

Multi-channel processor

# FA-1616 Series

Software  
Defined

Preliminary

FORA®

## Multi Channel Processor FA-1616 Series



Multi-channel processor series with essential video production features in a compact 1 RU enclosure. Besides its core role as a frame synchronizer for up to 32 channels, supporting IP/SDI (12G/6G/3G/HD-SDI) and 4K, the FA-1616 series also serves as a color corrector, video processing amp, and audio remapper. Software-defined architecture enables to choose just the right configuration for your needs. Build an optimal system without unnecessary costs by adding exactly what you need with VoIP cards<sup>\*1</sup> and a range of audio (including Dante and MADI) and GPI<sup>\*2</sup> cards.

<sup>\*1</sup> Optional. <sup>\*2</sup> Optional, to be supported.

**Product lineup** → please see page 3 for details.

**FA-1616HB-12G** 12G<sup>\*1</sup>/6G<sup>\*1</sup>/3G/HD-SDI supported 16 inputs/16 outputs, HD-BNC<sup>\*2</sup> connector model.

**FA-1616B-12G<sup>\*3</sup>** 12G/6G/3G/HD-SDI supported 16 inputs/outputs<sup>\*4</sup> model.

**FA-1616HB-3G<sup>\*3</sup>** 3G/HD-SDI supported 32 inputs/outputs<sup>\*4</sup>, HD-BNC<sup>\*2</sup> connector model.

<sup>\*1</sup> 12G/6G compatibility applies to only 8 of the 16 inputs/outputs. <sup>\*2</sup> HD-BNC is a registered trademark of Amphenol Corporation. <sup>\*3</sup> To be supported.

<sup>\*4</sup> Input or output is selected in a menu for each channel.

■ **Control and monitoring**

- Control from a browser and via Ember+ or NMOS IS-04/05.
- Browser-based control: No need to install a dedicated GUI.
- Ember+ control<sup>\*1</sup>: Enables control GUI development by users<sup>\*1</sup>.
- SNMP monitoring.
- Management/control system redundancy also ensured, with 2 dedicated LAN ports (1000BASE-T).<sup>\*3</sup>

<sup>\*1</sup> Using Lawo VSM. <sup>\*3</sup> FA-16MOIP is required.

■ **GENLOCK input**

■ **Timecode (To be supported)**

- LTC, ATC (LTC, VITC) time code generating and offset adjustment.
- Equipped with LTC I/O terminals; supports ancillary time code multiplexing.

■ **Others**

- Standard redundant power supply. With the fan, hot-swappable from the front.
- Compact, relatively shallow 1 RU enclosure. 430(W)×500(D)×44(H) mm.

**Features** → please see page 4 for details.

■ **Audio input/output**

- Mux/demux, remap, delay adjustment, and other processing for SDI embedded audio.

■ **Robust frame synchronization**

- Synchronization Mode: Selectable from Frame, Line, AVDL, or Line (Min).

■ **Advanced conversion**

- Interlace/progressive (from HD to 4K).
- Up/down/cross (from HD to 4K).
- Aspect ratio.
- Resize/repositioning.
- 2SI/SQD/3G-SDI Level-A/B conversion.
- Single Link 12G-SDI/Quad Link 3G-SDI interconversion.

■ **ProcAmp**

- Adjustment of video level, chroma level, and hue.

■ **Robust color correction**

- 2 color correction modes: Balance (RGB) mode and color difference (YCbCr) mode.
- Supports and converts between the broad ITU-R BT.2020 gamut and the conventional ITU-R BT.709 gamut<sup>\*</sup>.
- Compensates for differences among external devices by using EOTF/OETF corresponding to various HDR or SDR curves<sup>\*</sup>.
- EOTF/OETF log curves and gamut can be registered from a computer<sup>\*</sup>.
- SDR/HDR conversion designed for an array of log curves (including HLG, PQ, and SDR) and reliable round-trip performance<sup>\*</sup>.
- 1D and 3D LUTs supported<sup>\*</sup>.

<sup>\*</sup> To be supported.

**Main features available from expansion card** → please see page 9 for details.

■ **Video input/output**

- SMPTE ST 2022-6<sup>\*1</sup>, SMPTE ST 2110.

■ **Audio input/output**

- Dante, MADI, AES/EBU, analog<sup>\*1</sup>.

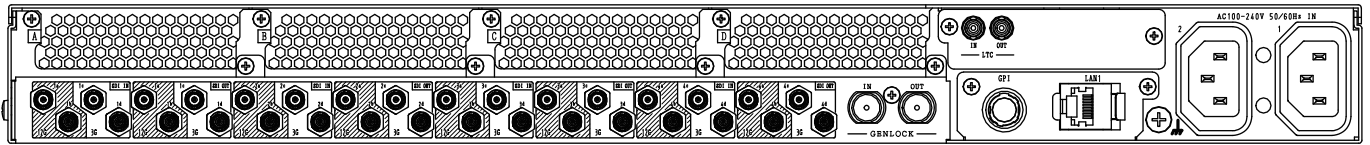
■ **PTP synchronization**

- Choose GENLOCK input or PTP for synchronization of each processor installed in processor block<sup>\*2</sup>.

<sup>\*1</sup> To be supported. <sup>\*2</sup> Please see page 4 for details of processor block.

## Product lineup

### FA-1616HB-12G



■ 12G-SDI<sup>\*1</sup> supported, 16 inputs/16 outputs model.

■ 32 HD-BNC connectors are mounted.

Input: 75Ω HD-BNC x 16, 12G/6G/3G/HD-SDI x 8, 3G/HD-SDI x 8.

Output: 75Ω HD-BNC x 16, 12G/6G/3G/HD-SDI x 8, 3G/HD-SDI x 8.

■ IP input/output.

Add the option(s)<sup>\*2</sup> to choose any mode<sup>\*3</sup>.

< SMPTE ST 2110 >

- Sender: HD(3G) x 16/4K x 4.

- Receive: HD(3G) x 16/4K x 4.

- Sender and Receive: HD(3G) x 8/4K x 4.

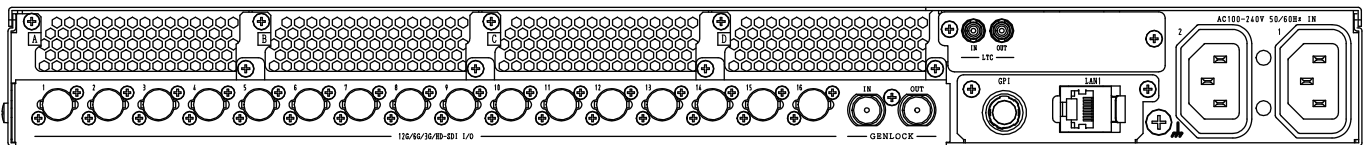
< SMPTE ST 2022-6 ><sup>\*</sup> To be supported

- Sender and Receive: 3G x 14/HD x 16.

<sup>\*1</sup> 12G compatibility applies to only 8 of the 16 inputs/outputs. <sup>\*2</sup> FA-16MOIP, FA-16MOIP-EX.

<sup>\*3</sup> Mode can be set per card. Number of channels indicated is for each card. Up to 2 MoIP cards can be installed.

### FA-1616B-12G (To be supported)



■ 12G-SDI supported, 16 inputs/outputs<sup>\*1</sup> model.

■ All terminals support 12G-SDI.

■ 16 normal HD connectors are mounted.

