

# TCPIP232

## Adapter



**ATM TCP/IP Interface**  
**Stand alone or with VSSI-Pro/VSI-**  
**Pro/VSI-Pro MAX**

**POS TCP/IP Interface**  
**Stand alone**  
**or with VSI-Pro /VSI-Pro Max**



**OPERATION MANUAL**

May 2010

## Introduction

The TCPIP232 Interface is designed to capture ATM or POS transactions on a Ethernet LAN system and then convert captured transactions to a serial port to interface with VSSI-Pro (ATM Synchronous Serial Interface), VSI-Pro Max or VSI-Pro to overlay the text on the video and export the data in formatted ASCII to other devices like a DVR. It also allows full programming of the TCPIP232 via on-screen interactive menu of the above devices.

When used standalone or connected to a DVR, programming is done via any laptop running HyperTerminal or other communications program. Default is MDI/MDIX but can be jumper configured for Tap or Mirror Modes.

## TCPIP232 Connections

### 1. Stand alone with Digital Video Recorder

This connection will interface directly to a DVR which supports Text Insertion. This insertion will interface via RS232C from TCPIP232 rear panel. So Please consult your DVR manual or contact the DVR manufacturer. The TCPIP232 is programmed by a laptop.

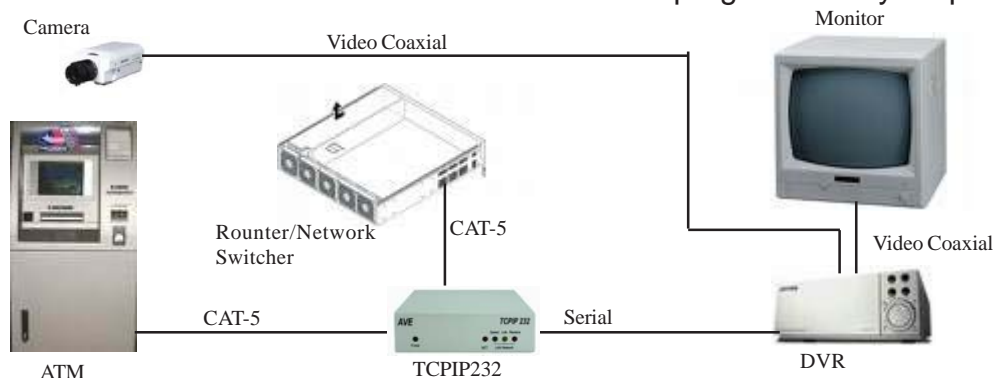


Figure 1. Stand alone connection

### 2. VSSI-Pro Interface

The VSSI-Pro also supports text insertion and programmable gray scale and background of text insertion. Users are able to define the ATM IP Address via Onscreen programming on VSSI-Pro Menu.

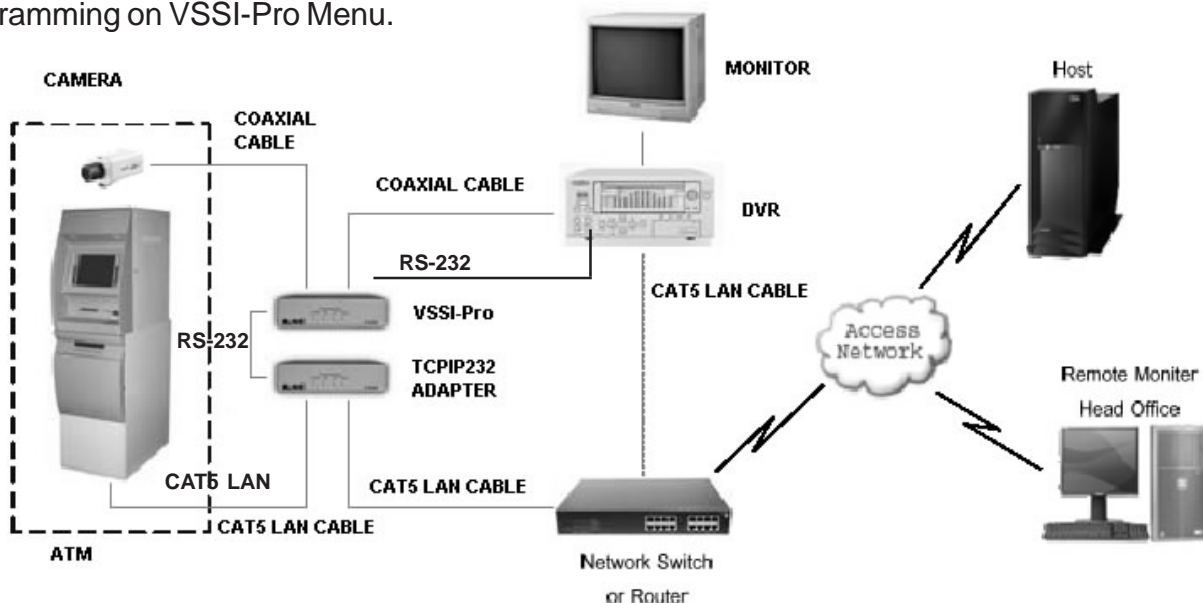


Figure 2. VSSI-Pro Interface  
PAGE 2

### 3. VSI-Pro or VSI-Pro MAX Interface

The VSI-Pro and VSI-Pro MAX support Text Insertion and programmable gray scale and background of text insertion and can be programmed via the Onscreen display for setting the ATM or POS IP in addition to PC Programming of both units.

