

**BOLIN**

# **NDI High Bandwidth Outdoor PTZ Camera**



**EXU248N**

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

The EXU248N outdoor FHD/4K NDI 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 extreme high-quality Ultra High-Definition image to output HDMI, 6G-SDI, Optical SDI, and NDI video streaming for NDI® and are fully compatible with NDI-enabled hardware and software for Live production in outdoor environment and even in extreme weather condition.

## EXU248N

## KEY FEATURES

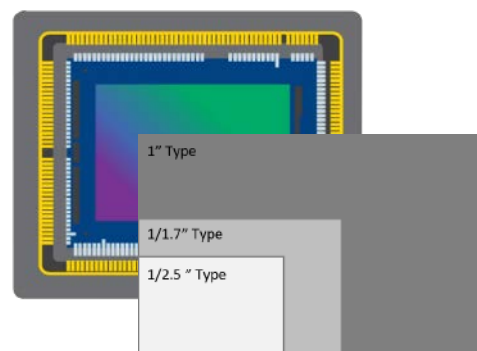


- NDI Certified, NDI 6 Ready, NDI HX3 Supported
- Sony image block with 1 Inch large 4K sensor
- Zeiss Vario-Sonnar T lens with 48X zoom range
- Resolution 4K 2160p29.97, 1080i59.94, 1080p60
- IP Video Resolution: Up to 2160p30, 1080p60
- Video Output: Simultaneous 6G-SDI, HDMI, NDI 6
- SFP Optical SDI video output
- Black Level, Color Matrix, Image Stabilizer
- RTSP, RTMP, SRT Supported
- NDI Control, Visca over IP, Onvif, FreeD, Serial Control
- Weather proof IP67 rated



## IMAGE MODULE

- EXU248N FHD/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, 36X 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

### FPGA Hardware Codec



### NDI 6 Ready

Interoperability | Low Latency | High Quality

#### EXU248N Output Interface

NDI 6	NDI HX3	RTSP, RTMP, RTMPS, SRT	True Dual-Output
Dual 6G-SDI	HDMI 2.0	SFP Optical SDI	Genlock
All Video with Audio Embedded	XLR Broadcast Audio Input/Output	FreeD	Serial/IP Control

#### 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





# 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.



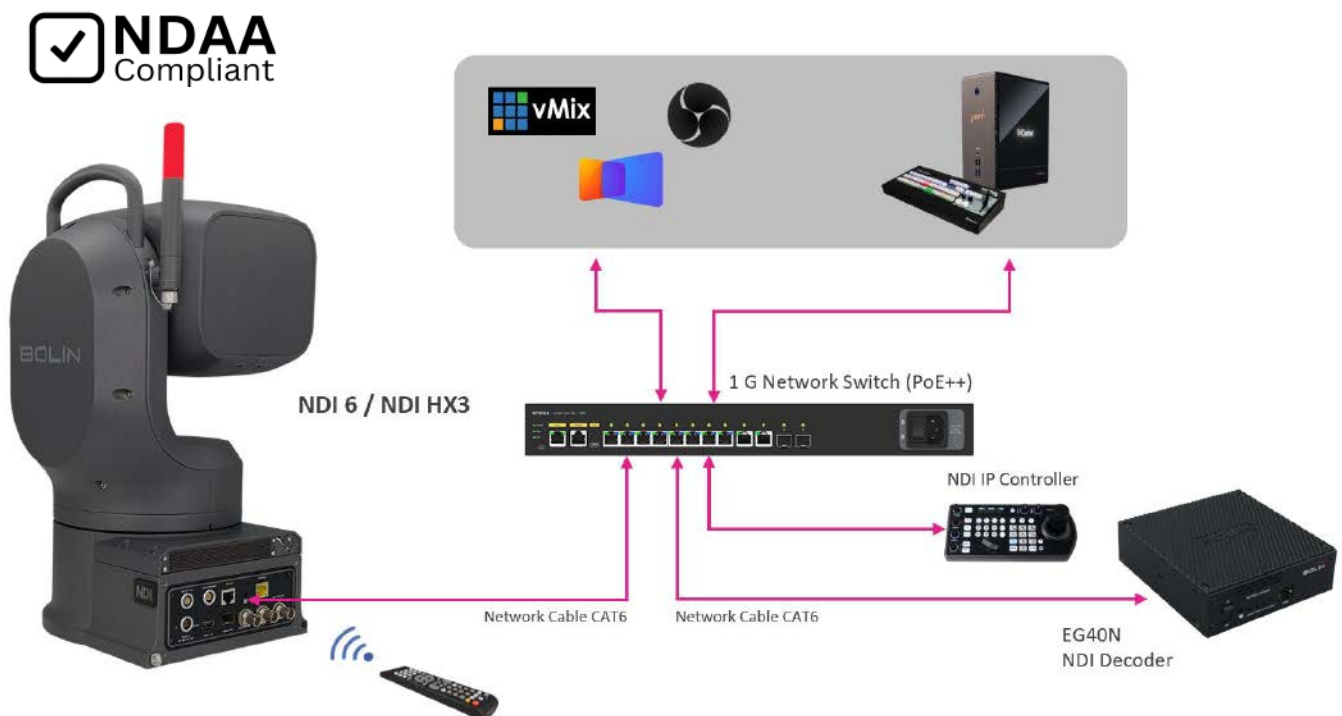
## FreeD Protocol Integrated for VR/AR Video Production

