

3G/HD/SD Multi Purpose Signal Processor

FA-9500 "THE Processor"



All In One

3G-SDI

HD-SDI

HD Analog Component

SD-SDI

SD Analog Component

Y/C

Analog Composite

Optical

Embedded Audio

Dolby E / Dolby Digital

AES/EBU

Analog Audio

Frame Synchronizer

Time Base Corrector

Up Converter

Down Converter

Cross Converter

Aspect Ratio Converter

A/D Converter

D/A Converter

Audio MUX

Audio DEMUX

Video Delay

Audio Delay

Proc Amp

Color Corrector

Logo Generator

Frame Rate Converter

Auto Video Optimizer

FA-9500, the Utmost in Frame Synchronizers

The FA-9500 is a multipurpose signal processor loaded with the functions you need for video production.

It supports 3G-SDI, HD/SD-SDI, and analog composite I/O, in addition to its functionality as a frame synchronizer, provides up/down/cross/aspect converters, second converter (down/cross/aspect conversion), color corrector, and automatic video optimizer (AVO) as standard features. It can convert many types of video and audio signals. The numerous additional functions include, as options, optical I/O, analog component I/O, frame rate converter, logo generator, Dolby E encoder and Dolby E decoder. By combining these varied options, a single unit can provide the optimal functionality for all video production scenes, including line, relay, reporting, production, editing and delivery. As long as you have the FA-9500, you won't need any other peripheral video equipment.



3G-SDI/HD-SDI/SD-SDI/Analog Composite I/O

For video input, 3 inputs come standard (2 3G/HD/SD-SDI inputs and 1 analog composite input). When you add options, you can select 1 channel from up to 5 inputs. For SDI input, 2 channels are synchronously coupled independently, so during switch over there is no shock in either video or audio.

In addition, each SDI input has an error detection function. When the signal is cut off or an error detected, this functions as a clean switch and effects a seamless changeover to the other channel. (optional)

Selected input signal go through a converter circuit of 2 internal channels and are output as SDI and analog composite. Each channel has 2 distributed outputs. SDI and analog composite both additionally are provided with an I/O bypass function in case power is cut or there is an emergency.

Powerful Frame Synchronizer Performance

FOR-A's frame synchronizers have always exhibited superior performance when processing video with poor quality signals. Synchronizer modes that can be selected are Frame, Line, Input and AVDL mode. AVDL adjust range is 5H in HD, 1H in SD.

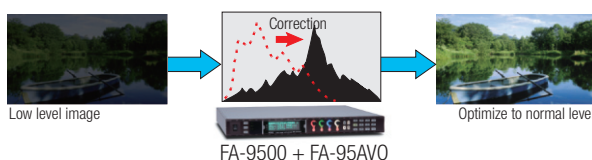
Moreover, in every mode ancillary data can be passed through together with both H and V.*

*If input/output formats differ, packets that can be passed through are subject to limitations.

Automatic Video Optimizer (AVO)

This lets you monitor video in real time and automatically correct it to normal levels. Ideal for correcting over/under-exposed video, video with exposure better suited to the background than the subject, and so on.

- Real time correction: monitors the video's white level, black level and gamma curve and automatically corrects them to normal levels (processing time: minimum of 1 frame)
- Dynamic range correction: recognizes dark and bright areas in video, and makes ideal corrections only in those places needing it, so highly viewable video with a wide dynamic range is output
- Correction range adjustment function: allows you to set the range for level adjustment (e.g. set level subject to correction of dark areas)
- Mask function: allows you to set unnecessary area for monitoring within the video (e.g. designate places where captions are displayed)



3G Signal Support

In addition to the ordinary processing 1.5 Gbps HD signal, the FA-9500 also supports 3Gbps signal processing. Aside from 3G-SDI signal I/O, the FA-9500 offers mutual conversion between ordinary HD and SD signals.

