Matrox® **NRG**

Redundant Power Supply Unit

User Guide

Contents

Matrox safety information

To ensure safe and reliable operation of your Matrox product, to avoid personal injury, and to prevent damage to your computer or Matrox hardware, read the following guidelines.

Installation and operation

- Read and retain all instructions. Only use your Matrox product according to the instructions, operating ranges, and guidelines provided in the Matrox user guide and other related Matrox documentation. Failure to follow these instructions could result in damage to your product or injury to the user or installer.

- Don't expose your Matrox product to rain, water, condensation, or moisture.

- Static electricity can severely damage electronic parts. Before touching any electronic parts, drain static electricity from your body (for example, by touching the metal frame of your computer).

- Don't stack devices or place devices so close together that they're subject to recirculated or preheated air.

- Don't operate your system or Matrox product near a heat source or restrict airflow to your system, and make sure the ambient temperature doesn't exceed the maximum recommended temperatures. Don't block ventilation holes on your unit or system.

- This product is designed for use in a "Pollution Degree 2" environment.

Power

- Only use replaceable power supply modules originally supplied with the product or use a replacement that's supplied by Matrox. Don't use modules that appear to be defective or damaged.

- AC-powered products must be connected to a grounded outlet installed by a licensed electrician. Don't defeat the safety purpose of the polarized or grounding-type plug of the NRG unit. 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 doesn't fit into your outlet, consult a licensed electrician to replace the obsolete outlet.

- Make sure that nothing rests on the power cables and that the cables aren't located where they can be stepped on, pinched, or tripped over.

- Don't use damaged power cables.

- Unplug your system or device during lightning storms or if unused for long periods of time.

- Before removing or replacing a power module, make sure to disconnect its AC power cable.

Repair

- Don't attempt to open or repair your Matrox product.

- Don't attempt to open or repair a replaceable power supply module.

- If there's a fault with your Matrox product, review your Matrox warranty for more information.

Overview

Thank you for purchasing a Matrox NRG product. Matrox NRG is an external, rack-mountable, dual redundant Power Supply Unit (PSU) which can be used to power virtually any 12 volt appliance currently manufactured by Matrox Video, including the Maevex 6100 Series, Extio 3 Series, QuadHead2Go Series, and Monarch EDGE Series.

Up to five appliances can be powered by a single NRG unit. The NRG units come equipped with two 300 watt power supply modules, either of which can be replaced without interrupting the power output to the connected appliances. The modules include automatic load balancing which ensures even usage of both power supplies and extends the life of each.

The single density solution ships with a single NRG unit installed on a 1U rack-mountable tray with space for any ½ wide appliance to be installed next to it. The dual density solution includes two NRG units installed on a single 1U tray.

Matrox NRG key features:

- 2 x field-replaceable redundant power supply modules (300 watts each). You can individually replace either power supply module without unplugging the other module, ensuring a continuous 12 volt output to your connected devices.

- High density device capable of powering five units from a single PSU.

- One (1) RU in height. One half (½) RU width.

- Comes pre-installed on a rack tray with the other half of the tray available for your Matrox appliance.

- GPIO connection to signal a possible error condition.

- 10/100 BASET Network connection to provide monitoring and control via management software (Matrox or custom).

- Remote control via IP of each power output.

- Recessed physical rocker switch (on-off) on the device.

- On device LEDs to display status.

Hardware supplied

Depending on your NRG device, the following hardware is supplied:

- One (1) or two (2) six-foot long power cables (DIN 4-pin male with lock).

- Rack mountable NRG RPSU.

- Mounting screws.

Hardware required (sold separately)

Depending on your device and setup, you may need the following hardware:

- IEC power cables.[*]

- CAT5e, CAT6, or CAT7 cable.

- GPIO Female DB-9 low profile connector.

Optional hardware (sold separately)

You may also need any of the following hardware (available for purchase from Matrox):

- Spare and/or replacement power supply module(s).[†]

- Spare and/or replacement power output cables.[‡]

Supported operating systems and web browsers

Matrox NRG supports the following:

- The software utilities used with Matrox NRG support Windows 10 only.

- The web-based Matrox NRG user interface supports Google Chrome only.

Other versions of Windows and other web browsers may work with Matrox NRG, but have not been officially validated by Matrox.

More information

Your Matrox NRG User Guide provides information on installing and connecting your Matrox hardware, updating your firmware package, and using the NRG configuration software.

Be sure to check for any last-minute release notes included with your product. Also, check the Matrox website (www.matrox.com/video) for the latest Matrox software, technical support, and product information.

---

[*] All NRG-compatible Matrox appliances include IEC power cables that can also be used with Matrox NRG. For North America only, use a cord set (provided by Matrox) bearing P/N FCABLE050 with the NRG. If needed, you can purchase additional cables from Matrox.

