BOLIN

EX-ULTRA
Outdoor PTZ Camera

EXU248F

Redefining The Outdoor PTZ Camera Experience

4K Outdoor PTZ Camera with 1.0-type Exmor R CMOS Sensor

The EXU248F outdoor 4K PTZ camera is equipped with Sony 1 Inch large 4K CMOS sensor image block with 48X zoom range Zeiss lens to provide Full HD(1080P60) and 4K30 high-quality Ultra High-Definition image to output HDMI, 6G-SDI, Optical SDI, and IP video streaming for POV, broadcast, operational awareness, sport application in outdoor environment and even in extreme weather conditions.
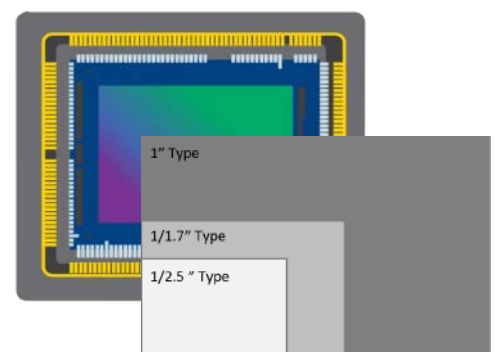
EXU248F

KEY FEATURES

- Sony image block with 1 Inch large 4K sensor
- Zeiss Vario-Sonnar T lens with 48X zoom range
- Resolution 4K 2160p29.97, 1080i59.94, 1080p60
- IP Video Resolution: Up to 2160p30, 1080p60
- Video Output: Simultaneous 6G-SDI, HDMI, IP
- FPGA FAST HEVC Ultra Low Lantency
- SFP Optical SDI video output
- Black Level, Color Matrix, Image Stabilizer
- RTSP. RTMP, SRT Supported
- Visca Over IP, Onvif, FreeD, Serial Control Supported
- Weatherproof IP67 rated

IMAGE MODULE

- EXU248F 4K PTZ Camera produces brilliant broadcast-quality color images in Full HD and 4K30 with excellent low-light sensitivity.
- 1 inch type Exmor R CMOS large sensor, 14.4 Megapixels
- Zeiss Vario-Sonnar T lens, Zoom Range 48X at FHD, 18X at 4K
- Constant aperture of F2.8, excellent low light sensitivity
- Full HD footage can be captured at 1080p60 optimal for fast, spontaneous action events.
- Optical Image Stabilizer
- The camera can also be operated in 23.98p/24p mode for Cinematic video.
- Black Level
- Color Matrix
- ND Filter
- True WDR

FEATURES

EXU248F Output Interface

Dual 6G-SDI	HDMI 2.0	SFP Optical SDI	Genlock
4K IP Streaming	AVC/HEVC	RTSP, RTMP, RTMPS, SRT	True Dual-Output
All Video with Audio Embedded	XLR Broadcast Audio Input/Output	On-screen Character Generator	Serial/IP Control
High-Quality	Low Latency	Low Bandwidth	Power Output

Full Broadcast SDI Format and Standard

Full Format
3840 x 2160P 30/29.97/25/24/23.98
1920 x 1080P 60/59.94/50/30/29.97/25/24/23.98
1920 x 1080i   60/59.94/50
1280 x 720P   60/59.94/50

SDI Standard
SMPTE 292M
SMPTE 296M (1.5Gb/s)
SMPTE 424M
SMPTE 274M
SMPTE 425-A (3Gb/s)
SMPTE 2081(6Gb/s)
SMPTE 2082-1(12Gb/s)
With SMPTE352 SDI Metadata Supported

- External Synchronization Genlock
- Audio embedded with all video output
- XLR broadcast audio input/output
- On-screen character generator
- All firmware upgrade via IP
- Tally Light
- Power Output for 3rd device
- POE++ and 24VDC/AC
- Rain Wiper built-in
- Weatherproof IP67 rated with tail cable cover for permanent mount
- Rainwater protection cover with cable support for tripod mount use

