

3G/HD/SD DUAL CHANNEL
MULTI PURPOSE SIGNAL PROCESSOR

FA-9520



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.

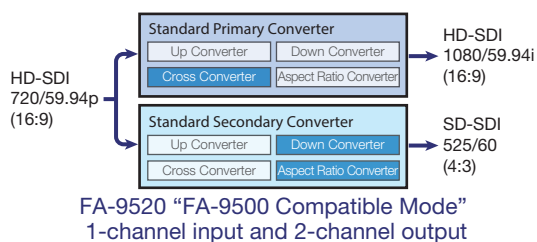
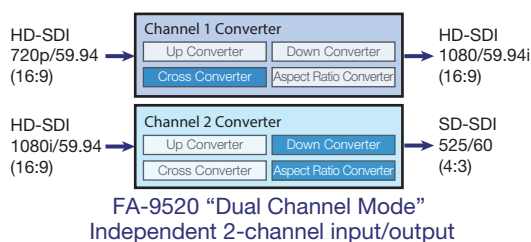
We have developed the FA-9520 to provide a dual channel version of our industry leading FA-9500 processor.

The FA-9520 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. 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 2 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 (two 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 2 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*3.

*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.).

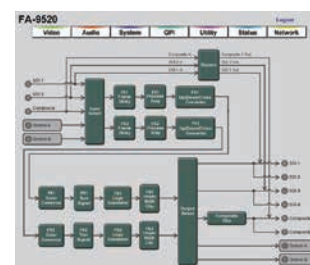
Closed Caption Conversion (Subtitles) between HD and SD Videos

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

Web GUI for Intuitive Operations and Remote Control

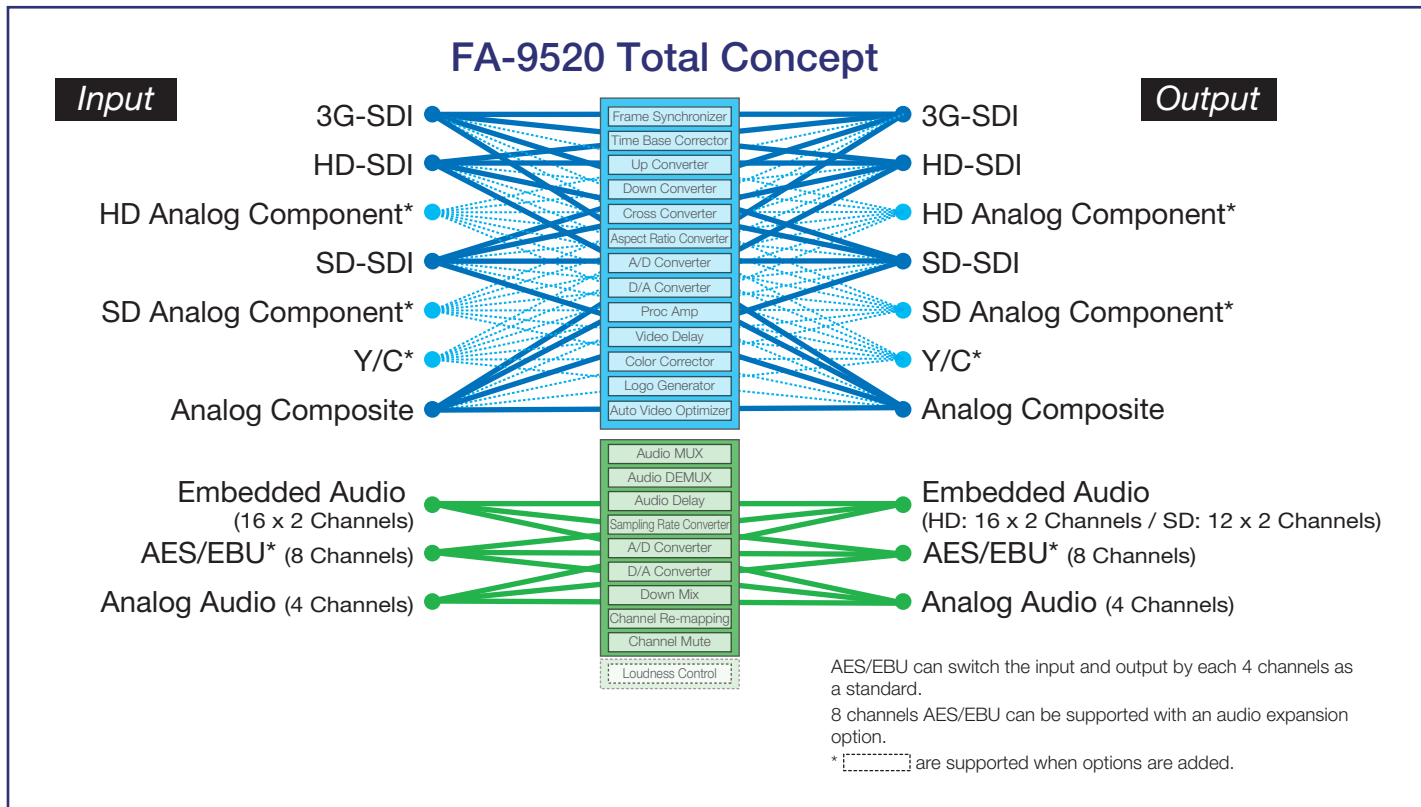
The Web server is installed in the main unit to enable operations and monitoring via Web browser from an external PC.

