BOLIN

R9-L420N



4K60 PTZ Camera with 1-Inch Sensor

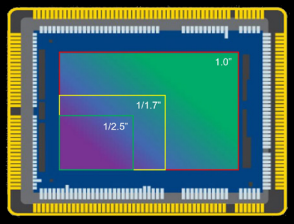
Built for Production

Large Sensor. Bigger Productions.



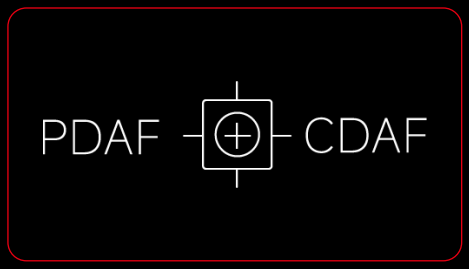
1 Inch 4K60 Image Sensor



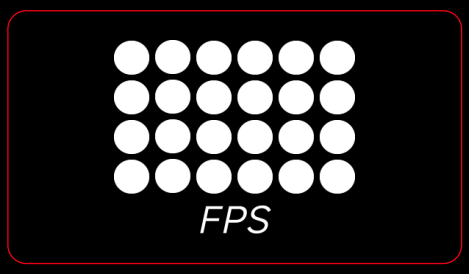


The R9-L420N features a 1-inch Sony image sensor capable of capturing detailed 4K60 video. The larger sensor captures more light, improving image clarity, dynamic range, and color reproduction. This allows the camera to deliver high-resolution video with natural color and strong performance across a wide range of lighting conditions, making it well suited for demanding broadcast and live production environments.

PDAF Focus



Hybrid autofocus combines Phase Detection Autofocus (PDAF) with Contrast Detection Autofocus (CDAF) to deliver both fast focus acquisition and precise focus accuracy. PDAF quickly determines the direction and distance needed to reach focus, while CDAF fine-tunes the image for maximum sharpness. This allows the camera to lock onto subjects quickly and maintain reliable focus even during subject movement or rapid zoom changes.



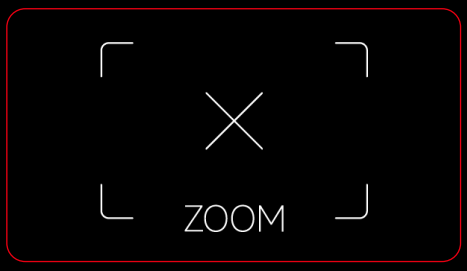
4K60 and 1080P120

Supports 4K60 for high-resolution video capture and 1080p120 for smooth motion and slow-motion playback of fast-moving action.



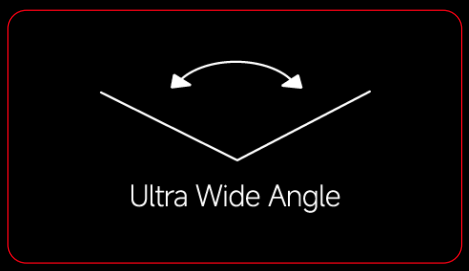
Advanced ISP

Advanced image processing optimizes exposure, color, and noise reduction to deliver balanced images across varied lighting conditions.



20X Zoom

A 20X zoom range provides flexible framing from wide establishing shots to tight close-ups without sacrificing image quality.



Ultra Wide Angle

A 71.3° horizontal field of view captures more of the scene, making it easier to cover stages, venues, and wide environments.



Color Matrix

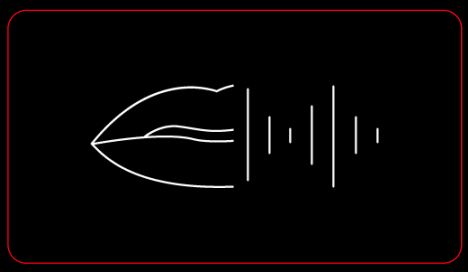
Adjust color properties to better match other cameras and maintain consistent color across multi-camera productions



Precise FreeD Production

FreeD output provides precise camera tracking data for AR elements, virtual sets, and XR production environments.

