Redefining The Indoor PTZ Camera Experience
The R9 series indoor PTZ camera has three imaging solutions: a large 1" 4K30 image sensor with amazing quality, a 4K60 sensor with exceptional performance in high-speed environments, or the Full HD option with great low light and superior image stabilization for tough (challenging) environments. There is an image option for every scenario.

**SKU: EXU418F**
4K30, 1080p60

- 1 inch type Exmor R CMOS large sensor
- 14.4 Megapixels
- Best Image Quality in its Class
- Zeiss Vario-Sonnar T lens, Zoom Range
  18X(4K)/24X(FHD)
- Optical Image Stabilizer
- Black Level
- Color Matrix
- ND Filter
- True WDR

**SKU: EXU230H**
1080p60

- 1/1.8 inch STARVIS 2 sensor
- Pro AV Optimised High Resolution Image Quality
- 30X 8M High Resolution Optical Zoom Lens
- Advanced AF Performance
- High Color Performance in Super Low Light Conditions
- Super Image Stabilization

**SKU: EXU420F**
4K60

- 1/2.5 Inch CMX715 High Class Sensor
- Crisp and Clean UHD Image Quality
- Crisp with 20X High Resolution Optical Zoom
- AI Face Detection Auto Focus/Exposure
**OUTPUT**

- Dual 12G-SDI
- HDMI 2.0
- 4K IP Streaming - AVC/HEVC
- SFP Optical SDI
- External Synchronization Genlock
- Audio embedded with all video output
- XLR broadcast audio input/output
- USB3.0 video output (Standard HEVC Only)
- On-screen character generator

**True Tri-Output**

Simultaneously output SDI, HDMI, and IP, which can be set to independent formats for different application use.
Full Broadcast SDI Format and Standard (Model Specific)

3840x2160/59.94p/60p
3840x2160/50p
3840x2160/29.97p/30p
3840x2160/25p
3840x2160/23.98p
3840x2160/24p
1920x1080/59.94p/60p
1920x1080/59.94i/60i
1920x1080/50p
1920x1080/50i
1920x1080/29.97p/30p
1920x1080/25p
1920x1080/23.98p/24p
1280x720/59.94p/60p
1280x720/50p

SITUATION-USING SDI/HDMI (Tradition AV System)

Planning an AV system structure or installation using SDI/HDMI video cables?  
**Do these issues sound familiar?**

- Signal loss over long distances
- The need for multiple SDI/HDMI amplifiers and splitters.
- Adding hardware workaround using SDI/HDMI matrixes and routers.
- Having to extend an AV installation, by adding cables, display, and endpoints.
- Looking to utilize advanced AV Over IP solutions, but the video bandwidth is too high for a standard 1G network infrastructure.
- Large cable count and hardware management issues within the space
- Unstable/high failure rate due to too many connected devices

*If the answer is “Yes”,*
- A FAST HEVC solution could easily replace a traditional SDI/HDMI installation saving you time and money, by having almost no compromises on the ultimate video signal quality of an SDI/HDMI installation.

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**SDI/HDMI REPLACEMENT - FAST HEVC**