FreeD helps provide all the axis data needed for a Bolin PTZ camera to intelligently and smoothly pan, tilt, and zoom while following designated 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

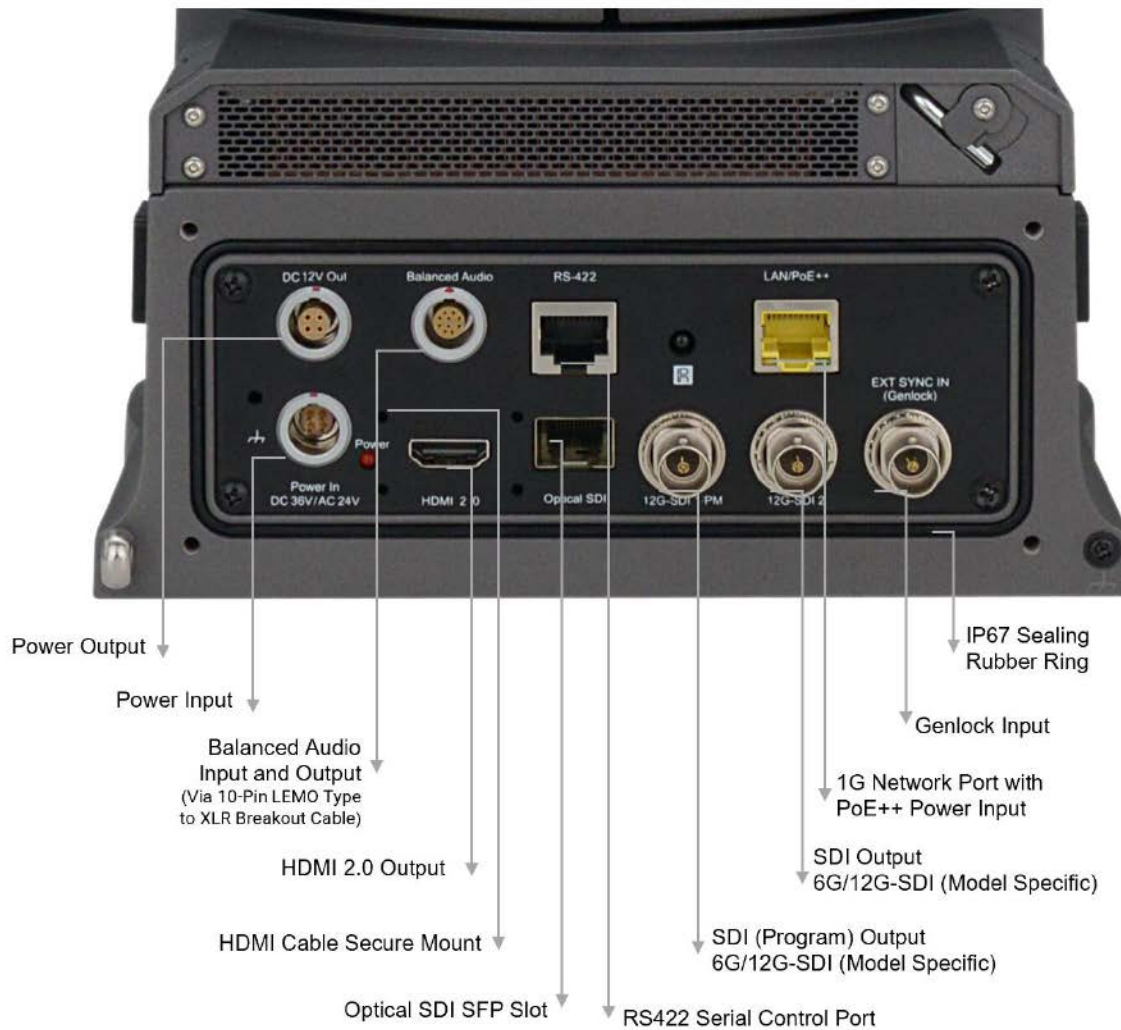


## Various Control Methods

- IP Control, Serial Control, IR Remote Control, Rest API-Software Control
- Protocol Supported: NDI Control, VISCA Over IP, ONVIF, VISCA, PELCO P/D, FreeD
- NDI Control is fully compatible with NDI Ecosystem, Tricaster, vMix, OBS, ProPresenter, etc.

