

NVA™ 1500 Network Video Switching Control System

- **Supports up to 8192 cameras and 512 monitor stations**
- **Central Processing Unit (CPU) includes internal graphic configurator and complete system database**
- **True network connectivity from CPU to existing Vicon video products through Communication Distribution Unit (CDU)**
- **Multiple levels of CPU redundancy, both local and remote, with instant switchover and no loss of operation over LAN/WAN environment**
- **Network architecture places remote switching systems in any location with the use of CDU**
- **Hot swappable application cards within the CDU provide internal redundancy and allow system maintenance without loss of operation**
- **Capable of replacing existing Vicon CPUs without changing other system components (keypads, PTZ units, matrix switchers, etc.)**

Vicon's V1500 CPU Control System was developed to satisfy the needs of large-scale matrix system users. The V1500 System incorporates LAN communication in a standard, open-architecture design that lends itself to simple expansion. This open-architecture design permits the easy addition of keypads, receivers, alarm devices, video switching units, and host RS-232 controllers.

The Vicon V1500 System is comprised of two main items, the V1500CPU (Central Processing Unit) that stores all system configuration information and the V1500CDU (Communication Distribution Unit) that can be configured in multiple ways to act as a gateway from the network environment to conventional non-network products, such as domes, keypads, matrix switchers, titlers, alarm interface units and other system components.

The V1500 CPU and CDU can each be configured with hot standby capability. This capability will allow redundant components to take over in the event of a primary system failure. The system is capable of supporting a maximum of 8192 cameras and 512 monitors.

V1500 CPU (Central Processing Unit)

The CPU is a rack-mount industrial PC running Windows® Embedded NT Operating System serving as a matrix controller that provides all switching, alarm processing, keypad/receiver communications and titling. The programming of these functions is performed using preloaded Configurator software. The Configurator software provides the following functions:

- User Administration
- Network Configuration
- Event Programming
- Keypad Profiling and Partition Configuration
- Receiver Profile Configuration
- Camera Setup and Partition Configuration
- Monitor Setup Configuration
- Salvo Configuration
- Tour Configuration
- Alarm Processing Configuration
- V1500VGC External Configurator Package Interfacing

The CPU is connected to the system via 10/100 BaseT Ethernet connection in a LAN/WAN system. It requires a connection to a local monitor, PC keyboard and mouse.

V1500 CDU (Communication Distribution Unit)

The CDU is a rack-mount component that interfaces with the V1500 CPU via an Ethernet interface. This unit serves as the network interface between the V1500 CPU and the CCTV components. The CDU is comprised of a card cage, backplane, network adapter, slots for up to 2 power supplies, slots for up to 2 network interface cards and slots for up to 11 application cards as described in Table 1. Each CDU is equipped with a single network interface card and power supply. There are 11 chassis slots for custom configuration of alarm, time/date/titling, video switching, keypad, receiver and host PC control. The configuration is defined by the adapters installed on the rear of the chassis and the Configurator software. The CDU has front panel access to all modules which can be swapped without the need of powering down (hot-swappable).

The CDU is also available with built-in hot standby redundancy that can be configured by adding a second network interface card. All hot standby modules provide immediate switchover support in the event of active module failure. The chassis is also capable of accepting a backup power supply. Any or all of the supported functions (alarm, TDT, video switching, etc.) can be configured for hot standby protection. All cards can be hot-swapped.

V1500 CDU Components

V1500 CDU-CC CDU Card Cage: The V1500 CDU-CC communication distribution card cage comes with one internal power supply and one network interface module. The card cage can be populated with different combinations of serial and parallel modules depending on system/site requirements.

Network Module

This module provides a link between LAN communications and the Serial/Parallel modules. It contains three LEDs to display power, communication and hot-standby status. All network addressing is set by DIP switches or software. Each CDU card cage comes with one network module.

