IRIS TECHNOLOGIES, INC.

Vision Series Routing Systems

Vision 64 and 128 User's Manual

IRIS TECHNOLOGIES, INC.
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Vision 64 and 128 User Manual

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Table of Contents

Introduction

Thank you for choosing a Video Commander system from IRIS Technologies. We're confident you'll find the Vision Series Router to be a powerful solution that will meet your routing needs, and exceed your expectations.

Hardware Overview

The Video Commander Vision Series Router is an intelligent routing matrix capable of routing either composite video, or balanced or unbalanced audio. The front panel shows LED indicators and may be removed to access the crosspoint boards for initial installation and for maintenance. The back of the Visual Router contains the input and output connectors, as well as the host computer interface connectors, power connectors and synchronization connectors. Below, you'll find a table showing the physical dimensions of our Video Commander Routing Systems.

Routing System	Rack Units	Dimensions
Vision-128 Video	7	12.25x19x17
Vision-128 Audio	11	12.25x19x17
Vision-64 Video	4	7x17x17
Vision-64 Audio	4	7x17x17
Vision Power Supply	3	5.25x19x17

Technical Support

If you encounter any difficulty using the Video Commander and are unable to find a solution within this manual or any of the others provided, please take advantage of our trained technical support personnel by calling:

- (800) 432-9190 during normal business hours, 8 am - 5 PM EST.
- For emergency calls after normal business hours use the number above and follow the emergency instructions .

When calling for technical support, please call from a telephone near the routing unit. It is much easier for us to assist you if we can actually guide you through the steps as we go. If your question is software related, please call from a phone near your computer.

Installation

This chapter discusses the setup and configuration of your router. The unit has been shipped with the following items:

- Vision Series matrix box.
- Power supply unit.
- 110VAC power cord.
- DC power supply cable(s).

Cabling, appropriate for your situation, may also be packed with your unit. Generally this includes an RS-422 converter and cable, or a six conductor RS-422 extension cable. If you've ordered any spare cards (video, audio, power, etc.) they may also be packed with your unit. Check the "Please Open This First" package included with your unit. Go over the check list carefully to be sure all equipment is included. If you are making your own cables, refer to Appendix B.

Unit Installation

- Carefully unpack the unit and other components, making sure you have everything you need. You may want to save the carton, in case there is a future need to ship the unit.
- Mount both the Visual Router and the power supply in a 19" rack unit. Because these units are quite heavy, you should use every available mounting hole to ensure a secure fit.
- Plug a six-conductor power cable from any empty jack on the power supply to a power jack on the back of the Visual Routing unit.
- Make certain the power supply is turned off. Plug the 110VAC power cable into the connector on the power supply, and then plug this cord into a grounded three-prong receptacle.
- The unit is not configured yet, so do not turn the power on at this time.

Communications Cable Installation

IRIS Technologies' Visual Routers are designed to connect several different IRIS routing or control devices to the same computer communications port. This is accomplished through a multi-drop RS-422 interface.

The host computer must have an RS-422 interface. IRIS Technologies offers a standard RS-232C to RS-422 adapter which can serve this purpose. This interface is cabled to the “data in" jack of the router.

A six-conductor modular cable is used to extend the RS-422 line from the “data out" jack of one unit to the ”data in" jack of another unit. Up to sixteen units may reliably connected together in this manner.

Power-up and Check-out

Once the unit is configured and the front panel secured, attach a few reliable source and destination devices to ensure everything works.

Connect the video and or audio signals you wish to test to input or output channels, as appropriate for the device.

Turn on the power supply. The front panel LED’s will illuminate after a moment. Each board has its own set of LED’s and these are described in detail in “Appendix A”.

If you do not currently own any computer software suitable for testing the router, you may choose to use an ASCII terminal or a terminal emulator. (Terminal emulator programs are included with, or available for, most kinds of computer systems. The “Terminal” accessory in Microsoft Windows and the “HyperTerminal” accessory in Microsoft Windows 95 are examples of this type of tool. See your system documentation for details.)

With a terminal of some kind connected to the other end of the RS-422 interface, set the following communications parameters: 9600 baud, eight data bits, one stop bit, no parity and no handshaking. (If “no handshaking” is not an option, choose “software handshaking” or “XON/XOFF handshaking”).

