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*Wireless Technology, Inc.*

## **Sidewinder Standard Definition IP Cameras**

**SW720-H.264-SD**

### **Installation and Operation Manual**

#### **Including:**

**Optional Electric Brakes (ENG)**

**Optional Nitrogen Pressurization (P)**

**Optional Connector Interfaces (HV)(AMP)**

**120VAC and 24VAC Power Options**

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# INFORMATION

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## ***FCC NOTICE***

This device complies with Part 15 of the FCC Rules.

Operation is subject to the following two conditions:

- 1.) This device may not cause harmful interference.
- 2.) This device must accept any interference that may be received, including interference that may cause undesired operation.

## ***READ THIS MANUAL***

Every effort has been made to insure that this WTI system is of the highest quality. This product has been carefully inspected to comply with rigid quality standards before shipment to you. In consideration of your investment and the desire to obtain full performance capability engineered into your new WTI product, we recommend that you read this manual before attempting to operate your system.

## **FOR MORE ASSISTANCE OR MORE INFORMATION**

WTI (Wireless Technology, Inc.)  
2064 Eastman Avenue, Suite 113  
Ventura, CA 93003-7787

TOLL FREE. 866/gotowti (468-6984)

TEL. 805/339-9696

FAX. 805/339-0932

EMAIL: [sales@gotowti.com](mailto:sales@gotowti.com)

INTERNET: <http://www.gotowti.com>

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## ***PRODUCT WARRANTY AND REPAIR***

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### **PRODUCT WARRANTY**

We appreciate your purchase of *Wireless Technology, Inc. (WTI)* security products. We take pride in the quality of our products and have manufactured each new WTI product to exacting quality standards. In normal use, it will provide you with years of satisfactory performance. However, should you experience difficulty; you are protected under the provisions of this warranty.

WTI warrants to the original user a product that is free of defects in materials and workmanship in normal use. WTI warrants to the original user that WTI's products will be free of defects in materials and workmanship in normal use for a period of 24 months from the date of sale. WTI's obligation under this warranty shall be limited to the repair, including all necessary parts and the cost of labor connected therewith, or at our option, the replacement of any product that shows evidence of a manufacturing defect within the warranty period. This warranty is extended to all WTI products purchased and used within the United States of America and is valid only when service is rendered by the authorized WTI (*Wireless Technology, Inc.*) Warranty Station.

This warranty shall not apply to appearance or accessory items including, but not limited to, knobs, connectors, cabinets and connecting cables. This warranty shall not, in addition, apply to repairs or replacements necessitated by any cause beyond the control of WTI including, but not limited to, acts of nature, improper installation, misuse, lack of proper maintenance, accident, voltage fluctuations, unauthorized repairs or modifications.

This warranty becomes void in the event serial numbers are altered, defaced or removed, or an attempt is made to field service or alter performance of any WTI products.

WTI reserves the right to make changes in design, or to make additions to, or improvements upon, products without incurring any obligation to install the same on products previously manufactured.

The foregoing is in lieu of all other warranties expressed or implied and WTI neither assumes nor authorizes any person to assume for it any other obligation or liability in connection with the sale of our products. In no event shall WTI or its Authorized Dealers be liable for special or consequential damage arising from the use of this product, or any delay in the performance of this warranty due to causes beyond its control.

# ***PRODUCT WARRANTY AND REPAIR***

---

## **REPAIR AUTHORIZATION**

Please contact *Wireless Technology, Inc. (WTI)*, to obtain a repair authorization number (RA) and provide the following information:

- 1.) Product Model & Serial Numbers
- 2.) Date of shipment, purchase order number, sales order number or WTI invoice number.
- 3.) Details of the defect or malfunction. If there is a dispute regarding the warranty or product, which does not fall under the warranty conditions stated within the description of the written warranty, please include a written explanation with the product when returned.

## **SHIP FREIGHT PRE-PAID TO:**

*WTI (Wireless Technology, Inc.)*  
2064 Eastman Avenue, Suite 113  
Ventura, CA 93003-7787  
TEL 805/339-9696  
FAX 805/339-0932

## **RETURNS**

No unauthorized returns will be accepted. All returns must have an authorized (RA) number issued by the factory (CA number if returned for credit and RA number if returned for repair). Products returned for repair or credit will be rejected if no authorization number has been issued or freight has not been pre-paid. All merchandise returned for credit will be subject to a 20% restocking and refurbishing charge.

## ***SAFEGUARDS***

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### **IMPORTANT SAFEGUARDS**

- 1.) Read Instructions. It is important to read all safety and operating instructions before installing or using this equipment.
- 2.) Retain Instructions. Retain this manual and any supplements for future reference.
- 3.) Follow Instructions. Follow all instructions herein for use of this equipment.
- 4.) Heed all warnings. Adhere to all warnings on the equipment, and in this manual.
- 5.) To reduce the risk of electric shock or equipment damage, work on the unit only when the power is shut off and is unplugged from its power source to prevent accidental activation. Also take precautions to avoid contact between the equipment and other electrical wires or power sources that may be present at the installation site.

## **MODELS AND FEATURES**

The Sidewinder Standard Definition IP cameras are available with several signal connector arrangements, optional electric brakes and optional pressurization. The following table provides a quick reference to the major features available in each camera model.

| <b>MODEL</b>                | <b>120VAC POWER</b> | <b>24VAC POWER</b> | <b>36 INCH MS UMBILICAL</b> | <b>36 INCH AMP UMBILICAL</b> | <b>SIDE EGRESS MS</b> | <b>PRESSURIZATION</b> | <b>ELECTRIC BRAKES</b> |
|-----------------------------|---------------------|--------------------|-----------------------------|------------------------------|-----------------------|-----------------------|------------------------|
| <b>SW720-H.264-SD</b>       | <b>x</b>            |                    | <b>x</b>                    |                              |                       |                       |                        |
| <b>SW720-H.264-SD-ENG</b>   | <b>x</b>            |                    | <b>x</b>                    |                              |                       |                       | <b>x</b>               |
| <b>SW720P-H.264-SD</b>      | <b>x</b>            |                    | <b>x</b>                    |                              |                       | <b>x</b>              |                        |
| <b>SW720P-H.264-SD-ENG</b>  | <b>x</b>            |                    | <b>x</b>                    |                              |                       | <b>x</b>              | <b>x</b>               |
| <b>SW720HV-H.264-SD</b>     | <b>x</b>            |                    |                             |                              | <b>x</b>              |                       |                        |
| <b>SW720HV-H.264-SD-ENG</b> | <b>x</b>            |                    |                             |                              | <b>x</b>              |                       | <b>x</b>               |
| <b>SW720AMP-H.264-SD</b>    | <b>x</b>            |                    |                             | <b>x</b>                     |                       |                       |                        |
| <b>SW720-24-H.264-SD</b>    |                     | <b>x</b>           |                             |                              | <b>x</b>              |                       |                        |
| <b>SW720P-24-H.264-SD</b>   |                     | <b>x</b>           |                             |                              | <b>x</b>              | <b>x</b>              |                        |

## GENERAL DESCRIPTION

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The Sidewinder SW720-H264-SD is a pan-tilt-zoom camera system that provides standard definition color video over an Ethernet connection, using H.264 or MJPEG video compression. The camera provides 360 degree continuous rotation in both the pan and tilt axes, and provides an optical zoom magnification of 35 times. A self-cleaning hydrophilic coating is provided on the front lens window of the camera to ensure clear, crisp video images and to reduce maintenance. An electrically conductive Indium-Tin-Oxide coating is provided on the inside of the front lens window to heat it and prevent fogging.

