OMX-9032

16x1 Vertical Interval Switcher

A WORD ON VIDEO/AUDIO SWITCHERS:

A video/audio Switcher usually switches between several sources and one or more acceptors. A Switcher that allows several inputs to be connected to several outputs simultaneously is called a Matrix Switcher. Switchers may be of the electronic or mechanical type. Most matrices are of the active electronic type, with many crosspoints.

Vertical Interval Switching, frequently used in video, ensures that the transition from one video source to another (such as switching between two genlocked cameras) is smooth and without interference. The switching and changeover is done during the blanked vertical interval period, when the transition is hidden.

Genlocked means synchronized so that the color and phase information from each source is identical. Thus switching is done with no interference on the screen, no rolling, no color loss and no jumping on the screen. Since the Syncs come with the same timing, all the information is identical and the transition between one switch and the other is smooth.

Vertical Interval Switching is needed when recording or transmitting a video program involving several video sources, as in live broadcast, to ensure clean, undisturbed picture transitions.

Matrices and Switchers may sometimes be RS-232 or RS-485/422 controlled. Each of these options is a way of remotely controlling a video/audio device (Switcher, SEG etc.) using a PC with a serial port, or another device that uses a similar communication protocol. Adding inputs or outputs will extend a Switcher's capability.

Factors Affecting Quality of Results:

There are many factors affecting the quality of results when signals are transmitted from a source to an acceptor:

❑ Source and acceptor signal handling capability - different brands provide different performance levels and the final result is largely determined by the component providing the worst performance. Using a source with poor performance will always result in low quality duplicates.

❑ Connection cables - low quality cables are susceptible to interference, degrade signal quality due to poor matching and cause elevated noise levels. They should therefore be of the best possible quality.

❑ Sockets and connectors of the sources and acceptors - so often ignored, should be of highest quality, since "Zero Ohm" connection resistance must be the target. Sockets and connectors must match the required impedance (75 ohms in video). Cheap, low quality connectors tend to rust, thus causing breaks in the signal path.

❑ Amplifying circuitry - must have quality performance when the demanded end result is high linearity, low distortion and low noise operation.

❑ Distance between sources and acceptors - this plays a major role in the final result. For long distances (over 15 meters) between sources and acceptors, special measures should be taken in order to avoid cable losses. These include using higher quality cables and, perhaps, adding line amplifiers.

❑ Interference from neighboring electrical appliances - these could have an adverse effect on signal quality. Balanced audio lines are less prone to interference, but unbalanced audio and video lines should be installed far from any mains power cables, electric motors, transmitters etc, even when the cables are shielded.

Equipment, Cables and Solutions

Video recording and playback frequently involve the use of several devices, such as: Video Cassette Recorders, Video Disc Players, Cameras, Video monitors, Video processors, Special Effects Generators, Live or Satellite Feeds or any combination of the above.

When hooking up a complex setup of several devices, you may find yourself in a maze of wires that is difficult to manage, cumbersome and possibly dangerous.

How Do I Get Started?

The fastest way to get started is to take your time and do everything right the first time. Taking 15 minutes to read this manual may save you a few hours later. You don't even have to read the whole manual. At the beginning of each section, you'll find an overview of the section. So if the section doesn't apply to you, you don't have to spend your time reading it.

UNPACKING AND CONTENTS

The items contained in your OCEAN MATRIX switcher package are listed below. Please save the original box and packaging materials for possible future transportation and shipment of the video switcher.

- ➢ Switcher
- ➢ AC power cable
- ➢ User's Manual
- ➢ DB-9 to DB-9 Serial Null Modem Adapter
- ➢ PC-Control Software

Getting To Know Your OMX-9032 Switcher

The **OMX-9032** Vertical Interval Switcher provides truly effortless switching between sixteen composite/ component video input sources and one acceptor. Switching is done during the Vertical Interval for flicker-free switching between synchronized sources. Several **OMX-9032** machines can be interconnected and cascaded to become 32x1, 48x1 etc. switchers, or connected in parallel to become 16x2, 16x3 etc. The **OMX-9032** has both RS-232 and touch switch controls. PC control software is also provided. Video output is DC coupled.

INSTALLATION

Rackmounting

The **OMX-9032** may be rackmounted in a standard 19" (1U) EIA rack assembly and includes rack "ears" at the ends of the front panel. These devices do not require any specific spacing above or below the unit for ventilation. To rack mount any the switcher, simply place the unit's rack ears against the rack rails of the rack, and insert standard screws through each of the four corner holes in the rack ears.

Connecting to Video Devices

Video sources (such as cameras and VCRs) and output devices (such as monitors, projectors or recorders) may be connected to the switcher through the connectors located on the back of the unit. Please keep in mind that the input signal format must match that of the output signal format. (Example: If the input is composite video, then the output is composite video.) All signal formats that use more than one interconnecting cable between devices should be of equal length. (Example: RGB cables between a camera and the switcher should be equal in length).

Looping the Inputs

There are two banks of termination switches on the back panel of the **OMX-9032**. Each of those switches may switch "**on**" or "**off**" the 75ohm termination required when interconnecting video devices. Each input may be individually switched, so that specific video inputs may be looped through to an additional input device. ("**ON"=75ohm, "OFF"=Hi-z**)

Connecting to the OMX-9032

Video sources and output devices may be connected to the switcher through the BNC connectors located at the back of the machine. Please keep in mind that the output signal format will match that of the input signal format. The **OMX-9032** supports composite /component signal types (using three machines).

