



I-ONYX VND-970IP Indoor Fixed Camera Dome

- **Compatible with ViconNet Version 5.2 software and higher**
- **Transmits high quality video across the LAN and WAN for remote viewing and recording on ViconNet NVRs, DVRs and Workstations**
- **Uses MPEG-4/M-JPEG real-time compression that optimizes file size and maximizes picture quality**
- **Power over Ethernet (PoE) eliminates the need for separate power supply; 12 VDC**
- **A range of fps available depending on resolution**
- **Supports Multicast**
- **Supports dual streams simultaneously**
- **Remote configuration across the network**
- **Password protection for configuration**
- **Camera features electronic iris, AGC, white balance, flip, mirror and privacy masks**
- **Integral varifocal 3.3-12 mm/F1.4 lens**
- **Indoor camera dome housing**

ASSOCIATED EQUIPMENT AND ACCESSORIES

Model VND-970-CM Ceiling Mount, Product Code 9658-10: Mount designed specifically for in-ceiling (recessed) mounting of the VND-970IP camera dome.

ViconNet VN-WS-SW Software: Full capability master workstation software package, except the recording function, for a PC for use with Kollektor recorders; registration required for use. Product Specification V113-09.

ViconNet VN-NVR-SW Software/VN-NVR Master Workstation: ViconNet master workstation software package (primarily for recording function)/PC preloaded with Master Control Software for use with Kollektor recorders; registration required for use. Product Specification V113-20.

Kollektor Family of Digital Video Recorders, Product Code varies by model: 16-channel networked digital video recorders. Includes the Kollektor Elite, Kollektor Pro and Kollektor Lite series. Product Specification V112, V128 and V185 respectively.

The VND-970IP I-Onyx® IP Camera Dome is a powerful IP camera compatible for operation within a ViconNet® (version 5.2 software and higher) digital video management system. The camera can be remotely managed and controlled from ViconNet NVRs, DVRs and Workstations. The camera supports an MPEG-4 and M-JPEG.

Equipped with a 100 Mbps LAN interface board, the camera allows direct plug-in to a network switch. Images received from the IP camera can be displayed, recorded or archived using the ViconNet management software.

The VND-970IP supports either Multicast or Unicast and allows networks that support multicast to take advantage of this feature. Multistream support allows viewing and recording video at different frame rates (fps) at the same compression (MPEG-4 or M-JPEG) and simultaneous dual streaming video.

The VND-970IP camera combines excellent picture quality with advanced features. The ¼" VGA CMOS imager offers progressive scan that provides up to VGA resolution (640 x 480 pixel array), providing a sharp color image with accurate color rendition. The camera provides a sensitivity of 0.01 fc (0.1 lux).

The VND-970IP camera is provided with an integral 3.3-12 mm/f1.4 varifocal lens. Synchronization is internal. The camera features configurable brightness, contrast, saturation, sharpness and white balance and provides AGC, AWB and electronic iris. Video image can also be flipped or mirrored and privacy masks are supported.

Camera may be powered by either PoE or a 12 VDC power input.

The camera is housed in a camera dome for indoor use. The camera dome provides 3-axis adjustment for pan, tilt and roll. It is designed for surface mounting. A mounting accessory is available for in-ceiling (recessed) mounting.

The VND-970IP camera complies with radiation requirements for an FCC Class B device and CE.

NETSWITCH-16, Product Code 8495-00: 16-port network switch, includes 10/100Mbps ports, desktop/wall mount, 120 VAC. Product Specification 161.

NETSWITCH-24, Product Code 8495-10: 24-port network switch, includes 10/100/1000Mbps ports, rack mount, 120 VAC. Product Specification 162.

NETSWITCH-24POE Network Switch, Product Code 8495-20: 16-port, 10/100/1000 autosensing network switch with a choice of 24 VAC or PoE power source, stackable. Product Specification V162-20.

Uninterruptible Power Supplies: 725 and 1000 VA units with DB9 (RS-232) and USB ports; 120 VAC input/output. Product Specification V147.

Vicon Product Facts		Model No: VND-970IP	Product Code 9658-00	SEC: 3	SPEC: V202	REV: 609
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Network and Storage Considerations

The VND-970 IP Camera Dome can be connected to any ViconNet version 5.6 network. ViconNet NVRs, DVRs and Workstations can be used for live viewing and recording of network-streamed video. A network can be as simple as a single camera connected to a ViconNet Workstation or can be complex with the addition of several networks interconnected via WAN. Refer to the network diagrams on the next page for sample configurations.