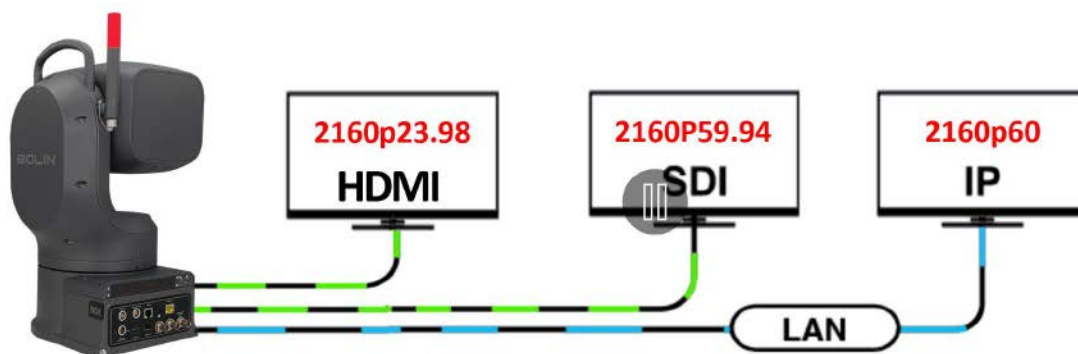


# OUTPUT



## True Tri-Output

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



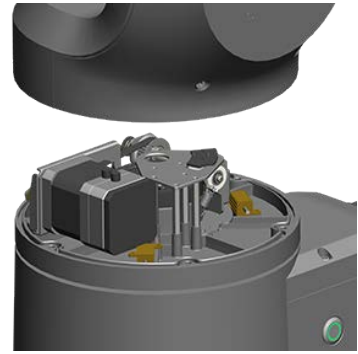
- External Synchronization Genlock
- Audio embedded with all video output
- XLR broadcast audio input/output
- On-screen character generator
- All firmware upgrade via IP
- Tally Light
- Power Output for 3rd device
- POE++ and 24VDC/AC
- Rain Wiper built-in
- Weatherproof IP67 rated with tail cable cover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

## RUGGED and DURABLE

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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
  - $-40^{\circ}\text{C}$  to  $60^{\circ}\text{C}$  ( $-40^{\circ}\text{F}$  to  $140^{\circ}\text{F}$ ) 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
- 1/4", 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
- Quietness less than NC35
- ZDP (Zero Deviation Positioning), Position Deviation Self-Correction



### Tally Light

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





# SPECIFICATIONS

<b>Model Number</b>	<b>EXU248N</b>
<b>Codec</b>	<b>FPGA Based NDI High Bandwidth</b>
<b>Camera Image</b>	<b>48X FHD</b>
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
<b>Mechanical</b>	
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
Finish	C5 Class Salt resistant coating
Wind Load Durability	Wind Load Durability, Non-Destructive and steady operation at 60 m/s or less
Wiper	Yes
Heater	Yes
Defroster	Yes
<b>Interface</b>	
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

<b>Model Number</b>	<b>EXU248N</b>
<b>Codec</b>	<b>FPGA Based NDI High Bandwidth</b>
<b>HDMI Video Signal System</b>	
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
<b>SDI Signal Format</b>	
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 output with different format
OSD Menu Display	Yes
On-Screen Title	Yes, video embedded On-Screen title character generator
<b>Network</b>	
Video Compression (Codec)	NDI High Bandwidth, NDI 6 ready, 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 with different format
IP Protocols	TCP/IP, IGMP, ICMP, ARP, QoS, SNMP, UDP, HTTP, DNS, DHCP, FTP, NTP, UPNP, SRT, NDI
Application Protocols	RTMP, RTSP, RTP Streaming (Unicast, Multicast), MP2TS over UDP (Unicast, Multicast) 、TS over RTP、TS over SRT, WebRTC, RTSP Encryption, NDI
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 and management settings.)	160-180Mbps, 4kp30 10 bit 4:2:2
	50-60Mbps, 1080p60 10 bit 4:2:2
Latency (Overall latency may increase depending on network configurations)	NDI certified, <100ms
Browser Support	Cross Browser Compatibility - HTML5 support for Microsoft Edge, Google Chrome, Firefox, and Safari
<b>General</b>	
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

