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

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**2 MP NETWORK IR DOME CAMERA**

**DIVISION 28 – ELECTRONIC SAFETY AND SECURITY**

**Notes to Specifier:**

1. Where several alternative parameters or specifications exist, or where, the specifier has the option of inserting text, such choices are presented in **<bold text>.**

2. Explanatory notes and comments are presented in **colored** text.

**Important: See further notes on the following page.**

**Important Note to Security Systems Specifiers**

CSI MasterFormat 2016 incorporates numerous significant changes affecting electronic safety and security. This document is written to provide flexibility in using either format, although adoption of MasterFormat 2016 is encouraged. The following is a guide to the MasterFormat numbers relevant to the product referenced in this specification.

**Primary Specification Area:**

MasterFormat 2014:

28 20 00 Electronic Surveillance

 28 23 00 Video Surveillance

 28 23 29 Video Surveillance Remote Devices and Sensors

MasterFormat 2016:

 28 20 00 Video Surveillance

 28 2x xx Surveillance Cameras

 28 2x xx IP Cameras

**Related Requirements:**

MasterFormat 2014:

 27 20 00 Data Communications

 28 23 13 Video Surveillance Control and Management Systems

 28 23 16 Video Surveillance Monitoring and Supervisory Interfaces

 28 23 19 Digital Video Recorders and Analog Recording Devices

 28 23 23 Video Surveillance Systems Infrastructure

MasterFormat 2016

 27 15 01.xx Video Surveillance Communications Conductors and Cables

 27 20 00 Data Communications

 28 05 xx.xx PoE Power Sources for Electronic Safety and Security

 28 05 xx Storage Appliances for Electronic Safety and Security

 28 05 xx.xx Network Video Recorders

 28 05 xx Cyber Requirements for Electronic Safety and Security

 28 05 xx Safety and Security Network Communications Equipment

 28 2x 00 Video Management System

**2 MP NETWORK IR DOME CAMERA**

1. **GENERAL**
	1. **SUMMARY**
		1. Section includes a 2 MP IP camera with IR LED.
		2. Product - A 2 MP dome type IP camera with multi-streaming (H.264 and MJPEG) capability.

## Related Requirements

**Refer to MasterFormat notes at the beginning of this document to select requirements specific to the MasterFormat version being used in the specification.**

