as LOCKED. Unlocked indicates that the above described criteria are not present.

GrpInUse

Detects the embedded audio groups that are used within the HD/SD data stream.

If no groups are detected, the display indicates `----`

A single group is detected as `1---`

All groups are represented by `1234`

FrmtStat-A	This status item displays the format of the selected embedded channels of A. The card can detect the formats `PCM`, `AC-3` and `Dolby-E`.
Audio_A-L	`Audio_A-L` displays when the selected embedded audio channel contains Silence. `Ok` if there is no silence, `Silence` when there is no audio according the criteria as set in `Silence-time` and `Level`.
Audio_A-R	`Audio_A-R`, displays when the selected embedded audio channel contains Silence. `Ok` there is no silence, `Silence` when there is no audio according the criteria as set in `Silence-time` and `Level`.
FrmtStat-B	This status item displays the format of the selected embedded channels of B. The card can detect the formats `PCM`, `AC-3` and `Dolby-E`.
Audio_B-L	`Audio_B-L` displays if the selected embedded audio channel contains Silence. `Ok` there is no silence, `Silence` when there is no audio according to the criteria set in `Silence-time` and `Level`.
Audio_B-R	`Audio_B-R` displays if the selected embedded audio channel contains Silence. `Ok` there is no silence, `Silence` when there is no audio according the criteria set in `Silence-time` and `Level`.
Audio-Clk	`Audio-Clk` displays to which clock the embedded audio is locked, either in `48KHz-ASYNC`, `48KHz-sync` or `out-of-range`.
Anc-Stat	This status item indicates the status of the ancillary data. `NA` is used when there is no ANC data `OK` is used when the data shows no errors `ERROR` is used when the ANC data is corrupt.
CRC-STAT	`CRC Stat` gives the status of the incoming HD/SDI signal CRC Error, Luma_CRC or Chroma_CRC

IO_delay	IO-Delay displays the processing time of the card in milli seconds (ms). It is necessary to enable this function in the settings menu under Delay status.
Switch-Det	Switch-Det displays the switching time of the card in milli seconds (ms). It is necessary to enable this function in the settings menu under Switch status.
Freeze-stat	Freeze-stat displays FREEZED in case of frozen input and if the criteria of Freeze time and Freeze Trsh are met. Moving if no frozen frames are detected.
Black-Stat	Black-Stat displays Black in case of black in the input and if the criteria of Black-time and Black-Trsh are met. OK when no black is detected.
Phase-A	Phase-A displays the phase between the channels as set in Meter_A-L and Meter_A-R. This is displayed as a value between 0deg and 180deg, in steps of 1degree.
Phase-B	Phase-B displays the phase between the channels as set in Meter_B-L and Meter_B-R. This is displayed in a value between 0deg and 180deg, in steps of 1degree.
Level_A-L	Level_A-L displays the level of the embedded audio channel as set in Meter_A-L. This is displayed in a range between –145dBFS and 0Dbfs. in steps of 1 dbfs.
Level_A-R	Level_A-R displays the level of the embedded audio channel as set in Meter_A-R. This is displayed in a range between –145dBFS and 0Dbfs. in steps of 1 dbfs.
Level_B-L	Level_B-L displays the level of the embedded audio channel as set in Meter_B-L. Displayed in a range between –145dBFS and 0Dbfs. in steps of 1 dbfs
Level_B-R	Level_B-R displays the level of the embedded audio channel as set in Meter_B-R. This is displayed in a range between –145dBFS and 0Dbfs. in steps of 1 dbfs

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.

HIM10 Events

The events reported by the HIM10 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

Input 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.

Lock-Status

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

CRC-Status

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

Freeze-Status

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

Black-Status

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

This information is only needed when the GPI16 card is used or when software is implemented.

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 HIM10 are:

Event Menu Item	Tag		Description
Announcements	0 or NA	0 or NA	Announcing of report and control values
Input	01_{hex}=INP_LOSS	81_{hex}=INP_RETURN	primary input lost or returned
Reference	02_{hex}=REF_LOSS	82_{hex}=REF_RETURN	reference lost or returned
EDH-Status	03_{hex}=EDH_ERROR	83_{hex}=EDH_OK	EDH error occurred
ANC-Status	04_{hex}=ANC_ERROR	84_{hex}=ANC_OK	ANC status error

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 SFS10 card is not configured correctly or has a hardware failure.