Once the terminal is set up correctly, send the following characters to the router, [C1,2] this means connect channel one input to channel two output. The first bracket means the beginning of the command string, the second means the end of the command string in video language. Try other channels if you like.

Substitute any input numbers you wish to use for the “1" and any output number you wish to use for the “2”. You may see a flicker of the Comm lights as each character is sent; you should see the Proc lights all blink when the closing bracket character is received. After that, the connection should be routed.

Verify with your equipment that the signal routed properly. If you have difficulties, don't go on. Re-check your serial cabling and terminal settings. If these check out OK, phone IRIS Technologies technical support for assistance.

If these connections work, your hardware is set up correctly. You can go on to connect other devices you wish to route.

Synchronize Options

- The Vision Series Visual Router offers two synchronization options for causing signal switches to occur cleanly.

- The first option is use of the “sync” jack. Providing any sort of composite video signal containing a standard vertical sync pulse will cause the router to always switch during the vertical blanking interval. This is particularly useful if your facility has a majority of devices synchronized to a single master signal. There are two sync jacks so you can chain the sync from unit to unit.
- The second option is the “execute jack”. This extends the Vision-128's default behavior of requiring all four internal crosspoint boards to switch at the same time. To make more than one unit switch concurrently, run a cable between the “execute” jacks of two units. Each vision unit has two execute jacks so you can combine as many units as you like.
- Both of these options are completely automatic, no special configuration is required to use or ignore these features.

For either of these options, it does not matter for any unit which jack (top or bottom) you use, as the signals are common between all units cabled together.

Working with Visual Routing

IRIS Technologies has taken the old difficult task of controlling the routing of signals to the ultimate level by developing a PC-based system. The Video Commander is the world’s first Visual Routing System. What does that mean? It means you can forget about poorly labeled mechanical keypads and pulling or pushing patch cables. IRIS Technologies has taken everything difficult about signal routing and replaced it with state-of-the-art hardware connected to the most amazing software you’ve ever seen. Confusing, coded labels are replaced with colorful “button” filled panels right on your PC screen. Buttons for each device in your facility not only say so in text, there’s a picture of the device on it as well! To connect signals simply select buttons from the screen. Different colors let anyone see at a glance exactly what’s routed and where. Best of all, you give up no signal quality in exchange for the convenience visual routing provides.

Failure Recovery

Vision series routers are designed to recover from both power failures and internal failures quickly and easily. The onboard microprocessor brain is designed to start up by restoring the crosspoint matrix to the same set of connections present before the failure.

The Routing Matrix

For diagnostic or maintenance purposes, it is important to recognize the duties of each board within the unit.

- Top board. The top board is the CPU board and also provides status information via front panel LED's.
- Second board. Handles all of the input and output crosspoints between 1 and 32.
- Third board. Handles all of the input and output crosspoints between 33 and 64.
- Fourth board (VS-128 only). Handles all of the input and output crosspoints between 65 and 96.

- Fifth board (VS-128 only). Handles all of the input and output crosspoints between 97 and 128.

Working with an Open Router

There may be times when, for purposes of diagnostic testing, you will need to operate the unit with the front cover removed. With care, this may be done.

Each Vision series unit has been designed with a magnetic safety switch. This switch makes it possible to change the CPU board while preserving connections on the crosspoint boards. It is important to remember that while prior routes are not effected, no new switching can occur while the front panel is open. Likewise, if you are using Video Commander Scheduler software, be aware that no scheduled switching can occur with the front panel removed.

Hot Swapping the CPU and Crosspoint board

Your matrix router was shipped with two wire ties holding each board in place during shipping. These will need to be removed before the board can be swapped. Simply find the tie on either side of the chassis and snip. Pull out the wire tie and the board is now free to slide out along the guides. With the front panel removed, grasp the CPU board on either side (the CPU board is in the top position)and pull firmly. The crosspoint boards have a handle mounted on the front center of the board. (Crosspoint boards are mounted in the second, third, fourth and fifth positions from the top.)pull the handle firmly. Slide the new board in between the guides mounted on either side of the chassis and push firmly. You will feel the board seat itself into the connector. Before closing the front cover, you will need to go into Video Commander software change the new board address and also “refresh” the software to maintain any switches. If you are using Video Commander software, refer to the Video Commander Administrator’s guide for additional information on addressing and refreshing.

