



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 CH 1080p ANALOG HD REAL-TIME 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 23 19 Electronic Surveillance
- 28 23 00 Video Surveillance
- 28 23 19 Digital Video Recorders and Analog Recording Devices

MasterFormat 2016:

- 28 05 00 Common Work Results
- 28 05 xx Storage Appliances for Electronic Safety and Security
- 28 05 xx.xx Network Video Recorders

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 1080p ANALOG HD REAL-TIME DVR

PART 1 GENERAL

1.01 SUMMARY

- A. Section includes a 4 channel 1080p digital video recorder.
- B. Product - A 4 channel digital video recorder with HDMI and VGA output, and 2 internal HDDs.
- 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. 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

B. Reference Standards

1. Video
 - a. NTSC
 - b. PAL
2. Certificates
 - a. C-TICK
 - b. FCC
 - c. CE-EMC
 - d. VCCI
 - e. CB
 - f. UL

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 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 product in the manufacturer's original, unopened, undamaged container with identification labels intact.
- B. Store the product in a temperature and humidity specified in this document, 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.

END OF SECTION

PART 2 PRODUCTS**2.01 EQUIPMENT**

- A. Manufacturer: Hanwha Techwin
<http://security.hanwhatechwin.com/>
- B. Model SRD-494
- C. Alternates: None

2.02 GENERAL DESCRIPTION

- A. The 4 channel Digital Video Recorder ("DVR") shall record video and audio from up to 4 analog video cameras to a hard disk array of 1 - 2 HDD's and enable playback of video and audio from the hard disk array.
- B. The DVR shall provide a remote monitoring environment for video and audio over the network using a remote computer or a smart phone.
- C. The DVR shall have the following further general properties:
 - 1. Recording and playback functions:
 - a. Supported recording rate
 - 1.) Up to 120fps@1920 x 1080 / Up to 100fps@1920 x 1080
 - 2.) Up to 120fps@1280 x 720 / Up to 100fps@1280 x 720
 - 3.) NTSC : Up to 120fps@960 x 480 / PAL : Up to 100fps@960 x 576
 - 4.) NTSC : Up to 120fps@704 x 480 / PAL : Up to 100fps@704 x 576
 - 5.) NTSC : Up to 120fps@704 x 240 / PAL : Up to 100fps@704 x 288
 - 6.) NTSC : Up to 120fps@352 x 240 / PAL : Up to 100fps@352 x 288
 - b. View status of internal connected storage hardware
 - c. Set recording schedules
 - d. Set up triggered recording based on:
 - 1.) sensor (input) detection
 - 2.) camera event
 - 3.) video loss detection
 - e. Available recording settings by channel for standard and event-based recording types:
 - 1.) resolution
 - 2.) images per second
 - 3.) quality
 - 4.) data transfer limit
 - 5.) pre-event and post-event record duration
 - f. Available actions upon reaching full HDD storage capacity:
 - 1.) stop recording
 - 2.) overwrite
 - g. Search recorded data by time or event.
 - 2. Live view:
 - a. Live, remote monitoring using Windows Network Viewer or Manufacturer supplied viewer

- b. Configure and exercise functions for connected PTZ cameras.
 - c. Capture and save snapshot images
 - d. Record current video in AVI format
- 3. Analytics:
 - a. Motion detection (Level 1 ~ 10)
 - b. Tampering (Level 1 ~ 3)
- 4. Remote access:
 - a. Maximum number of simultaneous remote users
 - 1.) Search 3
 - 2.) Live unicast 10
 - 3.) Live multicast 20
 - b. Mobile device:
 - 1.) Supported platforms: Android, IOS
 - 2.) Supported remote users:
 - a.) Live: 4
 - b.) Playback 1
 - c. Dynamic DNS (DDNS) support
- 5. VGA and High Definition (HDMI) local monitor outputs live viewing, playback, & backup functions
- 6. Alarm connections: 4 inputs; 2 outputs

2.03 DVR SOFTWARE

- A. 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.
- B. 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 4 live video channels in 1, 4, or PIP configurations.
 - 2. Status displays:
 - a. camera live status
 - b. camera record 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 PTZ controls
 - 10. Manual recording
 - 11. Image (snapshot) capture
- C. The DVR software shall provide setup screens which provide access to the following configuration settings and functions:
 - 1. System

