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

1. Specifications

Basic specifications

Temperature	0℃ to 40℃
Humidity	30% to 90% (no condensation)
Power	AC 100 V to 240 V ±10% 50/60 Hz
Consumption	
FA-1616HB-12G	290 VA (290 W) (at AC 100-120 V) 309 VA (294 W) (at AC 220-240 V) Max consumption with options 410 VA (409 W) (at AC 100-120 V) 419 VA (407 W) (at AC 220-240 V)
FA-1616B-12G	270 VA (270 W) (at AC 100-120 V) 287 VA (272 W) (at AC 220-240 V) Max consumption with options 400 VA (399 W) (at AC 100-120 V) 419 VA (407 W) (at AC 220-240 V)
FA-1616HB-3G	251 VA (251 W) (at AC 100-120 V) 264 VA (249 W) (at AC 220-240 V) Max consumption with options 381 VA (380 W) (at AC 100-120 V) 396 VA (383 W) (at AC 220-240 V)
Dimensions	430 (W) x 480 (D) x 44 (H) mm 480 (W) (Including rack mount brackets)
Weight	Approx. 11.5 kg (including 2 sets of FA-16MOIP/16MOIP-EX and FA-16ANA-AUD)
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	
FA-1616HB-12G FA-1616B-12G	2160p / 60,59.94, 50 ,30,29.97,25,24,23.98 2160PsF / 30,29.97,25,24,23.98 (Single-Link, 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
FA-1616HB-3G	2160p / 60,59.94, 50 (Quad-Link) 2160p /30, 29.97, 25, 24, 23.98 (Dual-Link, Quad-Link) 2160PsF / 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

Video input/output	
FA-1616HB-12G	Input: 12G/6G/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/6G/3G/HD-SDI 75 Ω Micro BNC (HD-BNC (*1)) x 8 3G/HD-SDI 75 Ω Micro BNC (HD-BNC (*1)) x 8
FA-1616B-12G	Input or output: 12G/6G/3G/HD-SDI 75 Ω BNC x 16
FA-1616HB-3G)	Input or output: 3G/HD-SDI 75 Ω Micro BNC (HD-BNC (*1)) x 32
MoIP input/output (FA-16MOIP) (FA-16MOIP-EX)	IP media transmission standard: SMPTE ST 2110 / ST 2022-6 SFP28 MSA 25 GbE(RS-FEC) x 4 (ST2022-7 route redundancy) SFP+ 10GBASE-SR/LR x 4 (ST2022-7 route redundancy) Video format: Same as SDI (2160PsF unsupported) <SMPTE ST 2110 Input/Output> (25GbE SFP) (10GbE SFP) Send only: HD x 16 / UHD x 4 HD x 16 / UHD x 2 Receive only: HD x 16 / UHD x 4 HD x 16 / UHD x 2 Send & Receive HD x 8 / UHD x 4 HD x 8 / UHD x 2 Video: ST 2110-20 Audio: ST2110-30, ST2110-31 Level B (2K: 16ch, 4K: 32ch) ANC data: ST 2110-40 <SMPTE ST 2110-22 (JPEG XS) Input/Output> (25GbE SFP) (10GbE SFP) Send only: HD x 8 / UHD x 4 HD x 8 / UHD x 4 (BPP2.4 or less) Receive only: HD x 8 / UHD x 4 HD x 8 / UHD x 4 (BPP2.4 or less) Send & Receive HD x 8 / UHD x 4 HD x 8 / UHD x 4 (BPP2.4 or less) Video: ST 2110-22 Audio: ST2110-30, ST2110-31 Level B (2K: 16ch, 4K: 32ch) ANC data: ST 2110-40 * Max numbers of input and output using JPEG XS Mixed use of ST 2110 is available within the capacity of SFP modules. <SMPTE ST 2022-6 Input / Output > (*2) Send & Receive: HD x 14 / 3G x 14 (25GbE SFP) Send & Receive: HD x 12 / 3G x 6 (10GbE SFP)
JPEG XS ST 2110-22 (FA-16JXS-ED-P2)	Profile: High 444.12 Level: 1k-1, 2k-1, 4k-1, 4k-2 Sublevel: Sublev2bpp, Sublev3bpp, Sublev4bpp, Sublev6bpp, Sublev9bpp Bit Depth: 10 Sample Structure: 4:2:2(YCbCr)
(FA-16MOIP-EX)	Encode compression ratio: 2K: 0.5 - 8.0 bpp / 4K: 0.5 - 5.0 bpp Decode compression ratio: 2K: 0.5 - 8.0 bpp / 4K: 0.5 - 5.0 bpp One encode or decode channel available per PRU FA-16MOIP required
PTP	Version: PTP v2 (two-step mode) Able to connect Boundary Clock / Transparent Clock (E2E) supported network switches. (PTP input to SFP1) * Note that "Transparent Clock" is a trial feature. Therefore, please test it thoroughly before use.
Color sampling	YCbCr 4:2:2 10-bit

