UAP-1781 - Preliminary -

Introduction

The UAP-1781 is an eight channel high quality audio processor designed to work alone or with a variety of video converters, frame sync or proc amps of the Densité series.

Inputs can be analog, digital and extracted from the associated video card. The card provides processing for 8 channels originating from a video card. The processed signals are sent back to the video processor to be embedded, and are also available at the analog and digital outputs.

It provides the combination of signal conversions (A to D and D to A), level controls, phase inverters, video match and fixed delay adjustments, shuffling and mixing.

An internal digital EBU tone generator facilitates alignment of audio levels. User-defined channel identification data may be encoded in the AES status bits. An input audio signal status is also available indicating the input signal presence or overload.

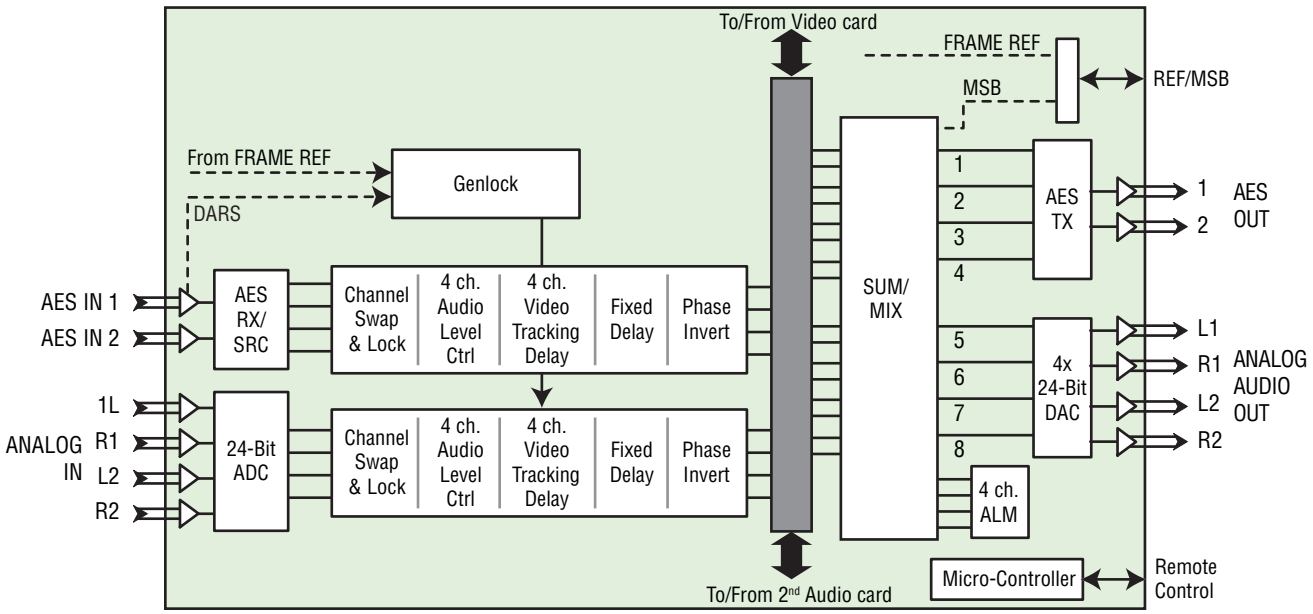
The card is housed in a (DENSITÉ) frame, with a single or double width rear connector panel. Based on the rear module installed, the UAP-1781 is compatible with AES3 or AES-3id digital audio standards.

Features

- analog and digital audio inputs/outputs
- fixed delay and up to 8 video frames tracking delay
- output shuffler and mixer
- 24 bits high quality audio converters
- Audio metering data for audio levels and phase over IP
- Dolby E compatibility
- Balanced AES3 or unbalanced AES3-id outputs
- -96 to +12 dB of level adjustment (by 0.5 dB steps)
- 0 dBFS selectable (0 to +28 dBu, 1 dB steps)
- Internal EBU tone generator
- Absence signal delay and threshold adjustable
- Overload detection and reporting
- All settings through frame control panel or remotely
- Status LED and alarms remote reporting

Applications

- With a DEC-1xxx in Incoming feeds applications as A to D converter and audio processor.
- Companion to an ENC-1xxx as an audio proc and a final D to A converter.
- Stand-alone or associated to a FRS-1xxx as an audio processor with analog inputs and outputs.



