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Hanwha Vision is a global leading supplier of solutions for IP and analog video surveillance. Building on the company's history of innovation, Hanwha Vision is dedicated to providing systems solutions with the highest levels of performance, reliability and cost-effectiveness. Hanwha Vision is committed to the continued development of innovative systems products for professional security applications.

For additional information, https://www.hanwhavision.com/en/, https://hanwhavisionamerica.com

1. **PRODUCTS**
   1. **EQUIPMENT**
      1. Manufacturer: Hanwha Vision (https://www.hanwhavision.com/en/, https://hanwhavisionamerica.com)
      2. Model: XRN-3220RB2
      3. Alternates: -
   2. **GENERAL DESCRIPTION**
      1. 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.
      2. The NVR used 12th gen. Intel® processor.
      3. The NVR supports RAID 5/6 mode and can safely store data in storage.
      4. 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.
      5. 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
      6. The 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)
      7. 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.
      8. 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.
      9. Dynamic event: The event function of cameras is available without NVR software (FW) update.
      10. 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. 520 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: sensor (input) detection, camera event, video loss detection
             8. Available recording settings by channel for standard and event-based recording types: Profile (codec), resolution, frame rate, bitrate control, pre-event and post-event record duration, I-frame and full frame recording
             9. Available actions upon reaching full HDD storage capacity (with automatic notifications to users): stop recording, overwrite, auto delete
             10. Search recorded data by time, event, text, ARB events, or smart search. Smart search shall include search options for Virtual line (in/out/both) and enter/exit
          4. Storage
             1. SATA 8 HDD Bays (up to 80TB).
             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 Web viewer
          6. Remote access:
             1. Multicast or unicast

Simultaneous unicast access by up to 10 users

Simultaneous multicast access by up to 20 users

Simultaneous search access by up to 3 users

* + - * 1. Mobile device:

Supported platforms: Android, IOS

Supported remote users: Live unicast 10, Live multicast 20, Playback: 3

* + - * 1. Dynamic DNS (DDNS) support
      1. High Definition (HDMI) local dual monitor outputs for live viewing, playback, & backup functions
      2. ONVIF Profile S compliance
  1. **NVR SOFTWARE**
     1. 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.
     2. 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: camera channel/profile status for Record/Live/Remote (model, connection status, IP address, codec, resolution, frame rate, bitrate)
        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
     3. 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: camera name, resolution, frame rate, bitrate, brightness, backlight, exposure, day/night, defog, focus, mirror and flip, 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

all frames, key frames, or no record

data limit per channel

pre and post event recording times

include audio

* + - * 1. set recording profile per channel: codec, resolution, frame rate, bitrate
        2. HDD full capacity options – stop, overwrite
        3. Event configuration: Alarm input, video loss, Camera event (Sensor, MD, Video Analytics, Defocus, Audio), AI metadata (AI search) with Wisenet AI camera, Dynamic event
      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 out: 2ea HDMI, configure display parameters
      3. Text device: channel allocation, encoding type and delimiting characters, network port
         1. event configuration: keyword entry, dollar value trigger
      4. Network
         1. address settings per physical port
         2. bandwidth limits
         3. software ports and protocol
         4. multicast parameters
         5. DDNS
         6. UPnP
         7. security: IP filtering, SSL encryption and certificates, 802.1x parameters
         8. NTP server
         9. SMTP e-mail settings
         10. SNMP settings
         11. live stream selection
         12. DHCP server settings
      5. Notifications: event types, intervals, recipients
    1. The NVR software shall provide Search and Playback functions as follows:
       1. Search by time, event, text and 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
    2. 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 10 or higher, Mac OS 13.5.2 or higher
          2. Acceptable browsers: Google Chrome, Microsoft Edge, Apple Safari
    3. The NVR provides AI search function when connecting Wisenet camera: Object attribute
  1. **DETAILED SPECIFICATIONS**
     1. Display
        1. Network camera
           1. Input: Max. 32ch
           2. Resolution: CIF up to 32 MP
           3. Protocols: SUNAPI, Onvif
        2. Decoding
           1. Local dual display

HDMI 1: 3840 x 2160 (30Hz)

HDMI 2: 1920 x 1080(Hz)

* + - * 1. Layout

Local Monitor: Dynamic layout, Virtual channel view

Clone Mode: Up to 32 Division

Expand Mode: HDMI1 up to 32 Div. HDMI2 up to 16 Div.

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

* + - * 1. Resolution: 32M(15fps, H.265 Only), 12M(30fps, H.265 Only), 8.3M(4ch@30fps), 1080p(16ch@30fps), 720P(32ch@30fps), D1(48ch@30fps)
    1. Performance
       1. Operating System: Embedded Linux
       2. Recording
          1. Compression: H.265, H.264, MJPEG
          2. Recording Bandwidth

