# GENERAL

## SYSTEM DESCRIPTION

### General Requirements

#### The specified unit shall be of manufacturer’s official product line, designed for commercial and/or industrial 24/7/365 use.

#### The specified unit shall be based upon standard components and proven technology using open and published protocols.

### Sustainability

#### The specified unit shall be manufactured in accordance with ISO 9001.

#### The specified unit shall be compliant with the EU directives 2011/65/EU (CE).

#### The specified unit shall be compliant with the EU regulation 1907/2006 (REACH).

#### The specified unit shall be Halogen-free in accordance with IEC 61249-2-21.

## CERTIFICATIONS AND STANDARDS

### General abbreviations and acronyms

#### AES: Advanced Encryption Standard

#### API: Application Programming Interface

#### AQI: Air Quality Index

#### Aspect ratio: A ratio of width to height in images

#### BACnet: Building Automation and Control (BAC) Network

#### Bit Rate: The number of bits/time unit sent over a network

#### Bonjour: Enables automatic discovery of computers, devices, and services on IP networks.

#### DHCP: Dynamic Host Configuration Protocol

#### DNS: Domain Name System

#### FPS: Frames per Second

#### FTP: File Transfer Protocol

#### IEEE 802.1x: Authentication framework for network devices

#### HTTP: HyperText Transfer Protocol

#### HTTPS: Hypertext Transfer Protocol Secure

#### IAQ: Indoor Air Quality

#### IP: Internet Protocol

#### ISO: International Standards Organization

#### LAN: Local Area Network

#### LED: Light Emitting Diode

#### MPEG: Moving Picture Experts Group

#### MJPEG: Motion JPEG (M-JPEG or MJPEG) is a video compression format in which each video frame or interlaced field of a digital video sequence is compressed separately as a JPEG image.

#### Multicast: Communication between a single sender and multiple receivers on a network

#### NTP: Network Time Protocol

#### PoE: Power over Ethernet (IEEE 802.3af Class 3 Compliance, 80 mA) standard for providing power over network cable

#### QoS: Quality of Service

#### RTSP: Real Time Streaming Protocol

#### SMTP: Simple Mail Transfer Protocol

#### SNMP: Simple Network Management Protocol

#### SSL: Secure Sockets Layer

#### TCP: Transmission Control Protocol

#### TLS: Transport Layer Security

#### Unicast: Communication between a single sender and single receiver on a network

### The specified unit shall carry the following EMC approvals:

#### EN 55024:2010

#### FCC 47 CFR Part 15 - Subpart B Class A

#### EN 55032:2012 + AC:2013

#### ICES-003 ISSUE 6:2016

#### EN 60950-1:2006 /A11:2009 / A1:2010

### The specified unit shall meet the following product safety standards:

#### IEC / EN / CE / WEEE / UL 60950-1 / UL 2043 / CUL 60950-1 / ROHS

### The specified unit shall meet the following standards

#### Networking:

##### IEEE 802.3af Class 3 Compliance, 125 mA)

##### IEEE 802.1X (Authentication)

##### IPv4 (RFC 791)

##### IPv6 (RFC 2460)

##### WiFi

#### Mechanical Environment:

##### IEC/EN 62262

##### Vandal Resistance with at least an IK-10 rating

## QUALITY ASSURANCE

### All installation, configuration, setup, program and related work shall be performed by electronic technicians thoroughly trained by the manufacturer in the installation and service of the equipment provided.

### The contractor or designated sub-contractor shall submit credentials of completed manufacturer certification, as proof of the knowledge.

### The specified unit shall be manufactured in accordance with ISO9001.

## WARRANTY

### The manufacturer shall provide warranty for (1) one year and optional extended warranty for the sensor for a total period of three years.

# PRODUCTS

## General

### Sensor shall be IP-based and comply with established network standards.

### Sensors shall be powered by the switch utilizing the network cable. Power injectors (midspans) shall be provided by the contractor when required for proper operation.

### Sensors shall be fully supported by an open and published API (Application Programmers Interface), which shall provide necessary information for integration of functionality into third party applications.

## Sensor schedule

### Sensors listed below shall be supplied by a single manufacturer.

### The sensor manufacturer and model numbers will be as follows:

#### IPVideo Corporation Halo Smart Sensor v2.0.

## Sensors

### Interior mounted Smart Sensor

#### The sensor shall meet or exceed the following design specifications:

##### The sensor shall operate on an open source; Linux-based platform and include a built-in web server.

##### The sensor shall provide local database storage utilizing internal memory.

##### The sensor shall be manufactured with an IP30-rated, IK10 impact-resistant, polycarbonate casing.

##### The sensor certified to operate in plenum space.

#### The sensor shall meet or exceed the following performance specifications:

##### Detection and measurement of

Particulates Size 1 µm particulates µg/m³

Particulates Size 2.5 µm particulates µg/m³

Particulates Size 10 µm particulates µg/m³

Carbon Dioxide Equivalents

Total Volatile Organic Compounds

Carbon Monoxide

Ammonia

Temperature/Humidity

Barometric Pressure

Light Level

Sound Levels

Tamper

Vape

Vape THC

Spoken Keyword

Gunshot

Aggression

Masking / Spray Paint

Indoor Air Quality, AQI: Air Quality Index

##### Scheduling

Shall have day and time selection for notification of detection.

