Multi-channel processor
FA-1616 Series

Preliminary

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 16 channels, supporting IP/SDI (12G/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 cards¹ and a range of audio (including Dante and MADI) and GPI cards².

*1 Optional. *2 Optional, to be supported.

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

- **FA-1616HB-12G** 12G*1/3G/HD-SDI supported 16 inputs/16 outputs, HD-BNC*2 connector model.
- **FA-1616B-12G** 12G/3G/HD-SDI supported 16 inputs/outputs*3 model.
- **FA-1616HB-3G** 3G/HD-SDI supported 32 inputs/outputs*3, HD-BNC*2 connector model.

*1 12G compatibility applies to only 8 of the 16 inputs/outputs. *2 HD-BNC is a registered trademark of Amphenol Corporation. *3 Input or output is selected in a menu for each channel.

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**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.
  - 2S/SD/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.
    - Compensates for differences among external devices by using EOTF/OETF corresponding to various HDR or SDR curves.
    - EOTF/OETF log curves and gamut can be registered from a computer.
    - SDR/HDR conversion designed for an array of log curves (including HLG, PQ, and SDR) and reliable round-trip performance.
    - 1D and 3D LUTs supported.

- **GENLOCK input**
  - Timecode
    - 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.

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

- **Video input/output**
  - SMPTE ST 2022, SMPTE ST 2110.

- **Audio input/output**
  - Dante, MADI, AES/EBU, analog.

- **PTP synchronization**¹
  - Choose GENLOCK input or PTP for synchronization of each processor installed in processor block¹.

*¹ Please see page 4 for details of processor block.
**Product lineup**

**FA-1616HB-12G**

- 12G-SDI\(^1\) supported, 16 inputs/16 outputs model.
- 32 HD-BNC connectors are mounted.
  - Input: 75Ω HD-BNC ×16, 12G/3G/HD-SDI×8, 3G/HD-SDI×8.
  - Output: 75Ω HD-BNC ×16, 12G/3G/HD-SDI×8, 3G/HD-SDI×8.
- IP input/output.
  - Add the option(s)\(^2\) to choose any mode\(^3\).
  - SMPTE ST 2110
    - Transmission only: HD×16/UHD×4.
    - Receive only: HD×16/UHD×4.
  - SMPTE ST 2022-6
    - Transceiver: HD×16/3G×14.

*1 12G compatibility applies to only 8 of the 16 inputs/outputs. *2 FA-16VOIP, FA-16VOIP-EX. *3 Mode can be set per card. Number of channels indicated is for each card.

**Note:** This external view is a tentative version.

**FA-1616B-12G**

- 12G-SDI supported, 16 inputs/outputs\(^1\) model.
- All terminals support 12G-SDI.
- 16 normal HD connectors are mounted.
  - Input/output\(^2\): 75Ω BNC ×16, 12G/3G/HD-SDI×16.
- IP input/output.
  - Add the option(s)\(^2\) to choose any mode\(^4\).
  - SMPTE ST 2110
    - Transmission only: HD×16/UHD×4.
    - Receive only: HD×16/UHD×4.
  - SMPTE ST 2022-6
    - Transceiver: HD×16/3G×14.

*1 Input or output is selected in a menu for each channel. *2 Used for both input and output. *3 FA-16VOIP, FA-16VOIP-EX.

*4 Mode can be set per card. Number of channels indicated is for each card.

**FA-1616HB-3G**

- 3G-SDI supported, 32 inputs/outputs\(^1\) model.
- 32 HD-BNC connectors are mounted.
  - Input/output\(^2\): 75Ω HD-BNC ×32, 3G/HD-SDI×32.
- IP input/output.
  - SDI to IP encapsulation and IP to SDI de-encapsulation for up to 32 channels.
  - Add the option(s)\(^2\) to choose any mode\(^4\).
  - SMPTE ST 2110
    - Transmission only: HD×16/UHD×4.
    - Receive only: HD×16/UHD×4.
  - SMPTE ST 2022-6
    - Transceiver: HD×16/3G×14.

*1 Input or output is selected in a menu for each channel. *2 Used for both input and output. *3 FA-16VOIP, FA-16VOIP-EX.

*4 Mode can be set per card. Number of channels indicated is for each card.