ZOOM 48X

FEATURES

48X Zoom Range

- The high-quality 4K lens offers a bright F2.8 maximum aperture and up to 48X zoom range when FHD resolution is used.
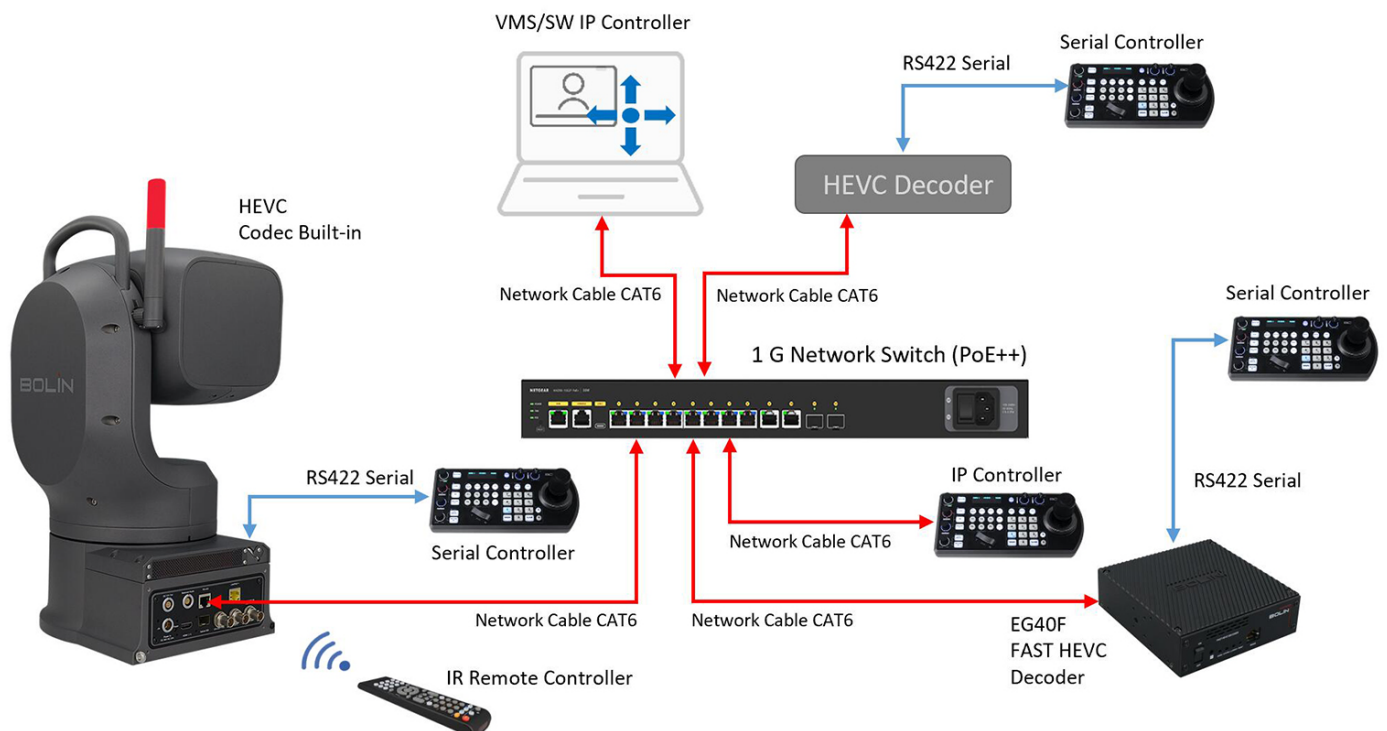- See EXU248F 48X Zoom Range Performance video on Bolin's website.

FreeD Protocol Integrated for VR/AR Video Production

FreeD helps provide all the axis data needed for a Bolin PTZ camera to intelligently and smoothly pan, tilt, and zoom while following targeted objects and people. Broadcasters can combine Bolin's FreeD-enabled PTZ cameras with available, sophisticated software to automate complex camera operations with spectacular results. It is especially useful for virtual live video productions with baseband video feeds and, with Bolin PTZ cameras, with ultra-low latency AV Over IP streaming
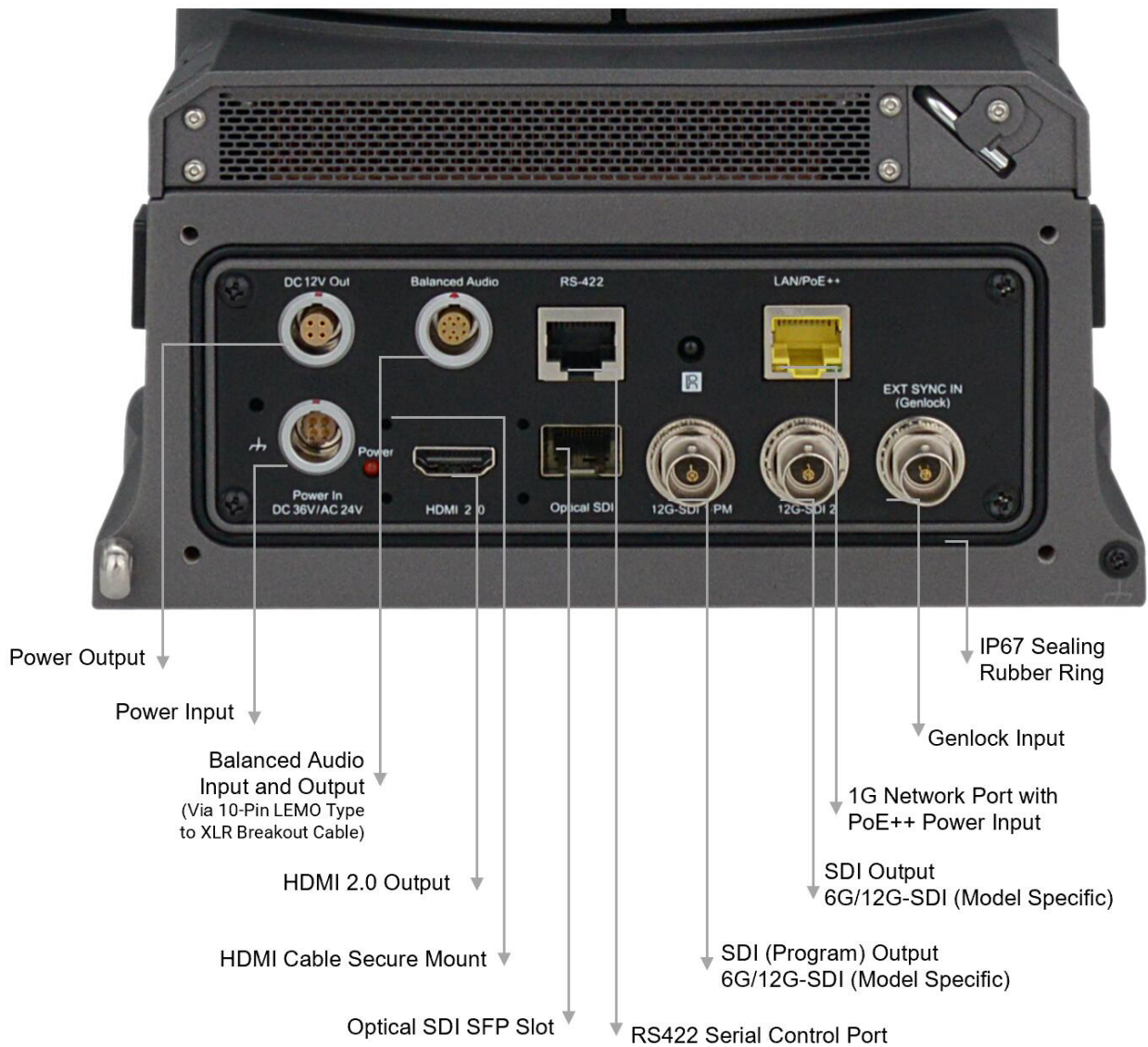