UAP-1781 Functional Block Diagram

Specifications

Analog Inputs (4)
Signal : ..... analog audio
Input impedance : ..... > 10 kΩ
Max. Level : ..... +24 dBu

Digital Inputs (2)
Sampling freq.: ..... 32 to 100 kHz
Quantization: ..... 16 to 24 bits

AES3:
Level : ..... 0.2 to 7 Vpp
Input impedance : ..... 110 Ω balanced

AES3-id:
Level : ..... 0.2 to 2 Vpp
Input impedance : ..... 75 Ω
Return loss: ..... 25 dB @ 12 MHz

Analog Outputs (4)
Signal : ..... balanced analog audio
Output impedance: ... 50 Ω
Max. Level : ..... +24 dBu
Min. Load: ..... 600 Ω

Digital Outputs (2)
Sampling freq.: ..... 48 kHz
Quantization: ..... 24 bits
Intrinsic Jitter : ..... 5 mUI (700 Hz to 100 kHz)

AES3
Level: ..... 4 Vpp
Impedance : ..... 110 Ω

AES-3id
Level: ..... 1.0 Vpp
Impedance: ..... 75 Ω
Return loss: ..... 15 dB @ 12 MHz

Processing:
Sampling frequency: . 48 kHz
Quantization: ..... 24 bits
0 dBFS: ..... adj. 0 to +28 dBu (1 dB steps)

Analog to Digital:
Freq. response: ..... ± 0.05 dB (20 Hz to 20 kHz)
SNR: ..... 118 dB (A weighted)
THD+N: ..... -100 dB (20 Hz to 10 kHz)
Crosstalk: ..... -100 dB (20 Hz to 20 kHz)
Group delay: ..... 0.427 ms

Digital to Analog:
Freq. response: ..... ± 0.1 dB (20 Hz to 20 kHz)
SNR: ..... 117 dB (A weighted)
THD+N: ..... -95 dB (20 Hz to 10 kHz)
Crosstalk: ..... -100 dB (20 Hz to 20 kHz)
Group delay: ..... 3.1 ms @ 48 kHz ISR

Digital to Digital:
Freq. response: .....± 0.02 dB (20 Hz to 20 kHz)
SNR: .....123 dB (A weighted)
THD+N: .....-130 dB (20 Hz to 10 kHz)
Crosstalk: .....-120 dB (20 Hz to 20 kHz)
Audio group delay: ....2.52 ms @ 48 kHz ISR
Data group delay: .....0.30 ms @ 48 kHz ISR

Analog to Analog:
Freq. response: .....± 0.3 dB (20 Hz to 20 kHz)
SNR: .....114 dB (A weighted)
THD+N: .....-95 dB (20 Hz to 10 kHz)
Crosstalk: .....-100 dB (20 Hz to 20 kHz)
Group delay: .....1.0 ms

Miscellaneous
Tone generator: ..... 1 kHz sine wave interrupted on left channel (250 ms / 3 s) EBU R49.
Signal presence threshold: from –72 to –54 dBFS (6 dB steps)
No signal delay: ..... from 0 to 255 s (1 s steps)
Fixed delay ..... 0 to 2.4 s
..... Step : 1 ms (coarse), 1 sample (fine)
Tracking delay ..... 0 to 8 video frames