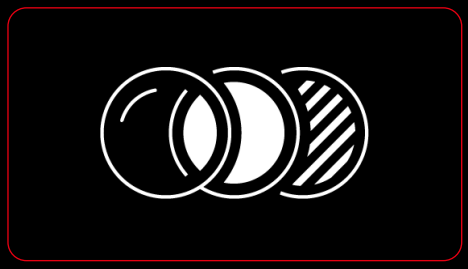
Lip Sync Adjustment





The camera is factory calibrated to ensure audio and video remain properly synchronized out of the box. Built-in lip sync adjustment allows operators to fine-tune audio timing when external equipment introduces processing delays. This helps maintain natural alignment between sound and on-screen action, ensuring voices and movements remain properly matched throughout production.

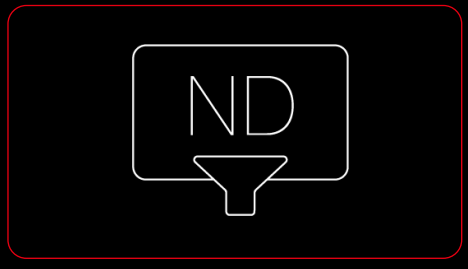
Threaded Lens Filter Mount





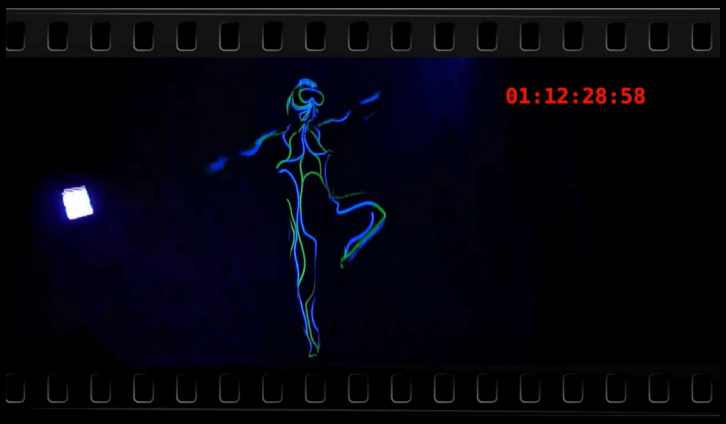
A standard 77 mm threaded filter mount allows common screw-on filters to be attached directly to the lens. This enables the use of accessories such as ND filters, diffusion filters, or protective filters without requiring additional mounting hardware. By supporting widely available 77 mm filters, the camera can be easily adapted to different lighting conditions and creative production needs.

Built-In ND Filters



Four selectable ND filter stops are built directly into the camera, allowing operators to quickly reduce incoming light while maintaining the desired aperture and shutter settings. The mechanical ND system preserves image quality while providing precise exposure control in bright environments. This makes it easier to maintain consistent depth of field when filming under strong lighting conditions.

Timecode Synchronization



Built-in timecode support allows the camera to synchronize with other cameras and production equipment. By aligning timecode across devices, operators can maintain accurate timing during multi-camera productions and complex broadcast workflows. This ensures video and audio remain properly aligned while simplifying synchronization across the production system.

120FPS High Frame Rate



Support for up to 120 frames per second at 1080p allows fast action to be captured with greater smoothness and clarity. The higher frame rate provides additional motion detail and enables clean slow-motion playback when needed. This gives operators more flexibility when capturing fast-moving subjects while maintaining natural motion and image quality.

External USB Recording



Video can be recorded directly to external storage through the USB-C port. This allows operators to capture footage locally without requiring an external recorder or additional recording hardware. Direct USB recording provides a simple way to create backups or standalone recordings during production.

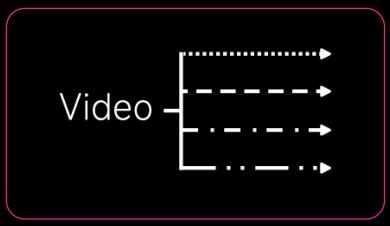
Built To Connect



12G-SDI 1-PM | 12G-SDI 2 | Genlock | Optical SDI SFP Slot | HDMI 2.0

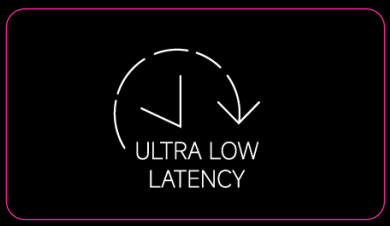
Balanced XLR Audio Input with Phantom Power | 1G LAN Port with POE++ Power Input

