Synapse

ASM10

**Analog to Digital A/V Bridge with
SDI+Embedded audio processing mode**

AXON
Digital Design

Synapse

TECHNICAL MANUAL

Analog to Digital A/V Bridge with SDI+Embedded audio processing mode

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AXON Digital Design
Smarter by Listening

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.

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

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

Axon Digital Design ASM10	This device complies with part 15 of the FCC Rules
FC Tested To Comply With FCC Standards	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.
FOR HOME OR OFFICE USE	

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 and RRC04 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) manual. The method of connection to a computer using Ethernet is described in the RRC manual.

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

Although not required to Setup a Synapse frame, you are strongly advised to use a remote personal computer or laptop PC with the Synapse Setup software 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 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.
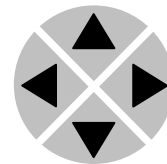
Default settings

In its default condition, the ASM10 will act as an analog to digital converter with a frame synchroniser and auto phase corrector.

Changing parameters and settings

The front panel controls or the Synapse Set-Up Software 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

[No Alarms]

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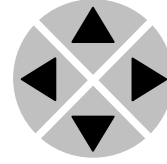
Press ►   To go forward through the menu structure.
Press ◄   To go back through the menu structure.
Press ▲   To move up within a menu or increase the value of
           a parameter.
Press ▼   To move down through a menu or decrease the
           value of a parameter.

NOTE: Whilst editing a setting, pressing ► twice will reset the value to its default.
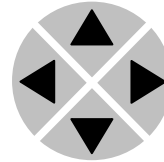
With the display as shown below

> RRC18 [Select Card]
> >S01=ASM10

Pressing the ► selects the ASM10 in frame slot 01.

The display changes to indicate that the ASM10 has been selected. In this example the Settings menu item is indicated.

> ASM10 [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 ASM10 Settings menu item SDI-Format has been selected and shows that it current setting is Auto.

> ASM10 [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 ASM10 Edit Setting menu item SDI-Format has been selected.

> ASM10 [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 Setup Software

Synapse Setup Software 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.

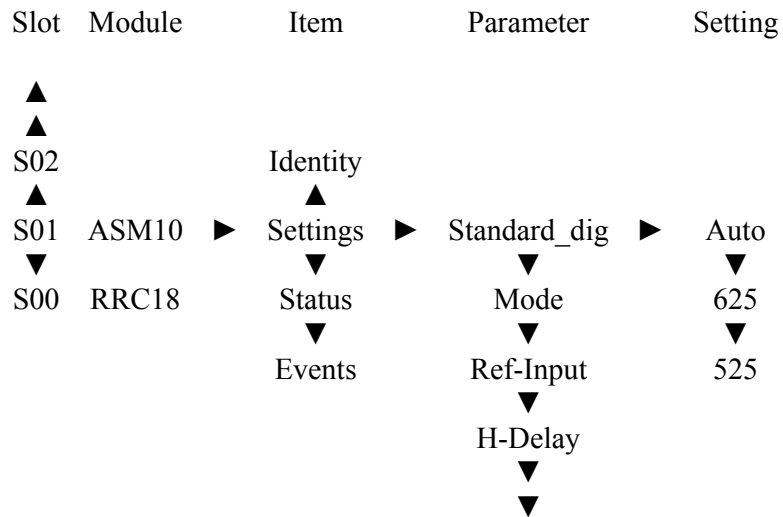Each Synapse frame is addressed through its rack controller's unique IP address, giving access to each module, its menus and adjustment items. The Synapse Setup software has access to data contained within the Synapse module and displays it on a GUI. The software has an intuitive structure following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

Having selected the desired Frame and Module from the GUI Synapse Network View, select the menu item that you wish to open. Opening the menu item gives a complete list of available properties with their associated Value.

For example to change a setting e.g. SDI-Format, select SDI-Format form the list of settings by 'double clicking' to open a dialogue box. The dialogue box allows parameters to be changed or set to default value. On completion close the dialogue box.

