

# CITY OF TRAVERSE CITY BID TABULATION

Project: TCPS - Camera System Location: 2nd Fl. conf. room  
 Date and Time Due: T, 12/20/16 @ 4 PM Staff: Julie Dalton  
 Staff: Nicole Van Ness

| VENDOR                          | BID AND/OR EXTRAS | TOTAL                     |
|---------------------------------|-------------------|---------------------------|
| Traffic + Safety Control Sys    | Equipment         | \$ 148,000. <sup>00</sup> |
|                                 | Labor             | \$ 43,250. <sup>00</sup>  |
|                                 | Total             | \$ 191,250. <sup>00</sup> |
| Master Electric/Technology Sys. | Total             | \$ 91,175. <sup>00</sup>  |
| Windemuller                     | Base Bid          | \$ 112,635. <sup>00</sup> |
|                                 | Add Optional      | \$ 11,264. <sup>00</sup>  |
|                                 | Total             | \$ 123,899. <sup>00</sup> |
| Security 101                    | Equipment         | \$ 44,938. <sup>93</sup>  |
|                                 | Installation      | \$ 27,763. <sup>25</sup>  |
|                                 | Materials         | \$ 11,264. <sup>06</sup>  |
|                                 | Total             | \$ 83,965. <sup>98</sup>  |
| SunTel Services                 | Equipment         | \$ 80,396. <sup>42</sup>  |
|                                 | Labor             | \$ 39,985. <sup>00</sup>  |
|                                 | Total             | \$ 120,381. <sup>42</sup> |
|                                 | Option 1:         |                           |
|                                 | Equip             | \$ 9,667. <sup>41</sup>   |
|                                 | Labor             | \$ 8,840. <sup>00</sup>   |
|                                 | Total             | \$ 18,507. <sup>41</sup>  |
| Top Line Electric               |                   | \$ 130,871. <sup>00</sup> |

+ many options (see attached)



Traffic and Safety Control Systems INC

*Proposal:* Traverse City Parking Services – Camera System

Tuesday December 20<sup>th</sup> 2016





# Traffic & Safety Control Systems, Inc.

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December 20<sup>th</sup>, 2016

Julie Dalton, Purchasing Agent  
400 Boardman Avenue, 2<sup>nd</sup> Floor  
Traverse City, MI 48684

RE: TCPS Cameras

Dear City of Traverse City,

Traffic and Safety Control Systems, INC is please to submit this formal response to the Traverse City Parking Services – Camera System, Request for Bid. Traffic and Safety Control Systems has fully reviewed the bid document. We are confident that the Salient Systems / Axis Communications solution suggested in our response will meet the needs stipulated in the bid document and will allow City of Traverse City to best manage their camera systems needs and move forward with new technology in the future. Both Salient Systems and Axis Communications are top tier brands. The aim of this proposal is to offer a best-in-breed solution for Traverse City.

Traffic and Safety Control Systems main office is located at 48584 Downing, Wixom, MI 48393. We also have offices located in Greater Grand Rapids, MI. Traffic and Safety is a corporation licensed to operate in the State of Michigan. Traffic and Safety has over 43 years experience installing and supporting parking systems and parking operators throughout Michigan. We are proud to serve the largest operations in Michigan including The City of Lansing, University of Michigan, Wayne State University, The City of Grand Rapids, City of Detroit, Cobo Convention Center, Ford Field, Ann Arbor DDA, and the Bedrock/Quicken Loans locations in downtown Detroit.

For this proposal process, Tom Neff has been designated as the Traffic and Safety Control Systems point of contact. Please direct all correspondence and questions relating to this submittal to :

Tom Neff  
Traffic and Safety  
Sales Representative  
248-756-7027  
[tomn@trafficandsafety.com](mailto:tomn@trafficandsafety.com)

Thank you for the opportunity to present our solution. We are happy to provide any further information you may need or arrange an in-person meeting, if desired.

Sincerely,

Tom Neff  
Sales Representative  
Traffic and Safety Control Systems Inc  
248-756-7027



## OVERVIEW OF SUGGESTED SOLUTION

### **NVR / System Set-up**

Our solution utilizes (2) Salient Systems video recorders at both the Old Town Parking Garage and the Hardy Parking Garage. Cameras in each deck will connect to an on-site Salient Systems server.

Each server can accommodate as many as 100 cameras. 24 Terra Bytes of video storage space will allow at minimum 30 days of HD 720p video storage @ 8FPS for up to 100 cameras with 24 hours of footage per camera per day. (H.264 compression). Server comes equipped with the most up to date Salient Systems Complete View video management software (Version 4.7). The single camera at the Opera House will be the only camera that connects back to another site to reach the server via network. With the exception of this Opera House camera, capturing the video footage is not contingent on the network.

Viewing of any / all of the video footage (stored or real-time) can be done at a local work station OR via web client (PC, tablet, or smart phone). In the event of a network failure, video footage is still captured and can be accessed or viewed with a local work station. Network is needed to view video feeds via web-client.

Complete View is built on the foundation of open architecture and provides the tools for unlimited scalability and flexibility. Complete View is fully upgradable. Known for its ease of use, Complete View provides a consistent user experience so there's no need to retrain when you upgrade; the user interface is the same throughout the editions. With industry leading security technology, Salient Systems Complete View VMS gives you the power to control your security installations, today and tomorrow.

Add or remove users, change the configurations of servers and clients, and push software updates out to servers and/or clients from a single desktop application. Complete View offers a simple and easy to use way to organize complex deployments and gives you complete control of view layouts and interactive maps for your enterprise installation.

Salient Systems software is designed for flexibility. Integration with all industry leading access control and camera manufacturers is standard. No extra fee for these integrations. Camera licensing is one time, per-camera with NO server or client fees; you can move, add and delete cameras without penalty.

### **Network**

Several network redundancies are included to ensure optimized up-time, security, and system stability. The proposed system features redundant traffic pathways to eliminate connectivity single point of failure. The network switches will utilize rapid spanning tree protocol to prevent network



loop. System will allow for 5ms failover to alternate pathway in the event of fiber failure. Also included is a Multi-gigabit backplane for full camera streaming and local recording.

A hardware firewall will allow viewing of multiple cameras by multiple remote viewers simultaneously. Secured and hardened programming assures secure operations of internal video system. Cloud managed firewall allows for instant connectivity alerts, link status changes, malware detection, malware prevention, etc.

The hardware and logical connectivity provided in this proposal allows for flexible future expansion. A second firewall could be added with no interruption of service and would allow for Active-Passive <30ms failover in the event of Primary failure. Switch network hardware provides SFP+, 10 Gigabit connection modules for additional throughput.

## **Cameras**

Axis is widely recognized for unparalleled quality, durability and reliability. We wanted to offer Traverse City the best products for this project to ensure the best possible operation and longevity of their system. Axis video surveillance products are recognized for their quality, innovation and ease of installation and operation.

## **This design is based off the following assumptions:**

\*Existing strands of fiber optic cabling are available and in usable condition. \*Clear line of site exists between Head-end and Remote locations. \*Internet connection available at each server and is appropriated and appropriately sized for usage.



## GENERAL

All equipment shall comply with all relevant electrical, environmental and safety standards and all applicable local, state and federal ordinances.

## COMPLIANT

### *1. Network Infrastructure*

a. The Traverse City Parking Services Security/Surveillance Camera network deployment requires high reliability and will be used to support parking facilities. However, the system is intended to expand and could include police, courts, public works and building security functions.

COMPLIANT – Our proposal allows for expandability of up to 100 cameras per server / (2) servers are included. The (2) quoted NVRs have 24 Terra Bytes of storage **each** allowing at least 30 days of video storage for up to 100 cameras @ 8FPS. All quoted cameras include vandal proof housings and are built to withstand outdoor use.

b. The Network will support fault tolerance mechanisms to mitigate and/or eliminate single points of failure and ensure high reliability.

The proposed system features redundant traffic pathways to eliminate connectivity single point of failure. The network switches will utilize rapid spanning tree protocol to prevent network loop. System will allow for 5ms failover to alternate pathway in the event of fiber failure. Also included is a Multi-gigabit backplane for full camera streaming and local recording.

c. Respondents must state the reliability levels they will commit to for the network.

The proposed system is not contingent on the network for functionality. In the event of a network failure, only the remote viewing functions will be compromised. The engineered network has several failovers that should produce up-time values of 98% or better.

d. Respondents must demonstrate the ability to deliver secure transmissions.

A hardware firewall will allow viewing of multiple cameras by multiple remote viewers simultaneously. Secured and hardened programming assures secure operations of internal video system. Cloud managed firewall allows for instant connectivity alerts, link status changes, malware detection, malware prevention, etc.

e. Respondents must demonstrate the ability to deliver excellent throughput (quality of service) for the Traverse City Parking Services camera deployment and other public safety applications.

The proposed system features redundant traffic pathways to eliminate connectivity single point of failure. The network switches will utilize rapid spanning tree protocol to prevent network loop. System will allow for 5ms failover to alternate pathway in the event of fiber failure. Also included is a Multi-gigabit backplane for full camera streaming and local recording.

f. Respondents must detail how the network design eliminates or minimizes single points of failure.



Several network redundancies are included to ensure optimized up-time, security, and system stability. The proposed system features redundant traffic pathways to eliminate connectivity single point of failure. The network switches will utilize rapid spanning tree protocol to prevent network loop. System will allow for 5ms failover to alternate pathway in the event of fiber failure. Also included is a Multi-gigabit backplane for full camera streaming and local recording.

A hardware firewall will allow viewing of multiple cameras by multiple remote viewers simultaneously. Secured and hardened programming assures secure operations of internal video system. Cloud managed firewall allows for instant connectivity alerts, link status changes, malware detection, malware prevention, etc.

The hardware and logical connectivity provided in this proposal allows for flexible future expansion. A second firewall could be added with no interruption of service and would allow for Active-Passive <30ms failover in the event of Primary failure. Switch network hardware provides SFP+, 10 Gigabit connection modules for additional throughput.

g. The network may include a fixed wireless point-to-multipoint, fiber or leased line solution as a backhaul tier for aggregating video traffic.

Our proposed system includes a wireless bridge to act as a failover should the fiber network fail. In this scenario, a user could still view stored or real-time footage. Once the fiber network is restored, the system will automatically switch back. Further, since the system utilizes managed network switches, events will be recorded and tracked.

h. The network will support contingency mechanisms to ensure operation during a natural or other disaster. Respondents will describe their proposed disaster recovery plan for the network and camera system.

Our proposed system includes a wireless bridge to act as a failover should the fiber network fail. If a natural disaster occurs, knocking out both the Fiber network and wireless bridge, the system will still capture all footage. This footage would be viewable via an on-site video client. Once the network is regained, web clients could view all footage.

i. The network design will easily accommodate scaled and upgrades to the system in a modular fashion to support additional cameras.

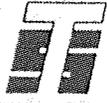
The proposed system allows for additional cameras / switches to be added. Each NVR is designed to accommodate up to 100 cameras. System offers scalability; Additional video recorders can also be added should Traverse City desire more than 200 channels.

## ***2. Digital Network Performance Requirements***

a. The Respondent must describe and provide network performance that will be adequate for video monitoring and surveillance in the proposed deployment.

The proposed system is not contingent on the network for functionality. In the event of a network failure, only the remote viewing functions will be compromised. The engineered network has several failovers that should produce up-time values of 98% or better.

b. Network Performance presentation must include Respondent's engineering assumptions regarding:



i. Compression protocol  
H.264 recording

ii. Resolution or frame size

The Axis cameras offered in our proposal are all HD cameras with a minimum 720p resolution (or greater). The NVR storage estimates assume stored video will be @ 8FPS with constant recording: 24/7/365. However, if Traverse City employs record on motion or has less than 100 cameras on any one server, the frame rate can be increased and the minimum 30 days of video storage can still be achieved. The Axis cameras detailed offer a max video resolution of 1280 x 800.

iii. Image ratio

The proposed Salient Systems VMS, Complete View, can support / display 4:3 or 16:9 aspect ratios in any configuration provided by the camera.

iv. Frame rate

Salient Systems Complete View VMS is fully configurable – Traverse City can select any desired frame rate from 1 FPS to 30 FPS. All Axis cameras detailed can achieve 30 FPS.

v. Compression ratio

HDTV resolution = 720p, H.264, Motion JPEG capable.

vi. Recommended bandwidth requirement per camera

712 Kbps

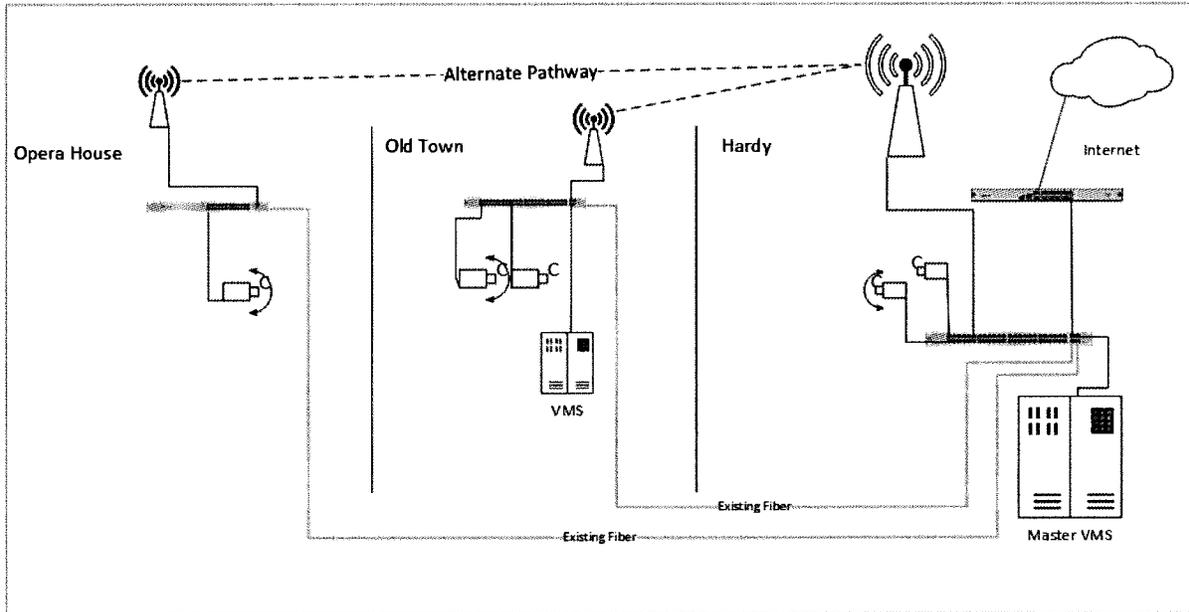
### ***3. Proposed Software & Computing Environment***

a. The Respondent must present in detail the version, features and capabilities of the proposed video management system. Included in this section should be a detailed technical overview of any proposed hardware or software platform, including:



# Traffic & Safety Control Systems, Inc.

i. Hardware/software architecture diagrams - ii. Process flow diagrams - iii. Network diagrams  
Refer to below diagram. Salient Systems Server (Power Plus) Product information sheet included as attachment...



iv. Minimum client computer configurations for desktop, remote and mobile device access.  
For quoting purposes, I have assumed 2 clients viewing 9 streams each at any given time. Additionally, smart phone app or web viewing can be done concurrently. If our solution is selected, Traverse City can stipulate the maximum concurrent users needs, we can design to fit.

v. Optimal and minimum network, server, storage and backup requirements.  
712 Kbps is the average bit rate per camera. The Salient Systems server includes Dual Intel Xeon processor, 16GB of RAM, 24 TB of storage, RAID1:RAID6, Quad Gigabit Ethernet network interface, Operating System = Windows Server 2012 with a 3 year hardware warranty. In order to backup only configuration data, a very small amount of storage is necessary (under 5MB). Video footage is available, but not included in my quote. A redundant server can be added, if desired, to store a second copy of all footage and act as a fail-over should the first server become inoperable.

## SERVICES

The Security/Surveillance Camera System upgrade or replacement proposal must address the means of connectivity with the City Offices and mobile data terminals through both wired and wireless connections. Head end and viewing equipment shall initially be installed at the City of Traverse City, Parking Services Offices, 303 E. State St. Traverse City, Michigan, 49684. The system must be able to be relocated.

The proposed system features redundant traffic pathways to eliminate connectivity single point of failure. The network switches will utilize rapid spanning tree protocol to prevent network loop. System will allow for 5ms failover to alternate pathway in the event of fiber failure. Also included is a Multi-gigabit backplane for full camera streaming and local recording.



A hardware firewall will allow viewing of multiple cameras by multiple remote viewers simultaneously. Secured and hardened programming assures secure operations of internal video system. Cloud managed firewall allows for instant connectivity alerts, link status changes, malware detection, malware prevention, etc.

The hardware and logical connectivity provided in this proposal allows for flexible future expansion. A second firewall could be added with no interruption of service and would allow for Active-Passive <30ms failover in the event of Primary failure. Switch network hardware provides SFP+, 10 Gigabit connection modules for additional throughput. System can be relocated if necessary.

## **DETAILED REQUIREMENTS**

### ***1. Camera Requirements***

a. The City is requesting that the Respondent provide a minimum of two camera options with distinguishable features and capabilities. The Respondent shall provide equipment that meets or exceeds the following specifications outlined below:

- i. Ability to pan 360 degrees via remote control.
- ii. Network IP camera
- iii. Transmit video in color
- iv. Provide a minimum of 22x optical zoom
- v. Ability to operate in low light (respondent is required to provide low light specifications).
- vi. Ability to tilt 180 degrees via remote control.
- vii. Ability to operate in an enclosed case in conjunction with the environmental conditions possible in Traverse City, Michigan.

#### ***Axis p5635E/VANPTZ***

***\*Product cut sheet is included as an attachment***

- i. Ability to pan 360 degrees via remote control. Compliant
- ii. Network IP camera. Compliant
- iii. Transmit video in color. Compliant
- iv. Provide a minimum of 22x optical zoom. Compliant - 30x Zoom
- v. Ability to operate in low light (respondent is required to provide low light specifications). Compliant
- vi. Ability to tilt 180 degrees via remote control. Compliant
- vii. Ability to operate in an enclosed case in conjunction with the environmental conditions possible in Traverse City, Michigan. Compliant

#### ***Axis M3024-LVE Network Camera***

***\*Product cut sheet is included as an attachment***

- i. Ability to pan 360 degrees via remote control. Non-Compliant – Camera is fixed
- ii. Network IP camera. Compliant
- iii. Transmit video in color. Compliant
- iv. Provide a minimum of 22x optical zoom. Non-Compliant
- v. Ability to operate in low light (respondent is required to provide low light specifications). Compliant – Camera is equipped with day/night mode and built in IR illumination.



- vi. Ability to tilt 180 degrees via remote control. Non-Compliant – Camera is fixed
- vii. Ability to operate in an enclosed case in conjunction with the environmental conditions possible in Traverse City, Michigan. Compliant

## **2. Power Supply**

- a. Ability to operate on a 110 VAC power supply, 24 hours a day for an extended period of time, no less than nine months in duration provided the proper power requirements are met.

COMPLIANT

- b. Respondent will describe automated camera operation recovery after restoration of power.

An uninterruptable power supply (UPS) will be present for any of the systems power supplies. These UPS units will provide power to the recorder and all cameras and switches. All devices will be protected from a power surge or brownout. In the event of a power outage, the UPS acts as a small battery to provide power battery is exhausted. If the reserve battery in a UPS is exhausted from a power outage, they will auto reset after power is restored. Server will also auto-reboot. The system will be designed so all needed elements fire up upon power restoration.

- c. Respondent will describe power maintenance requirements.

The proposed Salient Systems sever requires standard 120VAC. A UPS will be utilized to protect the server from surges, spikes, power outages, or brownouts. The UPS will continuously monitor the incoming power supply. Should a power issue be detected, the UPS can switch to AC power. This provides a continuous, uninterrupted, clean power source for the server. Upon power loss, the UPS will power the server for a short amount of time.

- d. The Respondent should provide a battery option in the event that a camera need to be deployed to a location that is unable to connect to a conventional power supply, the solution shall power the camera for a minimum of 48 hours.

Solution is available, however, the solution is purpose built – I must have more information to supply costs / details on such a battery option.

## **3. Transmission of Streaming Video**

- a. Ability to transmit wireless data.

COMPLIANT – The proposed system features redundant traffic pathways to eliminate connectivity single point of failure (a wireless bridge system). The network switches will utilize rapid spanning tree protocol to prevent network loop. System will allow for 5ms failover to alternate pathway (wireless bridge) in the event of fiber failure. Also included is a Multi-gigabit backplane for full camera streaming and local recording.

Cloud managed firewall allows for instant connectivity alerts, link status changes, malware detection, malware prevention, etc. Switch network hardware provides SFP+, 10 Gigabit connection modules for additional throughput.

- b. Ability to transmit a minimum of 30 frames a second

COMPLIANT



c. Ability to transmit the wireless data in a secure encrypted format. The Respondent is required to provide detailed specifications.

COMPLIANT - A hardware firewall will allow viewing of multiple cameras by multiple remote viewers simultaneously. Secured and hardened programming assures secure operations of internal video system. Cloud managed firewall allows for instant connectivity alerts, link status changes, malware detection, malware prevention, etc.

The hardware and logical connectivity provided in this proposal allows for flexible future expansion. A second firewall could be added with no interruption of service and would allow for Active-Passive <30ms failover in the event of Primary failure. Switch network hardware provides SFP+, 10 Gigabit connection modules for additional throughput.

d. Ability for Police or employees to view live video transmission at the Law Enforcement Center, at the Parking Services Office and remotely over the internet and on mobile devices.

COMPLIANT

e. Size of the video streams from real-time or captured video.

712 Kbps

#### **4. Recording Capabilities**

a. Allow the user to capture still pictures in multiple formats.

COMPLIANT

b. Allow the user to record streaming video in an industry-standard format that can be viewed on a standard DVD player or other common computer media.

COMPLIANT

c. Provide a date and time stamp option.

COMPLIANT – A time/date stamp can be enabled in the camera itself. Further, Complete View software shows a water mark built in to each video / still frame footage creating easy reference to time and date that the footage was captured. (NOTE: The camera option consumes less server resources.)

d. Provide video data in a manner consistent with the conveyance of video forensic evidence. Video must fairly and accurately represent what it depicts. It must be self-verifying providing a detailed enough picture of the scene for a witness to confirm that the area is accurately depicted.

COMPLIANT – Both the Salient Systems video server, software, and Axis cameras included in this system are top-tier, professional grade, and provide HD footage with auto focus functions ensuring high quality video. The system will provide a high quality, accurate, and clear depiction of captured scenes.

e. A test by the vendor must be conducted and provided in writing for each camera stating that the video from each camera fairly and accurately depicts the local area.

COMPLIANT – As the cameras are brought on-line, our technicians will test each camera, ensure proper function ability, and create a document that details each cameras properties.

f. DVR Requirements (for non-hosted solution):



i. Capable of Dual Streaming

The Salient Systems VMS system can display multiple clients simultaneously.

ii. Real time recording and playback rate for all Cameras

COMPLIANT

iii. Capable of Mobile/PDA/Browser Viewing

COMPLIANT

iv. Capable of Simultaneous Live, Recording, Playback, Archive and Remote Viewing

COMPLIANT

v. Camera Inputs

Max of 100 on the screen at a time, although this is not recommended without taking a very high powered viewing client into account. Complete View has no hard limit on cameras into a server. The max number is defined by system resources.

vi. Video Outputs – VGA/BNC

VGA on the server. VGA or HDMI on the client workstations.

vii. Audio – 2 Inputs / 1 Output

Server is equipped with a soundcard / Audio is typically accepted via the camera inputs.

viii. Recording Mode – Continuous, Event and Schedule

COMPLIANT

ix. Playback Search – Capable of Time, Event, Smart and Snapshot Searching

COMPLIANT

x. Alarm In – One per Video Input

This is achievable via the camera.

xi. Alarm Out – 1 Alarm Output

This is achievable via the camera.

xii. Capable of Video Pause, Video Loss Detection, Motion Detection, Event Log and Watch Dog timer

COMPLIANT

xiii. External Hard Drive Port

The server can be built with an external hard drive / port, if desired. (The quoted solution does not include an external hard drive port.)

xiv. Built In DVD burner or ability to plug in an external DVD burner device

COMPLIANT

xv. User Interface – Mouse or Front Panel Operated GUI



## COMPLIANT

xvi. Network – 10/100/1000Mb Ethernet  
COMPLIANT

xvii. Protocol – TCP-IP/DHCP/PPPoE/DDNS/SMTP/SSL/POP3/HTTP/NTP  
COMPLIANT - System is capable of TCP-IP, DHCP, PPPoE, DDNS, SMTP, SSL, POP3, HTTP, NTP

xviii. Capable of PTZ control  
COMPLIANT – This feature standard with the Salient System Complete View Video Management Software.

xix. At least 2 USB ports  
COMPLIANT

xx. Supports Express and Advanced Schedule Settings  
COMPLIANT – This feature standard with the Salient System Complete View Video Management Software.

xxi. At least 3 Levels of User access  
COMPLIANT – This feature standard with the Salient System Complete View Video Management Software.

xxii. RS-232 Connection  
COMPLIANT – This system is designed to utilize Video Over Network / Ethernet Cat 6, however, a USB to RS232 converter can be used to accomplish RS-232 connection.

xxiii. RS-485 Terminal Connector  
COMPLIANT – This system is designed to utilize Video Over Network / Ethernet Cat 6, however, a USB to RS-485 converter can be used to accomplish RS-485 connection.

xxiv. 12VDC Power Source  
Non-Compliant – This is a PoE system.

### ***5. Data Storage***

a. All data shall be capable of being stored in a digital format that can be retrieved, copied, viewed and deleted as needed.  
COMPLIANT

b. Data storage must be part of a secure chain of custody including physical and electronic security.  
COMPLIANT - passwords / permissions / locked door

### ***6. Server and Storage Specifications***



a. The City expects to retain 15 (minimum)/30 days of video archives from both a self-hosted and hosted solution.

COMPLIANT – The Traffic and Safety proposal includes (2) 24 Terra Byte Salient Systems recorders, each can accommodate as many as 100 cameras. 24 Terra Bytes of storage will allow at minimum 30 days of HD 720p video storage @ 8FPS for up to 100 cameras with 24 hours of footage per camera per day. (H.264 compression)

This storage duration can be increased by changing recording settings on the recorder. For example, recording on motion, deploying less than 100 cameras, or reducing the frame rate of stored video will increase the amount of days footage can be retained.

b. Respondent must detail server specifications to support Respondent's recommended configuration including backup. Respondent must specify:

i. Processor

Dual Intel Xeon

ii. Memory (RAM)

16GB

iii. Specify DVD+R/+RW

External device needed to read / write to DVD. Digital capture included.

iv. Storage

24 TB

v. Configuration (e.g. SAN)

Server is RAID1 for the OS drive, RAID6 for video storage

vi. Backup capacity

The quoted solution did not include a redundant drive for video backup. If desired, we can add additional storage for back-up and failover purposes.

c. The Respondent shall specify the amount of storage required per hour of video.

The quoted Salient Systems server includes 24TB of video storage. This will accommodate 30 days of footage retention for up to 100 cameras @ 8 FPS 24/7 recording. This equates to roughly 34.1 GB per hour of video.

d. If the video is compressed the Respondent shall provide the ratio of video compression.

H.264, also known as MPEG-4 Part 10/AVC for Advanced Video Coding, Axis' H.264 encoders use the baseline profile, which means that only I- and P-frames are used. This profile is ideal for network cameras and video encoders since low latency is achieved because B-frames are not used. Low latency is essential in video surveillance applications where live monitoring takes place, especially when PTZ cameras or PTZ dome cameras are used.

e. The Respondent shall list all proposed product name brands, models and configurations.

NVR = Salient Systems



VMS = Salient Systems Complete View

CAMERAS = Axis Communications

SWITCHES = Ubiquity

WIRELESS HARDWARE = Ubiquity

## **7. Network Viewing Specifications**

a. Respondents must specify minimum workstation requirements, including:

i. Processor requirements (i.e. 1 GHz). ii. Minimum memory requirements. iii. Minimum video card requirements. iv. Minimum requirements for the operating platform (e.g. Window 8).

Generic requirements are:

Operating Systems:, Windows 7, Professional or Ultimate, or later. · Core 2 Duo 2.0 Ghz or higher · 2 GB RAM or higher · Video Card w/ 256 MB RAM or higher · 10/100/1000 Ethernet Controller

\*This assumes viewing up to 9 cameras for 2 concurrent users. The system can accommodate almost any client demands Traverse City may have. We can build the system to fit the needs of the City.

## **8. Viewing**

a. Software shall allow for the viewing of multiple cameras on one screen.

COMPLIANT – This feature is standard with the Salient System Complete View Video Management Software.

b. Include ability to program the camera to pan/move in order to capture an area without an operator.

COMPLIANT – This feature is standard with the Salient System Complete View Video Management Software.

c. The viewing system shall provide for rapid search capabilities and allow navigation by way of a mouse or touchpad.

COMPLIANT – This feature is standard with the Salient System Complete View Video Management Software.

d. The controllers shall accommodate a minimum of four preset coordinates per camera.

Complete View will support any number of preset coordinates as the camera allows.

## **9. Testing**

a. **Equipment and hardware:** Installation of all equipment, software, laying of wire and all ancillary equipment and connectors must be installed, test verified and delivered in operating and ready-to-use condition.

COMPLIANT

b. **Software:**

i. Furnish, design, develop, configure, install, test, train and deliver the equipment and computer operating system(s) in a ready-to-use condition, and perform all other related work.

COMPLIANT

ii. Please provide an anticipated future release schedule of known software.



System updates for servers / switches / etc. are available on need basis. No schedule is available.

## **10. Warranty**

a. All equipment shall carry a minimum of one-year warranty on parts, hardware, and software installed by the Respondent. One-year warranty shall start upon project completion sign-off.

COMPLIANT

b. No additional labor costs shall be imposed on the City in order to correct documented defects within the one-year warranty period.

COMPLIANT

c. A contact person and phone number shall be provided in order to report any hardware and software defects.

Kliff Ciszewski - Service & Parts Manager

Traffic and Safety Control Systems Inc.

48584 Downing St.

Wixom, MI 48393

(248) 348-0570 ext 215

service@trafficandsafety.com

\* after hours/on-call service (248) 348-0570

d. The City requires that the contact be available on a Monday through Friday basis during normal working hours, 8:00 AM. to 5:00 PM, Eastern Time.

Kliff Ciszewski - Service & Parts Manager

Traffic and Safety Control Systems Inc.

48584 Downing St.

Wixom, MI 48393

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service@trafficandsafety.com

\* after hours/on-call service (248) 348-0570

e. The one-year warranty period shall not begin until the entire system is installed, inspected and accepted by City Manager, Parking Administrator or their designee.

COMPLIANT

f. The Respondent must also warrant that the hardware and software will operate at the time of delivery in accordance with the manufacturer's published specifications and the Respondent's written description of the system operation, as well as warrant against defects in workmanship and material.

COMPLIANT

g. If the Respondent offers additional warranty service or support programs other than what is stated above, the Respondent should state such programs and the additional cost of the program(s).

Service contract is available. Once final layout is secured, pricing will be offered.

## **11. Training**



a. The Respondent shall submit a training plan that describes the procedures that the Respondent will employ to adequately accomplish training related to the implementation and full utilization of the system.

COMPLIANT – Once the system is operable, training on all components will occur. Training will be tailored to the desires of the city. Continued training for entire system is included in the initial 12 months of the system. Proposal also includes one year of phone support from Salient Systems. Traffic and Safety can schedule employee training as needed and is available via phone for normal business hours inquiries.

b. The Respondent shall provide a contact person and phone number to assist the City with any technical questions. This service shall be provided as a part of the training for a minimum of six months from the date of installation.

Proposal includes 12 month warranty for parts, software and labor

**CONTACT:**

Kliff Ciszewski - Service & Parts Manager  
Traffic and Safety Control Systems Inc.  
48584 Downing St.  
Wixom, MI 48393  
(248) 348-0570 ext 215  
service@trafficandsafety.com  
\* after hours/on-call service (248) 348-0570

c. Training shall be provided to personnel designated by the City of Traverse City Parking Services within 15 City business days from the completed installation and acceptance date. Training for all hardware and software must be provided on-site and shall at a minimum include:

COMPLIANT – all of the below items will be addressed and further training will be offered as needed over the initial 12 months of system operability.\

i. Name and phone number of the person responsible for training for six months.

Tom Neff – 248-756-7027

ii. How to install or setup a computer as a viewing station.

iii. How to operate the camera software in order to zoom, pan and focus.

iv. How to record and retrieve data.

v. How to search and retrieve pre-recorded video information according to time stamps.

vi. How to search and retrieve pre-recorded video from the server.

vii. How to remove and reinstall the camera from the casing.

viii. How to align the camera to the receiver/antenna.

ix. How to mount the antennas(s).

x. How to secure and remove the power source.

## **12. Documentation**

a. The Respondent shall include:

COMPLIANT – see attachments for camera and server product information sheets. As-built drawings to be produced upon system completion.

i. A written manual that covers the specifications and operation of all hardware and software provided as part of the contract.



- ii. As-built drawings of the system and network.
- iii. As-built diagrams of the cameras and enclosures showing all equipment, antennas and other connections in the casing.
- iv. As-built wiring diagrams for the electrical connections in and to the camera and casing.
- v. As-built communications wiring diagrams for antennas and camera.
- vi. As-built casing installation diagrams for each type of structure or pole utilized.
- vii. As-built network drawing showing the chain of custody of video evidence.

### **13. Administration Toolsets**

a. Respondents must answer the following questions:

i. What administration toolsets are included with the system?

Admin Console, Server Configuration & Client Configuration applications.

ii. What skills are required to maintain the system?

The initial 12 months of the system is completely covered under warranty including parts, software, user training, and system updates. Maintaining the system requires general IT knowledge and Complete View training.

iii. How is the security profile defined?

All users are granted granular permissions within the server & client config applications

iv. What is included in the user security profile?

Ability to limit permissions for view, playback, snapshot, audio, export, PTZ, light controls on a per camera basis. Limits to specific views. User permissions can also be controlled through groups.

### **14. Security**

a. What security tools are included with the system? b. How is the security profile defined? c. What is included in the user security profile?

Web server can optionally be configured for secure communication. Windows firewall is optionally available in the server. All other security mechanisms would be network-based & outside the scope of CV.

### **15. Upgrade Tools**

a. What is the software upgrade frequency?

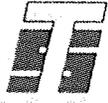
No mandatory upgrade. Salient Systems releases new minor versions generally at least quarterly but this is not a fixed schedule.

b. How are patches and fixes applied? c. How are patches and fixes deployed? d. How are upgrades applied?

The Salient Systems upgrades for the Video Management Software (Complete View) are available via the admin console. For Windows-through Windows Update

e. How much training is generally required with upgrades to the system?

Very little for minor versions. Major versions could require re-training but these do not happen often.



f. What happens to software customizations during an upgrade?  
All configuration data is saved.

g. How many versions of the software does your company support?  
No Limit.



**Bidder - Please complete and return**

**BID SUMMARY**

**TITLE: TRAVERSE CITY PARKING SERVICES – CAMERA SYSTEM**

**DUE DATE: TUESDAY, NOVEMBER 29, 2016 @ 4:00 PM**

Having carefully examined the attached specifications and any other applicable information, the undersigned proposes to furnish all items necessary for and reasonably incidental to the proper completion of this bid. Bidder submits this bid and agrees to meet or exceed all requirements and specifications unless otherwise indicated in writing and attached hereto.

Bidder certifies that as of the date of this bid the Company or he/she is not in arrears to the City of Traverse City for debt or contract and is in no way a defaulter as provided in Section 152, Chapter XVI of the Charter of the City of Traverse City.

Bidder understands and agrees, if selected as the successful Bidder, to accept a Purchase Order / Service Order / Contract and to provide proof of the required insurance.

Bidder submits this bid and agrees to meet or exceed all the City of Traverse city's requirements and specifications unless otherwise indicated in writing and attached hereto. Bidder shall comply with all applicable federal, state, local and building codes, laws, rules and regulations and obtain any required permits for this work.

The Bidder certifies that it is in compliance with the City's Nondiscrimination Policy as set forth in Administrative Order No. 47 and Chapter 605 of the City's Codified Ordinances.

The Bidder certifies that none of the following circumstances have occurred with respect to the Bidder, an officer of the Bidder, or an owner of a 25% or more share in the Bidder's business, within 3 years prior to the bid:

- (a) conviction of a criminal offense incident to the application for or performance of a contract;
- (b) conviction of embezzlement, theft, forgery, bribery, falsification or destruction of records, receiving stolen property, or any other offense which currently, seriously and directly reflects on the Bidder's business integrity;
- (c) conviction under state or federal antitrust statutes;
- (d) attempting to influence a public employee to breach ethical conduct standards; or
- (e) conviction of a criminal offense or other violation of other state, local, or federal law, as determined by a court of competent jurisdiction or an administrative proceeding, which in 14



# Traffic & Safety Control Systems, Inc.

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the opinion of the City indicates that the bidder is unable to perform responsibility or which reflects a lack of integrity that could negatively impact or reflect upon the City of Traverse City, including but not limited to, any of the following offenses or violations of:

- i. The Natural Resources and Environmental Protection Act.
- ii. A persistent and knowing violation of the Michigan Consumer Protection Act.
- iii. Willful or persistent violations of the Michigan Occupational Health and Safety Act.
- iv. A violation of federal, local, or state civil rights, equal rights, or non-discrimination laws, rules, or regulations.
- v. Repeated or flagrant violations of laws related to the payment of wages and fringe benefits.
- (f) the loss of a license or the right to do business or practice a profession, the loss or suspension of which indicates dishonesty, a lack of integrity, or a failure or refusal to perform in accordance with the ethical standards of the business or profession in question.

Bidder understands that the City reserves the right to accept any or all bids in whole or part and to waive irregularities in any bid in the best interest of the City. The bid will be evaluated and awarded on the basis of the best value to the City. The criteria used by the City may include, but will not be limited to: ability, qualifications, timeframe, experience, price, type and amount of equipment, accessories, options, insurance, permits, licenses, other pertinent factors and overall capability to meet the needs of the City. The City is sales tax exempt – Government.

Bidder agrees that the bid may not be withdrawn for a period of sixty (60) days from the actual date of the opening of the bid.

Submitted by:

Thomas Neff

Signature -

Traffic and Safety Control Systems, INC  
Company Name

Thomas Neff – Sales Representative  
Name and Title (Print)

48584 Downing, Wixom, MI 48393  
Company Address City, State, Zip

**248-348-0570**  
Phone

**Corporation**  
Sole proprietorship/partnership/corporation

**Michigan**  
If corporation, state of corporation



# Traffic & Safety Control Systems, Inc.

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REFERENCES: (include name of organization, contact person, and daytime phone number).

1. Michigan State University

Contact Person: Steve Grice

Telephone: (517) 355-2221

2. University of Michigan Ann Arbor

Contact Person: Doris Rodziewicz

Telephone: (734) 936-2208

3. City of Ferndale

Contact Person: Joe Gacioch

Telephone: (248) 546-2360



## Bid Tabulation Sheet

You must complete and include this sheet with your proposal.

| Item Number | Response                                                                                                                                                                                                                       |
|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1           | What is the name (company) of the camera system you are recommending? Axis Communications                                                                                                                                      |
| 2           | Is the camera solution you are proposing a TCPS-hosted solution, vendor-hosted solution, or both?                                                                                                                              |
| 3           | Are the existing cameras able to be reused with the proposed solution? TCPS(On-site servers)                                                                                                                                   |
| 4           | How much is the main server or hosted solution fees (one-time purchase, monthly subscription, or other) 1 <sup>st</sup> year of software upgrades are included for the Salient Systems Servers. \$22.00 per camera after that. |
| 5           | Did you attach the server specification and storage cut-sheet? YES                                                                                                                                                             |
| 6           | What is the per camera cost?<br>AXIS PTZ = \$2,600.00<br>AXIS FIXED = \$825.00                                                                                                                                                 |
| 7           | Did you attach the camera specification cut-sheet? YES                                                                                                                                                                         |
| 8           | Does the solution you are providing require annual fees, subscription fees, maintenance or upgrade fees? Please list all fees. Only required fee is \$1,500.00 annual firewall fee.                                            |
| 9           | How many additional cameras may be purchased and added to the system before additional server space, hardware or devices will need to be purchased? System can accommodate up 200 cameras.                                     |
| 10          | Do you offer a maintenance agreement? What is included in the maintenance agreement? Yes, extended warranty information is available at a later date.                                                                          |
| 11          | What are the additional fees and costs associated with Option 1 (from attached chart) Unsure of what you are asking here.                                                                                                      |



# Traffic & Safety Control Systems, Inc.

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See #9, if Option 1 (from attached chart) is purchased, is there still additional capacity to add more cameras. Yes, each server can accommodate up to 100 cameras.

## PRICING

To provide the system as described in the bid document, costs are as follows:

|                |                     |
|----------------|---------------------|
| EQUIPMENT =    | \$148,000.00        |
| Labor =        | \$ 43,250.00        |
| <b>TOTAL =</b> | <b>\$191,250.00</b> |

\*Pricing includes installation, conduit, electrical, servers, network services, switches, UPS devices, software, training, and 12 month warranty for parts, labor and software.

Please contact me should you have any questions,

Tom Neff

Traffic and Safety Control Systems, INC

248-756-7027

[tomn@trafficandsafety.com](mailto:tomn@trafficandsafety.com)

## **AXIS M3024-LVE Network Camera**

Outdoor-ready, day/night HDTV fixed dome with IR illumination

The affordably priced, vandal-resistant AXIS M3024-LVE is a HDTV fixed mini dome offering excellent video during day and night-time, in indoor or outdoor environments. It has day/night functionality and built-in IR illuminators, making it ideal for surveillance even in complete darkness. It supports Axis' Corridor Format for vertically oriented video streams. With its 3-axis camera angle adjustment, it can be mounted on walls, ceilings or pendants. AXIS M3024-LVE has support for AXIS Camera Application Platform enabling the installation of intelligent video applications such as people counting. The outdoor-ready camera has IP66 and NEMA 4X ratings for protection against dust, rain and snow.

- > Compact, vandal-resistant, outdoor-ready design
- > HDTV 720p/1 MP
- > Day/night and built-in IR illumination
- > Input/output ports
- > Power over Ethernet



## AXIS M3024-LVE Network Camera

| Camera                                        |                                                                                                                                                                                                                                                                                                                                                      |
|-----------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Image sensor</b>                           | 1/4" progressive scan RGB CMOS                                                                                                                                                                                                                                                                                                                       |
| <b>Lens</b>                                   | M12 mount, Fixed iris, IR corrected<br>2.8 mm, F2.0<br>Horizontal field of view: 77°                                                                                                                                                                                                                                                                 |
| <b>Day and night</b>                          | Automatically removable infrared-cut filter                                                                                                                                                                                                                                                                                                          |
| <b>Light sensitivity/minimum illumination</b> | Color: 0.8-100000 lux, F2.0, B/W: 0.16 lux, F2.0, 0 lux with IR illumination on                                                                                                                                                                                                                                                                      |
| <b>Shutter time</b>                           | 1/8000 s to 1/6 s                                                                                                                                                                                                                                                                                                                                    |
| <b>Camera angle adjustment</b>                | Pan ±175°, Tilt 65°, Rotation ±180°                                                                                                                                                                                                                                                                                                                  |
| Video                                         |                                                                                                                                                                                                                                                                                                                                                      |
| <b>Video compression</b>                      | H.264 (MPEG-4 Part 10/AVC) Main Profile<br>Motion JPEG                                                                                                                                                                                                                                                                                               |
| <b>Resolutions</b>                            | 1280x800 (1 MP) to 320x240                                                                                                                                                                                                                                                                                                                           |
| <b>Frame rate</b>                             | 25/30 fps with power line frequency 50/60 Hz                                                                                                                                                                                                                                                                                                         |
| <b>Video streaming</b>                        | Multiple, individually configurable streams in H.264 and Motion JPEG<br>Controllable frame rate and bandwidth<br>VBR/CBR H.264                                                                                                                                                                                                                       |
| <b>Pan/Tilt/Zoom</b>                          | Digital PTZ                                                                                                                                                                                                                                                                                                                                          |
| <b>Image settings</b>                         | Compression, color, brightness, sharpness, contrast, white balance, exposure control, backlight compensation, Wide Dynamic Range – dynamic contrast, text and image overlay, mirroring of images, privacy mask<br>Rotation: 0°, 90°, 180°, 270°, including Corridor Format                                                                           |
| Network                                       |                                                                                                                                                                                                                                                                                                                                                      |
| <b>Security</b>                               | Password protection, IP address filtering, HTTPS <sup>a</sup> encryption, IEEE 802.1X <sup>a</sup> network access control, Digest authentication, User access log, Centralized Certificate Management                                                                                                                                                |
| <b>Supported protocols</b>                    | IPv4/v6, HTTP, HTTPS <sup>a</sup> , SSL/TLS <sup>a</sup> , QoS Layer 3 DiffServ, FTP, CIFS/SMB, SMTP, Bonjour, UPnP, SNMPv1/v2c/v3 (MIB-II), DNS, DynDNS, NTP, RTSP, RTP, TCP, UDP, IGMP, RTCP, ICMP, DHCP, ARP, SOCKS, SSH                                                                                                                          |
| System integration                            |                                                                                                                                                                                                                                                                                                                                                      |
| <b>Application Programming Interface</b>      | Open API for software integration, including VAPIX <sup>®</sup> and AXIS Camera Application Platform; specifications at <a href="http://www.axis.com">www.axis.com</a><br>AXIS Video Hosting System (AVHS) with One-Click Connection ONVIF <sup>®</sup> Profile S, specification at <a href="http://www.onvif.org">www.onvif.org</a>                 |
| <b>Analytics</b>                              | Video motion detection, Active tampering alarm<br>Support for AXIS Camera Application Platform enabling installation AXIS Video Motion Detection 3, AXIS Cross Line Detection, AXIS Digital Autotracking and third-party applications, see <a href="http://www.axis.com/acop">www.axis.com/acop</a>                                                  |
| <b>Event triggers</b>                         | Analytics, Edge storage events, External input                                                                                                                                                                                                                                                                                                       |
| <b>Event actions</b>                          | File upload: FTP, HTTP, network share and email<br>Notification: email, HTTP and TCP<br>External output activation<br>Video recording to edge storage<br>Pre- and post-alarm video buffering                                                                                                                                                         |
| <b>Data streaming</b>                         | Event data                                                                                                                                                                                                                                                                                                                                           |
| <b>Built-in installation aids</b>             | Pixel counter                                                                                                                                                                                                                                                                                                                                        |
| General                                       |                                                                                                                                                                                                                                                                                                                                                      |
| <b>Casing</b>                                 | IP66- and NEMA 4X-rated, IK10 impact-resistant aluminum casing with transparent, polycarbonate cover and dehumidifying membrane, Encapsulated electronics, Captive screws (resistorx 10)<br>Color: White NCS S 1002-B<br>For repainting instructions of skin cover or casing and impact on warranty, contact your Axis partner.                      |
| <b>Memory</b>                                 | 256 MB RAM, 128 MB Flash                                                                                                                                                                                                                                                                                                                             |
| <b>Power</b>                                  | Power over Ethernet IEEE 802.3af/802.3a Type 1 Class 2 max 6.3 W                                                                                                                                                                                                                                                                                     |
| <b>IR illumination</b>                        | High-efficiency, long-life 850 nm IR LEDs. Range of reach up to 10 m (33 ft) depending on scene                                                                                                                                                                                                                                                      |
| <b>Connectors</b>                             | Male RJ45 10BASE-T/100BASE-TX PoE on a 2 m (6.6 ft) network cable, warranty can be maintained even when cable is cut-for more information, contact your Axis partner<br>Terminal block for 1 alarm input and 1 output                                                                                                                                |
| <b>Storage</b>                                | Support for microSD/microSDHC/microSDXC card<br>Support for recording to dedicated network-attached storage (NAS)<br>For SD card and NAS recommendations see <a href="http://www.axis.com">www.axis.com</a>                                                                                                                                          |
| <b>Operating conditions</b>                   | -30 °C to 50 °C (-22 °F to 122 °F)<br>Humidity 10-100% RH (condensing)                                                                                                                                                                                                                                                                               |
| <b>Approvals</b>                              | EMC<br>EN 55022 Class B, EN 55024, EN 61000-6-1, EN 61000-6-2, FCC Part 15 Subpart B Class B, ICES-003 Class B, VCCI Class B, RCM AS/NZS CISPR 22 Class B, KCC KN22 Class B, KN24<br>Safety<br>IEC/EN/UL 60950-22<br>IEC 62471<br>Environment<br>EN 50581, IEC 60529 IP66, NEMA 250 Type 4X, IEC 62262 IK10                                          |
| <b>Dimensions</b>                             | Ø 132 x 93 mm (Ø 5 3/16 x 3 11/16 in)                                                                                                                                                                                                                                                                                                                |
| <b>Weight</b>                                 | 770 g (1.7 lb)                                                                                                                                                                                                                                                                                                                                       |
| <b>Included accessories</b>                   | Installation Guide, Windows decoder 1-user license, Drill hole template, Resistorx L-key, Terminal block connector                                                                                                                                                                                                                                   |
| <b>Optional accessories</b>                   | AXIS T91 Mount Accessories, AXIS T94F01D Pendant Kit, AXIS T94F01L Recessed Mount Kit, AXIS T94F01M J-Box/Gang Box Plate, AXIS T94F01P Conduit Back Box, AXIS T94F01S Mount Bracket, AXIS T94F02D Pendant Kit with sunshield, Network Cable Coupler IP66, Network Cable Coupler Indoor, Network Cable Coupler Indoor Slim, Skin covers (White/Black) |
| <b>Video management software</b>              | AXIS Companion, AXIS Camera Station and video management software from Axis' Application Development Partners (not included). For more information, see <a href="http://www.axis.com/products/video/software">www.axis.com/products/video/software</a>                                                                                               |
| <b>Languages</b>                              | English, German, French, Spanish, Italian, Russian, Simplified Chinese, Japanese, Korean, Portuguese, Traditional Chinese                                                                                                                                                                                                                            |
| <b>Warranty</b>                               | Axis 3-year warranty and AXIS Extended Warranty option, see <a href="http://www.axis.com/warranty">www.axis.com/warranty</a>                                                                                                                                                                                                                         |

a. *This product includes software developed by the OpenSSL Project for use in the OpenSSL Toolkit (<http://www.openssl.org/>), and cryptographic software written by Eric Young ([leay@cryptsoft.com](mailto:leay@cryptsoft.com)).*

Environmental responsibility:

[www.axis.com/environmental-responsibility](http://www.axis.com/environmental-responsibility)

## **AXIS P5635-E Mk II PTZ Dome Network Camera**

### HDTV 1080p PTZ with 30x zoom and focus recall

AXIS P5635-E Mk II is a cost-effective, outdoor-ready HDTV 1080p camera with 30x optical zoom for high-definition video surveillance of large areas. It features continuous 360° pan for fast camera repositioning and continuous tracking of objects. The focus recall feature offers instant focus in predefined areas, while the day/night functionality and WDR provide great image quality even in complex light conditions. It offers shock detection, video motion detection, Advanced Gatekeeper and electronic image stabilization. Axis' Zipstream technology significantly reduces bandwidth and storage requirements. It supports two-way audio, I/O ports, an SD card slot, PoE+ and 24 V AC/DC.