Time Code | 3.5 mm Audio Input | USB C Recording | RS422 Serial Control



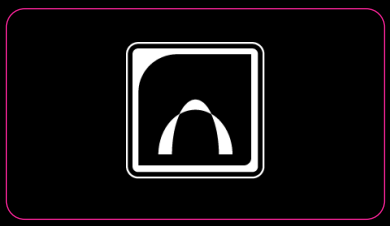
Simultaneous Multi-Stream

Output video simultaneously through HDMI, SDI, and IP with independently configurable resolutions and support for multiple concurrent IP streams.



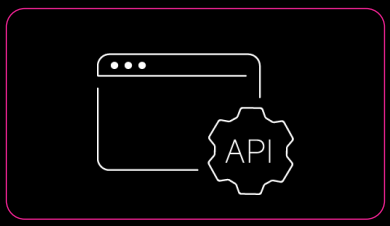
Ultra Low Latency

Ultra low latency video output ensures near real-time response for live production and monitoring workflows.



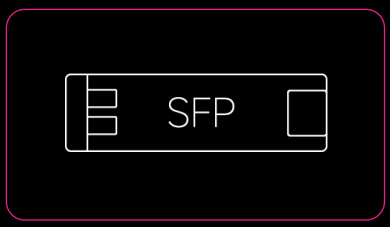
NDI Embedded Bridge

NDI Embedded Bridge enables secure NDI connections across different networks, supporting remote production and distributed workflows.



API

An open API allows developers and integrators to build custom applications, automate control, and integrate the camera into larger systems



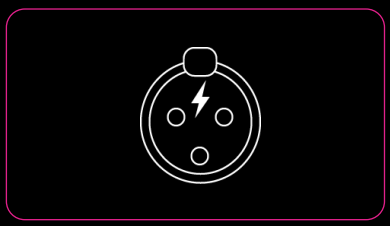
Optical SDI Output

Optical SDI uses an SFP module to transmit SDI video over fiber, enabling reliable long-distance signal delivery.



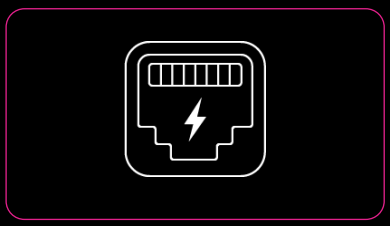
Genlock

Genlock synchronizes the camera with external reference signals for multi-camera productions, supporting both Black-burst and Tri-Level Sync .



Balanced XLR Audio Input

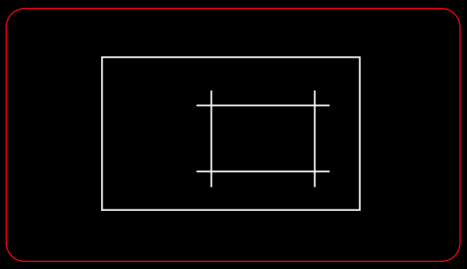
Balanced XLR inputs support mic or line-level audio with optional phantom power, allowing high-quality sound to be embedded with video.



One Cable Solution

A 1Gb Ethernet port with PoE++ support delivers power, control, and network connectivity through a single cable, simplifying installation.

Cropped Image Output







Output a user-defined cropped region of the main image through the SDI and/or IP feeds, providing additional framing options from a single camera. Define up to three crop zones, adjust them in real time, and dynamically switch between any zone for output.

LCD Display



A built-in front LCD screen provides quick access to key camera information such as IP address, resolution, video format, and codec settings. This allows operators and technicians to quickly verify system status during installation, setup, or troubleshooting.

