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**2 MP H.265 NETWORK STAINLESS 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 H.265 NETWORK STAINLESS IR DOME CAMERA**

1. **GENERAL**
   1. **SUMMARY**
      1. Section includes a 2 MP H.265 stainless IP camera with IR LED.
      2. Product - A 2 MP dome type IP camera with multi-streaming (H.265, 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 Auto Gain Control
        2. AES Advanced Encryption Standard
        3. API Application Programming Interface
        4. ARP Address Resolution Protocol
        5. AWB Auto White Balance
        6. BLC Back light compensation
        7. CBR Constant Bit Rate
        8. CVBS Composite Video Blanking Sync
        9. DHCP Dynamic Host Configuration Protocol
        10. DNR Digital Noise Reduction
        11. DNS Domain Name Server
        12. DDNS Dynamic Domain Name Server
        13. DSCP Differentiated Services Code Point
        14. fps frames per second
        15. FTP File Transfer Protocol
        16. GOV Group of Video
        17. GUI Graphical User Interface
        18. HD High Definition
        19. HTTP Hypertext Transfer Protocol
        20. ICMP Internet Control Message Protocol
        21. IGMP Internet Group Management Protocol
        22. IP Internet Protocol
        23. IR Infrared
        24. JPEG Joint Photographic Experts Group
        25. LAN Local Area Network
        26. LED Light Emitting Diode
        27. LDC Lens Distortion Correction
        28. LPR License Plate Recognition
        29. MJPEG Motion JPEG
        30. MP Megapixel
        31. MPEG Moving Pictures Experts Group
        32. NAS Network Attached Storage
        33. NTP Network Time Protocol
        34. PIM-SM Protocol Independent Multicast-Sparse Mode
        35. PoE Power over Ethernet
        36. PPPoE Point to Point Protocol over Ethernet
        37. QoS Quality of Service
        38. RTP Real-Time Transport Protocol
        39. RTCP Real-Time Control Protocol
        40. RTSP Real-Time Streaming Protocol
        41. SDK Software Development Kit
        42. SMTP Simple Mail Transfer Protocol
        43. SNMP Simple Network Management Protocol
        44. SSDR Super Smart Dynamic Range
        45. SSNR Super Smart Noise Reduction
        46. SSL Secure Sockets Layer
        47. TCP Transmission Control Protocol
        48. UDP User Datagram Protocol
        49. UPnP Universal Plug and Play
        50. VBR Variable Bit Rate
        51. VMS Video Management System
        52. WDR Wide Dynamic Range
     2. Reference Standards
        1. Network - IEEE
           1. 802.3 Ethernet Standards
           2. 802.1x Port-based Network Access Control
           3. IPv4 IP addressing version 4
           4. IPv6 IP addressing version 6
           5. QoS Quality of Service
        2. Video
           1. ISO / IEC 23008-2:2013, MPEG-H Part2 (ITU H.265, HEVC)
           2. ISO / IEC 14496–10, MPEG-4 Part 10 ( ITU H.264)
           3. ISO / IEC 10918 – JPEG
           4. ONVIF – Profile 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 and H.265 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 in H.265 and 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 XNV-6120RS
    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.265, H.264 and MJPEG compression, each derived from a dedicated encoder and capable of being streamed independently and simultaneously.
           1. H.265 and H.264 – maximum of 60fps at all resolution
           2. MJPEG – maximum of 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. 1920 x 1080, 1280 x 1024, 1280 x 960, 1280 x 720, 1024 x 768, 800 x 600,

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

* + - 1. The camera shall be able to stream at least 10 independent video stream types using unicast protocol.
      2. The camera shall support multicast and unicast video streaming.
      3. The camera shall be able to configure Dynamic DNS (DDNS). DDNS shall be provided with no additional cost by the manufacturer.
      4. The camera shall provide smart codec (WiseStream Ⅱ, 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. It shall provide Wi-Fi interface which can stream video to a smart phone for installation purposes. The smart phone application shall be available in iOS and Android for free of charge with search keyword, ‘Wisenet Installation’.