Input/output<sup>\*2</sup>: 75Ω BNC x 16, 12G/6G/3G/HD-SDI x 16.

■ IP input/output.

Add the IP option(s)<sup>\*3</sup> to choose any mode<sup>\*4</sup>.

< SMPTE ST 2110 >

- Sender: HD(3G) x 16/4K x 4.

- Receive: HD(3G) x 16/4K x 4.

- Sender and Receive: HD(3G) x 8/4K x 4.

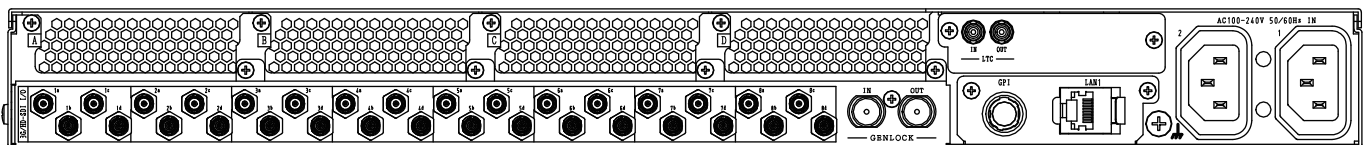
< SMPTE ST 2022-6 ><sup>\*</sup> To be supported

- Sender and Receive: 3G x 14/HD x 16.

<sup>\*1</sup> Input or output is selected in a menu for each channel. <sup>\*2</sup> Used for both input and output. <sup>\*3</sup> FA-16MOIP, FA-16MOIP-EX.

<sup>\*4</sup> Mode can be set per card. Number of channels indicated is for each card. Up to 2 MoIP cards can be installed.

### FA-1616HB-3G (To be supported)



■ 3G-SDI supported, 32 inputs/outputs<sup>\*1</sup> model.

■ 32 HD-BNC connectors are mounted.

Input/output<sup>\*2</sup>: 75Ω HD-BNC x 32, 3G/HD-SDI x 32.

■ IP input/output.

SDI to IP encapsulation and IP to SDI de-encapsulation for up to 32 channels.

Add the IP option(s)<sup>\*3</sup> to choose any mode<sup>\*4</sup>.

< SMPTE ST 2110 >

- Sender: HD(3G) x 16/4K x 4.

- Receive: HD(3G) x 16/4K x 4.

- Sender and Receive: HD(3G) x 8/4K x 4.

< SMPTE ST 2022-6 ><sup>\*</sup> To be supported

- Sender and Receive: 3G x 14/HD x 16.

<sup>\*1</sup> Input or output is selected in a menu for each channel. <sup>\*2</sup> Used for both input and output. <sup>\*3</sup> FA-16MOIP, FA-16MOIP-EX.

<sup>\*4</sup> Mode can be set per card. Number of channels indicated is for each card. Up to 2 MoIP cards can be installed.

## Instantly build the system you need with software-defined architecture

FA-1616 units are equipped with 2 processor blocks. Thanks to the processor's software-defined architecture, each block can be customized to get the functions and channels you need. By selecting an optimal configuration\* from 3 choices, hardware resources are applied more efficiently and flexibly for increasingly diverse video production. Instant reconfigurability also makes it a useful portable processor for events with constantly changing requirements.

\* Video processing capacity varies depending on the configuration selected. For details, contact your FOR-A dealer.

### Processor block A / Processor block B

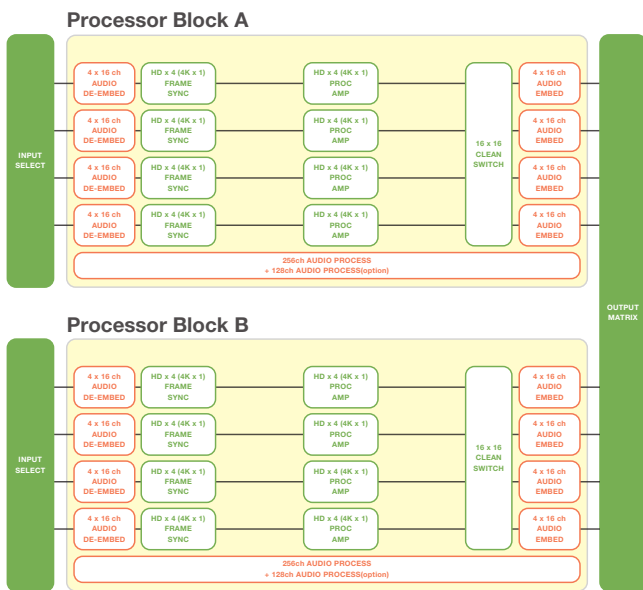
2 blocks process video and audio for output via SDI and IP. Equipped with up to 4 processors each, the blocks can be set up in the same or different configurations, depending on your application.

#### Processing available per video processor

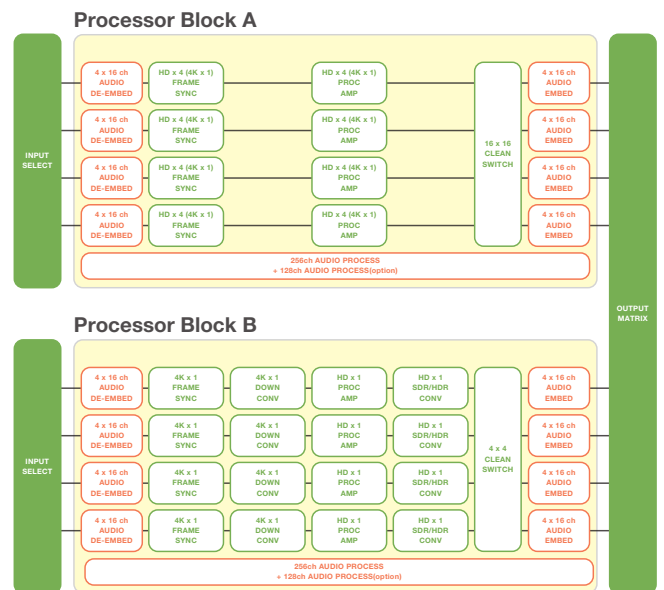
■ Video: 1 channel for 4K or 4 channels for 2K.

■ Audio: 4x16 channels.

#### Configuration example: Same configuration



#### Configuration example: Different configurations



### Table of configurable functions for processor blocks

Available functions will be changed depending upon the chosen configuration.

Frame synchronizer	ProcAmp	Clip function	Test signal output	
RGB color corrector	HDR/SDR conversion	HDR/SDR conversion 1D LUT	HDR/SDR conversion 3D LUT	
Aspect conversion	Resizing/positioning	1080/720 conversion	3G Level-A/B conversion	
Gearbox SQD/2SI conversion	2K → 4K up conversion	4K → 2K down conversion	Frame delay	Simple frame rate conversion
Audio MUX	Audio DEMUX	Audio SRC	Audio remapping	Audio delay
Audio gain				

