Synapse

ADC24

4 Channel Audio A/D converter
Tracking delay ADD-ON card

AXON Digital Design

Synapse

TECHNICAL MANUAL

ADC24

4 Channel Audio A/D converter
Tracking delay ADD-ON card

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Smarter by Listening

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

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

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

CE

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

Axon Digital Design ADC24

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 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

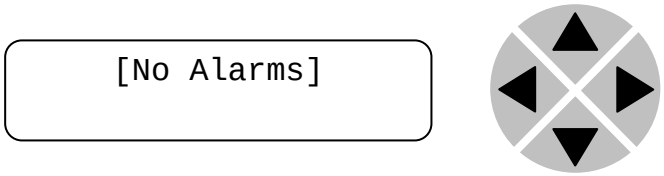
In the default condition, the ADC24 converts analog audio to AES/EBU digital audio.

Changing settings and parameters

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



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`.

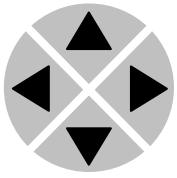
```
SFS10 [Settings]
>SDI-Format=Auto
```

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]
```



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

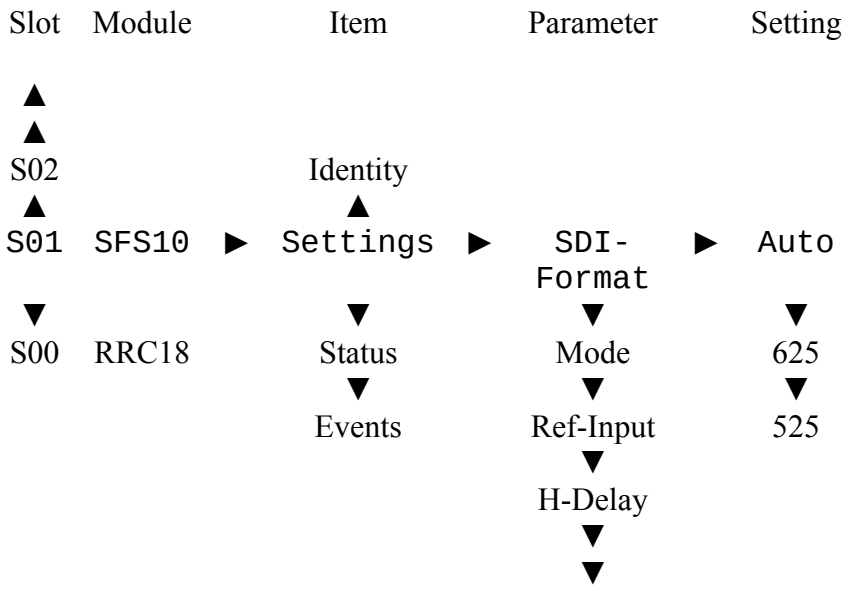
Synapse Setup Software can be used to change the settings of Synapse modules from a PC, either locally or remotely. The software enables communication based on TCP/IP between the Setup PC and Synapse frames/modules.

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



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

4 The ADC24 Card

Introduction

The AXON ADC24 is a multi function product. Its basic function is the conversion of analog audio to AES/EBU digital audio. In addition to the analog inputs it has AES/EBU inputs with a sample rate converter (SRC) on its input. The ADC24 has a tracking audio delay, a delay offset of up to 650ms at 96kHz or 1300ms at 48kHz, and can perform the Synapse ADD-ON function.

In ADD-ON mode the card acts as an analog or digital audio input board that feeds a master card positioned one slot left of the ADD-ON card. For example the ADC24 acts as a digital audio embedder when used with the Axon ASV10 or SFS11.

The manipulated audio data that enters the Synapse bus to a master card is identical to the data present on the local AES/EBU outputs. The AES/EBU in and outputs are available on 75 Ohm BNC or 110 Ohm screw terminals depending on the choice of rear connector panel. The BPL02 has 75 Ohm AES/EBU in and outputs. The BPL03 has 75 Ohm AES/EBU inputs and 110 Ohm AES/EBU outputs and the BPL04 has 110 Ohm AES/EBU in and outputs. The user has control over channel selection/swapping, gain and phase control of all 4 audio channels.

Key Features

The Key features of the ADC24 are as follows:

Performance

