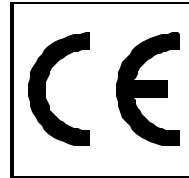


XX096-01

## V422-VI RS-422 TO VICOAX TRANSLATOR



Vicon Industries Inc. does not warrant that the functions contained in this equipment will meet your requirements or that the operation will be entirely error free or perform precisely as described in the documentation. This system has not been designed to be used in life-critical situations and must not be used for this purpose.

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# Installation & Operation Manual





Dear Valued Customer:

Thank you for selecting Vicon systems and products for your video needs.

Since Vicon's beginning in 1967, our only business has been the design, engineering, and production of the highest quality video systems and equipment for use in a wide variety of security, safety, control, surveillance, and communication applications.

We stand behind the quality and dependability of every product with an industry leading Beneficial Use warranty.

If you are not satisfied with a Vicon product or service, I would like to know. Your complete satisfaction is the mission of every Vicon employee.

Sincerely,

Kenneth M. Darby  
President

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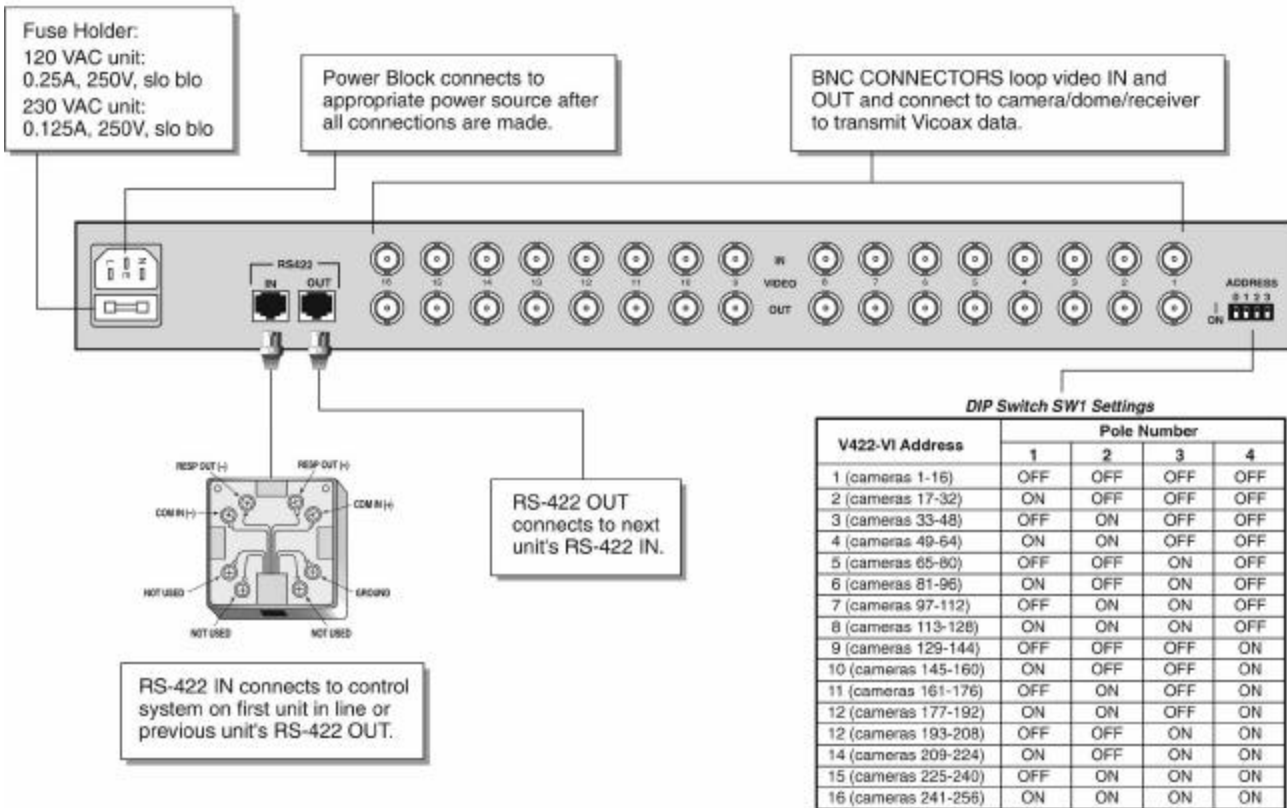
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# Quick Installation