Various Control Methods

- IP Control, Serial Control, IR Remote Control, Rest API-Software Control
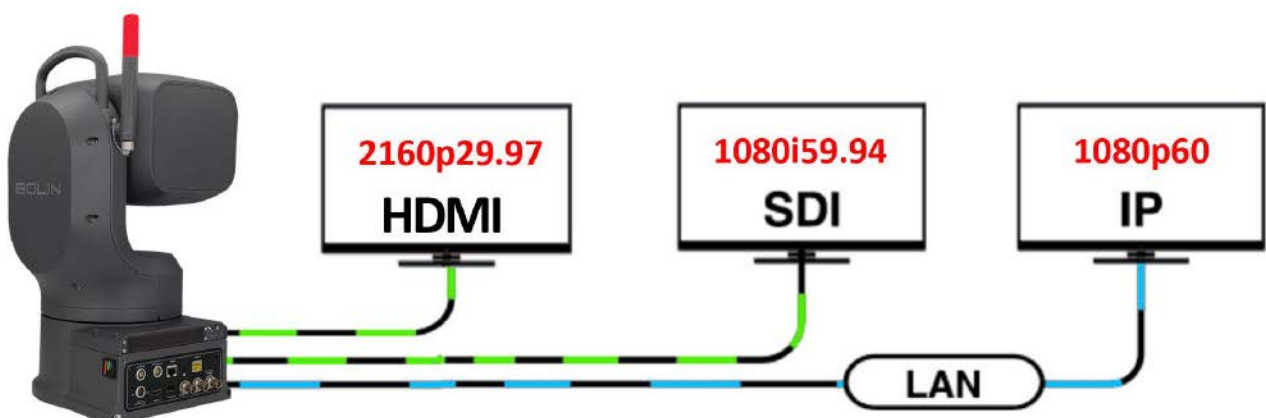- Protocol Supported: VISCA Over IP, ONVIF, VISCA, PELCO P/D, FreeD

OUTPUT

Power Output

Power Input

Balanced Audio
Input and Output
(Via 10-Pin LEMO Type
to XLR Breakout Cable)

HDMI 2.0 Output

HDMI Cable Secure Mount

Optical SDI SFP Slot

RS422 Serial Control Port

SDI (Program) Output
6G/12G-SDI (Model Specific)

SDI Output
6G/12G-SDI (Model Specific)

1G Network Port with
PoE++ Power Input

Genlock Input

IP67 Sealing
Rubber Ring

True Tri-Output

IP, SDI, and HDMI can be set to independent formats for different application use

NDAA Compliant

FAST HEVC

High Quality
Low Bandwidth
Low Latency

- Up to 4K60
- Dual stream, Multicast Support
- RTSP, RTMP, RTMPS, SRT, ONVIF
- IP Control protocol: Visca Over IP, Onvif
- Compatible With Standard AVC/HEVC
- Software Decode and Hardware Decode
- H.264/265 open platform, codec from AMD/Xilinx MPSoC

