Edition:2A

ODM-88

DVI Matrix Router

USER MANUAL



DVI MATRIX ROUTER : ODM-88



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1 Introduction and Installation

ODM-88 is a high speed cross-switch with 8 DVI inputs and 8 DVI outputs housed in a ruggedized metal enclosure to protect against harsh environments.

1.1 Key features:

- Eight (8) DVI single-link inputs and outputs
- Pixel resolution up to WUXGA (1920x1200) @ 60Hz refresh ratio with 1.65Gbps transmission bandwidth
- Dynamic EDID management adapts to overall power management of the system
 - Restores the default EDID to Input port
 - > Reads EDID from display and stores EDID to Input port via EEPROM
- Long distance extension of DVI Input and Output by Optical DVI cables or modules
- Re-Clocking of R,G,B of DVI inputs and outputs
- Various Control Interfaces:
 - Front panel key input
 - Input commands through RS232 and LAN
 - Graphical user interface using Ethernet and Proprietary PC software in the shipped system
- Hierarchical connection of multiple ODM-88 up to 3 levels to increase the number of display connections or source connections
- DIP switch for up to 255 different ID settings for multiple use of ODM-88 over RS232 connection
- IP setting for Ethernet point-to-point and local network control

1.2 ODM-88 Shipping Content:



- ODM-88 Mainframe: 1 EA
- AC/DC power adaptor (12V/5A, AC110V-240V): 1 EA
- AC power cord: 1 EA
- User Manual: 1 EA
- PC control software CD :1 EA

- Firmware download cable(USB): 1 EA
- RS-232 cable (crossed type): 1 EA
- RJ-45 UTP cable (crossed type): 1 EA
- Rack ear: 2 EA



1.3 Safety Instructions

- Use of the equipment in a manner not specified by the manufacturer may result in irrecoverable damage.
- Use the assigned power cord or power adaptor shipped with the system.
- Connect the power cord to the normal and safe outlet.
- Keep the unit away from liquid, magnetic and combustible substances.
- Do not place heavy weight on the unit.
- Move away from noisy environment such as vibration or impact.
- Do not install the unit vertically.
- Do not disassemble the unit.
- When malfunction or breakdown occurs, contact factory immediately.

1.4 Physical Description

1.4.1 Front Panel

- ODM-88 chassis is mountable on a 19" standard rack with rack ears. Control keys, Input-Output buttons and the status LCD display, are placed on the front panel as shown in Figure 1-1.
- Control keys: ①
 - **CREATE** Configure Input-Output setup
 - > **PREVIEW** Displays current status of Input-Output configuration
 - CANCEL Resets all Outputs configured with an Input or Reject any key inputs
 - ENTER Accepts keyed inputs and completes configuration of Input-Output setup
 - > FUNCTION Configures IP for Ethernet, baud rate for RS232 and EDID
- Input-Output Buttons:
 - > Eight (8) LED inputs: 2
 - ► Eight (8) LED outputs: ③
- Status display: LCD displays the control status in 20x4 text mode: ④
- POWER ON/OFF button: 5

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1.4.2 Rear Panel

- All Input ports, Output ports, interface ports and power connections are placed on the rear panel as follows;
 - ➢ Eight (8) single link DVI inputs: ①
 - > Eight (8) single link DVI outputs: 2
 - DIP switch 8 bits to set ID (identifier) in case of multiple connection of ODM-88: 3
 - ➢ RS-232 Serial port: ④
 - > 10/100 Base Ethernet port: (5)
 - Firmware download port: 6
 - ➤ DC power receptacle: ⑦
 - > MONITORING DVI port monitors a designated source for test purpose: ⑧

[Note] For ODM-88, Output #1 will be disconnected automatically when monitoring port is connected and working.



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Figure 1-2 Rear Panel

1.5 EDID Control and Configuration

- EDID (Extended Display Identification Data) is an information set that is provided by a display to describe its capabilities to a graphic source. It enables a graphic source to identify the connected display.
- The information set includes: manufacturer, product type, phosphor or filter type, timings supported by the display, display size, luminance data and (for digital displays only) pixel mapping data.
- Once the graphic source reads the information set (usually during the booting process), the EDID determines the optimal format for a connected display.
- ODM-88 supports storing of EDID information to an EEPROM for each Input by dedicated PC software.
- ODM-88 has two-way EDID settings, default EDID from factory and direct readout of stored EDID of any target display. The default EDID setting from the factory is 1080p (1920 x 1080) @ 60Hz for all inputs.

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Figure 1-3 Concept drawing for setting EDID in ODM-88

• As depicted in Figure 1-3, once EDID is configured, each EDID is stored in EEPROM at the front of the DVI Input. As a result, the video sources are able to read EDID from the EEPROM during boot-up; even though the ODM-88 and connected displays are not powered on yet.

1.6 Connecting Optical DVI cables and modules for extended distance

• ODM-88 supports connection of Optical DVI cables or modules to all inputs and outputs. The use of copper DVI cables over 3m (10ft.) is not recommended.

1.7 Initializing ODM-88 and Installation Guide

1.7.1 Initialization

Plug the provided AC power cord to the AC/DC power adaptor then plug the DC cord to the +12VDC connector on the rear panel; make sure that the arrow mark on the connector of the DC cord is aligned.

Push POWER button on the front panel then observe:

- Red LED (on the button) will light up
- Display will display "ODM-88......Initializing"

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- ➤ Green and Red lights on the Input and Output will sweep on.
- Display will show "USER MODE"
- > The system is now ready to accept commands.

1.7.2 Rack Mounting

• Before installing cables, attach two rack ears on left and right side of ODM-88 using the supplied screws.

1.7.3 Control Connection

• Commands and functions of ODM-88 are transferred through the RS-232 and Ethernet connection.

1.7.4 RS-232 Control

• Connect the ODM-88 to a video controller or PC with the supplied RS-232 cable.

1.7.5 Ethernet Control

• Connect the ODM-88 to a video controller or PC with the RJ-45 connector/cable.

1.7.6 Direct connection of PC or video controller to the ODM-88: Use a crossover Ethernet cable.

- Typically, a PC is connected to the network and configured for dynamic IP address by a network DHCP server. If the PC is connected directly to the ODM-88, the network server will not be able to address the PC.
- In this case, the PC should be manually set in a static IP address. Refer to Setting the PC IP address in Chap. 2.8.1.

1.7.7 LAN connection of ODM-88: Direct Ethernet connection.

- ODM-88 is configured at the factory with the default IP address of 192.168.0.88. Before connecting to your network, verify the IP address on your network.
- The IP address can be reconfigured by front key buttons or command lines over RS 232 and Ethernet.

2 **Communications Setup**

2.1 Setting the Router ID of ODM-88

 If multiple units of ODM-88 with a video controller or PC controller are used, each ODM-88 should be identified with the DIP switch located on the rear panel marked as Router ID. Each DIP switch has 8 digits, one (1) at the up position and zero (0) at the down position; possible ranges are 000 to 255 and the default factory setting is 255.

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Example Setting



• All command codes are required to have the Router ID in its header. For more details, refer to the command code instruction in Chapter. 3.2.

2.2 Front Panel Interface

- All communication with ODM-88 is possible using the front input keys without video controller or control PC.
 - Before pressing control keys, make sure that the LCD display shows USER MODE.
 - CREATE, PREVIEW and CANCEL keys are activated by pressing each key - the activated key is executed by pressing ENTER key.
 - > **The FUNCTION** has the ability to select multiple features on the ODM-88.
 - Repeatedly pressing the FUNCTION key will display each feature on the LCD display.
 - To save the selected feature, press ENTER to escape current setting, press another control key; i.e. CREATE or PREVIEW.

2.3 CREATE Mode

- Configures Input-Output connections for cross-switching.
 - 1) Press CREATE button once to activate (orange color LED is on) LCD will display the current Input and Output configuration.
 - 2) Select and Press an input key (the respective Green LED is on) LCD will display current configured Output (Red LED is on).
 - 3) Press single or multiple Output buttons to select desired outputs (Red LED is on for each selected Output button).
 - 4) Outputs can be deselected by pressing the respective Output button (Red LED is off)
 - 5) Press ENTER to save the selected configuration.
 - 6) To configure the next Input to Output or outputs, repeat steps 1 to 5.

2.4 PREVIEW Mode

- PREVIEW mode shows current Input-Output configuration.
 - 1) Press PREVIEW to see current Input-Output connection status on the LCD display.

Press any Input button (Green LED is on) to see the current connected Output (indicated by Red LED is on)

To preview status of another Output, press another Input button.

To see the status of all Input-Output connections, press **PREVIEW** then **ENTER**.

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2.5 CANCEL Mode

- To Cancel each Input-Output configuration:
 - 1) Press **CANCEL** then press the desired Input button to be cancelled. The configured Output buttons LED will be on.

Press ENTER to complete cancellation.

2.6 FUNCTION Mode

Press FUNCTION to view features – pressing FUNCTION repeatedly will cycle the following features:

- EDID Read/Write
- Monitor Output Selection
- RS-232 Baud Rate
- Gateway
- Subnet Mask
- IP Address
- Mac Address
- Port Number
- Factory mode

2.6.1 EDID Read/Write: press FUNCTION key once

• Reads EDID from connected displays and stores information to Input ports EEPROM.