- > Continuous 360° pan
- > Excellent light sensitivity
- > HDTV 1080p and 30x optical zoom
- > Focus recall
- > Axis' Zipstream technology



# AXIS P5635-E Mk II PTZ Dome Network Camera

|                                          |                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Models</b>                            | AXIS P5635-E Mk II 50 Hz<br>AXIS P5635-E Mk II 60 Hz                                                                                                                                                                                                                                                                                                                           | <b>Event actions</b>                                                                                                                                                                                                                                                                 | Day/night mode, overlay text, video recording to edge storage, pre- and post-alarm video buffering, send SNMP trap, WDR mode<br>External output activation, play audio clip<br>PTZ: PTZ preset, start/stop guard tour<br>File upload via FTP, SFTP, HTTP, HTTPS and email<br>Notification via email, HTTP, HTTPS and TCP                                                                                                                                                                      |
| <b>Camera</b>                            |                                                                                                                                                                                                                                                                                                                                                                                | <b>Data streaming</b>                                                                                                                                                                                                                                                                | Event data                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Image sensor</b>                      | Progressive scan CMOS 1/2.8"                                                                                                                                                                                                                                                                                                                                                   | <b>Built-in installation aids</b>                                                                                                                                                                                                                                                    | Pixel counter                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Lens</b>                              | 4.3–129 mm, F1.6–4.7<br>Horizontal field of view: 65.6°–2.0°<br>Vertical field of view: 39.0°–1.2°<br>Autofocus, auto-iris                                                                                                                                                                                                                                                     | <b>General</b>                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Day and night</b>                     | Automatically removable infrared-cut filter                                                                                                                                                                                                                                                                                                                                    | <b>Casing</b>                                                                                                                                                                                                                                                                        | IP66-, IK10- and NEMA 4X-rated<br>Metal casing (aluminum), clear dome (PC), repaintable skin cover                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Minimum illumination</b>              | Color: 0.2 lux at 30 IRE F1.6<br>B/W: 0.01 lux at 30 IRE F1.6<br>Color: 0.25 lux at 50 IRE F1.6<br>B/W: 0.02 lux at 50 IRE F1.6                                                                                                                                                                                                                                                | <b>Sustainability</b>                                                                                                                                                                                                                                                                | PVC free                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Shutter time</b>                      | 1/66500 to 2 s                                                                                                                                                                                                                                                                                                                                                                 | <b>Memory</b>                                                                                                                                                                                                                                                                        | 512 MB RAM, 256 MB Flash                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Pan/Tilt/Zoom</b>                     | Pan: 360° endless, 0.2°/s–350°/s<br>Tilt: 180°, 0.2°/s–350°/s<br>30x optical zoom and 12x digital zoom, total 360x zoom,<br>256 preset positions, e-flip, limited guard tour, control queue,<br>on-screen directional indicator, set new pan 0°, focus window,<br>speed zoom, focus recall                                                                                     | <b>Power</b>                                                                                                                                                                                                                                                                         | Axis PoE+ midspan 1–port: 100–240 V AC<br>IEEE 802.3at Type 2 Class 4<br>Camera consumption: typical 8 W, max 21 W<br>Multi-connector cable:<br>20–28 V DC, typical 7 W, max 20 W<br>20–24 V AC, typical 12 VA, max 28 VA<br>(PoE+ midspan or power supply not included)                                                                                                                                                                                                                      |
| <b>Video</b>                             |                                                                                                                                                                                                                                                                                                                                                                                | <b>Connectors</b>                                                                                                                                                                                                                                                                    | RJ45 for 10BASE-T/100BASE-TX PoE<br>RJ45 Push-pull Connector (IP66) included<br>I/O connector for DC or AC input, 4 configurable alarm<br>inputs/outputs, mic in/line in, line out (Axis 10-pin Push-pull<br>System Connector or Axis Multicable C I/O Audio Power1 m/5 m,<br>not included)                                                                                                                                                                                                   |
| <b>Video compression</b>                 | H.264 (MPEG-4 Part 10/AVC) Baseline, Main and High Profiles<br>Motion JPEG                                                                                                                                                                                                                                                                                                     | <b>Storage</b>                                                                                                                                                                                                                                                                       | Support for SDHC UHS-I/SDXC UHS-I card<br>Support for recording to dedicated network-attached storage<br>(NAS)<br>For SD card and NAS recommendations see <a href="http://www.axis.com">www.axis.com</a>                                                                                                                                                                                                                                                                                      |
| <b>Resolutions</b>                       | 1920x1080 (HDTV 1080p) to 320x180                                                                                                                                                                                                                                                                                                                                              | <b>Operating conditions</b>                                                                                                                                                                                                                                                          | –30 °C to 55 °C (–22 °F to 131 °F)<br>Humidity 10–100% RH (condensing)                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Frame rate</b>                        | Up to 25/30 fps (50/60 Hz) in 1080p<br>Up to 50/60 fps (50/60 Hz) in 720p                                                                                                                                                                                                                                                                                                      | <b>Storage conditions</b>                                                                                                                                                                                                                                                            | –40 °C to 70 °C (–40 °F to 158 °F)                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Video streaming</b>                   | Multiple, individually configurable streams in H.264 and Motion<br>JPEG<br>Controllable frame rate and bandwidth<br>Axis' Zipstream technology in H.264<br>VBR/MBR H.264                                                                                                                                                                                                       | <b>Approvals</b>                                                                                                                                                                                                                                                                     | EMC<br>EN 55022 Class B, EN 61000-6-1, EN 61000-6-2, EN 55024,<br>EN 50121-4, IEC 62236-4, FCC Part 15 Subpart B Class A+B,<br>ICES-003 Class B, VCCI Class B, RCM AS/NZS CISPR22 Class B,<br>KCC KN22 Class B, KN35<br>EN 61000-3-2, EN 61000-3-3<br>Safety<br>IEC/EN/UL 60950-1, IEC/EN/UL 60950-22<br>Environment<br>IEC/EN 60529 IP66, NEMA 250 Type 4X, IEC/EN 62262 IK10,<br>IEC 60068-2-1, IEC 60068-2-2, IEC 60068-2-6, IEC 60068-2-14,<br>IEC 60068-2-27, IEC 60068-2-78, ISO 4892-2 |
| <b>Image settings</b>                    | Compression, Color, Brightness, Sharpness, Contrast, Local<br>contrast, White balance, Exposure control, Exposure zones,<br>Automatic backlight compensation, Fine tuning of behavior at<br>low light, 120 dB WDR - Forensic Capture, Manual shutter time,<br>Text and image overlay, 20 individual 3D privacy masks, Image<br>freeze on PTZ<br>Electronic Image Stabilization | <b>Dimensions</b>                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Audio</b>                             |                                                                                                                                                                                                                                                                                                                                                                                | 217 x 188 x 188 mm (8 9/16 x 7 3/8 x 7 3/8 in)                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Audio streaming</b>                   | Two-way                                                                                                                                                                                                                                                                                                                                                                        | <b>Weight</b>                                                                                                                                                                                                                                                                        | 2.5 kg (5.5 lb)                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Audio compression</b>                 | AAC-LC 8/16 kHz, G.711 PCM 8 kHz, G.726 ADPCM 8 kHz<br>Configurable bit rate                                                                                                                                                                                                                                                                                                   | <b>Included accessories</b>                                                                                                                                                                                                                                                          | RJ45 Push-pull Connector (IP66), Hard ceiling mount, Spring<br>pipe adaptor, U-profile pipe adaptor, Installation Guide, Windows<br>decoder 1-user license, AVHS Authentication key                                                                                                                                                                                                                                                                                                           |
| <b>Audio input/output</b>                | External microphone or line input, and line output (Requires Axis<br>10-pin Push-pull System Connector or Axis Multicable C I/O<br>Audio Power 1 m/5 m, not included)                                                                                                                                                                                                          | <b>Optional accessories</b>                                                                                                                                                                                                                                                          | AXIS T91B Mounts, AXIS T94A02L Recessed Mount, Outdoor<br>RJ45 cable with premounted connector, AXIS T8133 Midspan<br>30 W 1-port, Repaintable skin covers<br>Smoked dome, Axis 10-pin Push-pull System Connector,<br>Axis Multicable C I/O Audio Power 1 m/5 m                                                                                                                                                                                                                               |
| <b>Network</b>                           |                                                                                                                                                                                                                                                                                                                                                                                | <b>Video management software</b>                                                                                                                                                                                                                                                     | AXIS Companion, AXIS Camera Station, Video management<br>software from Axis' Application Development Partners available<br>on <a href="http://www.axis.com/techsup/software">www.axis.com/techsup/software</a>                                                                                                                                                                                                                                                                                |
| <b>Security</b>                          | Password protection, IP address filtering, HTTPS <sup>a</sup> encryption,<br>IEEE 802.1X <sup>a</sup> network access control, Digest authentication, User<br>access log, Centralized certificate management                                                                                                                                                                    | <b>Languages</b>                                                                                                                                                                                                                                                                     | English, German, French, Spanish, Italian, Russian, Simplified<br>Chinese, Japanese, Korean, Portuguese, Traditional Chinese                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Supported protocols</b>               | IPv4/v6, HTTP, HTTPS <sup>a</sup> , SSL/TLS <sup>a</sup> , QoS Layer 3 DiffServ, FTP, SFTP,<br>CIFS/SMB, SMTP, Bonjour, UPnP <sup>TM</sup> , SNMP v1/v2c/v3 (MIB-II),<br>DNS, DynDNS, NTP, RTSP, RTP, TCP, UDP, IGMP, RTCP, ICMP, DHCP,<br>ARP, SOCKS, SSH, NTCIP                                                                                                              | <b>Warranty</b>                                                                                                                                                                                                                                                                      | Axis 3-year warranty and AXIS Extended Warranty option, see<br><a href="http://www.axis.com/warranty">www.axis.com/warranty</a>                                                                                                                                                                                                                                                                                                                                                               |
| <b>System integration</b>                |                                                                                                                                                                                                                                                                                                                                                                                | <b>Environmental responsibility:</b><br><a href="http://www.axis.com/environmental-responsibility">www.axis.com/environmental-responsibility</a>                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Application Programming Interface</b> | Open API for software integration, including VAPIX <sup>®</sup><br>and AXIS Camera Application Platform; specifications at<br><a href="http://www.axis.com">www.axis.com</a><br>AXIS Video Hosting System with One-Click Connection<br>ONVIF <sup>®</sup> Profiles S and G, specifications at <a href="http://www.onvif.org">www.onvif.org</a>                                 | <b>a. This product includes software developed by the OpenSSL Project for use in the<br/>OpenSSL Toolkit. (<a href="http://www.openssl.org">www.openssl.org</a>), and cryptographic software written by Eric<br/>Young (<a href="mailto:ey@cryptsoft.com">ey@cryptsoft.com</a>).</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Analytics</b>                         | Video motion detection, Advanced Gatekeeper<br>Audio detection<br>Support for AXIS Camera Application Platform enabling<br>installation of third-party applications, see <a href="http://www.axis.com/acap">www.axis.com/acap</a>                                                                                                                                              |                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Event triggers</b>                    | Detectors: live stream accessed, video motion detection,<br>shock detection, day/night mode, audio detection<br>Hardware: network, temperature<br>Input Signal: manual trigger, virtual inputs, digital input signal<br>PTZ: error, moving, preset reached, ready<br>Storage: disruption, recording<br>System: system ready<br>Time: recurrence, use schedule                  |                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |

## **AXIS P5635-E Mk II PTZ Dome Network Camera**

### HDTV 1080p PTZ with 30x zoom and focus recall

AXIS P5635-E Mk II is a cost-effective, outdoor-ready HDTV 1080p camera with 30x optical zoom for high-definition video surveillance of large areas. It features continuous 360° pan for fast camera repositioning and continuous tracking of objects. The focus recall feature offers instant focus in predefined areas, while the day/night functionality and WDR provide great image quality even in complex light conditions. It offers shock detection, video motion detection, Advanced Gatekeeper and electronic image stabilization. Axis' Zipstream technology significantly reduces bandwidth and storage requirements. It supports two-way audio, I/O ports, an SD card slot, PoE+ and 24 V AC/DC.

- > Continuous 360° pan
- > Excellent light sensitivity
- > HDTV 1080p and 30x optical zoom
- > Focus recall
- > Axis' Zipstream technology



# AXIS P5635-E Mk II PTZ Dome Network Camera

|                                          |                                                                                                                                                                                                                                                                                                                                                                 |
|------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Models</b>                            | AXIS P5635-E Mk II 50 Hz<br>AXIS P5635-E Mk II 60 Hz                                                                                                                                                                                                                                                                                                            |
| <b>Camera</b>                            |                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Image sensor</b>                      | Progressive scan CMOS 1/2.8"                                                                                                                                                                                                                                                                                                                                    |
| <b>Lens</b>                              | 4.3–129 mm, F1.6–4.7<br>Horizontal field of view: 65.6°–2.0°<br>Vertical field of view: 39.0°–1.2°<br>Autofocus, auto-iris                                                                                                                                                                                                                                      |
| <b>Day and night</b>                     | Automatically removable infrared-cut filter                                                                                                                                                                                                                                                                                                                     |
| <b>Minimum illumination</b>              | Color: 0.2 lux at 30 IRE F1.6<br>B/W: 0.01 lux at 30 IRE F1.6<br>Color: 0.25 lux at 50 IRE F1.6<br>B/W: 0.02 lux at 50 IRE F1.6                                                                                                                                                                                                                                 |
| <b>Shutter time</b>                      | 1/66500 to 2 s                                                                                                                                                                                                                                                                                                                                                  |
| <b>Pan/Tilt/Zoom</b>                     | Pan: 360° endless, 0.2°/s–350°/s<br>Tilt: 180°, 0.2°/s–350°/s<br>30x optical zoom and 12x digital zoom, total 360x zoom,<br>256 preset positions, e-flip, limited guard tour, control queue,<br>on-screen directional indicator, set new pan 0°, focus window,<br>speed zoom, focus recall                                                                      |
| <b>Video</b>                             |                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Video compression</b>                 | H.264 (MPEG-4 Part 10/AVC) Baseline, Main and High Profiles<br>Motion JPEG                                                                                                                                                                                                                                                                                      |
| <b>Resolutions</b>                       | 1920x1080 (HDTV 1080p) to 320x180                                                                                                                                                                                                                                                                                                                               |
| <b>Frame rate</b>                        | Up to 25/30 fps (50/60 Hz) in 1080p<br>Up to 50/60 fps (50/60 Hz) in 720p                                                                                                                                                                                                                                                                                       |
| <b>Video streaming</b>                   | Multiple, individually configurable streams in H.264 and Motion JPEG<br>Controllable frame rate and bandwidth<br>Axis' Zipstream technology in H.264<br>VBR/MBR H.264                                                                                                                                                                                           |
| <b>Image settings</b>                    | Compression, Color, Brightness, Sharpness, Contrast, Local contrast, White balance, Exposure control, Exposure zones, Automatic backlight compensation, Fine tuning of behavior at low light, 120 dB WDR - Forensic Capture, Manual shutter time, Text and image overlay, 20 individual 3D privacy masks, Image freeze on PTZ<br>Electronic Image Stabilization |
| <b>Audio</b>                             |                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Audio streaming</b>                   | Two-way                                                                                                                                                                                                                                                                                                                                                         |
| <b>Audio compression</b>                 | AAC-LC 8/16 kHz, G.711 PCM 8 kHz, G.726 ADPCM 8 kHz<br>Configurable bit rate                                                                                                                                                                                                                                                                                    |
| <b>Audio input/output</b>                | External microphone or line input, and line output (Requires Axis 10-pin Push-pull System Connector or Axis Multicable C I/O Audio Power 1 m/5 m, not included)                                                                                                                                                                                                 |
| <b>Network</b>                           |                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Security</b>                          | Password protection, IP address filtering, HTTPS <sup>a</sup> encryption, IEEE 802.1X <sup>a</sup> network access control, Digest authentication, User access log, Centralized certificate management                                                                                                                                                           |
| <b>Supported protocols</b>               | IPv4/v6, HTTP, HTTPS <sup>a</sup> , SSL/TLS <sup>a</sup> , QoS Layer 3 DiffServ, FTP, SFTP, CIFS/SMB, SMTP, Bonjour, UPnP <sup>TM</sup> , SNMP v1/v2c/v3 (MIB-II), DNS, DynDNS, NTP, RTP, RTCP, UDP, IGMP, RTCP, ICMP, DHCP, ARP, SOCKS, SSH, NTCIP                                                                                                             |
| <b>System integration</b>                |                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Application Programming Interface</b> | Open API for software integration, including VAPIX <sup>®</sup> and AXIS Camera Application Platform; specifications at <a href="http://www.axis.com">www.axis.com</a><br>AXIS Video Hosting System with One-Click Connection<br>ONVIF <sup>®</sup> Profiles S and G, specifications at <a href="http://www.onvif.org">www.onvif.org</a>                        |
| <b>Analytics</b>                         | Video motion detection, Advanced Gatekeeper<br>Audio detection<br>Support for AXIS Camera Application Platform enabling installation of third-party applications, see <a href="http://www.axis.com/acap">www.axis.com/acap</a>                                                                                                                                  |
| <b>Event triggers</b>                    | Detectors: live stream accessed, video motion detection, shock detection, day/night mode, audio detection<br>Hardware: network, temperature<br>Input Signal: manual trigger, virtual inputs, digital input signal<br>PTZ: error, moving, preset reached, ready<br>Storage: disruption, recording<br>System: system ready<br>Time: recurrence, use schedule      |

|                      |                                                                                                                                                                                                                                                                                                                          |
|----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Event actions</b> | Day/night mode, overlay text, video recording to edge storage, pre- and post-alarm video buffering, send SNMP trap, WDR mode<br>External output activation, play audio clip<br>PTZ: PTZ preset, start/stop guard tour<br>File upload via FTP, SFTP, HTTP, HTTPS and email<br>Notification via email, HTTP, HTTPS and TCP |
|----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

|                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|-----------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Data streaming</b>             | Event data                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Built-in installation aids</b> | Pixel counter                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>General</b>                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Casing</b>                     | IP66-, IK10- and NEMA 4X-rated<br>Metal casing (aluminum), clear dome (PC), repaintable skin cover                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Sustainability</b>             | PVC free                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Memory</b>                     | 512 MB RAM, 256 MB Flash                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Power</b>                      | Axis PoE+ midspan 1-port: 100–240 V AC<br>IEEE 802.3at Type 2 Class 4<br>Camera consumption: typical 8 W, max 21 W<br>Multi-connector cable:<br>20–28 V DC, typical 7 W, max 20 W<br>20–24 V AC, typical 12 VA, max 28 VA<br>(PoE+ midspan or power supply not included)                                                                                                                                                                                                       |
| <b>Connectors</b>                 | RJ45 for 10BASE-T/100BASE-TX PoE<br>RJ45 Push-pull Connector (IP66) included<br>I/O connector for DC or AC input, 4 configurable alarm inputs/outputs, mic in/line in, line out (Axis 10-pin Push-pull System Connector or Axis Multicable C I/O Audio Power 1 m/5 m, not included)                                                                                                                                                                                            |
| <b>Storage</b>                    | Support for SDHC UHS-I/SDXC UHS-I card<br>Support for recording to dedicated network-attached storage (NAS)<br>For SD card and NAS recommendations see <a href="http://www.axis.com">www.axis.com</a>                                                                                                                                                                                                                                                                          |
| <b>Operating conditions</b>       | –30 °C to 55 °C (–22 °F to 131 °F)<br>Humidity 10–100% RH (condensing)                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Storage conditions</b>         | –40 °C to 70 °C (–40 °F to 158 °F)                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Approvals</b>                  | EMC<br>EN 55022 Class B, EN 61000-6-1, EN 61000-6-2, EN 55024, EN 50121-4, IEC 62236-4, FCC Part 15 Subpart B Class A+B, ICES-003 Class B, VCCI Class B, RCM AS/NZS CISPR22 Class B, KCC KN22 Class B, KN35<br>EN 61000-3-2, EN 61000-3-3<br>Safety<br>IEC/EN/UL 60950-1, IEC/EN/UL 60950-22<br>Environment<br>IEC/EN 60529 IP66, NEMA 250 Type 4X, IEC/EN 62262 IK10, IEC 60068-2-1, IEC 60068-2-2, IEC 60068-2-6, IEC 60068-2-14, IEC 60068-2-27, IEC 60068-2-78, ISO 4892-2 |
| <b>Dimensions</b>                 | 217 x 188 x 188 mm (8 9/16 x 7 3/8 x 7 3/8 in)                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Weight</b>                     | 2.5 kg (5.5 lb)                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Included accessories</b>       | RJ45 Push-pull Connector (IP66), Hard ceiling mount, Spring pipe adaptor, U-profile pipe adaptor, Installation Guide, Windows decoder 1-user license, AVHS Authentication key                                                                                                                                                                                                                                                                                                  |
| <b>Optional accessories</b>       | AXIS T91B Mounts, AXIS T94A02L Recessed Mount, Outdoor RJ45 cable with premounted connector, AXIS T8133 Midspan 30 W 1-port, Repaintable skin covers<br>Smoked dome, Axis 10-pin Push-pull System Connector, Axis Multicable C I/O Audio Power 1 m/5 m                                                                                                                                                                                                                         |
| <b>Video management software</b>  | AXIS Companion, AXIS Camera Station, Video management software from Axis' Application Development Partners available on <a href="http://www.axis.com/techsup/software">www.axis.com/techsup/software</a>                                                                                                                                                                                                                                                                       |
| <b>Languages</b>                  | English, German, French, Spanish, Italian, Russian, Simplified Chinese, Japanese, Korean, Portuguese, Traditional Chinese                                                                                                                                                                                                                                                                                                                                                      |
| <b>Warranty</b>                   | Axis 3-year warranty and AXIS Extended Warranty option, see <a href="http://www.axis.com/warranty">www.axis.com/warranty</a>                                                                                                                                                                                                                                                                                                                                                   |

a. This product includes software developed by the OpenSSL Project for use in the OpenSSL Toolkit. ([www.openssl.org](http://www.openssl.org)), and cryptographic software written by Eric Young ([ey@cryptsoft.com](mailto:ey@cryptsoft.com)).

Environmental responsibility:  
[www.axis.com/environmental-responsibility](http://www.axis.com/environmental-responsibility)

## PowerPlus

The Salient PowerPlus is a 2U rack-mount NVR offering an excellent balance between processing power, storage capacity, redundancy for high performance and a flexible platform for video surveillance applications. The PowerPlus is optimized for performance with extensive memory and storage. It utilizes enhanced I/O capabilities with Salient's CompleteView VMS and is engineered for the rigors of continuous duty operation. Using best in class components, the PowerPlus provides the reliability and processing power required by mission critical video surveillance architectures.

Lower overall system-level power draw is the result of breakthrough system design. The PowerPlus NVR maximizes performance per watt through a combination of power and cooling, and energy efficient technologies and tools.

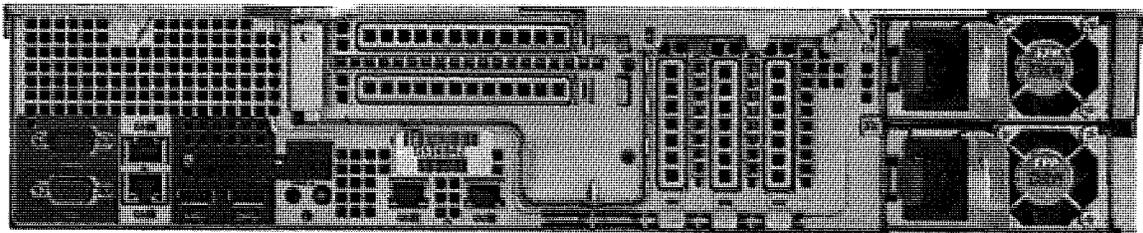
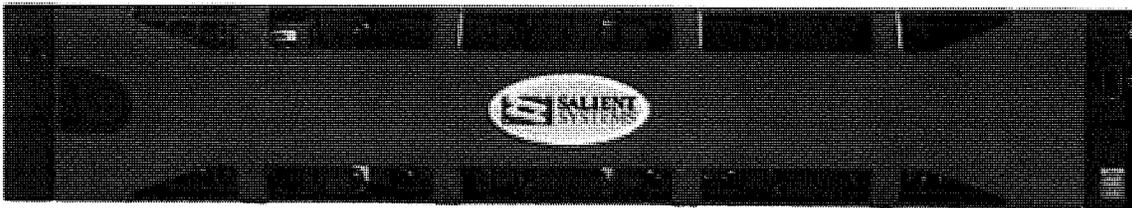
### Features

- Record, live view, playback, archive video
- Hybrid NVR for analog (max 64 channels) and IP cameras
- Rack mount 2U form factor
- Front access with locking bezel for hotswap

### Tech Specs at a Glance

#### System Performance Class: Enterprise Level

|              |                     |
|--------------|---------------------|
| CPU          | Dual Intel Xeon     |
| Memory       | 24GB                |
| Network      | Quad 1GbE NICs      |
| Storage      | 4TB up to 30TB      |
| Windows OS   | Windows Server 2012 |
| RAID Support | 5 or 6              |



# PowerPlus

## Technical Specifications

| Item                           | Description                                             |
|--------------------------------|---------------------------------------------------------|
| Operating System               | Windows Server 2012                                     |
| Processor                      | Dual Intel Xeon                                         |
| Memory                         | 24GB                                                    |
| Network                        | Quad 1Gbe NICs                                          |
| Hybrid Capable                 | Up to 64 direct connected analog cameras                |
| IP Camera Support              | Yes                                                     |
| Hard Drive (OS)                | 2- 500GB in RAID 1 configuration                        |
| Hard Drive (Video Storage)     | 4TB, 8TB, 12TB, 18TB, 24TB, or 30TB                     |
| RAID Controller                | Yes                                                     |
| RAID Level of Storage          | 5 or 6                                                  |
| # of Hot Spares Supported      | 1                                                       |
| Graphics Adapter               | Integrated graphics adapter                             |
| Video Display Ports            | 1 VGA (front),1 VGA (rear)                              |
| USB Ports                      | 2 USB 2.0 (front), 1 USB 2.0 (rear),1 USB 3.0 (rear)    |
| Other Ports                    | 1 serial port (rear)                                    |
| Optical Drive                  | Optional external USB attached DVD-RW                   |
| Accessories                    | Keyboard, mouse & rail kit included                     |
| Life Cycle Controller          | IDRAC 8                                                 |
| Life Cycle Controller Software | ACIS - iDRAC Enterprise software license for PowerPlus. |
| DAS Support                    | Yes - PERC RAID controller required. Part number ACDB   |
| Warranty                       | 3 and 5 year (basic, NBD, or 4HR)                       |

## Chassis Features

|                      |                                                               |
|----------------------|---------------------------------------------------------------|
| Form Factor          | 2RU Rackmount                                                 |
| Dimensions w/o Rails | 3.41"H x 18.99"W x 23.43"D (8.66cm H x 48.23cm W x 59.51cm D) |
| Weight               | 62lb (28.2Kg)                                                 |

## Operating Environment

|                       |                                                                         |
|-----------------------|-------------------------------------------------------------------------|
| Operating Environment | 50° F- 95° F (10° C - 35° C)                                            |
| Power Supply          | Dual 750W - 100 to 240VAC auto ranging and redundant                    |
| Relative Humidity     | Operating: 10% - 80% non-condensing<br>Storage: 5% - 95% non-condensing |
| BTU                   | 2559.1 BTU/hr                                                           |

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# SALIENT SYSTEMS



*City of Traverse City  
Traverse City Parking Services – Camera System*

Attention: Julie Dalton, Purchasing Agent  
The City of Traverse City  
400 Boardman Ave., 2<sup>nd</sup> Floor  
Traverse City, MI 49684

December 20, 2016

In compliance with the request for proposal, Master Electric Inc. is pleased to present our proposal for the above named project.

We have partnered with Panduit and General Cable for the required category 6 connectivity and cabling system. As a Panduit and General Cable certified integrator Master Electric warrants the new cabling will provide guaranteed network performance and system reliability. Additionally, we have partnered with Video Insight-Advidia-Panasonic for a sole source IP CCTV server and camera system. Master Electric has performed many IP CCTV installations in school districts and hospitals utilizing Video Insight as a NVMS including:

- Sanford Meridian Schools; Beaverton Rural Schools; Sandusky Community Schools; Bad Axe Public Schools; Sault Ste. Marie Area Public Schools; Iron Mountain Schools; War Memorial Hospital

Attach to this narrative you will find a CCTV design plan, key material cut sheets, business information and references. A complete description of our proposal can be found below.

**BID PRICING: \$91,175.00**

**Installation of Parking Garage Security Cameras, including:**

- New surface mounted conduit required to properly route new IP CCTV camera cabling throughout the Hardy and Old Town Parking Garages
- General Cable category 6 cable for each new camera
- Panduit category 6 jack for termination at each camera
- Termination of CCTV cabling onto Panduit category 6 patch panels
- Video Insight-Advidia E-37-V, vari-focal, IP CCTV dome cameras for interior locations shown on the attached CCTV design plan
  - Ceiling and wall mounts will be provided where appropriate to the installation
- Video Insight-Advidia A-200 2MP, PTZ, IP CCTV dome cameras for exterior locations shown on the attached CCTV design plan
  - Ceiling and wall mounts will be provided where appropriate to the installation
- Video Insight-Panasonic WV-SFV631L, vari-focal, IP CCTV dome cameras for parking garage locations shown on the attached CCTV design plan
  - Ceiling and wall mounts will be provided where appropriate to the installation
- Video Insight-Dell R730xd, 48TB rack mounted server for recording of new camera images via Video Insight enterprise software
  - New lifetime camera licenses for existing Axis cameras are included
- Etherwan POE switches as required to connect to each new IP camera installed
- Tripp-Lite shallow wall mount cabinets have been included for installation in the parking garages for the protection of new rack mount equipment installed
- Testing, labeling and warranty of new IP CCTV system installed
- Testing, labeling and warranty of new cabling installed



Exclusions/Clarifications:

- Additional cameras locations listed as not required/add on/optional in the RFP are not included in this pricing – this includes Option 1 for 200 East Front St. and 100 East Front St.
  - More information is needed to properly price these additional cameras
- No workstations, PC's or monitors are included in this pricing – it was determined at our walkthrough with Michael Helferich that existing equipment will be re-used
- Labor wage rates quoted are non-prevailing wage – if prevailing wage is required an increase in project cost will result and be required
- New components provided and installed by Master Electric shall be warranted for 1 year from date of installation, additional year warranties may be purchased for \$1,900.00 per year

Thank you for the opportunity to quote, please feel free to call us with any questions.

Regards,

A handwritten signature in black ink that reads "Erik Burr". The signature is written in a cursive, slightly slanted style.

Erik Burr, EAVA

**Bidder - Please complete and return**

**BID SUMMARY**

**TITLE: TRAVERSE CITY PARKING SERVICES – CAMERA SYSTEM**

**DUE DATE: TUESDAY, NOVEMBER 29, 2016 @ 4:00 PM**

Having carefully examined the attached specifications and any other applicable information, the undersigned proposes to furnish all items necessary for and reasonably incidental to the proper completion of this bid. Bidder submits this bid and agrees to meet or exceed all requirements and specifications unless otherwise indicated in writing and attached hereto.

Bidder certifies that as of the date of this bid the Company or he/she is not in arrears to the City of Traverse City for debt or contract and is in no way a defaulter as provided in Section 152, Chapter XVI of the Charter of the City of Traverse City.

Bidder understands and agrees, if selected as the successful Bidder, to accept a Purchase Order / Service Order / Contract and to provide proof of the required insurance.

Bidder submits this bid and agrees to meet or exceed all the City of Traverse city's requirements and specifications unless otherwise indicated in writing and attached hereto. Bidder shall comply with all applicable federal, state, local and building codes, laws, rules and regulations and obtain any required permits for this work.

The Bidder certifies that it is in compliance with the City's Nondiscrimination Policy as set forth in Administrative Order No. 47 and Chapter 605 of the City's Codified Ordinances.

The Bidder certifies that none of the following circumstances have occurred with respect to the Bidder, an officer of the Bidder, or an owner of a 25% or more share in the Bidder's business, within 3 years prior to the bid:

- (a) conviction of a criminal offense incident to the application for or performance of a contract;
- (b) conviction of embezzlement, theft, forgery, bribery, falsification or destruction of records, receiving stolen property, or any other offense which currently, seriously and directly reflects on the Bidder's business integrity;
- (c) conviction under state or federal antitrust statutes;
- (d) attempting to influence a public employee to breach ethical conduct standards; or
- (e) conviction of a criminal offense or other violation of other state, local, or federal law, as determined by a court of competent jurisdiction or an administrative proceeding, which in

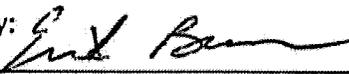
the opinion of the City indicates that the bidder is unable to perform responsibility or which reflects a lack of integrity that could negatively impact or reflect upon the City of Traverse City, including but not limited to, any of the following offenses or violations of:

- i. The Natural Resources and Environmental Protection Act.
- ii. A persistent and knowing violation of the Michigan Consumer Protection Act.
- iii. Willful or persistent violations of the Michigan Occupational Health and Safety Act.
- iv. A violation of federal, local, or state civil rights, equal rights, or non-discrimination laws, rules, or regulations.
- v. Repeated or flagrant violations of laws related to the payment of wages and fringe benefits.

(f) the loss of a license or the right to do business or practice a profession, the loss or suspension of which indicates dishonesty, a lack of integrity, or a failure or refusal to perform in accordance with the ethical standards of the business or profession in question.

Bidder understands that the City reserves the right to accept any or all bids in whole or part and to waive irregularities in any bid in the best interest of the City. The bid will be evaluated and awarded on the basis of the best value to the City. The criteria used by the City may include, but will not be limited to: ability, qualifications, timeframe, experience, price, type and amount of equipment, accessories, options, insurance, permits, licenses, other pertinent factors and overall capability to meet the needs of the City. The City is sales tax exempt – Government.

Bidder agrees that the bid may not be withdrawn for a period of sixty (60) days from the actual date of the opening of the bid.

Submitted by:   
\_\_\_\_\_  
Signature  
Erik Burr, Estimator  
\_\_\_\_\_  
Name and Title (Print)  
989-426-9860      989-426-9862  
\_\_\_\_\_  
Phone                                      Fax

\_\_\_\_\_  
Master Electric, Inc.  
\_\_\_\_\_  
Company Name  
2350 W. M-61  
\_\_\_\_\_  
Company Address  
Gladwin                      MI                      48624  
\_\_\_\_\_  
City,                                      State,                                      Zip  
\_\_\_\_\_  
Corporation  
Sole proprietorship/partnership/corporation  
\_\_\_\_\_  
Michigan  
\_\_\_\_\_  
If corporation, state of corporation

**REFERENCES:** (include name of organization, contact person, and daytime phone number).

1. See Attached Prequalification  
Contact Person: \_\_\_\_\_ Telephone: \_\_\_\_\_
2. \_\_\_\_\_  
Contact Person: \_\_\_\_\_ Telephone: \_\_\_\_\_
3. \_\_\_\_\_  
Contact Person: \_\_\_\_\_ Telephone: \_\_\_\_\_

**SUBCONTRACTORS:** (include name of organization, contact person, daytime phone number, and services to be performed).

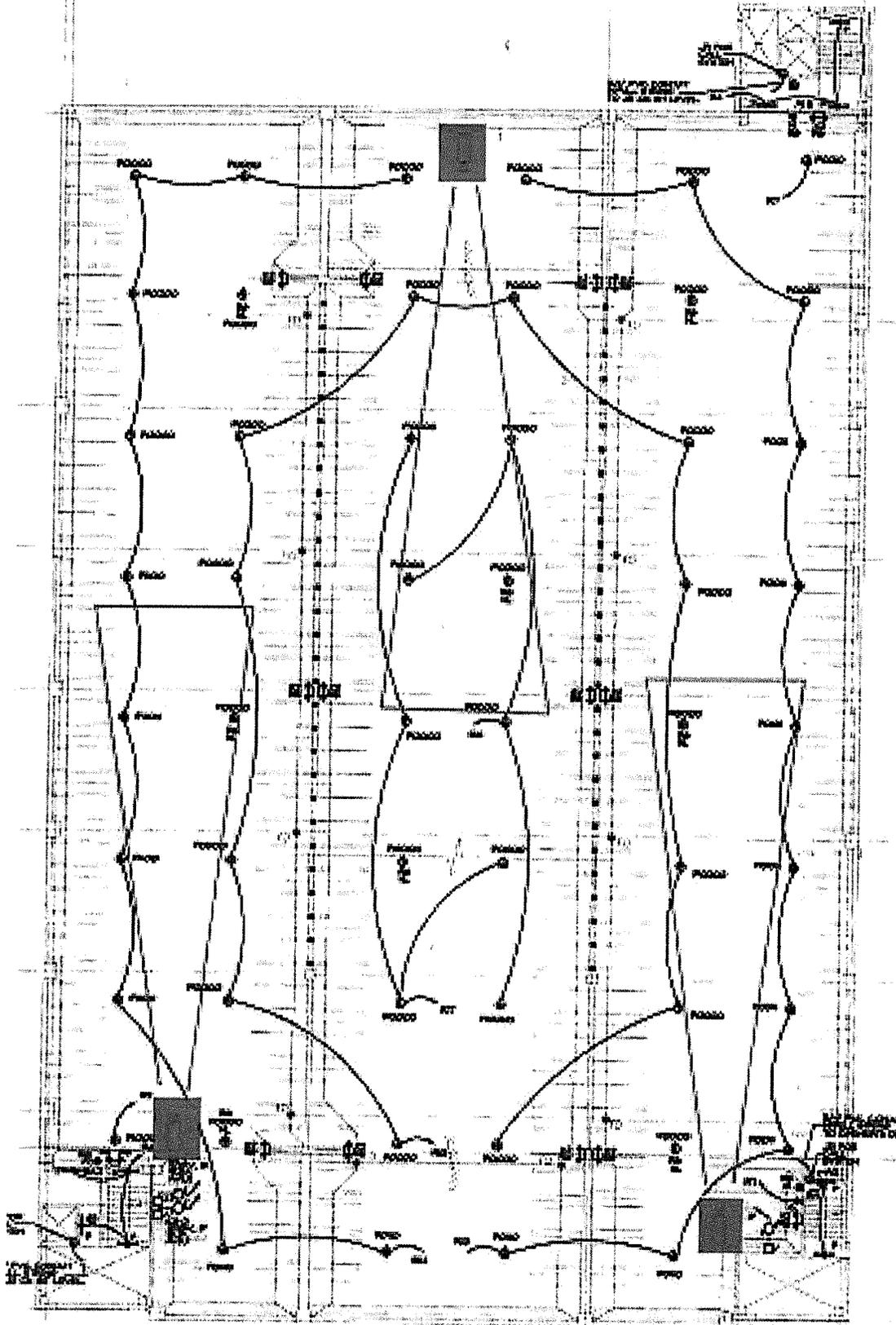
1. n/a  
Contact Person: \_\_\_\_\_ Telephone: \_\_\_\_\_  
Services to be Performed: \_\_\_\_\_
2. \_\_\_\_\_  
Contact Person: \_\_\_\_\_ Telephone: \_\_\_\_\_  
Services to be Performed: \_\_\_\_\_
3. \_\_\_\_\_  
Contact Person: \_\_\_\_\_ Telephone: \_\_\_\_\_  
Services to be Performed: \_\_\_\_\_

| Traverse City Parking Services - Camera RFP |                          |                                  |                                         |                                                                      |                                                    |
|---------------------------------------------|--------------------------|----------------------------------|-----------------------------------------|----------------------------------------------------------------------|----------------------------------------------------|
| Building Code                               | Building                 | Address                          |                                         |                                                                      |                                                    |
| OTD                                         | Old Town Parking Garage  | 125 E Eighth Street              |                                         |                                                                      |                                                    |
| LCH                                         | Hardy Parking Garage     | 303 E State Street               |                                         |                                                                      |                                                    |
| OH                                          | Opera House              | 125 E Front Street (south alley) |                                         |                                                                      |                                                    |
| 200EF                                       | 200 Block of East Front  |                                  |                                         | 200 E Front                                                          |                                                    |
| 100EF                                       | 100 Block of East Front  |                                  |                                         | 100 E Front                                                          |                                                    |
| Building Code                               | Area                     | Level/Floor                      | Existing Location (Currently Installed) | New Location (Required or Alternate Recommendation Required for RFP) | Additional Location (Not required/Add On/Optional) |
| OTD                                         | North Entry/Exit         | Level 1                          |                                         | X                                                                    |                                                    |
| OTD                                         | Pay Station/Bike Lockers | Level 1                          | X                                       |                                                                      |                                                    |
| OTD                                         | North Elevator Tower     | Level 1                          | X                                       |                                                                      |                                                    |
| OTD                                         | North Pedestrian Entry/  | Level 1                          | X                                       |                                                                      |                                                    |
| OTD                                         | North Elevator           | Level 1                          |                                         |                                                                      | X                                                  |
| OTD                                         | Storage Room             | Level 1                          |                                         | X                                                                    |                                                    |
| OTD                                         | L1 Parking               | Level 1                          | X                                       |                                                                      |                                                    |
| OTD                                         | South Entry/Exit         | Level 1                          | X                                       |                                                                      |                                                    |
| OTD                                         | South Elevator Tower     | Level 1                          | X                                       |                                                                      |                                                    |
| OTD                                         | South Elevator           | Level 1                          |                                         |                                                                      | X                                                  |
| OTD                                         | South Pay Station        | Level 1                          | X                                       |                                                                      |                                                    |
| OTD                                         | South Pedestrian Door    | Level 1                          |                                         | X                                                                    |                                                    |
| OTD                                         | Exit Lane                | Level 1                          | X                                       |                                                                      |                                                    |
| OTD                                         | South Entry Lane Door    | Level 1                          | X                                       |                                                                      |                                                    |
| OTD                                         | L2 North Parking         | Level 2                          |                                         | X                                                                    |                                                    |
| OTD                                         | L2 Southwest Parking     | Level 2                          |                                         | X                                                                    |                                                    |
| OTD                                         | L2 Southeast Parking     | Level 2                          |                                         | X                                                                    |                                                    |
| OTD                                         | Public Parking Sign      | Level 2                          |                                         | X                                                                    |                                                    |
| OTD                                         | L3 North Parking         | Level 3                          |                                         | X                                                                    |                                                    |
| OTD                                         | L3 Southwest Parking     | Level 3                          |                                         | X                                                                    |                                                    |
| OTD                                         | L3 Southeast Parking     | Level 3                          |                                         | X                                                                    |                                                    |
| OTD                                         | L4 North Stairtower      | Level 4                          |                                         | X                                                                    |                                                    |
| OTD                                         | L4 North Parking         | Level 4                          |                                         | X                                                                    |                                                    |
| OTD                                         | L4 Southwest Parking     | Level 4                          |                                         | X                                                                    |                                                    |
| OTD                                         | L4 South Stairtower      | Level 4                          |                                         | X                                                                    |                                                    |
| OH                                          | Rear of Building         | Alley                            | X                                       |                                                                      |                                                    |
| LCH                                         | North Stairtower         | Level 1                          |                                         | X                                                                    |                                                    |
| LCH                                         | Front Street Entry Lane  | Level 1                          |                                         | X                                                                    |                                                    |
| LCH                                         | L1 Northwest Parking     | Level 1                          |                                         | X                                                                    |                                                    |
| LCH                                         | L1 North Parking         | Level 1                          |                                         | X                                                                    |                                                    |
| LCH                                         | Park Street Pedestrian   | Level 1                          |                                         | X                                                                    |                                                    |
| LCH                                         | South Stairtower         | Level 1                          |                                         | X                                                                    |                                                    |
| LCH                                         | State Street Exit        | Level 1                          |                                         | X                                                                    |                                                    |
| LCH                                         | State Street Entry       | Level 1                          |                                         | X                                                                    |                                                    |



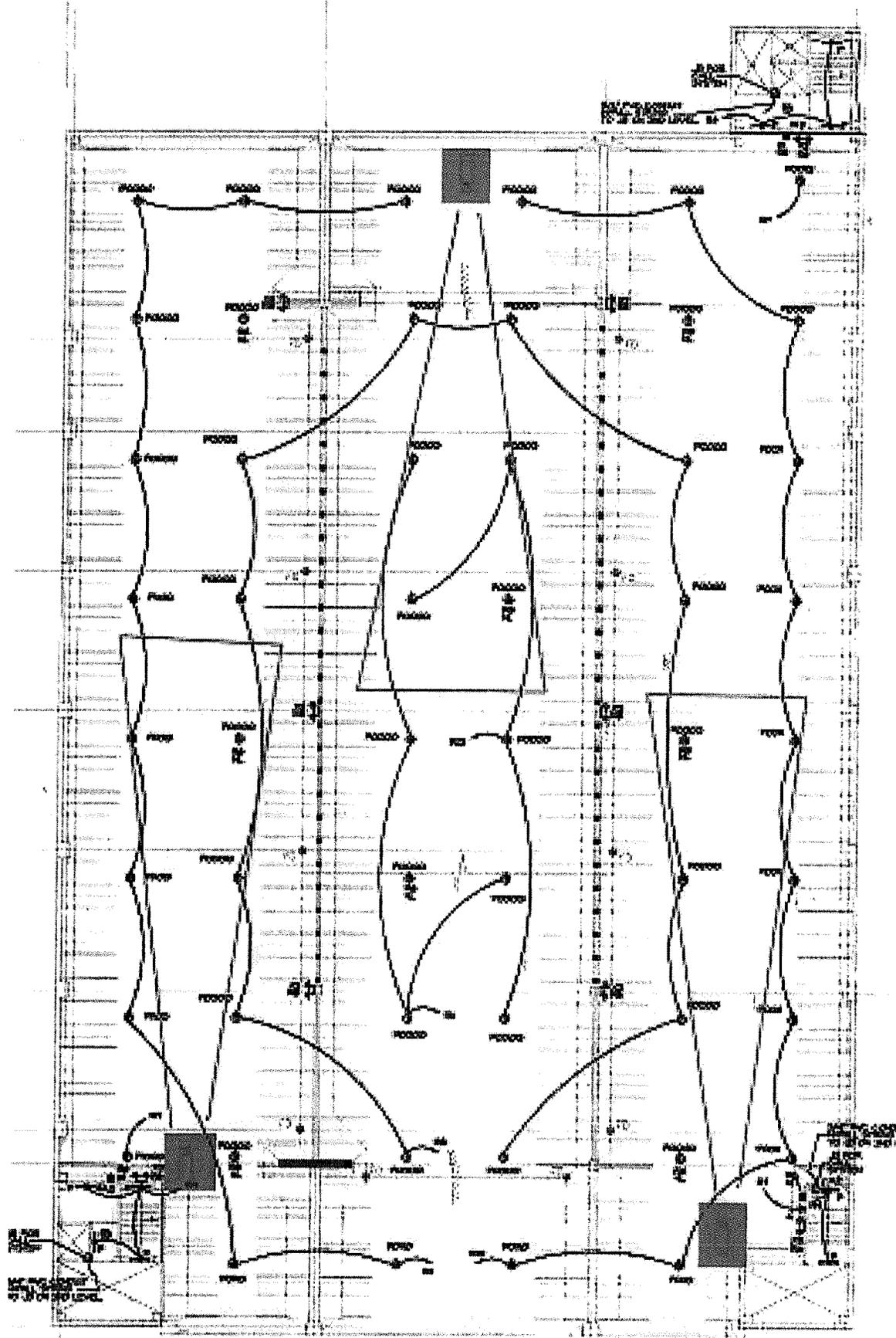


MASTER ELECTRIC INC. – TC PARKING SERVICES CAMERA SYSTEM



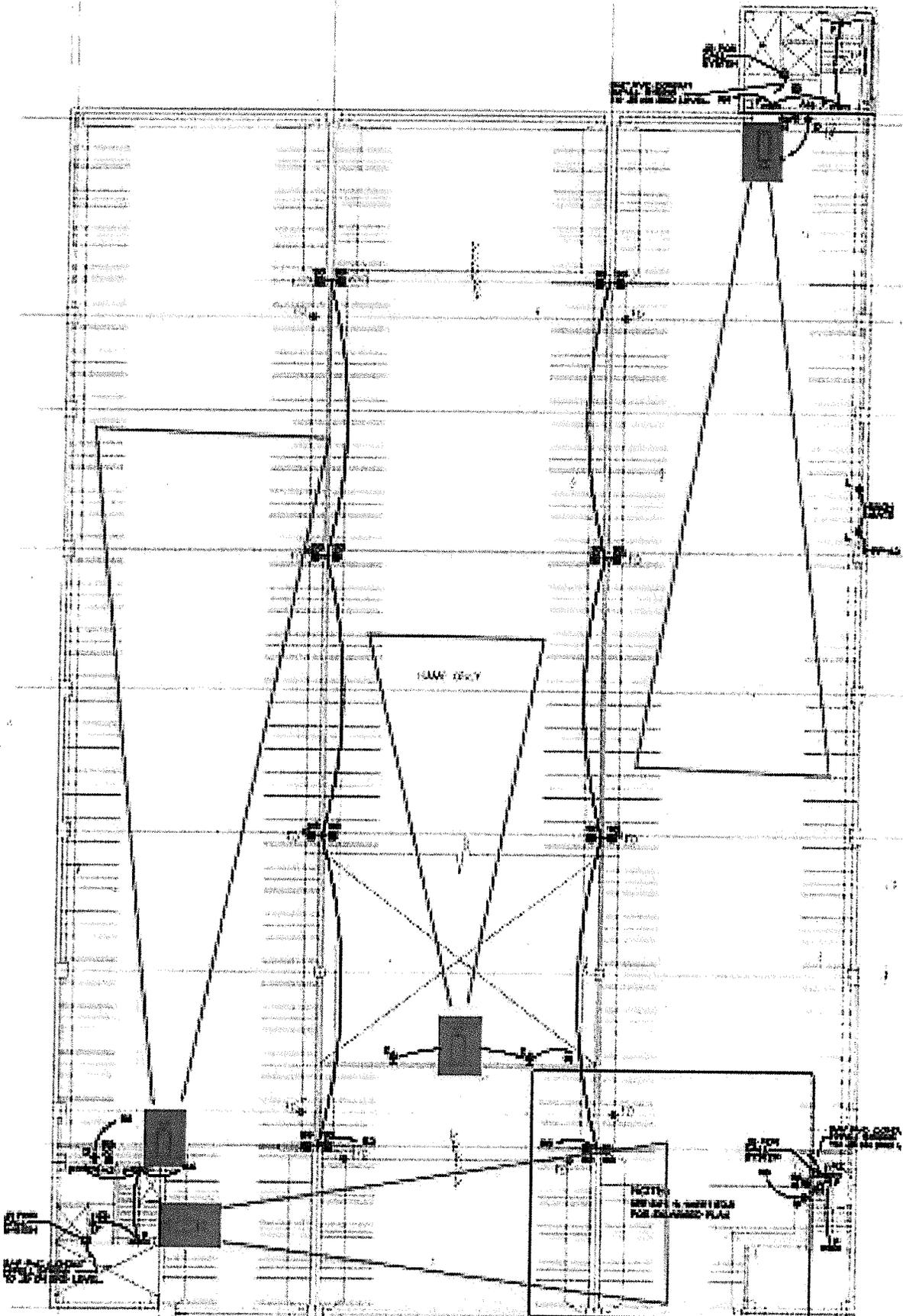
HARDY GARAGE PRELIMINARY CCTV SYSTEM DESIGN

MASTER ELECTRIC INC. – TC PARKING SERVICES CAMERA SYSTEM



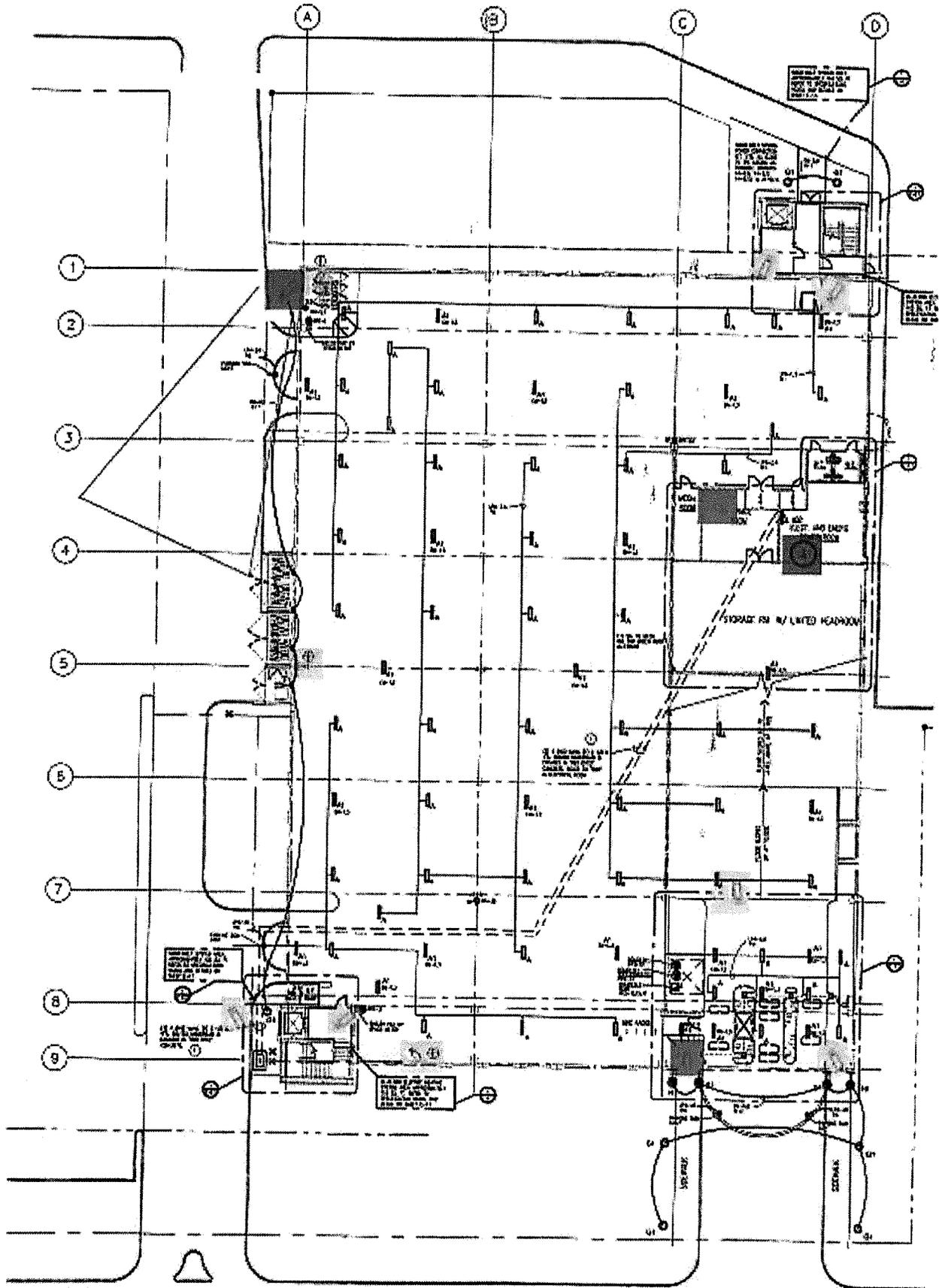
HARDY GARAGE PRELIMINARY CCTV SYSTEM DESIGN

