16 × 16

SOURCES × DISPLAYS

3G-SDI Matrix
w/ Push Button Controls

GEF-3GSDI-16416-PB

User Manual

Release A2

GefenPRO®

Important Safety Instructions

GENERAL SAFETY INFORMATION

1. Read these instructions.

2. Keep these instructions.

3. Heed all warnings.

4. Follow all instructions.

5. Do not use this product near water.

6. Clean only with a dry cloth.

7. Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.

8. Do not install or place this product near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.

9. Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.

10. Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.

11. Only use attachments/accessories specified by the manufacturer.

12. To reduce the risk of electric shock and/or damage to this product, never handle or touch this unit or power cord if your hands are wet or damp. Do not expose this product to rain or moisture.

13. Unplug this apparatus during lightning storms or when unused for long periods of time.

14. Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.

15. Batteries that may be included with this product and/or accessories should never be exposed to open flame or excessive heat. Always dispose of used batteries according to the instructions.

RACK MOUNT SAFETY INFORMATION

a. Maximum recommended ambient temperature: 40 ˚C (104 ˚F).

b. Increase the air flow as needed to maintain the recommended temperature inside the rack.

c. Do not exceed maximum weight loads for the rack. Install heavier equipment in the lower part of the rack to maintain stability.

Warranty Information

Gefen warrants the equipment it manufactures to be free from defects in material and workmanship.

If equipment fails because of such defects and Gefen is notified within two (2) years from the date of shipment, Gefen will, at its option, repair or replace the equipment, provided that the equipment has not been subjected to mechanical, electrical, or other abuse or modifications. Equipment that fails under conditions other than those covered will be repaired at the current price of parts and labor in effect at the time of repair. Such repairs are warranted for ninety (90) days from the day of reshipment to the Buyer.

This warranty is in lieu of all other warranties expressed or implied, including without limitation, any implied warranty or merchantability or fitness for any particular purpose, all of which are expressly disclaimed.

1. Proof of sale may be required in order to claim warranty.

2. Customers outside the US are responsible for shipping charges to and from Gefen.

3. Copper cables are limited to a 30 day warranty and cables must be in their original condition.

The information in this manual has been carefully checked and is believed to be accurate. However, Gefen assumes no responsibility for any inaccuracies that may be contained in this manual. In no event will Gefen be liable for direct, indirect, special, incidental, or consequential damages resulting from any defect or omission in this manual, even if advised of the possibility of such damages. The technical information contained herein regarding the features and specifications is subject to change without notice.

For the latest warranty coverage information, refer to the Warranty and Return Policy under the Support section of the Gefen Web site at www.gefen.com.

PRODUCT REGISTRATION

Please register your product online by visiting the Register Product page under the Support section of the Gefen Web site.

Contacting Gefen Technical Support

Gefen, LLC
c/o Customer Service
20600 Nordhoff St.
Chatsworth, CA 91311

Telephone:	(818) 772-9100
	(800) 545-6900
Fax:	(818) 772-9120
Email:	support@gefenpro.com
Visit us on the Web:	www.gefenpro.com
Technical Support Hours:	8:00 AM to 5:00 PM Monday - Friday, Pacific Time
	For 24 / 7 support, see the back of the product for the support number

16x16 3G-SDI Matrix w/ Push Button Controls is a trademark of Gefen, LLC.

Important Notice
Gefen, LLC reserves the right to make changes in the hardware, packaging, and any accompanying documentation without prior written notice.

Operating Notes

- There is no internal scaling in the *16x16 3G-SDI Matrix* w/ Push Button Controls. All of the attached monitors must be able to display the output resolutions of the source devices. For maximum compatibility it is recommended that only one compatible/ common resolution be used by all of the source devices.

- Routing features can be accessed using RS-232 or IP control. See for more information.

v

Features and Packing List

Features

- Supports resolutions up to 1080p, 1920x1200, and 2K.

- Front panel control buttons for local switching.

- Serial interface for remote control via a computer or control automation devices supports RS-232 and RS-485 protocols.

- IP Control

- Discrete IR remote control

- Redundant Internal AC power supply

- Output masking command

- Standby mode

- Grounding pin

- IR Sensor

- IR Extender

- Power On/Off switch

- Status LCD (shows routing status)

- Rack mountable

1080P PROGRESSIVE

Packing List

The 16x16 3GSDI Matrix ships with the items listed below. If any of these items are not present in your box when you first open it, immediately contact your dealer or Gefen.

- 1 x GefenPRO 16x16 3GSDI Matrix w/ Push Button Controls
- 1 x IR Remote Control unit
- 1 x AC Power Cord
- 1 x Set of rack ears
- 1 x Quick-Start Guide