<table>
<thead>
<tr>
<th>SDI/HDMI</th>
<th>Key Words</th>
<th>Key Words</th>
<th>IP Streaming (4K60) - FAST HEVC Codec</th>
</tr>
</thead>
<tbody>
<tr>
<td>Uncompressed video/Audio delivery</td>
<td>Analog/Traditional</td>
<td>IT-Future</td>
<td>Codec-based format (AVC/HEVC) audio/video delivery</td>
</tr>
<tr>
<td>AV signal running around 12 Gigabits per second</td>
<td>High bit rate</td>
<td>Adaptive bitrate</td>
<td>Fast adaptive bitrate AV encoding</td>
</tr>
<tr>
<td>Uncompressed up to 4K60 delivery</td>
<td>High cost</td>
<td>Lower cost</td>
<td>Slightly compressed UHD 4K delivery</td>
</tr>
<tr>
<td>Negotiable latency AV delivery</td>
<td>No-Latency</td>
<td>Visually Lossless</td>
<td>Ultra-low latency - less than 2 frames (30ms, visually zero-latency)</td>
</tr>
<tr>
<td>High-quality AV delivery</td>
<td>Lossless</td>
<td>Visually Lossless</td>
<td>4K60 (4:2:2 + 8/10/12bit, visually lossless)</td>
</tr>
<tr>
<td>One cable - One signal AV delivery</td>
<td>1 to 1</td>
<td>1 to Many</td>
<td>20-200Mbps bandwidth (45Mbps at streaming 4K60 4:2:2:12bit, visually lossless)</td>
</tr>
<tr>
<td>Robust reliable BNC connector and costly coaxial cable</td>
<td>Expensive</td>
<td>More affordable</td>
<td>Ethernet connector (RJ45) and CAT6 network cable</td>
</tr>
<tr>
<td>Up to 260ft (80m) range cable run without signal loss</td>
<td>Limited</td>
<td>Flexible Build</td>
<td>Flexible network infrastructure up to 250ft (80m)</td>
</tr>
<tr>
<td>Hardware device based, high power consumption</td>
<td>High heat</td>
<td>Low heat</td>
<td>Hardware FPGA codec with low power consumption and software decode application applicable</td>
</tr>
<tr>
<td>Supports all ancillary data</td>
<td>Vintage</td>
<td>Modern</td>
<td>Support some ancillary and metadata</td>
</tr>
<tr>
<td>Point to point hardware connection</td>
<td>1 To 1</td>
<td>1 To Many</td>
<td>Flexible one to many possibilities-Multicast</td>
</tr>
<tr>
<td>Costly solution for long distance broadcast</td>
<td>Expensive Build</td>
<td>Flexible Build</td>
<td>Highly flexible and lower cost IP streaming plus PoE</td>
</tr>
<tr>
<td>Predictable and very reliable</td>
<td>Rigid</td>
<td>Agile</td>
<td>Agile, flexible, and scalable</td>
</tr>
<tr>
<td>High quality audio</td>
<td>Hi-Fi</td>
<td>High Quality</td>
<td>Various high quality audio codecs</td>
</tr>
</tbody>
</table>

www.bolintechnology.com
### Two options of IP streaming codec:

1. Standard AVC/HEVC (H.264/265), software SOC based codec
2. Fast AVC/HEVC (H.264/265), hardware FPGA based codec

- Up to 4K60
- SDI Replacement
- 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 Xilinx MPSoC

#### FAST HEVC

- High Quality
- Low Bandwidth
- Low Latency

FPGA hardware codec,
*utilizing Xilinx Zynq™ UltraScale+™ EV 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*

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

*Results may vary depending on network configuration and management settings.

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**Open Platform**

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
WORKFLOW
MOVEMENT

Smooth and Accurate Movement

- PAN: 340° (-170° to +170°); Fully proportional speed 0.01° to 100°/s
- TILT: 120° (-30° to +90°); Fully proportional speed 0.01° to 50°/s
- Preset: 255 positions, Speed 100°/s, 0~5 Level Adjustable, Accuracy: 0.03°
- Picture Profile Preset
- Motionless Preset
- PTZ Trace Memory
- Quiet - Less than NC35

FEATURES

- On-screen character generator
- All firmware upgrade via IP
- Front and Rear Tally Light
- POE++ and 12VDC/AC
- Built-in handle
- Genlock
- HDMI cable secure mount
- Available Color: Black, White

Move, with you

- Industry-First unique portable body design
- Facilitates your video production installation.

Move • With You
### R9-230H
- **Camera Image**: 30X Full HD
- **Image Sensor**: CMOS
- **Lens**: Zeiss Vario-Sonnar T lens
- **Control Protocol**: PELCO D/PELCO P
- **Audio Input**: 3.5mm TRRS for bidirectional audio intercom
- **Audio Output**: 3.5mm TRRS for bidirectional audio intercom
- **Power Connector Type**: XLR
- **Environmental**: FreeD NC35 Compliant
- **Pan/Tilt Speed**: proportional to zoom range
- **Min. Illumination**: 0.1lux (color), 0.01lux (black)
- **Exposure**: 0.5lux (color), 0.02lux (black)
- **Day/Night**: Yes
- **Backlight Compensation**: Yes
- **Features**: High Sensitivity, Backlight Compensation, E-FLIP, Mirror, Day/Night
- **WDR**: Yes
- **Codec**: HEVC
- **Image Maker**: Sony
- **Video Resolution**: 4K60

### R9-418F
- **Camera Image**: 18X 4K50/FHD
- **Image Sensor**: CMOS
- **Lens**: Zeiss Vario-Sonnar T lens
- **Control Protocol**: PELCO D/PELCO P
- **Audio Input**: 3.5mm TRRS for bidirectional audio intercom
- **Audio Output**: 3.5mm TRRS for bidirectional audio intercom
- **Power Connector Type**: XLR
- **Environmental**: FreeD NC35 Compliant
- **Pan/Tilt Speed**: proportional to zoom range
- **Min. Illumination**: 0.1lux (color), 0.01lux (black)
- **Exposure**: 0.5lux (color), 0.02lux (black)
- **Day/Night**: Yes
- **Backlight Compensation**: Yes
- **Features**: High Sensitivity, Backlight Compensation, E-FLIP, Mirror, Day/Night
- **WDR**: Yes
- **Codec**: NEW V/NEW Y
- **Image Maker**: Sony
- **Video Resolution**: 4K60

