



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.

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2 MP 2.4mm REMOTE HEAD NETWORK 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 2.4mm REMOTE HEAD NETWORK CAMERA

PART 1 GENERAL

1.01 SUMMARY

- A. Section includes a full HD IP video camera with a remote head.
- B. Product - A 2 MP IP video camera, with multi-streaming H.264 and MJPEG capability in a box with discreet design.
- 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

B. Reference Standards

- 1. Network - IEEE
 - a. 802.3 Ethernet Standards
 - b. 802.1x Port-based Network Access Control
- 2. Video
 - a. ISO / IEC 14496–10, MPEG-4 Part 10 (ITU H.264)
 - b. ISO / IEC 10918 – JPEG
 - c. ONVIF – Profiles S
- 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)

C. 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 2 kinds of frames: I-Frame and P-Frame.
2. Multi-crop - Operation which allows a user-selected region to be used for a specific video profile, allowing a lower resolution and bandwidth image to be transmitted, leaving the field of view for the camera unchanged.
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 bright areas and a short exposure is used in dark areas.
4. Smart Codec – Operation in which the camera adaptively alters the video compression for a portion of the camera's field of view to improve the quality of video in the area specified.

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 of -30° C to 60° C (-22° F to 140° F), 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 SNB-6011B
- C. Alternates: None

2.02 GENERAL DESCRIPTION

- A. Video Compression and Transmission – The 2 MP 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
 - a. H.264 – frame rates to 30 fps
 - b. MJPEG – frame rates to 30 fps

Maximum frame rates are available at selected resolutions:

H.264: 30 fps is available at all resolutions

MJPEG: 30 fps available up to and including 800 x 600 resolutions: 15 fps at all higher resolutions

2. The 2 MP 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. Each IP video profile shall be able to have a customizable field of view using multi-crop technology.
 4. Resolution selections
 - a. 1080p (1920 x 1080) and 720p (1280 x 720) HD
 - b. 1280 x 1024, 1280 x 960, 1024 x 768, 800 x 600, 800 x 450, 640 x 480, 640 x 360, 320 x 240, 320 x 180
 - c. User customizable resolution when using multi-crop for specific field of view
 5. Simultaneous unicast access by up to 15 users
 6. Multicast or unicast capable
 7. Dynamic DNS (DDNS) support
 8. 1V peak-peak composite video output signal at camera for setup and diagnostics
- B. Camera – The 2 MP camera device shall have the following physical and performance properties:
1. 4.6mm pinhole connected to the main unit through RJ-12 connector. (Remote head)
 2. 120 dB multi-exposure Wide Dynamic Range, providing a wide range between dark and light areas visible at the same time
 3. 2D and 3D digital noise reduction
 4. Digital zoom
 5. 32 privacy masking regions utilizing a 4 point polygon
 6. Digital image stabilization

- C. Intelligence and Analytics – The 2 MP 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. line crossing (passing)
 - b. appear/disappear
 - c. audio detection
 - d. camera tamper (scene change)
 - e. enter/exit a predefined zone
 - 3. Face detection used to create an event whenever there is a face or multiple faces in the image, up to detection of 32 faces simultaneously
 - 4. Audio detection above a specified threshold
- D. Interoperability – The 2 MP camera shall be ONVIF Profile S compliant.
- E. The 2 MP 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. Bi-directional audio
 - 4. Alarms and notifications
 - a. physical alarm input and output (1 each)
 - b. alarm notification triggers:
 - 1.) video analytics
 - 2.) network disconnection
 - 3.) physical alarm input
 - 4.) audio detection
 - c. 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.) record to network storage
 - 5.) external output
 - 5. POE capable

2.03 CAMERA SOFTWARE

- A. The 2 MP 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. Activate alarm output
 7. 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, analog output enable, 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, sharpness, contrast, color level, defog, enhanced quality region of interest (Smart Codec), focus
 8. Event detection setup to include notification parameters, recording rules, alarm input and output, time schedule, tamper protection, motion detection, video analytics, face detection, audio analytic threshold, event triggers
 9. System function to include reboot, upgrade, check system and event logs, application (SDK) management
 10. View profile information
- E. Minimum client hardware requirements
1. Processor: Intel Core 2 Duo 2.4 GHz or higher
 2. RAM: 2 GB
 3. Acceptable Operating Systems: Windows XP / VISTA / 7 / 8 / 10, MAC OS X 10.8~10.11
 4. Display: 1280X1024 pixels or higher (32 bit color)
 5. Acceptable browsers: Microsoft Internet Explorer, Mozilla Firefox, Google Chrome, Apple Safari