When adding a VND-970 IP Camera Dome to the ViconNet network, the following items must be considered:

- The number of cameras on a switch with respect to switch capabilities and system bandwidth mapping.
- Bandwidth limitations on ports connected to workstations (using 100 or 1000 Mbps).
- Workstation capabilities such as processing speed and disk write speed.
- Storage size and location types including local Workstation recording, attached SCSI RAID and integrated SAN devices.

Refer to the network diagrams on the next page for sample configurations.

The VND-970 offers a variety of configurations that impact on the video quality (resolution/fps) vs bandwidth usage. Maximum frame rate is selectable, 1-30 fps. There is a choice of Constant Bit Rate or Fixed Quality. Constant bit rate maintains the bandwidth utilization regardless of the video quality; Fixed quality maintains quality but the bandwidth utilization varies. A range of bit rates are available to choose from; select from Medium, Standard, Good, Detailed or Excellent for quality. It is suggested that the Constant Bit Rate be selected, since it provides more exact control over the network; the parameters shown below have been tested and proven to provide the best quality of video.

Table 1: Constant Bit Rate Guidelines (MPEG-4 Mode)

Recording Requirement	Video Settings			Expected Recording Duration			
	Resolution	Frame Rate**		Video Suggested Bit Rate (K)	1 day	7 days	30 days
		NTSC	PAL				
	VGA (640x480@NTSC, 640x576@PAL)	30	25	500	5.4 G	37.8 G	162 G
		15	12	250	2.7 G	19 G	81 G
		10	8	167	1.8 G	12.6 G	54 G
	CIF (320x240@NTSC, 320x288@PAL)	30	25	250	2.7 G	18.9 G	81 G
		15	12	128	1.4 G	9.7 G	41.5 G
		10	8	85	0.9 G	6.5 G	27.6 G
		5	5	43	0.47 G	3.2 G	13.8 G

Product Specification

Table 2: Fixed Quality with MPEG

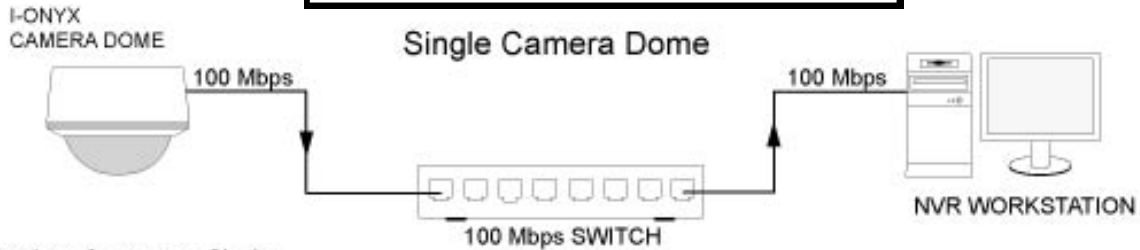
Resolution	Video Quality	Frame Rate		Expected Recording Time			
		NTSC	PAL	1 day	7 days	30 days	
VGA (640x480@NTSC, 640x576@PAL)	Medium	30	25	5.06 G	35.42 G	151.8 G	
		15	12	2.53 G	17.71 G	75.9 G	
		10	8	1.67 G	11.69 G	50.1 G	
	Standard	30	25	5.3 G	37.1 G	159 G	
		15	12	2.65 G	18.55 G	79.5 G	
		10	8	1.77 G	12.39 G	53.1 G	
	Good	30	25	5.6 G	39.2 G	168 G	
		15	12	2.8 G	19.6 G	84 G	
		10	8	1.87 G	13.09 G	56.1 G	
	Detailed	30	25	6.3 G	44.1 G	189 G	
		15	12	3.15 G	22.05 G	94.5 G	
		10	8	2.1 G	14.7 G	63 G	
	Excellent	30	25	6.5 G	45.5 G	195 G	
		15	12	3.25 G	22.75 G	97.5 G	
		10	8	2.17 G	15.19 G	65.1 G	
	CIF (320x240@NTSC, 320x288@PAL)	Medium	30	25	1.15 G	8.05 G	34.5 G
			15	12	0.57 G	3.99 G	17.1 G
			10	8	0.38 G	2.66 G	11.4 G
			5	5	0.19 G	1.33 G	5.7 G
		Standard	30	25	1.26 G	8.82 G	34.5 G
			15	12	0.63 G	4.41 G	18.9 G
10			8	0.42 G	2.94 G	12.6 G	
5			5	0.21 G	1.47 G	6.3 G	
Good		30	25	1.37 G	9.59 G	41.1 G	
		15	12	0.685 G	4.8 G	20.55 G	
		10	8	0.46 G	3.22 G	13.8 G	
		5	5	0.23 G	1.61 G	6.9 G	
Detailed		30	25	1.4 G	9.8 G	42 G	
		15	12	0.7 G	4.9 G	21 G	
		10	8	0.47 G	3.29 G	14.1 G	
		5	5	0.23 G	1.61 G	6.9 G	
Excellent		30	25	1.8 G	12.6 G	54 G	
		15	12	0.9 G	6.3 G	27 G	
		10	8	0.6 G	4.2 G	18 G	
		5	5	0.3 G	2.1 G	9 G	

