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**4 CH 4MP H.264 AHD DVR**

**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 Video Surveillance Remote Devices and Sensors

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 Cyber Requirements for Electronic Safety and Security

28 05 xx Safety and Security Network Communications Equipment

28 2x xx IP Cameras

28 2x 00 Video Management System

**4 CH 4MP H.264 AHD DVR**

1. **GENERAL**
   1. **SUMMARY**
      1. Section includes a four channel digital video recorder with 4MP resolution recording and live display.
      2. Product - A four channel digital video recorder with maximum internal storage of 12TB and support for AHD, TVI, and CVI formats.

## 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. ARP - Address Resolution Protocol
        2. DHCP - Dynamic Host Configuration Protocol
        3. DNR - Digital Noise Reduction
        4. DDNS - Dynamic Domain Name Server
        5. fps - frames per second
        6. GUI - Graphical User Interface
        7. HDD - Hard Disk Drive
        8. HTTP - Hypertext Transfer Protocol
        9. ICMP - Internet Control Message Protocol
        10. IGMP - Internet Group Management Protocol
        11. IP - Internet Protocol
        12. iSCSI – Internet Small Computer System Interface
        13. JBOD - Just a Bunch of Disks
        14. JPEG - Joint Photographic Experts Group
        15. MJPEG - Motion JPEG
        16. MP - Megapixel
        17. MPEG - Moving Pictures Experts Group
        18. NAS - Network Attached Storage
        19. NTP - Network Time Protocol
        20. POS - Point of Sale
        21. PPPoE - Pont to Point Protocol over Ethernet
        22. RAID - Redundant Array of Independent Disks (Drives)
        23. RTP - Real-Time Transport Protocol
        24. RTCP - Real-Time Control Protocol
        25. RTSP - Real-Time Streaming Protocol
        26. SMTP - Simple Mail Transfer Protocol
        27. SNMP - Simple Network Management Protocol
        28. SSL - Secure Sockets Layer
        29. TCP - Transmission Control Protocol
        30. UDP - User Datagram Protocol
        31. UPnP - Universal Plug and Play
        32. VMS - Video Management System
        33. DVR - Digital Video Recorder
        34. AHD - Analog High Definition
        35. TVI - Transport Video Interface
        36. CVI - Composite Video Interface
        37. PIP - Picture In Picture
     2. Reference Standards
        1. Video
           1. National Television System Committee (NTSC)
           2. Phase Alternation by Line (PAL)
        2. Standard Approvals
           1. FCC
           2. CE
     3. Definitions
        1. Smart Codec – Smart Codec that controls quantization parameter in H.264 to efficiently manage bitrate of the video stream and reduce the storage required while achieving similar quality compared to the one without Smart Codec.
        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 while achieving similar quality compared to the one without Dynamic GOV.
  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 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 product in the manufacturer’s original, unopened, undamaged container with identification labels intact.
     2. Store the product in a temperature and humidity specified in this document, protected from mechanical and environmental conditions as designated by the manufacturer.
  5. **WARRANTY, LICENSING AND SUPPORT**
     1. Manufacturer shall provide a limited 3 year warranty for the product to be free of defects in material and workmanship.

END OF SECTION

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

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

* + 1. Model HRD-442
    2. Alternates: None
  1. **GENERAL DESCRIPTION**
     1. The four channel DVR shall record video and audio from maximum of four analog video cameras to internal HDD. The maximum capacity of each HDD shall be up to 6TB and the DVR shall have two HDD slots. The manufacturer shall guarantee compatibility and reliability for HDD listed in ‘HDD Compatible List’ found in the home page.
     2. DVR shall enable users to play recorded video and audio with advanced search options. Search options shall include the following.
        1. Date/Time Search
        2. Event Search
        3. Backup Search
        4. PoS (Receipt) Search
        5. Motion Search
     3. All search options shall provide previews.
     4. The DVR shall provide monitoring software for video and audio from a remote computer or a smart phone with maximum simultaneous remote access for up to 20 users.
     5. The DVR shall provide maximum transmission bandwidth of 64 mbps to allow streaming of video and audio over network.
     6. The DVR shall provide an installation wizard for easy setup of recording, live, user permission and network.
     7. The DVR shall be able to receive text data from PoS devices and overlay on video.
     8. The DVR shall provide smart codec option which can reduce bit-rate of video and storage required while providing equal or similar video quality.
     9. The DVR shall have the following further general properties:
        1. Recording and playback functions:
           1. Supported recording rate