The block diagram-based, easy-to-understand GUI allows you to intuitively control video/audio routing and adjustment along with the signal flow.



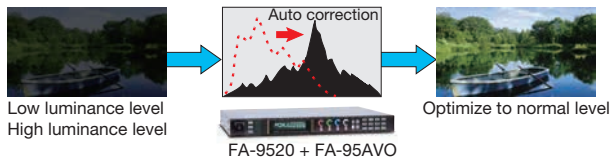
Other Features (Standard Functions)

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



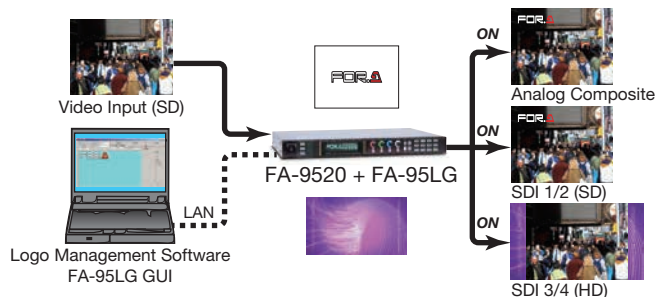
Automatic Video Optimizer (AVO)

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.



Variety of options

Includes a variety of options, such as video input/output cards.

Expandable card/cable

FA-95DACBL: Digital audio expansion cable

8 channels of digital audio (AES/EBU) output cable.
 All 8 channels of standard digital audio input/output terminals are fixed into input after installation.

FA-95ALA: Automatic loudness adjustment card

Automatic Loudness Adjustment is the function that measures and automatically adjusts the input audio signal loudness level to the target level. The FA-95ALA in one option slot can measure and adjust the loudness level of 2 signals (monaural, stereo, or 5.1 ch selectable) simultaneously.

Software

FA-95CO: Changeover

Switches to normal input channel automatically if an error is detected in video input signals. Operates in FA-9500 mode.

Other

FA-95PS: Redundant power supply unit

Remote control unit

FA-95RU: Remote control unit

FA-10DCCRU: Remote control unit for color correction

FA-95RU/FA-10DCCRU allows remote operation of the FA-9520 functions/color corrector functions. Single FA-95RU or FA-10DCCRU can control up to 100 FA-9520. In addition, one FA-9520 can be controlled by up to 5 remote control units (the FA-95RU and FA-10DCCRU) in any combination.



