OMM-1000
Multi-format Matrix

16x16 DVI / HDMI / SDI / DisplayPort Matrix

OPTICIS

Doc No. : OM-D210407 / Rev1.8

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Chapter 1.   Introduction and installation

Purpose

The modular matrix, OMM-1000 enables to connect between various video sources and displays and it offers flexible installation with other video controllers or control software. The input and output cards are composed of 4 ports, therefore user can easily configure any input and output channels from 4x4 to 16x16 by plugging the cards into OMM-1000 mainframe.

Introduction

The OMM-1000 modular matrix enables to switch up to 16 different DVI, HDMI, SDI, and DisplayPort sources to 16 different digital displays. It can be configured using 4 input and output cards and each card has 4 ports of input and output. In case of Dual link DVI card (DDVI-2EI / DDVI-2EO), it is composed of 2 ports, therefore configuration for input and output channels are from 2x2 to 8x8.

Note) SDI is not a licensed HDCP interface and if the content received from HDMI is protected by HDCP, there should be no output from the SDI slot.

1.1 Key features

- Up to 16 DVI, HDMI, SDI, and DisplayPort inputs and outputs can be configured.
- Each card has 4 input or 4 output ports and 4 cards can be fitted into input and output bays.
    - Dual link DVI supports from 2 x 2 to 8 x8 input and output.
- Has Electrical DVI, HDMI, SDI, DisplayPort and Optical DVI input and output cards.
- Complies with DDC/HDCP (Electrical DVI and HDMI cards only).
- Complies with DPCD (Electrical DisplayPort card only).
- Supports up to WUXGA (1920x1200) at 60Hz refresh ratio for Single link DVI, WQXGA (2560x1600) at 60Hz refresh ratio for Dual link DVI and DisplayPort or 1080p at 60Hz for HDMI and SDI.
- Supports 3 types of EDID management:
    - Default Mode.
    - Auto Mix Mode.
    - Output Copy Mode.
- Supports various control methods:
    - Key buttons operation
    - Command input (Such as Hyper terminal by RS-232 and Telnet by TCP/IP)
    - Web panel control (TCP/IP)
    - PC program by RS-232 and UDP
- Works with OPTICIS DVI, HDMI, SDI, and DisplayPort optical extender for long signal

extension.

· Has dual-power supplier for hot-swappable and load-sharing.

· Equips multi-viewer card to be used in various monitoring systems.

· Provides Preset mode to save and load the routings status.

· Provides diagnostic function for quick trouble shooting.

· Has video generator output and monitoring output for easy installation.

1.2 Shipping group

· OMM-1000, Modular matrix chassis: 1 EA

· Input output cards: Option

- · SDVI-4EI, 4 ports electrical Single link DVI input card
- · SDVI-4EO, 4 ports electrical Single link DVI output card
- · DDVI-2EI, 2 ports electrical Dual link DVI input card
- · DDVI-2EO, 2 ports electrical Dual link DVI output card
- · SDVI-1FI, 4 ports 1 fiber optical DVI input card
- · SDVI-1FO, 4 ports 1 fiber optical DVI output card
- · HDMI-4EI, 4 ports electrical HDMI input card
- · HDMI-4EI, 4 ports electrical HDMI output card
- · SDI-4EI, 4 ports electrical SDI input card
- · SDI-4EO, 4 ports electrical SDI output card
- · DP1-4EI, 4 ports electrical DisplayPort input card
- · DP1-4EO, 4 ports electrical DisplayPort output card
- · QDVI-O, Multi-viewer card

· AC power cord: 1 EA

· Power supplier: 1 EA (Dual power supplier is an option)

· User manual: 1 EA

· Firmware download cable: 1 EA (Use only this accessory specified by the manufacturer)

· RS-232 cable (Straight type): 1 EA

· PC software CD: 1 EA

1.3 Notice of safe usage

We recommend you to read following warning, precaution and information before start to operate the OMM-1000 modular matrix.

· Use of the equipment in a manner not specified by the manufacturer may result in ire-coverable damage.

· 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.

- Carry the unit using the handle in front of the panel with two (2) Users.

1.4 Physical description

The OMM-1000 modular matrix chassis is mountable on a 19" standard rack. Key buttons, LCD display and reset switch are placed on the front panel as shown in Figure 1-1.
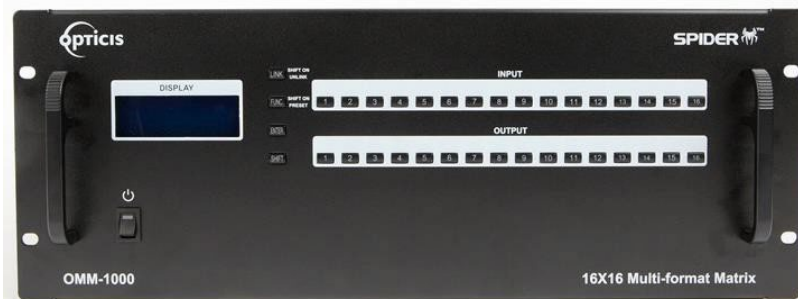
Figure 1-1 Front panel of OMM-1000

All Input and output cards, interface ports and power supplier are placed on the rear panel as below.

- **Input bay** for 4 input cards (left side)
- **Output bay** for 4 output cards (right side)
    - Input and Out bay for 2 in/output cards (Only Dual link cards)
- **SERVICE**, RJ-11 receptacle for firmware upgrade
- **RS-232**, Serial communication port
- **LAN**, RJ-45 receptacle for TCP/IP or UDP control
- **REFERENCE OUTPUT** for internal video source for easy installation
- **MONITORING OUTPUT** for internal output port to monitor input signal
- **Power supplier** (Dual-power is an option)

Figure 1-2 Rear panel of OMM-1000

1.5 Installation

1.5.1 Initialization

- Put insert the cards into each input or output bay according to user interface.
- All input or output cards have the same connection way, and tighten the screws just until snug against the main frame. Then, please make sure the cards are fully seated.
- Connect the provided AC power cord to AC power inlet and turn on switch on the front panel. Then, OMM-1000 will start initialization process (To turn it off completely, pull out AC power cord, switch on the front panel is reset switch).
- 'OMM-1000 Starting' will be shown on LCD display.
- After 7~10 sec, 'OMM-1000 Booting complete' message and hardware and firmware version information will be shown.
- Now, OMM-1000 is ready to receive commands from user.

1.5.2 Connection for remote control

- Connect the OMM-1000 to PC with the supplied RS-232 cable.
- Connect the OMM-1000 to PC with LAN cable with RJ-45 connector.

[NOTE] Typically, the IP address of PC connected to the network is configured by DHCP server. But, if the PC is connected directly to the OMM-1000, the network server will not able to assign the IP address. In this case, network information of PC should be set manually.
The default IP address of OMM-1000 is 192.168.1.117. Before connecting OMM-1000 to your network, please verify the availability of IP address in your network. The IP address can be reconfigured by key button, PC program or command lines over RS-232 or TCP/IP.

1.6 EDID 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.

- OMM1000 supports storing of EDID information to an EEPROM for each Input.

‣ OMM1000 has three-way EDID settings, 1) Default Mode: default EDID from the factory, 2) Output Copy Mode: read of EDID from any target display and copy in input port and the most advanced one is 3) Auto Mix Mode: analyzing of all EDID from the attached displays and store optimized EDID in input port to avoid any compliance problems in the field.
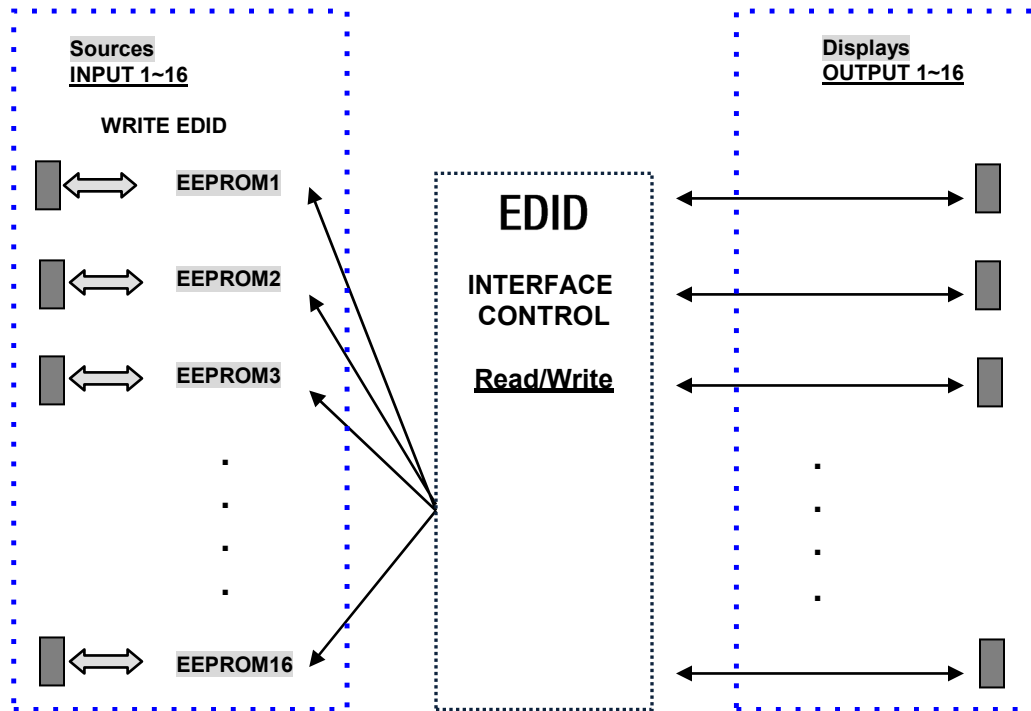
Figure 1-3 Concept of EDID setting and working in OMM-1000 modular matrix

As depicted in Figure 1-3, once EDID is configured, each EDID is stored in EEPROM in Input ports. As a result, the video sources are able to read EDID from the EEPROM during booting process even though the OMM-1000 and connected displays are not powered on yet.

