

PUBLIC-INTEREST FINDING FOR PROPRIETARY-MATERIAL USE

ROUTE: VAR DES NO: VAR
PROJECT NO: VAR COUNTY: VAR
PROJECT DESCRIPTION: Programmatic approval.

FHWA OVERSIGHT: YES NO

PROPRIETARY MATERIAL:

Closed Circuit TV (CCTV) system, including:

1. Sidewinder: H264 Standard Definition.
2. Sidewinder: H.264.High Definition.

Manufactured by WTI.

3. Field Box Camera interface model: RVSFB120IPR.
4. Composite cable model

Manufactured by TREEHAVEN technologies, Inc..

1. Description of Need:

The ITS Technology Deployment Division of the Indiana Department of Transportation is seeking approval to create a recurring special provision and ultimately incorporate into the Standard Specifications equipment essential to the providing Traffic Management Center (TMC) with real time visualized information from the roadways.

CCTV systems are designed to provide real time video stream from location, where system had been installed. They allow local and remote control of the Pan/Tilt/Zoom functions, which, in turn, allows operator to select the best view of the road, or incident.

Required functionalities include:

- Provide unique addressing in the network using internal protocol, compatible with existing INDOT Network.
- Provide 1 mile viewing area in any direction.
- Provide interface to existing INDOT Network.
- Provide capability of local and remote programming.
- Provide local and remote maintainability.

2. Product History: Previously used camera was suddenly discontinued by manufacturer. Submitted product has the same capability, as previously used, plus can be utilized in digital (IP based) format. Desired product is currently listed on INDOT Approved Materials List for Traffic Signal and ITS Control Equipment under ITS Networking Equipment. Testing was conducted according to the **ITM No. 951-10P and ITM No. 952-10P**

3. Product Availability: Desired products, manufactured by WTI and TREEHAVEN Technology, inc., are only products on the market, meeting all requirements and compatible with existing system. Although there are PTZ Cameras and field interfaces for them, none of such products is capable of interfacing with existing network. There were no attempts by the manufacturers to present their products to be tested to **ITM No. 951-10P and ITM No. 952-10P**. Google search for High Speed Analog PTZ Dome returns multiple devices, meeting some of the requirements, but not all.

4. Product Cost: There is no equipment on the market to make cost comparison.

5. Project Compatibility: Desired product is the only product on the market that is compatible with existing ITS hardware.

6. Maintenance: Desired equipment is designed such a way, that most of maintenance functions: monitoring, restoring functionality, programming/reprogramming – can be done remotely. Training is available on line in Wiki Notes, accessible for tech personnel from any location in Indiana. Low failure rate (less than 3% including “acts of God”) and short order turnaround time results in the minimal storage requirement.

7. Engineering Analysis: This application is programmatic by nature and unique not to a specific ITS project, but to the ITS architecture that is already in place. CCTV systems are essential components that allow monitoring of the live traffic. The specifications are needed for synchronization with existing system and not unique to the specific project.

8. Expanded Economic Analysis: Due to the fact, that there is no equipment on the market to do comparison life cycle analysis, it may be stated that actual yearly maintenance cost is low. The average life cycle of the desired product is evaluated as 5 years. There are units currently in service installed in 2007. Annual replacement rate, including damage done by lightning, is negligible.

9. Contractual or Performance Implications: Use of desired items does not impose any restrictions on the use of other items on the contracts.

10. Attach Supplemental Documentation: Attached are:

- a) INDOT ITS Architecture;
- b) ITM # 951-10P H264 Standard Definition Camera.
- d) ITM # 951-10P H264 High Definition Camera.
- c) ITM # 952-10P Camera Interface Rack Mounted.

11. Length of Time that Approval is Effective: 01/2018 to 01/2021

Prepared By: Konstantin Veygman

Field Engineer

INDOT-ITS Technology Deployment Division

Date: 01/25/2018

Based upon the above finding, the use of the proprietary material listed is in the public interest and is hereby approved.

APPROVED:  Date: 1/26/18
INDOT Deputy Commissioner
Engineering Services and Design Support

APPROVED:  Date: 1/26/18
Federal Highway Administration

Product Information - Viper : H.264 High Definition

WTI ~ Viper : H.264 High Definition ~ 30x

Camera	
Imager	1/2.8" Exmor CMOS 2.14 Megapixel
Resolution	1080p/720p
Lens	30x optical zoom, F1.6 to F4.7 with 12x digital zoom
Focal Length	4.3mm to 129mm
S/N Ratio	>50dB
Iris	Auto or manual override
Shutter	1 second to 1/10,000 second
Focus	Auto or manual override
Electronic Image Stabilization (EIS)	On/Off
Wide Dynamic Range (WDR)	On/Off
DeFog	On/Off
Sensitivity	On/Off (F1.6 with 50 IRE)
High Mode: On	0.35 lux
High Mode: Off	1.4 lux