[†] You can purchase additional power supply modules from Matrox (part number NRG-5-PM)

[‡] You can purchase a set of four 6-foot cables (double-ended DIN 4-pin male with lock) from Matrox under part number CAB-DIN4-6FT-4.

Connecting your devices and powering up Matrox NRG

This section describes how to connect and power up your Matrox NRG device.

Matrox NRG unit rear connections

Connector	Description
DIN 4-Pin	1 x 12V / 3A output, 4 x 12V / 5A output. Make sure any connected Matrox device supports the connector's power rating.
LAN	Connect a network cable to this connector.
GPIO	A low profile DB-9 connector which provides GPIO (General Purpose I/O) that can indicate if a power module has failed, as well as provide a reset switch to reconfigure the device. Pin 1 provides fault status of the power modules. It is a latched tally output (passive) which can accept a 0.75A (maximum) current at a maximum voltage of 20V. Pin 9 is to be used to reset the network settings via a simple grounding operation. Pin 5 is a ground connection. There is a reset pin hole at the top of the NRG unit which executes the same reset operation as the grounding of Pin 9. Pins 2, 3, 4, 6, and 8 are not assigned. For more information, see "GPIO pinouts" on page 22.
100-240V input	100-240V input for first power supply module.
100-240V input	100-240V input for second power supply module.

About the Matrox NRG rackmount

Matrox NRG comes pre-installed on a standard 1RU rackmount shelf. If you have a single unit NRG model, there is space on the shelf for another Matrox appliance next to it.

Matrox NRG-5-1DB (single unit model)

For more information on how to install other devices on the shelf, go to our website at: https://www.matrox.com/en/video/products/rackmount-kit-instructions.

Connection overview

This section describes how to connect your devices and power on Matrox NRG.

1 Before you connect any devices to your Matrox NRG, make sure that the power switch on the front panel is in the OFF position. This ensures that no power is coming from the DIN 4-Pin 12V d.c. outputs.

Power to the 12V d.c. outputs is OFF
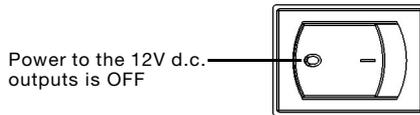
2 Connect your Matrox devices to the DIN 4-Pin 12V d.c. outputs on your Matrox NRG.

12V d.c. 3A devices only   12V d.c. 5A devices
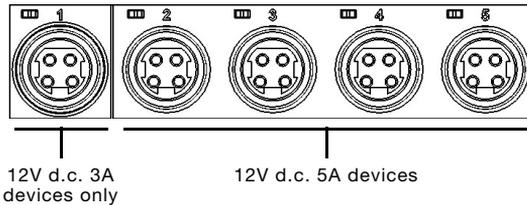
Make sure that you insert the connectors in the correct orientation (i.e. locking latch is in the correct position). Do not use excessive force to insert the connectors.

Output 1 supports 12V d.c. 3A devices only. Devices requiring more than 3A may not boot or function as intended if they are on output 1. Verify the voltage and/or current requirements specified on the Matrox device(s) you intend to use with Matrox NRG.

3 Make sure that your Matrox NRG's two field-replaceable power supply modules are fully inserted (they may have shifted or loosened during transport), then connect AC power to one or both power supply modules.

LEDs are green when power supply modules are active
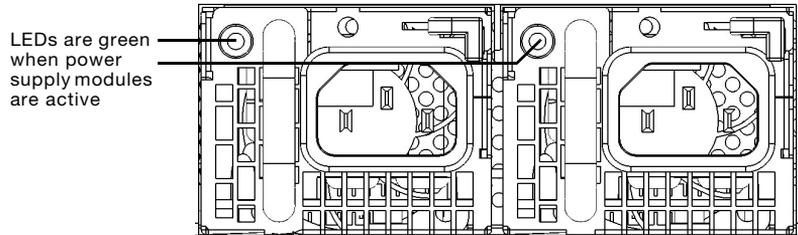
As the Matrox NRG does not come with an IEC 60320 C13 power cable, you can use the cable included with the Matrox appliance you intend to use with Matrox NRG, or any locally sourced IEC 60320 C13 cable that meets local regulatory requirements.

4 Turn ON the Matrox NRG's front panel power switch to power on the 12V d.c. outputs. The LED on the front will turn GREEN if both power modules are active, or blink GREEN if one module is not functioning.

When the LED is green, your Matrox NRG is ready to provide power redundancy to Matrox appliance(s).

Replacing power supply units

Matrox NRG has fully redundant power supplies. In the event one of the power supply modules fails, the output load will be completely supported by the second power module. The failed power supply module can then be replaced without interrupting the power output to connected devices. Although the power supply modules can be replaced at any time, NRG includes a stiffener bar that must be physically removed before you can remove either module.