Chapter 2.   Control setup

The OMM-1000 modular matrix can be controlled in various ways such as command input (RS-232, TCP/IP), Web control panel (TCP/IP), supplied PC program (RS-232, UDP) as well as key button on the front panel. To do this, PC should be configured properly.

2.1 TCP/IP

2.1.1 TCP/IP setup of PC

TCP/IP, the abbreviation of Transmission Control Protocol (TCP) and the Internet Protocol (IP) is commonly used protocol to control remote computers.

To control OMM-1000 over TCP/IP, set network properties of PC as below (Explained here is based on Win 7 OS).

- Open Control Panel.
- Select Network Status in Network and Internet menu.
- Select Adapter setting.
- Select Local Area Connection and right click to open property.
- Select Internet Protocol Version 4 (TCP/IPv4)
- Enter IP, Subnet mask, Gateway and DNS server address, compatible with the current network setting of OMM-1000.
- Click OK to terminate IP setup session.

[Note] If the IP address of OMM-1000 is 192.168.001.117, the PC IP address should be chosen as 192.168.001.nnn; where 'nnn' can range from 000 to 255 except 117.

2.1.2 Launching Telnet

Telnet is a terminal program embedded in Window OS system to access remote computers using TCP/IP protocol. With the network setting of the PC as above, launch Telnet as below.

- Make sure PC and OMM-1000 are connected by Ethernet.
- Click Start menu and select Run.
- Type CMD to open command window.
- Type 'telnet 192.168.1.117' (Type current IP address of OMM-1000).
- Press **ENTER** then, "==Welcome to OMM-1000==" and "== TELNET control ==" messages will be shown.
- Type command inputs to control OMM-1000. (Refer to Chap. 5)

2.2 RS-232

2.2.1 Launching HyperTerminal

The OMM-1000 modular matrix provides RS-232 serial communication. The simplest way to control OMM-1000 over RS-232 is using embedded software in Windows OS, HyperTerminal.

To launch Hyper Terminal (Explained here is based on Windows XP OS. Hyper Terminal is not available on Win 7.):

· Connect the PC to OMM-1000 over RS-232 cable.

· Select Start > Programs > Accessories > Communications > HyperTerminal.

· Enter a name and choose an icon in Connection Description window and click OK.

· In Connect To window, ignore the Country, Area Code and Phone Number fields but select available COM port of PC to be connected to OMM-1000 then, click OK.

· In COM Properties window, set the parameters as below:

· Bits per second (baud rate): 115200 (115200 is default baud rate of OMM-1000)
· Data bits: 8
· Parity: None
· Stop bits: 1
· Flow control: None

[Note] Bit per second of Hyper Terminal should be set as same as baud rate of OMM-1000.

· Click OK to save the parameters.

· Go Start > Programs > Accessories > Communications > HyperTerminal, then new icon will be shown. Then select it to launch Hyper Terminal.

· Type command inputs to control OMM-1000 (Refer to Chap. 5)

Chapter 3.   Key button operation

3.1 LINK mode

・It configures input / output connections for cross-switching.
1)   Press LINK key button.
2)   Press an input key button - LCD will display current connected output.
3)   Press single or multiple output key buttons to select desired outputs.
4)   Outputs can be deselected by pressing the each output key button again.
5)   Press ENTER key button to save the configuration.
6)   To configure next Input / output connection, repeat steps 1 to 5.

3.2 UNLINK mode

・It unlinks input /output connection.
1)   Press SHIFT key button.
2)   Press LINK key button.
3)   Press the input key button to be disconnected.
4)   Press ENTER key button.

3.3 FUNCTION mode

・It configures basic setting of OMM-1000 to be controlled by command input and PC program.
・Press FUNCTION to see features – FUNCTION key button will cycle the following features repeatedly:

- ・ Gateway
- ・ Subnet Mask
- ・ IP Address
- ・ Mac Address
- ・ UDP Port Number
- ・ Multi-viewer (It is activated when QDVI-O is in output bay)
- ・ Video Generator
- ・ Monitoring Output
- ・ EDID Configure
- ・ Baud Rate
- ・ Control Lock
- ・ Reset Mode

3.3.1 Gateway: Press FUNCTION key button once

· The cursor shows that it is selected and activated.
· Input 3 key button decreases the number.
· Input 4 key button increases the number.
· Input 1 and 2 key buttons move the cursor left and right.

    ======Gate Way======
    O: 192. 168. 001. 001
    N: 192. 168. 001. 001

· Modify the Gate way address to be used for your network.
· Press ENTER key button to complete the process.
· The default setting is 192.168.001,001

3.3.2 Subnet Mask: Press FUNCTION key button two times

· The cursor shows that it is selected and activated.
· Input 3 key button decreases the number.
· Input 4 key button increases the number.
· Input 1 and 2 key buttons move the cursor left and right.

    ====Subnet Mask====
    O: 255. 255. 255. 000
    N: 255. 255. 255. 000

· Modify the Subnet mask address to be used for your network.
· Press ENTER key button to complete the process.
· The default setting is 255.255.255.000.

3.3.3 IP Address: Press FUNCTION key button three times

· The cursor shows that it is selected and activated.
· Input 3 key button decreases the number.
· Input 4 key button increases the number.
· Input 1 and 2 key buttons move the cursor left and right.

    =====IP Address=====
    O: 192. 168. 001. 117
    N: 192. 168. 001. 117

· Modify the IP address to be used for your network.
· Press ENTER key button to complete the process.
· The default setting is 192.168.001.117.

3.3.4 MAC Address: Press FUNCTION key button four times

· The cursor shows that it is selected and activated.
· Input 3 key button decreases the number.
· Input 4 key button increases the number.
· Input 1 and 2 key buttons move the cursor left and right.

```
=====MAC Address====
O: 00.11.AA.EE.DD.FF
N: 00.11.AA.EE.DD.FF
```

· Modify the MAC address to be used for your network.
· Press ENTER key button to complete the process.

3.3.5 UDP Port Number: Press FUNCTION key button five times

· It makes number setting, data range from 0 to 65535.
· The cursor shows that it is selected and activated.
· Input 3 key button decreases the number.
· Input 4 key button increases the number.
· Input 1 and 2 key buttons move the cursor left and right.

```
========Function Mode=======
Port Number
Old data: 03000
New data: 03000
```

· Modify the UDP port number to be used for your network.
· Press ENTER key button to complete the process.
· The default UDP port number is 03000.

[Note] Port number setting in this section is used for UDP with supplied PC program not TCP/IP with web browser or Telnet. For TCP/IP, port number 23 is fixed value.

3.3.6 Multi Viewer: Press FUNCTION key button six times

· Multi-viewer card, QDVI-O can choose 4 inputs among 16 inputs of OMM-1000 and configure and output these input signals with 7 different layouts. For more details, refer to chap. 4.3.4.
· The cursor shows that it is selected and activated.
· Input 1 and 2 key buttons move the menu.
· Input 3 key button decreases the number.
· Input 4 key button increases the number.

```
====Multi Viewer====
SLOT No.: 01
Resol: 01   800x600
Layer: Layer 01
```

1) Select the SLOT No. by pressing input 3 or 4 key button. It shows location where the QDVI-O is inserted among output slots. If only one QDVI-O is inserted the number will be fixed and not changed.
2) Select the output resolution.
3) Select Layout.
4) Press ENTER key button to complete the process.

3.3.7 Video Generator: Press FUNCTION key button seven times

· It changes resolution and pattern of video generator.
· The cursor shows that it is selected and activated.
· Input 1 and 2 key buttons move the menu.
· Input 3 key button decreases the number.
· Input 4 key button increases the number.

```
==Video Generator==
Resol: 01   800x600
Image: 01 V Bar Stop
OSD: ON
```

1) Select the resolution, pattern and OSD by pressing the key buttons as guided above.
2) Press ENTER key button to complete the process.

[Note] OSD shows the resolution and pattern information on the top left of the display.

3.3.8 Monitoring Output: Press FUNCTION key button eight times

· It allocates input to Monitor Output port for monitoring uses.
· The cursor shows that it is selected and activated.
· Input 3 key button decreases the number.
· Input 4 key button increases the number.

=Monitoring Output=
Old Input: 01
New Input: 01

1) Connect a display to the Monitoring Output port and any video sources to the DVI input ports on the real panel.
2) Select an input port by pressing input 3 or 4 key button.
3) Press ENTER key button to complete the process.

3.3.9 EDID Configure: Press FUNCTION key button nine times

· It sets EDID information in input port.
· OMM-1000 supports three types of EDID setting: Default Mode, Auto Mix Mode and Output Copy Mode. For more information, refer to Chap. 5.2.
· The cursor shows that it is selected and activated.
· Input 1 and 2 key buttons select YES and NO.
· Input 3 and 4 key buttons move left and right (Change EDID mode).
· Input 5 and 6 key buttons move down and up (Decrease and increase the port number).

===EDID Configure===
Entry EDID
Configure? _1: Entry

1) Press input 1 key button to enter the EDID Configure Mode.

===EDID Configure===
Input: 01 Default
Default Mode?

1: Y 2: N 3: << 4: >> 5: ∨ 6: ∧

[Note] The EDID configuration that is shown next to the input number on the LCD display is current EDID mode

2) Select an input port by pressing input 5 or 6 key button.

3) Press input 3 or 4 key button to change EDID mode.

   3-1) If you select **Default Mode**, default EDID will be restored for allocated inputs.

   ===EDID Configure===
   Input: 01 Default
   Default Mode?
   1: Y 2: N 3: << 4: >> 5: ∨ 6: ∧

   Press input 1 key button then, the OMM-1000 will recover the Default EDID to allocated input as below.

   ===EDID Configure===
   EDID Copying….
   EDID Reading….

   3-2) If you select **Auto Mix Mode**, mixed EDID of all attached displays will be saved in allocated input.