FAST AVC/HEVC, FPGA hardware codec,
Utilizing AMD/Xilinx MPSoC to deliver

*Only **45Mbps** bandwidth that streaming **4K60** at 4:2:2 12bit*
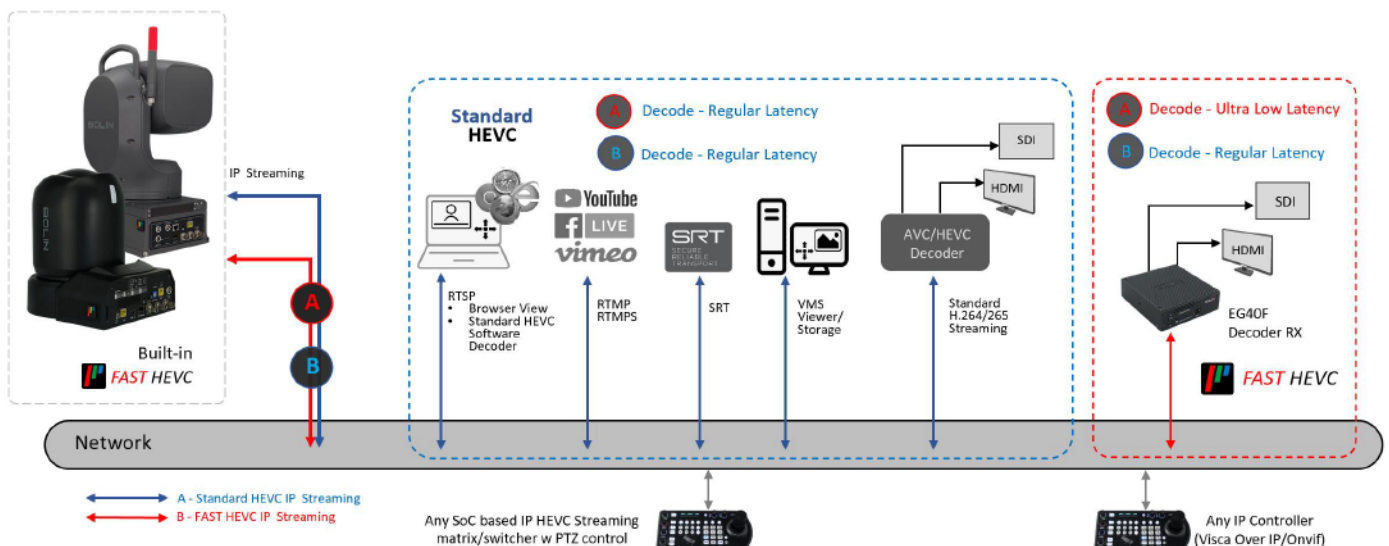*in less than **2 frame/s (32ms)** latency*

Comparison-The Facts of FAST HEVC Performance*

Fundation	Platform	Codec	1080p59.94/60			2160p59.94/60		
			Quality (Up To)	Latency (Point-to Point)	Bandwidth	Quality (Up To)	Latency (Point-to Point)	Bandwidth
H.264/265 AVC/HEVC	Software SOC	Stand HEVC	420SP(NV12)	4 frame/70ms	8Mbps	420SP(NV12)	25 frame/430ms	16Mbps
	Hardware SOC	Stand HEVC	4:2:2/12bit	2 frame/30ms	8Mbps	NA		
	Hardware FPGA	FAST HEVC	4:2:2/12bit(NV16)	2 frame/25ms	8-30Mbps	4:2:2/12bit(NV16)	2 frame/30ms	16-65Mbps
NDI	Hardware FPGA	Full NDI	4:2:2/10bit	3 frame/50ms	150Mbps	4:2:2/10bit	4 frame/70ms	300Mbps
Dante AV-Ultra	Hardware FPGA	JPEG 2K	4:2:2/12bit	1 frame/6ms	250Mbps	4:2:2/12bit	1 frame/8ms	550Mbps

