ADEMCO V-NET
VISTA Networking System
Installation Manual

1. DESCRIPTION

V-NET is an integrated system of elements that permits management and control of networked systems of up to 32 or multiples of 32 VISTA control panels. The network is controlled by a PC with ADEMCO software installed. Unlike passive wired local monitoring systems, V-NET is a true network, with two-way communication on a RS-485 serial digital communication bus.

It has been conceived in response to market demand to extend the existing VISTA systems to very large installations, including industrial sites, shopping malls, large office buildings. banking centers, museums, residential and commercial complexes, etc.

V-NET is built on the strong foundation of VISTA security systems, a well established family of control panels and accessories. It allows the user to take full advantage of VISTA's sophisticated features, such as wireless sensors, partitioning, schedule management, digital telephone communication, downloading, etc. Each VISTA is a stand-alone and self contained system, while V-NET is an additional layered feature, that connects the remote sub-systems together, creating a centrally managed network with distributed intelligence.

The basic elements of the network are: a PC with a WINDOWS operating system, a data converter/concentrator, an interface for each VISTA control panel and VISTA control panels themselves.

2. SYSTEM APPLICATION AND CONFIGURATION GUIDELINES

V-NET, as with any security installation, will greatly benefit from careful system design. Therefore, it is advisable that the designers have prior experience with VISTA systems.

The main advantages of V-NET are an almost infinite flexibility and future expansibility. The designer should take into account and plan the system in such a way that the user/investor is able to easily add new components and change the configuration of the system.

The possibility of integration with other electronic devices and systems should be considered in advance, as we constantly improve and upgrade the hardware and software of V-NET in order to accomodate new elements in the network, such as CCTV systems, fire detection systems, building management systems, access control, etc.

V-NET may be configured in many different ways. The networking can be added to an existing group of control panels in close proximity to one another, or the system can be designed and installed as a network from the beginning. The whole network may be used to protect one large premises with one common owner, or a premises with a group of independent owners.

The designer should start the project by dividing the area to be protected into small sub-areas, which can each be covered by one small VISTA system or by one partition of the larger, partitioned VISTA control panel. Each sub-area division should have some common logical characteristic, for example common owner, equal level of security, same operating hours, personnel access limitations,etc.

Special attention should be paid to the protection of the network elements, which should be well hidden and placed within zones that are protected when the control panel is ARMED. In addition the various elements should be tamper protected, with emphasis on the wiring, DC power supply, AC switching and crossing points powering the system, interface boxes and the VISTA control panels themselves.

Additional, independent telephone or LRR (Long Range Radio) monitoring at an external control room may be considered for extra security, at least for the most important sub-sytems.

The sounders of individual sub-systems should be installed as in a "normal" stand-alone system, so as to give appropriate warning in case the network fails, or if it is subjected to tampering attacks, or if the operator is attacked or held-up.

Special attention should be paid to the organization of the guard room, which must be done in accordance with Alarm Monitoring Central Station organization rules. The detailed description of the latter configuration is beyond the scope of this manual, but we do recommend proper protection against hold-up and equipping the guard room with good telecommunication facilities.

3. VISTA CONTROL PANELS

3.1 Compatibility

The VISTA family of control panels extends from a simple, 8 zone panel AD-4120 to the top of the line VISTA 4140XMPT2, and soon it will be introduced VISTA 120. In addition there are many regional versions for different parts of the world. Not all models however are compatible. The table below specifies the models which are compatible with V-NET.

VISTA Control Panel	Nr. of Zones	Nr. of Partitions	V-NET Compatibility
4120 SP	8	1	YES
4120XM	8 - 24	1	YES
4120 XMP	8 - 64	1	YES
4140 XMP	8 - 64	1	YESI
4140 XMP-EU	9 - 89	1	YES
4140 XMPT2	9 - 86	8	YESI
VISTA 120	9 - 128	8 + 1	YES
VISTA - 50P	9 - 86	8 + 1	YES

In case of doubt, please contact your ADEMCO distributor.

3.2 Advanced Features

VISTA control panels, depending on the model, offer many important advanced features, which should be checked and understood by the designer/installer before designing the network. None of the features normally available in the VISTA systems are limited or compromised in the networking application.