Note: Extreme care should be taken when handling any of the circuit boards within your Video Commander router. Static electricity can seriously damage the board. We recommend keeping the board in an anti-static bag until swapping.

Vision Series Router Protocol

For any communication to exist, the terminal or host computer must be properly cabled to one or more routers, and all of the connected devices must be using the same communications format (for all IRIS Technologies, Inc. firmware the selectable baud rate is defaulted to 9600, N, 8 and 1.,

With minor variations, the command protocol described in this section applies to all IRIS Technologies, Inc. routers. Compatibility issues are noted in the page to follow for anyone working with a variety of router models.

Router Addresses

Each vision unit is set to a particular "address number" through a combination of firmware and software. Each router on the same cable has a distinct address number, so the terminal or host computer can designate which unit is being addressed. At this point, you will need the EPROM serial number found on the front right edge of the CPU,(top), board. For Video Commander users, addressing is taken care of automatically through Video Commander software setup. For manual setting of the address, refer to the "@A" command found later in this chapter.

All Vision series commands accept an address as the last component of the command. This allows multiple devices connected by one data cable to know which device is being addressed. For example: **[C1,2,0]**. The "C" specifies a connection on input 1 to output 2 on address 0. (Address 0 is the default factory setting for all routers.)

For some Vision Series commands, the address number is optional, meaning that any and all routers on the cable should act on the command. As you might guess, this tells every address to connect input 1 to output 2. This is a convenient shortcut when you only have a single router address on the cable.

Additionally, for any command which considers the address number to be optional, you can specify a list of address numbers. For example, to connect input 1 to output 2 on addresses 0, 1 and 2, the command would be: **[C1,2,0,1,2].**

Single-plane Commands

The plane number is not optional for all commands, for a simple reason: since every router is on the same cable, a command which expects a reply form a router can only go to one plane. Otherwise, several devices might attempt to answer at the same time on the same cable, and the terminal or host computer would see a very scrambled response.

Thus, any command which expects a response requires a single plane number. The “H” command, which requests a quick “help” list of Vision commands, is an example. To ask for the help list from plane 0, this command is valid: **[H0]**. However, neither of these commands will generate any response, because the H command requires a single plane: **[H]** or **[HO,1,2].**

Deferred Routing

While the Video Commander Vision series 128 routing unit has a simple command for making a connection between a source and a destination, there are times when you may want to use a slightly less direct approach. This is called “deferred routing,” and allows several routing requests to be entered but not actually completed until a subsequent command instructs the router to do them all together.

If you wish to make a number of routes happen at the same time, this is the best way to go. The switch appears “cleaner” if everything happens together. Under computer program control, the deferred routing of several connections is actually faster, since the router only has to wait once for a vertical sync pulse and then reprogram all the crosspoint circuits.

Deferred routing uses a modified version of the connect called a “preset” to set up a connection but not actually do it. A separate command called a “take,” instructs the router to do all the pending operations.

The Vision series router allows you to shortcut the process still further, because a normal connect command will also cause any pending operations to happen at the same time. Thus, to do three connections together, it is most efficient to send two preset commands and a connect command, rather than three presets and a take. (This shortcut does not work on some routers with firmware versions below 3.0, however.)

Basic Commands

All Vision Series commands have several features in common. The same example we've been using, to connect an input, will serve as a demonstration of these features **[C1, 2,0]**.

Attention and End Character.

Every Vision command begins with an attention character marking the beginning of the command, and an end character marking the end of the command. The attention character is either Ctrl + A (ASCII code 1) or the open square brace character (“[”). The end character is either a Carriage Return (Ctrl + M, or ASCII code 13) or the close square brace character (“]”). The router uses these characters to identify a valid command sequence.

Command Character.

Immediately after the attention character is the command character, which is non-numeric and identifies a particular command to perform. The connect command for example, has the command character “C” and may also be called the “C” command.

Parameter Values.

Some (but not all) commands take numeric values which contain necessary information for the command. These values, when present, are separated by commas and/or spaces. The connect command for example, requires an input channel number and an output channel number.

