(DENSITÉ) SERIES

AMX-1842

Description

The AMX-1842 is a high-quality embedder which embeds up to four AES 24-bit 48 kHz digital audio signals into a single HD/SD serial digital video signal. It includes audio and video signal presence detection and reporting, and local or remote configuration and control. A unique feature is its ability to embed time code, a serial RS-422 data signal and two GPI status signals into the video signal. The card has built-in audio tone, time code and video color bar test signals.

The AMX-1842 is designed for use in the DENSITÉ frame, with the appropriate double-width rear panel.

Video - Features

- Serial HD/SD-SDI input with automatic equalization for up to 110/250 meters of cable.
- Automatic detection of video input format
- Automatic detection of input video loss and switchover to local black for continuity of embedded audio.

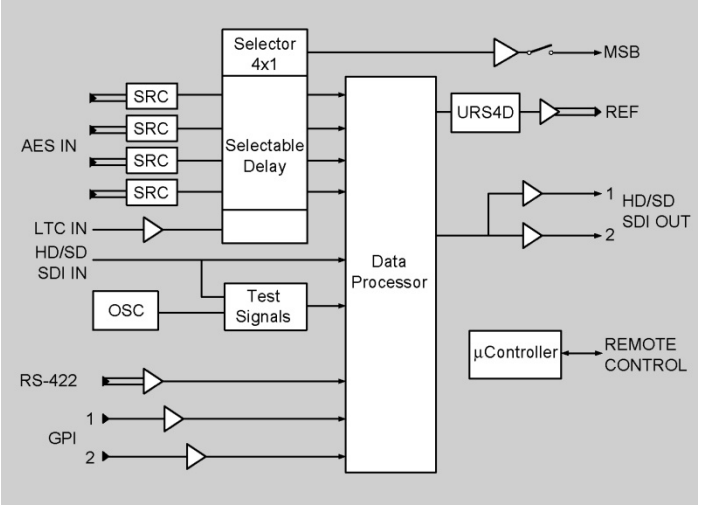
Audio - Features

- AES inputs: either 110 Ω balanced or 75 Ω unbalanced, depending on rear panel in use
- Sample rate conversion for asynchronous AES inputs
- Audio input channel gain selectable from -96dB to +12dB by 0.5dB steps
- Audio groups insertion/pass-through/delete
- Selectable audio delay of up to 3 frames in ½ frame steps
- Left/Right channels swappable for each AES input
- Automatic mute on AES error
- Selectable routing of AES signals to audio groups
- Dolby-E compatible (48kHz synchronous)
- Cards cascadeable to embed 4 groups (16 channels)
- 24-bit digital audio embedding
- Monitor selector for Densité frame monitor switcher (MSB)
- Universal reference signal output for audio DAC

Embedding Other Signals - Features

- Linear Time Code (LTC) embedding
- RS-422 serial data input for embedding as ANC data.
- Sampling of two GPI inputs for embedding as ANC data.

FUNCTIONAL BLOCK DIAGRAM



SPECIFICATIONS

VIDEO INPUT

Video Signal:	HD/SD-SDI SMPTE 292M / SMPTE 259M (see list of supported formats below)
Cable Length:	up to 110/250 meters of Belden 1694A
Return Loss:	>15 dB, 5 MHz to 1.485 GHz

AUDIO AES-3id INPUT

Signal:	AES-3id (SMPTE 276M)
Level:	0.2 to 2.0 Vp-p
Impedance:	75 Ω unbalanced
Cable length:	>400 m

AUDIO AES3 INPUT

Signal:	AES3
Level:	0.2 to 7.0 Vp-p
Impedance:	110 Ω balanced
Cable length	>200 m

AUDIO AES SIGNALS

Sampling Rate:	48kHz synchronous or asynchronous
Dolby-E Rate:	48kHz synchronous
Bits:	24-bit

SPECIFICATIONS(cont'd)

LTC SIGNAL

Signal:	LTC per SMPTE 12M
Impedance:	< 10kΩ (bridging 600Ω) unbalanced
Level:	0.2 to 5Vp-p

VIDEO OUTPUT

Video Signal:	HD/SD-SDI (SMPTE 292M / SMPTE 259M) Audio embedded per SMPTE 299M / SMPTE 272M LTC embedded as ATC/DVITC (SMPTE RP188/SMPTE 266M) RS-422 and two GPIs embedded as ANC data per SMPTE 291M (Proprietary type 1 DID)
Return Loss:	>15 dB up to 1.485 GHz
Wideband Jitter:	as per SMPTE-259M-C and 292M

ANC SERIAL DATA INPUT

Signal:	RS-422
Level:	200 mVpp (min)
Rate:	38.400 or 115.200 bauds

ANC GENERAL PURPOSE INTERFACE (GPI) OUTPUT

Signal (2):	Contact closure (opto-isolated), common ground
Level:	True = 0 to 0.8 V (max.) Maximum input voltage = ±5.5 V
Rate:	DC to 250 Hz

