Hanwha Vision is a global leading supplier of solutions for IP and analog video surveillance. Building on the company's history of innovation, Hanwha Vision is dedicated to providing systems solutions with the highest levels of performance, reliability and cost-effectiveness. Hanwha Vision is committed to the continued development of innovative systems products for professional security applications.

For additional information, https://www.hanwhavision.com/en/, https://hanwhavisionamerica.com

1. **PRODUCTS**
	1. **EQUIPMENT**
		1. Manufacturer: Hanwha Vision (https://www.hanwhavision.com/en/, https://hanwhavisionamerica.com)
		2. Model: PNO-A9311R
		3. Alternates: None
	2. **GENERAL DESCRIPTION**
		1. Video Compression and Transmission – The camera shall have the following properties relating to the video signals it produces.
			1. H.265, H.264 and MJPEG compression, each derived from a dedicated encoder and capable of being streamed independently and simultaneously.
				1. H.265 / H.264: Max. 30fps / 25fps (60Hz / 50Hz)
				2. MJPEG: Max. 30fps
			2. The camera shall be able to configure up to 10 independent video stream profiles with differing encoding, quality, frame rate, resolution, and bit rate settings.
			3. The camera shall be able to configure various resolution selections.
				1. 16:9 aspect ratio: 3840x2160, 3072x1728, 2688x1520, 2560x1440, 1920x1080, 1280x720, 800x448, 640x360
				2. 4:3 aspect ratio: 2592x1944, 2048X1536, 1600x1200, 1280x960, 1024x768, 800x600, 640x480
				3. 5:4 aspect ratio: 1280x1024, 720x576
				4. 3:2 aspect ratio: 720x480
			4. The camera shall support unicast video streaming up to 6 users.
			5. The camera shall support multicast video streaming.
			6. The camera shall be able to configure Dynamic DNS (DDNS). DDNS shall be provided with no additional cost by the manufacturer.
			7. The camera shall provide WiseStream Ⅱ, WiseStreamⅢ on AI engine to efficiently manage bit rate of the video stream and reduce storage.
			8. The camera shall provide WiseNRⅡ that working based on AI engine for reduce noise and blur on image.
		2. Camera – The camera device shall have the following physical and performance properties
			1. Rated for protection against impacts.
			2. True day/night operation with removable IR cut filter
			3. The camera shall be able to produce clear images in highly contrast scenes with multi-exposure wide dynamic range up to 120dB.
			4. The camera shall support digital noise reduction using both 2D and 3D noise reduction technology.
			5. The camera shall be able to configure 3 privacy masking areas with rectangle zones.
			6. The camera shall provide video display on smart phone (iPhone, Android) to adjust viewing angle, rotation and focus.
		3. Intelligence and Analytics – The camera shall have a suite of intelligent analytic functions.
			1. Analytics events based on AI engine
				1. Object detection: Person / Face / Vehicle / License plate
				2. Virtual line\* (Crossing / Direction), Virtual area\* (Loitering / Intrusion / Enter / Exit) \*Some of the video analytics only works with people and vehicle detection
				3. Face mask detection, Social distancing detection, Slip & Fall detection
			2. Analytics events: Defocus detection, Motion detection, Tampering, Audio detection, Sound classification, Shock detection, Virtual area (Appear / Disappear)
				1. Motion detection with 8 definable detection areas with polygonal zones, and minimum/maximum object size.
				2. Audio Detection and classification of the following sound

