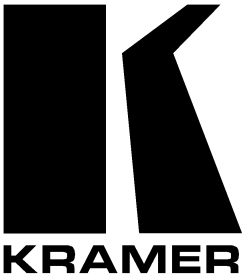
Kramer Electronics, Ltd.



USER MANUAL

Model:

VP-1201

12x1 XGA Switcher / Scanner

Contents

Figures

Tables

1 Introduction

Welcome to Kramer Electronics (since 1981): a world of unique, creative and affordable solutions to the infinite range of problems that confront the video, audio and presentation professional on a daily basis. In recent years, we have redesigned and upgraded most of our line, making the best even better! Our 350-plus different models now appear in 8 Groups[1], which are clearly defined by function.

Congratulations on purchasing your Kramer **VP-1201** *12x1 XGA Switcher / Scanner***,** which is ideal for the following typical applications:

- Any professional system requiring a 12x1 switcher / scanner
- Production studios
- Security, CCTV, and home theater systems

The package includes the following items:

- **VP-1201** *12x1 XGA Switcher / Scanner*
- Power cord and Null-modem adapter
- Windows®-based Configuration Manager XPort software and Com Port Redirector
- Windows®-based Kramer control software
- This user manual[2]

2 Getting Started

We recommend that you:

- Unpack the equipment carefully and save the original box and packaging materials for possible future shipment
- Review the contents of this user manual
- Use Kramer high performance high resolution cables[3]

3 Overview

The high performance **VP-1201** *12x1 XGA Switcher / Scanner* is a true switcher / scanner, routing up to 12 sources to one output.

1 GROUP 1: Distribution Amplifiers; GROUP 2: Video and Audio Switchers, Matrix Switchers and Controllers; GROUP 3: Video, Audio, VGA/XGA Processors; GROUP 4: Interfaces and Sync Processors; GROUP 5: Twisted Pair Interfaces; GROUP 6: Accessories and Rack Adapters; GROUP 7: Scan Converters and Scalers; and GROUP 8: Cables and Connectors

2 Download up-to-date Kramer user manuals from our Web site at http://www.kramerelectronics.com

3 The complete list of Kramer cables is on our Web site at http://www.kramerelectronics.com

The **VP-1201** features:

- A bandwidth of 400MHz for RGB signals
- Input signal detection
- Manual switching or automatic scanning of inputs (or Valid-Only inputs)
- Signal switching delay time, ranging from 1 to 16 seconds

Control the **VP-1201** using the front panel buttons, or remotely via:

- RS-485 or RS-232 serial commands transmitted by a touch screen system, PC, or other serial controller
- ETHERNET
- The Kramer **RC-IR1** Infra-Red Remote Control Transmitter[1]

The **VP-1201** is dependable, rugged and fits into one vertical space (1U) of a standard 19" rack.

To achieve the best performance:

- Connect only good quality connection cables, thus avoiding interference, deterioration in signal quality due to poor matching, and elevated noise-levels (often associated with low quality cables)
- Avoid interference from neighboring electrical appliances and position your Kramer **VP-1201** away from moisture, excessive sunlight and dust

4 Your VP-1201 12x1 XGA Switcher / Scanner

Figure 1 illustrates the front and rear panels of the **VP-1201**. Table 1 and Table 2 define the front and rear panels of the **VP-1201**, respectively.

1 Previously known as the IR-1/IR-1-01

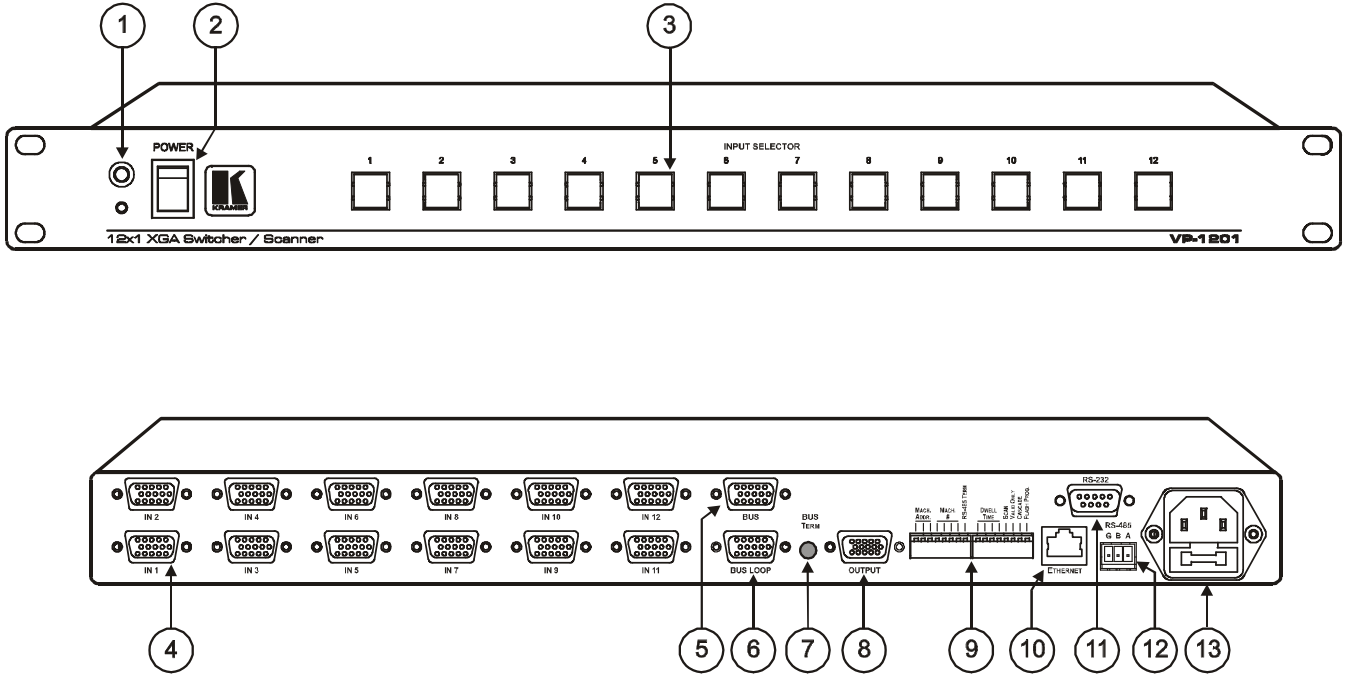


Figure 1: VP-1201 12x1 XGA Switcher / Scanner

Table 1: Front Panel VP-1201 12x1 XGA Switcher / Scanner Features

#	Feature	Function
1	IR Receiver	The red LED is illuminated when receiving signals from the Kramer Infra-Red remote control transmitter
2	*POWER* Switch	Illuminated switch supplying power to the unit
3	*INPUT SELECTOR* Buttons[1]	Select the input to switch to the output (from 1 to 12): The blue LED illuminates when a signal is detected on the input The red LED illuminates when the input is routed to the output but no signal is detected on the input Both the blue and red LEDs illuminate (creating purple) when a signal is transmitted to the output

Table 2: Rear Panel VP-1201 12x1 XGA Switcher / Scanner Features

#	Feature	Function
4	*HD15*F Input Connectors	Connect to the video sources (*IN1 through IN12*)
5	*HD15*F *BUS* Connector	Bus connector for cascading **VP-1201** units
6	*HD15*F *BUS LOOP* Connector	Loop for bus connector
7	*BUS TERM* Button	Press for BUS termination
8	*HD15*F *OUTPUT* Connector	Connects to the output acceptor
9	Setup Dipswitches	For machine setup (see section 5.7)
10	*ETHERNET* Connector	Connects to the PC or other controller through computer networking
11	*RS-232 DB 9F* Connector	Connects to the PC or other Serial Controller
12	*RS-485* Connector	Used for bi-directional communication with another unit
13	Power Connector with *Fuse*	AC connector enabling power supply to the unit

Figure 2 illustrates the underside of the **VP-1201** unit and Table 3 defines the underside features.

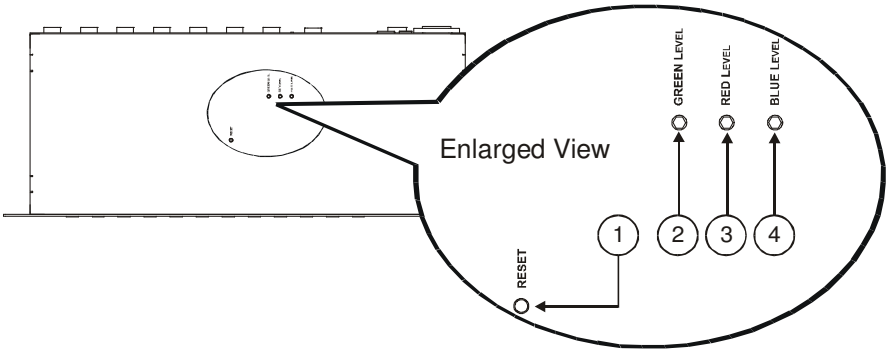


Figure 2: VP-1201 Underside Panel

1 The INPUT SELECTOR buttons are also used to set the highest machine number (see section 5.5.2)

Table 3: VP-1201 Underside Panel Features

#	Feature	Function
1	*RESET* Button	Press to reset the unit prior to a firmware upgrade (see section 5.8)
2	*GREEN LEVEL* Trimmer	Adjusts the green level[1]
3	*RED LEVEL* Trimmer	Adjusts the red level[1]
4	*BLUE LEVEL* Trimmer	Adjusts the blue level[1]

5 Connecting a VP-1201 12x1 XGA Switcher / Scanner

This section describes how to:

- Connect the **VP-1201** unit (see section 5.1)
- Connect the **VP-1201** to a controlling device via:
  - RS-232 (see section 5.2)
  - RS-485 (see section 5.3)
  - ETHERNET (see sections 5.4 and 5.6)
- Connect several **VP-1201** machines (see section 5.5)
- Set the dipswitches (see section 5.7)
- Reset the unit (see section 5.8)

5.1 Connecting a Single Unit or Multiple VP-1201 Units

To connect the **VP-1201** *12x1 XGA Switcher / Scanner*, do the following:

1. Connect the following to the rear panel:
   - Video sources (see Figure 3)
   - Output acceptor
   - Power cord
2. Connect to a controlling device (optional – see sections 5.2, 5.3 and 5.4).
3. Connect the RS-485 port to additional units (optional – see sections 5.5.1 and 5.5.2).
4. Connect the BUS ports to additional units (optional – see section 5.5.2).
5. Set the dipswitches (see section 5.7).