MASTER ELECTRIC INC. – TC PARKING SERVICES CAMERA SYSTEM



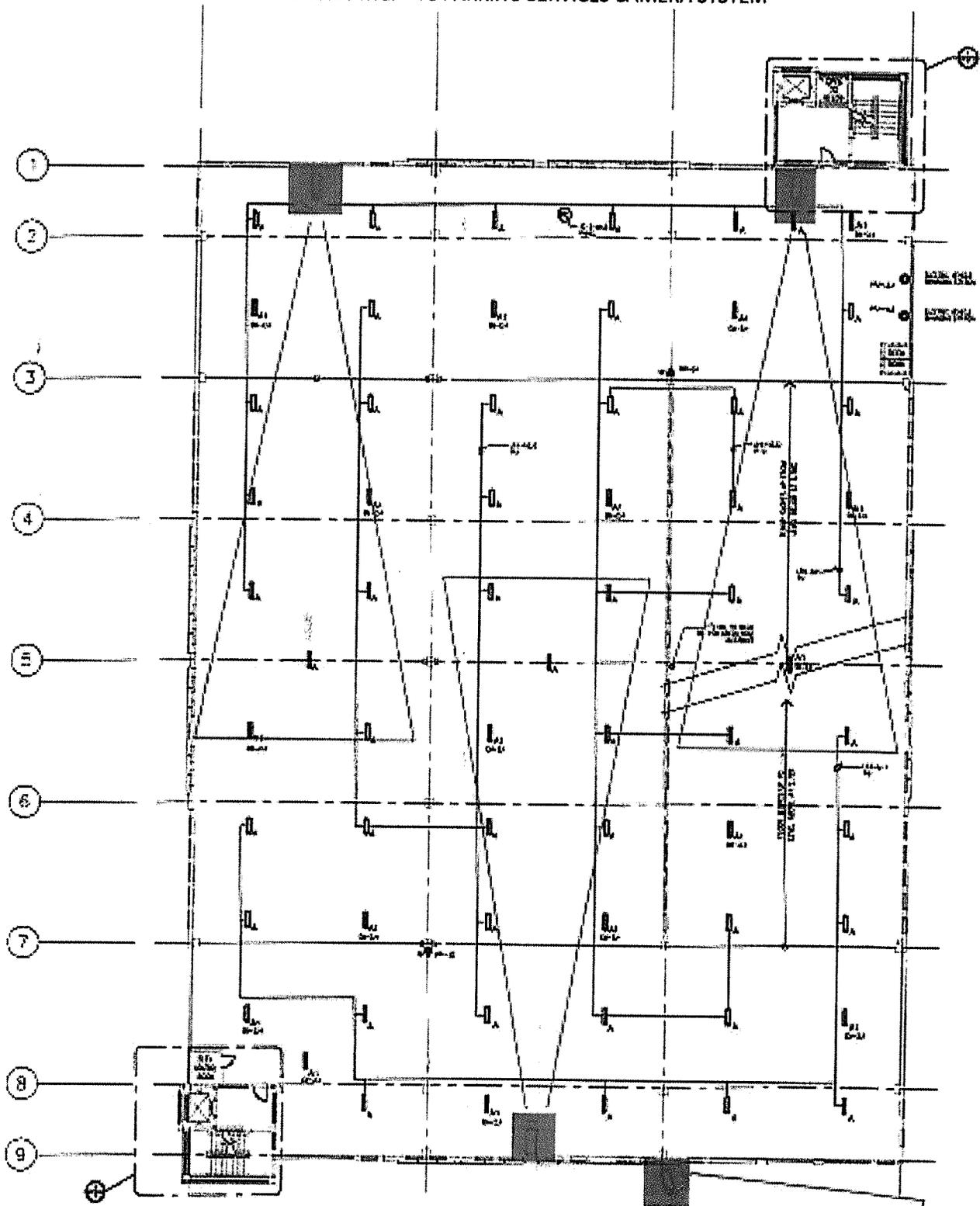
HARDY GARAGE PRELIMINARY CCTV SYSTEM DESIGN

MASTER ELECTRIC INC. - TC PARKING SERVICES CAMERA SYSTEM



OLD TOWN GARAGE PRELIMINARY CCTV SYSTEM DESIGN

MASTER ELECTRIC INC. - TC PARKING SERVICES CAMERA SYSTEM



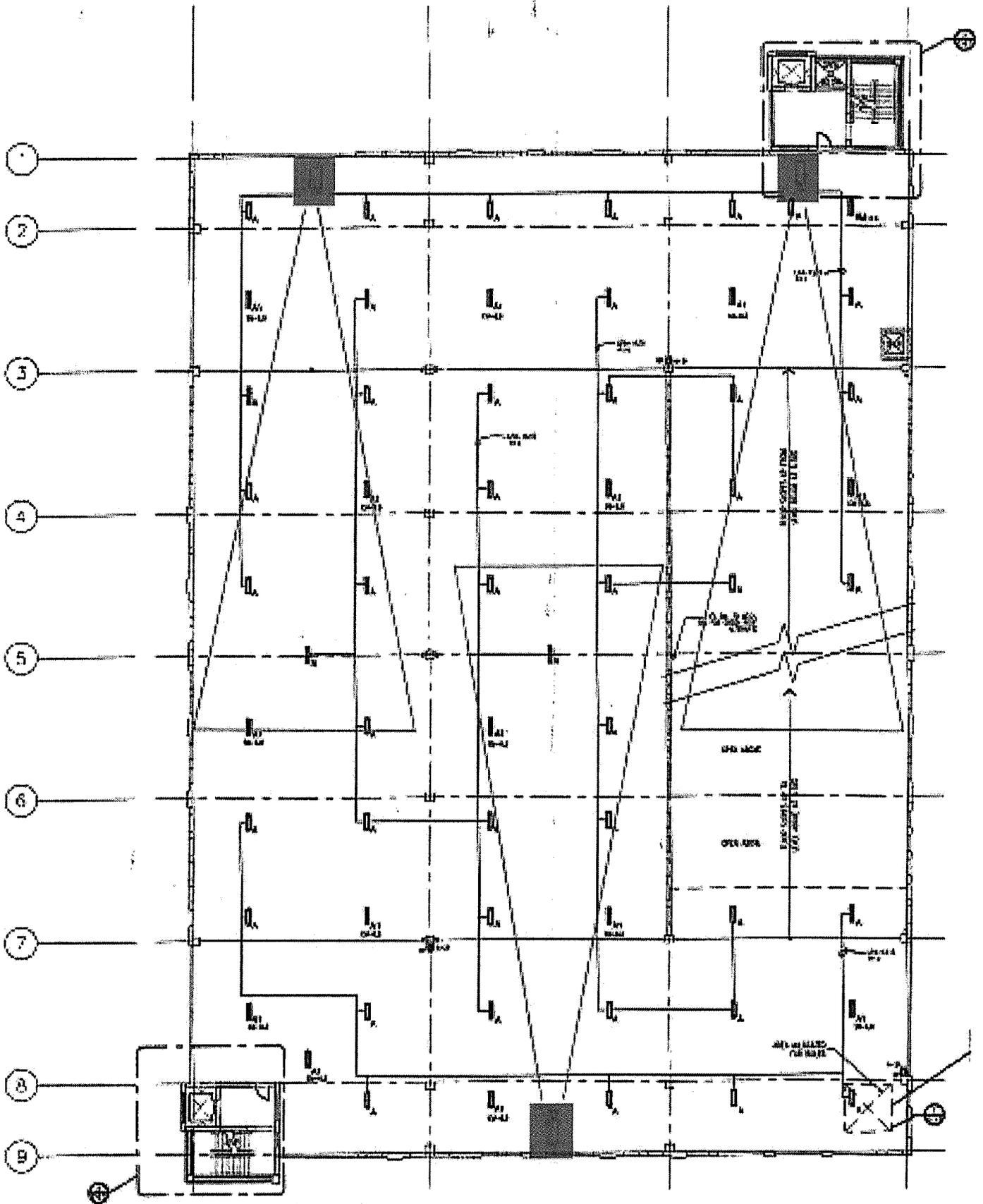
SECOND LEVEL FLOOR PLAN - ELECTRICAL  
SCALE 1/8" = 1'-0"



NOTED: ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE (NEC) AND THE NATIONAL FIRE ALARM AND SIGNAL CODE (NFPA 72). ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE CITY OF CHICAGO ORDINANCES AND THE CITY OF CHICAGO DEPARTMENT OF PUBLIC WORKS SPECIFICATIONS. ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE CITY OF CHICAGO DEPARTMENT OF PUBLIC WORKS SPECIFICATIONS.

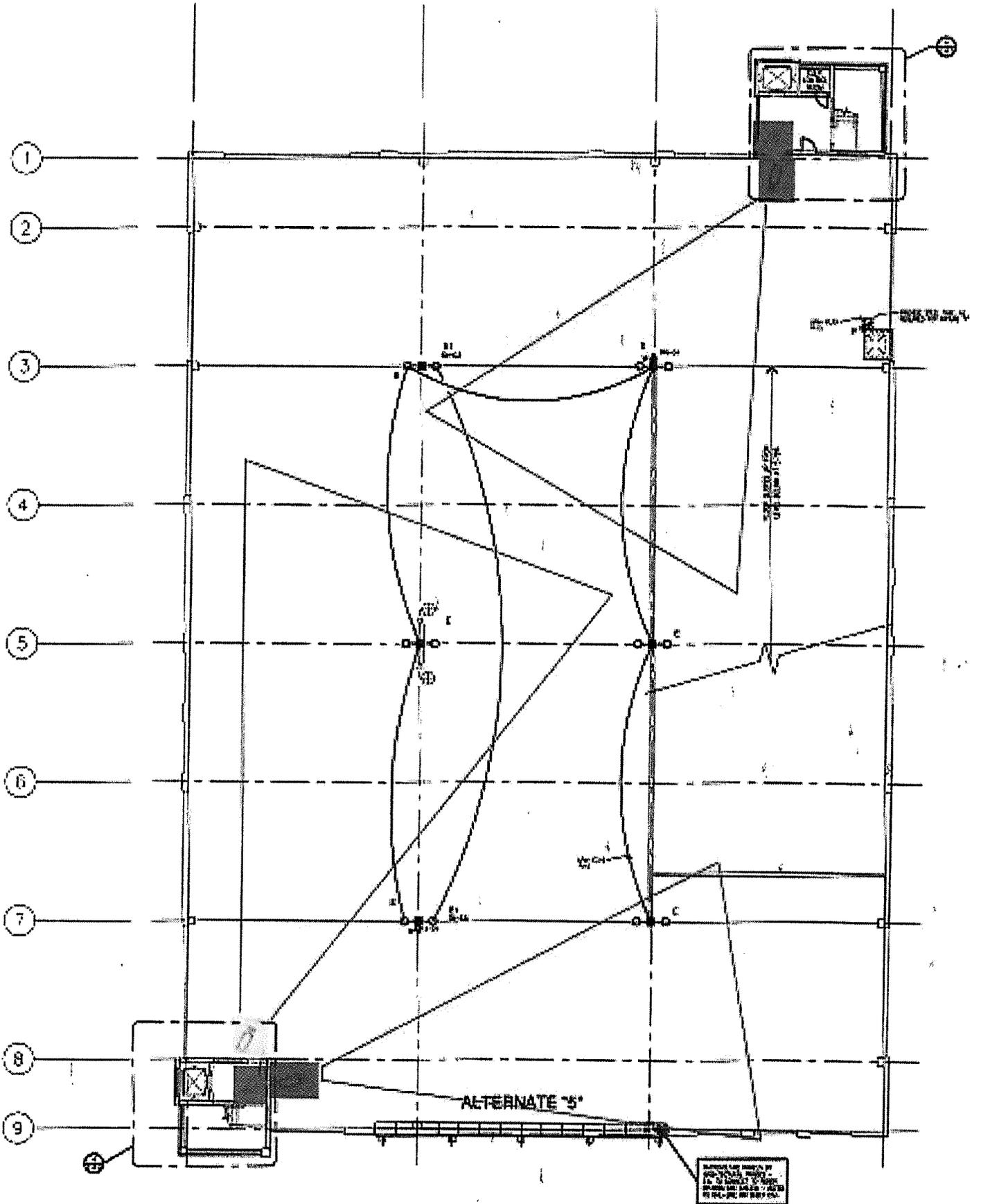
OLD TOWN GARAGE PRELIMINARY CCTV SYSTEM DESIGN

MASTER ELECTRIC INC. - TC PARKING SERVICES CAMERA SYSTEM



OLD TOWN GARAGE PRELIMINARY CCTV SYSTEM DESIGN

MASTER ELECTRIC INC. - TC PARKING SERVICES CAMERA SYSTEM



OLD TOWN GARAGE PRELIMINARY CCTV SYSTEM DESIGN

# Panasonic

## BUSINESS

Super Dynamic Full HD Vandal Resistant & Waterproof Dome Network Camera

# WV-SFV631L

Super Dynamic HD Vandal Resistant & Waterproof Dome Network Camera

# WV-SFV611L



Full HD / 1,920 x 1,080 60 fps H.264 Vandal Resistant Network Camera featuring **Super Dynamic** (WV-SFV631L)  
 HD / 1,280 x 720 60 fps H.264 Vandal Resistant Network Camera featuring **Super Dynamic** (WV-SFV611L)

### Key Features

- 1080p Full HD / 720p HD Images up to 60 fps<sup>\*1</sup>
- Approximate 1/3 inches, high sensitivity MOS image sensor
- Super high resolution at Full HD/1,920 x 1,080 created by high sensitivity MOS image sensor. (WV-SFV631L only)
- Multiple H.264 (High profile) streams (max. 4 streams) and JPEG streams ensure simultaneous real time monitoring and high resolution recording.
- Maximum Screen Size is 2,048 x 1,536\* @30 fps, H.264 (WV-SFV631L only)  
 \* Used by super resolution techniques
- **Enhanced Super Dynamic<sup>TM</sup>** and ABS (Adaptive Black Stretch) technologies deliver 133 dB wider dynamic range compared to conventional cameras.
- **Smart coding Technology : Group of Pictures (GOP) control function** removes unnecessary information from the frame for realizing efficient encoding. **Auto VIQS (Variable Image Quality on Specified area)** function recognizes the no movement area in a video automatically and lowering the resolution of it to reduce the data size. With the latest bit rate reducing technology, **GOP control, Auto VIQS, 3D-MNR (Multi process Noise Reduction) and FDF (Frequency Divided Filter)**, the network bandwidth and the disk space of recorder can be saved.
- High sensitivity with Day/Night (ICR\*) function:  
 WV-SFV631L: 0.04 lx (Color), 0.01 lx (B/W) at F1.3  
 WV-SFV611L: 0.01 lx (Color), 0.003 lx (B/W) at F1.3  
 \*ICR: IR Cut filter Removal
- IR LED equipped: The equipped infrared LED makes it possible to take pictures at zero lx.
- IR LED is controlled to match the environment, thereby the camera provides clear images of human faces without white blur.
- New camera attachment bracket allows an easy camera installation toward all four directions.
- High Speed ABF (Auto Back Focus) and Motorized Zoom ensures easy installation.
- Newly developed lens with aperture control function realizes the best focus in any environment.
- VIQS (Variable Image Quality on Specified area) technology allows the designated eight areas to retain higher image quality while the excluded area will have a decreased image quality, which enables to use lower image file size and bit rate.
- Cropping function enables to provide whole image and the part image simultaneously. Up to 4 image capture areas can be specified, and it is also possible to control the sequence.
- **Face Super Dynamic** technology ensures clear face image.
- Lens distortion compensation for the distorted images can be adjusted 256 steps.
- Selectable light control modes:  
 Outdoor scene, Indoor scene (50 Hz) / Indoor scene (60 Hz), Fix shutter  
 Indoor scene (50 Hz/60Hz): Flicker caused by fluorescent lightning will be automatically compensated.
- 3x (WV-SFV631L), 2x (WV-SFV611L) extra optical zoom at 640 x 360 resolution
- 2x, 4x digital zoom controlled by browser
- VMD (Video Motion Detection) with 4 programmable detection areas, 15 steps sensitivity level and 10 steps detection size
- Privacy Zone can mask up to 8 private areas, such as house windows and entrances/exits.
- Alarm sources including 3 terminal input, VMD and Panasonic alarm command can trigger actions such as SDXC/SDHC/SD memory recording, FTP image transfer, E-mail notification, Indication on browser, Alarm terminal output, and Panasonic alarm protocol output.
- Full duplex bi-directional audio allows interactive communication between camera site and monitoring site.
- Prioritized stream control: One of the video streams can be prioritized when multiple recorders or client PCs are accessing the camera so that the recorder or the client PC can maintain the frame rate.
- **Double SDXC/SDHC/SD Memory card slots for manual recording (H.264 / JPEG), alarm recording (H.264 / JPEG) and backup upon network failure (H.264 / JPEG).** Realize long-term recording and auto backup function.
- Newly developed dome cover provides clearer images above the horizontal. Thereby, it expands the tilting range of the lens.
- Face detection function detects the position of human face and the information is sent by XML or video stream. (Optional)
- Can be added new intelligent extension software (Optional) in addition to built-in VMD (Video Motion Detection), alarm function.
- **Fog compensation function** equipped as standard.
- **HLC (High Light Compensation) technology** reduces strong light sources such as vehicle headlights to prevent camera being blinded.
- **Super Chroma Compensation function** realizes a better color reproducibility even in low illumination.
- H.264 max. bit rate/client and Total bit rate control allows flexible network traffic management. Frame rate priority mode controls bit rate and compression ratio to provide the specified frame rate.
- Internet mode: H.264 images can be transmitted over HTTP protocol.
- Multi-language: English / Italian / French / German / Spanish / Portuguese / Russian / Chinese / Japanese
- Supports SSL, DDNS (viewnetcam, RFC2136)
- IP66 rated water and dust resistant. Compatible with IEC60529 measurement standard, Type 4X(JUL50), NEMA 4X compliant.
- Dehumidification device for use with various weather conditions
- Vandal resistant mechanism for high reliability

\*1 Super Dynamic function is automatically set off on 60 fps mode.

# Specifications

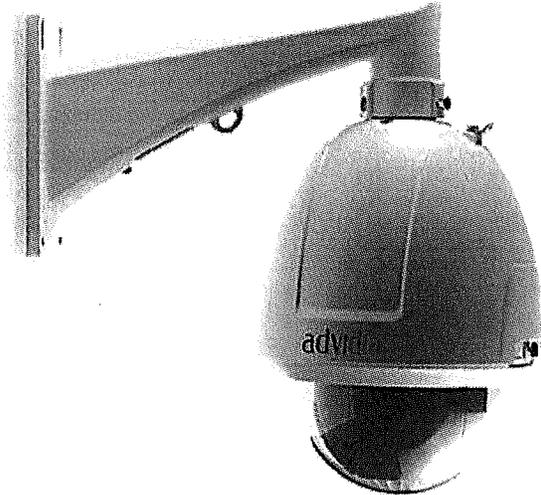
|                                                                                                                                                                                                            |                                                                                                 |                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Camera                                                                                                                                                                                                     | Image Sensor                                                                                    | Approx. 1/3 type CMOS image sensor                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|                                                                                                                                                                                                            | Scanning Mode                                                                                   | Progressive scan                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|                                                                                                                                                                                                            | Scanning Area                                                                                   | WV-SFV631L: 6.28 mm (0.25 inches) x 3.30 mm (0.13 inches) (V)<br>WV-SFV611L: 4.66 mm (0.18 inches) x 3.85 mm (0.15 inches) (V)                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|                                                                                                                                                                                                            | Minimum Illumination                                                                            | WV-SFV631L:<br>Color: less than 0.04 lx, BW: 0.01 lx<br>(F1.3, Maximum shutter: Max. 1/30s, Gain: On(F-High))<br>Color: less than 0.003 lx, BW: 0.0007 lx<br>(F1.3, Maximum shutter: Max. 18/30s, Gain: On(F-High)) <sup>1)</sup>                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|                                                                                                                                                                                                            |                                                                                                 | WV-SFV611L:<br>Color: less than 0.01 lx, BW: 0.003 lx<br>(F1.3, Maximum shutter: Max. Off (1/30s), Gain: On(F-High))<br>Color: less than 0.0007 lx, BW: 0.0002 lx<br>(F1.3, Maximum shutter: Max. 18/30s, Gain: On(F-High)) <sup>1)</sup>                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|                                                                                                                                                                                                            | IR LED Light                                                                                    | Off / Auto (High / Mid / Low)                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|                                                                                                                                                                                                            | IR LED irradiation distance                                                                     | Approx. 30 m (98.43 feet)                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|                                                                                                                                                                                                            | White Balance                                                                                   | AWC (2,000 - 10,000 K), ATW1 (2,700 - 8,000 K), ATW2 (2,000 - 8,000 K)                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|                                                                                                                                                                                                            | Light Control Mode                                                                              | Outdoor scene: Automatic integration of ALC and ELC                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|                                                                                                                                                                                                            |                                                                                                 | Indoor scene (50 Hz): Automatic integration of ALC and ELC with flickerless<br>Indoor scene (60 Hz): Automatic integration of ALC and ELC with flickerless                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|                                                                                                                                                                                                            | Shutter Speed                                                                                   | 1/2 mega pixel (16 : 9) (30 fps mode) 1.3 mega pixel (16 : 9) (30 fps mode)<br>0.8 (1/80), 1/100, 1/120, 1/250, 1/500, 1/1000, 1/2000, 1/4000, 1/10000                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|                                                                                                                                                                                                            |                                                                                                 | Other than 2 mega pixel (16 : 9) (30 fps mode) 1.3 mega pixel (16 : 9) (30 fps mode)<br>0.8 (1/80), 3/100, 3/120, 2/100, 2/120, 1/100, 1/120, 1/250, 1/500, 1/1000, 1/2000, 1/4000, 1/10000                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|                                                                                                                                                                                                            | Super Dynamic <sup>2)</sup>                                                                     | On (High) / On (Normal) / Off                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|                                                                                                                                                                                                            | Face Super Dynamic                                                                              | On / Off (Only when Super Dynamic: On)                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|                                                                                                                                                                                                            | Adaptive Black Stretch                                                                          | On / Off (Only when Super Dynamic: Off)                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|                                                                                                                                                                                                            | Fog compensation                                                                                | On / Off (Only when Super Dynamic / Adaptive Black stretch: Off)                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|                                                                                                                                                                                                            | AGC                                                                                             | On (Low) / On (Mid) / On (High) / Off                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|                                                                                                                                                                                                            | Electronic Sensitivity UP                                                                       | max. 1/1000 s, max. 1/500 s, max. 1/250 s, max. 1/100 s,<br>max. 1/50 s, max. 1/30 s, max. 2/30 s, max. 4/30 s, max. 6/30 s,<br>max. 10/30 s, max. 18/30 s                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|                                                                                                                                                                                                            |                                                                                                 | Day/Night (ICR)                                                                                                                                                                                                                                                                                                   | Off / On / Auto1 (Normal) / Auto2 (IR Light) / Auto3 (BCC)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|                                                                                                                                                                                                            | Dynamic Range                                                                                   | 133 dB typ. (Super Dynamic: On, Light Control Mode: Indoor)                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Digital Noise Reduction                                                                                                                                                                                    | High / Low                                                                                      |                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Video Motion Detection                                                                                                                                                                                     | 4 areas, Sensitivity: 15 steps, Detection size: 10 steps                                        |                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Privacy Zone                                                                                                                                                                                               | Up to 8 zones                                                                                   |                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| VOIS                                                                                                                                                                                                       | Up to 3 zones                                                                                   |                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Camera Title (OSD)                                                                                                                                                                                         | Up to 20 characters (alphanumeric characters, marks)                                            |                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Electric Zoom                                                                                                                                                                                              | TELE / WIDE, Auto Coarse adjustment of Focus                                                    |                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Focus Adjustment                                                                                                                                                                                           | ABF / MANUAL (HDMI only)                                                                        |                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Lens Distortion Compensation                                                                                                                                                                               | 256 steps                                                                                       |                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Lens                                                                                                                                                                                                       | Varifocal Length                                                                                | 2.8 - 10mm (1/8 inches - 13/32 inches)                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|                                                                                                                                                                                                            | Angular Field of View                                                                           | WV-SFV631L (16 : 9 mode) Horizontal: 23.8° (TELE) - 102.8° (WIDE)<br>Vertical: 16.0° (TELE) - 56.0° (WIDE)<br>(4 : 3 mode) Horizontal: 23.7° (TELE) - 84.3° (WIDE)<br>Vertical: 17.8° (TELE) - 62.4° (WIDE)                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| WV-SFV611L (16 : 9 mode) Horizontal: 25.4° (TELE) - 93.7° (WIDE)<br>Vertical: 14.8° (TELE) - 51.6° (WIDE)<br>(4 : 3 mode) Horizontal: 25.4° (TELE) - 93.7° (WIDE)<br>Vertical: 20.0° (TELE) - 65.3° (WIDE) |                                                                                                 |                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Maximum Aperture Ratio                                                                                                                                                                                     | 1 : 1.3 (WIDE) - 1 : 3.0 (TELE) with Smart DoF (Depth of Field) mode                            |                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Focusing Range                                                                                                                                                                                             | 0.3 m - ∞                                                                                       |                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Adjusting Angle                                                                                                                                                                                            | Horizontal: ±180°, Vertical: 0-85°<br>Image tilt adjustment range: -45° (Left) to +300° (Right) |                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Browser GUI                                                                                                                                                                                                | Cropping                                                                                        | H.264(1) / H.264(2) / H.264(3) / H.264(4) / H.264(All) /<br>JPEG(1) / JPEG(2) / JPEG(3)                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|                                                                                                                                                                                                            |                                                                                                 | Up to 4 image capture areas can be specified                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|                                                                                                                                                                                                            | Camera Control                                                                                  | Brightness, AUX On / Off                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|                                                                                                                                                                                                            | Display Mode                                                                                    | Spot, Quad; Image from 16 cameras can be displayed in 4 different Quad screens or 16 split screen (JPEG only), 20 characters camera title available.                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|                                                                                                                                                                                                            | Digital Zoom                                                                                    | 1x, 2x, 4x controlled by browser GUI                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|                                                                                                                                                                                                            | Camera Title                                                                                    | Up to 20 alphanumeric characters                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|                                                                                                                                                                                                            | Clock Display                                                                                   | Time: 12H/24H, Date: 5 formats on the browser, Summer time (Manual)                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|                                                                                                                                                                                                            | Alarm Control                                                                                   | Reset                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|                                                                                                                                                                                                            | One Shot Capture                                                                                | A still picture will be displayed on a newly opened window.                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|                                                                                                                                                                                                            | Audio                                                                                           | Mic (Line) Input: On / Off Volume adjustment: Low / Middle / High<br>Audio Output: On / Off Volume adjustment: Low / Middle / High                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|                                                                                                                                                                                                            | SD Memory Data Download                                                                         | Still or motion images recorded in the SDXC/SDHC/SD memory card can be downloaded.                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|                                                                                                                                                                                                            | GUI / Setup Menu Language                                                                       | English, Italian, French, German, Spanish, Portuguese, Russian, Chinese, Japanese                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|                                                                                                                                                                                                            | System Log                                                                                      | Up to 100 (Internal)<br>Up to 4,000 (SDXC/SDHC/SD memory when the recording format is set to JPEG.) error logs                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|                                                                                                                                                                                                            | Supported OS <sup>3)</sup>                                                                      | Microsoft® Windows® 10<br>Microsoft® Windows® 8.1<br>Microsoft® Windows® 8<br>Microsoft® Windows® 7<br>Microsoft® Windows Vista®                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|                                                                                                                                                                                                            | Supported Browser                                                                               | Windows® Internet Explorer® 11 (32-bit)<br>Windows® Internet Explorer® 10 (32-bit)<br>Windows® Internet Explorer® 9 (32-bit)<br>Windows® Internet Explorer® 8 (32-bit)<br>Windows® Internet Explorer® 7 (32-bit)<br>Safari®, Google Chrome®, Mozilla Firefox®<br>* with limitations in the part of setting screen |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Network                                                                                                                                                                                                    | Network I/F                                                                                     | 10Base-T / 100Base-TX, RJ45 connector                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|                                                                                                                                                                                                            |                                                                                                 | Image Resolution                                                                                                                                                                                                                                                                                                  | WV-SFV631L<br>*2 mega pixel (16 : 9) (30/60 fps)<br>1,920 x 1,080 / 1,280 x 720 / 640 x 360 / 320 x 180 / 160 x 90<br>*2 mega pixel (4 : 3) (30 fps)<br>1,600 x 1,200 / 1,280 x 960 / 800 x 600 / 640 x 480 / 400 x 300 / 320 x 240 / 160 x 120<br>*3 mega pixel (4 : 3) (30 fps)<br>2,048 x 1,536 / 1,280 x 960 / 800 x 600 / 640 x 480 / 400 x 300 / 320 x 240 / 160 x 120<br>* Used by super resolution techniques<br>WV-SFV611L<br>*1.3 mega pixel (16 : 9) (30/60 fps)<br>1,280 x 720 / 640 x 360 / 320 x 180 / 160 x 90<br>*1.3 mega pixel (4 : 3) (30 fps)<br>1,280 x 960 / 800 x 600 / 640 x 480 / 400 x 300 / 320 x 240 / 160 x 120 |
|                                                                                                                                                                                                            | H.264 <sup>4)</sup>                                                                             | Transmission Mode                                                                                                                                                                                                                                                                                                 | Constant bit rate / Variable bit rate / Frame rate priority / Best effort / Advanced VBR                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|                                                                                                                                                                                                            |                                                                                                 | Frame Rate                                                                                                                                                                                                                                                                                                        | 1 / 3 / 5 / 7.5 / 10 / 12 / 15 / 20 / 30 / 60 fps                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|                                                                                                                                                                                                            |                                                                                                 | Bit Rate/Client                                                                                                                                                                                                                                                                                                   | 64 / 128 / 256 / 384 / 512 / 768 / 1,024 / 1,536 / 2,048 / 3,072 / 4,096 / 6,144 / 8,192 / 10,240 / 12,288 / 14,336 / 16,384 / 20,480 / 24,576 kbps                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|                                                                                                                                                                                                            |                                                                                                 | Image Quality                                                                                                                                                                                                                                                                                                     | Low / Normal / Fine                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|                                                                                                                                                                                                            |                                                                                                 | Smart Coding mode                                                                                                                                                                                                                                                                                                 | On / Low / Mid / High / Off (Only when "Variable bit rate" is selected)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|                                                                                                                                                                                                            |                                                                                                 | Refresh Interval                                                                                                                                                                                                                                                                                                  | 0.2 / 0.25 / 0.33 / 0.5 / 1 / 2 / 3 / 4 / 5 s                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|                                                                                                                                                                                                            |                                                                                                 | Transmission Type                                                                                                                                                                                                                                                                                                 | Unicast / Multicast                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |

|                                 |                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                     |
|---------------------------------|------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|
| Network                         | JPEG                               | Image Quality                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 10 steps                                                                                            |
|                                 |                                    | Refresh Interval                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 0.1 fps - 30 fps<br>(JPEG frame rate will be restricted when displaying both JPEG and H.264 images) |
|                                 | Audio Compression                  | Refresh Interval                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Full / Push                                                                                         |
|                                 |                                    | Transmission Type                                                                                                                                                                                                                                                                                                                                                                                                                                                  | G.726 (ADPCM) 32 kbps / 16 kbps, G.711 64 kbps / AAC-LC                                             |
|                                 | Audio Mode                         | On / Mic (Line) Input / Audio output / Interactive (Half duplex) / Interactive (Full duplex)                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                     |
|                                 | Authentication for Audio           | Level 1 only / Level 2 Higher / All users                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                     |
|                                 | Total Bit Rate                     | 64 / 128 / 256 / 384 / 512 / 768 / 1,024 / 1,536 / 2,048 / 4,096 / 8,192 kbps / Unlimited                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                     |
|                                 | Supported Protocol                 | IPv6: TCP/IP, UDP/IP, HTTP, HTTPS, RTP, FTP, SMTP, DNS, NTP, SNMP, DHCPv6, MLD, ICMP, ARP, DNServ<br>IPv4: TCP/IP, UDP/IP, HTTP, HTTPS, RTP, RTSP, RTP, RTSP/RTCP, FTP, SMTP, DHCP, DNS, DDNS, NTP, SNMP, UPnP, IGMP, ICMP, ARP, DNServ                                                                                                                                                                                                                            |                                                                                                     |
|                                 | FTP Client                         | Alarm image transmission, FTP periodic transmission<br>(When the FTP transmission is failed, backup on an optional SDXC/SDHC/SD memory card is available.)                                                                                                                                                                                                                                                                                                         |                                                                                                     |
|                                 | No. of Simultaneous Users          | Up to 14 users (Depends on network conditions)                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                     |
|                                 | SDXC/SDHC/SD Memory Card (Option)  | H.264 recording:<br>Manual REC / Alarm REC (Pre/Post) / Schedule REC / Backup upon network failure<br>JPEG recording:<br>Manual REC / Alarm REC (Pre/Post) / Backup upon network failure<br>* Use the SD memory card that complies with UHS-1 (Ultra High Speed-1) in the class of SD Speed Class 10.                                                                                                                                                              |                                                                                                     |
|                                 | Employment of two SD cards         | Dual Recording for Redundancy<br>Series Recording for long time                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                     |
|                                 | Cellular Phone Compatibility       | JPEG image, AUX control (by access level)                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                     |
|                                 | Mobile Terminal Compatibility      | iPad, iPhone, iPod touch (OS 4.2.1 or later), Android™ mobile terminals                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                     |
|                                 | Alarm                              | Alarm Source                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 3 terminals input, VMD, Command alarm, Audio detection alarm                                        |
| Alarm Actions                   |                                    | SDXC/SDHC/SD memory recording, E-mail notification, HTTP alarm notification indication on browser, FTP image transfer, Panasonic protocol output                                                                                                                                                                                                                                                                                                                   |                                                                                                     |
| Alarm Log                       |                                    | With SDXC/SDHC/SD memory card:<br>Up to 50,000 logs for each SD memory card                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                     |
| Schedule                        |                                    | Alarm / VMD / Access permission / H.264 recording / Scene file                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                     |
| Monitor Output (for adjustment) |                                    | VBS: 1.0 V (p-p)/75 Ω, NTSC / PAL composite, e3.5mm mini jack MONITOR OUT conversion plug included                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                     |
| Input/Output                    | Microphone/Line Input              | MIC IN and Line IN are selectable.<br>e3.5 mm monaural mini jack (monaural input) (Applicable microphone: Plug-in power type)<br>Supply voltage: 2.5 V ±0.5 V                                                                                                                                                                                                                                                                                                      |                                                                                                     |
|                                 | Audio Output                       | Input Impedance: Approx. 2 kΩ (unbalanced)<br>e3.5 mm stereo mini jack (monaural output)<br>Output Impedance: Approx. 800 Ω (unbalanced)                                                                                                                                                                                                                                                                                                                           |                                                                                                     |
|                                 | External I/O Terminals             | ALARM IN (DAY/NIGHT IN), ALARM IN 2 (ALARM CUT), ALARM IN 3 (AUX OUT)                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                     |
| General                         | Safety                             | UL (UL60950-1), C-UL (CAN/CSA C22.2 No.60950-1), CE (IEC60950-1), EMC (Part115 ClassA), IEC60332 ClassA, EN55022 ClassB, EN55024                                                                                                                                                                                                                                                                                                                                   |                                                                                                     |
|                                 | Power Source and Power Consumption | When IR LED is ON<br>WV-SFV631L<br>DC power supply: DC12 V / 1080 mA / Approx. 12.9 W<br>PoE (IEEE802.3at compliant) Device:<br>DC48 V / 270 mA / Approx. 12.95 W (Class 0 device)<br>WV-SFV611L<br>DC power supply: DC12 V / 1010 mA / Approx. 12.1 W<br>PoE (IEEE802.3at compliant) Device:<br>DC48 V / 270 mA / Approx. 12.95 W (Class 0 device)<br>* Maximum power consumption on the camera power input side.<br>** ONLY CONNECT DC12 V CLASS 2 POWER SUPPLY. |                                                                                                     |
|                                 | Ambient Operating Temperature      | -45 °C to +50 °C (-49 °F to 122 °F)                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                     |
|                                 | Ambient Operating Humidity         | 10 to 90 % (the condensation)                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                     |
|                                 | Water and Dust Resistance          | IP68, IEC60529 measuring standard compatible, Type 4X (UL50), NEMA 4X compliant                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                     |
|                                 | Shock Resistance                   | Compliant with 50J IEC60068-2-75                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                     |
|                                 | Dimensions                         | e164 mm x 139 mm (0.65 inches x 5.47 inches) (H x W)<br>* Installing using the base bracket                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                     |
|                                 | Mass (approx.)                     | 1.6 kg (3.53 lbs.)                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                     |
|                                 | Finish                             | Main body: Aluminum die cast, light grey<br>Dome section: Clear polycarbonate resin                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                     |

<sup>1)</sup> Converted value  
<sup>2)</sup> Super Dynamic function is automatically set off on 60 fps mode.  
<sup>3)</sup> Refer to "Notes on Windows Vista® / Windows® 7 / Windows® 8 / Windows® 8.1 / Windows® 10" on the provided CD-ROM for further information about system requirements for a PC and precautions when using Microsoft® Windows 10 or Microsoft® Windows® 8.1 or Microsoft® Windows® 8 or Microsoft® Windows® 7 or Microsoft® Windows Vista®.  
<sup>4)</sup> Transmission for 4 streams can be individually set.

## Overview

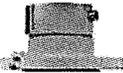
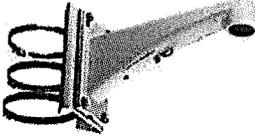
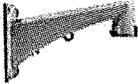
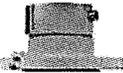
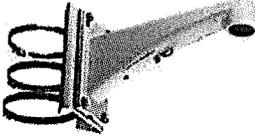
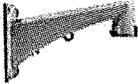
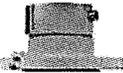
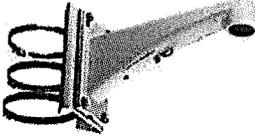
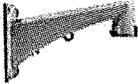
- Up to 2 megapixel resolution
- Standard H.264 video compression with high compression ratio
- Progressive scan CMOS
- Includes Hi-PoE Injector
- High Speed PTZ
- 20x Optical Zoom
- WDR and auto/manual day & night switch
- Weather Proof Rating: IP66
- Video Insight VMS license included



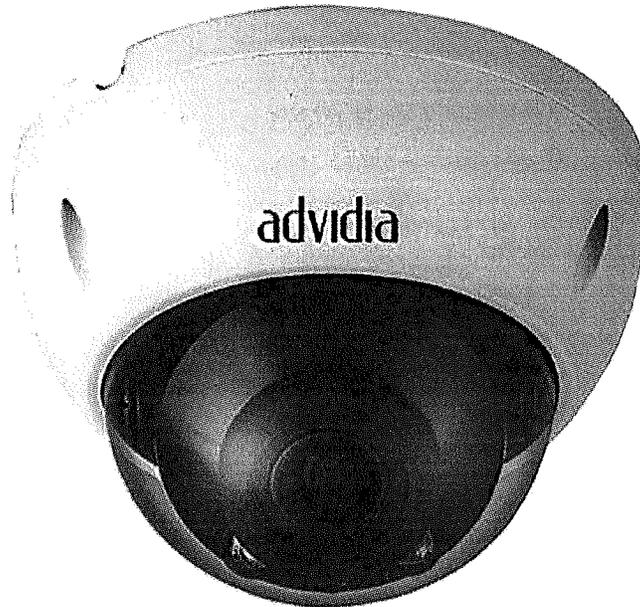
## Technical Specifications

|                             |                                                                                                                        |
|-----------------------------|------------------------------------------------------------------------------------------------------------------------|
| <b>Device</b>               |                                                                                                                        |
| Image Sensor:               | 1/3" Progressive Scan CMOS                                                                                             |
| Min. illumination:          | 0.5 Lux @ F1.6                                                                                                         |
| Shutter Time:               | 50Hz: 1/25-1/10,000s<br>60Hz: 1/30-1/10,000s                                                                           |
| Lens:                       | 4.7 - 9 mm, 20x optical zoom                                                                                           |
| Angle of View:              | 58.3° - 3.2° (Wide-Tele)                                                                                               |
| Mount Options:              | Long-arm wall mount, Corner mount, Pole mount, Power box mount                                                         |
| Zoom Speed:                 | Approx 2.7x(Optical Wide-Tele)                                                                                         |
| Pan Range:                  | 360° endless                                                                                                           |
| Aperture Range:             | F1.6 – F3.5                                                                                                            |
| Day/Night:                  | IR cut filter with auto switch                                                                                         |
| <b>Compression Standard</b> |                                                                                                                        |
| Video Compression:          | H.264/MPEG4                                                                                                            |
| <b>Image</b>                |                                                                                                                        |
| Max. Image Resolution:      | 1920 x 1080                                                                                                            |
| Frame Rate:                 | 50Hz: 25 FPS(1920x1080) 25 FPS(1280x960) 25 FPS(1280x720)<br>60Hz: 30 FPS(1920x1080) 30 FPS(1280x960) 30 FPS(1280x720) |
| <b>Network</b>              |                                                                                                                        |
| Alarm Trigger:              | Motion detection, tampering alarm, network disconnect, IP address conflict, storage exception                          |
| Protocols:                  | IPv4,HTTP,HTTPS,802.1x,Qos,FTP,SMTP,UPnP,SNMP,DNS,DDNS,NTP,RTSP,RTP,TCP,UDP,IGMP,ICMP,DHCP,PPPoE                       |
| Security:                   | User Authentication, reset button, flickerless, dual stream, heartbeat, mirror, watermark                              |
| System Compatibility:       | ONVIF, PSIA, CGI                                                                                                       |

### Technical Specifications

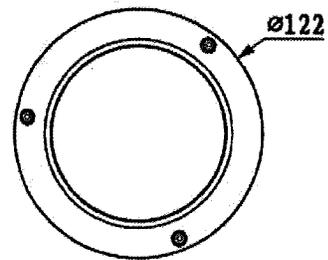
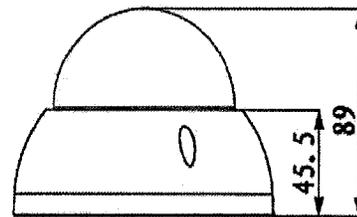
|                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                       |           |          |                                                                                    |                                                                                     |                                                                                      |           |           |          |                                                                                     |                                                                                      |                                                                                       |                  |                |             |                                                                                     |                                                                                      |                                                                                       |
|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|-----------|----------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|-----------|-----------|----------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|------------------|----------------|-------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| <b>Interface</b>                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                       |           |          |                                                                                    |                                                                                     |                                                                                      |           |           |          |                                                                                     |                                                                                      |                                                                                       |                  |                |             |                                                                                     |                                                                                      |                                                                                       |
| Communication Interface:                                                            | 1 RJ45 10 M/100 M Ethernet Interface                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                       |           |          |                                                                                    |                                                                                     |                                                                                      |           |           |          |                                                                                     |                                                                                      |                                                                                       |                  |                |             |                                                                                     |                                                                                      |                                                                                       |
| Reset Button:                                                                       | Yes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                       |           |          |                                                                                    |                                                                                     |                                                                                      |           |           |          |                                                                                     |                                                                                      |                                                                                       |                  |                |             |                                                                                     |                                                                                      |                                                                                       |
| <b>General</b>                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                       |           |          |                                                                                    |                                                                                     |                                                                                      |           |           |          |                                                                                     |                                                                                      |                                                                                       |                  |                |             |                                                                                     |                                                                                      |                                                                                       |
| Operating Conditions:                                                               | -22° F – 149° F (-30°C-65°) (Outdoor Dome) -14° F – 122° F (10°-50°C (Indoor Dome) Humidity 90% or less (non-condensing)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                       |           |          |                                                                                    |                                                                                     |                                                                                      |           |           |          |                                                                                     |                                                                                      |                                                                                       |                  |                |             |                                                                                     |                                                                                      |                                                                                       |
| Power Supply:                                                                       | HI-PoE: 40W max (heater: 20W) HI-PoE injector included 24VAC: 65W max (heater: 5W)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                       |           |          |                                                                                    |                                                                                     |                                                                                      |           |           |          |                                                                                     |                                                                                      |                                                                                       |                  |                |             |                                                                                     |                                                                                      |                                                                                       |
| WDR                                                                                 | 120DB                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                       |           |          |                                                                                    |                                                                                     |                                                                                      |           |           |          |                                                                                     |                                                                                      |                                                                                       |                  |                |             |                                                                                     |                                                                                      |                                                                                       |
| Dimensions:                                                                         | 12.81" × 8.66" Φ (325.37 x 219.96mm)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                       |           |          |                                                                                    |                                                                                     |                                                                                      |           |           |          |                                                                                     |                                                                                      |                                                                                       |                  |                |             |                                                                                     |                                                                                      |                                                                                       |
| Weather Proof Rating                                                                | IP66                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                       |           |          |                                                                                    |                                                                                     |                                                                                      |           |           |          |                                                                                     |                                                                                      |                                                                                       |                  |                |             |                                                                                     |                                                                                      |                                                                                       |
| Weight:                                                                             | 11.02 lbs (5Kg)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                       |           |          |                                                                                    |                                                                                     |                                                                                      |           |           |          |                                                                                     |                                                                                      |                                                                                       |                  |                |             |                                                                                     |                                                                                      |                                                                                       |
| Software:                                                                           | Includes Video Insight VMS License                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                       |           |          |                                                                                    |                                                                                     |                                                                                      |           |           |          |                                                                                     |                                                                                      |                                                                                       |                  |                |             |                                                                                     |                                                                                      |                                                                                       |
|                                                                                     | <table border="0" style="width: 100%; text-align: center;"> <tr> <td>A-200-CM</td> <td>A-200-LPM</td> <td>A-200-PM</td> </tr> <tr> <td></td> <td></td> <td></td> </tr> <tr> <td>A-200-CNR</td> <td>A-200-IFM</td> <td>A-200-WM</td> </tr> <tr> <td></td> <td></td> <td></td> </tr> <tr> <td>A-200-Clear Dome</td> <td>A-200-Parapete</td> <td>A-200-Smoke</td> </tr> <tr> <td></td> <td></td> <td></td> </tr> </table> | A-200-CM                                                                              | A-200-LPM | A-200-PM |  |  |  | A-200-CNR | A-200-IFM | A-200-WM |  |  |  | A-200-Clear Dome | A-200-Parapete | A-200-Smoke |  |  |  |
| A-200-CM                                                                            | A-200-LPM                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | A-200-PM                                                                              |           |          |                                                                                    |                                                                                     |                                                                                      |           |           |          |                                                                                     |                                                                                      |                                                                                       |                  |                |             |                                                                                     |                                                                                      |                                                                                       |
|   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |   |           |          |                                                                                    |                                                                                     |                                                                                      |           |           |          |                                                                                     |                                                                                      |                                                                                       |                  |                |             |                                                                                     |                                                                                      |                                                                                       |
| A-200-CNR                                                                           | A-200-IFM                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | A-200-WM                                                                              |           |          |                                                                                    |                                                                                     |                                                                                      |           |           |          |                                                                                     |                                                                                      |                                                                                       |                  |                |             |                                                                                     |                                                                                      |                                                                                       |
|  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |  |           |          |                                                                                    |                                                                                     |                                                                                      |           |           |          |                                                                                     |                                                                                      |                                                                                       |                  |                |             |                                                                                     |                                                                                      |                                                                                       |
| A-200-Clear Dome                                                                    | A-200-Parapete                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | A-200-Smoke                                                                           |           |          |                                                                                    |                                                                                     |                                                                                      |           |           |          |                                                                                     |                                                                                      |                                                                                       |                  |                |             |                                                                                     |                                                                                      |                                                                                       |
|  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |  |           |          |                                                                                    |                                                                                     |                                                                                      |           |           |          |                                                                                     |                                                                                      |                                                                                       |                  |                |             |                                                                                     |                                                                                      |                                                                                       |

## 3MP Full HD Water-Proof & Vandal-Proof Network IR Dome Camera



### Features

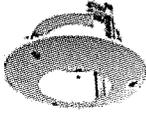
- 1/3" 3Megapixel progressive CMOS
- H.264 & MJPEG dual-stream encoding
- Max 20fps@3M(2304x1296) (2048x1536)&25/30fps@1080P(1920 x1080)
- DWDR, Day/Night(ICR), 3DNR, AWB, AGC, BLC
- 2.7~12mm motorized lens
- Max IR LEDs Length 30m
- IP67, IK10, PoE
- Micro SD card slot, up to 128GB



### Specification

|                          |                                       |
|--------------------------|---------------------------------------|
| Model                    | E-37-V                                |
| Camera                   |                                       |
| Image Sensor             | 1/3" 3Megapixel progressive scan CMOS |
| Effective Pixels         | 2304(H)x1536(V)                       |
| Scanning System          | Progressive                           |
| Electronic Shutter Speed | Auto/Manual, 1/3(4)~1/100000s         |
| Min. Illumination        | 0.1Lux/F1.4 (Color), 0Lux/F1.4(IR on) |
| S/N Ratio                | More than 50dB                        |
| Video Output             | N/A                                   |

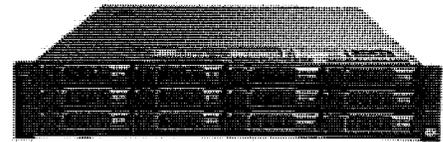
| Camera Features        |                                                                                                                                              |                                    |
|------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|
| Max. IR LEDs Length    | 30m                                                                                                                                          |                                    |
| Day/Night              | Auto(ICR)/Color/B/W                                                                                                                          |                                    |
| Backlight Compensation | BLC / HLC / DWDR                                                                                                                             |                                    |
| White Balance          | Auto/Manual                                                                                                                                  |                                    |
| Gain Control           | Auto/Manual                                                                                                                                  |                                    |
| Noise Reduction        | 3D                                                                                                                                           |                                    |
| Privacy Masking        | Up to 4 areas                                                                                                                                |                                    |
| Lens                   |                                                                                                                                              |                                    |
| Focal Length           | 2.7mm~12mm                                                                                                                                   |                                    |
| Max Aperture           | F1.4                                                                                                                                         |                                    |
| Focus Control          | Auto                                                                                                                                         |                                    |
| Angle of View          | H: 92° ~28°                                                                                                                                  |                                    |
| Lens Type              | Motorized/Fixed Iris                                                                                                                         |                                    |
| Mount Type             | Board-in Type                                                                                                                                |                                    |
| Video                  |                                                                                                                                              |                                    |
| Compression            | H.264/ H.264H/ MJPEG                                                                                                                         |                                    |
| Resolution             | 3M(2304x1296) (2048x1536)/1080P(1920x1080)/1.3M(1280x960)<br>/720P(1280x720)/D1(704x576/704x480)/CIF(352x288/352x240)                        |                                    |
| Frame Rate             | Main Stream                                                                                                                                  | 3M(1 ~ 20fps)/1080P (1 ~ 25/30fps) |
|                        | Sub Stream                                                                                                                                   | D1/CIF(1 ~ 25/30fps)               |
| Bit Rate               | H.264H: 40K ~ 8192Kbps;                                                                                                                      |                                    |
| Audio                  |                                                                                                                                              |                                    |
| Compression            | N/A                                                                                                                                          |                                    |
| Interface              | N/A                                                                                                                                          |                                    |
| Network                |                                                                                                                                              |                                    |
| Ethernet               | RJ-45 (10/100Base-T)                                                                                                                         |                                    |
| Wi-Fi                  | N/A                                                                                                                                          |                                    |
| Protocol               | IPv4/IPv6, HTTP, HTTPS, SSL, TCP/IP, UDP, UPnP, ICMP, IGMP, SNMP, RTSP, RTP, SMTP, NTP, DHCP, DNS, PPPOE, DDNS, FTP, IP Filter, QoS, Bonjour |                                    |
| Compatibility          | ONVIF, CGI                                                                                                                                   |                                    |
| Max. User Access       | 20 users                                                                                                                                     |                                    |
| Auxiliary Interface    |                                                                                                                                              |                                    |
| Memory Slot            | Micro SD , Max 128GB                                                                                                                         |                                    |
| RS485                  | N/A                                                                                                                                          |                                    |
| Alarm                  | N/A                                                                                                                                          |                                    |
| PIR Sensor Range       | N/A                                                                                                                                          |                                    |
| General                |                                                                                                                                              |                                    |
| Power Supply           | DC12V, PoE (802.3af)                                                                                                                         |                                    |
| Power Consumption      | <8.5W                                                                                                                                        |                                    |
| Working Environment    | -30°C~+60°C, Less than 95% RH                                                                                                                |                                    |

|                    |                                                                                                |                                                                                                |                                                                                                 |
|--------------------|------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|
| Ingress Protection | IP67                                                                                           |                                                                                                |                                                                                                 |
| Vandal Resistance  | IK10                                                                                           |                                                                                                |                                                                                                 |
| Dimensions         | φ122mm×89mm                                                                                    |                                                                                                |                                                                                                 |
| Weight             | 0.5kg                                                                                          |                                                                                                |                                                                                                 |
| Accessories        | E-A137-JB<br> | E-B200-FM<br> | E-B203-WM<br> |

**Preloaded Network Video Recorder 2U Rack**

- Easy Installation
- IP Licenses Activated
- Tested and Configured
- Superior US-based Technical Support
- 3 Year Hardware Warranty\*
- Unlimited Software Upgrades for all Video Insight software licenses.