Electrical

Power Input	85-265 VAC, 50/60 Hz, PoE++, or 24 VAC** +/- 6VAC **24VAC requires Side Egress with WTI interface panel or external power supply
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Power Consumption (with heater on)	50W
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Environmental

Ambient Temp. Limit	-40° F to +165° F (-40° C to +74° C) Conforms to NEMA 2.1.5.1 Std TS2 for traffic control systems
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Humidity	100% relative humidity
Protection Rating	IP-67/NEMA-4X/ASTM-B117 (entire camera)

Pressurization	optional
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Mechanical

Housing	All Aluminum
Weight	14.5 lbs. (6.5 kgs.)
Vibration (less lens)	3g (rms) random 5 to 1000 Hz, any axis
Air Contaminants	Withstands exposure to sand, dust, fungus, salt atmosphere, per MIL-E-5400T, paragraph 3.2.24.7, 3.2.24.8, and 3.2.24.9

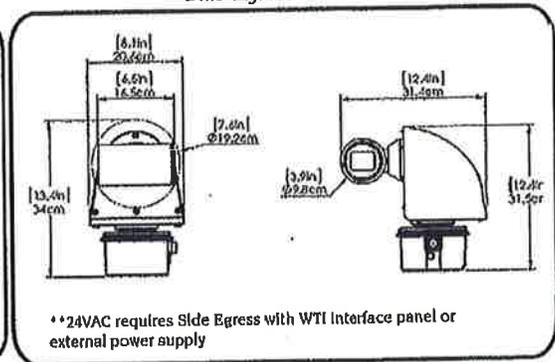
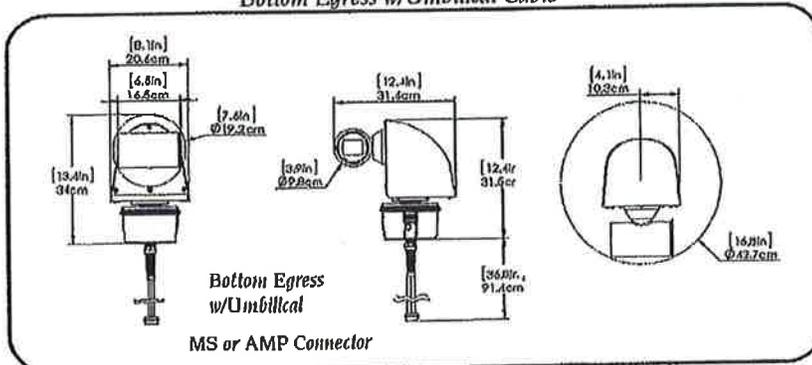
New All Aluminum Housing

Positioner	
Pan/Tilt Drive	Pan Angle Range: continuous 360° Tilt Angle Range: continuous 360° Pan Speed: 100°/sec., proportional to zoom Tilt Speed: 100°/sec., proportional to zoom Pan/Tilt Repeatability: 0.05°
Preset	64 preset positions
Title Generation	18 rows of 70 characters using default font and Logo Overlays
Tours	8 tours of 32 presets with individual dwell settings per preset
Protocol	ONVIF, Pelco-D, COHU, NTCIP, Bosch, Diamond, Javelin, WTI Field upgradable flash memory
Firmware	H.264/MPEG4/MJPEG
Video Encoding	Encoding Engine H.264 (Baseline, Main, High Profile / Level 4), MPEG4, or MJPEG
Image Resolution	720p, 1080p, D1, VGA, HVGA, QVGA, 2CIF
Video Streams	7 independent stream configurations
Streaming Mode	CBR or VBR
Image Settings	GOP (M, N)
Frame Rate	30, 15, 7, 4, 2, 1
Data Rate	Adjustable from 64kb to 12Mb/sec in VBR mode and 64kb to 16Mb/sec in CBR mode
Connection Types	Uni-cast or multi-cast
Network Protocol Layers	RTP, RTSP, UDP, TCP, IP, IGMPv2, ICMP, ARP



Bottom Egress w/Umbilical Cable

Side Egress



MADE IN THE USA

Contact a WTI applications engineer to configure a system to perfectly suit your needs.

Due to Wireless Technology, Inc.'s continuing efforts to engineer the best product, that is most responsive to our customer's needs, the above specifications are subject to change.

