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: TNV-C8014RM
		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) (WDR on/off)
				2. MJPEG: Max. 30fps(@5MP Max. 5fps)
			2. The camera shall be able to configure various resolution selections.
				1. 2592x1944, 2560x1440, 1920x1080, 1280x960, 1280x720, 800x600, 800x448, 720x576, 720x480, 640x480, 640x360
			3. The camera shall support multiple video streaming up to 5 profiles.
			4. The camera shall support unicast video streaming up to 20 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 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. Integral IR illumination, providing effective visibility of 30m(98.42ft) at 0 Lux when activated in Black & White mode
			6. The camera shall be able to configure 32 privacy masking areas with 8point polygonal zones
			7. 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. Classified object type: Person / Vehicle (Type: car / bus / truck / motorcycle / bicycle)
			2. Attributes: Person (Upper / lower clothes color), Vehicle (Type: car / bus / truck / motorcycle / bicycle and color)
			3. Support Bestshot
			4. Analytics events based on AI engine: Motion detection\*, Object detection, Virtual line\* (Crossing / Direction), Virtual area\* (Loitering / Intrusion / Enter / Exit) \*Some of the video analytics only works with people and vehicle detection
			5. Analytics events: Defocus detection, Tampering, Shock detection, Virtual area (Appear / Disappear)
			6. Business Intelligence: (based on AI engine) People counting, Vehicle counting, Queue management, Heatmap
		4. Interoperability – The camera shall be ONVIF Profile S, G, T and M compliant.
		5. 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. IP66, IK10
			5. This device has been verified using M12 connector ethernet cable. The use of appropriate GND grounding and M12 ethernet cable is recommended to effectively protect your product and property from transient voltage, thunder stroke, communication interruption.
			6. NDAA Compliant
			7. EN50155 Compliant
	3. **DETAILED SPECIFICATIONS**
		1. Video
			1. Imaging device: 1/2.8" CMOS
			2. Resolution: 2592x1944, 2560x1440, 1920x1080, 1280x960, 1280x720, 800x600, 800x448, 720x576, 720x480, 640x480, 640x360, 320x240
			3. Maximum Framerate
				1. H.265 / H.264: Max. 30fps/25fps(60Hz/50Hz) (WDR on/off)
				2. MJPEG: Max. 30fps(@5MP Max. 5fps)
			4. Minimum Illumination
				1. Color: 0.03Lux (F1.6, 1/30sec)
				2. BW: 0.003Lux (F1.6, 1/30sec), 0Lux (IR LED on)
			5. Video Out: Micro USB Type B, 1280x720 for installation
		2. Lens:
			1. Focal length: 3.0 mm fixed focal
			2. Max. Aperture Ratio: F1.6
			3. Field of View: H 100° / V 73° / D 129°
			4. Min. Object Distance: 0.5m (1.64ft)
			5. Focus Control: Fixed
			6. Lens Type: Fixed Iris
			7. Mount Type: M12
		3. Pan / Tilt / Rotate
			1. Pan / Tilt / Rotate Range: ±5° / 0°~67° / ±90°
		4. Operational Functions
			1. Camera Title: Displayed up to 85 characters
			2. Day & Night: Auto (ICR)
			3. Backlight Compensation: BLC / WDR / SSDR / Clear HDR
			4. Wide Dynamic Range: 120dB
			5. Digital Noise Reduction: SSNRⅤ, WiseNRⅡ(Based on AI engine)
			6. Digital Image Stabilization: Support (built-in gyro sensor)
			7. Defog: Support(manual)
			8. Motion Detection: 8ea, 8point polygonal zones
			9. Privacy Masking: 32ea, 4point quadrangle zones (Color: Gray / Green / Red / Blue / Black / White), Dynamic Privacy Mask (Mosaic)
			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. Prefer shutter control (Based on AI engine)
			14. Digital PTZ: support
			15. Video Rotation: Flip, Mirror, Hallway view (90° / 270°)
			16. Analytics
				1. Classified object type: Person / Vehicle (Type: car / bus / truck / motorcycle / bicycle)
				2. Attributes: Person (Upper / lower clothes color), Vehicle (Type: car / bus / truck / motorcycle / bicycle and color)
				3. Support Bestshot
				4. Analytics events based on AI engine: Motion detection\*, Object detection, Virtual line\* (Crossing / Direction), Virtual area\* (Loitering / Intrusion / Enter / Exit) \*Some of the video analytics only works with people and vehicle detection
				5. Analytics events: Defocus detection, Tampering, Shock detection, Virtual area (Appear / Disappear)
			17. Business Intelligence: (based on AI engine) People counting, Vehicle counting, Queue management, Heatmap
			18. Alarm I/O: None
			19. Alarm Triggers: Analytics, Network disconnect, MQTT subscription