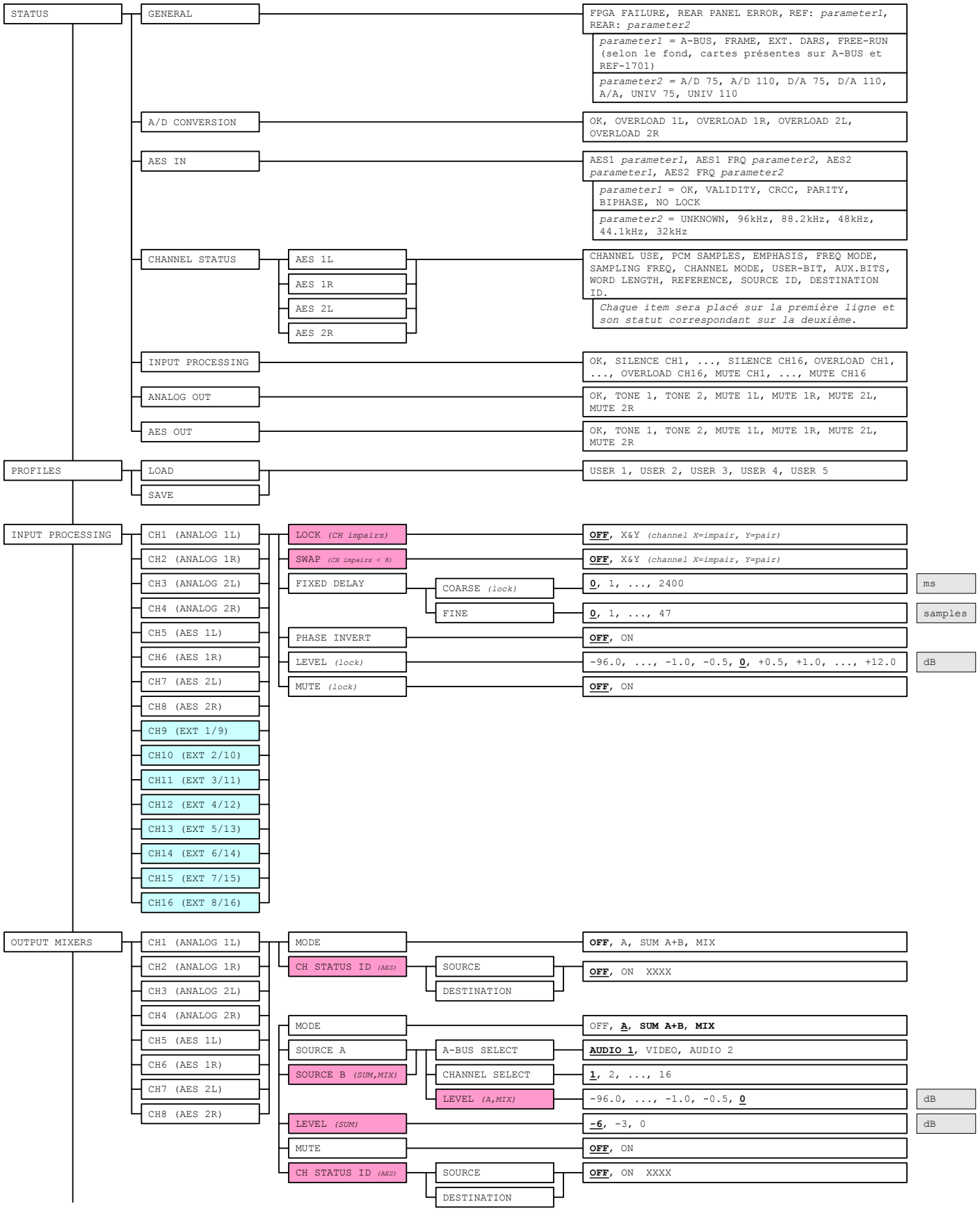
Power
UAP-1781-xxxxx-SRP: .....< 5 W
UAP-1781-xxxxx-DRP: .....< 10 W