Non-RAID mode

Distributed: Max. 520 Mbps

Normal: Max. 300 Mbps

RAID mode

Normal mode: Max. 520 Mbps

Degrade/Rebuild: Max. 520Mbps

* + - * 1. Resolution: CIF ~ 32 MP
        2. Mode: Normal, Dual Stream, Schedule (Continuous/Event), Event (Pre/Post), Bookmark
        3. Events Triggers: Alarm Input, Video Loss, Camera Event (Sensor, MD, Video Analytics, Defocus, Audio), Dynamic Event, User Event
        4. Event Action: e-mail, Event push, PTZ preset, Alarm out, Buzzer, Monitor Out, FTP, SUNAPI Command, Shutdown
      1. Search & Play
         1. Playback Bandwidth: Max. 200Mbps (32CH simultaneously)
         2. User: Max. 4 (Local 1, remote 3)
         3. Simultaneous playback: Max. 80ch (Local 32ch, Remote 16ch per user)
         4. Mode: Time/ Event/ Text/ ARB/ Bookmark/ Smart search
         5. Resolution: CIF ~ 32MP (Up to H.264 9MP, H.265 32MP)
         6. Playback control: Fast / Slow Forward / Backward, Move one step Up / Down
      2. Storage
         1. Supported HDD: Up to 10TB
         2. HDD slot: SATA 8ea (Max. 80TB, Non-RAID mode), Hot swap
         3. External: iSCSI storage
         4. RAID: RAID-5/6(Array size: 8 HDDs x 1 Array)
      3. Backup
         1. File backup: Recorder/SEC/AVI/JPG(Local), AVI/PNG(Network)
         2. Function: Multi channel (Up to 16CH) Play, Date-Time/Title display
    1. Network
       1. 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)
       2. DDNS: Hanwha DDNS
       3. Transmission Bandwidth: Max. 520Mbps
       4. Audio
          1. Input/Output: 32ch(network)/output(set)
          2. Compression: G.711, G.726, AAC (16/48KHz)
          3. Audio Communication: 2-way
       5. Max remote user: Search(3), Live Unicast(10), Multicast(20)
       6. Security: IP address filtering, User access Log, 802.1x, Encryption, Device certificate (Hanwha Techwin Root CA), Signed firmware, TPM support
       7. Web viewer
          1. Supported OS: Windows 10 or higher, Mac OS 13.5.2 or higher
          2. Supported browser: Google Chrome, Microsoft Edge, Mac Safari
       8. Viewer SW: WAVE, SSM, Webviewer, Wisenet Viewer, Wisenet mobile, Support CGI (SUNAPI) for integration to 3'rd party VMS
    2. Functions
       1. Camera Setup
          1. Camera register: Auto, Manual
          2. Item: 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
       2. PTZ
          1. PTZ control: Via GUI, Webviewer, SPC-2000/2001
          2. PTZ preset: 300 presets
       3. Smart phone: Wisenet mobile 2.0 or higher
          1. Supported model: iOS, Android
          2. Protocol: RTP, RTSP, HTTP, CGI(SUNAPI)
          3. Control: Live 16ch (Multi-Profile Support), Playback 4ch
          4. Max. remote user: Search(3), Live Unicast(10)
       4. Redundancy
          1. Failover: N+1
          2. ARB: Support
       5. Easy configuration: P2P (QR code)
    3. Intelligent Analysis
       1. AI Search: Object Attribute (compatible with Hanwha AI Camera)
    4. Interface
       1. Front indicator: HDD, Alarm, Power, Record, Backup, Network, RAID
       2. Storage: Yes
       3. Reset: Power button
       4. HDMI: 2ea (Playback/Setup → HDMI1)
          1. HDMI1: 3840 x 2160 30Hz
          2. HDMI2: 1920 x 1080 60Hz
       5. Audio: 1ea output (3.5mm Audio Jack)
       6. Ethernet: RJ-45 3ea (LAN/WAN, 1Gbps)
       7. Alarm: In 8ea, out 4ea
       8. USB: 4ea (Front 2 x USB 2.0, Rear 2 x USB 3.0)
       9. Power inlet: AC 1ea
    5. System
       1. Log List: Max. 100,000 (System Log, Event Log each)
       2. System control: Mouse(include wireless), Keyboard(include wireless), Web
       3. Language: English, French, German, Italian, Spanish, Russian, Turkish, Polish, Dutch, Czech, Portuguese, Danish, Romanian, Serbian, Croatian, Hungarian, Greek, Norwegian, Finnish, Korean, Chinese, Japanese, Thai, Vietnamese
    6. Electrical
       1. Power input: 100 ~ 240 VAC ±10%; 50/60 Hz, 1.7A
       2. Power Consumption: Max. 162W (533BTU with HDD 8ea)
    7. Mechanical And Environmental
       1. Color / Material: Black / Metal
       2. Dimensions (W x H x D): 438 x 86x 434.9 mm (17.24 x 3.38 x 17.12 inch)
       3. Weight: 8.8Kg (19.4lb, Except HDD)
       4. Operating Temperature: 0°C to +40°C(32℉ to 104℉)
       5. Operating Humidity: 20% ~ 85% RH
    8. Certification
       1. Emissions & RoHS
          1. FCC EMC – FCC Part 15, Subpart B & ICDS-003 (Issue.7)
          2. CE EMC/RoHS – Council Directives 2014/30/EU, Regulations 2016/1091

EN 55032:2015/A11:2020

EN 50130-4:2011/A1:2014

EN 61000-3 2:2014

EN 61000-3 3:2013

EN IEC 63000: 2018

* + - * 1. UKCA EMC/RoHS – S.I. 2016:1091, S.I. 2012:3032

BS EN 55032:2015/A11:2020

BS EN 50130-4:2011/A1:2014

BS EN 61000-3 2:2014

BS EN 61000-3 3:2013

BS EN IEC 63000: 2018

* + - * 1. VCCI-CISPR 32:2016 Class A
        2. RCM- AS/NZS CISPR32:2015, CISPR32 Ed2.0
      1. Safety
         1. E158873-A6225-DescriptionUL
         2. IEC 62368-1:2018

END OF SECTION