Table of Contents

04   Appendix

16 × 16
SOURCES DISPLAYS

3G-SDI Matrix
w/ Push Button Controls

01 Getting Started

Panel Layout
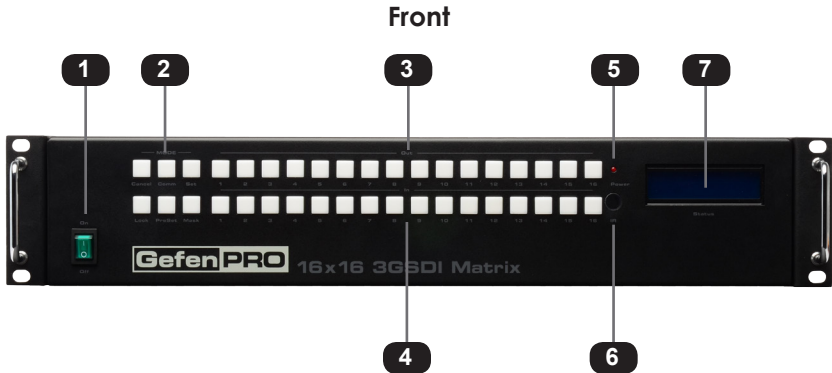
Front

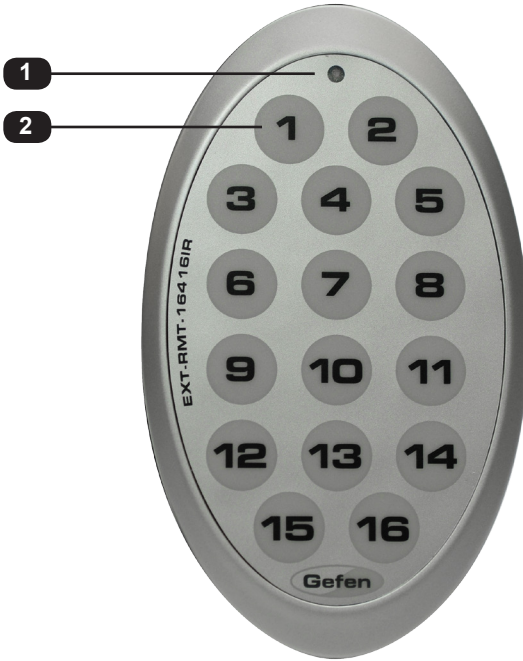| ID	Name	Description
1	On/Off	Used to power-ON or power-OFF the matrix.
2	Mode buttons	Used to control various features on the Matrix. See Front Panel Controls for more information.
3	Out (1 - 16)	Used for routing an Input to an Output. Each of these buttons represents an Output. See Routing Basics for more information on routing sources.
4	In (1 - 16)	Used for routing an Input to an Output. Each of these buttons represents an Input. See Routing Basics for more information on routing sources.
5	Power	This LED indicator will glow bright red when the matrix is powered ON.
6	IR	Receives signals from the included IR remote control unit.
7	LCD display	Provides feedback of matrix features during operation.

Back
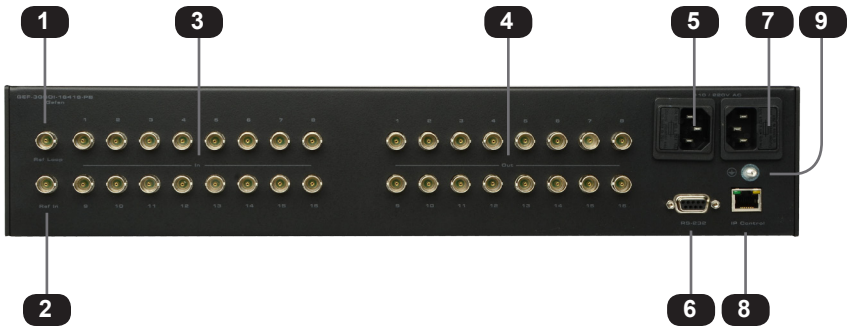
ID	Name	Description
1	Ref Loop	Connect a BNC cable from the Ref Loop connector to a signal analyzer, in order to view the signal on the Ref In connector.
2	Ref In	Connect an external (clock) reference to genlock the picture. Bi-level (Black Burst) and Tri-Level sync are supported.
3	In (1 - 16)	Connect an IR Extender (Gefen part no. EXT-RMT-IREXT).
4	Out (1 - 16)	Connect 3G-SDI monitors (or other destinations) to these ports.
5	IEC connector	Connect the included AC power cords from these receptacle to available electrical outlets. Each outlet should be on a separate circuit.
6	RS-232	Connect a DB-9 cable from this port to the RS-232 control device. See RS-232 and IP Configuration for more information on using RS-232.
7	Fuse drawer	Each internal power supply houses a fuse drawer. See Fuse Replacement for instructions on changing the fuse.
8	IP control	Connect an Ethernet cable from this RJ-45 jack to a Local Area Network (LAN).
9	Grounding terminal	Connect a grounding wire from this terminal to an approved ground path.

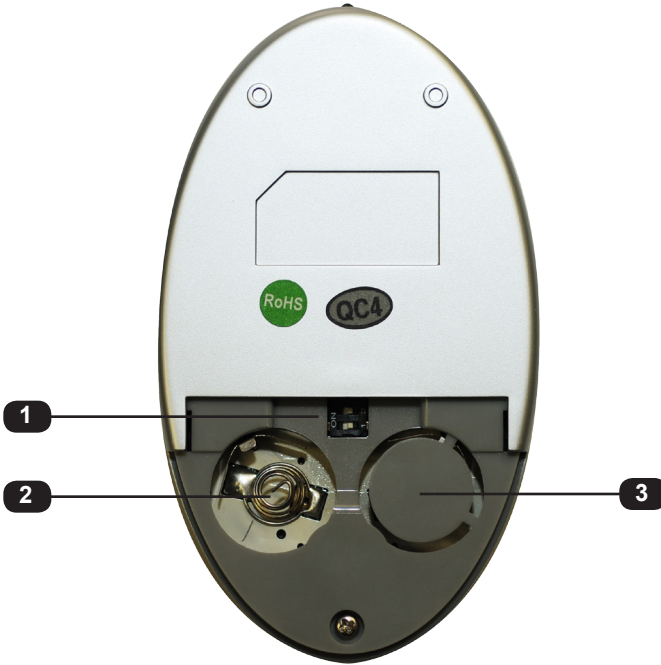# IR Remote Control Unit

Front

ID	Name	Description
1	Activity indicator	This LED glows bright orange when a key is pressed on the remote.
2	Buttons (1 - 16)	Used to select the desired input / output for routing.

Back
(shown with cover removed)

ID	Name	Description
1	DIP switch bank	Use these DIP switches to set the IR channel of the remote (see page 5).
2	Primary battery slot (shown without battery)	Holds the battery for operating the remote. Use only 3V CR2032-type batteries. Make sure that the positive (+) side of the battery is facing up.
3	Alternate battery slot	Allows for the installation of secondary (backup) battery.

Installing the Battery

The IR remote control unit ships with two batteries. Only one battery is required for operation. The second battery is a spare. Use only 3V CR2032-type batteries.

1. Remove the back cover the IR Remote Control unit.

2. Insert the included battery into the primary battery slot. The positive (+) side of the battery should be facing up.

3. Replace the back cover.

> ⚠️ **WARNING:** Risk of explosion if battery is replaced by an incorrect type. Dispose of used batteries according to the instructions.

> ℹ️ **NOTE:** If the Activity Indicator, on the IR remote control unit, flashes quickly while holding down any one of the buttons, then this indicates a low battery. Replace the battery as soon as possible**.**

Setting the IR Channel

In order for the included IR remote control to communicate with the 16x16 3GSDI Matrix, the IR remote control must be set to the same channel as the matrix. See the `#rmtiradd` command for instructions on setting the IR channel of the matrix.

