

**IP9191-HT Fixed Network Camera**

8MP 30fps • H.265 Compression • Smart Stream III • WDR Pro • SNV • Remote Focus • i-CS • DIS

**Architectural and Engineering Specification**

**2.01 Manufacturer**

- A. VIVOTEK Inc.  
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- B. Manufacturer shall warrant the camera to be free from defects in material and workmanship for 3 years from the purchase date.

**2.02 General Network Camera Descriptions**

VIVOTEK's IP9191-HT is a professional H.265 box network camera offering true 3840x2160 resolution at 30 fps. With ultra HD resolution at 30 frames per second, this camera is capable of delivering clear and detailed images for a variety of applications such as city surveillance, transportation and industrial monitoring.

VIVOTEK's in-house algorithm brings video compression to next level. With VIVOTEK's Smart Stream III technology, the IP9191-HT is capable of delivering excellent images while keeping bandwidth and storage consumption at extremely low levels, even smaller than typical 2-Megapixel image size.

The IP9191-HT is further equipped with an i-CS (intelligent-CS mount) lens with LSC (Lens Shading Correction) and LDC (Lens Distortion Correction) calibration functions to obtain even better images. When combined with remote focus system, these features enable installers to adjust zoom/focus remotely. These function-rich combinations make the IP9191-HT suitable for a wide range of video surveillance applications.

When housed inside the AE Series Enclosures, the IP9191-HT is excellent for long-range outdoor applications. Furthermore, when equipped with the 12-50mm AL-248 lens, the IP9191-HT is an ideal camera that could deliver exceptional images even from surveillance targets that are over 100 meters away.

**2.03 General Camera Requirements**

- A. The camera shall incorporate a progressive scan CMOS imager with a 1/2.8-inch optical format, no less than 8,294,400 pixels.
  
- B. The image resolution shall be no less than 3840 (H) x 2160 (V) pixels. Users can specify resolutions smaller than default for a specific purpose and supports ePTZ for data efficiency.
  
- C. The camera shall have performance list below:

- Frame rates:
  - H.265 & H.264 & MJPEG:
    - Up to 120 fps at 1920x1080
    - Up to 30 fps at 3840x2160
- D. The camera shall provide cropping functionality in order to reach higher frame rates while sacrificing field of view:
  - a. 3840x2160 MAX 30fps
  - b. 1920x1080 MAX 120fps
  - c. Cropping mode (adjustable place of interest can be configured), frame per second shall vary depending on the selected place of interest.
- E. The camera shall provide board lens, vari-focal, Remote focus, f=3.9~10mm, F1.5(W)~ F2.7(T), auto-iris (i-CS).
- F. The camera shall provide wide angle of view:
  - A. Horizontal: 45° ~ 119°
  - B. Vertical: 25° ~ 63°
  - C. Diagonal: 52° ~ 142°
- G. The minimum illumination required to produce an image shall be approximately 0.02 lux @ F1.5 (Color), and 0.01 lux @ F1.5 (B/W).
- H. The camera shall have at least 1GB of RAM and 128MB of flash memory.
- I. The camera shall provide the possibility to sync the frequency with the power line frequency to eliminate a flickering image.
- J. The camera shall provide on-screen text and timestamp display on video, the text size and location could be changeable by user.
- K. To ensure that the text on video works with the specific language of the country, the camera shall be able to allow the user to upload fonts to solve it.
- L. The camera shall support flip and mirror to allow flexibility in the installation.
- M. The camera shall support 90 and 270 degrees rotation of the video. Obtaining maximum coverage, utilizing the whole image sensor, eliminating bandwidth and storage waste to achieve maximum image quality and perfect adaption to the monitored environment, especially in aisles and corridors.
- N. The camera shall have a removable IR-cut filter for Day & Night function.
- O. At least 3 levels of users shall be provided in case there are different persons that have access to the camera. To increase the security, the administrator shall have the possibility configure his own password, select the permissions for the other user levels and configure the usernames and passwords for each account. Excluding the administrator user level, multiple accounts for the user levels must be available.