The Sidewinder SW720-H.264-SD camera operates on AC line voltages within a voltage range of 85VAC to 265VAC and an operating frequency of 47Hz to 63Hz. Optional 24VAC power is also available (Side Egress Only). Ethernet 10/100Base-T communication is used for transport of the video and control signals. Power and Ethernet signals are provided via a 36 inch long bottom egress umbilical cable bundle using an outdoor rated SJOOW #18x3 power cable, an outdoor rated shielded CAT-5e Ethernet cable and an RG-59 video cable. The camera umbilical cable can be terminated with an 18 Pin MS style male connector or a 16 Pin AMP style connector (SW720AMP-H.264-SD).

The Sidewinder SW720-H264-SD camera is capable of supporting an H.264 and a second H.264 or MJPEG compressed video stream simultaneously. Support is provided for unicasting and multicasting.

The SW720-H264-SD camera provides Ethernet ports for support of industry standard PTZ control protocols such as Pelco D, COHU, NTCIP, ONVIF and others. Legacy support for physical camera control units can be implemented using serial port to Ethernet converters.

Signal wiring for an RS-485 serial data port and analog NTSC video output are both provided for on the 18 Pin MS umbilical connector or 16 Pin AMP umbilical connector to support upgrading legacy camera installations or for replacing cameras with similar umbilical interfaces from other manufacturers.

The Sidewinder SW720-H264-SD camera is available with optional camera tube dry nitrogen pressurization and several output signal connector options.



# INSTALLATION

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## RECOMMENDED TOOLS FOR PROPER INSTALLATION

- 1) Tie wraps to secure cable runs.
- 2) Set of open end wrenches including 7/16" for mounting bolts.
- 3) Cordless power drill for mounting some brackets.
- 4) Safety cable recommended (prevents camera falling during overhead installations).
- 5) Self-sealing connector tape to weatherproof all cable connections.

## INSTALLATION PLANNING

- 1) The maximum cable length that should be planned for is 100 meters, based on the limit for 10/100Base-T Ethernet connections.
- 2) The Sidewinder SW720-H264-SD camera draws up to 50 Watts maximum, which translates to about 0.59 Amps at the low line voltage limit of 85VAC.
- 3) Be sure to verify that there are no physical obstructions that might prevent the camera from turning freely in all directions.
- 4) Be sure to verify that there are no physical obstructions in the way of any required viewing directions.
- 5) Be sure that there is access to the end of the umbilical cable on the bottom of the camera to facilitate connecting and disconnecting the camera while it is in place on the mounting bracket or pole.

## UNPACKING

Please examine the equipment carefully when unpacking the shipping container. If any damage is noted please be sure to file a claim with the carrier. WTI is not responsible for any damage that occurs during shipping. Please verify that all of the contents are present and carefully check the packing material for any loose items before recycling it.

## EQUIPMENT SUPPLIED WITH UNIT

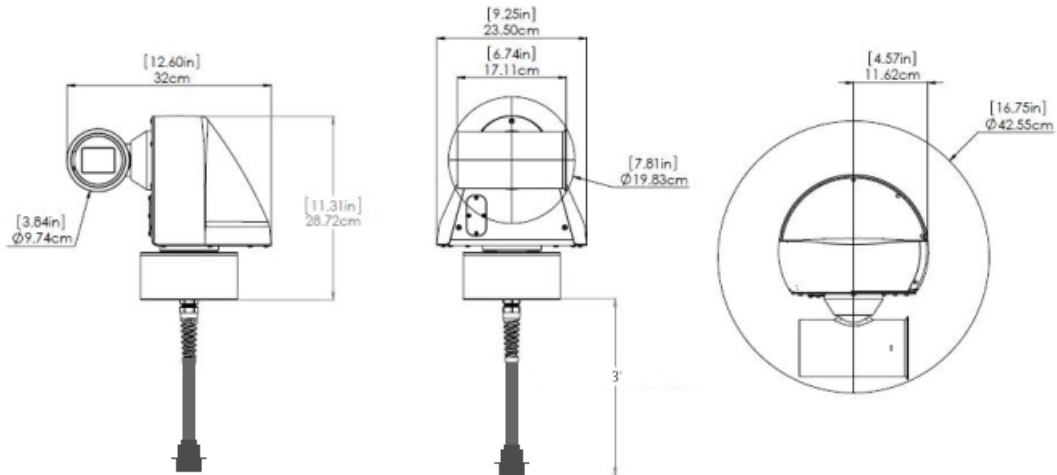
- 1.) Camera
- 2.) 4 each 1/4-20 x 3/4" mounting screws with washers
- 3.) Quick Start Manual

## EQUIPMENT THAT MAY BE REQUIRED, BUT NOT SUPPLIED WITH UNIT

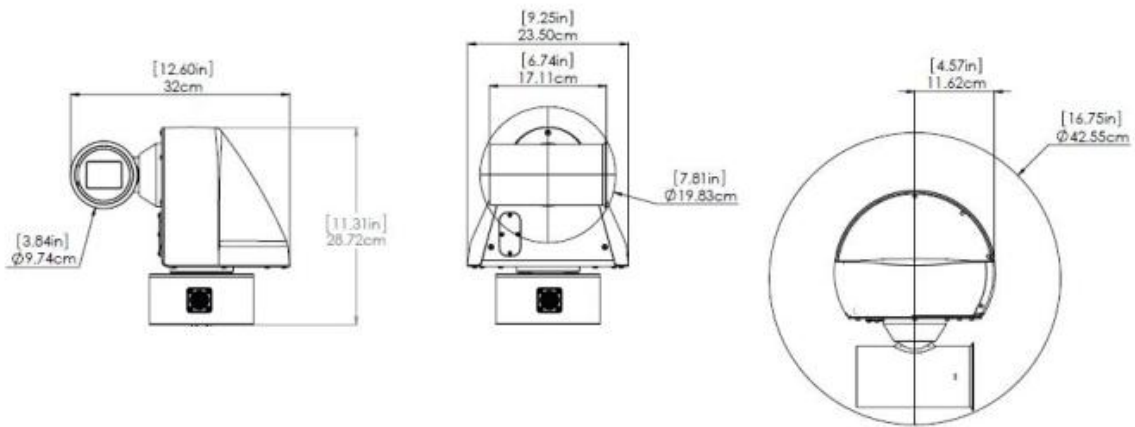
- 1.) Mating connector and strain relief for umbilical extension cable
- 2.) Camera mounting bracket
- 3.) Interconnect cables
- 4.) Video monitor
- 5.) PC or laptop computer
- 6.) Setup software