======Function Mode======

	EDID Read/Write
IN :	1. 2. 3. 4. 5. 6. 7. 8
OUT	1. 2. 3. 4. 5. 6. 7. 8

- IN: INPUT Chanel, OUT : OUTPUT Chanel
- Press Front panel INPUT key and choice channel, than choice Output channel which one need changing.
- The Under Bar mark represents selected and activated.(1~8chanel)
- Example1: Choice INPUT 1 OUTPUT 1, INPUT 2 OUTPUT 2 than Press Enter Key, will Display 1,2 channel's EDID Read/Write
- Example2: Choice INPUT 1,2,3,4,5,6,7,8 OUTPUT 1, than Press Enter key, system will be read the first (1)output channel EDID Data, and write to the INPUT 1~8 channel EEPROM.
- Press **ENTER** button to complete the configuration, store the information and execute the process.

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2.6.2 MONITOR OUTPUT SELECTION – To verify the video source press FUNCTION key twice.

1) Connect a display to the MONITORING port and any video sources to the DVI Input ports on the rear panel.

Press the FUNCTION key once - the LCD displays:

Monitor Output sel. Old Input Channel: 1 New Input Channel:

Press Input button of the Input to be monitored.

Press **ENTER** to finish the process.

[Note] For ODM-88, Output #1 will be disconnected automatically when monitoring port is connected and working.

2.6.3 RS-232 BAUD RATE: press FUNCTION three times

- Press Input 1 button for 19200
- Press Input 2 button for 38400
- Press Input 3 button for 57600
- Press Input 4 button for 115200
- Press **ENTER** to complete the process and return to the User mode.

======Function Mode======

RS-232 Baud Rate Old Baud Rate: 19200 New Baud Rate: 19200

[Note] Baud Rate of 19200 bps is highly recommended.

2.6.4 GATEWAY: press FUNCTION four times

- The Under Bar mark represents selected and activated.
- Pressing Input 1 button repeatedly changes the selected number from 0, 1, 2...9.
- The Input 2 button decreases the number.
- Input 3 and 4 buttons moves the Under Bar left and right.

=======Function Mode=======

Gate Way 192. 168. 000. 001 1<u>9</u>2. 168. 000. 001

- Factory setting is 192.168.000.001.
- Press ENTER button to complete the process and return to the User mode.

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2.6.5 SUBNET MASK: press FUNCTION five times

- The Under Bar mark represents selected and activated.
- Pressing Input 1 button repeatedly changes the selected number from 0, 1, 2...9.
- The Input 2 button decreases the number.
- Input 3 and 4 buttons moves the Under Bar left and right.

=======Function Mode======

Subnet Mask 255. 255. 255. 000 255. 255. 255. 000

- Factory setting is 255. 255. 255.000.
- Press ENTER button to complete the process and return to the User mode.

2.6.6 IP ADDRESS: press FUNCTION six times

- The Under Bar mark represents selected and activated.
- Pressing Input 1 button repeatedly changes the selected number from 0, 1, 2...9.
- The Input 2 button decreases the number.
- Input 3 and 4 buttons moves the Under Bar left and right.

======Function Mode======= IP Address 192. 168. 000. 088 192. 168. 000. 088

- Factory setting is 192. 168. 000. 088.
- Press ENTER button to complete the process and return to the User mode.

2.6.7 MAC ADDRESS: press FUNCTION seven times

- In computer networking, a Media Access Control address (MAC address) is a unique identifier assigned to most network adapters or network interface cards by the manufacturer for identification, and used in the Media Access Control protocol sub layer. If assigned by the manufacturer, a MAC address usually encodes the manufacturer's registered identification number. It may also be known as an Ethernet Hardware Address (EHA), hardware address, adapter address, or physical address.
 - There are three numbering spaces, managed by the Institute of Electrical and Electronics Engineers (IEEE), which are in common use for formulating a MAC address:
 - ODM-88 is shipped with a default MAC ADDRESS. The MAC ADDRESS of ODM-88 can be edited, however, it is strongly not recommended.
 - Editing MAC ADDRESS
 - The Under Bar mark represents selected and activated.
 - Pressing Input 1 button repeatedly changes the selected number from 0, 1, 2...9.

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- The Input 2 button decreases the number.
- Input 3 and 4 buttons moves the Under Bar left and right.

2.6.8 PORT NUMBER: press FUNCTION eight times

- The Under Bar mark represents selected and activated.
- Pressing Input 1 button repeatedly changes the selected number from 0, 1, 2...9.
- The Input 2 button decreases the number.
- Input 3 and 4 buttons moves the Under Bar left and right.

======Function Mode=======

Port Number Old Data: 03000 New Data: 03000

- Factory setting is 03000.
- Press ENTER button to complete the process and return to the User mode.

2.6.9 FACTORY MODE: press FUNCTION nine times

• Press **ENTER** to reset and restore factory default settings.

2.7 Serial Communication

2.7.1 HyperTerminal

- ODM-88 provides command line interface through serial port, RS-232.
- Hyper Terminal is an effective serial emulation software to communicate with ODM-88 when Microsoft Windows operating system is used to control ODM-88.
- Hyper Terminal connection procedures:
 - 1) Connect the ODM-88 to a PC as described in section RS-232 Control.
 - 2) Select Start > Programs > Accessories > Communications > HyperTerminal

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	Caracteries	Accessibility	
	C AhnLab	Communications	🕨 🌑 HyperTerminal
	Code Composer 'C3x - 'C4x	Entertainment	Network Connections
	📺 Games	 Tools 	Network Setup Wizard
102 102240	Microsoft Silverlight	🕨 😂 Address Book	New Connection Wizard
dministrator	NetWaiting	🕨 🗐 Calculator	🛛 🍳 Wireless Network Setup Wizard
	📺 Spectrum Digital	Command Prompt	
Internet	C Startup	🕨 📑 Notepad	
Incernet Explore	한 방침	🕨 🦉 Paint	
E-mail Outlook Express	🥭 Internet Explorer	🧐 Program Compatibility Wizard	
- Oddook Express	🐋 MSN	👞 Remote Desktop Connection	
A Mathematical	🔄 Outlook Express	🐋 Scanner and Camera Wizard	
J Nocepad	🔔 Remote Assistance	🧐 Synchronize	
Control today	🕑 Windows Media Player	3 Tour Windows XP	
CC C3x+C4x	😤 Windows Messenger	Windows Explorer	
A 14/14	🚳 Windows Movie Maker	🛃 WordPad	
	🛗 Altera	•	
S	ATMEL	*	
Windows Media	🛗 HHD Free Serial Port Monitor	▶ ^{DG}	
٥	P-CAD 2006 Viewer	· ·	
windows Messe	PonyProg	•	
The second second	ADuc	*	
Tour windows ?	microsoft Developer Network	•	
	microsoft Visual Studio 6.0	•	
	microsoft Web Publishing	*	
	TokApps	•	
All Programs 🕨	MetTerm	× .	

Figure 2-1 HyperTerminal Access

3) Connection Description Dialog: Enter a name and choose an icon.



Figure 2-2 Connection Description Dialog

4) Selecting **OK** displays the **Connect To** dialog. In the **Connect To** dialog box, ignore the **Country, Area Code** and **Phone Number** fields and select the available COM port to which ODM-88 is connected.





Connect To		<u>? ×</u>
🧞 ормхх		
Enter details for	he phone number that	you want to dial:
Country/region:	Korea (82)	×
Area code:	02	
Phone number:	<u> </u>	
Connect using:	СОМЗ	•
	OK	L Canad L

Figure 2-3 Connect To Dialog

5) Select **OK** to go to the **COM Properties** dialog box.

M2 Properties		?
ort Settings		
<u>B</u> its per second.	19200	Y
<u>D</u> ata bits:	0	*
Parity:	None	>
<u>S</u> top bits:	1	>
Elow control:	None	~

Figure 2-4 COM Properties Dialog

- 6) Configure the port settings as follows;
 - Bits per second (baud rate): 19200 (recommended)
 - Data bits: 8
 - Parity: None
 - Stop bits: 1
 - Flow control: None
- 7) Select **OK** to display the HyperTerminal window
- 8) Press ENTER on ODM-88 to begin communication with ODM-88
- 9) Type serial command set. (Refer to Chap. 3.2)

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2.7.2 Telnet

- Telnet is a terminal emulation program for TCP/IP networks such as the Internet.
- The Telnet program runs on your computer and connects your PC to a server on the network. You can then enter commands through the Telnet program and they will be executed as if you were entering them directly on the server console. This enables you to control the server and communicate with other servers on the network

2.7.3 Launching Telnet Session

- 1) Select Start menu and select Run.
- 2) Type **command** as shown below.





Figure 2-5 Run Windows

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- 3) Select **OK** to open the command window.
- 4) Type the command: **telnet 192.168.0.88**

[Note] 192.168.0.88 is the default IP address of ODM88. Change IP address as needed. (Refer to Chap. 2.6.6 and 2.8)

- 5) Press ENTER: "DVI Matrix Router Connected" will be displayed.
- 6) Type serial command set. (Refer to Chap. 3.2)

Image: State of the state

Figure 2-6 Telnet connected

2.8 Ethernet Control

- The ODM-88 can be controlled through the 10/100 base Ethernet port using either graphic user interfaces or a command line interface.
- The graphic user interfaces uses proprietary PC software.
- The physical connection of ODM-88 can be made on the standard LAN or point to point connection.
- The command line interface uses a Telnet session to a private port.
- To connect ODM-88 to Ethernet, specify a static IP address for ODM-88 (Refer to Chap. 2.6.6). The default IP address is 192.168.000.088.