- a. date and time
 - b. user passwords and permissions
 - c. system information
 - d. software upgrade
 - e. system logs
 - f. event logs
 - g. backup logs
2. Cameras
 - a. image preview of video
 - b. profile information
 - c. model information
 - d. adjust settings:
 - e. apply settings to groups of cameras
 - f. live streaming settings
3. Recording
 - a. setup recording schedule by day and time per channel
 - b. record settings per channel
 - c. HDD full capacity options – stop, overwrite
 - d. Event configuration
 - 1.) sensor operation
 - 2.) Camera events, including motion detection and video analytics
 - 3.) video loss detection
 - 4.) alarm output parameters
4. Storage media and devices
 - a. display working status, including current rate of recording, recording loss rate, and cumulative losses
 - b. storage use and capacity information
 - c. HDD temperature information
 - d. HDD alarm notifications
5. Monitor
 - a. select VGA or HDMI video output
 - b. configure display parameters
6. Point of Sale (POS) text device
 - a. channel allocation and synchronization
 - b. Baudrate, parity, data, and stop bit
 - c. network port
7. Network
 - a. bandwidth limits
 - b. multicast parameters
 - c. DDNS
 - d. NTP server

- e. SMTP e-mail settings
 - f. SNMP settings
 - g. live stream selection
 - h. DHCP server settings
- 8. Output relay settings
- D. The DVR software shall provide Search and Playback functions as follows:
 - 1. Search by:
 - a. time
 - b. event
 - c. PoS text
 - d. backup device
 - 2. Playback
 - a. play forward and reverse at normal or accelerated speeds, frame by frame, and next record
 - b. go to first and go to last functions
 - c. color-coded timeline with play head scrub bar
 - d. set audio on or off
 - e. initiate backup
- E. The DVR shall have a built in web server which supports browser-based configuration from a PC.
 - 1. Acceptable browsers: Internet Explorer, Google Chrome, Mozilla Firefox, and Apple Safari
 - 2. The web viewer shall provide a monitoring screen which displays video from cameras and simultaneously provides same-screen access to the following functions:
 - a. display layout configuration: 1, 4, PIP
 - b. additional display functions as available with direct connection to the DVR server
 - 3. The web viewer shall provide the same functionality as available when directly connecting to the DVR server with respect to the following:
 - a. system settings
 - b. backup and restoration of configuration settings to a file
 - c. recording
 - d. storage media and devices
 - e. monitor
 - f. PoS text device
 - g. network
 - h. events and notifications
 - i. output relay settings
 - j. search and playback
 - 4. Minimum client hardware requirements
 - a. Processor: Intel Core i5 Quad
 - b. RAM: 2 GB
 - c. Acceptable Operating Systems:
 - Windows XP Professional, Windows Vista Home Basic / Premium
 - Windows 7, Windows 8,

Mac OS 10.6 and later versions

- d. Acceptable browsers: Microsoft Internet Explorer, Mozilla Firefox, Google Chrome, Apple Safari

2.04 DETAILED SPECIFICATIONS

- A. Video
1. Inputs 4CH BNC, 1080p / 720p AHD camera, NTSC/PAL
 2. Resolution
 - a. NTSC: 1920 x 1080, 1280 x 720, 960 x 480, 704 x 480
 - b. PAL: 1920 x 1080, 1280 x 720, 960 x 576, 704 x 576
- B. Live
1. Frame rate NTSC: 120fps / PAL: 100fps
 2. Resolution
 - a. NTSC: 1920 x 1080, 1280 x 720, 960 x 480, 704 x 480
 - b. PAL: 1920 x 1080, 1280 x 720, 960 x 576, 704 x 576
- C. Multi-screen display 1 / 4 / PIP
- D. Operating System Linux
- E. Recording
1. Compression H.264
 2. Record rate

Up to 120fps@1920 x 1080 / Up to 100fps@1920 x 1080
 Up to 120fps@1280 x 720 / Up to 100fps@1280 x 720
 NTSC: Up to 120fps@960 x 480 / PAL: Up to 100fps@960 x 576
 NTSC: Up to 120fps@704 x 480 / PAL: Up to 100fps@704 x 576
 NTSC: Up to 120fps@704 x 240 / PAL: Up to 100fps@704 x 288
 NTSC: Up to 120fps@352 x 240 / PAL Up to 100fps@352 x 288
 3. Mode