- EXU248N (Full HD/4K30, 48X, NDI, Dark Grey)

# ACCESSORIES

Items marked \* are optional to purchase



VCC-RC-2  
IR Remote Controller



P36-4  
36VDC 4A Power Adapter



EG40N  
\*NDI 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

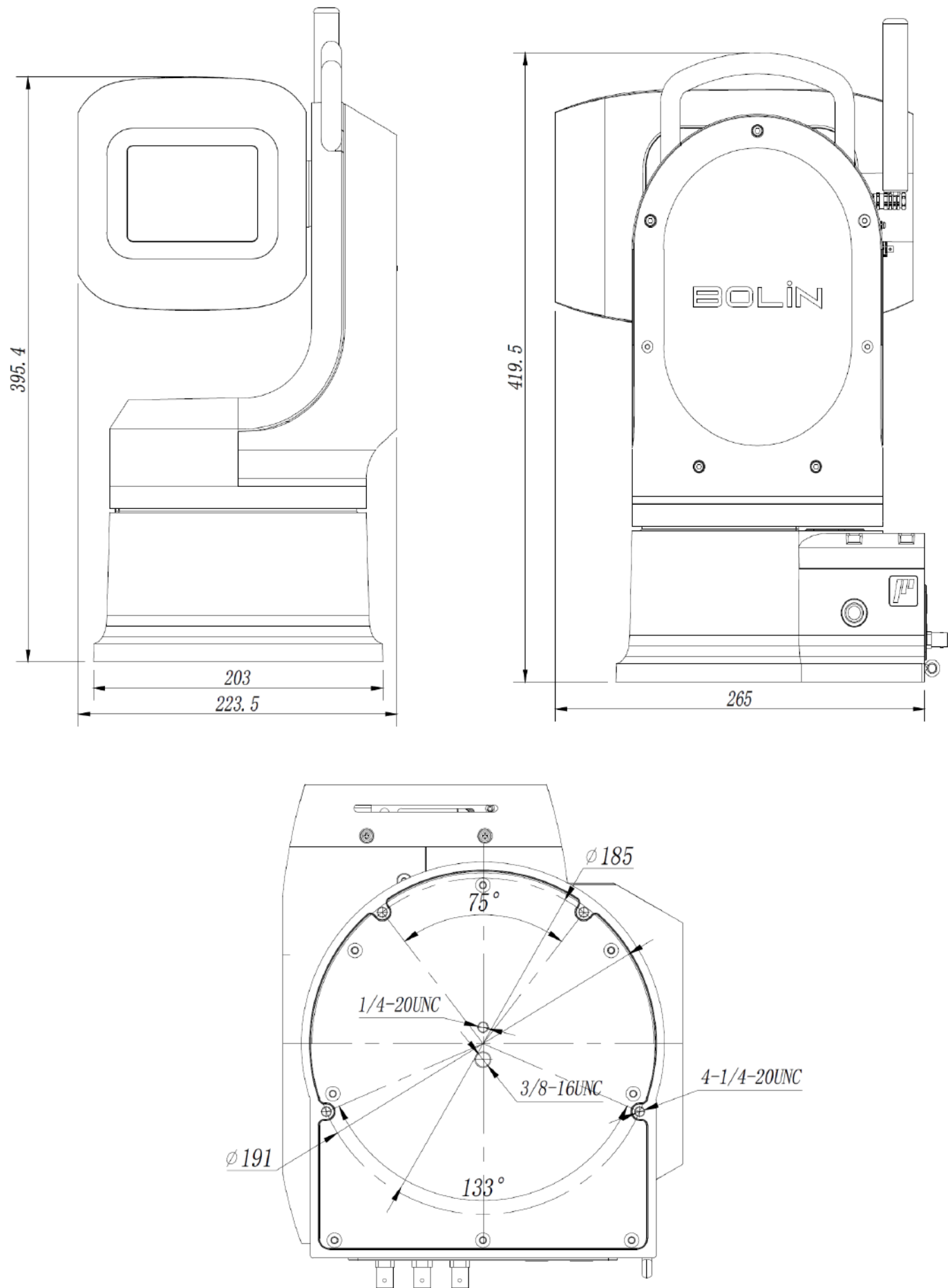


B-OSM-12  
\*Optical SFP Module Transceiver  
12G-SDI



DIMENSIONS

Unit: mm



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