1 Insert a screwdriver into the small hole and carefully rotate it to adjust the level

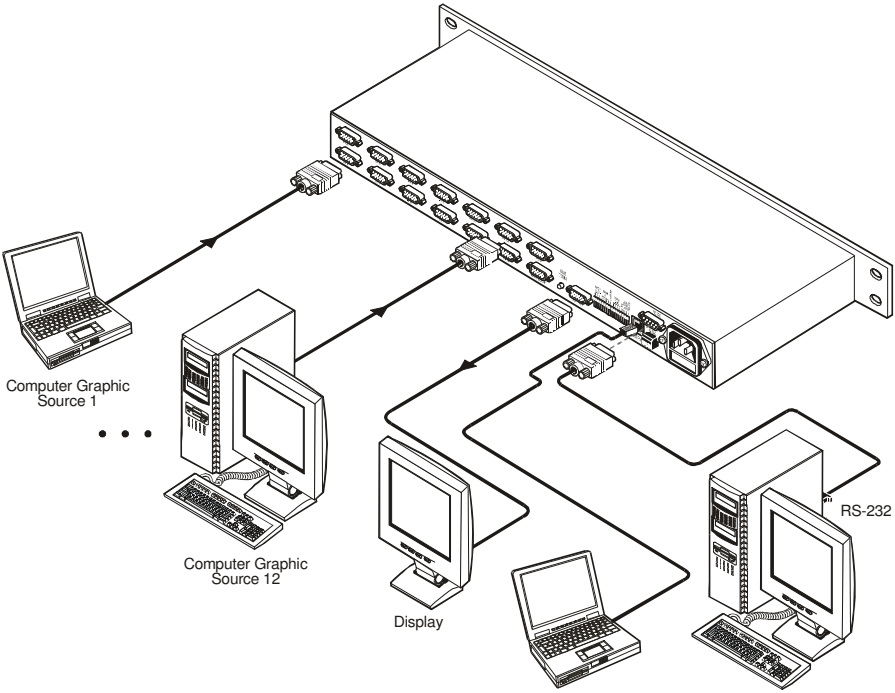


Figure 3: Connecting the VP-1201

5.2 Controlling via RS-232 (for example, using a PC)

To connect a PC to the **VP-1201** unit[1], using the Null-modem adapter provided with the machine (recommended):

- Connect the RS-232 DB9 rear panel port on the **VP-1201** unit to the Null-modem adapter and connect the Null-modem adapter with a 9-wire flat cable[2] to the RS-232 DB9 port on your PC

To connect a PC to the **VP-1201** unit[1], without using a Null-modem adapter:

- Connect the RS-232 DB9 port on your PC to the RS-232 DB9 rear panel port on the **VP-1201** unit, as Figure 4 illustrates[2] (depending on whether the PC has a 9-pin or 25-pin connector)

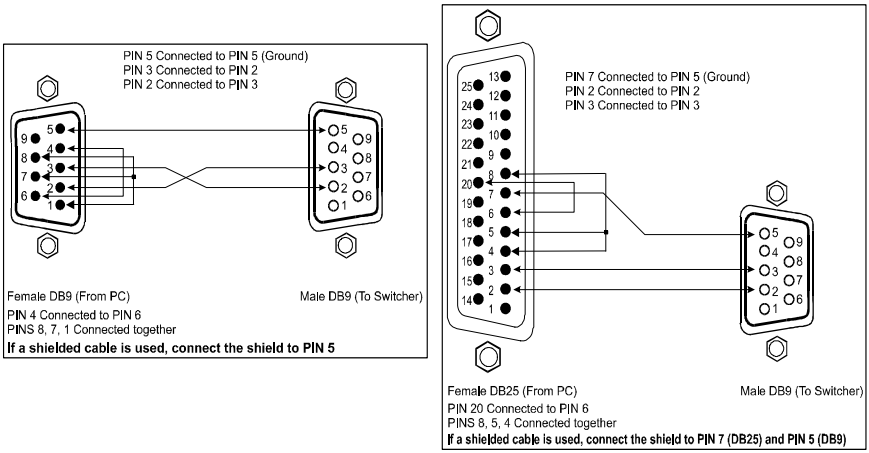


Figure 4: Connecting a PC without using a Null-modem Adapter

1 When connecting a single VP-1201 unit via RS-232, set the MACH. # dipswitches to MACHINE # 1, according to Table 10

2 Up to 50 feet of cabling may be used for the RS-232 connection

5.3 Controlling via RS-485

You can control a **VP-1201** unit via an RS-485 controller[1], for example, a PC (equipped with an RS-485 interface) or a Master Programmable Remote Control system, such as the Kramer **RC-3000**[2].

To connect an **RC-3000** to a single **VP-1201** unit (see Figure 5):

1. Connect the RS-485 terminal block port on the **RC-3000** to the RS-485 port on the **VP-1201** unit, as follows:
   - Connect the "A" (+) PIN on the RS-485 rear panel port of the **RC-3000** to the "A" (+) PIN on the RS-485 rear panel port of the **VP-1201** unit
   - Connect the "B" (-) PIN on the RS-485 rear panel port of the **RC-3000** to the "B" (-) PIN on the RS-485 rear panel port of the **VP-1201** unit
   - If shielded twisted pair cable is used, the shield may be connected to the "G" (Ground) PIN on one of the units (for example, on the **RC-3000**)
2. Set the MACH. # dipswitches on the **VP-1201** unit to Machine # 2 (or any other number other than 1), according to Table 10.
   Do not set as Machine # 1 (the Master).
3. Terminate the RS-485 line on both the **VP-1201** unit[3] (when a single unit is connected) and the **RC-3000**[4].

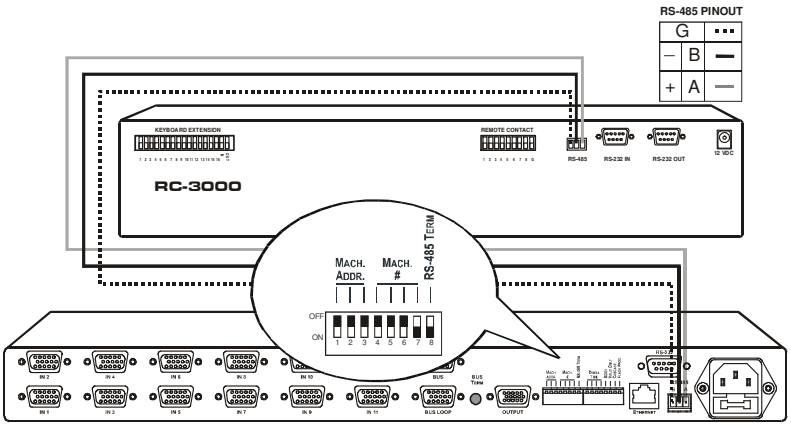


Figure 5: Controlling via RS-485 (for example, using an RC-3000)

1 RS-485 can be used for control even for distances exceeding 1km

2 Previously known as the VS-3000

3 To terminate RS-485 line on the VP-1201, set dipswitch 8 to ON (see section 5.7)

4 Refer to the RC-3000 user manual for details of how to terminate the RS-485 line

5.4 Setting the ETHERNET Port and Utilities

To control your **VP-1201** via the ETHERNET, do the following:

1. Connect the Ethernet port of the **VP-1201** to the LAN port of your PC (see section 5.4.1).
2. Install and configure your ETHERNET Port (see sections 5.4.2 through 5.4.4).
3. Install the COM Port Redirector to control the **VP-1201** (see section 5.4.5).

5.4.1 Connecting the VP-1201 Ethernet Port

You can connect the ETHERNET port either via a crossover cable (see section 5.4.1.1) or a straight through cable (see section 5.4.1.2).

5.4.1.1 Connecting via a Crossover Cable

Connect the ETHERNET port of the **VP-1201** to the LAN port on your PC, via a crossover cable with RJ-45 connectors, as Table 4 defines.

Table 4: Crossover Cable RJ-45 PINOUT

Side 1	
PIN	**Wire Color**
1	White-orange
2	Orange
3	White-green
4	Blue
5	White-blue
6	Green
7	White-brown
8	Brown

Side 2	
PIN	**Wire Color**
1	White-green
2	Green
3	White-orange
4	Blue
5	White-blue
6	Orange
7	White-brown
8	Brown

This type of connection is recommended for identification of the factory default IP Address of the **VP-1201** during the initial configuration

After connecting the ETHERNET port, configure your PC as follows:

1. Right-click the My Network Places icon on your desktop.
2. Select **Properties**.
3. Right-click Local Area Connection Properties.
4. Select **Properties**.
   The Local Area Connection Properties window appears.

5. Select the Internet Protocol (TCP/IP) and click the **Properties** Button (see Figure 6).

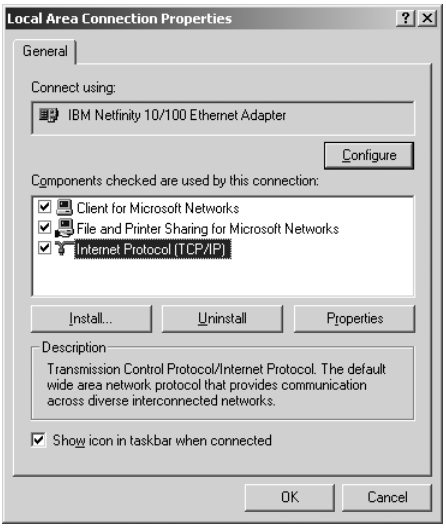


Figure 6: Local Area Connection Properties Window

6. Select Use the following IP Address, and fill in the details as shown in Figure 7.

7. Click **OK**.

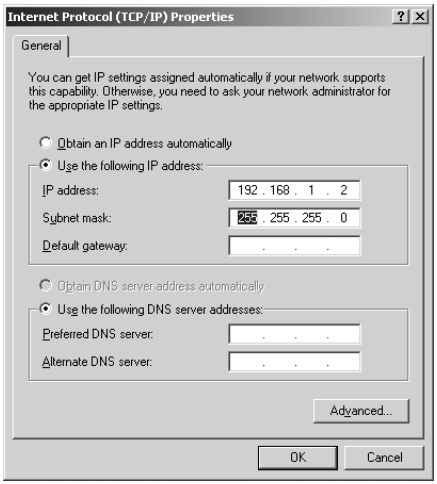


Figure 7: Internet Protocol (TCP/IP) Properties Window

5.4.1.2 Connecting via a Straight-Through Cable

If connecting the ETHERNET port of the **VP-1201** to the LAN port on a network hub or network router, use a straight-through cable with RJ-45 connectors, as Table 5 defines:

Table 5: Straight-through Cable RJ-45 PINOUT

Side 1	
PIN	Wire Color
1	White-orange
2	Orange
3	White-green
4	Blue
5	White-blue
6	Green
7	White-brown
8	Brown

Side 2	
PIN	Wire Color
1	White-orange
2	Orange
3	White-green
4	Blue
5	White-blue
6	Green
7	White-brown
8	Brown

5.4.2 Installing and Running the XPort Configuration Software

To configure the ETHERNET Port, you have to install and run the XPort configuration software.

It is important to consider the following points before logging into and configuring the ETHERNET Port:

- The **VP-1201** IP address must be configured before a network connection is available
- Only one person at a time may be logged into the network port. This eliminates the possibility of several people simultaneously attempting to configure the Device Server
- Network port logins can be disabled. The system manager will not be able to access the unit. This port can also be password protected

5.4.2.1 Install XPort™ Installer

To install the XPort™ Installer, do the following:

1. Insert the product CD into your CD-ROM drive.
2. Run the XPort installer setup.
3. Respond to the installation wizard prompts.
4. Restart your system.

5.4.2.2 Run XPort™ Installer

Click the **Start** button on the Task Bar and select **Programs\XPort Installer\XPort Installer**. The XPort™ Installer main dialog box displays (Figure 8).

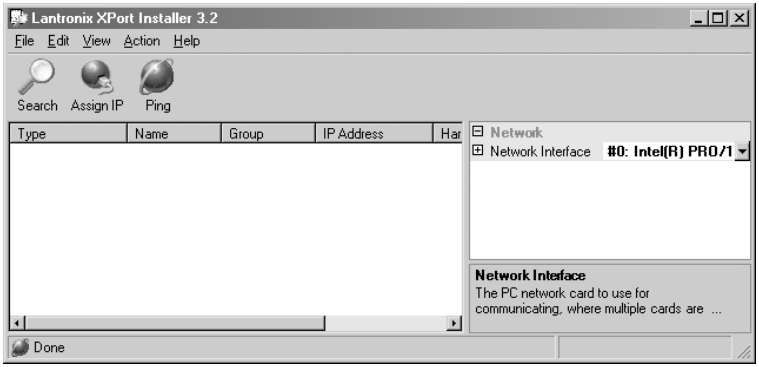


Figure 8: XPort™ Installer Main Dialog Box

To search for devices, click the **Search** icon or select **Search Network** from the Action menu.

5.4.2.3 Assign IP Address

Figure 9 shows a device found on the network, with the IP addresses assigned at the factory. The Hardware Address is an individual permanent address assigned to a particular device on the network. The Hardware Address can be found on the product label inside the unit.

Note: Click on a device to view its attributes

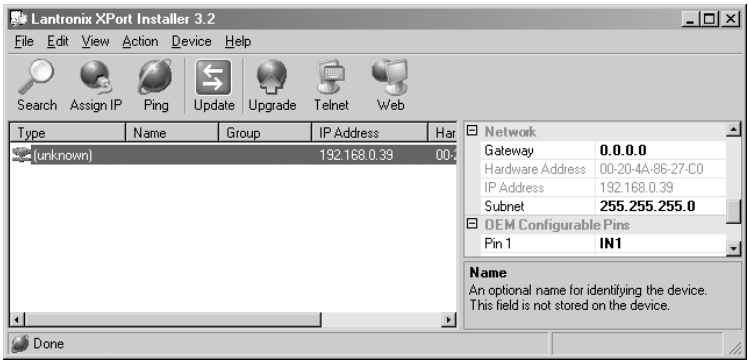


Figure 9: Device Found on the Network

To change the IP address, first select the device from the list, then click the **Assign IP** icon or select **Assign IP Address** from the Action menu. The hardware address and IP address are loaded into the Assign IP Address dialog box (Figure 10).

