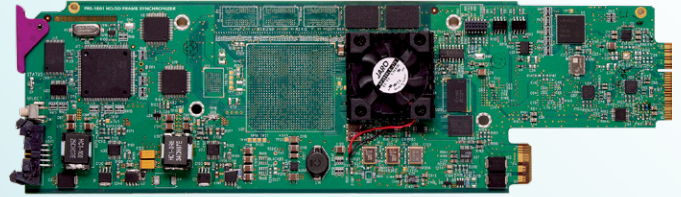**DATASHEET**

FRS-1801 HD/SD Frame Synchronizer

Space-saving, modular platform for advanced signal processing.

The FRS-1801 from Grass Valley® is a highly integrated module which offers frame synchronization, and video processing, including color correction and delay, for HD and SD signals in HD/SD hybrid plants. A processing delay of up to 1.3 seconds is available for Dolby E and AC3 encoders/decoders.

With the audio processing option, the card can process up to 16 channels (four groups) of embedded audio or eight channels (two groups) of discreet AES inputs/outputs. The

FRS-1801 can offer shuffling and downmixing, and provides four AES inputs and four AES outputs.

The FRS-1801 can also be associated with a Grass Valley audio processor modules, such as the UAP and DAP, for more advanced audio requirements, such as analog audio processing or Dolby E decoding.
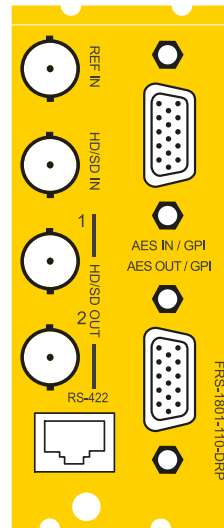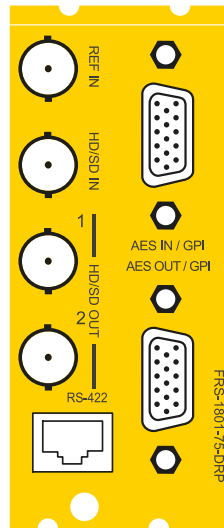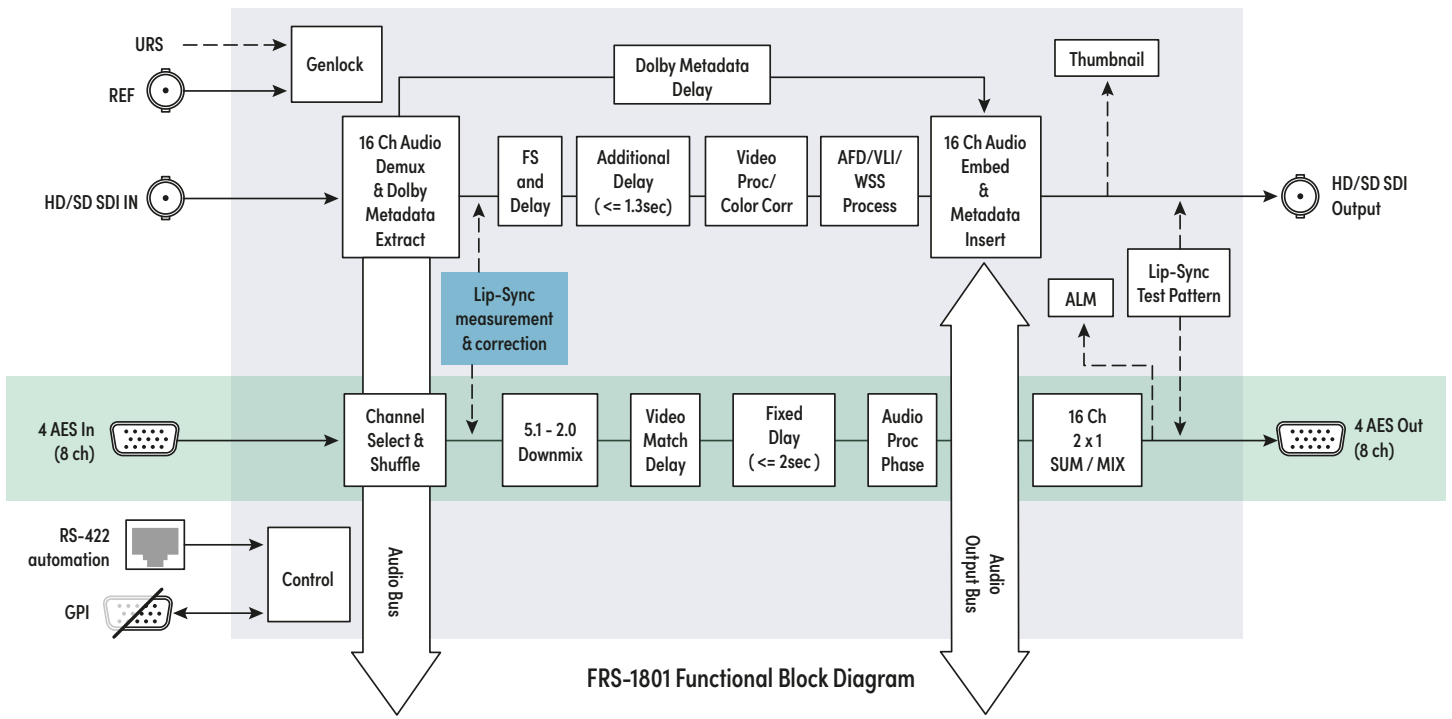
Advanced monitoring and control features include thumbnail and audio level meter (ALM) generation, as well as an optional waveform/

vectorscope over IP of the output signal, which allows the operator to control and see the changes made to the signal.