Channel 0 (default):   Remote Channel 1:

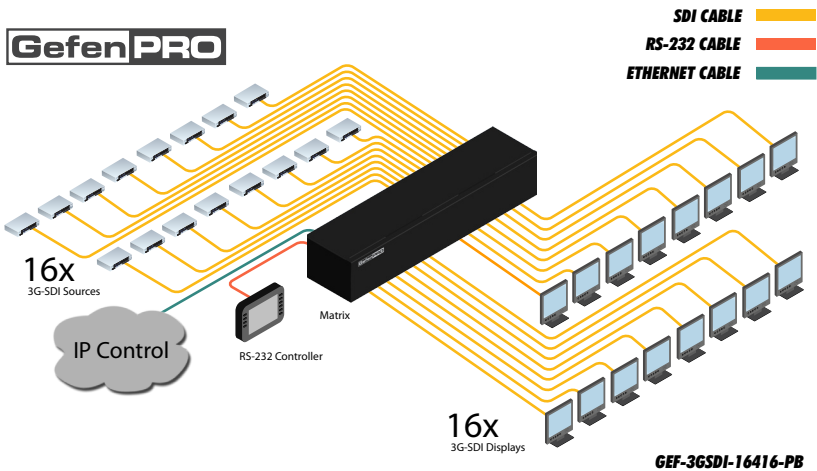Remote Channel 2:   Remote Channel 3:

DIP switches

Installation

Connecting the 16x16 3G-SDI Matrix

1. Connect up to 16 3G-SDI source devices to the 3G-SDI inputs on the rear panel of the 16x16 3GSDI Push Button Matrix using SDI cables.

2. Connect up to 16 3G-SDI displays to the 3G-SDI outputs on the rear panel of the 16x16 3GSDI Push Button Matrix.

3. Connect the included power cord to the power input receptacle on the rear panel of the 16x16 3GSDI Push Button Matrix. Connect the opposite end of the cable into a open wall power socket.

Sample Wiring Diagram

SDI CABLE

RS-232 CABLE

ETHERNET CABLE

GefenPRO

16x
3G-SDI Sources

IP Control

RS-232 Controller

Matrix

16x
3G-SDI Displays

GEF-3GSDI-16416-PB

> ⚠️ **WARNING:** Both power supplies should always be connected to a grounded electrical AC outlets. It is recommended that each power supply be connected to outlets on separate circuits.

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SOURCES DISPLAYS

3G-SDI Matrix
w/ Push Button Controls

02 Operating the
16x16 3G-SDI Matrix
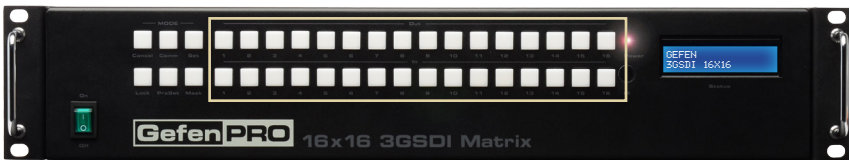
Front Panel Controls

Front Panel Buttons

There are a total of 38 buttons on the front panel of the matrix. These buttons are grouped according to their function.

Out and In

The **Out** and **In** buttons comprise the largest group of buttons. The top row of 16 buttons represent each output. The bottom row of 16 buttons represent each input.

For example, button 1 on the top row represents Output 1, button 2 represents Output 2, and so on. The input buttons on the bottom row are arranged in a similar fashion: Button 1 on the bottom row represents Input 1, button A2 represents Input 2, and so on.

Mode

The Mode buttons are used to control various other functions on the matrix such as output masking and loading / storing of routing presets.

Front Panel LCD Screen

The front-panel of the *16x16 3G-SDI Matrix w/ Push Button Controls* contains a 16-character 2-line LCD display which is used to provide feedback when performing routing functions. In addition, this display is used to show the current routing status of the matrix.

Besides displaying routing information and other feedback during various operations, the matrix provides setting information, from the Home screen. Consecutively press the **Cancel** button to display other matrix settings. The matrix will automatically return to the Home screen after a few moments if the **Cancel** button is not pressed within a certain amount of time.

LCD Screen	Description
FW 2.1 BOLO 1.6	Displays the current firmware and boot loader version.
IP ADDRESS 192.168.0.70	Displays the current IP address of the matrix. See IP Configuration for information on changing the IP address of the matrix.
MAC ADDRESS 0.1C.91.1.30.58	Displays the MAC address of the matrix. The MAC address cannot be changed.
IR ADDRESS SW1=0, SW2=0	Displays the DIP switch settings required in order for the IR remote control unit to communicate with the matrix.

Routing Basics

Routing Inputs to Outputs

The following example illustrates the routing process. An input may be routed to a single or multiple outputs. Multiple inputs cannot be routed to a single output.

1. Press the **Set** button on the front panel. Pressing the **Set** button tells the matrix that we want to perform a routing, masking, or preset operation. The **Set** button will glow bright blue, indicating that it has been pressed.

2. The LCD on the front panel will indicate that routing mode is active.

3. Press the desired output button(s) (A1 - A16). For this example, we will route the input (covered in the next step) to multiple outputs: Output 3, Output 6, Output 7, and Output 9. Press buttons A3, A6, A7, and A9. The selected buttons will glow bright blue.

4. Select the desired input (source) button (A1 - B8). For this example, we want to route the source connected to Input 6 to each of the outputs in step 3. Therefore, press button A6 on the bottom row. The selected input will glow bright blue.

> **NOTE:** Only one input can be routed at a time. If the wrong input button is accidentally pressed, then continue by pressing the correct input button. The previous input button will automatically be deselected.

5. Press the Set button on the front panel, once again. Pressing the Set button again tells the matrix that we have completed the routing operation. Once the Set button has been pressed, the LCD will indicate that the routing process has been completed.

6. After a few moments, the selected buttons on the front panel will turn off and the LCD will return to the Home screen.

Getting the Current Routing Status

To display the current routing status of the Matrix, press any one of the Input or Output buttons on the front panel.

From our previous routing example, we already know that Input 6 is routed to Output 3, 6, 7, and 9. However, let's use this to illustrate how to retrieve the current routing status of an input or output.

