GENERAL -NOT USED-

PRODUCTS

ONE CHANNEL NETWORK VIDEO ENCODER WITH EMBEDDED VIDEO ANALYTICS

### Manufacturer:

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General

The encoder shall:

Be designed to deliver embedded video analytics.

Be designed to provide H.264 and Motion JPEG (MJPEG) video.

Be designed to support resolutions up to 720 x 480(NTSC) / 720 x 576(PAL).

Be designed to provide video at 30 frames(NTSC) / 25 frames(PAL) per second (fps) for all resolutions.

Provide an embedded web-server.

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

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

Be equipped with at least one analogue video input and one analogue video output.

Digitalize one channel of analogue video.

Be equipped with an RS-485 connection for data transfer.

Hardware

The encoder shall meet or exceed the following specifications:

1 channel analogue video input (NTSC/PAL)

1 channel analogue video output (NTSC/PAL)

Audio: 1 x Audio In, 1 x Audio Out

External I/O Terminals: 2 x Alarm In, 2 x Alarm Out

Analogue Video output (NTSC/PAL)

Data port: RS485

256MB Flash memory and 256MB RAM

microSD/SDHC memory card slot

The encoder shall support up to 64GB SD memory card.

Video

Supported Encording format shall include:

H.264 Baseline, Main, High profile (MPEG-4 Part 10/ AVC)

MJPEG (Motion JPEG)

Video Streaming shall provide:

Two separate video streams which are individually configurable (e.g. Alarm event at high quality and Continuous recording at low quality)

Configurable range of 1 ~ 30 fps (NTSC) / 1 ~ 25 fps (PAL) in all resolutions of MJPEG

Configurable range of 1 ~ 30 fps (NTSC) / 1 ~ 25 fps (PAL) in all resolutions of H.264

Configurable Group of Pictures (GOP) in H.264

Constant Bit Rate (CBR) and Variable Bit Rate (VBR) in H.264

Configurable image quality (Highest, High, Normal, Low, Lowest) in VBR mode of H.264

Configurable JPEG quality in MJPEG

Supported video resolution shall include:

720x480 (NTSC) 720x576 (PAL)

704x480 (NTSC) 704x576 (PAL)

704x240 (NTSC) 704x288 (PAL)

640x480 (NTSC) 640x480 (PAL)

352x240 (NTSC) 352x288 (PAL)

320x240 (NTSC / PAL)

176x120 (NTSC / PAL)

Image control shall include:

Brightness, Contrast, Saturation and Sharpness

Image orientation (Vertical flip, Horizontal mirror)

Vertical Delay and Horizontal Delay

De-interlacing image processing

Audio

The encoder shall meet or exceed the following specifications:

Two-way full duplex audio

Input sources

External microphone

External line device

Output sources

External line device

Encoding

G.711 uLaw at 8/16kHz

Video Contents analytics (VCA)

General

The VCA software shall be embedded in the encoder, so it can keep the latency of the alarm at minimum.

The video source used for the VCA 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 VCA is performed.

The embedded VCA software shall be ready to use right out of the box minimizing difficulties in installation and maintenance.

The VCA software shall be usable for both indoor and outdoor video environment.

The VCA software shall operate in various environmental conditions including following:

Natural or artificial lighting in both indoor and outdoor environment

Day time and night time

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

Some encoder shake from wind or vibration due to encoder mounting location

Trees and leaves moving due to wind/weather

Slow creeping shadows and light

The VCA software shall operate with various video sources including color, black and white, SD resolution, HD resolution, infrared and thermal formats.

The VCA software shall provide a variety of detection zones. A detection zone is defined as a dedicated region within a encoder’s field of view used to detect behaviors specific to that zone.

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

The VCA 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.

The VCA software shall continually track moving and stationary targets and generate real-time alerts of object presence in multiple overlapping detection zones.

Multiple rules may be applied in a single detection zone. The encoder shall provide at least 60 simultaneously operable rules.

The VCA software shall be capable of detecting and tracking up to 100 objects simultaneously.

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

Detection zones shall include:

Non-detection zone

The VCA 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.

Line

Polygon

Detection rules shall include:

Enter/Exit/Appear/Disappear filter

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.

Stopping filter

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.

Dwell filter

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

Direction filter

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.

Tailgating filter

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

Object Classification filter

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

Speed filter

Objects that travel within the bounds of the configured speeds, through a detection zone trigger the detection rule and raise an alarm.

The encoder shall provide:

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

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:

Increment

Decrement

Occupancy

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

Counting Database along with Counter reporting interface to query the database to generate reports, tables and to export data to Microsoft Excel for further analysis.

Metadata in plain XML 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:

VCA event data

Object tracking data

Counting data

Blob diagnostic data

Counting line diagnostic data

Tamper diagnostic data

Scene change diagnostic data

Networking

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

The encoder shall support fixed IP addresses

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

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

The encoder 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.

Supported protocols shall include:

QoS Layer 3 DiffServ, TCP/IP, UDP/IP, HTTP, HTTPS, RTSP, RTCP, RTP/UDP, RTP/TCP, mDNS, UPnP™, SMTP, DHCP, DNS, DynDNS, NTP, SNMPv1/v2c/v3(MIB-II), IGMP, ICMP, SSLv2/v3, TLSv1

Video streaming protocol shall include:

HTTP (Unicast)

HTTPS (Unicast)

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

Video streaming protocol shall:

Provide Automatic and Manual Bandwidth control

Provide Selection for components of video stream (audio and metadata) to reduce bandwidth needed

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

Web interface

Web interface shall provide:

Live view

Local storage management (SD/SDHC card)

Configuration page for the encoder

ActiveX software installation with Microsoft Internet Explorer for specific task

ActiveX software shall:

Be downloaded directly from the encoder.

