Grass Valley
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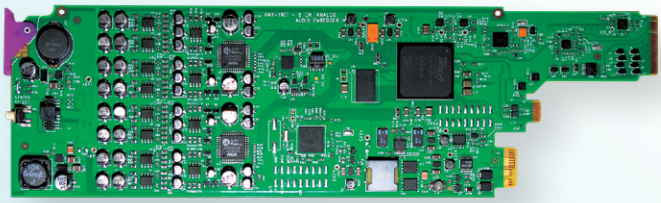
DATASHEET



AMX-1901 3G/HD/SD 8 Channel Analog Audio Embedder

Space-saving, modular platform for advanced signal processing.

The AMX-1901 is an advanced, high quality 24-bit 48 kHz analog audio embedder designed to insert up to eight analog audio signals into a 3G/HD/SD video signal. The AMX-1901 can process the eight audio input channels with functions including level, channel shuffling and mixing.

Options include Automatic Loudness Control and dynamic processing (limiter, compressor and expander). The loudness measurement features allows the measurement and logging of up to eight audio programs with iControl™ Loudness Monitoring software to analyze and report compliance with respect to various loudness legislation around the world. Furthermore, a delay of up to 2.7s can be programmed independently per audio input channel.

In the absence of an input video signal, an internally generated black or color bar signal is used, thus sustaining audio embedding even with a loss of input.

The AMX-1901 can embed longitudinal timecode (LTC) as ancillary timecode (ATC) in 3G/HD and DVITC in SD. Up to two GPIO can be used as input to embed GPI events to the timecode user bits in transport applications. Audio metadata insertion in the VANC is possible from an embedded VANC stream or an external RS-422 link.

A fiber input/output SFP cartridge is offered as an option on some rear modules. Once the cartridge is installed, the inputs or outputs are selectable through the control interface.

Key Features

Audio

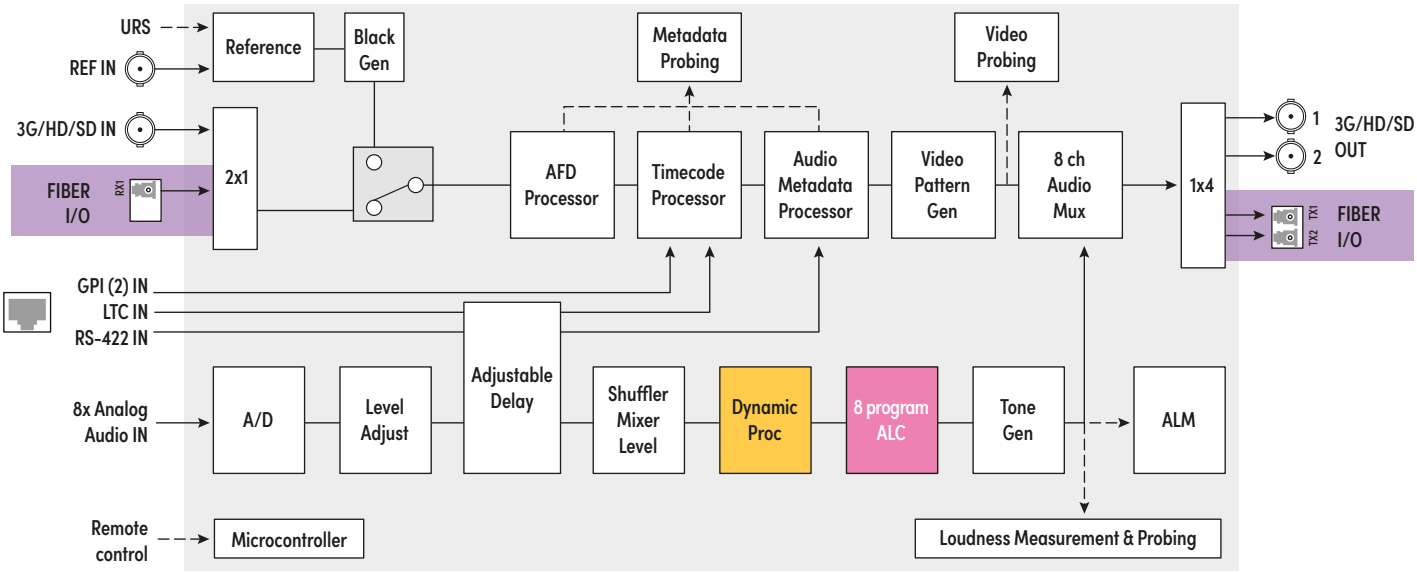
- 8 analog audio inputs with inputs shuffling
- Individually adjustable input level
- Audio delay adjustments of up to 2.7s to compensate for lip sync issues
- Audio dynamic processor option (compressor/limiter/expander)
- Optional 8 programs/8 channels Automatic Loudness Control with Wideband processing
- Loudness measurement of up to 8 audio programs and logging with iControl Loudness Monitoring software
- Loudness compliant to EBU R128-2014, ATSC A/85:2013 (FCC CALM compliant) and ARIB TR-B32 (ITU-R BS.1770-3)
- Built-in test generator (audio + video)
- Monitoring and reporting of audio input Overload, Max/Min Level, Silence and Phase