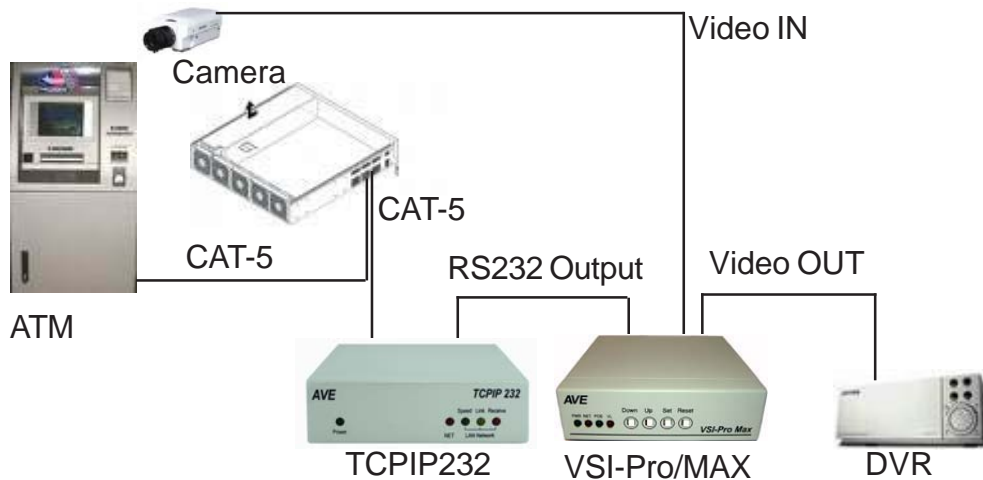


Figure 3. VSI-Pro or VSI-Pro MAX Interface

### 4. AVE RS485 Network Interface

The AVE RS485 Network is a text and information streaming solution that connects multiple devices via an RS485 port. There are Master and Slave for AVE RS485 Network solution. The Master unit is used for polling the data on the slave device and sending the text and information (Alarm , Time and Date) steaming to the DVR that supports AVE RS485 network solution commonly called the VSI-ADD protocol.

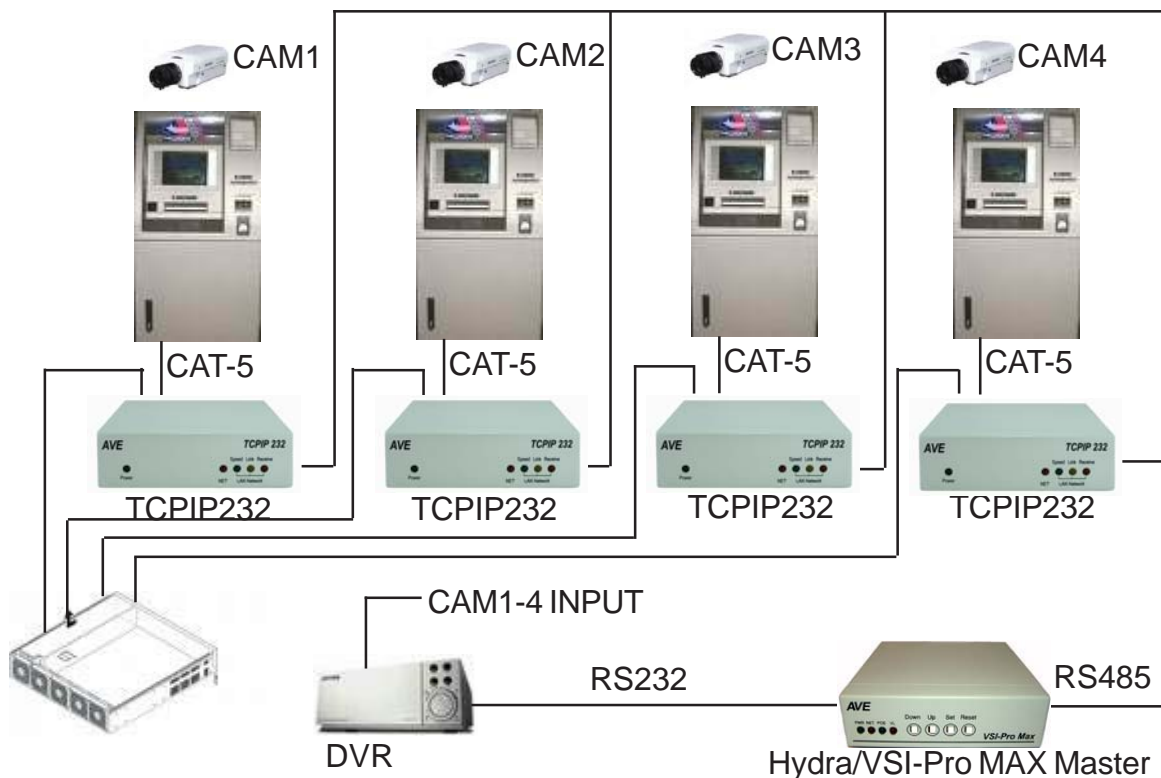
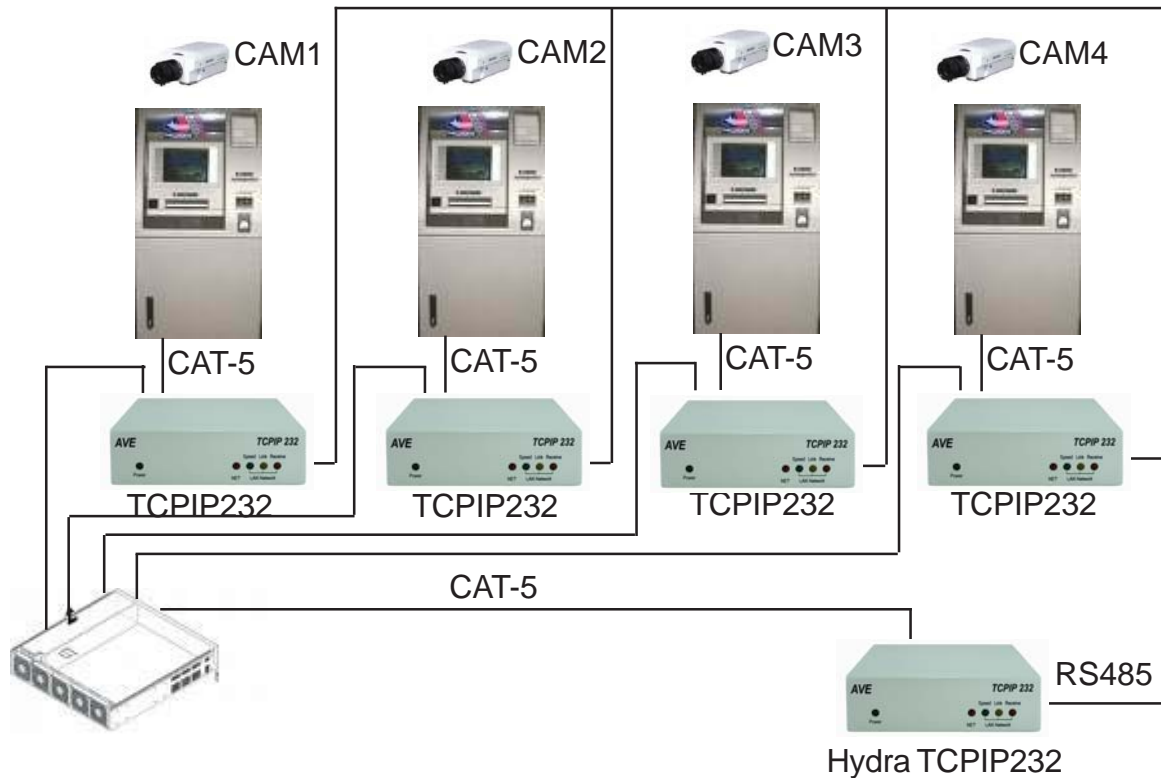