Video Insight NVR's come pre-loaded, activated and tested with the full Video Insight Software Suite. The "plug and play" NVR is ready immediately out of the box for a quick start to record and view you and your customer's cameras.



**Model Specifications**

| MODEL           | TOTAL STORAGE | USABLE STORAGE | RAM | PROCESSOR | POWER SUPPLY |
|-----------------|---------------|----------------|-----|-----------|--------------|
| NVR-R-2-2-48TB  | 48TB          | 39TB           | 8GB | Dual      | Dual         |
| NVR-R-2-2-60TB  | 60TB          | 50TB           | 8GB | Dual      | Dual         |
| NVR-R-2-2-72TB  | 72TB          | 61TB           | 8GB | Dual      | Dual         |
| NVR-R-2-2-84TB  | 84TB          | 66TB           | 8GB | Dual      | Dual         |
| NVR-R-2-2-96TB  | 96TB          | 77TB           | 8GB | Dual      | Dual         |
| NVR-R-2-2-112TB | 112TB         | 88TB           | 8GB | Dual      | Dual         |
| NVR-R-2-2-128TB | 128TB         | 103TB          | 8GB | Dual      | Dual         |

**Server Specifications**

| Component          | Description                                                                                 |
|--------------------|---------------------------------------------------------------------------------------------|
| Processor          | 2 x Intel® Xeon® Processor E5-2603 v3 1.6 HGZ, 15M Cache                                    |
| Chipset            | Intel® C610                                                                                 |
| Memory             | Up to 765GB (24 DIMM slots) 4GB/8GB/16GB/32GB DDR4 up to 2133MT/s                           |
| I/O Slots          | 6x PCIe slots                                                                               |
| Optical Drive      | DVD+/-RW                                                                                    |
| Drive Bays         | Up to sixteen 3.5" drives, two 2.5" drives                                                  |
| Network controller | Broadcom 5720 QP 1GB Network Daughter Card                                                  |
| Power Supply       | Dual, Hot-plug, Redundant Power Supply, 750W                                                |
| Operating System   | Windows 2008 Server (Windows Server 2012 upon request)                                      |
| RAID Configuration | OS (2, 500GB drives RAID 1), Storage configured in RAID 5 or RAID 6 (for 14 or more drives) |
| RAID Controller    | Perc H730 Integrated RAID Controller                                                        |
| Accessories        | Keyboard and Mouse                                                                          |
| Graphic Card       | 2D Matrox® G200 Integrated                                                                  |
| Dimensions         | H: 8.73 cm (3.44 in.) x W: 44.40 cm (17.49 in.) x D: 68.40 cm (26.92 in.)                   |
| Warranty           | Standard Dell® 3 Year next business day onsite service after remote diagnosis               |
| Monitor            | Not Included                                                                                |
| iDrac              | iDrac8 Enterprise                                                                           |

\*Rear drives are special order and requires extra time.

**Warranty terms and conditions:**

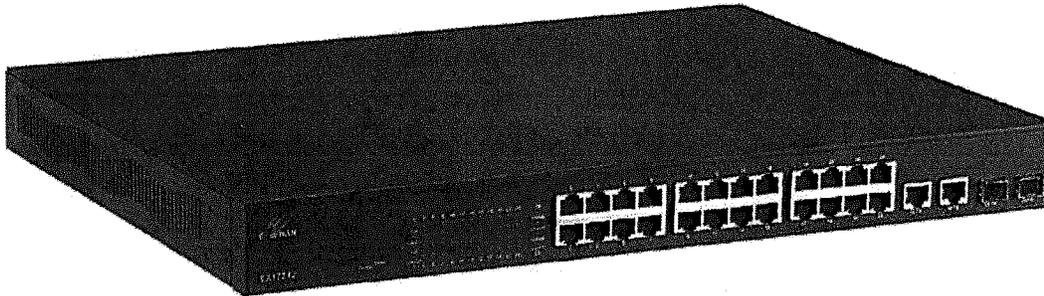
3 Year Dell® Hardware Limited Warranty includes onsite next business day service after telephone diagnosis. User must contact Video Insight for all warranty claims. End user may not be available for Dell onsite warranty. Contact Video Insight for storage warranty claims.

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Video Insight, Inc.  
3Riverway, Suite 700  
Houston, TX 77056  
713.621.9779  
www.video-insight.com  
sales@video-insight.com

# EX17242 Series

Web-smart 24-port 10/100BASE-TX PoE and 2-port combo Gigabit SFP Ethernet Switch



## Overview

EtherWAN's EX17242 provides a 26-port switching platform supporting IEEE802.3af Power over Ethernet, high performance switching with features required for small-business or enterprise environments.

The EX17242 is equipped with 24 10/100BASE-TX PoE ports, in combination with two Gigabit SFP options. The EX17242 is feature rich with full wire speed throughput, QoS support, making the EX17242 Series a powerful network switch.

The IEEE802.3af PoE ports provide up to 15.4W/port with a total power budget of 369.6W or 195W, making the switch truly versatile for connecting with PoE Powered Devices (PD) with different bandwidth and power consumption requirements.

Users are able to access management features such as IP configuration, QoS, VLANs, trunking and via web browser interfaces.

## Spotlight

- **Power over Ethernet**
  - Supports 24-port IEEE802.3af Power over Ethernet (PoE) and Power Sourcing Equipment (PSE)
- **SFP Connectivity**
  - Built-in 2-port combo Gigabit SFP for either Gigabit copper or SFP connectivity
- **Web-Managed Interface**
  - Comprehensive IP configuration, QoS, VLANs and trunking

## Ordering Information

### Model

|          |                                                                                         |
|----------|-----------------------------------------------------------------------------------------|
| EX17242  | Web-smart 24-port 10/100BASE-TX PoE and 2-port combo Gigabit SFP Ethernet Switch (390W) |
| EX17242L | Web-smart 24-port 10/100BASE-TX PoE and 2-port combo Gigabit SFP Ethernet Switch (195W) |

### NOTES:

- \* EX17242 PoE power: 15.4W per port/ 390W per switch
- \* EX17242L PoE power: 15.4W per 12 port or 7.5W per 24 port/195W per switch
- \* Rack mounting kit Included

# Hardware Specifications

## Technology

### Standards

- IEEE802.3 10BASE-T
- IEEE802.3u 100BASE-TX/100BASE-FX
- IEEE802.3ab 1000BASE-T
- IEEE802.3z 1000BASE-SX/1000BASE-LX
- IEEE802.3x Full duplex and flow control
- IEEE802.1p QoS
- IEEE802.3af Power over Ethernet (PoE)

### Forward and Filtering Rate

- 14,880pps for 10Mbps
- 148,810pps for 100Mbps
- 1,488,100pps for 1000Mbps

### Packet Buffer Memory

- 2.75M bits

### Processing Type

- Store-and-forward
- Auto Negotiation
- Half-duplex back-pressure and IEEE802.3x full-duplex flow control
- Auto MDI/MDIX

### Address Table Size

- 4096 MAC addresses

## Power

### Input

- 100 to 240VAC, 50/60Hz

### Power Consumption

- EX17242: 390W Max.; PoE power budget: 369.6W
- EX17242L: 195W Max.; PoE power budget: 180W

### PoE Power Output

- IEEE802.3af: up to 15.4W/port, 47 - 55VDC, 350mA Max

## Mechanical

### Casing

- Metal Case

### Dimensions

- 440mm (W) x 330mm (D) x 44mm (H)  
(17.32" (W) x 13.2" (D) x 1.73" (H))
- Standard 19" rack-mount size, one-unit-height

### Weight

- 4Kg (8.81lbs.)

### Installation

- Rack mounting

## Interface

### Ethernet Port

- 10/100BASE-TX: 24 PoE ports
- Gigabit: 2 ports

### LED Indicators

- Per Unit: Power Status
- Per Port 10/100TX: Link/Activity,
- Per Port PoE: Act/status
- Per Port Gigabit: Link/Activity

## Environment

### Operating Temperature

- 0°C to 45°C (32°F to 113°F)

### Storage Temperature

- -10°C to 70°C (14°F to 158°F)

### Ambient Relative Humidity

- 10% to 95% (non-condensing)

## Regulatory Approvals

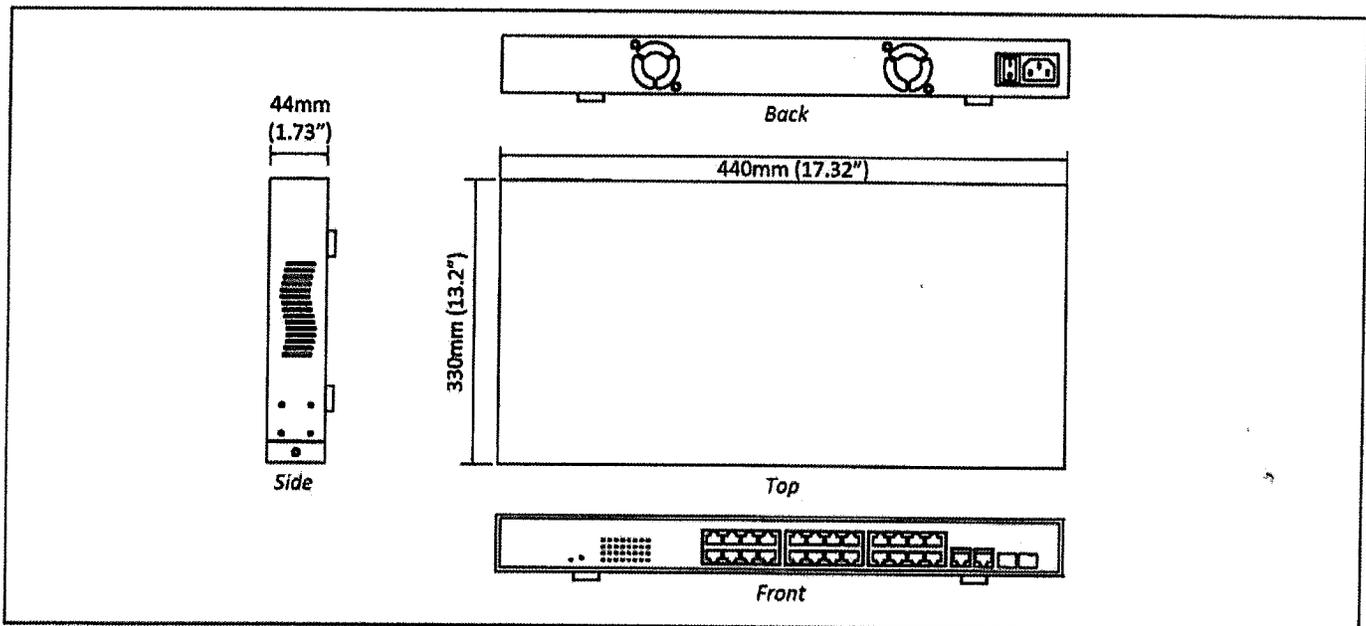
### ISO

- Manufactured in an ISO9001 facility

### EMI

CE Mark Class A, FCC Part 15 ClassA

## Dimensions



MODEL:

# SRWF4U36

## SmartRack® Low-Profile Wall-Mount Rack Enclosure Cabinet



4 Rack Units



2U Patch Panel Bracket



150 lb. Load Rating



Sturdy Steel Construction



Locking Doors & Side Panels



Accommodates Standard 19-inch Equipment



Convenient Cable Access



Adjustable Mounting Rails



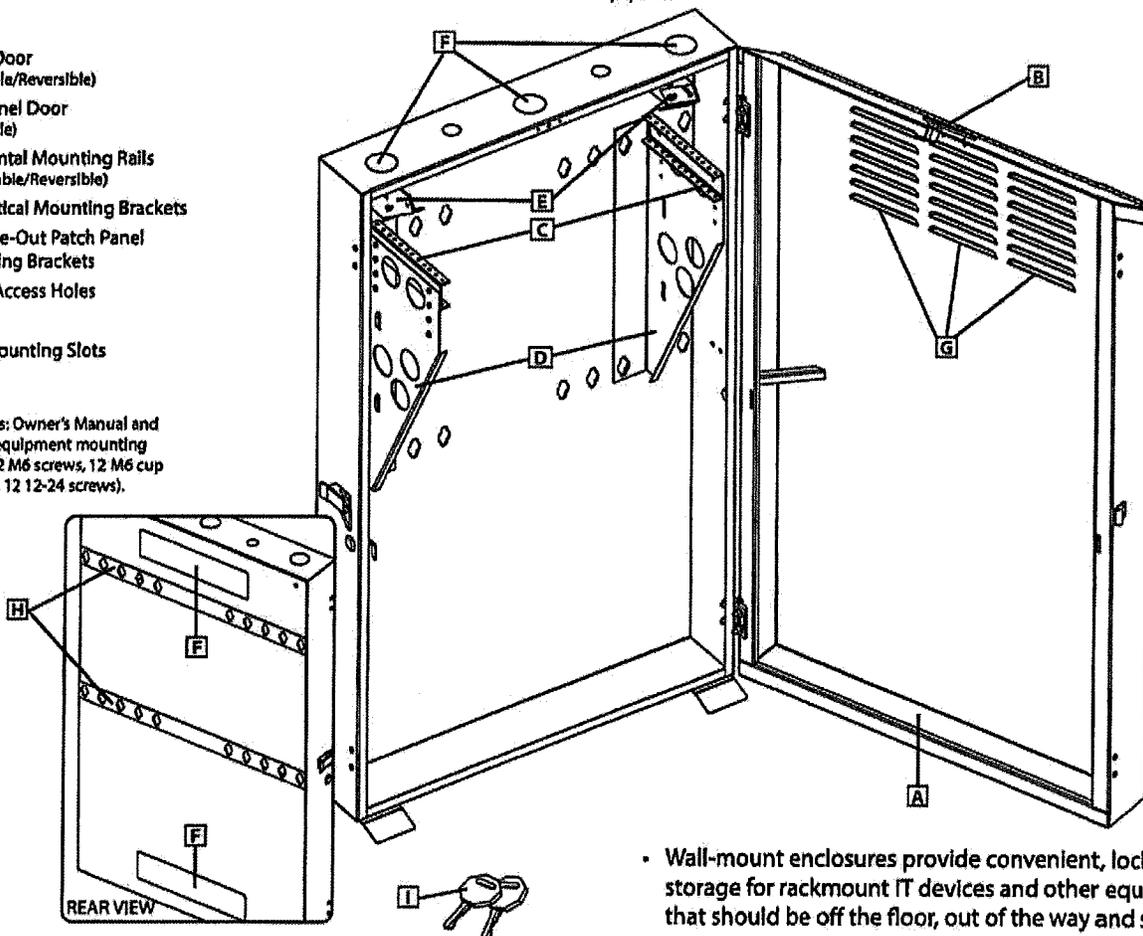
Ventilated for Ample Airflow



Reversible Door

- A** Front Door (Lockable/Reversible)
- B** Top Panel Door (Lockable)
- C** Horizontal Mounting Rails (Adjustable/Reversible)
- D** 5U Vertical Mounting Brackets
- E** 2U Slide-Out Patch Panel Mounting Brackets
- F** Cable Access Holes
- G** Vents
- H** Wall-Mounting Slots
- I** Keys

Also Includes: Owner's Manual and rackmount equipment mounting hardware (12 M6 screws, 12 M6 cup washers and 12 12-24 screws).



- Wall-mount enclosures provide convenient, locking storage for rackmount IT devices and other equipment that should be off the floor, out of the way and secure
- Low-profile design with vertical equipment mounting is ideal for back office or network closet applications where space is limited
- 2U slide-out mounting brackets located at the top of the unit provide space for separate patch panels and allow for easy cable access

SEE NEXT PAGE FOR DETAILED UNIT MEASUREMENTS

### Specifications

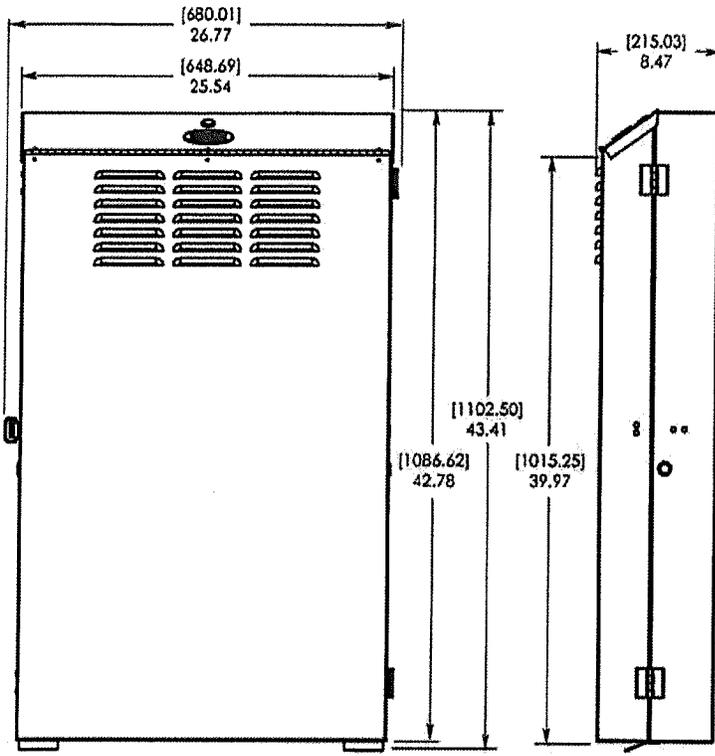


|                                 |                                               |
|---------------------------------|-----------------------------------------------|
| Model                           | SRWF4U36                                      |
| Rack Spaces                     | 4U                                            |
| Equipment Mounting Depth        | Up to 36 in. / 914 mm                         |
| Load Rating*                    | 150 lb. / 68 kg                               |
| Unit Dimensions (H x W x D)     | 43 x 25.6 x 8 in. / 1092 x 650 x 203 mm       |
| Shipping Dimensions (H x W x D) | 48.03 x 31.1 x 13.4 in. / 1220 x 790 x 340 mm |
| Unit Weight                     | 66.13 lb. / 30 kg                             |
| Shipping Weight                 | 73.2 lb. / 33 kg                              |
| Standards                       | Tested to EIA-310-E, NOM, RoHS, PCI-DSS       |

\* The load rating includes the combined weight of the unit and installed equipment. The unit must be mounted to a stable surface with user-supplied anchors capable of bearing the full load.

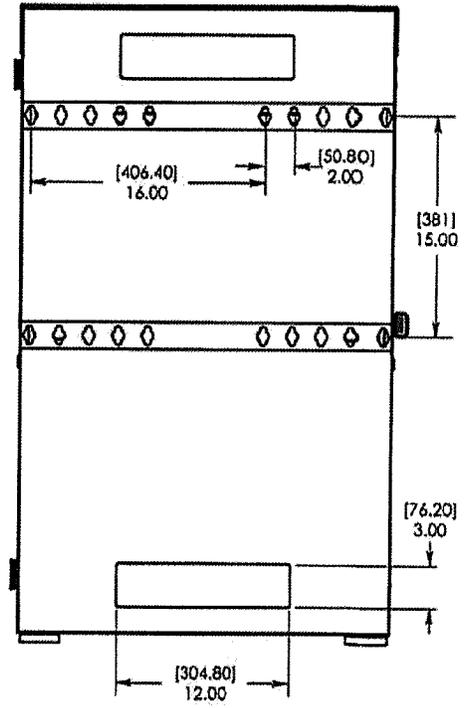


1111 W. 35th Street  
Chicago, IL 60609 USA  
773.869.1234  
www.tripplite.com

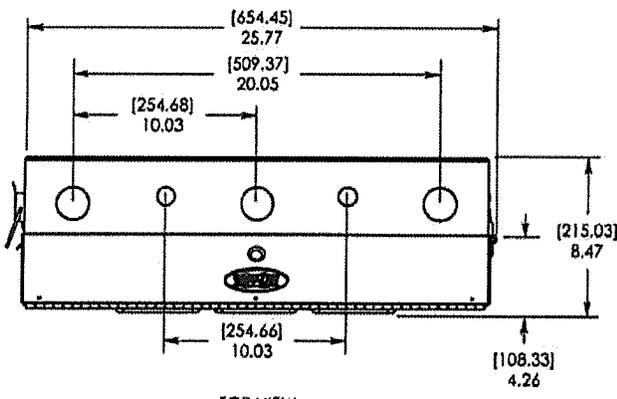


FRONT VIEW

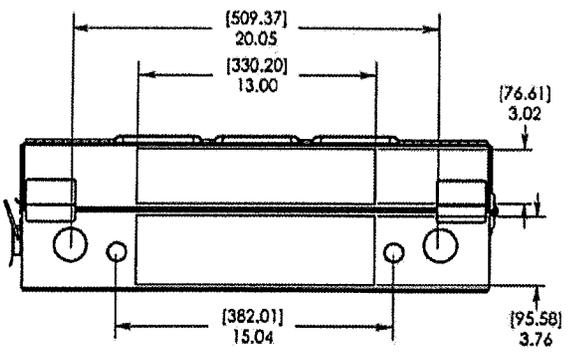
SIDE VIEW



REAR VIEW



TOP VIEW



BOTTOM VIEW

MODEL:  
**SRWF4U36**

**TRIPP-LITE**

1111 W. 35th Street  
Chicago, IL 60609 USA  
773.869.1234  
www.tripplite.com

Dimensions: [mm] INCHES

Tripp Lite has a policy of continuous improvement. Specifications are subject to change without notice.



**MASTER**  
*Inc.*  
**ELECTRIC**

**Electrical Contracting  
Technology Systems Integrating**

**Corporate Office:**  
2350 W. M-18  
Gladwin, MI 48624  
Ph. (989) 426-9860  
Fax (989) 426-9862

**Upper Michigan Office:**  
2205 North 19<sup>th</sup> St.  
Escanaba, MI 49829  
Ph. (906) 786-4600  
Fax (906) 786-4972

[www.masterelectricinc.net](http://www.masterelectricinc.net)

**Trade Contractor Qualification**

MASTER ELECTRIC, INC.  
TRADE CONTRACTOR QUALIFICATION FORM

Legal Name of Business: Master Electric, Inc.  
 Address: 2350 W. M-61 PO Box 404 Gladwin, MI 48624  
 Telephone No: 989-426-9860 Fax No: 989-426-9862  
 Contact Person: Jim Conger E-mail: jim@masterelectricinc.net  
 Corporation  Partnership  Individual  Joint Venture  Other  
 If Incorporated, State of Incorporation: Michigan  
 Federal ID No: 20-3578954 Duns No: 612258801  
 Average Number of Employees Office: 17 Field: 50-70  
 Labor Relations: Union  Open Shop   
 Your company is certified as: Woman Owned Business

Does your company have a written EEO policy? Yes  No

List company officers:

| Name       | Title          | Years with Organization |
|------------|----------------|-------------------------|
| Beth Smith | C.E.O.         | 12                      |
| Russ Smith | President      | 12                      |
| Doug Smith | Vice-President | 12                      |

State the type of work in which you specialize and regularly perform with your own personal:

Design Assist, CCTV, Access Control, Data & Fiber Cabling, Audio Visual, Communications, Public Address, Sound, and Security System

**FINANCIAL**

Bank Reference and Contact: Comerica Bank, Russ Mathews

Telephone: 989-839-2209

Amount of Line of Credit: \$4,000,000.00 Secured?: Yes  No

Is your company currently in default on any loan agreement or financial agreement with any bank, financial institution or other entity? (If yes, attach details) Yes  No

**BONDING INFORMATION**

If not bonded, furnish a signed statement of surety certifying the following:

Current Bonding Capacity of Company: Aggregate: \$25,000,000 Single: \$15,000,000

Amount of Work Currently Bonded: \_\_\_\_\_ Bond Rate: \_\_\_\_\_

MASTER ELECTRIC, INC.  
TRADE CONTRACTOR QUALIFICATION FORM

Name of Bonding Company: Philadelphia Indemnity Co. Rating: A

Name of Bonding Agent: Valenti, Trobec, Chandler, Inc.

Telephone: 248-828-3377 Length of Time with Bonding Company: 10 years

Have Performance or Payment Bond claims ever been made to a surety? Yes  No

Current capacity exists to cover the amount of this contract? Yes  No

**INSURANCE**

Experience Modification Rating (EMR) for the last three years: .76 .82 .82

**SAFETY**

Does your company have a written Safety Program? Yes  No

Does your company have a Substance Abuse Program? Yes  No

Does your company have a safety officer? Yes  No

If yes, provide name: Charlie Trumble, C.O.S.S.

Does your company hold weekly "tool box talk" meetings? Yes  No

Does your company provide foreman safety training? Yes  No

If yes, how often? Monthly

Does your company conduct safety inspections? Yes  No

If yes, how often? Bi-Weekly

Does your company give orientation/safety instructions to new hires? Yes  No

In the past three years, has your company been cited by state or federal OSHA for any willful violations? Yes  No

In the past three years, has your company experienced any employee fatalities? Yes  No

**EXPERIENCE**

List below three suppliers references:

| Supplier          | Project  | Contact      | Phone        | Amount Annually |
|-------------------|----------|--------------|--------------|-----------------|
| Standard Electric | Multiple | Vern Weber   | 989-497-2110 | \$ 1,500,000.00 |
| ADI               | Multiple | Kenny Bishop | 989-790-5000 | \$ 184,000.00   |
| CSC               | Multiple | Vince Lipari | 586-276-6306 | \$ 200,000.00   |

MASTER ELECTRIC, INC.  
TRADE CONTRACTOR QUALIFICATION FORM

Have you been deemed to be in default on any contract? Yes \_\_\_\_\_ No X  
Have you failed to complete any work awarded to you? Yes \_\_\_\_\_ No X  
Have you ever been adjudged bankrupt or filed a petition in bankruptcy? Yes \_\_\_\_\_ No X  
Have you filed any lawsuits or requested arbitration? Yes \_\_\_\_\_ No X

List the three most significant contracts completed or in progress

Name: Gus Harrison Correctional Facility Amount of work: \$1,958,751.00

Address: 2727 E. Beecher St Adrian, MI 49221

Contact: Bret Emerson Telephone: 616-433-7210

Description of work: Video Management and Perimeter Surveillance Enhancements

Date of Completion: Anticipated Jan 2017

Name: Chippewa County War Memorial Hospital Amount of work: \$241,582.00

Address: 500 Osborn Blvd Sault Ste Marie, MI 49783

Contact: Don Hendershot Telephone: \_\_\_\_\_

Description of work: IP CCTV and Access Control

Date of Completion: Summer 2016

Name: Forest Hills Public Schools Amount of work: \$315,549.98

Address: 6590 Casacade Rd SE Grand Rapids, MI 49546

Contact: \_\_\_\_\_ Telephone: \_\_\_\_\_

Description of work: Wireless LAN Cabling and Single Mode Fiber

Date of Completion: December 2016

As an Authorized Representative for Master Electric, Inc. I hereby certify that the answers to the foregoing questions, and all documents contained herein, are true and correct. I understand that submission of this information is in no way a guarantee of contract award and that the information is provided for review and evaluation purposes only.

Douglas E Smith  
(Signature)

Douglas E Smith

(Above name typed or printed)

December 20, 2016

(Date)

Vice President

(Title)

## **References**

### **Construction Manager / General Contractors:**

**Robert LaLonde**  
Clark Construction  
3535 Moores River Dr.  
Lansing, MI 48911  
(517) 372-0940

**Trace Hendrick**  
R.C. Hendrick & Son  
2885 S. Graham Rd.  
Saginaw, MI 48609  
(989) 781-8116

### **Clients / Owner Representatives:**

**Dale Klimmek**  
Saginaw Valley State  
University  
7400 Bay Rd  
University Center, MI 48710  
(989) 964-4915

**Ed Vallad**  
State of Michigan, MDOC  
206 E. Michigan Ave.  
P.O. Box 30003  
Lansing, MI 48909  
517.373.4569

### **Vendor Partners:**

**Kevin McIntyre**  
Standard Electric Company  
2650 Trautner Dr.  
Saginaw, MI 48603  
(989) 297-9354

**Phil Bowen**  
Siemens Industry, Inc.  
Building Technologies Division  
45470 Commerce Center Dr  
Plymouth, MI 48170  
(734) 233-5728

# Project Management

## **Workforce**

Master Electric, Inc. has a solid Project Management Team that works like a well oiled machine. We take great pride in providing quality work, whether in the office or on-site managing a job. Our team strives to meet and exceed our customers' expectations. Two of our most important objectives to managing a successful project are: "keeping on schedule" and "communicating effectively with the Owner".

To ensure schedule adherence, Master Electric's on-site Foreman and our Project Management Team work together to complete the scope of work prior to the projected completion date. We take a proactive approach to solving schedule delays by preparing "Two-Week Look Ahead Schedules". During this look ahead process, the Foreman and Project Manager will forecast which work tasks they hope to accomplish, what materials and equipment will be needed and how the labor force will be assigned to accomplish the two week goal. The Two-Week Look Ahead Schedule is then submitted to the Owner for review and comment. At this time, any possible workflow issues can be resolved before work progresses into this two-week phase.

The two-week forecast is a great tool that forces our Foreman to plan ahead, eliminate roadblocks and prevent unforeseen obstacles from keeping the project on schedule.

## **Pre Construction**

Master Electric has been preparing cost estimates using "Estimation Logistics" software. Linked into Estimation is "Trade Service", an online guide that offers daily updated market pricing for electrical materials. Together, these two systems form the base estimate for total labor and miscellaneous materials based on the estimator's input of quantities and task units.

After the base estimate is calculated package pricing is let out to our vendor partners for competitive bid and value-added alternates. Once the package pricing is entered into Estimation, the system generates a project cost total based on the total labor, miscellaneous materials and package pricing.

Estimation is flexible and allows us to build a uniquely structured pricing layout for the individual parameters of each bid package. Estimation Logistics has been completely reliable and henceforth, Master Electric consistently submits competitive bid proposals to Owners.

## **Labor**

Master Electric currently employs licensed electricians, data technicians and state-registered apprentices. All of our employees are members of the International Brotherhood of Electrical Workers. Many have completed either a three year or five years in the National Joint Apprenticeship Training program. All of our workforce complete an annual code update requirements.

All of our foreman and most of our apprentices carry several safety certifications: OSHA 30, OSHA 10, Lead Paint Awareness, Asbestos Awareness, Aerial lift certification, Great Lakes Safety certification, First Aid and CPR certification, to name a few. We enforce random drug testing, safe driving records, and background check clearance. We mandate that each employee attend weekly safety meetings held on every Master Electric job site. We have zero tolerance for unsafe work practices and expect complete compliance with our Safety Policies.

Master Electric is a union contracting company and employs local licensed electricians and data technicians to help install our projects under the watchful eyes of our onsite management team.

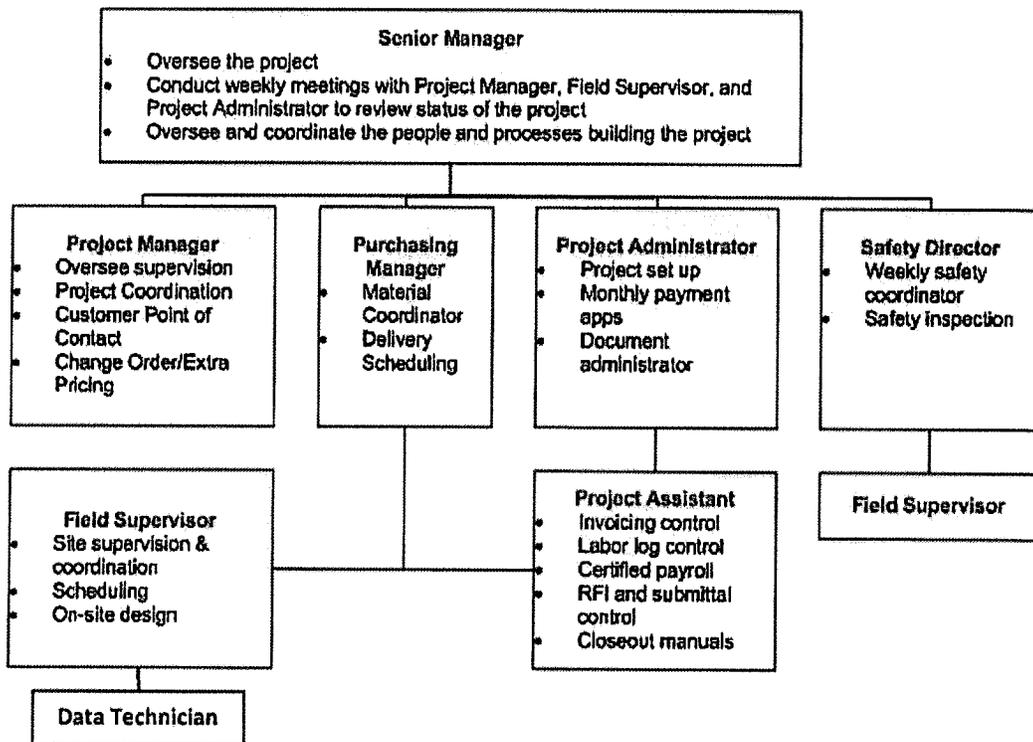
## **Affiliations:**

- National Electrical Contractors Association
- Signatory with International Brotherhood of Electrical Workers
- Michigan Business & Professionals Association
- Self-Certified Woman-Owned Business Enterprise
- Federal Government Contractor (SAM Registered)
- Certified in
  - Hubbell
  - Panduit
  - Belden
  - Isonas
  - Video Insight
  - Panasonic
- infoComm International Member
- ADI AV Elite Dealer

## Project Management Team

Our project management team chart below shows what type of responsibilities each of our team members manage on a day to day basis for our projects.

### Master Electric's Project Management Team





**WINDEMULLER**

*Partners in your success*

December 20, 2016

City of Traverse City  
Julie Dalton  
jdalton@traversecitymi.gov

**PROJECT:** TCPS - Cameras  
**SUBJECT:** Scope Letter - Proposal TAS16-205

Dear Julie Dalton,

This proposal is for material and labor to complete the following:

1. Old Town Parking Garage: **Base Bid**
  - a. The installation of (14) new Axis IP CCTV cameras per the spreadsheet in the RFP.
    - i. All Salient camera licenses are included for the new cameras, plus the (9) existing CCTV cameras currently installed. (30) Total licenses are included for this site, giving you a few extra for additional future cameras.
    - ii. The new cameras are a mix of outdoor rated PTZ cameras, outdoor rated fixed dome cameras, and indoor rated fixed dome cameras.
  - b. The installation of all Ethernet cabling to the (14) camera locations.
  - c. The installation of an Adtran 24 port POE Network switch.
  - d. All PVC conduit needed for the Ethernet cables, is included.
  - e. The installation of a NVR (Network Video Recorder) Server for this site.
    - i. Server is sized for (30) cameras, storage for thirty days.
  - f. All system programming is included.
  - g. All system training is included.
2. Hardy Parking Garage: **Base Bid**
  - a. The installation of (26) new Axis IP CCTV cameras per the spreadsheet in the RFP.
  - b. All Salient camera licenses are included for the new cameras, plus the (1) existing CCTV cameras currently installed. (30) Total licenses are included for this site, giving you a few extra for additional future cameras.
  - c. The new cameras are a mix of outdoor rated PTZ cameras, outdoor rated fixed dome cameras, and indoor rated fixed dome cameras.
  - d. The installation of all Ethernet cabling to the (26) camera locations.
  - e. The installation of an Adtran 48 port POE Network switch.

**AUTOMATION | COMMUNICATIONS & IT | ELECTRICAL | OUTDOOR UTILITIES | RENEWABLE ENERGY**

Corporate Headquarters: 1176 Electric Avenue - Wayland, MI 48348 | 800.333.2641 | 616.877.8770  
Mid-Michigan Branch: 2000 Venture Drive - Midland, MI 48640 | 659.631.2023  
Northern Michigan Branch: 1714 Northern Star Drive - Traverse City, MI 49696 | 800.891.5319 | 231.945.4800  
Office Locations: Big Rapids | Grand Rapids | Kalamazoo | Midland | Potosky | Traverse City | Whitehall

[windemuller.us](http://windemuller.us)



**WINDEMULLER**

*Partners in your success*

- f. All PVC conduit needed for the Ethernet cables, is included.
  - g. The installation of a NVR (Network Video Recorder) Server for this site.
  - h. Server is sized for (30) cameras, storage for thirty days.
  - i. All system programming is included.
  - j. All system training is included
3. Opera House: **Base Bid**
- a. Integration of the existing CCTV camera into the new Salient Server.

The total cost for the **Base Bid items** above described work is \$112,635.00, including sales tax. This proposal is valid for 30 days.

---

4. Additional Locations: Add On / Optional
- a. The installation of (2) CCTV cameras at the Old Town Parking Garage.
  - b. The installation of (2) CCTV cameras at the Hardy Parking Garage.

The total cost for the **Add On / Optional** items above described work is \$11,264.00, including sales tax. This proposal is valid for 30 days.

---

5. Option 1:
- a. **Windemuller is not providing pricing for Option 1 at this time.**
- 

Thank you for the opportunity to provide a proposal for your requirements. If you have any questions, please feel free to contact us.

Sincerely,

Tim Stoudt

**AUTOMATION | COMMUNICATIONS & IT | ELECTRICAL | OUTDOOR UTILITIES | RENEWABLE ENERGY**

Corporate Headquarters: 1176 Electric Avenue - Wyand, MI 48194 | 800.333.3641 | 816.877.8770

Mid Michigan Branch: 2036 Venture Drive - Midland, MI 48640 | 989.431.2023

Northern Michigan Branch: 1714 Northern Star Drive - Traversa City, MI 49786 | 631.891.6319 | 231.935.4900

Office Locations: Big Rapids | Grand Rapids | Kalamazoo | Midland | Petoskey | Traversa City | Whitehall

[windemuller.us](http://windemuller.us)

**Bid Tabulation Sheet**

You must complete and include this sheet with your proposal.

| Item Number |                                                                                                                                                     | Response                                                    |
|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|
| 1           | What is the name (company) of the camera system you are recommending?                                                                               | AXIS                                                        |
| 2           | Is the camera solution you are proposing a TCPS-hosted solution, vendor-hosted solution, or both?                                                   | TCPS - HOSTED                                               |
| 3           | Are the existing cameras able to be reused with the proposed solution?                                                                              | YES - REUSED                                                |
| 4           | How much is the main server or hosted solution fees (one-time purchase, monthly subscription, or other)?                                            | ONE-TIME PURCHASE                                           |
| 5           | Did you attach the server specification and storage cut-sheet?                                                                                      | NO - AVAILABLE UPON REQUEST.                                |
| 6           | What is the per camera cost?                                                                                                                        | THIS VARIES, 3 TYPES PLANNED.                               |
| 7           | Did you attach the camera specification cut-sheet?                                                                                                  | YES                                                         |
| 8           | Does the solution you are providing require annual fees, subscription fees, maintenance or upgrade fees? Please list all fees.                      | CAMERA LIC FEES ARE REQUIRED FOR CAMERA ADDS. (60 INCLUDED) |
| 9           | How many additional cameras may be purchased and added to the system before additional server space, hardware or devices will need to be purchased? | SYSTEM HAS (60) CAM LICENSES INCLUDED. (9 ADDITIONAL CAMS)  |
| 10          | Do you offer a maintenance agreement? What is included in the maintenance agreement?                                                                | YES                                                         |
| 11          | What are the additional fees and costs associated with Option 1 (from attached chart)                                                               | N/A<br>SEE BID SCOPE LETTER                                 |
| 12          | See #9, if Option 1 (from attached chart) is purchased, is there still additional capacity to add more cameras.                                     | BASE SYSTEM HAS ROOM FOR 9 ADDITONAL CAMS.                  |

**Bidder - Please complete and return**

**BID SUMMARY**

**TITLE: TRAVERSE CITY PARKING SERVICES – CAMERA SYSTEM**

**DUE DATE: TUESDAY, NOVEMBER 29, 2016 @ 4:00 PM**

Having carefully examined the attached specifications and any other applicable information, the undersigned proposes to furnish all items necessary for and reasonably incidental to the proper completion of this bid. Bidder submits this bid and agrees to meet or exceed all requirements and specifications unless otherwise indicated in writing and attached hereto.

Bidder certifies that as of the date of this bid the Company or he/she is not in arrears to the City of Traverse City for debt or contract and is in no way a defaulter as provided in Section 152, Chapter XVI of the Charter of the City of Traverse City.

Bidder understands and agrees, if selected as the successful Bidder, to accept a Purchase Order / Service Order / Contract and to provide proof of the required insurance.

Bidder submits this bid and agrees to meet or exceed all the City of Traverse city's requirements and specifications unless otherwise indicated in writing and attached hereto. Bidder shall comply with all applicable federal, state, local and building codes, laws, rules and regulations and obtain any required permits for this work.

The Bidder certifies that it is in compliance with the City's Nondiscrimination Policy as set forth in Administrative Order No. 47 and Chapter 605 of the City's Codified Ordinances.

The Bidder certifies that none of the following circumstances have occurred with respect to the Bidder, an officer of the Bidder, or an owner of a 25% or more share in the Bidder's business, within 3 years prior to the bid:

- (a) conviction of a criminal offense incident to the application for or performance of a contract;
- (b) conviction of embezzlement, theft, forgery, bribery, falsification or destruction of records, receiving stolen property, or any other offense which currently, seriously and directly reflects on the Bidder's business integrity;
- (c) conviction under state or federal antitrust statutes;
- (d) attempting to influence a public employee to breach ethical conduct standards; or
- (e) conviction of a criminal offense or other violation of other state, local, or federal law, as determined by a court of competent jurisdiction or an administrative proceeding, which in

the opinion of the City indicates that the bidder is unable to perform responsibility or which reflects a lack of integrity that could negatively impact or reflect upon the City of Traverse City, including but not limited to, any of the following offenses or violations of:

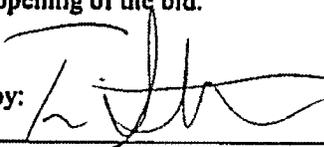
- i. The Natural Resources and Environmental Protection Act.
- ii. A persistent and knowing violation of the Michigan Consumer Protection Act.
- iii. Willful or persistent violations of the Michigan Occupational Health and Safety Act.
- iv. A violation of federal, local, or state civil rights, equal rights, or non-discrimination laws, rules, or regulations.
- v. Repeated or flagrant violations of laws related to the payment of wages and fringe benefits.

(f) the loss of a license or the right to do business or practice a profession, the loss or suspension of which indicates dishonesty, a lack of integrity, or a failure or refusal to perform in accordance with the ethical standards of the business or profession in question.

Bidder understands that the City reserves the right to accept any or all bids in whole or part and to waive irregularities in any bid in the best interest of the City. The bid will be evaluated and awarded on the basis of the best value to the City. The criteria used by the City may include, but will not be limited to: ability, qualifications, timeframe, experience, price, type and amount of equipment, accessories, options, insurance, permits, licenses, other pertinent factors and overall capability to meet the needs of the City. The City is sales tax exempt – Government.

Bidder agrees that the bid may not be withdrawn for a period of sixty (60) days from the actual date of the opening of the bid.

Submitted by:

  
\_\_\_\_\_  
Signature  
TIM A STOUDT ACCOUNT MANAGER  
\_\_\_\_\_  
Name and Title (Print)  
231-935-4800 231-935-4805  
\_\_\_\_\_  
Phone Fax

WINDEMULLER ELECTRIC INC.  
\_\_\_\_\_  
Company Name  
1301 BUSINESS PARK DR.  
\_\_\_\_\_  
Company Address  
TRAVERSE CITY MI 49686  
\_\_\_\_\_  
City, State, Zip  
CORPORATION  
\_\_\_\_\_  
Sole proprietorship/partnership/corporation  
MICHIGAN  
\_\_\_\_\_  
If corporation, state of corporation

**REFERENCES: (include name of organization, contact person, and daytime phone number).**

1. SUTTONS BAY PUBLIC SCHOOLS

Contact Person: TIM SMITH Telephone: 231-866-0003

2. MAGNA ELECTRONICS TECHNOLOGY

Contact Person: JOSH McCLEAR Telephone: 810-606-8688

3. LEXAMAR CORPORATION

Contact Person: JASON SNIDER Telephone: 231-439-1253

**SUBCONTRACTORS: (include name of organization, contact person, daytime phone number, and services to be performed).**

1. N/A

Contact Person: \_\_\_\_\_ Telephone: \_\_\_\_\_

Services to be Performed: \_\_\_\_\_

2. N/A

Contact Person: \_\_\_\_\_ Telephone: \_\_\_\_\_

Services to be Performed: \_\_\_\_\_

3. N/A

Contact Person: \_\_\_\_\_ Telephone: \_\_\_\_\_

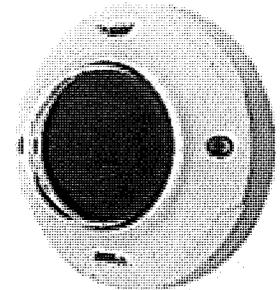
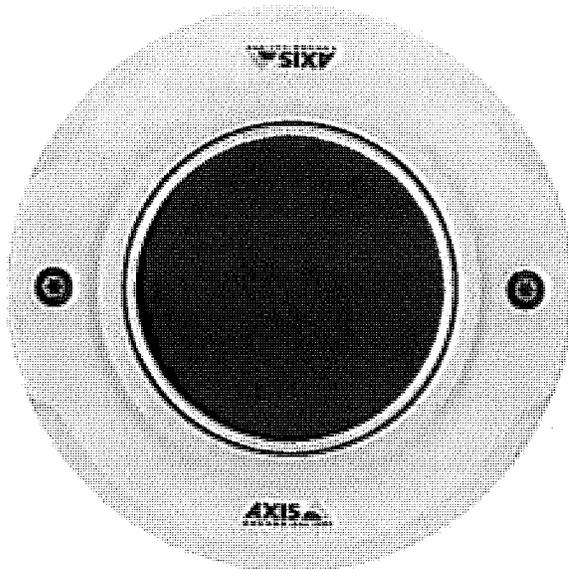
Services to be Performed: \_\_\_\_\_

## AXIS M3046-V Network Camera

Quad HD / 4 MP fixed mini dome with HDMI and wide view

AXIS M3046-V is an affordably priced, indoor fixed dome that provides 4 MP video. WDR ensures that details are visible both in dark and bright areas. HDMI support enables live streaming to an HDTV monitor for public viewing. The camera supports video analytics such as people counting. AXIS M3046-V can also be used as an alternative to a camera with varifocal lens – its 4MP resolution and digital PTZ capability enable sharp, cropped out views in HDTV 1080p, for example, with a horizontal field of view between 95° and 128°. No manual focusing is needed since the camera comes factory-focused.

- > Ultra-compact, vandal- and dust-resistant design
- > Digital PTZ and multi-view streaming
- > HDMI support enables streaming to a monitor
- > Axis' Zipstream technology for reduced bandwidth and storage
- > Axis' Corridor format & 3-axis camera angle adjustment



## **AXIS P3225-LV Mk II Network Camera**

Streamlined HDTV 1080p fixed dome for any light conditions

AXIS P3225-LV Mk II is a streamlined fixed dome that provides HDTV 1080p video. It features a varifocal lens and remote zoom and focus, which eliminates the need for hands-on fine tuning. Equipped with WDR – Forensic Capture to handle scenes with strong variations in light, Lightfinder technology for exceptional light sensitivity, as well as built-in IR illumination with OptimizedIR, this versatile camera provides outstanding video quality in any light conditions. It supports Axis' Zipstream technology that significantly reduces bandwidth and storage requirements.

- > **HDTV 1080p video quality**
- > **Remote zoom and focus**
- > **Lightfinder and WDR – Forensic Capture**
- > **OptimizedIR illumination**
- > **Axis' Zipstream technology**



## **AXIS P5635-E Mk II PTZ Dome Network Camera**

### **HDTV 1080p PTZ with 30x zoom and focus recall**

AXIS P5635-E Mk II is a cost-effective, outdoor-ready HDTV 1080p camera with 30x optical zoom for high-definition video surveillance of large areas. It features continuous 360° pan for fast camera repositioning and continuous tracking of objects. The focus recall feature offers instant focus in predefined areas, while the day/night functionality and WDR provide great image quality even in complex light conditions. It offers shock detection, video motion detection, Advanced Gatekeeper and electronic image stabilization. Axis' Zipstream technology significantly reduces bandwidth and storage requirements. It supports two-way audio, I/O ports, an SD card slot, PoE+ and 24 V AC/DC.

- > **Continuous 360° pan**
- > **Excellent light sensitivity**
- > **HDTV 1080p and 30x optical zoom**
- > **Focus recall**
- > **Axis' Zipstream technology**



# Traverse City Parking Services

Project Location

## **Traverse City Parking Services**

125 East Eighth St (Old Town Parking Garage)

303 East State St (Hardy Parking Garage)

Traverse City, MI 49684

## **S101 - Traverse City Parking - Parking Garage Cameras (4 Optional Cameras)**

Proposal No: 66959.1

December 16, 2016

Prepared For  
**Nicole VanNess**



8215 Ronda Drive  
Canton, MI 48187  
MI - Alarm: L911826

The data contained in all pages of this proposal has been submitted in confidence and contains trade secrets and/or privileged or confidential commercial or financial information. Such data shall be used or disclosed only for evaluation purposes, provided that if a contract is awarded to this proposer as a result of or in connection with the submission of this proposal, the Customer shall have the right to use or disclose the data herein to the extent provided in the contract. This restriction does not limit the customer's right to use or disclose data obtained without restriction from any source, including the proposer.



Security 101 - Detroit  
8215 Ronda Drive  
Phone: 734-237-8317  
Website: [www.Security101.com](http://www.Security101.com)

December 16, 2016

Nicole VanNess  
Traverse City Parking Services  
125 East Eighth St (Old Town Parking Garage)  
303 East State St (Hardy Parking Garage)  
Traverse City, MI 49684

Re: Video System and Other System Proposal

Dear Nicole VanNess:

Thank you for allowing Security 101 the opportunity to present this proposal for your consideration. This proposal is based on our discussions, meetings, site surveys, and bid documents created by your organization.

Our company is uniquely qualified to provide the installation and service required for the above referenced security system. Security 101 has an established track record of installing and maintaining similar systems as well as meeting strict time schedules and budget requirements.

Our engineering and project management staff have worked together with me to create this proposal. This team will be prepared to deliver your installation in an organized and professional manner. Our installation crews and service technicians will be uniformed, trained, and in company stocked vehicles.

In addition, upon completion of the installation, our service department staff will be ready to provide you with same day service utilizing our unique computerized dispatch system.

Finally, although most of the work to be done will be executed by other team members, I will be committed to monitoring the process and making sure that your system meets or exceeds your expectations.

Mike Johnson  
Account Executive

[mjohnson@security101.com](mailto:mjohnson@security101.com)  
Phone: 269-760-5790



# Scope of Work

Proposal 66959.1 S101 - Traverse City Parking - Parking Garage

## Video System

### Head Ends

#### Head End #1: Hardy Parking Garage Head End

- Other (1) Materials: Conduit Stub provided by S101
- Other (1) Additional Part: 48PRT C5E HD PATCH PANEL T568B
- Other (1) Additional Part: Axis Camera Station S1032 Recorder rack server validated and tested with AXIS products. Preloaded with AXIS Camera Station software with preconfigured AXIS Camera Station settings and all other necessary software e.g. Windows 10IoT. Includes licenses for 32 channels, three year hardware warranty and on-site hardware replacement service.
- Notes This proposal assumes that customer to provide POE switch with room for additional cameras This proposal assumes that customer to provide rack with room for server and patch panel

#### Head End #2: Old Town Parking Garage Head End

- Other (1) Materials: Conduit Stub provided by S101
- Other (1) Additional Part: 48PRT C5E HD PATCH PANEL T568B
- Other (1) Additional Part: Axis Camera Station S1032 Recorder rack server validated and tested with AXIS products. Preloaded with AXIS Camera Station software with preconfigured AXIS Camera Station settings and all other necessary software e.g. Windows 10IoT. Includes licenses for 32 channels, three year hardware warranty and on-site hardware replacement service.
- Notes This proposal assumes that customer to provide POE switch with room for additional cameras This proposal assumes that customer to provide rack with room for server and patch panel

### IP Cameras

#### IP Camera #1: LCH - Level 1 - Optional - North Elevator

Camera to View:

- Other (1) Additional Part: AXIS F4005 Dome Sensor Unit with a 12-meter (39-foot) cable to an AXIS F Series Main Unit. Recessed dome without a clear dome cover. Fixed lens that provides 113 horizontal FOV. Full HDTV 1080p resolution and support for WDR - Forensic Capture together with AXIS F41 Main Unit.
- Other (1) Additional Part: AXIS F41 Main Unit. To be used with any of AXIS F Series Sensor Units. Supports full HDTV 1080p and WDR - Forensic Capture. Two way audio, 4 configurable I/Os with 12 V output and RS232.