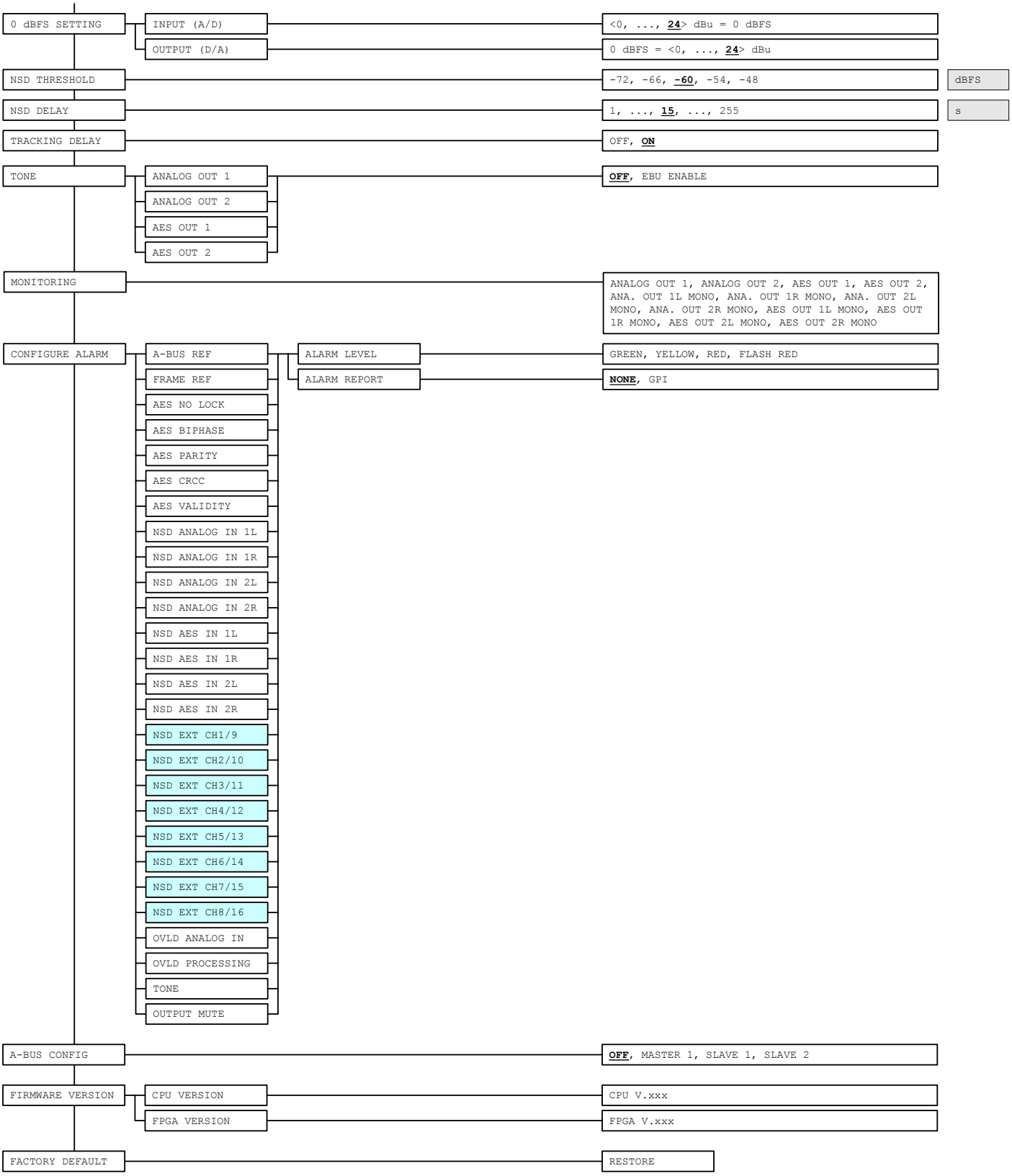
Specifications are subject to change without notice.

Menu Introduction

Most parameters are accessed and changed via an easy-to-use menu. The flow chart below outlines the entire DAC-1721 menu path. Each menu is described throughout this section.

The procedure and the operation mode are described in the common paragraph of the DENSITÉ Manual. The menu organization is made out of a main menu and several sub-menus. A press on the [SELECT] front panel push button accesses to the menu. A lack of activity turns off the display. Default values are written with bold characters.


STATUS
GENERAL
FPGA FAILURE, REAR PANEL ERROR, REF: parameter1, REAR: parameter2
parameter1 = A-BUS, FRAME, EXT. DARS, FREE-RUN (selon le fond, cartes présentes sur A-BUS et REF-1701)
parameter2 = A/D 75, A/D 110, D/A 75, D/A 110, A/A, UNIV 75, UNIV 110
A/D CONVERSION
OK, OVERLOAD 1L, OVERLOAD 1R, OVERLOAD 2L, OVERLOAD 2R
AES IN
AES1 parameter1, AES1 FRQ parameter2, AES2 parameter1, AES2 FRQ parameter2
parameter1 = OK, VALIDITY, CRCC, PARITY, BIPHASE, NO LOCK
parameter2 = UNKNOWN, 96kHz, 88.2kHz, 48kHz, 44.1kHz, 32kHz
CHANNEL STATUS
AES 1L
AES 1R
AES 2L
AES 2R
CHANNEL USE, PCM SAMPLES, EMPHASIS, FREQ MODE, SAMPLING FREQ, CHANNEL MODE, USER-BIT, AUX.BITS, WORD LENGTH, REFERENCE, SOURCE ID, DESTINATION ID.
Chaque item sera placé sur la première ligne et son statut correspondant sur la deuxième.
INPUT PROCESSING
OK, SILENCE CH1, ..., SILENCE CH16, OVERLOAD CH1, ..., OVERLOAD CH16, MUTE CH1, ..., MUTE CH16
ANALOG OUT
OK, TONE 1, TONE 2, MUTE 1L, MUTE 1R, MUTE 2L, MUTE 2R
AES OUT
OK, TONE 1, TONE 2, MUTE 1L, MUTE 1R, MUTE 2L, MUTE 2R
PROFILES
LOAD
SAVE
USER 1, USER 2, USER 3, USER 4, USER 5
INPUT PROCESSING
CH1 (ANALOG 1L)
CH2 (ANALOG 1R)
CH3 (ANALOG 2L)
CH4 (ANALOG 2R)
CH5 (AES 1L)
CH6 (AES 1R)
CH7 (AES 2L)
CH8 (AES 2R)
CH9 (EXT 1/9)
CH10 (EXT 2/10)
CH11 (EXT 3/11)
CH12 (EXT 4/12)
CH13 (EXT 5/13)
CH14 (EXT 6/14)
CH15 (EXT 7/15)
CH16 (EXT 8/16)
LOCK (CH impairs)
OFF, X&Y (channel X=impair, Y=pair)
SWAP (CH impairs < 8)
OFF, X&Y (channel X=impair, Y=pair)
FIXED DELAY
COARSE (lock)
0, 1, ..., 2400
ms
FINE
0, 1, ..., 47
samples
PHASE INVERT
OFF, ON
LEVEL (lock)
-96.0, ..., -1.0, -0.5, 0, +0.5, +1.0, ..., +12.0
dB
MUTE (lock)
OFF, ON
OUTPUT MIXERS
CH1 (ANALOG 1L)
CH2 (ANALOG 1R)
CH3 (ANALOG 2L)
CH4 (ANALOG 2R)
CH5 (AES 1L)
CH6 (AES 1R)
CH7 (AES 2L)
CH8 (AES 2R)
MODE
OFF, A, SUM A+B, MIX
CH STATUS ID (AES)
SOURCE
OFF, ON XXXX
DESTINATION
MODE
OFF, A, SUM A+B, MIX
SOURCE A
A-BUS SELECT
AUDIO 1, VIDEO, AUDIO 2
SOURCE B (SUM,MIX)
CHANNEL SELECT
1, 2, ..., 16
LEVEL (A,MIX)
-96.0, ..., -1.0, -0.5, 0
dB
LEVEL (SUM)
-6, -3, 0
dB
MUTE
OFF, ON
CH STATUS ID (AES)
SOURCE
OFF, ON XXXX
DESTINATION


