PART 1   **GENERAL -NOT USED-**

PART 2   **PRODUCTS**

2.01 HIGH DEFINITION OUTDOOR IR DOME NETWORK CAMERA WITH EMBEDDED Ai VIDEO ANALYTICS

A Manufacturer

     1. Wavesys Global ; www.wavesysglobal.com

B General

     1. The camera shall:

         a. Be designed to deliver embedded video analytics.

         b. Be designed to provide H.264, H.265 and MJPEG video compression.

         c. Be designed to support resolutions up to 2592 (H) x 1944 (V) pixels.

         d. Be designed to provide video at 30 frames per second (fps) for all resolutions.

         e. Provide an embedded web-server.

         f. Be equipped with a slot for microSD/SDHC/SDXC memory card.

         g. Be equipped with built-in IR LEDs. (H2IR)

         h. Support Power over Ethernet (PoE) and DC12V as a power source.

         i. Be designed to meet IP67 level of dust and water proof.

C Hardware

     1. The camera shall meet or exceed the following specifications:

         a. Sony STARVIS 1/2.8" 5.14M progressive scan CMOS sensor

         b. Mechanical IR-cut filter

         c. P-iris lens

         d. 5x optical zoom lens

            1) 2.7mm (wide) and 13.5 mm (tele)

2) F1.4

e. Two Motor Moterized Focus Controllable (MFZ)

1) Refocus mode: Sync with Day & Night mode transition

f. Angle of view

1) Horizontal: Approx. between 31° and 85°

2) Vertical: Approx. between 24° and 62°

g. Minimum Illumination

1) IR Sensitivity Range: 700-1100 nm

2) Min. Illumination: Color : 0.08Lux, BW : 0Lux with IR

h. IR Illuminator

1) IR LED: High Power IR LED x 2

2) IR working distance: max. 30m

i. External I/O Terminals: 1 x Alarm In, 1 x Alarm Out

j. Analogue Video output (NTSC/PAL)

k. Micro SD/SDHC memory card slot

1) The camera shall support up to 512GB SD memory card.

D Video

1. Supported Encording format shall include:

a. H.264, H.265, MJPEG (Motion JPEG)

2. Video Streaming shall provide:

a. Multi Video Streaming which are individually configurable Bitrate Control (e.g. CBR. CBR at H.264, H.265 Controllable frame rate and Bandwidth)

b. Configurable range of 100Kbps ~10Mbps, Multi-rate for Preview and Recording

c. Configurable Multiple Profule Streaming Performance of 2592 x1944p 30 / 480p30 with H.264, H.265 / MJPEG

3. Image control shall include:

      a. Brightness, Contrast, Hue, Saturation and Sharpness

      b. Image orientation (Vertical flip, Horizontal mirror)

      c. Image rotation (90 degrees to the left, 90 degrees to the right)

      d. Electronic shutter speed (Automatic and Manual, 1/15 ~ 1/32000)

      e. Auto Gain Control

      f. Exposure adjustment (Level : 25 ~ 400)

      g. AE Metering (Average, center, spot)

      h. Digital Slow Shutter (1/2, 1/3, 1/5, 1/6, 1/7.5, 1/10, off)

      i. Wide Dynamic Range (On/Off)

      j. Automatic Gain Control: Gain Limit (0dB ~ 72dB)

      k. White Balance : Auto/Manual

      l. 3D Digital Noise Reduction

      m. Special Feature: Smart RC, ROI

E   Audio

   1. The camera shall meet or exceed the following specifications:

      a. Two-way full duplex audio

      b. Input sources

         1) External line device (1.0Vms, 3K Ohm)

      c. Output sources

         1) External line device

      d. Encoding

         1) G.711, AAC

F   Video Contents analytics (WVCA)

   1. General

      a. The WVCA software shall be embedded in the camera, so it can keepthe latency of the alarm at minimum.

b. The video source used for the WVCA software shall not be affected by any encoding/decoding actions performed by Video Management Software (VMS), Digital Video Recorder (DVR) and Network Video Recorder (NVR) before the WVCA is performed.

c. The embedded WVCA software shall be ready to use right out of thebox minimizing difficulties in installation and maintenance.

d. The WVCA software shall be usable for both indoor and outdoorvideo environment.

e. The WVCA software shall operate in various environmentalconditions including following:

    1) Natural or artificial lighting in both indoor and outdoor environment

    2) Day time and night time

    3) Various weather conditions including sun, clouds, rain, wind or fog

    4) Some camera shake from wind or vibration due to camera mounting location

    5) Trees and leaves moving due to wind/weather

    6) Slow creeping shadows and light

f. The WVCA software shall provide a variety of detection zones. A detection zone is defined as a dedicated region within a camera'sfield of view used to detect behaviors specific to that zone.

g. Multiple zones may be defined in a single camera view. The camera shall provide at least 40 individually configurable zones.

h. The WVCA software shall provide a variety of detection rules. A detection rule is defined as a dedicated filter applied to a detection zone characterizing a specific behavior to detect for an object being tracked.

i. The WVCA software shall continually track moving and stationary targets and generate real-time alerts of object presence in multipleoverlapping detection zones.

j. The camera shall provide at least 60 simultaneously operable rules.

k. The WVCA software shall be capable of detecting and tracking up to100 objects simultaneously.

l. The WVCA software shall provide calculated size and speed of tracked objects with an additional calibration. To reduce time and effort for the calibration, the WVCA software shall provide 3 dimensional virtual grid, ruler and human figure as a guide for the calibration.