#### IP Camera #2: LCH - Level 1 - Optional - South Elevator

Camera to View:

- Other (1) Additional Part: AXIS F41 Main Unit. To be used with any of AXIS F Series Sensor Units. Supports full HDTV 1080p and WDR - Forensic Capture. Two way audio, 4 configurable I/Os with 12 V output and RS232.
- Other (1) Additional Part: AXIS F4005 Dome Sensor Unit with a 12-meter (39-foot) cable to an AXIS F Series Main Unit. Recessed dome without a clear dome cover. Fixed lens that provides 113 horizontal FOV. Full HDTV 1080p resolution and support for WDR - Forensic Capture together with AXIS F41 Main Unit.

#### IP Camera #3: LCH - Level 1- North Parking

Camera to View:

- IP Exterior (1) D/N fixed dome with support for OptimizedIR, built-in adaptable IR illuminators, (AXIS COMMUNICATIONS INC part number 0760-001)



## Scope of Work (cont)

Proposal 66959.1 S101 - Traverse City Parking - Parking Garage

### IP Camera #4: LCH - Level 1 - Park Street Pedestrian

Camera to View:

IP Exterior (1) Compact, day/night fixed mini dome in a vandal-resistant casing for outdoor or indoor installation D/N, HDTV 1080p, PoE, 2mp. (AXIS COMMUNICATIONS INC part number 0536-001)

### IP Camera #5: LCH - Level 1 - Parking Office Admin

Camera to View:

IP Interior (1) Ultra-compact, indoor fixed mini dome with dust- and vandal-resistant casing for easy mounting on wall or ceiling. Fixed lens. Multiple, individually configurable H.264 and Motion JPEG streams; max HDTV 1080p at 30 fps with WDR. HDMI output (micro). Axis' Zipstream technology for reduced bandwidth and storage needs. Memory card slot for optional local video storage. Video motion detection and active tampering alarm. Power over Ethernet. Midspan not included. (AXIS COMMUNICATIONS INC part number 0804-001)

Notes No Conduit Needed

### IP Camera #6: LCH - Level 1 - Parking Office Cashier

Camera to View:

IP Interior (1) Ultra-compact, indoor fixed mini dome with dust- and vandal-resistant casing for easy mounting on wall or ceiling. Fixed lens. Multiple, individually configurable H.264 and Motion JPEG streams; max HDTV 1080p at 30 fps with WDR. HDMI output (micro). Axis' Zipstream technology for reduced bandwidth and storage needs. Memory card slot for optional local video storage. Video motion detection and active tampering alarm. Power over Ethernet. Midspan not included. (AXIS COMMUNICATIONS INC part number 0804-001)

Notes No Conduit Needed

### IP Camera #7: LCH - Level 1 - Parking Office Reception

Camera to View:

IP Interior (1) Ultra-compact, indoor fixed mini dome with dust- and vandal-resistant casing for easy mounting on wall or ceiling. Fixed lens. Multiple, individually configurable H.264 and Motion JPEG streams; max HDTV 1080p at 30 fps with WDR. HDMI output (micro). Axis' Zipstream technology for reduced bandwidth and storage needs. Memory card slot for optional local video storage. Video motion detection and active tampering alarm. Power over Ethernet. Midspan not included. (AXIS COMMUNICATIONS INC part number 0804-001)

Notes No Conduit Needed

### IP Camera #8: LCH - Level 1 - Parking Office support

Camera to View:

IP Interior (1) Ultra-compact, indoor fixed mini dome with dust- and vandal-resistant casing for easy mounting on wall or ceiling. Fixed lens. Multiple, individually configurable H.264 and Motion JPEG streams; max HDTV 1080p at 30 fps with WDR. HDMI output (micro). Axis' Zipstream technology for reduced bandwidth and storage needs. Memory card slot for optional local video storage. Video motion detection and active tampering alarm. Power over Ethernet. Midspan not included. (AXIS COMMUNICATIONS INC part number 0804-001)

### IP Camera #9: LCH - Level 1 - South Stair Tower

Camera to View:

IP Exterior (1) Compact, day/night fixed mini dome in a vandal-resistant casing for outdoor or indoor installation D/N, HDTV 1080p, PoE, 2mp. (AXIS COMMUNICATIONS INC part number 0536-001)



## Scope of Work (cont)

Proposal 66959.1 S101 - Traverse City Parking - Parking Garage

### **IP Camera #10: LCH - Level 1 - Southeast Stair Lobby**

Camera to View:

IP Interior (1) Ultra-compact, indoor fixed mini dome with dust- and vandal-resistant casing for easy mounting on wall or ceiling. Fixed lens. Multiple, individually configurable H.264 and Motion JPEG streams; max HDTV 1080p at 30 fps with WDR. HDMI output (micro). Axis' Zipstream technology for reduced bandwidth and storage needs. Memory card slot for optional local video storage. Video motion detection and active tampering alarm. Power over Ethernet. Midspan not included. (AXIS COMMUNICATIONS INC part number 0804-001)

### **IP Camera #11: LCH - Level 1 - Front Street Entry Lane**

Camera to View:

IP Exterior (1) D/N fixed dome with support for OptimizedIR, built-in adaptable IR illuminators, (AXIS COMMUNICATIONS INC part number 0760-001)

### **IP Camera #12: LCH - Level 1 - North Stair Tower**

Camera to View:

IP Exterior (1) D/N fixed dome with support for OptimizedIR, built-in adaptable IR illuminators, (AXIS COMMUNICATIONS INC part number 0760-001)

### **IP Camera #13: LCH - Level 1 - Northwest Parking**

Camera to View:

IP Exterior (1) D/N fixed dome with support for OptimizedIR, built-in adaptable IR illuminators, (AXIS COMMUNICATIONS INC part number 0760-001)

### **IP Camera #14: LCH - Level 1 - Service Area Office**

Camera to View:

IP Exterior (1) D/N fixed dome with support for OptimizedIR, built-in adaptable IR illuminators, (AXIS COMMUNICATIONS INC part number 0758-001)

### **IP Camera #15: LCH - Level 1 - Service Area Open Office**

Camera to View:

IP Exterior (1) D/N fixed dome with support for OptimizedIR, built-in adaptable IR illuminators, (AXIS COMMUNICATIONS INC part number 0758-001)

### **IP Camera #16: LCH - Level 1 - State Street Entry**

Camera to View:

IP Exterior (1) D/N fixed dome with support for OptimizedIR, built-in adaptable IR illuminators, (AXIS COMMUNICATIONS INC part number 0758-001)

### **IP Camera #17: LCH - Level 1 - State Street Exit**

Camera to View:

IP Exterior (1) D/N fixed dome with support for OptimizedIR, built-in adaptable IR illuminators, (AXIS COMMUNICATIONS INC part number 0758-001)

### **IP Camera #18: LCH - Level 2 - North Parking**

Camera to View:

IP Exterior (1) D/N fixed dome with support for OptimizedIR, built-in adaptable IR illuminators, (AXIS COMMUNICATIONS INC part number 0760-001)



## Scope of Work (cont)

Proposal 66959.1 S101 - Traverse City Parking - Parking Garage

### **IP Camera #19: LCH - Level 2 - Northwest Parking**

Camera to View:

IP Exterior (1) D/N fixed dome with support for OptimizedIR, built-in adaptable IR illuminators, (AXIS COMMUNICATIONS INC part number 0760-001)

### **IP Camera #20: LCH - Level 2 - Southeast Parking**

Camera to View:

IP Exterior (1) D/N fixed dome with support for OptimizedIR, built-in adaptable IR illuminators, (AXIS COMMUNICATIONS INC part number 0760-001)

### **IP Camera #21: LCH - Level 3 - North Parking**

Camera to View:

IP Exterior (1) D/N fixed dome with support for OptimizedIR, built-in adaptable IR illuminators, (AXIS COMMUNICATIONS INC part number 0760-001)

### **IP Camera #22: LCH - Level 3 - Northwest Parking**

Camera to View:

IP Exterior (1) D/N fixed dome with support for OptimizedIR, built-in adaptable IR illuminators, (AXIS COMMUNICATIONS INC part number 0760-001)

### **IP Camera #23: LCH - Level 3 - Southeast Parking**

Camera to View:

IP Exterior (1) D/N fixed dome with support for OptimizedIR, built-in adaptable IR illuminators, (AXIS COMMUNICATIONS INC part number 0760-001)

### **IP Camera #24: LCH - Level 4 - North Parking**

Camera to View:

IP Exterior (1) D/N fixed dome with support for OptimizedIR, built-in adaptable IR illuminators, (AXIS COMMUNICATIONS INC part number 0760-001)

### **IP Camera #25: LCH - Level 4 - Northeast Parking**

Camera to View:

IP Exterior (1) D/N fixed dome with support for OptimizedIR, built-in adaptable IR illuminators, (AXIS COMMUNICATIONS INC part number 0760-001)

### **IP Camera #26: LCH - Level 4 - South Parking**

Camera to View:

IP Exterior (1) D/N fixed dome with support for OptimizedIR, built-in adaptable IR illuminators, (AXIS COMMUNICATIONS INC part number 0760-001)

### **IP Camera #27: LCH - Level 4 - Stair Tower**

Camera to View:

IP Exterior (1) Compact, day/night fixed mini dome in a vandal-resistant casing for outdoor or indoor installation D/N, HDTV 1080p, PoE, 2mp. (AXIS COMMUNICATIONS INC part number 0536-001)



## Scope of Work (cont)

Proposal 66959.1 S101 - Traverse City Parking - Parking Garage

### IP Camera #28: LCH - Level 4 - Southwest Parking

Camera to View:

IP Exterior (1) Compact, day/night fixed mini dome in a vandal-resistant casing for outdoor or indoor installation D/N, HDTV 1080p, PoE, 2mp. (AXIS COMMUNICATIONS INC part number 0536-001)

### IP Camera #29: OTD - Level 1 - Optional - North Elevator

Camera to View:

Other (1) Additional Part: AXIS F4005 Dome Sensor Unit with a 12-meter (39-feet) cable to an AXIS F Series Main Unit. Recessed dome without a clear dome cover. Fixed lens that provides 113 horizontal FOV. Full HDTV 1080p resolution and support for WDR - Forensic Capture together with AXIS F41 Main Unit.

Other (1) Additional Part: AXIS F41 Main Unit. To be used with any of AXIS F Series Sensor Units. Supports full HDTV 1080p and WDR - Forensic Capture. Two way audio, 4 configurable I/Os with 12 V output and RS232.

### IP Camera #30: OTD - Level 1 - Optional - South Elevator

Camera to View:

Other (1) Additional Part: AXIS F4005 Dome Sensor Unit with a 12-meter (39-feet) cable to an AXIS F Series Main Unit. Recessed dome without a clear dome cover. Fixed lens that provides 113 horizontal FOV. Full HDTV 1080p resolution and support for WDR - Forensic Capture together with AXIS F41 Main Unit.

Other (1) Additional Part: AXIS F41 Main Unit. To be used with any of AXIS F Series Sensor Units. Supports full HDTV 1080p and WDR - Forensic Capture. Two way audio, 4 configurable I/Os with 12 V output and RS232.

### IP Camera #31: OTD - Level 1 - North Entry/Exit

Camera to View:

IP Exterior (1) D/N fixed dome with support for OptimizedIR, built-in adaptable IR illuminators, (AXIS COMMUNICATIONS INC part number 0760-001)

### IP Camera #32: OTD - Level 1 - South Entry/Exit (Replacement)

Camera to View:

IP Exterior (1) D/N fixed dome with support for OptimizedIR, built-in adaptable IR illuminators, (AXIS COMMUNICATIONS INC part number 0760-001)

### IP Camera #33: OTD - Level 1 - South Pedestrian Door

Camera to View:

IP Exterior (1) Compact, day/night fixed mini dome in a vandal-resistant casing for outdoor or indoor installation D/N, HDTV 1080p, PoE, 2mp. (AXIS COMMUNICATIONS INC part number 0536-001)

### IP Camera #34: OTD - Level 1 - Storage Room

Camera to View:

IP Exterior (1) Compact, day/night fixed mini dome in a vandal-resistant casing for outdoor or indoor installation D/N, HDTV 1080p, PoE, 2mp. (AXIS COMMUNICATIONS INC part number 0536-001)

### IP Camera #35: OTD - Level 2 - North Parking

Camera to View:

IP Exterior (1) D/N fixed dome with support for OptimizedIR, built-in adaptable IR illuminators, (AXIS COMMUNICATIONS INC part number 0760-001)



## Scope of Work (cont)

Proposal 66959.1 S101 - Traverse City Parking - Parking Garage

### **IP Camera #36: OTD - Level 2 - Public Parking Sign**

Camera to View:

IP Exterior (1) D/N fixed dome with support for OptimizedIR, built-in adaptable IR illuminators, (AXIS COMMUNICATIONS INC part number 0760-001)

### **IP Camera #37: OTD - Level 2 - Southeast Parking**

Camera to View:

IP Exterior (1) D/N fixed dome with support for OptimizedIR, built-in adaptable IR illuminators, (AXIS COMMUNICATIONS INC part number 0760-001)

### **IP Camera #38: OTD - Level 2 - Southwest Parking**

Camera to View:

IP Exterior (1) D/N fixed dome with support for OptimizedIR, built-in adaptable IR illuminators, (AXIS COMMUNICATIONS INC part number 0760-001)

### **IP Camera #39: OTD - Level 3 - North Parking**

Camera to View:

IP Exterior (1) D/N fixed dome with support for OptimizedIR, built-in adaptable IR illuminators, (AXIS COMMUNICATIONS INC part number 0760-001)

### **IP Camera #40: OTD - Level 3 - Southeast Parking**

Camera to View:

IP Exterior (1) D/N fixed dome with support for OptimizedIR, built-in adaptable IR illuminators, (AXIS COMMUNICATIONS INC part number 0760-001)

### **IP Camera #41: OTD - Level 3 - Southwest Parking**

Camera to View:

IP Exterior (1) D/N fixed dome with support for OptimizedIR, built-in adaptable IR illuminators, (AXIS COMMUNICATIONS INC part number 0760-001)

### **IP Camera #42: OTD - Level 4 - North Parking**

Camera to View:

IP Exterior (1) D/N fixed dome with support for OptimizedIR, built-in adaptable IR illuminators, (AXIS COMMUNICATIONS INC part number 0760-001)

### **IP Camera #43: OTD - Level 4 - North Stair Tower**

Camera to View:

IP Exterior (1) D/N fixed dome with support for OptimizedIR, built-in adaptable IR illuminators, (AXIS COMMUNICATIONS INC part number 0760-001)

### **IP Camera #44: OTD - Level 4 - South Stair Tower ( Replacement)**

Camera to View:

IP Exterior (1) D/N fixed dome with support for OptimizedIR, built-in adaptable IR illuminators, (AXIS COMMUNICATIONS INC part number 0760-001)



## Scope of Work (cont)

Proposal 66959.1 S101 - Traverse City Parking - Parking Garage

### IP Camera #45: OTD - Level 4 - Southwest Parking

Camera to View:

IP Exterior (1) D/N fixed dome with support for OptimizedIR, built-in adaptable IR illuminators, (AXIS COMMUNICATIONS INC part number 0760-001)



## Scope of Work (cont)

Proposal 66959.1 S101 - Traverse City Parking - Parking Garage

### Other System

#### Server / Head Ends

**Server / Head End #1: Hotel/Travel**

Note:

Other (1) Expenses: Hotel/Travel/PD provided by S101



# Equipment List

Proposal 66959.1 S101 - Traverse City Parking - Parking Garage

| Qty | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Unit Price | Total     |
|-----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|-----------|
| 2   | 48PRT C5E HD PATCH PANEL T568B (ORTRONICS PHD5E6U48)                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 519.39     | 1,038.78  |
| 2   | Axis Camera Station S1032 Recorder rack server validated and tested with AXIS products. Preloaded with AXIS Camera Station software with preconfigured AXIS Camera Station settings and all other necessary software e.g. Windows 10IoT. Includes licenses for 32 channels, three year hardware warranty and on-site hardware replacement service. (AXIS COMMUNICATIONS INC 0202-830)                                                                                                                             | 7,050.78   | 14,101.56 |
| 4   | AXIS F4005 Dome Sensor Unit with a 12-meter (39-feet) cable to an AXIS F Series Main Unit. Recessed dome without a clear dome cover. Fixed lens that provides 113 horizontal FOV. Full HDTV 1080p resolution and support for WDR - Forensic Capture together with AXIS F41 Main Unit. (AXIS COMMUNICATIONS INC 0798-001)                                                                                                                                                                                          | 279.99     | 1,119.96  |
| 4   | AXIS F41 Main Unit. To be used with any of AXIS F Series Sensor Units. Supports full HDTV 1080p and WDR - Forensic Capture. Two way audio, 4 configurable I/Os with 12 V output and RS232. (AXIS COMMUNICATIONS INC 0658-001)                                                                                                                                                                                                                                                                                     | 450.79     | 1,803.16  |
| 6   | Compact, day/night fixed mini dome in a vandal-resistant casing for outdoor or indoor installation D/N, HDTV 1080p, PoE, 2mp. (AXIS COMMUNICATIONS INC 0536-001)                                                                                                                                                                                                                                                                                                                                                  | 551.59     | 3,309.54  |
| 4   | D/N fixed dome with support for OptimizedIR, built-in adaptable IR illuminators, (AXIS COMMUNICATIONS INC 0758-001)                                                                                                                                                                                                                                                                                                                                                                                               | 751.79     | 3,007.16  |
| 26  | D/N fixed dome with support for OptimizedIR, built-in adaptable IR illuminators, (AXIS COMMUNICATIONS INC 0760-001)                                                                                                                                                                                                                                                                                                                                                                                               | 851.19     | 22,130.94 |
| 5   | Ultra-compact, indoor fixed mini dome with dust- and vandal-resistant casing for easy mounting on wall or ceiling. Fixed lens. Multiple, individually configurable H.264 and Motion JPEG streams; max HDTV 1080p at 30 fps with WDR. HDMI output (micro). Axis' Zipstream technology for reduced bandwidth and storage needs. Memory card slot for optional local video storage. Video motion detection and active tampering alarm. Power over Ethernet. Midspan not included. (AXIS COMMUNICATIONS INC 0804-001) | 270.19     | 1,350.95  |

Total: 47,862.05



## Clarifications

Proposal 66959.1 S101 - Traverse City Parking - Parking Garage

Sales Tax Not Included

### Video System Clarifications

This proposal assumes normal business hours M-F 8-5

This proposal assumes continuous work that is uninterrupted by owner or other trades

This proposal assumes no camera is more than 300 feet from the MDF

This proposal assumes 1 MDF per location

This proposal assumes that no more than 10 feet of conduit per camera

This proposal assumes that customer to provide POE switches at each location

This proposal assumes that customer to provide rack with room for server and patch panels at each location



# Financial Summary

Proposal 66959.1 S101 - Traverse City Parking - Parking Garage

**BILLING ADDRESS**  
 Traverse City Parking Services  
 125 East Eighth St (Old Town Parking Garage)  
 303 East State St (Hardy Parking Garage)  
 Traverse City, MI 49684

**PROJECT LOCATION**  
 Traverse City Parking Services  
 125 East Eighth St (Old Town Parking Garage)  
 303 East State St (Hardy Parking Garage)  
 Traverse City, MI 49684

## System: Video System

### System totals:

| Description             | Net Price        |
|-------------------------|------------------|
| Installation Labor      | 30,217.25        |
| Equipment               | 47,861.74        |
| Materials               | 9,699.38         |
| <b>Total Investment</b> | <b>87,778.37</b> |

## System: Other System

### System totals:

| Description             | Net Price       |
|-------------------------|-----------------|
| Materials               | 2,250.00        |
| <b>Total Investment</b> | <b>2,250.00</b> |

### Grand Totals:

| Description             | Net Price        |
|-------------------------|------------------|
| Installation Labor      | 30,217.25        |
| Equipment               | 47,861.74        |
| Materials               | 11,949.38        |
| <b>Total Investment</b> | <b>90,028.37</b> |



# Terms and Conditions

Proposal 66959.1 S101 - Traverse City Parking - Parking Garage

## Limited Warranty: Exclusions and Disclaimers

1. To the extent not otherwise warranted pursuant to an applicable manufacturer's warranty, Security 101 warrants all equipment and installation labor rendered as part of the Work against defects in materials and labor, not inherent in the quality required or permitted by the Agreement, for a period of twelve (12) months (the "Warranty Period") from the date of substantial completion of the installation of the Work. Security 101's warranty specifically excludes remedy for damage or defect to expendable supplies, equipment or parts or any portions of the Work caused by misuse, abuse, modifications not executed by Security 101, improper or insufficient maintenance, improper operation, Acts of God, alteration, modification, manipulation, tampering or vandalism by any other party, or normal wear and tear and normal usage. Any and all warranty claims must be made by written notice to Security 101 within the Warranty Period and any defect claimed will be repaired or replaced at the sole option of Security 101. Any shipping charges in connection with a repair or replacement shall be the responsibility of Customer. Notwithstanding anything contained herein to the contrary, Security 101's sole liability for any warranty claims hereunder shall be limited to the repair or replacement of the Work or any portion thereof.
2. THE WARRANTY DESCRIBED IN SUBSECTION 1A ABOVE IS THE ONLY WARRANTY COVERING THE INSTALLATION LABOR, MATERIALS AND EQUIPMENT OR ANY OTHER PORTION OF THE WORK AND IS GIVEN IN LIEU OF ANY AND ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, STATUTORY OR COMMON LAW, AND ALL SUCH WARRANTIES, INCLUDING, BUT NOT LIMITED TO WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, AND HABITABILITY ARE HEREBY EXCLUDED AND SPECIFICALLY DISCLAIMED.
3. Except to the extent otherwise provided in Subsection 2A below, in no event shall Security 101 be liable to Customer or any third party for actual, special, incidental, consequential, exemplary, punitive damages or any other type of damages or for lost profits, lost sales, injury to person or property or any other cause as a result of defect in the installation labor, equipment, materials or other supplies with respect to any item furnished under the Agreement, the malfunction or non-function of any system, wrongful performance of or failure to perform any acts included in the Work, transportation delays, breach of warranty or any criminal or other activities by third parties resulting there from.
4. Customer acknowledges that no warranty, representation, or statement by any representative of Security 101 not expressly stated herein shall be binding. The Agreement and the document or documents attached hereto or to which this writing is a part, shall constitute the final expression of the parties' agreement and is a complete and exclusive statement of the terms of the Agreement.

## Limitation of Liability

5. To the extent of Security 101's insurance coverage and subject to the limitations contained in Subsections 2B and 2C below, Security 101 agrees to indemnify, defend and hold harmless Customer for, from and against all claims, damages, losses, costs or injury to property occurring during the installation of the Work under the Agreement, but only to the extent caused by the negligence of Security 101, its subcontractors or anyone employed by either of them. Customer and Security 101 agree that the indemnification given herein shall be limited to the amount of loss suffered by the indemnitees or the amount of Security 101's insurance coverage, whichever is less, which amount is stipulated by the parties to bear a reasonable commercial relationship to this Agreement and is hereby incorporated into the specifications for this project.
6. The parties acknowledge and agree that: (a) the Work is intended to constitute or be a part of a security system designed to reduce risk of loss for the Customer; (b) Customer has selected, accepted and approved the Scope of the Work after considering and balancing the levels of protection afforded by various types of systems and services available to it and the related costs of them; (c) neither Security 101 nor any person engaged by Security 101 to perform any portion of the Work shall be construed to be an insurer of the person or property of Customer, its employees, agents, contractors, assigns, customers, invitees or any other person at the location(s) where the Work is performed (the "Locations"); (d) the Price and Payment Terms are based solely on the cost and value of Security 101 providing the Work and are unrelated to the value of property of Customer or others located at the Locations; (e) the Price and Payment Terms do not contemplate any payment being made or consideration being given to Security 101 for any guarantee, warranty or insuring agreement by any one or more of them to Customer with respect to the person or property of anyone; and (f) Security 101 MAKES NO GUARANTEE OR WARRANTY OF ANY KIND THAT THE WORK (INCLUDING ANY MATERIALS AND EQUIPMENT SUPPLIED AS PART OF THE WORK) WILL AVERT OR PREVENT OCCURRENCES, CRIMINAL EVENTS, VANDALISM OR CONSEQUENCES THEREFROM WHICH THE WORK IS DESIGNED TO DETECT OR AVERT. CONSEQUENTLY, THE PARTIES ACKNOWLEDGE AND AGREE THAT SECURITY 101 IS NOT AN INSURER AND CUSTOMER WILL OBTAIN FROM ITS OWN INSURER ANY INSURANCE THAT IT DESIRES TO PROTECT ITS PROPERTY OR PERSONS FROM ANY SUCH EVENTS OR OCCURRENCES. CUSTOMER HEREBY WAIVES ALL SUBROGATION AND OTHER RIGHTS OR RECOVERY AGAINST SECURITY 101 THAT ANY INSURER OR OTHER PERSON MAY HAVE AS A RESULT OF PAYING ANY CLAIM OR LOSS OR INJURY TO ANY OTHER PERSON.
7. Notwithstanding the limited warranty and the limitation on liability provisions contained herein, in the event Security 101 is found liable for personal injury or property loss or damage caused by a failure to perform by Security 101 or the failure of any materials or equipment in any respect whatsoever or a court of competent jurisdiction determines the limitations on warranty or liability are inapplicable, then Customer agrees that the aggregate maximum liability of Security 101 under or with respect to the Agreement, the Work performed hereunder and any warranty provided for herein, shall be limited to a sum equal to the lesser of (i) one-tenth (1/10) of the total Price paid by Customer under the Agreement, or (ii) Five Hundred Dollars (\$500.00), and this liability shall be exclusive, and the provisions of this Subsection shall apply if loss or damage, irrespective of cause or origin, results directly or indirectly to persons or property, from performance or nonperformance of the Work, from breach of warranty, or from negligence, active or otherwise of Security 101.

## Indemnification

8. When Customer ordinarily has the property of others in its custody, or the Work extends to the protection of the person or property of others, Customer shall indemnify, save, defend and hold harmless Security 101 from and against all claims brought by parties other than the parties to the Agreement. This provision shall apply to all claims regardless of cause, including the performance or failure to perform by Security 101, and including without limitation, defects in products or system design, installation, repair service, monitoring, operation or non-operation of materials or equipment, whether based upon negligence, active or passive, express or implied contract or warranty, contribution or indemnification or strict or product liability; provided, however, Customer shall have no duty to indemnify in the case of gross negligence or willful misconduct by Security 101, its employees, agents or assigns. Customer agrees to indemnify Security 101 against, and to defend and hold Security 101 harmless from any action for subrogation which may be brought against Security 101 by any insurer or insurance company or its agents or assigns including the payment of all damages, expenses, costs and reasonable attorney's fees.



## Terms and Conditions (cont)

Proposal 66959.1 S101 - Traverse City Parking - Parking Garage

### Design Development, Programming, Drawings, Ownership, and Software License(s)

9. Design Development. Customer and Security 101 have together developed or will develop the design and specifications for the Work. When Customer has accepted or approved the design and specifications, the sole and final responsibility for the design and specifications shall be Customer's. Security 101 shall have no liability to Customer for any loss or damage claimed against or incurred by Customer or any employee, agent or licensee of Customer because of any defect or alleged defect in the design or specifications or the failure of the equipment or the Work to perform as desired or anticipated by Customer.
10. Programming. Security system programming is an essential element of the systems operation and performance. Customer acknowledges and agrees that security system programming is an ever-changing process, and in significant part subject to Customer's day-to-day and other business operations and parameters and the changes or modifications to them. To the extent required by the design and specifications of the Work, Security 101 shall:
  - (i) Load a configuration program that will allow Customer's security system to perform basic access control operation, door timers, lock timers, and basic alarm functions; and
  - (ii) Provide a total number of hours of personnel training regarding Customer's security system as specified in the Agreement; if a number of hours is not specified, the total number of hours of training shall not exceed fifteen (15). Personnel training may include training of operators, administrators, or other personnel designated by Customer. Training subjects shall be dictated by Work specifications but may include password configuration, door identification, timers, alarms and reports. Additional training, programming or related consulting services provided by Security 101 at Customer's request shall be provided at an above contract cost.
11. Drawings.
  - (i) To the extent required by the design and specifications of the Work, Security 101 shall provide reasonable descriptions of the functional operation of the system(s) being provided by the Work by furnishing riser diagram drawings.
  - (ii) Unless otherwise stated in schedule of work, Security 101 may provide, at Customer's request and at an above contract cost detail drawings utilizing industry standard electronic floor plans.
12. Ownership Prior to completion of the Work, any drawings, specifications and equipment lists developed in connection with the design for the Work shall remain the property of Security 101 whether the Work for which they were made is executed or not. Drawings, specifications and equipment lists shall be returned to Security 101 on demand at any time prior to substantial completion of the Work. Prior to substantial completion of the Work, any drawings, specifications and equipment lists: (a) shall be considered confidential information and trade secrets of Security 101 unless they constitute information which is exempted or excluded by law from confidential and trade secret status; (b) shall not be used by Customer on other projects or extensions of a project included within the Work, or to obtain other bids, except by agreement in writing and with appropriate compensation to Security 101; and (c) are not to be reproduced in whole or in part without prior written consent of Security 101. Upon substantial completion of the Work and final payment in full by Customer, ownership of drawings, specifications and equipment lists shall become Customer's.
13. Software License(s). Software required to operate systems are governed by the License Agreement provided by the system manufacturer(s).

### Video System

14. A dedicated circuit is recommended for the CCTV system, but not included.
15. Current and future lighting requirements are the responsibility of others.
16. Appropriate furniture or shelving for CCTV recording equipment is not included, unless specifically identified in the scope of work and/or the equipment list.

### Additional Terms and Conditions

#### Installation

17. All required installation documents are included.
18. Installation of all required equipment and materials with on-site supervision of project is included.
19. Labor quoted assumes normal eight (8) hour working days, excluding weekends, holidays and overtime.
20. Idle time incurred by Security 101 employees and their subcontractors due to escorts, clearances, inability to enter workspace, and other factors beyond our control, will be invoiced at our current labor rates.
21. This proposal includes travel to and from the site to perform our stated scope of work. Additional or duplicate site visits required due to factors beyond our control, will be invoiced at our current labor rates.
22. Client to coordinate with local Security 101 staff to provide safe and timely right-of-passage in the work area during cable run and system installation.
23. Client to provide and coordinate 110 VAC electrical service where needed.
24. All LAN/WAN connections, addressing and network functionality are the responsibility of the Client.
25. Any telephone lines or LAN/WAN connections must be installed and operational prior to Security 101 commencing work. The local Security 101 representative will verify the availability and functionality of all connections prior to starting work.



## Terms and Conditions (cont)

Proposal 66959.1 S101 - Traverse City Parking - Parking Garage

### Changes in Scope of Work

26. Any changes in the understood scope of work will be communicated and approved in writing (by an authorized Client representative), prior to commencing work.

### Permits/Bonding/Sealed Engineered Drawings

27. Permits, bonds, and other requirements by any government agency are not included.

### Miscellaneous

28. The bold headings and numbered paragraphs are for convenience only, have no legal significance, and shall not be deemed to alter or effect any provision of this Agreement.
29. Neither party shall be liable in damages or have the right to terminate this Agreement for any delay or default in performing hereunder if such delay or default is caused by conditions beyond its control including, but not limited to Acts of God, Government restrictions (including the denial or cancellation of any export or other necessary license), wars, insurrections and/or any other cause beyond the reasonable control of the party whose performance is affected.
30. Neither party shall be liable for any failure or delay in performance under this Agreement (other than for delay in the payment of money due and payable hereunder) to the extent said failures or delays are proximately caused by causes beyond that party's reasonable control and occurring without its fault or negligence, including, without limitation, failure of suppliers, subcontractors, and carriers, or party to substantially meet its performance obligations under this Agreement, provided that, as a condition to the claim of non-liability, the party experiencing the difficulty shall give the other prompt written notice, with full details following the occurrence of the cause relied upon. Dates by which performance obligations are scheduled to be met will be extended for a period of time equal to the time lost due to any delay so caused.
31. In the event that any one or more of the provisions contained herein shall, for any reason, be held to be invalid, illegal or unenforceable in any respect, such invalidity, illegality or unenforceability shall not affect any other provisions of this agreement, but this agreement shall be construed as if such invalid, illegal or unenforceable provisions had never been contained herein, unless the deletion of such provision or provisions would result in such a material change so as to cause completion of the transactions contemplated herein to be unreasonable.



# Acceptance

Proposal 66959.1 S101 - Traverse City Parking - Parking Garage

For the amount of **90,028.37** (plus tax of 3,169.31)  
This proposal dated December 16, 2016 is valid until February 16, 2017

The person or persons below represent that they are authorized to sign and execute this binding agreement. This acceptance indicates understanding of the complete proposal, including clarifications, design, programming, drawings, ownership and software licenses and the Warranty Service Plan, if included as a part of this proposal. This system proposal is intended to provide the customer partial protection of the designated premises. Its design should be understood to represent a compromise between the costs, understood scope of work and customer feedback. Accordingly, such a system may not provide ample protection from all possible threats, and Security 101 shall not be responsible in such an event.

## Payment Terms

50% upon Deposit  
50% upon Job Complete

Under no circumstances may the customer make payments directly to any subcontractor, material supplier, laborer or any other person performing work or furnishing material under the Agreement without the prior written consent of Security 101.

Security 101 may assign this Agreement to any other person, firm or corporation without notice to or approval by the customer and may subcontract any activities which may be performed under this Agreement, either voluntarily or by operation of law, without the consent of the customer.

## Licenses

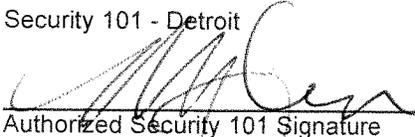
MI - Alarm: L911826

Traverse City Parking Services

Security 101 - Detroit

\_\_\_\_\_  
Authorized Customer Signature

(date)

  
Authorized Security 101 Signature

12/16/16  
(date)

\_\_\_\_\_  
Printed Name

Mike Johnson  
Printed Name

\_\_\_\_\_  
Title

Sales Rep  
Title

\_\_\_\_\_  
Purchase Order Number



## TRAVERSE CITY PARKING SERVICES – CAMERA SYSTEM

Prepared For



**Traverse City Parking Services**

**Traverse City, MI**

Designed by:

Jim Hopkins, West Michigan Account Manager  
Jason Buckman, Security Integration Manager

**Table of Contents**

**Section 1.....Proposal**

**Section 2.....Cutsheets**

# **Section 1**

## **Proposal**



December 20, 2016

Julie Dalton  
Purchasing Agent  
Traverse City Parking Services  
400 Boardman Avenue, 2<sup>nd</sup> floor  
Traverse City, MI 49684

**RE: Access Control and CCTV Systems**

Dear Mrs. Dalton,

SunTel Services appreciates the opportunity to provide the following proposal for providing and installing a CCTV system for the Traverse City Parking Services (TCPS). This proposal is in response to the RFP dated November 4, 2016. We have been asked to design, furnish and install all components necessary to provide a security camera system with web-based monitoring, that views and records various locations within three City facilities using at least 25 cameras in total.

**General:**

- SunTel Services has extensive experience in both design and installation of security cameras and recording systems.
- SunTel Services will provide within ten days a listing of all personnel assigned to this project.
- SunTel Services fully understands TCPS concerns for a reliable and robust network that is expandable as the system grows. We have included all items in 1.a through 1.i for our design and are willing to meet and explain and answer any and all questions about our design.
- SunTel Services feels that sections 2 and 3 would be best responded to by allowing us to bring in our network staff and VMS manufacturer to present this data.
- Our proposed VMS allows for easy remote viewing for City Offices and mobile devices. These are items that can be showed and explained best through a presentation to TCPS.
- SunTel Services has included cameras that meet or exceed the requirements outlined in section Detailed Requirements 1.a. We feel that with a presentation TCPS

will see that with today's technology and the intended use of the system PTZ cameras might not be the best camera to be deployed.

- Power supplies will not be needed for any of the cameras we have proposed at this time; all cameras will be PoE. The battery option requested in section 2.d has many options and intended use questions before a proper solution can be proposed.
- Transmission of streaming video is part of the VMS. We do not see any camera locations that require wireless transmission so we have not gone into great detail at this time on this aspect. We will be more than willing to address this at time of a presentation.
- SunTel Services has included a VMS that will meet or exceed all of the outlined requirements in section 4.f.i through 4.f.xxiv.
- All data storage is included in this proposal for 15 days and will be able to provide a secure chain of custody.
- SunTel Services has included the cut sheet on the server/storage unit for this project.
- SunTel Services has provided a VMS with a very robust viewing system. This will be best described during a presentation of the solution.
- SunTel Services has not included any cable, connectors, patch panels, conduit and testing of any cable both existing and new.
- SunTel Services will provide ten hours of training on the new software.
- SunTel Services will comply with section 10. Warranty.
- SunTel Services will comply with section 12. Documentation.
- SunTel Services feels that section 13. Administration Toolsets would be best described with a product presentation.
- SunTel Services feels that section 14. Security would be best described with a product presentation.
- SunTel Services feels that section 15. Upgrade tools would be best described with a product presentation.
- SunTel Services will comply with section 16. Insurance.

#### **Scope of Work Base Project:**

- SunTel Services will provide and install (26) outdoor multi-sensor fixed cameras. Locations to be field verified.
- SunTel Services will provide and install (14) outdoor single sensor fixed cameras. Locations to be field verified.
- SunTel Services will provide and install (2) AVAYA PoE switches.
- SunTel Services will provide one lift for one month for this project.
- SunTel Services will provide and install (1) Milestone Base Video Management license and (40) Milestone camera licenses with one year SUP.
- SunTel Services will provide and install (1) server with required storage.

#### **Scope of Work Option #1 Project:**

- SunTel Services will provide and install (10) outdoor single sensor fixed cameras. Locations to be field verified.
- SunTel Services will provide and install (1) AVAYA PoE switch.
- SunTel Services will provide (10) Milestone camera device licenses with one year SUP.

**Assumptions:**

- All work will be done during normal business hours, M-F 8am to 5 pm.
- Any fire/electrical permits are by others.
- Any required electrical is by others.
- Cable and conduit is NOT included in this proposal.

**Pricing Summary:**

**Base:**

|                     |                                   |
|---------------------|-----------------------------------|
| Equipment Total:    | \$ 80,396.42(no sales tax)        |
| Labor Total:        | <u>\$ 39,985.00</u>               |
| <b>Grand Total:</b> | <b>\$120,381.42(no sales tax)</b> |

**Option #1:**

|                     |                                  |
|---------------------|----------------------------------|
| Equipment Total:    | \$ 9,667.41(no sales tax)        |
| Labor Total:        | <u>\$ 8,840.00</u>               |
| <b>Grand Total:</b> | <b>\$18,507.41(no sales tax)</b> |

A one year parts and labor warranty is included with the purchase of the equipment. This does not include failures due to acts of God, electrical storms, or vandalism.

Please do not hesitate to contact us if I can be of further assistance, or if you have any questions in clarification of this proposal. We look forward to the opportunity to be of service to Traverse City Parking Services.

Sincerely,

*Jim Hopkins*

Jim Hopkins  
Account Manager  
SunTel Services

*Jason Buckman*

Jason Buckman  
Security Integration Manager  
SunTel Services

**Bidder - Please complete and return**

**BID SUMMARY**

**TITLE: TRAVERSE CITY PARKING SERVICES – CAMERA SYSTEM**

**DUE DATE: TUESDAY, NOVEMBER 29, 2016 @ 4:00 PM**

Having carefully examined the attached specifications and any other applicable information, the undersigned proposes to furnish all items necessary for and reasonably incidental to the proper completion of this bid. Bidder submits this bid and agrees to meet or exceed all requirements and specifications unless otherwise indicated in writing and attached hereto.

Bidder certifies that as of the date of this bid the Company or he/she is not in arrears to the City of Traverse City for debt or contract and is in no way a defaulter as provided in Section 152, Chapter XVI of the Charter of the City of Traverse City.

Bidder understands and agrees, if selected as the successful Bidder, to accept a Purchase Order / Service Order / Contract and to provide proof of the required insurance.

Bidder submits this bid and agrees to meet or exceed all the City of Traverse city's requirements and specifications unless otherwise indicated in writing and attached hereto. Bidder shall comply with all applicable federal, state, local and building codes, laws, rules and regulations and obtain any required permits for this work.

The Bidder certifies that it is in compliance with the City's Nondiscrimination Policy as set forth in Administrative Order No. 47 and Chapter 605 of the City's Codified Ordinances.

The Bidder certifies that none of the following circumstances have occurred with respect to the Bidder, an officer of the Bidder, or an owner of a 25% or more share in the Bidder's business, within 3 years prior to the bid:

- (a) conviction of a criminal offense incident to the application for or performance of a contract;
- (b) conviction of embezzlement, theft, forgery, bribery, falsification or destruction of records, receiving stolen property, or any other offense which currently, seriously and directly reflects on the Bidder's business integrity;
- (c) conviction under state or federal antitrust statutes;
- (d) attempting to influence a public employee to breach ethical conduct standards; or
- (e) conviction of a criminal offense or other violation of other state, local, or federal law, as determined by a court of competent jurisdiction or an administrative proceeding, which in 14

the opinion of the City indicates that the bidder is unable to perform responsibility or which reflects a lack of integrity that could negatively impact or reflect upon the City of Traverse City, including but not limited to, any of the following offenses or violations of:

- i. The Natural Resources and Environmental Protection Act.
  - ii. A persistent and knowing violation of the Michigan Consumer Protection Act.
  - iii. Willful or persistent violations of the Michigan Occupational Health and Safety Act.
  - iv. A violation of federal, local, or state civil rights, equal rights, or non-discrimination laws, rules, or regulations.
  - v. Repeated or flagrant violations of laws related to the payment of wages and fringe benefits.
- (f) the loss of a license or the right to do business or practice a profession, the loss or suspension of which indicates dishonesty, a lack of integrity, or a failure or refusal to perform in accordance with the ethical standards of the business or profession in question.

Bidder understands that the City reserves the right to accept any or all bids in whole or part and to waive irregularities in any bid in the best interest of the City. The bid will be evaluated and awarded on the basis of the best value to the City. The criteria used by the City may include, but will not be limited to: ability, qualifications, timeframe, experience, price, type and amount of equipment, accessories, options, insurance, permits, licenses, other pertinent factors and overall capability to meet the needs of the City. The City is sales tax exempt – Government.

Bidder agrees that the bid may not be withdrawn for a period of sixty (60) days from the actual date of the opening of the bid.

Submitted by:

*AMT*

Signature

Gary Mouton V.P. Sales

Name and Title (Print)

248-654-3642      248-654-3672

Phone

Fax

SunTel Services

Company Name

1095 Crooks Rd. Suite 100

Company Address

TROY                      MI.                      48084

City,

State,

Zip

CORPORATION

Sole proprietorship/partnership/corporation

MICHIGAN

If corporation, state of corporation

### Bid Tabulation Sheet

You must complete and include this sheet with your proposal.

| Item Number |                                                                                                          | Response                                                                                                                                                                                                                |
|-------------|----------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1           | What is the name (company) of the camera system you are recommending?                                    | Arecont Vision cameras & mounting hardware; Milestone Video Management software.                                                                                                                                        |
| 2           | Is the camera solution you are proposing a TCPS-hosted solution, vendor-hosted solution, or both?        | The VMS will be TCPS-hosted.                                                                                                                                                                                            |
| 3           | Are the existing cameras able to be reused with the proposed solution?                                   | Yes. SunTel Services has not included any warranty for the existing cameras.                                                                                                                                            |
| 4           | How much is the main server or hosted solution fees (one-time purchase, monthly subscription, or other)? | Fees and licensing are a one-time purchase included in our proposal. The only recurring fee will be for the Care Plus, the cost will be determined on length of care requested 1, 2 or 3 year.                          |
| 5           | Did you attach the server specification and storage cut-sheet?                                           | Yes                                                                                                                                                                                                                     |
| 6           | What is the per camera cost?                                                                             | Per camera costs is difficult to be determined at this time since there are many aspects that need to be decided on first: type of camera, FPS, image quality, storage, mounting, cable, conduit and mounting hardware. |
| 7           | Did you attach the camera specification cut-sheet?                                                       | Yes                                                                                                                                                                                                                     |

|    |                                                                                                                                                     |                                                                                                                                                                                                |
|----|-----------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 8  | Does the solution you are providing require annual fees, subscription fees, maintenance or upgrade fees? Please list all fees.                      | Fees and licensing are a one-time purchase included in our proposal. The only recurring fee will be for the Care Plus, the cost will be determined on length of care requested 1, 2 or 3 year. |
| 9  | How many additional cameras may be purchased and added to the system before additional server space, hardware or devices will need to be purchased? | Milestone Professional does not have a device limit. As the system expands, we would need to evaluate the need for additional switch ports, storage space and bandwidth on the system.         |
| 10 | Do you offer a maintenance agreement? What is included in the maintenance agreement?                                                                | Maintenance agreements are available, these agreements are custom to the customers need.                                                                                                       |
| 11 | What are the additional fees and costs associated with Option 1 (from attached chmt)                                                                | The additional fees are covered in the Alternate proposal                                                                                                                                      |
| 12 | See #9, if Option 1 (from attached chart) is purchased, is there still additional capacity to add more cameras.                                     | Yes.                                                                                                                                                                                           |

# Server and Storage Recommendation

## Calculation Information

|                     |                              |                                |
|---------------------|------------------------------|--------------------------------|
| Configuration Date: | December 20, 2016            | <b>Integrator Details</b>      |
| Configuration Name: | Traverse City Parking Garage | First name: Neal               |
| Product:            | XProtect Professional        | Last name: Anderson            |
|                     |                              | Company: -                     |
|                     |                              | Email: nealanderson@suntel.com |
|                     |                              | Phone: 248-654-3672            |

## Cameras

| Camera Name          | Manufacturer / Model      | Qty | Resolution / Codec / Complexity | Continuous FPS | Event FPS | Hours | Motion / Event % | Retention (Days) | Bitrate (Kbps) |
|----------------------|---------------------------|-----|---------------------------------|----------------|-----------|-------|------------------|------------------|----------------|
| Arecont AV2555DN-S   | Arecont Vision AV2555DN-S | 24  | 2MP (1600x1200) h.264 Medium    | 1              | 10        | 24    | 50               | 15               | 2536.88        |
| Arecont AV12176DN2.8 | Arecont Vision AV12176DN  | 25  | 12MP (8192x1536) h.264 Medium   | 1              | 7         | 24    | 50               | 15               | 11893.43       |

## Recording Server Specification

|            |                                                        |                                    |          |        |
|------------|--------------------------------------------------------|------------------------------------|----------|--------|
| <b>Qty</b> |                                                        |                                    |          |        |
| 1 x        | Server(s) with the following configuration             | Camera Bandwidth to Rec. Server:   | 349.83   | Mbps   |
|            | 2x Intel Xeon E5-2630 v3                               | Client Bandwidth from Rec. Server: | 7.13     | Mbps   |
|            | 8 GB RAM                                               | Rec. Server Bandwidth:             | 356.96   | Mbps   |
|            | 2 Gigabit NICs                                         | Rec. Server Disk Throughput Total: | 43.73    | MB/sec |
|            | Windows Server 2012 R2 x64 Standard/Data Center        | Estimated IOPS:                    | 559.74   |        |
|            | <b>OS and Application Volume - Disk Configuration:</b> | Rec. Server Video Storage:         | 32160.80 | GB     |
| 2 x        | 300 GB minimum RAID 1                                  |                                    |          |        |
|            | <b>Video Database Disk Configuration:</b>              |                                    |          |        |
|            | Connectivity Internal or Direct Attached               |                                    |          |        |
| 18 x       | 7.2K RPM 4TB RAID 1 / RAID10                           |                                    |          |        |

### Disk Notes:

Since the Live and Archive Database for each camera will be on the same array, make sure each array is configured as a single volume. If there are multiple arrays, evenly distribute the cameras between the arrays. The calculations have been done assuming that they are on a single volume.

### Network Notes:

Bandwidth calculations are done assuming 1 cameras being viewed simultaneously from each server. Milestone recommends using at least two network cards so the client network and camera network can be separated. A minimum of two network cards are used in this configuration for that reason.

### SQL Maintenance Notes:

SQL server should be set to a regular backup schedule and transaction logs truncated as part of the scheduled backup process.

### GENERAL DISCLAIMER:

All information, to include but not limited to, documentation, configuration calculations, installation and trouble-shooting advice, consultancy and support services which may be provided within this email is

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|    |                                                                                                                                                     |                                                                                                                                                                                                |
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|            | 2 Gigabit NICs                                         | Estimated IOPS:                    | 559.74   |        |
|            | Windows Server 2012 R2 x64 Standard/Data Center        | Rec. Server Video Storage:         | 32160.80 | GB     |
|            | <b>OS and Application Volume - Disk Configuration:</b> |                                    |          |        |
|            | 2 x 300 GB minimum RAID 1                              |                                    |          |        |
|            | <b>Video Database Disk Configuration:</b>              |                                    |          |        |
|            | Connectivity Internal or Direct Attached               |                                    |          |        |
| 18 x       | 7.2K RPM 4TB RAID 1 / RAID10                           |                                    |          |        |

**Disk Notes:** Since the Live and Archive Database for each camera will be on the same array, make sure each array is configured as a single volume. If there are multiple arrays, evenly distribute the cameras between the arrays. The calculations have been done assuming that they are on a single volume.

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**GENERAL DISCLAIMER:** All information, to include but not limited to, documentation, configuration calculations, installation and trouble-shooting advice, consultancy and support services which may be provided within this email is

delivered 'as is' without warranty of any kind. Unless otherwise agreed in writing between you and Milestone Systems A/S or its Affiliates, system integrator, as the recipient, agree to assume the entire risk as to the results and performance achieved or not achieved by reliance on such information. Milestone Systems A/S and its Affiliates shall, to the extent allowed by law, assume no liability for the Recipient's reliance on such information and disclaims all warranties, whether express or implied, including but not limited to, the implied warranties of merchantability, fitness for a particular purpose, title and non-infringement, or any warranty arising out of any proposal, specification or sample with respect to the email. Furthermore, Milestone Systems A/S and its Affiliates shall not be liable for loss of data, loss of production, loss of profit, loss of use, loss of contracts or for any other consequential, economic or indirect loss whatsoever in respect of delivery, use or disposition from the content of this email.

\*\* All figures above assume an even distribution of cameras (quantity and resolution) across all Recording Servers.

## Milestone Smart Client Specifications

### Computer running XProtect Smart Client, Protect Smart Client - Player and XProtect Smart Wall - Using Software Decoding

| Name             | Description                                                                                                                        |
|------------------|------------------------------------------------------------------------------------------------------------------------------------|
| CPU              | Intel® Core™2 Duo                                                                                                                  |
| RAM              | Minimum 1 GB                                                                                                                       |
| Network          | Ethernet 100 Mbit                                                                                                                  |
| Graphics Adapter | Onboard GFX, AGP or PCI-Express, minimum 1280 x 1024, 16-bit colors, DirectX 9.0 or newer                                          |
| Hard Disk Space  | 1 GB free                                                                                                                          |
| Operating system | Microsoft® Windows® 7 Professional SP1 (32-bit or 64-bit) *                                                                        |
|                  | Microsoft® Windows® 7 Enterprise SP1 (32-bit or 64-bit) *                                                                          |
|                  | Microsoft® Windows® 7 Ultimate SP1 (32-bit or 64-bit) *                                                                            |
|                  | Microsoft® Windows® 8 Pro (32-bit or 64-bit)                                                                                       |
|                  | Microsoft® Windows® 8 Enterprise (32-bit or 64-bit)                                                                                |
|                  | Microsoft® Windows® 8.1 Pro (32-bit or 64-bit)                                                                                     |
|                  | Microsoft® Windows® 8.1 Enterprise (32-bit or 64-bit)                                                                              |
|                  | Microsoft® Windows® 10 Pro (32-bit or 64-bit)                                                                                      |
|                  | Microsoft® Windows® 10 Enterprise (32-bit or 64-bit)                                                                               |
|                  | Microsoft® Windows® Server 2008 R2 (32-bit or 64-bit): Standard, Web, High Performance Computing (HPC), Enterprise, and Datacenter |

**Computer running XProtect Smart Client, Protect Smart Client - Player and XProtect Smart Wall - Using Software Decoding**

Microsoft® Windows® Server 2012 (32-bit or 64-bit): Standard and Datacenter

Microsoft® Windows® Server 2012 R2 (32-bit or 64-bit): Standard and Datacenter

\* Microsoft® Windows® 7 and Server 2008 R2 are only supported on physical PC's not on virtual machines

Software

Microsoft® .Net 4.5.1 Framework

Requires Operating System and Graphic Adaptor support for DirectX 9.0 or newer

Note: H.265 requires a computer supporting hardware decoding or 64-bit version of the application XProtect Smart Client, XProtect Smart Wall and XProtect Smart Client - Player.