2.8.1 SETTING THE IP ADDRESS of the PC

- If the PC is connected to the ODM-88 through the 10/100 Base Ethernet port, a static address should be configured on the PC:
 - Use Ethernet crossover cable (provided with ODM-88 system) for point to point direct connection between PC or controller and ODM-88 or use Ethernet strait cable to connect ODM-88 on LAN.
 - 2) From the PC: select Start menu, select Control Panel.
 - 3) In the Control Panel, select Network Connections.
 - In Network Connections, right click on Local Area Connection and select Properties tab.



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1000			Mances		
Conne	ct using:			_	
nà	Intel(R) PR	0/100+ P0	3 Adapter	1	Configure.
This c	prection u	ses the fol	lowing kema		
	Client for	Microsoft	Networka		
2	File and i	Printer Sha	sing for Micro	cont Net	Horks
M	GoS Pac	ket Sched	CD AD		
- 3 50 - 1	HIDESTICS	1080004[1	(PAP)		
	igetal		Uninotall		Pjoperties
Dex	noilgin	_	and she was a		
Allo	we your con work.	oputer to a	ocess resou	ices on a	Microsoft
-	w icon in n	oblication	atea when r	orrecte	e
IVI SH		n this conn	ection has li	miled or r	to connectivity
V Sh	ary the when				

Figure 2-7 Local Area Network Properties

Select Internet Protocol (TCP/IP) and click on Properties. In the Internet Protocol (TCP/IP) Properties, click Use the following IP address radio button. Enter IP address compatible with the current IP address of the ODM-88.

- For point to point direct connection, if the IP address of ODM-88 is 192.168.000.088, the PC IP address should be chosen as 192.168.000.nnn; where nnn ranges 000 to 255 except 088. (Refer to Chap. 2.6.6)
- For LAN connection, maintain existing PC IP address then consult you network manager to obtain available IP address for ODM-88.

eneral	
You can get IP settings assigned this capability. Otherwise, you ne the appropriate IP settings.	automatically if your network, supports ed to ask your network, administrator for
O Dbtain on IP address autom	atically
O Uge the following IP address	£
JP address.	20 12 12
Sybnet mask:	1 12 12
Default gateway:	10.00
O Option ONU server address	adonate ale
 Use the following DNS serv 	er addresses
Eleferred DNS server:	
Alternate DNS server:	1 14 14 1 1 H
	Adyanced.

Figure 2-8 PC IP address setting

Select OK to terminate IP setup session.

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3 **Operation**

- ODM-88 has various operational interfaces: Front Panel Key Input, Serial Command Lines, and Proprietary PC Software through RS-232, Ethernet.
- Proprietary PC Software is the most efficient since all other methods use command line interface.

3.1 Front Panel Operation

- Please Refer to Chap. 2.2 for detail explanation of front keys functions.
- Front Panel Operation examples:
- 8 Displays with 3 different typed of EDID:

Port No.	<u>Input</u>	<u>Output</u>
1 🖯	→ Source 1	Display 1 (EDID type A)
2 -	→ Source 2	Display 2 (EDID type B)
3 —	Source 3	Display 3 (EDID type B)
4 🔨	Source 4	Display 4 (EDID type A)
5	Source 5	Display 5 (EDID type B)
6 <	→ Source 6	Display 6 (EDID type C)
7 _	Source 7	Display 7 (EDID type C)
8	Source 8	Display 8 (EDID type A)

- The arrows represent :
 - Input 1 to Output 1 and 4
 - Input 2 to Output 2
 - Input 3 to Output 3
 - Input 4 to Output 5
 - Input 5 no connection
 - Input 6 to Outputs 6 and 7
 - Input 7 to Output 8
 - Input 8 no connection
- Operation is executed in two steps:
 - > Set EDID for each Input port for proper graphic signal transmittal.
 - > Configure Input-Output for cross-switching as configured above.





1) Press **FUNCTION** key – LCD will display EDID Read/Write:

======Function Mode======

EDID Read/Write IN : 1.2.3.4.5.6.7.8 OUT: 1.2.3.4.5.6.7.8

Configure as shown below:

======Function Mode======

EDID Read/Write IN : 1.2.3.4.5.6.7.8 OUT: 1.2.3.4.5.6.7.8

[Note] If a source is connected to two or more different displays, assigning the lower resolution EDID to Input port EEPROM is highly recommended. Assigning higher resolution will show 'OUT OF RANGE'.

Press ENTER to save.

[Note] EDID setting is valid until a new EDID setting is processed - even though the ODM-88 is powered on and off repeatedly.

To configure Input-Output, press **CREATE**; current Input-Output configuration will be displayed.

====== Create Mode ======= I: 1 2 3 4 5 6 7 8 N | | | | | | | | | O: 1 2 3 4 5 6 7 8 M

Where N is Not defined for the monitoring, M.

Press Input button 1 (Green LED is on) – LCD displays:

```
======= Create Mode =======
```

Input Channel NUM.: 1

Out: 1

New:

Press Output 1 and 4 (number 1 and 4) as the selected outputs for the given Input. Press ENTER key and then turn back to the user mode.

[Note] Specific Input can be connected to multiple Output channels. However, one Output channel cannot share multiple Input channels.

Repeat above process 4 to 5 for other Input channels.

Press **PREVIEW** key to review newly saved Input-Output configuration;

 ======
 Preview Mode ======

 I:
 1
 2
 3
 4
 5
 6
 7
 8
 N

 |
 |
 |
 |
 |
 |
 |
 |
 |

 O:
 1
 2
 3
 4
 5
 6
 7
 8
 M

[Note] Pressing ENTER key completes the Input-Output configuration.

DVI MATRIX ROUTER : ODM-88



3.2 Command Line Operation

- Command line interface is performed through RS-232 or Ethernet.
- The commands are coded in ASCII and HEXA. All descriptions are shown in Table 3.1. A command line consists of string of ASCII or HEXA codes in series as shown below;

Start (1 Byte) + Router ID (3 Bytes) + Command (1 Byte)

- + Data Length (3 Bytes)
- + Output Number (2 Bytes) + Input Number (2 Bytes)
- + Output Number (2 Bytes) + Input Number (2 Bytes) +
- + End (1 Byte)
- A command line allows execution of only one command. Multiple commands require execution of multiple strings; one command per string.
- All strings begin with **Start** byte.
- **Router ID** can be selected within the range of 000 to 255; written in 3 bytes. (Default factory setting is 255. Refer to Chap. 2.1.)
- **Data Length** represents total number of all bytes. Data Length is determined by the number of channels in the command line.
 - For example: Configuring 4 Input-Output connections (8 channels), data length is 016 in ASCII - 16 bytes in base of 2 bytes per channel regardless of Input and Output.
- Input channel Number follows Output channel Number designated as a pair.
- A command line closes with End byte.

Command Format	ASCII	HEX	Description	Byte
Start	*	0x2A	Header Code	1
Router ID	Variable	Variable	Router ID Value	3
Create	0	0x30	Connect or Disconnect the Selected Input and Output channels	1
Preview	1	0x31	Preview all connected channels	1
Cancel	2	0X32	Cancel selected channel connection	1
Upload Data Request	3	0x33	Upload connection information to the controller	1
Rolling	4	0x34	Rotates Input and Output connection	1
Upload Router ID	5	0x35	Upload Router ID to controller	1
Rolling Stop	6	0x36	Stop rolling command	1
Check Connection	7	0x37	Upload connection integrity	1
Upload One Channel Data Request	8	0x38	Uploads the connection status of selected channel	1
Baud Rate Setting	@	0x40	Change Baud rate of RS-232	1
Read Output Device EDID	Α	0x41	Read EDID from attached display	1
Default EDID Setting	В	0x42	Restore factory default EDID on EEPROM	1

Table 3.1 Descriptions of Command Codes



DVI MATRIX ROUTER : ODM-88

Read Input EEPROM	С	0x43	Read EDID from EEPROM	1
			Read EDID from display and write to	
EDID Write	D	0x44	EEPROM	1
Edit EDID Write	Е	0x45	Edit EDID Write mode	1
EDID Data	F	0x46	Send divided data by two	1
Monitoring	G	0x47	Set the monitoring channel	1
Data Length		Variable		3
Output channel		Variable	Selected Output channel	2
Input channel		Variable	Selected Input channel	2
End	!	0x21	Tail Code	1

• In response to the command line Input to OMD-88, the following ACK signals are returned to the controller shown in Table 3.2.

Acronym	Bytes	HEX Codes	Description
Error	1	0x05	Router received incorrect data packet
RX Complete	1	0x06	Router received correct data packet
Job Complete	1	0x07	Completed operation per command
Connection OK	1	0xA0	Successful connection

Table 3.2 Descriptions of Acknowledge (ACK) Signals

- ACK will be returned after command codes are sent.
- If the command codes are successfully done, 0x06, 0x07 will be returned. But if it is failed, 0x05 will follow it by return. Some command codes have special ACK and it is described under the each example command code below.

The followings illustrate example codes for various applications to be utilized on HyperTerminal for RS-232 and on Telnet for TCP/IP.

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3.2.1 Create:

- Configure cross-switching of inputs and outputs.
- Command line format:
 - Start (*) + Router ID (3 byte) + Command (0) + Data Length (Variable) + Output channel (2 byte) + Input channel (2 byte) + ... + End (!)
- ACK Return Signal:
 - > RX Complete 0x06(06h), TX Complete 0x07(07h)

Example 1: One (1) channel connection of Output Channel 1 and Input Channel 1

	Start	R	outer II	C	Command	Data Length		Out Cha	tput nnel	Input Channel		End	
ASCII	*	2	5	5	0	0	0	4	0	1	0	1	!
HEX	2Ah	32h	35h	35h	30h	30h	30h	34h	30h	31h	30h	31h	21h

Example 2: One (1) channel disconnection of Output Channel 1 by setting "0" on the Input channel bytes.