PAL

Max. 50fps@2560 x 1440

Max. 100fps@1920 x 1080

Max. 100fps@1280 x 720, 928 x 576, 704 x 576, 704 x 288, 352 x 288

NTSC

Max. 60fps@2560 x 1440

Max. 120fps@1920 x 1080

Max. 120fps@1280 x 720, 928 x 480, 704 x 480, 704 x 240, 352 x 240

* + - * 1. View status of internal storage hardware
        2. Set recording schedules
        3. Set up triggered recording based on:

motion

video loss detection

alarm inputs

tampering

* + - * 1. Available recording settings by channel for standard and event-based recording types:

resolution

images per second

quality

data transfer limit

pre-event and post-event record duration

* + - * 1. Available actions upon reaching full HDD storage capacity:

stop recording

overwrite

* + - 1. Live view:
         1. Live, remote monitoring using Windows Network Viewer or Manufacturer supplied viewer
         2. Capture and save snapshot images
         3. Backup current video in AVI or other secure format.
      2. Analytics:
         1. Motion detection (Level 1 ~ 10)
      3. Remote access:
         1. Maximum of 20 simultaneous remote users
         2. Dynamic DNS (DDNS) support
      4. VGA and High Definition (HDMI) for local monitor outputs including live viewing, playback, & backup functions
      5. Audio connections: 4 inputs, 1 outputs
  1. **DVR SOFTWARE**
     1. The DVR shall have a built-in server which provides access for authorized users to live view of connected cameras, DVR recording and playback functions, and DVR configuration settings.
     2. The DVR software shall provide a monitoring screen which displays live camera video and simultaneously provides same-screen access to the following functions:
        1. Screen mode, allowing set up and display of up to eight live video channels in 1, 4, PIP, or sequence configurations.
        2. Status displays:
           1. camera live status
           2. camera record status
           3. event status
        3. Start/stop recording
        4. Search recorded video
        5. Play recorded video
        6. Freeze live video
        7. Audio on, off, and mute
        8. Event monitoring
        9. Camera controls
        10. Manual recording
        11. Image (snapshot) capture
     3. The DVR software shall provide setup screens which provide access to the following configuration settings and functions:
        1. System
           1. date and time
           2. user passwords and permissions
           3. system information
           4. software upgrade
           5. system logs
           6. event logs
           7. backup logs
        2. Cameras
           1. image preview of video
           2. profile information
           3. model information
           4. adjust settings:
           5. apply settings to groups of cameras
           6. live streaming settings
        3. Recording
           1. setup recording schedule by day and time per channel
           2. record settings per channel
           3. HDD full capacity options – stop, overwrite
           4. Event configuration

sensor operation

Camera events, including motion detection and video analytics

video loss detection

alarm output parameters

* + - 1. Storage media and devices
         1. display working status, including current rate of recording, recording loss rate, and cumulative losses
         2. storage use and capacity information
         3. HDD temperature information
         4. HDD alarm notifications
      2. Monitor
         1. select VGA or HDMI video output
         2. configure display parameters
      3. Network
         1. bandwidth limits
         2. multicast parameters
         3. DDNS
         4. NTP server
         5. SMTP e-mail settings
         6. live stream selection
         7. DHCP server settings
      4. Output relay settings
    1. The DVR software shall provide Search and Playback functions as follows:
       1. Search by:
          1. date and time
          2. event
          3. backup
          4. PoS
          5. motion
       2. Playback
          1. play forward and reverse at normal or accelerated speeds, frame by frame, and next record
          2. go to first and go to last functions
          3. color-coded timeline with play head scrub bar
          4. set audio on or off
          5. initiate backup
    2. The DVR shall have a built in web server which supports browser-based configuration from a PC.
       1. Acceptable browsers: Internet Explorer
       2. The web viewer shall provide a monitoring screen which displays video from cameras and simultaneously provides same-screen access to the following functions:
          1. display layout configuration: 1, 4, PIP, sequence
       3. The web viewer shall provide the same functionality as available when directly connecting to the DVR server with respect to the following:
          1. system settings
          2. backup and restoration of configuration settings to a file
          3. recording
          4. storage media and devices
          5. monitor
          6. network
          7. events and notifications
          8. output relay settings
          9. search and playback
       4. Minimum client requirements
          1. Acceptable Operating Systems:

OS : Windows XP SP3 or higher, Windows Vista, Windows 7, 8, 10

* + - * 1. Acceptable browsers

Microsoft Internet Explorer (Ver. 8, 9, 10, 11)

* 1. **DETAILED SPECIFICATIONS**
     1. Video
        1. Inputs 4channel BNC: AHD (1MP, 2MP, 4MP), HDTVI (2MP),

HDCVI (2MP), NTSC / PAL

* + - 1. Resolution 2560 x 1440, 1920 x 1080, 1280 x 720, 960 x 480, 704 x 480,

960 x 576, 704 x 576

* + 1. Live
       1. Frame rate NTSC: 120fps / PAL: 100fps
       2. Resolution 2560 x 1440, 1920 x 1080, 1280 x 720, 960 x 480, 704 x 480,

960 x 576, 704 x 576

* + 1. Multi-screen display 1 / 4 / PIP / Sequence
    2. Operating System Linux
    3. Installation Wizard Yes
    4. Recording
       1. Compression H.264
       2. Record rate 
          1. PAL

Max. 50fps@2560 x 1440

Max. 100fps@1920 x 1080

Max. 100fps@1280 x 720, 928 x 576, 704 x 576, 704 x 288, 352 x 288

* + - * 1. NTSC

Max. 60fps@2560 x 1440

Max. 120fps@1920 x 1080

Max. 120fps@1280 x 720, 928 x 480, 704 x 480, 704 x 240, 352 x 240

* + - 1. Mode Manual, Schedule (Continuous/Event), Event (Pre/

Post), Time-lapse (1 ~ 30fps (N), 1 ~ 25fps (P))