## FRONT PANEL VIEW



## REAR PANEL VIEW



# Introduction

The information in this manual covers the installation, operation, and maintenance of the V422-VI RS-422 to Vicoax Translator. This unit should only be installed by a qualified technician using approved materials in accordance with national, state and local wiring codes. Read this manual through completely before attempting installation.

Vicon's V422-VI is an RS-422 to Vicoax translator that allows an RS-422 control to communicate with up to 16 Vicoax receivers. Up to 16 V422-VIs are DIP switch addressable and can be cascaded to address up to a maximum of 256 Vicoax receivers/cameras. In the event of a failure in the V422-VI, a fail safe circuit allows the control to communicate to the next RS-422 receiver.

The V422-VI receives RS-422 messages, through a rear panel RJ-45 connector, from a control, like the V1500, V1400, V1466, V1344, AurorA2000 and AurorAcorD. The RS-422 messages are typically commands for Aux, pan-and-tilt, and camera functions (focus, iris, zoom, etc). The V422-VI also sends RS-422 status messages back to the control. The V422-VI sends and receives Vicoax messages, through BNC connectors, to receivers, like Surveyor, V1311RB and V1305R-DC. The Vicoax messages for both send and receive are RS-422 command and status messages reformatted embedded signal to the receiver camera's video. The V422-VI is available with 120 VAC or 230 VAC input, Model V422-VI-230. The term V422-VI is used to refer to both models unless specifically stated otherwise.

The V422-VI meets FCC requirements for a Class A device.

**Table 1**  
**Models, Product Codes and Descriptions**

<b>Model</b>	<b>Product Code</b>	<b>Description</b>
V422-VI	7255	16-input RS-422 to Vicoax translator; 120 VAC
V422-VI-230	7255-01	16-input RS-422 to Vicoax translator; 230 VAC

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## Accessory Kit

The V422-VI is supplied with an accessory kit. The accessory kit includes:

- 1 termination box for RJ-45 connection
- 1 label for the termination box
- 1 10 ft RJ-45 to RJ-45 cable
- 1 line cord

# Installation

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## Unpacking and Inspection

All Vicon equipment is tested and inspected before leaving the factory. It is the carrier's responsibility to deliver the equipment in the same condition as it left the factory.

## Inspection for Visible Damage

Immediately inspect the cartons upon delivery. Make a note of any visible damage on all copies of the carrier's freight bill. Make sure the carrier's agent (the person making the delivery) signs the note on all copies of the bill. If the agent does not have claim forms, contact the carrier's office.

## Inspection for Concealed Damage

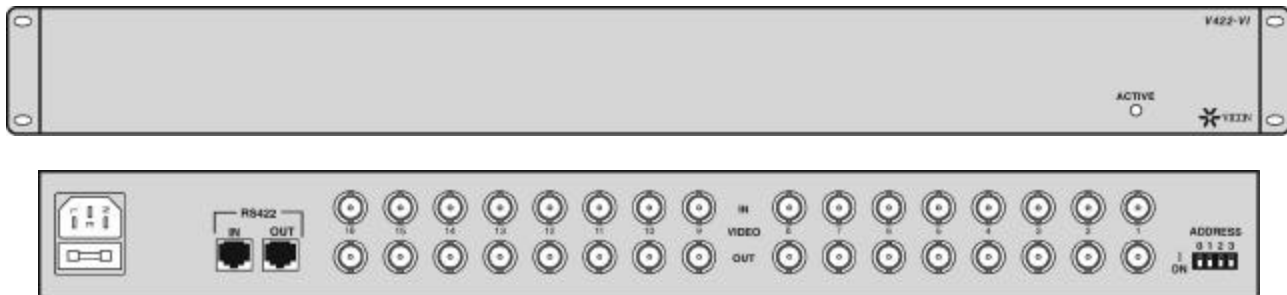
As soon as possible after delivery, unpack the unit and inspect it for concealed damage. Do not discard the carton or packing materials. If the unit is damaged, contact the carrier immediately and request forms for filing a damage claim. Make arrangements for a representative of the carrier to inspect the damaged equipment.