PROCESSING PERFORMANCE

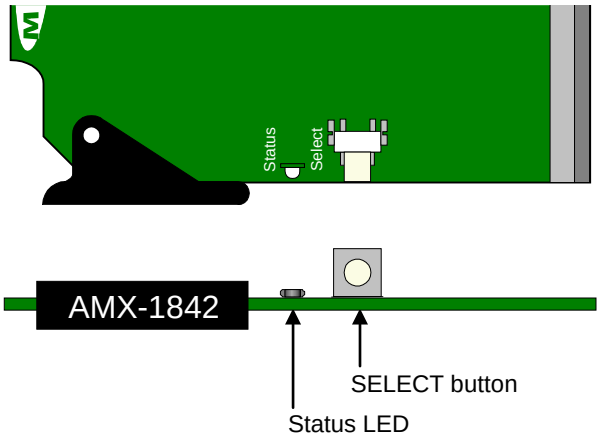
Signal Path:	10-bit video / 24-bit audio
Video Delay:	HD: 4.5 μs / SD: 11.5 μs
Audio Processing Delay:	875 μs audio insertion delay ‡‡
Audio Delay:	Up to 3 video frames (1/2 frame steps)
LTC Delay:	Up to 3 video frames (one frame steps)
RS-422	
Processing delay:	max 500 μs ‡‡
GPI	
Processing delay:	4 video lines ‡‡
Test Signals:	Video - color bars 100% Audio - 1 kHz tone (R steady, L pulsed) -18dBFS (EBU R49, R68) LTC – 10 second loop starting at 23:59:00:00
Power:	6 W

Note ‡‡: Applicable to combinations of this card and ADX-1842/1852.

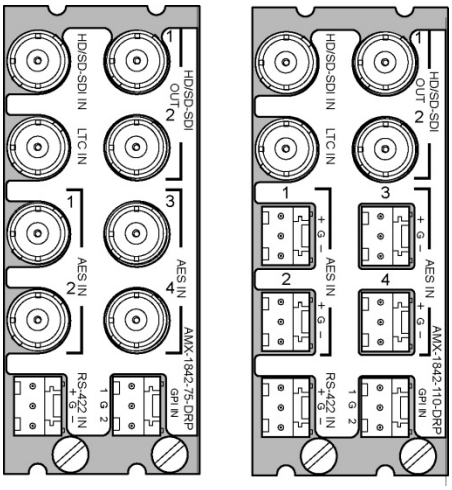
List of supported formats:

HD-SDI formats :
1920 x 1080/59.94/I
1920 x 1080/50/I
1920 x 1080/29.97/P
1920 x 1080/25/P
1920 x 1080/24/P
1920 x 1080/23.98/P
1920 x 1080/29.97/PsF
(detected as 1920 x 1080/59.94/I)
1920 x 1080/25/PsF
(detected as 1920 x 1080/50/I)
1920 x 1080/24/PsF
1920 x 1080/23.98/PsF
1280 x 720/59.94/P
1280 x 720/50/P

SD-SDI formats :
525
625



AMX-1842 Front card edge



AMX-1842 Rear Connector Panels

INSTALLATION

Make sure the following items have been shipped with your AMX-1842. If any of the following items are missing, contact your distributor or Miranda Technologies Inc.

* AMX-1842 Digital Audio Embedder
* AMX-1842 rear panel (see figure for options)

The AMX-1842 and its associated rear connector panel must be mounted in a DENSITÉ frame. It is not necessary to switch off the frame's power when installing or removing the AMX-1842. See the DENSITÉ Frame manual for detailed instructions for installing cards and their associated rear panels.

The AMX-1842 has multiple audio and video inputs and outputs, and making space for all the necessary connectors at the rear of the frame requires a double-width rear panel.

When a double–width rear panel has been installed, the AMX-1842 must be installed in the right-most of the two slots covered by the panel in order to mate with the panel's connectors. If it is placed in the wrong slot, the front panel LED will flash red. Move the card to other slot for correct operation. No damage will result to the card should this occur.

OPERATION

Overview

The DENSITÉ frame incorporates a central controller card, located in the center of the frame, which is equipped with an LCD display and a control panel. The controller handles error reporting and local and remote control for all cards installed in the frame. The display and control panel are assigned to the card in the frame whose SELECT button has been pushed.

Status Monitor LED

The status monitor LED is located on the front card-edge of the AMX-1842 module, and is visible through the front access door of the DENSITÉ frame. This multi-color LED indicates module status by color, and by flashing/steady illumination, according to the following chart (which also indicates fault reporting for this card on the DENSITÉ frame's serial and GPI interfaces).