Outputs to Inputs

1. Press the button **A3** on the top row of buttons.

    When we pressed **A3** (on the top row), button A6 on the bottom row was also selected. This tells us that Input 6 has been routed to Output 3.

2. Now, press button **A7** on the top row of buttons.

    We can see that Output 7 is also connected (routed) to Input 6. This agrees with our previous routing example.

    If button **A6** or **A9** is pressed, Input 6 will also be associated with Output 6 and Output 9.

Inputs to Outputs

1.   Press the **A6** button on the bottom row of buttons.

      By querying an input, all Outputs that are connected (routed) to the input are
      displayed:

2.   Now, press another Input button on the matrix. We will arbitrarily select Input 2
      (button A2).

      In the example above, we can see that Input 2 is routed to Output 2. This is called
      "one-to-one" routing. We could have achieved the same result by pressing Output 2.

One-to-One Routing

When an input-output pair share the same number, it is called "one-to-one" routing.
By default, the *16x16 3G-SDI Matrix w/ Push Button Controls* is shipped in "one-to-one"
mode. This means that Input 1 is routed to Output 1, Input 2 is routed to Output 2, and so
on.

Saving the Current Routing State

The *16x16 3G-SDI Matrix w/ Push Button Controls* allows routing (and masking) states to be saved to internal non-volatile memory. Each routing state can be recalled at a later time (see Recalling a Saved Routing State). Even if the matrix is powered OFF, the presets will be retained in memory.

We'll illustrate an example by saving the routing state, created on page 12.

1. To make sure we are saving the correct routing state, press Input 6 on the front panel. The following routing state should be displayed:

This is the routing state we created on page 12.

2. Press the **Cancel** button to hide the displayed routing state. The **Cancel** button will flash momentarily when pressed.

3. Press the **PreSet** button, *twice*.

The LCD will indicate that the matrix is in *save preset mode*:

4. Select a preset location by pressing any of the first eight input buttons (A1 - A8). The matrix supports up to eight preset locations. For this example, we will store the routing preset using button **A1**.

5. Press the **Set** button to store the routing state in the selected location. The **Set** button will flash momentarily.
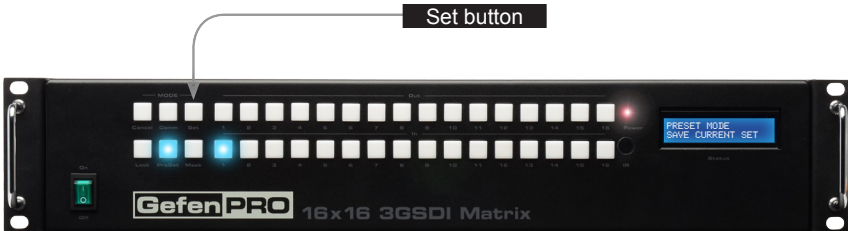
Set button

6. After a few moments, the selected buttons will turn off and the LCD will return to the Home screen.

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3GSDI 16X16

Recalling a Saved Routing State

The *16x16 3G-SDI Matrix w/ Push Button Controls* allows saved routing (and masking) states to be recalled from memory for instant access.

In this example, we will recall the routing preset that we stored in the previous example. In order to clearly see how the recall-process works, try changing the routing state of Input 6 to Output 2. Then, use the steps below to recall the original routing state. See Routing Inputs to Outputs, if necessary.

1. Press the **PreSet** button, *once*. The LCD will indicate that the matrix is in *recall preset mode*.

2. Since we stored our preset in Preset 1, press Input 1 to recall the routing state.

3. Press the **Set** button to recall the routing state from the selected location. The **Set** button will flash momentarily.

4. After a few moments, the selected buttons will turn off and the LCD will return to the Home screen.

Masking

Masking Outputs

"Masking" prevents the output device (display, etc) from receiving an output signal. Instead of powering-down or disconnecting the output device, individual or multiple outputs can be masked.

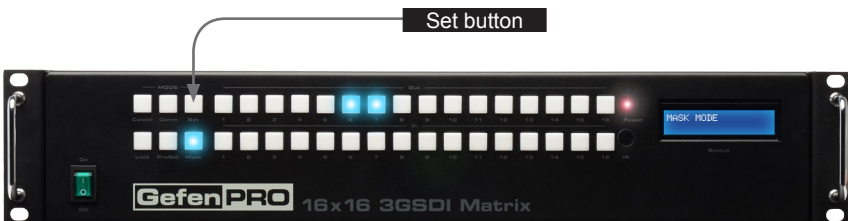To illustrate masking, we'll use our original routing example from page 12.

1. Press the **Mask** button. The Mask button will glow bright blue and the LCD will indicate that the matrix is in *mask mode*.

2. Select the desired outputs to be masked. In this example, we will select Output 6 and Output 7.

3. Press the **Set** button to mask the selected outputs. The **Set** button will flash momentarily.

Set button

4.   Once the **Set** button is pressed, the LCD display will indicate that the masking
       process was successful:

```
MASK MODE
MASK COMPLETED
```

5.   After a few moments, the selected buttons will turn off and the LCD will return to the
       Home screen.


```
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```

Getting the Current Masking Status

If the masking state is unknown, it can be queried using the Mask button. Alternatively, the masking state can be retrieved through the Web Interface or by using the m command.

1.   Press the **Mask** button. The Mask button will glow bright blue and the LCD will indicate that the matrix is in *mask mode*.

     If any outputs are currently masked, they will be indicated on the front panel. For example, since we recently masked Output 6 and Output 7, these buttons will glow bright blue, as shown below.


```
MASK MODE
```

2.   After a few moments, the selected buttons will turn off and the LCD will return to the Home screen.