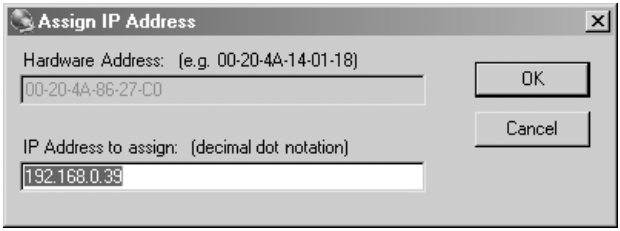


Figure 10: IP Address Assignment Dialog Box

Enter the new IP Address and click **OK**. The new IP Address will appear in the main window.

5.4.2.4 Test the IP Address

To test the IP Address, do the following:

1. Select the device from the main window list.
2. Click the **Ping** icon or select **Ping** from the Action menu. The Ping Device dialog box shows the IP Address of the selected device.
3. Click the **Ping** button and the results will be displayed in the Status window. Use the **Clear Status** button to clear the window so you can ping the device again.
4. Click the **Close** button to close the dialog box and return to the main window.

Note: If you do not receive "Reply" messages, make sure the unit is properly attached to the network and that the IP address assigned is valid for the particular network segment you are working with. If you are not sure, check with your Systems Administrator

5.4.3 Configuring the ETHERNET Port

You must configure the ETHERNET Port so that it can communicate on a network with your serial device. For example, you must set the way the unit will respond to serial and network traffic, how it will handle serial packets, and when to start or close a connection. You can configure your unit locally or remotely using the following procedures:

- Use the XPort™ Installer to configure the unit. Some features are only available through the XPort™ Installer menus
- Use a standard Web browser to access the unit's internal Web pages and configure the unit over the network (see section 5.4.4)
  This is the easiest and preferred method

- Make sure that the Java™ 2 Runtime Environment (Standard Edition, Version 1.4.1 or higher) software is installed on your PC. If not, download it from: http://java.sun.com

The unit's configuration is stored in non-volatile memory and is retained without power. The unit performs a reset after the configuration has been changed and stored.

5.4.4 Using the Web Manager Page

To configure the ETHERNET Port via a Web browser, first click one of the devices listed in the window, and then click the **Web** icon. The Web-Manager window now displays in your browser.

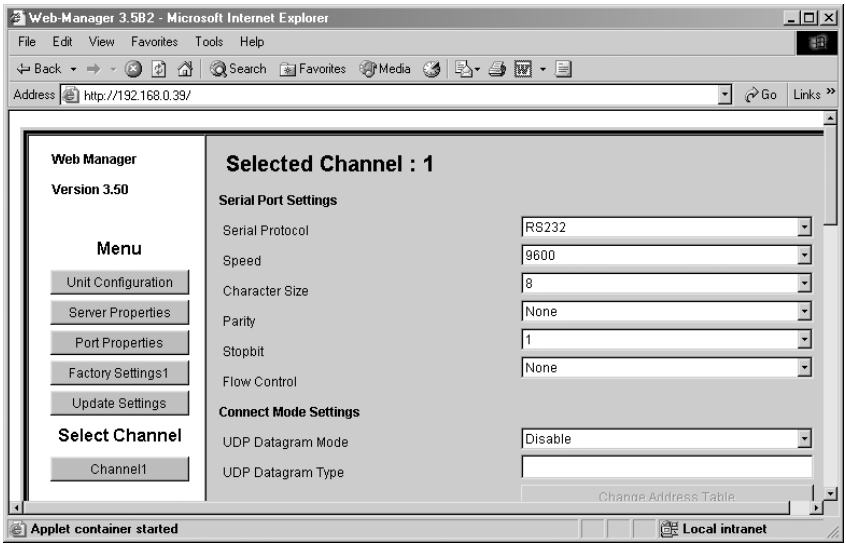


Figure 11: ETHERNET Port Web-Manager

Table 6 describes the Web Manager window buttons.

Table 6: Web Manager Window Buttons

Button	Function
Unit Configuration	Press to enter the Server Configuration and the Port Configuration settings (section 5.4.4.1)
Server Properties	Press to enter the Server Properties and change the server properties by editing any of the fields (section 5.4.4.2)
Port Properties	Press to enter the Port Properties and modify them
Factory Settings1	Press to set to factory default settings
Update Settings	Press to update settings
Channel 1	Disabled

When in the Web Manager window:

1. Use the menu buttons to navigate to sub pages where you can configure server settings. See explanations of the configuration parameters in the following sections.
2. When you are finished, click the **Update Settings** button to save your settings.

5.4.4.1 Unit Configuration Button

Click the **Unit Configuration** button to display the following dialog box (Figure 12). This page contains the Server Configuration and the Port Configuration settings. These are static settings read from the device.

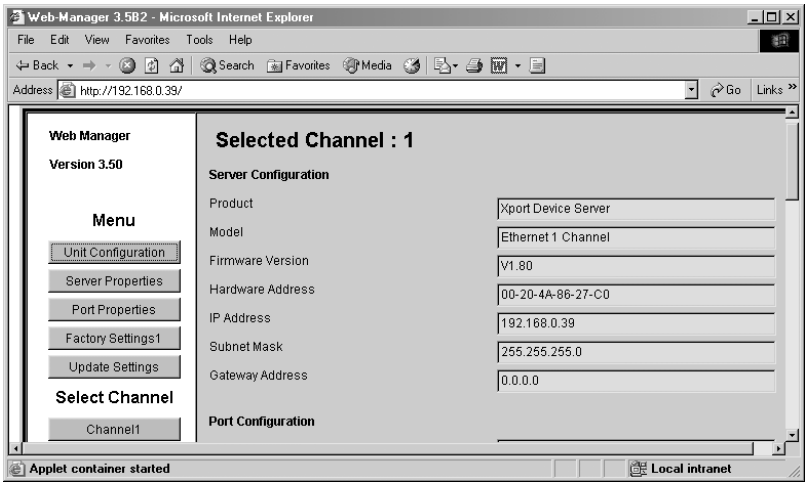


Figure 12: Server Configuration in the Unit Configuration Window

Figure 12 and Figure 13 show the information available in the Unit Configuration window.

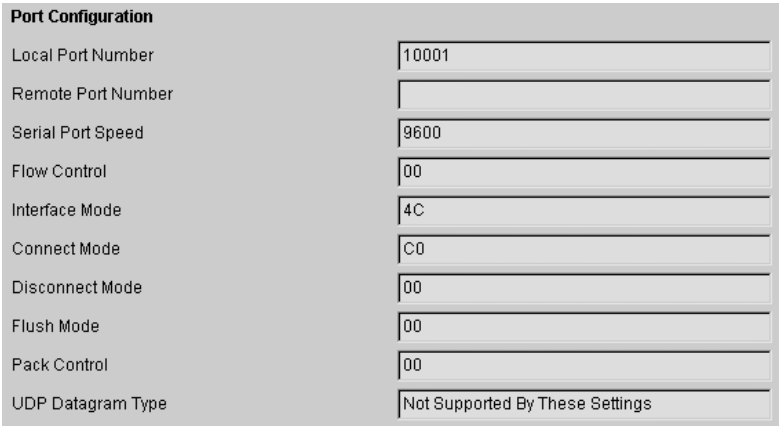


Figure 13: Port Configuration in the Unit Configuration Window

5.4.4.2 Server Properties Button

Click the **Server Properties** button to display the following dialog box (see Figure 14).

You can change the server properties by editing any of the fields. Hold the cursor over one of the fields to display Help messages.

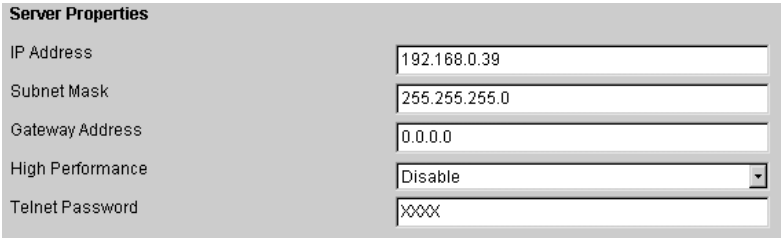


Figure 14: Server Properties in the Unit Configuration Window

- Changing the IP address will require you to enter the new IP address in the browser to reload the page
- In the Telnet Password field, enter a password to prevent unauthorized access to the Setup Mode via a Telnet connection to port 9999. The password is limited to 4 characters. (An enhanced password setting of 16 characters is available under Security Settings on the Telnet Setup Mode window)

5.4.4.3 Port Properties Button

Click the **Port Properties** button to display the following dialog boxes. Make sure that the Serial Port Settings window is set according to Figure 15[1].

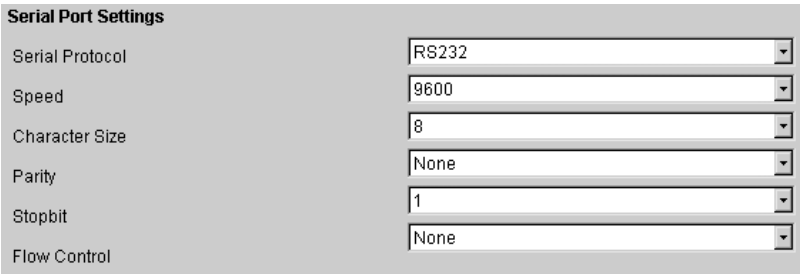


Figure 15: Serial Port Settings Window

Make sure that the Local Port in the Dedicated Connection window is set according to Figure 16.

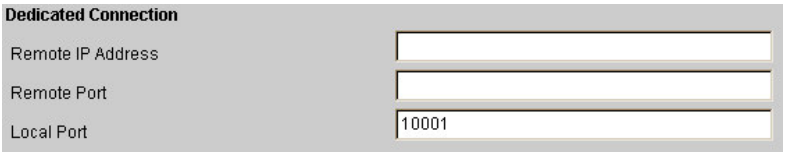


Figure 16: Dedicated Connection Window

Make sure that the Flush Mode Input buffer window is set according to Figure 17.

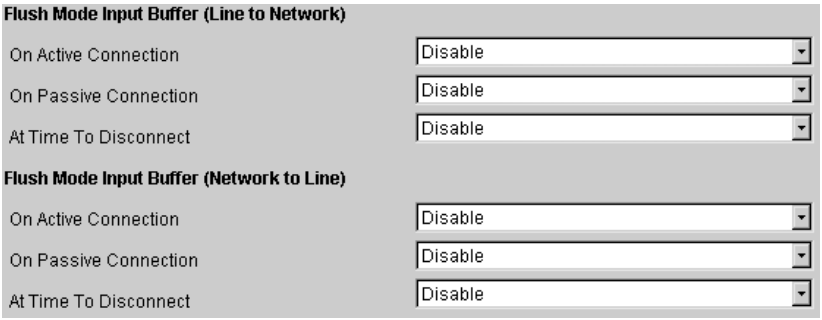


Figure 17: Flush Mode Input Buffer Window

1 You can change the server properties by selecting the desired properties from the drop down list

5.4.5 Controlling a Machine using the Com Port Redirector

The Com Port Redirector allows any PC running Windows to use ports on a network server as if they were connected directly to the PC. The Redirector creates a virtual COM port within Windows, which for most purposes acts just like the selected serial port on the server.

5.4.5.1 Installing the Com Port Redirector

To install the Com Port Redirector, do the following:

1. Perform the appropriate step to start the installation:
   - If the Com Port Redirector is on a CD-ROM, insert the CD-ROM into the computer's CD-ROM drive
   - If you downloaded the Com Port Redirector, double-click the downloaded file

   Either step displays the Redirector - Welcome screen in Figure 18

Figure 18: Com Port Redirector Welcome Screen

2. Click the **Continue** button and follow the on-screen installation instructions.
3. After installation, the Setup Complete dialog box appears (Figure 19).