	REPORT		COLOR (F=flashing)			
	SERIAL	GPI	G	Y	R	FR
No errors			✪			
No signal	✪				✪	
No rear						✪
Test mode				✪		

✪ : Factory default. ▭ User configurable

A "Flashing Yellow" Status LED indicates that the SELECT button on the front panel has been pushed, and the controller display and control panel are now assigned to this card. The LED color assignments for some error conditions can be reconfigured by the user (see the chart and menu for details).

User Interface

Pushing the SELECT button will cause the on-card STATUS LED to flash yellow, and the card identification and the current status will be shown on the controller card's display. The STATUS LED will revert to it's normal state upon a second push of the button, or after a short delay. The messages which may appear are shown in the top line of the menu chart on page 3

Example :

SELECT button pushed twice when there is no input signal connected to the rear panel and the LED is steady red:

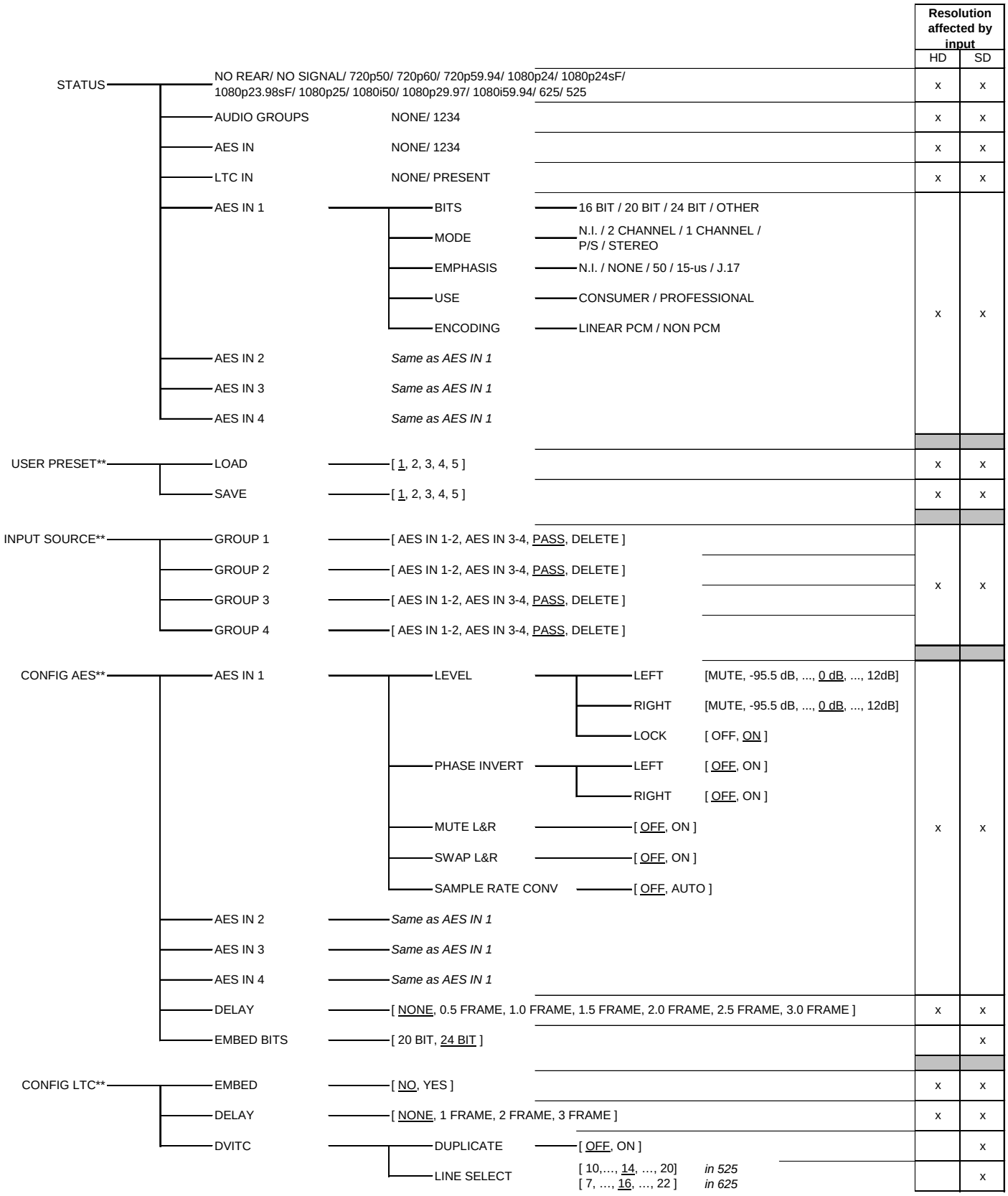
A	M	X	-	1	8	4	2							
N	O		S	I	G	N	A	L						

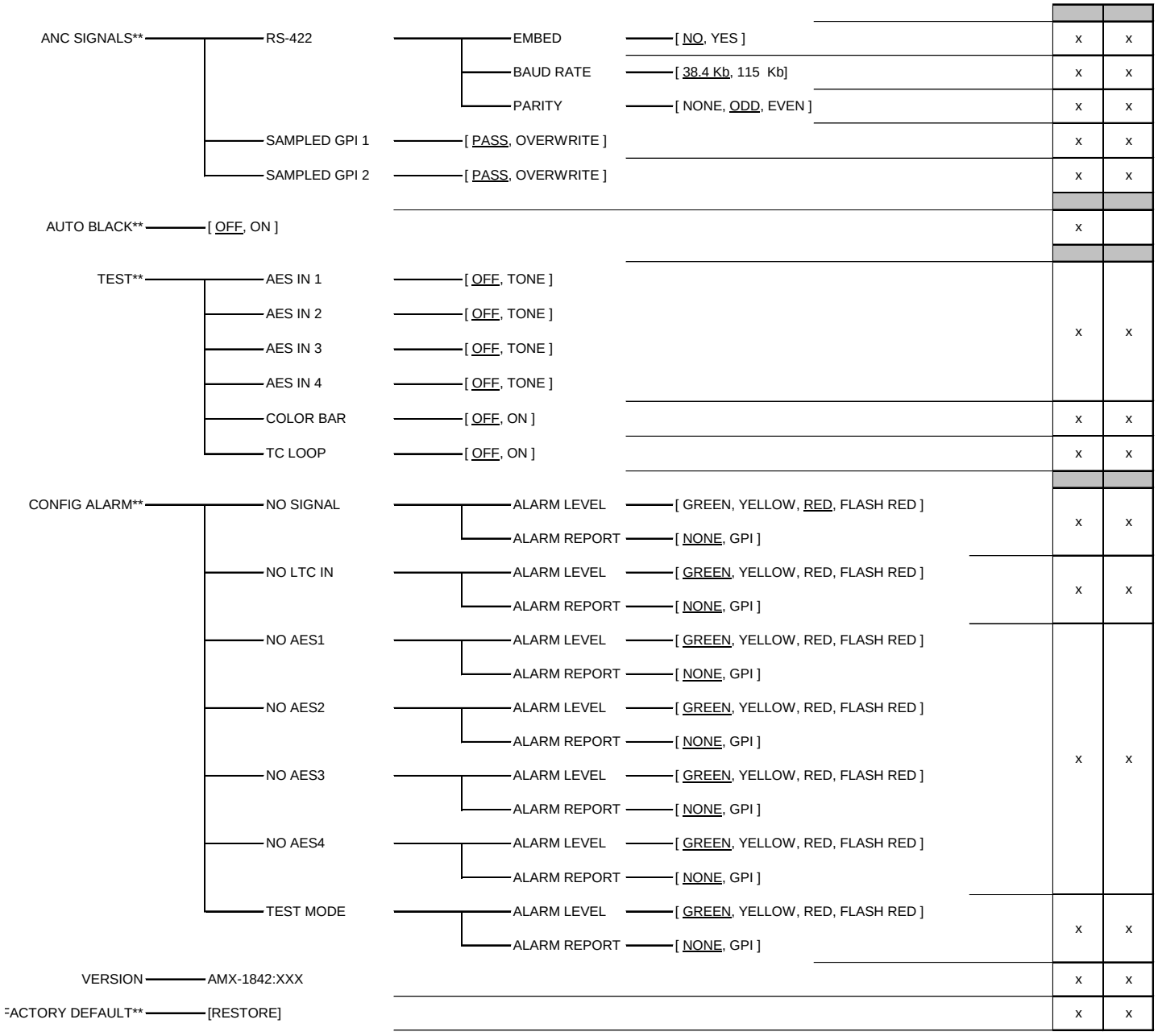
Use the local control panel to access the detailed status report shown in the STATUS menu on page 3.

Operating Parameter Adjustment

The AMX-1842 has operating parameters which may be adjusted at the controller card interface. After pressing the SELECT button on the AMX-1842 card, use the keys on the local control panel (described in the Controller card manual) to step through the displayed menu and adjust the parameters. The menus are shown below.

