

3G/HD/SD Dual Channel Multi Purpose Signal Processor

FA-9520 "THE Processor"

FOR.A[®]
INNOVATIONS IN VIDEO
and AUDIO TECHNOLOGY

3G/HD/SD DUAL CHANNEL
MULTI PURPOSE SIGNAL PROCESSOR
FA-9520

THE PROCESSOR



FA-9520, the Dual Channel Processor

The FA-9520 is a dual channel multipurpose signal processor loaded perfectly for a variety of applications including: master control, mobile production, post production services, live production and more.

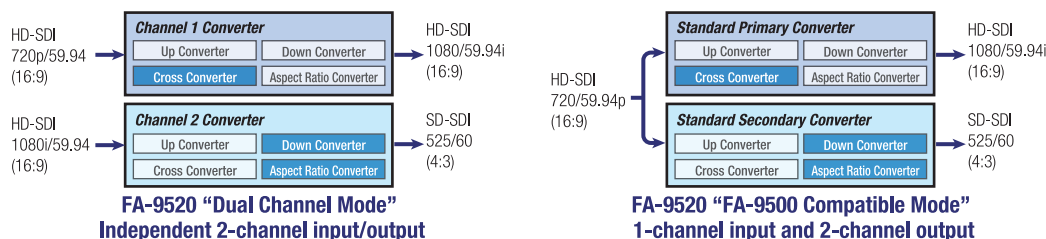
We have developed the FA-9520 to provide a dual channel version of our industry leading FA-9500 processor.

The FA-9250 supports 3G-SDI, HD/SD-SDI, and analog composite I/O. In addition to its functionality as a frame synchronizer, it also provides: up/down/cross/aspect converter, full color corrector and automatic video optimizer (AVO) as standard features. Numerous optional features include: analog component I/O, Dolby E encoder and Dolby E decoder. The wealth of features in the FA-9520 can replace many single purpose units. This is a complete toolbox for almost any video need, all with FOR-A's legendary signal quality and reliability.



Dual Channel Mode

The FA-9520 is provided with two modes, "Dual Channel Mode" and "FA-9500 Compatible Mode." The FA-9500 Compatible Mode can be used for HD/SD simultaneous operation using a second converter.



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

3 video inputs are standard (2 3G/HD/SD-SDI inputs and 1 analog composite input). Adding the optional analog component input provides a 4th input. Any of the inputs can be independently assigned to the two internal independent frame synchronizers.

In addition, each SDI input has an error detection function. When the signal is missing or an error is detected, this optional feature provides a clean switch for a seamless changeover to the other channel.

Both channels are equipped with emergency bypass. In case of a power outage, the original signal will be passed through to the appropriate output in its original format.

Digital/Analog Audio I/O

The FA-9520 supports a variety of audio signals, including: 16 synchronous/asynchronous channels*1 of embedded audio, 8 channels of AES/EBU, and 4 channels of analog audio. This provides a total of 28 input and 28 output audio channels. Many types of signal processing are incorporated such as, embedding/de-embedding with video and A/D, D/A conversion. The unit provides a lot of flexibility for multi-channel audio content. Individual sampling rate converters are provided for each audio channel. Signal processing without any phase difference between channels is possible for delay adjustment, level adjustment, down-mixing and remapping.

*1: 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, an up/down/cross/aspect converter is standard equipment on the FA-9520. In addition to bi-directional conversion between HD and SD, the FA-9520 also offers bi-directional conversion between 1080i format and 720p format (IP conversion). The aspect ratio conversion allows for specific control of horizontal and vertical sizing.

Powerful Frame Synchronizer Performance

FOR-A frame synchronizers are renowned for superior performance when processing video with poor quality signals and the FA-9520 is no exception. Synchronizer modes can be selected from, Frame, Line, Input*2 and AVDL mode. AVDL adjustment range is 5H in HD, 1H in SD.

In all modes, ancillary data can be passed through together with both H and V.³³

*2: The Input mode is supported only in "FA-9500 Compatible Mode"

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

Color Corrector

FOR-A's industry leading real-time color correction is a standard feature. This function has proven extremely popular for correcting on set monitors, correcting white balance problems and matching cameras. The unit provides intuitive control with 4 rotary encoders that light: red, green, blue and white to indicate the controlled function.