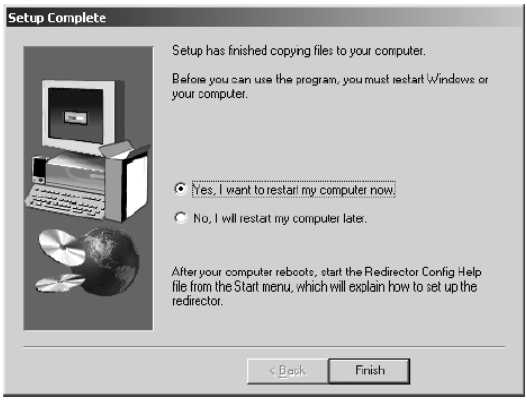


Figure 19: Setup Complete Dialog Box

4. Click **Finish** to complete the installation and restart your computer.
5. Click the **Start** button in the Windows Taskbar, point to **Programs**, point to **Lantronix Redirector**, and click **Configuration**.
   The Com Port Redirector Configuration window appears (see Figure 20).

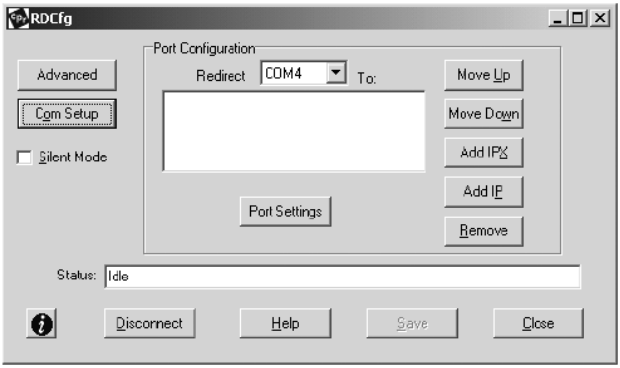


Figure 20: Com Port Redirector Configuration Window

6. Click the **Com Setup** button. A Port Setup dialog box appears (Figure 21), with the first logical communications port checked.
   - The physical communication ports on the computer where the Com Port Redirector is installed are grayed-out and unavailable. In Figure 21, these are Com1 through Com3.
     Your unavailable communication ports may vary

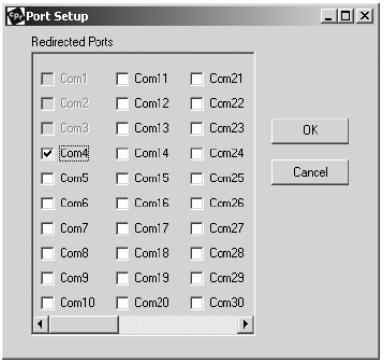


Figure 21: Port Setup Window

7. Click all the logical ports to which the PC will be redirected. A checkmark appears next to each logical port selected. Each port selected will be available from the Redirect To drop-down list in the Com Port Redirector Configuration window (see Figure 20).
8. To deselect a port, click it again to remove the checkmark next to it. Removing the checkmark indicates that the port will not be available from the Redirect To drop-down list.
9. When finished, click OK.

Note: After you use the Port Setup dialog box to add or remove Com ports, restart your computer

5.4.5.2 Configuring the Com Port Redirector

Com Port Redirector is a software utility for network-enabling legacy software applications that do not have network support. Com Port Redirector installs virtual Windows® communication ports. These virtual communication ports are redirected over a network to the serial port of the **VP-1201**.

Configuration Guidelines

Observe the following general guidelines when preparing the **VP-1201** for use with the Com Port Redirector:

- The machine to which the Com Port Redirector will connect must have an IP address
- The PC running the Com Port Redirector must have a good network connection to the **VP-1201**

- If redirecting over a Wide Area Network (WAN), both the PC and the **VP-1201** must have a correct gateway address configured in their TCP/IP[1] settings

Redirector Configuration

Before using the Com Port Redirector, you have to configure the **VP-1201** Ethernet Port. To do so, do the following:

- Assign a compatible IP address to the device server
- Set the serial settings (baud rate, parity, flow control, data bits)
- Set the port number to **10001** (recommended)

For specific instructions, see section 5.4.1.

To configure the Com Port Director:

1. Click the **Start** button in the Windows Taskbar, point to **Programs**, point to **Lantronix Redirector**, and click **Configuration**. The Com Port Redirector Configuration window appears (see Figure 20).
2. Using the **Redirect To** drop-down list at the top of the Com Port Redirector Configuration window, click a redirected Com port.
3. Click the **Add IP** button. The IP Service Setup dialog box appears (see Figure 22).

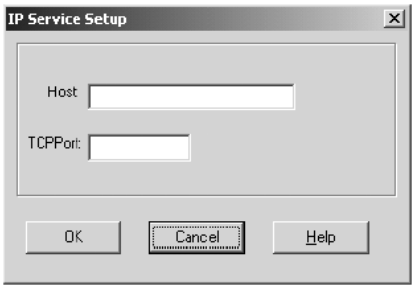


Figure 22: IP Service Setup Dialog Box

4. In the **Host** field, enter the IP address of the **VP-1201**.
5. In the **TCPPort** field, type **10001** for Channel 1 (according to the local port, configured in the **VP-1201** unit).
6. Click **OK**.

1 TCP/IP is Transmission Control Protocol/Internet Protocol

7. Click the **Port Settings** button. The Port Settings dialog box appears. Figure 23 shows the Port Settings dialog box and Table 7 describes its settings.
8. Check **Raw Mode**.

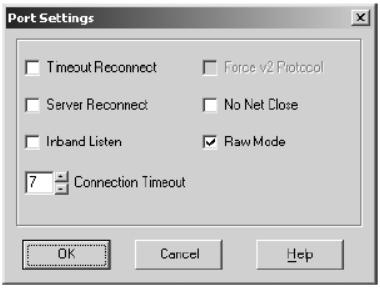


Figure 23: Port Settings Window

9. Click **OK**.
10. Click the **Save** button (see Figure 20).
11. Click the **Close** button (see Figure 20).

Table 7: Port Settings Description

Setting	Description
Timeout Reconnect	If checked, the Com Port Redirector re-establishes the connection if the connection times out[1]
Server Reconnect	If checked, the Com Port Redirector re-establishes the connection if the server closes it[1]
Inband Listen	If checked, the Com Port Redirector uses the inband redirector protocol on inbound connections from a **VP-1201**. This protocol allows settings like modem signals, baud rate and parity to be exchanged between Com Port Redirector and the server
Connection Timeout	Specifies the maximum number of seconds that the Com Port Redirector waits for a connection to be made before giving up on this attempt. If Timeout Reconnect is enabled, each connection attempt lasts this long. If Timeout Reconnect is disabled, the connection attempt fails after this interval and no more attempts are made
Force v2 Protocol	N/A
No Net Close	If checked, prevents the network connection from being dropped when the communications application is closed. To drop the connection, click the Disconnect button in the Com Port Redirector Configuration window. This allows applications to close and reopen ports, without waiting for the network connection to be reestablished and negotiated
Raw Mode	If checked, Raw Mode forms a raw TCP connection to the server's serial port, accelerating the connection between the communications application and the server, without sending configuration or status information from the PC to the server. When using Raw Mode, configure the Com Port Redirector and your **VP-1201** to use the same port number

1 When auto-reconnecting, the Com Port Redirector tries to reconnect until the connection succeeds or you click the Cancel button in the pop-up connection dialog box. If the port was closed by the communications application or by clicking Disconnect, the Com Port Redirector does not try to auto-reconnect

Verify Connectivity

After configuring the Com Port Redirector and the **VP-1201**, use a terminal emulation program such as HyperTerminal to verify connectivity from the Com Port Redirector to the **VP-1201**. To verify connectivity between the Com Port Redirector and the **VP-1201** using HyperTerminal:

1. Click the **Start** button in the Windows Taskbar, point to **Programs**, point to Accessories, point to Communications, and click HyperTerminal.
2. Open a new session to the virtual Com port configured to connect to the device server.
3. When the HyperTerminal window opens, a pop-up window displays: *Attempting to connect to service*.
   If this message is replaced by: *Successfully redirected to service*, the connection from the Com Port Redirector to the device server was successful.
   However, if the message is replaced by *Failed to connect to any service*, the connection failed. Ensure your settings are correct.
4. To hide the pop-up window, check **Silent Mode** on the Com Port Redirector Configuration window (Figure 24).

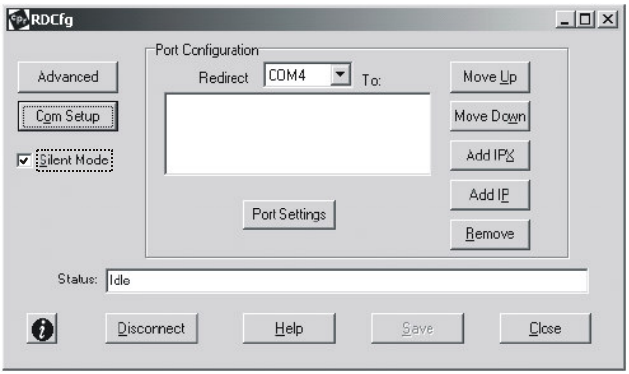


Figure 24: Silent Mode Checked in the RDCfg Window

5.4.6 Using the Com Port Redirector

Observe the following general guidelines when using the Com Port Redirector:

- Do not run the Com Port Redirector with other software that installs a virtual com port
- Do not run the Com Port Redirector with other Com Port Redirection software on the same PC

5.5 Connecting Several VP-1201 Machines

For certain applications, you may need more than just 12 inputs. Cascading **VP-1201** units enables you to expand the number of inputs.

You can cascade:

- Up to 16 individual **VP-1201** units in an Individual Control configuration (see section 5.5.1)
  For example, 16 **VP-1201** units, connected via RS-232 and RS-485, will operate separately: forming 16 12x1 separate machines (see Figure 25)
- Up to 8 interconnected **VP-1201** units in an Input Expansion configuration (see section 5.5.2)
  For example, 3 **VP-1201** units interconnected in this configuration will form a 36x1 machine (see Figure 26)

5.5.1 Connecting Several VP-1201 Units – Individual Control Configuration

To cascade up to 16 individual **VP-1201** units (see Figure 25), do the following:

1. Connect the video sources and acceptors as section 5 describes.
2. Turn ON the power (not illustrated).
3. Connect the RS-232 port on the first **VP-1201** unit to the PC using the Null-modem adapter provided with the machine (recommended), as section 5.2 describes[1].
4. Connect the RS-485 terminal block port on the first **VP-1201** unit to the RS-485 port on the second **VP-1201** unit and so on, connecting all the RS-485 ports.
5. Set the Machine dipswitches as follows:
   - Set the CASCADE dipswitches on all units to OFF
   - Set the first **VP-1201** unit MACH. # dipswitches to Machine # 1 and the following units to Machine # 2, Machine # 3, and so on – up to the last connected **VP-1201** unit (according to Table 10)
   - Set the RS-485 TERM dipswitch ON on the first (Master) and last **VP-1201** units (terminating the RS-485 line) and set OFF on the remaining units
   - Set the other dipswitches according to section 5.7.3 (SCAN) and section 5.7.5 (VALID ONLY)

1 Or connect via the ETHERNET port as section 5.6 describes

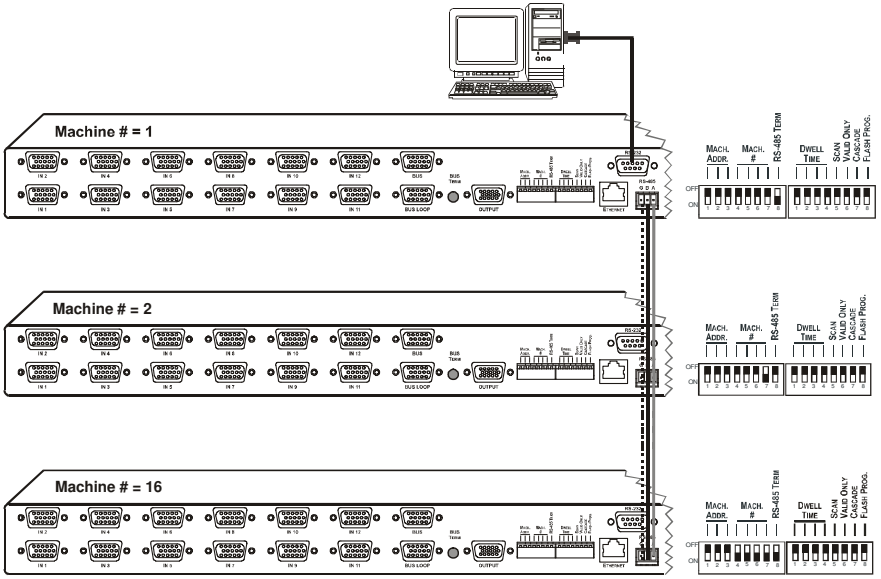


Figure 25: Connecting VP-1201 Machines – Individual Control Configuration

5.5.2 Connecting Several VP-1201 Units – Input Expansion Configuration

You can cascade up to 8 interconnected **VP-1201** units to form an input expansion configuration.