* + - 1. Event Video loss, Motion (Level 1 ~ 10), Alarm Input (4),
      2. Tampering (Level Low, Medium, High)
      3. Overwrite modes Off/On
      4. Pre-alarm 5, 10, 20, 30 sec
      5. Post-alarm 5, 10, 20, 30 Sec,1, 3, 5, 10, 20 Min,1, 2, 3, 4, 5, 6 Hour
    1. Search and Playback
       1. Search mode Date/Time, Event, Back up, PoS(SD signal only), Motion
       2. Playback function Fast forward / backward (2x, 4x, 8x, 16x, 32x, 64x)

※ Backward Play with I-frame Only

Slow forward / backward (1/2x, 1/4x, 1/8x)

Step forward / backward

※ Backward Play with I-frame Only

* + 1. Network (IPv4)
       1. Transmission speed
          1. Record Stream 4M (15fps),

1080p/720p/WD1/4CIF/CIF (NTSC: 30fps, PAL: 25fps)

* + - * 1. Network Stream WD1/4CIF (12fps)

2CIF/CIF (NTSC: 30fps, PAL: 25fps)

* + - 1. Bandwidth Up to 64Mbps (selectable for traffic control)
      2. Stream Record Stream and Network Stream Selectable
      3. Maximum remote users Search (3) / Live Unicast (10) / Live Multicast (20)
      4. Protocol support TCP/IP, DHCP, PPPoE, SMTP, NTP, HTTP, DDNS, RTP, RTSP,

SNMP

* + - 1. Monitoring SSM, WebViewer, SmartViewer, iPOLiS Mobile Viewer
    1. Remote Monitoring
       1. OS Windows XP SP3 or higher, Windows Vista, Windows 7, 8, 10
       2. Browsers Microsoft Internet Explorer (Ver. 8, 9, 10, 11)
    2. Storage
       1. Internal HDD 2 SATA HDDs (Each with Max. 6TB)
       2. External USB for backup
       3. File format BU (for DVR player), SEC (Hanwha Techwin’s Secure Format)

AVI

* + 1. Security
       1. Password protection 1 admin, 10 groups, 10 Users per group
    2. Monitors
       1. VGA 1 VGA (1920 x 1080, 1280 x 1024, 1280 x 720)
       2. HDMI 1 HDMI (4K (3840 x 2160), 2K (2560 x 1440), 1920 x 1080

1280 x 1024, 1280 x 720)

* + - 1. Spot Composite BNC (1CH) ※ Include OSD on screen, Multimode support
    1. Audio
       1. Input and output 4CH Line in, 1CH Line out
       2. Compression G.711
       3. Sampling rate 8KHz
    2. Alarm
       1. Input and output 4 Inputs (NO/NC) / 2 Relay Outputs (NO/NC 1ea, NO 1ea),

Rating: Max. 18V DC/2A, Typical 12V DC/2A

* + - 1. Remote notification Notification via e-mail
    1. Connections
       1. Ethernet 1 RJ-45 10/100/1000 Base-T
       2. Serial interface RS-485 (Full duplex) for PTZ, Hanwha system keyboard
       3. USB 2 USB 2.0 ports (front)
       4. Application support Mouse, Remote controller
       5. RS-485 Protocol Samsung-E/Samsung-T/Pelco-D/Pelco-P/Panasonic/Phillips/AD

DIAMOND/ERNA/KALATEL/ VCL TP/VICON/ELMO/GE

* + - 1. Coax Protocol
         1. NTSC/PAL Pelco-C (Coaxitron)
         2. AHD ACP (AHD Coax Protocol)
    1. Electrical
       1. Input voltage and current DC12V Adaptor(100~250V AC±10% , 50/60Hz)
       2. Power consumption Max. 18W (1 x 4TB HDD)
    2. Environmental
       1. Operating temperature +0°C ~ +40°C (+32°F ~ +104°F)
       2. Operating humidity 20% ~ 85% RH
    3. Mechanical
       1. Dimensions (W x H x D) 370.0 x 44.0 x 320.0mm (14.57" x 1.73" x 12.6")
       2. Weight (with hard disks) 2.9Kg (6.39 lb.)
    4. Language English, French, German, Spanish, Italian, Russian, Polish,

Czech, Turkish, Netherlands, Portuguese, Swedish, Danish, Rumania, Serbia, Croatia, Hungary, Greek, Finnish, Norwegian, Korean, Japanese, Chinese (Traditional), Thai

END OF SECTION

1. **EXECUTION**
   1. **INSTALLERS**
      1. Contractor personnel shall comply with all applicable state and local licensing requirements.
   2. **PREPARATION**
      1. The system design and configuration shall be verified for compatibility and performance with the camera(s).
      2. System configuration shall be tested and qualified by the Contractor prior to camera installation.
      3. All equipment shall be tested and configured in accordance with instructions provided by the manufacturer prior to installation
      4. 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).
      5. 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. 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