WISENET

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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32 CHANNEL NETWORK VIDEO RECORDER

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

32 CHANNEL NETWORK VIDEO RECORDER WITH AI SEARCH

PART 1   GENERAL

1.01   SUMMARY

A. Section includes a 32 channel network video recorder with AI search.

B. Product - A 32 channel network video recorder which is ONVIF compliant, with support for H.265, H.264, and MJPEG compression and recording bandwidth of 400 Mbps.

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

33. PoS – Point of Sales

34. VA – Video Analytics

35. PnP – Plug and Play

36. ARB – Auto Recovery Backup

B. Reference Standards

1. Network - IEEE

1. 802.3 Ethernet Standards

2. 802.1x Port-based Network Access Control

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 – Profiles S

3. Emissions

1. FCC-47 CFR Part 15 Subpart B and ICES-003, Class A

2. EN 55032:2015/AC:2016-07

3. EN 61000-3-2:2014

4. EN 61000-3-2:2013

5. AS/NZS CISPR32:2015

6. VCCI-CISPR 32:2016

4. Immunity

1. EN 61000-4-2:2009

2. EN 61000-4-3:2006/A1:2008/A2:2010

3. EN 61000-4-4:2012

4. EN 61000-4-5:2014/A1:2017

5. EN 61000-4-6:2014/AC:2015

6. EN 61000-4-11:2004/A1:2017

7. EN 50130-4:2011/A1:2014

5. Safety

1. UL listed

2. CE EN 50581:2012 (hazardous substances)

C. Definitions

1. JBOD - a collection of hard disks that have *not* been configured to act as a redundant array of independent disks (RAID) array.

2. 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.

3. 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.

4. 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.

5. Dynamic fps - Dynamic assignment of frames per second based on the complexity of the scene to efficiently manage bitrate of the video stream and reduce the storage required.

6. ARB (Auto Recovery Backup) – Automatic backup mechanism that enables WiseNet cameras to store videos on to SD card during failures and stream it to the storage device after recovery.

7. Dynamic Event – New event function of cameras is available without software update.

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 product in the manufacturer's original, unopened, undamaged container with identification labels intact.

B. Store the product 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.

END OF SECTION

PART 2   PRODUCTS

2.01   EQUIPMENT

    A. Manufacturer: Hanwha Techwin

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

    B. Model   PRN-3200B2

    C. Alternates:

2.02   GENERAL DESCRIPTION

    A. The 32 channel Network Video Recorder ("NVR") shall record video and audio from up to 32 network video cameras to a hard disk and enable playback of video and audio.

    B. The manufacturer shall be responsible for rigorous testing of NVR's reliability. The manufacturer shall provide a list of compatible hard disks that have been tested to guarantee reliable recording. The list shall be available in the manufacturer's home page.

    C. The NVR shall provide auto recovery backup (ARB) to transfer video that is recorded on network camera's SD cards during failures to the hard disk drive. The NVR shall allow users to set transfer speed or bandwidth dedicated for ARB in three levels; low, middle, high. If the bit-rate of video to be transferred exceeds the set bandwidth, then the NVR shall transfer video in the order of channel number until all transfer is finished or the video becomes more than 24 hours old based on NVR's current time. The NVR with ARB shall be able to handle the following failures.

        1. Network disconnection between cameras and NVR

        2. Unexpected shutdown of NVR

    D. The 32 channel NVR shall receive text data from external devices and overlay it on live as well as recorded video. It shall also provide search for text data and list all video with previews that is relevant to the search queries. The text shall include but not limited to the following.

        1. Text from PoS devices, namely the texts printed on the receipt of transactions

        2. Text from automatic number plate recognition software

        3. Text from automated teller machines (ATM)

    E. The NVR shall provide a remote monitoring environment for video and audio over the network using a remote computer. The remote monitoring software shall allow users to receive live streams, search for recoded videos, and configure devices.

    F. P2P Service: The NVR shall provide easy configuration of mobile viewer. The mobile viewer shall be freely available and connection shall be established by simply scanning QR code from a mobile device.

    G. Dynamic event: New event function of cameras is available without NVR software (FW) update.

    H. The NVR shall have the following further general properties:

        1. Camera search and discovery: The NVR shall have the capability to search the network for connected compatible cameras.

            1. If 32 or fewer cameras are searched or discovered, each camera will be automatically registered and current camera information (fps, days of recording) will be displayed.

            2. If more than 32 cameras are searched or discovered, the NVR shall provide the ability to selectively register up to 32 cameras.