The ADC24 has high quality 24bit A/D converters that are capable of sampling up to 96kHz. The SRC (sample rate conversion) based digital audio inputs can handle sample rates from 32k to 96k.

ADD-ON Functionality

As described in the introduction the ADC24 can be used as an ADD -ON card for embbeding digital audio. Examples of Master cards that are capable of embedding are ASV08, ASV10, ASC10, SFS11, SFS21, and the SEB20. The SEB20 is an audio embedder but can add an extra set of 4 audio channels when used with the ADC24 without the need to cascade serial digital video equipment.

In ADD-ON mode the ADC24 receives a clock from the master card. This audio clock is locked to the video on the master card. An extra VCXO based PLL removes any jitter that might be induced in the video environment.

The ADC24 is also acts as a loop card for an additional ADD-ON card. The block schematic illustrates this with the colored arrows. The yellow arrow is the output of the ADC24. The red, blue and green arrows provide a loop for adjacent ADD-ON cards.

Back planes

The ADC24 can be used with the BPL02, BPL03 BPL04 and BPL05D backplanes.

Miscellaneous

The ADC24 cards fit into the Axon SFR04 & SFR18 rack.

LED's on the front of the board indicate the presence of an Audio Input signal, Connection & Processor Errors.

The ADC24 can be controlled by Axon Synapse set-up software.

5 Analog reference level switches

Level switches

The ADC24 has a high quality analog to digital audio converter. To maintain maximum performance and optimum noise levels

The input section of this card has a selectable analog gain stage that ensures the A/D conversion IC is working in the ideal range for its input stage.

Reference levels of +15dBu, +18dBu and +24dBu have been implemented.

+15dBu

This setting produces 0dBFS when +15dBu is sourced to the analog input connector. 0dBu produces -15dBFS. See the PCB for switch setting.

+18dBu

This setting produces 0dBFS when +18dBu is sourced to the analog input connector. 0dBu produces -18dBFS. See the PCB for switch setting.

+24dBu

This setting produces 0dBFS when +24dBu is sourced to the analog input connector. 0dBu produces -24dBFS. See the PCB for switch setting.

6 Settings Menu

Introduction

The settings menu displays the current state of each setting within the ADC24 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.

Out-Ch_1

The ADC24 has analog and digital audio inputs. This menu item provides the choice to route any of the inputs to any of the outputs.

The AES/EBU outputs are defined as Out1 to Out4. Out1 is the left channel of AES/EBU 1 and Out2 is the right channel of AES/EBU 1. Left and right of AES/EBU 2 are channel 3 and 4 respectively.

The setting `Out-Ch_1` designates an input to output channel 1 as described above. The Setting of `Out-Ch_1` are `Analog_1`, `Analog_2`, `Analog_3`, `Analog_4`, and `Aes_1_R`, `Aes_1_L`, `Aes_2_R`,