Video

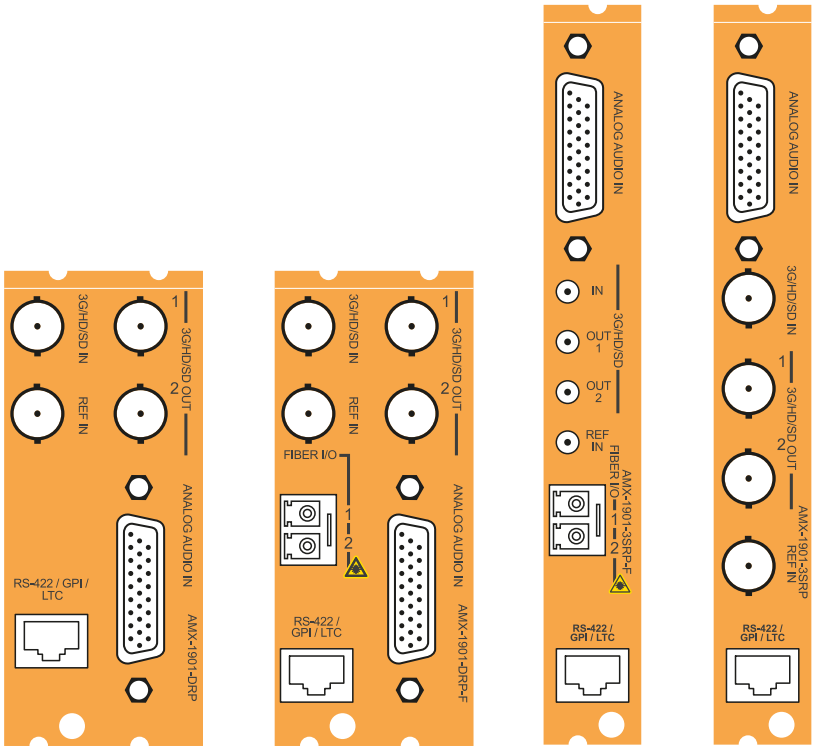
- 3G/HD/SD input
- Supports 3G level A (mapping 1) and level B
- Internal black or color bar generator in case of input signal absence or loss
- Flexible HD/SD/URS reference input, used only with an input signal absence
- Optional optical fiber SFP cartridge
- Black Detection monitoring

Metadata

- AFD (SMPTE ST 2016), VLI (SMPTE RP 186) and WSS insertion
- Longitudinal timecode (LTC input) embedding into DVITC (SD) or ATC (3G/HD)
- Audio metadata insertion (SMPTE ST 2020-A) from RS-422 serial data input
- 2 GPI inputs that can be inserted in the timecode user bits



AMX-1901 Functional Block Diagram



AMX-1901-DRP AMX-1901-DRP-F AMX-1901-3SRP-F AMX-1901-3SRP

Specifications

Analog Audio Inputs (8)

Signal: balanced analog audio

Input impedance: > 12 kΩ

Max. level: +24 dBu

Audio Processing Performance

Quantization: 24 bits

Sampling: 48 kHz

SNR: >117 dB A weighted

0 dBFS: 0 to +24 dBu (1 dB steps)