Product Information : Viper : H.264 Standard Definition

WTI ~ Viper: H.264 Standard Definition

Camera

Imager	1/4" color progressive scan, Interline transfer CCD
Resolution	540 Horizontal TV lines
Effective Pixels	768 x 494
Lens	High durability 36X optical zoom, F1.4 w/ 12X digital zoom
Focal Length	3.4 mm ~ 120 mm
S/N Ratio	>52dB
Iris	Auto or Manual Override
Shutter	Auto or Manual Override
Focus	Auto or Manual Override
Wide Dynamic Range	(WDR) On/Off
DeFog	Off/On
Sync	Internal or external
IR Cut Filter	Auto or manual (on/off)
Sensitivity	0.25 lux typical down to 0.01 lux in IR mode

Electrical

Power Input	85-265 VAC, 50/60Hz, PoE++, or 24 VAC**	**24VAC requires Side Egress with WTI Interface panel or external power supply
Power Consumption (with heater on)	50 W	

Mechanical

Housing	All Aluminum
Weight	14.5 lbs. (6.5 kgs.)
Vibration (less lens)	3g (rms) random 5 to 1000 Hz, any axis
Air Contaminants	Withstands exposure to sand, dust, fungus, salt atmosphere, per MIL-E-5400T, paragraph 3.2.24.7, 3.2.24.8, and 3.2.24.9

All Aluminum Housing

Environmental

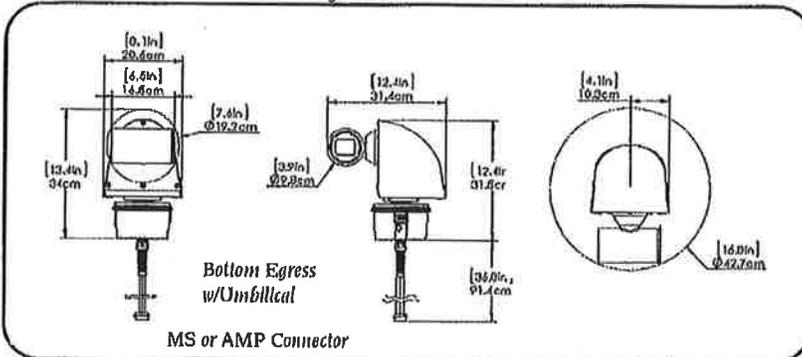
Ambient Temp. Limit	-40° F to + 165° F (-40° C to +74° C)
	Conforms to NEMA 2.1.5.1 Std T32 for traffic control systems
Humidity	100% relative humidity
Protection Rating	IP-67/NEMA-4x/ASTM-B117 (entire camera)

Positioner

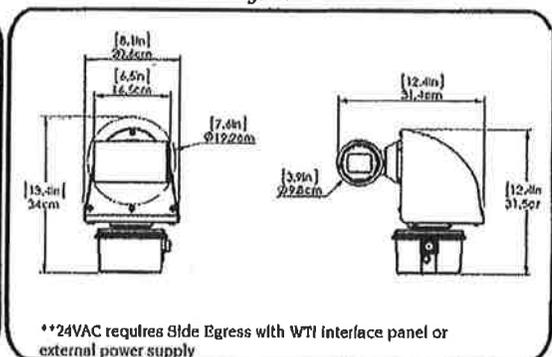
Pan/Tilt Drive	Pan Angle Range: continuous 360° Tilt Angle Range: continuous 360° Pan Speed: 100°/sec - proportional to zoom Tilt Speed 100°/sec - proportional to zoom Pan/Tilt Encoder Resolution: 0.05° Pan/Tilt Repeatability: 0.05°
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Preset	64 preset positions
Title Generation	2 lines of 24 characters for camera ID and preset ID Logo Overlay
Tours	8 tours of 32 presets with individual dwell settings per preset
Protocol	ONVIF, Pelco-D, COHU, NTCIP, Bosch, Diamond, Javelin, WTI
Firmware	Field upgradable flash memory
H.264/MPEG4/MJPEG Encoding Engine	
Video Encoding	H.264 (Baseline, Main, High Profile / Level 4), MPEG4, or MJPEG
Image Resolution	D1, VGA, HVGA, QVGA, 2CIF
Video Streams	7 independent stream configurations
Streaming Mode	CBR or VBR
Image Settings	GOP (M, N)
Frame Rate	30, 15, 7, 4, 2, 1
Data Rate	Adjustable from 10kb to 8Mb/sec in VBR mode and 10kb to 3Mb/sec in CBR mode
Connection Types	Uni-cast or multi-cast
Network Protocol Layers	RTP, RTSP, UDP, TCP, IP, IGMPv2, ICMP, ARP

Bottom Egress w/Umbilical Cable



Side Egress



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Product Information - WTI-POE-I PoE++ Injector