### R9-420F
- **Camera Image**: 20X 4K60
- **Image Sensor**: CMOS
- **Lens**: Zeiss Vario-Sonnar T lens
- **Control Protocol**: PELCO D/PELCO P
- **Audio Input**: 3.5mm TRRS for bidirectional audio intercom
- **Audio Output**: 3.5mm TRRS for bidirectional audio intercom
- **Power Connector Type**: XLR
- **Environmental**: FreeD NC35 Compliant
- **Pan/Tilt Speed**: proportional to zoom range
- **Min. Illumination**: 0.1lux (color), 0.01lux (black)
- **Exposure**: 0.5lux (color), 0.02lux (black)
- **Day/Night**: Yes
- **Backlight Compensation**: Yes
- **Features**: High Sensitivity, Backlight Compensation, E-FLIP, Mirror, Day/Night
- **WDR**: Yes
- **Codec**: NEW V/NEW Y
- **Image Maker**: Sony
- **Video Resolution**: 4K60
## SPECIFICATIONS

### Codecs

<table>
<thead>
<tr>
<th>R9-230H</th>
<th>R9-418F</th>
<th>R9-420F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Codec</td>
<td>HEVC</td>
<td>FAST HEVC</td>
</tr>
</tbody>
</table>

### HDMI Video Signal System

<table>
<thead>
<tr>
<th>Format</th>
<th>1920 x 1080/59.94p/60p</th>
<th>1920 x 1080/59.94i/60i</th>
<th>1920 x 1080/50p</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>3840 x 2160/29.7p/30P</td>
<td>3840 x 2160/25p</td>
<td>3840 x 2160/50p</td>
</tr>
<tr>
<td></td>
<td>3840 x 2160/23.98p</td>
<td>3840 x 2160/25p</td>
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<td>3840 x 2160/25p</td>
<td>3840 x 2160/50p</td>
</tr>
<tr>
<td></td>
<td>1280 x 720/59.94p/60p</td>
<td>1280 x 720/50p</td>
<td>1280 x 720/50p</td>
</tr>
<tr>
<td></td>
<td>1280 x 720/50p</td>
<td></td>
<td>1280 x 720/50p</td>
</tr>
</tbody>
</table>

### Color Precision

- R9-230H: 12bit(HDMI), YUV4:2:2, YUV4:2:0
- R9-418F: YUV, RGB
- R9-420F: Yes, with image insert

### On-Screen Title

- R9-230H: Yes, video embedded On-Screen title character generator
- R9-418F: Yes, video embedded On-Screen title character generator
- R9-420F: Yes, video embedded On-Screen title character generator

### USB Signal Format

<table>
<thead>
<tr>
<th>Port</th>
<th>USB 2.0 Type-C</th>
<th>–</th>
</tr>
</thead>
<tbody>
<tr>
<td>Encoder</td>
<td>H.264, MJPEG</td>
<td>–</td>
</tr>
<tr>
<td>Encoder</td>
<td>–</td>
<td>H.264, MJPEG</td>
</tr>
</tbody>
</table>

### SDI Video Format

<table>
<thead>
<tr>
<th>Format</th>
<th>1920 x 1080/59.94p/60p</th>
<th>1920 x 1080/59.94i/60i</th>
<th>1920 x 1080/50p</th>
</tr>
</thead>
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</tr>
<tr>
<td></td>
<td>1280 x 720/50p</td>
<td></td>
<td>1280 x 720/50p</td>
</tr>
</tbody>
</table>

### Color Space

- R9-230H: 10bit(SDI), YUV 4:2:2

### OSD Menu Display

- R9-230H: Customized OSD
- R9-418F: Customized OSD

### Network

<table>
<thead>
<tr>
<th>Video Compression</th>
<th>MJPEG, H.264/4:2:0 by SoC</th>
</tr>
</thead>
<tbody>
<tr>
<td>IP Resolution/Framerate</td>
<td>1920x1080p60/50/30/25, 1280x720p60/50/50/25</td>
</tr>
<tr>
<td></td>
<td>3840x2160p60/50/30/25, 1280x720p60/50/50/25</td>
</tr>
<tr>
<td></td>
<td>3840x2160p60/50/30/25, 1280x720p60/50/50/25</td>
</tr>
<tr>
<td></td>
<td>1280x720p60/50/50/25</td>
</tr>
</tbody>
</table>