# DIMENSIONS AND MOUNTING

## MECHANICAL DIMENSIONS



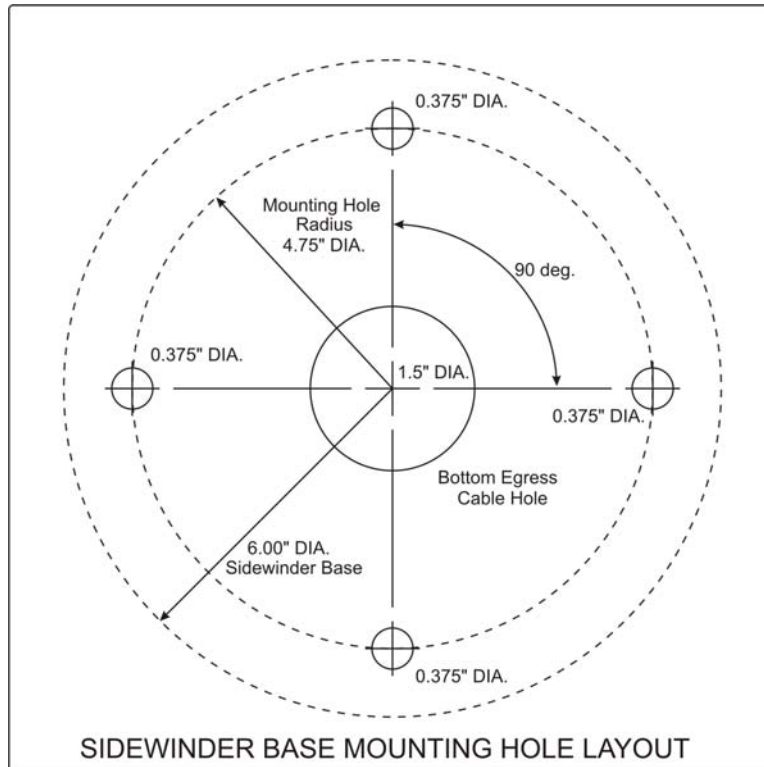
**Bottom Egress**



**Side Egress**

## MOUNTING

The Sidewinder SW720-H264-SD camera should normally be mounted in an upright orientation, as shown above. The camera may also be mounted upside down if desired, but a cover of some sort should be placed over the bottom of the camera, extending out to about 6 inches past the camera all around, to prevent debris, dirt or snow and ice from accumulating on the bottom of the camera housing, since the conical shaped profile of the camera will no longer be able to naturally shed material to the sides. The camera may NOT be mounted with the base facing horizontally.

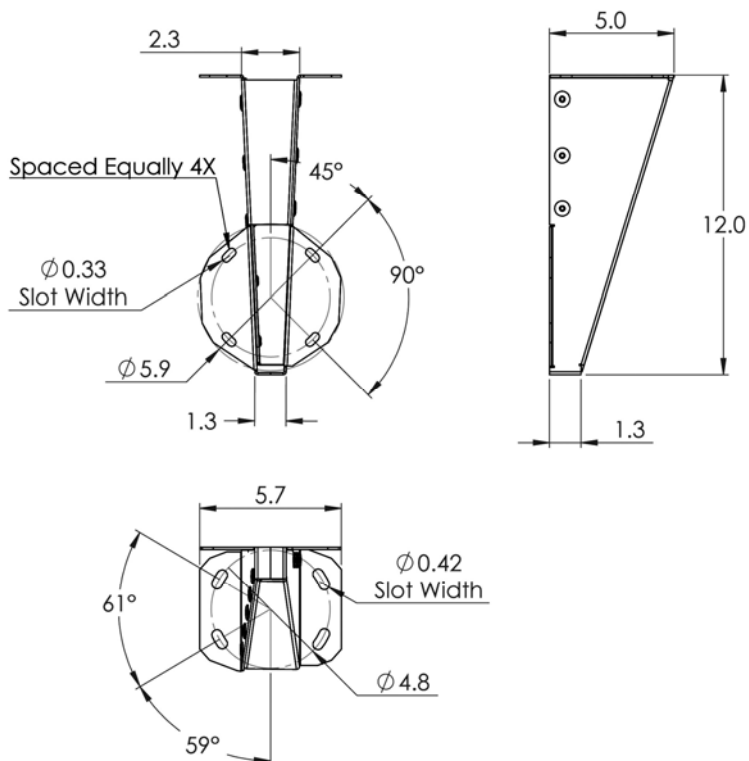
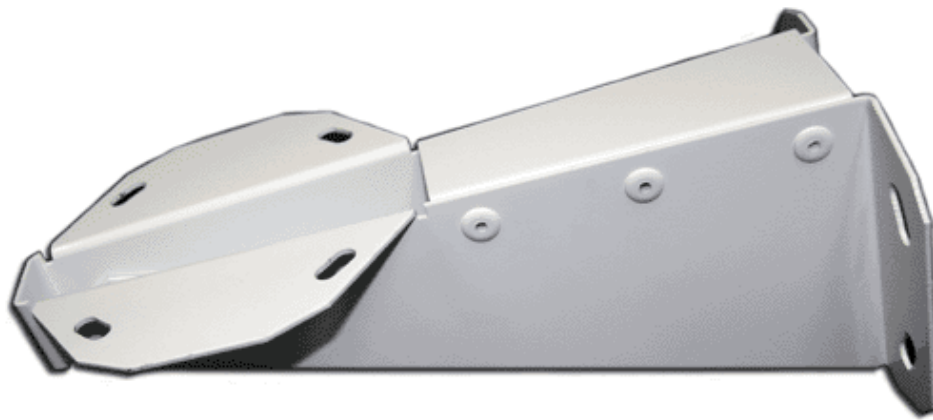


The base of the Sidewinder SW720-H.264-SD camera has four ¼-20 screw holes that are equally spaced, 90 degrees apart, on a 4.75" diameter circle, as shown in figure 2 (Note that 24VAC versions of the Sidewinder camera will have 5/16" mounting screws). If mounting screws other than those provided with the camera are used, the length of the mounting screws should be selected so that the screws penetrate no more than 0.75 inches into the base.