0 dBFS SETTING
INPUT (A/D)
<0, ..., **24**> dBu = 0 dBFS
OUTPUT (D/A)
0 dBFS = <0, ..., **24**> dBu
NSD THRESHOLD
-72, -66, **-60**, -54, -48
dBFS
NSD DELAY
1, ..., **15**, ..., 255
s
TRACKING DELAY
OFF, **ON**
TONE
ANALOG OUT 1
ANALOG OUT 2
AES OUT 1
AES OUT 2
OFF, EBU ENABLE
MONITORING
ANALOG OUT 1, ANALOG OUT 2, AES OUT 1, AES OUT 2, ANA. OUT 1L MONO, ANA. OUT 1R MONO, ANA. OUT 2L MONO, ANA. OUT 2R MONO, AES OUT 1L MONO, AES OUT 1R MONO, AES OUT 2L MONO, AES OUT 2R MONO
CONFIGURE ALARM
A-BUS REF
FRAME REF
AES NO LOCK
AES BIPHASE
AES PARITY
AES CRCC
AES VALIDITY
NSD ANALOG IN 1L
NSD ANALOG IN 1R
NSD ANALOG IN 2L
NSD ANALOG IN 2R
NSD AES IN 1L
NSD AES IN 1R
NSD AES IN 2L
NSD AES IN 2R
NSD EXT CH1/9
NSD EXT CH2/10
NSD EXT CH3/11
NSD EXT CH4/12
NSD EXT CH5/13
NSD EXT CH6/14
NSD EXT CH7/15
NSD EXT CH8/16
OVLD ANALOG IN
OVLD PROCESSING
TONE
OUTPUT MUTE
ALARM LEVEL
GREEN, YELLOW, RED, FLASH RED
ALARM REPORT
NONE, GPI
A-BUS CONFIG
OFF, MASTER 1, SLAVE 1, SLAVE 2
FIRMWARE VERSION
CPU VERSION
CPU V.xxx
FPGA VERSION
FPGA V.xxx
FACTORY DEFAULT
RESTORE

Menu Description

(ACH)	Analog input channel 1L, 1R, 2L or 2R.
(CHN)	Any channel, N will take a value from 1 to 16. Channels 1 to 4 refer to the analog inputs, 5 to 8 to the digital inputs, 9 to 16 to the eight channels coming from the adjacent video card via the ABUS link.
(STE)	1 for stereo 1L and 1R, 2 for 2L and 2R.