   3-3) If you select **Output Copy Mode**, OMM-1000 reads EDID from any target displays and copies it in allocated input.

   [Note] There is Edit Data Mode but it is used to modify existing EDID to make new EDID working with specific systems. It is not recommended for general user. For further information, please contact techsupp@opticis.com

3.3.10 Baud Rate: Press FUNCTION key button ten times

It sets RS-232 Baud Rate. OMM-1000 supports 9600, 19200, 38400, 57600, 115200bps.

=====Baud rate=====
Old baud: 115200
New baud: 115200

・Input 3 key button decreases the number.
・Input 4 key button increases the number.
・Press ENTER key button to complete the process.
・The default setting is 115200

3.3.11 Control Lock: Press FUNCTION key button eleven times

· It locks and unlocks the controls such as Web, RS-232, TCP/IP, UDP and key button

```
====Control Lock====
Web Lock?     UnLock
Data Lock?    UnLock
Key Lock?      UnLock
```

· Input 1 and 2 key buttons move the cursor up and down.
· Input 3 key button moves Lock.
· Input 4 key button moves UnLock.
· Press ENTER key button to complete the process.

3.3.12 Reset Mode: Press FUNCTION key button twelve times

· It resets OMM-1000. It starts rebooting and restores all default setting.
· Press Input 1 key button to complete the process.

3.4 Preset Mode

· It saves and loads the current routings to up to ten (10) specified preset number.

· Press SHIFT key button and then, press FUNC key button.

· The screen shows Preset LOAD mode.

· Press FUNC key button to choose between Preset Load and Preset Save.

   - Preset Save mode

· The cursor shows that it is selected and activated.

· Select a preset number by pressing input 3 or 4 key button.

· Press Input 1 key button to save the preset number and it saves the current routings status.

· If you want to save another routings, please configure and save another Link connection at Link mode.

   - Preset Load mode

· The cursor shows that it is selected and activated.

· Select a preset number by pressing input 3 or 4 key button.

· Press Input 1 key button to load the saved preset number.

[Note] The previous preset data will be saved even if the Reset Mode is operated.

Chapter 4. PC program operation

Run the setup.exe to install OMM-1000 PC program. The OMM icon will be shown on the wallpaper. Double click it to launch PC program for OMM-1000.

The PC program provides a user-friendly graphic interface alternative to key button input and command input operation.

Copy OMM ver1.x.exe file in any directories in your PC and double click it to run. Then, initial window of PC program for OMM-1000 as below will open.
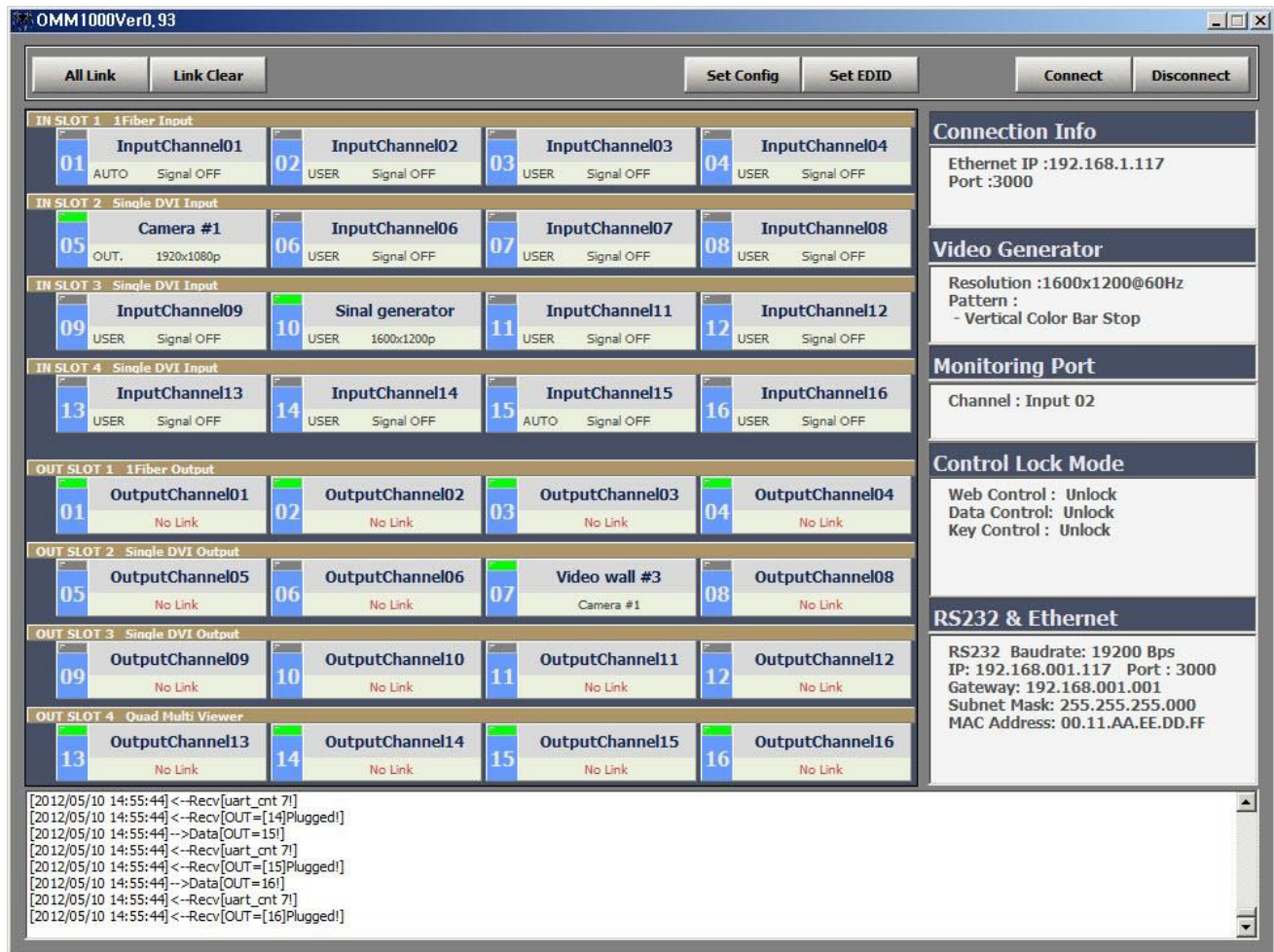

Fig 4-1 PC program of OMM-1000

4.1 Basic setup

Click **Set Config** button to set the communication method, input / output name, Video generator and so on. Then, the Set Config window as below will open.

Fig 4-2 Set Config window of OMM-1000 PC program

4.1.1 Connect Info

· Select the way of control method between RS-232 and Ethernet (UDP) by click the radio buttons.
· In case of RS-232 control, enter available COM port number of your PC and select baud rate. The baud rate should be same as that OMM-1000. (115200 is default)
· In case of Ethernet, enter IP address of OMM-1000 and port number. 3000 is default port number of OMM-1000.
· Click save button and close Set Config window then click **Connect** button on PC program of OMM-1000 to start it.
· If the connection is properly made, current status of OMM-1000 will be shown at the bottom side of PC program.

4.1.2 Channel Name

- User can allocate specific names for all inputs and outputs to distinguish them
- On Fig 4.2, The name of **Camera #1** was assigned for Input CH05 and **Wall display #3** for output CH07.
- Click Save button to save it then, these will be applied on the PC program as shown in Fig 4-1.

4.1.3 Video Generator

- Select the resolution and pattern of video generator.
- Click Apply button to save it.

4.1.4 Control Lock Mode

- It locks and unlocks the controls such as Web, Data control (RS-232, TCP/IP and UDP) and key button input.
- Click Apply button to save it.

4.1.5 Network

- It changes network information of OMM-1000.
- Click Apply button to save it.

4.2 EDID setup

OMM-1000 offers 3 types of EDID setting for easy installation with various displays in the market. To set the EDID option for each input port, click **Set EDID** button then, Setup EDID window as below will open.
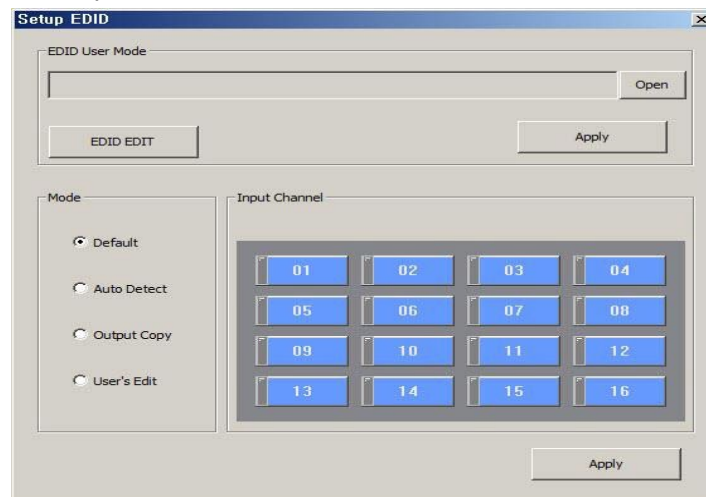
Fig 4-3 Setup EDID window of OMM-1000 PC program

To set EDID information for each input select mode button and click input channel. For each mode, multi-input channels can be allocated.

- **Default** mode is default EDID from the factory. By selecting it, default EDID will be recovered for allocated input channels.
- **Auto Mix** mode is the most advanced one it analyzes all EDID of attached displays at the output ports of OMM-1000 and get optimized EDID. By selecting it, user can avoid any compliance problems in the field.
- **Output Copy** mode is most popular one. It reads EDID from any target displays and copies it in input port. Select output channel first and click input channels. And click Apply button to save it.

There is **User's Edit** mode but it is used to modify existing EDID to make new EDID working with specific systems. It is not recommended for general user. For further information, please contact techsupp@opticis.com

4.3 Operation

And all of setting parameters will be shown on the right side of PC program as Fig 4-3. After clicking **Connect** button (Refer to Chap. 4.1.1), OMM-1000 is ready to get the command from user.