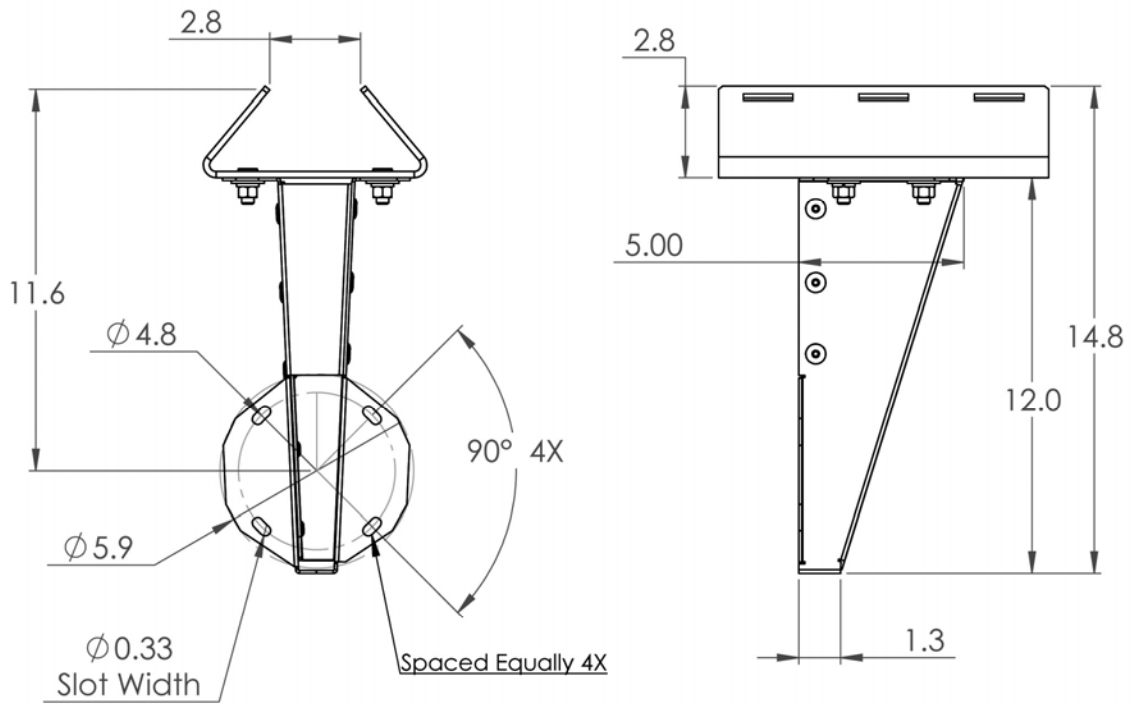
# MOUNTING ACCESSORIES

WTI manufactures several different mounts for the Sidewinder SW720A that allow the camera to be attached to pole tops, horizontal poles, vertical poles and walls. The Sidewinder SW720-H.264-SD camera is supplied with a 36 inch umbilical cable to allow the cable to be routed through the camera mount before the actual physical installation of the camera.

## SWWM1 – Wall Mount Option

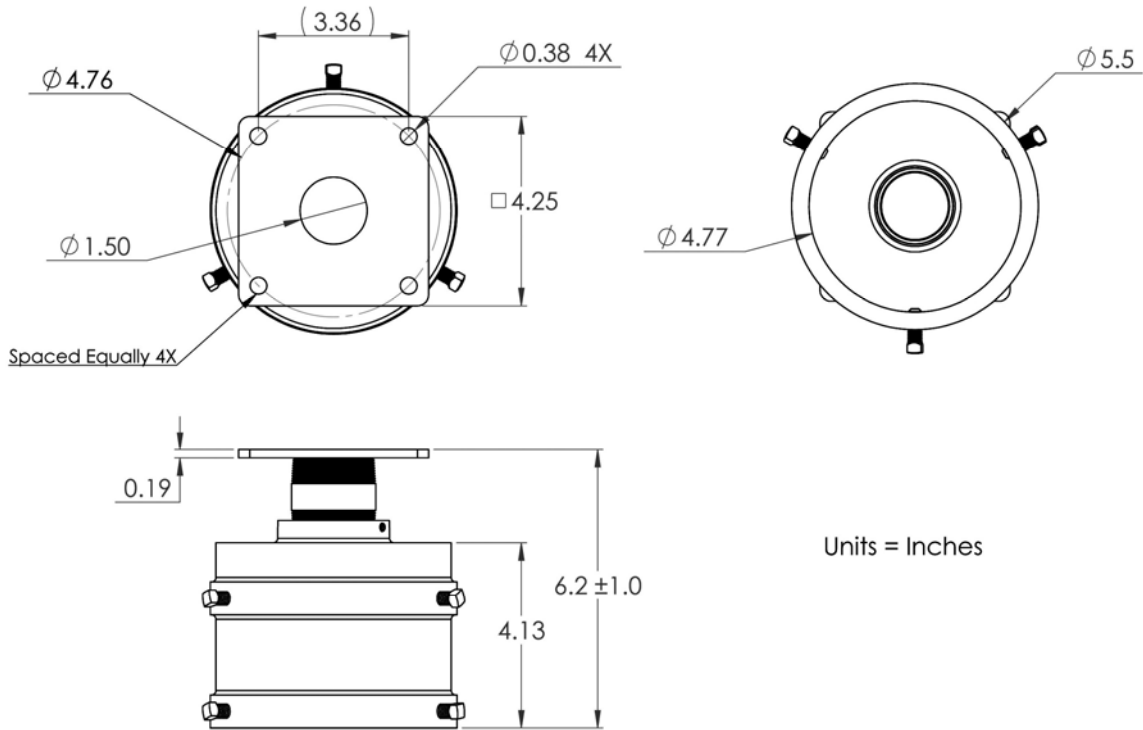


# SWWM1 + SWVPA – Wall Mount with Vertical Pole Adapter

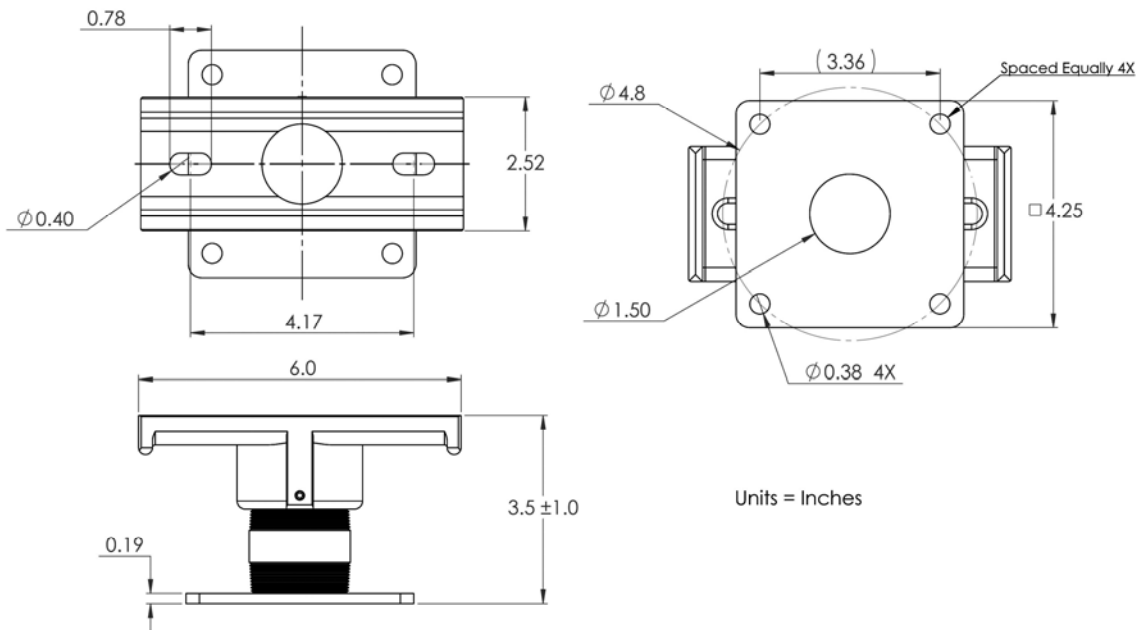
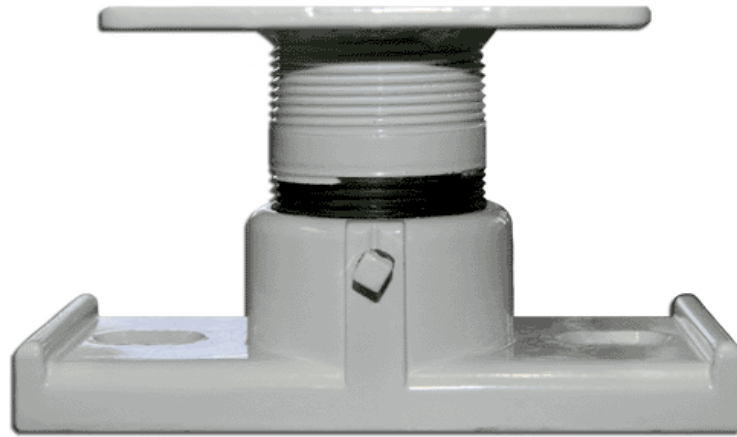


