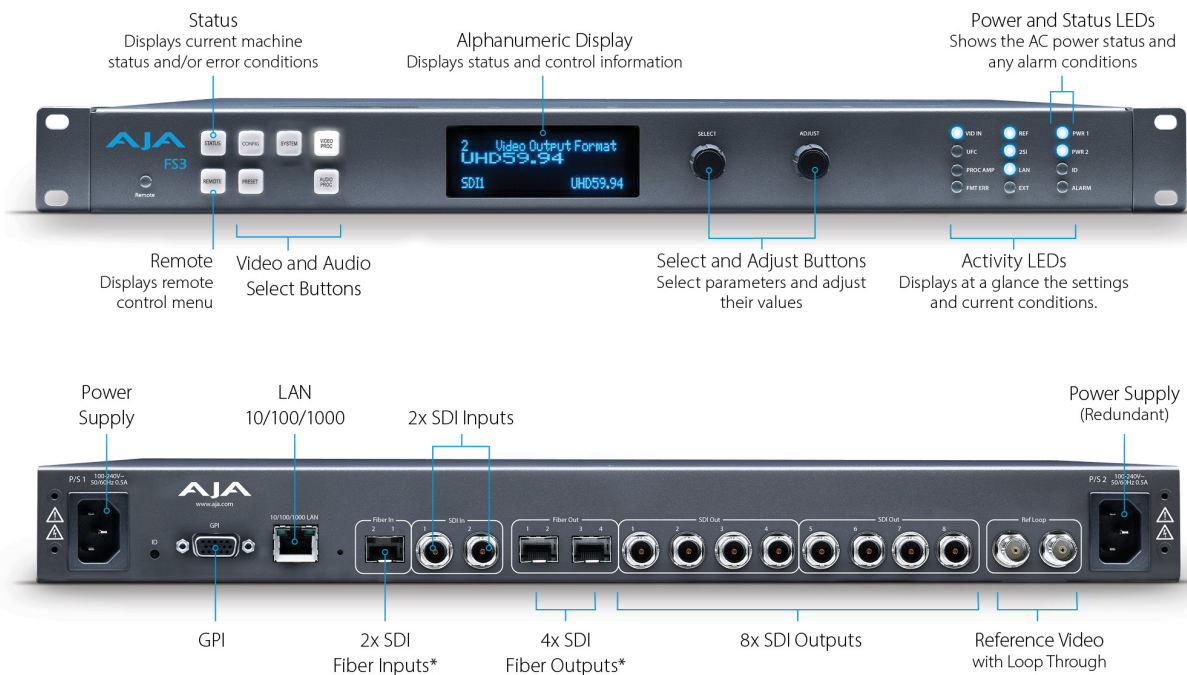# FS3

FS3 is a full-featured HD/SD frame-synchronizer, with HD/SD up/down/cross-conversion and realtime 4K up-conversion. FS3 syncs to analog, HD tri-level sync, SD Blackburst or to the incoming SDI signal. FS3 also provides integer frame rate conversion (3:2, 1:2, 2:1). Included are all the industry proven features provided in AJA frame synchronizers, such as full Video Proc Amp and RGB color correction, region of interest scaling, extensive audio controls and routing, web UI control, GPI triggers and more.

The growth of 5.1 and 7.1 audio has further increased the number of audio channels that must be managed in a production. FS3 accepts embedded SDI audio on all four SDI inputs (two coax and two optional fiber) and has an internal 64 x 64 audio matrix that allows routing of all embedded audio channels. Besides audio level, phase, and delay controls, FS3 also provides for 5.1 and 7.1 mixdown to stereo.

https://www.aja.com/products/fs3

$2,995 US MSRP

Status
Displays current machine status and/or error conditions

Alphanumeric Display
Displays status and control information

Power and Status LEDs
Shows the AC power status and any alarm conditions

Remote
Displays remote control menu

Video and Audio Select Buttons

Select and Adjust Buttons
Select parameters and adjust their values

Activity LEDs
Displays at a glance the settings and current conditions.

Power Supply

LAN 10/100/1000

2x SDI Inputs

Power Supply (Redundant)

GPI

2x SDI Fiber Inputs*

4x SDI Fiber Outputs*

8x SDI Outputs

Reference Video with Loop Through

*Optional

Video Input Digital

- Four 3G-SDI inputs, 2 BNC and up to 2 fiber (optional)
- 4x1 selector feeds video processor
- SD/HD/3G-SDI, SMPTE-259/292/424, 8 or 10-bits
  - 3G-SDI Level A, Level B-DL, or Level B-DS
  - Dual Link HD-SDI (2x 1.5G), SMPTE -372
  - Single Link SD/HD/3G-SDI
- Fiber SDI, SMPTE-297, 8 or 10-bits (optional)
  - Dual Channel LC connector modules
  - Single Channel LC connector modules
  - Single Channel SC connector modules
- Formats and frame rates
  - (2K) 2048 x 1080p 23.98, 24, 25, 29.97, 50, 59.94
  - (HD) 1920 x 1080p 23.98, 24, 25, 29.97, 50, 59.94
  - (HD) 1920 x 1080PsF 23.98, 24, 25, 29.97, 50, 59.94
  - (HD) 1920 x 1080i 50, 59.94
  - (HD) 1280 x 720p 50, 59.94
  - (SD) 625i 50
  - (SD) 525i 59.94
  - YCbCr, 4:2:2, 10-bit