Shall have the scheduling be adjustable separately for each detection type.

##### Audio microphones

###### Shall have (2) two microphones

###### Sensor shall perform audio analysis only

###### Sensor shall not record live audio stream

##### LED Indicator Light

###### The sensor shall have a multi-color LED indicator.

##### Speaker

###### The sensor shall have a speaker.

##### Encoding of Data Screen

###### The sensor shall support the following video encoding algorithms:

Motion JPEG encoding of 1 frame per second.

##### Video Transmission

###### The sensor shall allow for video to be transported over:

HTTP (Unicast)

HTTPS

RTSP

##### User Interface

###### Web server

The sensor shall contain a built-in web server making video and configuration available to multiple clients in a standard operating system and browser environment using HTTP and HTTPS, without the need for additional software.

##### IP addresses

###### The sensor shall support both fixed IP addresses and dynamically assigned IP addresses provided by a Dynamic Host Control Protocol (DHCP) server.

###### The sensor shall allow for automatic detection of the sensor based on UPnP and Bonjour when using a PC with an operating system supporting this feature.

###### The sensor shall provide support for IPv4.

###### The sensor shall provide support for IPv6.

##### Event functionality

###### The sensor shall be equipped with an integrated event functionality, which can be triggered by:

Sensor tampering

Manual Trigger/Virtual Inputs

Event threshold met

###### Response to triggers shall include:

Relays Outputs

(2) Two relay outputs

Normally Open or Closed

Rated at 48VDC at 1 amp

Status Light

Speaker

Pre-Recorded Files

Programmable

Send notification, using HTTP, HTTPS, TCP, RTSP, or Email

Send images, using FTP, HTTP, HTTPS, RTSP, network share or email

Identification in data logs

##### Protocol

###### The sensor shall incorporate support for at least IPv4/v6, HTTP, HTTPS, SSL/TLS, TCP, ICMP, SMTP, DHCP, UPnP, ARP, DNS, NTP, RTSP, Bonjour, BACnet.

###### The SMTP implementation shall include support for SMTP authentication.

##### Security

###### The sensor shall be in compliance with California’s law for IoT device cyber security, California Civil Code Section 1798.91.04.

###### The sensor shall restrict access to the built-in web server by usernames and passwords at two different levels.

###### The sensor shall have minimum user-name and password criteria requirements.

##### Configurability

###### The sensor shall permit configuration of Event thresholds, time requirements, filters, and combinational Events. Built in test functions shall be provided.

###### The sensor shall permit configuration live viewing elements, live viewing style/colors, and live viewing ranges

###### Sensor shall permit configuration of Actions including lighting patterns and colors, audible alerts, relay outputs, Email alerts, SMS alerts, and TCP/IP socket alerts.

###### Sensor shall permit configuration of user accounts, network parameters, SMTP connection parameters with built in test function.

##### API support

###### The sensor shall be fully supported by an API (Application Programmers Interface), which shall provide necessary information for integration of functionality into third party applications.

##### Installation and maintenance

###### The sensor shall provide built-in means which allows the assignment of IP addresses, upgrade of firmware and backup of the sensor’ configuration without use of external software.

###### The sensor shall be supplied with Windows-based management software which allows the assignment of IP addresses, upgrade of firmware and backup of the sensor’ configuration.

###### Sensor shall provide means to restore configuration with selection of desired sections of configuration to be restored.

###### The sensor shall allow updates of the software (firmware) over the network, using FTP, HTTP, or HTTPS.

###### Sensor shall provide logging and means to download daily files of Events, System States, and System Operation.

###### The sensor shall accept external time synchronization from an NTP (Network Time Protocol) server.

###### The sensor shall store all customer-specific settings in a non-volatile memory that shall not be lost during power cuts or soft reset.

###### Sensor shall provide a built-in complete system test that can be performed at any time.

##### Hardware interfaces

###### Network interface

The sensor shall be equipped with one 10BASE-T/100BASE-TX Fast Ethernet-port using a shielded RJ45 connector and shall support auto negotiation of network speed (100 MBit/s and 10 MBit/s) and transfer mode (full and half duplex).

##### Enclosure

###### The sensor shall:

Be manufactured with an IP30-rated, IK10 impact-resistant, polycarbonate casing.

Secure the outer cover with anti-tamper TORX screws

Be provided with self-locking mounting features for installation in materials up to ¾” (19MM) in thickness.

##### Power

###### Power over Ethernet IEEE 802.3af

##### Environmental

###### Operate in a temperature range of 0 °C to +50 °C (+32 °F to 122 °F).

###### Operate in a humidity range of 0–90% RH (non-condensing).

# execution

## installation

### The Contractors or subcontractors’ main resources within the project shall carry proper professional certification or training issued by the manufacturer.

### The Contractor shall carefully follow instructions in documentation provided by the manufacturer to ensure all steps have been taken to provide a reliable, easy-to-operate system.

### All equipment shall be tested and configured in accordance with instructions provided by the manufacturer prior to installation.

### All firmware found in products shall be the latest and most up to date provided by the manufacturer.

### All equipment requiring users to log on using a password shall be configured with individually unique password/passwords. No system/product default passwords shall be allowed.

### A proper installation shall meet NEC (National Electrical Code – US only) per the guidelines of that year’s revision. When properly installed equipment meets Low Voltage, Class 2 classification of the NEC.

END OF SECTION