	Start	R	outer II	C	Command	Da	Data Length		Out Cha	tput nnel	Input Channel		End
ASCII	*	2	5	5	0	0	0	4	0	1	0	0	!
HEX	2Ah	32h	35h	35h	30h	30h	30h	34h	30h	31h	30h	30h	21h

Example 3: Two (2) channel connection: Output Channel 1 → Input Channel 8 & Output Channel 8 → Input Channel 1

	Start	F	Router II	C	Command	Da	ta Len	gth	Out Cha	put nnel	Input C	Channel
ASCII	*	2	5	5	0	0	0	8	0	1	0	8
HEX	2Ah	32h	35h	35h	30h	30h	30h	38h	30h	31h	30h	38h

Output (Channel	Input C	hannel	End
0	8	0	1	!
30h	38h	30h	31h	21h





	Start	R	outer l	D	Command	Da	ta Len	gth	Output Channel		Input Channel	
ASCII	*	2	5	5	0	0	3	2	0	1	0	1
HEX	2Ah	32h	35h	35h	30h	30h	33h	32h	30h	31h	30h	31h

Ou Cha	tput nnel	Inp Cha	out nnel	 Ou Cha	Output Channel		out nnel	Ou Cha	tput nnel	Input Channel		END
0	2	0	2	 0	7	0	7	0	8	0	8	!
30h	32h	30h	32h	 30h	37h	30h	37h	30h	38h	30h	38h	21h

3.2.2 Preview: Shows all Input-Output configurations

- Command line format:
 - Start (*) + Router ID (3 byte) + Command (1) + Data Length (000) + End (!)
- ACK Return Signal:
 - RX Complete 0x06(06h), TX Complete 0x07(07h)

Byte	Start	Router ID			Command	Da	ta Len	gth	End
ASCII	*	2	5	5	1	0	0	0	!
Hex	2Ah	32h	32h 35h 35h		31h	30h	30h	30h	21h

3.2.3 Cancel: Cancels configuration of outputs for each Input.

- Command line format:
 - Start (*) + Router ID (3 byte) + Command (2) + Data Length (variable) + Input Channel (2 byte) + End (!)
- ACK Return Signal:
 - RX Complete 0x06(06h), TX Complete 0x07(07h)

Example: Disconnect Input Channel 1

Byte	Start	R	outer I	D	Command	Da	ta Len	gth	Inp Cha	out nnel	End
ASCII	*	2	5 5		2	0	0	2	0	1	!
Hex	2Ah	32h	35h	35h	32h	30h	30h	32h	30h	31h	21h

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3.2.4 Upload Data Request: Uploads connection data to the controller.

- Command line format:
 - Start (*) + Router ID (3 byte) + Command (3) + Data Length (000) + End (!)

Byte	Start	Router ID			Command	Da	ta Len	gth	End
ASCII	*	2 5 5		3	0	0	0	!	
Hex	2Ah	32h 35h 35h		33h	30h	30h	30h	21h	

- Allows ODM-88 to respond with ACK signal to controller in the following format: 0x06(06h) + Connection DATA + 0x07(07h)
- The Connection Data represents the connection information of router

* Connection Data for ODM-88: 1-1, 2-2, 3-3, 4-4, 5-5, 6-6, 7-7, 8-8

Byte	Start	R	outer l	D	Command	Da	ta Len	gth	Out Cha	put nnel	Inp Cha	out nnel
ASCII	*	2	5 5		3	0	3	2	0	1	0	1
Hex	2Ah	32h	35h	35h	33h	30h	33h	32h	30h	31h	30h	31h

Ou Cha	tput nnel	Inp Cha	out Innel	 Output Channel		Inp Cha	out nnel	Out Cha	tput nnel	Inp Cha	END	
0	2	0	2	 0	7	0	7	0	8	0	8	!
30h	32h	30h	32h	 30h	37h	30h	37h	30h	38h	30h	38h	21h

3.2.5 Rolling command

- Rotates Input at fixed Output.
- Checks connection status of all inputs and outputs by changing them in sequence.
- Format of Command Line:
 - Start (*) + Router ID (3 byte) + Command (4) + Data Length (Variable) + Output Channel (2 byte) + Input Channel (2 byte) + ... + End (!)
 - Example: To rotate three(3) inputs1, 2, and 3 on three (3) outputs 1, 2, and 3.
- ACK Return Signal:
 - RX Complete 0x06(06h), TX Complete 0x07(07h)



DVI MATRIX ROUTER : ODM-88

1) Output Channel 1 → Input Channel 1, Output Channel 2 → Input Channel 2, Output Channel 3 → Input Channel 3

Byte	Start	R	outer	D	Command	Da	ta Len	gth	Output	Channel	Input Channel		
ASCII	*	2	5 5		4	0	1	2	0	1	0	1	
Hex	2Ah	32h	35h 35h		34h	30h	31h	32h	30h	31h	30h	31h	

Output	Channel	Input C	hannel	Output	Channel	Input C	hannel	End
0	2	0	2	0	3	0	3	!
30h	32h	30h	30h 32h		33h	30h	33h	21h

2) Output Channel 1 → Input Channel 2, Output Channel 2 → Input Channel 3, Output Channel 3 → Input Channel 1

Byte	Start	R	outer I	D	Command	Da	ta Len	gth	Output	Channel	Input C	hannel
ASCII	*	2	5 5		4	0	1	2	0	1	0	2
Hex	2Ah	32h	35h	35h	34h	30h	31h	32h	30h	31h	30h	32h

Output	Channel	Input C	hannel	Output (Channel	Input Channel		End
0	2	0 3		0	3	0	1	!
30h	32h	30h 33h		30h	33h	30h	31h	21h

3) Output Channel 1 → Input Channel 3, Output Channel 2 → Input Channel 1, Output Channel 3 → Input Channel 2

Byte	Start	R	Router ID		Command		ta Len	gth	Output	Channel	Input Channel		
ASCII	*	2	5 5		4	0	1	2	0	1	0	3	
Hex	2Ah	32h	35h	35h	34h	30h	31h	32h	30h	31h	30h	33h	

Output	channel	Input c	hannel	Output	channel	Input c	End	
0	2	0 1		0	3	0	2	!
30h	32h	30h 31h		30h	33h	30h	32h	21h

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3.2.6 Upload Router ID

- Uploads Router ID to the controller or PC.
- Command line format:
 - Start (*) + Router ID (3 byte) + Command (5) + Data Length (000) + End (!)

Byte	Start	Router ID			Command	Da	ta Len	gth	End
ASCII	*	2 5 5		5	0	0	0	!	
Hex	2Ah	32h 35h 35h		35h	30h	30h	30h	21h	

- Allows ODM-88 to respond with ACK signal to controller in the following format: 0x06(06h) + Connection DATA + 0x07(07h)
 - ▶ If the Router ID is 015, ACK signal is as follows:

Connection DATA

Byte	Start	Router ID			Command	Da	ta Len	gth	End
ASCII	*	0 1 5			5	0	0	0	!
Hex	2Ah	30h 31h 35h		35h	30h	30h	30h	21h	

3.2.7 Rolling Stop

- Rolling stop command.
- Command line format:
 - Start (*) + Router ID (3 byte) + Command (6) + Data Length (000) + End (!)
- ACK Return Signal:
 - RX Complete 0x06(06h), TX Complete 0x07(07h)

Byte	Start	R	outer l	D	Command	Da	ta Len	gth	End
ASCII	*	2 5 5		6	0	0	0	!	
Hex	2Ah	32h 35h 35h		36h	30h	30h	30h	21h	

3.2.8 Check Connection

- Check status of all connections
- Command line format:
 - Start (*) + Router ID (3 byte) + Command (7) + Data Length (000) + End (!)

Byte	Start	Router ID			Command	Da	ta Len	gth	End
ASCII	*	2 5 5			7	0	0	0	!
Hex	2Ah	32h 35h 35h		37h	30h	30h	30h	21h	

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- By sending **Check Connection** command to the router, ODM-88 responds with the following **ACK** signal to controller :
 - Good connection: 0xA0 (A0h)
 - Bad connection: 0x05 (05h)

3.2.9 Upload One Channel Data Request

- Upload connection status of a selected Output channel.
- Command line format:
- Start (*) + Router ID (3 byte) + Command (8) + Data Length (002) + Output channel (2 byte) + End (!)
- Allows ODM-88 to respond with ACK signal to controller in the following format: 0x06(06h) + Connection DATA + 0x07(07h)

Byte	Start	R	outer l	D	Command	Da	ta Len	gth	Output	channel	End
ASCII	*	2	5 5		8	0	0	2	0	1	!
Hex	2Ah	32h	35h 35h		38h	30h	30h	32h	30h	31h	21h

Input 6 \rightarrow Output 1 connection

Connection DATA

Byte	Start	R	outer l	D	Command	Da	ta Len	gth	Input c	hannel	End
ASCII	*	2 5 5		8	0	0	2	0	6	!	
Hex	2Ah	32h	2h 35h 35h		38h	30h	30h	32h	30h	36h	21h

3.2.10 Read Output Device EDID

- Read EDID from connected display.
- Command line format:
 - Start (*) + Router ID (3 byte) + Command (A) + Data Length (002) + Output channel (2 byte) + End (!)
- Allows ODM-88 to respond with ACK signal to controller in the following format: 0x06(06h) + Connection DATA + 0x07(07h)

Byte	Start	Router ID			Command	Da	Data Length			Output Channel		
ASCII	*	2	5	5	А	0	0	2	0	1	!	
Hex	2Ah	32h	35h	35h	41h	30h	30h	32h	30h	31h	21h	

Example: Read EDID from a Display connected to Output 1





Connection DATA

Byte	Start		ID		Command	Da	Data Length Output Channel EDID (256Byte		EDID (256Byte)	End		
ASCII	*	2	5	5	А	2	5	8	0	1		!
Hex	2Ah	32h	35h	35h	41h	32h	35h	38h	30h	31h	00hxxh	21h

EDID (256 Bytes) contains EDID information of Output display 1.