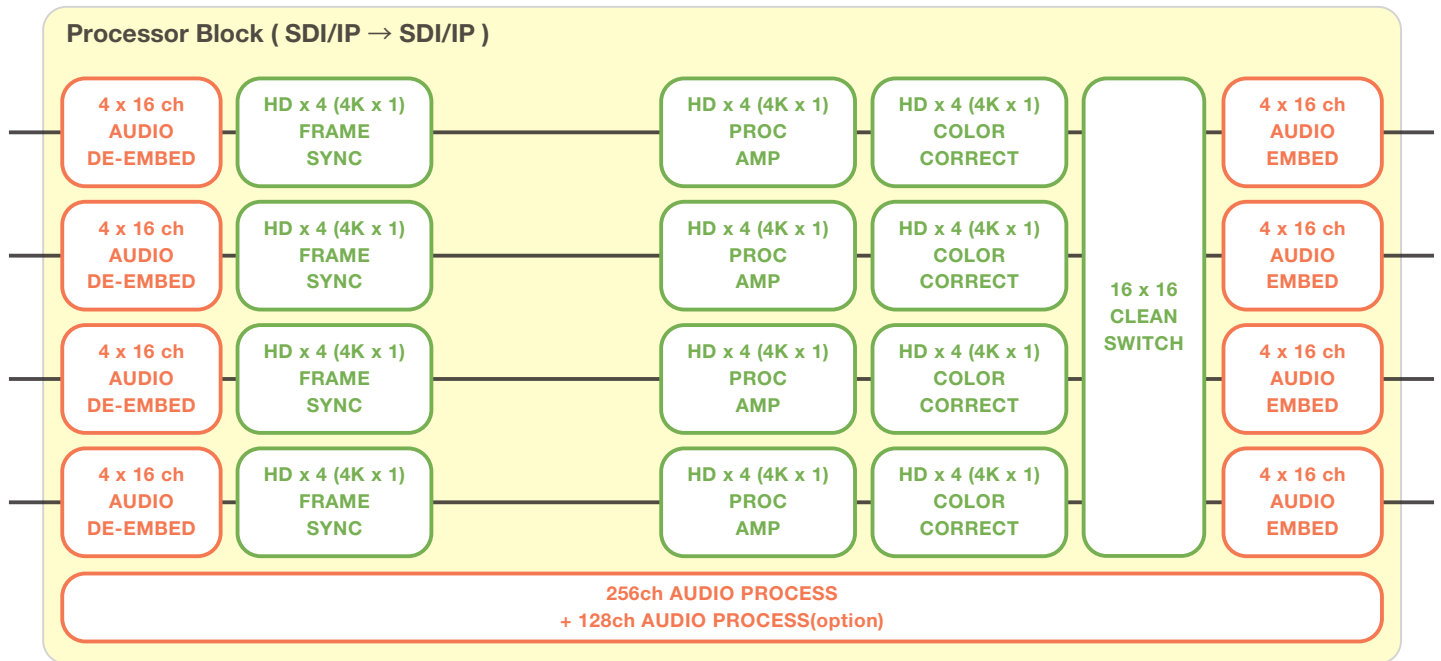
## Configuration lineup selectable according to application

### Configuration 1: Standard configuration

#### Configuration 1 Features

- 4 video processors used for 2K (x4 channels) and 4K (x1 channel). Frame synchronization: up to 16 channels\*1 for 2K, 4 channels\*1 for 4K.
- Adding optional MoIP cards enables use as an SDI/IP gateway with FS.
- Audio processing: 256 channels standard. Optional cards enable audio processing for up to 128 additional channels.

\*1 Configuring both processor blocks (A and B) in this way doubles the number of channels.



#### Table of functions available in Configuration 1

\* Available function is highlighted in yellow.

Frame synchronizer	ProcAmp	Clip function	Test signal output	
RGB color corrector	HDR/SDR conversion	HDR/SDR conversion 1D LUT	HDR/SDR conversion 3D LUT	
Aspect conversion	Resizing/positioning	1080/720 conversion	3G Level-A/B conversion	
Gearbox SQD/2SI conversion	2K→4K up conversion	4K→2K down conversion	Frame delay	Simple frame rate conversion
Audio MUX	Audio DEMUX	Audio SRC	Audio remapping	Audio delay
Audio gain				

## Configuration lineup selectable according to application

### Configuration 2\* : Optional configuration (Up/down conversion, SDR/HDR conversion)

\* To be supported.

#### Required options

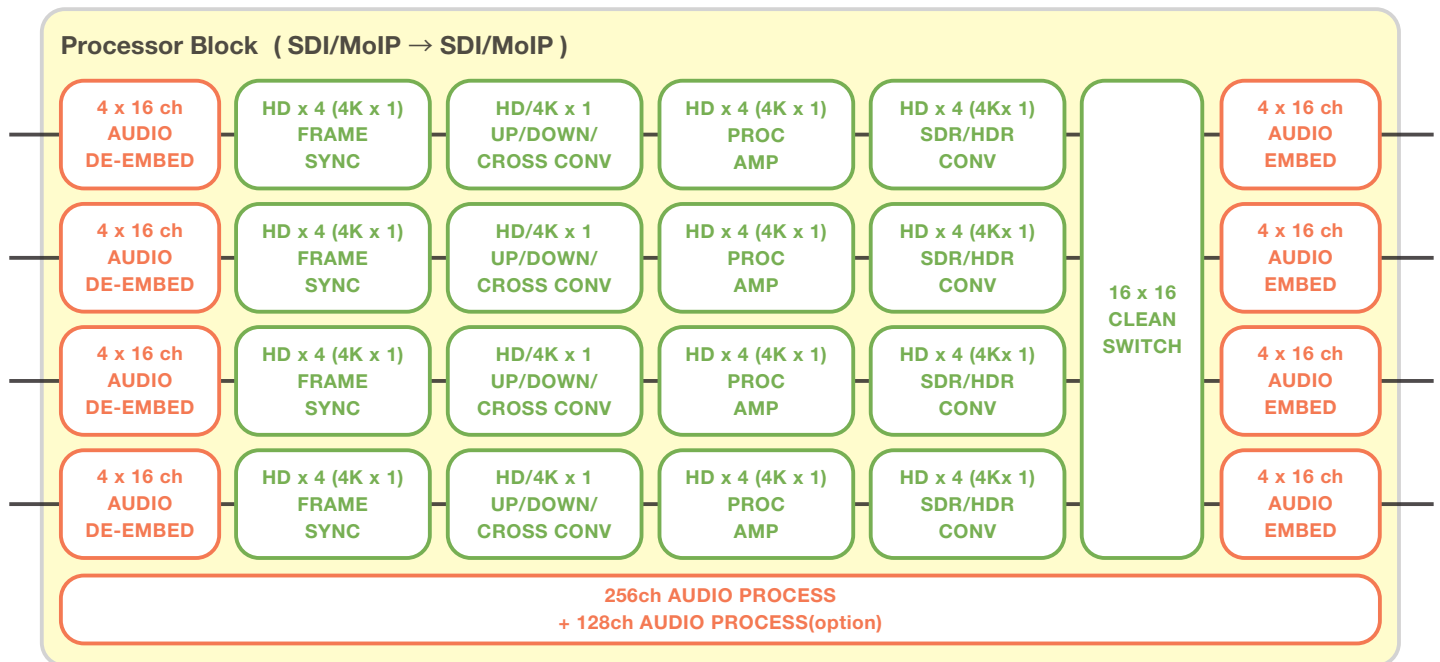
FA-16UDC-P2: Up/down/cross conversion functionality

- Enabling this functionality with one unit allows for up/down/cross conversion with two processors
- A maximum of 4 FA-16UDC-P2 units can be installed\*

FA-16HDR-P2: SDR/HDR conversion

- Enabling this in one unit allows for SDR/HDR conversion using two processors
- A maximum of 4 FA-16HDR-P2\* units can be installed

If converter functions (up/down/cross/aspect conversion/resize, etc.) are used, including in HD/4K, the number of, one channel can be processed by one processor. Without converter functions, SDR/HDR conversion of 3G/HD x 16 channels or 4K x 4 channels is possible.