Main Functions

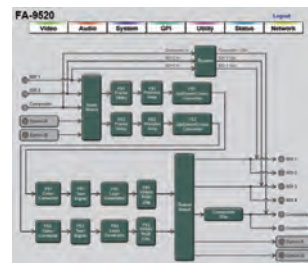
- Three types of color correction modes (balance, differential and sepia)
- Gamma adjustment function with high, mid and low tone
- White level and black level adjustment function
- Various clip functions (Y white, C white, Y black, etc.)

Closed Caption Conversion (Subtitles) between HD and SD Videos

You can convert the closed captioning (subtitles) during up/down conversion (CEA-608 \rightleftharpoons CEA-708).

Web GUI for Intuitive Operations and Remote Control

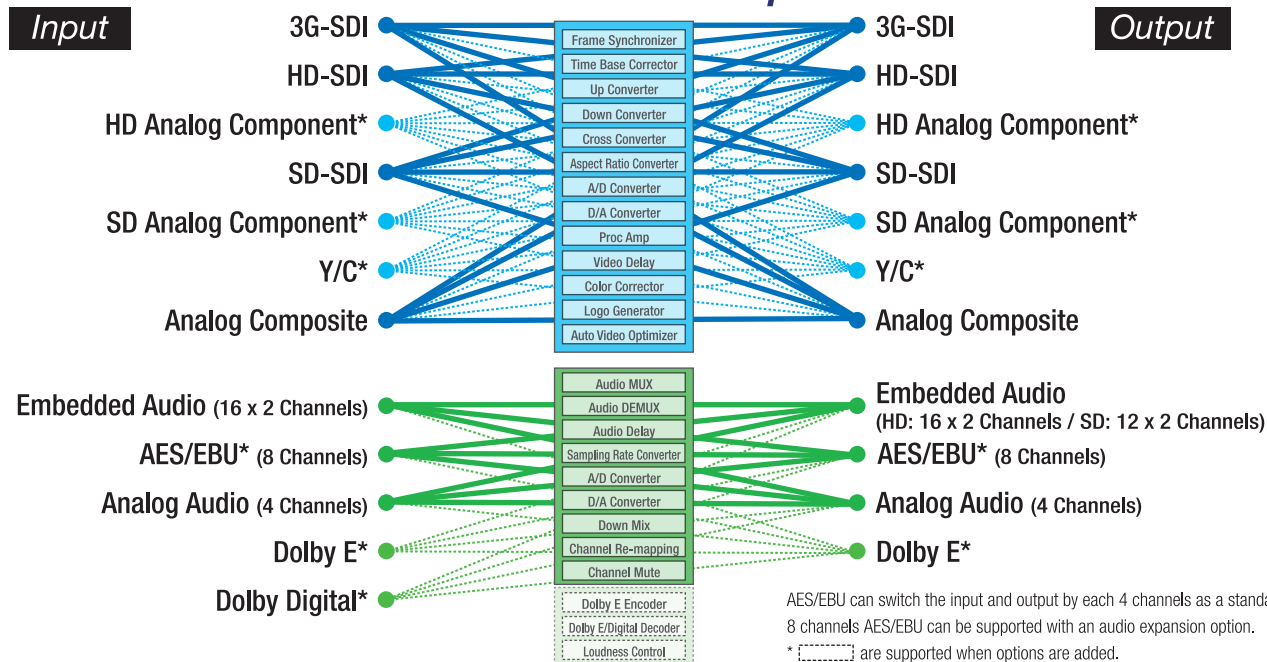
The Web server is installed in the main unit to enable operations and monitoring via Web browser from an external PC. The block diagram-based, easy-to-understand GUI allows you to intuitively control video/audio routing and adjustment along with the signal flow.