- P. The user shall be able to configure polygon-shaped motion detection windows (5 configurable windows). The user shall be able to set up different sensibilities for each window. It shall also offer 2 sets of 5 motion detection windows: one set for day environments and one set for night environments.
- Q. The camera shall provide 4 kinds of camera tampering detections:
  - I. Normal tampering detection
  - II. Tampering when the image is too dark
  - III. Tampering when image is too bright
  - IV. Tampering when image is too blurry
- R. The camera shall be able to detect the signal level of audio-in (microphone) and trigger events accordingly.
- S. The camera shall allow the user to remotely adjust the focus of the camera, offering hassle-free installation and maintenance.
- T. The camera shall support Micro SD/SDHC/SDXC card or SD/SDHC/SDXC card for on-board storage, so that the camera could be a standalone recorder. When the network connection is lost, the camera will continue to record on the Micro SD/SDHC/SDXC card or SD/SDHC/SDXC card.
- U. The camera shall support Micro SD/SDHC/SDXC or SD/SDHC/SDXC Cards with a size of at least 64GB for recording video over extended period of time.
- V. The camera shall be offer the user to choose Ext4 or FAT32 as the file system used to format the SD or MicroSD card.
- W. When recording the video in the SD or MicroSD card, the camera shall offer the option of automatically recycling the old video and automatically erase video after a certain period of time.
- X. Depending on the microSD or SD card brand/model used, the camera shall be able to issue an error or warning from a failing or failed microSD or SD card and display the usage of spare blocks and lifespan via web browser.
- Y. To ensure a perfect recording in the recording server, the camera shall be able to detect when the connection with recording server is lost and start to record in the SD or Micro SD card. When the connection is restored, the camera shall be able to synchronize with the recording server to stream the video and events that the recording server couldn't record. This function shall be available only if the recording server supports this functionality.
- Z. The user shall be able to configure at least 5 polygon-shaped privacy masks.
- AA. A mechanical reset button shall be provided to return the camera to factory default settings.

#### **2.04 Camera Networking Requirements**

- A. The camera shall incorporate a built-in web server.
- B. Camera functionality shall be available to users running versions of Internet Explorer™ 10, 11 or Mozilla™ Firefox 7~10 (Streaming only).
- C. The camera shall provide integrated support for IPv4, IPv6, TCP/IP, HTTP, HTTPS, UPnP, RTSP/RTP/RTCP, IGMP, CIFS/SMB, SMTP, FTP, DHCP, NTP, DNS, DDNS, PPPoE, CoS, QoS, SNMP, 802.1X, UDP, ICMP, ARP, SSL/ TLS.
- D. The camera shall provide integrated support Multicast RTSP streaming (following the standard RFC 2326).
- E. No unique or proprietary client software shall be required for viewing or controlling the camera.
- F. The camera shall be configurable and users may modify the camera's web pages according to a specific purpose.
- G. The camera shall be ONVIF compliant.
- H. The camera shall be able to control the video quality using variable bit rate (VBR) and constant bit rate (CBR).
- I. A. The camera shall provide a RTSP/RTP/RTCP protocol video output via a RJ-45 10/100/1000 Mbps Ethernet connection.
- J. The camera shall be able to transmit H.265/H.264 streaming over HTTP to pass the firewall protection (RTSP over HTTP).
- K. The camera shall be able to transmit H.265/H.264 streaming over UDP for time-sensitive applications to achieve a better real-time Streaming.
- L. The camera shall be able to transmit H.265/H.264 streaming over TCP for applications where the video quality is a top-priority, preventing packet losses.
- M. The camera shall support encrypted data transmission (HTTPS) to increase the overall security.
- N. The camera shall allow the live viewing for up to 10 clients simultaneously.

## **2.05 Camera Audio/Video Requirements**

- A. The camera shall offer at least 3 simultaneous streams offering multiple simultaneous streaming for multiple purposes. All these streams shall support H.264, H.265 and MJPEG. All these streams shall support resolutions from 2048x1536 to 320x240:

- a. 1<sup>st</sup> streaming: configurable codec / FPS / Resolution / Quality / Region of interest to be used for the recording.
  - b. 2<sup>nd</sup> streaming: configurable codec / FPS / Resolution / Quality / Region of Interest to be used for live viewing.
  - c. 3<sup>rd</sup> streaming: configurable codec / FPS / Resolution / Quality to be used as a backup stream for multiple uses (snapshot, etc.).
- B. The camera shall be able to control the video quality using variable bit rate (VBR) and constant bit rate (CBR).
- C. The camera shall be able to control the maximum bit rate consumed when using variable bit rate (VBR).
- D. The camera shall support H.264 Main Profile, H.264 Baseline Profile and H.264 High Profile.
- E. The camera shall support H.265 HEVC (high efficiency video coding) codec to reduce bitrate compared to H.264.
- F. The camera shall support MJPEG codec.
- G. The camera shall provide 20~80000 Kbps H.265 video bit rate.
- H. The camera shall provide 20~80000 Kbps H.264 video bit rate.
- I. The camera shall provide 20~80000 Kbps MJPEG video bit rate.
- J. In order to optimize bandwidth consumption by using high quality only in the important objects/areas (foreground areas) and using low quality for the unimportant objects/areas (background areas), the camera shall let the user configure the quality for the areas. The camera shall let the user choose from the following usage scenarios:
1. Under the same stream, the camera shall be able to detect moving objects, assigned them as foreground areas and give high quality only to those moving objects, while maintaining the rest of the image in a low quality.
  2. Under the same stream, the camera shall be able to let the user define multiple regions of interest and only give those regions high quality while maintaining the rest of the image in a low quality.
  3. Under the same stream, the camera shall be able to detect moving objects, assigned them as foreground areas and give high quality to those moving objects. In addition, the camera shall also let the user define multiple regions of interest and give those regions high quality. The rest of the image will be assigned as background and have low quality.
- K. The camera shall be able to dynamically change the I-frame interval to optimize the bandwidth consumption. The user shall be able to configure the minimum I-frame interval.
- L. Based on the content of the video the camera shall be able to adjust dynamically the compression ratio for different regions of the image.

