Hanwha Techwin is a leading supplier of advanced video surveillance solutions for IP-video, analog and hybrid systems. 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-efficiency. Hanwha Techwin is committed to the continued development of innovative systems products for professional security applications.

For additional information, visit http://security.hanwhatechwin.com/

4 MP VANDAL RESISTANT 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

4 MP VANDAL RESISTANT NETWORK IR DOME CAMERA

PART 1 GENERAL

1.01 SUMMARY

A. Section includes a 4 MP IP video camera.

B. Product - A 4 MP IP video camera, with multi-streaming (H.265, H.264 and MJPEG) capability in a vandal resistant IP66/IK10 rated dome housing with integral IR illuminator.

C. 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.

1.02 REFERENCES

A. 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

B. Reference Standards
   1. Network - IEEE
      a. 802.3 Ethernet Standards
      b. 802.1x Port-based Network Access Control
   2. Video
      a. H.265
      b. H.264
      c. MJPEG
      d. ONVIF – Profiles S and G
   3. Emissions
      a. FCC-47 CFR Part 15 Subpart B Class B
      b. CE EN 55022:2010
   4. Immunity - CE
      a. EN 50130-4:2011
      b. EN 61000-3-3:2014
      c. EN 61000-4-2:2009
      d. EN 61000-4-3:2006+A2:2010
      e. EN 61000-4-4:2012
      f. EN 61000-4-5:2014
      g. EN 61000-4-6:2009
   5. Safety
      a. UL listed
      b. CE EN 50581:2012 (hazardous substances)
   6. Ingress Protection and Vandal Resistance

a. ANSI / IEC60529 – Degrees of Protection Provided by Enclosures – IP66
b. IEC EN 62262 - Degrees of protection provided by enclosures for electrical equipment against external mechanical impacts – IK10
c. IEC 60068-2-75

C. 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 2 kinds of frames: I-Frame and P-Frame.
2. WiseStream – Smart Codec that controls quantization parameter in H.265 and H.264 to efficiently manage bitrate of the video stream and reduce the storage required.
3. 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.
4. 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 bright areas and a short exposure is used in dark areas.

1.03 SUBMITTALS

A. Product Data
1. Manufacturer’s printed or electronic data sheets
2. Manufacturer’s installation and operation manuals
3. Warranty documentation

1.04 QUALIFICATIONS

A. Manufacturer shall have a minimum of five years’ experience in producing IP video equipment.
B. Installers shall be trained and authorized by the Manufacturer to install, integrate, test, and commission the system.

1.05 DELIVERY, STORAGE AND HANDLING

A. Deliver the camera in the manufacturer’s original, unopened, undamaged container with identification labels intact.
B. 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.

1.06 WARRANTY, LICENSING AND SUPPORT

A. Manufacturer shall provide a limited 3 year warranty for the product to be free of defects in material and workmanship.
B. Manufacturer shall provide embedded camera video analytics free of license charges.

END OF SECTION

PART 2 PRODUCTS

2.01 EQUIPMENT

A. Manufacturer: Hanwha Techwin
http://security.hanwhatechwin.com/

B. Model QNV-7010R

C. Alternates: None

2.02 GENERAL DESCRIPTION

A. 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
   a. H.265 and H.264 – frame rates to 30 fps
   b. MJPEG – frame rates to 15 fps

Maximum frame rates are available at selected resolutions:
H.265 and H.264: 20 fps at 4 M and 30 fps at 2 M or under.
MJPEG: Max. 15 fps.

---

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. Resolution selections
   a. 2592 x 1520, 2560 x 1440 (16 : 9), 2304 x 1296, 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
4. Simultaneous unicast access by up to 6 users
5. Multicast or unicast capable
6. Dynamic DNS (DDNS) support.
7. WiseStream and Dynamic GOV to efficiently manage bitrate of the video stream.