### Table of functions available in Configuration 2

\* Available function is highlighted in yellow.

Frame synchronizer	ProcAmp	Clip function	Test signal output	
RGB color corrector	HDR/SDR conversion	HDR/SDR conversion 1D LUT	HDR/SDR conversion 3D LUT	
Aspect conversion	Resizing/positioning	1080/720 conversion	3G Level-A/B conversion	
Gearbox SQD/2SI conversion	2K→4K up conversion	4K→2K down conversion	Frame delay	Simple frame rate conversion
Audio MUX	Audio DEMUX	Audio SRC	Audio remapping	Audio delay
Audio gain				

## Configuration lineup selectable according to application

### Configuration 3\* : Optional configuration (Up/down conversion, 3D LUT)

\* To be supported.

#### options

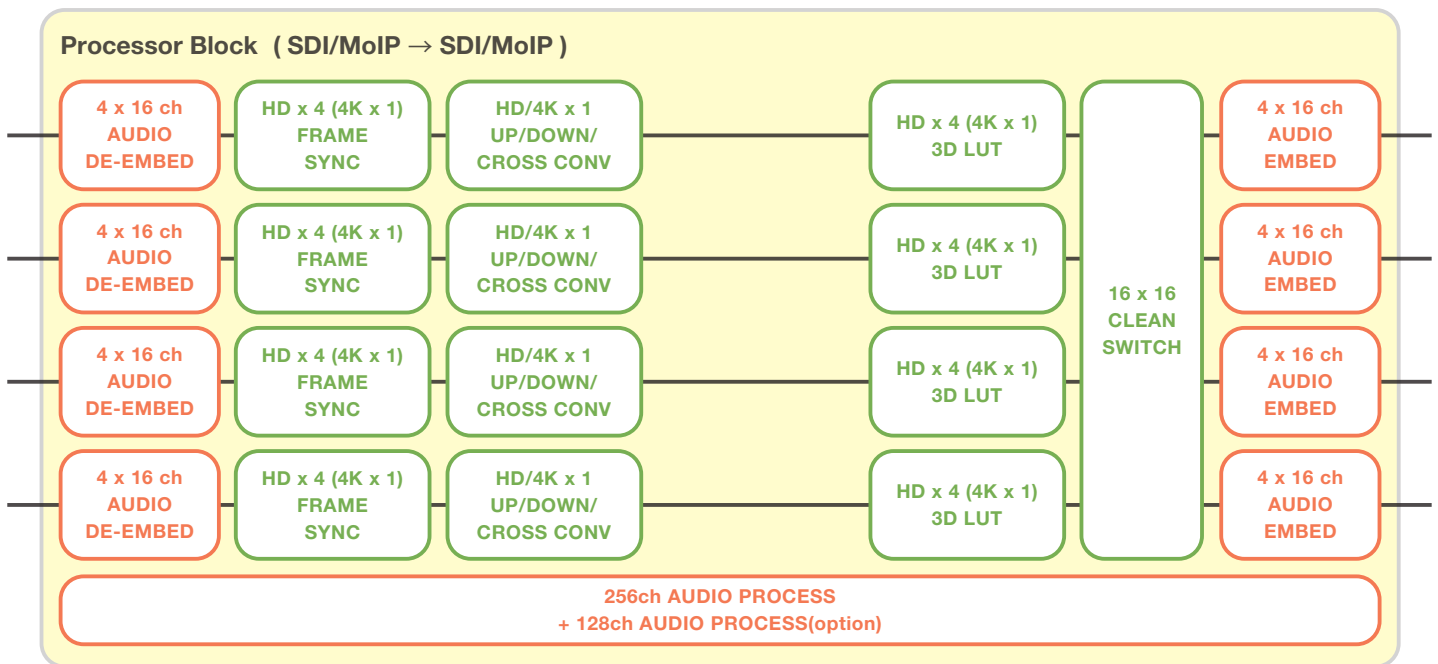
##### FA-16UDC-P2: Up/down/cross conversion

- Enabling this functionality with one unit allows for up/down/cross conversion with two processors
- A maximum of 4 FA-16UDC-P2 units can be installed\*

##### FA-16LUT-P2: 3D LUT conversion

- Enabling this functionality with one unit allows for 3D LUT conversion using two processors
- A maximum of 4 FA-16LUT-P2\* units can be installed

If converter functions (up/down/cross/aspect conversion/resize, etc.) are used, including in HD/4K, the number of channels that can be processed by one processor is limited to one channel.  
 If converter functions are not used, 3D LUT conversion of 3G/HD x 16 channels or 4K x 4 channels is possible.



### Table of functions available in Configuration 3

\* Available function is highlighted in yellow.

Frame synchronizer	ProcAmp	Clip function	Test signal output	
RGB color corrector	HDR/SDR conversion	HDR/SDR conversion 1D LUT	HDR/SDR conversion 3D LUT	
Aspect conversion	Resizing/positioning	1080/720 conversion	3G Level-A/B conversion	
Gearbox SQD/2SI conversion	2K → 4K up conversion	4K → 2K down conversion	Flame delay	Simple frame rate conversion
Audio MUX	Audio DEMUX	Audio SRC	Audio remapping	Audio delay
Audio gain				

## IP Support

FA-1616 supports SMPTE ST 2110/ST 2022-6 encapsulation and de-encapsulation with an optional MoIP card(FA-16MOIP,FA-16MOIP-EX). It can also be used as an IP gateway for up to 32-channel SDI/MoIP conversion. Add as many as 2 MoIP cards with four 25G SFP ports (2 redundant channels). Ready for production where IP is already in use, where a mix of IP and SDI is used, or where future IP migration is planned.

### Video

- SMPTE ST 2110/ST 2022-6 encapsulation or de-encapsulation for up to 32 channels.
- Encapsulation/de-encapsulation capacity per MoIP card
- 2 dual 25 GbE (SFP28) port supports hitless operation for redundancy (SMPTE ST 2022-7).
- 2 MoIP cards can be added to expand capacity and enable SMPTE ST 2022-6/ST 2110 transcoding.

### FA-16MOIP

- < SMPTE ST 2110 >
- Sender : HD(3G) x 16/4K x 4
  - Receiver : HD(3G) x 16/4K x 4
  - Sender and Receiver : HD(3G) x 8/4K x 4
- < SMPTE ST 2022-6 > \*To be supported
- Sender and Receiver : 3G x 14 /HD x 16