Connection Info

Ethernet IP :192.168.1.117
Port :3000

Video Generator

Resolution :1600x1200@60Hz
Pattern :
 - Vertical Color Bar Stop

Monitoring Port

Channel : Input 02

Control Lock Mode

Web Control : Unlock
Data Control: Unlock
Key Control : Unlock

RS232 & Ethernet

RS232 Baudrate: 19200 Bps
IP: 192.168.001.117 Port : 3000
Gateway: 192.168.001.001
Subnet Mask: 255.255.255.000
MAC Address: 00.11.AA.EE.DD.FF

Fig 4-4 Setting parameters of OMM-1000

The right side of PC program shows various connection status such as input / output connections, Input signal resolution and status, EDID setting for each input and Input / output

card information and used to make new input / output connections too.

Fig 4-5 Input and output status of OMM-1000

4.3.1 Input / output connection

- Click one of input channels and click any of output channels. If you click input CH05 (Camera #1) and click output CH05, CH06, CH07 and CH06 input signal 05 will be connected to output monitor 05, 06, 07 and 08 as shown in Fig 4-5.
- To connect one input to all output, click **All Link** button and click desired input. Then all of output will be connected to it.
- To disconnect all outputs, click **Link Clear** button.

4.3.2 Input channel status

- Green LEDs above input channel number such as CH05 and CH10 are signal detection from source. It means only CH05 and CH10 are connected with video sources.
- If the green LED lit ON, user can recognize the resolution of input signal (ex. CH05=1920x1080p).
- If LED OFF, sources are not connected and it shows 'Signal OFF'.
- DEF., AUTO, OUT. and USER, right side of input channel number are EDID mode that is allocated for each input (Refer to Chap. 4.2)
- There are 4 slots for input cards and OMM-1000 recognizes its type during booting

process and shows it on PC program when it launched. (Ex. Slot 1 is fiber optic input card, SDVI-1FI and Slot 2 is electrical DVI input card, SDVI-4EI)

4.3.3 Output channel status

· Green LEDs above output channel number such as CH07 is Hot Plug Detection (HPD) from display. It means CH07 is connected with display.
· But in case of fiber optic card (slot 1), multi-viewer card (slot 4) and SDI output channel LEDs are lit ON regardless of HPD.
· The connected outputs show input source information (ex. CH07=Camera #1, input CH05).
· The disconnected outputs show 'No Link'.
· There are 4 slots for output cards and OMM-1000 recognizes its type during booting process and shows it on PC program when it launched. (Ex. Slot 1 is fiber optic output card, SDVI-1F0 and Slot 2 is electrical DVI output card, SDVI-4EO)

4.3.4 Multi-viewer

· The most outstanding feature of OMM-1000 is embedded multi-viewer card, QDVI-O.
· Multi-viewer card, QDVI-O can choose 4 inputs among 16 inputs of OMM-1000 and configure and output these input signals with 7 different layouts.
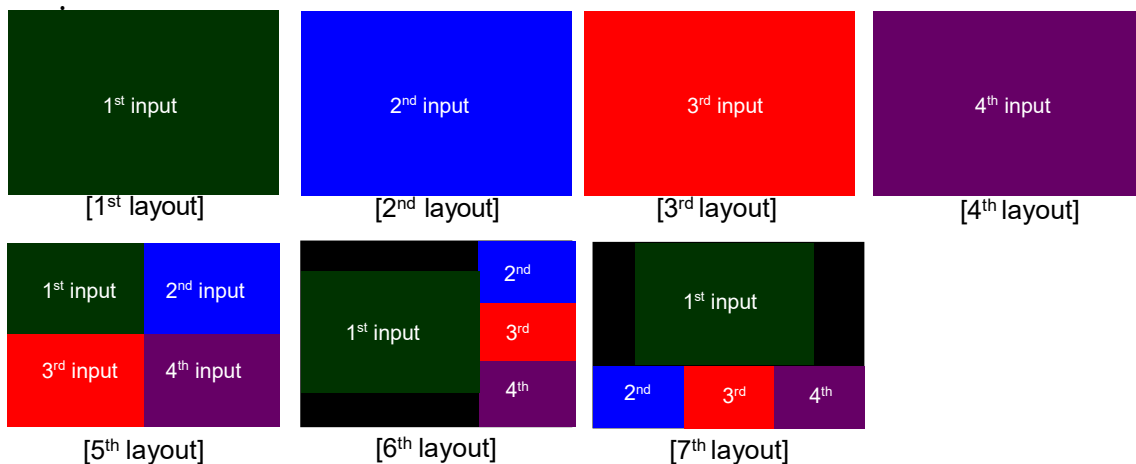
Fig 4-6 Layouts of Multi-viewer

· 1st layout: Select 1st input of QDVI-O and output it on a full screen
· 2nd layout: Select 2nd input of QDVI-O and output it on a full screen
· 3rd layout: Select 3rd input of QDVI-O and output it on a full screen
· 4th layout: Select 4th input of QDVI-O and output it on a full screen
· 5th layout: Make quad-view of 4 inputs (same size)
· 6th layout: Set 1st input on the left side and other 3 on the right side
· 7th layout: Set 1st input on the top side and other 3 on the bottom side

- QDVI-O can be inserted one of output slots and it will be shown on PC program as in Fig 4-5 (Out slot 4).
- Click **OUT SLOT 4** bar to launch Setup Quad Multiviewer Card window as shown in Fig 4-7.
- Select output resolution of multi-viewer card first.
- Select output layout.
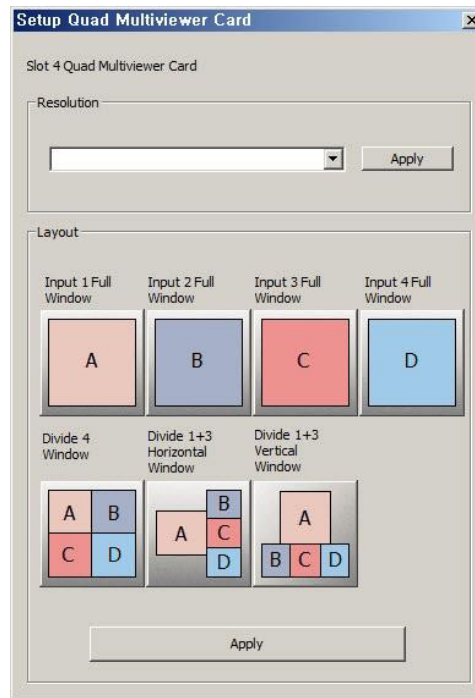
Fig 4-7 Multi-viewer card setup

[Note] 1. Changing the output resolution and layout of multi-viewer card, QDVI-O can be done by PC program and command input and key button operation.

2. To change position of window in layout 5, 6 and 7, user must change the order of input to QDVI-O. For example, If the QDVI-O is in output slot 2, to change window position of layout 5 as shown in Fig 4-8, user must change input output connection.
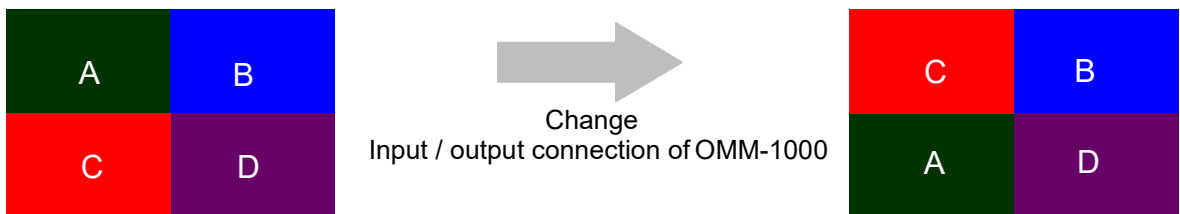
Fig 4-8 Changing widow position of layout

In Fig 4-8, Video source A is output 5 of OMM-1000 and it is also the 1st input to QDVI-O and source C is output 7 of OMM-1000 and the 3rd input of QDVI-O. To change A and C, user makes source A be connected to output 7 of OMM-1000 (It will be the 3rd input of

QDVI-O) then, source A will be shown on the bottom left side of layout 5. As the same method, if user allocate source C to output 5 of OMM-1000, it will be shown on the top left side.

3. Scale-down error will happen when the **number of scale-down vertical pixels are less than 1/5 (Progressive input case) or 1/4 (Interlaced input case) of original input vertical pixels**. For example, in case of layout 6, if you use input resolution, 1280x1024 and set the output resolution of QDVI-O at 800x600, the number of vertical pixels of 1st 2nd and 3rd inputs will be fitted into one third of output vertical pixels (600). In this case, there would be an error because the number of scale-down vertical pixels, 200 (600/3) is less than 204.8 (1024/5).

Chapter 5.   Web control panel operation

The Web control panel operation provides a user-friendly graphic interface and easy access to control OMM-1000, if the PC is connected to Ethernet. But the functions are a little bit limited comparing with other methods.

The OMM-1000 supports standard web browser but Microsoft Explorer is highly recommended to run OMM-100 stably. Before running the web browser to control OMM-1000, please confirm that Network setting of OMM-1000 and Ethernet connection of the PC (Refer to Chap 2 and Chap 3).

Launch the web browser and enter the IP address of current OMM-1000 into the URL address line.