**Computer running XProtect Smart Client, Protect Smart Client - Player and XProtect Smart Wall - Using Hardware Decoding**

| Name             | Description                                                                                                 |
|------------------|-------------------------------------------------------------------------------------------------------------|
| CPU              | Intel CPU supporting Intel QuickSync, Intel GPU enabled in BIOS                                             |
| RAM              | Minimum 1 GB                                                                                                |
| Network          | Ethernet 100 Mbit                                                                                           |
| Graphics Adapter | AGP or PCI-Express, minimum 1280 x 1024, 32-bit colors, DirectX 11.0 or newer                               |
| Hard Disk Space  | 1 GB free                                                                                                   |
| Operating system | Microsoft® Windows® 8.1 Pro (32-bit or 64-bit)<br><br>Microsoft® Windows® 8.1 Enterprise (32-bit or 64-bit) |

**Computer running XProtect Smart Client, Protect  
Smart Client - Player and XProtect Smart Wall - Using  
Software Decoding**

Microsoft® Windows® 10 Pro (32-bit or 64-bit)

Microsoft® Windows® 10 Enterprise (32-bit or  
64-bit)

Microsoft® Windows® Server 2012 (32-bit or  
64-bit): Standard and Datacenter

Microsoft® Windows® Server 2012 R2 (32-bit  
or 64-bit): Standard and Datacenter

Software

Microsoft® .Net 4.5.1 Framework

Requires Operating System and Graphic  
Adaptor support for DirectX 11.0 or newer

## **Section 2**

### **Cutsheets**

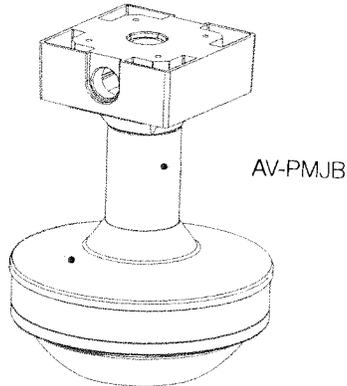
# Standard Dome Accessories

Accessories for Indoor/Outdoor Ceiling, Wall, Pole and Corner Mounting Solutions

## Ceiling Mount Configuration

Cap Options:

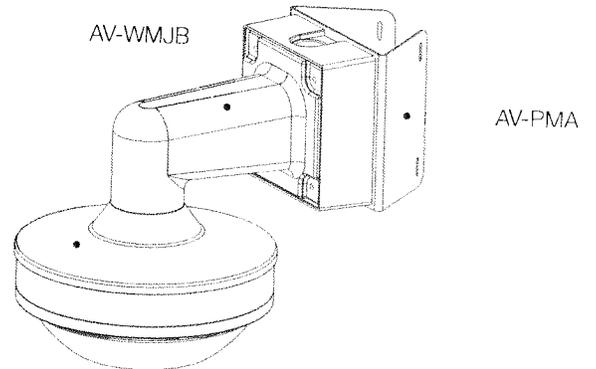
- SO-CAP *(shown)*
- SV-CAP
- MD-CAP



## Wall Mount Configuration with Pole Mount Adapter

Cap Options:

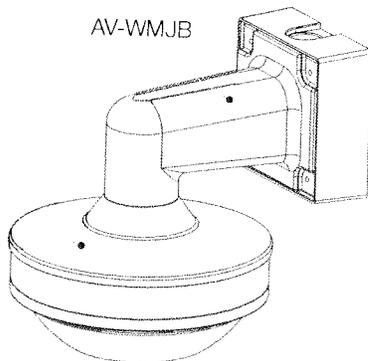
- SO-CAP *(shown)*
- SV-CAP
- MD-CAP



## Wall Mount Configuration

Cap Options:

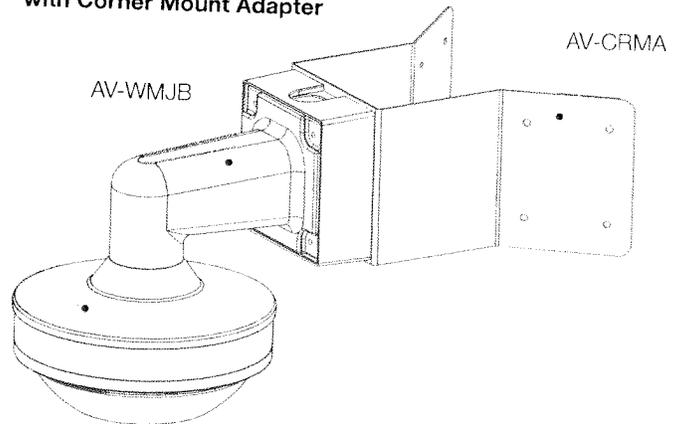
- SO-CAP *(shown)*
- SV-CAP
- MD-CAP



## Wall Mount Configuration with Corner Mount Adapter

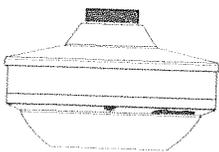
Cap Options:

- SO-CAP *(shown)*
- SV-CAP
- MD-CAP



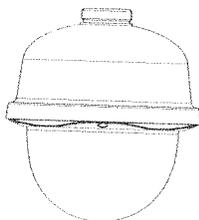
Cap Options:

**SO-CAP**



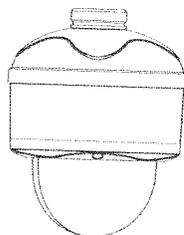
Works with SurroundVideo<sup>®</sup> Omni

**SV-CAP**



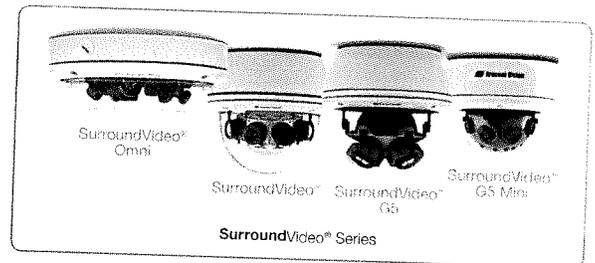
Works with SurroundVideo<sup>®</sup> and SurroundVideo<sup>®</sup> G5

**MD-CAP**

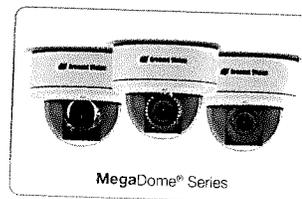


Works with MegaDome<sup>®</sup> Series, SurroundVideo<sup>®</sup> G5 Mini and MegaVideo<sup>®</sup> Compact D4SO

Compatible Cameras:



SurroundVideo<sup>®</sup> Series



MegaDome<sup>®</sup> Series



MegaVideo<sup>®</sup> Compact D4SO

### AV-PMJB

Pendant Mount Bracket with Junction Box



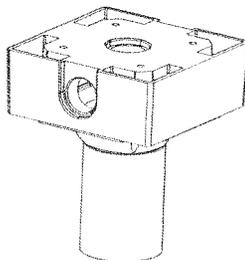
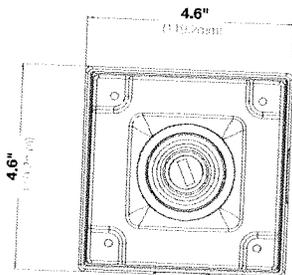
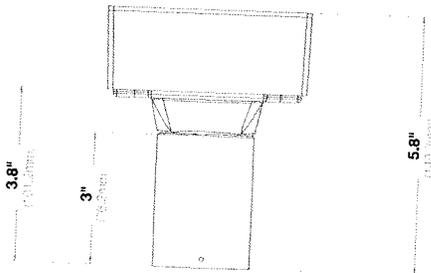
**Features:**

- Easy Installation and Superior Design
- Heavy Duty Enclosure Protection for Applications in Harsh Environments
- Die-Cast Aluminum is Resistant to Impact and Salt Damage

**Compatibility** Compatible with 1.5" NPT Female  
Works with SurroundVideo® Series, MegaDome® Series, and D4SO

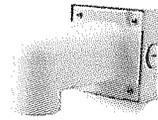
**Mechanical**

|                        |                                         |
|------------------------|-----------------------------------------|
| <b>Casing Material</b> | Aluminum                                |
| <b>Color</b>           | Ivory (Pantone Cool Gray 1C)            |
| <b>Dimensions</b>      | 5.87" H (149.31mm) x 4.69" W (119.20mm) |
| <b>Weight</b>          | w/o Camera 2.12lbs (0.96kg)             |



### AV-WMJB

Wall Mount Bracket with Junction Box



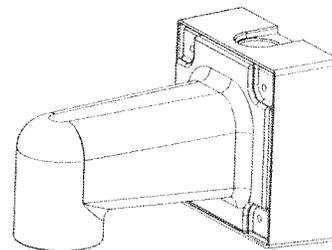
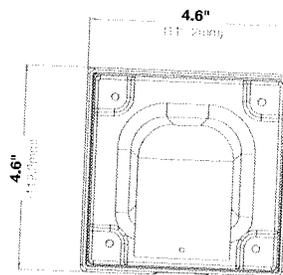
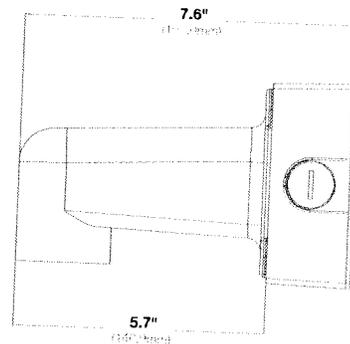
**Features:**

- Easy Installation and Superior Design
- Heavy Duty Enclosure Protection for Applications in Harsh Environments
- Die-Cast Aluminum is Resistant to Impact and Salt Damage

**Compatibility** Compatible with 1.5" NPT Female  
Works with SurroundVideo® Series, MegaDome® Series, and D4SO

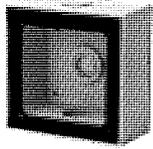
**Mechanical**

|                        |                                         |
|------------------------|-----------------------------------------|
| <b>Casing Material</b> | Aluminum                                |
| <b>Color</b>           | Ivory (Pantone Cool Gray 1C)            |
| <b>Dimensions</b>      | 7.68" L (195.05mm) x 4.69" W (119.20mm) |
| <b>Weight</b>          | w/o Camera 2.49lbs (1.13kg)             |



## AV-JBA

Junction Box Adapter



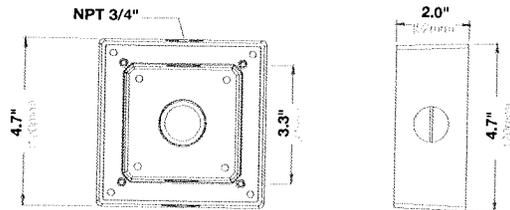
**Features:**

- Easy Installation and Superior Design
- Heavy Duty Enclosure Protection for Applications in Harsh Environments
- Die-Cast Aluminum is Resistant to Impact and Salt Damage

**Compatibility** Compatible with 3/4" NPT standard  
Works with AV-PMJB\*, AV-WMJB\*, D4S-WMT, HSG2-WMT, and MegaView® 2\*

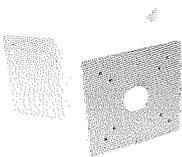
**Mechanical**

|                        |                                                 |
|------------------------|-------------------------------------------------|
| <b>Casing Material</b> | Aluminum                                        |
|                        | IP66 Outdoor Protection Grade                   |
| <b>Color</b>           | Ivory (Pantone Cool Gray 1C)                    |
| <b>Dimensions</b>      | 4.7" L (120mm) x 4.7" W (120mm) x 2.0" H (52mm) |
| <b>Weight</b>          | <b>w/o Camera</b> 1.3lbs (0.63kg)               |



## AV-CRMA

Corner Mount Adapter



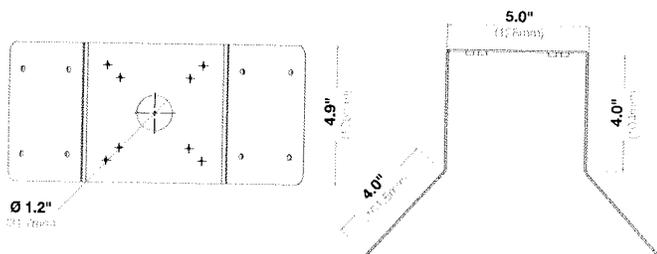
**Features:**

- Easy Installation and Superior Design
- Heavy Duty Enclosure Protection for Applications in Harsh Environments
- Die-Cast Aluminum is Resistant to Impact and Salt Damage

**Compatibility** Works with AV-PMJB, AV-WMJB and AV-JBA

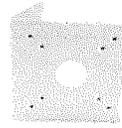
**Mechanical**

|                        |                                       |
|------------------------|---------------------------------------|
| <b>Casing Material</b> | Aluminum                              |
| <b>Color</b>           | Ivory (Pantone Cool Gray 1C)          |
| <b>Dimensions</b>      | 13.04" W (331.25mm) x 4.92" H (125mm) |
| <b>Weight</b>          | <b>w/o Camera</b> 0.59lbs (0.27kg)    |



## AV-PMA

Pole Mount Adapter



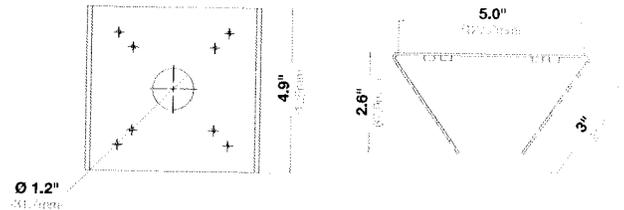
**Features:**

- Easy Installation and Superior Design
- Heavy Duty Enclosure Protection for Applications in Harsh Environments
- Die-Cast Aluminum is Resistant to Impact and Salt Damage

**Compatibility** Works with AV-PMJB, AV-WMJB and AV-JBA

**Mechanical**

|                        |                                      |
|------------------------|--------------------------------------|
| <b>Casing Material</b> | Aluminum                             |
| <b>Color</b>           | Ivory (Pantone Cool Gray 1C)         |
| <b>Dimensions</b>      | 5.01" W (127.32mm) x 4.92" H (125mm) |
| <b>Weight</b>          | <b>w/o Camera</b> 0.32lbs (0.15kg)   |



## AV-EBA

Electrical Box Adapter



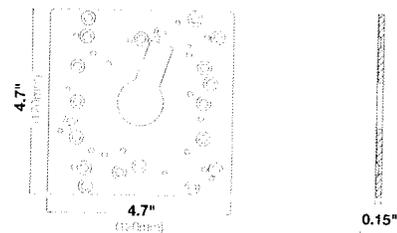
**Features:**

- Easy Installation and Superior Design
- Heavy Duty Enclosure Protection for Applications in Harsh Environments
- Die-Cast Aluminum is Resistant to Impact and Salt Damage

**Compatibility** Compatible with 3/4" NPT standard  
Works with all Arecont Vision® Cameras

**Mechanical**

|                        |                                                 |
|------------------------|-------------------------------------------------|
| <b>Casing Material</b> | Aluminum                                        |
| <b>Color</b>           | Ivory (Pantone Cool Gray 1C)                    |
| <b>Dimensions</b>      | 4.7" L (120mm) x 4.7" W (120mm) x 0.15" H (4mm) |
| <b>Weight</b>          | <b>w/o Camera</b> 0.3lbs (0.13kg)               |



### SO-CAP Mounting Cap



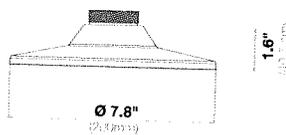
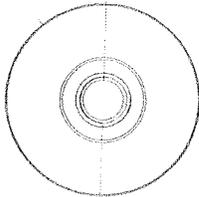
**Features:**

- Easy Installation and Superior Design
- Heavy Duty Enclosure Protection for Applications in Harsh Environments
- Die-Cast Aluminum is Resistant to Impact and Salt Damage

**Compatibility** Compatible with 1.5" NPT Male  
Works with SurroundVideo® Omni

**Mechanical** **Casing Material** Aluminum  
**Color** Ivory (Pantone Cool Gray 1C)  
**Dimensions** Ø 7.87" (200mm) x 1.6" H (40.79mm)  
**Weight** w/o Camera 0.85lbs (0.39kg)

Ø 7.8"  
(200mm)



### SV-CAP Mounting Cap

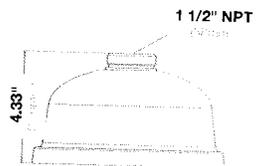
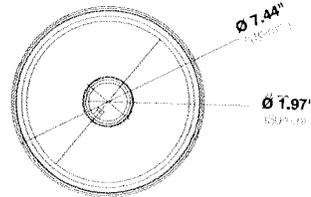


**Features:**

- Easy Installation and Superior Design
- Heavy Duty Enclosure Protection for Applications in Harsh Environments
- Die-Cast Aluminum is Resistant to Impact and Salt Damage

**Compatibility** Compatible with 1.5" NPT standard  
Works with SurroundVideo® and SurroundVideo® G5

**Mechanical** **Casing Material** Aluminum  
IP66 Outdoor Protection Grade  
**Color** Ivory (Pantone Cool Gray 1C)  
**Dimensions** Ø 7.4" (189mm) x 4.33" H (110mm)  
**Weight** w/o Camera 1.47lbs (0.69kg)



### MD-CAP Mounting Cap

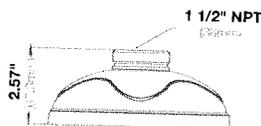
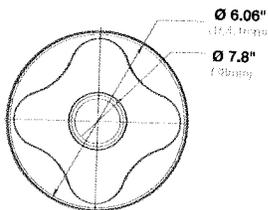


**Features:**

- Easy Installation and Superior Design
- Heavy Duty Enclosure Protection for Applications in Harsh Environments
- Die-Cast Aluminum is Resistant to Impact and Salt Damage

**Compatibility** Compatible with 1.5" NPT standard  
Works with MegaDome® Series, SurroundVideo® G5 Mini and MegaVideo® Compact D4SO

**Mechanical** **Casing Material** Aluminum  
**Color** Ivory (Pantone Cool Gray 1C)  
**Dimensions** Ø 6.06" (154.1mm) x 2.57" H (65.3mm)  
**Weight** w/o Camera 1.02lbs (465kg)



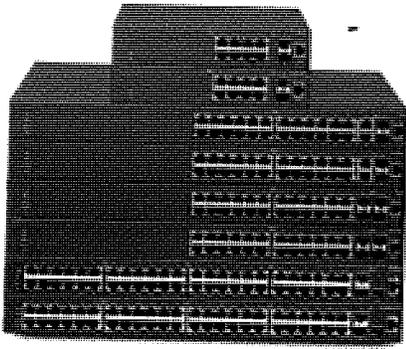


Figure 1. The ERS 3500 (stacked format).

# AVAYA

## AVAYA ETHERNET ROUTING SWITCH 3500 SERIES

### HIGHLIGHTS

- Cost effective Fast Ethernet and Gigabit Ethernet switches available in 10, 24 and 48-port model variants.
- Enterprise class features at SME price points with 100+ enterprise class features at price points that fit into tight capital budgets.
- Fanless models for silent operation in open areas - ideal for classrooms, boardrooms and retail shops.
- Resilient stacking that provides pay as you grow scaling with up to 80 Gbps of virtual backplane capacity in a stack of 8 units.
- PoE/PoE+ models for powered connection of IP Phones and other devices.
- Simplified operations including 3-minute plug-and-play capabilities for IP Phones, automatic QoS provisioning and intuitive management options.
- Unique quick set-up utility that simplifies installation with IP Office.

The Avaya Ethernet Routing Switch (ERS) 3500 is a series of eight high-performance compact Ethernet switches specifically designed for Mid-Market, SMEs, branches and open environments outside the wiring closet.

A cost-effective, feature-rich solution, the ERS 3500 Series provides both standalone and stackable Ethernet switching perfectly suited to the unique requirements of Mid-Market and SME customers, as well as enterprise branch offices.

The Avaya Ethernet Routing Switch 3500 is a reliable, low-cost solution that provides converged services within single or multiple sites typically of 300 users or less.

It offers three models which can operate in fanless mode to provide silent operation for classrooms, hospitality suites, retail sites or other noise sensitive environments - outside of the wiring closet.

It also supports IEEE 802.3at Power-over-Ethernet Plus (PoE+) which can power IP Phones, Wireless Access Points, surveillance cameras and other devices. PoE+ with its 32-watt power budget ensures investment protection for current as well as future high-powered end-points.

For environments that need upside capacity, all ERS 3500 24-port and 48-port models support Avaya's Stackable Chassis architecture. This allows up to eight ERS 3500 units to be cabled together to form a single logical chassis with up to 384 user ports and 80 Gigabits of virtual backplane capacity. The ERS 3500 Stackable Chassis architecture can also improve network availability and resiliency through hot-swap and link aggregation capabilities across the system.

Delivering high performance Layer 2 switching, Layer 3 local and static routing, advanced convergence and a range of security features, the ERS 3500 provides enterprise class features at an SME price. It also can automate many of today's manual processes to simplify operations and reduce costs for the cost conscious enterprise.

## Simplified Operations

The ERS 3500 is well suited for smaller environments where there might be little or no local IT staff. It is designed to be simple to install, manage and operate. And when deployed in conjunction with an Avaya IP Office system the ERS 3500 offers increased operational simplicity over third party switching solutions through features that both simplify the initial deployment as well as ongoing adds, moves and changes.

### Automated switch set up with Avaya IP Office

For deployment scenarios where there may not be a data networking support specialist on site, the ERS 3500 provides an automated script to enable fast, error free installation when deployed with IP Office. An installation script automates the

entire set up process on the ERS 3500 switch by utilizing LLDP or ADAC functionality to automatically set up voice and data VLANs, QoS and policies on the IP Phones, meaning that IP Office and IP Phones are ready to be connected immediately. This helps ensure fast setup and error free deployment according to Avaya best practices and consistency between different locations for large rollouts in multiple Branch Offices.

### Validated interoperability with Avaya IP Office

Avaya has also validated interoperability between the ERS 3500 and the IP Office system to ensure the two products work together seamlessly. This eliminates any complexities associated with having to provision, manage and troubleshoot a third party Switch with the Avaya voice / unified communications infrastructure. A Technical Solutions Guide, available to partners and end customers, showcases best practice configurations, ensuring optimal performance of the solution.

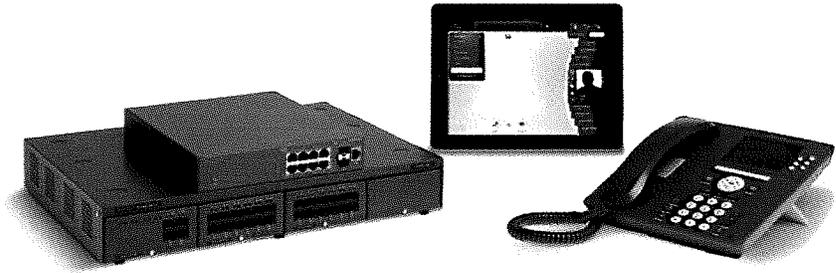


Figure 2: Left to right: ERS 3500, My Avaya IP Office (IP Office) and Avaya IP Office IP Phone

## The ERS 3500 Series models

### Fast Ethernet Models

|                       |                                                                                                            |
|-----------------------|------------------------------------------------------------------------------------------------------------|
| <b>ERS 3526T</b>      | 24 x 10/100Mbps + 2 Combo 10/100/1000 or SFP ports + 2 SFP / 2.5G rear ports. Fanless.                     |
| <b>ERS 3526T-PWR+</b> | 24 x 10/100Mbps PoE+ ports + 2 Combo 10/100/1000 or SFP ports + 2 SFP / 2.5G rear ports. PoE budget 370W.  |
| <b>ERS 3550T</b>      | 48 x 10/100Mbps ports plus 2 Combo SFP ports (with ports 47-48) + 2 SFP / 2.5G rear ports.                 |
| <b>ERS 3550T-PWR+</b> | 48 x 10/100Mbps PoE+ ports plus 2 Combo SFP ports (with 47-48) + 2 SFP / 2.5G rear ports. PoE budget 370W. |

### Gigabit Ethernet Models

|                         |                                                                                                                                |
|-------------------------|--------------------------------------------------------------------------------------------------------------------------------|
| <b>ERS 3510GT</b>       | 8 x 10/100/1000Mbps + 2 SFP ports. Standalone and Fanless.                                                                     |
| <b>ERS 3510GT-PWR+</b>  | 8 x 10/100/1000Mbps PoE+ ports + 2 SFP ports. Standalone. Fanless mode @ 60W PoE budget, Fan operation mode @ 170W PoE budget. |
| <b>ERS 3524GT</b>       | 24 x 10/100/1000Mbps with 4 Combo SFP ports (with ports 21-24) + 2 SFP / 2.5G rear ports                                       |
| <b>ERS 3524GT-PWR+</b>  | 24 x 10/100/1000Mbps PoE+ ports with 4 Combo SFP ports (with ports 21-24) + 2 SFP / 2.5G rear ports. PoE budget 370W.          |
| <b>ERS 3549GTS</b>      | 48 x 10/100/1000 ports, plus 2 Combo SFP ports (with ports 47-48), plus 1 SFP+ uplink port, plus 2 SFP / 2.5G rear ports.      |
| <b>ERS 3549GTS-PWR+</b> | 48 x 10/100/1000 PoE+ ports, plus 2 Combo SFP ports (with ports 47-48), plus 1 SFP+ uplink port, plus 2 SFP / 2.5G rear ports. |

### Certified 1-minute plug-and-play for IP Phones

Plug-and-play means that as soon as an IP Phone is plugged into an Avaya Ethernet Switch, the IP Phone is automatically recognized and configured. This feature can dramatically simplify the roll out of IP Phones and simplify ongoing adds, moves and changes; empowering employees to move their own phones without the assistance of an outside contractor. To enable this plug-and-play capability, Avaya offers IEEE 802.1AB Link Layer Discovery Protocol and LLDP-Media Endpoint Discovery (LLDP-MED) as well as the Avaya Auto Discovery and Auto Configuration (ADAC) feature.

With LLDP enabled, the ERS 3500 learns the identification of neighboring devices and provides these details to the network management system. This enables the system to have the most up-to-date physical view of the network. In addition, ERS 3500 can dynamically apply voice VLANs and QoS to both the IP Phone and the attached Edge Switch port. When the IP Phone is moved to another location, the configuration is automatically updated. QoS is also automatically provisioned on the ERS 3500 uplink ensuring voice is given top priority into the Core. With one of the most comprehensive implementations of LLDP in the industry, Avaya offers enhancements for standards based provisioning of Avaya IP Phones via integrated and customizable TLV support.

These features not only save network operators time, they can virtually eliminate the likelihood of a provisioning error during a large IP Phone deployment. Third-party testing conducted by Miercom<sup>1</sup> validated that when IP Phones were plugged into an Avaya Ethernet Switch, they were operational in just over 1 minute.

### Intuitive Management

ERS 3500 Series offers flexible options for managing, troubleshooting and operating your devices.

- For customers more comfortable using the Command Line Interface (CLI), the ERS 3500 offers an industry-aligned CLI that is intuitive

and requires little to no formal training for individuals with networking backgrounds.

- For customers who are looking for a simple Graphical User Interface (GUI) for management and provisioning, Avaya's Enterprise Device Manager (EDM) is an embedded web-based element management and configuration tool that enables set-up, configuration and monitoring of a single device using either HTTP or HTTPS (Secure Web). The on-box embedded version of EDM is available at no extra charge with every switch and can be accessed by a standard web browser. There is also an off-box version available as a free downloadable software plug-in that can be installed on Avaya's Configuration and Orchestration Manager (COM) application.
- For customers rolling out many ERS 3500 devices, the Avaya Configuration and Orchestration Manager (COM) application, simplifies multi-element configuration via wizards and templates – increasing consistency and reducing the chances of error during configuration changes. COM also provides network discovery, device backup, bulk configuration management and audits of configuration changes.
- SNMP-based management (SNMP v1, v2 and v3) provides an alternative standards-based management approach as well as an interface for Configuration and Orchestration Manager.

The Avaya ERS 3500 supports secure management via IPv4 or IPv6 through features such as Secure Shell (SSHv1/2), Secure Sockets Layer (SSL), Simple Network Management Protocol (SNMPv1,2,3), IP Manager Lists, and administrative authentication via RADIUS or TACACS+ when connecting to the switch or stack.

## Convergence-ready for Unified Communications, High-Definition Video and more

For businesses looking to consolidate all forms of communication – voice, video and data – on a single infrastructure, the Avaya ERS 3500 Series delivers functionality that simplifies convergence of these technologies.

### Support for IEEE 802.3at PoE+ to power your Converged Device

Through support for IEEE 802.3at PoE+ which delivers up to 32 Watts of power per port to end-devices, ERS 3500s are able to power IP Phones, Wireless LAN Access Points, networked high-definition CCTV cameras and other devices. This eliminates the need for separate power supplies for each unit, enabling reduced cabling and management costs for adds, moves, or changes.

The higher power budget delivered by the PoE+ standard ensures that customers have the added flexibility of converging video surveillance traffic over the network, since pan, tilt

and zoom cameras are one of the end devices that require the additional power provided by PoE+. It also ensures investment protection for future end points, such as new Wireless LAN Access Points (3x3 802.11n Access Points and emerging 802.11ac Access Points) as well as next-generation video phones.

The 24-port and 48-port PoE+ enabled products (ERS 3526T-PWR+, ERS 3550T-PWR+, 3524GT-PWR+ and ERS 3549GTS-PWR+) support a maximum power budget of 370 Watts. And the 10-port Gigabit Ethernet model (ERS 3510-PWR+) supports a maximum power budget of 170 Watts – dramatically higher than competitive switches in its class – enabling it to deliver a concurrent average of 20 Watts of power to each of the eight PoE+ enabled access ports.

### Comprehensive QoS capabilities

The ERS 3500 series delivers unsurpassed control for networks supporting a wide range of different application types. The ERS 3500 classifies, prioritizes and marks LAN IP traffic using up to four hardware queues on every port – including the rear SFP ports.

Classification can be based on MAC address, IP ToS/DSCP marking, IP source/destination address or subnets, TCP/UDP source/destination port/port range, IEEE 802.1p user priority bits, ingress source port, IP Protocol ID (e.g., TCP, UDP, IGMP), EtherType (e.g., IP, IPX) or the IEEE 802.1Q VLAN ID. Comprehensive

### Delivering both connectivity and power to users & devices within a small office

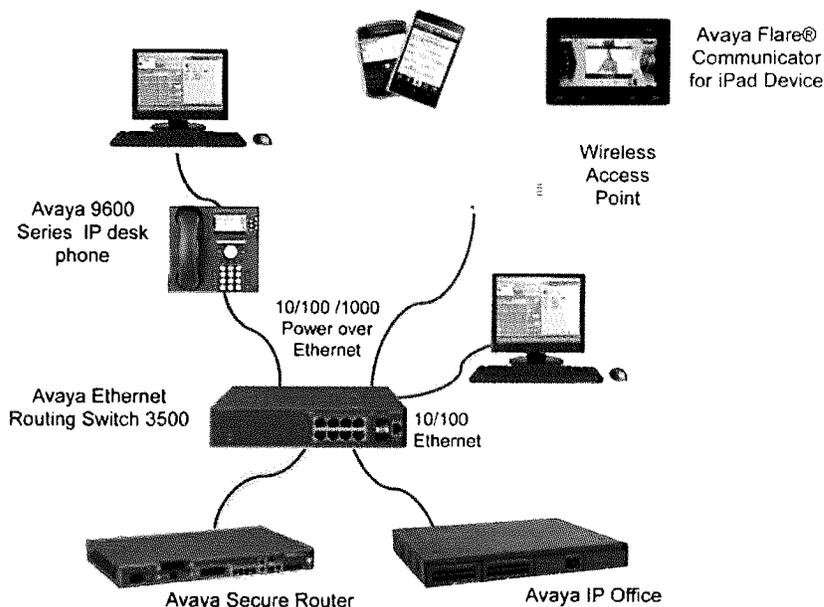
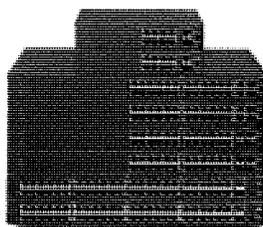


Figure 1: Small office network

traffic policing and traffic shaping are also supported.

### Intelligent stacking solution delivering scalability, flexibility, resilience and performance

No one knows stacking like Avaya. We introduced our first Stackable Chassis



product in 1998 and have been perfecting the technology ever since. We were the first and only vendor to break the Terabit boundary with our ERS 5600 Series products and we have differentiated ourselves in the industry by ensuring that our Stackable Chassis perform like a traditional modular chassis implementation. We offer genuine

chassis-like features including true pay-as-you-grow scaling and in-service maintenance and restoration. From a management perspective, our Stackable Chassis looks like a single network entity – utilizing only a single IP address.

Up to eight ERS 3500 units can be stacked – combining 24 or 48-port models – to deliver up to 80Gbps stacking throughput and up to 384 x 10/100/1000 user ports. Stacking is supported on ERS 3526T/3526T-PWR+, ERS 3550T/3550T-PWR+, ERS 3524GT/3524GT-PWR+ and ERS 3549 GTS/3549 GTS-PWR+ models.

### High performance architecture with true pay-as-you grow scaling

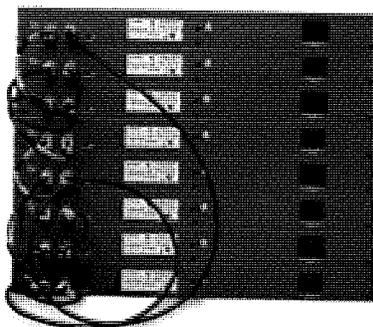
Our Stackable Chassis products combine non-blocking internal switching fabrics with high-speed virtual backplane architecture for a

high performance solution that scales proportionally as new switches are added. The ERS 3500 series scales to a maximum of 80Gbps of virtual backplane throughput by simply cabling up 8 units together. Avaya's Stackable Chassis architecture simplifies stack management. Customers do not have to worry about different software versions on different products, since all ERS 3500 units run the same software image. The software image is loaded onto the base unit of the stack which then loads the image to all the other Switches in the stack. As new units are added to the stack, the ERS 3500 automates the software image and configuration download process. Third party testing<sup>1</sup> has validated that new ERS 3500 units can become operational in just over 2 minutes of being cabled into the stack.

To ensure wire-speed performance, our Stackable Chassis architecture is based on a shortest-path forwarding algorithm for optimal data flow across the stack. Unlike competitive solutions that use unwieldy logical ring or token technology, Avaya allows traffic to flow upstream and downstream simultaneously from every Switch connected to the virtual backplane, optimizing performance, resiliency, and resource utilization. Avaya has an additional advantage in that Quality-of-Service settings are honored as traffic passes over the stacking connections - providing applications with optimal performance, and a positive user experience.

All ERS 3500 24 and 48-port models come with two in-built Stackable Chassis interfaces for simple, cost-effective and efficient connectivity. Unlike comparative offerings which daisy chain low-speed interfaces, this design frees uplink ports for dedicated connectivity to the backbone. In addition to the stacking cables, a return cable is also used to provide full virtual chassis resiliency and to protect against any stack port, Switch unit or cable failures.

Unlike competitive solutions which charge large premiums for stacking, the ERS 3500 offers the ability for customers to utilize its Stackable Chassis architecture without incurring any licensing or hardware costs.



### In-service maintenance and restoration

Virtual hot swap, a critical serviceability and operability capability, helps ensure that failure in any stacked unit is quickly and easily rectified. Pioneered in modular switches, virtual hot swap is available in Avaya Stackable Chassis solutions where, without complex engineering, it enables immediate like-for-like unit replacement with no impact on other functionality and traffic, empowering operators to deploy our solutions just as they would a chassis. If a failure occurs, neighboring switches automatically wrap their fabric

connections to help ensure that other Switches in the stack are not impacted. The failed unit is simply disconnected from the fabric and, without pre-staging of software or configuration, a like unit is inserted, cabled, and powered-up. The Automatic Unit Replacement (AUR) process self-manages the software and configuration downloads to the new Switch then brings it online, without the need for an engineer to manage the process.

Further complementing the Avaya ERS 3500 solution, Avaya supports standards-based 802.3ad Link Aggregation as well as its own Multi-Link Trunking technology that allows grouping of ports to form high-speed trunks/aggregations. These bundles or groups of ports can be distributed across different units in the same stack, delivering higher levels of resiliency in case of link or switch failure to help ensure that traffic gets to its destination.

Stack health-check monitoring, a real-time, at-a-glance view of stack operational status and health, further enhances operational and management simplicity.

### Centralized Management

From a management perspective, an ERS 3500 Stackable Chassis solution appears as a single networking entity - utilizing only a single IP Address. This can significantly reduce the number of Switches to be managed within the network as a stack of up to 8 Switches can be managed just as easily as a single device.

## Increasing access security at the Edge

The Ethernet Routing Switch 3500 offers a high level of security with authenticated network access that leverages IEEE 802.1X Extensible Authentication Protocol (EAP) with multiple extensions including support for Multi-Host Multi-Authentication mode (MHMA), Multi-Host Single-Authentication mode (MHSA), non EAP device support (i.e. printers, etc.) and RADIUS based MAC authentication support. Up to 32 host devices per switch port are supported in these modes.

Based on the IEEE 802.1X standard, EAP limits access to the network based on user credentials. A user is required to login to the network using a username/password; the user database is maintained on the authentication server (not the Switch). Additionally MAC-address based security limits access to only network-authorized and trusted personnel, including full tracking of network connections. Network access is granted or denied via proper MAC-address identification (up to a maximum of 448).

When advanced, policy-based and centralized user/device authentication is required, the Avaya ERS 3500 can be used in conjunction with the innovative Avaya Identity Engines portfolio solution. This easy-to-deploy, policy-based solution assigns network access rights and permissions based on user role, where the user connects (local or remote) and how the user connects (wired or wireless). In this way, each connected device and user are known and are governed by device-specific security policies. For example, based on their network credentials, an employee using a corporate owned device will be granted full corporate access however, while

using a non-corporate-owned device, they will be granted limited access.

As the number of employee-owned devices increases, Identity Engines can help network operators retain control by running device health checks and verifying user and device credentials. Identity Engines can enforce network access permission levels without undue effort on the part of the IT staff. It can also apply consistent access and security policies to all end points – whether they be wired or wireless.

In addition, the Avaya ERS 3500 offers security features that help protect against malicious network attacks. These include increased protection from snooping of DHCP services, verification and filtering of ARP traffic via in-hardware processing (Dynamic ARP inspection), restriction of IP traffic to registered end devices (IP Source Guard), and control of the flow of Spanning Tree BPDUs within the network (BPDU Filtering).

## Compact Form Factors with Flexible Installation Options

The 10 port ERS 3500 models (3510GT & 3510GT-PWR+), which are 1U tall, 8.75" wide and 8" and 11" deep (44.5mm x 220mm x 200mm and 280mm) respectively, can be installed on a table or shelf using rubber feet (included), or can be wall mounted using the wall mount screws and anchors (also included). Additionally, optional rack accessory kits are available allowing the ERS 3510GT and ERS 3510GT-PWR+ to be mounted either alone or with two units side-by-side in a standard 19" rack.

The 24 and 48-port ERS 3500 models can be installed on a table or shelf or

wall mounted using the included rack mount brackets mounted at 90 degrees, or in a standard 19" equipment rack.

## Energy Efficiency

New regulations and rising awareness of the ever-increasing cost of electrical power keep energy efficiency top of mind. An innovator in this area, Avaya has built energy efficiency into many of its hardware products. In fact, independent testing indicates that Avaya LAN Switches, Call Servers, Gateways, Unified Messaging Servers and Gigabit IP Phones are typically more energy efficient than competitive equipment. The ERS 3500 is based on highly efficient power supplies – delivering over 80% efficiency.<sup>2</sup> The ERS 3500 also supports dynamic power management where each port can be configured to limit the power delivered to a device and for power priority level—low, high, and critical.

The ERS 3500 also supports Avaya Energy Saver which can further conserve energy by turning down port speeds during designated off-peak hours.

## Lifetime Warranty

Avaya includes industry-leading warranty services for our portfolio of Stackable Chassis Switches, including Avaya ERS 3500 Series products. The Lifetime Hardware Warranty Offer includes complimentary next-business-day shipment of replacement units for the life of the product (including fans and power supplies) and technical support as follows: Basic technical support for the supported lifecycle of the product and full technical support for the first 90 days after purchase. Products sold on or after July 1, 2015 are supported by the Lifetime Software Warranty Offer. This provides our Customers

with access to software if and when published, so that the product's conformity to published specifications and capabilities may be maintained. For products sold prior to July 1, 2015, Avaya also offers a very cost-effective option to purchase the Software Release Service, providing access to new feature releases and

additional hardware support programs. Detailed information on Avaya's Lifetime Warranty Offers is available online.

## Summary

Avaya is positioned to provide an end-to-end solution for converged

networks. The Ethernet Routing Switch 3500 Series, along with other Avaya products, can increase profitability and productivity, streamline business operations, lower costs and help your business gain a competitive edge.

## Model Specifications

### ERS 3526T



|                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|---------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Switch Details:</b>    | <p>24 10/100BASE-TX ports, plus 2 Combo 10/100/1000BASE-T or SFP ports</p> <p>2 rear SFP ports can be used as additional ports in Standalone Mode, or, 2 rear ports delivering up to 10Gbps (FDX) of Stackable Chassis throughput per Switch in Stacking Mode</p> <p>Fanless operation</p> <p>System CPU speed: 400MHz</p> <p>System memory: 64MB Flash, 256MB DRAM</p> <p>RJ-45 Console port provides industry standard serial port connectivity</p> <p>Switch capacity and forwarding rate (64-byte): 12.8Gbps / 9.5Mpps</p> <p>MTBF: 645,510 hrs</p> |
| <b>Dimensions:</b>        | <p>Height: 1U or 44.5mm / 1.75"</p> <p>Width: 440mm / 17.5"</p> <p>Depth: 280mm / 11"</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Weight:</b>            | 3.60kg / 8lb                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Power and Thermal:</b> | <p>Input voltage: 100 to 240 VAC@ 47 to 63 HZ</p> <p>Input current (max): 0.28A@100VAC</p> <p>Power consumption: 28.5 Watts max</p> <p>Thermal rating (output): 65 BTU/hr max</p>                                                                                                                                                                                                                                                                                                                                                                       |

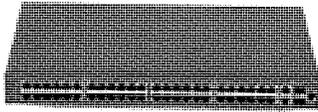
### ERS 3526T-PWR+



|                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|---------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Switch Details:</b>    | <p>24 10/100BASE-TX ports with support for IEEE 802.3af PoE or IEEE 802.3at PoE+, plus 2 Combo 10/100/1000BASE-T or SFP ports</p> <p>2 rear SFP ports can be used as additional ports in Standalone Mode, or, 2 rear ports delivering up to 10Gbps (FDX) of Stackable Chassis throughput per Switch in Stacking Mode</p> <p>System CPU speed: 400MHz</p> <p>System memory: 64MB Flash, 256MB DRAM</p> <p>RJ-45 Console port provides industry standard serial port connectivity</p> <p>Switch capacity and forwarding rate (64-byte): 12.8Gbps / 9.5Mpps</p> <p>MTBF: 332,778</p> |
| <b>Dimensions:</b>        | <p>Height: 1U or 44.5mm / 1.75"</p> <p>Width: 440mm / 17.5"</p> <p>Depth: 280mm / 11"</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Weight:</b>            | 4.50kg / 10lb                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Power and Thermal:</b> | <p>Input voltage: 100 to 240 VAC@ 47 to 63 HZ</p> <p>Input current (max): 5.0A@100VAC</p> <p>Power consumption: 500Watts max</p> <p>Thermal rating (output): 360 BTU/hr max</p> <p>Maximum power budget: 370 Watts</p>                                                                                                                                                                                                                                                                                                                                                            |

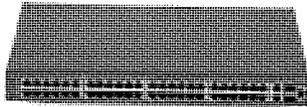
# Model Specifications

## ERS 3550T



|                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|---------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Switch Details:</b>    | <p>48 x 10/100BASE-TX ports, plus 2 Combo 10/100/1000BASE-T or SFP ports</p> <p>2 rear SFP ports can be used as additional ports in Standalone Mode, or 2 rear ports delivering up to 10Gbps (FDX) of Stackable Chassis throughput per Switch in Stacking Mode</p> <p>Stacking, up to 8 units with 10Gbps throughput per Switch</p> <p>System CPU speed: 400Mhz</p> <p>System memory: 32MB Flash, 128MB DRAM</p> <p>RJ-45 Console port provides industry standard serial port connectivity</p> <p>Switch capacity and forwarding rate (64-byte): 17.6Gbps / 13.1Mpps</p> <p>MTBF: 446,323</p> |
| <b>Dimensions:</b>        | <p>Weight: 1U or 445mm / 1.75"</p> <p>Width: 440mm / 17.5"</p> <p>Depth: 280mm / 11"</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Weight:</b>            | 4.6kg / 10.2lb                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Power and Thermal:</b> | <p>Input voltage: 100 to 240 VAC @ 47 to 63 Hz</p> <p>Input current (max): 0.83 Amps @ 100 VAC</p> <p>Power consumption: 35 Watts max</p> <p>Thermal rating (output): 118 BTU/hr max</p>                                                                                                                                                                                                                                                                                                                                                                                                      |

## ERS 3550T-PWR+



|                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|---------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Switch Details:</b>    | <p>48 x 10/100BASE-TX ports with support for IEEE 802.3ad PoE or IEEE 802.3at PoE+, plus 2 Combo 10/100/1000BASE-T or SFP ports</p> <p>2 rear SFP ports can be used as additional ports in Standalone Mode, or 2 rear ports delivering up to 10Gbps (FDX) of Stackable Chassis throughput per Switch in Stacking Mode</p> <p>Stacking, up to 8 units with 10Gbps throughput per Switch</p> <p>System CPU speed: 400Mhz</p> <p>System memory: 32MB Flash, 128MB DRAM</p> <p>RJ-45 Console port provides industry standard serial port connectivity</p> <p>Switch capacity and forwarding rate (64-byte): 17.6Gbps / 13.1Mpps</p> <p>MTBF: 237,581</p> |
| <b>Dimensions:</b>        | <p>Weight: 1U or 445mm / 1.75"</p> <p>Width: 440mm / 17.5"</p> <p>Depth: 280mm / 11"</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Weight:</b>            | 5.6kg / 12.7lb                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Power and Thermal:</b> | <p>Input voltage: 100 to 240 VAC @ 47 to 63 Hz</p> <p>Input current (max): 6.8 Amps @ 100 VAC</p> <p>Power consumption: 504 Watts max</p> <p>Thermal rating (output): 456 BTU/hr max</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                             |

## Model Specifications

### ERS 3510GT



|                           |                                                                                                                                                                                                                                                                                                                                                          |
|---------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Switch Details:</b>    | <p>8 10/100/1000BASE-T ports with 2 SFP ports</p> <p>Fanless operation</p> <p>Standalone</p> <p>System CPU speed: 400MHz</p> <p>System memory: 64MB Flash, 256MB DRAM</p> <p>RJ-45 Console port provides industry standard serial port connectivity</p> <p>Switch capacity and forwarding rate (64-byte): 20Gbps / 14.9Mpps</p> <p>MTBF: 892,667 hrs</p> |
| <b>Dimensions:</b>        | <p>Height: 1U 44.5mm / 1.75"</p> <p>Width: 220mm / 8.75"</p> <p>Depth: 200mm / 8"</p>                                                                                                                                                                                                                                                                    |
| <b>Weight:</b>            | <p>1.75kg / 3.9lb</p>                                                                                                                                                                                                                                                                                                                                    |
| <b>Power and Thermal:</b> | <p>Input voltage: 100 to 240 VAC @ 47 to 63 HZ</p> <p>Input current (max): 0.18A @ 100VAC,</p> <p>Power consumption: 18 Watts max</p> <p>Thermal rating (output): 61 BTU/hr max</p>                                                                                                                                                                      |

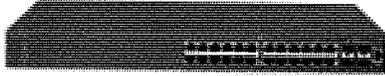
### ERS 3510GT-PWR+



|                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|---------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Switch Details:</b>    | <p>8 10/100/1000BASE-T ports with support for IEEE 802.3af PoE or IEEE 802.3at PoE+ with 2 SFP ports</p> <p>Standalone</p> <p>Dual power modes - fanless operation in Low Power Budget mode @ 60W max PoE budget, or normal fan operation in High Power Budget mode @ 170W max PoE budget.</p> <p>System CPU speed: 400MHz</p> <p>System memory: 64MB Flash, 256MB DRAM</p> <p>RJ-45 Console port provides industry standard serial port connectivity</p> <p>Switch capacity and forwarding rate (64-byte): 20Gbps / 14.9Mpps</p> <p>MTBF: 673,452 hrs</p> |
| <b>Dimensions:</b>        | <p>Height: 1U 44.5mm / 1.75"</p> <p>Width: 220mm / 8.75"</p> <p>Depth: 280mm / 11"</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Weight:</b>            | <p>2.70kg / 6lb</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Power and Thermal:</b> | <p>Input voltage: 100 to 240 VAC @ 47 to 63 HZ</p> <p>Input current (max): 2.1A @ 100VAC</p> <p>Power consumption: 210 Watts</p> <p>Thermal rating (output): 156 BTU/hr max</p> <p>Maximum power budget: 170 Watts</p>                                                                                                                                                                                                                                                                                                                                     |

## Model Specifications

### ERS 3524GT



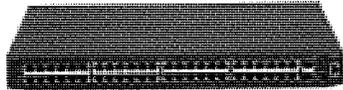
|                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|---------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Switch Details:</b>    | <p>24 10/100/1000BASE-T ports, with 4 Combo SFP ports (with ports 21-24)</p> <p>2 rear SFP ports can be used as additional ports in Standalone Mode, or, 2 rear ports delivering up to 10Gbps (FDX) of Stackable Chassis throughput per Switch in Stacking Mode</p> <p>System CPU speed: 400MHz</p> <p>System memory: 64MB Flash, 256MB DRAM</p> <p>RJ-45 Console port provides industry standard serial port connectivity</p> <p>Switch capacity and forwarding rate (64-byte): 52Gbps / 38.7Mpps</p> <p>MTBF: 657,619 hrs</p> |
| <b>Dimensions:</b>        | <p>Height: 1U 44.5mm / 1.75"</p> <p>Width: 440mm / 17.5"</p> <p>Depth: 280mm / 11"</p>                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Weight:</b>            | 3.55kg / 7.8lb                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Power and Thermal:</b> | <p>Input voltage: 100 to 240 VAC@ 47 to 63 HZ</p> <p>Input current (max): 0.28A @ 100VAC</p> <p>Power consumption: 28.5 Watts max</p> <p>Thermal rating (output): 95 BTU/hr max</p>                                                                                                                                                                                                                                                                                                                                             |

### ERS 3524GT-PWR+



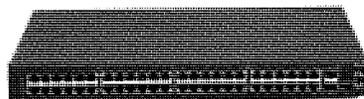
|                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|---------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Switch Details:</b>    | <p>24 10/100/1000BASE-T ports with support for IEEE 802.3af PoE or IEEE 802.3at PoE+, with 4 Combo SFP ports (with ports 21-24)</p> <p>2 rear SFP ports can be used as additional ports in Standalone Mode, or, as 2 rear HiStack ports delivering up to 10Gbps (FDX) of Stackable Chassis throughput per Switch in Stacking Mode</p> <p>System CPU speed: 400MHz</p> <p>System memory: 64MB Flash, 256MB DRAM</p> <p>RJ-45 Console port provides industry standard serial port connectivity</p> <p>Switch capacity and forwarding rate (64-byte): 52Gbps / 38.7Mpps</p> <p>MTBF: 336,357 hrs</p> |
| <b>Dimensions:</b>        | <p>Height: 1U or 44.5mm / 1.75"</p> <p>Width: 440mm / 17.5"</p> <p>Depth: 280mm / 11"</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Weight:</b>            | 4.61kg / 10.2lb                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Power and Thermal:</b> | <p>Input voltage: 100 to 240 VAC@ 47 to 63 HZ</p> <p>Input current (max): 5.0A@100VAC</p> <p>Power consumption: 500 Watts max</p> <p>Thermal rating (output): 357 BTU/hr max</p> <p>Maximum power budget: 370 Watts</p>                                                                                                                                                                                                                                                                                                                                                                           |

## Model Specifications



### ERS 3549GTS

|                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|---------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Switch Details:</b>    | <p>48 10/100/1000BASE-T ports, with 2 Combo SFP ports (with ports 47-48)</p> <p>1 SFP+ (1Gig or 10Gig) uplink port</p> <p>2 rear SFP ports can be used as additional ports in Standalone Mode, or, 2 rear ports delivering up to 10Gbps (FDX) of Stackable Chassis throughput per Switch in Stacking Mode</p> <p>System CPU speed: 400 MHz</p> <p>System memory: 64MB Flash, 256MB DRAM</p> <p>RJ-45 Console port provides industry standard serial port onnectivity</p> <p>Switch Capacity and forwarding rate (64-byte): 120Gbps/89.3Mpps</p> <p>MTBF: 471,289 hours</p> |
| <b>Dimensions:</b>        | <p>Height: 1U 44.5mm / 1.75"</p> <p>Width: 440mm / 17.5"</p> <p>Depth: 405mm / 15.75"</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Weight:</b>            | 6.15kg / 13.55lb                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Power and Thermal:</b> | <p>Input voltage: 100 to 240 VAC @ 50 to 60 HZ</p> <p>Input current (max): 0.71A @ 100VAC</p> <p>Power consumption: 65 Watts max</p> <p>Thermal rating (output): 223 BTU/hr max</p>                                                                                                                                                                                                                                                                                                                                                                                        |