- M. The camera shall be able have independent compression values for the I-frame and the P-frames.
- N. The camera shall provide 13 levels of exposure compensation.
- O. The camera shall support exposure time from 1/32000 sec. to 1/5 sec.
- P. The camera shall able to provide the audio codec G.711 which is most widely supported.
- Q. The camera shall provide pcma and pcmu for G.711.
- R. The camera shall be able to provide the audio codec G.726 to obtain high quality audio.
- S. The camera shall provide 4 audio quality levels for G.726.
- T. The camera shall allow the possibility to connect an external microphone.
- U. The camera shall have audio out connector for external speaker.
- V. The camera shall offer full duplex two way audio capability.
- W. The camera shall provide automatic white balance. The camera shall also provide manual white balance to fit different light conditions. The camera shall have configurable brightness, contrast, saturation and sharpness.
- X. The camera shall provide defog functionality in order to provide a clearer image in environments with fog/rain.
- Y. The camera shall have implemented 3D Noise Reduction technology in order to improve the image quality.
- Z. The camera shall have auto exposure (AE), but the camera shall allow the user to select manual mode if necessary.
- AA. The camera shall have Automatic Gain Control (AGC).
- BB. The camera shall support backlight compensation (BLC).
- CC. The camera shall allow the user to configure the speed of the Auto Exposure. This will allow it to make the Auto exposure react faster to sudden changes of lighting and reach the correct/suitable exposure in a small amount of time.
- DD. The camera shall provide dynamic range of 120 dB.
- EE. The camera shall provide WDR (wide dynamic range) by using 2 shutter capture method to obtain visibility in extremely dark & light environments.
- FF. The camera shall support digital WDR (WDR Enhanced) capability for unparalleled visibility in extremely bright and dark environments.

- GG. The camera shall provide SNR higher than 60.5 dB.
- HH. The camera shall feature streaming of the full field of view (FOV) and simultaneous multiple region on interest (ROI) for forensic zooming.
- II. The camera shall provide ePTZ function of 48x digital zoom (4x on IE plug-in, 12x built-in).
- JJ. The camera shall support HLC (Highlight Compensation), which detects strong light spots such as car headlights and flashlights in the dark, masking them in the captured image to relieve operator eye strain and making monitoring easier.

## 2.06 Connectors

- A. RJ-45 cable connector for Network/PoE 10 Base-T / 100 Base-TX / 1000 Base-T Ethernet connection.
- B. Two D/I and two D/O for external sensor and alarm.
- C. One DC 12V/AC 24V power input.
- D. One RS-485 output to control scanners and/or motorized zoom lens.
- E. One Microphone input.
- F. One Audio output.

## 2.07 Electrical Specifications

- A. Power Consumption:
  - a. Maximum 12 watts
- B. Power requirement:
  - a. IEEE 802.3af PoE Class 0
  - b. DC 12V
  - c. AC 24V

## 2.10 Mechanical Specifications

- A. Net weight: 671 g (without lens)  
743 g (with lens)
- B. Dimensions:
  - Camera:  $\emptyset$  151 mm (D) x 70mm (W) x 61 mm (H) (without lens)
  - 209 mm (D) x 70mm (W) x 61 mm (H) (with lens)

## 2.11 Environmental Specifications

- A. Starting temperature range: 0°C ~ 50°C (32°F~ 122°F)

- B. Working Temperature:  $-10^{\circ}\text{C} \sim 50^{\circ}\text{C}$  ( $14^{\circ}\text{F} \sim 122^{\circ}\text{F}$ )
- C. The camera shall support up to 90% Humidity.

## 2.12 Certifications and Approvals

### A. Electromagnetic Compatibility Emissions:

- FCC Class B
- CE
- LVD
- VCCI
- C-Tick
- UL

### B. RoHS

All material and/or components used in the manufacture of the product shall be in compliance with the EU Directive 2002/95/EC Restriction of Hazardous Substance (RoHS).

**VIVOTEK confidential**