Genlock	Input: BB (NTSC / PAL) or Tri-level Sync 75 Ω BNC x 1 Output: Input loop-through: BB (NTSC/PAL), tri-level sync or BB generated from Genlock In or PTP, 75 Ω BNC x 1 * If there is no Genlock In/PTP, BB generated from the internal clock.
Timecode	LTC input: DIN 1.0/2.3 x 1 (SMPTE 12M-1 compatible) LTC output: DIN 1.0/2.3 x 1 (SMPTE 12M-1 compatible SDI input/output: Ancillary timecode (LTC/VITC) (SMPTE 12M-2 compatible) MoIP input/output: Ancillary timecode (LTC/VITC) (SMPTE 2110-40 / 12M-2 compatible) Feature: Generator (Source selectable from PTP, LTC, SDI, etc.) Reader (Source selection and ± offset)
Ancillary data	H ANC data: All data passed-through or overwritten Overwrite: Audio and timecode insertion selectable V ANC data: All data passed-through, erased or rewritten Rewrite: Pass-through data selectable
Sync mode	Frame, Line, AVDL Frame: Hysteresis selection for handling signals with significant phase jitter Line: Adjustable range selectable from Minimum, 0.5H and 0.75H AVDL: Alignment with up to 5 lines.
Converter (FA-16UDC-P2)	Up-/Down-/Cross-conversion*, Interlace-progressive conversion*, Level A-B conversion, Enhancer *, Anti-Alias*, Noise Reducer*, Crop*, Resize*, Simple framerate conversion, 2SI-SQD conversion (4K) * HD: One channel available (in 4 channels) per PRU 4K: One channel available per PRU
Color processing	<Standard features> Proc Amp: Video level, Chroma Level, Black level, Hue Color Corrector: Balance (RGB) mode, Differential (YCbCr) mode Video Clip: Knee Clip (RGB), YCbCr Clip <Optional features> Color space and dynamic range and 1D LUT Gamma conversions (FA-16HDR-P2) Color space and dynamic range and 3D LUT Gamma conversions (FA-16LUT-P2) HD: Four channels available per PRU 4K: One channel available per PRU
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 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 bitt 75 Ω 1.0 V(p-p) unbalanced
AES/EBU audio (FA-16AES-PNL))	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)	25-pin D-sub (female) x 1 Input: 4-ch (2 stereo pairs) 600 Ω /Hi-Z balanced