1   Disconnect the AC power cord from the power supply module you want to replace.

2   The Matrox NRG rack has a stiffener bar that partially blocks the power supply modules. You will need to unscrew the stiffener bar from the rack and remove it to access the modules.
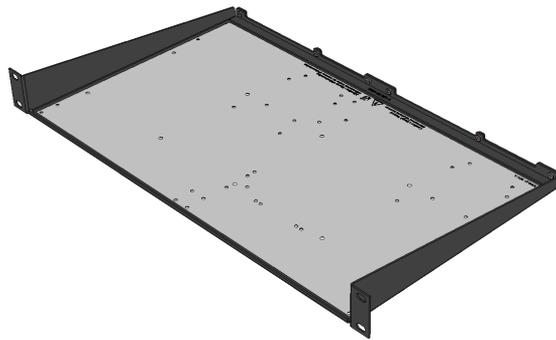
Stiffener bar (attached)
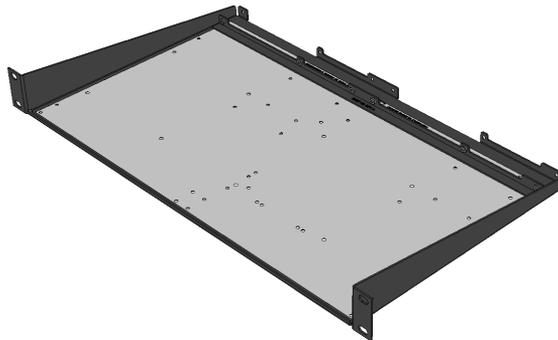
Stiffener bar (removed)

3 Slide the locking lever to unlock the power supply module from the Matrox NRG unit.
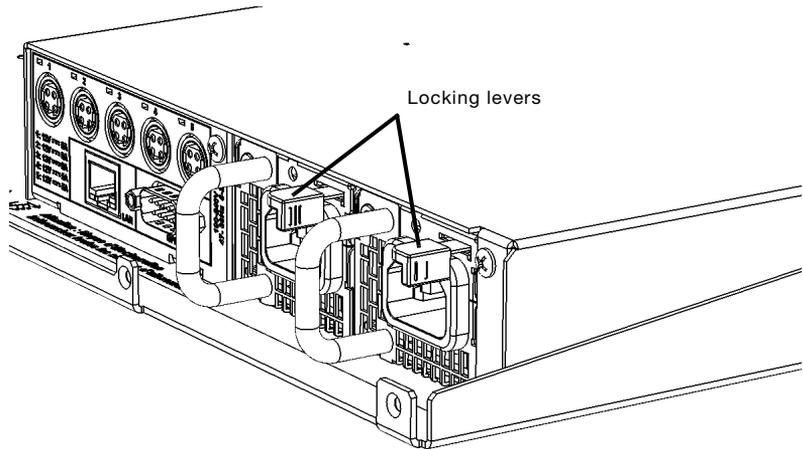
Locking levers

4 Pull on the handle to remove the module from the Matrox NRG unit.

Pull handles to remove
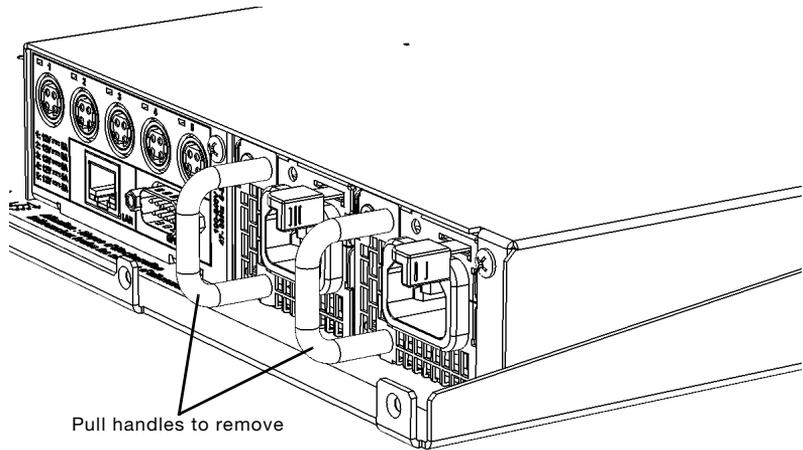
5 Insert the new module until the locking lever clicks into place, then re-attach the stiffener bar.

6 Reconnect the AC power cord to the new module.

The power supply module has been replaced.

Connecting Matrox NRG to your network

Matrox NRG is fully functional as a power redundancy device without a network connection, but network connectivity provides additional benefits such as remote monitoring and reboot capability.

Connecting to a DHCP-enabled network

Matrox NRG is set to a DHCP protocol by default, so a DHCP-enabled network will assign an IP address to the NRG when it is connected to your network. You'll need this IP address to connect to the NRG through a web browser.