**Note:** This external view is a tentative version.
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.

### 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:** 4×16 channels.

**Configuration example: Same configuration**

<table>
<thead>
<tr>
<th>Processor Block A</th>
<th>Processor Block B</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 blocks process video and audio for output via SDI and IP.</td>
<td>Equipped with up to 4 processors each, the blocks can be set up in the same or different configurations, depending on your application.</td>
</tr>
</tbody>
</table>

**Configuration example: Different configurations**

<table>
<thead>
<tr>
<th>Processor Block A</th>
<th>Processor Block B</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 blocks process video and audio for output via SDI and IP.</td>
<td>Equipped with up to 4 processors each, the blocks can be set up in the same or different configurations, depending on your application.</td>
</tr>
</tbody>
</table>

**Table of configurable functions for processor blocks**

Available functions will be changed depending upon the chosen configuration.

<table>
<thead>
<tr>
<th>Frame synchronizer</th>
<th>ProcAmp</th>
<th>Clip function</th>
<th>Test signal output</th>
</tr>
</thead>
<tbody>
<tr>
<td>RGB color corrector</td>
<td>HDR/SDR conversion</td>
<td>HDR/SDR conversion</td>
<td>HDR/SDR conversion</td>
</tr>
<tr>
<td>Aspect conversion</td>
<td>Resizing/positioning</td>
<td>1080/720 conversion</td>
<td>3G Level-A/B conversion</td>
</tr>
<tr>
<td>Gearbox SQD/2SI conversion</td>
<td>2K → 4K up conversion</td>
<td>4K → 2K down conversion</td>
<td>Frame delay</td>
</tr>
<tr>
<td>Audio MUX</td>
<td>Audio DEMUX</td>
<td>Audio SRC</td>
<td>Audio remapping</td>
</tr>
<tr>
<td>Audio gain</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Video processing capacity varies depending on the configuration selected. For details, contact your FOR-A dealer.
Configuration lineup selectable according to application

### Configuration 1: Standard configuration

**Configuration 1 Features**

- 4 video processors used for 2K (×4 channels) and UHD (×1 channel). Frame synchronization: up to 16 channels\(^*1\) for 2K, 4 channels\(^*1\) for UHD.
- Adding optional VoIP 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.

<table>
<thead>
<tr>
<th>Frame synchronizer</th>
<th>ProcAmp</th>
<th>Clip function</th>
<th>Test signal output</th>
</tr>
</thead>
<tbody>
<tr>
<td>RGB color corrector</td>
<td>HDR/SDR conversion</td>
<td>HDR/SDR conversion 1D LUT</td>
<td>HDR/SDR conversion 3D LUT</td>
</tr>
<tr>
<td>Aspect conversion</td>
<td>Resizing/positioning</td>
<td>1080/720 conversion</td>
<td>3G Level-A/B conversion</td>
</tr>
<tr>
<td>Gearbox SQD/2SI conversion</td>
<td>2K → 4K up conversion</td>
<td>4K → 2K down conversion</td>
<td>Frame delay Simple frame rate conversion</td>
</tr>
<tr>
<td>Audio MUX</td>
<td>Audio DEMUX</td>
<td>Audio SRC</td>
<td>Audio remapping Audio delay</td>
</tr>
<tr>
<td>Audio gain</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Configuration lineup selectable according to application

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

*1 To be supported.

Configuration 2 Features

- Configuration for switching between upconversion, downconversion, or other processing based on source signals.
- 2 high-performance processors are available.

When using converter functions such as up/down/cross/aspect converter or resizing, only 1 channel can be processed by 1 processor for both HD/4K signals.

Table of functions available in Configuration 2

* Available function is highlighted in yellow.

<table>
<thead>
<tr>
<th>Frame synchronizer</th>
<th>ProcAmp</th>
<th>Clip function</th>
<th>Test signal output</th>
</tr>
</thead>
<tbody>
<tr>
<td>RGB color corrector</td>
<td>HDR/SDR conversion</td>
<td>HDR/SDR conversion 1D LUT</td>
<td>HDR/SDR conversion 3D LUT</td>
</tr>
<tr>
<td>Aspect conversion</td>
<td>Resizing/positioning</td>
<td>1080/720 conversion</td>
<td>3G Level-A/B conversion</td>
</tr>
<tr>
<td>Gearbox SOD/2SI conversion</td>
<td>2K → 4K up conversion</td>
<td>4K → 2K down conversion</td>
<td>Frame delay</td>
</tr>
<tr>
<td>Audio MUX</td>
<td>Audio DEMUX</td>
<td>Audio SRC</td>
<td>Audio remapping</td>
</tr>
</tbody>
</table>
Configuration lineup selectable according to application

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

*1 To be supported.