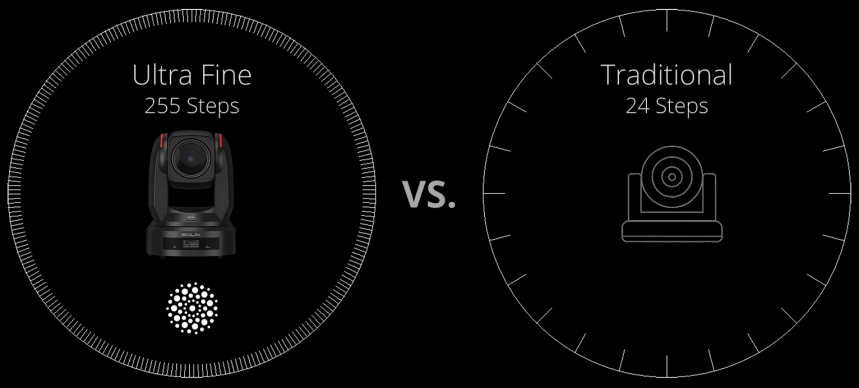
Built for AV Over IP

NDI HIGH BANDWIDTH | NDI HX3 | SRT | RTSP | RTMP | ONVIF

Built to Move

Ultra Fine Movement Control

UltraFine Movement Control expands PTZ positioning to 255 control steps, far beyond the typical 24-step standard used by most cameras. This increased precision allows operators to achieve smoother, more refined camera movement and more accurate positioning. The result is more controlled motion and subtle adjustments that are especially valuable in broadcast, studio, and live production environments where precise framing matters.

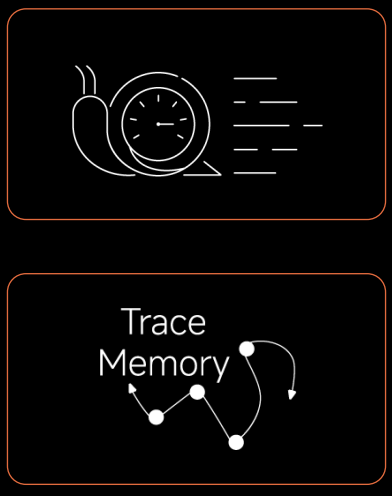


Silent Movement

Quiet motor operation minimizes mechanical noise, making the camera well suited for studio and noise-sensitive environments.

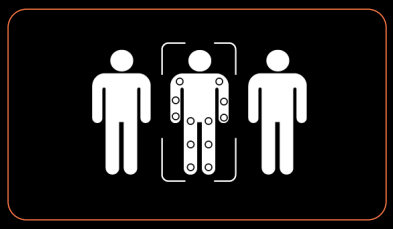
Slow and Fast Movement

Pan and tilt speeds range from an ultra-slow 0.05° per second to a fast 70° per second, enabling both precise motion and rapid repositioning.



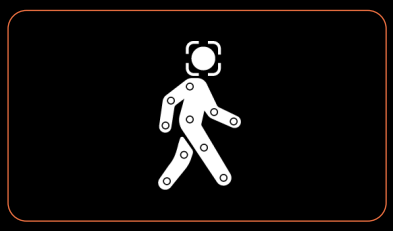
Trace Memory

Record camera movements and replay them to repeat complex motion paths with smooth, consistent results.



AI Framing

AI framing maintains balanced composition by automatically adjusting the shot to keep subjects properly positioned. To be released in a future firmware update.



AI Tracking

AI tracking automatically follows subjects as they move, helping keep them in the shot without manual camera control. To be released in a future firmware update.

NDAA Compliant

Built without restricted components from banned manufacturers, supporting deployment in security-sensitive environments.