With the Out-of-Service lip-sync measurement and correction option, broadcasters can measure and correct lip-sync problems within their facilities.

Key Features

- HD/SD frame synchronizer, delay and line sync
- Video delay up to 1.3 seconds
- Video proc and color correction
- 16 channels of embedded audio processing

- Out-of-Service lip sync measurement and correction option
  - Able to detect the AV delay using the lip sync test pattern
  - Able to correct automatically or manually the AV delay that is offset by up to 1.3 seconds in HD
  - Supports both embedded audio and AES/EBU audio I/O
- AFD insert

- Downmixing from 5.1 to 2.0
- Flexible HD/SD reference input
- Perfect audio/video synchronization with adjustable fixed delay
- Processes and delays ancillary data such as CC, timecode and audio metadata (SMPTE ST 2020-A)
- Compatible with Grass Valley audio processing cards
- Thumbnail and audio level meter (ALM) generation

FRS-1801 Functional Block Diagram

Software Enabled Options

FRS-1801-OPT-AUD16   FRS-1801-OPT-LIPSYNC

FRS-1801-75-DRP   FRS-1801-110-DRP

Specifications

Video Input

Signal:

SD: SMPTE ST 259-C (270 Mb/s)

HD: SMPTE ST 292 (1.485, 1.485/1.001 Gb/s)

Supported formats:

SD: SMPTE ST 125: 480i59.94

SD: EBU: 576i50

HD: SMPTE ST 274: 1080i59.94, 1080i50

HD: SMPTE ST 296: 720p59.94, 720p50

Embedded audio: SMPTE ST 299, SMPTE ST 272

Cable length:

350m (1,148 ft.) Belden 1694A at 270 Mb/s

150m (492 ft.) Belden 1694A at 1.485 Gb/s

Return loss: >15 dB up to 1.5 GHz

Video Output

Signal:

SMPTE ST 259-C (270 Mb/s)

SMPTE ST 292 (1.485, 1.485/1.001 Gb/s)

Supported formats:

SD: 480i59.94, 576i50

HD: SMPTE ST 274: 1080i59.94, 1080i50

HD: SMPTE ST 296: 720p59.94, 720p50

Embedded audio: SMPTE-299M, SMPTE-272

Return loss: >15 dB up to 1.5 GHz

Jitter: HD/SD: <0.2 UI

Reference Input

Signal:

SMPTE ST 170/SMPTE ST 318/ITU 624-4/BUT 470-6 or blackburst

SMPTE ST 274/SMPTE ST 296 tri-level sync (black)

Return loss: >35 dB up to 5.75 MHz

Video Processing Performance

Signal path: 10 bits

Latency: 3 lines minimum

Additional video delay: 1.3s maximum (HD/SD)

Audio Digital Inputs(4)

Sampling freq.: 32 to 96 kHz

Quantization: 16 to 24

Inputs:

AES3

– Level: 0.2 to 7 Vp-p

– Impedance: 110Ω balanced

AES3-id

– Level: 0.2 to 7 Vp-p

– Impedance: 75Ω

– Return loss: 25 dB at 6 MHz

Outputs:

AES3

– Level: 4 Vp-p

– Impedance: 110Ω balanced

AES3-id

– Level: 1 Vp-p

– Impedance: 75Ω

– Return loss: 15 dB at 6 MHz

Audio Processing Performance

Quantization: 20-24 bits

Sampling: 48 kHz, synchronous

Number of channels: 16 (4 groups)

Freq. response: ±0.02 dB (20 Hz to 20 kHz)

SNR: 123 dB (A weighted)

THD+N: -138 dB (20 Hz to 20 kHz)

Miscellaneous

Signal Presence

Threshold: From -72 to -48 dBFS (6 dB steps)

Silence detection delay: From 0 to 255s

Fixed delay: 0 to 2.0s

Step: 1 ms (coarse), 1 sample (fine)

GPI (8)

Connector: 15-pin D-Sub

GPI in: Input selection: 1 or 2

Presets: 1, 2, 3, 4

GPI out: Provides status of selected input: 1 or 2

RS-232/422

Connector: RJ-69 (RJ45 10 contact)

ABUS Connector

As per ABUS standard, Grass Valley

Test Pattern Generator

Video: Color bars - 100% white bar with 75% color

Audio: Left channel pulsed 1 kHz / Right channel steady 1 kHz tone

Electrical

Power: 10W

Ordering

Densité® 2 frame	Densité 3 frame	Description
FRS-1801	FRS-1801-3RU	HD/SD frame synchronizer
FRS-1801-75-DRP	FRS-1801-75-DRP-3RU	Double rear connector panel, 75Ω
FRS-1801-110-DRP	FRS-1801-110-DRP-3RU	Double rear connector panel, 110Ω

Options	Description
FRS-1801-OPT-AUD16	16 channel on-board audio processing option
FRS-1801-OPT-LIPSYNC	Out-of-Service lip sync measurement and correction option
BOC-DE15-4BNC-1	75Ω digital audio breakout cable
Remote control	iControl, iControl Solo, RCP-200