Figure 4. AVE RS485 Network Interface

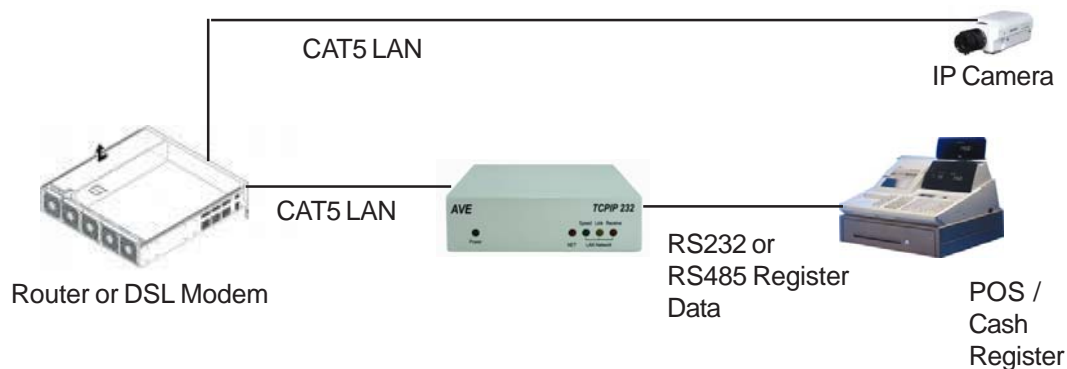
## 5. Hydra TCPIP232 Interface

The Hydra TCPIP232 is a Master unit that polls slave devices via the RS485 network and retrieves the text and information (Alarm , Time and date). This streaming data is then converted to TCP/IP and delivered back to the Ethernet LAN. A Host computer, NVR, DVR or any device connected on the LAN can then receive all the information for further processing or display. This can work not only with ATMs or POS networks but any LAN connection.



**Figure 5. Hydra TCPIP232 Networking Interface**

The Hydra TCPIP232 as a Master can also convert single RS-232 or RS-485 data from any POS or other device to TCP/IP LAN data. This is a perfect solution for IP based cameras to include the transaction data within the LAN network for display on the NVR.



**Figure 5A. Hydra TCPIP232 POS / Cash Register Interface**

## TCPIP232 Hardware Configuration:

TCPIP232 hardware operation depends on your network connection. TCPIP232 is able to operate with HUB and Network Switcher. There are 2 hardware configurations:

### 1. Mirror Mode

This Mode supports HUB and Programmable Network Switchers. The user needs to provide a port for TCPIP232 to capture ATM transactions on the HUB and needs to mirror the ATM LAN port for TCPIP232 port to capture data. This kind of switcher we called “programmable network switcher” which is very expensive.