SPECIFICATIONS

Model No.	**R9-L420N**
Camera Image	**20X 4K60**
Image Sensor	1 Inch Sony Back-illuminated CMOS
Number of Effective Pixels	50MP
Picture Elements	3840x2160
Optical Zoom	20X Optical Zoom
Digital Zoom	16X
Horizontal Angle of View	71.28° (W) ~ 4.08° (T)
Vertical Angle of View	40.22° (W) ~ 2.16° (T)
Focal Length	f= 9.8mm (WIDE) to 196mm (TELE)
Min. Object Distance	100 mm (Wide end), 200 mm (Tele end)
Aperture	F/2.8-F4.5
Min. Illumination	0.5Lux(F2.8, AGC ON)
Shutter Speed	1/25 sec to 1/100K sec (24 steps)
Focus	Auto, Manual
Focus Mechanism	PDAF(Phase Detection Auto Focus)+CDAF(Contrast Detection Auto Focus);
White Balance	Auto,ATW,Indoor,One Push WB,Manual WB,Outdoor Auto
Exposure	Auto, Manual, Shutter/Iris/Gain Priority
Image Adjustments	Backlight Compensation, E-FLIP, Mirror, Day/Night, Flicker , Contrast, Effect, Sharpness
WDR	Yes
Mechanical ND Filter	Yes, Through, 1/4, 1/16, 1/64
Contrast	Yes
Color Gain	Yes
Color Hue	Yes
Color Matrix	Yes
Gamma	Yes
Gamma Level	Yes
Black Level	Yes
Black Gamma	Yes
Variable Gamma Mode	Yes
Gamma Offset	Yes
Noise Reduction	3D / 2D Noise Reduction
S/N Ratio	≥50db
HLC	Yes
E-Flip	Yes
Defog	Yes
Day/Night	Yes
Backlight Compensation	Yes
Low Latency Mode	YES, when it is on, 3D/2D Noise reduction features will be off, latency with image module and HDMI,SDI Output≤4 frames
AI Face Detection Focus	Yes
AI Face Auto Exposure	Yes
Focus Area	Top, Center, Bottom, All, Default
Image Style	Default, Clear, Bright, Soft
Auto Flip	Yes
AI Framing	Yes (Future Firmware Update)
AI Tracking	Yes (Future Firmware Update)
Mechanical	
Pan Movement	PAN: 340° (-170° to +170°); Fully proportional 0.05°∽70°/S
Tilt Movement	TILT: 210° (-30° to +180°); Fully proportional 0.05°∽70°/S
UltraFine Control	Yes; Supports up to 255 steps of VISCA for granular control
Speed Proportional	Pan/Tilt Speed Proportional to Zoom Range
Preset Position	255 positions, Speed 70°/s, 0~5 Level Adjustable, Accuracy: 0.05°
Preset Memory	Picture Profile Preset-Preset Memory for Image Parameters: Backlight Compensation, White Balance, Auto Exposure, Bright, Iris, Shutter, Gain, Aperture, Effect, Noise Reduction, Gamma, Ex-COMP, Color Hue, Contrast
Motionless Preset	Yes
PTZ Trace Memory	Yes; Up to 4 Recorded Traces
Cruise	Yes, Up to 12 Saved Positions
Quietness	NC35
Home Position	Yes
FreeD	Yes; FreeD Protocol for Camera Tracking Data Output
Environmental	Indoor Use

