12G/3G/HD/SD Dual Channel Multi Purpose Signal Processor

FA-9600
Dual channel frame synchronizer, SDR/HDR processor, converter, is the next generation technology from FOR-A. Offering exceptional conversion format delivery, including 12G, 4K UHD, 1080p and SD/HD. Extremely versatile and easy to use. Build with the high reliability in mind. The FA-9600 is the ideal device for any HD transition to 4K UHD.

**Applications**

FA-9600 multipurpose signal processor offers essential features for emerging trends in video production. They are used in many professional settings.

Each of the two HD/SD inputs incorporates a frame synchronizer, and because the signal processor features 12G-SDI terminals, optional software opens the door to 4K UHD production. Adding an optional expansion card provides four more channels of 3G-SDI input or output. The FA-9600 is more than a basic frame synchronizer. Video conversion of all kinds is easy. A newly developed color processing circuit supports the latest gamut and dynamic range specifications, and an optional converter circuit is available for up/down/cross conversion. Offering a wide range of audio processing, core features of remapping and gain adjustment, the FA-9600 can be expanded by adding an optional card that makes it an ideal standalone solution at transmission centers, in mobile production trucks, production studios, news stations, and other nonlinear editing and playout production environments.

For details, see the expansion cards in "Options."

### Advantages in mixed HDR/SDR environments

<table>
<thead>
<tr>
<th>Mobile OB and Up-Link production trucks</th>
<th>Live staging</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Convenient size where rack space is limited</td>
<td>- Greatly reduces the need for other equipment.</td>
</tr>
<tr>
<td>- Energy-efficient</td>
<td>- Can be used as a simplified switcher.</td>
</tr>
<tr>
<td>HDR 4K UHD camera</td>
<td>- Audio embedding</td>
</tr>
<tr>
<td>SDR camera</td>
<td>- Multi-camera editing</td>
</tr>
<tr>
<td>4K UHD 30p camera</td>
<td>Camera with HDMI output</td>
</tr>
<tr>
<td>x 4</td>
<td></td>
</tr>
</tbody>
</table>

### Frame synchronizer

- Clean switch
- Up/down/cross converter
- Delay adjustment
- Aspect ratio converter
- Resizing/repositioning
- Frame rate converter
- 2SI/SQD converter
- Color corrector
- Process amplifier
- Color space converter
- External remote unit

**FA-9600**

Direct HDR, 12G-SDI output

Converted to HDR, 12G-SDI output

*1 For details, see the expansion cards in “Options.”

*2 Optional
Frame synchronizer
Clean switch
Delay adjustment
Up/down/cross converter*2
Aspect ratio converter*2
Resizing/repositioning*2
Frame rate converter*2
2SI/SQD converter*2
Color corrector
Process amplifier
Color space converter
External remote unit*2

Transmission Centers
- Saves significant space
- Efficient processing of stable video
- Conversion to formats needed by recipients
- Redundant power supply

Control rooms
- Program production using uniform, converted output of a variety of source video formats

Nonlinear video and audio editing
- Conversion to formats used in editing, even for unusual source formats
## Standard features

- Dual channel frame synchronization, via 2 SDI inputs and 4 outputs
- Extensive professional video format support, from SD to HD formats
- Connect a broad range of equipment—also equipped with HDMI ports.
- The FA-9600 comes standard with a dedicated application that runs on Windows, providing full access to many functions, and allows a wide variety of settings. Web server functionality is also implemented in the main unit, allowing adjustments*3 to be made to various parameters from mobile and tablet devices.
- New color processing circuit provides strong support in HD/4K UHD production. Useful not only at input—when converting to unified specifications before input to a switcher or editing system—but also at output, before HDR and SDR simulcasts, for example.

*3 This feature is available for a limited number of function and parameters.

- Supports and converts between the broad ITU-R BT.2020 gamut for 4K/8K and the conventional ITU-R BT.709 gamut for HD.

- Compensates for differences among external devices using EOTF/OETF corresponding to various HDR or SDR curves.
- EOTF/OETF log curves and gamut registrable from a computer.
- Dynamic range conversion compatible with HLG, PQ, SDR, and other log curves. Also compatible with S-Log3, Canon Log2, and other camera log curves.
Options

FA-964K
4K/12G-SDI-compatible software

Enables video processing up to 4K UHD, 6G/12G-SDI connectivity, and SQD/2SI conversion. Add an optional expansion card for quad link 3G-SDI or single 12G-SDI or HDMI 2.0 input and output.

FA-96UDC
Up/down/cross converter

Enables conversion between SD/HD and 4K UHD*4 and between SD and HD. Also enables cross-conversion between 1080i and 720p.

*4 When FA-964K is installed
Expansion cards

Rear panel

For slot A

FA-96EX3G44-R
3G-SDI I/O Card
Card for input and output of standards from SD-SDI to 3G-SDI.
Pass-through supported on all 4 inputs and outputs.

FA-96EX12G06
12G-SDI 6 Output Expansion Card
Card for 6 distributed outputs of 12G/HD/SD-SDI.

For slots B and C

FA-96AES-UBL
AES Audio I/O Card
Card for unbalanced AES input and output.
Enables input and output using pairs of terminals (a configuration of 8 inputs, 4 inputs/4 outputs, or 8 outputs is available).