{STATUS}

***GENERAL*:** displays status of the different board alarms, the selected reference signal and the rear type.

FPGA FAILURE	Faulty programmable component.
REAR PANEL ERROR	Indicates an absence of the rear panel or an incompatibility between the module and the rear panel. The *STATUS* led turns on flashing red.
REF*(parameter)*	The reference source selection is automatic between *ABUS* (highest priority), via the card front edge ABUS link, *FRAME* from a REF-1701 in slot 20, *EXT.DARS* from the card digital input 1, or *FREE RUN* (lowest priority).
REAR*(parameter)*	It indicates the type of the rear panel. The five single width panels are A/D 110, A/D 75, D/A 110, D/A 75 and A/A. The two double width panels are UNIV 110 or UNIV 75.
***A/D CONVERSION*:**	Displays OK or OVERLOAD ***(ACH)*** to Indicate an input signal level higher than –0.5 dBFS.
***AES IN*:**	Gives access, for each digital input, to the carrier quality and to the sampling frequency measured value.
AES(*parameter1*)	AES carrier , only the highest rank error is displayed. It can be NO LOCK, BIPHASE, PARITY, CRCC or VALIDITY. No error displays OK.
AES(*parameter2*)	The input signal sampling frequency is measured and this parameter gives the value of the closest standard sampling frequency with a +/- 4% window.
INPUT PROCESSING	It will indicate, for each of the 16 input channels, if it is in a silence, overload or muted condition. No error displays OK.
SILENCE (*CHN*)	The parameters are defined in the NSD THRESHOLD and NSD DELAY menu.
OVERLOAD (*CHN*)	The threshold is set at -0.035 dBFS.
MUTE (*CHN*)	Input mute condition.
ANALOG OUT	Displays OK, TONE for each stereo output or MUTE for each output.
TONE *(STE)*	The tone provides channel identification: the left channel is cut off for 250 ms every 3s.
MUTE (A*CH*)	Output mute condition.
AES OUT	Displays OK, TONE foe each stereo output or MUTE for each output.
TONE *(STE)*	The tone provides channel identification: the left channel is cut off for 250 ms every 3s.
MUTE (A*CH*)	Output mute condition.
CHANNEL STATUS	This menu gives access to the most relevant parameters coded with the channel status bit on a per channel basis.
CHANNEL USE	Displays PRO or CONSUMER.
PCM SAMPLES	Coding of incoming data: LINEAR or NON LINEAR.
EMPHASIS	Coding of the emphasis applied on the signal.
FREQ MODE	Indicates if the source is locked to a local reference signal.
SAMPLING FREQURNCY	Value of the sampling frequency.
CHANNEL MODE	Describes the way the two channels are used.
USER BIT	Utilization of the user bits.
AUX. BITS	Utilization of the auxiliary bits.
WORD LENGTH	Coded quantization value.
REFERENCE	Specifies if the source is a reference signal.
SOURCE ID	“origin” signal message (4 ASCII characters).
DESTINATION ID	“destination” signal message (4 ASCII characters).

Menu Description (suite)

{PROFILES}

Five user setups (USER1 to USER5) are available, they allow saving five card configurations into a non-volatile memory.

LOAD Recall the stored board parameters.

SAVE Stores the actual setup in a user memory.

{INPUT PROCESSING}

For digital channels, the processing will be effective only on channels carrying audio PCM samples. Non audio data will pass through the input stage, with the FIXED DELAY as the only parameter still active.

According to the SLAVE 1/SLAVE 2 selection (ABUS menu) the channels 9 to 16 will be numbered EXT 1 to 8, or EXT 9 to 16.

LOCK Accessible only after an odd channel selection. When locked, for the parameters DELAY (COARSE only), LEVEL and MUTE, the same value will be applied to the two channels (n and n+1).

SWAP Accessible only after an odd channel selection (channel 1 to 7 only), swaps the selected odd channel and the associated even one.

FIXED DELAY Select COARSE to get a 1 ms step and FINE for a sample step (20.8 µs).

PHASE INVERT

LEVEL This adjustment is made within a range of -96 dB to +12 dB by 0.5 dB steps. The default value is 0 dB.

MUTE Input mute.

{OUTPUT MIXERS}

For digital channels, the processing will be effective only on channels carrying audio PCM samples. Non audio data will pass through the output stage, with the source selector (in MODE A) as the only parameter still active.

MODE This menu allows for each output signal the source selection between single channel and the sum or mix of two channels. The available sub-menus will depend on the mode selection

MODE (OFF) The output channel is muted.