SPECIFICATIONS

Interface	
HDMI Video Output	HDMI 2.0
SDI 1 Video Output (PM)	12G-SDI: SMPTE424M /SMPTE292M /SMPTE 296M / SMPTE 274M /SMPTE ST-2081 /SMPTE ST-2082 standards, 75Ω BNC
SDI 2 Video Output	12G-SDI: SMPTE424M /SMPTE292M /SMPTE 296M / SMPTE 274M /SMPTE ST-2081 /SMPTE ST-2082 standards, 75Ω BNC
Image Crop	Yes, User-defined Cropped Output via SDI Out-2 and/or IP. When camera set to 4K, crop is 1080p. When camera set to 1080p, crop is 720p.
SDI Optical Fiber Output	Optical 12G-SDI (Module Excluded). Detachable slot, Connector: Duplex LC
	Optical Unit SFP (Optional): Single-mode 1,310nm DFB-LD transmitter and PIN receiver Complaint with MSA SFP+ Specification SFF-8402
Network LAN Port	RJ45, Standard 10M/100M/1000M Ethernet, LAN Connector for IP Control/Video/Audio/FW Upgrade
USB	USB3.0,Type C for Local Recording
Timecode	Yes,Timecode In; BNC
PTP	Yes
External Sync. Input	Yes,Genlock In; BNC Support for Blackburst and Tri-Level
Audio Input	Yes; 3.5mm Stereo Audio In and Balanced XLR In 2 channels, XLR Balanced Input (Mini XLR - Hirose Connector) Sensitivity(MIC):-50 dBu (Manual volume center,-40dB to +20dB) Sensitivity(LINE):+4 dBu (Manual volume center,-40dB to +20dB) XLR Supply Voltage:48V DC 1 channel, Mic 3.5mm Stereo Input (Unbalanced, Plug-In Power Supported) Sensitivity(MIC):-40 dBV volume center.-30dB to +15dB) Sensitivity(LINE):-10 dBV (Manual volume center,-30dB to + 3.5mm Supply Voltage:2.5V DC
Lip Sync Adjustment	Built-in lip sync adjustment allows operators to fine-tune audio timing when external equipment introduces processing delays. From -70ms to +90ms
Audio Output	Embedded with HDMI, SDI, Optical SDI, IP, USB Recording
Audio S/N Ratio	≥85dB
Audio THD+N	≤0.05%
Audio Noise (RMS)	≤-90dB
Local Recording	Yes, Type-C (USB MSC Compatible)
Tally Light	Yes
Dip Switch	Yes
System Firmware Update	Update via IP
Power Connector Type	Input: DC12V, Connector with secure lock
	PoE: RJ45, PoE++ (IEEE802.3bt, Type 4 Class8)
Control Interface	RS422 via RJ45 Port; IP Control via RJ45, IR Remote Controller via IR Receiver
Control Protocol	IP Control: VISCA Over IP via UDP/TCP, ONVIF, NDI, Bolin API Serial Control: VISCA, PELCO P/D;
HDMI Video Signal System	
HDMI Video Format	2160P60*, 2160P59.94, 2160P50, 2160P30, 2160P29.97, 2160P25, 2160P24, 2160P23.98, 1080P120, 1080P119.88, 1080P100, 1080P60, 1080P59.94, 1080P50, 1080P30, 1080P29.97, 1080P25, 1080P24, 1080P23.98, 1080I60, 1080I59.94, 1080I50, 720P60, 720P50
Color Precision	12bit(HDMI), YCbCr
Color Space	YUV,RGB
OSD Menu Display	Yes
On-Screen Title	Yes;On-Screen Title Character Generator embedded with video
True Multioutput	IP and SDI signals can output different formats
SDI Signal Format	
SDI Video Format	2160P60*,2160P59.94, 2160P50, 2160P30, 2160P29.97, 2160P25, 2160P24, 2160P23.98, 1080P60, 1080P59.94, 1080P50, 1080P30, 1080P29.97, 1080P25, 1080P24, 1080P23.98, 1080I60, 1080I59.94, 1080I50, 720P60, 720P50
Color Precision	10bit(SDI), YCbCr, 4:2:2
Color Space	YUV
SDI 1 (PM)	Main PM SDI Video Output, can be different format with SDI 2
SDI 2	SDI Video Output with OSD Overlay or Cropped Image Output, can be different format with SDI 1
True Multioutput	IP and SDI signals can output different formats
OSD Menu Display	Yes
On-Screen Title	Yes;On-Screen Title Character Generator embedded with video