If the equipment must be returned for repair, follow the Shipping Instructions at the end of this manual.

---

## Mounting the Unit

The V422-VI is a rack mount unit designed to fit into a standard EIA 19-inch (483 mm) rack. Install it according to the instructions accompanying the rack.



**Figure 1**  
**Front and Rear Panels**

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# Connections

All connections are made from the rear panel of the V422-VI. Refer to Figure 1.

## Power Connections

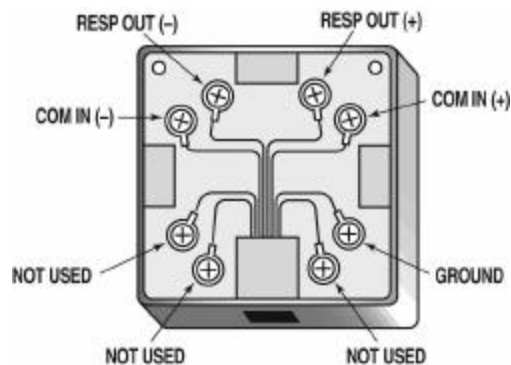
The V422-VI is supplied with a 3-conductor line cord. Power input is 120 or 230 VAC, 50/60 Hz. The appropriate line cord is supplied with the unit.

**Note:** *Vicon systems and components, like most electronic equipment, require a clean, stable power source. Voltage irregularities such as surges, drops, and interruptions can affect the operation of your equipment and, in severe cases, damage certain components. Vicon strongly recommends the use of line conditioners, voltage regulators, and uninterruptible power supply (UPS) systems.*

## NOVA Control Connections

The V422-VI receives RS-422 (NOVA) messages from the control via an RJ-45 connector. The V422-VI is compatible with the V1500, V1400, V1466, and V1344 NOVA control systems and the AurorA2000 and AurorAcorD. The V422-VI also sends status messages back to the control system.

Communication signal connections are made at the RS-422 IN and OUT RJ-45 connectors on the V422-VI rear panel using the supplied 10-foot (3.1 m) RJ-45-to-RJ-45 cable and RJ-45 termination box supplied in the accessory kit. Refer to Figure 2 for connection diagram. The RS-422 OUT connector is used to loop out V422-VI units, up to a total of 16, making it possible to connect to up to 256 receivers. The V422-VI can be installed in either a star or daisy-chain configuration.



**Figure 2**  
**Termination Box Connections**

## Star Configuration

A star configuration provides multiple communication paths. By fanning out communications, a star configuration increases system reliability. It limits the affect of a failed unit or cable run. A failure on one leg of a star has no affect on units on the other legs. In a star configuration, if more than one V422-VI is connected to the NOVA control, a distribution unit (V1400X-IDL, instruction manual XX017) is required. Only the RJ-45 input on each V422-VI is used. Refer to Figure 3.