Menu Structure Example

Slot	Module		Item		Parameter		Setting
▲							
▲							
S02			Identity				
▲			▲				
S01	ASM10	►	Settings	►	Standard_dig	►	Auto
▼			▼		▼		▼
S00	RRC18		Status		Mode		625
			▼		▼		▼
			Events		Ref-Input		525
					▼		
					H-Delay		
					▼		
					▼		

NOTE: Further information about Front Panel Control and Synapse Setup Software can be obtained from the RRC18 and RRC04 operational manuals.

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4 The ASM10 Card

Introduction

The ASM10 card has analog audio, component, and composite video inputs. It outputs SDI + embedded audio and AES/EBU audio. The ASM10 also has a full functional frame synchronizer with embedding functions and audio processing (if the input signal has embedded audio). The ASM10 also has a tracking output. An additional group can be added through the Synapse audio bus. De-embedding to an AES/EBU output is another product feature. It has a proc-amp on the SDI output and gain, with phase and delay adjustment on the analog audio inputs. WSS, VI inserter and EDH generator are available settings.

The converter is compliant to common television standards as PAL, SECAM and NTSC.

All Digital Decoding

The ASM10 utilises 10-bit digital decoding to ensure accurate high quality signal processing for video. 24 bits converters are used for audio.

Composite, Component and SDI Inputs

The ASM10 has an analog composite input, a component input and a serial digital (SDI) input with a cable equalization reach of 300 meters. Several Pal, NTSC and SECAM standards are possible as analog video inputs.

Analog Audio inputs

Four Analog audio inputs on d-sub. (See Chapter 10 for details).

Two Serial Digital Outputs

Two SDI ouputs are available with embedded audio, VLI and WSS.

Two Digital audio Outputs

Two Digital AES/EBU audio outputs on d-sub (See Chapter 10 for details).

Automatic Standard Selection

Most video standards can be handled by the ASM10. In 'Auto' Mode, the unit automatically detects the used input standard and changes the signal processing in accordance with this detected standard.

Built-in Framestore

After both analog and digital video inputs, a frame line synchronizer locks a digital or analog video signal to a reference (frame synchronizer) or a line synchronizer /autophaser to solve switching errors.

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Reference Input | The ASM10 provides two reference inputs by the Synapse Bus. In order to provide redundancy, these are in the same TV standard. Different TV standards allow operating in two different modes). These are either in the same TV standard in order to provide redundancy, or in different TV standards to allow operation in two different modes.

Tracking output | The ASM10 provides a tracking output. This output provides a timing pulse for use with other Axon Synapse devices, e.g. for audio synchronisation with a DIO24 , ADC24 or ADL24.

Back planes | The ASM10 can only used with the BPL12 back plane. See Chapter 10 for more information.

Miscellaneous | The ASM10 cards can be housed in either the Axon SFR04 or SFR18 rack. LED's at the front of the board indicate the present video reference, the input signal, and connection and processor errors.

The ASM10 can be controlled by Axon Synapse set-up software.

Embedded audio data packet formatting | One of the important advantages of the SDI interconnection as defined by SMPTE259M is the ability to embed several channels of digital audio in the digital domain. This is particularly useful in large systems where separate routing of digital audio becomes a cost consideration. The convenience and assurance that the correct audio associated with the video is available is also an advantage. The SDI interconnection is designed to handle 16 channels of embedded audio with a sample rate of 48KHz and a word length of 20 bits. The four audio channels from audio group 1 are ordered such that channels 1 and 2 make one channel pair, and channels 3 and 4 make another. Audio Group 2 contains channels 5 and 6 as one channel pair and so on.

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 autophaser 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.

Breakout cable

It is possible to order a breakout cable order#ADD942026001

5 Settings Menu

Introduction

The settings menu displays the current state of each setting within the ASM10 and enables the item to be changed or adjusted.

Settings can be changed using the front panel of the Synapse frame (SFR18 or SFR04) or Synapse Setup software.

Please refer to chapter 3 for information on the Synapse front panel control and Synapse Setup software.