Other Features (Standard Functions)

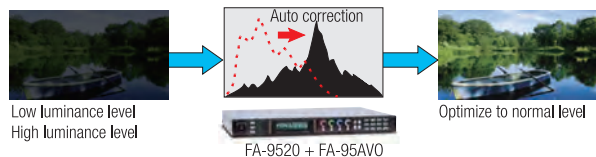
- Video/audio delay
- 2D/3D comb filter for Y/C separator (composite)
- Active Format Description (AFD)
- SNMP monitoring/control function (partially)

FA-9520 Total Concept



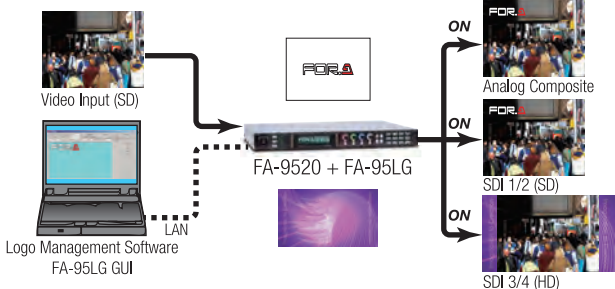
Automatic Video Optimizer (AVO)

The AVO is a unique feature that can monitor and adjust luminance levels in real time. Parameters are user set to provide correction for changing lighting conditions. The AVO function can only be assigned to a single channel.



Logo Generator

This allows you to key logo images over input video. Data is maintained even when the unit is powered off. The logo function can be used for branding purposes, or used as a side panel added to a 4:3 video in place of a logo. One Logo Generator each is provided for each of dual channels.

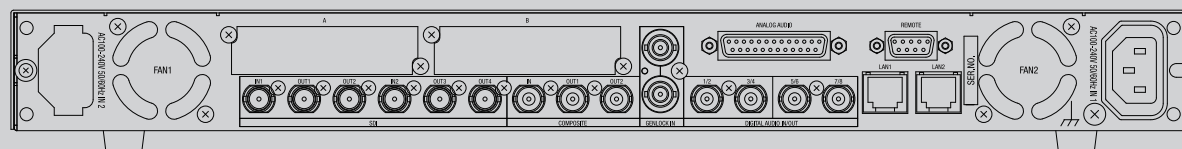


Options

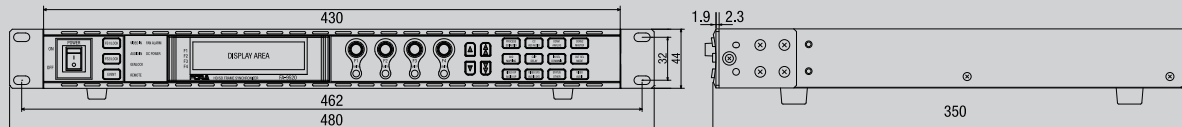
The FA-9520's wide range of options to let you add the specific functions you require.

- Dolby E encoder/decoder
- Loudness control
- Analog component I/O
- Change over function (supported only in FA-9500 Compatible Mode)
- Digital audio expansion cable
- Redundant power supply unit

Rear Panel



External Dimensions



Specifications

Video Formats	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)
Video Input	3G-SDI: 3 Gbps, HD-SDI: 1.5 Gbps or SD-SDI: 270 Mbps, 75Ω × 2 BNC Analog Composite: 1.0 Vp-p, 75Ω BNC × 1
Video Input (option)	HD Analog Component SD Analog Component
Video Output	3G-SDI: 3 Gbps or HD-SDI: 1.5 Gbps or SD-SDI: 270 Mbps, 75Ω BNC × 4 (2 × 2 outputs) Analog Composite: 1.0 Vp-p, 75Ω BNC × 2
Video Output (option)	HD Analog Component SD Analog Component
Video I/O Process	3 inputs (standard) or 5 inputs (maximum input) → 1 processing → 2 × 2 outputs
Video Processing	4:2:2 Digital Component
Quantization	3G/HD/SD-SDI: 10-bit Analog Composite: 12-bit
Sampling Frequency	3G-SDI (option): 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
Frequency Response	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)
	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)
DG/DP	1% / 1° (composite)
S/N Ratio	60 dB or higher (without quantization noise, composite)
K-factor (2T pulse)	1% (composite)
Comb Filter	2D or 3D comb filter (selectable, composite)
Genlock Input	BB: NTSC 0.429 Vp-p/PAL 0.45 V p-p or Tri-level Sync: 0.6 Vp-p, 75Ω BNC × 1, loop-through (Terminate with 75Ω terminator, if unused.)
Synchronizer mode	Frame Sync mode, Line Sync mode, AVDL mode, Input Sync mode ^{*2}
System Phase Control	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 + 1 H, Minimum delay: +1 H
	Line Sync mode ^{*1}
AVDL mode ^{*1}	H phase: -1/2 H to +1/2 H V phase: -1/2 frame to +1/2 frame Maximum delay: 1 H + 1/2 H, Minimum delay: 1 H+2 H
	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)
Input Sync mode ^{*1*2}	H phase: -1/2 H to +1/2 H V phase: -1/2 frame to +1/2 frame Maximum delay: 1 frame, Minimum delay: +520 clk
	Maximum 8 frames (Frame Sync or Input Sync)
	Maximum 8 frames (Frame Sync or Input Sync)
Video Delay	Up/Down/Cross converter, Aspect ratio converter, Proc Amp, Color corrector, Automatic Video Optimizer, Logo Generator
	Video level: 0.0% to 200.0%
	Chroma level: 0.0% to 200.0%
	Black level: -20.0% to 100.0%
Proc Amp	HUE: -179.8° to +180°