Electrical

Operating Voltage: 89-265 VAC
 Operating Frequency: 50/60Hz
 Power Consumption: 100W Maximum
 Output Voltage 56VDC

Mechanical

Size 8.15"W x 1.67"H x 6.00"D (with side rails)
 (20.7 cm W x 4.24 cm H x 15.24 cm D)
 Weight 3.35 lbs (1.52 kg)

Rear Panel Features

Captive Grounded 3 foot AC Line Cord
 Power On/Off Rocker Switch
 Replaceable 5x20mm 3A SLO-BLO FUSE

Front Panel Features

RJ-45 8P8C Ethernet Data Input
 RJ-45 8P8C Ethernet Data+POE Output
 AC Line Power Indicator LED
 POE Link Indicator LED

Mounting Features

Wall Mount Side Rails 3.4" x 7.85" Spacing with
 6-32 clearance holes
 Bottom Mounting Holes for Tray Mount - 6-32 PEMs
 with 4.0" x 6.0" Spacing

Environmental

Operating Temp.: -40 C to +75 C (-40 F to +167 F)
 Humidity 0 to 90% non-condensing
 Shock and Vibration NEMA TS-2 Compliant
 Regulatory: RoHS, FCC Part 15

POE Compatibility

POE++	Class 0 through Class 8 - Up to 90W (PD Type 3 and 4)
IEEE 802.3bt	Class 0 through Class 8 - Up to 90W (PD Type 3 and 4)
IEEE 802.3at	Class 0 through Class 4 - Up to 30W (PD Type 2)
IEEE 802.3af	Class 0 through Class 3 - Up to 15.4W (PD Type 1)

Operation

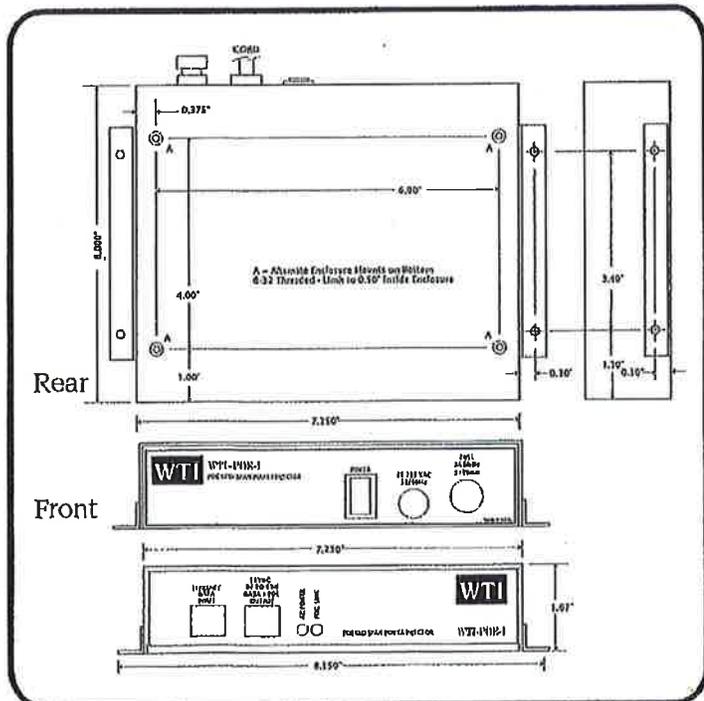
AC POWER LED is active when AC Line power is applied to unit, power switch is ON, fuse is good and internal 56VDC power supply is working.

POE Link LED is active when POE handshake negotiation with powered device (PD) is complete and 56VDC power is applied to powered device.

Power sequencing is not important - Ethernet cables may be inserted before or after AC Line power is applied to the unit.

Notes

All 4 Ethernet pairs are powered - Do not use in applications where normally unused pairs have been re-tasked for other purposes.
 All 4 Ethernet pairs should be used for higher power outputs above 30W