Just remember the most important ones; these are:

- possibility of wireless expansion using supervised wireless detectors, pushbuttons, consoles and accessories

- possibility of addressable multiplex expansion using dedicated devices and conventional detectors via adaptor modules

- internal, non volatile event logging (important for user code storage, it is not possible using the PC)

- digital telephone monitoring (multiformat, including ADEMCO Contact ID format)

- printer output

- timer controlled, real time, programmable scheduling for the control of the system and for driving output relays by means of an intelligent monthly plan

- X-10 appliance control compatibility by means of modulation of the mains AC network

- output contacts with relay driving capability

- direct wired and telephone downloading/uploading feature

- voice module compatibility for remote control of the system via DTMF telephone with digital synthesized speech from VISTA.

3.3 Programming

The VISTA control panel requires very little programming, within the network PC, in order to be connected. The most important thing is to program the virtual consoles in the partitioned VISTA systems (models 4140 XMPT, XMPT2, V-50P and V-120). The network interface is parallel connected to the console bus of the VISTA and reads the data present on this bus. The various commands from the PC are "injected" into the console bus, therefore the PC behaves like a user with another console, with one important difference: the interface can impersonate all partition consoles, while the real console can "see" only the partition for which it is programmed. In order to connect a VISTA partitioned panel to the network, the installer must program one virtual console for every partition used in the VISTA. If the panel has been programmed for 5 partitions, the installer must program 5 consoles, starting from DEVICE address number 16 - see the table shown on the next page.

Device Address	1	2	3	4	5	6	7	8
16	x							
17		x						
18			x					
19				x				
20					x			
21								
22								
23								

Example of addressing a virtual console with 5 partitions (devices addresses from 16 to 23 within the VISTA system should be reserved for V-NET use).

The physical consoles are programmed as normal and are unaffected by the presence of V-NET.

The second programming requirement is to add the virtual user to the VISTA panel with a security code. We recommend assigning this code the highest authority level for the launch of the installation; this can be modified later.

This code is also programmed in the PC software, and is used every time the PC is sending a command to the VISTA. This code is logged in the VISTA event memory and it can be identified as one of the "human" users.

The user codes for the PC must have the following access setup: multi access (1), NO global arming (0), level of authority of choice (may be limited later by the PC software).

There may be a different user code assigned in the PC and in the VISTA for each partition and each control panel; they are not necessarily the same for all networks.

4.0 System Wiring

The system wiring should be made using dedicated cabling. The wiring should be widely separated from AC mains lines and other system wiring. We strongly recommend 30 cm (1 ft approx.) spacing as a guideline.

The distance calculation between VISTA and its network interface must take into account the existing wiring of consoles and bus expansion modules.

The total console bus length as well as the distance from the most distant point are given in the VISTA manual and must be strictly observed.

If the VISTA PCB is housed in large cabinet, the interface may be mounted inside the same box as VISTA, saving cost and shortening cable runs. Moreover, the AI-4164RS interface is tamper protected by the VISTA control panel's tamper protection.

ADEMCO
INTERNATIONAL

The 12 VDC power supply for the interface may be taken from the console bus, but first the VISTA system overall power capacity must be evaluated. If the load of the external devices is near the maximum capability, the power supply for the VISTA must be upgraded. Another solution is to provide a separate, supervised supply for the interface.

For security reasons, the alarm output from the external power supply indicating AC loss and low battery conditions should be connected to the AI-4164RS additional input.This solution enables monitoring the supply conditions at the central PC.

The cable between the interface and the concentrator/converter must be a 4 wire twisted, non shielded cable.

The minimun size requested for the cables is 0,6 square mm. The maximun length is 2 Km.