Video Clip	YPbPr mode, RGB mode, Composite mode
Color Correction	Balance mode, Differential mode, Sepia mode
Audio Input	Embedded Audio
	3G/HD: 16 channels (Group 1 to 4), 48 kHz, 16 to 24-bit, synchronous/asynchronous SD: 16 channels (Group 1 to 4), 48 kHz, 16 to 24-bit, synchronous only
AES/EBU	Unbalanced, 1.0 Vp-p, 75 Ω BNC × 4 for AES/EBU input/output, Maximum 4 pairs of stereo channels, 48 kHz, 16 to 24-bit
Analog Audio	Balanced or unbalanced, 4 inputs (2 stereo channels), 25-pin D-sub (female) × 1 for analog audio input/output 600 Ω or High impedance, 48 kHz, 24-bit
Audio Output	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
AES/EBU	Unbalanced, 1.0 Vp-p, 75 Ω BNC × 4 for AES/EBU input/output, Maximum 4 pairs of stereo channels, 48 kHz, 16/20/24-bit
Analog Audio	Balanced or unbalanced, 4 outputs (2 stereo channels) 25-pin D-sub (female) × 1 for analog audio input/output less than 100 Ω, 48 kHz, 24-bit
Audio Delay	4 ms to 1,000 ms (adjustable in 1 ms steps)
Audio Processing (Set per channel)	Sampling rate converter (SRC), Gain control, Down mix, Channel re-mapping, Channel mute
Interfaces	Ethernet: 10BASE-T/100BASE-TX/1000BASE-T, RJ-45 × 2
	Remote (GPI): 9-pin D-sub (male) (7 terminals) × 1 TTL negative logic level signal or Make contact
Temperature/Humidity	0°C to 40°C / 30% to 90% (no condensation)
Power	100 V AC to 240 V AC ±10%, 50/60 Hz
Consumption	FA-9520: 60 VA (59W) (at 100 V AC to 120 V AC), 62 VA (56W) (at 220 V AC to 240 V AC)
	FA-9520 + FA-95PS: 60 VA (59W) (at 100 V AC to 120 V AC), 70 VA (59W) (at 220 V AC to 240 V AC)
Dimensions/Weight	430 (W) × 350 (D) × 44 (H) mm / 3.0 kg (without options)
Consumable parts	Time for replacement
	Power supply unit: Approx. 5 years; Cooling fan: Approx. 6 years
Accessories	Operation manual, AC cord, rack mount brackets
Options	FA-95PS: Redundant power supply unit
	FA-95DACBL: Digital audio expansion connector cable
	FA-95D-D: Dolby E / Dolby Digital decoder
	FA-95DE-E: Dolby E encoder
	FA-95RU: Remote control unit
	FA-95CO: Changeover function ^{*2}
	FA-95AIO: HD/SD analog component, Y/C input/output
	FA-95ALA: Loudness control

^{*1} The phase control range indicates values at the time of the SDI input. For values at the time of analog (composite, component, Y/C) input, please see the operation manual.

^{*2} This function operates in FA-9500 Compatible Mode only.

Dolby is a registered trademark of Dolby Laboratories.



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