When TESTTONE is selected a 1kHz –20dB tone is present on the output, when Master is selected in ref-input then the tone is also presented to the mastercard.

The default setting is `Analog_1`.

Out-Ch_2

The setting `Out-Ch_2` designates an input to output channel 2 as described above (Out-Ch_1). The Setting of `Out-Ch_2` are `Analog_1`, `Analog_2`, `Analog_3`, `Analog_4`, and `Aes_1_R`, `Aes_1_L`, `Aes_2_R`, `Aes_2_L`. Testtone.

The default setting is `Analog_2`.

Out-Ch_3

The setting `Out-Ch_3` designates an input to output channel 3 as described above (Out-Ch_1). The Setting of `Out-Ch_3` are `Analog_1`, `Analog_2`, `Analog_3`, `Analog_4`, and `Aes_1_R`, `Aes_1_L`, `Aes_2_R`, `Aes_2_L`. Testtone

The default setting is `Analog_2`.

Out-Ch_4

The setting `Out-Ch_4` designates an input to output channel 4 as described above (Out-Ch_1). The Setting of `Out-Ch_4` are `Analog_1`, `Analog_2`, `Analog_3`, `Analog_4`, and `Aes_1_R`, `Aes_1_L`, `Aes_2_R`, `Aes_2_L`. Testtone

The default setting is `Analog_4`.

SRC

The AES/EBU inputs are connected to a Sample Rate Converter. This enables the input to use audio sample rates that are non-synchronous to video. For Non PCM audio data the SRC can be bypassed and the data is inserted in the card transparently (`Trans`).

The settings of `SRC` are On and `Trans`. The default setting is `On`.

Ref-Input

The output frequency of the ADC24 can be free running from a local oscillator or locked to different sources.

The setting of `Ref-Input` are as follows;

`NO_ref` set the ADCC in to free running mode.

`Master` enables the ADC24 to be locked to the adjacent master card.

`Wordclk1` and `Wordclk2` is used when a 48k wordclock is connected to the genlock inputs of the SFR18/04.

`Genlock1` and `Genlock2` is used when a video Black& Burst is connected to the genlock inputs of the SFR18/04.

The default setting of `Ref-Input` is `NO_ref`.

Smplrate

The frequency that is used to clock the A/D converter or the output of the Sample Rate converter can be set to 48 kHz or 96 kHz. This will be the output sample rate of the AES/EBU signal and the signal entering the ADD-On bus. In ADD-On mode `Smplrate` must be set to `48kHz`.

The settings of `Smplrate` are `48kHz` and `96kHz`. The default setting is `48kHz`.

Masterfade

The setting `Masterfade` enables the ADC24 to receive a pulse from the master card located on the left of the ADC24. This pulse is an internal tracking pulse. When the mastercard drops or adds a frame then the master card will produce a pulse, the ADC24 will receive that pulse and mute audio at that moment to avoid disturbance in the audio.

The settings of `Masterfade` are `On` and `Off`.