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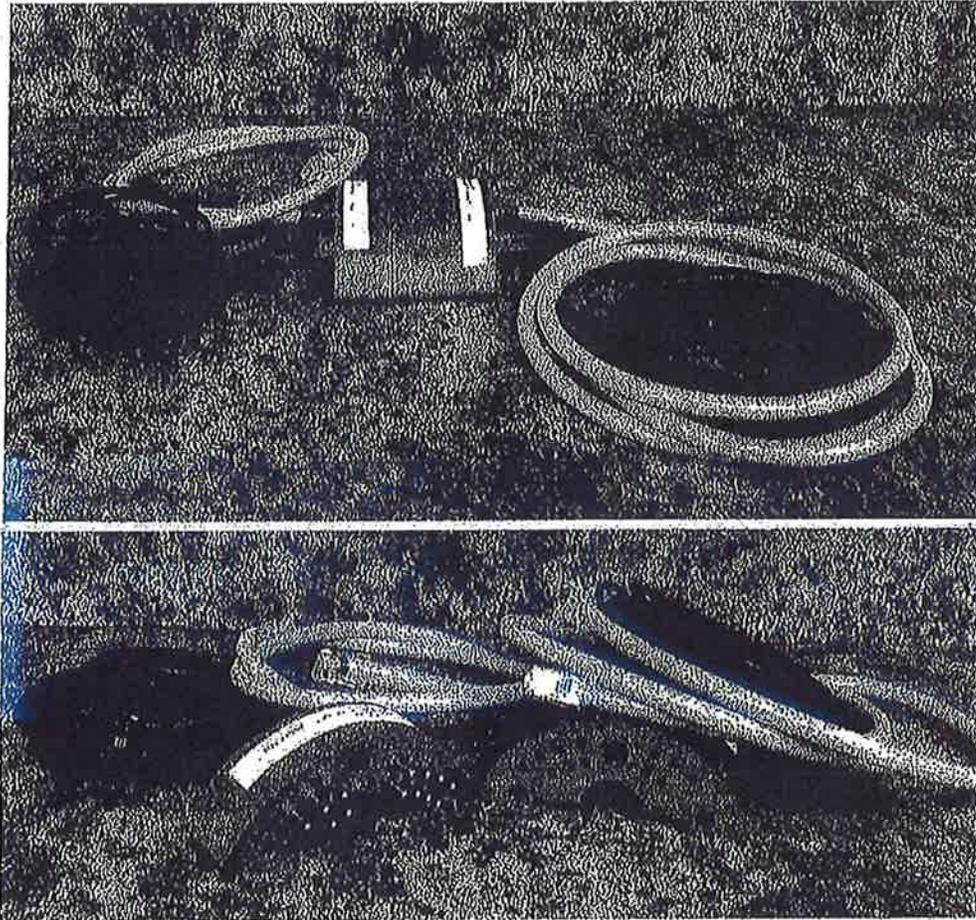
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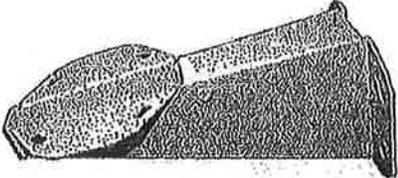
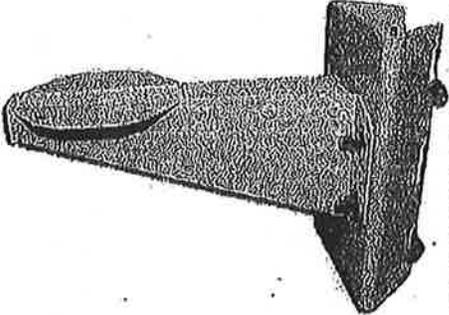
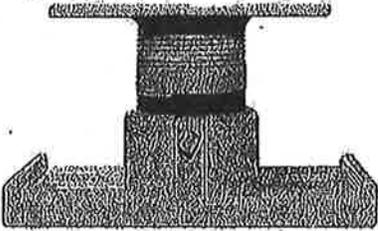
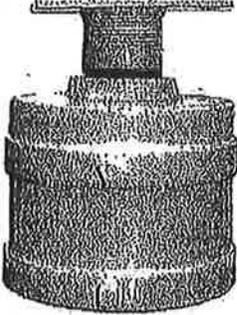


MG2 Ethernet/IP Connectors



Ethernet/IP Connectors — MG2 Ethernet/IP connectors are specifically designed for outdoor use within the disconnect unit of the MG2 camera lowering device (CLD). The insulating connector bodies are molded from a thermosetting synthetic rubber (Hypalon or Neoprene). Each of the gold-plated contacts measures 0.09" min. in diameter. The female barrels are equipped with stainless steel sleeves to prevent any possibility of over springing the leaves of the contacts, and prohibit the entry of foreign matter into the slots of the contacts. Each connector has (5) 0.09" diameter gold-plated contacts to #18 UL wire leads (for ground, alarms, or power), and (8) 0.09" diameter gold-plated contacts to CAT5e cable for Ethernet data/video/control (POE where applicable). Each contact is rated up to 600V, 7A Max and is derated according to the wire used in the application. These Male/Female contacts are permanently and integrally molded in the synthetic rubber body. The connectors are manufactured in accordance with MIL SPEC Q-9858 and MIL SPEC I-45208. The male and female connector is equipped with a spring-assisted disconnect when mounted in the disconnect head which maintains constant pressure upon the contact bodies. The CAT5e cable is terminated on both ends with an RJ-45 male connector. The (5) #18 UL wire leads are bare and numbered. Each contact is tested & verified for Ethernet data transmission speeds up to 1000BASE-T (1GB/s).