### FA-16MOIP + FA-16MOIP-EX

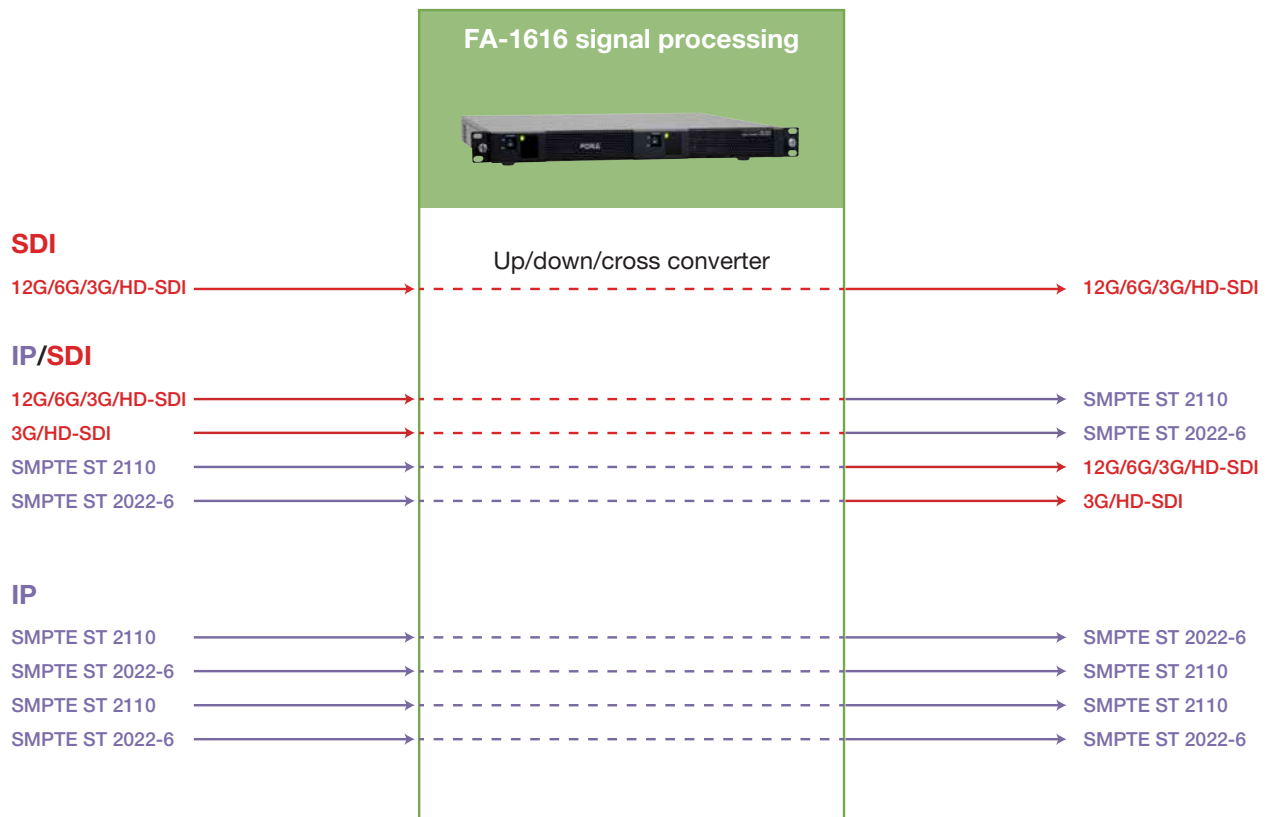
- < SMPTE ST 2110 >
- Sender:HD(3G) x 32/4K x 8
  - Receiver:HD(3G) x 32/4K x 8
  - Sender and Receiver:HD(3G) x 16/4K x 8
- < SMPTE ST 2022-6 > \*To be supported
- Sender and Receiver:3G x 28 / HD x 32

### Audio

- Convert various type of audio data to IP audio data. Audio data received over IP can also be output via an array of optional audio interfaces.

## FA-1616 signal processing

SDI up/down/cross-conversion is supported as well as conversion between SDI/IP and SMPTE ST 2110/ST 2022-6. Besides the added functionality of software-defined architecture and expansion cards, effective signal processing makes the FA-1616 valuable in many production environments.





## Expansion card options

The extensive options available include cards that add IP capabilities and expand audio and GPI interfaces.

### Expansion cards for Media over IP

#### FA-16MOIP: Media over IP card

Enables SMPTE ST 2022-6\*/ST 2110 encap/decap and PTP synchronization. Only one card can be installed.

\*To be supported

#### FA-16MOIP-EX: MOIP Expansion card

Expands MoIP functionality. Only one card can be installed.

Note: FA-16MOIP is required.

### Expansion cards for audio interface

#### FA-16DNT: Dante audio card

Enables sending/receiving of Dante audio. Supports RJ45x2, RX/TX 64ch each.

Note: Dante® is a registered trademark of Audinate Pty Ltd.

#### FA-16MADI: MADI audio card

Enables input/output of MADI audio. Supports HD-BNCx4, SFPx2, RX/TX 64cheach.

#### FA-16AES-UBL: Unbalanced AES audio card

Enables input/output of AES audio. BNCx4, Rx/Tx switching supported for 8 channels.

#### FA-16AES-PNL<sup>1</sup>: AES audio expansion card

Expands I/O channels for AES audio. BNCx4.

Note: FA-16AES-UBL is required.

#### FA-16ANA-AUD<sup>1</sup>: Balanced analog audio card

Enables input/output of analog audio. DSUB-25 pin x1, Balanced audio for 4 Rx and 4 Tx channels.

### Expansion cards for GPI interface

#### FA-16GPI<sup>1</sup>: General purpose interface card

Adds support for GPI control. DSUB-25 pin x 1, 10 inputs + 10 outputs + power + GND.

#### FA-16GPI-PNL<sup>1</sup>: GPI Extension panel

Expands channel control via GPI. DSUB-25 pin x 1.

Note: FA-16GPI is required.

<sup>1</sup>To be supported.

## Examples of applications

Production studios are only the start. Can be set up at live/events, in OB vans, and in many other settings.

### Live/Event



#### ■ In LED wall staging: Color correction

Coordinate the colors of LED walls and floors or projections at event venues to create a unified space.

#### ■ In LED wall staging: Resizing

In multi-screen staging, resizing function enables 8 video signals to be enlarged, aligned, or otherwise scaled to fit LED displays.

#### ■ Audio selector applications

With support for SDI embedded audio, SMPTE ST 2110-30, MADI, Dante, AES, and other interface formats, a single FA-1616 unit can integrate the many audio interfaces used at venues. Also useful as an audio selector for remapping, delay or gain adjustment.

### OB vans



- Up to 16 channels of video signals and embedded audio can be managed from a compact 1 RU processor that offers color correction and frame synchronization. In addition, it is possible to select optimum configuration for the operation. In OB vans with size and weight constraints, the FA-1616 series is an ideal solution.

## FA-1616HB-12G / FA-1616B-12G / FA-1616HB-3G Datasheet

### 1. Specifications

#### Basic specifications

Temperature	0°C to 40°C
Humidity	30% to 90% (no condensation)
Power	AC 100 V to 240 V $\pm$ 10% 50/60 Hz
Consumption	<p>FA-1616HB-12G:</p> <p style="padding-left: 40px;">221 VA (219 W) (at AC 100-120 V) 242 VA (225 W) (at AC 220-240 V)</p> <p style="padding-left: 40px;">Max consumption with options</p> <p style="padding-left: 40px;">312 VA (308 W) (at AC 100-120 V) 331 VA (314 W) (at AC 220-240 V)</p> <p>FA-1616B-12G:</p> <p style="padding-left: 40px;">250 VA (248 W) (at AC 100-120 V) 242 VA (225 W) (at AC 220-240 V)</p> <p style="padding-left: 40px;">Max consumption with options</p> <p style="padding-left: 40px;">330 VA (327 W) (at AC 100-120 V) 331 VA (314 W) (at AC 220-240 V)</p>
Dimensions	430 (W) x 480 (D) x 44 (H) mm 480 (W) (Including rack mount brackets)
Weight	Approx. 11.5 kg (including FA-16MOIP/16MOIP-EX)
Consumables (at 24-hour operation)	Power unit: Recommended replacement period: 5 years Cooling fan: P-1677 (x6), Recommended replacement period: 6 years