Since all of the network elements are parallel connected to the RS485 bus, the failure of one interface does not affect the other parts of the network, unlike daisy-chain type system.
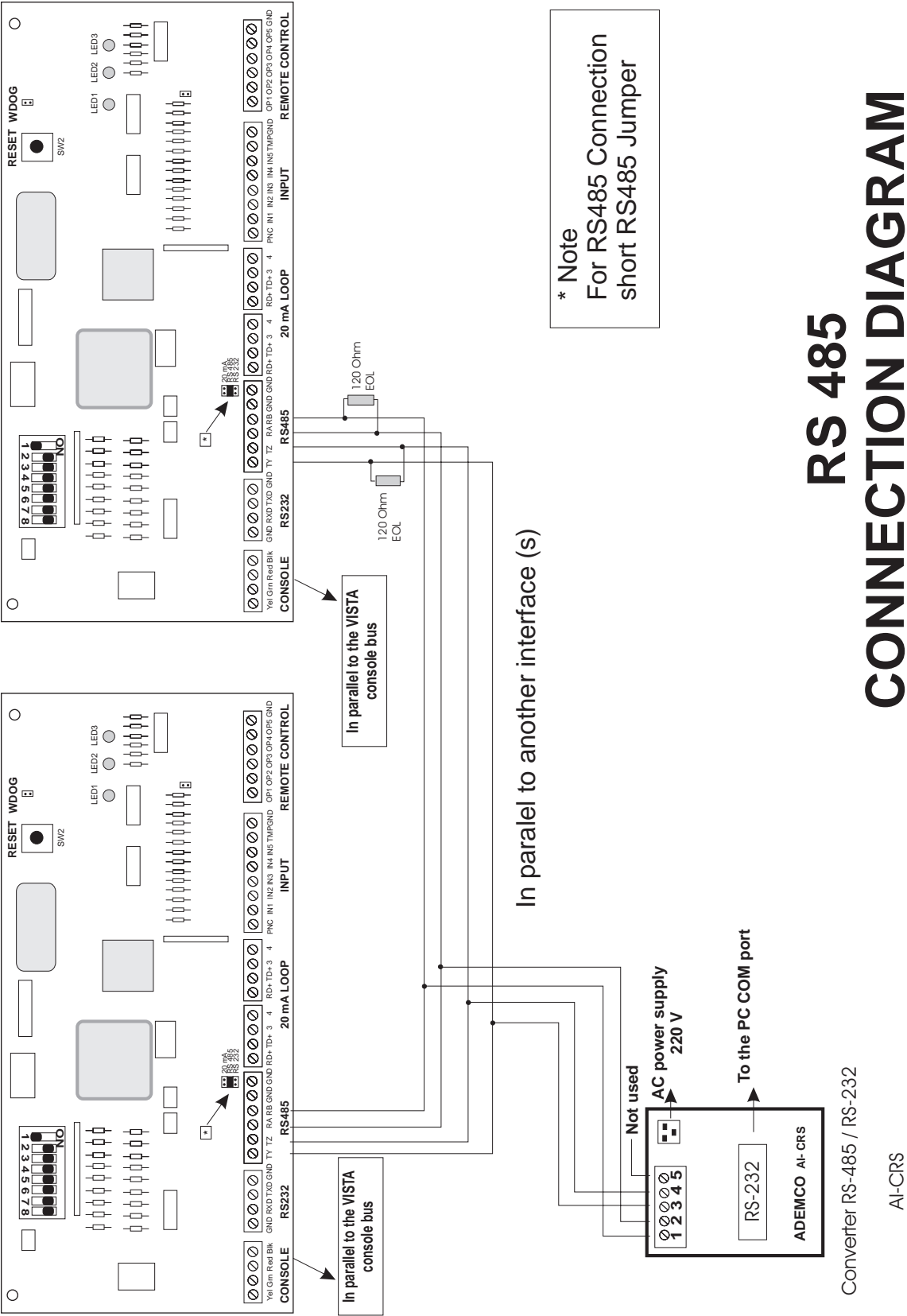
The cable between the concentrator and the PC is a standard RS232 cable, so the obvious limitations apply. We recommend keeping this cable length to an absolute minimum, not exceeding a few meters (15 feet).
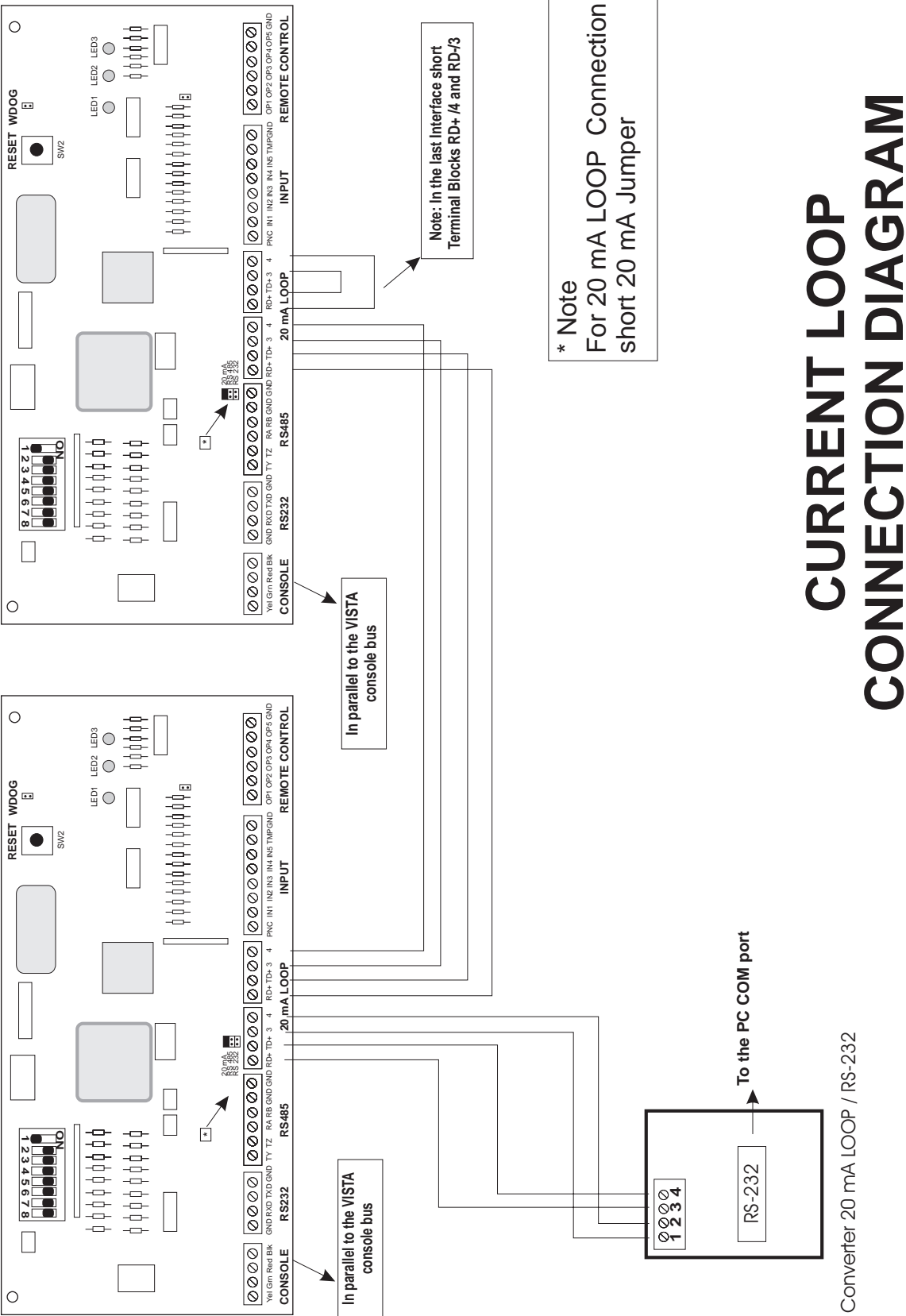