### 2. Tapping Mode

The Tapping mode supports HUB and Typical Network Switcher. Tapping Mode captures ATM transactions by tapping receiving data at the ATM only. So HUB and Switch will not see TCPIP232 as a network device. see Figure 6

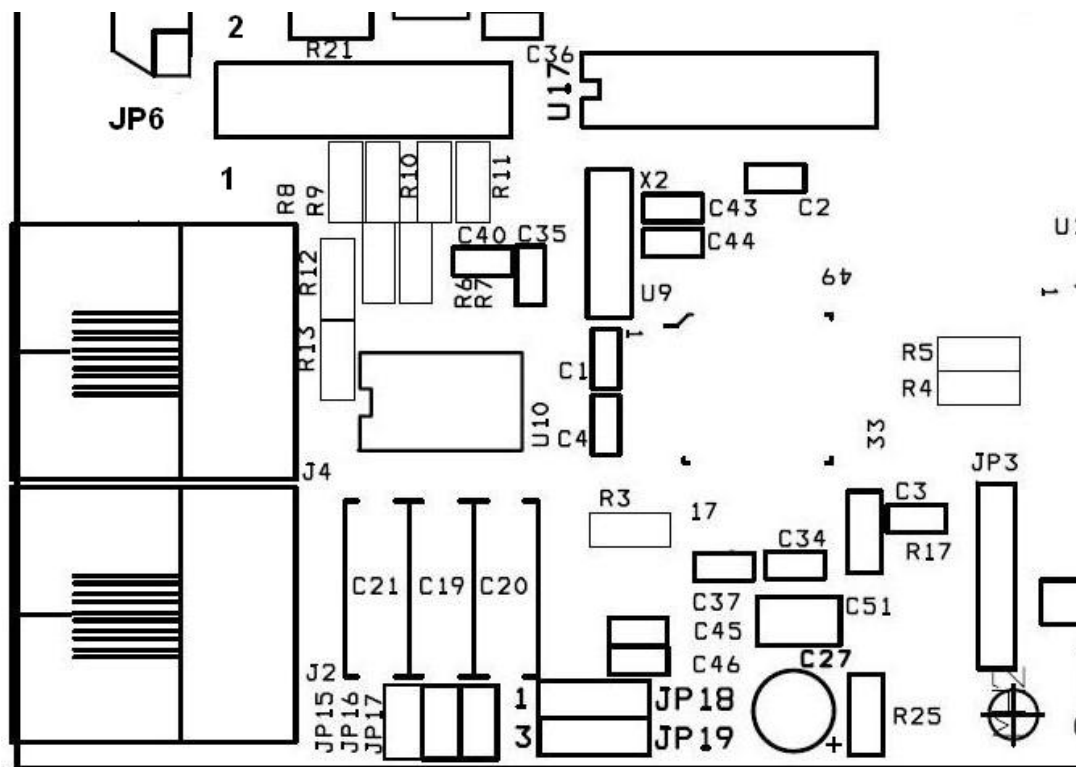


Figure 6. TCPIP232 Silkscreen (Left Corner Back)

#### Tapping Mode Setup. *(This is a default from manufacturer)*

1. Open JP15,JP16
2. JP6 Close 1-2,3-4,5-6,11-12
3. JP18 and JP19 Close 1-2

#### Mirror Mode Setup

1. Close JP15, JP16
2. JP16 Close 1-2,3-4,5-6,11-12
3. JP18 and JP19 Close 2-3

## TCPIP232 Setups

The user must be careful to unplug the LAN cable from the ATM or POS. The ATM or POS has the protection when there is no communication between the ATM and Host Server in limited time your ATM will be offline automatically. This period is called the "ATM Time Out". This time out depends on your ATM system. It is approximately 6-10 seconds.

### Stand alone Setup

Connect the PC/DVR cable (021-037-SF) which comes from the TCPIP232 adapter to your laptop. Power up your TCPIP232 and your laptop and run serial program like Hyper Terminal at baudrate 19200,n,81 with VT100 emulation. Press ESC key (1BH) , [ (5Bh) and P (50H) to enter to the Main Menu.

| TCPIP232 SETUP  |             |
|-----------------|-------------|
| * IP ADDRESS    | 192.168.0.1 |
| - INFORMATION 0 | ON          |
| - INFORMATION 1 | ON          |
| - INFORMATION 2 | ON          |
| - INFORMATION 3 | ON          |
| - INTERFACE     | GENERIC     |
| - ID            | 1           |
| - SENSE         | AUTO        |
| - EXIT          |             |

Press Arrow key to move the cursor or change the configurations Press Enter key to select or save the configurations.

### IP ADDRESS

The IP address will be the same as the ATM or POS machine.

### INFORMATION

This is a user define for additional information in the transaction to display special information.

### INTERFACE: Selections; Generic, RegCom57600, RegCom9600, Vnet

Select Generic if you connect with VSSI-Pro/VSI-Pro/Max then select VSSI-Pro for TCPIP232 will send raw data to VSSI-Pro to analyze the data but the VSSI-Pro is able to use Generic mode by select TCPIP GENERIC when you program the VSSI-Pro.