3.2.11 Read Input EEPROM EDID

- Read EDID stored on EEPROM of an Input.
- Format of Command Line:
 - Start (*) + Router ID (3 byte) + Command (C) + Data Length (002) + Input EEPROM (2 byte) + End (!)
- Allows ODM-88 to respond with ACK signal to controller in the following format: 0x06(06h) + Connection DATA + 0x07(07h)

Example: Read EDID stored on EEPROM of Input 2

Byte	Start	Router ID			Command	Data Length			Input El	End	
ASCII	*	2	5	5	С	0	0	2	0	2	!
Hex	2Ah	32h	35h	35h	43h	30h	30h	32h	30h	32h	21h

Connection DATA

Byte	Start	R	outer l	D	Command	Data Length			Inp EEPf	out ROM	EDID (256Byte)	End
ASCII	*	2	5	5	С	2	5	8	0	2		!
Hex	2Ah	32h	35h	35h	43h	32h	35h	38h	30h	32h	00hxxh	21h

EDID (256 Bytes) contains EDID information stored on EEPROM 2.

3.2.12 EDID Write

- Read EDID information from connected displays and writes EDID to each EEPROM.
- Format of Command Line:
 - Start (*) + Router ID (3 byte) + Command (D) + Data Length (Variable) + EEPROM 1 (2 byte) + EEPROM 2 (2 byte) + ... + End (!)
 - Variable in Data Length is determined by multiplying 2 bytes to the maximum number of Input channels. With ODM-88, it is 16 bytes, multiplying 2 bytes by 8 inputs.

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 The 2 bytes in EEPROM # represents the Output port number of target display. For example, 03 in EEPROM 2 represents: load the EDID of Output 3 display into EEPROM 2. The value, 00 in EEPROM # represent: no updating to EEPROM.

Example: \$	Sets.	Output 1	displav→	Input 1	EEPROM:	Output 3	display ->	Input 2 EEPROM	/1)
	,	••••••••••••••••••••••••••••••••••••••			,	• • • • • • • •			• /

Byte	Start	R	outer l	D	Command	Data Length		EEPROM 1		EEPROM 2		
ASCII	*	2	5	5	D	0	1	6	0	1	0	3
Hex	2Ah	32h	35h	35h	44h	30h	31h	36h	30h	31h	30h	33h

EEPR	OM 3	 	EEPR	8 MO	END
0	0	 	0	0	!
30h	30h	 	30h	30h	21h

- ACK Return Signal:
 - RX Complete 0x06(06h), TX Complete 0x07(07h)

3.2.13 Default EDID Setting

- Restores factory default EDID on EEPROM.
- Command line format:
 - Start (*) + Router ID (3 byte) + Command (B) + Data Length (000) + End (!)
- ACK Return Signal:
 - RX Complete 0x06(06h), TX Complete 0x07(07h)

Byte	Start	R	outer I	D	Command	Da	ta Len	gth	End
ASCII	*	2	5	5	В	0	0	0	!
Hex	2Ah	32h	35h	35h	42h	30h	30h	30h	21h

3.2.14 Baud rate Setting

- Change baud rate through RS-232.
- Command line format:
 - Start (*) + Router ID (3 byte) + Command (@) + Data Length (002) + Baud Rate (variable) + End (!)
 - The default baud rate is 19,200
 - Baud rate options:
 - 01 for 19,200bps
 - 02 for 38,400bps

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- 03 for 57,600bps
- 04 for 115,200bps
- Allows ODM-88 to respond with ACK signal to controller in the following format: 0x06(06h) + Connection DATA + 0x07(07h)

Byte	Start		ID		Command	Da	ta Len	gth	Baud	End	
ASCII	*	2	5	5	@	0	0	2	0	2	!
Hex	2Ah	32h	35h	35h	40h	30h	30h	32h	30h	32h	21h

Example: Set the baud rate to 38,400bps.

Connection DATA

Byte	Start		ID		Command	Da	ta Len	gth	Baud	End	
ASCII	*	2	5	5	@	0	0	2	0	2	!
Hex	2Ah	32h	35h	35h	40h	30h	30h	32h	30h	32h	21h

3.2.15 Monitoring

- Sets monitoring channel.
- Format of Command Line:
 - Start (*) + Router ID (3 byte) + Command (G) + Data Length (002) + Monitoring Data (2 byte) + End (!)
- ACK Return Signal:
 - RX Complete 0x06(06h), TX Complete 0x07(07h)

Ex.> Set Input Channel 2 as the Monitoring channel

Byte	Start		ID		Command	Data Length			Monitor	End	
ASCII	*	2	5	5	G	0	0	2	0	2	!
Hex	2Ah	32h	35h	35h	47h	30h	30h	32h	30h	32h	21h

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3.3 Proprietary PC Software Installation

3.3.1 Installation of PC Application

- Insert ODM-88 software CD ROM into PC. If the CD ROM does not automatically run, Select Start >Run. Enter X:\ 'ODM-88 Setup.exe, (where X is the letter of your CD ROM drive)
- 2) Installation of ODM-88 screen will be opened. Click on the Next button.

🦉 ODM-88	
ODM-88	
It is strongly recommended that you exit all programs before running this installer. Applications that run in the background, such as virus-scanning utilities, might cause the installer to take longer than average to complete.	
<< Back Next >>	<u>C</u> ancel

3) Select the destination directory path and click on the **Next** button.

🦞 ODM-88	
Destination Directory Select the primary installation directory.	
All software will be installed in the following location(s). To install software into a different location(s), click the Browse button and select another directory.	
Target directory for application C:₩Program Files₩ODM-88₩ Browse	
Target directory for National Instruments software C:₩Program Files₩National Instruments₩ Browse	
< <u> </u>	<u>C</u> ancel

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4) Select "I accept the License Agreement(s)" and click on the **Next** button.

	🛒 ОДМ-88				
	License Agreement You must accept the license(s) displayed below to proceed.				
NATIONAL INSTRUMENTS 소프트웨어 라이센스 계약					
설치상 주의사항: 이것은 계약이다. 소프트웨어 다운로드 및 설치 과정을 완료하기 이전에 본 계약내용을 신중히 읽도록 한다. 귀하는 소프트웨어 다운 로드 및 설치 과정 완료를 위한 해당 버튼을 누름으로써, 본 계약 조건에 동의 하고 본 계약에 구속받을 것에 동의하게 된다. 본 계약의 당사자로써 본 계약 상의 조건에 구속되기를 원치 않는 경우, 설치 과정 취소 버튼을 클릭하여 소 프트웨어를 다운로드 및 사용하지 말며 소프트웨어 취득 장소로 소프트웨어 를 (모든 수반 문서와 용기 포함) 수령한 일로부터 30일 이내에 소프트웨어를 반납한다. 반납 시, NI의 당시 반납 정책에 따른다.					
	1 첫의 본계약에서 다음의 용어들은 다음과 같은 의미를 갖는다. ◎I accept the License Agreement(s) ○I do not accept the License Agreement(s).				
	<< Back Next >> Cancel				

5) Click on the **Next** button.

1 ODM-88					
Start Installation Review the following summary before continuing.					
Adding or Changing • DDM-88 Files					
Click the Next button to begin installation. Click the Back button to change the installation settings.					
Save File Next >>	Cancel				

To complete the installation, click on the **Finish** button.

🦉 ODM-88			
Installation Complete			
The installer has finished updating your syste	em.		
		_	
	<< Back	Next >>	Einish
DVI MATRIX ROUTER : ODM-88



3.4 Proprietary PC Software Operation

3.4.1 PC Operation using RS-232

- 1) Connect RS-232 cable between ODM-88 and PC.
- 2) Turn on power switch.
- 3) Set Baud rate with reference to Function mode manual. (Refer to chap. 2.6.3)- Default setting is 19200bps.
- 4) Execute PC operating software. (Select **Start > Program > ODM-88**)

 printec Formtec 	*
🗑 ODM-88	• DDM-88
	위치: C:\Program Files\ODM-6

5) Following will be displayed at first page (Title).



DVI MATRIX ROUTER : ODM-88



6) Following message will be opened step by step for serial communication, router ID and output channel status.



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7) Following will be displayed if all connection and setting is in normal.

- 8) Error message will be opened if the connection and setting is not in normal.
 - ex) Following error message will be opened when cable connection and baud rate setting is not in normal.





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ex) Following error message will be opened when Router ID is not set in normal.



Set ID = PC Software Receive ID = ODM-88 MATRIX ROUTER [Note] Set ID and Receive ID should be same.

9) Setting for Serial Port, Baud Rate and Router ID



Select System > RS232 at the menu bar.