Units = Inches

# SWPTM1 – Pole Top Mount



### SWHPM1 – Horizontal Pole Mount

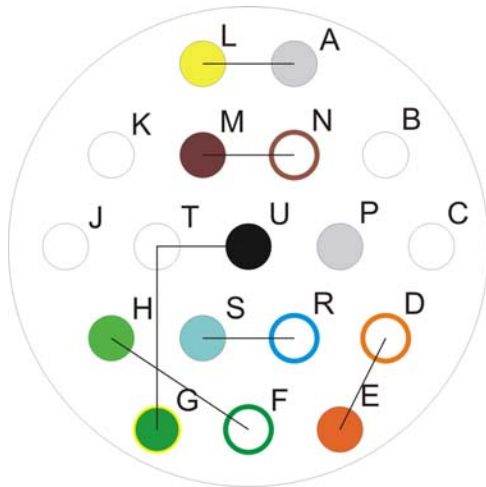


## 120 VAC MS STYLE SIGNAL CONNECTIONS

**SW720-H.264-SD** - 36 inch umbilical cable with an 18 pin MS style connector

**SW720P-H.264-SD SD** - 36 inch umbilical cable with an 18 pin MS style connector

**SW720HV-H.264-SD** - Side egress 18 Pin MS style connector



### Mating Connector

Female MS - Style MIL-DTL-26482

Amphenol P/N MS3116F-14-18S

Shell Size 14 - 18 Contact Pattern

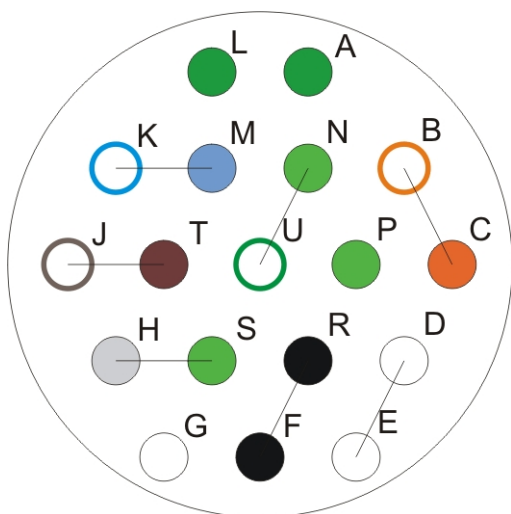
| PIN | <i>Signal Description</i>       | <i>Wiring Color Code and Wire Recommendations</i> |
|-----|---------------------------------|---|
| A   | Analog Video Ground             | RG-59U Shield                                     |
| B   |                                 |   |
| C   |                                 |   |
| D   | Ethernet Tx+                    | Orange/White CAT-5e                               |
| E   | Ethernet Tx-                    | Orange CAT-5e                                     |
| F   | Ethernet Rx+                    | Green/White CAT-5e                                |
| G   | AC Safety Ground                | SJOOW Green (18 AWG)                              |
| H   | Ethernet Rx-                    | Green CAT-5e                                      |
| J   |                                 |   |
| K   |                                 |   |
| L   | Analog Video Out                | RG-59U Center                                     |
| M   | RS-422 RX +                     | Brown CAT-5e                                      |
| N   | RS-422 RX -                     | Brown/White CAT-5e                                |
| P   | RS-422 Data Shield              | CAT-5e Shield (Belden 1300A)                      |
| R   | RS-422 TX -                     | Blue/White CAT-5e                                 |
| S   | RS-422 TX +                     | Blue CAT-5e                                       |
| T   | AC Line Neutral (low)           | SJOOW White (18 AWG)                              |
| U   | 85-265 AC Line Input (high/hot) | SJOOW Black (18 AWG)                              |



## 24 VAC MS STYLE SIGNAL CONNECTIONS

**SW720-24-H.264-SD** - Side egress 18 Pin MS style connector

**SW720P-24-H.264-SD SD** - Side egress 18 Pin MS style connector



### Mating Connector

Female MS - Style MIL-DTL-26482

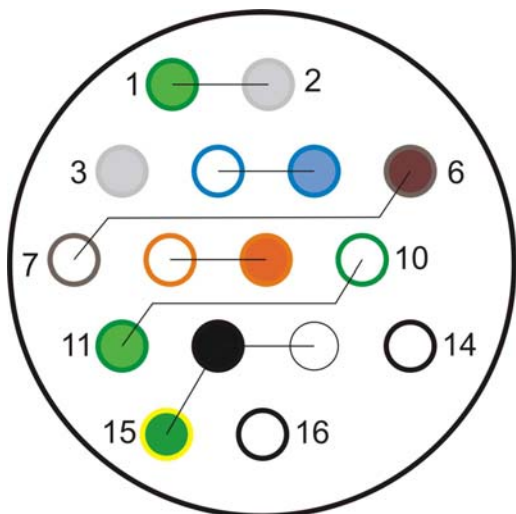
Amphenol P/N MS3116F-14-18S

Shell Size 14 - 18 Contact Pattern

| PIN | <i>Signal Description</i> | <i>Wiring Color Code and Wire Recommendations</i> |
|-----|---------------------------|---|
| A   | Chassis Ground            | Overall Shield Drain Wire                         |
| B   | Ethernet TX+              | CAT-5 Orange/White                                |
| C   | Ethernet TX-              | CAT-5 Orange                                      |
| D   | 24 VAC - 1                | White 20 AWG Minimum                              |
| E   | 24 VAC - 1                | White 20 AWG Minimum                              |
| F   | 24 VAC - 2                | Black 20 AWG Minimum                              |
| G   |                           |   |
| H   | Analog Video Shield       | RG-59U Shield                                     |
| J   | RS-422/485 Rx-            | CAT-5 Brown/White                                 |
| K   | RS-422/485Tx-             | CAT-5 Blue/White                                  |
| L   | Data Ground               | Data Cable Shield                                 |
| M   | RS-422/485 Tx+            | CAT-5 Blue  |
| N   | Ethernet RX-              | CAT-5 Green                                       |
| P   | AC Safety Ground          | Green 20 AWG Minimum                              |
| R   | 24 VAC - 2                | Black 20 AWG Minimum                              |
| S   | Analog Video Output       | RG-59U Center                                     |
| T   | RS-422/485 Rx+            | CAT-5 Brown                                       |
| U   | Ethernet RX+              | CAT-5 Green/White                                 |