*Results may vary depending on network configuration and management settings.
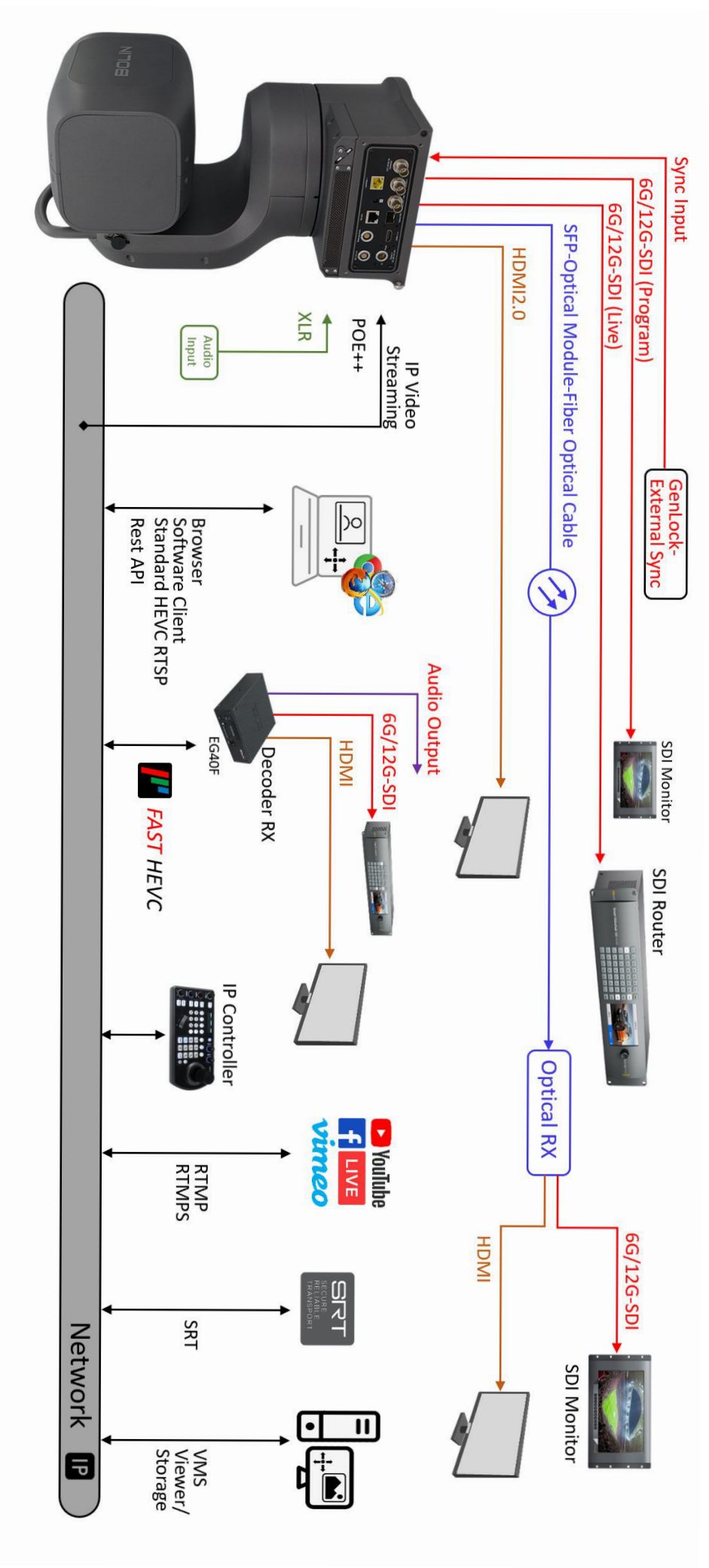
Open Platform
FAST HEVC Codec

Bolin FAST HEVC codec camera can be decoded by standard HEVC decoder but will not have Ultra Low Latency

HEVC codec camera/device can be decoded by Bolin FAST HEVC decoder but will not have Ultra Low Latency

Sync Input

6G/12G-SDI (Program)

6G/12G-SDI (Live)

SFP-Optical Module-Fiber Optical Cable

HDMI2.0

GenLock-
External Sync

XLR

Audio Input

POE++

IP Video Streaming

Browser
Software Client
Standard HEVC RTSP
Rest API

EG40F

Decoder RX

FAST HEVC

Audio Output

6G/12G-SDI

HDMI

IP Controller

SDI Monitor

SDI Router

Optical RX

RTMP
RTMPS

YouTube
vimeo
LIVE

SRT
SECURE RELIABLE TRANSPORT

6G/12G-SDI

HDMI

SDI Monitor

VMS
Viewer/
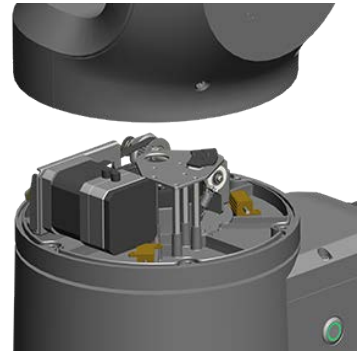Storage

Network
IP

*Genlock Input On Decoder is model specific

RUGGED and DURABLE

Sun Shield and
Hidden-Type Rain Wiper

All stainless Steel/brass/metal
interior mechanical parts

Rainwater protection cover
with cable support
for tripod mount use

Weatherproof IP67 rated
with tail cable cover
for permanent mount use

- Wind Load Durability, Non-Destructive and steady operation at up to 60 m/s
- Heater, Defroster built-in
- –40 °C to 60 °C (-40°F to 140°F) operational

INSTALLATION

Permanent Installation
- IP67 wall mount bracket (ES-WM)
- Quick release docking system
- Wiring conduit/pipe interface
- Upright/Pendant Mount
- Waterproof compartment for accessories
- Ceiling pendent mount (C-PMBA)

Live Production
- Tripod mount
- Tripod mount rain waterproof rear panel cover
- Cable support
- ¼", 3/8" tripod threads

Vibration Absorption Platform (VAP-10)
- Use on Stage, Vehicle, Moving Platform, Vibration Prone Environments

Base Mount (QR-BM)
- For flat surface upright mount
- Quick release docking system

MOVEMENT

Smooth and Accurate Movement

- PAN: 340° (-170° to +170°); Fully proportional speed 0.01° to 60°/s
- TILT: 210° (-90° to +120°); Fully proportional speed 0.01° to 60°/s
- Preset: 255 positions, Speed 100°/s, 0~5 Level Adjustable, Accuracy: 0.03°
- Picture Profile Preset
- Motionless Preset
- PTZ Trace Memory
- Noise Criterion less than NC55
- ZDP (Zero Deviation Positioning), Position Deviation Self-Correction