USING THE SWITCHER

Powering on the Switcher

The video switcher should only be powered on after all connections are completed, and all source devices have been powered on. Do not attempt to connect or disconnect any video, audio or control signals to the switcher while it is powered on. The switcher may be powered on by pressing the

toggle switch on the far-left front panel to the up position. In the up position, the toggle switch glows red, and the active input button illuminates as well.

Using the Front Panel Controls

The front panels of **OMX-9032** switcher are designed to be simple to operate, and accomplish the basic function of selecting an input source (and output device). Keep in mind that a glowing input button always represents the active input.

Selecting an Input on the OMX-9032

Input selection on the **OMX-9032** is made by pressing any of the buttons marked "**1**" through "**16"** on the front panel. These buttons correspond to input connections as marked on the back panel.

Setting the Configuration Switches

Setting the configuration switches is accomplished through a bank of DIP switches located on the back panel of each switcher. The chart below refers to the settings and configurations for each of the "**Program**" DIP switches. To set the configuration switches, confirm that power to the switcher is removed, and with a small flathead screwdriver, move the dip switches to the appropriate "on" or "off" position. Master/Slave DIP switches configure the switcher for operation in a multiple switcher configuration. If a switcher is operating and being controlled independently, it should be assumed that it is operating in the "**Master**" configuration. If the control ports of multiple OCEAN MATRIX switchers are "daisy-chained", then one switcher must be configured as the master switcher, or ID number 1, while all others are assigned as slave switchers or an ID other than 1. (Available addresses vary per switcher, but support from 8 up to 16 switchers in a daisy chain configuration. The RS-232 protocol supported by these switchers is designed to support bi-directional (transmit and receive) communication. This is desirable, so that the controlling device "knows" that the controlled device has carried out it's instructions. Some controlling devices do not receive communication, and can only send out or transmit commands. In this scenario, you may want to disable bi-directional communication by disabling "ACK", or acknowledgement commands.

Bank2

Machine Number	SW4	SW3	SW2	SW1
1.	ON	ON	ON	ON
2.	ON	ON	ON	OFF
3.	ON	ON	OFF	ON
4.	ON	ON	OFF	OFF
5.	ON	OFF	ON	ON
6.	ON	OFF	ON	OFF
7.	ON	OFF	OFF	ON
8.	ON	OFF	OFF	OFF
9.	OFF	ON	ON	ON
10.	OFF	ON	ON	OFF
11.	OFF	ON	OFF	ON
12.	OFF	ON	OFF	OFF
13.	OFF	OFF	ON	ON
14.	OFF	OFF	ON	OFF
15.	OFF	OFF	OFF	ON
16.	OFF	OFF	OFF	OFF

Bank 1

Switch#6, Switch#7, Switch#8	OFF FOR Slave ON for Master (Machine #1)
Switch #5	OFF Enables reply from switcher to PC. ON Disables reply from switcher to PC.

Protocol Used for the OMX-9032Communication

The protocol used for communication between the PC and the **OMX-9032** is done using two bytes of information as defined below. The rate of data is 9600 baud with no parity, 8 data bits and one stop bit.

1st byte

				ADDRESS			
0	X	0	0	X	X	X	X
N7	N6	N5	N4	N3	N2	N1	N0

2nd byte

COMMAND				DATA			
0	X	0	0	X	X	X	X
N7	N6	N5	N4	N3	N2	N1	N0

Detailed Description

1st byte

N3N2N1N0 = Describe the number of the machine being addressed.

N6 = Destination bit**.** When sending a message from the PC (i.e. to machine) this bit must be "0". When the machine sends a message to the PC, this bit must be "1".

is used for communication between the Slave and the Master only and is always 0 for communication with the PC.

N7N5N4 =Must be "0".

2nd byte

N0N1N2N3=Data. These bits describe the input number that is to be connected to the output.

N4N5N6=Command

Technical Specifications:

INPUTS:	16 composite / component video, 1Vpp/75 Ω, on BNCs.
OUTPUTS:	1 composite / component video, 1Vpp/75 Ω on a BNCs.
BANDWIDTH:	Exceeding 80 MHz (-3dB).
DIFF. GAIN:	0.07%.
LUMA S/N:	74 dB.
DIFF. PHASE:	0.28 Deg.
K-FACTOR:	<0.05%.
OUTPUT COUPLING:	DC.
CROSSTALK:	-48dB (Chroma).
CONTROL:	16 front-panel touch switches, RS-232.
SWITCHING:	During Vertical Interval.
DIMENSIONS:	19 inch (W), 7 inch (D), 1U (H) rack mountable.
POWER SOURCE:	115 VAC 50/60 Hz 8.7 VA.
WEIGHT:	2.8 Kg. (6.2 Lbs.) Approx.
ACCESSORIES:	Power cord, Windows 95/98 control software, Null modem adapter.

Please note that if the output signal is disturbed or interrupted by very strong external electromagnetic interference, it should return and stabilize when such interference ends. If not, turn the power switch off and on again to reset the machine.

The socket-outlet shall be installed near the equipment and shall be easily accessible. To fully disconnect equipment, remove power cord from its socket.

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