The default setting is `Off`.

Gain-Ch_1

The settings menu item `Gain-Ch_1` controls the output gain of channel 1, the left channel of the first AES/EBU output. `Gain-Ch_1` has an adjustment range between `–60.0dB` and `+12.0dB`. When `Gain-Ch_1` is set to `0dB` the output level is equal to the input level. The default setting of `Gain-Ch_1` is `0dB`.

Gain-Ch_2

The settings menu item `Gain-Ch_2` controls the output gain of channel 2, the right channel of the first AES/EBU output. `Gain-Ch_2` has an adjustment range between `–60.0dB` and `+12.0dB`. When `Gain-Ch_2` is set to `0dB` the output level is equal to the input level. The default setting of `Gain-Ch_2` is `0dB`.

Gain-Ch_3

The settings menu item `Gain-Ch_3` controls the output gain of channel 3, the left channel of the second AES/EBU output. `Gain-Ch_3` has an adjustment range between `–60.0dB` and `+12.0dB`. When `Gain-Ch_3` is set to `0dB` the output level is equal to the input level. The default setting of `Gain-Ch_3` is `0dB`

Gain-Ch_4

The settings menu item `Gain-Ch_4` controls the output gain of channel 4, the right channel of the second AES/EBU output. `Gain-Ch_4` has an adjustment range between `–60.0dB` and `+12.0dB`. When `Gain-Ch_4` is set to `0dB` the output level is equal to the input level. The default setting of `Gain-Ch_4` is `0dB`.

Phase-Ch_1

The phase of channel 1 can be adjusted using the setting menu item `Phase-Ch_1`. The settings of `Phase-Ch_1` are `0 deg` (degrees) and `180 deg`. The default setting of `Phase-Ch_1` is `0 deg`.

Phase-Ch _2

The phase of channel 2 can be adjusted using the setting menu item `Phase-Ch_2`. The settings of `Phase-Ch_2` are `0 deg` (degrees) and `180 deg`. The default setting of `Phase-Ch_2` is `0 deg`.

Phase-Ch _3

The phase of channel 3 can be adjusted using the setting menu item `Phase-Ch_3`. The settings of `Phase-Ch_3` are `0 deg` (degrees) and `180 deg`. The default setting of `Phase-Ch_3` is `0 deg`.

Phase-Ch _4

The phase of channel 4 can be adjusted using the setting menu item `Phase-Ch_4`. The settings of `Phase-Ch_4` are `0 deg` (degrees) and `180 deg`. The default setting of `Phase-Ch_4` is `0 deg`.

Tracking

The ADC24 can be used as a tracking audio delay. The tracking input must be connected to a tracking output of a Frame synchronizer, for example the SFS11.

The setting `Tracking` has 3 modes, they are as follows;

`Off`: No tracking.

`Hard`: Fast tracking and handling of frame drops enabling instantaneous synchronization of audio.

`Smooth`: Slow correction of frame drops enabling gradual synchronization of audio.

The default setting of `Tracking` is `Off`.

Delay