FA-95RU



FA-10DCCRU

FA-9520 Datasheet

1. Specifications

Basic specifications

Temperature / Humidity	0°C to 40°C / 30% to 90% (no condensation)
Power	100 VAC - 240 VAC \pm 10%, 50/60 Hz
Consumption	FA-9520: 60 VA (59 W) (at 100 - 120 VAC) 62 VA (56 W) (at 220 - 240 VAC) with FA-95PS: 60 VA (59 W) (at 100 - 120 VAC) 70 VA (59 W) (at 220 - 240 VAC) Add the amount of power consumption of options installed: FA-95D-D (*1): 4 VA (4 W) (at 100 - 120 VAC) 5 VA (5 W) (at 220 - 240 VAC) FA-95DE-E (*1): 6 VA (6 W) (at 100 - 120 VAC) 7 VA (7 W) (at 220 - 240 VAC) FA-95AIO: 8 VA (9 W) (at 100 - 120 VAC) 9 VA (9 W) (at 220 - 240 VAC) FA-95ALA: 8 VA (9 W) (at 100 - 120 VAC) 9 VA (9 W) (at 220 - 240 VAC)
Dimensions	430 (W) x 350 (D) x 44 (H) mm 480 (W) (Including rack mount brackets)
Weight	3.0 kg (without options) FA-95D-D/DE-E (*1): 0.3 kg FA-95AIO: 0.3 kg (with a connection cable PC-3307-1) FA-95ALA: 0.2 kg FA-95PS: 0.3 kg (without AC cord)
Consumables (at 24-hour operation)	(Recommended replacement timespans) Power unit (within 5 years) Cooling fan: P-1437 (FAN 1 and FAN 2) (within 6 years)

(*1) FA-95DE-E and FA-95D-D have been discontinued.

Technical specifications

Input Video Formats	1080/59.94p (Level-A), 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)
Output Video Formats	1080/59.94p (Level-A), 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), PAL-M
Video Input	3G-SDI: 3 Gbps, HD-SDI: 1.5 Gbps or SD-SDI: 270 Mbps, 75 Ω , BNC x 2 Analog Composite: 1.0 Vp-p, 75 Ω , BNC x 1

Video Input (FA-95AIO option)	<p>SDTV YPbPr: 75Ω, BNC (Y, Pb and Pr 1ea.) Y: 1.0 Vp-p Pb, Pr: 0.525 Vp-p (SMPTE level) 0.757 Vp-p (BETACAM level) SMPTE and BETACAM menu selectable Analog RGB: 1.0 Vp-p 75Ω, BNC (R, G, and B 1 ea.) Y/C: 1.0Vp-p 75Ω, BNC (Y and C 1 ea.)</p> <p>HDTV YPbPr: 75Ω, BNC (Y, Pb and Pr 1ea.) Y: 1.0 Vp-p Pb, Pr: 0.525 Vp-p Analog RGB: 1.0 Vp-p 75Ω, BNC (R, G, and B 1 ea.)</p>
Video Output	<p>3G-SDI: 3 Gbps or HD-SDI: 1.5 Gbps or SD-SDI: 270Mbps, 75Ω, BNC x 4 (2 x 2 outputs) Analog Composite: 1.0Vp-p, 75Ω, BNC x 2</p>
Video Output (FA-95AIO option)	<p>SDTV YPbPr: 75Ω, BNC (Y, Pb and Pr 1ea.) Y: 1.0 Vp-p Pb, Pr: 0.525 Vp-p (SMPTE level) 0.757 Vp-p (BETACAM level) SMPTE and BETACAM menu selectable Analog RGB: 1.0 Vp-p 75Ω, BNC (R, G, and B 1 ea.) Y/C: 1.0Vp-p 75Ω, BNC (Y and C 1 ea.)</p> <p>HDTV YPbPr: 75Ω, BNC (Y, Pb and Pr 1ea.) Y: 1.0 Vp-p Pb, Pr: 0.525 Vp-p Analog RGB: 1.0 Vp-p 75Ω, BNC (R, G, and B 1 ea.)</p>
Video I/O Process	3 inputs (standard) or 4 inputs (maximum input) > 1 processing < 2 x 2 outputs
Color Sampling	<p>3G/HD/SD-SDI: 4:2:2 10-bit Analog Composite: 4:2:2 12-bit</p>
Frequency Response	
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)
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)
DG/DP	1% / 1° (composite)
S/N Ratio	60 dB (without quantization noise, composite)
Genlock Input	BB: NTSC: 0.429 Vp-p / PAL: 0.45 Vp-p; or Tri-level Sync: 0.6 Vp-p, 75Ω BNC x 1, loop-through (Terminate with 75Ω terminator, if unused.)
Synchronizer mode	Frame Sync mode, Line Sync mode, AVDL mode,
System Phase Control	
Frame Sync mode	<p>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</p>