Digital/Analog Audio I/O

Like video signals, audio signals have digital and analog I/O. Provided are 16 synchronous/asynchronous channels* of embedded audio, 8 channels of AES/EBU, and 4 channels of analog audio, supporting audio signals of a total of 28 input channels and 28 output channels. Many types of signal processing are possible, including embedding and de-embedding with video signals and A/D, D/A conversion, flexibly supporting even multi-channel audio content. Individual sampling rate converters are provided for each audio channel. Signal processing without any phase gap between channels is possible for such processes as delay adjustment, level adjustment, down-mixing and remapping.

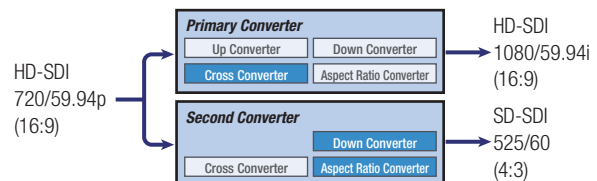
*During HD input/output only. In SD, only synchronous audio is supported, and at most there are 16 input channels and 12 output channels.

Up/Down/Cross/Aspect Converter

In addition to A/D and D/A conversion, up/down/cross/aspect converter is standard equipment on the FA-9500. Besides mutual conversion between HD and SD, the FA-9500 offers mutual conversion between 1080i format and 720p format (IP conversion) and video expand and shrink.

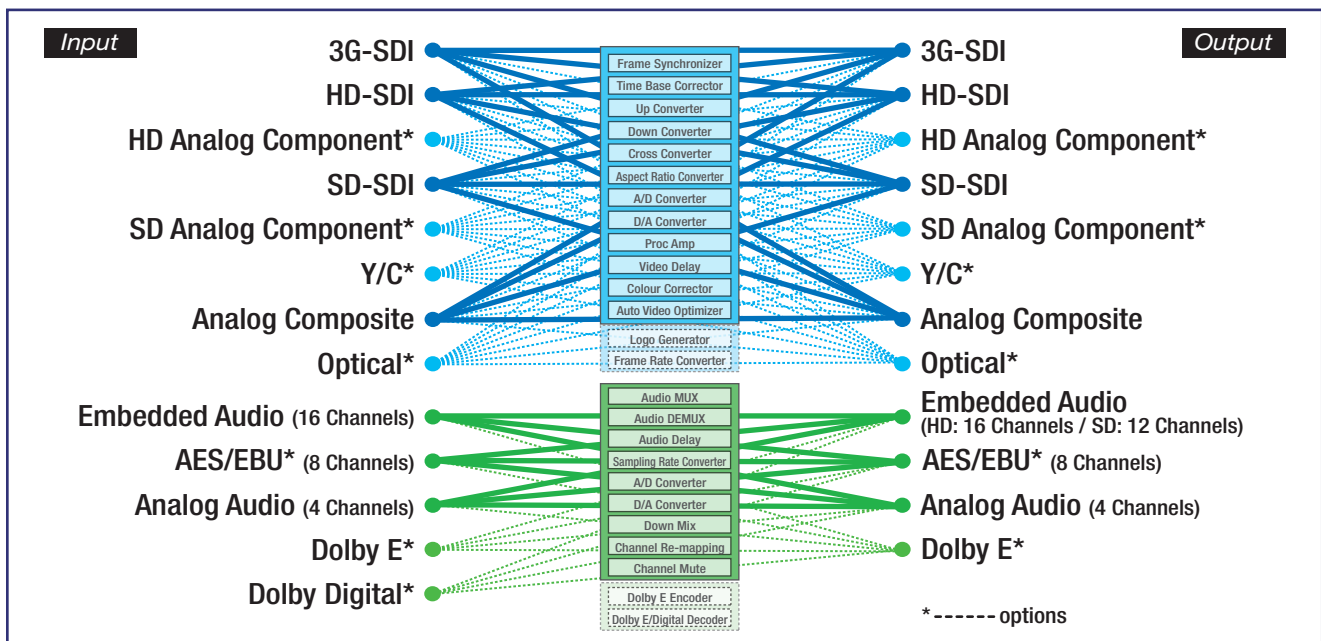
Second Converter

In addition to the ordinary up/down/cross/aspect conversion process, 1 more converter channel is provided for down/cross/aspect conversion. The second converter does not have an up-convert function, but even if HD/SD simul output is needed, this unit is all it takes to deal with that need flexibly.