Router Address.

All commands accept at least one plane number after any parameter, again using commas and/or spaces to separate numbers. As discussed earlier, some commands accept multiple addresses or none at all.

Set Address Command

@A - Set address

Syntax: @Anewaddress, oldaddress

Routing Commands

This section lists the Vision commands which perform routing operations.

C - Connect

syntax: C source, dest{,plane}

This causes an immediate connection between the input channel identified by source and the output channel identified by dest. A source of zero specifies that the destination is to be disconnected from all sources. This command may be sent to any number of planes, and generates no response. Examples: **[C1,2]** or **[C1, 2, 0]** or **[C1, 2, 0, 1, 2]**.

P - Preset

syntax: P source, dest{,plane}

This sets up a connection for inclusion in a subsequent connect or take command. Apart from not occurring immediately, this command works the same as the connect command. This command may be sent to any number of planes, and generates no response. Examples: **[P1,2]**, or **[P1,2,0]**, or **[P1,2,0,1,2]**

T - Take Presets

syntax: T[plane{,plane}]

This causes any preset commands to occur at the same time. This command may be sent to any number of planes, and generates no response. Examples: **[T]**, **[T0**] or **[T0,1,2]**.

L - Clear Presets

syntax: L [plane {,plane}]

This causes any preset routes to be discarded, so that they are not included in any subsequent connect or take commands. This is a good command to send in to initialize a program, just in case there is something “left over” in the routers' preset tables. This command may be sent to any number of planes, and generates no response. Examples: **[L]**, or **[L0]**, or **[L0,1,2]**.

Z - Special Connects

syntax: Z [plane{,plane}]

This causes the router to set up a certain list of connections for diagnostic purposes, where input 1 is connected to output 1, input 2 is connected to output 2, and so on. This command is only useful for testing purposes. This command may be sent to any number of planes, and generates no response. Examples: **[Z]**, or **[Z0]**, or **[Z0,1,2]**.

R - Reset Connects

syntax: R[plane{,plane}]

This causes the router to disconnect all of the output channels so that nothing is routed. This command may be sent to any number of planes, and no response. Examples: **[R]**, **[R0]**or **[R0,1,2]**.

Information Commands

This section lists the Vision commands which request information from the router plane.

M - Query Router

syntax: M plane

This requests a diagnostic message from the router concerning the router unit and the specified plane. This is intended for informational and diagnostic purposes; other commands in this section are better suited for gathering information within computer programs. Example: **[M0]**

Program = AV

Version = 4.0b

Build = Nov 25 1997 15:36:29

Level = 00

Serial = 1023

Size = 128x128

Signal = Video

Manufacture = IRIS Technologies, Inc.

V - Query Version

syntax: V plane

This requests a simple, one-line display of the firmware class and version used in the router containing the specified plane. Example: **[V0]**

AV Ver = 4.0b

S - Query Connection Status

syntax: S plane

This requests a complete display of a connected source to destination (if any are indeed connected). The list is finished with a line containing the word "END," to help a computer program process the list. A program which cannot accept that much data at once should use the Q command instead. Example: **[S0]**

Output = Input

001 = 031

002 = 000

003 = 117

...(lines omitted for example)

126 = 019

127 = 127

128 = 000

END

Q - Query Destination

syntax: Q dest, plane

This requests a one-line display of a destination and the source, if any, connected to it. The destination is shown first, then an equal sign, and then the source number (or zero). This is equivalent to a single line of the response from the S command. This command is not supported on older PX routers with firmware versions below 3.0. Example: **[Q3,0]**

003 = 117

H - Help

syntax: H plane

This requests a summary of the commands available in the router. The syntax is indicated in the same manner as in this manual, with square braces for optional elements and curly braces for optional, repeatable elements. Example: **[H0]**