	Output: 4-ch (2 stereo pairs) 100 Ω balanced A/D and D/A conversions and internal processing: 24 bit 48 kHz Input/output level adjustment: +8, +4, 0, -10 dBu Max: +24 dBu Frequency Response: Within ±0.3dB (20 Hz to 20 kHz) Distortion rate: 0.05% or less (1 kHz, +24 dBu) S/N: 90dB or better (at maximum level input)
MADI audio (FA-16MADI)	Input: 56/64-ch (PCM) 32/44.1/48 kHz 16-24 bit 75 Ω Micro BNC (HD-BNC (*1))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. Output: 56/64-ch (PCM) 48 kHz 24 bit 75 Ω Micro BNC (HD-BNC (*1))x 2 56/64-ch (PCM) 48 kHz 24 bit SFP x 2 Four ports output the same processed audio streams.
Dante audio (FA-16DNT)	1000BASE-T RJ-45 x 2 (Primary/Secondary) Input: Max. 64-ch 44.1/48 kHz 24 bit Output: Max. 64-ch 48 kHz 24 bit
Audio delay adjust	1ms to 1,000ms
Audio process	Sample rate converter, Gain control, Downmix, Monosum, Remap, Mute and Tone
Interfaces	
Ethernet & Control protocols	<LAN 1> Web, Ember+ (*2), SNMP v2c (Monitoring only), Remote Control: 100BASE-TX RJ-45 x 1 <LAN 2A/2B> (With FA-16MOIP) NMOS control: 100BASE-TX RJ-45 x 2 (Teaming available)
GPI	Round connector (7 input/output) FA-16GPI : 25-pin D-sub (female) x 1 (10-input, 10-output) FA-16GPI-PN : 25-pin D-sub (female) x 1 (10-input, 10-output) * FA-16GPI required
Time	Time accuracy per month: ±10 seconds Time keeping: 60 hours Time correction with NTP Server
Remote Control (Separate purchase)	FA-10RU Features: Process Amplifier / Color Correct / Video Clip / PRU Input Select / Video Format / Synchronizer / Video Test Signal / Freeze / Audio Delay / Audio Gain / Audio Test Signal / Mute / Event Memory * FA-10RU-1616 software required. FA-10DCCRU Features: Process Amplifier / Color Correct / Video Clip / Freeze / HDR / Event Memory * FA-10DCCRU-1616 software required.

(*1) HD-BNC is a trademark of Amphenol Corporation.
(*2) Some functions can be controlled.

Software Option

FA-164K	Option to enable 4K (UHD) signal processing. The following options automatically add the FA-164K to the system. FA-16MOIP, FA-16UDC-P2, FA-16HDR-P2, FA-16LUT-P2, FA-16JXS-ED-P2

FA-16UDC-P2 (*1)	Up-/down-/cross-conversion for 2 processors (PRUs) Do not use with FA-16JXS-ED-P2 at the same time.
FA-16HDR-P2	Gamut and dynamic range converter by 1D LUT for 2 PRUs. FA-16HDR-P2 and FA-16LUT-P2 cannot be assigned to the same BLOCK. Do not use with FA-16JXS-ED-P2 at the same time.
FA-16LUT-P2	Gamut and dynamic range converter by 3D LUT for 2 PRUs. FA-16HDR-P2 and FA-16LUT-P2 cannot be assigned to the same BLOCK. Do not use with FA-16JXS-ED-P2 at the same time.
FA-16JXS-ED-P2	JPEG XS(ST2110-22) encoder/decoder for 2 PRUs FA-16MOIP option required. Do not use with FA-16UDC-P2, FA-16HDR-P2 or FA-16LUT-P2 at the same time.

(*1) FA-16UDC-P2 can convert one 2K and 4K video signal with one PRU. When the maximum license is added, conversion of up to 8 channels is possible.

Hardware Option (Optional Card and Cable)

ITEM	QTY	REMARKS
FA-16MOIP (*1) (*2)	1	Encapsulation/decapsulation of ST2022-6 and ST2110 standards
FA-16MOIP-EX (*1) (*2)	1	MoIP input/output expansion card * FA-16MOIP required
FA-16AES-UBL (*2)	1-4	Digital audio (unbalanced) expansion card
FA-16AES-PNL (*2)	1-2	Digital audio (unbalanced) input/output expansion card * FA-16AES-UBL required
FA-16DNT (*2)	1-4	Dante audio card
FA-16MADI (*2) (*3)	1-4	MADI audio card
FA-16ANA-AUD (*2)	1-4	Analog audio (balanced) 4-input / 4-output card
FA-16GPI (*2)	1-4	GPI input/output card
FA-16GPI-PNL (*2)	1-2	GPI input/output expansion panel * FA-16GPI required

(*1) Note that SFP transceiver modules are not equipped with the product. Please prepare appropriate SFP modules by the user.
Factory tested 25GbE 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)
Factory tested 10GbE SFP module:
Coherent (II-VI) FTLX8574D3BCL Coherent (II-VI) FTLX1475D3BCL
* All SFP modules installed in the FA-16MOIP card should be the same speed.
All SFP modules installed in the FA-16MOIP-EX card should be the same speed.

(*2) Cables are not equipped with the product. Please prepare appropriate cables by the user.