Select REGCOM57600 or REGCOM9600 or VNET when you connect with RS485 network. Put jumper on JP9(1-2) , JP10(1-2) and JP11(1-2) for using AVE RS485 Network.

### ID

Use when you select REGCOM57600 or REGCOM9600 or VNET.

### SENSE

Select type of LAN cable for Straight Through or Cross Over cable if you select AUTO then TCPIP232 will select cable type automatically.

Select EXIT and Unplug your PC/DVR Cable from your laptop and plug it to your DVR Com port. Now your need to program your DVR to display text insertion.

## VSSI-Pro Setup

Connect the TCPIP232 adapter to the VSSI-Pro with the provided cable(021-010-SF), connect video, ATM LAN and power up both units.

1. Enter the VSSI-Pro Main Menu by simultaneously pressing and holding the DOWN and UP while then press and releasing RESET Button. The main menu will be displayed as below. So move cursor to ATM Select by press UP or DOWN button. Press SET to enter the ATM Select Menu.

- ☒ ATM SELECT
- ☐ SCREEN SETUP
- ☐ TEXT DISPLAY
- ☐ COMMUNICATION
- ☐ EXCEPTION REPORT
- ☐ ALARM OUTPUTS
- ☐ TEST/DEMO MODE
- ☐ DOWN/UP LOAD SETUP
- ☐ HELP

2. On ATM Select Menu, Move cursor to TCPIP Interface then press SET to enter.

- ☐ SDLC
- ☐ BISYNC
- ☐ ASYNC
- ☐ CAMERA PORT
- ☐ JOURNAL PRINTER
- ☒ TCPIP INTERFACE
- ☐ CUSTOM
- ☐ EXIT

3. The Menu in TCPIP Interface will be displayed as below.

- ☒ TCPIP GENERIC
- ☐ TCPIP FORMAT I
- ☐ TCPIP FORMAT II
- ☐ TCPIP DEBUGGING
- ☐ EXIT

### NOTE:

If you select TCPIP Format I or II and program the IP to the TCPIP232 Adapter you can not disconnect from the VSSI-Pro and plug direct to the DVR. You can only do this is set for Generic.

4. Select TCPIP GENERIC to enter and Change the IP Address the same as ATM's IP Address. **Example**, if the ATM's IP address is 192.168.0.141 So the address on TCPIP-232 Adapter this menu as:

- ☒ IP ADDRESS 1 : 192
- ☐ IP ADDRESS 2 : 168
- ☐ IP ADDRESS 3 : 0
- ☐ IP ADDRESS 4 : 141
- ☐ EXIT

1. Exit off to return to the main menu then press RESET button to operation mode.
2. Test you transaction on ATM to verify VSSI-Pro and TCPIP-232 Adapter's Operation.



## VSI-Pro and VSI-Pro MAX Setup

1.To access the main-menu of the VSI-Pro, simultaneously hold down the “Down” & “Up” buttons and press and release the “Reset” button and then release the “Down” & “Up” buttons. This will take you to the main programming menu.

- ☒ REGISTER SELECT
- ☐ SCREEN SETUP
- ☐ TEXT DISPLAY
- ☐ COMMUNICATION
- ☐ EXCEPTION REPORT
- ☐ ALARM OUTPUT
- ☐ TEST/DEMO MODE
- ☐ DOWNLOAD/UPLOAD SETUP
- ☐ HELP

2.Press the “Up” or “Down” button to move the cursor to “REGISTER SELECT” and press “Set”. The REGISTER SELECT menu will appear.

- ☐ GENERIC
- ☒ TCPIP
- ☐ ADDRESSABLE VSI
- ☐ AD4323
- ☐ ADS
- ☐ ANSI
- ☐ BEETLE/50 PRINTERS
- ☐ CASIO QT2100 REM DISPLAY
- ☐ CASIO QT6000
- ☐ ----NEXT PAGE
- ☐ EXIT

3.Press the “Up” or “Down” button to move the cursor to “TCPIP” and press “Set” to sub menu will appear.

- ☒ IP ADDRESS
- ☐ DISPLAY INFORMATION
- ☐ DOWNLOAD CONFIGURATION
- ☐ EXIT

## IP ADDRESS Setup

Press the “Up” or “Down” button to move the cursor to “IP ADDRESS” and press “Set” to change the IP address to the same as the IP address you wish to monitor.

**EXAMPLE:** If the IP address is 192.168.0.141, set the address on the TCPIP 232 Adapter using this menu.

- ☒ IP ADDRESS 1 : 192
- ☐ IP ADDRESS 2 : 168
- ☐ IP ADDRESS 3 : 0
- ☐ IP ADDRESS 4 : 141
- ☐ EXIT



## INFORMATION DISPLAY Setup

Press the “Up” or “Down” button to move the cursor to “IP ADDRESS” and press “Set” to show or hide the Bank Information display.

|  |    |
|--|----|
| <input checked="" type="radio"/> INFORMATION 0 | ON |
| <input type="radio"/> INFORMATION 1            | ON |
| <input type="radio"/> INFORMATION 2            | ON |
| <input type="radio"/> INFORMATION 3            | ON |
| <input type="radio"/> EXIT                     |    |

4.) Press the “Up” or “Down” button to move the cursor to “Download Configuration” and press “Set” to execute. Make sure a TCPIP232 Adapter is connected and the VSI-Pro will download the configuration to this device.