—IRIS Router Commands—

C source, dest {,plane}Connect sou

P source, dest {,plane}Preset a con

X - Factory Reset

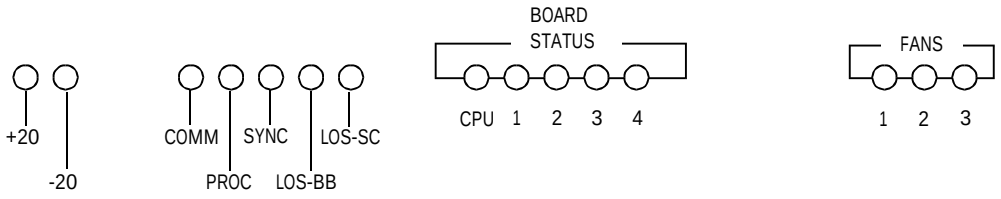
syntax: X [planes {,plane}]

This command causes the router to deliberately corrupt its internal memory tables and then trigger a power-on reset sequence via the watchdog timer. This will cause a full diagnostic self-test and will reinitialize all memory in the same fashion as the router does the very first time it is turned on. All current state information, virtual routers, parallel routers and option settings are lost and the factory default state is restored. This command is primarily intended for diagnostics, as well as final checkout at IRIS Technologies Inc. Example: **[X]**.

Appendix A

This section lists the meaning of the individual LED indicators on the front panel of the Vision-128. There is a set of LED's for each of the four circuit boards; each of the boards LED's have the same significance.

Front Panel LED's



The illustration above represents the LED indicators on the front panel of a vision series router. The hole pattern will differ slightly between VS-64 and VS-128 models. Reading from left to right, a description of each LED function is given below:

- + 20.
- - 20.
- COMM. This LED is lit after power up and indicates comm port readiness.
- PROC. This indicator is lit each time the microprocessor is processing a command. The indicator also stays lit when waiting for a vertical sync for a connect or take operation. This means that a blinking PROC LED is normal and is no cause for alarm.
- SYNC. This LED will be lit when a composite signal with a vertical sync pulse is connected to one of the SYNC jacks found on the rear panel of the vision router.
- LOS-BB. Loss of black burst, this LED will remain unlit at all times. (Reserved for future firmware options).
- LOS-SC. Los of sub-carriers, this LED will remain unlit at all times. (Reserved for future firmware options).

Board Status

The LED's under the heading "Board Status" correspond with the boards found inside your Vision routing unit:

- CPU. Represents the CPU board.
- 1. Represents board level one.
- 2. Represents board level two.
- 3. (VS 128 only) Represents board level three.
- 4. (VS 128 only) Represents board level four.

These LED's should be lit during normal operation indicating CPU readiness.

Fans

- Three cooling fans have been mounted on the CPU card in your unit. LED's 1,2 and 3 each represent a fan. If all LED's are lit, the fans are operational.

Appendix B

This section presents the cable and connector details so you can make any necessary cables for the Video Commander Vision Routing system.

Vision-128 Cables

RS-422 Cables

The communications line from a host to a router, or between routers, is a six-conductor cable. If wiring from an RS-422 interface, the connections are as follows:

Pin	Color	Signal
1	White	RXDA (from host)
2	Black	Gnd
3	Red	TxDA (to host)
4	Green	TxDB (to host)
5	Yellow	n/c
6	Blue	RxDB (from host)

Power Cable

The power cable runs between two six-conductor “Phoenix” plugs. The connections on the plug going into the router are as follows:

Pin	Signal
1	+20 VDC
2	+20 VDC
3	GND
4	GND
5	- 20 VDC
6	- 20 VDC

Video Cable

The Video cable is a standard coaxial cable with a BNC connector at the router end.

Audio Cable

The audio cable is a shielded two-conductor cable which connects to the unit through a three-conductor “Phoenix” plug (see illustration). The plug may be wired for either balanced or unbalanced audio.

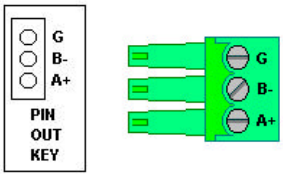
Balanced audio connections:

Pin	Signal
A	Positive (+)
B	Negative (-)
G	Ground

Unbalanced audio connections:

Pin	Signal Input	Signal Output
A	Audio Signal	Audio Signal
B	Ground	No Connection
G	No Connection	Ground

Pin out key illustration found on the rear of vision audio routers and how it corresponds to the wiring of the Phoenix plug.



Index

L

O

P

R

S

T

V