SPECIFICATIONS

USB Recording	
USB Port	USB3.0,Type C
Bandwidth	5Gbps+ (Support up to 4K60)
Codec	H.264 / H.265
Bitrate	1080P60: 10-20 Mbps, 4K60: 30-50 Mbps
Recording Format	MP4
Storage Type	SSD
Storage Format	exFAT; SDXC: 32GB to 2TB, exFAT; SDUC: 2TB to 128TB, exFAT **Only exFAT supports segmented video storage.
Compatible Integration	USB MSC
Network	
Encode	FPGA
Video Compression	H.264/H.265 by FPGA, NDI High Bandwidth; NDI HX3
IP Resolution/Frame Rate	Main Stream: 3840x2160p/59.94/60/50/29.97/30/25/24 1920x1080p/120/59.94/60/50/29.97/30/25/24 1920x1080i/59.94/60/50 1280x720p/59.94/60/50 Second Stream: 720P, 704x576, 640x480, 640x360, 576x480, 352x228
True Multioutput	IP and SDI/HDMI signals can output different 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),MPEG-TS over UDP, MPEG-TS over RTP, NDI High Bandwidth, NDI HX3
Multi-stream	2 stream(8 users)
Audio Compression	AAC-LC Broadband Audio Encoding(Duplex Communicate Supported, Audio/Video synchronization)
Audio-Video Synchronization	Factory calibrated for less than 1 frame of delay between audio and video Audio delay adjustable in web UI
OSD	Yes (Customized OSD,with image insert)
Control Protocol	ONVIF2.4 (Profile T), VISCA Over IP, NDI, Bolin API 2.0, CGI
Bandwidth (results may vary depending on network configuration and management settings.)	RTSP：128-60000kbps，By Default 3840x2160(H.264) 16384kbps；3840x2160(H.265) 8192kbps
	NDI HX3: By Default (H.264) 3840x2160 112640kbps; (H.265) 3840x2160 86016kbps;
	NDI HB: By Default 3840x2160 256000kbps
Latency (Overall latency may increase depending on network configurations)	≤100ms
Browser Support	Cross Browser Compatibility - HTML5 support for Microsoft Edge, Google Chrome, Firefox, and Safari
RTSP URL	Main Stream: rtsp://username:password@IP:port/media/video1 2nd Stream: rtsp://username:password@IP:port/media/video2
General	
Operating Temperature	-10 to +50 (°C)
Operating Humidity	≤80%
Power Input	DC 12V, PoE++(Compatible with IEEE802.3bt)
Power Consumption	Min 38W； MAX 42W
Installation Method	Tripod, Upright, Pendant
Mount	Ceiling mount, Wall mount, Tripod
Handle	Yes, built-in
Screw Hole for Tripod	1/4"
Body Color	Black, White
Dimension	200x270x253mm (WxHxD)
Weight	4.45kg/9.9lbs
Accessories Included	Power Adapter x1, Power Cord x3 (UK, EU, US), IR Remote Controller x1, RS422 Control Adaptor Cablex1; Screwx3, Installlation Secure Lock x1; Thank You Card x1
Accessories Optional	Indoor Wall Mount (C-WM3B), Ceiling Mount (BL-CM-01), Drop Ceiling Pendant Mount System (C-PMSB), Quick Release Plate for Indoor PTZ Cameras (QR-M), Pendant Mount Base Adaptor (C-PMBA), B-OSM-12, BLA-10
Certificates	CE,FCC,IC,UL,UKCA,ROHS,WEEE

Legend * = By Default

ACCESSORIES

Items marked * are optional to purchase



VCC-RC-2
IR Remote Controller



P12-4L
12VDC 4A Power Adapter



EG40N
*NDI Decoder



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



C-WM3B
*Wall Mount Bracket-Size 3



C-WM3B-CV
*Wall Mount Cover-Size 3



BL-CM-01
*Ceiling Mount Bracket



EX-CMK
*Indoor/Outdoor PTZ Ceiling Mount Kit



C-PMBA
*Pendant Mount Base Mount Adaptor



QR-M
*Quick Release Plate for Indoor PTZ Cameras



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



BL-PP97
*97W POE POWER INJECTOR



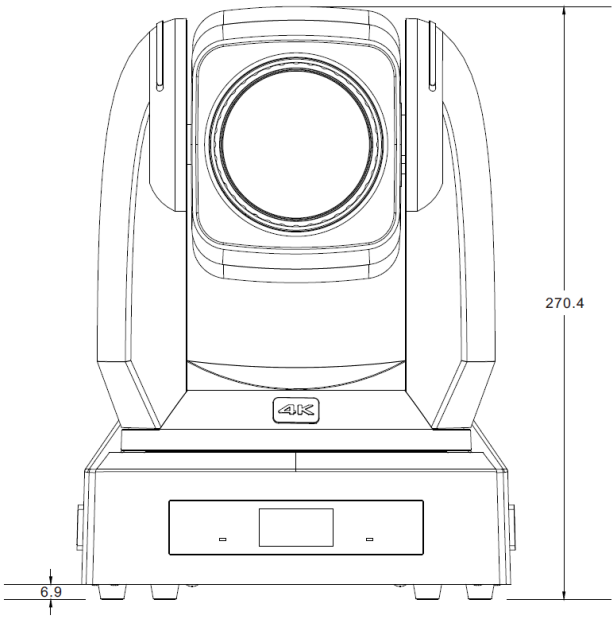
BLA-10
*LEMO connector
10Pin Mini to XLR L/R In/Out