## STAR CONFIGURATION

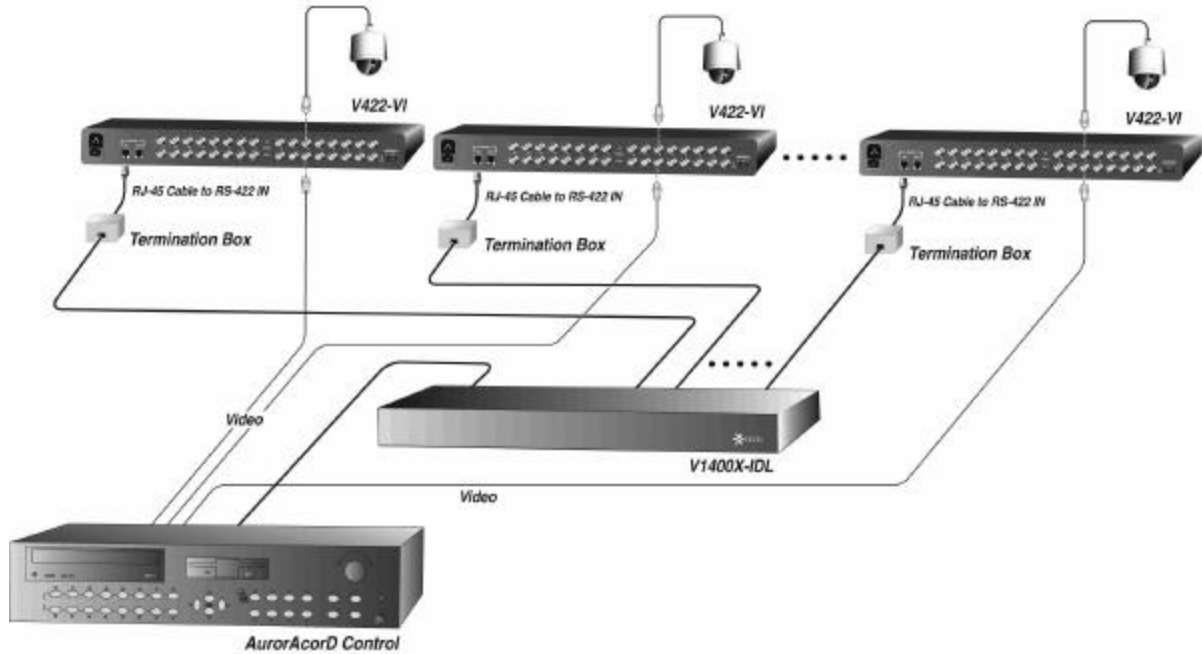


Figure 3  
Star Configuration

## **Daisy-Chain Configuration**

A daisy-chain configuration loops signals from one unit to the next along one RS-422 control line. A failure on a daisy-chain cuts off all communications beyond the point of failure. In a daisy-chain configuration, a number of V422-VI units are connected using the RS-422 IN and OUT RJ-45 connectors. Refer to Figure 4. In this configuration, a failed V422-VI does not break communication with other units in the system, due to its internal fail-safe circuit. In this situation, the V422-VI bypasses itself out of the chain.