Input-Sel

The ASM10 accepts a range of inputs, SDI, composite (CVBS) ,Y_Pr_Pb and YC. Input-Sel selects the Active Picture content from the selected source.

The settings of Input-Sel are;

Composite: Composite input.

YC : SVHS Style Input

Y_Pr_Pb : Component input

SDI: SDI.

The default setting of Input-Sel is Composite.

Standard_Dig

This item controls the detection of the input standard. The settings of Standard are Auto detection, 625, 525. The default setting is Auto. Having detected or set a standard, the ASM10 automatically utilises the settings in the menus 625-Stndrd or 525-Stndrd.

Standard_Ana

Standard_Ana sets either the PAL, NTSC and SECAM standard. An Auto detection function is also available. A divergent PAL, NTSC or SECAM standard can be selected in Stndrd_NTSC and Stndrd_PAL.

The default setting is AUTO.

Auto_NTSC

Within the Standard_Ana, Standard_NTSC determines whether NTSC_J or NTSC_M is selected.

The default setting is NTSC_M.

Auto_PAL

Standard_PAL sets Within the Standard_Ana, Standard_PAL determines whether PAL-BGHI or PAL_N is selected.

The default setting is PAL-BGHI.

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 selected in the Input-Sel menu.

The default setting is Synchronize.

Synchronizing 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 1.15 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' + 0.15 lines. Due to a hysteresis, When the timing between in- and output is from 0.15 lines to 1.15 lines, due to a hysteresis it is not possible to say whether the card is in a frame delay or not.The maximum delay between the input and output signal (output advanced) is a frame delay of '1frame' + 0.27 lines.
The total delay of the card in synchronizer mode is the delay mentioned above, plus the delay in Delay Mode (1.8μs).

Delay Mode:

When Mode is set to Delay, the card is in Delay Mode. In this mode the delay between input and output is 48 samples (1.8μsec). The H-Delay and V-Delay settings give an additional delay.

Note: 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.

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

The H-Delay setting gives a delay in addition to the reference timing. For example, if 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 0-1727 samples, 0..64 μs (one PAL TV line).

In 525/60 the adjustment range of H-Delay is 0-1715 samples, 0...63.556 μs (one NTSC TV line).

The default setting is 0 samples.

The Delay of the card in Delay mode is;

Input-sel =	SDI:	78µs
Input-sel =	Composite:	
Input-sel =	Y_Pr_Pb	

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

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 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.

Input-Gain

Input-gain determines whether the gain for the composite and Y_Pr_Pb is fixed, variable or auto. In FIXED mode the input stage is static and expects a compliant input signal with the correct amplitude. In AUTO mode an AGC stage is enabled and the voltage is adjusted automatically, depending on the sync amplitude. If the sync is less than 300mV, the video input signal will be amplified with the amount specified as the 300mV sync amplitude. If the sync amplitude is too high the opposite occurs. In VARIABLE mode the input signal is manually adjustable.

The default setting is AUTO.

Var-Gain

This is the adjustment menu for the Variable mode as mentioned above. The adjustable range is from 0.26x ('x' as in 'multiply') to 1.99x. The default setting is 1x.

Ref-Input	This setting allows the user to determine which reference input is used to lock the ASM10. Input 1 is the uppermost input of the RRC18 rack controller connector panel at the back of the SFR18; Input 2 is the lower. 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.
	1, 2: Locks to the reference at the respective input.
	Auto: Selects Ref_1 to 625, Ref_2 to 525. If a signal is not connected the reference, the reference will automatically be locked to the reference.
Freeze	Freeze enables the capture of one video frame when it is set to On. Freeze can be set On or Off. The default setting is Off.
Frz-Mode	Frz-mode gives the option of storing a complete Video Frame or Field (double written) for the above Freeze Menu and the external freeze input. The settings of Frz-mode are Field and Frame. The default setting is Field.
Input-Loss	With this item you can set what should be the output of the ASM card in case of an input-loss. Input loss always uses Field mode, irrespective of the settings of the Freeze-mode menu item.
	FREEZE: the capture of the last video information when the input signal is lost is displayed.
	BLACK: the output is Black.
	GREEN: the output is Green.
	CONT_ANA_INP: can only be used in case of analog input loss and will continue displaying the analog input after input loss. This way a poor analog signal can still be displayed.
	SW_OUT_OFF: In case of an input loss, there will be no output at all (not even a video framework).
	The default setting is FREEZE.
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 is 100%.
C-Gain	C-Gain controls the Chroma gain of the built-in processing amplifier. The control range is between 0% and 199.8%. The default setting is 100%.