Serial Module

This module provides two ports that provide for serial communications to keypads, receivers, host CPUs and other devices. The ports can be configured for RS-232 or RS-422 protocols. This module contains three LEDs to display power, communication and hot-standby status.

Product Specification (cont'd)

Parallel Module

This module provides two ports for parallel communication to alarm, time/date/titling, and video switching equipment. The function is defined by attaching the appropriate adapter to the rear of the CDU IP card slot. The module has three LEDs to display power, communication, and hot standby status.

Compatibility

The V1500 System was designed for backward compatibility with conventional Vicon systems. The following (see table below) are all compatible with the V1500 Switching Control System.

Matrix Systems Matrix 66 Matrix 44	Receivers: All RS-422 receivers including: Surveyor, Surveyor99 and Surveyor2000, V1311RB Series with V1311R-VPS Interface Titlers: V1300X-TDT Titler System Alarm Interfaces: V1300X-IA, V1200X-IA
Keypads V1300X-DVC V1300X-RVC V1400X-DVC V1410X-DVC	
GUI V1400X-PAC	

Model	Product Code	Description
V1500 CPU CONFIGURATION		
V1500CPU	7709	V1500 Central Processing Unit, network-based.
V1500 CDU CONFIGURATIONS		
V1500CDU-1	7715	V1500 Central Distribution Unit, configured typical.
V1500CDU-H-1	7710	V1500 Central Distribution Unit, configured typical Hot Standby.
<i>Note: Several versions of typical CDUs are available with variations in communication modules.</i>		
V1500 CDU COMPONENTS		
V1500CDU-CC	7222	V1500 Central Distribution Unit Card Cage. Includes Power and Network modules.
V1500CDUH-CC	8236	V1500 Central Distribution Unit Card Cage, Includes 2 Power and 2 Network modules.
V1500CDU-ALRM	7223	V1500 Central Distribution Unit Card Cage Alarm Module.
V1500CDU-TDT	7224	V1500 Central Distribution Unit Card Cage Time/Date/Titler Module.
V1500CDU-VID	7225	V1500 Central Distribution Unit Card Cage Video Module.
V1500CDU-SER	7226	V1500 Central Distribution Unit Card Serial Card Module.
V1500CDU-RCP	7227	V1500 Central Distribution Unit Blank Enclosure Panel.
V1500HSB-POW	7228	V1500 Central Distribution Unit Power Module.
V1500HSB-NET	7229	V1500 Central Distribution Unit Network Module.
V1500CDU-HSB-ALRM	7230	V1500 Central Distribution Unit Hot Standby Alarm Module.
V1500CDU-HSB-TDT	7231	V1500 Central Distribution Unit Hot Standby Time/Date/Titler Module.
V1500CDU-HSB-VID	7232	V1500 Central Distribution Unit Hot Standby Video Switcher Module.
V1500CDU-HSB-SER	7233	V1500 Central Distribution Unit Hot Standby Serial Card Module.
OPTIONAL V1500 KVM COMPONENTS		
V1500-KVM-R	7634	V1500 Keyboard, Video and Mouse Multiplexer with Cable.
V1500-KVM-CAB	7636	V1500-KVM-R Cable, for additional PCs.
V1500X-PKA-MS	8203	Keyboard and Mouse.
OPTIONAL V1500 NETWORK COMPONENTS		
NETSWITCH-8	7787	8 Port, 10/100 Autosensing Network Switch, stackable.
CAT5e-PATCH-6	7788	CAT5e Patch Cable, 6 ft, blue, preterminated with RJ-45 booted connectors.
CAT5e-PATCH-10	7789	CAT5e Patch Cable, 10 ft, blue, preterminated with RJ-45 booted connectors.