			20. Alarm Events (When alarm trigger occurred)
				1. File upload (image/video clip): e-mail/FTP/SFTP
				2. Notification: e-mail
				3. Recording: SD/SDHC/SDXC or NAS recording at event triggers
				4. Handover: PTZ preset, Send message by HTTP / HTTPS / TCP
				5. Audio clip playback
				6. MQTT: publication
			21. Audio in: Selectable (mic in/line in/built-in mic)
			22. Audio out: Line out
			23. Light Type: IR LED (850nm)
			24. Light Viewable Length: 30m(98.42ft)
			25. Webpage Language: English, Korean, Simplified Chinese, Traditional Chinese, French, Italian, Spanish, German, Japanese, Russian, Portuguese, Czech, Polish, Turkish, Dutch, Hungarian, Greek
			26. Edge Storage: Micro SD/SDHC/SDXC 1 slot 256GB
			27. Memory: 2GB RAM, 1GB Flash
		5. Network
			1. Ethernet: M12 (10/100 BASE-T)
			2. Video compression
				1. H.265 / H.264: Main / High
				2. MJPEG
			3. 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
			4. Smart Codec: Manual (5ea area), WiseStream Ⅲ (using AI engine)
			5. Video Quality Adjustment
				1. H.265 / H.264: Target bitrate level control
				2. MJPEG: Quality level control
			6. Bitrate Control Method
				1. H.265 / H.264: CBR or VBR
				2. MJPEG: VBR
			7. Streaming
				1. Unicast (20 users) / Multicast
				2. Multiple streaming: Up to 5 profiles
			8. Protocol: IPv4, IPv6, TCP/IP, UDP/IP, RTP(UDP), RTP(TCP), RTCP, RTSP, NTP, HTTP, HTTPS, SSL/TLS, DHCP, FTP/SFTP, SMTP, ICMP, IGMP, SNMPv1/v2c/v3(MIB-2), ARP, DNS, DDNS, QoS, UPnP, Bonjour, LLDP, CDP, SRTP(TCP, UDP Unicast), MQTT
			9. DDNS – The camera shall support DDNS services offered by the manufacturer and others publicly available service offerings
			10. QoS – Layer 3 DSCP
			11. Application Programming Interface
				1. ONVIF Profile S / G / T/ M
				2. SUNAPI (HTTP API)
				3. Hanwha Vision Open Platform
		6. 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: SD card partition encrypt
			10. The device shall not provide a manufacture default password. Default password change shall be required to access the camera.
			11. A minimal level of password complexity shall be required by the camera.
			12. The camera shall not have a manufacture back-door password.
			13. The manufacturer shall provide a tool that provides the ability to make password changes to multiple cameras at the same time.
			14. IP address filtering – List of allowed or blocked IP addresses
		7. General
			1. Discovery – The manufacturer shall offer a discovery program to identify all devices of them on the network.
			2. Configuration – The manufacturer shall offer a configuration program that remotely allows users to change settings on multiple cameras simultaneously.
			3. Firmware upgrade – The manufacturer shall offer a program capable of upgrading multiple cameras at the same time (not requiring access to individual cameras).
			4. 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.
			5. 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.
		8. Electrical
			1. Input Voltage: PoE (IEEE802.3af, Class3)
			2. Power Consumption: Max 7.2W, typical 4.2W
		9. Mechanical And Environmental
			1. Color/Material: White / Aluminum, Hard-coated dome bubble
			2. RAL Code: RAL9003
			3. Dimensions (W x H x D): 106 x 105 x 55mm (4.17 x 4.13 x 2.17")
			4. Weight: 466g(1.03lb)
			5. Certification: IP66, IK10
			6. Operating Temperature & Humidity: -40°C~+55°C(-40°F~+131°F) / 0~100% RH(Condensing) \*Start up should be done at above -30°C, Humidity control /w Air vapor control
			7. Storage Temperature & Humidity: -40°C~+55°C(-40°F~+131°F) / 0~95% RH
		10. Compatible Models
			1. Dome Cover: SPB-VAN23W, SPG-VAN23W
			2. Other Compatible Models: SBD-110GPA
		11. DORI Distance
			1. Detect (25PPM / 8PPF): 43.5m(142.71ft)
			2. Observe (63PPM / 19PPF): 17.5m(57.09ft)
			3. Recognize (125PPM / 38PPF): 8.7m(28.5ft)
			4. Identify (250PPM / 76PPF): 4.3m(14.27ft)
		12. 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
				4. VCCI CISPR 32 Class A
				5. RCM AS/NZS CISPR 32 Class A
				6. Railway/Vehicle Application
				7. EN50121-4, EN50121-3-2
			2. Safety
				1. UL 62368-1
				2. CAN/CSA C22.2 NO. 62368-1
				3. IEC/EN 62471
			3. Environment
				1. IEC/EN 63000
				2. IEC/EN 60529 IP66, IEC/EN 62262 IK10
				3. Railway/Vehicle Application
				4. JIS E 5006, IEC62236-3-2, IEC62236-4, EN50121-4
				5. JIS E 4031, EN50498, EN50155, IEC/EN61373, EN45545-2 HL3,

END OF SECTION