## TCPIP232 LED Indicators

|        |         |  |
|--------|---------|--|
| GREEN  | POWER   | TCPIP-232 Power Status                 |
| RED    | RECEIVE | TCPIP-232 Receive Data from ATM        |
| GREEN  | LINK    | ATM Status, On = Ready/OFF = Not ready |
| YELLOW | SPEED   | OFF = 10Mbps, On = 100Mbps Ethernet    |
| RED    | REGCOM  | Regcom Network Communication           |

## AVE RS485 Network

TCPIP232 is able to interface with multiple devices on AVE RS485 Network that uses the Vnet or Regcom Protocol. The TCPIP232 is a slave device which needs to connect with master unit for the purpose of transaction logging.

Before connecting to the RS485 network, you must program the TCPIP232 Adapter to be the same protocol of the RS485 network so the ID will not duplicate with another devices.

## Cables and Pin assignments

### TCPIP232 Stand alone - VSI-Pro(AVE P/N: 021-041-SF)

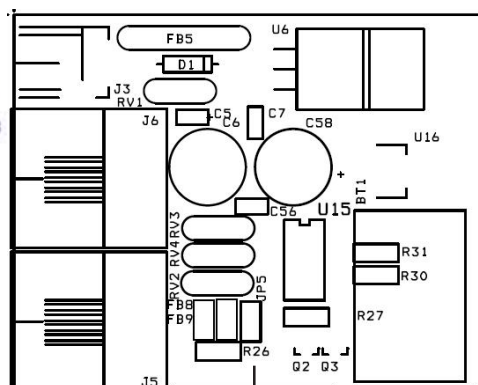
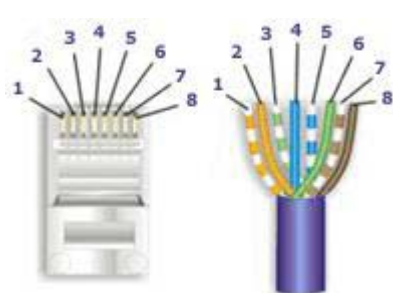
This is RS232 cable for sending data to the VSI-Pro in Generic mode and Output to the DVR.

|                 |                 |            |
|-----------------|-----------------|------------|
| TCPIP232        | VSI-Pro         | DVR        |
| DB9 Male        | DB9 Male        | DB9 Female |
| Pin-5(GND)----- | Pin-5(GND)----- | Pin-5(GND) |
| Pin-3(TXD)----- | Pin-2(RXD)      |            |
|                 | Pin-3(TXD)----- | Pin-2(RXD) |
|                 | Pin-1(Alarm)    |            |

Note: You must use 021-037-SF to program the IP Address of the TCPIP232 Adapter first and then connect using 021-041-SF.

## TCPIP232 RS485 - VSI-Pro MAX(AVE P/N:021-139-SF)

This is RS485 cable for TCPIP232 Adapter connect to VSI-Pro MAX RJ45 Network connections for the purpose of transaction logging.



### TCPIP232

2 Pin Removable Terminal plug

### VSI-Pro MAX

RJ45

Pin-1(NC) - White/Orange

Pin-2(NC) - Orange

Pin-3(NC) - White/Green

Pin-2-----Pin-4(+/A) - Blue

Pin-1-----Pin-5(-/B) - White/Blue

Pin-6(NC) - Green

Pin-7(NC) - White/Brown

Pin-8(NC) - Brown

RS485 Termination: Open Cover and looking JP5 Right Conner , Close JP5

Note: If the RS485 port is RJ45 connector just use CAT-5 LAN cable(Straight Through)

## TCPIP232 to VSSI-Pro Cable(AVE P/N: 021-010-SF)

This is the RS232 cable that users use to interface with VSSI-Pro. This cable also provides alarm outputs to interface with alarm systems. and also includes the Serial output to connect with DVR to get text insertion. This connection will also send the data to the DVR to be used to search the video by searching from Text . This feature is for AVE or compatibly 3rd party DVR only.

| TCPIP232        | VSSI-Pro        | DVR        |
|-----------------|-----------------|------------|
| DB9 Male        | DB9 Male        | DB9 Female |
| Pin-5(GND)----- | Pin-5(GND)----- | Pin-5(GND) |
| Pin-2(RXD)----- | Pin-3(TXD)      |            |
| Pin-3(TXD)----- | Pin-2(RXD)      |            |
|                 | Pin-8(CTS)----- | Pin-2(RXD) |
|                 | Pin-1(Alarm)    |            |

## TCPIP232-PC/DVR Cable(AVE P/N: 021-037-SF)

This is and RS232 Cable to program the IP Address on TCPIP232 and then remove and plug to the DVR to insert ASCII text on Video for stand alone application.

| TCPIP232 Port   | PC/DVR Port |
|-----------------|-------------|
| DB9 Male        | DB9 Female  |
| Pin-5(GND)----- | Pin-5(GND)  |
| Pin-2(RXD)----- | Pin-3(TXD)  |
| Pin-3(TXD)----- | Pin-2(RXD)  |