Product Specification

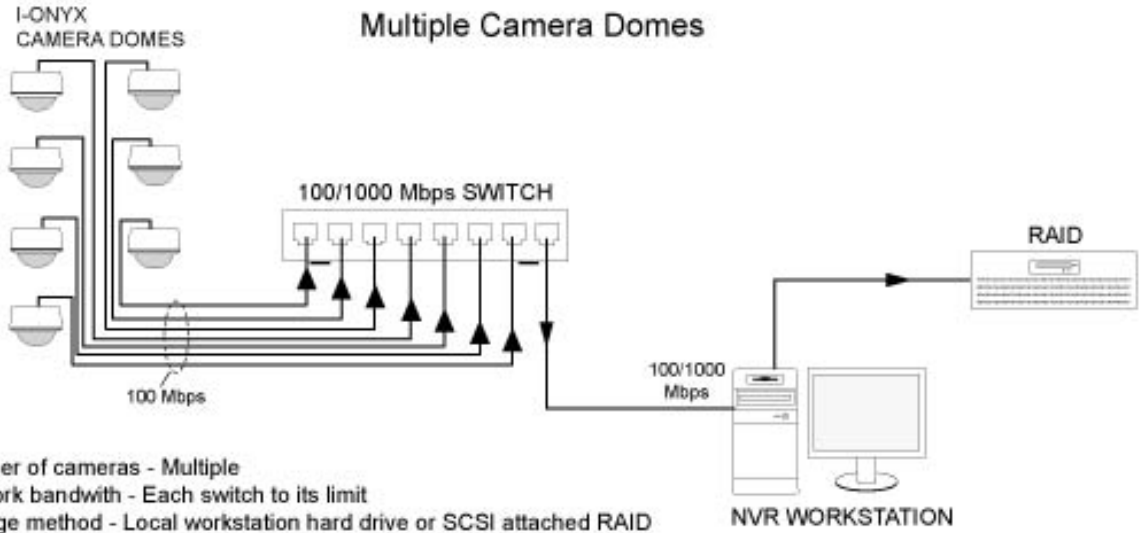
Table 3: Fixed Quality with M-JPEG

Resolution	Video Quality	Frame Rate		Expected Recording Time			
		NTSC	PAL	1 day	7 days	30 days	
VGA (640x480@NTSC, 640x576@PAL)	Medium	30	25	20.25 G	141.75 G	607.5 G	
		15	12	10.125 G	70.875 G	303.75 G	
		10	8	6.75 G	47.25 G	202.5 G	
	Standard	30	25	22.78 G	159.46 G	683.4 G	
		15	12	11.39 G	79.73 G	341.7 G	
		10	8	7.59 G	53.13 G	227.7 G	
	Good	30	25	32.9 G	230.3 G	987 G	
		15	12	16.45 G	115.15 G	493.5 G	
		10	8	10.97 G	76.79 G	329.1 G	
	Detailed	30	25	48.09 G	336.63 G	1442.7 G	
		15	12	24.045 G	168.32 G	721.35 G	
		10	8	16.03 G	112.21 G	480.9 G	
	Excellent	30	25	67.1 G	469.7 G	2013 G	
		15	12	33.55 G	234.85 G	1006.5 G	
		10	8	22.37 G	156.59 G	671.1 G	
	CIF (320x240@NTSC, 320x288@PAL)	Medium	30	25	8.35 G	58.45 G	250.5 G
			15	12	4.175 G	29.225 G	125.25 G
			10	8	2.78 G	19.46 G	83.4 G
5			5	1.39 G	9.73 G	41.7 G	
Standard		30	25	9.87 G	69.09 G	296.1 G	
		15	12	4.94 G	34.58 G	148.2 G	
		10	8	3.29 G	23.03 G	98.7 G	
		5	5	1.65 G	11.55 G	49.5 G	
Good		30	25	13.34 G	93.38 G	400.2 G	
		15	12	6.67 G	46.69 G	200.1 G	
		10	8	4.45 G	31.15 G	133.5 G	
		5	5	2.2 G	15.4 G	66 G	
Detailed		30	25	17.47 G	122.29 G	524.1 G	
		15	12	8.74 G	61.8 G	262.2 G	
		10	8	5.8 G	40.6 G	174 G	
		5	5	2.9 G	20.3 G	87 G	
Excellent		30	25	22.78 G	159.46 G	683.4 G	
		15	12	11.39 G	79.73 G	341.7 G	
	10	8	7.59 G	53.13 G	227.7 G		
	5	5	3.8 G	26.6 G	114 G		