**Wi-Fi dongle is required for Wi-Fi connection.**

* + - 1. The camera shall be able to produce clear images in highly contrast scenes with multi-exposure wide dynamic range up to 150dB.
      2. Enhanced digital image stabilization (DIS) with built-in gyro sensor. DIS with built-in gyro sensor greatly reduces false alarm caused by scene changes.
      3. Lens distortion correction which corrects curviness caused by distortion at the edges of images.
      4. Automated, manual, scheduled, or externally triggered day and night operation with infrared cut filter. Images are available in color or black and white.
         1. Low light level operation to 0.03lux (F1.6) in color mode and 0 (IR LED on) in black and white mode.
      5. The camera shall support digital noise reduction using both 2D and 3D noise reduction technology.
      6. Configurable 32 privacy masking regions utilizing a polygon
      7. Hallway view mode which rotates the images to 90 or 270 degrees so that the view is more suitable for hallways.
      8. Defog feature to remove fogginess of scene which can be triggered automatically from fog detection event.
    1. Intelligence and Analytics – The camera shall have a suite of integral intelligent operations and analytic functions to include:
       1. Motion detection with eight definable detection areas with eight point polygonal zones, and minimum/maximum object size.
       2. Motion detection hand-over to PTZ cameras. The camera shall be able to call a preset of PTZ camera when motion event is triggered.
       3. Detection of logical events of specified conditions from the camera’s video
          1. Tampering
          2. Loitering
          3. Directional detection
          4. Defocus detection
          5. Fog detection
          6. Virtual line
          7. Enter/Exit
          8. (Dis)Appear,
          9. Audio detection
          10. Face detection
          11. Motion detection
       4. Detection and classification of the following sound.
          1. Scream
          2. Gunshot
          3. Explosion
          4. Crashing glass
    2. Interoperability – The camera shall be ONVIF Profile S and G compliant. Moreover it shall allow users to install third party applications from the manufacturer’s partners through Open Platform and the list of available applications and partners shall be available from the manufacturer’s homepage.
    3. The camera shall possess the following further characteristics:
       1. Built-in web server, accessed via standard HTML5 browsers including Internet Explorer, Firefox, Chrome & Safari
       2. The camera shall provide streaming to multiple smart phones with DDNS provided freely from the manufacturer. In addition, the application shall be available for both iOS and Android, free of charge with search keyword, ‘Wisenet Mobile’.
       3. Micro SD/SDHC/SDXC memory card with configurable pre-alarm and post-alarm recording intervals
       4. NAS recording option with configurable pre-alarm and post-alarm recording intervals
       5. Alarms and notifications
          1. alarm notification triggers:

Alarm input

Motion detection

Video & Audio analytics

Network disconnect

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

File Upload via FTP and E-mail

Notification via E-mail

Local storage (SD / SDHC / SDXC) or NAS recording at event triggers

External output

Presets

* + - 1. Pixel Counter available in the web viewer.
      2. PoE capable
  1. **CAMERA SOFTWARE**
     1. The camera shall have a built in web server which supports HTML5 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 or NAS
        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, and 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 and lens distortion correction.
        7. Event detection setup to include notification parameters, recording rules, time schedule, tamper protection, motion detection and event triggers
        8. System function to include reboot, upgrade, check system and event logs and 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, Apple Safari (Mac OS X only)

* 1. **DETAILED SPECIFICATIONS**
     1. Video
        1. Imager
           1. Sensor 1/2.8" 2MP CMOS

pixels per sensor 1945 (H) x 1109 (V) total; 1945 (H) x 1097 (V) effective

scanning progressive

* + - * 1. Minimum illumination

Color mode 0.03Lux (F1.6, 1/30sec)

Black & white mode0Lux (IR LED on)

* + - * 1. S/N Ratio 50dB
        2. Video Out (Installation) CVBS: 1.0 Vpp / 75Ω composite, 720 x 480(N), 702 x 576(P)

USB: micro USB type B, 1280x720 for installation

* + - * 1. The following features with control settings shall be available:

Camera Title Off / On (Displayed up to 85 characters per line)

W/W English / Numeric / Special characters

China English / Numeric / Special / Chinese characters

Common Multi-line (Max. 5), Color (Grey/Green/Red/Blue/Black/White),

Transparency, Auto scale by resolution

Day/night setting Auto (ICR) / Color / B/W / External / Schedule

Backlight compensation (BLC) Off / BLC / HLC, WDR

WDR 150dB

Contrast Enhancement Off / On (SSDR)

Digital Noise Reduction (DNR) Off / On (SSNR5 : 2D+3D noise filter)

2D + 3D Noise Filter

Digital Image Stabilization Off / On (Built-in gyro sensor)

Defog Off / Auto / Manual

Motion Detection Off / On (8ea, 8point polygonal zones)

Handover to PTZ

Privacy Masking Off / On (32ea, polygonal zones)

- Color: Gray/Green/Red/Blue/Black/White

- Mosaic

Gain Control Off / Low / Middle / High

White Balance ATW / AWC / Manual / Indoor / Outdoor

Including Mercury and Sodium

Electronic shutter speed

settings min, max, anti-flicker (2 ~ 1/12,000sec)

Digital Zoom 24x digital zoom, (preset, group)

Image flip Off / On

Image mirror Off / On

Hallway View 90° / 270°

Alarm I/O Input 1ea / Output 1ea

Alarm Triggers Alarm Input, Motion detection,

Video & Audio analytics,

Network disconnect

Alarm Events File Upload via FTP and E-mail,

Notification via E-mail,

Local storage (SD / SDHC / SDXC) or

NAS recording at event triggers,

External output, Preset

Pixel Counter Available in the web viewer.