Sidewinder Series of Cameras: Mounting Options (all Sidewinder cameras)

	
<p><i>Model #SWWM1: Wall Mount</i></p>	<p><i>Model #SWWM1 and #SWVPA: Wall Mount with Vertical Pole Mount Adapter</i></p>
	
<p><i>Model #SWHPM1: Horizontal Pole Mount</i></p>	<p><i>Model #SWPTM1: Post Top Mount</i></p>

The Sidewinder requires mounting in vertical orientation with camera head at top. Please specify which mount you require when ordering your Sidewinder.

When Failure is Not an Option!

Sidewinder

H.264 Standard Definition

Model Listing:

SW720-H.264-SD

SW720-H.264-SD-ENG

SW720Amp-H.264-SD

SW720HV-H.264-SD

SW720HV-H.264-SD-ENG

SW720HVP-H.264

SW720P-H.264

SW720-21-H.264-SD

For use in any application!

- | | | |
|----------------|------------------|--------------------------|
| ⇒ Power plants | ⇒ Intersections | ⇒ Government |
| ⇒ Airports | ⇒ Freeways | ⇒ Military Applications |
| ⇒ Parking | ⇒ Parks | ⇒ Water Treatment |
| ⇒ Bridges | ⇒ Arenas | ⇒ Border Surveillance |
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An ISO 9001 Certified Company

Features include:

- 0.05° preset repeatability accuracy.
- Continuous 360° rotation in both axes.
- 36X optical zoom lens with electronic image stabilization.
- Hydrophilic "self cleaning" glass window.
- Wide Dynamic Range (WDR).
- Day/night DSP camera technology.
- H.264/MPEG-4/MJPEG video encoding.
- Optional camera enclosure pressurization.
- Optional RS422-485 Serial control (with composite analog video).

2064 Eastman Avenue, Suite 119 • Ventura, CA 93003-7787

toll free 866/gotowti (468.6984) • fax 805/339,0932

R0815

Product Information : Sidewinder : H.264 Standard Definition

WTI ~ Sidewinder : H.264 Standard Definition

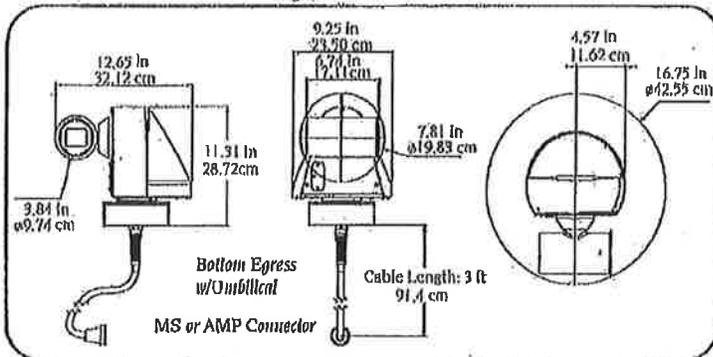
Camera	
Imager	1/4" color progressive scan, Interline transfer CCD
Resolution	540 Horizontal TV lines
Effective Pixels	768 x 494
Lens	High durability 36X optical zoom, F1.4 with 12X digital zoom
Focal Length	3.4 mm ~ 120 mm
S/N Ratio	>52dB
Iris	Auto or Manual Override
Shutter	Auto or Manual Override
Focus	Auto or Manual Override
Wide Dynamic Range (WDR)	On/Off
Sync	Internal or external
IR Cut Filter	Auto or manual (on/off)
Sensitivity	0.5 lux typical down to 0.01 lux in IR mode

Electrical	
Power Input	24VAC ± 6 VAC or 85-265 VAC
Power Consumption (with heater on)	50W

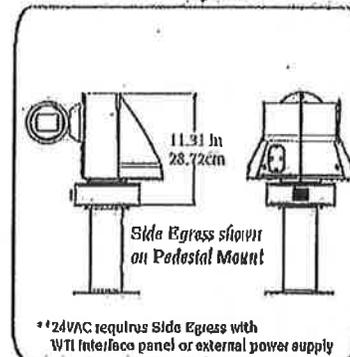
Mechanical	
Weight	14.5 lbs. (6.5 kg.)
Vibration (less lens)	3g (rms) random 5 to 1000 Hz, any axis
Air Contaminants	Withstands exposure to sand, dust, fungus, salt atmosphere, per MIL-E-5400T, paragraph 3.2.24.7, 3.2.24.8, and 3.2.24.9