Tally Light
- 360 degree viewable tally light
- Removable when tally light is not needed

SPECIFICATIONS

Model Number	EXU248F
Codec	FAST HEVC
Camera Image	48X FHD
Image Maker	Sony Image Block
Image Sensor	1.0-type back-illuminated Exmor R CMOS sensor
Number of effective pixels	14.2 Megapixels
Picture elements	3840 x 2160, 8.29 Megapixels
Lens	Zeiss Vario-Sonnar T lens, Zoom range 48X(FHD)/18X(4K)
Horizontal Angle of View	64.6˚ (Wide) - 6.1˚ (Tele),
Vertical Angle of View	39.2˚ (Wide) - 3.4˚ (Tele),
Focal Length	f=9.3 to 111.6mm, F2.8(Wide) ,F4.5(Tele)
Min. object distance	80mm (Wide), 1000mm (Tele)
Aperture	F2.8 Constant (W)~F4.5(T), 16 Steps
Min. Illumination	0.5 lx (1/30 sec, 50%, High Sensitivity On)
	2.0 lx (1/30 sec, 50%, High Sensitivity Off)
Shutter Speed	1/1 sec to 1/10000 sec (28 steps)
Focus	Spot Focus, Auto Focus(Trigger/Interval), Manual Focus(Variable Speed), One Push Trigger, Near Limit,
White Balance	AUTO, ATW, Indoor, Outdoor, One Push WB, Manual WB, Outdoor Auto, Sodium Vapor Lamp (Fix/Auto/Outdoor Auto)
Exposure	Full Auto, Gain, Shutter Priority, Iris Priority, Manual, Bright
Features	High Sensitivity, Backlight Compensation, HLC, E-FLIP, Mirror, Day/Night
WDR	YES(130dB), Shown as VISIBILITY ENHANCER in OSD
ND Filter	Yes
Image Stabilizer	YES, Optical Image Stabilizer
Color Gain	Yes (15 step)
Color Hue	Yes (15 step)
Gamma	Standard/Straight/Pattern
Gamma Level	Yes (15 step)
Black Level	Yes (97 step)
Black Gamma	Yes (15 step)
Color Matrix	Off/Standard/High Saturation/FL light
Noise Reduction	On/Off (level 5 to 1 / Off, 6 steps), 2D/3D
S/N Ratio	≥50db
HLC	Yes
E-Flip	Yes
Privacy Zone Masking	Yes
Defog	Yes, (off, low, mid, high)
High Sensitivity	Yes
Slow AE Response	Yes
Day/Night	Yes
Backlight Compensation	Yes
Mechanical	
Pan Movement	PAN: 340° (-170° to +170°); Fully proportional 0.01° to 60°/s
Tilt Movement	TILT: 210° (-90° to +120°); Fully proportional 0.01° to 60°/s
Speed Proportional	Pan/Tilt Speed proportional to zoom range
Preset Position	255 positions, Speed 100°/s, 0~5 Level Adjustable, Accuracy: 0.03°
Preset Memory	Picture Profile Preset-Preset Memory for image parameters: Backlight Compensation, White Balance, R-Gain/B-Gain, Auto Exposure, Bright, Iris, Shutter, Gain, Aperture, Effect, Noise Reduction, Mirror, Gamma, Ex-COMP, Color Hue, Contrast etc.)
Motionless Preset	YES, ON/OFF
PTZ Trace Memory	YES, 12
Cruise	YES, 4
Quietness	NC55(45/35) or less when operating speed is 60°/30°/15°/sec or less
Home Position	Yes
FreeD	Yes, FreeD protocol for AR/VR camera tracking, via serial control/IP
Position Deviation Correction	Optical
Turning Radius	PAN: Φ 400 mm TILT: Φ 480 mm
Environmental	Outdoor, IP67 compliant for Waterproof and Dust Proof
Body Finishing	C5 Corrosion Resistant Power Coating
Wind Load Durability	Wind Load Durability, Non-Destructive and steady operation at 60 m/s or less
Wiper	Yes
Heater	Yes
Defroster	Yes
Interface	
HDMI Video Output	HDMI 2.0 Type A
SDI Video Output	6G-SDI, SMPTE424M /SMPTE292M /SMPTE 296M / SMPTE 274M /SMPTE ST-2081 standards, 75Ω BNC x 2，SDI/PM for output to has OSD display
SDI Optical Fiber Output	Optical 12G-SDI (Module Excluded). Detachable slot, Connector: Duplex LC (optional via ST, LC or SMPTE)
	Laser Unit: Single-mode 1,310nm DFB-LD transmitter and PIN receiver Complaint with MSA SFP+ Specification SFF-8402.
Network LAN Port	RJ45X1, Standard 10M/100M/1000M Base-TX Ethernet, LAN connector for IP control/video output/audio output/System FW Upgrade
Synchronization System	Internal/External synchronization (BBS/Tri-level sync)
External Sync Input	Genlock, BNC connector, BBS (Black Burst Sync), tri-level sync supported
Audio Input	• 2 channels, XLR balanced input (Mini XLR - Hirose Connector)
	• Input signal level: 0 dBu, • Volume variable range: –40 dB to +12 dB (can be changed in 1 dB steps in the menu)
Audio Output*	• 2 channels, XLR balanced input (Mini XLR - Hirose Connector); Embedded with main HDMI, 24bit Stereo, Embedded with SDI, 24bit Stereo
	• 4 channels, superimposed over SDI & HDMI output, Sampling frequency: 48 kHz (synchronized to video) • Quantization bit rate: 24-bit (LPCM) • Audio compression format (IP): G.726, AAC-LC (High quality)
Tally Light	Red, Green Color, Front
System Firmware Upgrade	Upgrade via IP for camera system MCU, Driver, FPGA and Encoder
Power Connector Type	INPUT: DC24V,Pin connector
	INPUT: RJ45, PoE++ (IEEE802.3bt)
	OUTPUT: 12VDC, Pin connector
Control Interface	RJ45X1-RS422, RJ45X1-IP Control, IR Remote Control
Control Protocol	Serial: VISCA, PELCO P/D, FreeD; IP: VISCA Over IP, ONVIF