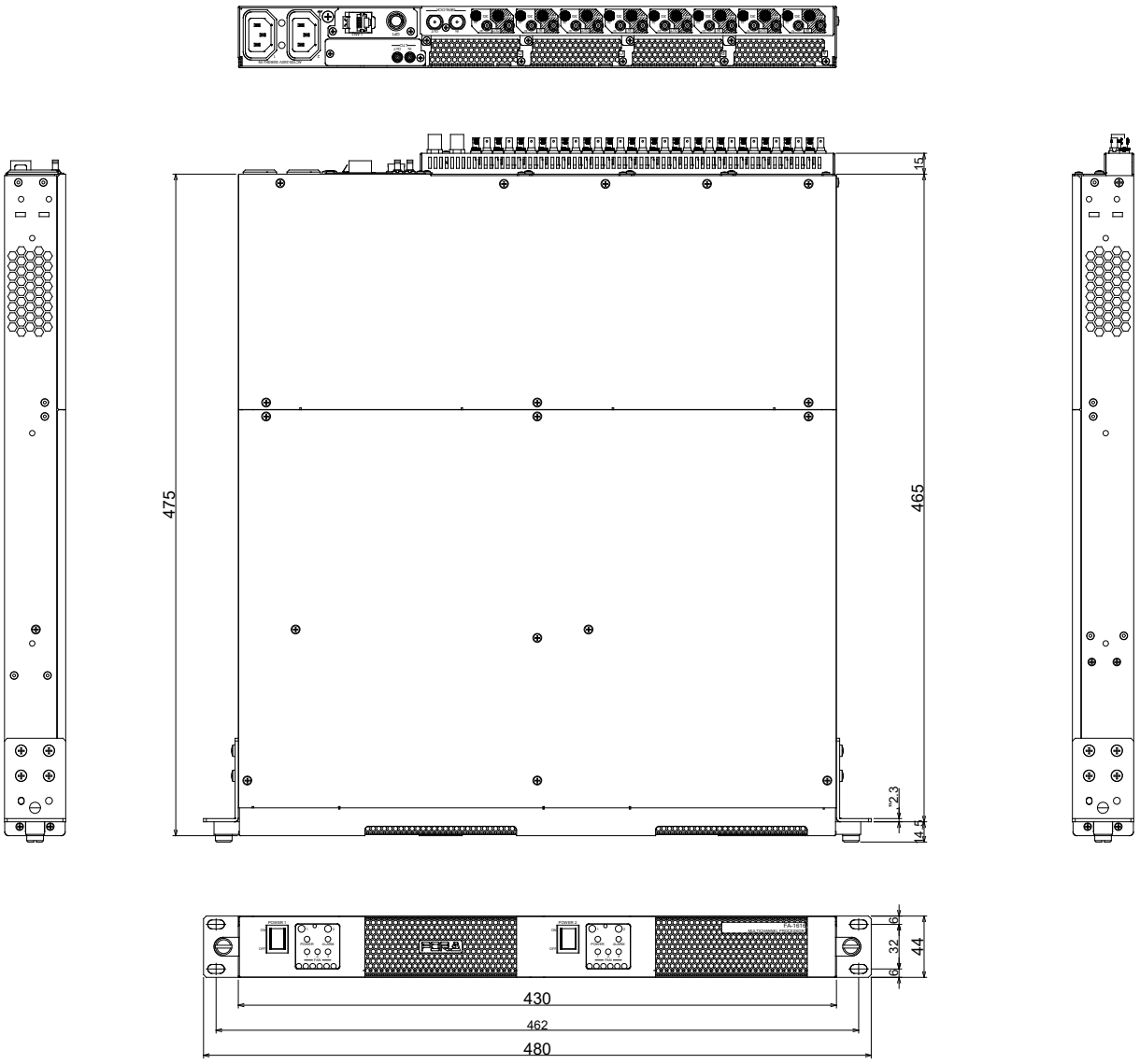
(*3) Note that SFP transceiver modules are not equipped with the product. Please prepare appropriate SFP modules by the user.
Factory tested SFP module:
RME (https://www.rme-audio.de/home.html)
MADI-SFP-MM MADI-SFP-SM
APAC Opto Electronics Inc. (https://www.apacoe.com.tw/ja/)
LM38-A3S-TC-N LS38-A3S-TC-N