AMX-1842 Menu





ANC SIGNALS** / RS-422 / EMBED	x	x
ANC SIGNALS** / RS-422 / BAUD RATE	x	x
ANC SIGNALS** / RS-422 / PARITY	x	x
ANC SIGNALS** / SAMPLED GPI 1	x	x
ANC SIGNALS** / SAMPLED GPI 2	x	x
AUTO BLACK**	x	
TEST** / AES IN 1	x	x
TEST** / AES IN 2		
TEST** / AES IN 3		
TEST** / AES IN 4		
TEST** / COLOR BAR	x	x
TEST** / TC LOOP	x	x
CONFIG ALARM** / NO SIGNAL	x	x
CONFIG ALARM** / NO LTC IN	x	x
CONFIG ALARM** / NO AES1	x	x
CONFIG ALARM** / NO AES2		
CONFIG ALARM** / NO AES3		
CONFIG ALARM** / NO AES4		
CONFIG ALARM** / TEST MODE	x	x
VERSION	x	x
FACTORY DEFAULT**	x	x

[] Parameter to select

** Press Select pushbutton to activate selection.
Underlined values in the parameter value lists are the factory default values, and will be applied when factory default-restore is selected.

USER PRESET menu

LOAD: Selects which predefined parameter settings will be used by loading a personalized profile.

SAVE: Saves the parameter settings in one of the five possible user preset profiles.

INPUT SOURCE menu

GROUP1, GROUP2, GROUP3, GROUP4: Selects the source of audio for the four embedded audio groups. AES IN 1-2 and AES IN 3-4 select audio from the AMX-1842 inputs. PASS leaves the incoming embedded audio group intact, passing it through to the HD/SD-SDI output. DEL deletes the incoming embedded audio groups, leaving the HD/SD-SDI output without embedded audio. Sample rate converters permit the AES inputs to be synchronous or asynchronous.

Note: The standard for embedded audio specifies 48kHz sampling, synchronous to video. Sample rate converters permit the input of asynchronous linear PCM audio; however, AES signals containing non-PCM audio must be synchronous 48kHz. Asynchronous inputs will affect the integrity of channel status and user data, causing error flags to be set that may be detected by downstream equipment.

***CONFIG AES* menu**

AES IN 1, 2, 3, 4: Select *MUTE:* ON or OFF, *SWAP L&R*: ON or OFF, or *SAMPLE RATE CONV*: OFF or AUTO for each of the four AES channels. In *AUTO* mode, AES input detected as non-PCM audio will automatically turn off the sample rate conversion process.

LEVEL: Sets the audio gain from -96 dB to +12 dB in 0.5 dB steps.

PHASE INVERT: When “on”, inverts the selected audio channel phase.

DELAY: sets the delay of the AES signal as it passes through the embedder, from NONE to 3 video frames by 0.5 frame steps.

EMBED BITS: Select the number of embedded bits in the AES signal to either 20 or 24 bits.

CONFIG LTC menu

EMBED: Permits the user to embed LTC, as ATC into an HD-SDI signal or as DVITC into a SD-SDI signal.

DELAY: LTC delay selectable between NONE and a number of video frames (1 to 3).

DVITC (only in video SD mode) : *LINE SELECT* allows user to choose the position of DVITC in the video signal. DUPLICATE fonction allows the user to insert DVITC twice, on two different video lines.To insert DVITC twice, set *DUPLICATE* feature to ON.

ANC SIGNALS menu

RS-422: The incoming RS-422 serial data may be embedded as ANC data. Select PASS to leave any already embedded RS-422 data untouched (no insertion) or OVERWRITE, which embeds incoming RS-422 data to the HD/SD-SDI signal while any existing embedded RS-422 data is removed. Only works with signals at 38.400 or 115.200 Bauds with accurate selection of BAUD RATE.

SAMPLED GPI 1, 2: The incoming GPI status data is sampled and may be embedded as ANC data. Select PASS to leave any already embedded GPI data untouched (no insertion) or OVERWRITE, which embeds incoming GPI data to the HD/SD-SDI signal while any existing embedded GPI data is removed.

AUTO BLACK menu

Turn *AUTO BLACK* ON or OFF. Auto Black replaces the video input with a locally-generated video black in the event of an input failure, to maintain audio embedding.

CONFIG TEST menu

AES IN 1, 2, 3, 4: User can enable (TONE) or disable (OFF) a test tone (1 KHz, R-steady, L-pulsed, at –18dBFS) on each of the four AES channels individually.

COLOR BAR: User can enable (ON) or disable (OFF) color bars on the video output.

TC LOOP: User can enable a test loop (10 second loop starting at 23:59:00:00) that is inserted into the video as ATC (HD-SDI video) or DVITC (SD-SDI video).

CONFIG ALARM menu

The user can configure the status LED presentation (ALARM LEVEL) and fault reporting (NONE or GPI) for some of the fault conditions of the AMX-1842. Those not listed here are factory-set and cannot be user-modified.

NO SIGNAL: Errors include no signal attached to the card input, or faulty incoming HD/SD-SDI signal.

TEST MODE: Indicates whether test signals are present on any of the AMX-1842 outputs (audio or video).