* + - * 1. Lens: 5.2mm ~ 62.4mm (Optical 12x)

Max. Aperture Ratio F1.6 (Wide) ~ F3.0 (Tele)

Angle of view H: 54.58˚ (Wide) ~ 5.30° (Tele) V: 32.19° (Wide) ~ 3.00° (Tele)

D: 61.40° (Wide) ~ 6.06° (Tele)

Min. Object Distance 2.1m (6.89ft)

Focus Control Auto / Manual / One shot AF

Lens Type DC Auto Iris

Mount Type Board-in Type

* + - * 1. Pan/Tilt/Rotate

Pan 0° ~ 354°

Tilt 0° ~ 75°

Rotate 0° ~ 355°

* + - 1. Video Streams
         1. The camera shall be able to produce 10 video profiles, each of which may have the following properties:

Encoding type

H.265

H.264

MJPEG

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, 720 x 480, 640 x 480,

640 x 360, 320 x 240

Maximum frame rate

H.265 and H.264 Max. 60fps at all resolutions

MJPEG Max. 30fps

Smart Codec WiseStreamⅡ, Dynamic GOV, Dynamic fps

Bit rate control method

H.265 and H.264

target bitrate level control

constant bit rate (CBR) or variable bit rate (VBR)

MJPEG

target bitrate level control

variable bit rate (VBR)

* + - 1. Number of multi-streaming profiles 10 maximum
      2. Simultaneous users (total) 20 maximum (unicast)
      3. Storage and Recording
         1. The camera shall have onboard SD card storage

Card type Micro SD/SDHC/SDXC

Capacity 512GB (256GB x 2 slots)

Video or images content on the card shall have the ability to be downloaded to a selected destination.

* + - * 1. NAS
        2. The capacity of the SD card storage capacity shall not be compromised by other factors such as 3rd party applications.
      1. Interoperability – Video streams shall be capable of supporting ONVIF profile S and G.
      2. Single Images – The camera shall support image screenshot and export.
      3. The camera shall support open platform to allow users to install third party applications.
    1. Network
       1. Connectivity 10/100 Base-T Ethernet via RJ-45 connector
       2. Protocols supported
          1. Transmission Control Protocol (TCP), Internet Protocol (IP) v4 and v6, User Datagram Protocol (UDP)
          2. Configuration: Dynamic Host Configuration Protocol (DHCP)
          3. Web services: Hypertext Transfer Protocol (HTTP), Secure HTTP (HTTPS)
          4. Network services: Address Resolution Protocol (ARP), Bonjour, Domain Name System (DNS), Internet Control Message Protocol (ICMP), Network Time Protocol (NTP), Protocol Independent Multicast-Sparse Mode (PIM-SM), Simple Network Management Protocol (SNMP v1/2c/3 – MIB-2), Universal Plug and Play (UPnP)
          5. Media: Real-Time Transport Protocol (RTP), Real-Time Control Protocol, Real-Time Streaming Protocol (RTSP)
          6. Multicast: Internet Group Management Protocol (IGMP)
          7. Notifications: File Transfer Protocol (FTP), Simple Mail Transfer Protocol (SMTP)
          8. Remote Access: Point-to-Point Protocol over Ethernet) (PPPoE)
       3. DDNS – The camera shall support DDNS services offered by the Manufacturer and other publicly available service offerings.
       4. Quality of Service (QoS) – Layer 3 DSCP
       5. Security features:
          1. User password protection
          2. The device shall not provide a manufacture default password. Default password change shall be required to access the camera.
          3. A minimal level of password complexity shall be required by the camera.
          4. The camera shall not have a manufacture back-door password.
          5. The manufacturer shall provide a tool that provides the ability to make password changes to multiple cameras at the same time.
          6. IP address filtering - list of allowed or blocked IP addresses
          7. HTTPS(SSL) login authentication
          8. HTTPS(SSL) secured communications
          9. Digest login authentication
          10. User access log
          11. 802.1x authentication
       6. Discovery – Manufacturer shall offer a discovery program to identify all devices of his manufacture on the network.
       7. Configuration – Manufacturer shall offer a configuration program that remotely allows users to change settings on multiple cameras simultaneously.
       8. Firmware upgrade – 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 the cameras if needed.
       10. Reporting – the manufacturer shall provide a tool that can generate a report that including thumbnail view, MAC address, IP address, serial number and other camera settings.
    2. Electrical
       1. Power
          1. Input Voltage / Current 24V AC, 12V DC, PoE
          2. Power Consumption Max. 14W (24V AC), Max. 11.5W (12V DC), Max. 12.95W (PoE)
    3. Mechanical And Environmental
       1. Material SUS316L, Nylon(Bubble)
       2. Dimensions (W x H) Ø162 x 130.5mm (Ø6.38" x 5.14")
       3. Weight 2.92Kg (6.44lb)
       4. Temperature
          1. Operating -40°C to 55°C (-40°F to 131°F)
          2. Storage -50°C to 60°C (-58°F to 140°F)
       5. Humidity 0 ~ 90%, non-condensing
       6. Ingress Protection / Vandal Resistance
          1. IP66
          2. IK10+
          3. NEMA 4X

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