FA-96GPI
GPI I/O Expansion Card
GPI card for 10 inputs/10 outputs.

Other options

FA-96PS
Redundant power supply unit

Remote control units

FA-10RU
The FA-10RU allows remote operation of almost all FA-9600 functions. A single FA-10RU is able to control up to 100 FA-9600s. In addition, one FA-9600 is able to also be controlled from up to five remote control units (including the FA-10DCCRU and FA-9600GUI) simultaneously.

FA-10DCCRU
The FA-10DCCRU allows remote operation of the color corrector functions of the FA-9600. One FA-9600 is able to be controlled from up to five remote control units (including the FA-10RU and FA-9600GUI) simultaneously.
Block diagram

External view

Frame synchronizer lineup
Specifications (preliminary)

Video formats

- **Optional FA-964K**: 3840 x 2160/59.94p, 3840 x 2160/50p, 3840 x 2160/25P, 3840 x 2160/24P, 3840 x 2160/23.98P

Video inputs

- **Standard**: 3G/HD/SD-SDI: 3 Gbps to 270 Mbps, 75Ω, BNC x 4
- **Optional FA-964K**: 12G/6G/3G/HD-SDI: 12 Gbps to 270 Mbps, 75Ω, BNC x 1
- **Optional FA-96EX3G44-R**: 3G/HD/SD-SDI: 3 Gbps to 270 Mbps, 75Ω, BNC x 4

Video outputs

- **Standard**: 3G/HD/SD-SDI: 3 Gbps to 270 Mbps, 75Ω, BNC x 4
- **Optional FA-964K**: 12G/6G/3G/HD-SDI: 12 Gbps to 270 Mbps, 75Ω, BNC x 2
- **Optional FA-96EX3G44-R**: 3G/HD/SD-SDI: 3 Gbps to 270 Mbps, 75Ω, BNC x 4

Video functions

- **I/O processing**: Standard: 2 inputs, 2 distributed outputs (3G-SDI to SD-SDI) + 1 input (12G-SDI to SD-SDI) x 1
- **Processing**: 4:2:2 digital component
- **Quantization**: 12G/6G/3G/HD-SDI: 10-bit
- **Genlock input**: BB: 0.429 Vp-p (NTSC)/0.45 Vp-p (PAL)
- **Synchronizer modes**: Frame, Line, AVDL, and Input modes
- **System phase adjustment**: Frame mode: Horizontal: -1/2H to +1/2H, Vertical: -1/2 frames to +1/2 frames
- **Line mode**: Horizontal: -1/2H to +1/2H, Vertical: -1/2 frames to +1/2 frames
- **AVDL mode**: Horizontal: -1/2H to +1/2H, Vertical: -1/2 frames to +1/2 frames
- **Input mode**: Horizontal: -1/2H to +1/2H, Vertical: -1/2 frames to +1/2 frames

Video delay adjustment

- Max. 8 frames (in frame or Input mode)

Converter (optional)

- **IP conversion**: up/down/cross-conversion, aspect conversion, resizing and repositioning, frame delay conversion, 4K 2SI/4SI conversion, 3G/SDI Level A-B conversion
- **Video processing**: Process amplifier, color space conversion, EOTF/OETF (gamma), color corrector, video clipping

Audio inputs

- **Embedded**: 4K UHD: 32 channels (Group 1 to 8), 48 kHz, 16 to 24-bit, synchronous/asynchronous
- **AES/EBU**: 1.0 Vp-p, unbalanced, 75Ω, BNC x 4 (input/output switchable), Max. number of stereo inputs: 4, 32/44.1/48kHz, 16-bit to 24-bit

Audio functions

- **Delay adjustment**: Fixed mode: 4 ms to 1,000 ms (adjustable in 1 ms increments)
- **Signal processing**: Sample rate converter (SRC), gain control, down-mixing, remapping, mute (per channel)

Main unit

- **Interfaces**: Ethernet: 10BASE-T/100BASE-TX/1000BASE-T, RJ-45 x 1
- **Temperature/humidity**: 0°C to 40°C/30% to 90% (no condensation)
- **Power**: 100 V to 240 V AC ±10%, 50/60 Hz

Dimensions/weight

- **430 W (x) 44 (H) x 300 (D) mm / 3.0 kg
- **Consumables/ replacement timing** (under constant use at room temperature)
- **Main unit**: Power unit: approx. 5 years
- **Cooling fan**: approx. 6 years

Included accessories

- Operation manual, AC cont., rack mount brackets

Options

- **For Slot A**: FA-96EX/3G44-R: 3G-SDI I/O card
- **For Slot B**: FA-96EX/SG44: 3G-SDI I/O card
- **For Slot C**: FA-96EX/SG44: 3G-SDI I/O card
- **For Slot D**: FA-96EX/SG44: 3G-SDI I/O card

Other options

- **FA-96UC**: 4K/12G-SDI-compatible software
- **FA-96CP**: Up/down/cross converter
- **FA-96PS**: Redundant power supply unit
- **FA-10RU**: Remote control unit
- **FA-10DCCRU**: Remote control unit

**Notes**

1. Pass-through supported between IN1 and OUT1a.
2. 3 Gbps to 270 Mbps between IN1 and OUT1b without FA-964K expansion.
3. Pass-through supported.