Environmental	
Ambient Temp. Limit	-29° F to + 165° F (-34° C to +74° C) Conforms to NFEMA 2.1.5.1 Std TS2 for traffic control systems
Humidity	100% relative humidity
Protection Rating	IP-67/NEMA-4x/ASTM-B117 (entire camera)
Positioner	
Pan/Tilt Drive	
Pan Angle Range:	continuous 360°
Tilt Angle Range:	continuous 360°
Pan Speed:	100°/sec - proportional to zoom
Tilt Speed:	100°/sec - proportional to zoom
Pan/Tilt Encoder Resolution:	0.05°
Pan/Tilt Repeatability:	0.05°
Preset	64 preset positions
Title Generation	2 lines of 24 characters for camera ID and preset ID Logo Overlay
Tours	8 tours of 32 presets with individual dwell settings per preset
Protocol	ONVIF, Pelco-D, COHU, NTCIP, Bosch, Diamond Javelin, WTI
Firmware	Field upgradable flash memory
H.264/MPEG4/MJPEG Encoding Engine	
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Connection Types	Uni-cast or multi-cast
Network Protocol Layers	RTP, RTSP, UDP, TCP, IP, IGMPv2, ICMP, ARP

Bottom Egress w/Umbilical Cable



Side Egress



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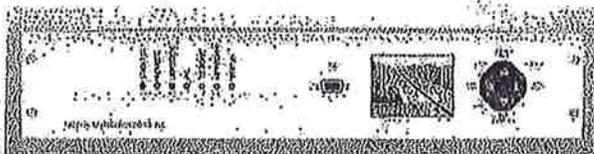
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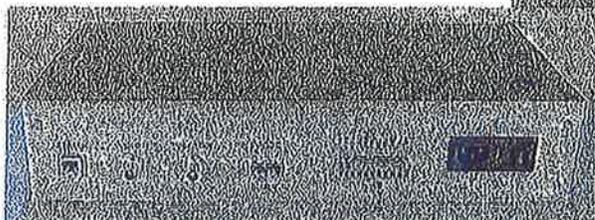
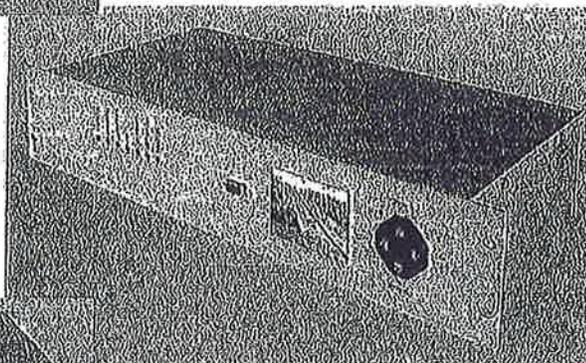


R0815

IP Camera Field/Box Rack Mount Remote Diagnostics



RVSFB120RNET



Features:

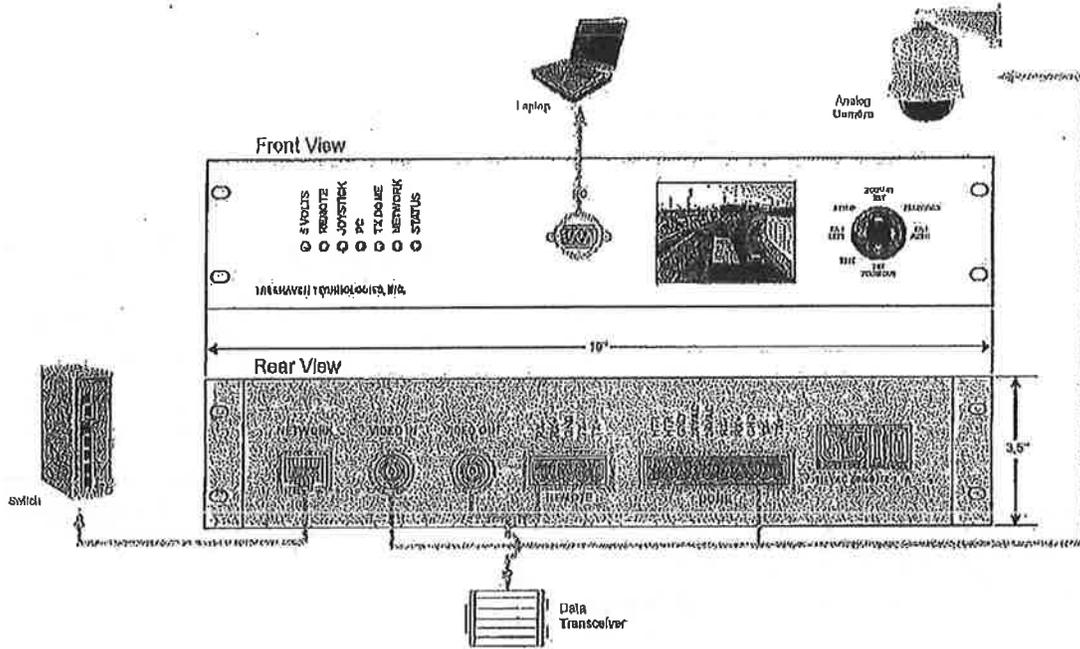
- Front panel ultra bright LED backlit color LCD display readable in direct sunlight
- Local PTZ control: Front panel control buttons and/or plug-in Joystick
- Provides camera power and lightning protection for all inputs and outputs
- Heater current and power factor detection. Displays heater failure details on LCD display
- Detects and reports video loss and generates sync signal with "Loss of Video" message on blue screen
- Text overlay to report system health status and other system parameters. Text overlay can be turned ON and OFF remotely using a predefined PreSet command
- Remote Diagnostics
- Auto-sensing of joystick, serial and remote data connections
- System status: Loss of video, Network status, Power, Heater/Blower
- Text on video (OSD)
- Hardened