NTSC: Manual, Schedule (Continuous / Event), Event (Pre / Post), Time lapse (1~30fps)
 PAL: Manual, Schedule (Continuous / Event), Event (Pre / Post), Time lapse (1 ~ 25fps)
 4. Event Video loss, Motion (Level 1 ~ 10), Alarm, Tampering (Level 1 ~ 3)
 5. Overwrite modes Continuous
 6. Pre-alarm Up to 30sec (5, 10, 20, 30sec)
 7. Post-alarm Up to 6hour (5,10, 20, 30sec, 1, 3, 5, 10, 20min, 1, 2, 3, 4, 5, 6hour)
- F. Search and Playback
1. Search mode Date/Time, Event, Back up, POS, Motion (*All search include preview function)
 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 (2x, 4x, 8x, 16x, 32x, 64x) *Backward play with i-frame only

G. Network (IPv4)

1. Transmission speed
 - a. Option 1: 1M ~ 2M (NTSC: 120fps, PAL: 100fps), 4CIF (NTSC: 120fps, PAL: 100fps)
 - b. Option 2: 4CIF / 2CIF / CIF (NTSC: 120fps, PAL: 100fps)
2. Bandwidth Up to 64Mbps
3. Bandwidth control Selectable
4. Stream H.264 (1080p / 720p / 4CIF / 2CIF / CIF selectable)
5. Maximum remote users Search 3 / Live unicast 10 / Live multicast 20
6. Protocol support TCP/IP, DHCP, PPPoE, SMTP, NTP, HTTP, DDNS, RTP, RTSP, SNMP
7. Monitoring SmartViewer, Webviewer, SSM (CMS)

H. Smart Phone

1. Platform Android, iOS
2. Protocol Support RTP, RTSP, HTTP, CGI
3. Maximum remote users Live 4, Playback 1CH

I. Storage

1. Internal HDD Up to 2 SATA HDDs
2. External (e-SATA Interface) Up to 2 expansion bays (*Model : SVS-5R)
3. USB (Backup) 2 USB ports
4. File format BU (DVR player), EXE (Include player), AVI

J. Security

1. Password protection 1 Admin, 10 Group, 10 User per 1 group
2. Data authentication Watermark

K. Monitors

1. VGA 1 VGA (1280 x 720, 1280 x 1024, 1920 x 1080)
2. HDMI 1 HDMI (1280 x 720, 1280 x 1024, 1920 x 1080)
3. SPOT composite Digital spot (2CH) *Included OSD on screen, Multi-mode support

L. Audio

1. Input and output 4CH line in, 1CH line out
2. Compression G.711
3. Sampling rate 8KHz

M. Alarm

1. Input and output Terminal 4 inputs (NO/NC) / Terminal 2 relay outputs (NO/NC),
Rating: 30V DC / 2A, 250V AC / 0.25A
2. Remote notification Notification via e-mail

N. Connections

1. Ethernet 1 RJ-45 10/100/1000 Base-T
2. Serial interface RS-232/RS-485 (Full duplex) for PTZ,

	Samsung system keyboard
3. USB	USB 2.0, 2 ports (front)
4. Application support	Mouse, Remote controller
5. RS-485 Protocol	Samsung-T/E, Pelco-D/P, Panasonic, Phillips, AD, DIAMOND, ERNA, KALATEL, VCL TP, VICON, ELMO, GE
6. Coax Protocol	NTSC/PAL: Pelco-C (Coaxitron) AHD: ACP (AHD Coax Protocol)
O. Electrical	
1. Input voltage and current	12V DC adaptor, 4A, 100 ~ 200V AC, 50/60Hz, 36Watt
2. Power consumption	Max. 13.3W (With 1x 1T HDD)
P. Environmental	
1. Operating temperature	+0°C ~ +40°C (+32°F ~ +104°F)
2. Operating humidity	20% ~ 85% RH
Q. 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)	Approx. 2.68Kg (5.91 lb.)
R. 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, Taiwanese (25 Languages)

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 equipment shall be tested and configured in accordance with instructions provided by the manufacturer prior to installation
- D. 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).
- E. 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. 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