The concentrator/converter AI-CRS should be placed on the computer desk, and should be visible by the operator. The LED controls of the converter indicate the status of the bus - see chapter 8 for more details.
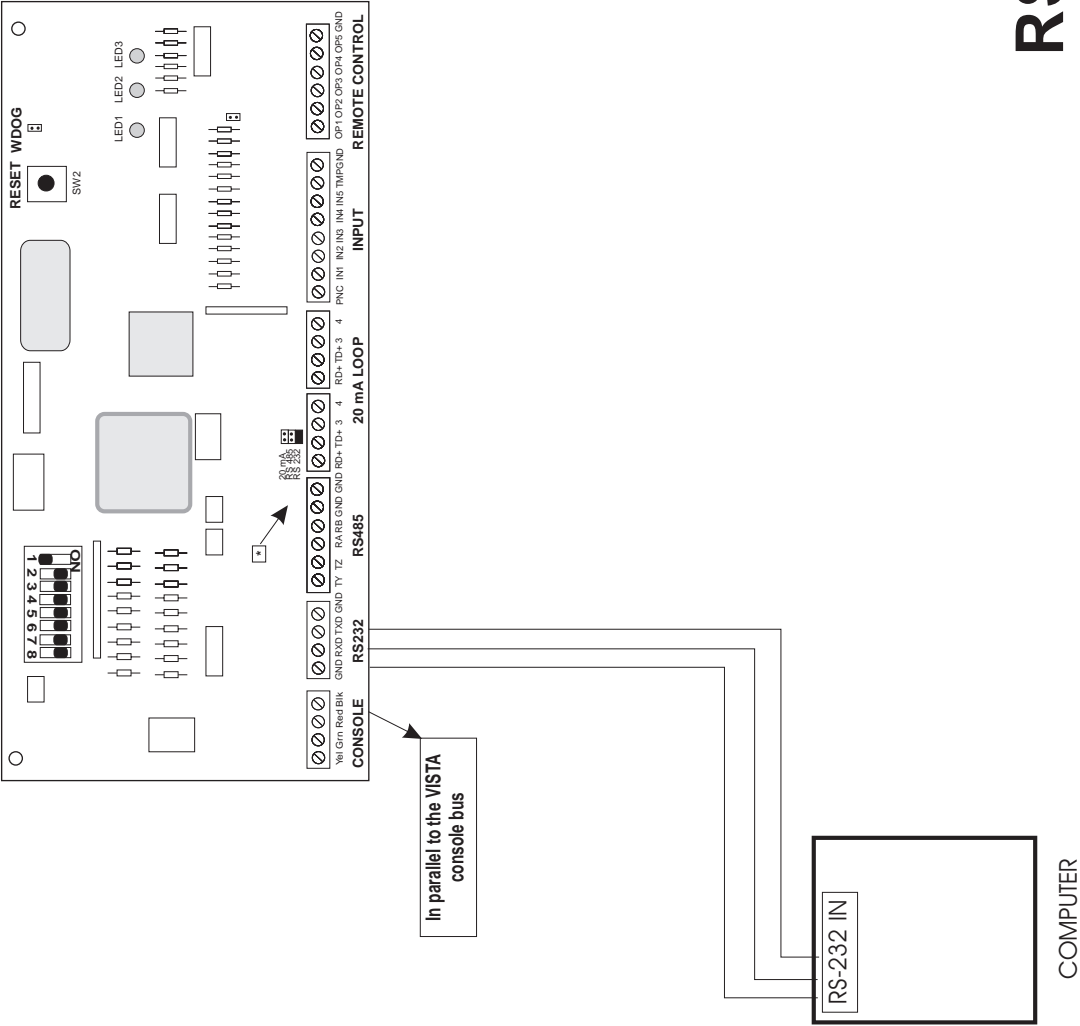
The concentrator/converter needs AC power (220 V or 24 V, depending on versions), therefore a UPS is mandatory in order to sustain the operation of the PC, the printer and the concentrator/converter in case of a power black-out.