Scream, Gunshot, Explosion, Crashing glass

* + - 1. Business Intelligence based on AI engine.
				1. People/Vehicle/Crowd counting, Queue management, Heatmap
			2. Support BestShot per object.
			3. Support WiseDetector for Adding custom objects.
		1. Interoperability – The camera shall be ONVIF Profile S, G, T and M compliant.
		2. The camera shall possess the following further characteristics:
			1. Micro SD/SDHC/SDXC memory card with configurable pre-alarm and post-alarm recording intervals
			2. NAS recording option with configurable pre-alarm and post-alarm recording intervals
			3. Alarm triggers and notifications
			4. Pixel Counter available in the web viewer.
			5. PoE+ capable including heater
			6. Impact protection, Water & Dust protection
			7. This device has been verified using STP cable. The use of appropriate GND grounding and STP cable is recommended to effectively protect your product and property from transient voltage, thunder stroke, communication interruption.
			8. NDAA Compliant
	1. **DETAILED SPECIFICATIONS**
		1. Video
			1. Imaging device: 1/1.8" CMOS
			2. Scanning: Progressive
			3. Minimum Illumination
				1. Color: 0.075Lux (F1.36, 1/30sec)
				2. BW: 0.0075Lux (F1.36, 1/30sec), 0Lux (IR LED on)
		2. Lens:
			1. Focal length: 6.91 ~ 214.7mm (31x) motorized varifocal
			2. Max. Aperture Ratio: F1.36(Wide) ~ F4.6 (Tele)
			3. Field of View
				1. H:60.92°(Wide) ~ 2.2°(Tele)
				2. V:35.26°(Wide)~1.24°(Tele)
				3. D:69.18°(Wide)~2.52°(Tele)
			4. Min. Object Distance: 3m (9.84ft)
			5. Focus Control: Simple focus
			6. Lens Type: P Iris
		3. Pan & Tilt & Rotate
			1. Range: None
		4. Operational Functions
			1. Camera Title: Displayed up to 85 characters
			2. Day/Night Setting: Auto (ICR) / Color / B/W / Schedule
			3. Backlight Compensation: Off / BLC / WDR / SSDR
			4. WDR: 120dB
			5. Digital Noise Reduction: SSNRⅤ, WiseNRⅡ(Based on AI engine)
			6. Digital Image Stabilization: Support (built-in gyro sensor)
			7. Defog: None
			8. Motion Detection: 8ea, Polygonal zones
			9. Privacy Masking: 3ea, Rectangle zones (Color: Gray / Black / White)
			10. Gain Control: Off / Low / Middle / High
			11. White Balance: ATW / AWC / Manual / Indoor / Outdoor
			12. Lens Distortion Correction: Support
			13. Electronic Shutter Speed
				1. Min / Max / Anti-flicker (1/5 ~ 1/12,000sec)
				2. Auto prefer shutter control based on AI engine
			14. Digital PTZ: None
			15. Video Rotation: Flip, Mirror, Hallway view (90° / 270°)
			16. Analytics
				1. Classified object type: Person / Face / Vehicle / License plate
				2. Attributes: Person (Gender, Color and Bag), Face (Age, Gender, Mask and Glasses), Vehicle (Type: car / bus / truck / motorcycle / bicycle and Color)
				3. Support BestShot per object
				4. Analytics events based on AI engine

Object detection

Virtual line\* (Crossing / Direction), Virtual area\* (Loitering / Intrusion / Enter / Exit) \*Some of the video analytics only works with people and vehicle detection

Face mask detection, Social distancing detection, Slip & Fall detection

* + - * 1. Analytics events

Defocus detection, Motion detection, Tampering, Audio detection, Sound classification, Shock detection, Virtual area (Appear / Disappear)