Other Features (Standard Functions)

- Video delay
- 2D/3D comb filter for Y/C separator (composite)
- Web browser-based monitoring and control possible
- SNMP monitoring/control function

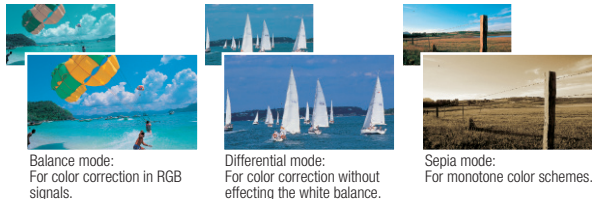


Color Corrector

A color correction function is also standard. You can not only make color corrections with 3 color correction modes (balance, differential and sepia) but also reproduce the original colors in the selected color space using gamma adjustment or various level adjustment functions.

- Three types of color correction modes (balance, differential and sepia)
- Gamma adjustment function with high, mid and low tone
- White level and black level adjustment function
- Various clip functions (Y white, C white, Y black)

Color correction mode



Varied Options

The FA-9500 offers a wide range of options that let you expand with the functions you need without waste. There are all types of functions you can add, starting with video I/O boards.

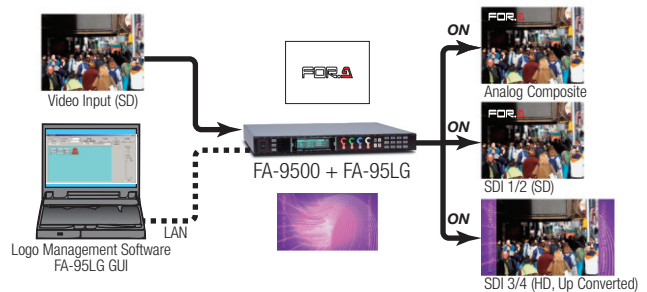
Frame Rate Converter

Besides up/down/cross/aspect conversion, a frame rate converter function can be added. This achieves high-grade frame rate conversion with the conversion know-how FOR-A has developed with our FRC Series of specialty devices.

*There is no motion compensation function.

Logo Generator

This lets you impose logo images, including corporate logos and net logos. Data is maintained even when the power is off. This can be used for branding purposes, or used as a side panel added to a 4:3 video in place of a logo.



Dolby E encoder/decoder

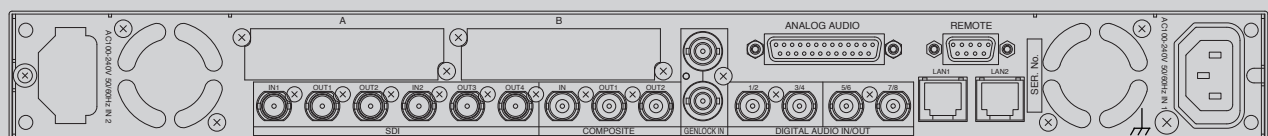
An optional Dolby E encoder/decoder can be equipped as a function for adding audio. This enables accurate monitoring and signal correction even of surround signals with multiple channels.