#### Technical specifications

Video format	<p><b>FA-1616HB-12G/ FA-1616B-12G</b></p> <p>2160p / 60,59.94, 50, 30,29.97,25,24,23.98 (Single-Link, Dual-Link, Quad-Link)</p> <p>1080p / 60,59.94, 50, 30,29.97,25,24,23.98 1080psf / 30,29.97,25,24,23.98 1080i / 60,59.94, 50 720p / 60,59.94, 50, 30, 29.97, 25, 24, 23.98</p> <p><b>FA-1616HB-3G</b></p> <p>2160p / 60,59.94, 50 (Quad-Link) 2160p /30,29.97,25,24,23.98(Dual-Link, Quad-Link) 1080p / 60,59.94, 50, 30,29.97,25,24,23.98 1080psf / 30,29.97,25,24,23.98 1080i / 60,59.94, 50 720p / 60,59.94, 50, 30, 29.97, 25, 24, 23.98</p> <p>* Other formats will be supported later.</p>
Video input/output	
FA-1616HB-12G	<p>Input: 12G/6G/3G/HD-SDI 75 <math>\Omega</math> Micro BNC (HD-BNC <sup>(*)</sup>) x 8 3G/HD-SDI 75 <math>\Omega</math> Micro BNC (HD-BNC <sup>(*)</sup>) x 8</p> <p>Output: 12G/6G/3G/HD-SDI 75 <math>\Omega</math> Micro BNC (HD-BNC <sup>(*)</sup>) x 8 3G/HD-SDI 75 <math>\Omega</math> Micro BNC (HD-BNC <sup>(*)</sup>) x 8</p>
FA-1616B-12G	Input or output: 12G/6G/3G/HD-SDI 75 $\Omega$ BNC x 16
FA-1616HB-3G <sup>(*)</sup>	Input or output: 3G/HD-SDI 75 $\Omega$ Micro BNC (HD-BNC <sup>(*)</sup> ) x 32

MoIP input/output (FA-16MOIP)	<p>IP media transmission standard: SMPTE ST 2110, SMPTE ST 2022-6 <sup>(*)</sup>  SFP28 MSA (25 GbE) x 4 (ST2022-7 route redundancy)</p> <p>&lt; SMPTE ST 2110 Input/Output &gt;  Send only: HD x 16 / UHD x 4  Receive only: HD x 16 / UHD x 4  Send and Receive: HD x 8 / UHD x 4  Video: ST 2110-20  Audio: ST 2110-30 Level B (2K: 16ch, 4K: 32ch)  ANC data: ST 2110-40</p> <p>&lt; SMPTE ST 2022-6 Input/Output <sup>(*)</sup> &gt;  Send and Receive: HD x 16 / 3G x 14</p> <p>&lt;PTP&gt;  Version: PTP v2 (two-step mode)  Boundary Clock (network switch) connection available</p>
(FA-16MOIP-EX)	Same as above
Color sampling	YCbCr 4:2:2 10-bit
Genlock	Input: BB (NTSC / PAL) or Tri-level Sync 75 Ω BNC x 1 Output: BB (Input-loop-through or generated from PTP) 75 Ω BNC x 1
Timecode <sup>(*)</sup>	Input: LTC (SMPTE 12M) DIN 1.0/2.3 x 1 Output: LTC (SMPTE 12M) DIN 1.0/2.3 x 1
Sync mode	Frame, Line, AVDL, Line (Min)
Converter <sup>(*)</sup> (optional)	Up-/ Down-/ Cross-converter(FA-16UDC-P2) Gamma conversion, Color space conversion and Dynamic Range conversion with 1D LUT (FA-16HDR-P2) Gamma conversion with 3D LUT (FA-16LUT-P2)
Color processing	Proc Amp: Video level, Chroma Level, Black level, Hue Color Corrector: Balance (RGB) mode, Differential (YCbCr) mode Video Clip: Knee Clip (RGB), YCbCr Clip
SDI audio	Input: 3G/HD-SDI 16-ch 6G-SDI Dual Link 32-ch 12G-SDI 32-ch 48 kHz 16-24 bit Synchronous/Asynchronous audio Output: 3G/HD-SDI 16-ch 6G-SDI Dual Link 32-ch 12G-SDI 32-ch 48 kHz 16/20/24 bit Synchronous/Asynchronous audio
AES/EBU audio (FA-16AES-UBL)	BNC x 4 (AES/EBU input or output) 8-ch Input: 32/44.1/48 kHz 24 bit 75 Ω 1.0 V(p-p) unbalanced Output: 48 kHz 24 bit 75 Ω 1.0 V(p-p) unbalanced
AES/EBU audio (FA-16AES-PNL) <sup>(*)</sup>	BNC x 4 (AES/EBU input or output) 8-ch Input: 32/44.1/48 kHz 24 bit 75 Ω 1.0 V(p-p) unbalanced Output: 48 kHz 24 bit 75 Ω 1.0 V(p-p) unbalanced * FA-16AES-UBL required
Analog audio (FA-16ANA-AUD) <sup>(*)</sup>	25-pin D-sub (female) x 1 Input: 4-ch 600 Ω /Hi-Z balanced Output: 4-ch 100 Ω balanced 24 bit 48 kHz (A/D and D/A conversions and internal processing)

MADI audio (FA-16MADI)	<p>Input: 56/64-ch (PCM) 32/44.1/48 kHz 16-24 bit 75 Ω Micro BNC (HD-BNC <sup>(*)</sup>)x 2 56/64-ch (PCM) 32/44.1/48 kHz 16-24 bit SFP x 2 Only one stream is processed within 4 inputs.</p> <p>Output: 56/64-ch (PCM) 48 kHz 24 bit 75 Ω Micro BNC (HD-BNC <sup>(*)</sup>)x 2 56/64-ch (PCM) 32/44.1/48 kHz 24 bit SFP x 2 Four ports output the same processed audio streams.</p>
Dante audio (FA-16DNT)	<p>1000BASE-T RJ-45 x 2 (Primary/Secondary)</p> <p>Input: Max. 64-ch 44.1/48 kHz 24 bit</p> <p>Output: Max. 64-ch 48 kHz 24 bit</p>
Audio delay adjust	1ms to 1,000ms
Audio process	Sample rate converter, Gain control, Downmix, Monosum, Remap and Mute
Interfaces	
Ethernet & Control protocols	<p>&lt;LAN 1&gt; Web, Ember+ <sup>(*)</sup>, SNMP v2c (Monitor only), Remote Control: 100/1000BASE-T RJ-45 x 1</p> <p>&lt;LAN 2A/2B&gt; (With FA-16MOIP) NMOS control: 100/1000BASE-T RJ-45 x 2 (Teaming available)</p>
GPI	<p>Round connector (7 input/output)</p> <p>FA-16GPI <sup>(*)</sup>: 25-pin D-sub (female) x 1 (10-input, 10-output)</p> <p>FA-16GPI-PNL <sup>(*)</sup>: 25-pin D-sub (female) x 1 (10-input, 10-output)</p> <p>FA-16GPI required</p>
Time	<p>Time accuracy per month: ±10 seconds</p> <p>Time keeping: Approx. 60 hours</p> <p>Time correction with NTP Server</p>
Remote Control	FA-10RU (Control of some functions is available.) Sold separately.