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Y-Black	This item controls the Luminance black level adjustment between -128BIT and 127BIT
	The default setting is 0BIT.
C-Black	This item controls the Colour black level black level adjustment. Between –128bit and 127 bit.
	The default setting is 0 bit
DNR	DNR is the Dynamic Noise Reduction.
	On will activate this setting; OFF will turn it off.
	The default setting is ON.
Hue	The selectable NTSC hue range is from –180 to +180 degrees.
	The default setting is 0.
Y shaping	Y shaping allows you to select a range of filters.
	AWN auto wide notch: this is an auto detect filter that detects the video standard, and samples the quality of the signal. In accordance with that sample, a wide notch around the subcarrier frequency filter is selected.
	ANN auto narrow notch: this is an auto detect filter that detects the video standard, and samples the quality of the signal. In accordance with that sample, a narrow notch around subcarrier frequency filter is selected.
	S1..S18 These are lowpass filters from 2 MHz (S1) to 8 MHz (S18).
	NN1..3 NTSC Narrow notch filters for the NTSC subcarrier.
	NW1..3 NTSC Wide notch filters for the NTSC subcarrier.
	PN 1..3 PAL Narrow notch filters for the PAL subcarrier.
	PW1..2 PAL Wide notch filters for the PAL subcarrier.
	The default setting is ANN.
Y peaking	Y-Peaking: this filter is to compensate the luma signal around the subcarrier frequency notation in dB.
	Selectable values , + 4.5, +1.25, 0, -1.25, -1.75, -3.dB.
	The default setting is 0dB.

Ana_inp_level

The setting Ana_inp_level will give a full-scale input on all four channels. The available settings are 15dBu, 18dBu and 24 dBu.

The default setting is 24dBu.

Phase-Ch_1

The phase of channel 1 can be adjusted with the Phase-Ch1 menu setting item. The setting Phase-Ch_1 can be either 0 deg (degrees) or180 deg.

The default setting of PhaseCh1 is 0 deg.

Phase-Ch_2

The phase of channel 2 can be adjusted with the Phase-Ch2 menu setting item. The setting Phase-Ch_2 can be either 0 deg(degrees) and 180 deg.

The default setting of PhaseCh2 is 0 deg.

Phase-Ch_3

The phase of channel 3 can be adjusted with the Phase-Ch3 menu setting item. The setting Phase-Ch_3 can be either 0 deg (degrees) and 180 deg.

The default setting of PhaseCh3 is 0 deg.

Phase-Ch_4

The phase of channel 4 can be adjusted with the Phase-Ch4 menu setting item. The setting Phase-Ch_4 can be either 0 deg (degrees) and 180 deg.

The default setting of PhaseCh4 is 0 deg.

Gain-Ch_1

The menu setting item Gain-Ch_1 controls the output gain of channel 1. Gain-Ch1 has an adjustment range from –60dB to +12dB. When Gain-Ch_1 is set to 0dB, the output level is equal to the input level. Below –60dB, a setting of –999dB is automatically entered and a mute is activated.

The default setting of Gain-Ch_1 is 0 dB.

Gain-Ch_2

The menu setting item Gain-Ch_2 controls the output gain of channel 2. Gain-Ch2has an adjustment range from –60dB to +12dB. When Gain-Ch_2 is set to 0dB, the output level is equal to the input level. Below –60dB, a setting of –999dB is automatically entered and a mute is activated.

The default setting of Gain-Ch_2is 0 dB.