* 1. **REFERENCES**
		1. Abbreviations
			1. AGC - Automatic Gain Control
			2. ARP – Address Resolution Protocol
			3. AWB - Automatic White Balance
			4. BLC – Back light compression
			5. CBR – Constant Bit Rate
			6. CVBS – Color, Video, Blanking, Sync
			7. DHCP - Dynamic Host Configuration Protocol
			8. DNR – Digital Noise Reduction
			9. DNS - Domain Name Server
			10. DDNS – Dynamic Domain Name Server
			11. DSCP – Differentiated Services Code Point
			12. fps - frames per second
			13. FTP - File Transfer Protocol
			14. GOV – Group of Video
			15. GUI – Graphical User Interface
			16. HD – High Definition
			17. HTTP - HyperText Transfer Protocol
			18. ICMP – Internet Control Message Protocol
			19. IGMP - Internet Group Management Protocol
			20. IP - Internet Protocol
			21. JPEG - Joint Photographic Experts Group
			22. MJPEG - Motion JPEG
			23. MP - MegaPixel
			24. MPEG - Moving Pictures Experts Group
			25. NAS – Network Attached Storage
			26. NTP - Network Time Protocol
			27. PIM-SM - Protocol Independent Multicast-Sparse Mode
			28. PoE - Power over Ethernet
			29. PPPoE – Point to Point Protocol over Ethernet
			30. RTP - Real-time Transport Protocol
			31. RTCP – Real-Time Control Protocol
			32. RTSP - Real-Time Streaming Protocol
			33. SDK – Software Development Kit
			34. SMTP - Simple Mail Transfer Protocol
			35. SNMP – Simple Network Management Protocol
			36. SSL – Secure Sockets Layer
			37. TCP - Transmission Control Protocol
			38. UDP - User Datagram Protocol
			39. UPnP – Universal Plug and Play
			40. VBR – Variable Bit Rate
			41. VMS - Video Management System
			42. WDR – Wide Dynamic Range
			43. LDC – Lens Distortion Correction
		2. Reference Standards
			1. Network - IEEE
				1. 802.3 Ethernet Standards
				2. 802.1x Port-based Network Access Control
			2. Video
				1. ISO / IEC 14496–10, MPEG-4 Part 10 ( ITU H.264)
				2. ISO / IEC 10918 – JPEG
				3. ONVIF – Profiles S and G
			3. Emissions
				1. FCC-47 CFR Part 15 Subpart B Class B
				2. CE EN 55022:2010
			4. Immunity - CE
				1. EN 50130-4:2011
				2. EN 61000-3-3:2014
				3. EN 61000-4-2:2009
				4. EN 61000-4-3:2006+A2:2010
				5. EN 61000-4-4:2012
				6. EN 61000-4-5:2014
				7. EN 61000-4-6:2009
			5. Safety
				1. UL listed
				2. CE EN 50581:2012 (hazardous substances)
		3. Definitions
			1. GOV (Group of Video object planes) - A set of video frames for H.264 compression, indicating a collection of frames from the initial I-Frame (key frame) to the next I-Frame. GOV consists of two kinds of frames in video surveillance setup: I-Frame and P-Frame.
			2. Dynamic GOV – Dynamic assignment of GOV length based on the complexity of the scene to efficiently manage bitrate of the video stream and reduce the storage required.
			3. Multi-exposure wide dynamic range - Operation which automatically adjusts shutter speed to provide a wide range between dark and light areas visible at the same time, preventing backlighting issues. Long exposure is used for dark areas and a short exposure is used in bright areas.
			4. Dynamic fps – Dynamic assignment of fps (frames per seconds) based on the movement of object(s) in the scene to efficiently manage bitrate of the video stream and reduce the storage required.
			5. Smart Codec –Codec that controls quantization parameter, fps, and GOV length H.264 to efficiently manage bitrate of the video stream and reduce the storage required. Smart Codec may be referred to as WiseStream in this document.
	2. **SUBMITTALS**
		1. Product Data
			1. Manufacturer’s printed or electronic data sheets
			2. Manufacturer’s installation and operation manuals
			3. Warranty documentation
	3. **QUALIFICATIONS**
		1. Manufacturer shall have a minimum of five years’ experience in producing IP video equipment.
		2. Installers shall be trained and authorized by the Manufacturer to install, integrate, test, and commission the system.
	4. **DELIVERY, STORAGE AND HANDLING**
		1. Deliver the camera in the manufacturer’s original, unopened, undamaged container with identification labels intact.
		2. Store the camera in a temperature environment specified in section 2.04 Detailed Specification, protected from mechanical and environmental conditions as designated by the manufacturer.
	5. **WARRANTY, LICENSING AND SUPPORT**
		1. Manufacturer shall provide at least a limited 3 year warranty for the product to be free of defects in material and workmanship.
		2. Manufacturer shall provide embedded camera video analytics free of license charges.

END OF SECTION

1. **PRODUCTS**
	1. **EQUIPMENT**
		1. Manufacturer: Hanwha Techwin

http://www.hanwha-security.com/

* + 1. Model LND-6021R
		2. Alternates: None
	1. **GENERAL DESCRIPTION**
		1. Video Compression and Transmission – The camera shall have the following properties relating to the video signals it produces.
			1. H.264 and MJPEG compression, each derived from a dedicated encoder and capable of being streamed independently and simultaneously.
				1. H.264 – maximum of 30 fps at all resolution
				2. MJPEG – maximum of 15 fps
			2. The camera shall be able to stream up to three 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. 1920 x 1080, 1280 x 1024, 1280 x 960, 1280 x 720, 1024 x 768, 800 x 600,

800 x 448, 720 x 576, 640 x 480, 640 x 360, 320 x 240

* + - 1. The camera shall support multicast and unicast video streaming and allow six users at unicast mode.
			2. The camera shall be able to configure Dynamic DNS (DDNS). DDNS shall be provided with no additional cost by the manufacturer.
			3. The camera shall provide smart codec (WiseStream, Dynamic GOV, and Dynamic fps) to efficiently manage bit rate of the video stream and reduce storage while producing video quality that is visually equal to the one without smart codec.
		1. Camera – The camera device shall have the following physical and performance properties:
			1. The camera shall be able to produce clear images in highly contrast scenes with multi-exposure wide dynamic range up to 120dB.
			2. Lens distortion correction which corrects curviness caused by distortion at the edges of images.
			3. Automated or manual day and night operation with infrared cut filter. Images are available in color or black and white.
				1. Low light level operation to 0.18 lux (F2.0) in color mode and 0 (IR LED on) in black and white mode.
			4. The camera shall support digital noise reduction using both 2D and 3D noise reduction technology.
			5. Configurable six privacy masking regions utilizing a polygon
			6. Hallway view mode which rotates the images to 90 or 270 degrees so that the view is more suitable for hallways.
			7. The camera shall support PoE.
		2. Intelligence and Analytics – The camera shall have a suite of integral intelligent operations and analytic functions to include:
			1. Motion detection with four definable detection areas with rectangular zones, and minimum/maximum object size.
			2. Detection of logical events of specified conditions from the camera’s video
				1. Tampering
				2. Motion detection
		3. Interoperability – The camera shall be ONVIF Profile S and G compliant.
		4. The camera shall possess the following further characteristics:
			1. Built-in web server, accessed via standard browsers including Internet Explorer, MS Edge, Firefox, Chrome & Safari.
			2. Micro SD/SDHC memory card with configurable pre-alarm and post-alarm recording intervals
			3. Alarms and notifications
				1. alarm notification triggers:

Motion detection

Tampering detection

SD card error

* + - * 1. available notification means upon trigger:

File Upload Via FTP and E-mail

Local storage (SD / SDHC) recording at event triggers

Notification via E-mail

* 1. **CAMERA SOFTWARE**
		1. The camera shall have a built in web server which supports browser-based configuration using Internet Explorer, MS Edge, Google Chrome, Mozilla Firefox, and Apple Safari from a PC or Mac.
		2. The web viewer shall provide a monitoring screen which displays live camera video and simultaneously provides same-screen access to the following functions:
			1. Live view window size
			2. Resolution setting
			3. Image (snapshot) capture
			4. Manual recording to SD
			5. Access recorded data playback and camera configuration menus
		3. The web viewer shall provide a playback screen which provides access to the following functions:
			1. Recorded data search using date and time range
			2. Recorded data search using event type
			3. Play a recorded video by event triggering
			4. Set resolution
			5. Generate a backup copy of saved video data
		4. The web viewer shall provide a setup screen which provides access to the following configuration settings and functions in the camera:
			1. Digital video profile to include compression type, maximum or target bit rate, frame rate, multicast parameters, crop encoding area
			2. User profile to include password, access level, authentication
			3. Date and time
			4. Network settings and IP version
				1. DDNS
				2. SSL, including certificate management
				3. 802.1x authentication
				4. Quality of Service settings
				5. SNMP to include version selection and settings
				6. Auto configuration
			5. Video setup to include flip and mirror mode, video type, and privacy zone
			6. Camera settings to include image preset, sensor frame capture, dynamic range, white balance, back light, exposure, day/night operation, on-screen display, sharpness, contrast, color level, lens distortion correction.
			7. Event detection setup to include notification parameters, recording rules, time schedule, tamper protection, motion detection, event triggers
			8. System function to include reboot, upgrade, check system and event logs, application (SDK) management
			9. View profile information
		5. Client requirements
			1. Acceptable Operating Systems: Windows 7 / 8.1 / 10, MAC OS X 10.10, 10.11, 10.12
			2. Acceptable browsers:
				1. Non-plugin WebViewer Google Chrome, MS Edge, Mozilla Firefox

(Windows 64bit only), Safari (Mac OS X only)

* + - * 1. Plug-in WebViewer MS Explore

* 1. **DETAILED SPECIFICATIONS**
		1. VIDEO
			1. Imaging Device 1/2.9" 2.19M CMOS
			2. Total Pixels 2,000(H) x 1,121(V)
			3. Effective Pixels 1,984(H) x 1,105(V)
			4. Scanning System Progressive Scan
			5. Min. Illumination Color: 0.18Lux (F2.0), B/W: 0Lux (IR LED on)
		2. LENS
			1. Focal Length (Zoom Ratio) 4mm fixed
			2. Max. Aperture Ratio F2.0
			3. Angular Field of View H: 80°

V: 43°

D: 94°

* + - 1. Min. Object Distance 0.5m (1.64ft)
			2. Lens / Mount Type fixed / Board-in type
		1. PAN/TILT/ROTATE
			1. Pan / Tilt / Rotate Range 0° ~ 350° / 0° ~ 67° / 0° ~ 355°
		2. OPERATIONAL
			1. IR Viewable Length 20m (65.62ft)
			2. Camera Title Off / On (Displayed up to 15 characters)
			3. Day & Night Auto (ICR) / Color / B/W / Schedule
			4. Backlight Compensation Off / BLC / WDR
			5. Wide Dynamic Range 120dB
			6. Contrast Enhancement SSDR (Off / On)
			7. Digital Noise Reduction SSNR (Off / On)
			8. Motion Detection Off / On (4ea rectangular zones)
			9. Privacy Masking Off / On (6ea rectangular zones)
			10. Gain Control Off / Low / Middle / High
			11. White Balance ATW / AWC / Manual / Indoor / Outdoor
			12. LDC (Lens Distortion Correction) Off / On (5 levels with min / max)
			13. Electronic Shutter Speed Minimum / Maximum / Anti flicker
			14. Flip / Mirror Off / On, Hallway view
			15. Video & Audio Analytics Tampering, Motion detection
			16. Alarm Triggers Motion detection, Tampering detection, SD card error
			17. Alarm Events File upload via FTP and E-mail