DVI MATRIX ROUTER : ODM-88



ne mana cono	OI EDID			- F	S232C	Eth	ernet	Router ID	255
Pattern I	List			Input	Cha	nnel S	tate		
	1	1	2	3	4	5	6	7	8
			-		-	-	-	-	-
		2	- S2		-	1.		÷	
			Internet Color	mandet antio	-		2.43	*	
			a start start a start in		-		0.00		
			Seria	Port	-	-			-
			CO	M3 •	-				
		•	tsaud	38400 v	-				
			Rout	er ID	-				-
			2	55	nnel D	evice			
		1	Ok	Cancel	5	6	7	8	N
-	4		_	Input Cha	innei S	elect			
Add	Delete	N	N	NN	N	N	N	N	
Add			lear	Clear		Roll	ing		tart

10) Click on the **OK** button after setting desired data.



DVI MATRIX ROUTER : ODM-88



11) RS232C check box color will be changed to **red color** if all process is in normal.



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3.4.2 PC Operation using Ethernet

- Connect Ethernet cable between ODM-88 and PC. Caution) Crossover cable should be used for point to point connection and direct cable should be used for LAN connection. Shipping cable as an accessory is crossover cable.
- 2) Turn on power switch.
- 3) Set the Gate Way, Subnet Mask, IP Address with reference to Function mode manual. (Refer to chap. 2.6.4 ~ 2.6.6)
 - For point to point direct connection, if the IP address of ODM-88 is 192.168.000.088, the PC IP address should be chosen as 192.168.000.nnn; where nnn ranges 000 to 255 except 088. (Refer to Chap. 2.8.1)

AND DEDOMEDIAN AND AND AND	1.000000				100
eneral					
You can get IP settings assigned a this capability. Otherwise, you need the appropriate IP settings.	utomatic d to ask y	ally if y our ne	out ne twork	twork, sup administr	ator for
O @btain an IP address automa	tically				
O Use the following IP address:		_	_	_	_
JP address.		10	112	12	1
Sybnet mask:		11	121	11	1
Default gateway:		12	G,	34	1
O Option DNIS server address a	utomatic	ile i			
 Use the following DNS server 	addressi	28			
Evelened DN5 server.	E	-			l.
Alternate DNS server		11	14	-	10
				Adya	nced.
		-		-	-

4) Execute PC operating software.(Select Start > Program > ODM-88)



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5) Following will be displayed at first page (Title).



6) Following message will be opened step by step for Ethernet communication, router ID and output channel status.



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7) Following will be displayed if all connection and setting is in normal.



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- 8) Error message will be opened if the connection and setting is not in normal.
- ex) Following error message will be opened when Ethernet setting is not in normal.

Ethernet Communication Error	×
Timeout expired	
<u> </u>	

ex) Following error message will be opened when Router ID is not set in normal.

Router ID Error	×
Router ID Miss-Match Set ID = 001 Receive ID = 255	
<u>O</u> K	

Set ID = PC Software Receive ID = ODM-88 MATRIX ROUTER [Note] Set ID and Receive ID should be same.

DVI MATRIX ROUTER : ODM-88



 Set the Ethernet communication and Router ID [Note] Both IP address of ODM-88 and PC should be same. Select System > Ethernet at the menu bar



10) Click on the **OK** button after setting desired data.



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Message Ethernet Communication Open Ok	×
Message Router ID Receive	
Message OK	X

11) Ethernet check box color will be changed to **red color** if all process is in normal.

itle Matrix Con	trol EDID (RS232C	Eth	emet	Router ID	255	
Pattern	liet					1100,00,0		enter	-		
Tattern	یر ا				Inpu	t Char	nnel S	tate			
		1	2		3	4	5	6	7	8	
				a l	÷.	÷.		-	- 10 - 1	-	
		1.00			5			570			
		-		1	-	-	•	-	-		
				5					(e)	- 23	
					-	-				- 2	
		1			-		14	-	222	41	
					•	-	-		-		
				Ou	tput Cl	nannel D	evice				
		1	2	3	4	5	6	7	8	N	
-	1			h	put Ch	annel Se	elect				
545/494	THE REAL PROFESSION	N	N	IN	IN	IN	IN	N	IN	3	
Add	Delete		2	2	1		1	1			
			Rolling								
Lin Load	Enter		Clear		Glear		Select 🕭 Pa		ttern	start	
Up Load	Enter	Enter		-			Count	R	olling Tim		

DVI MATRIX ROUTER : ODM-88



3.4.3 System menu

- <u>R</u>S232: Set the Serial Port, Baud Rate, Router ID for RS232 communication.
- <u>E</u>thernet: Set the IP Address, Subnet Mask, Gateway, Router ID and Port number for Ethernet communication.
- > <u>C</u>ommunication Information: Information for Tx and Rx communication.
- > <u>Information</u>: Information for PC software version.



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3.4.4 Function menu

- > <u>Get Router ID: Match PC Software with Router ID after reading Router ID</u>
- > <u>PreView: Verifies current Input-Output connection status.</u>
- > <u>Communication Information: Information for Tx and Rx communication.</u>
- <u>Baud Rate Change: Change Baud Rate at PC Software</u>





DVI MATRIX ROUTER : ODM-88



3.4.5 Title Folder – Initial screen of PC Software



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3.4.6 Matrix Control Folder

- > Set the IN/OUT channel and save the edited data.
- Set the Monitoring Output.
- Set the Rolling function.
- > Read switching pattern of IN/OUT CH by selecting Upload button.

tle Matrix Con	trol EDID				R\$232C	Eth	ernet	Router ID	255	
Pattern	List			Inp	ut Cha	nnel S	tate			
	1	1	2	3	- 4	5	6	7	8	
			-	-		-		-	10	
		1040		-		-	2		-21	
		0.80		~			19 19	3 -	24	
			8	8	1		1.0	1		
		-		-	•					
			•							
		2.2	2		÷.			1	S.	
				Output	Channel	Device				
		1	2	3 4	1 5	6	7	8	M	
AE	لد sc		1	Input (Channel S	select				
Add	Delete	N	N	N	NN	N	N	N		
		Rolling								
100010000	HOLDON		clear	Clear		Select	· ····Pa	ttern 🔽 🖻	tart	

3.4.7 EDID Folder

- Store EDID
- Read EDID From Output Device
- > Read EDID From Output Device and store it in Input EEPROM
- EDID User defined EDID
- Restore defined EDID(in all Input Channel)
- One touch store(in all Input Channel)
- Store EDID by individual selection
- > Basic EDID structure: EDID Block 0 [128 bytes]

DVI MATRIX ROUTER : ODM-88



3.5 Matrix Control Operation

3.5.1 Select Input Channel

1) Output Channel Device is not activated. (It's fixed always)

OM-88 DVI MATRIX em Function	ROUTER									モ門
itle Matrix Cont	trol EDID.					RS232C	Eth	ernet	Router ID	255
Pattern	List				Input	Char	nnel S	tate		
	-	1	2	-	3	4	5	6	7	8
					÷.			-		-1
		1			5			S.*.C		
					-			-	-	-
				_	.	*	26			- 8
				-	38	- 10 H				- 10
				-	20	-				-
					•	•	-		-	
				Ou	tput Ch	annel D	evice			
		1	2	3	4	5	6	7	8	М
	5			In	put Cha	annel Se	elect			
Add	Delete	N	N	N		N	N	N	N	
	_		Clear		Clear		Roll	ling Pa	ittern	Start
Up Load	Enter	1	Set		Check	Count	R	olling Tim	10 Sec	Stop



DVI MATRIX ROUTER : ODM-88



2) Select desired input channel

(Click on "N" which is located at the below of Output Channel Device number)

ODM-88 DVI MATRIX stem Function	ROUTER								EF
Title Matrix Con	trol EDID			1	RS232C	Eth	ernet	Router ID	255
Pattern	List			Inp	ut Cha	nnel S	tate		
	4	1	2	3	4	5	6	7	8
			-	-	-		-		
								•	
		1.12	. Car		21	- ¥	1.1	-	1
			363	÷S	8	<u>8</u>	(3)	(æ)	2
			-	- 10		1.5	•		- 10
		-			-	12	112.51		-
			2.00	•		-	1.0		
				Output (Channel I	Device			
		1	2	3 4	5	6	7	8	М
	-			Input C	hannel S	lelect			1
Add	Delete	N	N	NI	N	N	N	N	
Up Load	Enter		Clear	Clea	er Cour	Rol Select M R	ling t 🛥 Pa colling Tim	ttern	tart

DVI MATRIX ROUTER : ODM-88



3) Channel link for Input and Output

ex) Link Input Channel 1 to Output Chanel 1

 Click on the "N" which is located at the right under Output Channel Device No. 1 > select 1 > click on the Enter button > OK message

Matrix Con	trol EDID				RS232C	Ett	ernet	Router ID	255
Pattern	List			Inpu	t Cha	nnel S	tate		
		N	2	3	4	5	6	7	8
		1		-	-	- i -	<u></u>	-	
				*		- 24		3 4),	
		2		*					
		3			-		- 23	•	•
		H	1.00	*			14		
		4						•	
		5		-	-	- ie	- 2		
				-					
		0		Output C	hannel t	Device	-		
		7	2	3 4	- 5	6	7	8	N
	4	8		Input Ch	annel S	elect			
Add	Delete	1	N	NIN	N	N	N	N	4
Auu	Delete	-							
			Clear	Class		Rol	ling		tart
Up Load	Enter		Cical	Great	Court	Selec	Pa	ttern	lan
op Loud	Linci	1	Set	Check	Cour		olling Tim		top
							man 2		
	Message								
	I MICHAELER IN						101		
					-				
		01 Ou	tput Ci	nannei	Enter				

OK

DVI MATRIX ROUTER : ODM-88



IDM-68 DVDMATRIX Iem Fanction	HOUTER									
itie Matrix Con	trol EDID			- 1	RS232C	Ett	ernet	Router ID	255	
Pattern	n List			Inp	ut Cha	nnel S	tate			
			2	3	4	5	6	7	8	
		1	1.0	1985	8	*	-	19 1 0	- 68	
			2		19	-	- 22			
			-				•			
		H			1	- 2				
			÷.		2		÷.			
							7.0			
				Output	Shannel I	Device				
		1	2	3 4	5	6	7	8	M	
1	- 4		_	Input C	hannel S	ielect			4	
Add	Delete	1	N	NI	NN	N	IN C	N		
Up Load	Enter		Clear Clear Select - Pattern							
Up Load	Enter] 1	Clear Set	Clea	ck	Rol Selec I F	ling t - Pa tolling Tim Min 1	mem	s	

• Output CH 1 will be marked in green color in the line of Input CH 1.