## DAISY-CHAIN CONFIGURATION

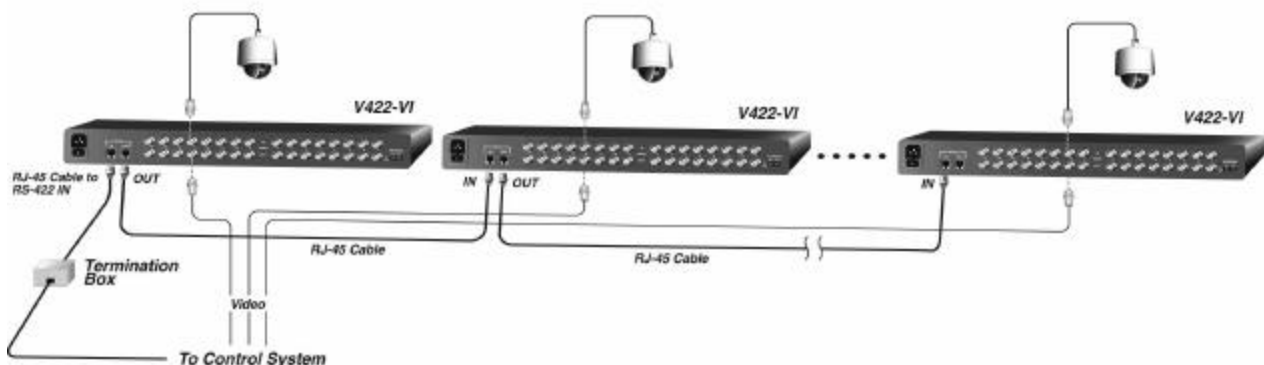


Figure 4  
Daisy-Chain Configuration



## Vicoax Connections

The V422-VI sends and receives Vicoax messages to receivers like the Surveyor series, V1311RB with the V1311R-VI-1 interface card and V1305R-DC-2. The Vicoax messages for both send and receive are RS-422 commands and status messages that are reformatted and the signal is embedded to the receiver camera's video. There are 16 sets of video IN/OUT BNC connectors.

## Addressing

There is a 4-pole DIP switch, labeled ADDRESS, on the rear panel of the unit. Refer to Figure 1. The DIP switch allows the user to select a group of 16 cameras/receivers within the 256 possible addresses to communicate with a particular V422-VI; up to 16 V422-VIs may be addressed in the system. Refer to Table 1 for address settings.

**Table 1**  
**DIP Switch SW1 Settings**

V422-VI Address	Pole Number			
	1	2	3	4
1 (cameras 1-16)	OFF	OFF	OFF	OFF
2 (cameras 17-32)	ON	OFF	OFF	OFF
3 (cameras 33-48)	OFF	ON	OFF	OFF
4 (cameras 49-64)	ON	ON	OFF	OFF
5 (cameras 65-80)	OFF	OFF	ON	OFF
6 (cameras 81-96)	ON	OFF	ON	OFF
7 (cameras 97-112)	OFF	ON	ON	OFF
8 (cameras 113-128)	ON	ON	ON	OFF
9 (cameras 129-144)	OFF	OFF	OFF	ON
10 (cameras 145-160)	ON	OFF	OFF	ON
11 (cameras 161-176)	OFF	ON	OFF	ON
12 (cameras 177-192)	ON	ON	OFF	ON
13 (cameras 193-208)	OFF	OFF	ON	ON
14 (cameras 209-224)	ON	OFF	ON	ON
15 (cameras 225-240)	OFF	ON	ON	ON
16 (cameras 241-256)	ON	ON	ON	ON

# Operation

Energize the unit by applying power. Since the V422-VI is controlled by the control system, refer to the appropriate instruction manual for general operating instructions.

# Maintenance

The V422-VI requires no scheduled maintenance other than replacing the fuse when necessary.

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## Fuse Replacement

The V422-VI has a fuse located on the rear panel. If it must be changed, be sure to replace it with one with the same rating, 0.25 A, 5 mm, 250 V, slo blo for 120 VAC or 0.125 A, 250 V, slo blo for 230 VAC.

# Troubleshooting

***The Active LED does not illuminate*** – Check that the line cord is securely attached to the rear of the unit and that it is connected to an appropriate power source.

***The control system is not communicating to the V422-VI*** – Check that the signals are connected to the termination box correctly and the RS-422 IN and OUT connections are correct. Also check that the video cable or cables is properly terminated (75 ohms); It is important that each video cable has only one terminator.

***The wrong camera station is responding*** – Make sure that the address DIP switch is set properly; make sure the BNC connections are correct.

***There is no video or picture is noisy or weak*** – Check to see if the cable length is correct: ≤1500 ft (150 m) for RG-59/U and RG-6/U; ≤5000 ft (1524 m) for RG-11/U.

# Shipping Instructions

Use the following procedure when returning a unit to the factory:

1. Call or write Vicon for a Return Authorization (R.A.) at one of the locations listed below. Record the name of the Vicon employee who issued the R.A.