SPECIFICATIONS

Model Number	EXU248F
Codec	FAST HEVC

HDMI Video Signal System

HDMI Video Format	3840 x 2160p/29.97/30/25/23.98/24 1920 x 1080p/59.94/60/50/29.97/30/25/23.98/24 1920 x 1080i/59.94/60/50 1280 x 720p/59.94/60/50
Color Precision	12bit(HDMI), YUV4:2:2, YUV4:2:0
Color Space	YUV、RGB
OSD Menu Display	Yes, with image insert
On-Screen Title	Yes, video embedded On-Screen title character generator

SDI Signal Format

SDI Video Format	3840 x 2160p/29.97/30/25/23.98/24 1920 x 1080p/59.94/60/50/29.97/30/25/23.98/24 1920 x 1080i/59.94/60/50 1280 x 720p/59.94/60/50
Color Precision	10bit(SDI), YUV 4:2:2
Color Space	YUV
Standard	SMPTE 292M，SMPTE 296M (1.5Gb/s), SMPTE 424M, SMPTE 274M，SMPTE 425-A (3Gb/s), SMPTE 2081(6Gb/s), SMPTE 2082-1（12Gb/s）standard / 75 Ω (BNC x 1)，With SMPTE352 SDI Metadata Supported
True Dual Output	HDMI and SDI signal can be set to independent resolution formats
OSD Menu Display	Yes
On-Screen Title	Yes, video embedded On-Screen title character generator

Network

Video Compression (Codec)	AVC-H.264/HEVC-H.265/MJPEG/MP4 by FPGA
IP Resolution/Frame Rate	3840x2160p30/25, 1920x1080p60/50/30/25, 1280x720p60/50
True Dual Output	IP, HDMI, and SDI signal can be set to independent resolution formats
IP Protocols	TCP/IP, IGMP, ICMP, ARP, QoS, SNMP, UDP, HTTP, DNS, DHCP, FTP, NTP, UPNP, SRT
Application Protocols	RTMP，RTSP，RTP Streaming (Unicast, Multicast)，MP2TS over UDP (Unicast, Multicast)，TS over RTP，TS over SRT, WebRTC, RTSP Encryption
Color Format	10bit, YUV 4:2:2
Multi-stream	2 stream
Audio Compression	64Kbps(G.711) / 16Kbps(G.722.1) / 16Kbps(G.726) / 32-128Kbps(MP2L2) / 32-128Kbps(AAC-LC) Selectable
OSD	Customized OSD
Compatible Integration	ONVIF2.4 (Profile S/G/T), VISCA Over IP
Bandwidth (results may vary depending on network configuration	30-50Mbps, 4kp60 10 bit 4:2:2 10-20Mbps, 1080p60 10 bit 4:2:2
Latency (Overall latency may increase depending on network configurations)	2-3 frame (e.g. 2160p60 latency is < 45ms glass to glass)
Browser Support	HTML5 support for Microsoft Edge, Google Chrome, Firefox, and Safari

General

Operating Temperature	–40 °C to 60 °C (-40°F to 140°F), (PoE is not suggested to be used and camera preheating automatically will be processed when -15°C (5°F) or less)
Operating Humidity	100% Suitable for Use (no condensation)
Power Input	DC24V, PoE++(Compatible with IEEE802.3bt, Type 4 Class8) Suggest that not to use POE when environment temperature is -10°C lower
Power Consumption	Min: 30W(Static state with no movement); Max: 60W（Fully loaded operation with heater on）
Installation Method	Stand-alone (Upright) or suspended (Pendent), • To ensure safety, the unit must be secured using the mount bracket supplied.
Mount	Ceiling Mount, Wall Mount, Heavy duty tripod
Handle	Built-in for portable use application
Wiper	Yes, hidden type
Size of Tripod Screw Hole	1 x 3/8", 1 x 1/4" + secure lock point
Body Color	Dark Gray
Dimension-Camera	PAN: Φ 400 mm TILT: Φ 480 mm
Weight	10kg（22lb)
Accessories Included	IR Controllerx1, Secure Chain Lock and screwx1, Power Adaptor x1，Seal ringx12, Quick install panel bolt x4, IP67 Tail Cover x1, Rainwater Cover x1