DVI MATRIX ROUTER : ODM-88



3.5.2 Easy link for Input CH to all Output CH

- 1) Select Input CH number and Enter button.
 - ex) Link Input CH 2 to all Output CH:

Select No. 2 > Set button > Enter button

Matrix Con	trol EDID			1	RS232C		themet	Router ID	255		
Pattern	List			Inp	ut Cha	nnel	State				
	1	1	2	3	4	5	6	7			
				-							
		+2			*	(.			1.41		
					•						
		+1	- 4		×.	(140)		×			
					*						
		-									
				-				*			
				Output	Channel	Device					
		1	2	3 4	5	6	7	8	M		
		Input Channel Select									
Add	Delete	N	N	N	NN	N	N	N	H		
			Clear	Cle		Ro	illing et 🛥 Pa	ttern	Start		
Up Load	Enter	12	Set	Che	Cou		Rolling Time				

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If user wants to clear the link setting, select Clear and Enter button.

Clear button > Enter button

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3.5.3 Select Monitoring

- Output #1 will be disconnected automatically when monitoring port is connected and working.
 - > ex) Monitoring for Input CH 4: Select No. 4 > select Check Box



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3.5.4 Save Switching Pattern

• Select link for Input CH and Output CH > Create Pattern Name >

Select Add button.

 ex) Select link for Input CH and Output CH as 1:1 > Write ABC as Pattern Name > Select Add button





DVI MATRIX ROUTER : ODM-88



ie Matrix Con	rol EDID				1	Router ID	255				
Pattern	List				Inne	t Cha	nnel S	tate	1		
ABC			1	-	mpe	n Ond	initia d	teres	-		
		1	2		3	-4	5	6	7	8	
		1960			•	8		۲	-	1.	
		1.00							2	•	
		1.4	-		•			. 3		•	
		1.00							~	•2	
						9					
			-		0			-	-	-	
		8			-				•		
					3 I				1 7 1	-	
				Ou	tput C	hannel (Device				
			2	3	- 4	-5	6	7	8	N	
DE	F			lin	iput Cl	hannel S	elect				
100000	Sector Control	8	7	6	1 5	4	13	2	11	3	
Add	Delete	E.	1	1	2		1	2	1		
			Class		-		Rol	ling			
Up Load	Entor		Clear		Crea		Selec	r 🛲 Pa	ittern	Cart	
	Enter	1.				Cour	nt p	alling Tir	-	-	

 ex) Select link for Input CH and Output CH in reverse order > Create Pattern Name(DEF) > Select Add button.

> In order to delete Pattern Name in the list, the process is:

Select **check box** for the Pattern Name > Click on the **Delete** button.

> ex) Delete DEF Pattern Name in the list



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3.5.5 Rolling Function

- Allows users to rotate Input sources.
- Used to verify all Input-Output connections.
 - If Output channel was not connected to any Input channel, Check Box would not be checked.
 - > Must have at least 2 Output Channels.



- > ODM-88 has two types of rolling function (Select and Pattern).
- Select mode process is:

Click on the Select > select Input CH No. > set Rolling Time > select Start button

Pattern mode process is:

Click on the Pattern > Select Pattern in the list > Start button.

> The number of rolling count will be indicated at **Count**.

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3.5.6 Select Rolling Mode

Click on the Select > select Input CH No. > set Rolling Time > select Start button.

- For example:
 - When user selects Input CH 1, 2, 3 to be rolled, the sequence will be as below.



3.5.7 Pattern Rolling Mode

• Click on the Pattern > Select Pattern in the list > Start button.



DVI MATRIX ROUTER : ODM-88



3.6 EDID Setting

3.6.1 Features:

- Store EDID
- Read EDID from Output device
- Read EDID from Output device and store it in Input EEPROM
- EDIT user defined EDID
- Restore default EDID (in all Input channels)
- One touch store (in all Input channels)
- Store EDID by individual selection
- Basic EDID structure: EDID Block 0 [128 bytes]

3.6.2 Importance of EDID - Example

- Four (4) sources with four (4) different types of displays configured as below: -Source Input 1 is distributed to Output 1 and 4.
 - 1Source 1Display 12Source 2Display 23Source 3Display 34Source 4Display 4
- Resolution of Display 1 is 1080p and Display 4 is 1080i
- Input 1 EDID must be set a 1080i for all Output 1 and 4 Displays to show 1080i image.
- If Input 1 EDID is set to 1080p, Display 4 cannot display the image

3.6.3 Setting EDID

- Select 'EDID Fold Button', and go to EDID setting.
- This section consist of two functions:
 - Write EDID Data from Output Device
 - > EDID EDIT & Write EDID Data from PC

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3.6.4 Write EDID data of Output Device to Input CH EEPROM

- 1) Select EDID, and go to EDID setting.
- 2) Select Output Device EDID Select No.
- 3) Verify all Input EEPROM # and selected Output Device #.
- 4) Select EDID Write button to save the EDID data.

[Note]

- Match: Same number will be assigned for EEPROM # and Output # (1 : 1 matching).
- Set: Select all the number of Output Device EDID Select with desired number.
- Clear: Clear the selected number of Output Device EDID Select.

no. many south cons	_				R\$232	c. 1	Ethernet	Router	ID 255
EDID File List				Input	Chan	nel EEP	ROM		
4	1	2	2	3	4	5	6	7	8
				Outpu	t Devic	e EDID	Select		
	N	1	N .	N	Ν	N	: N	N	N
		lear		Mat	e h		Sat	E	DID
		lear		mau	un i	3.	Set	w	rite
	E	EPRON	И1 Г И2 Г	EEP	ROM :	5 8 E	Edit	Ve Pro	evter ID F-&-@ seluct ID
		EPRON EPRON	vi2 ⊺ vi3 ∏	EEP	ROM 7	7 E	DID /rite	Seria	6 Number 60000000
		EPRON EPRON EPRON	vi2 ⊺ vi3 ∏ vi4 ∏	EEP	ROM 7		DID /rite	Serk	d Number cocococo EDID iditor

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3.6.5 Read EDID

- 1) Select EDID, and go to EDID setting.
- 2) Select the number of Input Channel EEPROM Read.
- 3) Select the number of Output Device EDID Read.
- 4) Default EDID Data can be read with Default EDID Read button.

If user click on the EDID Editor button, the read EDID Data at the above 2) 3) 4) process can be checked.

Title Matrix Control EDID				RS23 2	20	Ethernet	Router ID	255	
EDID File List			Inp	out Chan	nel EEP	ROM			
sm.DAT 4	1	2	3	4	5	6	7	8	
			Out	put Devi	ce EDID	Select			
	8	N	N	N	N	N	N	Ν	
	С	ear	Ma	atch	1	Set	EDID Write)	
		put Cha PROM 1	All Check	EDID Informatio					
		PROM 2 PROM 3	: [E 	EPROM EPROM	6 E	Edit DID /rite	Product Sorial Na	ND 9860 mbor	
		PROM 4	. <u>Г</u> е	EPROM	EDID Editor				
older c:WODM-88_DataWEDIDW	Defau EDID	t D	efault EDID		put Cha	nnel 3 8	Output I	Device Read	

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3.6.6 Write the read EDID Data

• User can write default EDID Data as following process.

Click on the **Default EDID Read** button > select **Input Channel EEPROM No.** > click on the **Edit EDID Write** button.

• User can write desired Input Channel EDID Data as following process.

Select desired no. at the selection box of **Input channel EEPROM Read** > select **Input Channel EEPROM No.** > click on the **Edit EDID Write** button.

• User can write desired Output Device Channel EDID Data as following process.

Select desired no. at the selection box of **Output Device EDID Read** > select **Input Channel EEPROM No.** > click on the **Edit EDID Write** button.

Title Matrix Control EOID	BS232C Et								Ethe	hemet Router ID 25						
EDID File List			Input Channel EEPRON						Ń							
ysm.DAT 실	1		2		3		4		5		6		7		8	
					Out	put	Devi	ce E	DID	Sele	et					
	į N	I j	N	1	N	1	N	-	Ν		Ν		Ν	1	Ν	
	(Clea	ar		Ma	atc	h	1	1	Se	et		EW	DID /rite		
	Input Channel EEPROM Clear All Clear Check									heck	EDID Information					
										Vender ID GSM Ptoduct ID Serial Number 0006FD6						
L	I	EEPR	OM 4	1	- E	EPR	OM	8					i E	EDID		
older c:WODM-88_DataWEDIDW	Defi	ault	D	efau	ilt		In	out (Chan	mel			gtuC	ut D	evice	

DVI MATRIX ROUTER : ODM-88



3.6.7 Save the edited EDID Data and open the saved file

- The read EDID Data could be saved as a file.
- The saved EDID File's directory is Folder c:\ODM-88_Data\EDID.
- File name will be listed with following process.