Video Output Digital

- Twelve 3G-SDI outputs, 8x BNC and up to 4x fiber (optional)
- Video processor feeds all outputs
- SD/HD/3G-SDI, SMPTE-259/292/424, 8 or 10-bits
  - Quadrant (Square Division) or 2SI (Two Sample Interleave) 4K/UltraHD pixel mapping
  - 3G-SDI Level A, Level B-DL, or Level B-DS
  - Quad 3G-SDI for 4K/UltraHD p50/59.94 (3 copies on Quad SDI)
  - Dual 3G-SDI for 4K/UltraHD p23.98/24/25/29.97 (6 copies on Dual SDI)
  - Single Link SD/HD/3G-SDI (12 copies on single SDI)
- Fiber SDI, SMPTE-297, 8 or 10-bits (optional)
  - Dual Channel LC connector modules
  - Single Channel LC connector modules
  - Single Channel SC connector modules
- Formats and frame rates:
  - (4K) 4096 x 2160p 23.98, 24, 25, 29.97, 50, 59.94
  - (UltraHD) 3840 x 2160p 23.98, 24, 25, 29.97, 50, 59.94
  - (2K) 2048 x 1080p 23.98, 24, 25, 29.97, 50, 59.94
  - (HD) 1920 x 1080p 23.98, 24, 25, 29.97, 50, 59.94
  - (HD) 1920 x 1080PsF 23.98, 24, 25, 29.97, 50, 59.94
  - (HD) 1920 x 1080i 50, 59.94
  - (HD) 1280 x 720p 50, 59.94
  - (SD) 625i 50
  - (SD) 525i 59.94
  - YCbCr, 4:2:2, 10-bit

Audio Input Digital

- 64-Channels via four 16-Channel audio disembedders (1 disembedder per SDI input)
- SD/HD/3G-SDI, SMPTE-272/299
- 20-bit SD, 24-bit HD/3G, 48 kHz sample rate
- Drop/repeat sample rate conversion to match output reference

Audio Output Digital

- 64-Channels via four 16-Channel audio embedders
- SD/HD/3G-SDI, SMPTE-272/299
- 20-bit SD, 24-bit HD/3G, 48 kHz sample rate
- 64 x 64 mono audio matrix

Video Processing

- Proc amp controls

- Color corrector
- Legalizer
- Frame rate conversion (3:2, 1:2, 2:1)
- Delay 0-6 frames with H and V controls
- Closed Captioning conversion (CEA-608/CEA-708)
- AFD input detection, down-convert control, and output pass through or overwrite
- Freeze (manual or on input signal loss) to black or last good frame
- Matte generator for background fill
- Video test generator
- Nominal video delay
  - 4K/UltraHD, 3 frames (LFR), 6 frames (HFR)
  - HD/SD, 2 frames (LFR), 4 frames (HFR)

Format Conversion

- Convert any supported input HD/SD format to any supported 4K/UltraHD/HD/SD output format, as long as the input and output frame rates are of the same frame rate family. These three families are:
  - 59.94, 29.97, 23.98
  - 50, 25
  - 24

Scaling

- Zoom in and out
- Reposition
- Region of Interest

Up-Conversion

- SD/HD/2K to UltraHD/4K
- SD to HD/2K
- Hardware 10-bit
- Zoom 14:9: results in a 4:3 image zoomed slightly to fill a 14:9 image with black side bars
- Zoom Letterbox: results in image zoomed to fill fullscreen
- Zoom Wide: results in a combination of zoom and horizontal stretch to fill a 16:9 screen; this setting will introduce a small aspect ratio change

Down-Conversion

- HD/2K to SD
- Hardware 10-bit
- Anamorphic: fullscreen
- Letterbox: image is reduced with black top and bottom added to image area with the aspect ratio preserved
- Crop: image is cropped to fit new screen size

Aspect Ration Conversion

- Letterbox: This transforms SD anamorphic material to a letterboxed image
- H Crop: Will produce a horizontally stretched effect on the image; transforms anamorphic SD to full frame
- SD Pillarbox: Will produce an image in the center of the screen with black borders on the left and right sides and an anamorphized image in the center
- V Crop: Will transform SD letterbox material to an anamorphic image

Audio Processing

- 64 x 64 mono audio matrix, route 1 to 1, 1 to many
- Independent controls for each channel
  - Gain +18 to -18 dB in 0.5 dB steps
  - Delay -16ms to 256 ms in 20.8 us steps
  - Phase invert
- 5.1 or 7.1 to stereo mixdown with gain adjust

- Audio test generator

Timecode

- SDI RP188 via SDI BNC

Reference Input

- Blackburst or tri-level sync
- Looping, nonterminating

Network Interface

- 10/100/1000 Ethernet (RJ-45)
- Embedded web server for remote control

Machine Control

- GPI in/out, 15-pin D-connector
  - Pinout is as follows :

1	GND	9	GPI OUT 2
2	GPI IN 1	10	GPI I/O GND 3
3	GPI IN 2	11	GPI I/O GND 4
4	GPI IN 3	12	GPI OUT 3
5	GPI I/O GND 1	13	GPI OUT 4
6	GPI I/O GND 2	14	NC
7	GPI IN 4	15	GND
8	GPI OUT 1		

- RS-422, Sony 9-pin protocol (reserved for future use)

Size (w x d x h)

- 17.5" x 16.0" x 1.75" 1RU (444.5 x 406.4 x 44.45 mm)

Weight

- 7.9 lb (3.6 kg)

Power

- 100-240 VAC 50/60 Hz (Dual, redundant power supplies), 55W typical; 80W max.

Environment

- Safe Operating Temperature: 0 to 40 C (32 to 104 F)
- Safe Storage Temperature (Power OFF): -40 to 60 C (-40 to 140 F)
- Operating Relative Humidity: 10-90% noncondensing
- Operating Altitude: <3,000 meters (<10,000 feet)