Table 1: Models, Product Codes and Descriptions

Vicon Product Facts		Model No: See Table 1	Product Code: See Table 1	SEC: 9	SPEC: V087	REV: 603
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**TECHNICAL SPECIFICATIONS
DIVISION 13 - SPECIAL CONSTRUCTION
SECTION 137__ - SECURITY CCTV SYSTEM**

SECURITY SYSTEM

PART 2 - PRODUCTS

2.01 GENERAL

- A. All equipment and materials used shall be standard components, regularly manufactured, regularly utilized in the manufacturer's system.
- B. All systems and components shall have been thoroughly tested and proven in actual use.
- C. All systems and components shall be provided with the availability of a toll free 24-hour technical support phone number from the manufacturer. The phone number shall allow for immediate technical assistance for either the dealer/installer or the end user at no charge.
- D. All systems and components shall be provided with an explicit manufacturer warranty.

2.02 PC-BASED LAN MATRIX SYSTEM

- A. The Switching Control System shall use standard 10/100-BaseT Ethernet communicable protocol to distribute operator commands to system keypads, matrix video switcher bays, receivers/distribution units, interfaces, titlers and RS-232 host ports.
- B. The Switching Control System shall be comprised of one or more CPUs (Central Processing Unit) and one or more CDUs (Communication Distribution Unit).
- C. The CPU shall be a PC-based system with an embedded NT operating system that includes a graphical user interface used to program and store system parameters as follows:
 - User Administration
 - Receivers
 - Monitors
 - Keypads
 - Alarms
 - Events
 - Tours
 - Ports
 - Communications Protocol
- D. The CPU shall meet or exceed the following design and performance specs: support 8192 cameras, 512 monitors, 8192 direct alarms, 512 keypads/consoles/host RS-232, 256 tours with 128 salvos and 64 time-activated events.
- E. The CPU shall be provided with a CD-R/W drive, 3.5-inch floppy drive and an RJ-45 connection for LAN/WAN interface. The CPU shall be a Personal Computer with a Windows NT (Embedded) operating system. The hardware platform shall be a Pentium III, 600 MHz processor, 256 MB of RAM, 40 GB hard drive and a video display driver capable of 1024 × 768 pixel resolution with a minimum of 256 colors, 16-bit color preferred.
- F. The CPU shall be configurable as primary or hot-standby (redundant). The primary and redundant CPUs shall communicate configuration updates and operational states via the Ethernet network. In the event of a failure of the primary CPU, the redundant CPU shall automatically assume system control without disruption of system operations.
- G. An API shall be available which shall provide easy third party integration. The API shall include software links to all major system functions for programming and control.
- H. The CDU (Communication Distribution Unit) shall have the following design and performance parameters: consist of a card cage backplane providing 15 slots for different application cards, 2 for the power supplies and 2 for the 10/100 BaseT Network Interface cards.
- I. The CDU shall be capable of different configurations of application modules for primary operation and internal redundancy of all functions including: Network Communications, Power Supply, Video Switching Interface, Keypad/Receiver Communications, TDT, Alarm Communications and Host PC Interface.

Contractors' Specification (cont'd)

J. The CDU shall be configured by installing the appropriate Application Modules in the Card Cage Backplane. Each module shall consist of an Application Card and an Adapter Plate. The Backplane shall consist of 15 total card slots; 2 dedicated Power Supply slots, 2 dedicated Network Card Slots and 11 dedicated slots for the application cards. There shall be two basic application card types, Serial and Parallel. When each of these cards is paired with a particular Adapter Plate, the combination shall form an Application Module. All modules shall be entirely software configurable using proprietary software. Modules shall be installed in their proper slots on an as-needed basis for any particular configuration of communications parameters. Adapter Plates shall provide the proper rear panel external connector. All modules shall be available in standalone and hot-standby configurations. The front of each card shall house 3 LEDs that provide system status. The LEDs shall be defined as follows:

LED Color	On	Flashing	Off
Red	Module powered and operating	Module powered, not operating	Module not powered, not functional
Green	Module communicating with CPU	Not Applicable	Module not communicating with CPU
Amber	Not Applicable	Greater than 1 sec rate, Module normal operation. Less than 1 sec rate, Module normal operation, no communication	Module hot-standby secondary

