

NCS™ V1500 Network Video Switching Management System

- **Supports over 8000 cameras and 512 monitor stations**
- **Embedded NT 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 personality cards within the CDU provide internal redundancy and allow system maintenance without loss of operation**
- **Capable of replace existing Vicon CPUs without changing other system components. (Keypads, PTZ units, matrix switching, etc...)**
- **Full hot-swap capability of all communication cards**

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 V1500-CPU (Central Processing Unit) that stores all system configuration information and the V1500-CDU (Communication Distribution Unit) which 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 stand-by 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 Unit (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 using a single Ethernet Cable, equipped with standard RJ-45 connectors, in a LAN/WAN system. It requires a local monitor and PC keyboard connected.

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 chassis, 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. There is a serial module for providing keypad, receiver and video switching functions. The configuration is defined by the adapters installed on the rear of the chassis. The CDU has front panel access to all modules which can be swapped without the need of powering down.

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

V1500 CDU Components

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

Product Specification (cont'd)

Network Module

This module provides a link between LAN communications and Serial/Parallel communications. It is equipped with an RJ-45 connector for simple connection. It contains three LEDs to display power, communication and hot-standby status. All network addressing is set by DIP switches or software. Each CDU chassis comes with one network module.

Serial Module

This module provides two ports that allow serial communications for keypads, receivers, host CPUs and other devices. The ports can be configured for RS-232, RS-422 or RS-485 protocols. This module contains three LEDs to display power, communication and hot-standby status.

Parallel Module

This module provides two ports for parallel communication for alarm, time/date/titling, and video switching equipment. The function is defined by attaching the appropriate adapter to the rear of the CDU 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 are all compatible with the V1500 Video Switcher Management System.

Matrix Systems	Matrix 66 Matrix 44	Receivers:	All RS-422 receivers including: Surveyor, Surveyor99 and S2K V1311R-1W, 2W and 3W with V1311R-VPS Interface
Keypads	V1300X-DVC V1400X-DVC V1410X-DVC	Titlers:	V1300X-TDT Titler System
GUI	V1400X-PAC	Alarm Interface:	V1300X-IA V1200X-IA

Contractors' Specification

PC Based LAN Matrix System

The Video Switching Management System shall use standard 10/100-Base-T Ethernet communicable protocol to distinguish operator comments to system keypads, matrix video switcher bays, receivers/distribution units, interfaces, titlers and RS-232 host ports.

The Video Switching Management System shall be comprised of one or more CPU units (Central Processing Unit) and one or more CDUs (Communication Distribution Unit).

The CPU shall be a PC-based system with an embedded NT operating system that includes a graphic user interface used to program and store system parameters as follows:

- User Administration
- Receivers
- Monitors
- Keypads
- Alarms
- Events
- Tours
- Ports
- Communications Protocol

The CPU shall meet or exceed the following design and performance specs. The CPU shall support 8192 cameras, 512 monitors, 8192 direct alarms, 512 keypads/conssoles/host RS-232, 256 tours with 128 salvos and 128 time-activated events.

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 computer platform shall be a Pentium III, 600 MHz processor, 256 MB of RAM, 40 GB hard drive and a display monitor capable of 1024 × 768 pixel resolution with a minimum of 256 colors, 16-bit color preferred.

The CPU shall be configurable as a primary or hot-standby (redundant). The primary and redundant CPUs shall, on a regular basis, communicate configuration updates and operational states via the TCP/IP network. In the event of a failure of the primary CPU, two redundant CPUs shall automatically assume system operation without disruption of system operations.

The CPU shall have a pre-developed API for easy third party integration. The API shall include software links to all major system functions for programming and control. Contact Vicon Industries for details.

The CDU (Communication Distribution Unit) shall have the following design and performance parameters: It shall consist of a chassis backplane accompanying 13 slots for different application cards, a power supply and a 10/100 Base-T Network Interface card.

Contractors' Specification (cont'd)

The CDU shall be capable of different configurations of personality 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.