Sound classification: Scream, Gunshot, Explosion, Crashing glass

* + - * 1. Support WiseDetector for Adding custom objects
			1. Business Intelligence: People / Vehicle / Crowd counting, Queue management, Heatmap based on AI engine
			2. Alarm I/O: 2 configurable I/O ports, DC 12V output (Max. 50mA)
			3. Alarm Triggers: Analytics, Network disconnect, Alarm input, App event, Time schedule, MQTT subscription
			4. Alarm Events (When alarm trigger occurred)
				1. File upload(image): e-mail/FTP
				2. Notification: e-mail
				3. Recording: SD/SDHC/SDXC or NAS recording at event triggers
				4. Alarm output
				5. Handover: PTZ preset, Send message by HTTP / HTTPS / TCP
				6. Audio clip playback
				7. MQTT: publication
			5. Audio in: Selectable (mic in / line in)
			6. Audio out: Line out
			7. Audio Compression
				1. G.711 u-law / G.726 Selectable,
				2. G.726(ADPCM) 8KHz, G.711 8KHz
				3. G.726: 16Kbps, 24Kbps, 32Kbps, 40Kbps,
				4. AAC-LC: 48Kbps at 16KHz
			8. Light Type: IR LED (850nm)
			9. IR Viewable Length: WiseIR 70m(229.66ft)
			10. Video Out (for Installation)
				1. CVBS: 1.0 Vp-p / 75Ω composite, 720x480(N), 720x576(P)
				2. USB: Micro USB Type B, 1280x720
			11. Edge Storage: Micro SD/SDHC/SDXC 256GB (2 slots), NAS support
			12. Memory: 4096MB RAM, 1024MB Flash
		1. Video Streams
			1. Video compression: H.265, H.264, MJPEG
			2. Resolution: 3840x2160, 3072x1728, 2592x1944, 2688x1520, 2560x1440, 2048x1536, 1920x1080, 1600x1200, 1280x1024,1280x960, 1280x720, 1024x768, 800x600, 800x448, 720x576, 720x480, 640x480, 640x360
			3. Maximum Framerate
				1. H.265 / H.264: Max. 30fps / 25fps (60Hz / 50Hz)
				2. MJPEG: Max. 30fps
			4. Smart Codec: Manual (5ea area), WiseStreamⅡ, WiseStreamⅢ (using AI engine)
			5. Bitrate Control Method
				1. H.265 / H.264: CBR or VBR
				2. MJPEG: VBR
			6. Streaming method: Unicast / Multicast
			7. Streaming Capability: Multiple streaming (Up to 6 profiles)
			8. Simultaneous Users: Max. 6 users (Unicast)
			9. Profile set: Max. 10ea
			10. Application Programming Interface
				1. ONVIF Profile S / G / T/ M
				2. SUNAPI (HTTP API)
				3. Wisenet open platform: WiseAI application included (Analytic based on AI, Business intelligence)
		2. Network
			1. Ethernet: Metal shielded RJ-45 (10/100/1000 BASE-T)
			2. Protocol: IPv4, IPv6, TCP/IP, UDP/IP, RTP(UDP), RTP(TCP), RTCP, RTSP, NTP, HTTP, HTTPS, SSL/TLS, DHCP, FTP, SMTP, ICMP, IGMP, SNMPv1/v2c/v3(MIB-2), ARP, DNS, DDNS, QoS, UPnP, Bonjour, LLDP, SRTP (TCP, UDP Unicast), MQTT
			3. DDNS – The camera shall support DDNS services offered by the manufacturer and others publicly available service offerings
			4. QoS – Layer 3 DSCP
			5. Security Feature
				1. OS / Firmware Protect: Encrypted Firmware, Secure boot, Signed Firmware
				2. User authentication: Digest Authentication, Prevent brute-force attack
				3. Network authentication: IEEE 802.1X (EAP-TLS, EAP-LEAP, EAP-PEAP, MSCHAPv2)
				4. Secure Communication: HTTPS, WSS (WebSocket Secure)
				5. Access Control: IP-based access control
				6. Data Protect: Encryption Credentials, Encrypt compress for live recording file
				7. Audit: Access / System / Event Log management
				8. Device ID: Device certificate (Hanwha Techwin Root CA)
				9. Secure Storage: TPM, SD card partition encrypt
				10. Security Certificate: TPM with FIPS 140-2 level 2
				11. The device shall not provide a manufacture default password. Default password change shall be required to access the camera.
				12. A minimal level of password complexity shall be required by the camera.
				13. The camera shall not have a manufacture back-door password.
				14. The manufacturer shall provide a tool that provides the ability to make password changes to multiple cameras at the same time.
				15. IP address filtering – List of allowed or blocked IP addresses
			6. Discovery – The manufacturer shall offer a discovery program to identify all devices of them on the network.
			7. Configuration – The manufacturer shall offer a configuration program that remotely allows users to change settings on multiple cameras simultaneously.
			8. Firmware upgrade – The manufacturer shall offer a program capable of upgrading multiple cameras at the same time (not requiring access to individual cameras).
			9. Camera backup setting – The manufacturer shall provide a program that provides the ability to save multiple camera settings to a file and restore these camera settings if needed.
			10. Reporting – The manufacturer shall provide a tool that can generate a report including thumbnail view, MAC address, IP address, serial number and other camera settings.
		3. Electrical
			1. Input Voltage: PoE+ (IEEE802.3at), 12VDC
			2. Power Consumption
				1. PoE+: Max 25.5W, typical 14.0W
				2. 12VDC: Max 24.0W, typical 12.7W
		4. Mechanical And Environmental
			1. Color/Material: White / Aluminum, Bubble: Hard-coated window
			2. RAL Code: RAL9003
			3. Dimensions (W x H): ø136.2 x 358.7mm (ø5.36 x 14.12") \*without sunshield
			4. Weight: 3200g(7.05lb)
			5. Compatible Conduit Hole: 19.1mm (3/4”) (M25)
			6. Gangbox: single, double,4” octagon, 4” square
			7. Temperature & Humidity
				1. Operating: -40°C ~ +55°C (-40°F ~ +131°F) / Less than 90% RH \* Start up should be done at above -30°C
				2. Storage: -50°C ~ +60°C (-58°F ~ +140°F) / Less than 90% RH
			8. Certification: IP66, IP67, IK10, NEMA4X
		5. DORI Distance
			1. Detect (25PPM / 8PPF): Wide: 130.6m(428.4ft) / Tele: 4,000m(13,122ft)
			2. Observe (63PPM / 19PPF): Wide: 52.2m(171.4ft) / Tele: 1,600m(5,249ft)
			3. Recognize (125PPM / 38PPF): Wide: 26.1m(85.7ft) / Tele: 800m(2,625ft)
			4. Identify (250PPM / 76PPF): Wide: 13.1m(42.8ft) / Tele: 400m(1,312ft)
		6. Certification
			1. EMC
				1. FCC 47 CFR 15 Subpart B Class A
				2. ICES-3(A)/NMB-3(A)
				3. CE/UKCA

EN 55032 Class A, EN 50130-4, EN 61000-3-2, EN 61000-3-3

* + - * 1. VCCI CISPR 32 Class A
				2. RCM AS/NZS CISPR 32 Class A
			1. Safety
				1. UL 62368-1, CAN/CSA C22.2 NO. 62368-1, IEC/EN 62471
			2. Environment
				1. IEC/EN 63000, IEC/EN 60529 IP66/67, IEC/EN 62262 IK10

END OF SECTION