K. The modules shall be defined as follows:

1. The Alarm Module shall consist of a one-slot card and a two-slot adapter plate having two 37-pin connectors. This module shall be a parallel communications type and installed in any of the available 11 slots (slot numbers 3-13). Each connector port shall be capable of connecting to a maximum of 256 discrete alarm inputs via alarm interface units. Each card shall be capable of handling up to 512 discrete alarm inputs.
2. The Video Module shall consist of a one-slot card and a two-slot adapter plate having two 25-pin connectors and one BNC-F video input connector. This module shall be a parallel communications type and installed in any of the available 11 slots (slot number 3-13). The video input connector shall accept a sample matrix video signal to ensure video switching during the vertical interval. Each module shall be capable of connecting to multiple video matrix card cages and handle up to 8192 cameras and 64 monitors (or 4096 cameras and 128 monitors).
3. The TDT Module shall consist of a one-slot card and a one-slot adapter plate having two 25-pin connectors. This module shall be a parallel communications type and installed in any of the available 11 slots (slot number 3-13). Each module shall connect to a maximum of four external titling units using a single cable for each pair. Each module shall be capable of handling up to 128 discrete monitors.
4. The Serial Module shall consist of a one-slot card and a one-slot adapter plate having two RJ-45 connectors. This module shall be a serial communications type and installed in any of the available 11 slots (slot number 3-13). Each module shall provide software-configurable RS-232 or RS-422 protocol. Each module shall connect to a maximum number of devices, based on the protocol, as follows:
 RS-232 Protocol: 1 generic device per port, Host PC currently supported.
 RS-422 Protocol: 16 proprietary keypads or 256 proprietary receivers.
5. The Power Module shall consist of a two-slot card and a four-slot adapter plate having one 120 VAC/230 VAC receptacle/fuse block assembly. This module shall be a unique type and installed in only two dedicated slots (slot number 14-15). Each module shall provide power to the entire CDU Card Cage. A maximum of 2 Power Cards can be installed (Hot-Standby configuration) in any CDU Card Cage and one Power Card must be installed for the CDU to operate.
6. The Network Module shall consist of a one-slot card and a two-slot adapter plate having two RJ-45 connectors. This module shall be a unique type and installed in only two dedicated slots (slot number 1-2). Each module shall connect to a maximum of 1 network device (hub or switch), supporting standard Ethernet TCP/IP protocol and using a single cable for connection. The CDU shall connect to the CPU via this module and shall be IP-addressable.

Contractors' Specification (cont'd)