Other Options

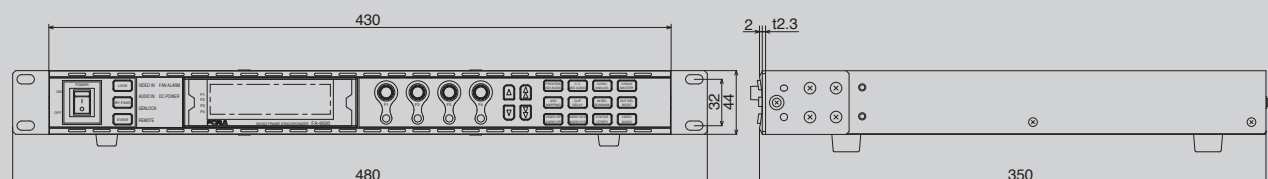
- Optical I/O (OE/EO)
- Analog component I/O
- Change over function
- Digital audio expansion cable
- Redundant power supply unit

Many other functions are planned to be added.

Rear Panel



External Dimensions



Specifications

Standard	1080/60p, 1080/59.94p, 1080/50p (Level-A), 1080/59.94i, 1080/50i, 1080/24PsF, 1080/23.98PsF, 720/59.94p, 720/50p, 525/60 (NTSC), 625/50 (PAL)	Proc Amp	Video level: 0.0% to 200.0% Chroma level: 0.0% to 200.0% Black level: -20.0% to 100.0% HUE: -179.8° to +180°
Additional Standard (option)	1080/60i, 1080/30p, 1080/30PsF, 1080/29.97p, 1080/29.97PsF, 1080/25p, 1080/25PsF, 1080/24p, 1080/23.98p, 720/60p	Video Clip	YPbPr mode GBR mode Composite mode
Video Input	3G-SDI: 3 Gbps, HD-SDI: 1.5 Gbps or SD-SDI: 270 Mbps, 75Ω, 2 inputs, BNC Analog Composite: 1.0 Vp-p, 75Ω, 1 input, BNC	Color Correction	Balanced mode Differential mode Sepia mode
Video Input (option)	HD Analog Component SD Analog Component Optical (OE): Convert from optical signal to above video signal	Audio Input	
Video Output	3G-SDI: 3 Gbps or HD-SDI: 1.5 Gbps or SD-SDI: 270Mbps, 75Ω, 4 outputs, BNC (2 x 2 outputs) Analog Composite: 1.0Vp-p, 75Ω, 2 outputs, BNC	Embedded Audio	3G/HD: 16 channels (Group 1 to 4), 48 kHz, 16-bit to 24-bit, synchronous/asynchronous SD: 16 channels (Group 1 to 4), 48 kHz, 16-bit to 24-bit, synchronous only
Video Output (option)	HD Analog Component SD Analog Component Optical (EO): Convert from video signal to optical signal, 1 port	AES/EBU	Unbalanced, 1.0 Vp-p, 75Ω, 4 inputs, BNC *Selectable of AES/EBU output Maximum 4 pairs of stereo, 32/44.1/48 kHz, 16-bit to 24-bit
Processing	4:2:2 Digital Component	Analog Audio	Balanced or unbalanced, 4 inputs (2 channels stereo), 1 port, 25-pin D-sub (female) *Share of analog audio output, 600Ω or High impedance, 48 kHz, 24-bit
Quantization	3G/HD/SD-SDI: 10-bit Analog Composite: 12-bit	Audio Output	
Sampling Frequency	3G-SDI: Y: 148.5 MHz, C: 74.25 MHz HD-SDI: Y: 74 MHz, C: 37 MHz SD-SDI: Y: 13.5 MHz, C: 6.75 MHz	Embedded Audio	3G/HD: 16 channels (Group 1 to 4), 48 kHz, 16/20/24-bit, synchronous/asynchronous SD: 12 channels (Group 1 to 3), 48 kHz, 16/20/24-bit, synchronous only
Frequency Response		AES/EBU	Unbalanced, 1.0 Vp-p, 75Ω, 4 outputs, BNC *Selectable of AES/EBU input Maximum 4 pairs of stereo, 48 kHz, 16-bit to 24-bit
NTSC	100 kHz to 4.2 MHz: -0.5 dB to +0.5 dB 4.2 MHz to 5.0 MHz: -1.0 dB to +1.0 dB, roll off above 5.0 MHz (NTSC, composite)	Analog Audio	Balanced or unbalanced, 4 outputs (2 channels stereo), 1 port, 25-pin D-sub (female) *Share of analog audio input, less than 100Ω, 48 kHz, 24-bit