<sup>(\*)</sup> HD-BNC is a trademark of Amphenol Corporation

<sup>(\*)</sup> Planned for future support

#### Software Option

FA-164K	<p>4K (UHD) signal processing expansion</p> <p>The following options can automatically add the FA-164K to the system. FA-16MOIP, FA-16UDC-P2, FA-16HDR-P2*, FA-16LUT-P2*</p>
FA-16UDC-P2	<p>Up-/down-/cross-conversion for 2 processors</p> <p>Version 2.00 supports only one license.</p>
FA-16HDR-P2 *	HDR color corrector for 2 processors
FA-16LUT-P2 *	3D-LUT color processing for 2 processors.

\* Planned for future support

### Hardware Option (Optional Card and Cable)

FA-16MOIP <sup>(*)1</sup>	Encapsulation/decapsulation card of ST 2022-6 <sup>(*)2</sup> / ST 2110 standards
FA-16MOIP-EX <sup>(*)1</sup>	MolP input/output expansion card (FA-16MOIP required)
FA-16AES-UBL	Digital audio (unbalanced) card.
FA-16AES-PNL <sup>(*)2</sup>	Digital audio (unbalanced) expansion panel (FA-16AES-UBL required)
FA-16DNT <sup>(*)3</sup>	Dante audio card
FA-16MADI <sup>(*)4</sup>	MADI audio card
FA-16ANA-AUD <sup>(*)2</sup>	Analog audio (balanced) 4-input / 4-output card
FA-16GPI <sup>(*)2</sup>	GPI input/output card
FA-16GPI-PNL <sup>(*)2</sup>	GPI input/output expansion panel (FA-16GPI required)

<sup>(\*)1</sup> Note that SFP transceiver modules are not equipped with the product. Please prepare appropriate SFP modules by the user.

Factory tested SFP module:

nVIDIA(Mellanox) MMA2P00-AS

PB\_MMA2P00-AS\_MMA2P00-ASHT\_25GbE\_SFP28\_MMF\_Transceiver.pdf (nvidia.com)

nVIDIA (Mellanox) MMA2L20-AR

PB\_MMA2L20-AR\_25GbE\_SFP28\_LR\_Transceiver.pdf (nvidia.com)

<sup>(\*)2</sup> Planned for future support

<sup>(\*)3</sup> Cables are not equipped with the product. Please prepare appropriate cables by the user.

<sup>(\*)4</sup> Note that SFP transceiver modules are not equipped with the product. Please prepare appropriate SFP modules by the user.

Factory tested SFP module:

RME (<https://www.rme-audio.de/home.html>) MADI-SFP-MM, MADI-SFP-SM

APAC Opto Electronics Inc. (<https://www.apacoe.com.tw/ja/>) LM38-A3S-TC-N, LS38-A3S-TC-N

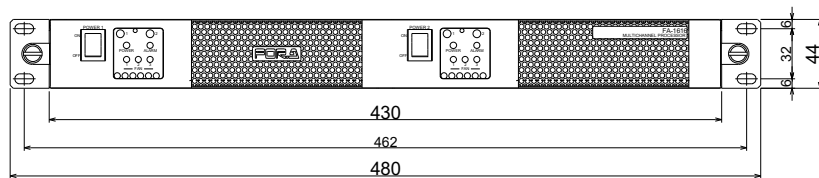
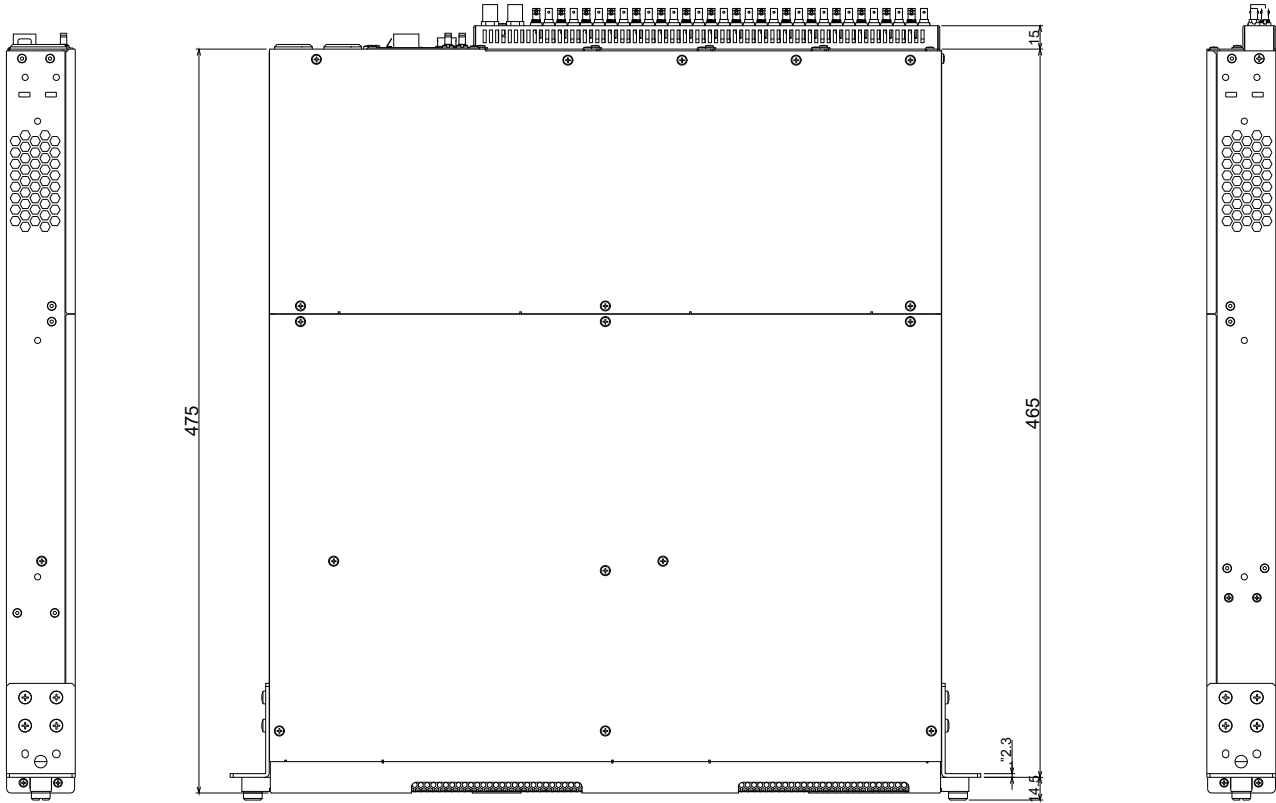
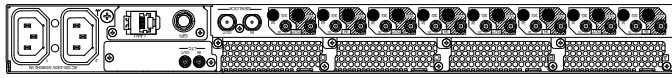
### Accessories