The CDU shall be configured by installing the appropriate Application Modules in the Chassis 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 Communication Cards. There shall be two basic Communication 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-need 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	>1 sec rate, Module normal operation <1 sec rate, Module normal operation, no communications	Module hot-standby secondary

The modules shall be defined as follows:

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 module shall be capable of connecting to a maximum of 16 external alarm interface units using one cable per 8 units. Each card shall be capable of handling up to 512 discrete alarm inputs.

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 two external titling units using a single cable for each unit. Each module shall be capable of handling up to 128 discrete monitors.

The Video Module, for systems below 2048 cameras, shall consist of a one-slot card and a one-slot adapter plate having one 25-pin connector 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 2048 cameras and 64 monitors.

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: 32 Vicon keypads or 256 Vicon Receivers.

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 Chassis. A maximum of 2 Power Cards can be installed (Hot-Standby configuration) in any CDU Chassis and one Power Card must be installed for the CDU to operate.

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 protocol and using a single cable for connection. The CDU shall connect to the CPU via this module and shall be comprised of a partially hard-coded IP addressing scheme (IP, Gateway and Subnet), allowing configuration of the lowest 2 IP Address nibbles for address setting. If necessary to integrate this system into an existing network, the Network Module shall provide a mode of complete unique IP Addressing capability with no hard-coded nibbles.

Contractors' Specification (cont'd)

The Video Module for systems above 2048 cameras, 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 require a sample matrix video signal for timing purposes. Each module shall be capable of connecting to multiple video matrix card cages and combiner systems handling between 2048 cameras/128 monitors and 8192 cameras/64 monitors.

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 module shall be capable of connecting to a maximum of 16 external alarm interface units using one cable per 8 units. Each card shall be capable of handling up to 512 discrete alarm inputs. Upon failure of the primary alarm bank, the secondary alarm bank shall provide immediate operation of the system alarm handling. Any failed card shall be hotswappable.

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 two 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 bank, the secondary bank shall provide immediate operation of the system TDT operation. Any failed card shall be hotswappable.

The Hot-Standby Video Module, for systems below 2048 cameras, 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 2048 cameras and 64 monitors. Upon failure of the primary Video bank, the secondary bank shall provide immediate operation of the system Video switching. Any failed card shall be hotswappable.

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: 32 Vicon keypads or 256 Vicon Receivers.

Upon failure of the primary Serial Comm bank, the secondary bank shall provide immediate operation of the system Serial Communications. Any failed card shall be hotswappable.

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 protocol and using a single cable for connection. The CDU shall be comprised of a partially hard-coded IP addressing scheme (IP, Gateway and Subnet), allowing configuration of the lowest 2 IP address nibbles for address setting. If necessary to integrate this system into an existing network, the hot-standby network module shall provide complete unique IP addressing capability with no hard-coded nibbles. Upon failure of the primary network bank, the secondary bank shall provide immediate operation of system network communications. Any failed card shall be hot-swappable.

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 chassis. Upon failure of either of the Power Cards, the remaining card shall provide continuous operation of the CDU chassis. Any failed card shall be hotswappable.

The Video Switching Management System shall be modular in design, utilizing standard rack-mount chassis 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 weight 21.2 lb (9.6 kg).

The Video Switching Management System shall be Vicon models V1500-CPU and V1500-CDU. The V1500-CPU and V1500-CDU shall be equipped with a universal power input of 120 VAC-230VAC. There shall be no configuring of switches or fuses for correct power and shall be provided with 2 proper line cords.