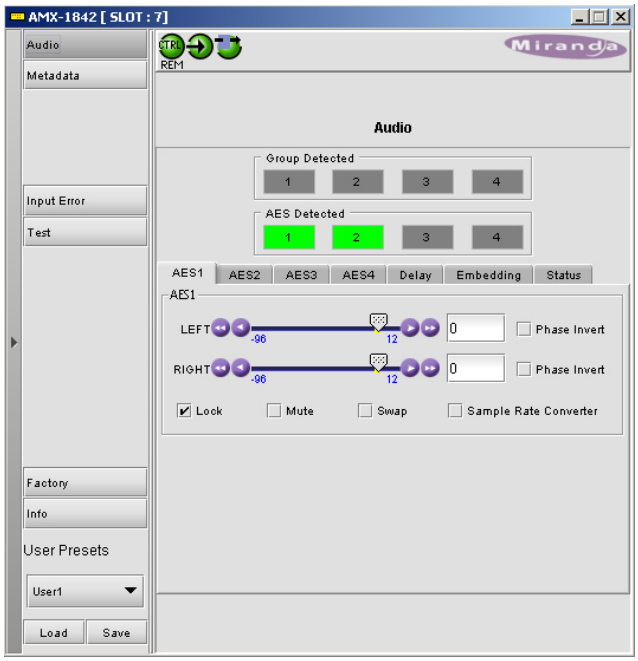
FACTORY DEFAULT menu

Select *RESTORE* to reset all of the menu-adjustable parameters to a factory-preset state (indicated in the menu by an underline in the list of available choices).

iControl Interface

The AMX-1842 can be operated using Miranda's iControl system. This manual describes and explains the control panel associated with the AMX-1842. Please consult the iControl User's Guide for information about setting up and operating iControl.

In Control Navigator or iControl Websites, double-click on the AMX-1842 icon to open the control panel.



There are 8 sections in the AMX-1842 iControl panel:

Status Bar: located at the top of the panel, it provides status icons for several key items and text messages explaining the detected errors. A complete description of the **Status bar** begins on this page.

Select the following tabs by clicking on their name at the left side of the panel:

Audio: provides controls for processing and embedding audio signals. A complete description of the **Audio** tab begins on this page.

Metadata : gives access to the controls for LTC, RS-422 and GPI status data embedding in an HD/SD SDI signal. A complete description of the **Metadata** tab begins on page 8.

Input Error: allows the user to turn on and off the auto black feature. A complete description of the **Input error** tab begins on page 9.

Test: gives the option to insert test signals. A complete description of the **Test** tab begins on page 9.

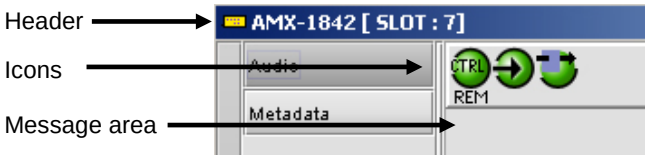
Factory: Allows the user to reset the options to the default factory-preset settings. A complete descrition of the **Factory** tab begins on page 9.

Info: shows information about the AMX-1842 and allows entry of some data. A complete description of the **Info** tab begins on page 9.

User Presets: Allows the creation of user profies for a personalised configuration of the AMX-1842. A complete description of the **User presets** begins on page 9

Status bar

The **status bar** provides a continuous update of the status of the AMX-1842. The status bar includes three sections:



The **header** gives the product's name, and identifies the slot in which it is installed in its Densité frame. At the left is a status icon whose color shows the overall status of the AMX-1842:

Green = OK
Yellow = warning
Red = error

The 3 **icons** monitor specific aspects of the AMX-1842's operations. Move the cursor over an icon to see its current status in the **message area** below the icons. If there is an error status, the message will appear automatically

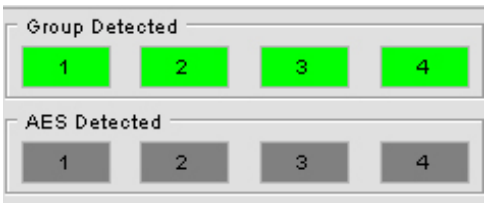
The first icon shows whether the remote control of this AMX-1842 device is enabled or not.

The second icon shows the input status. Move the cursor over the icon to display the audio format.

The third icon indicates if audio or video test signals are active.

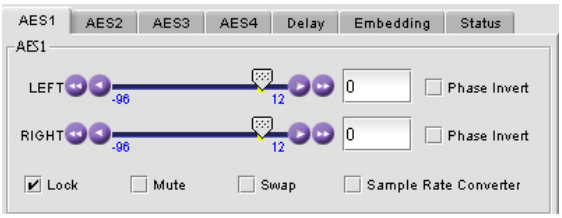
Audio

The **audio** tab shows the audio groups detected and provides resources for managing the audio processing of the AMX-1842.