PAL	100 kHz to 4.2 MHz: -0.5 dB to +0.5 dB 4.2 MHz to 5.5 MHz: -1.0 dB to +1.0 dB, roll off above 5.5 MHz (PAL, composite)	Audio Delay	2 ms - 1,000 ms (Each channels adjustable in 1 ms steps)
DG/DP	1% / 1° (composite)	Audio Process Function	Sampling rate converter (SRC) Gain control Down mix Channel re-mapping Channel mute (Each functions set in each channels)
S/N Ratio	60 dB (without quantization noise, composite)	Interfaces	
K-factor (2T pulse)	1% (composite)	Ethernet	10 Base-T / 100 Base-TX / 1000 Base-T, 2 ports, RJ-45
Comb Filter	2D or 3D comb filter (selectable, composite)	Remote (GPI)	1 port, 9-pin D-sub (male) (7 terminals), TTL negative logic level signal or Make contact
Internal Process	Selectable one source from 3 inputs (standard) or 5 inputs (maximum input) (auto selection or manual setting)	Temperature	0°C to 40°C
Reference Input	BB: NTSC: 0.429 Vp-p / PAL: 0.45 Vp-p; or Tri-level Sync: 0.6 Vp-p, 75Ω or loopthrough, 1 input, BNC	Humidity	30% to 90% (no condensation)
Synchronizer mode	Frame Sync mode Line Sync mode AVDL mode Input Sync mode (minimum delay)	Power	100 VAC - 240 VAC ±10%, 50/60 Hz
System Phase Control		Consumption	FA-9500: 53 W (at 100 VAC to 120 VAC), 56 W (at 220 VAC to 240 VAC) FA-9500 + FA-95PS: 65 W (at 100 VAC to 120 VAC), 62 W (at 220 VAC to 240 VAC)
Frame Sync mode	H phase: -1/2 H to +1/2 H V phase: -1/2 frame to +1/2 frame Maximum delay: 1 frame + 1H, Minimum delay: +1H	Dimensions	430 (W) x 350 (D) x 44 (H) mm
Line Sync mode	H phase: -1/2 H to +1/2 H V phase: -1/2 frame to +1/2 frame Maximum delay: 1H +1/2 H, Minimum delay: +1/2 H	Weight	Approx. 3.0 kg (without option)
AVDL mode	H phase: -1/2 H to +1/2 H V phase: -1/2 frame to +1/2 frame Maximum delay: 5 H +1/2 H, Minimum delay: +1/2 H (HD) Maximum delay: 1 H +1/2 H, Minimum delay: +1/2 H (SD)	Term Assurance of Parts	Power unit: within 5 years Cooling fan: within 6 years
Input Sync mode	H phase: +400 clk to 1 frame Maximum delay: 1 frame +400 clk, Minimum delay: +400 clk	Accessories	Operation manual, AC cord, rack mount brackets
Video Delay	Maximum 8 frames	Options	FA-95PS: Redundant power supply unit FA-95DACBL: Digital audio expansion connector cable
Video Process Functions	Up/Down/Cross converter Aspect ratio converter Proc Amp Color Corrector Automatic video optimizer (AVO) Second converter (Down/Cross/Aspect ratio)	Future Planned Features	Dolby E / Dolby Digital decoder Dolby E encoder Remote control unit Change over function HD/SD analog component input/output card Optical input/output card FRC (Frame Rate Converter) (includes additional standard) Logo generator

Dolby is a registered trademark of Dolby Laboratories.

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