Vicon Industries Inc.  
89 Arkay Drive  
Hauppauge, NY 11788  
Phone: 631-952-CCTV (2288); Toll-Free: 1-800-645-9116; Fax: 631-951-CCTV (2288)

For service or returns from countries in Europe, contact:

Vicon Industries Ltd  
Brunel Way  
Fareham, PO15 5TX  
United Kingdom  
Phone: +44 (0) 1489 566300; Fax: +44 (0) 1489 566322

2. Attach a sheet of paper to the unit with the following information:
  - a. Name and address of the company returning the unit
  - b. Name of the Vicon employee who issued the R.A.
  - c. R. A. number
  - d. Brief description of the installation
  - e. Complete description of the problem and circumstances under which it occurs
  - f. Unit's original date of purchase, if still under warranty
3. Pack the unit carefully. Use the original shipping carton or its equivalent for maximum protection.
4. Mark the R.A. number on the outside of the carton on the shipping label.

# Reference

## Coaxial Cable

Coaxial cables used to route video signals to and from the unit must meet the video recommendations in this section.

**⚠ Caution:** Careful selection of the proper cable is essential to obtain the best performance from this equipment. Vicon assumes no responsibility for poor performance when cables other than those recommended are installed. In all cases, coaxial cable impedance should be 75 ohms.

### Materials

Use only cable with a pure copper center conductor. Do not use cable with either a copper-plated steel or an aluminum center conductor because these do not transfer signals effectively in the frequency range used in CCTV networks. A center conductor with low DC resistance is required for effective CCTV operation. Solid-core bare copper conductor is best suited to video applications, except where flexing occurs. If the coaxial cable will be subjected to flexing during normal use, select a cable with a stranded center conductor. The preferred dielectric material is cellular (foam) polyethylene. It has better electrical characteristics than solid polyethylene, but is more vulnerable to moisture. Therefore, use only solid polyethylene dielectric cable with a heavy exterior insulation in applications subject to moisture. The shield must be copper braid providing 95% or better coverage.

### Cable Types

The most commonly used cable types are RG-59/U and RG-11/U. Each is actually a family of cables with widely varying electrical characteristics, some of which are not suitable for CCTV applications. Choose a cable type by referring to the characteristics and maximum distances listed below. The maximum distance for best picture refers to the distance between the camera and the unit. The characteristics of the cables in this table should be used as a guideline when cables other than Belden are used. Materials and construction must follow the guidelines above. Note that "BC" refers to bare copper and "TC" refers to tinned copper.

**Recommended Coaxial Cable Types**

Cable Type	Belden Type No.	Alpha Type No.	West Penn Type No.	Type Center Conductor	Type Shield and % Coverage	DC Resistance ohms per 1000 feet (km)
RG-11/U	8213	9847	811,4811	14 Solid BC	BC braid (95%)	2.6 (8.5)
RG-6/U	9248	9804C	806,4806	18 Solid BC	Foil + 61% TC braid (100%)	7.5 (24.6)
RG-59/U	8281	9803	815	20 Solid BC	2 TC braids (96%)	9.9 (32.5)
RG-59/U	9259	----	816	22 Stranded BC	BC braid (95%)	15.0 (49)
RG-59/U	9659	----	----	22 Stranded BC	BC braid (95%)	15.0 (49)

**Picture Quality vs. Cable Length**

Picture Quality	Maximum Cable Run* ft (m)		
	RG-59/U	RG-6/U	RG-11/U
Usable picture	1100 (350)	1500 (450)	2400 (750)
Clean picture	820 (250)	1000 (300)	1600 (500)
Best picture	400 (120)	530 (160)	820 (250)

\* Longer cable runs may produce a dim, faint picture. Use a Vicon Video Amplifier to obtain a usable picture for long cable runs.

**Usable Vicoax Signal vs. Cable Length**

Usable Vicoax signal.	Maximum Cable Length ft (m)		
	RG-59/U	RG-6/U	RG-11/U
	1500 (450)	1500 (450)	5000 (1524)

# Twisted-Pair Cable

**▲ Caution:** Careful selection of the proper cable is essential to obtain the best performance from this equipment. Vicon assumes no responsibility for poor performance when cables other than those recommended are installed.