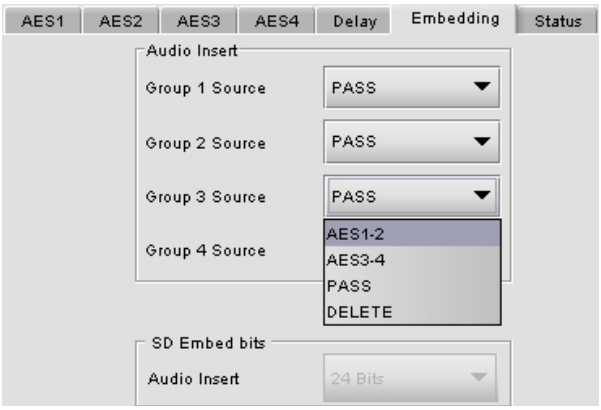
Group detected: indicates embedded audio groups in the AMX-1842 SDI imput by turning green.

AES detected: indicates AES audio on the indicated AMX-1842 AES input by turning green.



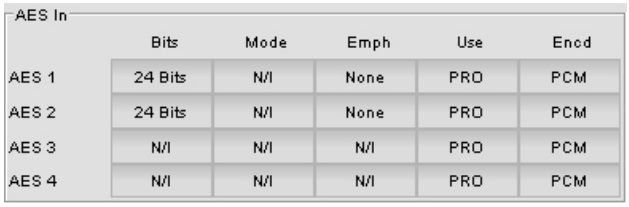
To configure the **AES** digital audio signals, access the AES1 to 4 tabs. There are two sliders (left and right for stereo sound) available to set the level from -96 dB to +12 dB in steps of 0.5 dB. To invert the selected audio channel phase, check the **phase invert** boxes. The **lock** option locks both channel level sliders together, so that moving one slider moves the other one as well. The **mute** option mutes both audio channels completely. The **swap** option interchanges the right and the left audio channels. The **sample rate converter** can be set to either auto or off. While in auto mode, the sample rate conversion process is automatically turned off upon detection of non-pcm channel status.

The **Delay** tab allows the user to set the delay of the AES audio as it passes through the embedder. The delay is selectable between none, and a number of video frames (0 to 3 frames in 0.5 frames steps).



The **Embedding** tab specifies the content of the AES groups embedded in the output signal. Each group can be composed of a pair of AES inputs (AES1-2 or AES3-4). If the video input already contains an embedded audio group, it can either be allowed to pass through directly without modifications (PASS) or it can be deleted (DELETE). The **SD Embed bits** is not selectable for HD (24 bits). For SD signals, the options are 20 or 24 bits

The **status** tab monitors some of the information carried in the AES inputs channel status..



The **Bits** status monitors the audio samples word length (in bits). The possible values are 16 bits, 20 bits, 24 bits or other. If the information is not available, it will show as N/I.

The **Mode** status monitors the channel mode. The possible values are two channels (Two ch), one channel (One ch), primary or secondary (Pri/Sec), Stereo or Other. If not indicated, it will show as N/I.

The **Emph** status monitors the audio channel emphasis. The possible values are none, 50/15 μs (CD type) and J.17. If not indicated, it will show as N/I.

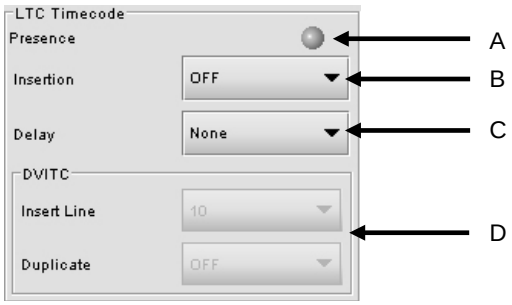
The **Use** status monitors the use of channel status block. The possible values are either professional (PRO) or consumer (CONS).

The **Encd** status monitors the audio channel encoding type. The possible values are PCM or NPCM (non PCM).

Metadata

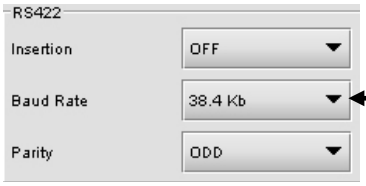
The **Metadata** tab offers setting options for 3 types of input signals: LTC, RS422 and GPI.

The **LTC** window allows the embedding of an LTC signal, as ATC, into an HD-SDI or as DVITC into an SD-SDI signal.



A: the **presence** icon shows if an LTC signal is detected by turning green.
B: the **insertion** can be toggled to OFF or ON, to disable or activate the embedding of the LTC signal into the HD/SD SDI dignal.
C: the **delay** option allows correction of lipsync problems by adding up to 3 frames of delay.
D: the DVITC menu has two parameters, **Insert line** and **duplicate**. The insert line option allows the user to choose the position of the DVITC in the video signal, while the duplicate option inserts a second DVITC packet on the video line following the one chosen by the user.