For initial testing purposes or for interface troubleshooting, the AI-4164RS board may be connected to the PC directly via its dedicated RS232 port, without the need for the converter/concentrator. No additional setup is required other than the standard procedure as described for the normal network connection.

In the next page, a typical connection diagram is shown.

ADEMCO
INTERNATIONAL

RS 485
CONNECTION DIAGRAM

* Note
For RS485 Connection
short RS485 Jumper

In paralel to another interface (s)

Converter RS-485 / RS-232

AI-CRS

CURRENT LOOP CONNECTION DIAGRAM

Note: In the last Interface short Terminal Blocks RD+ /4 and RD-/3

* Note
For 20 mA LOOP Connection
short 20 mA Jumper

In parallel to the VISTA console bus

In parallel to the VISTA console bus

To the PC COM port

RS-232

Converter 20 mA LOOP / RS-232

ADEMCO
INTERNATIONAL

RS 232 CONNECTION DIAGRAM

* Note
For RS 232 Connection
short RS 232 Jumper

In parallel to the VISTA console bus

COMPUTER

RS-232 IN

5. AI-4164RS INTERFACE

5.1 Technical Specifications

- dimensions: 93 mm x 200 mm x 20 mm (W x D x H)
- mounting holes: diam 4 mm, distance: 92 x 192 mm, non metalized, not grounded
- power consumption: board alone   120 mA at 12 VDC
-                             with full trigger output load   270 mA total at 12VDC
- transmission speed and word: 1200 bps, 8-bit, No parity, 1 stop-bit

5.2 Setup

The interface does not requires programming of any kind and is easy to connect. The only important thing is to correctly set the DIP-SWITCHES on the AI-4164RS PCB.