2. The NVR shall support WiseStream and Dynamic GOV, a smart codec used by WiseNet IP cameras. The smart codec shall produce visually equal video quality while reducing storage required.

3. Recording and playback functions:

    1. Support recording from CIF up to 32 MP per channel

    2. 400 Mbps network camera recording throughput

    3. Simultaneous playback capability up to 32 video channels in local and 32 video channels in network

    4. H.265, H.264, and MJPEG compression support

    5. View status of connected storage hardware

    6. Set recording schedules

    7. Set up triggered recording based on:

        1.) sensor (input) detection

        2.) camera event

        3.) video loss detection

    8. Available recording settings by channel for standard and event-based recording types:

        1.) Profile (codec)

        2.) resolution

        3.) frame rate

        4.) bitrate control

        5.) pre-event and post-event record duration

        6.) I-frame and full frame recording

    9. Available actions upon reaching full HDD storage capacity (with automatic notifications to users):

        1.) stop recording

        2.) overwrite

        3.) auto delete

    10. Search recorded data by time, event, text, ARB events, or smart search. Smart search shall include search options for

        1.) Virtual line (in/out/both)

        2.) Enter/exit

4. Storage

    1. 10TB HDDs in JBOD configuration for 1 array.

    2. USB connection for memory/storage device for video clip backup and settings export

5. Live view:

    1. Live, remote monitoring using Windows Network Viewer or Manufacturer supplied viewer

    2. Configure and exercise functions for connected PTZ cameras, including functionality with compatible USB joystick

    3. Capture and save snapshot images

    4. Record current video in BU, SEC format (EXE format from GUI mode) from Local UI and AVI format from Webviewer

6. Remote access:

1. Multicast or unicast

    1.) Simultaneous unicast access by up to 10 users

    2.) Simultaneous multicast access by up to 20 users

    3.) Simultaneous search access by up to 3 users

2. Mobile device:

    1.) Supported platforms: Android, IOS

    2.) Supported remote users:

        a.) Live unicast: 10

        b.) Live multicast: 20

        c.) Playback: 3

3. Dynamic DNS (DDNS) support

7. High Definition (HDMI) local dual monitor outputs for live viewing, playback, & backup functions

8. ONVIF Profile S compliance

2.03   NVR SOFTWARE

A. The NVR shall have a built in server which provides access for authorized users to live view of connected cameras, NVR recording and playback functions, and NVR configuration settings.

B. The NVR 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 live video channels in various layouts or sequence configurations.

2. Hallway view mode for hallway view cameras.

3. Status displays:

    1. camera channel/profile status for Record/Live/Remote

        1.) model

        2.) connection status

        3.) IP address

        4.) codec

        5.) resolution

        6.) frame rate

        7.) bitrate

            a.) type : CBR/VBR

            b.) bitrate

            c.) bitrate range

4. Start/stop recording

5. Search recorded video

6. Play recorded video

7. Freeze live video

8. Audio on, off, and mute

9. Event monitoring

10. Digital zoom

11. Camera PTZ controls

12. Manual recording

13. Image (snapshot) capture

C. The NVR 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. compression information

    4. protocol information

    5. model information

    6. IP address

    7. connection status

    8. total amount of data received by channel

    9. auto or manual search and register

    10. select and setup ONVIF protocol operation

    11. add, delete, and edit camera profile

    12. adjust settings:

        1.) camera name

        2.) resolution

        3.) frame rate

        4.) bitrate

        5.) brightness

        6.) backlight

        7.) exposure

        8.) day/night

        9.) defog

        10.) focus

        11.) mirror and flip

        12.) motion detection

    13. apply settings to groups of cameras

    14. live streaming settings

3. Recording

    1. setup recording schedule by day and time per channel

    2. record settings per channel

        1.) all frames, key frames, or no record

        2.) data limit per channel

        3.) pre and post event recording times

        4.) include audio

    3. set recording profile per channel:

        1.) codec

        2.) resolution

        3.) frame rate

        4.) bitrate

    4. HDD full capacity options – stop, overwrite

    5. Event configuration

        1.) Alarm input

        2.) video loss

        3.) Camera event

            a.) Sensor

            b.) MD

            c.) Video Analytics

            d.) Defocus

            e.) Audio

        4.) AI metadata(AI search) with Wisenet AI camera

        5.) Dynamic event

4. 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

5. Monitor

    1. Dual HDMI video output on local

        1.) HDMI 1: 3840 x 2160 (30Hz)

        2.) HDMI 2: 1920x1080 (60Hz)