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

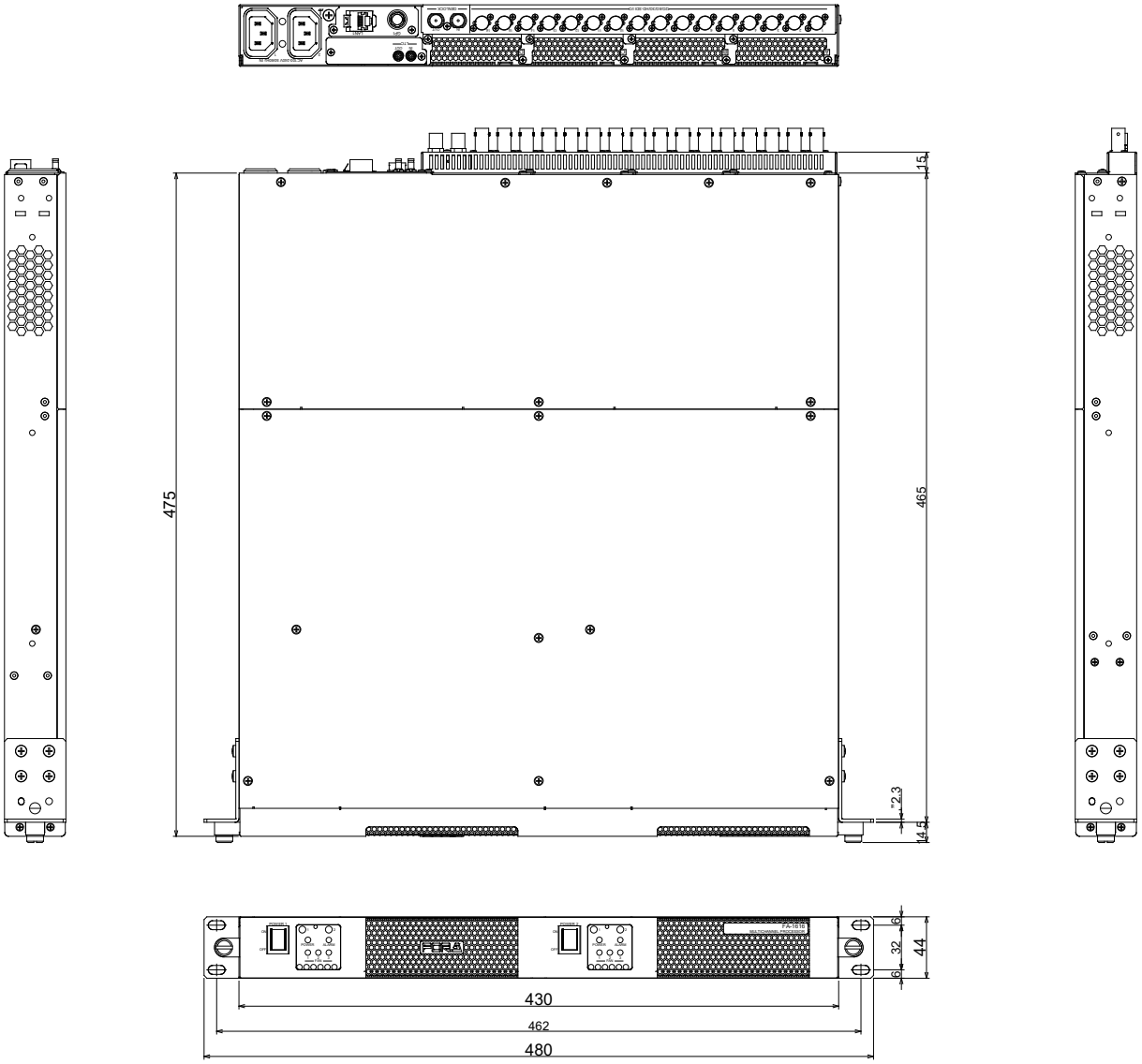
2. External Dimensions

(All dimensions in mm.)

FA-1616HB-12G



FA-1616B-12G



FA-1616HB-3G