## Materials

Use a pure copper stranded conductor with or without a tin plating to obtain a low DC resistance. Do not use cable with either a steel or an aluminum stranded conductor because these do not transfer signals effectively for long distances. The preferred insulation and cable jacket is Polyvinyl chloride (PVC). It has better electrical characteristics than polyethylene and resists flames, sunlight and most solvents, but is more vulnerable to moisture.

## Cable Types

The most commonly used cable types are dual individually-shielded, twisted pair in a single jacket. This configuration is the most convenient for RS-422/ RS485 applications. Single twisted pair is also a suitable cable.

Choose a Belden cable type by referring to the characteristics and maximum distances listed below. The maximum distance for the most reliable digital control refers to the distance between the CPU/Keypad and the Camera Dome Assembly. The characteristics of the cables in Table 6 should be used as a guideline when cables other than Belden are used. Materials and construction must follow the guidelines above.

CABLE TYPE	WIRE SIZE (AWG)	INSULATION MATERIAL	JACKET MATERIAL	DISTANCE ft (m) max.	NUMBER OF TWISTED PAIRS
Belden 9406	22	PVC	PVC	5000 (1500)	2
Belden 9402	20	PVC	PVC	5000 (1500)	2
Belden 8723	22	Polypropylene	PVC	8000 (2400)	2
Belden 8162	24	Datalene <sup>1</sup>	PVC	15000 (4600)	2
Belden 9729	24	Datalene <sup>1</sup>	PVC	15000 (4600)	2
Belden 9182	22	Datalene <sup>1</sup>	PVC	25000 (7600)	1

<sup>1</sup> Datalene is a Registered Trademark of Belden.

### Recommended Individually-Shielded, Twisted-Pair Cable Types

# Technical Information

## ELECTRICAL

**Input Voltage:** 120 or 230 VAC, 50/60 Hz.

**Current Rating:** 75 mA @ 120 VAC.  
38 mA @ 230 VAC.

**Power Consumption:** 9 W.

**Heat Equivalent:** 0.5 btu/min (0.13 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.

**Line Cord:** Standard 3-conductor SV No. 18 AWG cable with grounding plug.

**Fuse:** 120 VAC: 0.25 A, 250 V, slo blo.  
230 VAC: 0.125 A, 250 V, slo blo.

**Radio Frequency Emission Rating:** FCC Class A.

## CONTROLS and CONNECTORS

**Active (LED):** Red front panel LED indicates power condition.

**Power:** Rear panel 120 or 230 VAC grounded female connector.

**DIP SW1:** 4-pole DIP switch used to set an address for up to 16 V422-VIs (in groups of 16 camera/receivers up to a possible 256).

**Control Station:** RJ-45, RS422 IN and OUT.

**Video:** BNCs, IN and OUT; high impedance input/output loop out.

## OPERATIONAL

**General:** Unit is operated using external control system.

**Control Format:** Converts RS-422 protocol to Vicoax protocol (superimposed digital data on video). Supports simplex or half duplex at 4800 baud rate.

## MECHANICAL

<b>Application:</b>	Indoor.
<b>Mounting:</b>	Rack mount.
<b>Dimensions:</b>	Height: 1.7 in. (43 mm). Depth: 7.1 in. (180 mm). Width: 19.0 in. (483 mm).
<b>Weight:</b>	Approximately 6.5 lb (2.9 kg).
<b>Construction:</b>	Steel chassis and cover.
<b>Finish:</b>	Black baked enamel chassis and cover

## ENVIRONMENTAL

<b>Operating Temperature Range:</b>	32 to 104° F (0 to 40° C).
<b>Operating Humidity:</b>	Up to 90% relative, noncondensing.
<b>Storage Temperature Range:</b>	-40 to 150° F (-40 to 65° C).
<b>Storage Humidity:</b>	Up to 90% relative, noncondensing.

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