    2. configure display parameters

6. Text device

    1. channel allocation

    2. encoding type and delimiting characters

    3. network port

    4. event configuration

        1.) keyword entry

        2.) dollar value trigger

7. Network

1. address settings per physical port
2. bandwidth limits
3. software ports and protocol
4. multicast parameters
5. DDNS
6. UPnP
7. security:
    1.) IP filtering
    2.) SSL encryption and certificates
    3.) 802.1x parameters
8. NTP server
9. SMTP e-mail settings
10. SNMP settings
11. live stream selection
12. DHCP server settings

8. Notifications
    1. event types
    2. intervals
    3. recipients

D. The NVR software shall provide Search and Playback functions as follows:
1. Search by:
    1. time
    2. event
    3. text
    4. backup device
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

E. The NVR shall have a built in web server which supports browser-based configuration from a PC.
1. Acceptable browsers: Internet Explorer, Google Chrome and Apple Safari
2. The web viewer shall provide a monitoring screen which displays video from registered cameras and simultaneously provides same-screen access to the following functions:
    1. display layout configuration
    2. additional display functions as available with direct connection to the NVR server
3. The web viewer shall provide the same functionality as available when directly connecting to the NVR server with respect to the following:
    1. system settings
    2. backup and restoration of configuration settings to a file

3. camera configuration settings and functions

4. recording

5. storage media and devices

6. monitor

7. text device

8. network

9. events and notifications

10. search and playback

4. Minimum client requirements

1. Acceptable Operating Systems: Windows XP, Vista, 7, 8, 10, Mac OS X (10.9, 10.10, 10.11)

2. Acceptable browsers: Microsoft Internet Explorer, Microsoft Edge, Google Chrome, Apple Safari

F. The NVR provides AI search function when connecting Wisenet camera.

1. AI based object detection　　　Person, Face (Wisenet AI camera), Vehicle, LP,

2. AI based IVA　　　　　　　　LPR (Wisenet AI, P/X camera)

3. AI based bestshot attribute metadata

2.04 DETAILED SPECIFICATIONS

A. Display

1. Network camera input　Max. 32ch

2. Resolution　　　　　　CIF up to 32 MP

3. Protocols　　　　　　SUNAPI, Onvif

B. Decoding

1. Local dual display　　HDMI 1 : 3840 x 2160 (30Hz)

　　　　　　　　　　　　HDMI 2 : 1920 x 1080 (60Hz)

2. Layout　　　　　　　Local Monitor : 1/ 2V/ 3V/ 4/ 8/ 9/ 13/ 16/ 25/ 36/ Sequence

　　　　　　　　　　　　Webviewer : 1/ 2H/ 2V/ 3V/ 4/ 6/ 8/ 9

3. Resolution　　　　　　32M(15fps, H.265 Only), 12M(30fps, H.265 Only), 8.3M(120fps),

　　　　　　　　　　　　 1080p(480fps), 720P(960fps), D1(1920fps)

C. OS　　　　　　　　　　Embedded Linux

D. Recording

1. Compression　　　　　H.265, H.264, MJPEG, WiseStream(H.265, H.264)

2. Channel capability　　32

3. Recording bandwidth　Up to 400 Mbps

4. Resolution　　　　　　CIF up to 32 MP

5. Mode　　　　　　　　Normal, Dual Stream, Schedule(Continuous/Event), Event (Pre/Post),

　　　　　　　　　　　　Bookmark

E. Events and Response Actions

1. Triggers:

1. Alarm input

        2.   Video loss

        3.   Camera event

            1.) Sensor

            2.) MD

            3.) Video Analytics

            4.) Defocus

            5.) Audio

        4.   Dynamic event

    2. Response Actions:

        1.   e-mail

        2.   event push

        3.   PTZ preset

        4.   Alarm out

        5.   Buzzer

        6.   Monitor out

F. Playback (Search)

1.	Playback BW	RAID mode Max. 64Mbps (32ch simultaneously)
		Non RAID mode Max. 32Mbps
2.	User	Max. 4 (Local 1, remote 3)
3.	Simultaneous playback	Max. 80ch
	1. Local	32ch
	2. Remote	16ch per user (up to 3)
4.	Fisheye Dewarping	CMS
5.	Mode	Date & Time(Calendar), Event list, Text Search, Smart Search
6.	Resolution	CIF ~ 32MP (Up to H.264 9MP, H.265 32MP)
7.	Playback control	Fast/Slow Forward / Backward, Move one step Up / Down