Gain-Ch_3	The menu setting item Gain-Ch_3 controls the output gain of channel 3. Gain-Ch3 has an adjustment range from –60dB to +12dB. When Gain-Ch_3 is set to 0dB, the output level is equal to the input level. Below –60dB, a setting of –999dB is automatically entered and a mute is activated.
	The default setting of Gain-Ch_3is 0 dB.
Gain-Ch_4	The menu setting item Gain-Ch_4 controls the output gain of channel 4. Gain-Ch4 has an adjustment range from –60dB to +12dB. When Gain-Ch_4 is set to 0dB, the output level is equal to the input level. Below –60dB, a setting of –999dB is automatically entered and a mute is activated.
	The default setting of Gain-Ch_4 is 0dB.
Ana-Ch1	Ana-Ch1 selects to what embedded channels or AES/EBU output channel, input channel_1 is routed. Channels can be routed to every output channel, even when it is already in use. Ana_Inp1 , Ana_Inp2, Ana_Inp3 and Ana_Inp4 can be selected.
	The default setting is Ana_Inp1.
Ana-Ch2	Ana-Ch2 selects to what embedded channels or AES/EBU output channel, input channel_1 is routed. Channels can be routed to every output channel, even when it is already in use. Ana_Inp1 , Ana_Inp2, Ana_Inp3 and Ana_Inp4 can be selected.
	The default setting is Ana_Inp2.
Ana-Ch3	Ana-Ch3 selects to what embedded channels or AES/EBU output channel, input channel_1 is routed. Channels can be routed to every output channel, even when it is already in use. Ana_Inp1 , Ana_Inp2, Ana_Inp3 and Ana_Inp4 can be selected.
	The default setting is Ana_Inp3.
Ana-Ch4	Ana-Ch4 selects to what embedded channels or AES/EBU output channel, input channel_1 is routed. Channels can be routed to every output channel, even when it is already in use. Ana_Inp1 , Ana_Inp2, Ana_Inp3 and Ana_Inp4 can be selected.
	The default setting is Ana_Inp4.
De-Emb_Ch_1	De-Emb_Ch_1 defines what channel of the embedded audio (Ch_1 to Ch_16) is routed to output channel 1. Any channel can be selected, even if the channel is selected by another output.
	The default setting is Channel_1.

De-Emb_Ch_2 De-Emb_Ch_2 defines what channel of embedded audio (Ch_1 to Ch_16) is routed to output channel 2. Any channel can be selected, even if the channel is selected by another output.

The default setting is Channel_2.

De-Emb_Ch_3 De-Emb_Ch_3 defines what channel of embedded audio (Ch_1 to Ch_16) is routed to output channel 3. Any channel can be selected, even if the channel is selected by another output.

The default setting is Channel_3.

De-Emb_Ch_4 De-Emb_Ch_4 defines what channel of embedded audio (Ch_1 to Ch_16) is routed to output channel 4. Any channel can be selected, even if the channel is selected by another output.

The default setting is Channel_4.

Audio_out Audio_out selects whether the cards act as a de-embedder or as an embedder. When the embedder is selected, it is also possible to use an add_on card for extra audio inputs.

Ana_In: the local analog audio inputs are embedded into the SDI and the analog audio inputs are digitalized.

De-emb_in: the de-embedder is active and the output is routed to the AES/EBU outputs.

Add_On_A selects the Add_on function of an ADD_ON card.

Ana_In setting is the default setting.

Emb-B Emb-B determines which ADD-on card is selected.

A, being the first card on the right, or B, the second card on the right of card A.

To activate the second card, it is required to place both cards.

The default setting is Add_On A.

Emb-Mode Emb-Mode enables additional audio channels to be added to the existing audio-groups in the ancillary data space of the SDI stream Emb-Mode has three settings, Off, Append, and Overwrite. The default setting is Overwrite.

In Overwrite mode all existing audio groups will be overwritten and the processes group is inserted.

In Append mode additional audio channels will be added.