Configuration 3 Features

- Configuration for switching between upconversion, downconversion, or other processing based on source signals.
- 3D LUT-based upconversion and downconversion supported.
- Without upconversion or downconversion, can also be used as a 3D LUT converter for HD/3G (×8 channels)*2 or 4K (×2 channels)*2.

*2 Configuring both processor blocks (A and B) in this way doubles the number of channels. When using converter functions such as up/down/cross/aspect converter or resizing, only 1 channel can be processed by 1 processor for both HD/4K signals.

Table of functions available in Configuration 3

* Available function is highlighted in yellow.

<table>
<thead>
<tr>
<th>Frame synchronizer</th>
<th>ProcAmp</th>
<th>Clip function</th>
<th>Test signal output</th>
</tr>
</thead>
<tbody>
<tr>
<td>RGB color corrector</td>
<td>HDR/SDR conversion</td>
<td>HDR/SDR conversion</td>
<td>HDR/SDR conversion</td>
</tr>
<tr>
<td>Aspect conversion</td>
<td>Resizing/positioning</td>
<td>1080/720 conversion</td>
<td>3G Level-A/B conversion</td>
</tr>
<tr>
<td>Gearbox SOD/2SI conversion</td>
<td>2K → 4K up conversion</td>
<td>4K → 2K down conversion</td>
<td>Flame delay</td>
</tr>
<tr>
<td>Audio MUX</td>
<td>Audio DE-MUX</td>
<td>Audio SRC</td>
<td>Audio remapping</td>
</tr>
</tbody>
</table>
**IP Support**

FA-1616 supports SMPTE ST 2110/ST 2022-6 encapsulation and de-encapsulation with an optional VoIP card. It can also be used as an IP gateway for up to 32-channel SDI/VoIP conversion. Add as many as 2 VoIP 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 VoIP card
    - For SMPTE ST 2110: 16 channels for HD/3G-SDI or 4 channels for 4K.
    - For SMPTE ST 2022-6: 16 channels for HD-SDI or 14 channels for 3G-SDI.
  - 2 dual 25 GbE (SFP28) port supports hitless operation for redundancy (SMPTE ST 2022-7).
  - 2 VoIP cards can be added to expand capacity and enable SMPTE ST 2022-6/ST 2110 transcoding.

- **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 video over IP**

- **FA-16VOIP**: Video over IP card
  Enables SMPTE ST 2022-6/ST 2110 encap/decap and PTP synchronization. Only one card can be installed.

- **FA-16VOIP-EX**: VOIP Expansion card
  Expands VoIP functionality. Only one card can be installed.
  Note: FA-16VOIP is required.

**Expansion cards for video over IP**

- **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 BNCx2, RX/TX 64ch each.

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- **FA-16MADI**: MADI audio card
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- **FA-16GPI**: General purpose interface card
  Adds support for GPI control. DSUB-25 pin x 1, 10 inputs + 10 outputs + power + GND.

- **FA-16GPI-PNL**: GPI Extension panel
  Expands channel control via GPI. DSUB-25 pin x 1.
  Note: FA-16GPI is required.

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- **FA-16AES-UBL**: Unbalanced AES audio card
  Enables input/output of AES audio. BNCx4, Rx/Tx switching supported for 8 channels.

- **FA-16AES-PNL**: AES audio expansion card
  Expands I/O channels for AES audio. BNCx4.
  Note: FA-16AES-UBL is required.

- **FA-16ANA-AUD**: Balanced analog audio card
  Enables input/output of analog audio. DSUB-25 pin x1.
  Balanced audio for 4 Rx and 4 Tx channels.

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  Note: FA-16GPI is required.