TREEHAVEN technologies, Inc.
24 Village Pointe Drive, Powell, OH 43065
Phone: (614) 791-8843 Fax: (614) 789-0252
www.treehavenvision.com

TREEHAVEN
technologies

integrated video

Specifications



Electrical

AC Input Voltage: 120VAC 50/60 Hz
Dome Power Output: 24V, 80W, 50/60 Hz

Power Transformer:

Power Rating: 130 VA
4000VRMS Hipot
Class F Insulation (155°C)
UL Recognized
TUV Type Approval
CE Certified to IEC 950

Surge Suppression Data Ports:

Peak Surge Current (8 x 20 μ S): 10kA
Response Time: <1 nS
Voltage Clamp: 6V
Technology: Hybrid
Resistance: 5.4 Ω
Impulse Life (10/1000 μ S 500A): 400 times
EFT IEC 1000-4-4 and IEC 1000-4-2

Surge Suppression Video Ports:

Peak Surge Current (8 x 20 μ S): 10 kA
Response Time: <1 nS
Voltage Clamp: 8V
Technology: Hybrid
DC Resistance: 2.7 Ω
Impulse Life (10/1000 μ S 500A): 400 times
EFT IEC 1000-4-4 and IEC 1000-4-2

Surge Suppression AC Main:

Peak Pulse Current (8 x 20 μ S): 4500A
Peak Pulse Energy (10 x 1000 μ S): 75J
Max Clamping Voltage (8 x 20 μ S): 710V

Network:

10/100 Base T, RJ-45

Embedded 4 Port Managed Switch (Optional)

- Simple plug & play operation - automatic learning, negotiation and crossover detection
- RSTP (802.1w) and Enhanced Rapid Spanning Tree (eRSTP) network fault recovery (<5ms)
- Quality of Service (802.1q) for real-time traffic
- VLAN (802.1q) with double tagging and GVRP support
- Link aggregation (802.3ad)
- IGMP Snooping for multicast filtering
- Port Rate Limiting and Broadcast Storm Limiting
- Port configuration, status, statistics, mirroring, security
- SNTP time synchronization (client and server)
- Multi-level user passwords
- SSH/SSL encryption
- Enable/disable ports, MAC based port security
- Port based network access control (802.1x)
- VLAN (802.1q) to segregate and secure network traffic
- Radius centralized password management
- SNMPv3 encrypted authentication and access security
- Web-based, Telnet, CLI management Interfaces
- SNMP v1/v2/v3
- Remote Monitoring (RMON)
- Rich set of diagnostics with logging and alarms
- Powerful Marvell 886097F switch fabric
- Wire-speed, non-blocking, store and forward switching
- Full RPS® feature set including eRSTP for fast network fault recovery
- Coldfire 5272 management CPU Engine (66Mhz, 16MB RAM)

Environmental

Operating Temperature: -34°C to 60°C
Humidity: 5% to 95%, non-condensing

Data

Joystick: RS-422, Rx+, Rx-, Tx+, Tx-
Laptop: RS-232, Tx, Rx, Gnd
Remote Control: RS-422, Rx+, Rx-, Tx+, Tx-

Video

Video Input: BNC, 75 Ohms, NTSC, 1 Vpp
Video Output: BNC, 75 Ohms, NTSC, 1 Vpp
Monitor Output: BNC, 75 Ohms, NTSC, 1 Vpp

VDA:

Input Composite Video Signal: 1.0 Vpp
S/N Ratio: +60 dB typ.
2nd Distortion: -40 dB typ.