The first six switches are used for setting the individual address number, identifying the interface within the network. Switch number one, as described on the switch front, is that nearest to the green terminal blocks. The ID number is selected by means of a normal binary code. Number 000000 (bin) is not allowed. The PC software "talks" to the operator in decimal numbers, so the binary setting of the switch should be noted for reference in decimal figures.

The last two switches, numbers 7 & 8, determine the compatibility with VISTA panels. Set the switches as follows, depending on the type of device used.

A table indicating the DIP-SWITCHES interface number - VISTA control panel compatibility is available on the next page.

5.3 Network Connections

The network, in its basic configuration, may expand to up to 32 VISTA panels, offering the theoretical capability of 252 separate partitions up to a total of 4096 addressable zones.

Customized software and COM port expansion via a DIGIBOARD may enhance the capability to 512 VISTA systems. A multi-operator station, that allows the operators to correctly identify alarms and react accordingly can be required in such case: please contact ADEMCO for more details.

If a BUS type mouse is employed, both COM ports may be used for 32 VISTA panels each, allowing up to 64 VISTA systems to be networked. This configuration requires a software modification of the current version.

ADEMCO
INTERNATIONAL

DIP SWITCH SETTING
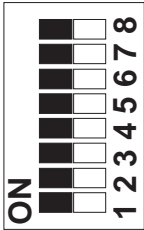
DIP from 1 to 5 = Interface address

DIP 6   = Always OFF

DIP 7 and 8   = Type of control panel

ADDRESS SELECTION

DIP-SWITCH number	INTERFACE ADDRESS																															
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
1	-	off	-	off	-	off	-	off	-	off	-	off	-	off	-	off	-	off	-	off	-	off	-	off	-	off	-	off	-	off	-	off
2	-	-	off	off	-	-	off	off	-	-	off	off	-	-	off	off	-	-	off	off	-	-	off	off	-	-	off	off	-	-	off	off
3	-	-	-	-	off	off	off	off	-	-	-	-	off	off	off	off	-	-	-	-	off	off	off	off	-	-	-	-	off	off	off	off
4	-	-	-	-	-	-	-	-	off	off	off	off	off	off	off	off	-	-	-	-	-	-	-	-	off	off	off	off	off	off	off	off
5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	off	off	off	off	off	off	off	off	off	off	off	off	off	off	off	off

"-" = ON

SPEED SELECTION

DIP SWITCH number 6	SPEED
ON	Not Used
OFF	4800 Bps

4

CONTROL PANEL SELECTION

DIP SWITCH 7	DIP SWITCH 8	TYPE OF CONTROL PANEL
ON	ON	4140 XMPT2, VISTA-50P
OFF	ON	NOT USED
ON	OFF	4140XMP,4140XMPEU,4120SP,4120XM,4120XMP
OFF	OFF	VISTA 120

ADEMCO INTERNATIONAL

5.4 Additional Inputs

The additional inputs extend the control capabilities of the system beyond that of VISTA alone. This can be an important feature. For example, the inputs can be programmed in the PC software to act like the alarm inputs, expanding those of the VISTA sub-system. It can be a surprise to the intruder to find two overlapping means of protection in only one area. The inputs can only be controlled from the PC; so if the operator is not enabled to arm and disarm the VISTA syatem, but only to control those additional loops, the system requires two people to arm/disarm successfully.

These inputscan act as silent panic input zones, because most VISTA systems are unable to pass this particular datum on the control bus to the PC (see chapter 9 for reference).

The inputs are non-supervised NO type. No EOLR option is available.

The inputs can provide technical security for the V-NET hardware, covering the tamper connections and power supply supervision.

Finally, the inputs can serve as triggers for the output relays (see next paragraph).

The inputs are triggered by applying the common ground to the input terminals.

PNC = panic input

1 .. 5 = inputs one to five

TMP = tamper protection input

GND = ground (common for all interfaces and VISTA)

5.5 Additional Outputs

The additional outputs are completely independent of the VISTA control. They can be activated by the operator from the PC software. The activation can be programmed in the V-NET software as an automatic response to particular conditions in the sub-system (for example, in response to alarms or armings or faults) or they can be programmed to respond to the interface additional inputs (see paragraph above).