For example, if the IP address of OMM-1000 is set as 192.168.001.117, jut type 192.168.1.117.
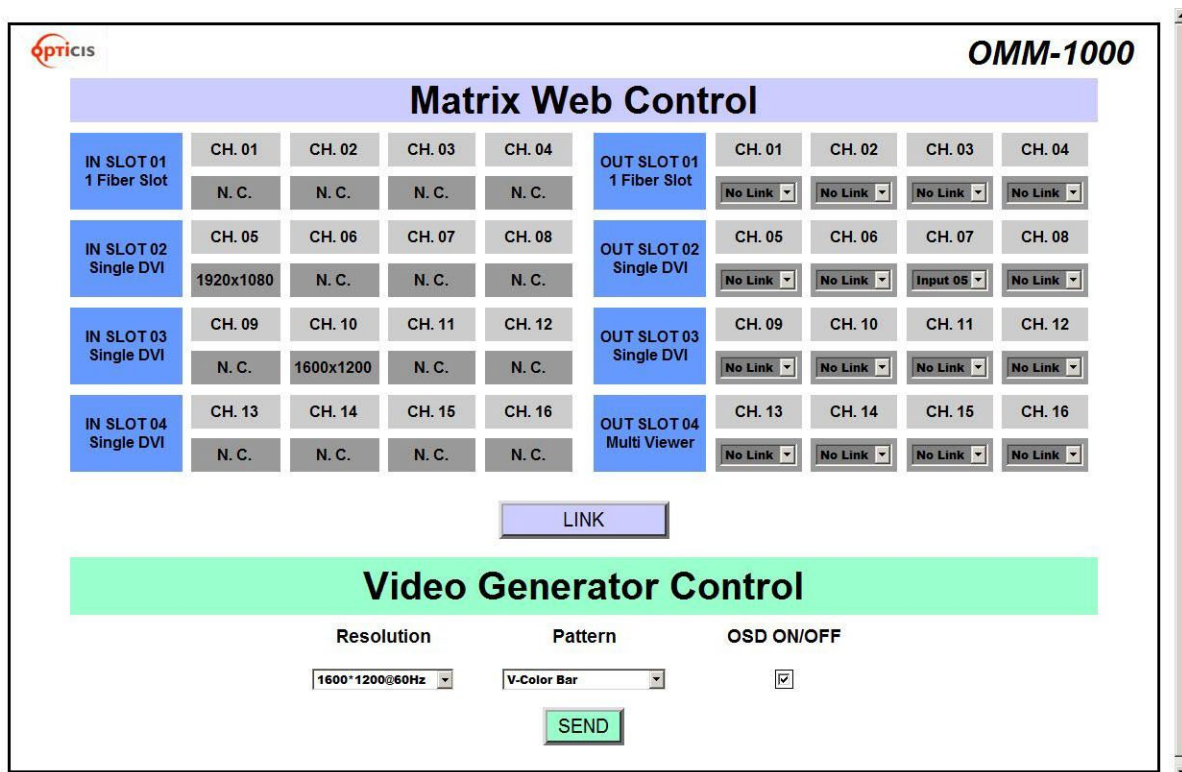
Fig 5-1 Web control panel

Fig 5-1 shows structure of Web control panel. It controls input / output connection and vide generator and informs simple input / output status. Please remind that after new input /output connection, user has to click **LINK** button and **SEND** button for new generator setting.

Chapter 6.   Command input operation

The OMM-1000 modular matrix could be operated with various interfaces such as key button inputs, command input through RS-232 and TCP/IP, Web control through TCP/IP and PC program through RS-232 and UDP. All functions are executed on a basis of a serial command input, but the graphic interfaces on the Web or the PC program make more efficient way to operate the OMM-1000 modular matrix.

Command input operation is accomplished through RS-232 or TCP/IP. For setting procedures for those protocols, please refer to Chap 2 and Chap 3.

6.1 Command input structure

The command inputs are composed of a string of ASCII codes and its basic structure is;

Command + Delimiter ('=') + Data + Delimiter ('^' or ',' or '_') + Data + End ('!')

Table 6.1 shows all commands and its brief descriptions

Command	Description
LINK	Input and Output connection
IN	Input signal status request
OUT	Output signal status request
NET	Network information request
NETGW	Gateway address setting
NETSN	Subnet mask address setting
NETIP	IP address setting
NETPA	MAC address setting
NETPT	UDP port number setting
VID	Video generator status request
VIDRES	Video generator resolution setting
VIDIMG	Video generator pattern setting
MON	Monitoring port setting and status request
EDID	EDID mode setting
EDIT	Edited EDID transferring
RS232	RS-232 Baud rate setting
QUAD	Quad-viewer card status request
QUADRES	Quad-viewer card output resolution setting
QUADLAY	Quad-viewer card layout setting
SLOT	Input output slot status request
LOCK	Lock/Unlock the control type

Table 6.1 Commands set

- The command input allows executing only one command. Multiple command inputs require executing multiple strings having each command per a string.
- User can use capital letters and small letters for commands but cannot mix it like 'Link', it must be corrected as 'link' or 'LINK'.
- After all input commands, OMM-1000 sends back replies to conform the execution of commands.
- Input and output port number range from 1 to 16 and prefix, '0' can be used such as '001' and '010, but in the replies after the command inputs, the digits of port number are two such as '01' and '10'.

6.2 Examples of command inputs

6.2.1 Link input and output

- It makes single or multi-connections of inputs and outputs.
- It makes disconnection of all inputs when used with '0'.
- It requests inputs and outputs status of OMM-1000.

Command	Description and reply
LINK=01^10!	Makes input 1 connected to output 10. Reply: LINK=01^10!
LINK =1^03,04^7!	Makes input 1 connected to output 3 and 4 to 7. Reply: LINK =01^03,04^07!
LINK =05!	Makes input 5 connected to all outputs. Reply: LINK=05!
LINK =00!	Makes all connections disconnected. Reply: LINK =00!
LINK =00^06!	Makes output 6 disconnected. Reply: LINK =00^06!
Link=?!	Requests current inputs and outputs connections status. Reply: LINK =01^01,02^04,~16^13!

Table 6.2 Link command examples

6.2.2 Input and output status

- It requests input signal status. If the input is connected, it replies input resolution, but if it is not connected, it returns 'Signal Off'.
- It requests output status whether it is connected to display or not.

Command	Description and reply
IN=05!	Requests input 5 status. Reply: IN=[05] 1920x1200p! or IN=[05] Signal Off!
OUTPUT=12!	Requests output 12 status. Reply: OUT=[12] Un Plugged! or OUT=[12] Plugged!

Table 6.3 Input and output status command examples

6.2.3 Network setting

· It sets IP, Gateway, Subnet mask, MAC address and UDP port number.
· It requests current network setting.

Command	Description and reply
NETGW=192.168.1.1!	Sets Gateway address, each data ranges from 000 to 255. Reply: NETGW=192.168.001.001!
NETIP=192.168.1.118!	Sets IP address, each data ranges from 000 to 255. Reply: NETGW=192.168.001.118!
NETSN=255.255.255.0!	Sets Subnet mask address, each data ranges from 000 to 255. Reply: NETSN=255.255.255.000!
NETPA=AA.BB.CC.DD.EE.FF!	Sets MAC address, each data ranges from 00 to FF. Reply: NETPA= AA.BB.CC.DD.EE.FF!
NETPT=3000!	Sets UDP port number, data ranges from 0 to 65535. NETPT=3000!
NET=?!	Requests current network setting. Reply: NETGW=192.168.001.001! 　　　 NETIP=192.168.001.118! 　　　 NETSN=255.255.255.000! 　　　 NETPA=AA.BB.CC.DD.EE.FF! 　　　 NETPT=3000!

Table 6.4 Network setting command examples

6.2.4 Video generator setting

· It changes resolution and pattern of video generator.
· It requests current video generator setting.

Table 6.5 describes the resolutions and patterns OMM-1000 supports. By command input operation, user can change these to be used with on-site source for easy installation

Data #	Resolution	Pattern
1	800x600@60Hz	Vertical Color Bar
2	1024x768@60Hz	Vertical Color Bar scroll (Interval:0.5sec)
3	1280x960@60Hz	Vertical Color Bar scroll (Interval:1.0sec)
4	1280x1024@60Hz	Horizontal Color Bar
5	1600x1200@60Hz	Horizontal Color Bar scroll (Interval:0.5sec)

6	1920x1200@60Hz	Horizontal Color Bar scroll (Interval:1.0sec)
7	1280x720p@60Hz	Full White
8	1920x1080i@60Hz	Full Yellow
9	1920x1080p@60Hz	Full Cyan
10		Full Green
11		Full Magenta
12		Full Red
13		Full Blue
14		Full Gray
15		Cross Hatch 16x16
16		Grayscale bars

Table 6.5 Video generator resolutions and patterns

Command	Description and reply
VIDRES=4!	Sets video generator resolution by data #4. Reply: VIDRES=1280x1024@60HZ!
VIDIMG=3!	Sets video generator pattern by data #3. Reply: VIDIMG=VCOLORBAR10SMOVE!
VID=?!	Requests current video generator resolution and pattern. Reply: VID=04_03! 　　　　(it means data #4 resolution and data #3 pattern)

Table 6.6 Video generator command examples

6.2.5　Monitor output port setting

· It makes input to connected to monitor output port.
· It requests current input port that connected to monitor output port.

Command	Description and reply
MON=13!	Makes input 13 connected to monitor output ports. Reply: MON=13!
MON=?!	Requests current input port that connected to monitor output port. Reply: MON=13!

Table 6.7 Monitor output setting command examples

6.2.6 EDID control command

・ It stores EDID information in input port of OMM-1000.
・ It requests current EDID setting for all input ports.

Command	Description and reply

EDID=DE1,7,15!	Default mode: Saves default EDID in input ports 1, 7 and 15.
	Reply: EDID=01DEF.!
	        EDID=07DEF.!
	        EDID=15DEF.!

EDID=AUTO2,8,9!	Auto mix mode: Analyzes all EDID information of connected displays to makes optimized EDID then save it in input ports 2, 8 and 9.
	Reply: EDID=02AUTO!
	        EDID=08AUTO!
	        EDID=09AUTO!

EDID=OUT3_5!	Output copy mode: Copies EDID information of output 3 display and stores it in input port 5. Reply: EDID=03OUT.!
EDID=?!	Requests current EDID setting for all inputs. Reply: EDID=01OUT.02AUTO03OUT.~16EDF.!