7. The Hot-Standby Alarm Module shall consist of two one-slot cards and a three-slot adapter plate having two 37-pin connectors. This module shall be a parallel communications type and installed in any of the available 11 slots (slot number 3-13). Each connector port shall be capable of connecting to a maximum of 256 discrete alarm inputs via alarm interface units. Upon failure of the primary alarm card, the secondary alarm card shall provide immediate operation of the alarm handling. Any failed card shall be hot-swappable.
8. The Hot-Standby TDT Module shall consist of two one-slot cards and a two-slot adapter plate having two 25-pin connectors. This module shall be a parallel communications type and installed in any of the available 11 slots (slot number 3-13). Each module shall connect to a maximum of four external titling units using a single cable for each unit. Each module shall be capable of handling up to 128 discrete monitors. Upon failure of the primary TDT card, the secondary card shall provide immediate operation of the TDT operation. Any failed card shall be hot-swappable.
9. The Hot-Standby Video Module shall consist of two one-slot cards and a two-slot adapter plate having two 25-pin connectors and one BNC-F video input connector. This module shall be a parallel communications type and installed in any of the available 11 slots (slot number 3-13). The video input connector shall require a sample matrix video signal for timing purposes. Each module shall be capable of connecting to multiple video matrix card cages and handle up to 8192 cameras and 64 monitors. Upon failure of the primary video card, the secondary card shall provide immediate operation of the video switching. Any failed card shall be hot-swappable.
10. The Hot-Standby Serial Module shall consist of two one-slot cards and a two-slot adapter plate having two RJ-45 connectors. This module shall be a serial communications type and installed in any of the available 11 slots (slot number 3-13). Each module shall provide software-configurable RS-232 or RS-422 protocol. Each module shall connect to a maximum number of devices, based on the protocol, as follows:
 - RS-232 Protocol: 1 generic device per port, Host PC currently supported.
 - RS-422 Protocol: 16 proprietary keypads or 256 proprietary receivers.
 Upon failure of the primary Serial Comm card, the secondary card shall provide immediate operation of the serial communications. Any failed card shall be hot-swappable.
11. The Hot-Standby Network Module shall consist of two one-slot cards and a two-slot adapter plate having two RJ-45 connectors. This module shall be a unique type and installed in only two dedicated slots (slot number 1-2). Each module shall connect to a maximum of 1 network device (hub or switch), supporting standard Ethernet TC/IP protocol and using a single cable for connection. The CDU shall connect to the CPU via this module and shall be IP-addressable. Upon failure of the primary network card, the secondary card shall provide immediate operation of network communications. Any failed card shall be hot-swappable.
12. The Hot-Standby Power Module configuration shall consist of two standard power cards and a four-slot adapter plate having one 120 VAC/230VAC receptacle/fuse block assembly. This module shall be a unique type and installed in only two dedicated slots (slot number 14-15). This module shall provide redundant power to the entire CDU card cage. Upon failure of either of the power cards, the remaining card shall provide continuous operation of the CDU card cage. Any failed power supply card shall be hot-swappable.
- L. The Switching Control System shall be modular in design, utilizing standard rack-mount card cage enclosures and front panels finished in black with white screen printing. The CPU shall measure 3.5 in. (89 mm) high, 19.0 in. (483 mm) side and 17.7 in. (450 mm) deep and weigh 21.8 lb (9.7 kg). The CDU shall measure 5.25 in. (133 mm) high, 19.0 in. (483 mm) wide, 14.0 in. (355.5 mm) deep and weigh 21.2 lb (9.6 kg).
- M. The Switching Control System shall be Vicon models V1500CPU and V1500CDU. The V1500CPU and V1500CDU shall be equipped with a universal power input of 120 VAC-230 VAC. There shall be no configuring of switches or fuses for correct power and shall be provided with 2 proper line cords.

Technical Information

ELECTRICAL (V1500CPU)

- Input Voltage:** Selectable 120/230 VAC, 47-64 Hz.
Current: 6A nominal.
Power Consumption: 300 W nominal
Heat Equivalent: 17.0 btu/min (4.3 kg-cal/min) max.
Note: These figures represent the conversion of 100% of the electrical energy to heat. Actual percentage of the 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.
- CPU:** Pentium® III, Intel® 600 MHz.
RAM Memory: 256 MB.
Hard Drive: 40 GB.
Operating System: Windows® NT Embedded.
Display Adapter: 1024 × 768 pixels, 16-bit color.
LAN Interface: 10/100 BaseT Ethernet interface on main board.
Floppy Drive: Standard 3.5 inch.
CD Drive: Internal CD-RW drive.
Front Panel Controls/Indicators: Power on/off/reset switch, power on low voltage power supply, hard drive activity LEDs.
- Radio Frequency Emission Rating:** FCC Class A.

ELECTRICAL (V1500CDU)

- Input Voltage:** Universal 85-265 VAC, 47-60 Hz.
Current: 300 mA nominal.
Power Consumption: 36 W nominal.
Heat Equivalent: 2.0 btu/min (0.5 kg-cal/min) max.
Note: These figures represent the conversion of 100% of the electrical energy to heat. Actual percentage of the 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.
- Rear Panel Controls/Indicators:** Network: Two RJ-45 connectors.
Video: Two 25-pin D-shell connectors and one BNC-F connector.
Alarm: Two 37-pin D-shell connectors.
Serial: Two RJ-45 connectors.
TDT: Two DB-25.
- Radio Frequency Emission Rating:** FCC Class B and EN55022.