The outputs are TTL type (positive in active condition), so each of them is unable to control loads higher than 30 mA per all five; so, if higher local currents are needed or a dry contact is needed, an additional relay board must be employed (ADEMCO AI-1250RE with 5 relays, or any other standard relay). The relays must be supplied with power from the AI-4164RS PCB or from the VISTA control.

ADEMCO
INTERNATIONAL

5.6 AI-CRS Concentrator/Converter

The AI-CRS concentrator/converter has the function to convert the data signals coming from the various AI-4164RS interfaces in RS485 serial communication protocol, to the RS232 protocol, suitable for processing by the COM port of the PC.

Each converter can be connected to a maximum of 32 interfaces, this is the reason for its name "concentrator/converter". It is galvanically insulated by means of optoisolators and it is protected against overvoltages.

IMPORTANT:

The V-NET system needs a balanced line.This converter permits to introduce the resistors by the use of the switch SW2. Be sure that the dips 1 and 2 of SW2 are in ON position.
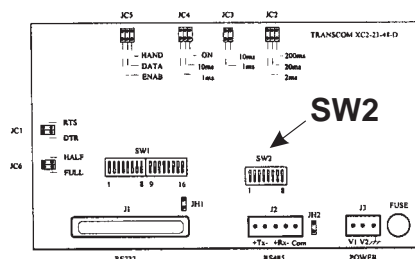
It is available in a desktop version or with standard DIN mounting for use inside junction boxes or other enclosures.

Its main technical characteristics are:

- Desktop version

  - Power supply 220 VAC

  - Consumption 3,3 W

  - Dimensions 200 x 140 x 60 mm (W x D x H)

- Junction box version

  - Power supply 24 VAC

  - Consumption 3 W
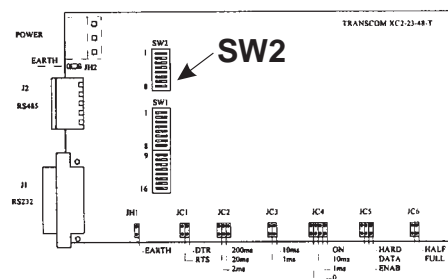
Desktop Version

Standard DIN Version

- Dimensions 160 x 110 x 85 mm (W x D x H).

6.0 FUTURE ENHANCEMENTS

Our R&D team is constantly working on further enhancements of the V-NET system.

We are developping upgrade packages which will enable integration with other systems, such as CCTV, access control, climate control, fire protection, etc. Upgrade from LAN (Local Area Network) to WAN (Wide Area Network) is under development. In fact our system has been designed with expansion capabilities as primary goal. Please, contact your ADEMCO distributor to know the latest developments in ADEMCO's V-NET.

7. TROUBLESHOOTING AND MAINTENANCE

Silent panic (24 hr silent zone) is not "seen" by the V-NET software. In order to utilize this feature, the panic and hold-up contacts (or other silent 24 hr warnings) must be wired to the inputs of the AI-4164RS network interface (see paragraph 6.4 Additional Inputs for details). Another way is to wire the 24 hr silent devices to the VISTA panel as usual, and take the output of a 4204 or a main PCB digital trigger output into the AI-4164RS.

If the communication between the PC and the network seems to be one-way only, please check the interface-to-concentrator wiring. Note that it is not a pin-to-pin type of connection, but the wires 4 and 3 are crossed.

Check DIP-SWITCH settings, paying special attention to the positioning of switches. Note that OFF means logical ONE.

Always press the RESET switch of the AI-4164RS PCB after any hardware modifications or power interruption. It will re-establish the flow of data.

Pay attention to the LEDs on the AI-4164RS PCB. The meaning of their activity is as follows:

LED1 (RD-PC) = receipt of data from the PC

       Blink slowly = polling in standby mode

       Blink fast = communication or command received from PC

LED2 (AD) = communication between VISTA panel and interface

       Blink indicates data transfer

LED3 (TD-PC) = transmission of data to the PC

       It blinks always in response to LD1 received data

Carefully check that the EPROM and the other ICs are properly positioned in their sockets.