Table 6.8 Monitor output setting command examples

6.2.7 Baud rate setting for RS-232

・ It sets RS-232 baud rate. OMM-1000 supports 9600, 19200, 38400, 57600, 115200bps.
・ It requests current RS-232 baud rate.

Command	Description and reply
RS232=115200!	Sets RS-232 baud rate. Reply: RS232=115200BPS!
RS232=?!	Requests current baud rate. Reply: RS232=115200BPS!

Table 6.9 Baud rate setting command examples

6.2.8 Multi-viewer card (QDVI-O) setting

- It sets output resolution and layout of QDVI-O.
- It requests current status of QDVI-O.

Data #	Resolution	Layout
1	800x600@60Hz	1st input of QDVI-O on a full screen
2	1024x768@60Hz	2nd input of QDVI-O on a full screen
3	1280x960@60Hz	3rd input of QDVI-O on a full screen
4	1280x1024@60Hz	4th input of QDVI-O on a full screen
5	1600x1200@60Hz	Quad-screen
6	1920x1200@60Hz	1 Large screen (Left side) + 3 Small screen (Right side)
7	1280x720p@60Hz	1 Large screen (Top side) + 3 small screen (Bottom side)
8	-	-
9	1920x1080p@60Hz	-

Table 6.10 Supporting resolutions and layouts of QDVI-O

The first numeric data in command line represents slot number of output bay of OMM-1000 where QDVI-O is inserted.

Command	Description and reply
QUADRES=3_9!	Sets output resolution of QDVI-O at 1920x1080P. In this case, QDVI-O is inserted in 3rd slot of output bay. Reply: QUADRES=03_09!
QUADLAY=1_5!	Sets layout of QDVI-O as quad-screen. In this case, QDVI-O is inserted in 1st slot of output bay. Reply: QUADLAY=01_05!
QUAD=?!	Request current status of QDVI-O. If one QDVI-O is inserted in 2nd slot and output resolution is 1600x1200@60Hz with layout #6: Reply: QUAD=01_00_00,02_05_06,03_00_00,04_00_00!

Table 6.11 Multi-viewer card setting command examples

6.2.9 Slot status request

· It requests current cards type in input and output bay.

Data	Card type	Data	Card type
02	Single DVI input card, SDVI-4EI	12	SDI input card, SDI-4EI
03	Single DVI output card, SDVI-4EO	13	SDI output card, SDI-4EO
18	1 Fiber DVI input card, SDVI-IFI	0C	DisplayPort input card, DP1-4EI
19	1 Fiber DVI output card, SDVI-1FO	0D	DisplayPort output card, DP1-4EO
21	Multi-viewer card, QDVI-O	1A	Reserved
0A	HDMI input card, HDMI-4EI	1B	Reserved
0B	HDMI output card, HDMI-4EO	-	

Table 6.12 Card types and its data

The first numeric data in reply represents the order row of slot and second and third data represents type of input and output cards.

Command	Description and reply

SLOT=?!	Requests current cards type in input and output bay.
	OMM-1000 has 4 rows of input and output slots. If the input output cards are configured as below:
	  1st row: Single DVI input card / 1 Fiber DVI output card
	  2nd row: Single DVI input card / Multi-viewer card
	  3rd row: 1 Fiber DVI input card / Single DVI output card
	  4th row: 1 Fiber DVI input card / NO output card
	Reply: SLOT=01_02_19!
	        SLOT=02_02_21!
	        SLOT=03_18_03!
	        SLOT=04_18_00!

Table 6.13 Slot status request command example

6.2.10 Control lock command

- It locks and unlocks the controls such as Web, RS-232, TCP/IP and UDP.
- It request open status of controls.

ASCII	Description
WL	Web control lock
WUL	Web control unlock
DL	Data control (UDP, TCP/IP, RS-232) lock
DUL	Data control (UDP, TCP/IP, RS-232) unlock
KL	Key control lock
KUL	Key control unlock

Table 6.14 Locking type and its ASCII data

Command	Description and reply
LOCK=DL!	Locks data control. Reply: LOCK=DL!
LOCK=?!	Request current status of control method. Reply: LOCK=WUL,DUL,KUL!

Table 6.15 Control lock command examples

6.2.11 Preset Control Command

- It saves routings under a preset number
- It requests current Preset mode setting.

Command	Description and reply
PRE=SAVE<Preset Number>!	Requests to save the current routings under the preset number selected. Reply: PRE=SAVE<Preset Number>_<link state>! Example: Send: PRE=SAVE01! Reply: PRE=SAVE01_00^01,00^02,00^03,00^04..... 00^16! (04^04 indicates input 4 linked to output 4. Input 00 indicates no link set for the output)
PRE=LOAD<Preset Number>!	Requests to load the saved preset number. Reply: PRE=LOAD<Preset Number>_<link state>! Example: Send: PRE=LOAD01! Reply: PRE=LOAD01_00^01,00^02,00^03,00^04. ....00^16!

Table 6.16 Preset control command examples

Chapter 7.   Firmware update

1. Please install   **Megaboot.exe**   under Windows XP OS.

    [Note]   Megaboot.exe can't be installed under Windows 7 and Vista OS.

2. Click ①**,** Open of **'File to be programmed in the Flash'** to select directory and file (hex.

    Format)   to be uploaded.
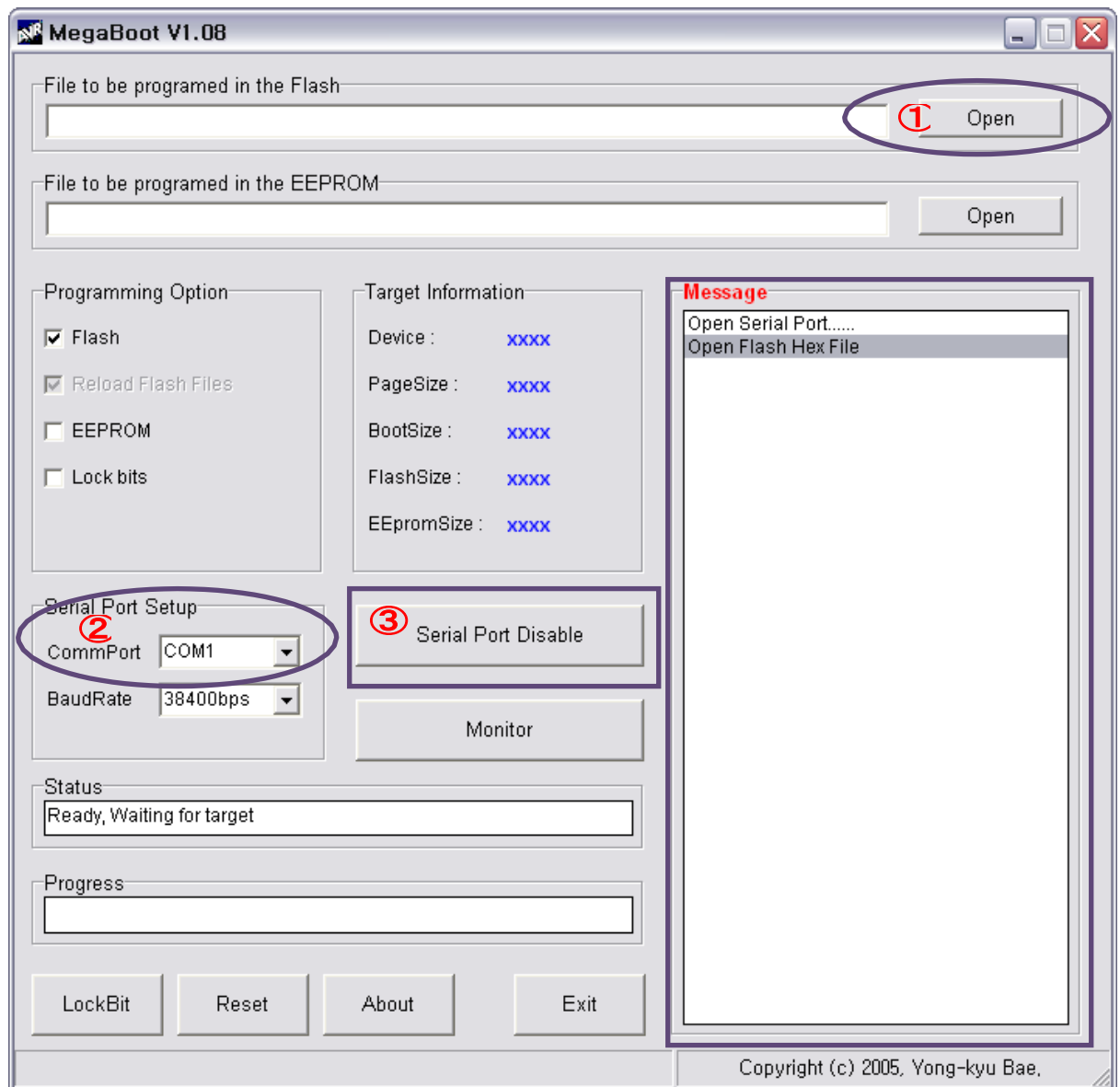
3. Connect Service Port in a rear panel of OMM-1000 RS-232 (Comm port) in PC using a supplied **download cable (RJ11 to D-Sub 9Pin cable) + RS-232 cable.**

4. Select ②, **'Comm port'** to select communication port of PC for RS-232 communication with OMM-1000.

5. To enable Comm port, Click ③ when it shown as 'Serial Port Enable'.

6. **Power-On of OMM-1000**.