2.04 DETAILED SPECIFICATIONS

A. Video

1. Imager

- a. Sensor: 1/2.8" 2.38 MP CMOS
 - 1.) pixels per sensor: 1952 (H) x 1116(V) total; 1944 (H) x 1104 (V) effective
 - 2.) scanning : progressive
- b. Minimum illumination
 - 1.) Color mode: 0.3Lux (1/30sec, F2.5, 50IRE)
- c. The following features with control settings shall be available:
 - 1.) Camera Title up to 45 characters
 - 2.) Day/night setting: Auto (Electrical) / Color / B/W / Schedule
 - 3.) Backlight compensation (BLC): Off / BLC / WDR
 - 4.) Wide Dynamic Range 120dB
 - 5.) Contrast enhancement: On/Off (Samsung Super Dynamic Range)
 - 6.) Digital Noise Reduction (DNR): On/Off (SSNRIII, 2D+3D noise filter)
 - 7.) Digital image stabilization: On/Off
 - 8.) Defog: Off / Manual / Auto
 - 9.) Motion detection
 - a.) 4 zones with 4 sided polygon
 - b.) selectable for On/Off
 - 10.) Privacy masking
 - a.) 32 zones with 4 sided polygon
 - b.) selectable for On/Off
 - 11.) Automatic gain control 3 levels or Off
 - 12.) White Balance ATW / AWC / Manual / Indoor / Outdoor
 - 13.) Electronic shutter speed: 2 - 1/12,000 sec.
 - a.) settings: min, max, anti-flicker
 - 14.) Image flip: On/Off
 - 15.) Image mirror: On/Off
- d. Lens: 2.4mm pinhole
 - 1.) Maximum aperture ratio: F2.0
 - 2.) Angle of view: H : 134.3° / V : 70.9°
 - 3.) Minimum Object Distance: 0.3m (0.98ft)
 - 4.) Mount Type Connected to main unit through RJ-12
- e. Analog output: 1.0 V p-p / 75Ω composite, 720 x 480(NTSC), 720 x 576(PAL)
 - 1.) connector type: DIP (supplied)

2. Video Streams

- a. The 2 MP camera shall have 10 video profiles, each of which may have the following properties:
 - 1.) Encoding type:
 - a.) H.264

- b.) MJPEG
- 2.) Resolution: 1920 x 1080, 1280 x 1024, 1280 x 960, 1280 x 720, 1024 x 768, 800 x 600, 800 x 450, 640 x 480, 640 x 360, 320 x 240, 320 x 180
- 3.) Bit rate control method:
 - a.) H.264
 - i. compression level
 - ii. target bitrate level control
 - iii. constant bit rate (CBR) or variable bit rate (VBR)
 - b.) MJPEG
 - i. quality level control
 - ii. variable bit rate (VBR)
- 4.) Maximum frame rate:
 - a.) H.264: 30 fps at all resolutions
 - b.) MJPEG:
 - i. 30fps @ 800 x 600, 800 x 450, 640 x 480, 640 x 360, 320 x 240, 320 x 180
 - ii. 15fps @ 1920 x 1080, 1280 x 1024, 1280 x 960, 1280 x 720, 1024 x 768
- 3. Number of multi-streaming profiles: 10 maximum
- 4. Simultaneous users (total): 15 maximum (unicast)
- 5. Storage and Recording
 - a. The 2 MP control shall have onboard SD card storage.
 - 1.) Card type: Micro SD/SDHC/SDXC
 - 2.) Capacity: 4 GB – 64 GB per card
 - 3.) Image content on the card shall have the ability to be downloaded to a selected destination.
- 6. Interoperability - Video streams shall be capable of supporting ONVIF protocol, profiles S.
- 7. Single Images - The 2 MP 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 2 MP 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: bi-directional
 - 2. Levels:
 - a. In: selectable (Mic in / Line in), Max output level : 1 Vrms
 - 1.) supply voltage: 2.5V DC (4mA)
 - 2.) input impedance: 2K ohm
 - 3.) connector: 3.5mm stereo mini jack
 - b. Out: line out (3.5mm stereo mini jack)
 - 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 and Current
 - 1.) PoE (IEEE 802.3af)
 - 2.) 12V DC
 - b. Power Consumption:
 - 1.) PoE Max. 7.5 W
 - 2.) 12V DC Max. 6.5 W
 - c. Ethernet: RJ-45 connector
- E. Mechanical And Environmental
- 1. Material:
 - a. Camera Header: Plastic
 - b. Main Unit: Plastic
 - 2. Configuration: discreet box
 - 3. Dimensions:

- a. Camera Header (W x H) 24.0 x 50.0 mm (0.94 x 1.97 in.)
- b. Main Unit (W x H x D) 131.1 x 28.0 x 86.0 mm (5.16 x 1.1 x 3.39 in.)
- 4. Weight
 - a. Camera Header 80g (0.18lb) with a 1.5m cable
 - b. Main Unit 255g (0.56lb)
- 5. Temperature:
 - a. Operating: -10° C to 55° C (-14° F to 131° F)
 - b. Storage: -30° C to 60 C (-22° F to 140° F)
- 6. Humidity: 0 - 90%, non-condensing

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 2 MP camera hardware shall be stored in an environment where temperature and humidity are in the range specified by the Manufacturer.

END OF SECTION