## 120VAC AMP STYLE SIGNAL CONNECTIONS

**SW720AMP-H.264-SD** - 36 inch umbilical cable with an 16 pin AMP style connector



### Mating Connector

AMP Connector - P/N 206037-1

Clamp – P/N 1310307

16 Contact Pattern

Female Pins – 3 each – P/N 66565-4 - #20-24

Female Pins – 12 each – P/N 66109-4 - #24-26

| PIN | <i>Signal Description</i> | <i>Wiring Color Code and Gauge Recommendations</i> |
|-----|---------------------------|--|
| 1   | Analog Video Output       | RG-59U Center                                      |
| 2   | Analog Video Shield       | RG-59U Shield                                      |
| 3   | Data Ground               | Cat-5e Data Cable Shield                           |
| 4   | RS-485 Tx-                | CAT-5e Blue/White                                  |
| 5   | RS-485 Tx+                | CAT-5e Blue  |
| 6   | RS-485 Rx+                | CAT-5e Brown                                       |
| 7   | RS-485 Rx-                | CAT-5e Brown/White                                 |
| 8   | Ethernet TX+              | CAT-5e Orange/White                                |
| 9   | Ethernet TX-              | CAT-5e Orange                                      |
| 10  | Ethernet RX+              | CAT-5e Green/White                                 |
| 11  | Ethernet RX-              | CAT-5e Green                                       |
| 12  | 85-265 AC Line Hot        | SJOOW Black (18 AWG)                               |
| 13  | AC Line Neutral           | SJOOW White (18 AWG)                               |
| 14  | spare                     |  |
| 15  | 115 VAC Safety Ground     | SJOOW Green (18 AWG)                               |
| 16  | Spare                     |  |

# **SIGNAL DESCRIPTIONS**

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## **AC LINE CONNECTIONS**

The AC Line connections should be connected to an AC mains source with a voltage of 85VAC to 265V AC, operating at a frequency of 47Hz to 63Hz. The nominal operating voltage is normally 115VAC or 230VAC. The camera draws 50 Watts maximum, which translates to about 0.6 Amps at the worst case low line voltage of 85VAC.

## **24VAC POWER CONNECTIONS**

The 24VAC power connections require the use of heavier gauge wiring and shorter cable lengths than the 120VAC power option, as the 24VAC camera model draws approximately 5 times as much current through the cable wiring, due to the reduced operating voltage. Four power connection terminals are provided on the MS connector to allow paralleled power wiring. Cable runs of up to 150 feet require paralleled #20 AWG wiring (equivalent to #17 AWG) for reliable operation. Longer runs should use correspondingly larger wire gauges to minimize voltage drop along the cables. Runs of 300 feet can use #14 AWG wiring and runs of 500 feet can use #10 AWG or #12 AWG wiring.

## **ETHERNET SIGNAL CONNECTIONS**

The Ethernet signals should be connected using a CAT-5e or CAT-6 cable. If the legacy serial data control port is to be used, the Ethernet cable should be the shielded type and the Ethernet cable shield should be connected to the data shield signal.

## **ANALOG VIDEO CONNECTIONS**

An NTSC standard definition video signal output provides a 1Vpp NTSC video signal with a 75 Ohm drive impedance on Pins L and A of the 18 pin MS connector (see wiring chart).

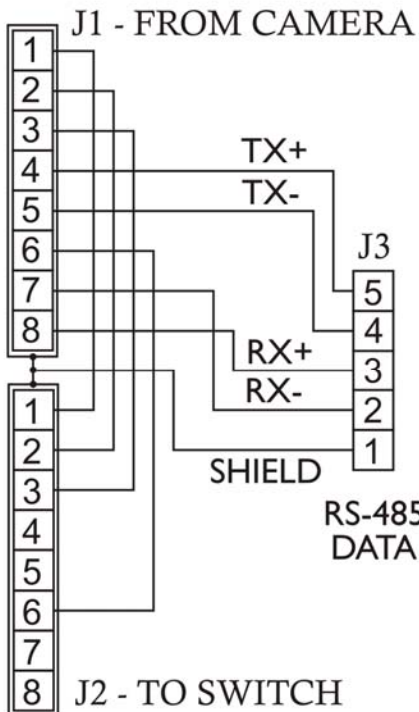
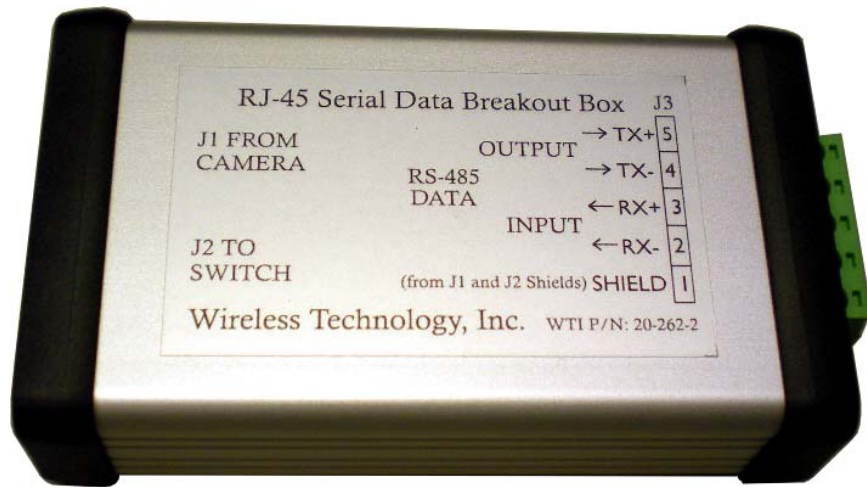
## **HARD WIRED PTZ SERIAL CONTROL PORT**

A secondary hard wired RS-485 port is provided on the SW720-H264-SD camera for PTZ and other camera control functions. These signals can be conveniently accessed at the cabinet end of the customer installed control cable by using the WTI RJ-45 Serial Data Breakout Box.

There are internal 120 Ohm termination resistors for both the TX and RX signal pairs. The factory shipped default state for the 120 Ohm terminations is for both the TX and RX terminations to be enabled. Applications that involve multiple cameras on the same RS-485 communications lines will require that the terminations on all cameras but one be turned off.

## RJ-45 SERIAL DATA BREAKOUT BOX

An RJ-45 Serial Data Breakout Box is available to facilitate legacy installations that utilize the RS-485 signals available on the SW720-H.264-SD series of cameras. The RS-485 signals are routed on the two unused pairs in the Ethernet CAT-5e or CAT-6 cable. Note that shielded Ethernet CAT-5e or CAT-6 cable, like Belden 1300A, should be used for these types of legacy installations. The breakout box is wired into the system at the cabinet end of the Ethernet cable on the RJ-45 Ethernet plug. An input RJ-45 and Output RJ-45 connector are provided on the breakout box for passing through the Ethernet data, and a 5 Pin Phoenix style connector interface is provided for extracting the RS-485 signals from the Ethernet cable.