In addition to the tracking function the ADC24 can add an offset delay to the audio signal. This delay can be used to compensate for other static video propagation delays for example a direct audio feed that is combined with a satellite video feed.

`Delay` can be adjusted within the range `0ms` to `650ms` in 1 ms increments when the sample rate is set to 96kHz or `1300ms` at 48kHz.

The default setting of `Delay` is `0ms`.

7 Status Menu

Introduction

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

Audio-Ch_1

The status item `Audio-Ch_1` indicates the condition of an analog audio signal at the input of channel 1. `Audio-Ch_1` indicates if the input signal is `OK`, `Clipped` or `NA` (not available) (N/A for AES/EBU inputs only).

Audio-Ch_2

The status item `Audio-Ch_2` indicates the condition of an analog audio signal at the input of channel 2. `Audio-Ch_2` indicates if the input signal is `OK`, `Clipped` or `NA` (not available) (N/A for AES/EBU inputs only)..

Audio-Ch_3

The status item `Audio-Ch_3` indicates the condition of an analog audio signal at the input of channel 3. `Audio-Ch_3` indicates if the input signal is `OK`, `Clipped` or `NA` (not available) (N/A for AES/EBU inputs only).

Audio-Ch_4

The status item `Audio-Ch_4` indicates the condition of an analog audio signal at the input of channel 4. `Audio-Ch_4` indicates if the input signal is `OK`, `Clipped` or `NA` (not available) (N/A for AES/EBU inputs only).

Audio-Lock

This status item indicates a valid lock signal is applied to `Addon`, `Wordclk1`, `Wordclk2`, `Genlock1`, `Genlock2`. When the unit is not able to lock to any of the above items, `Free` will be indicated.

Master-Mute

`Mater-Mute` is used when the card is in ADD-On mode, it indicates a mute pulse being inserted from a master card. The status item will indicate `On` or `Off`.

8 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.

ADC24 Events

The events reported by the ADC24 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` reports the loss of the audio at the input of channel 1 and can be set between 0 .. 255. 0= no event, 1..255 is the priority setting.

Input_2

`Input_2` reports the loss of the audio at the input of channel 2 and can be set between 0 .. 255. 0= no event, 1..255 is the priority setting.

Input_3

`Input_3` reports the loss of the audio at the input of channel 3 and can be set between 0 .. 255. 0= no event, 1..255 is the priority setting.

Input_4

`Input_2` reports the loss of the audio at the input of channel 2 and can be set between 0 .. 255. 0= no event, 1..255 is the priority setting.

Reference

Reference can be set between 0 .. 255. 0= no event, 1..255 are the priority setting. If the reference is lost an Event will be generated at the priority.

Audio-Data