In order to blank the ancillary data space of the SDI stream, set Emb-Mode to Overwrite and set Emb-Sel to Off

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Emb-A-Sel   Emb-A-Sel determines which of the four available audio groups on the Synapse bus will be embedded into the SDI stream by embedder A of the ASM10. The settings of Emb-A-Sel are Off, Group_1, Group_2, Group_3, Group_4.

The default setting is Group_1.

Emb-B-Sel   Emb-B-Sel determines which of the four available audio groups on the Synapse bus will be embedded into the SDI stream by the embedder_B of the ASM10. The settings of Emb-B-Sel are Off, Group_1, Group_2, Group_3, Group_4.

The default setting is Group_2.

Blank-V-ANC   This item allows blanking of the vertical ancillary data. All data is removed in the vertical interval.

OFF means that the data is passed, ON means that the data is removed.

The default setting is OFF.

EDH-Gen   This setting allows the user to switch the built in EDH generator on/off. The EDH generator inserts EDH (SDI Error Detection Handling) into the output signal.

The possible settings of EDH-Gen are On and Off.

The default setting is On.

EDH-Det   This item allows the user to choose between Active picture (active-p without VBI) or Full field (full field with VBI) EDH detection.

The default setting is Active-P.

VLI-Insert   The Video Line Index insertion menu enables the generation of Video Index information. Video Index is used to trigger cascaded equipment that processes wide screen manipulation such as aspect ratio converters. Video Line Index data insertion recognises 16 different modes. These modes are divided into 2 groups, 4:3 and 16:9, each group having 8 sub-categories numbered 0-7. Valid VLI-Data ranges are 4:3_0, 4:3_1, 4:3_2, etc., to 16:9_0, 16:9_1, 16:9_2 etc. The default setting is 4:3_0.

Off means that there is no added VLI information.

The default setting is Off.

WSS-insert | The WSS insertion menu selects the WSS mode. OFF, Standard, Extended and Blank can be set. The WSS extended is a special mode that uses the physical structure of WSS but with a VI like data setting.

The default setting is Off.

WSS-Ext-ins | WSS-Ext-ins sets the WSS extended format. The setting can be within the range. 4:3_0, 4:3_1, 4:3_2, etc to 16:9_0, 16:9_1, 16:9_2 etc.

The default setting is 4:3_0

WSS-Std-ins | The WSS standard has 16 levels, 8 for video and 8 for 8 film. Selection is made between #1_vid...#8_vid, or 1_flm to 8_flm.

The default setting is 1_vid

Tracking | The ASM10 also has an integrated tracking function to keep the audio in track with the video. If the frame synchronizer drops or adds frames the tracking function is activated. There are two function modes:

HARD: Fast tracking and handling of frame drops to enable instantaneous synchronization of audio.

SMOOTH: Slow correction of frame drops to enable gradual synchronization of audio.

The default setting is Smooth.

Delay | The local analog audio inputs can be set to a fixed audio delay. The delay can also be set as an offset for the tracking delay. The delay range is from 0 till 5200 mSec. Defaults setting is 0 mSec.

6 Status Menu

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

SDI-Input This status item indicates the presence of a valid Serial video signal at the SDI input. SDI-Input indicates if an input signal is NA (not available) or Present.

ANA-Input This status item indicates the presence of a valid analog video signal at the input. Possible statuses are:
- NTSC-MJ
- NTSC-443
- PAL-M
- PAL-60
- PAL-BGHID
- SECAM
- PAL-cmbN
- SECAM-525
- FIXED
- NA (not available)

Reference This status item recognises a valid reference input on the chosen reference input. Status is not set to feedback when there is no input.(analog or digital).

Reference indicates if a reference input is NA (not available) or Present.

Format-Det 625-Lines and 525-Lines standards can be detected as the valid input signal format, 625/50 and 525/60 are recognised as valid inputs.

EDH-Stat EDH-Stat, indicates the status of the EDH within the incoming SDI signal.

OK is indicated if the status of the detected EDH does not indicate errors.

UES is shown if an EDH data block is not present.

EDA is displayed if an EDH error has previously been detected by another card in the SDI chain.

EDH is displayed if a previously undetected EDH error is detected.