Local storage recording at event,

Notification via E-mail

* + 1. NETWORK
			1. Ethernet RJ-45 (10/100BASE-T)
			2. Video Compression Format H.264, MJPEG
			3. Resolution 1920 x 1080, 1280 x 1024, 1280 x 960, 1280 x 720,

1024 x 768, 800 x 600, 800 x 448, 720 x 576, 640 x 480, 640 x 360, 320 x 240

* + - 1. Max. Framerate H.264 : Max. 30fps at all resolutions

MJPEG : Max. 1fps at 1920 x 1080, 1280 x 1024,

1280 x 720, 1024 x 768,

Max. 15fps at other resolution

* + - 1. WiseStream II Support
			2. Video Quality Adjustment H.264, MJPEG : Target Bitrate Level Control
			3. Bitrate Control Method H.264 : CBR or VBR, MJPEG : VBR
			4. Streaming Capability Multiple streaming (Up to 3 profiles)
			5. IP IPv4, IPv6
			6. Protocol TCP/IP, UDP/IP, RTP(UDP), RTP(TCP), RTCP,RTSP,

NTP, HTTP, HTTPS, SSL/TLS, DHCP, PPPoE, FTP, SMTP, ICMP, IGMP, SNMPv1/v2c/v3(MIB-2), ARP, DNS, DDNS, QoS, UPnP, Bonjour

* + - 1. Security HTTPS(SSL) login authentication, Digest login

authentication, IP address filtering, User access log, 802.1X authentication (EAP-TLS, EAP-LEAP)

* + - 1. Streaming Method Unicast / Multicast
			2. Max. User Access 6 users at unicast mode
			3. Edge Storage Micro SD/SDHC Max. 32GB

- Motion images recorded in the SD memory card can be downloaded

- Manual recording at local PC

* + - 1. Application Programming Interface ONVIF profile S/G, SUNAPI (HTTP API)
			2. Webpage Language English, French, German, Spanish, Italian, Chinese,

Korean, Russian, Japanese, Swedish, Danish, Portuguese, Turkish, Polish, Czech, Rumanian, Serbian, Dutch, Croatia, Hungary, Greek, Finnish, Norwegian

* + - 1. Web Viewer Supported OS: Windows 7, 8.1, 10,

Mac OS X 10.10, 10.11, 10.12

* + - * 1. Non-plugin Webviewer - Supported Browser : Google Chrome 63, MS Edge 41,

Mozilla Firefox 57 (Window 64bit only),

Apple Safari 11 (Mac OS X only)

* + - * 1. Plug-in Webviewer - Supported Browser : MS Explore 11
			1. Central Management Software SmartViewer, SSM
		1. ENVIRONMENTAL
			1. Operating Temperature / Humidity -10°C ~ +55°C (-14°F ~ +131°F) / Less than 90% RH
			2. Storage Temperature / Humidity -30°C ~ +60°C (-22°F ~ +140°F) / Less than 90% RH
		2. ELECTRICAL
			1. Input Voltage / Current PoE (IEEE802.3af, Class3)
			2. Power Consumption 6.5W
		3. MECHANICAL
			1. Color / Material Ivory / Plastic
			2. Dimensions (WxH) Ø110.0 x 86.0mm (Ø4.33" x 3.39")
			3. Weight 230g (0.51 lb)

END OF SECTION

1. **EXECUTION**
	1. **INSTALLERS**
		1. Contractor personnel shall comply with all applicable state and local licensing requirements.
	2. **PREPARATION**
		1. The network design and configuration shall be verified for compatibility and performance with the camera(s).
		2. Network configuration shall be tested and qualified by the Contractor prior to camera installation.
		3. All firmware found in products shall be the latest and most up-to-date provided by the manufacturer, or of a version as specified by the provider of the Video Management Application (VMA) or Network Video Recorder (NVR).
		4. All equipment requiring users to log on using a password shall be configured with user/site-specific password/passwords. No system/product default passwords shall be allowed.
	3. **INSTALLATION**
		1. The contractor shall carefully follow instructions in documentation provided by the manufacturer to insure all steps have been taken to provide a reliable, easy-to-operate system.
		2. All equipment shall be tested and configured in accordance with instructions provided by the manufacturer prior to installation.
		3. Before permanent installation of the system, the Contractor shall test the system in conditions simulating the final installed environment.
	4. **STORAGE**
		1. The hardware shall be stored in an environment where temperature and humidity are in the range specified by the Manufacturer.

END OF SECTION