`Audio-Data` reports the audio signal being clipped at 0dB and can be set 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 ADC24 are:

Event Menu Item	Tag		Description
Announcements	0 or NA	0 or NA	Announcing of report and control values
Input_1..4	01_{hex}=INP_LOSS	81_{hex}=INP_RETURN	Channel 1-4 input lost or returned
Reference	02_{hex}=REF_LOSS	82_{hex}=REF_RETURN	reference lost or returned
Audio-Data	05_{hex}=AUDIO_ERROR	85_{hex}=AUDIO_OK	Audio data 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.

9 LED Indication

Error LED

The error LED indicates an error if the internal logic of the ADC24 card is not configured correctly or has a hardware failure.

Input LED

This LED indicated the presence of a valid AES/EBU signal on the input. The presence of an analogue audio signal is not indicated

Reference LED

This LED indicates the presence of a valid reference signal and that the ADC24 is locked.

Data Error LED

This led indicates two different types of errors:

- Audio signal 1, 2, 3 or 4 of the local outputs are clipped.

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.

10 Setup Examples

Stand-Alone Mode

A basic audio A/D converter.

This example shows how 4 channels of analog audio can be routed to the AES/EBU output channels 1 and 2 with a free running sample clock

ADC24 Settings-Menu

Out1:	Analog 1
Out2:	Analog 2
Out3:	Analog 3
Out4:	Analog 4
Ref_inp:	No ref

ADD-ON Mode

Insert 4 extra analog audio channels into a adjacent (left) Master card with built-in ADD-ON embedder the SEB20 for example.

This example shows how 8 channels of digital audio can be inserted into the serial digital video signal using a SEB20 and an ADC24.

The local AES/EBU channels, 1/2 and 3/4 are inserted into group 1. The other four digital audio channels come from the ADC24-card which has to be inserted right next to the SEB20-card in the SFR18-frame. The four digital channels of the ADC24 are routed to the embedder block Emb_B of the SEB20 and can be found in the setting menu Emb_B1/2 and Emb_B3/4 as AddOn_A1/2 and AddOn_A3/4. Others settings in the Settings-menu do not effect the functionality of this example and are not shown.

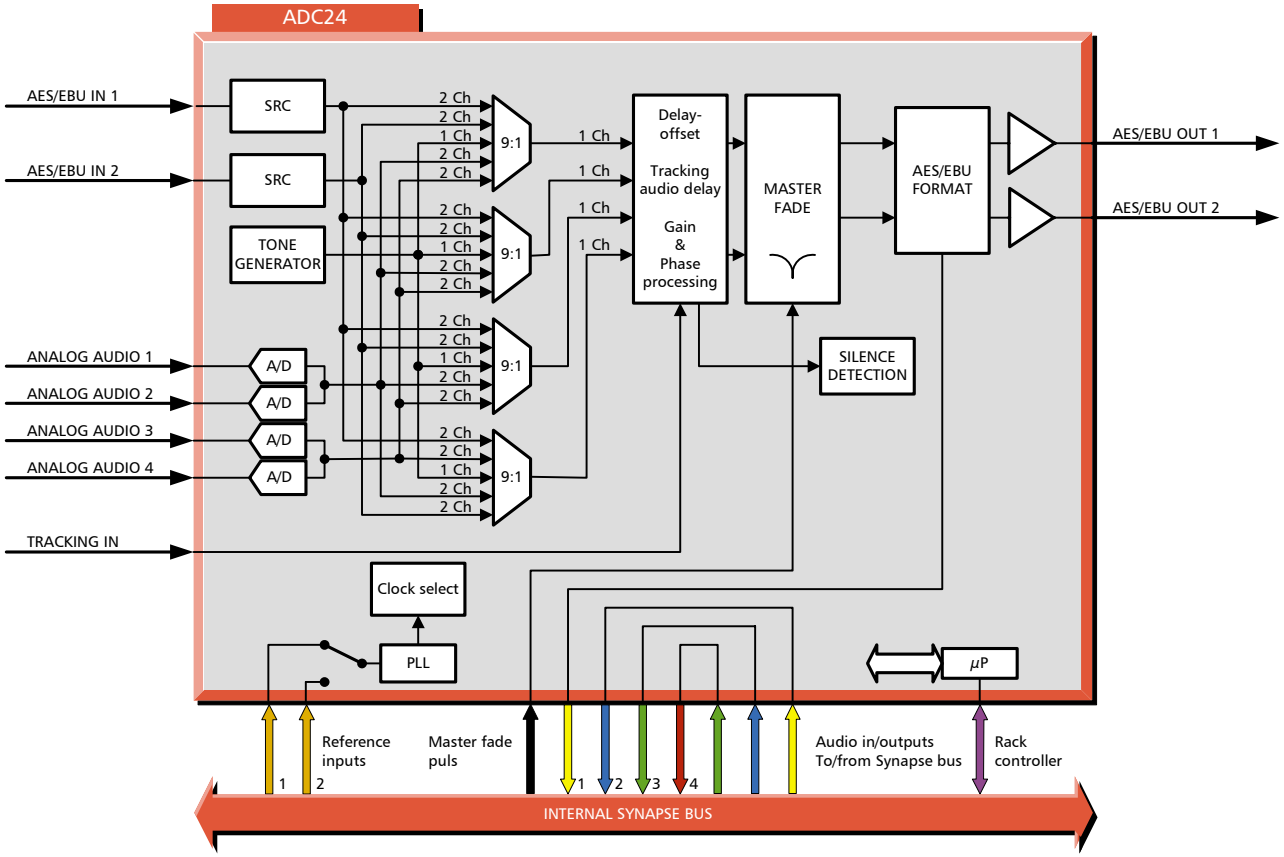
SEB20 Settings-Menu

Emb-Mode:	Overwrite
Emb-A-Sel:	Group_1
Emb-B-Sel:	Group_2
Emb-A1/2:	AES1/2
Emb-A3/4:	AES3/4
Emb-B1/2:	AddOn_A1/2
Emb-B3/4:	AddOn_A3/4
SRC:	On

ADC24 Settings-Menu

Out1:	Analog 1
Out2:	Analog 2
Out3:	Analog 3
Out4:	Analog 4
Ref_inp:	Master
Sample rate:	48kHz

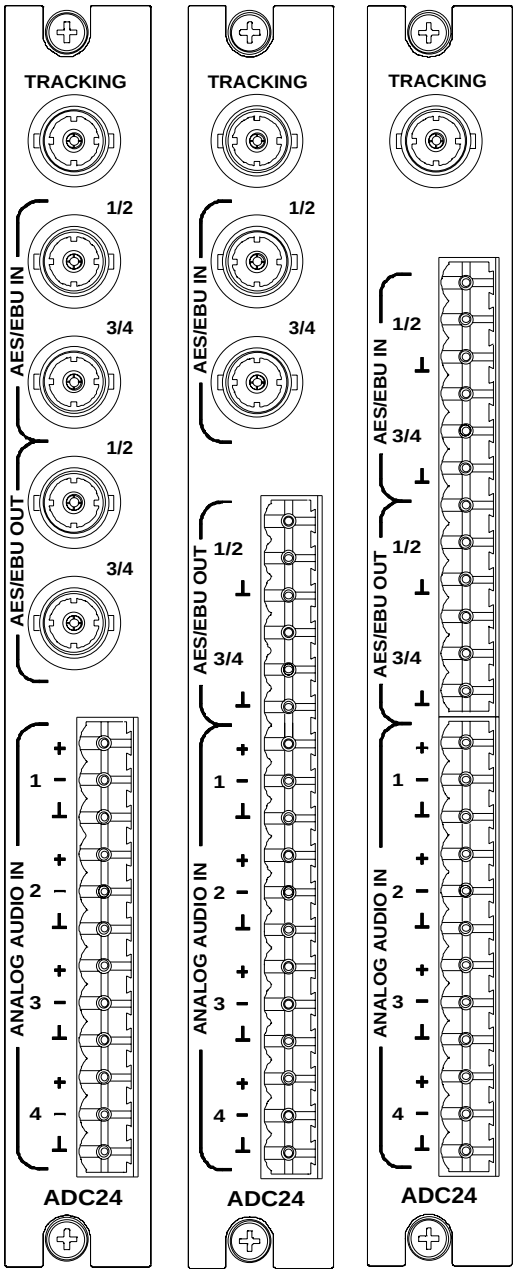
11 Block Schematic



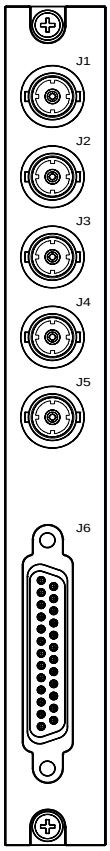
12 Connector Panel

The ADC24 can be used with the following backplanes: BPL02, BPL02D, BPL03, BPL03D BPL04 BPL02D and BPL05D:

BPL02 BPL03 BPL04



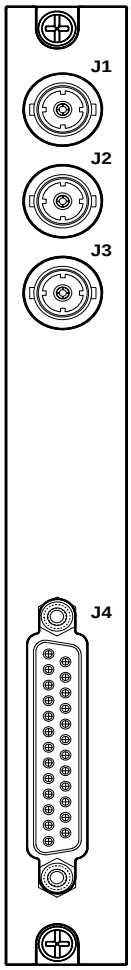
BPL02D



J1	Tracking
J2	AES/EBU input_1 unbalanced