## TCPIP232 Update firmware cable(AVE P/N:021-055-SF)

|                 |            |
|-----------------|------------|
| TCPIP232 Port   | PC         |
| DB9 Male        | DB9 Female |
| Pin-5(GND)----- | Pin-5(GND) |
| Pin-4(DTR)----- | Pin-4(DTR) |
| Pin-2(RXD)----- | Pin-3(TXD) |
| Pin-3(TXD)----- | Pin-2(RXD) |

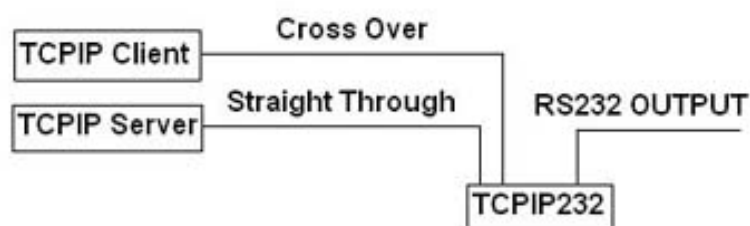
## Firmware Update

TCPIP232 is able to update firmware by using software that is supplied to qualified customers. Contact the factory if this is required.

1. Install Update Firmware Software.
2. Use Update firmware cable (021-055-SF) connect between TCPIP232 and Computer.
2. Select Device from list.
3. Select Device form list and Set option as follows.
  - Flash Start 0x400000
  - Flash End 0x480000
  - Reset wait 250
  - Default Bank num 0x1
4. Select baud rate 115200 then Open comport.
5. Send Reset command.
6. Erase memory on Bank 40 , 41 and 42 by typing Z40 then press Y to confirm then erase Bank 41 and 42.
7. Load file Boot System and TCPIP firmware.

## TCPIP232 Testing

The TCPIP232 can be tested by using 2 computers in simulate mode. Connect the equipment same as below.



This connecting diagram has no need to a Hub/Switch just use 1 Cross Over cable and 1 Straight Through cable and use TCPIP232-PC/DVR Cable(021-037-SF) to program IP Address same as TCPIP Server software.

1. Install TCPIP Client Tester software to the computer that simulates to be host
2. Install TCPIP Server software to the computer that simulating to be ATM that tapped data by TCPIP232.
3. Set port Address for listening on TcpiServer(ATM).
4. Use TCPIP Client(Host) to send data to TCPIP Server(ATM) the destination IP address and port same as TcpiServer configurations then connect and select datadump to send to TcpiServer on File menu.

## AVE RS485 Network Protocol

The Master unit will poll to the Slave devices starting from address 1 until 16 then poll address 1 again. This is a routine for checking the information of each the Slave devices.

### Regcom 9600

Master >>> Slave

The Master polls the Slave device with baudrate 9600,n,8,1 by sending <2FH(/)><Address(1-16)> to each address within 10 milliseconds if there is no response from the Slave device then the Master will poll another address. If the Master get a reply from the Slave then increase time out for getting the data within 150 milliseconds.

Slave >>> Master

After the Slave get a polling from the Master then the Slave will respond to the Master if the data is not available then the Slave send <2FH(/)><6EH(n)>. If the data is available then send <01H(SOH)><ADD-1>TEXT<0DH(CR)>

EX The Master polls the Slave address 3

Master: <2FH(/)><03H(ADD)>

If the data is not available at address 3 then

Slave: <2FH(/)><6EH(n)>

If the data is available at address 3 then

Slave: <01H(SOH)><02H(ADD-1)><4EH(N)><4FH(O)><20H(SPACE)><53H(S)>  
<41H(A)><4CH(L)><45H(E)><0DH(CR)>

### Regcom 57600

Master >>> Slave

The Master polls the Slave device with baudrate 57600 Multiprocessor mode (ADD byte set Bit9 , DATA byte clear Bit9) by sending <ADD><05H(ENQ)> within 10 milliseconds if there is no response from the Slave device then the Master will poll another address. If the Master get a reply from the Slave then increase time out for getting the data within 30 milliseconds.

Slave >>> Master

After the Slave get a polling from the Master then the Slave will respond to the Master if the data is not available then the Slave send <ADD><15H(NAK)>. If the data is available then send <ADD>TEXT<0DH(CR)>

EX The Master polls the Slave address 7

Master: <07H(ADD, Bit9 = 1)><05H(ENQ, Bit9 = 0)>

If the data is not available at address 7 then

Slave: <07H(ADD, Bit9 = 1)><15H(NAK, Bit9 = 0)>

If the data is available at address 7 then

Slave: <07H(ADD, Bit9 = 1)><4EH(N, Bit9 = 0)><4FH(O, Bit9 = 0)>  
<20H(SPACE, Bit9 = 0)><53H(S, Bit9 = 0)><41H(A, Bit9 = 0)>  
<4CH(L, Bit9 = 0)><45H(E, Bit9 = 0)><0DH(CR, Bit9 = 0)>

## Vnetworker

Master >>> Slave

The Master polls the Slave device with baudrate 19200,n,8,1 by sending <SOH><ADD(Ten)><ADD(One)><STX><ENQ><ETX> to each address within 10 milliseconds if there is no response from the Slave device then the Master will poll another address. If the Master get a reply from the Slave then increase time out for getting the data within 50 milliseconds.