2. Detection zones shall include:

    a. Non-detection zone

        1) The WVCA software shall provide a special zone that will suppress alarm generation until an object has left the object blocking zone. Object will be tracked while it is in the zone, but this will not generate alarms till it leaves the zone. This can be used in areas such as wildly moving trees, reflective surfaces, or moving door and gates and will greatly reduce the number of false alarms.

    b. Line

    c. Polygon

3. Detection rules shall include:

    a. Enter/Exit/Appear/Disappear filter

        1) An object entered alarm is raised when an object crosses from the outside to the inside of a detection zone. Conversely, an object exited alarm is raised when an object crosses from the inside to the outside of a detection zone.

    b. Stopping filter

        1) Objects that are stopped inside a detection zone for longer than the defined amount of time will trigger the detection rule and raise an alarm.

    c. Dwell filter

        1) Objects that dwell inside a detection zone for longer than the defined amount of time will trigger the detection rule and raise an alarm.

    d. Direction filter

        1) Objects that travel in the configured direction (within the limits of the acceptance angle) through a detection zone, trigger the detection rule and raise an alarm.

    e. Tailgating filter

1) Object tailgating is defined as an object crossing a detection zone within a certain time after an object has already crossed the zone.

f. Object Classification filter

1) Object classification filter can be activated once the camera is calibrated. The object classification is based on properties extracted from the object including object area and speed.

g. Abandoned object detection

1) Suspicious objects can be detected when carried into the scene and planted by a person as well as when dropped or thrown into the scene; this triggers the rule and raises an alarm.

h. Removed object detection

1) Significant objects can be detected when carried into the scene; this will trigger the rule and raise an alarm.

i. Logical Rules

1) The WVCA software shall enable users to create customized rules by combining various standard detection rules or other complex rules with various types of clauses such as and clause, or clause, within clause, and etc.

j. The WVCA software shall enable Deep learning Object tracker, Deep learning people tracker ,pose tracker which is design to Classify behavior through deep learning Ai Technology

4. The camera shall provide:

a. Tamper Detection which shall detect camera tampering events such as bagging, de-focusing, moving the camera, etc. This is achieved by detecting large persistent changes in the image.

b. At least 20 Counters which count triggers generated by detection rule violation. For example, if it is required to count the number of objects entering a detection zone, the zone must initially be configured to raise an alarm every time an object enters it. The zone can then be assigned to a counter and the counter will count the objects according to the type of counting required. Supported types of counting are:

1) Increment

2) Decrement

c. Counting Line which is specifically designed as a detection filter optimized for bi-directional object counting in busier detection

scenarios.

      d. Metadata in plain XML/JSON format via video streaming protocol for third party applications. Contents to be included in the metadata shall be customizable by providing following content options to choose:

        1) WVCA event data

        2) Object tracking data

        3) Counting data

G Networking

1. The camera shall connect to the network via a RJ-45 with built-in Auto switching 10/100 Mbit/s Ethernet interface.

2. The camera shall support fixed IP addresses

3. The camera shall support IP addresses dynamically obtained by a Dynamic Host Control Protocol (DHCP)

4. IP addresses shall be compliance with the IP version 4 (IPv4).

5. The camera shall be accessible by a Link-Local Address supported system or software, providing an additional IP address in the Link-Local Address range. Link-Local Addresses shall be able to automatically be assigned and also be able to manually be assigned by user.

6. Supported protocols shall include:

    a. TCP/IP, UDP/IP, HTTP, HTTPS, RTSP, RTCP, RTP/UDP, RTP/TCP, UPnP™, SMTP, DHCP, DNS, DynDNS, NTP, SNMPv1/v2c/v3(MIB-II), IGMP, ICMP, SSLv2/v3, TLSv1

7. Video streaming protocol shall include:

    a. HTTP (Unicast)

    b. HTTPS (Unicast)

    c. RTP over RTSP (Unicast & Multicast, UDP & TCP)

8. Video streaming protocol shall:

    a. Provide Automatic and Manual Bandwidth control

    b. Provide Selection for components of video stream (metadata) to reduce bandwidth needed

    c. Support Quality of Service (QoS) to be able to prioritize network traffic for video and metadata

H Web interface

    1. Web interface shall provide:

        a. Live view

        b. Local storage management (SD/SDHC card)

        c. Configuration page for the camera

I Recording

    1. The camera shall provide a recording function to store video into:

        a. A SD memory card mounted in the camera

    2. All video recording files in SD memory card shall be searchable and downloadable via web interface and via application programmable interface.

    3. Event Recording

        a. The camera shall support Event alarm based Recording in SD memory card and in an external FTP server.

        b. The camera shall provide at least 5 seconds of pre alarm recording and 240 seconds of post alarm recording.