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
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)
Video Delay	Maximum 8 frames (Frame Sync or Input Sync)
Video Processing Functions	Up/Down/Cross converter Aspect ratio converter Proc Amp Color Corrector Automatic video optimizer (AVO) Second converter (Down/Cross/Aspect ratio)
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°
Video Clip	YP _B P _R 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-bit to 24-bit, synchronous/asynchronous SD: 16 channels (Group 1 to 4), 48 kHz, 16-bit to 24-bit, synchronous only
AES/EBU	Unbalanced, 1.0 Vp-p, 75Ω, BNC x 4 for AES/EBU input/output, Maximum 4 pairs of stereo channels, 32/44.1/48 kHz, 16-bit to 24-bit
Analog Audio	Balanced or unbalanced, 4 inputs (2 stereo channels), 25-pin D-sub (female) x 1 for analog audio input/output, 600Ω 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, 75Ω, BNC x 4 for AES/EBU input/output, Maximum 4 pairs of stereo channels, 48 kHz, 16-bit to 24-bit
Analog Audio	Balanced or unbalanced, 4 outputs (2 stereo channels), 25-pin D-sub (female) x 1 for analog audio input/output, less than 100Ω, 48 kHz, 24-bit
Audio Delay	2 ms - 1,000 ms (adjustable in 1 ms steps)
Audio Processing Functions (Set per channel)	Sampling rate converter (SRC), Gain control, Down mix, Channel re-mapping Channel mute
Interfaces	
Ethernet	10 Base-T / 100 Base-TX / 1000 Base-T, RJ-45 x 2

Remote (GPI)	9-pin D-sub (male) (7 terminals) x 1, IN: TTL negative logic level signal or Make contact OUT: Rated current 10mA (each terminal), Absolute maximum current 40mA
FA-95D-D/FA-95DE-E Option (*1)	
Audio Input	AES/EBU Unbalanced, 1.0 Vp-p, 75Ω, BNC x 1, 48 kHz, 16-bit to 24-bit
Audio Output	AES/EBU Unbalanced, 1.0 Vp-p, 75Ω, BNC x 1, 48 kHz, 16/20/24-bit
Reference Input	BB: NTSC: 0.429 Vp-p / PAL: 0.45 Vp-p; or Tri-level Sync: 0.6 Vp-p, 75Ω, BNC x 1 (Internally 75Ω terminated)
FA-95AIO (Analog Component I/O) Option	
Input Video Formats	1080/59.94i, 1080/50i, 1080/24PsF, 1080/23.98PsF, 720/59.94p, 720/50p 525/60 (NTSC), 625/50 (PAL)
Output Video Formats	1080/59.94i, 1080/50i, 1080/24PsF, 1080/23.98PsF, 720/59.94p, 720/50p 525/60 (NTSC), 625/50 (PAL), PAL-M
FA-95ALA (Automatic Loudness Adjustment) Option	
Supported standard	ARIB TR-B32, ATSC A/85, EBU-R128, ITU-R BS.1770

(*1) FA-95DE-E and FA-95D-D have been discontinued.

Options

FA-95RU	Remote Control Unit
FA-95PS	Redundant power supply unit (with AC cord and AC cord retaining clip)
FA-95DACBL	Digital audio expansion cable (to expand digital audio I/O up to 8 inputs and 8 outputs.) Normally installed in slot B.
FA-95AIO	Analog component I/O expansion card (with dedicated connection cable: PC-3307-1)
FA-95ALA	Automatic Loudness Adjustment card
FA-10DCCRU	Remote Control Unit for color correction.

Software Options

FA-95CO	Changeover
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Accessories

AC cord, EIA rack mount brackets, and Quick setup guide

2. External Dimensions

(All dimensions in mm.)