*1 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 2 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 Datasheet

### 1. Specifications

#### Basic specifications

<table>
<thead>
<tr>
<th>Specification</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Temperature</strong></td>
<td>0°C to 40°C</td>
</tr>
<tr>
<td><strong>Humidity</strong></td>
<td>30% to 90% (no condensation)</td>
</tr>
<tr>
<td><strong>Power Consumption</strong></td>
<td>FA-1616HB-12G: 207 VA (203 W) (at AC 100-120 V) 238 VA (196 W) (at AC 220-240 V)</td>
</tr>
<tr>
<td></td>
<td>W/ FA-16MOIP and FA-16MOIP-EX:</td>
</tr>
<tr>
<td></td>
<td>289 VA (286 W) (at AC 100-120 V)</td>
</tr>
<tr>
<td></td>
<td>321 VA (285 W) (at AC 220-240 V)</td>
</tr>
<tr>
<td><strong>Dimensions</strong></td>
<td>430 (W) x 480 (D) x 44 (H) mm</td>
</tr>
<tr>
<td></td>
<td>480 (W) (Including rack mount brackets)</td>
</tr>
<tr>
<td><strong>Weight</strong></td>
<td>Approx. 11.5 kg (including FA-16MOIP/MOIP-EX)</td>
</tr>
<tr>
<td><strong>Consumables</strong></td>
<td>(at 24-hour operation) Power unit: Recommended replacement period: 5 years</td>
</tr>
<tr>
<td></td>
<td>Cooling fan: P-1677 (x6), Recommended replacement period: 6 years</td>
</tr>
</tbody>
</table>

#### Technical specifications

<p>| Video format        | 2160p / 59.94, 50 (Single-Link, Dual-Link, Quad-Link)                    |
|                     | 1080p / 59.94, 50                                                        |
|                     | 1080i / 59.94, 50                                                        |
|                     | * Other formats will be supported later.                                 |
| <strong>Video input/output</strong> | FA-1616HB-12G: 12G/3G/HD-SDI 75 Ω Micro BNC (HD-BNC (1)) x 8            |
|                     | 3G/HD-SDI 75 Ω Micro BNC (HD-BNC (1)) x 8                               |
|                     | Output: 12G/3G/HD-SDI 75 Ω Micro BNC (HD-BNC (1)) x 8                   |
|                     | 3G/HD-SDI 75 Ω Micro BNC (HD-BNC (1)) x 8                               |
| <strong>FA-1616B-12G (2)</strong> | Input or output: 12G/3G/HD-SDI 75 Ω BNC x 16                            |
| <strong>FA-1616HB-3G (2)</strong> | Input or output: 3G/HD-SDI 75 Ω Micro BNC (HD-BNC (1)) x 32              |
| <strong>MoIP input/output</strong> | (FA-16MOIP) IP media transmission standard: SMPTE ST 2110, SMPTE ST 2022-6(*2) |
|                     | SFP28 MSA (25 GbE) x 4 (ST2022-7 route redundancy)                      |
|                     | Input/Output                                                            |
|                     | &lt; SMPTE ST 2110 &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: ST2110-20                                                        |
|                     | Audio: ST2110-30 Level B (16ch)                                         |
|                     | ANC data: ST2110-40                                                     |
|                     | &lt; SMPTE ST 2022-6 (2) &gt;                                                 |
|                     | Send and Receive: HD x 16 / 3G x 14                                     |
| (FA-16MOIP-EX)      | Same as above                                                           |</p>
<table>
<thead>
<tr>
<th><strong>Color sampling</strong></th>
<th>YCbCr 4:2:2 10-bit</th>
</tr>
</thead>
</table>
| **Genlock** | Input: BB (NTSC / PAL) or Tri-level Sync 75-ohm BNC x 1  
Output: BB (Input-loopthrough or generated from PTP) 75-ohm BNC x 1 |
| **Timecode** | 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** | Up-/Down-converter  
Color space conversion , Dynamic Range conversion |
| **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: 12G/3G/HD-SDI 16-ch  
48 kHz 16-24 bit Synchronous/Asynchronous audio  
Output: 3G/HD-SDI 16-ch  
12G/3G/HD-SDI 32-ch  
48 kHz 16/20/24 bit Synchronous/Asynchronous audio |
| **AES/EBU** | (FA-16AES-UBL) BNC x 4 (AES/EBU input or output) 8-ch  
Input: 32/44.1/48kHz 16-24 bit 75-ohm 1.0 V(p-p) unbalanced  
Output: 48 kHz 16-24 bit 75-ohm 1.0 V(p-p) unbalanced  
(FA-16AES-PNL) BNC x 4 (AES/EBU input or output) 8-ch  
Input: 32/44.1/48kHz 16-24 bit 1.0 V(p-p) unbalanced  
Output: 48 kHz 16-24 bit 1.0 V(p-p) unbalanced  
* FA-16AES-UBL required |
| **Analog audio** | Input: 4-ch 600-ohm /Hi-Z balanced  
Output: 4ch 100-ohmΩ balanced  
24 bit 48 kHz (A/D and D/A conversion and internal processing) |
| **MADI audio** | Input: 56/64-ch (PCM) 32/44.1/48kHz 16-24 bit 75Ω BNC x 1  
Output: 56/64-ch (PCM) 48kHz 16/20/24 bit 75Ω BNC x 1 |
| **Dante audio** | Input: Max. 64-ch 44.1/48 kHz 16/24 bit  
Output: Max. 64-ch 48 kHz 16/24 bit |
| **Audio delay adjust** | 1 ms to 1,000 ms |
| **Audio process** | Sample Rate Converter, Gain control, Downmix, Remap, Mute |
| **Interfaces** | Ethernet: MoIP control (w/ FA-16MOIP): 100BASE-TX/1000BASE-T RJ-45 x 2  
* LAN 2A/2B teaming available  
FA-1616 control: 100BASE-TX/1000BASE-T RJ-45 x 1  
Control protocol: Web, Ember+ (FA-16MOIP control): LAN 2A/2B |
| **GPI** | Round connector (7 input/output)  
FA-16GPI: 25-pin D-sub (female) x 1 (10-input, 10-output)  
FA-16GPI-PNL: 25-pin D-sub (female) x 1 (10-input, 10-output)  
FA-16GPI required |
| **Time keeping period** | Approx. 20 days |