Slave >>> Master

After the Slave get a polling from the Master then the Slave will respond to the Master if the data is not available then the Slave send

<SOH><ADD(Ten)><ADD(One)><STX><NAK><NAK><ETX>

If the data is available then send

<SOH><ADD(Ten)><ADD(One)><STX>TEXT<BCC><ETX>

NOTE: BCC is a Block Checksum Character This is a checksum value generated by taking the exclusive OR (XOR) of the ASCII values of all the characters transmitted after STX that excluding SOH,ADD(Ten),ADD(One),STX and ETX.

Note: ADD(Ten) and ADD(One) are the ASCII format of the address.

EX The Master polls the Slave address 10

Master: <01H(SOH)><31H(ADD TEN)><30H(ADD ONE)><02H(STX)>  
<05H(ENQ)><03H(ETX)>

If the data is not available at address 10 then

Slave: <01H(SOH)><31H(ADD TEN)><30H(ADD ONE)><02H(STX)>  
<15H(NAK)><15H(NAK)><03H(ETX)>

If the data is available at address 10 then

Slave: <01H(SOH)><31H(ADD TEN)><30H(ADD ONE)><02H(STX)>  
<4EH(N)><4FH(O)><20H(SPACE)><53H(S)>  
<41H(A)><4CH(L)><45H(E)><0DH(CR)>  
<37H(BCC)><03H(ETX)>

# **LIMITED WARRANTY**

(Terms and Conditions)

For **2 Years** from the date of shipment, Seller warrants to Buyer that the Product is free from defects in material or workmanship **under normal use and service**. Equipment manufactured by other than Seller but furnished by Seller carries the same warranty to Buyer as Seller receives from the other manufacturer, notwithstanding any provision to the contrary. If Buyer has specified a particular manufacturer's product which is not the brand standardly supplied by Seller, Buyer shall look only to the other manufacturer's warranty and Seller shall not warrant such item.

**EXCLUSIONS.** Seller's warranty does not cover the following:

- (1) in-transit damage claims, improper handling by carrier or post office (Note: only the consignee of the shipment can file a claim with the common carrier)
- (2) damages caused by incorrect use, modification, carelessness, improper storage, hostile operating conditions, or unauthorized service, installation or repairs without proper training from the Seller
- (3) damages caused by fire, flood, lightning, collision, acts of God or other events beyond the control of Seller
- (4) products or parts thereof that have had serial numbers removed, altered or defaced
- (5) products returned without an RMA number and sales or delivery receipt showing the date of original purchase
- (7) use of components that do not meet Seller's specifications
- (9) external parts such as cabinets or keypads
- (10) periodic maintenance and adjustments resulting from normal use

**WARRANTIES EXCLUDED.** SELLER EXPRESSLY DISCLAIMS AND EXCLUDES ANY EXPRESS OR IMPLIED WARRANTY OR MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE WHICH EXCEEDS OR IS INCONSISTENT WITH THE WARRANTY HEREIN EXPRESSLY SET FORTH.

**NON-WARRANTY CLAIMS.** In the event Buyer makes a warranty claim and Seller's warranty does not apply, Buyer shall reimburse Seller for all reasonable expenses incurred by Seller in diagnosing the installation/repair problem.

**BUYER'S EXCLUSIVE REMEDIES.** If the Product supplied shall fail to conform to the contract or any applicable warranty, Buyer shall immediately notify Seller of such condition and afford Seller a reasonable opportunity to inspect said Product. Seller shall, at its option, either repair or replace such nonconforming Product. Seller shall not be responsible for labor charges for removal or installation of such equipment or material or charges for transportation, handling and shipping except as provided in Seller's written service policy. No Product shall be returned without Seller's prior written consent.

**SELLER SHALL NOT BE LIABLE FOR ANY SPECIAL, DIRECT INCIDENTAL OR CONSEQUENTIAL DAMAGES OF A COMMERCIAL NATURE ARISING OUT THE USE OF OR INABILITY TO USE SELLER'S PRODUCT BY REASON OF THE FACT THAT SUCH PRODUCT DOES NOT CONFORM TO THE CONTRACT OR TO ANY EXPRESS OR IMPLIED WARRANTY. SELLER'S MAXIMUM LIABILITY SHALL BE LIMITED TO THE COST OF REPAIR AND/OR REPLACEMENT OF THE PRODUCT CLAIMED TO BE DEFECTIVE OR NONCONFORMING, SUBJECT TO SELLER'S RIGHT OF REMOVAL AND RETURN OF PRODUCT.**

All of the foregoing constitute Buyer's sole and exclusive remedy and Seller's sole and exclusive liability for supplying nonconforming or defective Product.

**RETURNS.** AVE products are fully inspected and carefully packed to ensure you are delivered a quality product in good condition. If you are not fully satisfied with our product, returns of standard stocking items with no restocking fee can be made within thirty (30) days of invoice to Buyer. All such returns must have prior consent of Seller by obtaining an RMA number and must include the sales or delivery receipt showing the date of original purchase and be in an unused condition contained in its original packaging. Any other returns must have prior written consent of Seller and are subject to a restocking fee of fifteen percent (15%) and freight charges.

**RMA NUMBER.** The RMA (Return Material Authorization) number must be obtained by contacting Seller prior to the shipment of the the product for return. The RMA number is valid only for 15 days from the date of issue. The RMA number must be clearly displayed on all shipping labels.





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