To connect several **VP-1201** units in the Input Expansion configuration (see Figure 26), do the following:

1. Connect the video sources and acceptor[1] (see section 5).
2. Connect the RS-232 port on the first **VP-1201** unit to the PC using the Null-modem adapter provided with the machine[2] (recommended – see section 5.2).
3. Connect the RS-485 terminal block port on the first **VP-1201** unit to the RS-485 port on the second **VP-1201** unit and so on, connecting all the RS-485 ports.
4. Interconnect the HD15F BUS connector and HD15F BUS LOOP connector between the **VP-1201** units as follows:
   - Attach the Cable's first 15-pin HD connector to the 15-pin HD BUS connector on the first **VP-1201** unit
   - Attach the Cable's second 15-pin HD connector to the 15-pin HD BUS Loop on the second **VP-1201** unit
   - Continue attaching the 15-pin HD connectors on each **VP-1201** unit, up to and including the last **VP-1201** unit
5. Set the dipswitches on the **VP-1201** units as follows:
   - Make sure that the CASCADE dipswitches on all machines are set to the ON position
   - Set the MACH # on all units to the same number. For example, set all the dipswitches on all the connected **VP-1201** units to MACH # 2 (according to Table 10)
   - Set the MACH. ADDR. dipswitches on the first **VP-1201** unit (connected to the controller) to Machine Address 1. Set the following units to Machine Address 2, Machine Address 3, and so on – up to the last connected **VP-1201** unit (according to Table 9)
   - Set RS-485 TERM dipswitch ON on the first (Master) and last **VP-1201** units (Terminating the RS-485 line) and set OFF on the remaining units
   - Set other dipswitches according to section 5.7.3 (SCAN) and section 5.7.5 (VALID ONLY)

1 Connect the acceptor to the output of any one of the connected units

2 Or connect via the ETHERNET port as section 5.6 describes

6. Press the BUS TERM button on the first and last units.
7. Insert the highest machine address[1]:
   - On one of the connected units only, set the CASCADE dipswitch to OFF and then back to ON.
     The blue LED on one of the input buttons blinks (indicating the last selection of the highest machine address, as stored in the non-volatile memory)
   - Press the input button denoting the current highest machine address. Blinking will cease

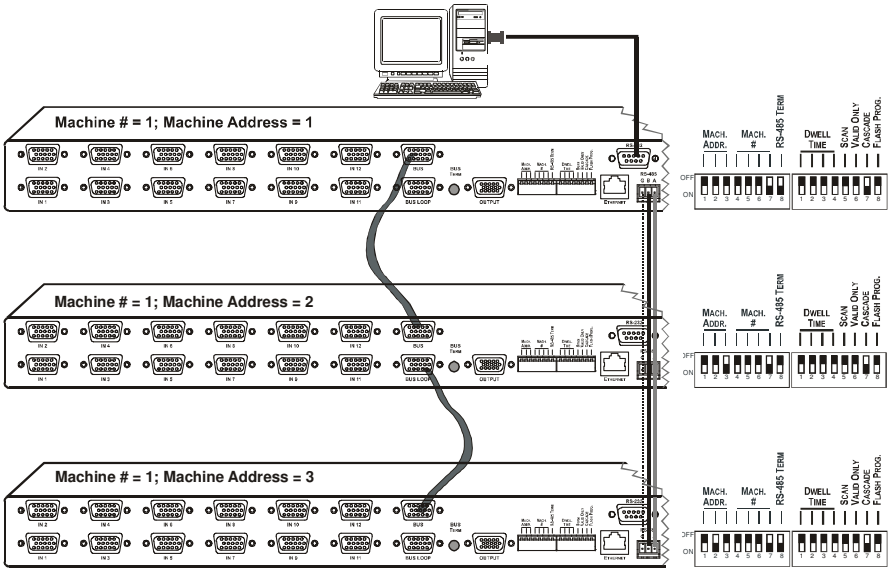


Figure 26: Connecting VP-1201 Machines – Input Expansion Configuration

5.6 Control Configuration via the ETHERNET Port

To control several units via the ETHERNET (in the Individual Control configuration or the Input Expansion configuration), connect the Master unit (MACH # 1) via the ETHERNET port to the LAN port of your PC. Using your PC, initially configure the settings as described in section 5.4.

1 The highest MACHINE ADDRESS is the total number of machines in the Input Expansion configuration. In Figure 26, for example, the highest machine address will be 3

5.7 Setting the Dipswitches

This section describes the machine set-up and dipswitch selection.

By default, all the **VP-1201** dipswitches are set to OFF. Figure 27 and Table 8 describe the **VP-1201** unit dipswitches, which consist of two sets, each numbered 1 to 8, respectively.

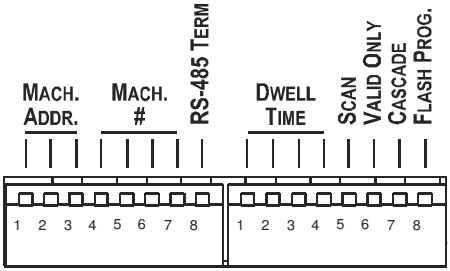


Figure 27: VP-1201 Dipswitches

Table 8: Dipswitch Settings

DIPS	Function	Description
1, 2, 3	MACH. ADDR.	Determines the position of the machine in the input expansion configuration
4, 5, 6, 7	MACH. #	For allowing several cascaded systems to be interconnected for control purposes[1]
8	RS-485 TERM	ON for RS-485 Line Termination OFF for no RS-485 Line Termination
1, 2, 3, 4	DWELL TIME	Determines scanning delay time – the number of seconds each input is connected to the output in the Scanner mode
5	SCAN	ON for Scanner mode; OFF for switcher mode
6	VALID ONLY	ON determines automatic scanning of only valid signals
7	CASCADE	ON when in the Input Expansion configuration (see section 5.5.2)
8	FLASH PROG.	ON to enable upgrade to the latest Kramer firmware (see section 7)

1 A configuration may be built with several groups of cascaded machines. To do this, set the machine addresses accordingly for each group, and set all the machines in a group with the same MACHINE #. For example, a system with a 24 input switcher and 36 input switcher would consist of two switchers with machine # 1, and three switchers with machine # 2. Machine # 1 would consist of a unit with MACHINE ADDRESS 1 and a unit with MACHINE ADDRESS 2. Machine # 2 would consist of units with MACHINE ADDRESSES 1, 2 and 3

5.7.1 MACH. ADDR. (Machine Address) Dipswitches Setup

The MACH. ADDR. dipswitches are set to define the position[1] of a machine that is connected within the Input Expansion configuration. Set the MACH. ADDR. on each **VP-1201** unit that is connected in the Input Expansion configuration according to Table 9.

Table 9: MACH. ADDR. Dipswitch Settings

MACH. ADDR.	DIPS		
	1	2	3
1	OFF	OFF	OFF
2	OFF	OFF	ON
3	OFF	ON	OFF
4	OFF	ON	ON
5	ON	OFF	OFF
6	ON	OFF	ON
7	ON	ON	OFF
8	ON	ON	ON

5.7.2 MACH. # (Machine Number) Dipswitches Setup

Set the MACH # according to the system configuration (Table 10):

- When connecting a single unit, set the MACH. # dipswitches to 1[2]
- When connecting several **VP-1201** units in the Input Expansion configuration, set an identical MACH. # on all units
- When connecting other machines (in the Individual Control configuration), set the MACH. # to subsequent numbers. For example, 1 for the first unit, 2 for the second unit, and so on
- If a remote controller is connected via RS-485, set the MACH. # on the **VP-1201** unit to any number other than 1 (see section 5.3)

Table 10: MACH. # Dipswitch Settings

Mach. #	DIP 4	DIP 5	DIP 6	DIP 7
1 Master	OFF	OFF	OFF	OFF
2	OFF	OFF	OFF	ON
3	OFF	OFF	ON	OFF
4	OFF	OFF	ON	ON
5	OFF	ON	OFF	OFF
6	OFF	ON	OFF	ON
7	OFF	ON	ON	OFF
8	OFF	ON	ON	ON

Mach. #	DIP 4	DIP 5	DIP 6	DIP 7
9	ON	OFF	OFF	OFF
10	ON	OFF	OFF	ON
11	ON	OFF	ON	OFF
12	ON	OFF	ON	ON
13	ON	ON	OFF	OFF
14	ON	ON	OFF	ON
15	ON	ON	ON	OFF
16	ON	ON	ON	ON

1 For example, set the second unit to 2, the third unit to 3, and so on (see Figure 26); when operating a single unit, set MACH. ADDR. to 1 (the Master unit)

2 Except if controlling via RS-485

5.7.3 SCAN Dipswitch Setup

The SCAN dipswitch lets you operate the unit in two modes:

- The Switcher mode, for manually switching from one input to another
- The Scanner mode, for automatic switching between inputs in sequence

Set the SCAN dipswitch as described in the following sections.

5.7.3.1 SCAN Dipswitch Setup for the Switcher Mode

By default, the machine is set to the Switcher mode (the SCAN dipswitch is set to OFF). Other dipswitches are set according to the machine configuration.

5.7.3.2 SCAN Dipswitch Setup for the Scanner Mode

To operate in the Scanner mode, perform the following setup:

1. Set the SCAN dipswitch to ON.
2. Set the DWELL TIME dipswitches according to the desired delay time (see section 5.7.4).
3. Set the other dipswitches according to the machine configuration.

5.7.4 DWELL TIME Dipswitches Setup

The DWELL TIME dipswitches-setup determines the number of seconds[1] each input is connected to the output in the Scanner mode. Table 11 defines the DWELL TIME dipswitches settings.

Table 11: DWELL TIME Dipswitch Settings

sec	DIP 1	DIP 2	DIP 3	DIP 4
1	OFF	OFF	OFF	OFF
2	OFF	OFF	OFF	ON
3	OFF	OFF	ON	OFF
4	OFF	OFF	ON	ON
5	OFF	ON	OFF	OFF
6	OFF	ON	OFF	ON
7	OFF	ON	ON	OFF
8	OFF	ON	ON	ON

sec	DIP 1	DIP 2	DIP 3	DIP 4
9	ON	OFF	OFF	OFF
10	ON	OFF	OFF	ON
11	ON	OFF	ON	OFF
12	ON	OFF	ON	ON
13	ON	ON	OFF	OFF
14	ON	ON	OFF	ON
15	ON	ON	ON	OFF
16	ON	ON	ON	ON

5.7.5 VALID ONLY Dipswitch Setup

Set the VALID ONLY dipswitch to ON if you want the **VP-1201** to connect only valid inputs to the output. Otherwise, set it to OFF[2].

1 1 to 16 seconds

2 For VALID ONLY, the unit detects whether or not there is an input present, and will only scan to the detected inputs in this case

5.7.6 FLASH PROG Dipswitch Setup

Set the FLASH PROG dipswitch to ON only when upgrading to the latest Kramer firmware (see section 7.2). Following the firmware upgrade, set to OFF.