MODE (A) A single channel will be output among 48 sources. Its selection is done in sub-menu SOURCE A:

MODE (SUM A+B) The sum of two channels selected among 48 sources with separate level adjustments. The two selections are done in sub-menus SOURCE A and SOURCE B.
ABUS SELECT, CHANNEL SELECT and LEVEL are available for each source.

MODE (MIX) The mono mix of two channels selected among 48 sources. Fixed attenuations of 0, -3 and -6 dB are available via the specific LEVEL menu. The two selections are done in sub-menus SOURCE A and SOURCE B.
ABUS SELECT and CHANNEL SELECT exist for each source.

CH.STATUS ID Sub-menu available only for digital channels. It allows the choice of specific source and destination identifiers. When OFF is selected the input and output identifiers are identical.

SOURCE A Selection and level adjust for the SOURCE A channel.

ABUS SELECT first selection between three groups of 16 signals. One group comes from the video card, and two groups from the audio card 1 and 2.

CHANNEL SELECT selection of 1 of the 16 channels from the selected group.

LEVEL This adjustment is made within a range of -96 dB to 0 dB by 0.5 dB steps. The default value is 0 dB.

SOURCE B Selection and level adjust for the SOURCE B channel with the same sub-menus.

LEVEL Attenuation selection, active only in MIX MODE.

MUTE Output mute.

{O dBFS}

Enables the selection of the RMS value of the input and output sine wave voltages associated to the digital full scale 0 dBFS.

{NSD THRESHOLD}

Signal absence is declared when the signal level is lower than the signal threshold during the selected period. The threshold can be adjusted from –72 to –48 dBFS by 6 dB steps. The default value is –60 dBFS.

{NSD DELAY}

The signal absence period can be adjusted from 0 to 255 s. The default value is set to 15 s.

{TRACKING DELAY}

When enabled this variable delay ensures synchronization between audio signals and video image.

{TONE}

Enables to activate the tone generator. The internal tone generator provides an 1 kHz (- 18 dBFS) sine wave. The EBU mode provides channel identification: left channel is cut off for 250 ms every three seconds.

{MONITORING}

Remote audio control is available via a monitor card in slot 20 of the Densité frame. The menu allows the selection of a single or dual channel audio signal, the ON/OFF command will be remote controlled by the monitor card.

Menu Description (suite)

{CONFIGURE ALARM}

It is possible to associate the *STATUS* Led color and/or GPI relay activation to each detected error.

Alarm relay activation depends of the ENABLE selection of the controller board menu GPI REPORT.

ALARM LEVEL — Associates to each error the *STATUS* led color: GREEN, YELLOW, RED and FLASH RED. This selection has no influence on the {STATUS} menu display.

ALARM REPORT — The default value NONE is assigned to errors. Alarm relay activation will be associated to an error when GPI is set.

{ABUS CONFIG}

When the ABUS link is used with a video processor, the audio card has to be in slave mode. If another audio card is also present, one has to be selected in SLAVE 1 and the other in SLAVE 2.

When two audio cards are used alone, one must be selected in MASTER 1 and the other in SLAVE 2. If the selection is OFF, the audio card does not send any signal onto the ABUS.

CAUTION: All the cards which will use the ABUS link have to be powered up before the connection of the flat cable.

{FIRMWARE VERSION}

CPU VERSION — Microcontroller firmware version

FPGA VERSION — Programmable logic element firmware version.

{FACTORY DEFAULT}

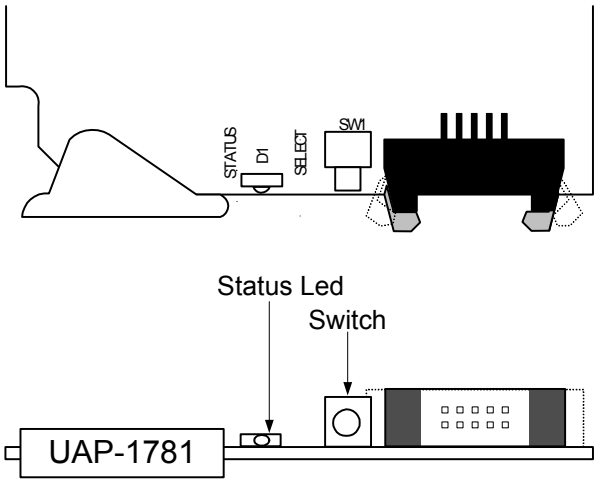
RESTORE — Set the module with the factory default parameters.

Status and Report

This table shows the front Led color and the report action according to the level of a given error condition. Notice that the "Flashing Yellow" indicates that the SELECT button on the front panel has been pushed, and the card is being accessed via the communication protocol.