B. Camera – The camera device shall have the following physical and performance properties:

1. Dustproof, waterproof, and IP66 rated.
2. IK10 rated for protection against impacts.
3. True day/night operation with removable IR cut filter
   a. Low light level operation to 0.5 lux (color) and 0 lux (black and white)
4. 2D and 3D digital noise reduction
5. Integral IR illumination, providing effective visibility of 20m at 0 Lux when activated in Black & White mode.
6. 6 privacy masking regions utilizing a 4 point polygon

C. 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, minimum / maximum object size definition and a learning algorithm that ignores false alarms such as trees and waves on water.
2. Detection of logical events of specified conditions from the camera's video input
    a. camera tamper (scene change)
    b. defocus detection
    c. motion detection with metadata

D. Interoperability – The camera shall be ONVIF Profile S and G compliant.

E. The camera shall possess the following further characteristics:
1. Built-in web server, accessed via standard browsers including Internet Explorer, Firefox, Chrome & Safari
2. Micro SD/SDHC/SDXC memory card and NAS recording options, with configurable pre-alarm and post-alarm recording intervals
3. Uni-directional audio
4. Alarms and notifications
    a. alarm notification triggers:
        1.) motion detection
        2.) tampering detection
        3.) SD card error
        4.) NAS error
        5.) alarm input
        6.) defocus detection
    b. available notification means upon trigger:
        1.) file upload via FTP and e-mail
        2.) notification via e-mail
        3.) record to local storage (SD card)
        4.) external output
5. Pixel Counter available in the plug-in viewer.
6. POE capable

2.03 CAMERA SOFTWARE

A. The camera shall have a built in web server which supports browser-based configuration using Internet Explorer, Google Chrome, Mozilla Firefox, and Apple Safari, for which web viewer plug-ins are available, from a PC or Mac.

B. 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. Audio/microphone control
6. Access Playback and Setup menus

C. The web viewer shall provide a playback screen which provides access to the following functions:
1. Search date and time range

2. Search event type
3. Play an event video
4. Set resolution
5. Play audio if present
6. Generate a backup copy of saved video data

D. 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
   a. DDNS
   b. SSL, including certificate management
   c. 802.1x authentication
   d. Quality of Service settings
   e. SNMP to include version selection and settings
   f. Auto configuration
5. Video setup to include flip and mirror mode, hallway view mode, video type, privacy zone
6. Audio setup to include source, audio codec type, gain, and bit rate
7. Camera settings to include image preset, sensor frame capture, dynamic range, white balance, back light, exposure, day/night operation, on-screen display, IR illumination, sharpness, contrast, color level, lens distortion correction.
8. Event detection setup to include notification parameters, recording rules, time schedule, tamper protection, motion detection, event triggers
9. System function to include reboot, upgrade, check system and event logs, application (SDK) management
10. View profile information

E. Minimum client requirements
1. Acceptable Operating Systems: Windows 7 / 8.1 / 10, MAC OS X 10.9~10.11
2. Acceptable browsers: Microsoft Internet Explorer and Edge, Mozilla Firefox, Google Chrome, Apple Safari

2.04 DETAILED SPECIFICATIONS

A. Video
1. Imager
   a. Sensor: 1/3" 4 MP CMOS
      1.) pixels per sensor: 2720 (H) x 1536 (V) total; 2688 (H) x 1520 (V) effective
      2.) scanning : progressive
   b. Minimum illumination
      1.) Color mode: 0.5Lux
      2.) Black & white mode: 0Lux (IR LED on)

c. The following features with control settings shall be available:

1.) Camera Title		Off / On (Displayed up to 20 characters per line)
	a.) W/W:	English / Numeric / Special characters
	b.) China:	English / Numeric / Special / Chinese characters
	c.) Common:	Multi-line (Max. 5), Color (Grey/Green/Red/Blue/Black/White), Transparency, Auto scale by resolution
2.) Day/night setting:		True Day & Night
3.) Backlight compensation (BLC):		Off / BLC / WDR
4.) WDR		120dB
5.) Digital Noise Reduction (DNR):		Off / On (Samsung Super Noise Reduction)
6.) Motion Detection		Off / On (4ea polygonal zones)
7.) Privacy Masking		Off / On (6ea rectangular zones)
8.) Gain Control		Off / Low / Middle / High
9.) White Balance		ATW / AWC / Manual / Indoor / Outdoor
10.) LDC		Off / On (5 levels with min / max)
11.) Electronic shutter speed:		
	a.) settings:	min, max, anti-flicker
12.) Image flip:		Off / On
13.) Image mirror:		Off / On
14.) Hallway view:		Off / On
15.) Alarm I/O		Input 1 / Output 1
16.) Alarm Triggers		Motion detection, Tampering detection, SD card error, NAS error, Alarm input, Defocus detection
17.) Alarm Events		File upload via FTP and E-mail, Local storage recording at event, Notification via E-mail, External output
18.) Pixel Counter		Available in the plug-in viewer.