# CAMERA ETHERNET PROTOCOLS AND PORTS

The PTZ camera control functions and video streaming functions to and from the SW720-H264-SD camera are transmitted over a 100Base-TX Ethernet connection using specific Ethernet ports assigned for each of the various functions and protocols.

## DEFAULT IP ADDRESS

The SW720-H264-SD camera default IP Address is: **192.168.1.251**

## DEFAULT PORT ADDRESSES

The following ports are provided for the various services available.

| Protocol                    | Default Port | Default Transport                                   | Notes  |
|-----------------------------|--------------|---|--|
| WTI                         | 53935        | UDP   |  |
| NTCIP                       | 55000        | UDP   |  |
| Pelco-D                     | 55001        | UDP   | Sidewinder H.264 series devices are fixed at multidrop address 1.  |
| Cohu                        | 55002        | UDP   | Sidewinder H.264 series devices are fixed at multidrop address 1.  |
| ONVIF                       | 55003        | TCP   | UDP not supported. Server shared with HTTP by default.   |
| HTTP Server                 | 55003        | TCP   | UDP not supported. Server shared with ONVIF by default.  |
| Pass-Through                | 55004        | UDP   | Disabled by default on Sidewinder SW720 H.264 SD/HD. Enabled by default on Sidewinder H.264 Video Encoder. |
| WS-Discovery                | 3702         | UDP Multicast<br>(group address<br>239.255.255.250) |  |
| RTSP Server                 | 8554         | TCP   | UDP not supported  |
| Multicast Video<br>RTP/RTCP | 18888/18889  | UDP Multicast<br>(group address                     | Only if video stream 1 is set up for Multicast transport. A  |

| Protocol                                  | Default Port | Default Transport                              | Notes  |
|---|--------------|--|--|
| (Stream 1)                                |              | random SSM)                                    | static group address may also be configured.   |
| Multicast Video<br>RTP/RTCP<br>(Stream 2) | 18890/18891  | UDP Multicast<br>(group address<br>random SSM) | Only if video stream 2 is set up for Multicast transport. A static group address may also be configured. |

## CAMERA PROTOCOL SUPPORT

The SW720-H264-SD camera supports COHU, Pelco D, WTI, NTCIP, Web/ONVIF and other protocols through the RS-485 data connections. The RS-485 serial port can be configured using the On Screen Menu system or by using the WTI Camera Control GUI program through the Ethernet connection.

The various protocols can also be accessed through the use of different port numbers when sending camera control commands to the Sidewinder using an Ethernet connection.

COHU Protocol: 55002  
Pelco D Protocol: 55001  
WTI Protocol: 53935  
NTCIP Protocol: 55000  
Web/ONVIF Protocol: 55003

As long as they are not used simultaneously, it is possible to use multiple different protocols from different control stations when using the Ethernet protocol support. For example, if COHU protocol is being used locally on the RS-485 serial data port, it is possible to use NTCIP protocol over the Ethernet from the head end monitoring center to control the camera on port 55000.

# **SURGE PROTECTION AND PRESSURIZATION**

## **SURGE PROTECTION**

The SW720-H264-SD camera provides internal surge protection for all of the power, data and video signals.

- 1.) The AC line power connections are provided with 275 volt 135 Joule MOV surge arrestors rated for 6000 Amp pulses. A 3A SMT fuse is included in the primary circuit to prevent catastrophic printed circuit board damage in the case of gross AC line input overloads.
- 2.) The video signal lines incorporate a two stage protection circuit consisting of a primary 90V gas discharge tube, followed by a high speed, low capacitance 6.2V 2kW peak power transient voltage suppressor.
- 3.) The data signal lines incorporate a two stage protection circuit consisting of a primary 90V gas discharge tube, followed by an 18V, 300W, 40A transient voltage suppressor.

## **SEALING AND PRESSURIZATION**

The SW720-H264-SD camera provides two levels of sealing and pressurization. The entire camera, including the base, housing and camera tube are all sealed to IP66/67 levels to prevent any ingress of dust or moisture. An additional option is available, in which the camera housing tube is pressurized to 5 psi with dry nitrogen gas.



The SW720P-H264-SD camera with the pressurization option is provided with a Schrader valve to allow periodic replenishment of the dry Nitrogen in the camera housing tube. Since no sealing system will remain 100% airtight indefinitely, it may be necessary to replenish the dry Nitrogen occasionally. This can be done at the same time that the regular camera cleaning is performed. A 15psi pressure relief safety valve is provided to prevent damage to the seals and to prevent blowing out the front or back plates of the

camera housing if an unregulated high pressure dry Nitrogen tank were to be connected to the Schrader valve.

## **SPECIFICATIONS**

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### **IMAGE SENSOR AND LENS**

|                          |   |
|--------------------------|---|
| Image Sensor Type        | Solid State Interline Transfer Progressive Scan CCD   |
| Image Sensor Size        | ¼" inch type  |
| Image Resolution         | >540 horizontal TV Lines (typically 540 horizontal by 340 vertical)   |
| Pixel Resolution         | 811 horizontal x 508 vertical (total) – 768(H) x 494(V) viewable  |
| Video Output Format      | NTSC, 1Vpp at 75 Ohms, unbalanced   |
| Maximum Lens Aperture    | F1.4 at full wide angle – F4.2 at full telephoto  |
| Optical Zoom Range       | x1 to x36   |
| Focal Length             | 3.3mm ~ 119mm   |
| Digital Zoom Range       | x1 to x12 with smooth transition from optical to digital  |
| Combined Focal Length    | 119mm ~ 1428mm  |
| Optical Zoom Speed       | 2.0s for manual focus preset change - 4.6s for focus trace curve mode   |
| Horizontal Angle of View | 60.2 degrees (wide angle) to 1.8 degrees (tele)   |
| Minimum Focus Distance   | 0.4 inches (wide angle) to 40 inches (tele)   |
| Electronic Stabilization | Selectable for either 5Hz or 10Hz (reduces image resolution slightly)   |
| Auto Focus               | Selectable between Auto/Manual  |
| Manual Focus Speed       | Approximately 2.0 seconds – near to far   |
| Shutter Speed            | Adjustable from 1 second to 1/30,000 second. Settings below 1/60 second increase integration time to improve low light sensitivity with video frame store to provide continuous video output. |
| Auto Iris                | Electronically controlled from F1.4 to F32 to provide optimum sensor illumination for constant video output.  |
| AGC Range                | 0dB to 30dB   |
| Gamma                    | 0.45 (Adjustable)   |
| Color Balance            | Auto White Balance with adjustable red and blue levels.   |
| Signal to Noise Ratio    | >50dB   |
| Synchronization          | Crystal   |