Model	Product Code	Description
V1500 CPU CONFIGURATION		
V1500CPU	7709	V1500CPU, Network-based.
V1500 CDU CONFIGURATIONS		
V1500DU-TYP	7715	V1500 Central Distribution Unit configured typical.
V1500DU-TYP-HSB	7710	V1500 Central Distribution Unit configured typical Hot Standby.
V1500 CDU COMPONENTS		
V1500DU-CC	7222	V1500 CPU Central Distribution Unit Card Cage. Includes Power and Network modules.
V1500DU-ALRM	7223	V1500 CPU Central Distribution Unit Card Cage Alarm Module.
V1500DU-TDT	7224	V1500 CPU Central Distribution Unit Card Cage Time/Date/Title Module.
V1500DU-VID	7225	V1500 CPU Central Distribution Unit Card Cage Video Module for systems up to 2048 inputs.
V1500DU-SER	7226	V1500 CPU Central Distribution Unit Card Serial Card Module.
V1500DU-RCP	7227	V1500 CPU Central Distribution Unit Blank Enclosure Panel.
V1500HSB-POW	7228	V1500 CPU Central Distribution Unit Power Module.
V1500HSB-NET	7229	V1500 CPU Central Distribution Unit Network Module.
V1500DU-HSB-ALRM	7230	V1500 CPU Central Distribution Unit Hot Standby Alarm Module.
V1500DU-HSB-TDT	7231	V1500 CPU Central Distribution Unit Hot Standby Time/Date/Title Module.
V1500DU-HSB-VID	7232	V1500 CPU Central Distribution Unit Hot Standby Video Switcher Module.
V1500DU-HSB-SER	7233	V1500 CPU Central Distribution Unit Hot Standby Serial Card Module.
V1500DU-VID-EXP	7477	V1500 CPU Central Distribution Unit Card Cage Video Module for systems above 2048 inputs.
V1500 KVM COMPONENTS		
V1500-KVM-R	7634	V1500 Keyboard, Video and Mouse Multiplexer with Cable.
V1500-KVM-CAB	7636	V1500-KVM-R Cable.
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

Technical Information

ELECTRICAL (V1500-CPU)

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 x 768 pixels, 16-bit color.

LAN Interface: 10/100 MBps 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.

European Community

(CE) Standards: EN 50081-1 generic emissions.
 EN-50082-1 generic immunity.

ELECTRICAL (V1500-CDU)

Input Voltage: Universal 85-265 VAC, 47-60 Hz.

Current: 300 mA nominal.

Power Consumption: 36 W nominal.

Technical Information (cont'd)

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.
 Alarm: Two 37-pin D-shell connectors.
 Serial: Two RJ-45 connectors.

Radio Frequency Emission Rating: FCC Class B and EN55022.

European Community (CE) Standards: EN 50081-1 generic emissions.
 EN-50082-1 generic immunity.

MECHANICAL (V1500-CPU)

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 (V1500-CDU)

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: Personality and power modules are front panel accessible. The chassis is fitted with a removable 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: 19.0 in. (483 mm).
 Height: 5.25 in. (133 mm).
 Depth: 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: The V1500 is compatible with all generations of V1400 matrix system components, V1300 matrix system components, NOVA and Surveyor product lines.

Maximum Component Configurations:

Video Inputs: 2048 standard, 8192 expanded.
 Monitor Outputs: 64 standard, 512 expanded.
 Receiver/Dome Support: 4096 standard, 8192 expanded.
 XIA Alarm Inputs: 4096 standard, 8192 expanded.
 Keypad/Console/Host RS-232 Support: 256 standard, 512 expanded.
 Time/Date/Title Outputs: 512 standard and expanded.
 Video Tour Patterns: 256 standard, 512 expanded.
 Salvo Switch Configurations: 256 standard, 512 expanded.

Camera/Alarm Title Configuration:

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

ENVIRONMENTAL (V1500-CPU)

Operating

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

Operating

Humidity Range: 10 to 90%, noncondensing.

ENVIRONMENTAL (V1500-CDU)

Operating

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

Operating

Humidity Range: 10 to 90%, noncondensing.

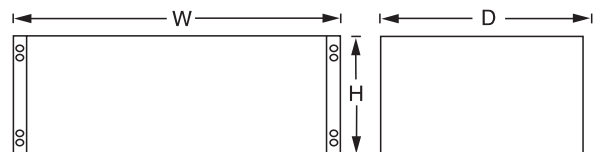
ADDITIONAL COMPLIANCE (Main CPU and CDU)

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.