d. Lens: 2.8 mm, fixed

1.) Max. Aperture Ratio	F2.0
2.) Angle of view:	H: 111.0° / V: 63.0° / D: 133.0°
3.) Lens Type	Fixed
4.) Mount Type	Board Type

e. Manual positional settings:

a.) pan:	0° – 350°
b.) tilt:	0° – 67°
c.) rotation	0° ~ 355°

2. IR Viewable Length: 20 m (65.62ft)
3. Video Streams
   a. The camera shall be able to produce 10 video profiles, each of which may have the following properties:
      1.) Encoding type:

a.) H.265
b.) H.264
c.) MJPEG

2.) Resolution: 2592 x 1520, 2560 x 1440 (16 : 9), 2304 x 1296, 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

3.) Maximum frame rate:
a.) H.265 and H.264: 20 fps at 4 M and 30 fps at 2 M or under
b.) MJPEG: Max. 15 fps

4.) Smart Codec WiseStream, Dynamic GOV

5.) Bit rate control method:
a.) H.265 and H.264
i. target bitrate level control
ii. constant bit rate (CBR) or variable bit rate (VBR)
b.) MJPEG
i. quality level control
ii. variable bit rate (VBR)

4. Number of multi-streaming profiles: 3 maximum
5. Simultaneous users (total): 6 maximum (unicast)
6. Storage and Recording
   a. The camera shall have onboard SD card storage.
      1.) Card type: Micro SD/SDHC/SDXC
      2.) Capacity: Up to 128 GB per card
      3.) Image content on the card shall have the ability to be downloaded to a selected destination.
   b. NAS
7. Interoperability - Video streams shall be capable of supporting ONVIF protocol, profiles S and G.
8. Single Images - The camera shall support jpg file image screenshot and export.

B. Network

1. Connectivity: 10/100 Base-T Ethernet via RJ-45 connector
2. Protocols supported:
   a. Transmission Control Protocol (TCP), Internet Protocol (IP) v4 and v6, User Datagram Protocol (UDP)
   b. Configuration: Dynamic Host Configuration Protocol (DHCP)
   c. Web services: Hypertext Transfer Protocol (HTTP), Secure HTTP (HTTPS)
   d. 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)
   e. Media: Real-Time Transport Protocol (RTP), Real-Time Control Protocol, Real-Time Streaming Protocol (RTSP)

f. Multicast: Internet Group Management Protocol (IGMP)
g. Notifications: File Transfer Protocol (FTP), Simple Mail Transfer Protocol (SMTP)
h. 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:
   a. user password protection
   b. IP address filtering - list of allowed or blocked IP addresses
   c. HTTPS(SSL) login authentication
   d. HTTPS(SSL) secured communications
   e. Digest login authentication
   f. User access log
   g. 802.1x authentication
6. Discovery - Manufacturer shall offer a discovery program to identify all devices of his manufacture on the network.

C. Audio
1. Direction: uni-directional
2. I/O Line-in
3. Compression:
   a. G.711 u-law/G.726 selectable
      1.) G.726 (ADPCM) 8KHz, G.711 8KHz
      2.) G.726: 16Kbps, 24Kbps, 32Kbps, 40Kbps

D. Electrical
1. Power
   a. Input Voltage / Current PoE (IEEE802.3af, Class3), 12V DC
   b. Power Consumption: <7 W (PoE), <5.8 W (12V DC)

E. Mechanical And Environmental
1. Material:
   a. Housing: metal, vandal resistant
2. Dimensions (W x H): 120.3 x 91.7 mm (4.74 x 3.61 in.).
3. Weight 490g (1.08 lb.)
4. Temperature:
   a. Operating: -30° C to 55° C (-22° F to 131° F)
   b. Storage: -30° C to 60° C (-22° F to 140° F)
5. Humidity: 0 - 90%, non-condensing
6. Environmental Rating:
   a. Ingress Protection IP66
   b. Mechanical (Vandal) Protection IK10

END OF SECTION

PART 3 EXECUTION

3.01 INSTALLERS

A. Contractor personnel shall comply with all applicable state and local licensing requirements.

3.02 PREPARATION

A. The network design and configuration shall be verified for compatibility and performance with the camera(s).

B. Network configuration shall be tested and qualified by the Contractor prior to camera installation.

C. 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).

D. 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.

3.03 INSTALLATION

A. 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.

B. All equipment shall be tested and configured in accordance with instructions provided by the manufacturer prior to installation.

C. Before permanent installation of the system, the Contractor shall test the system in conditions simulating the final installed environment.

3.04 STORAGE

A. The hardware shall be stored in an environment where temperature and humidity are in the range specified by the Manufacturer.

END OF SECTION