Input file name at the **File** line > click on the **Save** button > the saved file will be listed.

• If user wants to delete the save file, the process is as following.

Select **desired file** which needs to be deleted > click on the **Delete** button > the file will be disappeared in the list.

• User can write the saved EDID Data to Input Channel EEPROM as following process.

Select **desired file** in the list > select **Input Channel EEPROM No.** > click on the **Edit EDID Write** button.

EDID File List	Title Matrix Control EDID				RS23	32C	Ethernet	Route	r ID 25
Output Device EDID Select N <th>EDID File List</th> <th>1</th> <th>2</th> <th>In 3</th> <th>put Cha 4</th> <th>nnel EE</th> <th>PROM</th> <th>7</th> <th>8</th>	EDID File List	1	2	In 3	put Cha 4	nnel EE	PROM	7	8
Clear Match 1 Set EDID Write Input Channel EEPROM All Clear Clear Check EDID Information Imput Channel EEPROM Clear Check EDID Information Imput Channel EEPROM Clear Check EDID Information Imput Channel EEPROM EEPROM EEPROM GSM Imput Channel EEPROM EEPROM Edit EDID Imput Channel EEPROM EEPROM EEDID Set of Manuale (Display in the set of the		N	N	Out N	N	rice EDI	D Select	j N	ţ N
Input Channel EEPROM All Clear Check EDID information Clear Check		Cl	ear	M	atch	1	Set	E	DID /rite
EEPROM 2 EEPROM 6 Edit EEPROM 3 EEPROM 7 Write Other		In EE	put Cha	nnel EEI		Clear	All Theok	EDID	Information ender ID cost
EEPROM 3 EEPROM 7 Write		EEPROM 2 EEPROM 6 Edit							odact ID 589 Ial Number 0006FD6
		EE	PROM 3		EPROM	17	Write		EDID Editor



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3.6.8 EDID EDITOR

 Confirm and edit for Input Channel EEPROM, Output Device EDID and Default EDID. The read EDID Data will be displayed when clicking on the EDID Editor button. The edited EDID Data could be saved as a file and saved it to Input Channel EEPROM.

DOM-80 DVI MATRIX ROUTER System Function Title | Matrix Control EDID BS232C Ethernet Router ID 255 EDID File List Input Channel EEPROM abc.DAT ssm.DAT 2 8 1 3 4 5 6 7 **Output Device EDID Select** 8 N N Ν N Ν Ν Ν EDID 1 Clear Match Set Write All Input Channel EEPROM EDID Information Clear 🔳 Check Vender ID EEPROM 1 EEPROM 5 ſ *** Product ID Edit EEPROM 2 EEPROM 6 EDID Serial Hambe 0000 **EEPROM 3** EEPROM 7 Write EDID EEPROM 4 EEPROM 8 Editor Folder c:WODM-88_DataWEDIDW Default Default File đ **Input Channel Output Device** 1 1 EDID EDID EEPROM Read EDID Read Write Read Save Delete

It's not recommended to edit the EDID Data with no purpose.

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- > Confirm the read EDID Data as a below display.
- It will be asked whether save the edited data or not when trying to close the window.
- > It can be editable, but it's not recommended with any purpose.

0	Sen	era	Inf	om	atio		100	-	5	Screen Size								Video Input Definition									Feature Support											
V P	1.3 endk	1 ar ID ect ID	4	CE	AE	xter • GSM	stion 585	n: 13	P - 7	Horiz Vorti	v st onta cal	e F rRa	4 1 1	51 (29 (1 - 2	55) (55) (2m 2m	• WILLE	Ana Vii Se	ilog Sign (0.2) Ieo S para cipo	al Le 10, E Setup do Si outro	vel 300 pro: Sync	On	Hort				Sti Su Ac	and ispe the Dis	nd M off /	ide Isde Low	Pow	10					
i N	lode NFG V	Nun L'ini Nee	ntser ai	01	(01	- 50	1010		- 100	Argee	et R	i La atto	ndas	1	.00	2			Dig	erati ital olor	sille nn V	Syns ortic opth	al 55	Garoe mil		e.	-	1	Enil IGH	or de	ng Fe	in mail (ACC)	101	8.				
с с	hec	kSu kSu	m of	Low High			80	7		3am Garn	ma ma	Def	init	2	.20			THE WEIL	DF	ch dan P 15	odelt lister (NI)	ne face npat	the state	i.				uR Pr De	tGB efer faul	red 1 t GF1	Firmer r	ning I	Mod	•				
					0	rigii	nal	EDI	D R	aw	Dat	a											м	odi	lied	ED	ID I	Raw	De	ata								
	0	1	2	3	4	5	6	7	8	9	A	8	C	D	E	F	4		0	1	2	3	4	5	б	7	8	9	٨	в	С	D	E	F	ŀ			
1	00	FF	FF	FF	FF	FF	FF	00	1E	6D	93	58	01	01	01	01		0	00	FF	FF	FF	FF	FF	FF	00	1E	60	93	58	01	01	01	01	l			
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4. Troubleshooting

Problem	Symptom	Remedy
Power	No Power LED	Check the connection of power cord to the ODM-88 and AC power outlet and that make sure that power switch is in the ON.
		Check the Input Output DVI cables are firmly connected to each port of ODM-88 and double check the Input Output connection configuration you want.
Output	No Output present	The display is not capable of handling graphic resolution. Check the compatibility of EDID in the EEPROM and attached displays. When a single Input is routed to multiple outputs, lower resolution EDID should be selected. EX> Input $1 \rightarrow$ Output 1 (UXGA) & Output 2(SXGA) If EEPROM 1 store the display 1 EDID (UXGA), the display 2 (SXGA) will not work due to resolution limit.
		The source has stopped sending a graphic signal. Check that Input source status by connecting it to availa- ble monitor without the ODM-88.

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5. Features

This unit is designated to make cross-switch between the 8 DVI inputs and the 8 DVI outputs in a way of any of 8 inputs to one or multiple outputs. Chassis is hardened enough to be applicable in harsh environments like staging, control room and military.

- 1) Enables to connect the maximum 8 independent displays.
- 2) Complies with DVI-HDCP standard.
- 3) Each Output port can be used as a Signal-Distributor.
- 4) Supports Windows PLUG & PLAY function.
- 5) Offers various control interfaces like Front-Key Input, RS-232 and Ethernet communication.
- 6) Fulfills real-time display of running status on 20x4 LCD and with illuminated LED type keys.
- 7) Be rack-mountable with solid 19 inch standard RACK TYPE CASE.
- 8) Supports real-time Hot Plug Detection and program each EDID to connected DVI sources as per user's specification. (EDID programming option)
- 9) Offers various options to set EDID to enhance compatibility.

6. Specification

- 1) Input & Output Video Signals Type: TMDS (Transient Minimized Differential Signal)
- 2) DVI Signal Bandwidth: Maximum 1.65Gbps
- 3) Resolution: VGA (640x480) ~ WUXGA (1920x1200), 480~1080i and 1080p
- 4) RS-232 baud rates: 19,200bps ~115,200bps
- 5) LAN Port: 10/100 bases
- 6) AC/DC Power Supply: 110~240V/1.5A, 50~60Hz, DC12V/5A
- 7) Size: 440 x 165 x 75mm (W x D x H)
- 8) Weight: 2.5Kg (Router only)
DVI MATRIX ROUTER : ODM-88



7. Firmware downloading

Router KEY Control

- MegaBoot is a firmware update software program for ODM-88
- Follow the instructions below to install the MegaBoot software into your PC.

Insert the software CD into your PC and copy the MegaBoot.exe file to your desktop. Then there will be created below Icon on your desktop.



Connect USB Cable (A Plug –B Plug) over the Router. Power it on pressing Input key number 2 & 5 at the same time.

Click the AVR Icon to execute setup.exe. The following screen will be displayed.

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	0.014	
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Status No File Open tile first]	
Progress		
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plication Status Information		Copyright (c) 2005, Yong-kyu Bae

Click on the Open button and select file to be downloaded and click on the open(O) button.

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DVI MATRIX ROUTER : ODM-88



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Next step is Serial Port Setup.

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Status Ready, Waiting for target Progress	Monitor		

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Select proper Comm Port and Baud Rate.

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Double click on the "Serial Port Disable" button to execute firmware download.

Open Programming Option Target Information P Flash Device: Ratioad Flash Flass Device: Ratioad Flash Flass PageSize: EEPROM BootSize: Lack bits Serial Port Disable BaodRate COMB It52000ps Manitor	File to be programed in the E	EEPROM		
Programming Option Target Information 2 Flash Device: xxxx Reload Flash Flass PagaSize: xxxx EEPROM PagaSize: xxxx Lock bits FlashSize: xxxx Element for Setup Serial Port Disable CommPoint COMB • T152000ps • Manizor			1	Open
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	CommPot COM9 .	Serial Port Disable		

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Firmware downloading will be started and the progress will be displayed.

Download completion screen is as below.

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Now Router will be operated under new firmware.

DVI MATRIX ROUTER : ODM-88





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