5.8 Resetting the Unit

Push the RESET button, located on the underside of the unit, only prior to upgrading to the latest Kramer firmware (see section 7.2).

6 Operating the VP-1201

The **VP-1201** can operate in two different modes:

- Switcher mode – inputs are selected manually. Move from one signal to another by pressing the appropriate input button.
- Scanner mode – inputs are automatically scanned in sequence.

6.1 Switching between Modes

To toggle from the Switcher mode to the Scanner mode, do the following:

1. Set the SCAN dipswitch to ON (see section 5.7.3.1).
2. Set the DWELL TIME dipswitch as desired (see section 5.7.4).
3. Set the VALID ONLY dipswitch as desired (see section 5.7.5).

Toggle from the Scanner mode to the Switcher mode in the reverse order.

6.2 The VP-1201 Input Buttons

The Input buttons on the front panel give the following indications:

- The blue LED illuminates when a valid input is connected
- The red LED illuminates when an input is routed to the output but no valid signal is detected on the input
- Both the blue and red LEDs illuminate (creating purple) when a valid input signal is being routed to the output

To understand how the Input button LEDs function, consider the following example:

Figure 28 shows an acceptor connected to the **VP-1201** unit and 3 sources connected to inputs # 1, 5 and 10.

On the front panel we can see that:

- The blue LEDs in buttons 1, 5 and 10 are illuminated (indicating that these 3 sources are connected and active)
- The red LED in button 2 is illuminated (indicating that Input 2 is routed to the output – but there is no active source connected to Input 2)

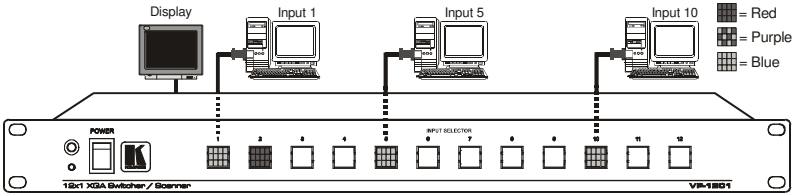


Figure 28: VP-1201 Input Buttons Illuminated (I)

We now want to route Input 5 to the output (see Figure 29). To do so we have to press the Input 5 button. On the front panel we can see that:

- The blue LEDS are illuminated in Input buttons 1, and 10
- The red and blue LEDs in button 5 are also illuminated (creating purple) because input 5 is now routed to the output
- The Input 2 button no longer illuminates

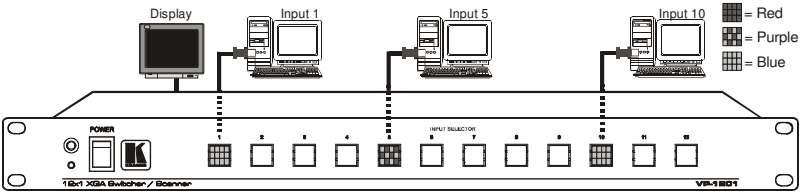


Figure 29: VP-1201 Input Buttons Illuminated (II)

7 Firmware Upgrading

The **VP-1201** firmware is located in FLASH memory, which lets you upgrade to the latest Kramer firmware version in minutes! The process involves:

- Downloading from the Internet (see section 7.1)
- Connecting the PC to the RS-232 port (see section 7.2)
- Upgrading firmware (see section 7.3)

7.1 Downloading from the Internet

You can download the up-to-date file from the Internet. To do so:

1. Go to our Web site at http://www.kramerelectronics.com and download the file: "*FLIP_VP1201.zip*" from the Technical Support section.
2. Extract the file: "*FLIP_VP1201.zip*" to a folder (for example, C:\Program Files\Kramer Flash).
3. Create a shortcut on your desktop to the file: "*FLIP.EXE*".

7.2 Connecting the PC to the RS-232 Port

Before installing the latest Kramer firmware version on a **VP-1201** unit, do the following:

1. Connect the RS-232 DB9 rear panel port on the **VP-1201** unit to the Null-modem adapter and connect the Null-modem adapter with a 9 wire flat cable to the RS-232 DB9 COM port on your PC (see section 5.2).
2. Connect the power to the **VP-1201** unit and switch it ON.
3. Set Flash Program dipswitch to ON.
4. On the underside panel push the reset button, using a screwdriver (see Figure 2).

7.3 Upgrading Firmware

Follow these steps to upgrade the firmware:

1. Double click the desktop icon: "*Shortcut to FLIP.EXE*".
   The Splash screen appears as follows:

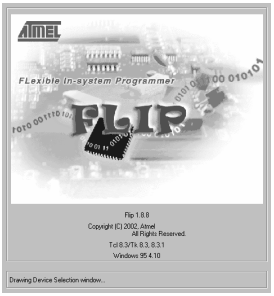


Figure 30: Splash Screen

2. After a few seconds, the Splash screen is replaced by the "*Atmel – Flip*" window:

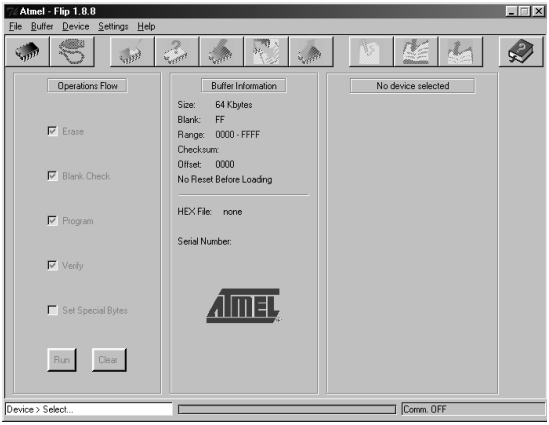


Figure 31: Atmel – Flip Window

3. Press the keyboard shortcut key F2 (or select the "Select" command from the Device menu, or press the integrated circuit icon in the upper right corner of the window).
   The "Device Selection" window appears:

Figure 32: Device Selection Window

4. Click the button next to the name of the device and select from the list: AT89C51RD2:

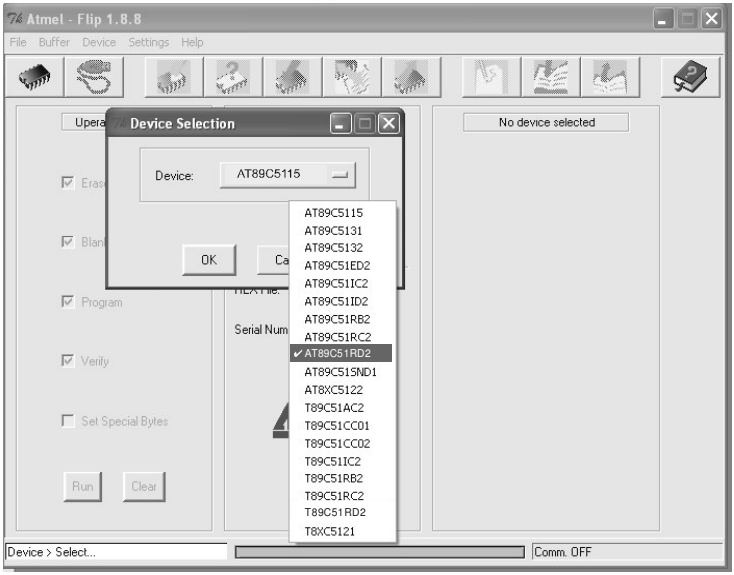


Figure 33: Selecting Device from Selection Window

5. Click OK and select "Load Hex" from the File menu.

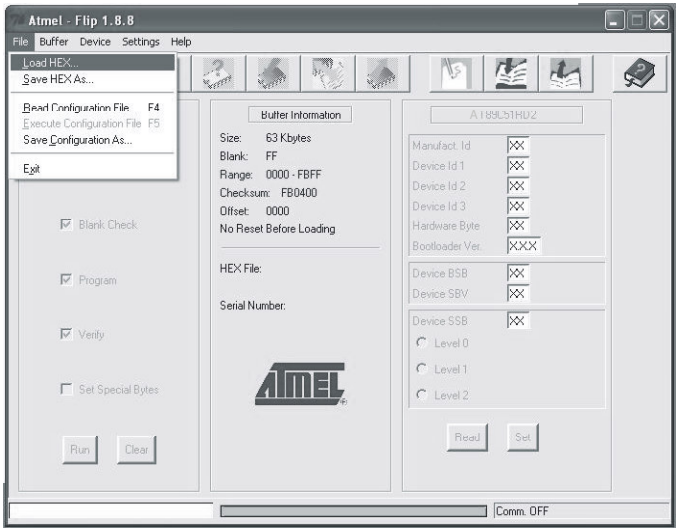


Figure 34: Loading the Hex

6. The Open File window opens. Select the correct HEX file that contains the updated version of the firmware for **VP-1201** (for example 1201M_V1p2.hex) and click Open.

7. Press the keyboard shortcut key F3 (or select the "Communication / RS232" command from the Settings menu, or press the keys: Alt SCR). The "RS232" window appears. Change the COM port according to the configuration of your computer and select the 9600 baud rate:

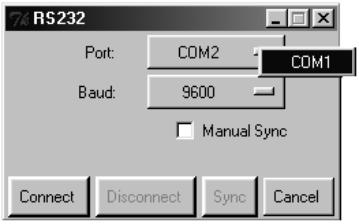


Figure 35: RS-232 Window

8. Click Connect.
   In the "Atmel – Flip" window, in the Operations Flow column, the Run button is active, and the name of the chip appears as the name of the third column: AT89C51RD2.
   Verify that in the *Buffer Information* column, the "*HEX File: VP1201.hex*" appears.

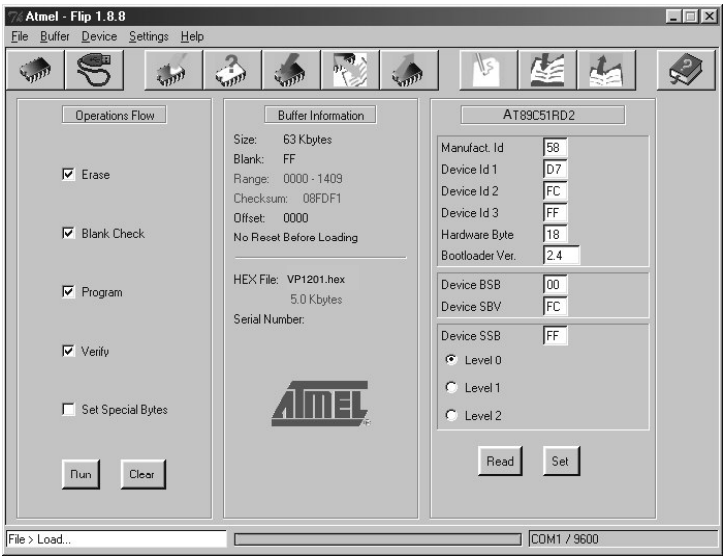


Figure 36: Atmel – Flip Window (Connected)

9. Click *Run*.
   Upon completion of each stage of the operation, the check-box for that stage turns green[1].
   When the operation is completed, all 4 check-boxes will be colored green and the status bar message: *Memory Verify Pass* appears[2]:

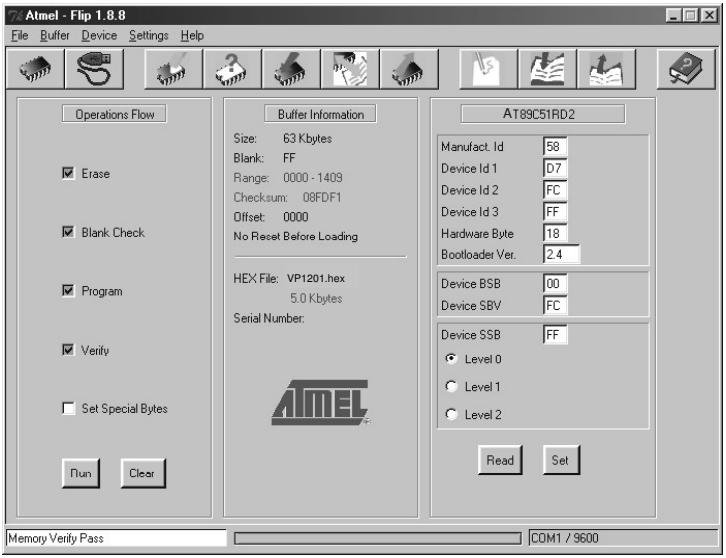


Figure 37: Atmel – Flip Window (Operation Completed)

10. Close the "*Atmel – Flip*" window.
11. Disconnect the power on the **VP-1201**.
12. If required, disconnect the RS-232 rear panel port on the **VP-1201** unit from the Null-modem adapter.
13. Connect the power on the **VP-1201**.