```
GEFEN
3GSDI 16X16
```

Unmasking Outputs

Once an output (or multiple outputs) has been masked, it can be unmasked.
Unmasking an output will allow the video signal to be displayed after a masking operation.

We'll continue with our previous example and unmask Output 6 and Output 7.

1. Press the **Mask** button. The **Mask** button will glow bright blue and the LCD will
    indicate that the matrix is in mask mode.
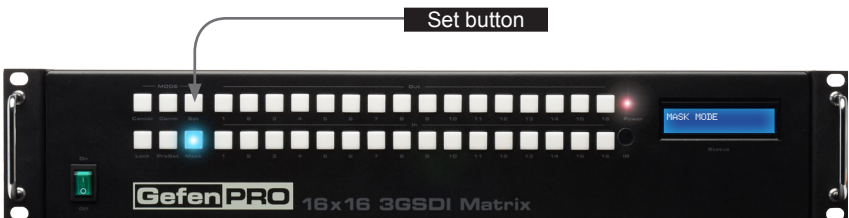
    Once the mask button is pressed, any outputs that have been masked will be
    indicated on the front panel.

2. To unmask an output, press the desired output(s). In our case, we will select both
    Output 6 and Output 7. Each button will turn off as it is pressed.

3. Press the **Set** button. The **Set** button will flash momentarily.

Set button

4.   Once the **Set** button is pressed, the LCD display will indicate that the unmasking process was successful:

```
MASK MODE
MASK COMPLETED
```

5.   After a few moments, the matrix will return to the Home screen.


```
GEFEN
3GSDI 16X16
```

Locking the Matrix

Locking the matrix will prevent any changes by disabling all buttons (except the Lock button) on the front panel. This feature is useful in preventing routing or other changes caused by accidentally bumping or pressing the buttons on the front panel.

1. Press the **Lock** button under the Mode group. The **Lock** button will glow bright blue, indicating that the matrix is now locked. The LCD display will also indicate that the matrix has been locked.

2. To unlock the matrix, press the **Lock** button again. The **Lock** button will turn off and the LCD display will return to the Home screen.

Communication Settings

The *16x16 3G-SDI Matrix w/ Push Button Controls* supports both RS-232 and RS-485 protocols. In general, RS-485 (a superset of RS-422) is used in the configuration of multidrop (point-to-point) communication links and supports up to 32 drivers and 32 receivers (RS-232 only supports a single driver and receiver). RS-485 can sustain data rates up to 10 MB/s.

Setting the Communication Mode

1. Consecutively press the **Comm** button to cycle through each of the options. The current option will be displayed in the LCD.

LCD Screen	Description
RS232	RS-232 is the default communication protocol of the matrix.
RS485 TERMINATION ON	Use this mode if both ends of the cable are using termination resistors.
RS485 TERMINATION OFF	Use this mode if no termination is being used.

2. Press the **Set** button to save the desired setting. The LCD will indicate the current state. For example:

RS485 SELECTED
TERMINATION ON

3. After a few moments, the matrix will return to the Home screen.

Using the IR Remote Control

Routing Sources using the IR Remote Control

The included IR Remote Control unit provides discrete routing between each input and output.The IR remote control unit consists of 16 buttons. Each button represents an input / output.

Let's look at an example: Route Input 3 to Output 7

1.   Point the IR remote control at the IR sensor on the front panel of the matrix.

2.   First, select the output by pressing button 7 on the IR remote control unit. Button A7, on the front panel, will glow bright blue to indicate that Output 7 has been selected.

LED indicates a button was pressed

Press button 7

Output 7 selected

ROUTING MODE

IR sensor
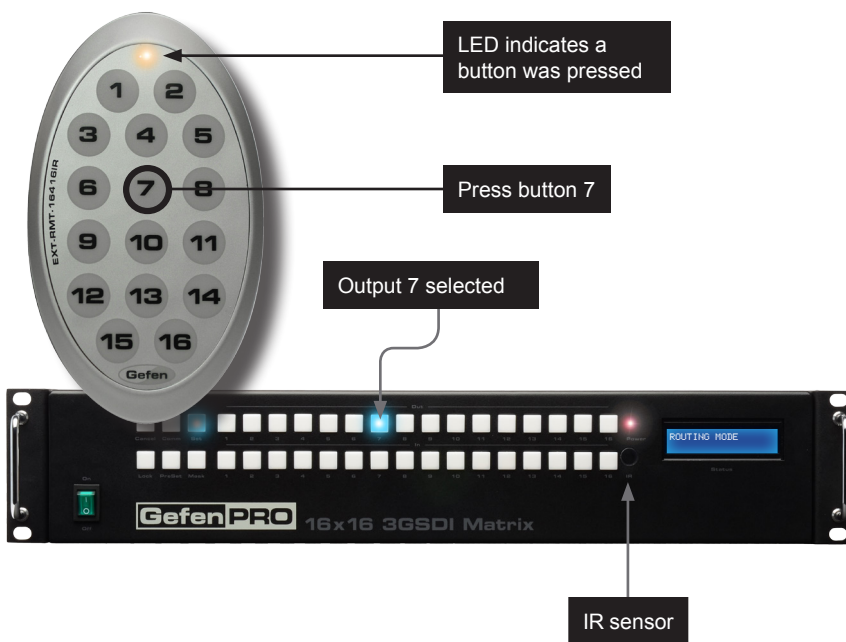