GrpInUse GrpInUse indicates the audio groups that are already present in

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the incoming SDI signal. The indication of a group, or groups being present is displayed as:

Display

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

When no groups are present GrpInUse indicates ____.

Grp-Ins When the serial digital video signal already contains audio data and Emb-Mode is set to Append and the selection Emb-Sel is set to the same group number as the present audio, this status item will generate an Error. No embedding occurs for the selected group that creates the error. If Emb-Mode is set to Overwrite the present audio data will be lost, and replaced by the new audio data. If Emb-Mode is set to Overwrite, no Grp-Ins error can occur. If an error does not occur Grp-Ins will indicate Ok.

Emb-Audio-1 ~ Emb-Adio-4 Audio-1 till Audio-4 displays the status of audio channel A1 till A4. The status can be NA (not available) or Present.

ANC-Stat ANC-stat, Ancillary Status, indicates that embedded audio is present and valid. ANC-stat indicates if an input signal is OK, NA (not available) or Error.

Ana-Audio-1 ~ Ana-Audio-4 These statuses indicate the status of the analog audio inputs 1 till 4. Statuses can be NA (not available), Present or Clipped.

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 ASM10 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_analog

Input_analog can be selected between 0 .. 255. 0= no event, 1..255 are the priority settings. If set to 0, no events will be generated. If the input is lost a priority event will be generated.

Input_SDI

Input_SDI can be selected between 0 .. 255. 0= no event, 1..255 are the priority settings. If set to 0, no events will be generated. If the input is lost a priority event will be generated.

Ref-Status

Reference can be selected between 0 .. 255. 0= no event, 1..255 are the priority settings. If the reference is lost, a priority event will be generated.

EDH-Status

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

Grp-Insert

Grp-Insert status 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 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 ASM10 are:

Event Menu Item	Tag		Description
Announcements	0 or NA	0 or NA	Announcing of report and control values
Input_CVBS	01_{hex}=INP_LOSS	81_{hex}=INP_RETURN	Analog input lost or returned
Input_SDI	01_{hex}=INP_LOSS	81_{hex}=INP_RETURN	SDI input lost or returned
Ref-Status	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
Grp-Insert	06_{hex}=GRP_ERROR	86_{hex}=GRP_OK	Grp-Insert 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.
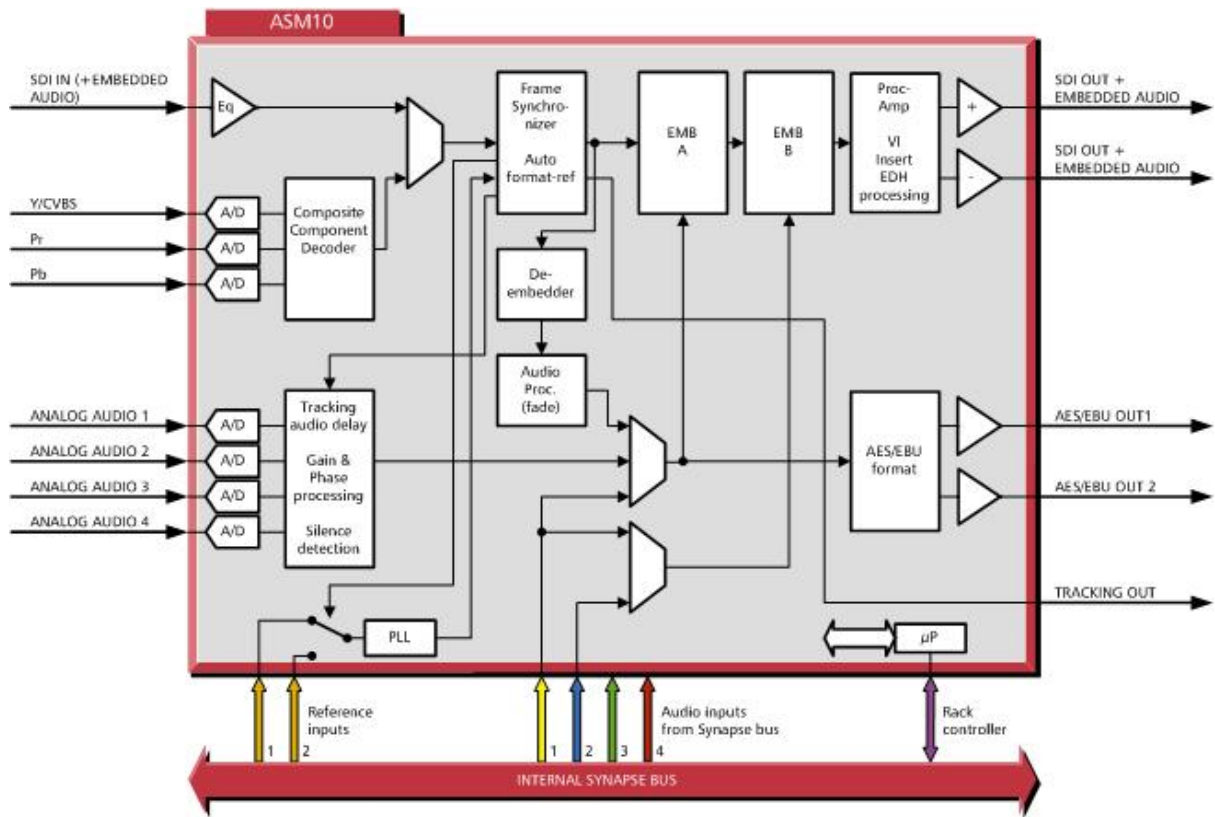
The Address Together with the message string, the tag, the slot number or address of the card, it is relevant to be able to assign the event to a certain card.
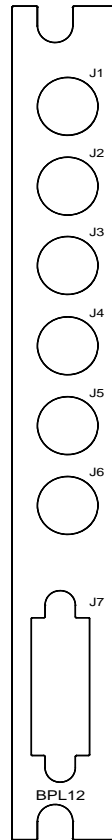
8 LED Indication