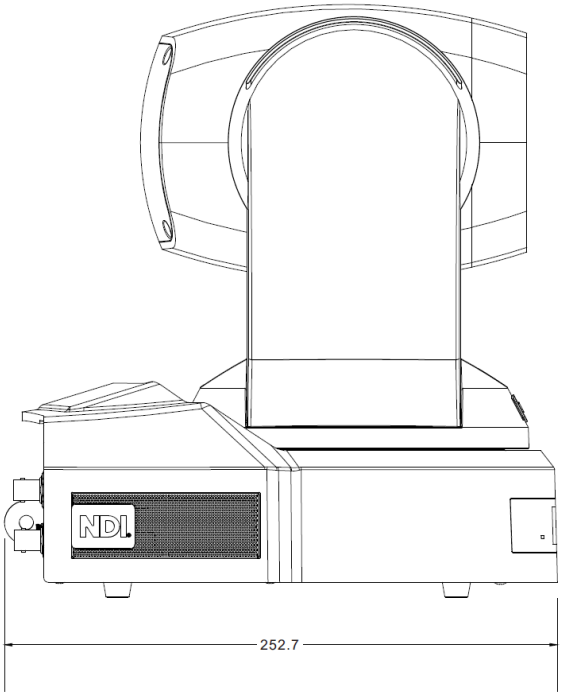
ORDER INFORMATION

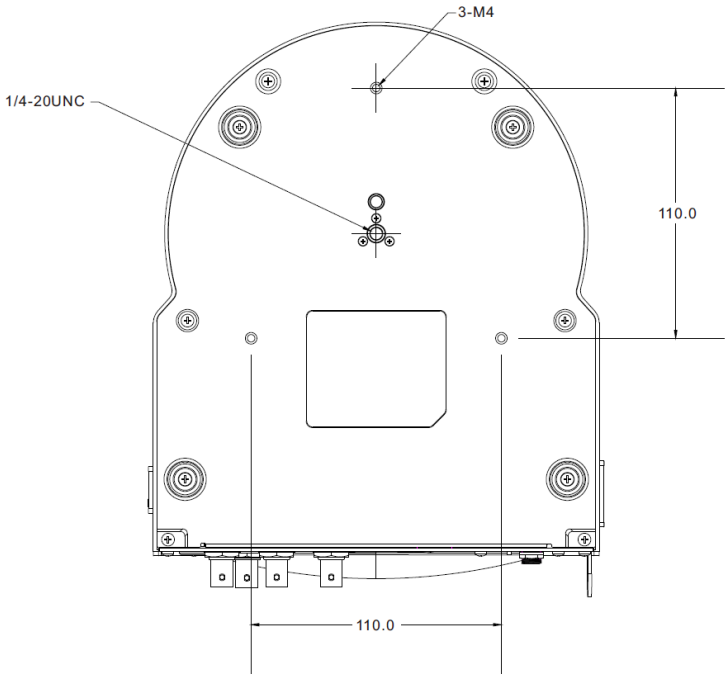
- Visit Bolin Technology Website

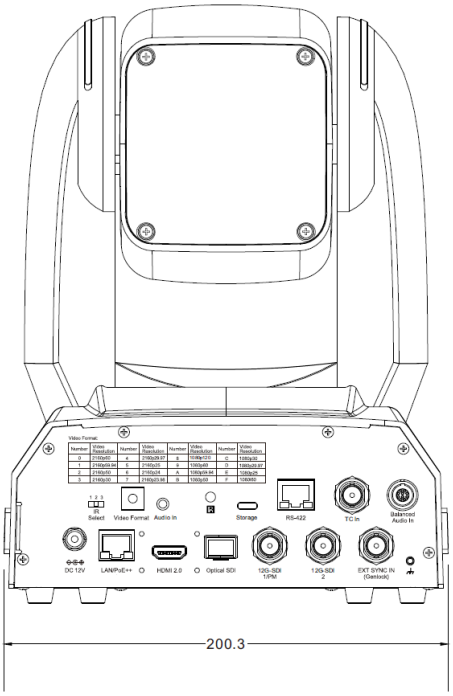
DIMENSIONS

Unit: mm









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