G. Storage

1.	HDD slot	SATA 8ea(Max. 80TB, non-RAID mode), Hot swap
2.	Supported HDD	Up to 10TB
3.	External	iSCSI
4.	RAID	RAID-5/6(Single, 1 Array)

H. Backup

1.	File backup	BU/Exe(GUI), JPG/AVI(Network-webviewer)
2.	Function	Multi channel(Up to 32CH) Play, Date-Time/Title display

I. Network

1.	Connectivity:	RJ-45 3EA (LAN/WAN, 1Gbps)
2.	Protocols	IPv4, IPv6, TCP/IP, UDP/IP, RTP (UDP), RTP (TCP), RTSP, NTP, HTTP, DHCP (Server, Client), SMTP, ICMP, IGMP, ARP, DNS, DDNS, uPnP, HTTPS, SNMP, ONVIF (Profile-S), SUNAPI(Server, Client)
3.	DDNS	Hanwha DDNS
4.	Security features	IP address filtering, User access Log, 802.1x, Encryption

Device certificate (Hanwha Techwin Root CA), Signed firmware

    5.   Transmission BW   Max. 400Mbps

J.   Audio

    1.   Channel capability   32 ch

    2.   Compression   G.711, G.726, AAC(16/48KHz)

    3.   Audio Communication   2 way

K.   Max remote user   Search(3), Live Unicast(10), Multicast(20)

L.   Web viewer

    1.   Supported OS   Windows 10, Mac OS 10.13

    2.   Supported browser   Google Chrome, Microsoft Edge, Mac Safari

M.   Viewer SW   SSM, Webviewer, Smart Viewer, Wisenet mobile,

    Support SDK/CGI (SUNAPI) for integration to 3'rd party VMS

N.   Functions

    1.   Camera register   Auto, Manual

    2.   Camera setup   IP address, Add profile edit, Bitrate, Compression, GOP, Quality,

    Camera MD, setup (4, 8 point polygon),

    Camera video setup (Simple focus, Brightness/Contrast, Flip/Mirror, IRIS,

    WDR, D&N, SSNR, Shutter, SSDR, DIS), Fisheye Dewarping Mode,

    Hallway View Setup, Camera Webpage

    3.   PTZ control   Via GUI, Webviewer, SPC-2000

    4.   PTZ preset   300 presets

    5.   Smart phone   Wisenet mobile 2.0 or higher

        1.   Supported model   iOS, Android OS

        2.   Protocol   RTP, RTSP, HTTP, CGI(SUNAPI)

        3.   Control   Live 16CH(Multi-Profile Support), Playback 4CH

        4.   Max. user   Search(3), Live Unicast(10)

    6.   Redundancy

        1.   Failover   N+1

        2.   ARB   Support

    7.   Easy configuration   P2P (QR code)

O.   Intelligent Analysis

    1.   AI search/Attribute

        1.   Object Attribute   Person, Face (with Wisenet AI camera), Vehicle, License Plate

        2.   LPR   English, Number (Wisenet AI, P/X Camera)

P.   Interface

    1.   Front indicator   HDD, Alarm, Power, Record, Backup, Network

    2.   HDD key lock

    3.   HDMI   2 port support (Playback/Setup → HDMI1)

    HDMI1 : 3840x2160 30Hz

    HDMI2 : 1920x1080 60Hz

4. Audio   out 1ea

5. Ethernet   RJ-45 3EA (LAN/WAN, 1Gbps)

6. Alarm   In 8ea, out 4ea

7. USB   4EA(Front 2 x USB 2.0, Rear 2 x USB 3.0)

Q. System

1. Log   Max. 100,000 (System Log, Event Log each)

2. System control   Mouse, Web, Controller (SPC-2000)

3. Language   English, French, German, Italian, Spanish, Russian, Turkish, Polish, Dutch, Swedish, Czech, Portuguese, Danish, Rumanian, Serbian, Croatian, Hungarian, Greek, Norwegian, Finnish, Korean, Chinese, Japanese, Thai, Vietnamese

R. Environment

1. Operating Temperature 0°C to +40°C(32℉ to 104℉)

2. Operating Humidity   20% ~ 85% RH

S. Electrical

1. Power input   100 ~ 240 VAC ±10%; 50/60 Hz, 2.1A

2. Power Consumption   Max. 205W (with HDD 10TB 8ea)

T. Mechanical And Environmental

1. Color / Material   Black / Metal

2. Dimensions (WxHxD)   438 x 86 x 434.9 mm

3. Weight   Approx. 9.1Kg (20.1 lb, HDD not included)

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