MECHANICAL (V1500CPU)

- Application:** Indoor.
Mounting: Rack mounted in a standard EIA compliant rack, 19 in. (483 mm) wide opening. Rack height is 4 in. (102 mm) or 2U.
Drive Bays: Three (3) total shock mount bays. Two (2) bays are 5.25 in. (133 mm) or 3.5 in. (89 mm) external access and one (1) 3.5 in. (89 mm) internal.

- Dimensions:** Width (W): 19.0 in. (483 mm).
Depth (D): 17.7 in. (450 mm).
Height (H): 3.5 in. (89 mm).

Weight: 21.8 lb (9.8 kg).

- Shipping Dimensions:** Width: 23.5 in. (597 mm).
Height: 8.5 in. (203 mm).
Depth: 23.5 in. (597 mm).

Shipping Weight: 27.2 lb (12.3 kg).

Construction: Heavy duty steel.

Color: Matte black finish.

MECHANICAL (V1500CDU)

Application: Indoor.

Mounting: Rack mounted in a standard EIA compliant rack, 19 in. (483 mm) wide opening. Rack height is 5.25 in. (133 mm) or 3U.

Configuration: Application and power modules are front panel accessible. The card cage is fitted with a hinged front cover, upper and lower card guides and manual ejectors for easy card mounting. Connector modules are accessible through the rear and independently serviceable.

Dimensions: Width (W): 19.0 in. (483 mm).
Height (H): 5.25 in. (133 mm).
Depth (D): 14.0 in. (355.5 mm) with external hardware.

Weight: 21.2 lb (9.6 kg) standard configuration.

- Shipping Dimensions:** Width: 22.5 in. (571.5 mm).
Height: 9.75 in. (248 mm).
Depth: 20.75 in. (527 mm).

Shipping Weight: 28.7 lb (13.0 kg).

Construction: Sheet steel with galvanized plating.

Color: Matte black finish.

OPERATIONAL

Compatibility: Compatible with all generations of V1400 matrix system components, V1300 matrix system components, NOVA and Surveyor product lines.

Maximum Component Configurations:

- Video Inputs: 8192.
Monitor Outputs: 512.
Receiver/Dome Support: 8192.
XIA Alarm Inputs: 8192.
Keypad/Console/Host RS-232 Support: 512.
Time/Date/Title Outputs: 512.
Video Tour Patterns: 256.
Salvo Switch Configurations: 128.

Camera/Alarm

Title Configuration: One (1) line of 20 characters per camera/alarm.

ENVIRONMENTAL (V1500CPU)

- Operating Temperature Range:** 32 to 113° F (0 to 45° C).
Operating Humidity Range: 10 to 90%, noncondensing.

Technical Information (cont'd)

ENVIRONMENTAL (V1500CDU)

Operating Temperature Range: 32 to 113° F (0 to 45° C).

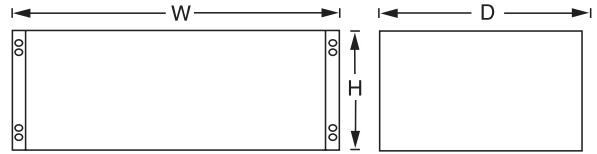
Operating Humidity Range: 10 to 90%, noncondensing.

ADDITIONAL COMPLIANCE (Main CPU and CDU)

Vibration Testing, Unit packed: Complies with MIL-STD-202F. Complies with method 2 of ASTM D999.

Drop Test: Complies with ASTM D775.

Stack Height Test: Complies with ASTM D999.