1 See also the blue progress indicator on the status bar

2 If an error message: "Not Finished" shows, click Run again

8 Technical Specifications

Table 12 includes the technical specifications.

Table 12: Technical Specifications[1] of the VP-1201

INPUTS:	12 XGA inputs on HD15F connectors
OUTPUT:	1 XGA output on an HD15F connector
MAX. OUTPUT LEVEL:	1.9Vpp
BANDWIDTH (-3dB):	400MHz
DIFF. GAIN:	0.03%
DIFF. PHASE:	0.05 Deg.
K-FACTOR:	< 0.05%
S/N RATIO:	76dB
CROSSTALK (all hostile):	-61dB @ 5MHz
CONTROLS:	-1.3dB to + 6dB, RGB level control
COUPLING:	DC
POWER SOURCE:	230 VAC, 50/60 Hz (115 VAC, USA)
DIMENSIONS:	19 inch (W), 7 inch (D), 1U (H) rack mountable
WEIGHT:	2.7 kg (6 lbs.) approx.
ACCESSORIES:	Power cord, Null modem adapter, Windows®-based control software, Windows®-based Configuration Manager XPort software and Com Port Redirector

9 Table of Hex Codes for Serial Communication

Table 13 lists the Hex values for a single machine (*MACH #* 1).

Table 13: VP-1201 Hex Codes for Switching via RS-232/RS-485

IN 1	IN 2	IN 3	IN 4	IN 5	IN 6	IN 7	IN 8	IN 9	IN 10	IN 11	IN 12
01	01	01	01	01	01	01	01	01	01	01	01
81	82	83	84	85	86	87	88	89	8A	8B	8C
81	81	81	81	81	81	81	81	81	81	81	81
81	81	81	81	81	81	81	81	81	81	81	81

Table 14 Lists the Hex values for request for detection of valid input

Table 14: VP-1201 Hex Codes for Valid Input Detection Request

IN 1	IN 2	IN 3	IN 4	IN 5	IN 6	IN 7	IN 8	IN 9	IN 10	IN 11	IN 12
0F	0F	0F	0F	0F	0F	0F	0F	0F	0F	0F	0F
81	82	83	84	85	86	87	88	89	8A	8B	8C
81	81	81	81	81	81	81	81	81	81	81	81
81	81	81	81	81	81	81	81	81	81	81	81

1 Specifications are subject to change without notice

10 Kramer Protocol 2000

The **VP-1201** is compatible with Kramer's Protocol 2000 (version 0.42) (below). This RS-232/RS-485 communication protocol uses four bytes of information as defined below.

For RS-232, a null-modem connection between the machine and controller is used. The default data rate is 9600 baud, with no parity, 8 data bits and 1 stop bit.

Table 15: Protocol Definitions

MSB							LSB
	DESTI-NATION	**INSTRUCTION**					
0	D	N5	N4	N3	N2	N1	N0
7	6	5	4	3	2	1	0
1st byte							
	INPUT						
1	I6	I5	I4	I3	I2	I1	I0
7	6	5	4	3	2	1	0
2nd byte							
	OUTPUT						
1	O6	O5	O4	O3	O2	O1	O0
7	6	5	4	3	2	1	0
3rd byte							
			MACHINE NUMBER				
1	OVR	X	M4	M3	M2	M1	M0
7	6	5	4	3	2	1	0
4th byte							

1st BYTE: Bit 7 – Defined as 0.
D – "DESTINATION": 0 - for sending information to the switchers (from the PC);
1 - for sending to the PC (from the switcher).
N5…N0 – "INSTRUCTION"
The function that is to be performed by the switcher(s) is defined by the INSTRUCTION (6 bits). Similarly, if a function is performed via the machine's keyboard, then these bits are set with the INSTRUCTION NO., which was performed. The instruction codes are defined according to the table below (INSTRUCTION NO. is the value to be set for N5…N0).

2nd BYTE: Bit 7 – Defined as 1.
I6…I0 – "INPUT".
When switching (ie. instruction codes 1 and 2), the INPUT (7 bits) is set as the input number which is to be switched. Similarly, if switching is done via the machine's front-panel, then these bits are set with the INPUT NUMBER which was switched. For other operations, these bits are defined according to the table.

3rd BYTE: Bit 7 – Defined as 1.
O6…O0 – "OUTPUT".
When switching (i.e. instruction codes 1 and 2), the OUTPUT (7 bits) is set as the output number which is to be switched. Similarly, if switching is done via the machine's front-panel, then these bits are set with the OUTPUT NUMBER which was switched. For other operations, these bits are defined according to the table.

4th BYTE: Bit 7 – Defined as 1.
Bit 5 – Don't care.
OVR – Machine number override.
M4…M0 – MACHINE NUMBER.
Used to address machines in a system via their machine numbers. When several machines are controlled from a single serial port, they are usually configured together with each machine having an individual machine number. If the OVR bit is set, then all machine numbers will accept (implement) the command, and the addressed machine will reply.
For a single machine controlled via the serial port, always set M4…M0 = 1, and make sure that the machine itself is configured as MACHINE NUMBER = 1.

Table 16: Instruction Codes for Protocol 2000

Note: All values in the table are decimal, unless otherwise stated.

INSTRUCTION		DEFINITION FOR SPECIFIC INSTRUCTION		NOTE
#	DESCRIPTION	INPUT	OUTPUT	
0	RESET VIDEO	0	0	1
1	SWITCH VIDEO	Set equal to video input which is to be switched (0 = disconnect)	Set equal to video output which is to be switched (0 = to all the outputs)	2, 15
2	SWITCH AUDIO	Set equal to audio input which is to be switched (0 = disconnect)	Set equal to audio output which is to be switched (0 = to all the outputs)	2
3	STORE VIDEO STATUS	Set as SETUP #	0 - to store 1 - to delete	2, 3, 15
4	RECALL VIDEO STATUS	Set as SETUP #	0	2, 3, 15
5	REQUEST STATUS OF A VIDEO OUTPUT	Set as SETUP #	Equal to output number whose status is reqd	4, 3
6	REQUEST STATUS OF AN AUDIO OUTPUT	Set as SETUP #	Equal to output number whose status is reqd	4, 3
7	VIS SOURCE	Set as input # (for OUTPUT byte = 6) or as output # (for OUTPUT byte = 7), or set = 0	0 - No VIS (immediate) 1 - Input # 1 2 - External digital sync 3 - External analog sync 4 - Dynamic sync 5 - Inter-machine sync 6 - Input # (INPUT byte) 7 - Output # (INPUT byte) 8 - User-defined sync 64 - Set for delayed switch 65 - Execute delayed switch 66 - Cancel delayed switch setting	2, 5, 17
8	BREAKAWAY SETTING	0	0 - audio-follow-video 1 - audio breakaway	2
		1	0 - FOLLOW mode 1 - Normal mode	15
9	VIDEO / AUDIO TYPE SETTING	0 - for video	0 - CV 4 - SDI 1 - YC 5 - CV+YC 2 - YUV 6 - VGA scaler 3 - RGBS	2
		1 - for audio	O0=0 – Unbalanced audio O0=1 – Balanced audio O1=0 – Digital audio O1=1 – Analog audio O4=0, O3=0, O2=0-Mono O4=0, O3=0, O2=1-Stereo	
		2 - for VGA	1 - 640X480 2 - 800X600 3 - 1024X768	
10	REQUEST VIS SETTING	Set as SETUP #, or set to 126 or 127 to request if machine has this function	0 - VIS source 1 - Input # or output # of source 2 - Vertical sync freq (Hz)	3, 4, 6, 7
11	REQUEST BREAKAWAY SETTING	Set as SETUP #, or set to 126 or 127 to request if machine has this function	0 - Request audio breakaway setting 1 - Request “FOLLOW” setting	3, 4, 6, 15
12	REQUEST VIDEO / AUDIO TYPE SETTING	Set as SETUP #, or set to 126 or 127 to request if machine has this function	0 - for video 1 - for audio 2 - for VGA	3, 4, 6
13	SET HIGHEST MACHINE ADDRESS	0 - for video 1 - for audio	Set equal to highest machine address	2
14	REQUEST HIGHEST MACHINE ADDRESS	0 - for video 1 - for audio	0	4
15	REQUEST WHETHER SETUP IS DEFINED	Set as SETUP #	0	8
16	ERROR / BUSY	0	0 - error 1 - invalid instruction 2 - out of range 3 - machine busy	9
17	RESERVED	- - - -	- - - -	10
18	RESET AUDIO	0	0	1

INSTRUCTION		DEFINITION FOR SPECIFIC INSTRUCTION		NOTE
#	DESCRIPTION	INPUT	OUTPUT	
19	STORE AUDIO STATUS	Set as SETUP #	0 - to store 1 - to delete	2, 3
20	RECALL AUDIO STATUS	Set as SETUP #	0	2, 3
21	SET VIDEO PARAMETER	Equal to input / output number whose video parameter is to be set (0 = all)	Set as parameter value	2, 11, 23
22	SET AUDIO PARAMETER	Equal to input / output number whose gain is to be set (0 = all)	Set as parameter value	2, 11, 23
23	INCREASE / DECREASE VIDEO PARAMETER	Equal to input / output number whose video parameter is to be increased / decreased (0 = all)	0 - increase video gain 1 - decrease video gain 2 - increase contrast 3 - decrease contrast 4 - increase brightness 5 - decrease brightness 6 - increase color 7 - decrease color 8 - increase hue 9 - decrease hue 16 - increase H-phase 17 - decrease H-phase 18 - increase V-position 19 - decrease V-position	23
24	INCREASE / DECREASE AUDIO PARAMETER	Equal to input / output number whose parameter is to be increased / decreased (0 = all)	0 - increase output 1 - decrease output 2 - increase left output 3 - decrease left output 4 - increase right output 5 - decrease right output 6 - increase input 7 - decrease input 8 - increase left input 9 - decrease left input 10 - increase right input 11 - decrease right input	23
25	REQUEST AUDIO PARAMETER	Equal to input / output number whose parameter is requested	0	6, 23
26	REQUEST VIDEO PARAMETER	Equal to input / output number whose video parameter is requested	0	6, 23
30	LOCK FRONT PANEL	0 - Panel unlocked 1 - Panel locked	0	2
31	REQUEST WHETHER PANEL IS LOCKED	0	0	16
32	RESERVED	- - - -	- - - -	10
33	RESERVED	- - - -	- - - -	10
34	RESERVED	- - - -	- - - -	10
35	RESERVED	- - - -	- - - -	10
40	DIRECT MEMORY SAVE	Memory address	Data	20
42	AUDIO PARAMETER SETTINGS FOR INSTRUCTIONS 22, 24, 25	INPUT Bit: I0 - 0=input; 1=output I1 - Left I2 - Right	0 - Gain 1 - Bass 2 - Treble 3 - Midrange	23
43	VIDEO PARAMETER SETTINGS FOR INSTRUCTIONS 21, 23, 26	1 – Input 2 – Output	0 - video gain 1 - contrast 2 - brightness 3 - color 4 - hue 4 - H-phase 5 - V-position	23
56	CHANGE TO ASCII	0	0	18
57	SET AUTO-SAVE	I3 - no save I4 - auto-save	0	12, 2
58	EXECUTE LOADED DATA	Set as 0, or as SETUP #	1-Take 2-Cancel	21, 3
59	LOAD VIDEO DATA	Set equal to video input (0 = disconnect) (127 = load SETUP #)	Set equal to video output (0 = to all the outputs) or SETUP #	21, 22

INSTRUCTION		DEFINITION FOR SPECIFIC INSTRUCTION		NOTE
#	DESCRIPTION	INPUT	OUTPUT	
60	LOAD AUDIO DATA	Set equal to audio input (0 = disconnect) (127 = load SETUP #)	Set equal to audio output (0 = to all the outputs) or SETUP #	21, 22
61	IDENTIFY MACHINE	1 - video machine name 2 - audio machine name 3 - video software version 4 - audio software version 5 - RS422 controller name 6 - RS422 controller version 7 - remote control name 8 - remote software version 9 - Protocol 2000 revision	0 - Request first 4 digits 1 - Request first suffix 2 - Request second suffix 3 - Request third suffix 10 - Request first prefix 11 - Request second prefix 12 - Request third prefix	13
62	DEFINE MACHINE	1 - number of inputs 2 - number of outputs 3 - number of setups	1 - for video 2 - for audio 3 - for SDI 4 - for remote panel 5 - for RS-422 controller	14
63	EXTENDED DATA	7 MSBs for INPUT data	7 MSBs for OUTPUT data	19

NOTES on the above table:

NOTE 1 - When the master switcher is reset, (e.g. when it is turned on), the reset code is sent to the PC. If this code is sent to the switchers, it will reset according to the present power-down settings.