AC cord (2 sets), Rubber feet and Packing List sheet

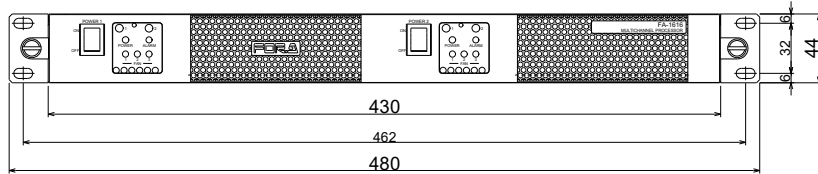
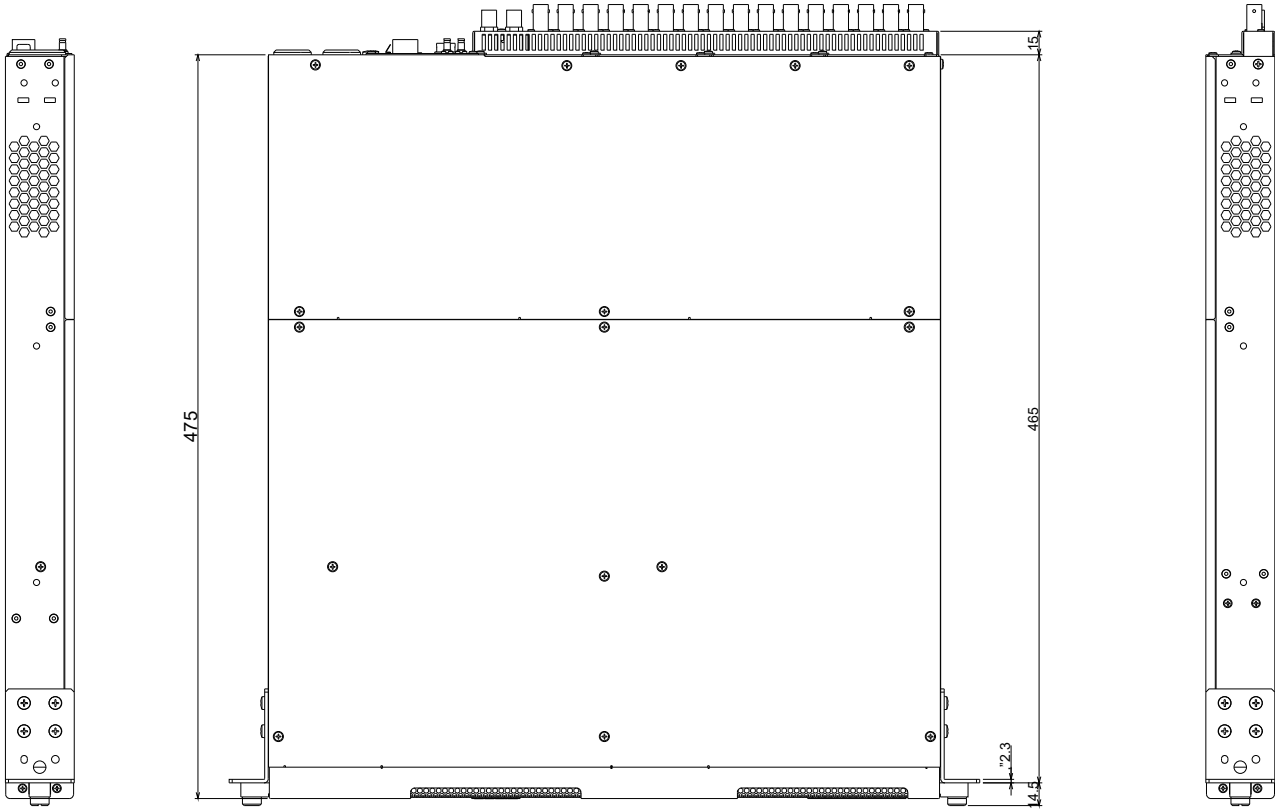
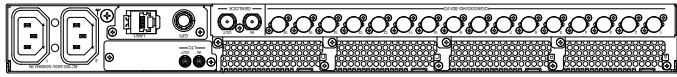
**2. External Dimensions**

FA-1616HB-12G

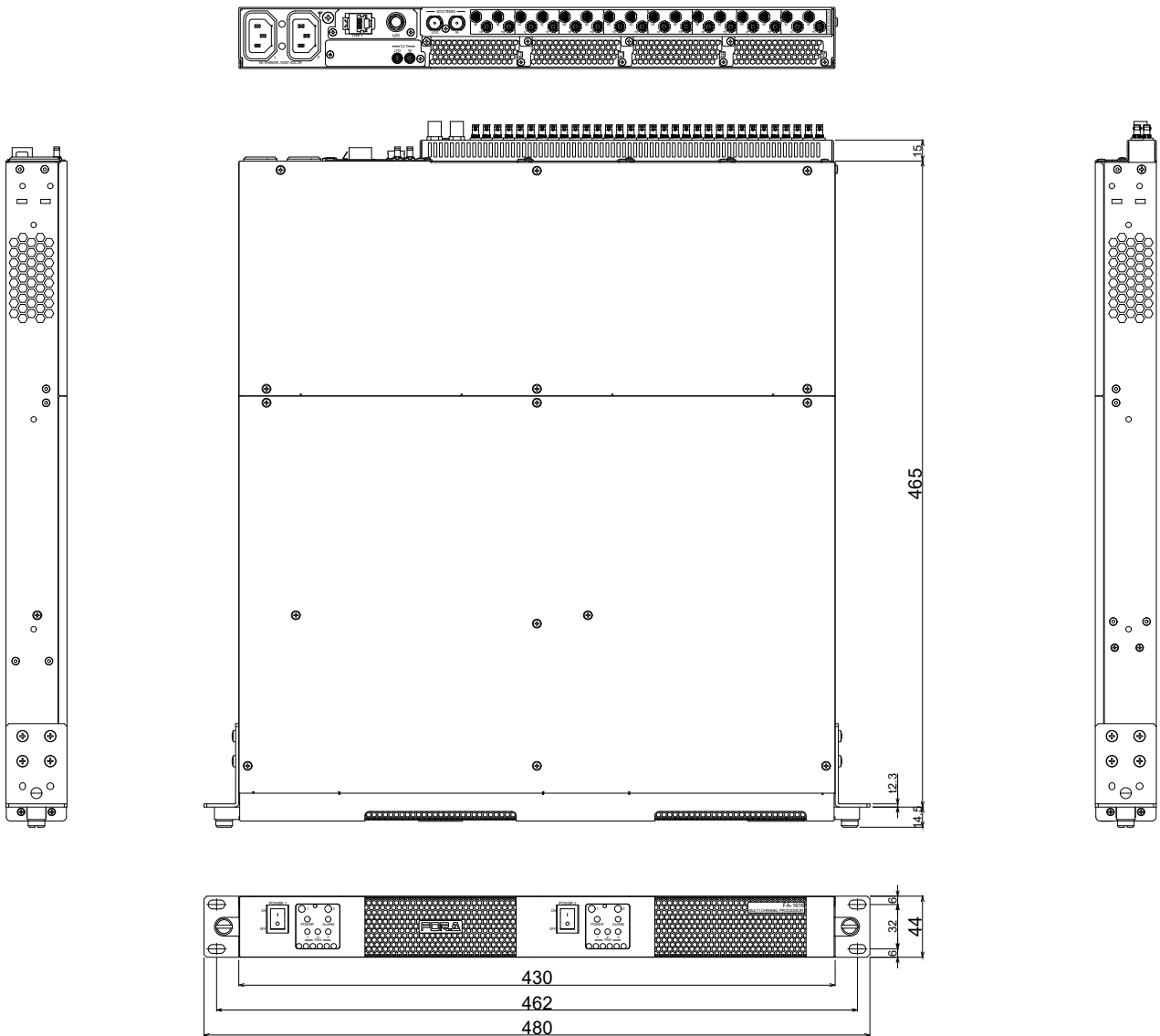
(All dimensions in mm.)



FA-1616B-12G



FA-1616HB-3G







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