7. Then the firmware will be uploaded and its status will be shown in the message box shown as below.
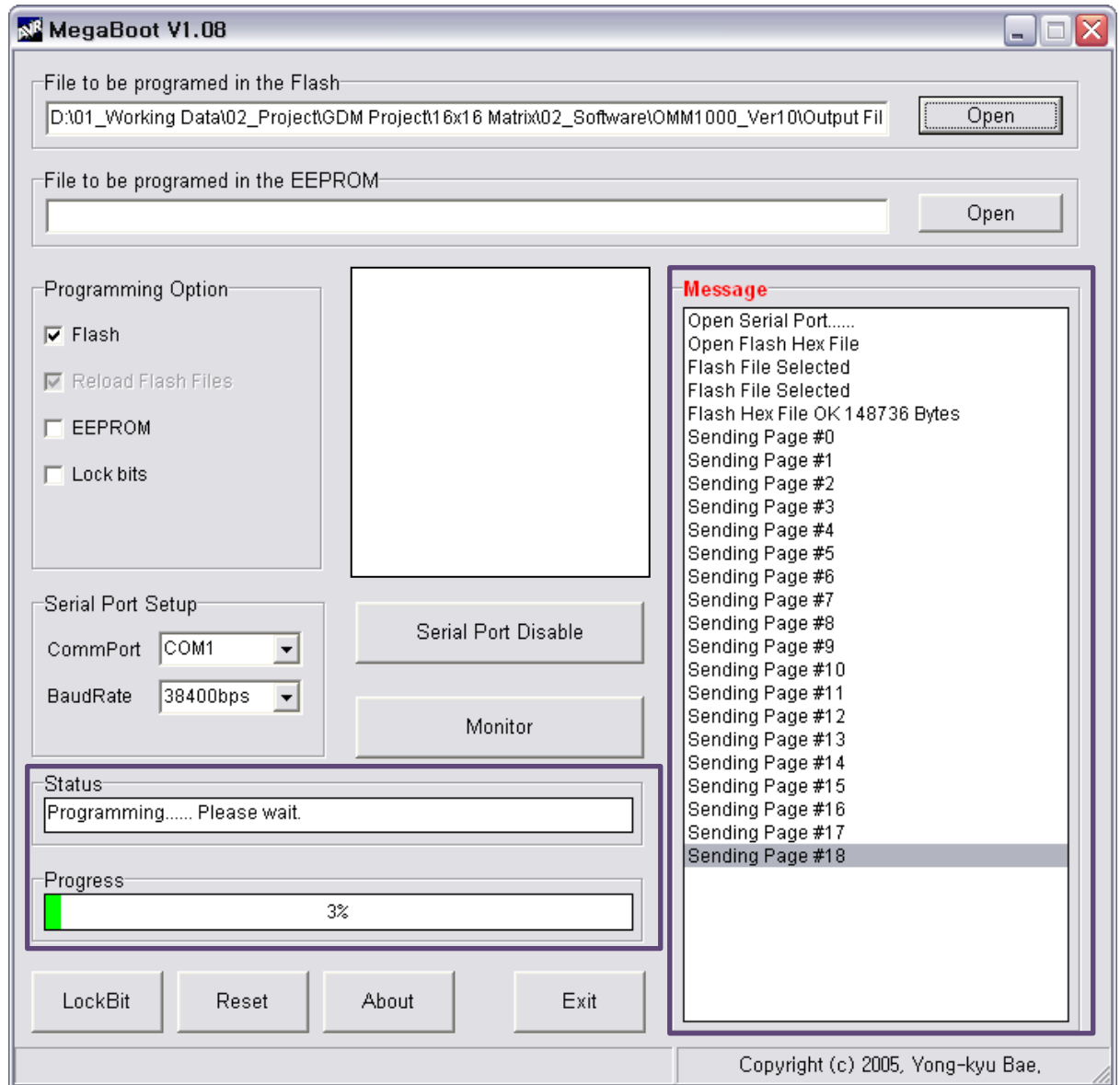
8. After 3~4 minutes, **Application Code Runing!!!** message will be shown. Then the firmware upload is completed.
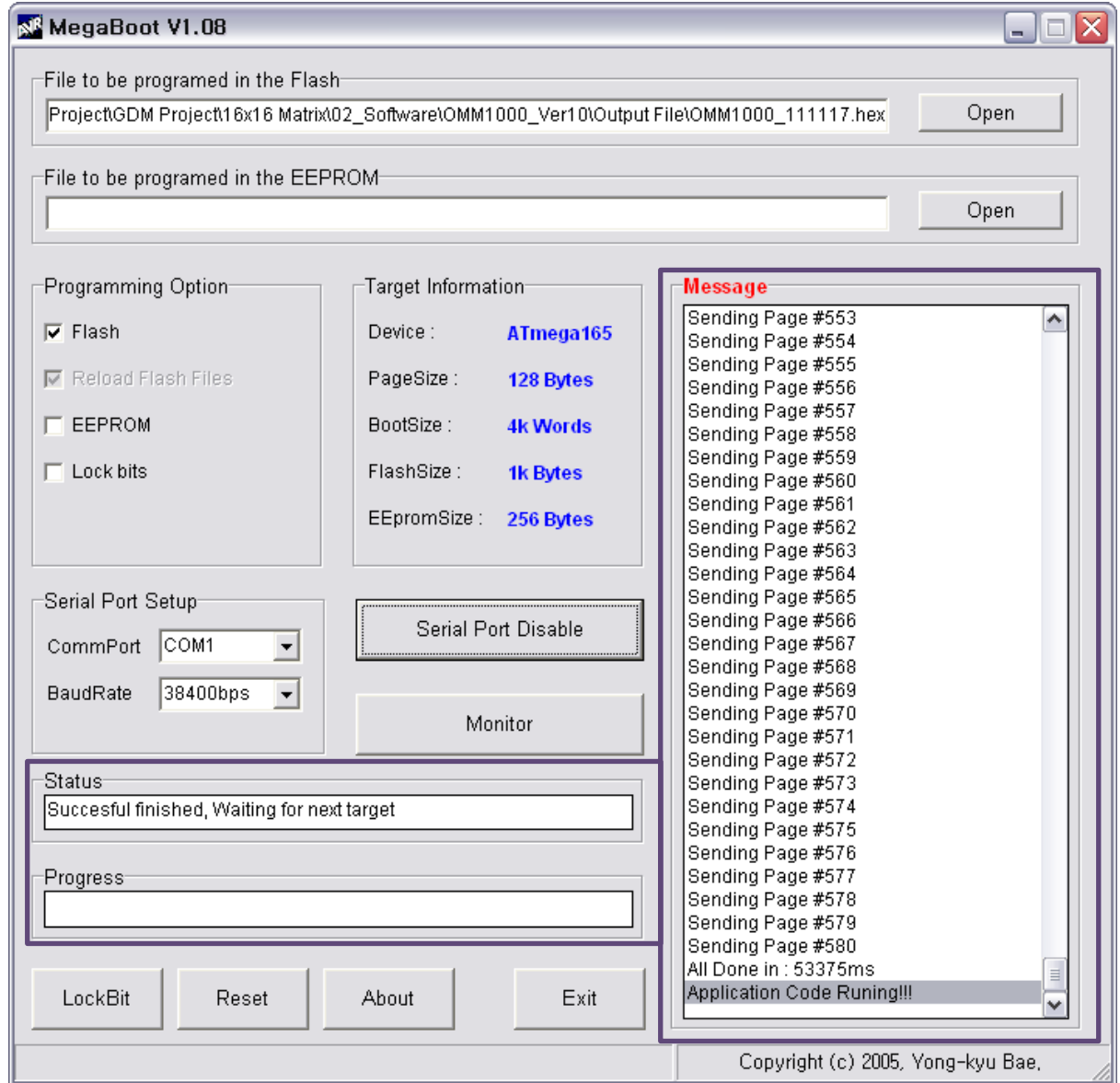
9. **Please close a megabox.exe program and reboot OMM-1000 to run it under new firmware.**

Chapter 8.   Trouble shooting

Problem	Symptom	Solution
No Power	**Power LED Off**	Check the connection of power cord to the OMM-1000 and AC power outlet and that make sure that power switch is in the ON.
No Output	**No Output present**	Check the Input Output DVI cables are firmly connected to each port of OMM-1000. Check the Input and Output connection configuration you want.
		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 → 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 the Input source status by connecting it to available monitor without the OMM-1000.

Chapter 9. Specification

9.1 General specification

Section	Basic Spec.	Section	Basic Spec.
Video resolution	Main VESA resolution & Main vertical frequency from 640x480 up to WUXGA (1920x1200), @60Hz WQXGA (2560x1600),@60Hz (Dual link , DisplayPort card only)	Reference video output	9 output video resolutions with 16 patterns
HDCP	Support : Electric DVI, Dual link DVI, HDMI Non-support : Optical DVI, SDI, DisplayPort	Diagnosis	1) In/Output Link condition 2) source & display Link condition 3) EDID, HDCP information by the remote control through the Web
Video format conversion	Video format conversion without scaling function	Configuration	Save & Restore for Current connection & Control condition by internal memory
Multi -viewer	With additional output card (QDVI-O), Quad view & picture in picture (PIP)	EDID management	1) Default Mode 2) Auto Mix Mode 3) Output Copy Mode
In/Output	16 x 16 (4 ports in one in/output card) 8 x 8 (2 ports in one in/output card)	Color	Black
Switching speed	< 1 sec (If No format searching by Display)	Front Key	LED key (Use of long-term reliability prepared product)

		In/Output card Spec.		
Size	440 x 380 x 178mm (WDH), (4U, 19")	Section	Model name	In/Output port
		Single DVI input	SDVI-4EI	4 x DVI-D receptacle
Weight	< 11Kg (net weight for single power)	Single DVI output	SDVI-4EO	4 x DVI-D receptacle
		Dual DVI input	DDVI-2EI	2 x DVI-D receptacle
		Dual DVI output	DDVI-2EO	2 x DVI-D receptacle
		HDMI input	HDMI-4EI	4 x HDMI receptacle
Cooling system	Cooling fan (Forced cooling system)	HDMI output	HDMI-4EO	4 x HDMI receptacle
		SDI input	SDI-4EI	4 x SDI receptacle
		SDI output	SDI -4EO	4 x SDI receptacle
Certificate	UL/EN 60601, CE, FCC class B	DisplayPort input	DP1-4EI	4 x DP receptacle
		DisplayPort output	DP1-4EO	4 x DP receptacle
		Quad output	QDVI-O	1x DVI-D receptacle + 1x SC receptacle
Control system	Front-key, RS-232, TCP/IP, Web	1 fiber DVI input	SDVI-1FI	4 x SC receptacle
		1fiber DVI output	SDVI-1FO	4 x SC receptacle

Operating condition	Temperature (℃)	10 ~ 40	Transport And Storage condition	Temperature (℃)	-30 ~ +70
	Relative humidity (%)	+30~ +75		Relative humidity (%)	+10~ +95
	Atmospheric Pressure (hPa)	700 ~ 1060		Atmospheric Pressure (hPa)	500 ~1060

9.2 Power Specification

AC Power

1) Input Voltage: AC100-240V ±10%, 50/60Hz
2) Power consumption: 2.2-0.9A
3) Shall have a power cord that complies with regulatory requirements imposed by the country of sale.
4) Incorporate a power cord management system for securing a bundled up cord.