### ERS 3549GTS-PWR+

|                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|---------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Switch Details:</b>    | <p>48 10/100/1000BASE-T ports with support for IEEE 802.3af PoE or IEEE 802.3at PoE+, with 2 Combo SFP ports (with ports 47-48)</p> <p>1 SFP+ (1Gig or 10Gig) uplink port</p> <p>2 rear SFP ports can be used as additional ports in Standalone Mode, or, 2 rear HiStack ports delivering up to 10Gbps (FDX) of Stackable Chassis throughput per Switch in Stacking Mode</p> <p>System CPU speed: 400 MHz</p> <p>System memory: 64MB Flash, 256MB DRAM</p> <p>RJ-45 Console port provides industry standard serial port onnectivity</p> <p>Switch Capacity and forwarding rate (64-byte): 120Gbps/89.3Mpps</p> <p>MTBF: 259,615 hours</p> |
| <b>Dimensions:</b>        | <p>Height: 1U 44.5mm / 1.75"</p> <p>Width: 440mm / 17.5"</p> <p>Depth: 405mm / 15.75"</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Weight:</b>            | 6.15kg / 13.55lb                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Power and Thermal:</b> | <p>Input voltage: 100 to 240 VAC @ 47 to 63 HZ</p> <p>Input current (max): 5.0A @ 100VAC</p> <p>Power consumption: 484 Watts max</p> <p>Thermal rating (output): 424 BTU/hr max</p> <p>Maximum power budget: 370 watts</p>                                                                                                                                                                                                                                                                                                                                                                                                                |

## Avaya Ethernet Routing Switch 3500 Series Ordering Information

| ERS 3500 SERIES MODELS |                                                                                                                                                          |
|------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|
| AL3500?01-E6*          | ERS 3526T featuring 24 x 10/100 ports, plus 2 Combo 10/100/1000/SFP ports, plus 2 SFP / 2.5G rear ports. Fanless.                                        |
| AL3500?11-E6*          | ERS 3526T-PWR+ featuring 24 x 10/100 PoE+ ports, plus 2 Combo 10/100/1000/SFP ports, plus 2 SFP / 2.5G rear ports. PoE budget 370W.                      |
| AL3500?02-E6*          | ERS 3550T featuring 48 x 10/100 ports, plus 2 Combo 10/100/1000/SFP ports, plus 2 SFP / 2.5G rear ports. Fanless.                                        |
| AL3500?12-E6*          | ERS 3550T-PWR+ featuring 48 x 10/100 PoE+ ports, plus 2 Combo 10/100/1000/SFP ports, plus 2 SFP / 2.5G rear ports. PoE budget 370W.                      |
| AL3500?04-E6*          | ERS 3510GT featuring 8 x 10/100/1000 ports, plus 2 SFP ports. Standalone. Fanless.                                                                       |
| AL3500?14-E6*          | ERS 3510GT-PWR+ featuring 8 x 10/100/1000 PoE+ ports, plus 2 SFP ports. Standalone. Fanless mode @ 60W PoE budget, Fan operation mode @ 170W PoE budget. |
| AL3500?05-E6*          | ERS 3524GT featuring 24 x 10/100/1000Mbps ports, plus 4 Combo SFP ports (with ports 21-24) + 2 SFP / 2.5G rear ports.                                    |
| AL3500?15-E6*          | ERS 3524GT-PWR+ featuring 24 x 10/100/1000 PoE+ ports, plus 4 Combo SFP ports (with ports 21-24), plus 2 SFP / 2.5G rear ports. PoE budget 370W.         |
| AL3500?06-E6           | ERS 3549GTS featuring 48 x 10/100/1000 ports, plus 2 Combo SFP ports (with ports 47-48), plus 1 SFP+ uplink port, plus 2 SFP / 2.5G rear ports.          |

### Notes:

- Each switch ships with Base software license.
- Stacking cables are not included and must be ordered separately for ERS 3500 24-port and 48-port models.
- The seventh character (?) of the order number must be replaced with the proper letter to indicate desired product nationalization.

| ERS 3500 SERIES STACKING CABLES |                                                   |
|---------------------------------|---------------------------------------------------|
| AL3518001-E6                    | ERS 3500 46cm SFP direct connect stack cable      |
| AL3518002-E6                    | ERS 3500 1.5 meter SFP direct connect stack cable |
| AL3518003-E6                    | ERS 3500 3 meter SFP direct connect stack cable   |

| ERS 3500 SERIES ACCESSORIES |                                                                                                                             |
|-----------------------------|-----------------------------------------------------------------------------------------------------------------------------|
| AL3511001-E6                | Standard set of 19" rack mount brackets - spare                                                                             |
| AL3511002-E6                | Optional accessory kit for joining two ERS 3510GT / ERS 3510GT-PWR+ switches together (side-by-side) to mount in a 19" rack |
| AL3511003-E6                | Optional accessory kit for mounting one ERS 3510GT or ERS 3510GT-PWR+ switch in a 19" rack.                                 |

## Technical Specifications

### Avaya Ethernet Routing Switch 3500 Standards Compliance

|                                                                      |                                                                               |
|----------------------------------------------------------------------|-------------------------------------------------------------------------------|
| IEEE 802.1D Spanning Tree Protocol                                   | RFC 2660 HTTPS - Secure Web                                                   |
| IEEE 802.1w Rapid Spanning Tree                                      | RFC 2665 / RFC 1643 Ethernet MIB                                              |
| IEEE 802.1s Multiple Spanning Tree                                   | RFC 2674 Q-BRIDGE-MIB                                                         |
| IEEE 802.1p Prioritizing                                             | RFC 2819 RMON                                                                 |
| IEEE 802.1t 802.1D Maintenance                                       | RFC 2851 Textual Conventions for Internet network addresses                   |
| IEEE 802.1v VLAN Classification by Protocol and Port                 | RFC 2863 Interfaces Group MIB                                                 |
| IEEE 802.1Q VLAN Tagging                                             | RFC 2865 RADIUS                                                               |
| IEEE 802.1AB Link Layer Discovery Protocol                           | RFC 2866 RADIUS Accounting                                                    |
| IEEE 802.1X Ethernet Authentication Protocol                         | RFC 2869 RADIUS Extensions - Interim updates                                  |
| IEEE 802.3 Ethernet                                                  | RFC 2933 IGMP MIB                                                             |
| IEEE 802.3af Power over Ethernet                                     | RFC 3046 DHCP Relay Agent Information Option 82                               |
| IEEE 802.3at Power over Ethernet Plus                                | RFC 3058 RADIUS Authentication                                                |
| IEEE 802.3ab Gigabit Ethernet over Copper                            | RFC 3140 Per-Hop Behavior Identification codes                                |
| IEEE 802.3ad Link Aggregation Control Protocol (LACP)                | RFC 3162 IPv6 RADIUS Client                                                   |
| IEEE 802.3ae 10Gbps Ethernet                                         | RFC 3246 Expedited Forwarding Per-Hop Behavior                                |
| IEEE 802.3i 10Base-T                                                 | RFC 3260 Architecture for Differentiated Services                             |
| IEEE 802.3u Fast Ethernet                                            | RFC 3361 DHCP Option 120 for SIP Servers                                      |
| IEEE 802.3x Flow Control                                             | RFC 3289 DiffServ MIBs                                                        |
| IEEE 802.3z Gigabit Ethernet                                         | RFC 3410 SNMPv3                                                               |
| RFC 768 UDP                                                          | RFC 3411 SNMP Frameworks                                                      |
| RFC 783 TFTP                                                         | RFC 3412 SNMP Message Processing                                              |
| RFC 792 ICMP                                                         | RFC 3413 SNMPv3 Applications                                                  |
| RFC 793 TCP                                                          | RFC 3414 SNMPv3 USM                                                           |
| RFC 826 ARP                                                          | RFC 3415 SNMPv3 VACM                                                          |
| RFC 854 Telnet                                                       | RFC 3416 SNMP                                                                 |
| RFC 894 IP over Ethernet                                             | RFC 3417 SNMP Transport Mappings                                              |
| RFC 903 Reverse ARP                                                  | RFC 3418 SNMPv2 MIB                                                           |
| RFC 950 / RFC 791 IP                                                 | RFC 3484 Default Address Selection for IPv6                                   |
| RFC 1112 IGMPv1                                                      | RFC 3513 IPv6 Addressing Architecture                                         |
| RFC 1122 Requirements for Internet hosts                             | RFC 3579 RADIUS support for EAP                                               |
| RFC 1155 SMI                                                         | RFC 3584 Co-existence of SNMP v1/v2/v3                                        |
| RFC 1156 MIB for management of TCP/IP                                | RFC 3587 IPv6 Global Unicast Format                                           |
| RFC 1157 SNMP                                                        | RFC 3596 DNS extensions to support IPv6                                       |
| RFC 1212 Concise MIB definitions                                     | RFC 3621 Power over Ethernet MIB                                              |
| RFC 1213 MIB-II                                                      | RFC 3635 Definitions of Managed Objects for the Ethernet-like Interface Types |
| RFC 1215 SNMP Traps Definition                                       | RFC 3826 AES for the SNMP User-based Security Model                           |
| RFC 1340 Assigned Numbers                                            | RFC 3879 Deprecating Site Local Addresses                                     |
| RFC 1350 TFTP                                                        | RFC 3993 DHCP Subscriber-ID sub-option                                        |
| RFC 1354 IP Forwarding Table MIB                                     | RFC 4007 Scoped Address Architecture                                          |
| RFC 1398 Ethernet MIB                                                | RFC 4022 TCP MIB                                                              |
| RFC 1442 SMI for SNMPv2                                              | RFC 4113 UDP MIB                                                              |
| RFC 1450 MIB for SNMPv2                                              | RFC 4133 Entity MIB                                                           |
| RFC 1493 Bridge MIB                                                  | RFC 4193 Unique Local IPv6 Unicast Addresses                                  |
| RFC 1519 Classless Inter-Domain Routing (CIDR)                       | RFC 4250 SSH Protocol Assigned Numbers                                        |
| RFC 1542 BootP                                                       | RFC 4251 SSH Protocol Architecture                                            |
| RFC 1591 DNS Client                                                  | RFC 4252 SSH Authentication Protocol                                          |
| RFC 1650 Definitions of Managed Objects for Ethernet-like Interfaces | RFC 4253 SSH Transport Layer Protocol                                         |
| RFC 1908 Coexistence between SNMPv1 & v2                             | RFC 4254 SSH Connection Protocol                                              |
| RFC 1945 HTTP v1.0                                                   | RFC 4291 IPv6 Addressing Architecture                                         |
| RFC 1981 Path MTU Discovery for IPv6                                 | RFC 4293 IPv6 MIB                                                             |
| RFC 2011 SNMP v2 MIB for IP                                          | RFC 4301 Security Architecture for the Internet Protocol                      |
| RFC 2012 SNMP v2 MIB for TDP                                         | RFC 4344 SSH Transport layer Encryption Modes                                 |
| RFC 2013 SNMP v2 MIB for UDP                                         | RFC 4345 Improved Arcfour Modes for SSH                                       |
| RFC 2096 IP Forwarding Table MIB                                     | RFC 4432 SSHv2 RSA                                                            |
| RFC 2131 Dynamic Host Configuration Protocol (DHCP)                  | RFC 4443 ICMPv6 for IPv6                                                      |
| RFC 2132 DHCP Option 6, 43 & 60                                      | RFC 4541 Considerations for IGMP and MLD snooping switches                    |
| RFC 2138 RADIUS Authentication                                       | RFC 4604 IGMPv3                                                               |
| RFC 2139 RADIUS Accounting                                           | RFC 4673 RADIUS Dynamic Authorization Server MIB                              |
| RFC 2236 IGMPv2                                                      | RFC 4675 RADIUS Attributes for VLAN and Priority Support                      |
| RFC 2454 IPv6 UDP MIB                                                | RFC 4716 SSH Public Key File Format                                           |
| RFC 2460 IPv6 Specification                                          | RFC 4789 SNMP over IEEE 802 Networks                                          |
| RFC 2464 Transmission of IPv6 packets over Ethernet                  | RFC 4861 Neighbor Discovery for IPv6                                          |
| RFC 2474 Differentiated Services (DiffServ)                          | RFC 4862 IPv6 Stateless Address Auto-Configuration                            |
| RFC 2541 Secure Shell protocol architecture                          | RFC 5010 DHCPv4 Relay Agent Flags Suboption                                   |
| RFC 2597 Assured Forwarding PHB Group                                | RFC 5095 Deprecation of Type 0 Routing Headers in IPv6                        |
| RFC 2598 Expedited Forwarding PHB Group                              | RFC 5176 Dynamic Authorization Extensions to RADIUS                           |
| RFC 2616 HTTP 1.1                                                    | RFC 5859 TFTP Server DHCP Option                                              |

## About Avaya

Avaya is a leading, global provider of customer and team engagement solutions and services available in a variety of flexible on-premise and cloud deployment options. Avaya's fabric-based networking solutions help simplify and accelerate the deployment of business critical applications and services. For more information, please visit [www.avaya.com](http://www.avaya.com).

## General Performance

Switch Fabric performance: 12.8Gbps to 120Gbps

Frame forwarding rate: 9.5 to 89.3Mpps

Latency (64 byte packet LIFO): 2.4 to 3.6 microseconds (all GbE ports) and 7.9 microseconds (FE access ports)

Frame length: 1522 bytes (including Q tag)

Jumbo Frame support: up to 9216 octets

MLT / 802.3ad LACP: 6 groups with 4 active trunks

Concurrently configured VLANs: 256

Egress queues: 4

Multiple Spanning Tree Groups: 8

MAC Address: up to 16,000

DHCP Snooping: up to 512 entries

802.1X Clients per port: 32

ARP Entries: up to 512

IP Interfaces: up to 32

RMON entries per port: 4 groups

ADAC (IP Phones): 32 per port

QoS filters per precedence: 256

QoS precedence: 4

QoS filters per switch: 1024

## Pluggable Interfaces

100BASE-FX SFP up to 2km reach over MMF (Duplex LC)

1000BASE-T SFP up to 100m over CAT5E or better UTP Cable (RJ-45)

1000BASE-SX SFP up to 550m reach on MMF (Duplex LC)

1000BASE-LX SFP up to 550m reach on MMF, and up to 10 km on SMF (Duplex LC)

1000BASE-XD CDWM SFP up to 40 km reach on SMF (Duplex LC)

1000BASE-ZX CDWM SFP up to 70 km reach on SMF (Duplex LC)

1000BASE-EX SFP up to 120 km reach on SMF (Duplex LC)

1000BASE-BX SFP up to 10 and 40 km reach variants on SMF (LC)

10GBASE-SR SFP+ up to 300m reach over MMF (Duplex LC)

10GBASE-LRM SFP+ up to 220m over FDDI-grade MMF (Duplex LC)

10GBASE-LR SFP+ up to 10km reach over SMF (Duplex LC)

10GBASE-ER SFP+ up to 40km reach over SMF (Duplex LC)

10GBASE-X SFP+ Direct Attach Cables, in 3, 5, & 10m lengths

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## Environmental Specifications

- Operating temperature: 32° and 122° F (0° and 50° C)
- Operating altitude: 10,000 ft.
- Storage temperature: -40C to 70C
- Storage altitude: 10,000 ft
- Acoustic noise (dB): up to 58 (0 for Fanless models)
- Operating humidity: 95% RH non-condensing
- Storage humidity: 95% RH non-condensing
- No nearby heat sources such as hot air vents or direct sunlight
- No nearby sources of severe electromagnetic noise
- No excessive dust
- Adequate power source within six feet; one 15-Amp circuit required for each power supply.
- At least 5cm (2") on each side of the switch unit for ventilation

## Safety Agency Approvals

- IEC 60950 International CB Certification
- EN 60950 European Certification
- UL60950 US certification
- CSA22.2, #60950 Canadian Certification
- NOM Mexican Certification

## Electromagnetic Emissions and Immunity

- CISPR22, Class A/CISPR24 International
- EN55022, Class A/EN55024 European
- FCC, Part 15, Class A US Certification
- ICES-003, Class A Canadian Certification
- AN/NZS 3548 Australian/NZ Certification
- BSMI - Taiwan - CNS 13438, Class A
- MIC - Korea - MIC, No. 2001-116
- VCCI Class A Japanese Certification

<sup>1</sup>Miercom Lab Testing Summary Report "Plug and Play" Switches Aug.2011.

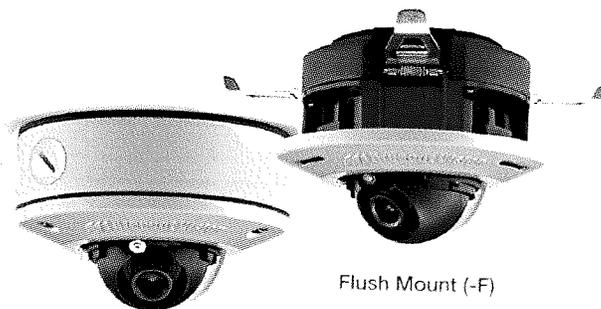
<sup>2</sup>Based on Avaya testing



Provide feedback for this document

# MicroDome<sup>®</sup> G2 IP Megapixel Cameras

H.264 All-in-One Ultra Low Profile Remote Focus True Day/Night Indoor/Outdoor Dome IP Cameras with WDR (Wide Dynamic Range) Models



Surface Mount (-S)

Flush Mount (-F)

The MicroDome G2 multi-megapixel camera series delivers 1.2-, 1080p, 3-, or 5-megapixel resolutions. These true day/night cameras are available with a choice of lenses 2.8mm, 4mm, 6mm, 8mm, 12mm, and 16mm options. With a day/night mechanical IR cut filter this camera is ideal for applications with challenging lighting conditions, regardless the time of day.

The MicroDome G2 megapixel IP camera series is available in an in-floor, in-ceiling housing or in a surface mount IP66 rated version for indoor and outdoor applications. Surface and flush mount models feature a vandal resistant, IK-10 rated cast-aluminum housing with a polycarbonate bubble making it capable of withstanding the equivalent of 55 kg (120 lbs) of force.

MicroDome G2 megapixel IP cameras deliver professional surveillance, with ease of installation and set-up, for a variety of network surveillance requirements. The remote focus module allows users to simply click “Short-range Focus” or “Full-range Focus” saving installers time and end users money—an easy return on investment. The three-axis lens adjustment

provides users with more camera placement options, allowing the camera to be easily mounted on a wall or ceiling so they can pan, tilt, and rotate the lens in a variety of directions for a precise field of view. An innovative spring arm design makes in-ceiling F-model installations a snap: simply slide the camera through the hole and secure the magnolized cover ring with a single screw. No additional hardware is required.

For challenging low light applications, the 1.2MP model features NightView™, making it capable of covering areas where very little light is present. For applications with strong backlighting, reflections from wet flooring/puddles, or contrast due to fog, mist, or glare, optional wide dynamic range is available on some 1080p and 3MP models.

The MicroDome G2 is ONVIF Profile S (Open Network Video Interface Forum) and PSIA (Physical Security Interoperability Alliance) compliant, providing interoperability between network video products regardless of manufacturer.



True Day/Night with Mechanical IR Cut Filter



CorridorView™ with 90° Image Flip



Interchangeable Lenses with Remote Focus



NightView™ on 1.2MP Models



Wide Dynamic Range Available on AV2556 and AV3556 Models



Pixel Binning Mode on 3 and 5MP Models



All-in-One PoE and Integrated Lens



Ultra Low Profile Design



3-Axis Gimbal



Impact / Weather Resistant IK-10 and IP66 Rated (-S Models)



Integrated Microphone (-F Models)

## Series Features

- 1.2–5MP Models
- True Day/Night Functionality with Mechanical IR Cut Filter
- CorridorView™ Allows 90° Image Rotation for Better Coverage in Hallways and Corridors
- Dual Encoder H.264/MJPEG
- Privacy Mask, Motion Detection, Flexible Cropping, Bit Rate Control, Multi-Streaming and Forensic Zooming
- Multiple Lens Options Available (Sold Separately)
- Remote Focus Module
- Easily Adjustable 3-Axis Gimbal
- All-in-One H.264 Total Power Over Ethernet (PoE) Solution
- Ultra Low Profile Design / Small Size
- IK-10 Impact-Resistant Housing

## Model Dependent Features

- Strong Low Light Performance via NightView™ for 1.2MP Cameras and Binning Mode for 3MP and 5MP Cameras
- True WDR up to 100dB at Full Resolution Available in 1080p and 3MP WDR Models
- Outdoor Rated IP66 (-S Models)
- Integrated Microphone (-F Models)
- Casino Mode™ Maintains 30fps or Higher Required by Gaming Industry Regulations (AV2555 Models)



Camera Imaging Specifications

| Model                       | AV1555DN                                     | AV2555DN                                     | AV2556DN                                     | AV3555DN                                     | AV3556DN                                     | AV5555DN                                                                          |                                                                   |
|-----------------------------|----------------------------------------------|----------------------------------------------|----------------------------------------------|----------------------------------------------|----------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------|
| <b>Image Sensor (CMOS)</b>  | 1.2MP                                        | 1080p                                        | 1080p                                        | 3MP                                          | 3MP                                          | 5MP                                                                               |                                                                   |
| <b>Optical Format</b>       | 1/3"                                         | 1/3"                                         | 1/3.2"                                       | 1/3"                                         | 1/3.2"                                       | 1/2.5"                                                                            |                                                                   |
| <b>Pixel Pitch</b>          | 3.75µm                                       | 2.2µm                                        | 2.2µm                                        | 2.2µm                                        | 2.2µm                                        | 2.2µm                                                                             |                                                                   |
| <b>Minimum Illumination</b> | Color (Day Mode)                             | 0.03 Lux                                     | 0.2 Lux                                      | 0.2 Lux                                      | 0.2 Lux                                      | 0.3 Lux                                                                           |                                                                   |
|                             | Color Binning (Day Mode)                     | -                                            | -                                            | -                                            | 0.1 Lux                                      | 0.15 Lux                                                                          |                                                                   |
|                             | B/W (Night Mode)                             | 0.003 Lux, IR sensitive                      | 0.02 Lux, IR sensitive                       | 0.02 Lux, IR sensitive                       | 0.02 Lux, IR sensitive                       | 0.02 Lux, IR sensitive                                                            | 0.03 Lux, IR sensitive                                            |
| <b>Full FOV Resolution</b>  | 1280 H x 960 V                               | 1920 H x 1080 V                              | 1920 H x 1080 V                              | 2048 H x 1536 V                              | 2048 H x 1536 V                              | 2592 H x 1944 V                                                                   |                                                                   |
| <b>1/4 Resolution</b>       | 640 H x 480 V                                | 960 H x 540 V                                | 960 H x 540 V                                | 1024 H x 768 V                               | 1024 H x 768 V                               | 1296 H x 972 V                                                                    |                                                                   |
| <b>Dynamic Range</b>        | 83.5dB                                       | 69.5dB                                       | WDR up to 100dB                              | 69.5dB                                       | WDR up to 100dB                              | 70.1dB                                                                            |                                                                   |
| <b>Frame Rates</b>          | At Max Res.                                  | 37fps (1280 x 960)                           | 30fps (1920 x 1080)                          | 30fps (1920 x 1080)                          | 21fps (2048 x 1536)                          | 21fps (2048 x 1536)                                                               | 14fps (2592 x 1944)                                               |
|                             | Cropped                                      | -                                            | 42fps (1280 x 1024)                          | 41fps (1280 x 1024)                          | 30fps (1920 x 1080)<br>41fps (1280 x 1024)   | 30fps (1920 x 1080)<br>41fps (1280 x 1024)                                        | 21fps (2048 x 1536)<br>29fps (1920 x 1080)<br>41fps (1280 x 1024) |
|                             | Binning Mode                                 | -                                            | -                                            | -                                            | 46fps (1024 x 768)<br>64fps (960 x 540)      | 21fps (1024 x 768)<br>27fps (800 x 600)<br>31fps (960 x 540)<br>32fps (640 x 512) | 34fps (1296 x 972)<br>46fps (1024 x 768)<br>64fps (960 x 540)     |
| <b>Lens*</b>                | 2.8mm Integrated, 1/2.5", F/2.0, H-FOV = 95° | 2.8mm Integrated, 1/2.5", F/2.0, H-FOV = 83° | 2.8mm Integrated, 1/2.5", F/2.0, H-FOV = 83° | 2.8mm Integrated, 1/2.5", F/2.0, H-FOV = 89° | 2.8mm Integrated, 1/2.5", F/2.0, H-FOV = 89° | 2.8mm Integrated, 1/2.5", F/2.0, H-FOV = 113°                                     |                                                                   |

\* 2.8mm standard lens

Programmability

|                                   |                                                                          |
|-----------------------------------|--------------------------------------------------------------------------|
| <b>Optics</b>                     | M12 lens and remote focus module                                         |
| <b>Low Light Performance</b>      | <b>NightView™ Mode</b> 1.2MP models                                      |
|                                   | <b>Pixel Binning Mode</b> 3MP and 5MP models                             |
| <b>Picture-in-Picture</b>         | Simultaneous delivery of full field-of-view and zoomed images            |
| <b>Programmable Shutter Speed</b> | Controls motion blur, 1ms – 500ms                                        |
| <b>Motion Detection</b>           | Real-time, 1024 detection zones                                          |
| <b>Privacy Masking</b>            | Unlimited                                                                |
| <b>Casino Mode™</b>               | Maintains 30fps or higher (AV2555 model)                                 |
| <b>Flexible Cropping</b>          | Resolution windowing down to 1x1 pixel for JPEG and 2x2 pixels for H.264 |
| <b>Backlight Compensation</b>     | Custom white balance                                                     |
| <b>Flicker Control</b>            | 50/60Hz selectable                                                       |
| <b>Image Rotation</b>             | CorridorView™ (90°, 180° and 270° image rotation)                        |
| <b>Wide Dynamic Range</b>         | Auto switch control adjustment between WDR and LDR modes (WDR models)    |
| <b>Noise Reduction</b>            | Low light noise filter control                                           |
| <b>Microphone</b>                 | Integrated (-F models)                                                   |
| <b>Efficiency</b>                 | Bit rate and bandwidth limitation control                                |
|                                   | Bandwidth and storage savings by running at 1/4 resolution               |
| <b>Sharpness</b>                  | Selectable enhancement level                                             |
| <b>Miscellaneous</b>              | Programmable resolution, brightness, saturation, gamma, tint             |
|                                   | Electronic pan, tilt, zoom (PTZ)                                         |

Audio Electrical

|                    |                                        |
|--------------------|----------------------------------------|
| <b>Compression</b> | G.711 PCM 8 kHz                        |
| <b>Input</b>       | Microphone In (Integrated on F-models) |

Data Transmission

|                          |                                                             |
|--------------------------|-------------------------------------------------------------|
| <b>Compression Type</b>  | H.264 (MPEG-4, Part 10)/Motion JPEG<br>21 levels of quality |
| <b>Network Protocols</b> | RTSP, RTP/TCP, RTP/UDP, HTTP, DHCP, TFTP, QoS, IPv4, IPv6   |
| <b>Network Interface</b> | 100Base-T Ethernet                                          |
| <b>Multi-Streaming</b>   | 8 non-identical streams                                     |

Compliance

|                          |                                                                    |
|--------------------------|--------------------------------------------------------------------|
| <b>Industry Standard</b> | ONVIF Profile S and PSIA Conformant                                |
| <b>Listings</b>          | UL (CB)                                                            |
| <b>FCC Compliance</b>    | 47 CFR 15 Class A                                                  |
| <b>Environmental</b>     | RoHS, REACH, WEEE                                                  |
| <b>Markings</b>          | (CE) EN55022 Class A, EN55024, EN61000-3-2, EN61000-3-3, EN60950-1 |
| <b>Mechanical</b>        | IP66 (EN60529) (-S Model), IK-10                                   |
| <b>CoO</b>               | Made in the USA                                                    |

Environmental

|                              |          |                                |
|------------------------------|----------|--------------------------------|
| <b>Operating temperature</b> | -F Model | -5°C (23°F) to +50°C (122°F)   |
|                              | -S Model | -40°C (-40°F) to +50°C (122°F) |
| <b>Humidity</b>              |          | 0% to 90% (non-condensing)     |
| <b>Storage temperature</b>   |          | -20°C (-4°F) to +60°C (140°F)  |

Electrical

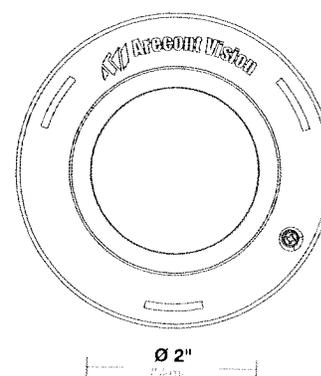
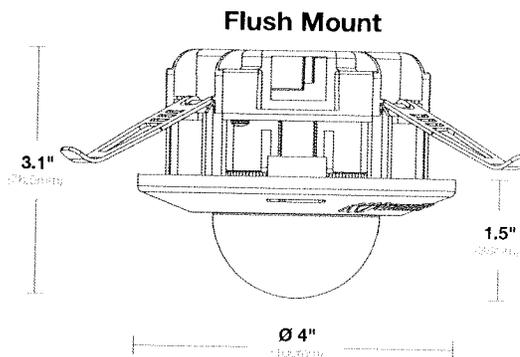
|                            |                                                |
|----------------------------|------------------------------------------------|
| <b>Alarm Input/Output</b>  | General purpose opto-coupled, 1 input/1 output |
| <b>Power Over Ethernet</b> | PoE 802.3af, Class 3                           |
| <b>Power Consumption</b>   | 5.59 Watts DC Power                            |

See Next Page for Mechanical Spc.

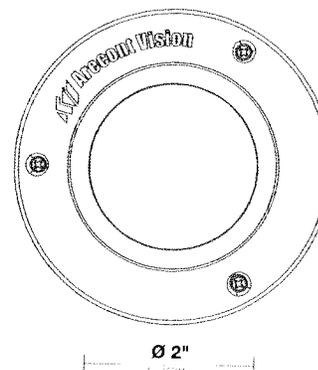
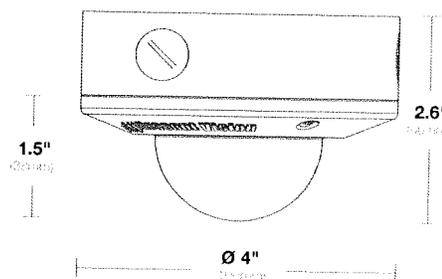
## Mechanical

|                         |                                                                                |                                                 |
|-------------------------|--------------------------------------------------------------------------------|-------------------------------------------------|
| <b>Casing</b>           | Tamper-resistant housing, IK-10 Impact-resistant                               |                                                 |
| <b>-F Model</b>         | In-ceiling mount with die-cast aluminum cover and 2" polycarbonate dome bubble |                                                 |
| <b>-S Model</b>         | Surface mount with die-cast aluminum housing and 2" polycarbonate dome bubble  |                                                 |
|                         | IP66 weather proof standard                                                    |                                                 |
|                         | 3/8" NPT w/ 1/2" NPT adapter included                                          |                                                 |
| <b>Lens</b>             | 2.8mm board mount (M12), fixed iris, F/2.0 (except -NL models)                 |                                                 |
| <b>Gimbal</b>           | Easy 3-axis camera adjustment w/ 359° pan and 90° tilt and 360° z-axis         |                                                 |
| <b>Dimensions</b>       | <b>Unit</b>                                                                    | Ø 4" (100mm) x 3.1" H (78.5mm)                  |
| <i>(See Dimensions)</i> | <b>Packaged</b>                                                                | 5.6" W (142mm) x 5.6" L (142mm) x 3.5" H (90mm) |
| <b>Weight</b>           | <b>Unit</b>                                                                    | 0.7lbs (0.3kg)                                  |
|                         | <b>Packaged</b>                                                                | 1.3lbs (0.6kg)                                  |

## Dimensions

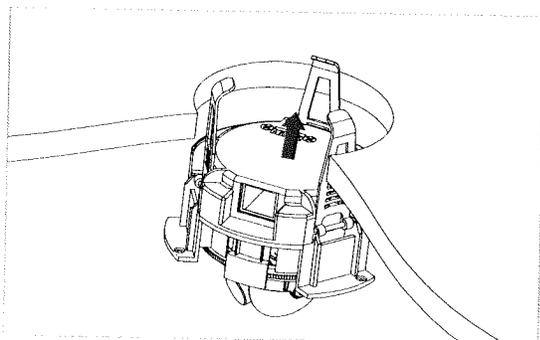


## Surface Mount

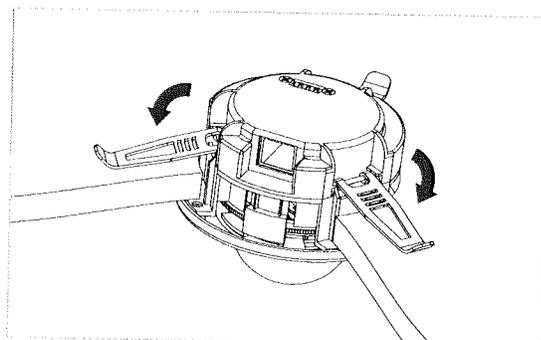


## Quick Installation (Flush Mount Models)

- 1 Push the three spring actuated retention arms in the upward position.

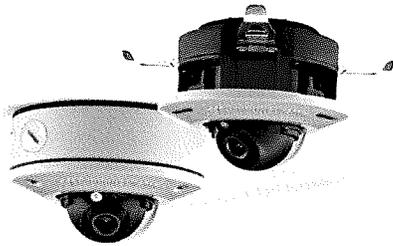


- 2 The retention arms lock into place.



See Next Page for Ordering Information

## Ordering Information



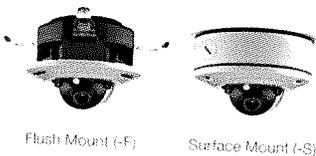
### Model Specific Features

| Model    | Resolution | Frame Rate | Features |              |            |
|----------|------------|------------|----------|--------------|------------|
|          |            |            | -        | -            | NightView™ |
| AV1555DN | 1.2MP      | 37fps      | -        | -            | NightView™ |
| AV2555DN | 1080p      | 30fps      | -        | Casino Mode™ | -          |
| AV2556DN | 1080p      | 30fps      | WDR      | -            | -          |
| AV3555DN | 3MP        | 21fps      | -        | -            | Binning    |
| AV3556DN | 3MP        | 21fps      | WDR      | -            | Binning    |
| AV5555DN | 5MP        | 14fps      | -        | -            | Binning    |

### Options

|     |               |
|-----|---------------|
| -F  | Flush Mount   |
| -S  | Surface Mount |
| -NL | No Lens       |

### Configurations

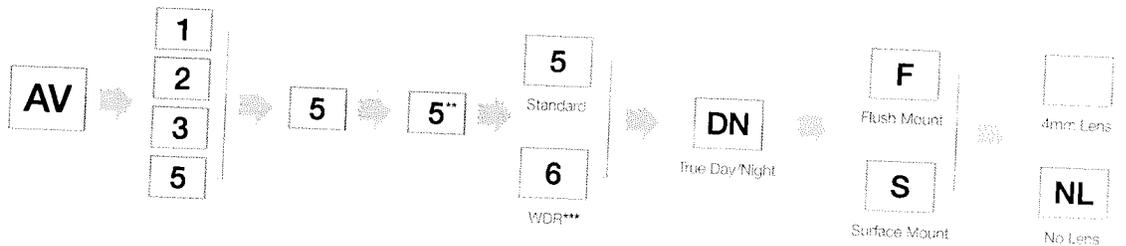


Flush Mount (-F)

Surface Mount (-S)

### Create Your Model (Example: AV2556DN-F-NL)

| Megapixel Resolution | Body Generation | Body Type | Compression | True Day/Night | Mount Type | Lens |
|----------------------|-----------------|-----------|-------------|----------------|------------|------|
|----------------------|-----------------|-----------|-------------|----------------|------------|------|



\*\* -5\* represents MicroDome G2 product line  
 \*\*\* WDR for AV2556 and AV3556 models only

### Model Numbers

|       |            |  |               |  |
|-------|------------|--|---------------|--|
| 1.2MP | AV1555DN-F |  | AV1555DN-F-NL |  |
|       | AV1555DN-S |  | AV1555DN-S-NL |  |
| 1080p | AV2555DN-F |  | AV2555DN-F-NL |  |
|       | AV2555DN-S |  | AV2555DN-S-NL |  |
|       | AV2556DN-F |  | AV2556DN-F-NL |  |
| 3MP   | AV2556DN-S |  | AV2556DN-S-NL |  |
|       | AV3555DN-F |  | AV3555DN-F-NL |  |
|       | AV3555DN-S |  | AV3555DN-S-NL |  |
| 5MP   | AV3556DN-F |  | AV3556DN-F-NL |  |
|       | AV3556DN-S |  | AV3556DN-S-NL |  |
|       | AV5555DN-F |  | AV5555DN-F-NL |  |
|       | AV5555DN-S |  | AV5555DN-S-NL |  |

### Lens Options (Sold Separately)

| Model    | Focal Length | Horizontal Field of View |        |           |        |         |      |
|----------|--------------|--------------------------|--------|-----------|--------|---------|------|
|          |              | 1.2MP                    | 1080p  | 1080p WDR | 3MP    | 3MP WDR | 5MP  |
| MPM2.1   | 2.1mm        | 130°                     | 113.1° | 113.1°    | 121.4° | 121.4°  | -    |
| MPM2.8A* | 2.8mm        | 95°                      | 83°    | 83°       | 89°    | 89°     | 113° |
| MPM4.0A  | 4mm          | 67°                      | 59°    | 59°       | 63°    | 63°     | 80°  |
| MPM6.0   | 6mm          | 46°                      | 40°    | 40°       | 43°    | 43°     | 56°  |
| MPM8.0   | 8mm          | 35°                      | 30°    | 30°       | 33°    | 33°     | 42°  |
| MPM12.0A | 12mm         | 23°                      | 20°    | 20°       | 22°    | 22°     | 28°  |
| MPM16.0  | 16mm         | 17°                      | 15°    | 15°       | 16°    | 16°     | 20°  |

\* Standard lens for MicroDome G2 except on "-NL" models

### Accessories (-S Models Only)

|         |                                                                                                             |
|---------|-------------------------------------------------------------------------------------------------------------|
| AV-CRMA | Corner mount adapter                                                                                        |
| AV-EBA  | Electrical box adapter plate accessory                                                                      |
| AV-PMA  | Pole mount adapter                                                                                          |
| MCD-CMT | Pendant mount with 1/2" NPT standard                                                                        |
| MCD-WMT | Wall mount with 1/2" NPT standard                                                                           |
| MCD-4S  | Electrical box surface mount cover fits 3rd party 4-inch square box 2-1/8inch deep (e.g. Lowes item # 4788) |

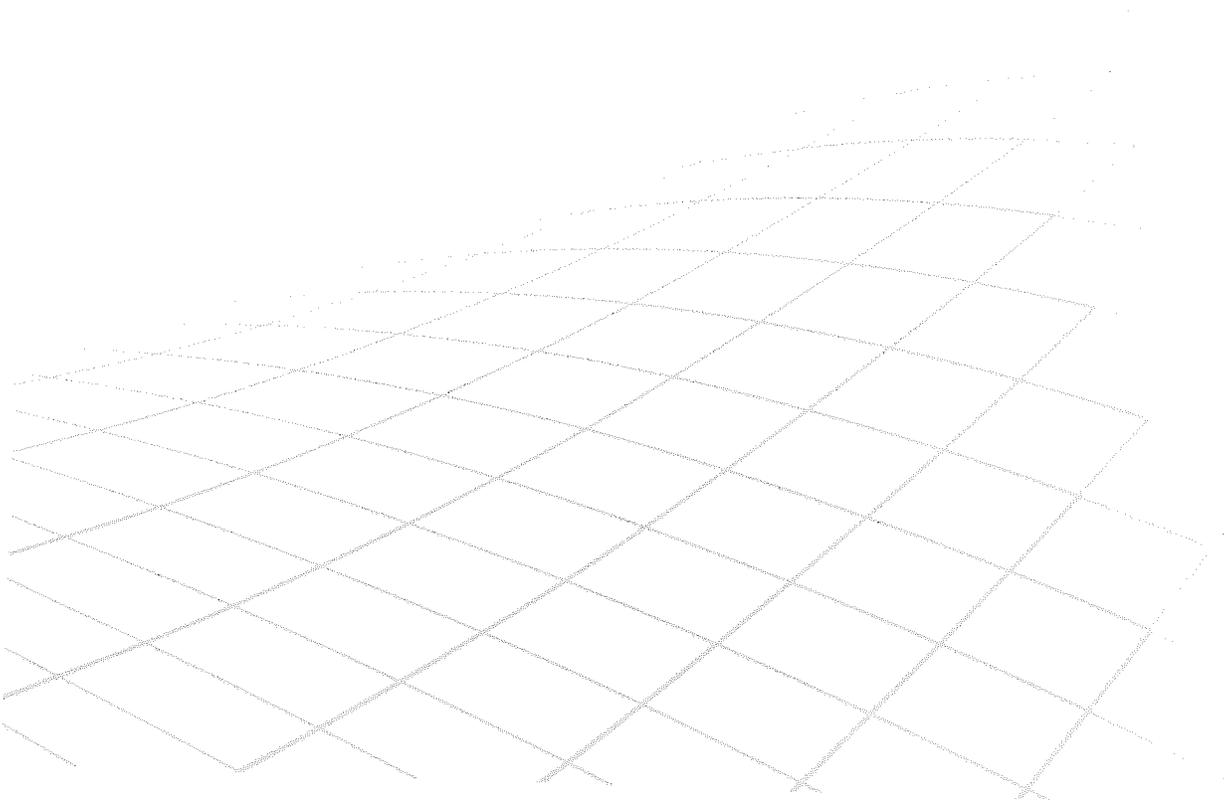


The Open Platform Company



# XProtect<sup>®</sup> Professional 2016 R2

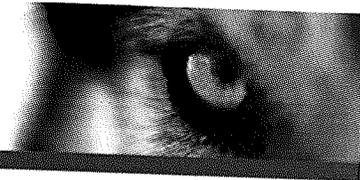
## Specification Sheet





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## Feature Overview

### XProtect Professional server modules

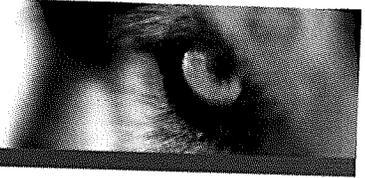
- **Open platform:**  
Open application programming interface (API)/software development kit (SDK) support seamless integration with third-party applications
- **Multi-server and multi-site video surveillance solution:**  
Unlimited recording of video from IP cameras, IP video encoders and selected digital video recorders (DVRs) with analog cameras
- **Wide IP camera and device support:**  
Supports more than 2,400 IP cameras, encoders and DVRs from 120 different manufacturers
- **ONVIF™ and PSIA compliant:**  
Supports ONVIF™ and PSIA compliant cameras and devices
- **Optimized recording storage management:**  
Unique data storage and archiving solution that combines superior performance and scalability and cost-efficient, long-term video storage
- **Wide compression technology support:**  
Supports a variety of compression methods: MJPEG, H.263, MPEG-4 Pt. 2 Simple Profile and Advanced Simple Profile, H.264/MPEG-4 AVC, and MxPEG
- **Dual streaming:**  
Hardware use is optimized with two independent, configurable video streams, one for live viewing and one for recording. No client configuration needed
- **System configuration wizards:**  
Guide the user through the process of adding cameras, configuring video and recording, adjusting motion detection and configuring users
- **Built-in video motion detection:**  
Independent of camera model
- **Automatic license activation:**  
Automatic online or offline activation with a 30-day camera license grace period
- **Privacy masking:**  
Enables administrators to define privacy masks for individual cameras, to hide areas in the camera view that must not be visible or recorded in order to comply with local legislation
- **Easy installation:**  
Start the installation with a few mouse clicks – all languages and applications in one installer (Management Application supports 11 languages). Unified installer that is shared between all XProtect Professional VMS products<sup>1</sup>. Users can add components or remove them from the installation at a later time

- **Supported by the Software Manager:**  
Deploy XProtect Professional centrally via the Software Manager utility
- **Support for the Customer Dashboard**  
Resellers can monitor the health of installed systems with a valid and active Care Plus, so actions can be taken proactively before the issue becomes a problem for the customer. This offers peace of mind to system owners

### XProtect Professional client modules

- **Power of choice:**  
Use any combination of the three available clients, XProtect Smart Client, XProtect Web Client and Milestone Mobile
- **View live video:**  
Use any client for constant live monitoring
- **View recorded video:**  
Use any client to view incidents which occurred in the past
- **Situational awareness:**  
With support for Maps and Alarms, XProtect Smart Client offers real-time situational awareness
- **Common design:**  
The three XProtect clients share a common design and basic functionalities, such as camera views, enabling a seamless switch between interfaces
- **PTZ Control:**  
Pan-tilt-zoom (PTZ) cameras can be controlled with any of the clients; therefore, suspicious activity can be investigated
- **Share or export recordings:**  
Export video in native database format and share with external viewers using the XProtect Smart Client Player. Moreover, instantly share exports between Milestone Mobile and XProtect Web Client using a server side export to avoid moving large files through remote connections
- **Output control and event triggering:**  
Use any of the clients to activate system events or trigger outputs on the connected devices
- **Push Notifications**  
Receive push notifications in Milestone Mobile when alarms are triggered or alarms are assigned to a specific user. Even when the application is not running
- **Available in 29 languages**  
Use any of the clients in your preferred language from the list of the 29 languages supported

<sup>1</sup> XProtect Enterprise, XProtect Professional, XProtect Express, XProtect Essential and XProtect Go



## Detailed Product Features

### XProtect Professional server modules

#### XProtect Professional server 2016 R2

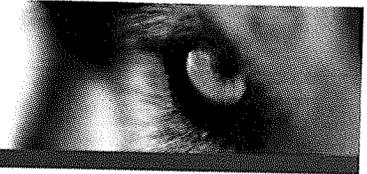
##### Management Application

- A single Management Application provides a consolidated point of access to XProtect Professional Recording Servers
- System configuration wizards guide the user through the process of adding cameras, configuring video and recording, adjusting motion detection and configuring multiple users
- Device scanning enables the fast discovery of camera devices using methods such as Universal Plug and Play, broadcast and IP range scanning
- Smart bulk configuration option allows simultaneous changes to the settings across multiple devices in few clicks
- The adaptable application behavior guides novice users, while expert users can optimize the application for a more advanced use
- The export and import of system and user configuration data enables a reliable system operation and fast system recovery
- System cloning enables users to efficiently clone multiple systems with the same or similar configuration
- The import of offline configuration data enables offline editing of configuration data including camera and device definitions
- Each time a configuration change is confirmed, automatic system restore points are created enabling an easy rollback to previously defined system configuration points. This also enables the cancelation of undesired configuration changes and restoration of earlier valid configurations
- Automatic configuration wizard helps users to configure the system when the Management Application starts for the first time

##### Recording Server

- Native 64-bit recording server provides the optimal utilization of available hardware resources
- Flexible multi-site, multi-server license structure charged per camera and per recording server
- Unlimited number of installed cameras with simultaneous recording and live view. If users have more than 250 cameras in total, Milestone recommends the use of XProtect Expert or XProtect Corporate
- The recording quality depends entirely on the camera and video encoder capabilities: no software limitation (30+ frames per second per camera)
- Cameras supporting SSDP, mDNS or ONVIF Discovery are automatically discovered and installed in the default Smart Client view

- The Milestone Customer Dashboard allows resellers to take immediate action and fix any problems on a customer's installation for example: a broken camera, hard disk failure, etc.
- Dual streams from cameras can be optimized individually on compression, resolution and frame rate, meeting recording and live monitoring requirements
- Bandwidth is optimized with multi-streaming by splitting a single camera video stream to different streams for live view and recording, therefore they can each be optimized independently with respect to frame rate and resolution
- Simultaneous digital multi-channel video and audio recording and live viewing (relaying)
- Connectivity to cameras, video encoders and selected DVRs supports MJPEG, H.263, MPEG-4 Pt. 2 Simple Profile and Advanced Simple Profile, H.264/MPEG-4 AVC, and MxPEG
- Recording technology: secure high-speed database holding JPEG images or MPEG4 and MxPEG streams including audio
- Unlimited recording capacity with multiple archives possible per day
- Hourly to daily database archiving with optional automatic move to network drive saves storage capacity on the local server – with images still available transparently for playback
- Start recording on event
- Authenticate access based on Microsoft Active Directory user account, or XProtect username and password
- Authorize access privileges per Microsoft Active Directory user account/group, XProtect user profile or grant full access
- Audit logs of exported evidence by user and file
- Audit logs of client user activity by time, location and camera
- Local console management of the Recording Server accessible from the notification area
  - Start and stop Recording Server service
  - Access to Recording Server configuration settings
  - Access to Recording Server help system
  - View system status and log information
  - Built-in web server for download and launch of clients and plug-ins
- Remote access for XProtect Smart Client and XProtect Web client
- User profiles control access to: live view, PTZ, PTZ presets, output control, events, listen to microphone, talk to speaker, manual recording; playback, AVI export, JPG export, XProtect (database) export, sequences, Smart Search and audio – as well as set up views, edit private views and edit shared public views
- Client-initiated start of recording based on a predefined recording time or manual stop and access privileges
- Start cameras on live view requests from clients



- Built-in camera independent motion detection; choice of fully adjustable to sensitivity or automatic sensitivity adjustment, zone exclusions and recording activation with frame rate speed up and alert activation through email or SMS
- Two-way audio enables an integrated control of microphones and speakers connected to IP devices
- On predefined events Matrix remote commands are automatically sent to display live video remotely on computers running XProtect Smart Client
- Flexible notification (sound, email and SMS) and camera patrolling scheduling, triggered by time or event
- PTZ preset positions for up to 50 per camera
- Absolute and relative PTZ positioning
- PTZ go-to preset position on events
- Combine PTZ patrolling and go-to positions on events
- Set multiple patrolling schedules per camera per day, for example, for day, night and weekends
- PTZ scanning on supported devices: viewing or recording while moving slowly between PTZ positions
- Video motion-detection sensitive PTZ patrolling among selected presets allows sending of wipe and wash commands to supported PTZ models
- Copy a Smart Client – Player to all hard drives used for recording and archiving. A Smart Client Project file is also created (when the recording server is shut down), making it simple and easy to access video even if the hard drive is removed from the server

#### **Mobile Server**

- Runs as a dedicated service allowing it to be installed with an existing installation or on dedicated hardware for more demanding installations
- Can transcode video so the streams are robust and can adapt to changing connection bandwidth. The server also optimizes the use of available bandwidth to get the best possible stream quality
- Several options for the administrator to configure the system to meet performance expectations. Including optional transcoding, client-side decoding, or a dynamic combination depending on streams
- The Mobile server plugin in the Management Application gives access to the Milestone Mobile server management in order to change default settings and read out miscellaneous status information
- Multiple Milestone Mobile servers can be installed in parallel, offering redundant setups and/or allowing more simultaneous users. They also allow users to connect to a server of their choice
- Can be configured through the tray controller to easily adjust or update settings

- Use either a default-generated certificate for HTTPS encrypting the connection to the Milestone Mobile server or provide your own custom certificate
- All configuration of Video Push is done from the server, therefore users can download and use the Milestone Mobile client without having to do any configuration
- Supports creating server side export through XProtect Web Client and Milestone Mobile. The Milestone Mobile management plugin allows administrators to configure codec used as well as manage ongoing and completed exports
- Automatically installs the XProtect Web Client. No additional setup is needed
- Smart Connect can automatically configure network addresses and validate external connectivity, as well as invite users to start using Milestone Mobile

## **XProtect Professional client modules**

### **XProtect Smart Client**

- Choice of simple or advanced layouts depending on current user need
- Application theme support with choice of dark or light theme
- Dedicated task-oriented tab for the Sequence Explorer in addition to the traditional Live and Playback tabs
- Installed per default on a Recording Server for local viewing and playback of video and audio
- Camera search function, which promptly finds cameras, type of cameras and views in the system with the ability to create temporary views to display all or a subset of cameras matching the search criteria
- Start recording on cameras with a predefined time for example, default five minutes. Subject to privileges set by administrator
- Support for native 64-bit operating systems
- Independent playback capability allows for instant play back of recorded video for one or more cameras, while in live and playback mode
- Interactive, multi-layered maps provide the operator with a comprehensive overview of cameras, devices and layouts of an entire surveillance installation
- Seamlessly export video in various formats including video from multiple cameras, with evidence viewer, data logs and user notes included
- The storyboarding function makes it possible to include video sequences from different or overlapping time intervals from different cameras in the one and the same export
- When exporting video in AVI or MKV format, the export can be played back in a standard player application. When exporting in MKV format the video is exported in the same format as originally



recorded (similar to creating database export), as long as privacy masking is not enabled and video is recorded in H.264, JPEG or MPEG-4, except for MPEG-4 short header mode