VPS1500 System Layout

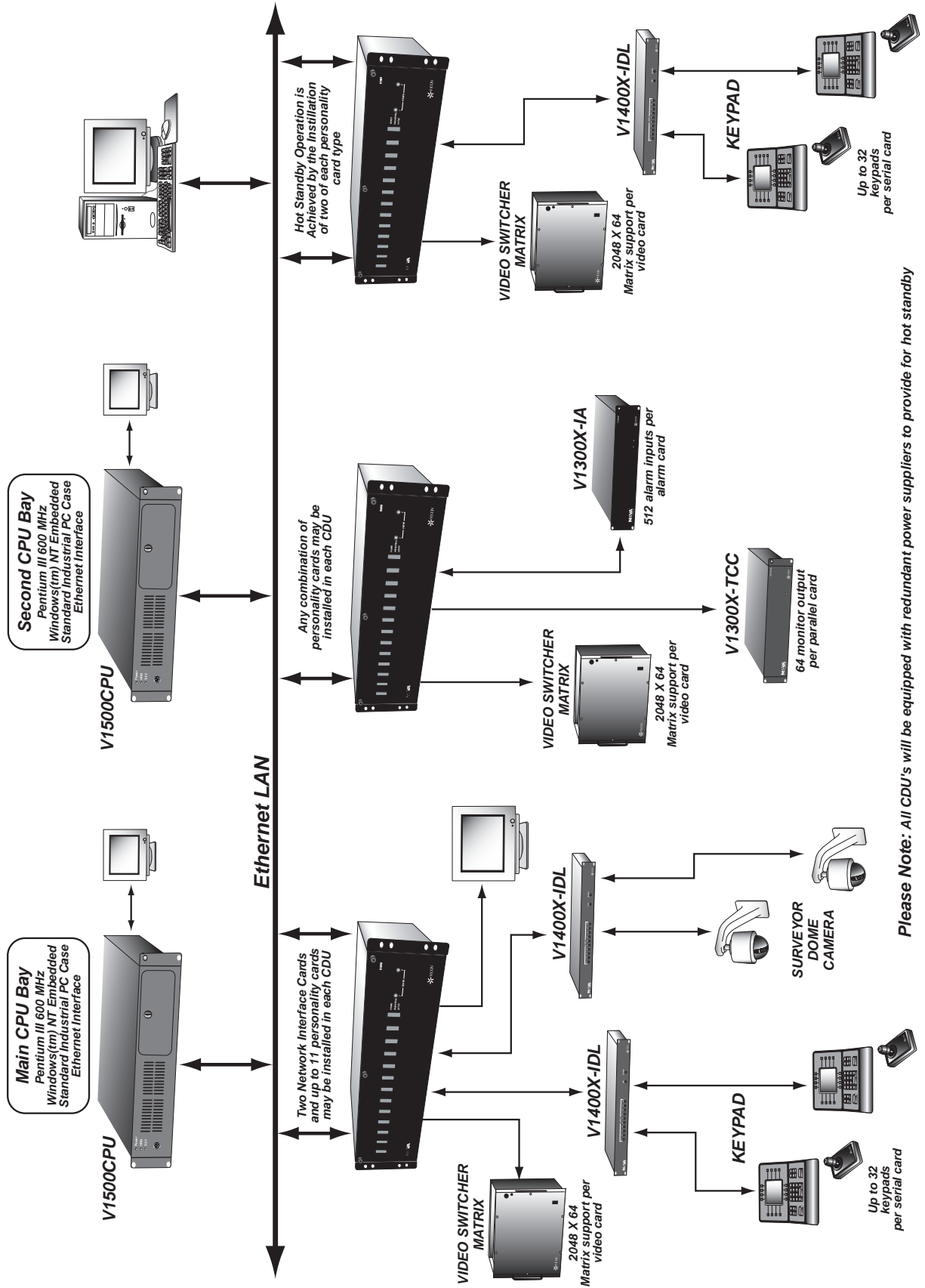


Figure 1: System Layout

Please Note: All CDU's will be equipped with redundant power suppliers to provide for hot standby