J Event Management

    1. Event shall be triggered by:

        a. External Sensor (DI, Digital Input) which shall programmatically work as a normally open type sensor or a normally close type sensor

        b. External Alarming device (DO, Digital Output)

        c. Motion Detection (MD)

        d. Video Content Analytics (WVCA)

        e. Network Loss/Detect

        f. Recurrence (timer)

    2. When an event triggered, there shall be available actions to:

        a. Activate an external alarming device (DO, Digital Output)

      b. Start recording in SD memory card (SD event recording) or start transferring recorded video into an external FTP server after the SD event recording is initiated.

      c. Send a notification message with snapshots via Email. At least 3 snapshots as pre-image taken before an alarm triggers shall be available.

      d. Send HTTP notification

      e. Send TCP notification

      f. Save a notification message and a snapshot in an external FTP server

      g. Save event logs

3. The camera shall provide event scheduler to manage event monitoring to be activated only within pre-defined time period, providing following options:

      a. Time (Start time ~ End time, 00:00 ~ 23:59)

      b. Day (Sunday, Monday, Tuesday, Wednesday, Thursday, Friday, Saturday)

4. Motion Detection function shall:

      a. Provide at least 4 individually configurable motion zones with sensitivity as properties of each motion zones. Multiple motion zones may be defined in a single camera view.

5. The camera shall provide a search interface for events, allowing the events to be searched by a specific event type with a given time period.

K Text Overlay

1. Text Overlay is defined as a function which delivers on-screen embedded texts or drawings over a video stream and a snapshot. Supported element of the Text Overlay shall include:

      a. Burnt-in Text

      b. Burnt-in WVCA annotation

      c. Privacy mask

2. The Burnt-in Text shall deliver:

      a. A customer-specific text of at least 30 ASCII characters.

      b. Date and time

3. The Burnt-in WVCA annotation shall deliver:

   a. Detection zone and line

   b. Non-detection zone

   c. Object tracking bounding box

   d. Counter (name, value)

   e. Object classification

   f. Object height

   g. Object speed

   h. Object area

   i. Event message

4. The Burnt-in WVCA annotation shall be individually configurable foreach video stream. (First stream, Second stream, Snapshot stream)

5. The camera shall provide at least 4 individually configurable privacy masks to conceal defined areas in the image as non-viewable. These masks shall be dynamically adjusted based on current zoom-factor.

L   Application Programmable Interface (API) support

1. The camera shall be fully supported by an open API, which shall provide necessary information for integration of funcionality into third party applications.

2. Supported Third Party API shall include:

   a. ONVIF Profile S

M Security

1. The camera shall:

   a. Support the use of HTTPS and SSL/TLS

   b. Provide multiple user account with a password protection restricting access to the built-in web interface and video stream.

   c. Provide authentication procedure which requires users to view video stream using an account ID and a password. The ID and password shall be encrypted by the Digest method (MD5) before being transferred.

      d. Provide IP filtering function which allows or blocks network connection to the camera from pre-defined IP addresses.

      e. Support replay attack protection of ONVIF by reinforcing authentication process.

N Maintenance

1. The camera shall:

      a. Be supplied with MS Windows-based management software, which discovers the cameras in the same network and allows assignment of IP addresses, firmware update and rebooting the camera.

      b. Allow firmware (FW) update over the network via web interface.

      c. Provide reset function via web interface which turns all settings of camera back to its factory default with selectable exceptions to preserve:

         1) Network settings

         2) User account information

O Diagnostics

1. The camera shall:

      a. Be monitored by a Watchdog functionality, which shall automatically re-initiate processes, restart the unit if a malfunction is detected.

      b. Provide system log file which shall keep at least 10000 records. The camera shall keep records in log file when:

         1) Any event occurs

         2) Any event configuration is changed

         3) Network configuration is changed

P Environmental

1. The camera shall meet or exceed the following specifications:

      a. Weatherproof: Rated IP67 or higher

      b. Operating Temperature Range

         1) DC 12V / PoE : -22 to 122 degrees Fahrenheit (-30 to 50 degrees Celsius)

   c. Relative Humidity Range

    1) 10 Up to 90% RH, non-condensing

  Q Power Requirement

   1. DC 12V

    a. Input voltage range: 10.8 ~ 13.2 VDC

    b. Consumption: max.

     1) 12V DC: 7.4 Watt (IR-LED on)

     2) PoE: 8.7 Watt (IR-LED on)

   2. Power Over Ethernet

    a. Standard: IEEE 802.3af

  R Warranty

   1. Manufacturer shall provide at least a 3 years warranty on parts and repair labor for the camera commencing with the date of purchase.

 2.02 MANUFACTURED UNITS

  A The camera shall be

   1. IP-50303LDO Outdoor Remote Zoom and Focus IR Dome Network Camera

    a. Dimensions: 125 mm x 92mm

    b. Color: White

    c. Weight: 0.51kg

  B Provided material shall include

   1. Quick guide

   2. Mounting template

 PART 3   **EXECUTION -NOT USED-**

END OF SECTION