	Serial Report	GPI Report	Green	Yellow	Red	Flashing Red	Flashing Yellow
ABUS reference error	✪			✪			-
Frame Reference Error	✪			✪			-
AES carrier no lock	✪				✪		-
AES carrier biphase	✪				✪		-
AES carrier parity	✪				✪		-
AES carrier CRCC	✪			✪			-
AES carrier invalid sample	✪			✪			-
NSD Analog input 1 L	✪			✪			-
NSD Analog input 1 R	✪			✪			-
NSD Analog input 2 L	✪			✪			-
NSD Analog input 2 R	✪			✪			-
NSD AES input 1 L	✪			✪			-
NSD AES input 1 R	✪			✪			-
NSD AES input 2 L	✪			✪			-
NSD AES input 2 R	✪			✪			-
NSD external channel 1 (9)	✪			✪			-
NSD external channel 2 (10)	✪			✪			-
NSD external channel 3 (11)	✪			✪			-
NSD external channel 4 (12)	✪			✪			-
NSD external channel 5 (13)	✪			✪			-
NSD external channel 6 (14)	✪			✪			-
NSD external channel 7 (15)	✪			✪			-
NSD external channel 8 (16)	✪			✪			-
OVERLOAD analog inputs	✪				✪		
OVERLOAD processing	✪				✪		-
Any TONE activated	✪			✪			-
Any output Mute	✪			✪			-
User attention	-	-	-	-	-	-	Yes
Rear panel error	-	-	-	-	-	Yes	-
FPGA error	-	-	-	-	-	Yes	
✪ : Factory default.							
Note: The non requested message affectation to an alarm status can only be accessed by the communication protocol (serial port)							

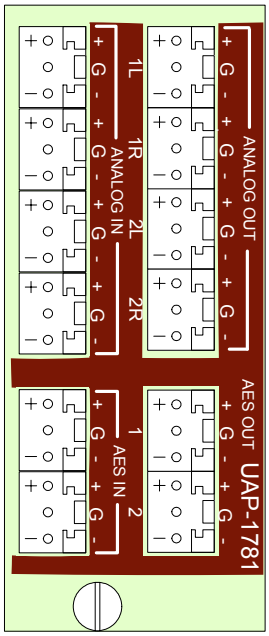
Front Edge Presentation



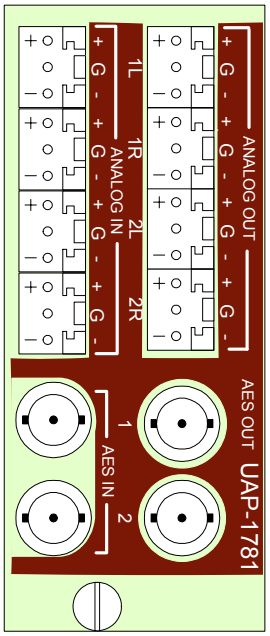
Connections

Dual rear panels AES3 or AES3-id compatible:

UAP-1781-AADD110-DRP

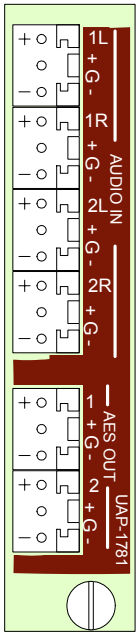


UAP-1781-AADD75-DRP

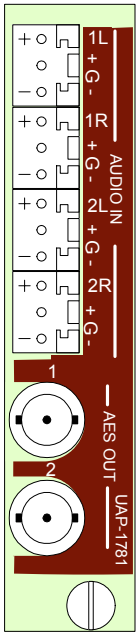


Single rear panels AES3 or AES3-id compatibles

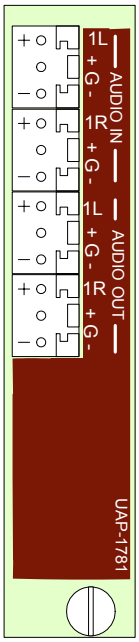
UAP-1781-AD110-SRP



UAP-1781-AD75-SRP

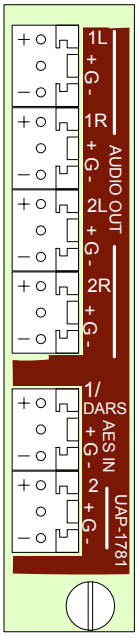


UAP-1781-AA-SRP



Single rear panels AES3 or AES3-id compatibles

UAP-1781-DA110-SRP



UAP-1781-DA75-SRP