NOTE 2 - These are bi-directional definitions. That is, if the switcher receives the code, it will perform the instruction; and if the instruction is performed (due to a keystroke operation on the front panel), then these codes are sent. For example, if the HEX code

01 85 88 83

was sent from the PC, then the switcher (machine 3) will switch input 5 to output 8. If the user switched input 1 to output 7 via the front panel keypad, then the switcher will send HEX codes:

41 81 87 83

to the PC.

When the PC sends one of the commands in this group to the switcher, then, if the instruction is valid, the switcher replies by sending to the PC the same four bytes that it was sent (except for the first byte, where the DESTINATION bit is set high).

NOTE 3 - SETUP # 0 is the present setting. SETUP # 1 and higher are the settings saved in the switcher's memory, (i.e. those used for Store and Recall).

NOTE 4 - The reply to a "REQUEST" instruction is as follows: the same instruction and INPUT codes as were sent are returned, and the OUTPUT is assigned the value of the requested parameter. The replies to instructions 10 and 11 are as per the definitions in instructions 7 and 8 respectively. For example, if the present status of machine number 5 is breakaway setting, then the reply to the HEX code

0B 80 80 85

would be HEX codes

4B 80 81 85

NOTE 5 – For the OUTPUT byte set as 6, the VIS source is the input selected using the OUTPUT byte. Similarly, for the OUTPUT byte set as 7, the VIS source is the output selected using the OUTPUT byte. Note also, that on some machines the sync source is not software selectable, but is selected using switches, jumpers, etc!

NOTE 6 – If INPUT is set to 127 for these instructions, then, if the function is defined on this machine, it replies with OUTPUT=1. If the function is not defined, then the machine replies with OUTPUT=0, or with an error (invalid instruction code).

If the INPUT is set to 126 for these instructions, then, if possible, the machine will return the current setting of this function, even for the case that the function is not defined. For example, for a video switcher which always switches during the VIS of input # 1, (and its VIS setting cannot be programmed otherwise), the reply to the HEX code

0A FE 80 81 (i.e. request VIS setting, with INPUT set as 126dec)

would be HEX codes

4A FE 81 81 (i.e. VIS setting = 1, which is defined as VIS from input # 1).

NOTE 7 – Setting OUTPUT to 0 will return the VIS source setting as defined in instruction # 7. Setting to 1 will return the input # or output # of the sync source (for the case where the VIS source is set as 6 or as 7 in instruction # 7). Setting to 2 returns the vertical sync frequency (0 for no input sync, 50 for PAL, 60 for NTSC, 127 for error).

NOTE 8 - The reply to the "REQUEST WHETHER SETUP IS DEFINED" is as in TYPE 3 above, except that here the OUTPUT is assigned with the value 0 if the setup is not defined; or 1 if it is defined.

NOTE 9 - An error code is returned to the PC if an invalid instruction code was sent to the switcher, or if a parameter associated with the instruction is out of range (e.g. trying to save to a setup greater than the highest one, or trying to switch an input or output greater than the highest one defined). This code is also returned to the PC if an RS-232 instruction is sent while the machine is being programmed via the front panel. Reception of this code by the switcher is not valid.

NOTE 10 – This code is reserved for internal use.

NOTE 11 – For machines where the video and / or audio gain is programmable.

NOTE 12 - Under normal conditions, the machine's present status is saved each time a change is made. The "power-down" save (auto-save) may be disabled using this code. Note that whenever the machine is turned on, the auto-save function is set.

NOTE 13 - This is a request to identify the switcher/s in the system. If the OUTPUT is set as 0, and the INPUT is set as 1, 2, 5 or 7, the machine will send its name. The reply is the decimal value of the INPUT and OUTPUT. For example, for a 2216, the reply to the request to send the audio machine name would be (HEX codes):

7D 96 90 81 (i.e. 128dec+ 22dec for 2nd byte, and 128dec+ 16dec for 3rd byte).

If the request for identification is sent with the INPUT set as 3 or 4, the appropriate machine will send its software version number. Again, the reply would be the decimal value of the INPUT and OUTPUT - the INPUT representing the number in front of the decimal point, and the OUTPUT representing the number after it. For example, for version 3.5, the reply to the request to send the version number would be (HEX codes):

7D 83 85 81 (i.e. 128dec+ 3dec for 2nd byte, 128dec+ 5dec for 3rd byte).

If the OUTPUT is set as 1, then the ASCII coding of the lettering following the machine's name is sent. For example, for the VS-7588YC, the reply to the request to send the first suffix would be (HEX codes):

7D D9 C3 81 (i.e. 128dec+ ASCII for "Y"; 128dec+ ASCII for "C").

NOTE 14 - The number of inputs and outputs refers to the specific machine, which is being addressed, not to the system. For example, if six 16X16 matrices are configured to make a 48X32 system (48 inputs, 32 outputs), the reply to the HEX code

3E 82 81 82 (ie. request the number of outputs)

would be HEX codes

7E 82 90 82

i.e. 16 outputs

NOTE 15 – When the OVR bit (4th byte) is set, then the "video" commands have universal meaning. For example, instruction 1 (SWITCH VIDEO) will cause all units (including audio, data, etc.) to switch. Similarly, if a machine is in "FOLLOW" mode, it will perform any "video" instruction.

NOTE 16 - The reply to the "REQUEST WHETHER PANEL IS LOCKED" is as in NOTE 4 above, except that here the OUTPUT is assigned with the value 0 if the panel is unlocked, or 1 if it is locked.

NOTE 17 – Delayed execution allows switching after a delay dictated by RS-232. To do this, the user sends instruction 7 with the "Set for delayed switch" option (64dec) before sending the switch command (instruction 1) or pressing via front panel. The switch is not executed (unless timed-out) until the "Execute delayed switch" code is sent, or the ""Set for delayed switch" code is sent again. (The mode is automatically cancelled after implementation of the switch if the "execute" command is used).

For example, to connect input 4 to output 3 after a delay, send HEX codes

07	80	C0	81	(set for delayed switch)
01	84	83	81	(switch code)

then, after the required delay, send HEX codes

07	80	C1	81	(execute delayed switch)

to implement the switch.

NOTE 18 – After this instruction is sent, the unit will respond to the ASCII command set. The ASCII command to operate with the HEX command set must be sent in order to return to working with HEX codes.

NOTE 19 – When data (ie. the INPUT and/or OUTPUT bytes) of more than 7 bits is required, this instruction is sent before sending the instruction needing the additional bits. The data in this instruction then becomes the Most Significant Bits of that next instruction. For example, to set the audio gain (instruction 22) of output 3 to 681dec (2A9hex), you would first send HEX codes

3F 80 85 81

and then send HEX codes

16 83 A9 81

To set the audio gain of output 6 to 10013dec (271Dhex), first send HEX codes

3F 80 CE 81

followed by HEX codes

16 86 9D 81

NOTE 20 – To store data in the non-volatile memory of the unit, e.g. the EEPROM for saving SETUPS. The EEPROM address is sent using the INPUT byte, and the data to be stored is sent using the OUTPUT byte. To use this instruction, it is necessary to understand the memory map, and memory structure of the particular machine.

NOTE 21 – Instruction 59 and instruction 60 load data for sending to the crosspoint switcher (or for storing in a SETUP), i.e. the data is "lined-up" to be executed later. Instruction 58 executes the loaded data.

NOTE 22 – If the INPUT byte is set as 127dec, then the data stored in a SETUP is loaded. The SETUP # is in the OUTPUT byte.

NOTE 23 – Further information needed in instructions 21, 22, 25 and 26, is sent using instruction 42 – which is sent prior to the instruction. For example, to request the audio gain value of right input # 9, send hex codes

2A 84 80 81

and then send HEX codes

19 89 81 81

LIMITED WARRANTY

Kramer Electronics (hereafter *Kramer*) warrants this product free from defects in material and workmanship under the following terms.

HOW LONG IS THE WARRANTY

Labor and parts are warranted for three years from the date of the first customer purchase.

WHO IS PROTECTED?

Only the first purchase customer may enforce this warranty.

WHAT IS COVERED AND WHAT IS NOT COVERED

Except as below, this warranty covers all defects in material or workmanship in this product. The following are not covered by the warranty:

1. Any product which is not distributed by Kramer, or which is not purchased from an authorized Kramer dealer. If you are uncertain as to whether a dealer is authorized, please contact Kramer at one of the agents listed in the Web site www.kramerelectronics.com.
2. Any product, on which the serial number has been defaced, modified or removed.
3. Damage, deterioration or malfunction resulting from:
   - i) Accident, misuse, abuse, neglect, fire, water, lightning or other acts of nature
   - ii) Product modification, or failure to follow instructions supplied with the product
   - iii) Repair or attempted repair by anyone not authorized by Kramer
   - iv) Any shipment of the product (claims must be presented to the carrier)
   - v) Removal or installation of the product
   - vi) Any other cause, which does not relate to a product defect
   - vii) Cartons, equipment enclosures, cables or accessories used in conjunction with the product

WHAT WE WILL PAY FOR AND WHAT WE WILL NOT PAY FOR

We will pay labor and material expenses for covered items. We will not pay for the following:

1. Removal or installations charges.
2. Costs of initial technical adjustments (set-up), including adjustment of user controls or programming. These costs are the responsibility of the Kramer dealer from whom the product was purchased.
3. Shipping charges.

HOW YOU CAN GET WARRANTY SERVICE

1. To obtain service on you product, you must take or ship it prepaid to any authorized Kramer service center.
2. Whenever warranty service is required, the original dated invoice (or a copy) must be presented as proof of warranty coverage, and should be included in any shipment of the product. Please also include in any mailing a contact name, company, address, and a description of the problem(s).
3. For the name of the nearest Kramer authorized service center, consult your authorized dealer.

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The liability of Kramer for any effective products is limited to the repair or replacement of the product at our option. Kramer shall not be liable for:

1. Damage to other property caused by defects in this product, damages based upon inconvenience, loss of use of the product, loss of time, commercial loss; or:
2. Any other damages, whether incidental, consequential or otherwise. Some countries may not allow limitations on how long an implied warranty lasts and/or do not allow the exclusion or limitation of incidental or consequential damages, so the above limitations and exclusions may not apply to you.

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This equipment has been tested to determine compliance with the requirements of:

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CFR-47:	FCC Rules and Regulations: Part 15: "Radio frequency devices Subpart B – Unintentional radiators"

CAUTION!

- Servicing the machines can only be done by an authorized Kramer technician. Any user who makes changes or modifications to the unit without the expressed approval of the manufacturer will void user authority to operate the equipment.
- Use the supplied DC power supply to feed power to the machine.
- Please use recommended interconnection cables to connect the machine to other components.

For the latest information on our products and a list of Kramer distributors, visit our Web site: www.kramerelectronics.com, where updates to this user manual may be found.
We welcome your questions, comments and feedback.

Kramer Electronics, Ltd.
Web site: www.kramerelectronics.com
E-mail: info@kramerel.com
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