Input LED

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

Reference LED

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

Data Error LED

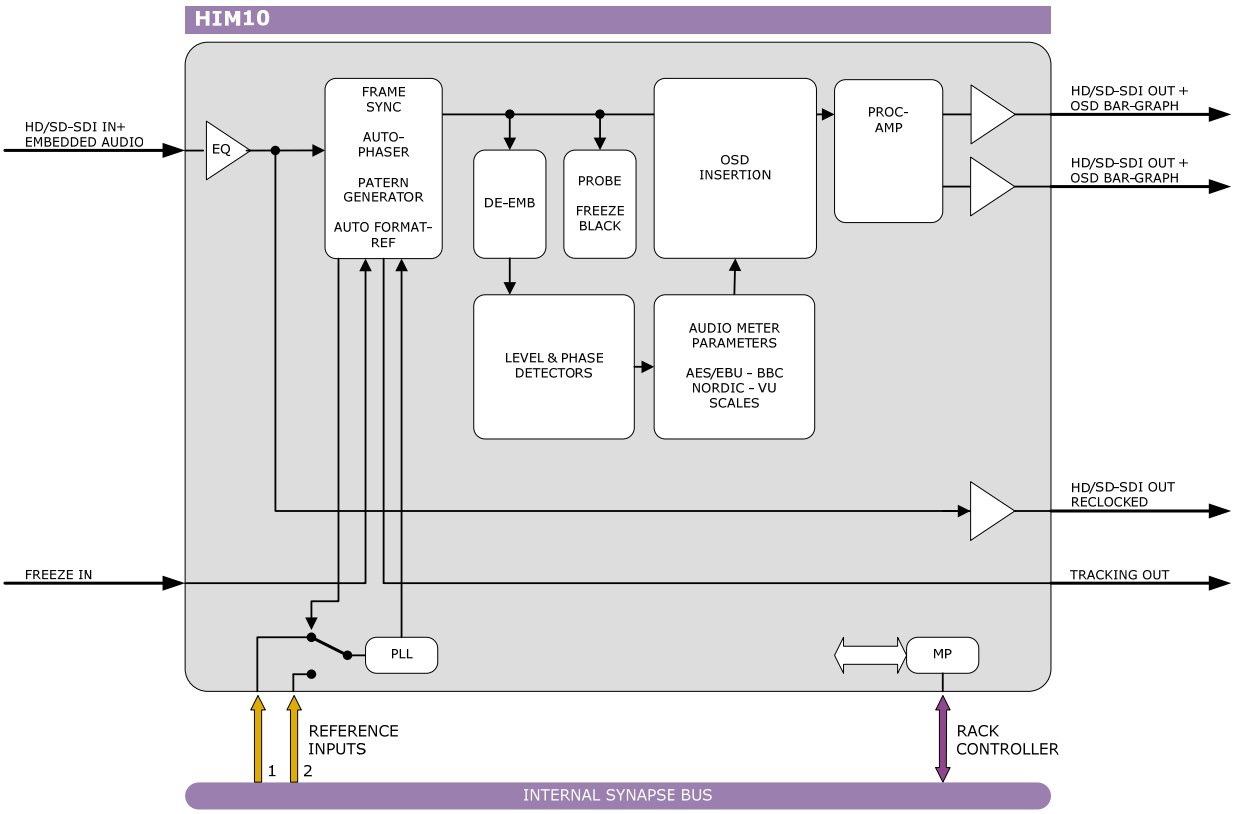
This LED indicate two different types of error:

- ANC (embedded audio) checksum error.
- EDH error

Connection LED

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

9 Block Schematic

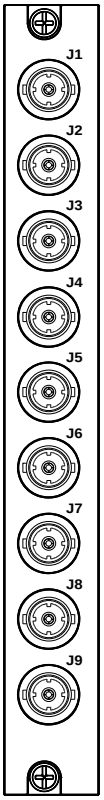


10 Connector Panel

The HIM10 can be used with the following backplane

BPH01

Compatible with fiber backplanes: BPH01T_FC/PC, BPH01T_SC, BPH01R_FC/PC, BPH01R_SC



J1 = HD/SDI INPUT

J2 = HD/SDI RECLOCKED OUTPUT

J3 = HD/SDI PROCESSED OUTPUT

J4 = HD/SDI PROCESSED OUTPUT

J7 = FREEZE GPI INPUT

J8 = TRACKING TTL OUTPUT

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