Distortion: -90 dB (20 Hz to 5 kHz)

Crosstalk: -100 dB (20 Hz to 20 kHz)

Freq. response: ± 0.05 dB (20 Hz to 20 kHz)

Processing delay: 400 µs to 3 ms depending video resolution and processing options

Tone generator: -18 dBFS 1 kHz sine wave interrupted on left channel (250 ms) per EBU R49

Video Input (1) / Output (2)

Signal:

- SMPTE ST 259 (270 Mb/s)
- SMPTE ST 292 (1.485, 1.485/1.001 Gb/s)
- SMPTE ST 424 (2.970, 2.970/1.001 Gb/s)

Supported formats:

- 480i59.94, 576i50
- SMPTE ST 274: 1080/59.94, 1080p23.98/24sF/25/29.97
- SMPTE ST 296: 720p24, 720p23.98, 24/50/59.94
- SMPTE ST 425 Level A (mapping 1), Level B: 1080p59.94, 1080/50

Embedded audio:

- SMPTE ST 272 (SD)
- SMPTE ST 299 (HD)

Embedded ATC: SMPTE RP 188

Embedded ANC: SMPTE ST 291

Cable length:

- 300m (984 ft.) Belden 1694A at 270 Mb/s
- 150m (492 ft.) Belden 1694A at 1.485 Gb/s
- 120m (393 ft.) Belden 1694A at 2.970 Gb/s

Input impedance: 75Ω

Return Loss:

- >15 dB up to 1.5 GHz
- >10 dB from 1.5 GHz to 3 GHz

Jitter:

- SD/HD: < 0.2 UI
- 3G : < 0.3 UI

External Reference Input (1)

Signal:

- SMPTE ST 170/SMPTE ST 318/ITU 624-4 Black Burst
- SMPTE ST 274/SMPTE ST 296 Tri-level sync

Input impedance: 75Ω

Return loss: >35 dB up to 5.75 MHz

Frame Reference

Signal: URS from REF-1801 card installed in the frame

LTC Input (1)

Signal: SMPTE ST 12

Connector: RJ45

Impedance: 10 kΩ unbalanced

Level: 0.2 to 5 Vp-p

GPI Input (2)

Signal: Contact closure to ground

Connector: RJ45

RS-422 Metadata Input (1)

Signal: RS-422

Connector: RJ45

Level: 300 mVp-p min.

Rate: 115200 bauds

Optical Video Input (0 or 1)

Refer to SFP module specifications:

- SFP-R-S13-LC
- SFP-RT-S13-LC

Optical Video Output (0, 1 or 2)

Refer to SFP module specifications:

- SFP-T-S13-LC
- SFP-TT-S13-LC

Video Processing

Signal Path: 10 bits

I/O Processing delay:

- Normal: < 1.1 line for all format except 3G Level B
- Minimum: < 0.25 line for all format except 3G Level B

Electrical

Power: <7W with dual SFP cartridge

Ordering

Densité® 2 Frame	Densité 3 Frame	Description
AMX-1901	AMX-1901-3RU	3G/HD/SD 8 channel analog audio embedder
AMX-1901-DRP		Double rear connector panel
AMX-1901-DRP-F		Double rear connector panel with fiber cage
	AMX-1901-3SRP	Single rear connector panel
	AMX-1901-3SRP-F	Single rear connector panel with fiber cage

Options (Software)	Description
AMX -1901-OPT-DP	Dynamic Processing Option (Compressor/Limiter/Expander)
AMX -1901-OPT-ALC	8-channel Automatic Loudness Control option

Options (Hardware)	Description
NSH26M	HD-26 to terminal block adapter
SFP-TT-S13S13-LC	Dual fiber TX (output) cartridge at 1310 nm with LC/PC connector
SFP-R-LC	Single fiber RX (input) cartridge with LC/PC connector
SFP-T-S13-LC	Single fiber TX (output) cartridge at 1310 nm with LC/PC connector
SFP-RT-S13-LC	Dual fiber RX/TX (input/output) cartridge at 1310 nm with LC/PC connectorr

Other types of SFP Optical Plug-In Cartridges may be available for this product. Please visit www.grassvalley.com for more information.

Remote Control	GV Orbit, iControl, iControl Solo