### True Dual Output

- R9-230H: HDMI and SDI signal can be output with different format
- R9-418F: Yes

### IP Protocols

<table>
<thead>
<tr>
<th>IP Protocols</th>
<th>TCP/IP, ICMP, ARP, RTP, UDP, HTTP, DNS, DHCP, FTP, NTP, SRT</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>TCP/IP, ICMP, ARP, QoS, SMIP, SMTP, HTTP, DNS, DHCP, FTP, NTP, UPnP, SRT</td>
</tr>
</tbody>
</table>

### Application Protocols

- R9-230H: RTMP(S), RTSP, RTSP Encryption, SMTP, MT2S over UDP (Unicast, Multicast)
- R9-418F: RTMP, RTSP, RTP Streaming (Unicast, Multicast), MT2S over UDP (Unicast, Multicast), TS over RTP, TS over SRT, Webrtc, RTPSP Encryption

### Color Format

- R9-230H: 10bit, YUV 4:2:2
- R9-418F: 2 stream

### Audio Compression

- R9-230H: AAC-LC, LPCM, FLAC
- R9-418F: Broadcast Audio Encoding/Duplex Communicate
- R9-420F: Supported, Audio Video synchronization

### OSD

<table>
<thead>
<tr>
<th>Customized OSD</th>
<th>Standardized OSD</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Compatibility Integration

- R9-230H: ONVIF 2.4 (Profile B), VISCA Over IP
- R9-418F: ONVIF 2.4 (Profile S/G/T), VISCA Over IP

### Bandwidth

- R9-230H: 8Mbps, 1080p60
- R9-418F: 30-50Mbps, 4Kp60 12 bit 4:2:2
- R9-420F: 10-25Mbps, 1080p 12 bit 4:2:2

### Latency

- R9-230H: 0 ms latency is < 170ms glass to glass
- R9-418F: 2-3 frame (e.g. 2160p60 latency is < 45ms glass to glass

### Browser Support

- R9-230H: Cross Browser Compatibility - HTML5 support for Microsoft Edge, Google Chrome, Firefox, and Safari

### Operating Temperature

- R9-230H: -10°C to 50°C
- R9-418F: -10°C to 50°C
- R9-420F: -10°C to 50°C

### Power Consumption

- R9-230H: Min: 25W (Static state with no movement) Max: 40W (Fully loaded operation)
- R9-418F: Min: 25W (Static state with no movement) Max: 50W (Fully loaded operation)
- R9-420F: Min: 25W (Static state with no movement) Max: 50W (Fully loaded operation)

### Mounting Method

- R9-230H: Stand-alone (Upright) or suspended (Pendent) or Tripod
- R9-418F: Ceiling mount, Wall mount, Tripod
- R9-420F: Ceiling mount, Wall mount, Tripod

### Accessories Included

- R9-230H: IR Remote controller x1, Power adapter and power cord (US, EU, UK), Mounting screws x3, RJ45 to RS422 Extension cable, Thanks card x1
- R9-418F: Wall mount bracket, Ceiling mount bracket, Quick mounting plate, Tripod mount adapter, Cable Connection Junction Box, Stabilizer Platform
- R9-420F: Wall mount bracket, Ceiling mount bracket, Quick mounting plate, Tripod mount adapter, Cable Connection Junction Box, Stabilizer Platform
**ACCESSORIES**

Items marked * are optional to purchase

- **VCC-RC-2**  
  IR Remote Controller
- **VCC-P12-4**  
  12VDC 4A Power Adapter
- **VCC-CC45RS**  
  RJ45 To RS232/RS422/485 Adapter
- **C-PMSB**  
  *Pendant Mount for Drop Ceiling /Hard Surface Ceiling
- **C-WM3B**  
  *Wall Mount Bracket-Size 3
- **C-WM2B-CV**  
  *Wall Mount Cover-Size 3
- **C-WPILB**  
  *Wall Mount Plate
- **BL-CM-01**  
  *Ceiling Mount Bracket
- **BL-PP97**  
  *97W POE POWER INJECTOR

**ORDER INFORMATION**

- **R9-418F**  
  (4K30/FHD, 18X/24X, FAST HEVC, Black)
- **R9-420F**  
  (4K60, 20X, FAST HEVC, Black)
- **R9-230H**  
  (Full HD, 30X, HEVC, Black)
- **R9-418F/W**  
  (4K30/FHD, 18X/24X, FAST HEVC, White)
- **R9-420F/W**  
  (4K60, 20X, FAST HEVC, White)
- **R9-230H/W**  
  (Full HD, 30X, HEVC, White)