*(1) HD-BNC is a trademark of Amphenol Corporation  
*(2) Not supported as of Ver. 1.10.
**Software Option**

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>FA-164K</td>
<td>4K (UHD) signal processing expansion</td>
</tr>
<tr>
<td>FA-16UDC-P2 *</td>
<td>Up-/down-/cross-conversion for 2 processors</td>
</tr>
<tr>
<td>FA-16HDR-P2 *</td>
<td>HDR color corrector for 2 processors</td>
</tr>
<tr>
<td>FA-16LUT-P2 *</td>
<td>3D-LUT color processing for 2 processors.</td>
</tr>
</tbody>
</table>

* Not supported as of Ver. 1.10

**Hardware Option (Optional Card and Cable)**

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>FA-16MOIP</td>
<td>Encapsulation/decapsulation card of ST 2022-6 / ST 2110 standards</td>
</tr>
<tr>
<td>FA-16MOIP-EX</td>
<td>MoIP input/output expansion card (FA-16MOIP required)</td>
</tr>
<tr>
<td>FA-16AES-UBL</td>
<td>Digital audio (unbalanced) card.</td>
</tr>
<tr>
<td>FA-16AES-PNL</td>
<td>Digital audio (unbalanced) expansion panel (FA-16AES-UBL required)</td>
</tr>
<tr>
<td>FA-16DNT</td>
<td>Dante audio card</td>
</tr>
<tr>
<td>FA-16MADI</td>
<td>MADI audio card</td>
</tr>
<tr>
<td>FA-16ANA-AUD</td>
<td>Analog audio (balanced) 4-input / 4-output card</td>
</tr>
<tr>
<td>FA-16GPI</td>
<td>GPI input/output card</td>
</tr>
<tr>
<td>FA-16GPI-PNL</td>
<td>GPI input/output expansion panel (FA-16GPI required)</td>
</tr>
</tbody>
</table>

* Not supported as of Ver. 1.10

Note that SFP transceiver modules are not equipped with the product. Please prepare appropriate SFP modules by the user.

Factory tested SFP module: MMA2P00-AS (Mellanox)

**Accessories**

AC cord and Rubber feet
2. External Dimensions

(All dimensions in mm.)
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