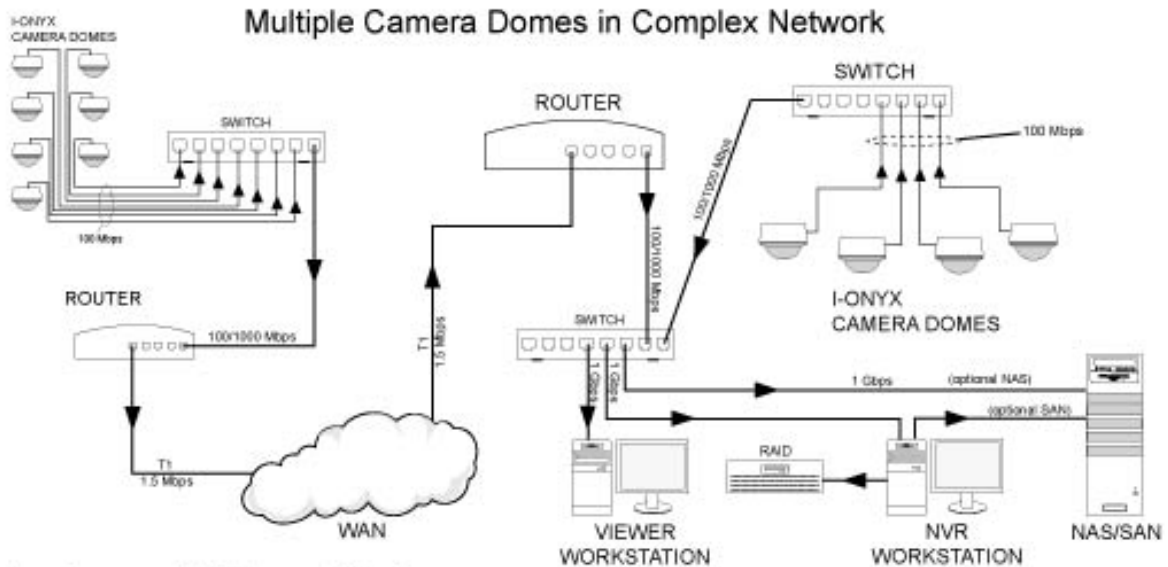
Product Specification



- Number of cameras - Single
- Network bandwidth - 100 Mbps
- Storage method - Local workstation hard drive



- Number of cameras - Multiple
- Network bandwidth - Each switch to its limit
- Storage method - Local workstation hard drive or SCSI attached RAID



- Number of cameras - Multiple on multiple sites
- Network bandwidth - Each switch to its limit (as shown above), constrained only by the WAN (T1 @ 1.5 Mbps)
- Storage method - Local workstation hard drive, SCSI attached RAID or NAS/SAN storage

Technical Information

ELECTRICAL

Input Power Source: 12 VDC or PoE (IEEE 802.3af).

Current: 300 mA.

Power Consumption: 3.6 W.

Heat Equivalent: 0.2 btu/min (0.05 kg-cal/min);
 Note: These figures represent the conversion of 100% of the electrical energy to heat. Actual percentage of heat generated will be less and will vary from product to product. These figures are provided as an aid in determining the extent of cooling required for an installation.

Radio-Frequency Emission Standard: FCC Class B; CE.

Communication System: ViconNet Digital Video Management System Ver 5.2 and higher.