ORDER INFORMATION

• EXU248F   (4K30/FHD, 48X, FAST HEVC, Dark Grey)

ACCESSORIES

Items marked * are optional to purchase

VCC-RC-2
IR Remote Controller

P36-4
36VDC 4A Power Adapter

EG40F
*FAST HEVC Decoder

C-PMSB
*Pendant Mount for Drop Ceiling
/Hard Surface Ceiling

ES-WM
*Wall Mount Bracket

C-PMBA
*Pendant Mount Base Mount Adaptor

QR-BM
*Base Mount

VAP-10
*Vibration Absorb Plate Kits

BL-PP97
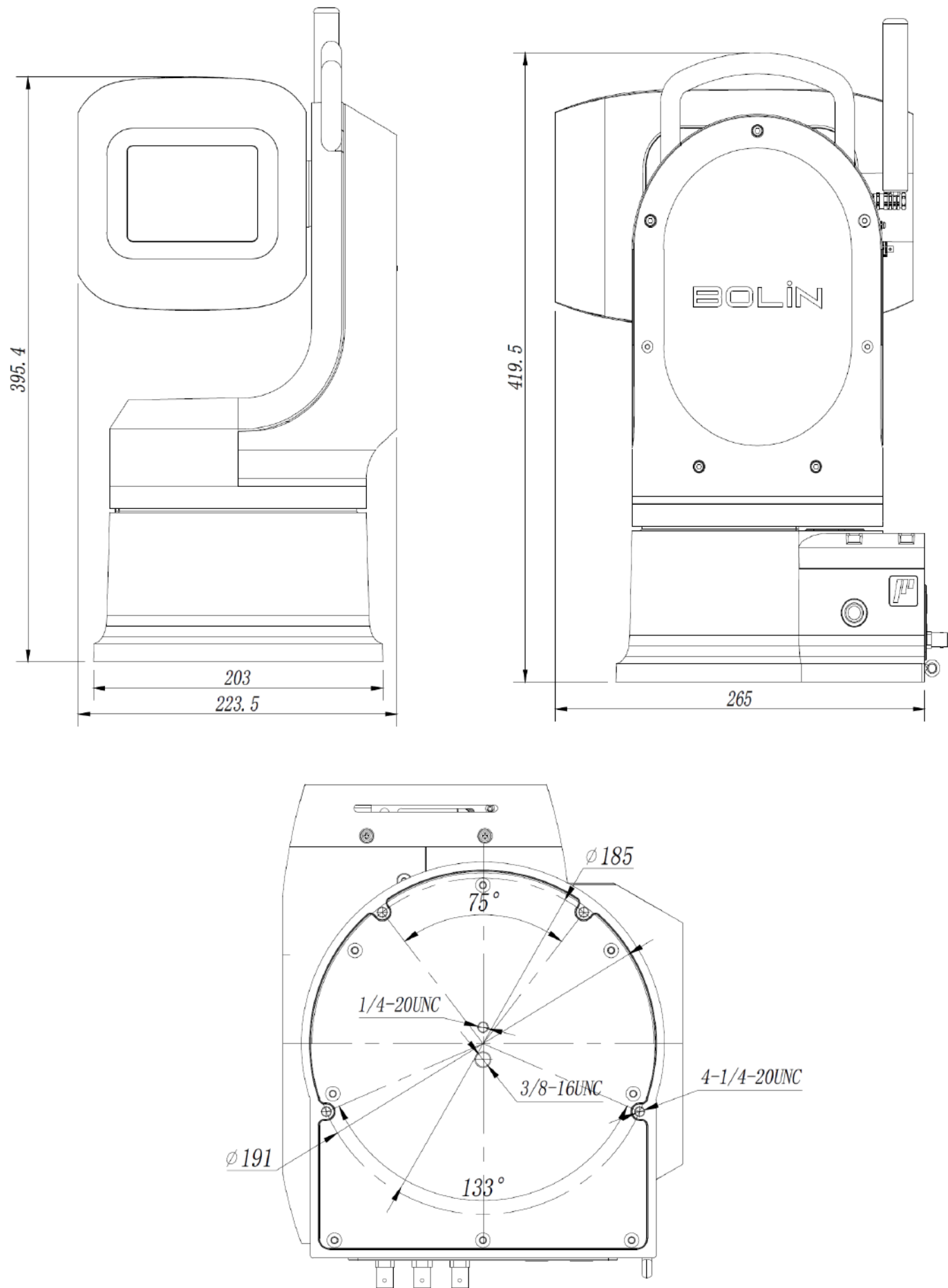*97W POE POWER INJECTOR

BLA-10
*LEMO connector
10Pin Mini to XLR L/R In/Out

B-OSM-12
*Optical SFP Module Transceiver
12G-SDI

DIMENSIONS

Unit: mm

All models and specifications are subject to change without notice.
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