J3	AES/EBU input_2 unbalanced
J4	AES/EBU output_1 unbalanced
J5	AES/EBU output_2 unbalanced

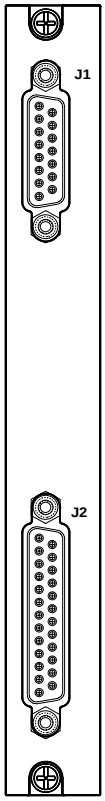
J6	Pin#	
Analog IN 1	7	Analog 1 in neg
	20	GND
	8	Analog 1 in pos
Analog IN 2	21	Analog 2 in neg
	9	GND
	22	Analog 2 in pos
Analog IN 3	10	Analog 3 in neg
	23	GND
	11	Analog 3 in pos
Analog IN 4	24	Analog 4 in neg
	12	GND
	25	Analog 4 in pos
	13	GND

BPL03D



J1	Tracking	
J2	AES/EBU input_1 unbalanced	
J3	AES/EBU input_2 unbalanced	
J4	Pin#	
AES/EBU 1 out	2	AES_1 out pos
	3	GND
	1	AES_1 out neg
AES/EBU 2 out	15	AES_2 out pos
	17	GND
	16	AES_2 out neg
Analog IN 1	8	Analog 1 in pos
	9	GND
	7	Analog 1 in neg
Analog IN 2	22	Analog 2 in pos
	20	GND
	21	Analog 2 in neg
Analog IN 3	11	Analog 3 in pos
	9	GND
	10	Analog 3 in neg
Analog IN 4	25	Analog 4 in pos
	23	GND
	24	Analog 4 in neg
	3,4,5,6,9,12,13,14 ,17,18,19,20,23	GND

BPL05D



J1	PIN#	
Tracking	3	Tracking
	9	GND

J2	PIN #	
AES/EBU 1 in	2	AES_1 in pos
	3	GND
	1	AES_1 in neg
AES/EBU 2 in	16	AES_2 in pos
	17	GND
	15	AES_2 in neg
AES/EBU 1 out	5	AES_1 out pos
	6	GND
	4	AES_1 out neg
AES/EBU 2 out	18	AES_2 out pos
	20	GND
	19	AES_2 out neg
Analog IN 1	8	Analog 1 in pos
	9	GND
	7	Analog 1 in neg
Analog IN 2	22	Analog 2 in pos
	20	GND
	21	Analog 2 in neg
Analog IN 3	11	Analog 3 in pos
	12	GND
	10	Analog 3 in neg
Analog IN 4	25	Analog 4 in pos
	23	GND
	24	Analog 4 in neg
	3,6,12.,13,14,17,20,23	GND

13 Specifications

Analog Audio Input

Input Impedance	10 kOhm
Input Levels (0dBFS)	24/18/15/12 dBu

Digital Audio Inputs

Format	AES/EBU
Input Impedance	75/110 Ohm
Input Level	0.1 – 2.5V @ 75Ohm
	0.2 – 10V @ 110Ohm
Sample Frequency	48kHz (locked SDI)
	32kHz- 96kHz in SRC Mode

Audio Performance

Conversion		24 bits
Input for Full-Scale Amplitude	(@ 0 dB FS, Unity Gain, 1kHz, Rsource = 40R)	15.00 dBu
Maximum Input Amplitude	(THD+N < 1%, Unity Gain, 1kHz, Rsource = 40R)	15.30 dBu
Gain Mismatch	(@ 1kHz, -20 dB FS = -5 dBu, Multi-channel, worse case)	< 0.15 dB
Frequency Response	(@ -20 dB FS = -5 dBu, 20-20kHz)	+0 / -0.15 dB
THD + Noise	(@ -1 dB FS = +14 dBu, 22-22 kHz, Unweighted)	< -95 dB
Signal-to-Noise	(@ -60 dB FS = -45 dBu, 22-22 kHz, CCIR-RMS)	> 103 dB
Dynamic Range	(@ -60 dB FS = -45 dBu, 22-22 kHz, A-weighted-RMS)	> 107 dB
Idle-Channel-Noise	(No input, 22-22 kHz, A-weighted-RMS)	< -107 dB
Crosstalk	(@ -20 dB FS = -5 dBu, 1kHz)	< -104 dB
	(@ -20 dB FS = -5 dBu, 20-20kHz)	< -95 dB
Level Non-Linearity	(@ 2 dB error, 1kHz, wordlength dither on)	< -125 dB
Propagation Delay	(A-D/D-D, MLS-methode, worse-case, 48 kHz)	< 1.5 ms / < 2.0 ms

Miscellaneous

Supply Voltage	25 to 32VDC
Power Consumption	0.035A @ 30V
Weight	206g
Operating temperature	0 °C to 50 °C
Dimensions	20 x 137 x 296 mm

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