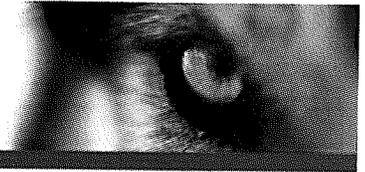
- Quickly gather and refine evidence using Smart Search to locate changes or objects in the video
- With multi-channel, two-way audio, it is easy to communicate with people at gates/entrances or broadcast messages to many people at once
- Live view digital zoom allows zoomed-out recordings while the operator can digitally zoom in to see details
- "Update on Motion Only" optimizes CPU use by letting motion detection control whether or not the image should be decoded and displayed. The visual effect is a still image in the view until motion is detected
- Shared and private camera views offer 1x1 up to 10x10 layouts in addition to asymmetric views
- Views optimized for both 4:3 and 16:9 screen ratios
- Multiple computer monitor support with a main window and any number of either windowed or full screen views
- Hotspot function for working in detail with a camera selected from a view containing multiple cameras
- Carousel function allows a specified view to rotate between predefined cameras with individual timing and order with multiple appearances. Carousel function can be controlled allowing the operator to pause the carousel function and to switch to previous or next camera
- Overlay buttons provide intuitive control of cameras, camera-integrated devices and other integrated systems directly from the camera view
- Matrix function to view live video from multiple cameras through the Image Server in any view layout with customizable rotation path, remotely controlled by XProtect Smart Clients or Recording Servers sending Matrix remote commands
- Send Matrix remote commands to display live video remotely on computers running XProtect Smart Client
- Cameras' built-in audio sources available in live and in playback
- Separate pop-up window displaying sequences and time intervals in thumbnail previews, the Sequence Explorer gives a visual overview of recorded video combined with smooth navigation
  - Presents recorded sequences for individual cameras, or all cameras in a view
  - Available in both live and playback modes
  - Smooth navigation with sliding preview and "drag-and-throw" function for video thumbnails
  - Instant playback of video sequences
- Application options allow users to adapt the layout and personalize the application to their particular preferences
- Dual authorization offers an optional additional level of system security, where XProtect Smart

Client users are granted access to the system only when a second user or supervisor has confirmed the log-in with a successful authorization of the second user

- Create, edit or delete PTZ presets (not possible for PTZ type 2, where PTZ presets are stored in the camera device, but can't be modified from the XProtect software)
- Control PTZ cameras by using;
  - PTZ preset positions
  - PTZ point-and-click control
  - Overlay buttons
  - PTZ zoom to a defined rectangle
  - Video overlaid PTZ control
  - Virtual joystick function
  - Joystick
- 360° ImmerVision Enables® panomorph lens technology removes blind spots and allows operators to track, detect and analyze the entire area in live or playback mode. Only one camera license required for the 360° panomorph lens
- Camera Navigator allows the easy tracking of objects
- Milestone Integration Platform Software Development Kit (MIP SDK) 4.5 plug-in support
- XProtect Smart Client – Player replaces the former viewer application and offers efficient handling of multiple exports
- Support for hardware accelerated decoding using Intel Quick Sync video

#### **XProtect Smart Client - Player**

- Playback recorded or received video and audio evidence
- Offers a simplified and even more user-friendly interface compared to the XProtect Smart Client, including the capability to switch back to the full XProtect Smart Client interface, with almost the same functions as the XProtect Smart Client
- Instant one-click playback for easy viewing of exported video evidence
- Advanced second-level investigation tools make it easy to refine exported video and re-export the most essential evidence
- The project tool allows users to merge video exports or archives from two different locations or XProtect systems together into one new export
- View up to 100 time-synched cameras during playback
- Scrollable activity timeline with a magnifying feature
- Instant search on recordings based on date/time and activity/alarm
- Evidence can be generated as a printed report, a JPEG image, an AVI or MKV film or in XProtect format
- Export audio recordings in WAV or AVI format
- Audio in MKV export is PCM, therefore it is available in a decoded version of what was originally recorded



- Export video digitally zoomed to view area of interest only and to minimize export footprint size
- Re-export evidence in XProtect, AVI or MKV format with the XProtect Smart Client - Player for instant, easy viewing by authorities
- Encryption and password protection option for exported recordings and files
- Ability to add comments to exported evidence, also encrypted
- De-interlacing of video from analog cameras
- 360° ImmerVision Enables® panoramorph lens technology
- Automatically copied to all hard drives used by the Recording Server to store recordings and archives

### **XProtect Web Client**

- Access XProtect Smart Client views through a browser to avoid using any advanced features
- Shared views can be managed centrally via the server with administrator/user rights and user groups
- Playback video easily including fast/slow playback, single frame step and jump to date/time with frame preview while adjusting time
- Search for cameras and views to quickly find specific cameras in the system
- Control PTZ cameras remotely using preset positions
- Dynamic bandwidth optimization when streaming from server to client giving a better use of bandwidth
- Optional client-side decoding for improved video quality and reduced server load
- Create AVI files or save JPEG images
- Create investigations with one or more cameras to quickly access them from anywhere and convert to exports when needed
- Export on the server to avoid moving large video files back and forth. Users can download only the files they need or save them to download when a faster connection is available
- Trigger outputs and events with live view of related camera
- System login using XProtect user name and password
- System login using Microsoft Active Directory user
- Secure connection through HTTPS
- No installation required

### **Milestone Mobile**

- Add login credentials for multiple servers in the Milestone Mobile Client to easily switch between sites or different connection addresses
- Views are inherited from the connected XProtect VMS system. The client automatically obtains the user's private and shared views from the system to be used as camera lists in the Milestone Mobile client
- A view with all cameras is automatically generated, allowing the Milestone Mobile client to be used

when no views are set up. It also provides a quick way of searching through cameras

- Cameras can be viewed in full screen to better view any details. It is also possible to search through cameras in a view while in full screen by swiping left or right
- Search for cameras and views to quickly find specific cameras in the system
- Digital pinch to zoom enables users to zoom in on a part of the image for closer review and to conduct a detailed investigation of video when using megapixel or high-definition cameras
- Playback recordings from the database and select a specific time or recorded sequence to start playback, step through recordings and select a playback speed
- View recordings from the database while keeping an eye on what is currently happening. The client displays a live picture-in-picture frame of the same camera when in playback mode. The picture-in-picture can be moved by dragging and double-tapping will return to live view
- Control PTZ cameras manually or by selecting predefined presets for quick navigation
- Video Push allows users to use the camera in their mobile device as any other camera in the installation. It is very easy to use and requires no setup in the mobile device
- Trigger outputs and events: Administrators can use their mobile device to trigger outputs connected to the XProtect VMS or trigger user-defined events to have greater control on the go
- Connect securely to the Milestone Mobile server using HTTPS encryption
- Export on the server to avoid moving large video files back and forth. Download only the required files or save them to download later when a faster connection is available
- View and manage alarms with easy access to related video recordings
- Receive push notifications when new alarms are triggered or alarms are assigned to a user
- Automatic server setup with Smart Connect



## Integration options

- XProtect's open SDK makes it possible to incorporate video in a business process through the seamless integration of third-party applications, such as video analytics and access systems
- Compatible with XProtect® Access Control Module, an add-on to enable easy integration of third-party access control solutions with Milestone's video management solutions. Users of the Smart Client have a consolidated interface to operate the access control systems with dedicated functions to effectively monitor access events, manually assist passages and conduct investigations on specific access points or cardholders
- Compatible with XProtect® Retail, an add-on to perform advanced data analysis. Based on transaction data from point-of-sale (POS) or automated teller machines (ATMs), XProtect Retail links data with corresponding video from relevant cameras
- Compatible with XProtect® Transact that directly links video with transaction data from POS or ATMs. Transactions and corresponding video can be monitored live or viewed later to identify shrinkage, fraud or simply validate a transaction
- With Milestone Interconnect, XProtect Corporate provides continuous monitoring of alarm status from XProtect servers, video surveillance cameras and external devices
- Compatible with XProtect Screen Recorder, an add-on function that enables XProtect VMS to inconspicuously capture screen recordings of any Microsoft Windows-based PC or POS terminal. Captured screen recordings are managed just like camera recordings and can be viewed in live and playback mode and exported for evidence
- Integrates with systems such as access control, alarms, gates and building management using hardware input/output (I/O), internal events and TCP/IP events



## System Requirements

The listing of the system requirements are moved online to better service our customers. Please find the system requirements per product here:

<http://www.milestonesys.com/SystemRequirements>

## Supported languages

For details on supported languages, please refer to:

<http://www.milestonesys.com/SupportedLanguages>

## Licensing structure

### Base server license

- An XProtect Professional base server license is mandatory to install the software; it may be installed on a single computer designated as master server per software license code (SLC). The software may be installed on any number of slave server computers per designated master server using the same SLC
- The base server license contains the XProtect Professional server module and XProtect Mobile server, plus the client modules XProtect Smart Client, XProtect Smart Client – Player, XProtect Web Client and Milestone Mobile

### Camera license

- To connect a camera, one license per camera is required. In total, for all copies of the product installed under this license, the product may only be used with as many cameras as you have purchased camera licenses for
- Video encoders connected to multiple analog cameras require a camera license per encoder to operate
- I/O devices require a camera license per I/O device
- An unlimited number of camera licenses may be purchased
- To extend the installation with additional camera licenses, the SLC is required

### Client license

- The XProtect Professional client modules: XProtect Smart Client, XProtect Smart Client – Player, XProtect Web Client and Milestone Mobile do not require additional licenses and can be installed and used on any number of terminals

milestone XPROTECT®  
2016

POSSIBLE  
STARTS  
HERE

In control  
like never  
before

PROFESSIONAL VMS

XProtect® Essential

XProtect® Express

XProtect® Professional

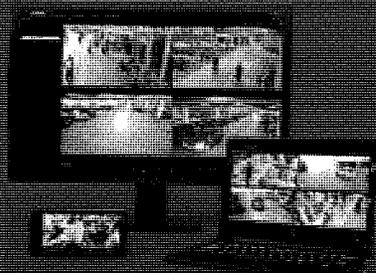
XProtect® Enterprise

When it comes to your security, being in control is vital. Your people, your assets and your business are at stake, and nothing can be left to chance. Our XProtect VMS is designed to give you control of your surveillance, and with XProtect 2016, we're putting you in control — like never before.

#### Know when something needs your attention

You can't watch your video feed 24/7. Milestone Mobile 2016 notifies you when an alarm is triggered on your premises. Go about your day with the peace of mind that if something should happen, your system will let you know.

# 24/7

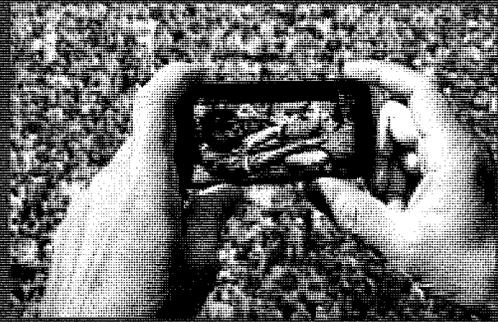


#### Access your system your way

- We offer three flexible ways to access your system, at work, at home and on-the-go
- XProtect Web Client – Access your system's core video functionality from any Internet-enabled device
- Milestone Mobile – Access your system on-the-go from any smartphone or tablet
- XProtect Smart Client – Use this powerful interface for daily managing your Milestone installation

### Document incidents as they happen

Turn your mobile phone into an extension of your surveillance system with Milestone Mobile. Employees can use their mobile device's camera to record and document events as they happen and send video directly from their device to the system. Respond to incidents quickly and address situations before they escalate – all with Milestone Mobile.



### Get the most out of your system

Our mission is to make using our system as simple as possible. Our interactive, self-paced eLearning modules help you get the most out of your solution and empower you with on-the-job performance through learning. You can also get an in-depth look at the wide range of new features in XProtect 2016.

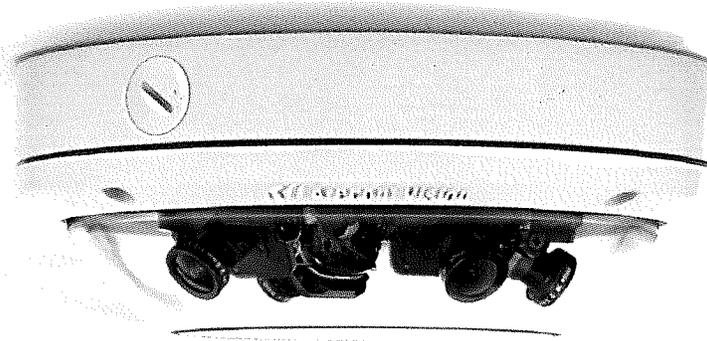


Find out more at [milestonesys.com](http://milestonesys.com)

**POSSIBLE  
STARTS  
HERE**

## SurroundVideo® Omni IP Megapixel Cameras

12MP WDR or 20MP H.264 All-in-One Omni-Directional User-Configurable Multi-Sensor True Day/Night Indoor/Outdoor Dome IP Cameras



Delivering revolutionary flexibility, Arecont Vision SurroundVideo Omni multi-sensor, multi-megapixel cameras provide ample resolution to zoom-in for details in live and recorded video. With multiple imagers, each with a choice of an IR corrected lens, one SurroundVideo Omni can replace 4 standard cameras, requiring just a single installation with only one ethernet cable.

A unique track design allows four individual sensor gimbals to be independently placed in nearly any configuration. Popular uses of SurroundVideo Omni IP66 rated / IK-10 impact-resistant cameras are

to cover the intersection of hallways or to provide a 270° view at the corner of a building.

SurroundVideo Omni cameras are available in total resolutions of 12 megapixels (MP) or 20 megapixels. Optional lenses can be selected from a choice of 2.1, 2.8, 4, 6, 8, 12 and 16mm. Wide Dynamic Range (WDR) that delivers up to 100dB at full resolution is available in the 12MP model. H.264 compression reduces bandwidth and storage requirements, while delivering full frame rates and resolution, without sacrificing image quality.



Omni-Directional Track with  
4 Customizable Sensors



270° FOV  
Capable



Wide Dynamic Range  
on 12MP Models



True Day/Night  
with IR Cut Filter



Pixel Binning Mode



Dual Encoder  
H.264/MJPEG



Ultra Low Profile  
Design



Impact / Weather Resistant  
IK-10 and IP66 Rated

### Series Features

- 12MP WDR and 20MP Models
- Up to 4 Individual Camera Gimbals can be Independently Placed in Any Orientation Around a 360° Track with Extra Positions for Locking Straight Down
- Multiple Lens Options in a Single Camera Housing from 2.1mm up to 16mm
- True Day/Night Functionality with Mechanical IR Cut Filter
- Forensic Zooming – Zoom Live or After the Event While Recording Full Field-of-View in HD – Replace PTZ Devices
- Privacy Mask, Motion Detection, Flexible Cropping, Bit Rate Control and Multi-Streaming
- Dual Encoder H.264/MJPEG
- PoE and Auxiliary Power: 12–48V DC/24V AC
- Ultra Discrete, Low-Profile Housing
- Outdoor Rated IP66 and IK-10 Impact-Resistant Housing
- Complete Mounting Options
- True WDR up to 100dB at Full Resolution: See Clearly in Shaded and Bright Light Conditions Simultaneously
- Binning Mode for Strong Low Light Performance



Camera Specifications

| Model                |                                | AV12176DN                      | AV20175DN                 |
|----------------------|--------------------------------|--------------------------------|---------------------------|
| Image Sensor         |                                | 4 x 3MP CMOS                   | 4 x 5MP CMOS              |
| Optical Format       |                                | 1/3.2"                         | 1/2.5"                    |
| Pixel Pitch          |                                | 2.2µm                          | 2.2µm                     |
| Minimum Illumination | Color (Day Mode)               | 0.5 Lux                        | 0.3 Lux                   |
|                      | Color Binning (Day Mode)       | 0.15 Lux                       | 0.15 Lux                  |
|                      | B/W (Night Mode)               | 0 Lux, IR sensitive            | 0 Lux, IR sensitive       |
| Full FOV Resolution  | Total                          | 8192 H x 1536 V                | 10240 H x 1920 V          |
|                      | Per Sensor                     | 2048 H x 1536 V                | 2560 H x 1920 V           |
| 1/4 Resolution       | Total                          | 4096 H x 768 V                 | 5120 H x 960 V            |
|                      | Per Sensor                     | 1024 H x 768 V                 | 1280 H x 960 V            |
| Dynamic Range        |                                | Up to 100dB at Full Resolution | 70.1dB                    |
| Frame Rates          | At Max Resolution              | 5.2fps (8192x1536)             | 3.5fps (10240x1920)       |
|                      | 1/4 Resolution                 | 16.7fps (4096x768)             | 11fps (5120x960)          |
|                      | Binning Mode                   | 17fps (4096x768)               | 13fps (5120x960)          |
| Lens                 | 2.8mm Lens Option (-28 Models) | 2.8mm, F1.8, H-FOV = 89°       | 2.8mm, F1.8, H-FOV = 113° |
|                      | 8mm Lens Option (-08 Models)   | 8mm, F1.6, H-FOV = 33°         | 8mm, F1.6, H-FOV = 40°    |

Programmability

|                                   |                                                                                                                                                                                                                                                                                  |
|-----------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Optics</b>                     | Pixel Binning Mode                                                                                                                                                                                                                                                               |
| <b>Picture-in-Picture</b>         | Simultaneous delivery of full field-of-view and zoomed images                                                                                                                                                                                                                    |
| <b>Programmable Shutter Speed</b> | Controls motion blur, 1ms–500ms                                                                                                                                                                                                                                                  |
| <b>Motion Detection</b>           | Real-time, 1024 detection zones                                                                                                                                                                                                                                                  |
| <b>Privacy Masking</b>            | Unlimited                                                                                                                                                                                                                                                                        |
| <b>MoonLight™ Mode</b>            | Extended exposure and noise cancellation                                                                                                                                                                                                                                         |
| <b>Flexible Cropping</b>          | Resolution windowing down to 1x1 pixel for JPEG and 2x2 pixels for H.264                                                                                                                                                                                                         |
| <b>Backlight Compensation</b>     | Auto multi-matrix white balance                                                                                                                                                                                                                                                  |
| <b>Flicker Control</b>            | 50/60Hz selectable                                                                                                                                                                                                                                                               |
| <b>Wide Dynamic Range</b>         | Auto switch control adjustment between WDR and LDR modes (WDR models)                                                                                                                                                                                                            |
| <b>Efficiency</b>                 | Bit rate and bandwidth limitation control<br>Bandwidth and storage savings by running at 1/4 resolution                                                                                                                                                                          |
| <b>Sharpness</b>                  | Selectable enhancement level                                                                                                                                                                                                                                                     |
| <b>Miscellaneous</b>              | Programmable resolution, brightness, saturation, gamma, tint<br>Simultaneous delivery of full field-of-view and zoomed images<br>Electronic pan, tilt, zoom (PTZ)<br>Auto Exposure (AE) and Gain Control (AGC) > 120dB<br>Programmable shutter speed to help control motion blur |

Data Transmission

|                          |                                                             |
|--------------------------|-------------------------------------------------------------|
| <b>Compression Type</b>  | H.264 (MPEG-4, Part 10)/Motion JPEG<br>21 levels of quality |
| <b>Network Protocols</b> | RTSP, RTP/TCP, RTP/UDP, HTTP, DHCP, TFTP                    |
| <b>Network Interface</b> | 100Base-T Ethernet                                          |
| <b>Multi-Streaming</b>   | 8 non-identical streams                                     |

Compliance

|                          |                                                                                                                                                                                              |
|--------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Industry Standard</b> | ONVIF Profile S Conformant                                                                                                                                                                   |
| <b>Listings</b>          | UL (CB)                                                                                                                                                                                      |
| <b>FCC Compliance</b>    | 47 CFR 15 Class A                                                                                                                                                                            |
| <b>Environmental</b>     | RoHS, REACH, WEEE                                                                                                                                                                            |
| <b>Markings</b>          | (CE) EN 55022:2010 Class A, EN 55024:2010, EN 61000-3-2:2006+A1:2009+A2:2009, EN61000-3-3: 2008, EN60950-1:2006+A11:2009+A1:2010+A12:2011, (UL) IEC 60950-1 (ed. 2) and IEC 60950-22 (ed. 1) |
| <b>CoO</b>               | Made in the USA                                                                                                                                                                              |

Environmental

|                              |                                |
|------------------------------|--------------------------------|
| <b>Operating temperature</b> | -40°C (-40°F) to +50°C (122°F) |
| <b>Humidity</b>              | 0% to 90% (non-condensing)     |
| <b>Storage temperature</b>   | -40°C (-40°F) to +60°C (140°F) |

## Electrical

|                                  |                      |
|----------------------------------|----------------------|
| <b>Alarm Input/Output</b>        | 1 input/1 output     |
| <b>Power Over Ethernet</b>       | PoE 802.3af, Class 3 |
| <b>Auxiliary Power</b>           | 12–48V DC, 24V AC    |
| <b>Maximum Power Consumption</b> | 14 Watts Max (Aux)   |

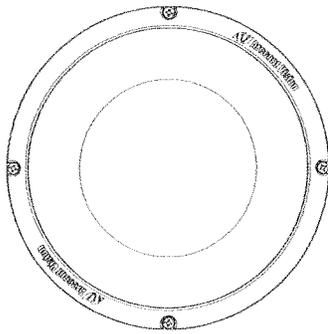
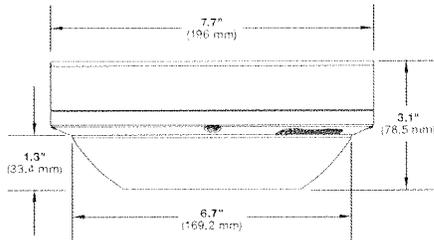
## Mechanical

|               |                                                                                                                          |
|---------------|--------------------------------------------------------------------------------------------------------------------------|
| <b>Casing</b> | Die-cast aluminum chassis with polycarbonate dome bubble<br>IP66 weather proof standard<br>Impact resistant, IK-10 rated |
|---------------|--------------------------------------------------------------------------------------------------------------------------|

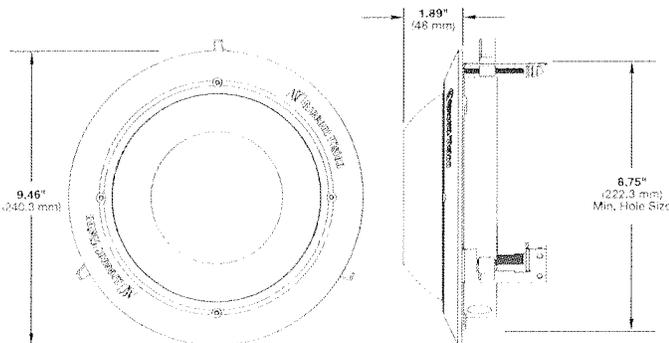
**Gimbal** Easily adjustable, 2-axis w/360° pan and 90° tilt

|                                                      |                    |                                            |
|------------------------------------------------------|--------------------|--------------------------------------------|
| <b>Dimensions</b><br><small>(See Dimensions)</small> | <b>Unit</b>        | Ø 7.7" (196mm) x 3.1" H (78.5mm)           |
|                                                      | <b>Bubble Only</b> | Ø 6.7" (169.2mm) x 1.3" H (33.4mm)         |
|                                                      | <b>Packaged</b>    | 8" W (203mm) x 8" L (203mm) x 4" H (102mm) |
| <b>Weight</b>                                        | <b>Unit</b>        | 2.8lbs (1.27kg)                            |
|                                                      | <b>Packaged</b>    | 3.4lbs (1.54kg)                            |

## Dimensions

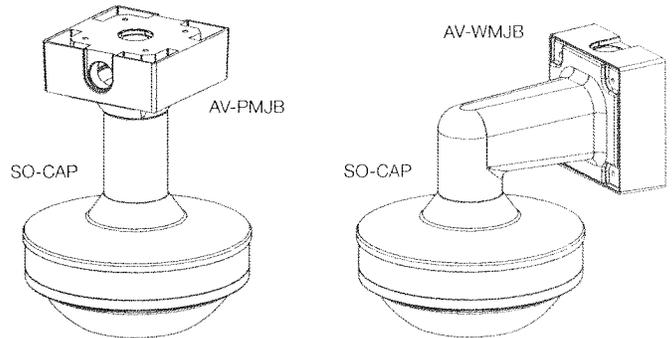


## SO-FMA



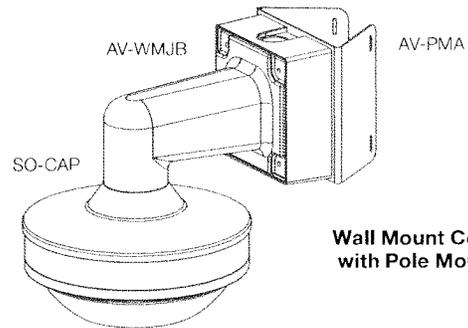
## Accessories (Sold Separately)

|                |                                         |
|----------------|-----------------------------------------|
| <b>AV-CRMA</b> | Corner Mount Adapter                    |
| <b>AV-EBA</b>  | Electrical Box Adapter                  |
| <b>AV-PMA</b>  | Pole Mount Adapter                      |
| <b>AV-PMJB</b> | Pendant Mount Bracket with Junction Box |
| <b>AV-WMJB</b> | Wall Mount Bracket with Junction Box    |
| <b>SO-CAP</b>  | Cap for SurroundVideo® Omni             |
| <b>SO-FMA</b>  | Flush Mount Adapter                     |

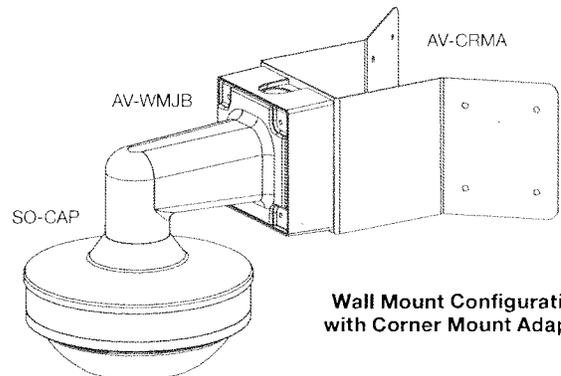


**Ceiling Mount Configuration**

**Wall Mount Configuration**

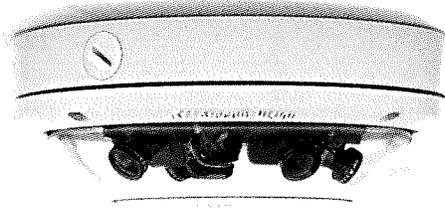


**Wall Mount Configuration with Pole Mount Adapter**



**Wall Mount Configuration with Corner Mount Adapter**

## Ordering Information



### Options

|     |                                                      |
|-----|------------------------------------------------------|
| -NL | No Lenses (User Configurable and Ordered Separately) |
| -28 | Configured with 2.8mm Lenses*                        |
| -08 | Configured with 8mm Lenses**                         |

- \* Good option for a 270° Corner Mount configuration
- \*\* Good configuration option for a hallway intersection

### Lens Options

| Manual Fixed Focal                    |     |      |
|---------------------------------------|-----|------|
| MPM2.1 (2.1mm) Ordered Separately     | 3MP | 1280 |
| MPM2.8A (2.8mm) Standard (-28 Models) | 3MP | 1280 |
| MPM4.0A (4mm) Ordered Separately      | 3MP | 1280 |
| MPM6.0 (6mm) Ordered Separately       | 3MP | 1280 |
| MPM8.0 (8mm) Standard (-08 Models)    | 3MP | 1280 |
| MPM12.0A (12mm) Ordered Separately    | 3MP | 1280 |
| MPM16.0 (16mm) Ordered Separately     | 3MP | 1280 |

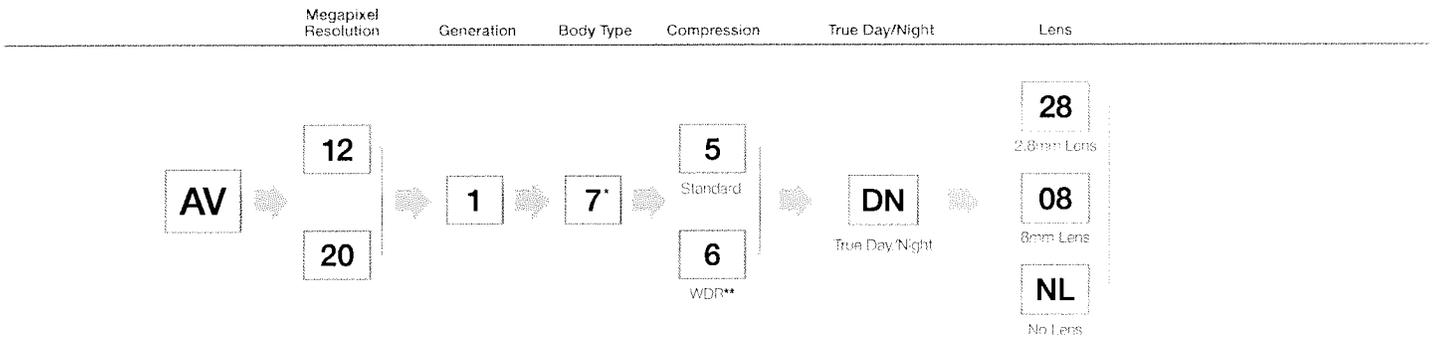
### Model Specific Features

| Model     | Resolution | Frame Rate | Features |         |
|-----------|------------|------------|----------|---------|
|           |            |            | WDR      | Binning |
| AV12176DN | 12MP       | 5.2fps     | WDR      | Binning |
| AV20175DN | 20MP       | 3.5fps     | -        | Binning |

### Model Numbers

|      |              |     |
|------|--------------|-----|
| 12MP | AV12176DN-NL | WDR |
|      | AV12176DN-28 | WDR |
|      | AV12176DN-08 | WDR |
| 20MP | AV20175DN-NL |     |
|      | AV20175DN-28 |     |
|      | AV20175DN-08 |     |

### Create Your Model (Example: AV12176DN-28)



- \* \*7' represents SurroundVideo Omni product line
- \*\* WDR for AV12176 models only



Licensed Electrical Contractor  
5057 Sawyer Woods Drive  
Traverse City, MI 49685  
(231) 922-8626  
(231) 922-2007 Fax  
[toplineelectric.us](http://toplineelectric.us)

**Julie Dalton- Purchasing Agent  
The City of Traverse City  
400 Boardman Avenue, 2nd floor  
Traverse City, MI 49684**

Dear Julie Dalton and Nicole VanNess:

Thank you for allowing us the opportunity to bid this video project. We are pleased to have prepared a comprehensive video solution that will accomplish your goals and exceed your expectations.

Top Line Electric is a local Electrical Contractor based in **Traverse City**, we are licensed in the state of MI for Electrical and Low Voltage Design and Installation. We have trained, local technicians what live and work in and around **Traverse City**.

We are pleased to present you with this **TURN-KEY** security solution for Video Surveillance. We will design, build, install, commission, test, train and manage the entire project.

Please feel free to contact us at any time if you have any questions!

Thank You,

A handwritten signature in black ink, appearing to read "Art Doran".

**Art Doran**

Technology Manager  
Top Line Electric LLC  
5057 Sawyer Woods Drive  
Traverse City, Michigan 49685  
(231) 922-8626  
[artd@toplineelectric.us](mailto:artd@toplineelectric.us)

**Bidder- Please Complete and Return**

**BID SUMMARY**

**TITLE: TRAVERSE CITY PARKING SERVICES – CAMERA SYSTEM**

**DUE DATE: TUESDAY, NOVEMBER 29, 2016 @ 4:00PM**

*(Changed to Tuesday December 20, 2016 @ 4:00PM on Amendment #1)*

Having carefully examined the attached specifications and any other applicable information, the undersigned proposes to furnish all items necessary for and reasonably incidental to the proper completion of this bid. Bidder submits this bid and agrees to meet or exceed all requirements and specifications unless otherwise indicated in writing and attached hereto.

Bidder certifies that as of the date of this bid the Company or he/she is not in arrears to the City of Traverse City for debt or contract and is in no way a defaulter as provided in Section 152, Chapter XVI of the Charter of the City of Traverse City.

Bidder understands and agrees, if selected as the successful Bidder, to accept a Purchase Order / Service Order / Contract and to provide proof of the required insurance.

Bidder submits this bid and agrees to meet or exceed all the City of Traverse city's requirements and specifications unless otherwise indicated in writing and attached hereto. Bidder shall comply with all applicable federal, state, local and building codes, laws, rules and regulations and obtain any required permits for this work.

The Bidder certifies that it is in compliance with the City's Nondiscrimination Policy as set forth in Administrative Order No. 47 and Chapter 605 of the City's Codified Ordinances.

The Bidder certifies that none of the following circumstances have occurred with respect to the Bidder, an officer of the Bidder, or an owner of a 25% or more share in the Bidder's business, within 3 years prior to the bid:

(a) conviction of a criminal offense incident to the application for or performance of a contract;

(b) conviction of embezzlement, theft, forgery, bribery, falsification or destruction of records, receiving stolen property, or any other offense which currently, seriously and directly reflects on the Bidder's business integrity;

(c) conviction under state or federal antitrust statutes;

(d) attempting to influence a public employee to breach ethical conduct standards; or

(e) conviction of a criminal offense or other violation of other state, local, or federal law, as determined by a court of competent jurisdiction or an administrative proceeding, which in the opinion of the City indicates that the bidder is unable to perform responsibility or which reflects a lack of integrity that could negatively impact or reflect upon the City of Traverse City, including but not limited to, any of the following offenses or violations of:

- i. The Natural Resources and Environmental Protection Act.
- ii. A persistent and knowing violation of the Michigan Consumer Protection Act
- iii. Willful or persistent violations of the Michigan Occupational Health and Safety Act
- iv. A violation of federal, local, or state civil rights, equal rights, or nondiscrimination laws, rules, or regulations.
- v. Repeated or flagrant violations of laws related to the payment of wages and fringe benefits.

(f) the loss of a license or the right to do business or practice a profession, the loss or suspension of which indicates dishonesty, a lack of integrity, or a failure or refusal to perform in accordance with the ethical standards of the business or profession in question.

Bidder understands that the City reserves the right to accept any or all bids in whole or part and to waive irregularities in any bid in the best interest of the City. The bid will be evaluated and awarded on the basis of the best value to the City. The criteria used by the City may include, but will not be limited to: ability, qualifications, timeframe, experience, price, type and amount of equipment, accessories, options, insurance, permits, licenses, other pertinent factors and overall capability to meet the needs of the City. The City is sales tax exempt – Government.

Bidder agrees that the bid may not be withdrawn for a period of sixty (60) days from the actual date of the opening of the bid.

Submitted by:

  
Signature

Top Line Electric, LLC  
Company Name

ALI DORAN TECHNOLOGY MANAGER  
Name and Title (Print)

5057 Sawyer Woods Drive  
Company Address

(231) 922-8626      (231) 922-4476  
Phone                      Fax

Traverse City                      MI                      49685  
City                                      State                      Zip

CORPORATION  
Sole Proprietorship/partnership/corporation

2006  
If corporation, state of corporation

**BID TABULATION SHEET**

|    |                                                                                                                                                     |                                                                                                                                                                                                                                            |
|----|-----------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1  | What is the name (company) of the camera system you are recommending?                                                                               | <b>ExacqVision – “Enterprise” version.</b>                                                                                                                                                                                                 |
| 2  | Is the camera solution you are proposing a TCPS hosted solution, vendor-hosted solution, or both?                                                   | <b>Combination/Hybrid-</b> The Recording Server will reside on-site (in the network). The system Health-Monitoring, IT Management, Firmware Upgrades, Software Upgrades and Integrity will be monitored and administered by the Contractor |
| 3  | Are the existing cameras able to be reused with the proposed solution?                                                                              | <b>Yes</b>                                                                                                                                                                                                                                 |
| 4  | How much is the main server or hosted solution fees (one-time purchase, monthly subscription, or other)?                                            | <b>\$27,540</b> for the Server.<br><b>\$600/Month</b> for Health Monitoring and IT support (remote).<br><b>\$2900/Month</b> for Full Maintenance agreement (includes Health Monitoring and IT Support).                                    |
| 5  | Did you attach the server specification and storage cut-sheet?                                                                                      | <b>Yes</b>                                                                                                                                                                                                                                 |
| 6  | What is the per camera cost?                                                                                                                        | <b>\$1020-</b> not including labor, cable and conduit                                                                                                                                                                                      |
| 7  | Did you attach the camera specification cut-sheet?                                                                                                  | <b>Yes</b>                                                                                                                                                                                                                                 |
| 8  | Does the solution you are providing require annual fees, subscription fees, maintenance or upgrade fees? Please list all fees.                      | <b>No-</b> if the Maintenance Agreement is chosen.<br><b>Yes –</b> if the Maintenance Agreement is not chosen, then it is <b>\$25</b> per camera every year after the third year. (2016 prices)                                            |
| 9  | How many additional cameras may be purchased and added to the system before additional server space, hardware or devices will need to be purchased? | <b>50</b>                                                                                                                                                                                                                                  |
| 10 | Do you offer a maintenance agreement? What is included in the maintenance agreement?                                                                | <b>Yes-</b> All Equipment installed by us, excluded “acts of God”. All Software and Firmware updates.<br><b>Reduces Labor rate and 24-hour service</b>                                                                                     |
| 11 | What are the additional fees and costs associated with Option 1 (from attached chart)                                                               | <b>License Fee with Each Camera added</b>                                                                                                                                                                                                  |
| 12 | See #9, if Option 1 (from attached chart) is purchased, is there still additional capacity to add more cameras.                                     | <b>There is room to add 50 More Cameras on this server. More servers can be added and it remains a simple user interface with one client</b>                                                                                               |



5057 Sawyer Woods Drive  
Traverse City, Michigan 49685  
(231) 922-8628

### Family Relationship Disclosure Form

Company name: Top Line Electric LLC.

Company Contact Information: www.toplineelectric.us (231) 922-8626

Employee name: Arthur Doran

Employee Contact Information: artd@toplineelectric.us (231) 922-8626

For purposes of this disclosure, relative is defined as the following: spouse, dependent, adult child and his or her spouse, parent, spouse's parents, siblings and his or her spouse.

There are no familial relationships between any employees of Top Line Electric LLC. and the City of Traverse City.

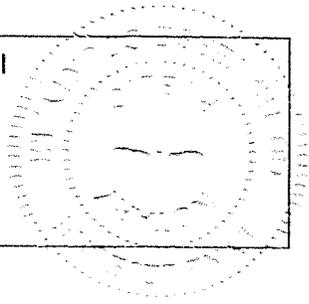
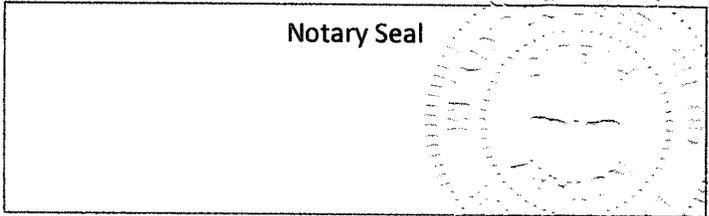
As the representative of Top Line Electric LLC., I affirm that all information contained herein is correct to the best of my knowledge.

Signed: [Signature] 12-20-2016  
Employee Date

Subscribed and affirmed before me in the county of Grand Traverse, State of Michigan, this 20 day of 12, 2016.

[Signature]  
(Notary's Official Signature)

7-11-2017  
(Commission Expiration)



**LYNE LEJEUNE**  
Notary Public, State of Michigan  
County of Grand Traverse  
My Commission Expires Jul. 11, 2017  
Acting in the County of

**Top Line Electric LLC.**  
5057 Sawyer Woods Drive  
Traverse City, Michigan 49685

**AFFIDAVIT OF COMPLIANCE – IRAN ECONOMIC SANCTIONS ACT**  
**Michigan Public Act No. 517 of 2012**

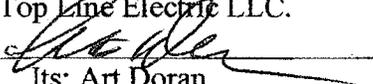
The undersigned, the owner or authorized officer of Top Line Electric LLC. (the "Bidder"), pursuant to the compliance certification requirement provided in the Ingham Intermediate School District' (the "Intermediate School District") Invitation To Bids For Video Streaming and Digital Content, hereby certifies, represents and warrants that the Bidder (including its officers, directors and employees) is not an "Iran Linked Business" within the meaning of the Iran Economic Sanctions Act, Michigan Public Act No. 517 of 2012 (the "Act"), and that in the event Bidder is awarded a Contract as a result of the aforementioned Invitation To Bid, the Bidder will not become an "Iran Linked Business" at any time during the course of performing under the Contract.

The Bidder further acknowledges that any person who is found to have submitted a false certification is responsible for a civil penalty of not more than \$250,000.00 or 2 times the amount of the Contract or proposed Contract for which the false certification was made, whichever is greater, the cost of the Intermediate School District's investigation, and reasonable attorney fees, in addition to the fine. Moreover, any person who submitted a false certification shall be ineligible to bid on an Invitation To Bid for three (3) years from the date the it is determined that the person has submitted the false certification.

**BIDDER:**

Name of Bidder

By: Top Line Electric LLC.

Signature: 

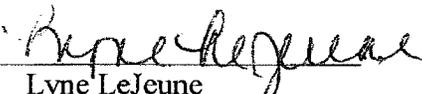
Its: Art Doran

Date: 12-20-2016

STATE OF (Michigan)

COUNTY OF (Grand Traverse)

This instrument was acknowledged before me on the 20th day of December, 2016,

by 

Lyne LeJeune

Notary Public

Grand Traverse County, Michigan  
My Commission Expires: 7/11/2017  
Acting in the County of : Grand Traverse



**Base Bid**

- (40) 2MP IP Cameras/Forensic Capture/WDR/Vandal Resistant/with IR and low light.
- (6) Outdoor Camera Pendants (caps for snow and Ice)
- (6) Outdoor Mounts (to keep cameras away from the wall, to keep ice and snow away)
- (52) Enterprise Channel Licenses for 40 new cameras and 12 Existing (see design for locations)
- (4) 750Watt Gigabit IEEE 802.3af/at PoE L3 48 Port Ethernet switches for power and networking
- (2) 9-Core Gigabit Ethernet routers with redundant power supplies for Routing/secure access. Provides necessary redundancy in case of gateway maintenance or failure.
- (1) **108TB Exacq Enterprise Video Server** with Health monitoring. Storage is calculated so that the owner (TCPS) can add **50** more cameras at minimum while maintaining the desired storage requirements. *(Multiple Exacq Video Servers can be added in the future while maintaining a single-user experience- ideal for TCPS and future growth).*
- (1) Conduit throughout entire Parking Garages, to every location included
- (1) All bored holes, concrete cutting, drilling and fasteners included
- (1) All necessary Back Boxes, fittings and sealant included
- (1) All Ethernet cabling, Cat5 and power connectors included
- (1) All necessary Fiber and connectors included
- (1) All Installation labor, programming, setup and user training included

**Total Price: \$130,871.00**

**Base Bid Options/ Alternates as requested by Owner (TCPS)**

**Second Camera Option/Alternate Camera**

- (1) Upgrade any 2MP Fixed camera (from base bid) to a PTZ, 2MP, PoE Low-light Camera at the time of installation.

**Total Price: \$485.00**

**Elevator Camera Installation**

- (4) 2MP IP Cameras /WDR/Vandal Resistant/ low light
- (1) Vendor-meet and coordination with Elevator Contractor- traveler cable installation
- (1) Labor for Installation and commission

**Total Price: \$16, 050.00**

\*Based on budget Estimate from Elevator Contractor. Actual costs may vary by field conditions.

**Front Street Camera Options**

- (6) 2MP PTZ/ 1080P/ X30/ IP66 Pan-Tilt-Zoom Cameras
- (6) Enterprise Channel Licenses
- (6) PoE Injectors for Power
- (1) Labor for Installation, testing and programming

**Total Price: \$30,267.00**

\*Based on using existing power (110VAC) at each location and wireless network by City of Traverse City. VLAN by others, PoE and IP Addressing by others, must be able to stream RTSP and HTTP TCP ports over existing WIFI/Wireless network, by others. Health-Monitoring, and equipment monitoring cannot be applied to the WIFI network by TCPS, as it is not maintained by Top Line Electric.

**Remote Management/IT and Network Health Option (Suggested)**

- (1) Monitor all devices on network, including Hard Drive Health, fans in NVR and Switches, all PoE ports, Network Bandwidth, Cameras, Wireless Nodes and security. Also includes monitoring backup batteries in the main rack, server power, router integrity.

**Total Price: \$600/Month**

**Full Maintenance Agreement**

- (1) Service/Repair and support all equipment, replace at no cost if needed, all firmware and software updates covered, reduced labor rates and no trip fees. Acts of God not covered.

**Total Price: \$2900/Month (Includes Remote Management above)**

**Base Bid Options as suggested by Contractor (Top Line Electric)**

**Front Street Wireless Equipment Upgrade Option- Install a separate aggregate wireless PtP with redundancy.**

- (21) Wireless Radios with Encryption
- (21) Power supplies and Cabling/Hardware for Mounting
- (1) Labor for Installation, testing and programming

**Total Price: \$41,625.00**

\*Power (110VAC) by the city of Traverse City, at each location (see design for locations). These devices can be monitored for integrity and function by Top Line Electric

**Install additional cameras for better coverage as designed by Top Line Electric. See design for locations.**

- (34) 2MP IP Cameras/Forensic Capture/WDR/Vandal Resistant/with IR and low light.
- (3) Outdoor Camera Pendants (caps for snow and Ice)
- (3) Outdoor Mounts (to keep cameras away from the wall, to keep ice and snow away)
- (1) Labor for Installation, testing and programming

**Total Price: \$59,850.00**

**Install (2) 60TB servers for 120TB instead of 1 for 108TB. This will add redundancy to the system, in case of maintenance or possible failure, the load of the system will be split in half. Also, the servers will have more head-room for processing and can add up to 60 more similar cameras without the need for HDD expansion.**

- (2) 60 TB Exacq *Enterprise* Video Server with Health monitoring. Storage is calculated so that the owner (TCPS) can add 60 more cameras at minimum while maintaining the desired storage requirements. (*Multiple Exacq Video Servers can be added in the future while maintaining a single-user experience- ideal for TCPS and future growth*).
- (1) Labor for Installation, testing and programming

**Total Price: \$37,067.00**

## **ABBREVIATIONS AND DEFINITIONS:**

**Ethernet-** Ethernet is a standard technology for network communications in LANs (Local Area Networks). Ethernet LANs use twisted pair cabling, with network devices connecting to a central cable or hub. The most common Ethernet systems are 10BASE-T and 100BASE-T10, which transmit data at speeds of 10 Mbps and 100 Mbps

**Image Compression:** Image compression reduces the file size of video images to optimize bandwidth while streaming surveillance footage. The most common compression technologies for IP network cameras are Motion JPEG and MPEG-4. **H.264** is the latest compression technology that significantly reduces the file size of high-quality video images

**IP (Internet Protocol):** This refers to anything "network" oriented. For example; a security camera that connects to a computer network is referred to as a "IP Camera".

**IP Camera:** An IP camera (or network camera) captures and transmits live video images directly over an IP network. Each camera has a built-in web server and its own IP address. IP cameras allow for remote viewing, recording, and management from anywhere using a web server or video management software.

**Infrared (IR):** Is a color, but in the terms of security cameras, it means that the camera generates IR light in extreme low-light conditions. The camera will also have an IR cut filter, to prevent IR in the daytime.

**Local Area Network (LAN):** is a grouping of computers and network devices that share common resources within a small physical area, for instance an office building or school. LANs usually offer high data transfer rates and use Ethernet or Wi-Fi for network communication.

**Network Video Recorder (NVR):** is a hardware box that receives video streams over a LAN or WAN and captures them onto hard disk in digital format. Recording and playback can be managed remotely using a network PC.

**Power over Ethernet (PoE):** With Power over Ethernet, a network device, such as an IP camera, receives power and transmits video and data over a single Ethernet cable. This allows for flexible installation in locations where power outlets aren't readily available.

**PTZ (Pan Tilt Zoom):** These are the three typical ways that a camera can be motorized. Some cameras may have on 1 or 2 of these adjustable axis, while cameras with all three are becoming increasingly more common.

**Resolution:** Resolution is the measure of how much detail an image can hold. The higher the resolution the more detailed the images are. In the case of IP cameras, resolution is usually specified by pixel-count.

**Server:** In general, a server is a computer program, or a computer running a server program, that provides services to other computer programs. A server appliance is a network-connected hardware appliance that provides dedicated applications to a network, while a web server is a computer program that delivers requested html files and pages to the client

**Video Server:** A video server is a computer-based device dedicated to delivering video streams online. In terms of IP-based video surveillance, a video server converts video footage from analog security cameras into digital IP video streams. This allows users to incorporate existing analog cameras into an IP surveillance system.

**WDR (Wide Dynamic Range):** A feature very important to any application where light and dark zones are simultaneously in the field of view of the camera. This is a digital enhancement that allows the digital iris of a camera to overlap over and underexposed images to provide a single usable picture. It helps compensate for glare and dim areas in images.

**WPA:** WPA (Wi-Fi Protected Access) is a wireless encryption standard that indicates compliance with security protocol established by the Wi-Fi Alliance to secure wireless networks.

**REFERENCES: (include name of organization, contact person, and daytime phone number).**

1. **City of Frankfort** - 412 Main St. P.O. Box 351 Frankfort, MI. 49635

**Josh Mills**- Superintendent (231) 352-7117 - [jmills@cofrankfort.net](mailto:jmills@cofrankfort.net)

Project: (Top Line Electric and TKS Security) *ExacqVision* 12 TB Server/ RAID-5, 30 Days retention, **12 IP Cameras**, Remote Access, Multi- User Viewing, **Wireless Point-to-Point** Camera Locations, Camera on top of the Water Tower, Camera on the Lighthouse, Broadcasting of public web cameras option was included for tourism. TKS Security designed and maintains the system, Top Line Electric was the Installation Contractor. The Frankfort Police Department has access to view City Cameras according to permissions.

2. **Wexford County Road Commission** - 85 W M 115, Boon, MI 49618

**Alan Cooper**- Superintendent (231) 775-9731 - [adcooper36@gmail.com](mailto:adcooper36@gmail.com)

Project: (TKS Security designed and maintains the system, Top Line Electric organized and reworked the network Rack, including the head end equipment). *ExacqVision* 12 TB Server/RAID-5, 180 Days Retention, **25 HD IP Cameras**, Remote Access, Multi- User Viewing, Wireless Point-to-Point Camera Locations (cameras on light poles), Access Control Integration (can use the camera system to unlock card readers), Intercom Integration (remotely monitor locked doors from anywhere, grant access if desired).

3. **Michigan Public Health Institute** - 2436 Woodlake Dr. # 300, Okemos, MI 48864

**Zach Lambright** – Security Officer (517) 324-8300 - [zlambrig@mphi.org](mailto:zlambrig@mphi.org)

Project: (TKS Security Design/Build) – Fully integrated Camera, Alarm System, Fire Alarm, Access Control and Intercom Solution. 14 Buildings working together, centrally managed with remote access and administration within HIPAA requirements. *ExacqVision* (1) 20TB Server/RAID-5, *ExacqVision* (1) 12TB Server/RAID-5, Multi-Site Integration (14 Buildings), Multi-Server Viewing and Administration , 72 Days Retention, **57+ High Definition IP Cameras**, Remote Access, Multi- User Viewing, Access Control Integration, Intercom Integration, Health Monitoring, Full Maintenance/Service Agreement with Emergency response.

4. **Harbor Springs Public Schools** – 800 S. State Street, Harbor Springs, MI 49740

**Chris Cerrudo** – Technology Director (231) 526-4839 - [ccerrudo@harborps.org](mailto:ccerrudo@harborps.org)

Project: *ExacqVision* – (TKS Security) (1) 40TB Enterprise RAID-5 Server, **60+ HD 5MP IP Cameras**, Indoor/Outdoor with challenging locations. TKS also integrated connected with the previous *ExacqVision* system installed by a different contractor, the two systems work as one from a user experience. Storage was specifically calculated and exceeds minimum requirements.

**5. Benzie County Government** – 448 Court Place, Beulah, MI 49617

**Frank Post** – Emergency Management (231) 882-0567 – [fpost@benzieco.net](mailto:fpost@benzieco.net)

Project: *ExacqVision* – (TKS Security) (1) 6TB Professional RAID-5 Server to take over existing analog cameras and to allow for **new HD IP Cameras**. Added an Access Control system and alarm system with Durrress/Hold-up buttons fully integrated. The system is additionally monitored by the Emergency Management office. The *ExacqVision* system is also monitored by Benzie County 911/Dispatch.

**6. Benzie Transportation Authority** – 14150 US Hwy. 31, Beulah, MI 49617

**Chad Hollenbeck** – Operations manager (231) 325-3000 – [chad@benziebus.com](mailto:chad@benziebus.com)

Project: *ExacqVision* – (TKS Security) (1) 8TB Professional RAID-5 Server to take over existing analog cameras and to allow for **new HD IP Cameras**. Added 6 HD cameras in 2016 for improved outdoor and Parking Lot View. Integrated system with the Access Control System.

**SUBCONTRACTORS: (include name of organization, contact person, daytime phone number, and services to be performed).**

**1. TKS Security** – 955 E. Commerce Drive Ste. D, Traverse City, MI 49685

**Brett Byrnes** – Project Manager (231) 631-5413– [brett@gotks.com](mailto:brett@gotks.com)

Programming, Training, PC setup. Mobile App support, IP Addresses, Switch setup and General networking.