The **RS-422** tab allows the embedding of an RS-422 serial data as ANC data in the HS/SD SDI signal.



Only supports 38,4 Kb and 115 Kb

Setting the i**nsertion** option to OFF will leave any already-embedded RS-422 data untouched, while setting it at ON will remove any existing embedded RS-422 data and embed the incoming RS-422 data in the HD/SD SDI signal.

The **parity** pulldown, allows the user to set the parity to NONE, ODD or EVEN, insuring the continuity of the input signal's parity.

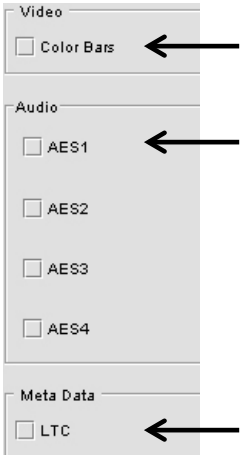
The **GPI** insertion tab allows the embedding of sampled GPI status data as ANC data. Setting the option OFF will not insert the GPI data, leaving the already embedded data untouched, while setting it to ON wil overwrite it, embedding the new GPI data in the HD/SD-SDI signal.

Input error

In the event of an imput failure, activating the **auto black** feature will replace the video input with a locally generated video black in order to maintain audio embedding.

Test

The **test** menu allows the user to enable test signals on the AES and video outputs for troubleshooting purposes.



Enables color bars into the video output.

Enables a test tone (1 KHz, R-steady, L-pulsed, at-18 dBFS) in each of the four AES channels individually

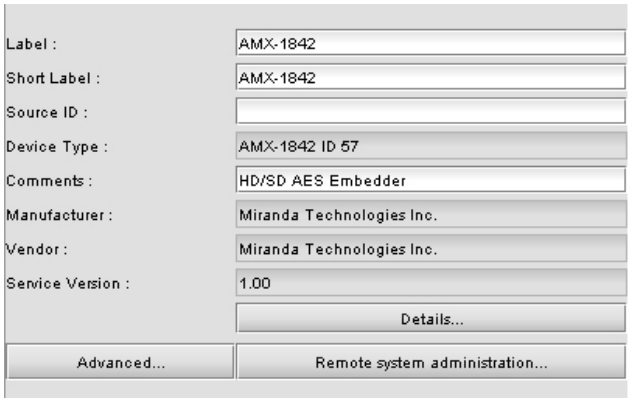
Enables an output test loop (10 second loop starting at 23:59:00:00) in the video as ATC into HD-SDI or as DVITC in SD-SDI video.

Factory

Clicking the **Load Factory** button will restore all of the adjustable parameters to a factory-preset state. Those preset settings are indicated by an underline in the **AMX-1842 menu** on pages 4 and 5 of this manual.

Info

The **Info** tab provides information about the AMX-1842, and provides some data entry options.



Label and Short label: type a label and a short label for this device in the appropriate data entry boxes.

Source ID: enter the source ID

The **details** option gives additional information about the device. The manufacturing process, firmware version, service version and panel version can be found there.

The **advanced** tab shows the long ID of the device. The Miranda Long ID is the address of this AMX-1842 in the iControl network.

Open the **remote system administration** tab to acess the "joining locators: AMX-1842" window.

User presets

User Presets

The AMX-1842 has memory registers which can hold up to 5 user-defined parameter settings.

Select any one of the five presets using the pull-down list. The name of the currently-selected User Preset is shown on the name bar.

- Click **Load** to load the contents of the selected User Preset into the AMX-1842. All parameter settings and values will be replaced by the contents of the selected User Preset.
- Click **Save** to store the current parameter settings and values from the AMX-1842 into the selected User Preset. The existing contents of the preset will be overwritten.

Electromagnetic Compatibility

This equipment has been tested for verification of compliance with FCC Part 15, Subpart B requirements for Class A digital devices.

NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

This equipment has been tested and found to comply with the requirements of the EMC directive 2004/108/CE:

- 2004/108/EC Electromagnetic Compatibility (EMC) Directive
- EN 55022 Conducted emissions, Class A
- EN 55022 Radiated emissions, Class A
- EN 61000-3-2 Harmonic current emission limits
- EN 61000-3-3 Voltage fluctuation and flicker limitations
- EN 61000-4-2 Electrostatic discharge immunity
- EN 61000-4-3 Radiated electromagnetic field immunity – RF
- EN 61000-4-4 EFT immunity
- EN 61000-4-5 Surge immunity
- EN 61000-4-6 Conducted immunity
- EN 61000-4-11 Voltage dips, short interruption and voltage variation immunity

CONTACT MIRANDA

For technical assistance, please contact the Miranda Technical support centre nearest you:

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