LAN Interface: 10/100 Mbps, TCP/IP Unicast/Multicast.

Number of Video Channels: 1, over LAN connection.

Picture Resolution and Frame Rate: CIF: 320 x 240, VGA: 640 x 480. 1 to 30 fps (25 in PAL) in all resolutions.

Alarm/Audio Input/Output: Future feature.

Video Bandwidth: Refer to Tables 1-3.

Hard Drive Consumption Rate: Refer to Table 1-3.

SOFTWARE OPERATION (ViconNet)

Network Setup: Standard network protocol type using IP addressing scheme and separate PC application software.

Site Administration: Camera can be setup from NVRs, DVRs and Workstations.

Macro Create & Edit: System macros can be configured to use the camera's video.

VIDEO CHARACTERISTICS

Image Device: 1/4-inch CMOS progressive scan.

Effective Pixels: 640 x 480.

Sensitivity: 0.01 fc (0.1 lux); Conditions: lens at F1.4.

Resolution: Scalable CIF (320x240) to VGA (640x480).

Electronic Iris: Automatic 1/5-1/15000.

Signal-to-Noise Ratio: Better than 48 dB.

White Balance: Automatic On/Off.

Video Signal Output: 1.0 V p-p VBS @ 75 ohms composite video.

Synchronization In: Internal.

Gain Control: Automatic (AGC), On/Off.

Compression: MPEG-4 or M-JPEG, selectable.

Lens: Focal Length: 3.3-12 mm/F1.4. Angle of View: Horizontal- 83.9°- 23.91°; Vertical- 61.9°- 17.93°. Focus and zoom adjustment.

Image Settings: OSD menus for video settings: Adjustable image size, quality and bit rate. Time stamp and test caption. Flip and mirror functions. Configurable brightness, contrast, saturation, sharpness and white balance. Supports privacy masks.

CONTROLS AND CONNECTORS

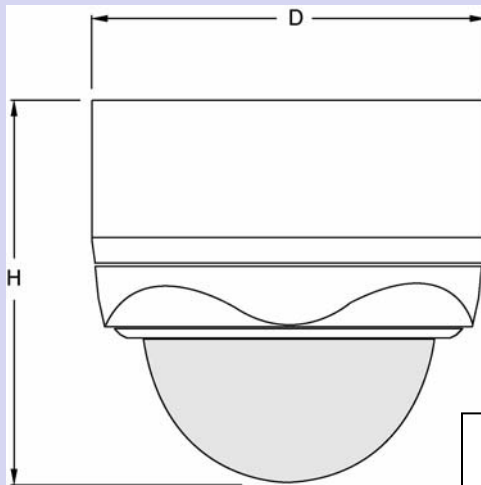
External Controls: Reset button: Sets factory defaults.
Status LED.

Connectors: Power: 12 VDC: socket;
PoE: RJ-45.
Ethernet: RJ-45 CAT 5.
Data Input/Output: 4-pin screw terminal (future use).
MIC In/Audio Out: socket (future use).
See figure.

CAMERA SOFTWARE

Network: Ethernet: 10/100Base-T.
Protocol: TCP/IP, UPnP, HTTP, DHCP, PPPoE, RTP/RTSP/RTCP, FTP, SMTP, DNS, DDNS, NTP, PPPoE.
Web Browser: Microsoft Internet Explorer 5.0 or above.

Software Security: Password protection configured by administrator. Three levels of user privilege.



Dimension Diagram

MECHANICAL

Positioning Adjustment: Loosen screws for pan, tilt and roll adjustment:
Pan: 350°.
Tilt: 45°.
Rotation: 350°.

Construction: White plastic housing, polycarbonate lower dome.

Dimensions: See Figure.
Height (H): 4.2 in. (106 mm).
Diameter (D): 5.6 in. (143 mm).

Weight: 1.3 lb (0.6 kg).

Mounting: Surface mount; option for in-ceiling (recessed) mounting.

Shipping Dimensions: Height: 6 in. (152 mm).
Width: 12.25 in. (311 mm).
Length: 8 in. (203 mm).

Shipping Weight: 2.8 lb (1.3 kg).

Shipping Volume: 0.03 ft³ (0.001 m³).

ENVIRONMENTAL

Operating Temperature Range: 32 to 104° F (0 to +40° C).

Humidity: Up to 90% relative, noncondensing.

Controls and Connection Diagram