### **VIDEO ENCODING**

|                  |  |
|------------------|--|
| Video Encoding   | H.264 (High Profile/Level 3.1) and MJPEG standards                                   |
| Video Streams    | Two independently configurable streams; (2) H.264 streams or (1) H.264 and (1) MJPEG |
| Codec            | Video Stream 1: H.264<br>Video Stream 2: H.264 or MJPEG                              |
| Image Resolution | 720p, D1, VGA, CIF   |



|                         |  |
|-------------------------|--|
| Streaming Mode          | CBR or VBR   |
| Image Settings          | (GOP (M, N)), Quality Value  |
| Frame Rate              | 30, 15, 7, 4, 2, 1   |
| Data Rate               | Adjustable from 64k to 8Mbps in VBR mode and 64k to 3Mbps in CBR mode. |
| Connection Types        | Unicast, multi-unicast or multi-cast                                   |
| Video Latency           | <250ms   |
| Network Protocol Layers | RTP, RTSP, UDP, TCP, IP, HTTP, IGMPv2, ICMP, ARP as a minimum          |

### **CAMERA HOUSING MODULE**

|                         |   |
|-------------------------|---|
| External Window Coating | High temperature vacuum deposited hydrophilic coating to reduce window cleaning maintenance.  |
| Internal Window Coating | Electrically conductive coating to allow energy saving direct heating of window glass to prevent fogging.   |
| Window Heat Control     | Proportionally controlled closed loop window heater drive circuit with outside temperature sensor unit to provide fog free window operation under all environmental conditions. |
| Block Camera Heating    | Temperature sensor and microprocessor controlled image sensor heater to provide reliable operation of zoom lens down to -34 degrees Celsius.                                    |

### **PAN AND TILT DRIVE ASSEMBLIES**

|                       |   |
|-----------------------|---|
| Drive Range           | 360 degrees continuous rotation (both axes)   |
| Drive Speed           | Variable from 0.0003 Deg/Sec to 100 Deg/Sec   |
| Drive Resolution      | 0.005625 Degrees  |
| Drive Repeatability   | 0.05 Degrees typical  |
| Preset to Preset Time | Selectable between 2 seconds and 5 seconds for 180 degree motion in both axes   |
| Operator Motion Speed | Pan and Tilt speeds are proportional to both operator speed commands and camera zoom setting.   |
| Brakes                | Optional electrically operated pan and tilt motor brakes with a minimum holding torque of 300 oz./in available to maintain the camera position when power is removed from the camera.   |
| Presets               | Minimum of 64 presets, each preset to store variable data for pan position, tilt position, zoom setting, focus setting and 24 characters of titling text to be displayed when the preset is recalled. Preset titling to remain on screen until subsequent preset or camera control commands are received. |

|                      |   |
|----------------------|---|
| Tours                | Eight tours of up to 32 presets each shall be supported. Presets may be assigned to the tours in any order and may be used multiple times within one tour.  |
| Panning Tours        | Any or all of the eight tours may be used as “panning” tours by selecting exactly two presets for the tour. The first preset selected for the tour shall set the counter-clockwise panning limit and the tilt angle for the tour, and the second preset selected shall set the clockwise panning limit for the tour. The positioning system shall pan smoothly from one preset to the other and back again until a subsequent camera command is received. |
| Sector Zones         | Up to 16 sector zones with user settable right and left pan limits may be programmed with one line of up to 20 characters of ID titling per zone.   |
| Privacy Zones        | Any Sector Zone may be utilized as a privacy zone by setting the video mode to “OFF” within that zone.  |
| Low Pressure Warning | Provides low pressure warning indicator on video display for cameras supplied with pressurized camera housing option.   |
| Temperature Warning  | Provides an internal temperature warning indication on the video display.   |
| Program Memory       | Unit is field upgradable using FLASH non-volatile memory to store programming.  |

**ELECTRICAL**

|                            |   |
|----------------------------|---|
| AC Line Voltage            | 85-265 VAC 50/60 Hz   |
| Power Consumption          | <50W with all options operating   |
| Analog Video Output        | 75 Ohm, 1Vpp, NTSC, EIA-170A  |
| Video Transient Protection | Gas discharge tube followed by 40A 2kW transient voltage suppressor.  |
| Control Data               | EIA RS-485 signal levels and drive capabilities.  |
| Data Transient Protection  | Gas discharge tubes followed by 40A 300W transient voltage suppressors.   |
| Control Data Protocol      | Cohu, Pelco D, WTI, NTCIP, ONVIF and others.  |
| Power interrupt immunity   | NEMA TS-2 paragraph 2.1.4.  |
| Power transient immunity   | NEMA TS-2 paragraph 2.1.6.  |
| Interface connector        | MS style 18 Pin weatherproof and corrosion resistant type with gold plated contacts or AMP style 16 pin type with gold plated contacts. |

**ENVIRONMENTAL**

|                     |  |
|---------------------|--|
| Ambient Temp. Limit | -29° F to +165° F (-34° C to +74° C)<br>(Conforms to NEMA TS-2 paragraphs 2.1.2, 2.1.3 and 2.1.5.) |
| Humidity            | 100% relative humidity   |
| Protection Rating   | IP-67/NEMA-4X/ASTM-B117 (entire camera)  |
| Air Contaminants    | Withstands exposure to sand, dust, fungus, salt atmosphere, per MIL-E-5400T,                       |

|                      |   |
|----------------------|---|
| Vibration            | paragraph 3.2.24.7, 3.2.24.8, and 3.2.24.9<br>NEMA TS-2 paragraphs 2.1.9 and 2.2.3 using a 0.5g amplitude signal from 5Hz to 30Hz applied in each of 3 mutually perpendicular axes for 30 minutes.  |
| Shock                | NEMA TS-2 paragraphs 2.1.10 and 2.2.4 using a 10g amplitude, 10ms duration shock pulse in each of three mutually perpendicular axes.  |
| Water Spray Immunity | IPx6 rating - IEC 60529 section 14.2.6 using a 25 gallon per minute water stream through a 12.5mm nozzle at nine feet for three minutes.<br>Water Immersion Immunity IPx7 - IEC 60529 section 14.2.7 using an immersion depth of 1 meter measured at the bottom of the camera and a duration of 30 minutes. |
| Icing Immunity       | NEMA 250-2003 section 5.6.  |
| Corrosion Immunity   | NEMA 250-2003 section 5.10 and the procedure specified in ASTM-B117 Marine.   |
| EMI Radiation        | Within the limits set by FCC Regulations 47 CFR Part 15 for Class A devices.  |

## **MECHANICAL**

|              |  |
|--------------|--|
| Dimensions   | 12.6”L x 11.3”H x 9.25”W (32cm x 29cm x 20cm)                                |
| Weight       | 14.6 lbs. (6.64 kg.)   |
| Construction | White powder coated aluminum and Kydex 550 with all stainless steel hardware |

## **REVISION HISTORY**

6/14 – Added: Specification section at end of document, multiple model numbers to title page, model feature matrix, AMP connector pin outs, RJ-45 Breakout Box, 24VAC wiring diagrams, Ethernet address and port data.

11/13 – Analog video and RS-485 signal wiring in MS umbilical connector wiring chart changed to standard, rather than optional. Mechanical dimensions drawing modified to show umbilical connector with standard 3 foot length, rather than AC Plug and RJ-45 Connector.