The front panel LCD will indicate that the matrix is in routing mode:

ROUTING MODE

3.   Press the desired input. In this example, we want to route Output 7 to Input 3. Therefore, we'll press button 3 on the IR remote control.

Press button 3
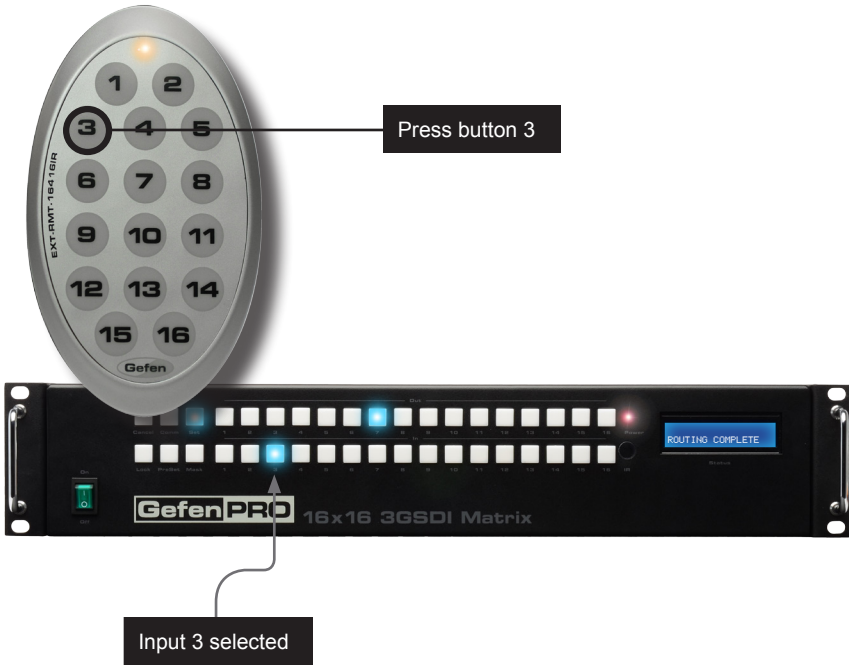
Input 3 selected

4.   After the input has been selected, the LCD will indicate that the routing was successful.

ROUTING COMPLETE

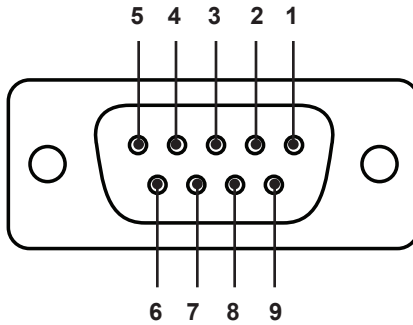**16** × **16**

SOURCES   DISPLAYS

3G-SDI Matrix
w/ Push Button Controls

03   Advanced Operation

RS-232 and IP Configuration

RS-232 Interface

RS-232 Controller   Matrix

DCD	1		1	DCD
RXD	2		2	RXD
TXD	3		3	TXD
DTR	4		4	DTR
GND	5		5	GND
DSR	6		6	DSR
RTS	7		7	RTS
CTS	8		8	CTS
R1	9		9	R1
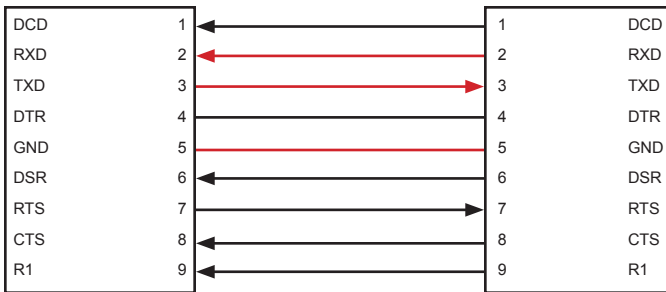
Only TXD, RXD, and GND are used.

RS232 Settings

Description	Setting
Baud rate	19200
Data bits	8
Parity	None
Stop bits	1
Hardware flow control	None

IMPORTANT: When sending RS-232 commands, a carriage return must be included at the end of the command. A space *must* be included between the command and the parameter.

IP Configuration

The *16x16 3G-SDI Matrix w/ Push Button Controls* supports IP-based control using RS-232 or the built-in Web-based GUI. To set up IP control, the network settings for the *16x16 3G-SDI Matrix w/ Push Button Controls* must be configured via RS-232. The default network settings for the matrix are as follows:

Description	IP Address / Port	Description	IP Address / Port
IP Address	192.168.0.72	Gateway	192.168.1.1
Subnet	255.255.255.0	HTTP port	80

1. Connect an RS-232 cable from the PC to the *16x16 3G-SDI Matrix w/ Push Button Controls*. Also make sure that an Ethernet cable is connected between the matrix and the network.

2. Launch a terminal emulation program (e.g. HyperTerminal) and use the RS-232 settings listed on the previous page.

> **NOTE:** Depending upon the network, all related IP, Telnet, and UDP settings will need to be assigned. Consult your network administrator to obtain the proper settings.

3. Set the IP address for the matrix using the `#sipadd` command.

4. Set the subnet mask using the `#snetmask` command.

5. Set the gateway (router) IP address using the `#sgateway` command.

6. Set the HTTP listening port using the `#sport` command.

7. Reboot the matrix to apply all changes, then type the IP address that was specified in step 3, in a Web browser to access the Web GUI.

RS-232 / IP Commands

Command	Description
#activebolo	Enables the boot loader
#checkref	Displays the Ref In signal
#fadefault	Resets the routing and masking to factory-default settings
#prreftable	Displays the reference signal table
#prwebadd	Displays the current IP configuration
#rmtiradd	Set the IR channel of the matrix
#rstip	Resets the IP configuration to factory-default settings
#sgateway	Sets the IP address of the (router) gateway
#sipadd	Sets the IP Address
#snetmask	Sets the Net Mask
#sport	Sets the Web server listening port
m	Displays the current matrix status in tabular form
r	Routes the specified input to the specified output
s	Routes the specified input to all outputs

#activebolo

The #activebolo command activates the boot loader used to upgrade the firmware.
See the Firmware Upgrade Procedure for more information.

Syntax:

#activebolo

Parameters:

None

#checkref

The `#checkref` command displays information about the input signal on the Ref In connector.

Syntax:

```
#checkref
```

Parameters:

None

Examples:

```
#checkref
```

```
 Please wait...
 Mesurment result: 262 lines , 6101 H sync period
 Detect REF 18 , 480i , 262 lines , 6101 H sync period, 34720 XSET timing
Function completed
```

#fadefault

The `#fadefault` command resets the routing and masking to factory-default settings.. This command is similar to the `#rstip` command, except that the IP settings are preserved.

Syntax:

```
#fadefault
```

Parameters:

None

Example:

```
#fadefault
```

```
 Please wait...
Routed 1-1,2-2...
Function completed
```

#prreftable

The #prreftable command displays the reference signal in tabular format.

Syntax:

```
#prreftable
```

Parameters:

None

Example:

```
#prreftable

Please wait...
 num   |      name     |  lines | H period | XSET timing (nsec)
 ------|---------------|--------|----------|---------
   1   |      1080i60  |    562 |   2844   | 14850 (168670)
   2   |      1080i59  |    562 |   2847   | 14880 (168830)
   3   |      1080i50  |    562 |   3413   | 17980 (201260)
   4   |      1080p23  |   1125 |   3559   | 17010 (191050)
   5   |      1080p24  |   1125 |   3555   | 16980 (190890)
   6   |      1080p25  |   1125 |   3413   | 16280 (183480)
   7   |      1080p29  |   1125 |   2847   | 13450 (154000)
   8   |      1080p30  |   1125 |   2844   | 13430 (153860)
   9   |       720p60  |    750 |   2133   | 11670 (115270)
  10   |       720p59  |    750 |   2135   | 11890 (117150)
  11   |       720p50  |    750 |   2560   | 11860 (137490)
  12   |       720p23  |    750 |   5339   | 25760 (282170)
  13   |       720p24  |    750 |   5333   | 25730 (281940)
  14   |       720p25  |    750 |   5120   | 24660 (270820)
  15   |       720p29  |    750 |   4271   | 21130 (234040)
  16   |       720p30  |    750 |   4266   | 20400 (226380)
  17   |         576i  |    312 |   6144   | 31880 (345930)
  18   |         480i  |    262 |   6101   | 34720 (375480)
 ------|---------------|--------|----------|---------
Function completed
```

#prwebadd

The #prwebadd command displays the current IP settings of the matrix.

Syntax:

#prwebadd

Parameters:

None

Example:

```
#prwebadd

 Please wait...
Function completed
IP add   = 192.168.1.249
Net Mask = 255.255.255.0
Gateway  = 192.168.1.1
port     = 80
MAC add = 0.1C.91.1.30.58

Hardware version 0
Firmware version 3.2
Release date     25,12,2012
```

#rmtiradd

The `#rmtiradd` command sets the IR channel of the matrix. The specified IR channel must match the IR channel of the included IR remote control unit. See Setting the IR Channel for more information.

Syntax:

```
#rmtiradd param1
```

Parameters:

param1   IR channel   [0 ... 3]

Example:

```
#rmtiradd

 Please wait...
Function completed
```

#rstip

The `#rstip` command resets the IP configuration and routing state to factory-default settings. The matrix must be rebooted after executing this command. To reset only the routing states to factory-default settings, use the `#fadefault` command.

Syntax:

```
#rstip
```

Parameters:

None

Example:

```
#rstip

 Please wait...
Function completed
```

#sgateway

The #sgateway command sets the gateway (router) address of the matrix. Each number (parameter) in the gateway address must be separated by a space. The default gateway address is 192.168.0.1

Syntax:

#sgateway param1 param2 param3 param4

Parameters:

param1	Number	[0 ... 255]
param2	Number	[0 ... 255]
param3	Number	[0 ... 255]
param4	Number	[0 ... 255]

Example:

#sgateway 192 168 1 1

 Please wait...

Function completed

#sipadd

The `#sgateway` command sets the IP address of the matrix. Each number (parameter) in the IP address must be separated by a space. The default IP address is `192.168.0.70`.

Syntax:

```
#sipadd param1 param2 param3 param4
```

Parameters:

param1	Number	[0 ... 255]
param2	Number	[0 ... 255]
param3	Number	[0 ... 255]
param4	Number	[0 ... 255]

Example:

```
#sipadd 192 168 1 249

 Please wait...
Wrong parameter , Function cancelled
```

#snetmask

The `#snetmask` command sets the net mask of the matrix. Each number (parameter) in the net mask must be separated by a space. The default net mask is `255.255.255.0`.

Syntax:

```
#snetmask param1 param2 param3 param4
```

Parameters:

param1	Number	[0 ... 255]
param2	Number	[0 ... 255]
param3	Number	[0 ... 255]
param4	Number	[0 ... 255]

Example:

```
#snetmask 255 255 0 0

 Please wait...
Function completed
```

#sport

The `#sport` command set the HTTP listening port for the Web interface. The default listening port is `80`.

Syntax:

```
#sport param1
```

Parameters:

param1	HTTP port	[1 ...65535]

Example:

```
#sport 85
 Please wait...
Function completed
```

m

The m command displays the current matrix status in tabular form. Do not precede this command with the "#" symbol. This information can also be viewed using the View Matrix Status page in the Web interface.

Syntax:

m

Parameters:

None

Example:

```
m
Output   |  Input  |  Signal
 ---------|---------|---------
    1     |    1    |  ACTIVE
    2     |    2    |  ACTIVE
    3     |    3    |  ACTIVE
    4     |    4    |  ACTIVE
    5     |    5    |  ACTIVE
    6     |    6    |  ACTIVE
    7     |    7    |  ACTIVE
    8     |    8    |  ACTIVE
    9     |    9    |  ACTIVE
   10     |   10    |  ACTIVE
   11     |   11    |  ACTIVE
   12     |   12    |  ACTIVE
   13     |   13    |  ACTIVE
   14     |   14    |  ACTIVE
   15     |   15    |  ACTIVE
   16     |   16    |  ACTIVE
 ---------|---------|--------
```

r

The r command routes the specified input to the specified output. Do not precede this command with the "#" symbol.

Syntax:

```
r param1 param2
```

Parameters:

param1	Output	[1 ... 16]
param2	Input	[1 ... 16]

Example:

```
r 1 3
Input 3 is routed to output 1
```

```
r 5 0
Input 5 is routed to all Outputs
```

s

The s command routes the specified input to all outputs. Do not precede this command with the "#" symbol. If *param1* = 0, then the matrix will be placed in a 1-to-1 routing state. In other words, Input 1 is routed to Output 1, Input 2 is routed to Output 2, and so on.

Syntax:

```
s param1
```

Parameters:

param1	Input	[1 ... 16]

Example:

```
s 2
All outputs are routed to input 2
```

```
s 0
Routed 1-1,2-2...
```

Web Interface

Using the built-in Web Server

The Web interface is divided into three main pages: **View Matrix Status**, **Masking**, and **IP Configuration**. Each of these pages is represented by a button, near the top portion of the screen. Click on the desired button to open the its page. When the Web interface is opened, the **View Matrix Status** page will be displayed.

Access the built-in Web interface by entering the IP address of the matrix that was specified in step 3 on page 46.

View Matrix Status

Matrix Status
Displays the current routing status of the matrix. The numbers in the **Output** column are always fixed. The numbers under the **Input** column will change depending upon the routing status. The **Status** column indicates the signal state. "Loss" indicates no signal. "Active" indicates that a signal is detected.

Refresh
Click either of these buttons to refresh the Web page.

Outputs
Click to place a check mark in the box and select the desired output.
Multiple outputs can be selected at a time.

Inputs
Click the radio button next to the desired input. Only a one input can be selected
at a time.

Switch
Click this button to route the current
input and output selection(s).

Masking

Matrix Status
This section is carried over from the View Matrix Status page and displays the current routing status of the matrix. The numbers in the **Output** column are always fixed. The numbers under the **Input** column will change depending upon the routing status. The Status column indicates the signal state. "Loss" indicates no signal.

Matrix Status

Output	Input	Status
1	2	Loss
2	3	Loss
3	3	Loss
4	3	Loss
5	5	Loss
6	3	Loss
7	3	Loss
8	3	Loss
9	9	Loss
10	10	Loss
11	11	Loss
12	12	Loss
13	13	Loss

Refresh

Refresh
Click either of these buttons to refresh the information displayed on the Web page.

Outputs
Click the Active or Mask radio button next to the desired output. Selecting Mask will mask the output. Selecting Active will unmask a masked output. Click the Submit button to make the change. Multiple outputs can be selected.

Submit
Click this button to activate the current masking selection(s).

IP Configuration

The information at the top portion of the screen displays the current IP configuration of the matrix. Use the fields under the Change IP Settings section to change the IP settings of the matrix.

MAC Address	IP Address	Subnet	Gateway	Port
0:1C:91: 1:30:58	192.168.1.249	255.255.255.0	192.168.1.1	80

Refresh
Click this button to refresh the information displayed on the Web page.

Save
Click this button after entering new IP information. The matrix must be rebooted for changes to take effect.

Reset
Click this button to reset the matrix to restore the IP configuration to factory-default settings.

16×16

SOURCES   DISPLAYS

3G-SDI Matrix
w/ Push Button Controls

04   Appendix

Warning Messages

System Failure

In the case of a critical malfunction, the following warning message will be displayed on the front-panel LCD:

```
SYSTEM FAILURE!
```

If the **m**atrix is connected to a PC using a terminal program, the following message will be displayed in the terminal window:

```
System failure !!!
```

In either case, immediately power-down the matrix and contact Gefen Technical Support.

Firmware Upgrade Procedure

The following items are required to update firmware:

- GefenPRO 16x16 3GSDI Matrix
- Computer running Windows XP
- Terminal-emulation program (e.g. HyperTerminal)
- RS-232 cable (do not use a null-modem cable)
- Firmware files (downloaded from the Gefen Web site)

To begin the update procedure use the `#activebolo` command. The following set of instructions will be using Hyperterminal.

1. Power-on the matrix.
2. Connect an RS-232 cable between the matrix and the computer.
3. Open the terminal program. See RS-232 and IP Configuration for configuration information.
4. Type and enter the command: `#activebolo`.
5. The following will be displayed on the terminal screen:

```
 Please wait..
 To activate boot loader please type the command again
Function completed
```

6. Type and enter the `#activebolo` command again. The following will be displayed:

```
================================================
==           Gefen Boot Loader              ==
==                v 1.6                     ==
================================================

============= Main Menu ==================
  Download new program  ---------------  1
  Cancel  -----------------------------  2
=======================================
```

7. Press the '`1`' on the computer keyboard to select `Download new FW`.

    The following will be displayed:

    ```
    Waiting for the file to be sent ... (press 'a' to abort)
    ```

8. In Hyperterminal, click `Transfer --> Send File...`
9. Select the firmware file and then select YModem from the Protocol drop-down list.
10. Click the OK button.

    The firmware update procedure will begin. This process should take a couple of minutes. The matrix will automatically reboot when the firmware upgrade process has completed.

Fuse Replacement

The 16x16 3GSDI Matrix contains a fuse as part of the internal power supply. This fuse can easily be replaced by using the following steps.

> ✋ **STOP:** Before installing modules and prevent the risk of possible electrical shock, unplug the AC power cord from back of the matrix.

1. Disconnect the power AC power cord from the IEC connector on the matrix.

2. Locate the fuse door, between the IEC connect and the power switch, on the back of the unit.

3. Use a small flat-head screwdriver to gently pry the locking mechanism, on the fuse door, from the matrix.

4. Pull the fuse door until the fuse is exposed.

5. Replace the fuse. Only use a 5mm x 20mm 250V / 2A fuse.

> ⚠ **ATTENTION:** Do not use a fuse other than the type specified by the manufacturer. Replacement of an incorrect fuse can result in electrical fire and damage to the matrix, which will void the warranty.

6. Gently push the fuse drawer back into place. Do not force the fuse drawer into place. If the fuse drawer does not lock into place, the fuse may not be centered in the C-cradle. In this case, rotate the matrix on its side and push the fuse drawer into place. This will allow the fuse to stay centered as the fuse drawer is installed.

Specifications

Supported Formats	
Standards	• SD-SDI (SMPTE 259M) • HD-SDI (SMPTE 292M) • 3G-SDI (SMPTE 424M)
Resolutions (max.)	• 1080p Full HD • 1920 x 1200 (WUXGA) • 2K
Reference (sync)	• NTSC • PAL • Tri-Level

Electrical	
Input Video Signal	• 1.2V p-p
Input / Output Impedance	• 75 Ω
Output Level	• 750 mV - 850 mV (p-p)

Connectors	
Inputs	• 16 x BNC, female
Outputs	• 16 x BNC, female
Reference In	• 1 x BNC, female
Reference Loop Out	• 1 x BNC, female
IR Extender	• 3.5mm mini-stereo
RS-232	• DB-9, female
IP Control	• RJ-45, shielded

Operational	
Power Input	• 2 x 100 - 240V AC
Power Consumption	• 30W (each power supply)
Operating Temperature	• +32 to +104° F (0 to +45° C)
Storage Temperature	• -4 to +140° F (-20 to +60° C)
Relative Humidity (non-condensing)	• +20 to 90%

Physical	
Dimensions (W x H x D)	• 19" x 3.5" x 7" (482mm x 89mm x 178mm)
Unit Weight	• 13.8 lbs (6.26 kg)

Stretch it, Switch it, Split it, Control it.
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20600 Nordhoff St., Chatsworth CA 91311
1-800-545-6900   818-772-9100   fax: 818-772-9120
www.gefen.com   support@gefen.com

This product uses UL or CE listed power supplies.