External Fuse

1) Input Voltage: AC100-240V ±10%, 50/60Hz
2) Power consumption: 2.2-0.9A
3) F 6.3 AH250V

9.3 SDI video input and output scaling condition

Input card	Output card	Input resolution		Output resolution
SDI card	SDI card	480i		720p@ 60
		576i		
		720p@ 23.98	720p@ 30	
		720p@ 24	720p@ 50	
		720p@ 25	720p@ 59.94	
		720p@ 29.97	720p@ 60	
		1035i		720p@ 60
		1080i, 1080sf		1080p@ 60
		1080p@ 23.98	1080p @ 30	1080p@ 60
		1080p@ 24	1080p @ 50	
		1080p@ 25	1080p @ 59.94	
		1080p@ 29.97	1080p @ 60	
SDI card	HDMI, DVI, Fiber card	480i		SXGA (1280x1024)
		576i		
		720p@ 23.98	720p@ 30	720p@ 60
		720p@ 24	720p@ 50	
		720p@ 25	720p@ 59.94	
		720p@ 29.97	720p@ 60	
		1035i		720p@ 60
		1080i, 1080sf		1080p@ 60
		1080p@ 23.98	1080p @ 30	1080p@ 60
		1080p@ 24	1080p @ 50	
		1080p@ 25	1080p @ 59.94	
		1080p@ 29.97	1080p @ 60	
HDMI, DVI, Fiber card	SDI card	depends on V display	720≤ V display <1080	720p@ 60
			V display ≥1080	1080p@ 60

[Note] Both SDI input and output card do not support audio signal.

9.4 Compatibility between Dual link DVI In/Output cards and another In/Output cards

Input \ Output		DDVI-2EO	SDVI-4EO	SDVI-1FO	HDMI-4EO	SDI -4EO
DDVI-2EI	Dual DVI	Pass	N/D	N/D	N/D	N/D
	Single DVI	Pass	Pass	Pass	Pass	Pass
SDVI-4EI		Pass	Pass	Pass	Pass	Pass
SDVI-1FI		Pass	Pass	Pass	Pass	Pass
HDMI-4EI		N/D	Pass	Pass	Pass	Pass
SDI -4EI		N/D	Pass	Pass	Pass	Pass

9.5 Compatibility between DisplayPort In/Output cards and another In/Output cards

Input card	Output card	Resolution
DP1-4EI	DP1-4EO	Up to WQXGA (2560x1600) at 60Hz (Not support Deep color)
DP1-4EO	SDVI-1FO	Up to WQXGA (2560x1600) at 60Hz
	SDVI-4EO	
	HDMI-4EO	
	SDI-4EO	
	DDVI-2EO	

Chapter 10.   Warranty Information

1 (One) Year Warranty

Opticis warrants this product to be free from defects in workmanship and materials, under normal use and service, for a period of one (1) year from the date of purchase from Opticis or its authorized resellers.

If a product does not work as warranted during the applicable warranty period, Opticis shall, at its option and expense, repair the defective product or part, deliver to customer an equivalent product or part to replace the defective item, or refund to customer the purchase price paid for the defective product.

This product should be serviced such as repair or replace by Opticis and please contact your reseller or Opticis if you have any problems. All products that are replaced will become the property of Opticis. Replacement products may be new or reconditioned.

Any replaced or repaired product or part has a ninety (90) day warranty or the reminder of the initial warranty period, whichever is longer.

Opticis shall not be responsible for any software, firmware, information, or memory data of customer contained in, stored on, or integrated with any products returned to Opticis for repair under warranty or not.

Warranty Limitation and Exclusion

Opticis shall have no further obligation under the foregoing limited warranty if the product has been damaged due to abuse, misuse, neglect, accident, unusual physical or electrical stress, unauthorized modifications, tampering, alterations, or service other than by Opticis or its authorized agents, causes other than from ordinary use or failure to properly use the product in the application for which said product is intended.

Dispose of Old Electrical & Electronic Equipment

(Applicable in the European Union and other European countries with separate systems)

This marking shown the product or its literature, indicates that it should not be disposed with other household wastes at the end of its working life. To prevent possible harm to the environment or human health from uncontrolled waste disposal, please separate this from other types of wastes and recycle it responsibly to promote the sustainable reuse of material resources.

Household users should contact either the retailer where they purchased this product, or their local

government office, for details of where and how they can take this item for environmentally safe recycling.

Business users should contact their supplier and check the terms and conditions of the purchase contract. This product should not be mixed with other commercial wastes for disposal

Chapter 11.   Safety Instructions

WARNING: Do not touch signal input, signal output of other connectors, and the patient simultaneously.

WARNING: Do not connect any accessory except provided by Opticis. Any damage caused other power adapters or accessories will not be taken any responsibility by Opticis.

Warning for Medical usage

WARNING: External equipment intended for connection to signal input, signal output or other connectors, shall comply with relevant IEC Standard (e.g., IEC60950 for IT equipment and IEC60601-1 series for medical electrical equipment). In addition, all such combination-system-shall comply with the standard IEC60601-1 and/or IEC60601-1-1 harmonized national standard or the combination. If, in doubt, contact a qualified technician or your local representative.

WARNING: (Detachable) This unit uses plug for US: 120V rating 5-15P type only.

This system complies to the above standards only when used with the supplied medical grade power supply.

Caution: Make sure the power cord is the correct type that is required in your area.

This system has a universal power supply that allows operation in either 100-120V AC or 200-240V AC voltage areas (no user adjustment is required).

Use the proper power cord with correct attachment plug type. If the power source is 120V AC, use a Hospital Grade Power Cord with NEMA 5-15 style plug, labeled for 125 volts AC with UL and C-UL approvals.

If the power source is a 240 V AC supply, use the tandem (T blade) type attachment plug with ground conductor power cord that meets the respective European country's safety regulations.

The hospital-grade plug for medical products intended for use in Denmark has DEMKO approval and is rated 13 amps at 250Vac. This plug is recommended for use in medical applications and specifications are being added to the standard SB 107-2-D1. The plug mates with maker's Danish hospital-grade socket. Hospital sockets have slightly different shaped openings allowing only the hospital plug, not the standard Danish plug, to be inserted, to protect the AC circuit in specific medical settings.

Chapter 12.   Maintenance

No special maintenance is required for the matrix and power. Ensure that the matrix and power are stored or used in a benign environment free from liquid or dirt contamination.

Refer all service and repair issues to Opticis.

- For commercial or general product support, contact your reseller. For technical service, contact Opticis by email techsupp@opticis.com or visit its website at www.opticis.com

Cleaning

- Turn off the power.

- Remove all of the electrical and optical fiber from the Modular matrix chassis, OMM-1000.

- Separate each input / output card from the body.

- Put the cards on the safety place and keep it carefully.

- Clean with dry cloth inside of the body after each card is separated.

- Remove dust on the surface of each card with air gun.

- Install each card back to the body

Chapter 13. UL /EN Statement

This equipment has been tested and found to comply with the limits for medical devices in IEC/EN 60601-1-2 and FCC/CE. These limits are designed to provide reasonable protection against harmful interference in a typical medical installation.

This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to other devices in the vicinity. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to other devices, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving device.

- Increase the separation between the equipment.

- Connect the equipment into an outlet on a circuit different from that to which the other device(s) are connected.

- Consult the manufacturer or field service technician for help.

- Type of protection against electric shock: Class I equipment

- Degree of protection against electric shock: Not classified - no applied parts

- Classification according to the degree of protection against ingress of water as detailed in the current edition of IEC 529: IPX0, ordinary equipment

- This equipment is not suitable for use in the presence of flammable anesthetics or oxygen

- Mode of operation: continuous operation

Chapter 14.   Symbol Definitions

No	Product Label
1-a	MANUFACTURED IN SOUTH KOREA OPTICIS CO., LTD 16X16 Multi-Format Matrix **OMM-1000** Please read the user manual carefully before use. E345276 MEDICAL EQUIPMENT UL60601-1/CAN/CSA C22.2 No. 601.1 5BF0 AC 100-240V, 50-60 Hz, 2.2-0.9 A SN

Symbol	SN	CE	Consult User manual symbol	Waste symbol	! symbol	FCC
Remark	Serial number	CE certificate	Consult User manual	Dispose of Old Electrical & Electronic Equipment caution	Refer to instruction use	FCC certificate

Symbol	CLASSIFIED c(UL)us
Remark	MEDICAL EQUIPMENT WITH RESPECT TO ELECTRIC SHOCK, FIRE, AND MECHANICAL HAZARDS ONLY IN ACCORDANCE WITH UL60601-1/CAN/CSA C22.2 NO. 601.1 5BF0

- **Box Symbol**

Symbol	↑↑	glass	umbrella	RoHS COMPLIANT
Remark	Loading direction	Fragile caution	Wet caution	RoHS certificate

Optolinks

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For order support, please contact your Distributor or Reseller.

For technical support, check with the our website www.vigillink.com or contact info@vigillink.com