

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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**1CH NETWORK VIDEO ENCODER**

**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

**1CH NETWORK VIDEO ENCODER**

1. **GENERAL**
   1. **SUMMARY**
      1. Section includes a network video encoder
      2. Product – A network video encoder max 4MP resolution with 16ch analog camera

## 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 and 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. HTTPS Secure HTTP
        21. ICMP Internet Control Message Protocol
        22. IGMP Internet Group Management Protocol
        23. IP Internet Protocol
        24. IR Infrared
        25. JPEG Joint Photographic Experts Group
        26. LAN Local Area Network
        27. LED Light Emitting Diode
        28. LDC Lens Distortion Correction
        29. LLDP Link Layer Discovery Protocol
        30. LPR License Plate Recognition
        31. MJPEG Motion JPEG
        32. MP Megapixel
        33. MPEG Moving Pictures Experts Group
        34. NTP Network Time Protocol
        35. NVR Network Video Recorder
        36. PIM-SM Protocol Independent Multicast-Sparse Mode
        37. PoE Power over Ethernet
        38. PPPoE Point to Point Protocol over Ethernet
        39. QoS Quality of Service
        40. RTP Real-Time Transport Protocol
        41. RTCP Real-Time Control Protocol
        42. RTSP Real-Time Streaming Protocol
        43. SDK Software Development Kit
        44. SFP Small Form factor Pluggable
        45. SMTP Simple Mail Transfer Protocol
        46. SNMP Simple Network Management Protocol
        47. SSDR Super Smart Dynamic Range
        48. SSNR Super Smart Noise Reduction
        49. SSL Secure Sockets Layer
        50. TCP Transmission Control Protocol
        51. UDP User Datagram Protocol
        52. UPnP Universal Plug and Play
        53. VBR Variable Bit Rate
        54. VMS Video Management System
        55. 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
        3. EMC & Safety
           1. FCC 47 CFR Part 15 Subpart B

ANSI C63.4-2014 Class A

* + - * 1. IC Regulation ICES-003:2016

ANSI C63.4-2014 Class A

* + - * 1. CE EMC-Directive 2014/30/EU

EN 55032:2015 Class A

EN 50130-4:2011+A1:2014

* + - * 1. VCCI-CISPR 32: Class A
        2. AS/NZS CISPR32:2015 Class A
        3. UL listed
        4. CE EN 50581:2012 (hazardous substances)
    1. 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.
  1. **SUBMITTALS**
     1. Product Data
        1. Manufacturer’s printed or electronic data sheets
        2. Manufacturer’s installation and operation manuals
        3. Warranty documentation
  2. **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.
  3. **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.
  4. **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

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* + 1. Model SPE-110
    2. Alternates: None
  1. **GENERAL DESCRIPTION**
     1. Video Compression and Transmission – The encoder 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 30fps/25fps(60Hz/50Hz) at all resolution
           2. MJPEG – maximum of 30fps/25fps(60Hz/50Hz)
        2. Input signal support CVBS, AHD(1, 2&4MP), CVI(1 & 2MP), TVI(1 & 2MP) format and detect automatically.
        3. The encoder shall be able to use below protocol.
           1. RS-485 : SAMSUNG-T, PELCO-P/D
           2. Coaxial :

NTSC/PAL : Pelco-C (Coaxitron)

AHD : ACP (AHD Coax protocol)

* + - 1. The encoder shall be able to configure various resolution selections.
         1. 2560 x 1440, 1920 x 1080, 1280 x 720, 640 x 360,
         2. 928 x 480(N), 704 x 480(N), 704 x 240(N), 352 x 240(N),
         3. 928 x 576(P), 704 x 576(P), 704 x 288(P), 352 x 288(P)
      2. The encoder supports the following frame rate.
         1. Main Stream :

4MP : 15fps/CH, 1080p/720p/WD1/4CIF/CIF : 30fps/CH(N), 25fps/CH(P)

* + - * 1. Sub Stream :

WD1/4CIF : 12fps/CH, 2CIF/CIF/QVGA/QCIF : 30fps/CH(N), 25fps/CH(P)

* + - * 1. MJPEG : 2fps @ 1920x1080, 1280x720, 960H, D1
      1. The encoder shall support unicast video streaming up to 6 users.
      2. The encoder shall support dual streaming up to 3 profiles per channel.
      3. The encoder shall support multicast video streaming.
      4. The encoder shall be able to configure Dynamic DNS (DDNS). DDNS shall be provided with no additional cost by the manufacturer.
      5. The encoder shall provide Dynamic GOV and Dynamic fps to efficiently manage bit rate of the video stream and reduce storage.
    1. Privacy mask with 4 definable detection areas with rectangle zones, and minimum/maximum object size.
    2. Interoperability – The encoder shall be ONVIF Profile S & SUNAPI(HTTP API) compliant.
    3. The encoder shall possess the following further characteristics:
       1. Built-in web server, accessed via non-plugin browsers including Google Chrome 54, MS Edge 38, IE11, Mozilla Firefox 49 (Windows 64bit only), Apple Safari 9 (Mac OS X only).
       2. Alarms and notifications
          1. alarm notification triggers:

Motion Detection

Video Loss

Tempering

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

File Upload via FTP and E-mail

Notification via E-mail

* + - 1. Pixel Counter available in the web viewer.
      2. PoE capable
  1. **ENCODER SOFTWARE**
     1. The encoder shall have a built in web server which supports non-plugin browsers including Google Chrome, IE11, MS Edge, 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. 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 and multicast parameters
        2. User profile to include password, access level, authentication
        3. Date and time
        4. Network settings and IP version
           1. DDNS
           2. IP filtering
           3. SSL, including certificate management
           4. 802.1x authentication
           5. Quality of Service settings
           6. SNMP to include version selection and settings
           7. Auto IP configuration
        5. Video setup
           1. Flip / mirror mode
           2. Video output type
           3. Privacy zone.
        6. Event detection setup to configure notification parameters, tamper protection, motion detection and event triggers
        7. System function to control reboot, upgrade, check system and event logs and application (SDK) management
        8. View profile information
     5. Client requirements
        1. Acceptable Operating Systems: Windows 7, 8, 10, Mac OS X 10.10, 10.11, 10.12
        2. Acceptable browsers:
           1. Non-plugin WebViewer Google Chrome 54, MS Edge 38, IE11, Mozilla Firefox 49

(Windows 64bit only), Apple Safari 9 (Mac OS X only)

* 1. **DETAILED SPECIFICATIONS**
     1. Video
        1. Input Channel SPE-110N : 16CH BNC, 1.0 Vp-p / 75Ω composite NTSC

SPE-110P : 16CH BNC, 1.0 Vp-p / 75Ω composite PAL

* + - 1. Input Signal & Resolution CVBS, AHD(1, 2&4MP), CVI(1 & 2MP), TVI(1 & 2MP)
    1. Operational Functions
       1. Motion Detection Off/On
       2. Privacy Masking Off / On (4ea rectangular zones)
       3. De-Interlacing Support
       4. Alarm Triggers Motion detection, Video loss, Tampering
       5. Alarm Events File upload via FTP

Notification via e-mail

* + - 1. Remote Control Interface 1ea RS-485/422
      2. RS-485 Protocol SAMSUNG-T, PELCO-P/D
      3. Coaxial Control NTSC/PAL : Pelco-C (Coaxitron)

AHD : ACP (AHD Coax protocol)

* + 1. Video Streams
       1. Video compression H.265, H.264, MJPEG
          1. Resolution 2560 x 1440, 1920 x 1080, 1280 x 720,

928 x 480(N), 704 x 480(N), 704 x 240(N), 352 x 240(N),

928 x 576(P), 704 x 576(P), 704 x 288(P), 352 x 288(P)

* + - 1. Maximum Framerate
         1. H.265 / H.264 Main Stream :

- 4MP : 15fps/CH, 1080p/720p/WD1/4CIF/CIF : 30fps/CH(N), 25fps/CH(P)

Sub Stream :

- WD1/4CIF : 12fps/CH, 2CIF/CIF/QVGA/QCIF : 30fps/CH(N), 25fps/CH(P)

* + - * 1. MJPEG 2fps @ 1920x1080, 1280x720, 960H, D1
      1. Bitrate Control Method H.265 / H.264: CBR or VBR

MJPEG: VBR

* + - 1. Streaming Capability Multiple streaming (Up to 3 profiles per channel)
      2. Streaming method Unicast / Multicast
      3. Simultaneous Users 6 users maximum (Unicast)
      4. Interoperability ONVIF Profile S, SUNAPI
    1. Network
       1. Connectivity 1 RJ-45 10/100 BASE-T
       2. Video Compression Format H.264 (MPEG-4 Part 10/AVC) : Main / Baseline / High, MJPEG
       3. 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, ONVIF, Bonjour

* + - 1. DDNS – The camera shall support DDNS services offered by the manufacturer and others publicly available service offerings
      2. QoS – Layer 3 DSCP
      3. Security Feature
         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 communication
         9. Digest login authentication
         10. User access log
         11. 802.1x authentication (EAP-TLS, EAP-LEAP)
      4. Discovery – The manufacturer shall offer a discovery program to identify all devices of them on the network.
      5. Configuration – The manufacturer shall offer a configuration program that remotely allows users to change settings on multiple cameras simultaneously.
      6. Firmware upgrade – The manufacturer shall offer a program capable of upgrading multiple cameras at the same time (not requiring access to individual cameras).
      7. Encoder 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.
      8. 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.
    1. Electrical
       1. Power
          1. Input Voltage / Current DC 12V, PoE(IEEE 802.3af )
          2. Power Consumption Max 3.6W(DC 12V), Max 4.0W(PoE)
    2. Mechanical And Environmental
       1. Color/Material White (Plastic), Silver (Metal)
       2. Dimensions 43.0 x 29.2 x 94.15mm (1.693” x 1.150” x 3.706”)
       3. Weight 104g (0.229 lb)
       4. Temperature
          1. Operating -10°C ~ +50°C (14°F ~ +122°F)
       5. Humidity 20~80% RH
       6. Certification EN 55032:2012, EN 50130-4, EN 61000-3-2:2014, EN 61000-3-

3:2013

END OF SECTION

1. **EXECUTION**
   1. **INSTALLERS**

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

* 1. **PREPARATION**

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

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

All firmware found in products shall be the latest and the most up-to-date provided by the manufacturer, or of a version as specified by the provider of the VMS or NVR.

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.

* 1. **INSTALLATION**

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.

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

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

* 1. **STORAGE**

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

END OF SECTION