Display live video images from the encoder.

Save snapshots from the encoder into a storage of a client computer.

Record and store live video images from the encoder into a storage of a client computer.

Recording

The encoder shall provide a recording function to store video into:

A SD memory card mounted in the encoder

A storage of a client computer via web interface with Microsoft Internet Explorer.

An external storage server, such as FTP server.

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

The recording in SD memory card shall be instantly started for pre-defined timeframe by request of the user via the web interface, providing so-called Instant Recording.

The encoder shall provide a video streaming function to transfer recorded video in SD memory card via RTSP/RTP connection.

Continuous Recording

The encoder shall support continuous video recording in SD memory card.

The encoder shall automatically start replacing old video footages with new video recordings when there is not enough space left in the SD memory card.

The encoder shall allow video recordings to be stored in SD memory card being segmented by pre-defined length or by pre-defined size.

Event Recording

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

The encoder shall provide at least 5 seconds of pre alarm recording and 60 seconds of post alarm recording.

The encoder shall provide a search interface for recording files in SD memory card, allowing the files to be searched by a specific event with a given time period.

The encoder shall ensure a reliability of video file transfer into the external FTP server against any incident, such as connection to encoder is down or recording FTP server is down. This is done by utilizing SD memory card as a buffer. It will resume the video file transfer after a recovery from system or network failure, providing so-called fail over recording on SD card.

Event Management

Event shall be triggered by:

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

External Alarming device (DO, Digital Output)

Motion Detection (MD)

Video Content Analytics (VCA)

Network configuration change

Recurrence (timer)

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

Activate an external alarming device (DO, Digital Output)

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.

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

Send HTTP notification

Send TCP notification

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

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

Date (Start date ~ End date, 01/01/2000 ~ 12/31/2099)

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

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

Motion Detection function shall:

Provide at least 8 individually configurable motion zones with sensitivity and minimum object size as properties of each motion zones. Multiple motion zones may be defined in a single encoder view.

Provide an option to show motion blob in the web interface to reduce time and effort for configuration of motion zones.

The encoder shall provide a search interface for events, allowing the events to be searched by a specific event type with a given time period. A video recording file for the event, if it is available, shall be downloaded via the search interface.

The encoder shall provide a functionality of automatic and manual event log transfer to an external FTP server.

Text Overlay

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:

Burnt-in Text

Burnt-in VCA annotation

Privacy mask

The Burnt-in Text shall deliver:

A customer-specific text of at least 48 ASCII characters.

Date and time

The Burnt-in VCA annotation shall deliver:

Detection zone and line

Non-detection zone

Object tracking bounding box

Counter (name, value)

Object classification

Object height

Object speed

The Burnt-in VCA annotation shall be individually configurable for each video stream. (First stream, Second stream, Snapshot stream)

The encoder 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 and encoder's pan/tilt position.

Application Programmable Interface (API) support

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

Supported Third Party API shall include:

ONVIF Profile S

GENETEC Protocol

Security

The encoder shall:

Support the use of HTTPS and SSL/TLS

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

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.

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

Support replay attack protection of ONVIF by reinforcing authentication process.

Maintenance

The encoder shall:

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

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

Provide automatic and manual backup of system logs into an external File Transfer Protocol (FTP) server

Allow backup and reload a user-specific configuration data via web interface.

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

Network settings

User account information

Timezone setting

Diagnostics

The encoder shall:

Be equipped with an LED, indicating the encoder’s functional status.

Be monitored by a Watchdog functionality, which shall automatically re-initiate processes, restart the unit if a malfunction is detected or turn on Safe mode providing a simple interface to upload Firmware (FW) if Operating System (OS) is damaged.

Provide a heart beat signal, which continuously transfers a signal over network to a pre-defined destination with a certain time interval. It may be an indicator of which ensures whether or not the encoder is alive.

Provide system monitor on a real time basis via web interface. The system monitor shall contain information of:

CPU usage

Memory usage

Device uptime

Video streaming (Type, Resolution, Frame per second, Bitrate)

List of RTSP streaming connection (IP address, port number)

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

Any event occurs

Any event configuration is changed

Network configuration is changed

CPU is overloaded

System memory is overused

Environmental

The encoder shall meet or exceed the following specifications:

Operating Temperature Range

32 to 122 degrees Fahrenheit (0 to 50 degrees Celsius)

Relative Humidity Range

Up to 85%, non-condensing

Power Requirement

DC 12V

Input voltage range: 10.8 ~ 13.2 VDC

Consumption: max. 2.8 Watt

Power Over Ethernet

Standard: Class 0 (IEEE 802.3af)

Warranty

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

MANUFACTURED UNITS

The encoder shall be

Ganz ZS1-1DS One Channel Encoder

Dimensions: 103(W) x 38(H) x 141(D) mm

Color: Dark Gray

Weight: 1 pound (430g)

Provided material shall include

Installation Guide

User’s Guide

API Guide

EXECUTION -NOT USED-

END OF SECTION