Error LED

The error LED indicates an error if the internal logic of the ASM10 card is not configured correctly or if it has a hardware failure.

Input LED

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

Reference LED

Indicates the presence of a valid reference signal on the selected reference input connector (ref-1 or ref-2). See section 5 - Ref Input.

ANC Data LED

This led indicates the presence of embedded audio in the serial digital video signal.

DATA ERROR LED

This led indicates three different types of errors:

- Audio signal 1, 2, 3 or 4 of the local output is clipped
- ANC Error
- EHD 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 ASM10 can be used with the following backplane: BPL12,

Fiber backpanels: BPL12T_FC/PC, BPL12T_SC, BPL12R_FC/PC and BPL12R_SC

J1 = SDI INPUT

J2 = SDI OUTPUT

J3 = SDI OUTPUT

J4 = Y / CVBS

J5 = Pr

J6 = Pb

J7 = see next page

It is possible to order a Breakout cable

Product number ADD9420260001

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

J1
J2
J3
J4
J5
J6
J7
BPL12

J7			When used with Breakout cable	
Function	Pin#	Description	Pair-number	Color
AES_output_1	10	AES_positive	1	White
AES_output_1	1	GND	1	Black
AES_output_1	19	AES_negative	1	Blue
AES_output_2	11	AES_positive	2	White
AES_output_2	2	GND	2	Black
AES_output_2	20	AES_negative	2	Blue
Analog_input_1	12	Analog_positive	3	White
Analog_input_1	3	GND	3	Black
Analog_input_1	21	Analog_negative	3	Blue
Analog_input_2	13	Analog_positive	4	White
Analog_input_2	4	GND	4	Black
Analog_input_2	22	Analog_negative	4	Blue
Analog_input_3	14	Analog_positive	5	White
Analog_input_3	5	GND	5	Black
Analog_input_3	23	Analog_negative	5	Blue
Analog_input_4	15	Analog_positive	6	White
Analog_input_4	6	GND	6	Black
Analog_input_4	24	Analog_negative	6	Blue
Tracking	18		9	Blue