NOVA 1500 System Layout

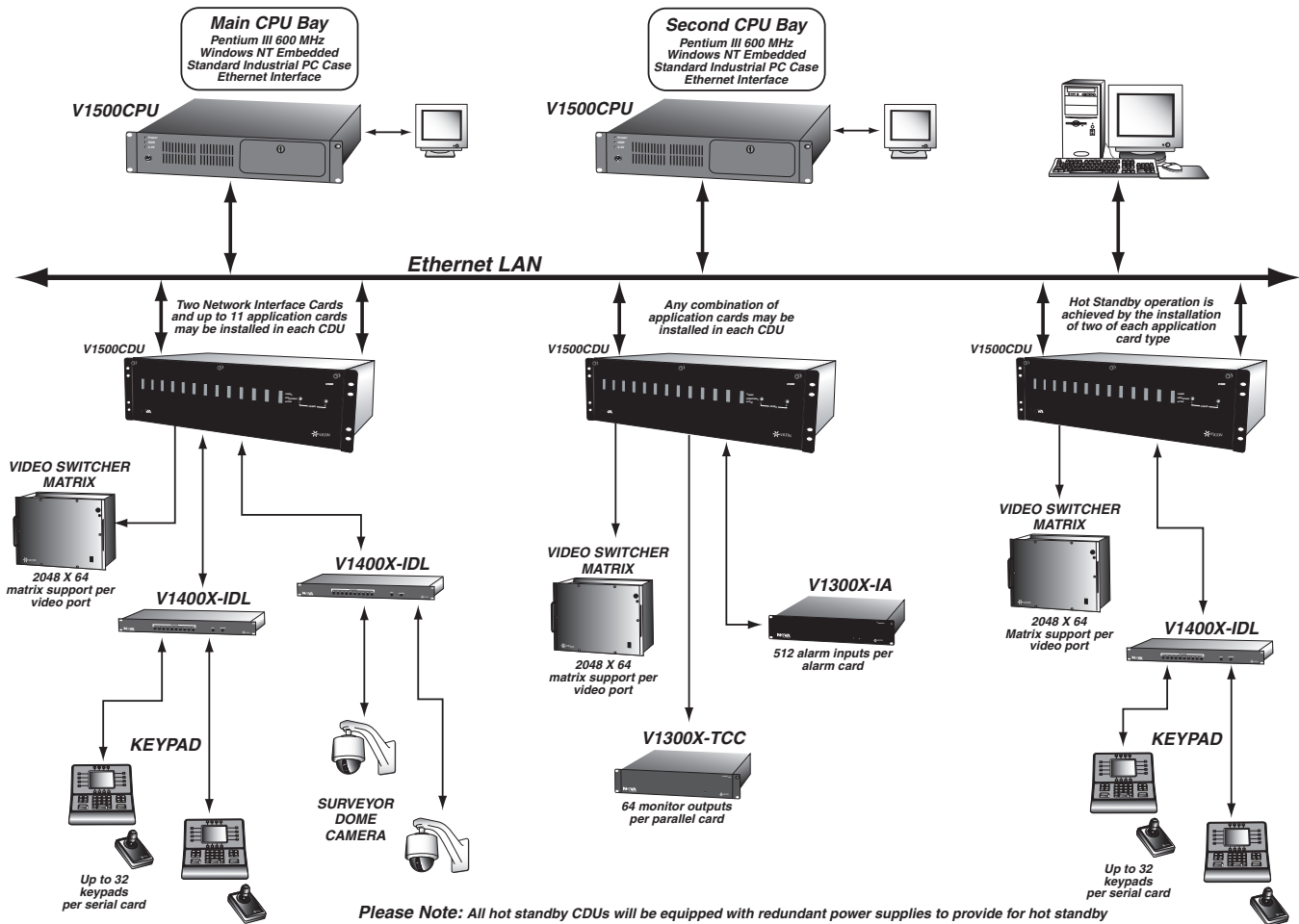


Figure 1: System Layout