1   Connect your Matrox NRG to your network via the LAN connector.

2   From the Matrox website (www.matrox.com/en/video/apps/drivers/home), download the zip file *NRGUtils_<release number>.zip*, and extract the contents to a folder on your computer.

3   From the extracted folder, run *NRGupdater.exe*.

4   Click **Find** to find your NRG unit on the network (it must be on the same subnet). You can also use the MAC address printed on the Matrox NRG device itself to find it in your router manifest.

5   Take note of your NRG unit's IP address and update the firmware if needed.

    If you have the *Matrox NRG-5-2DB* model (i.e. two NRG units on the tray), each unit has its own dedicated IP address. When you connect to one of the units, you will see an "A" or "B" as a suffix to the device name. This suffix corresponds to the NRG unit's place on the tray which is also marked with A or B.

6   From a web browser (Google Chrome is recommended) go to the IP address of your Matrox NRG.

7   If this is your first time logging in to Matrox NRG, you will be asked to set your password. Passwords must be at least eight characters long, and include at least one number, one upper case letter, and one lower case letter.

Your Matrox NRG is connected to the network for remote monitoring and other functions.

Connecting to a network using a static IP

If you want to set your Matrox NRG to a static IP address, you can do so with the *NrgIpSetup* application. Setting Matrox NRG to a static IP will reboot your Matrox NRG device. A reboot can take up to 30 seconds and will result in a power cycle for any connected devices.

1. Connect your Matrox NRG to your network via the LAN connector.

2. From the Matrox website (www.matrox.com/en/video/apps/drivers/home), download the zip file *NRGUtils_<release number>.zip*, and extract the contents to a folder on your computer.

3. From the extracted folder, run *NRGipsetup.exe*.

4. The application opens and automatically detects any Matrox NRG device(s) on your network (it must be on the same subnet).
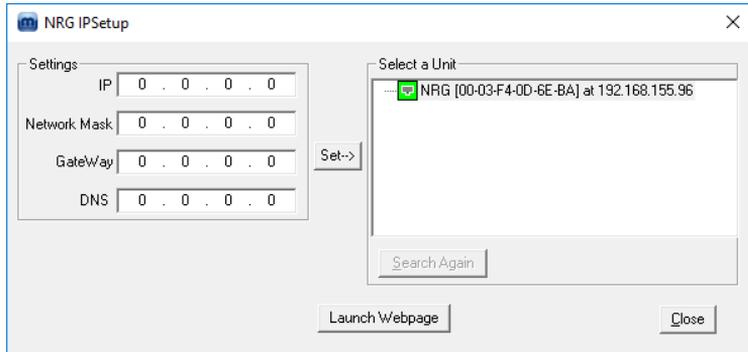
Since all Matrox NRG devices are set to DHCP by default, the fields will all have values of zero (0) initially.

5. Click on the Matrox NRG device you want to configure.
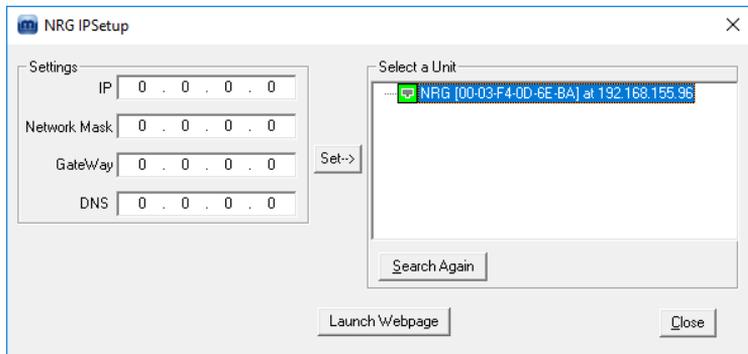
6   Enter the static **IP** you want for your Matrox NRG, as well as the **Network Mask**, **Gateway**, and **DNS**. For more information on these fields, contact your network administrator.
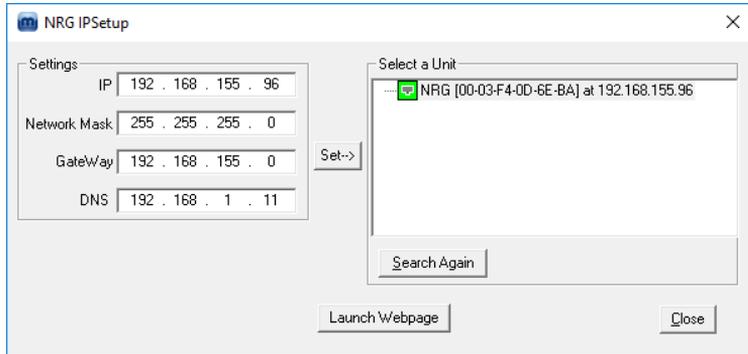
7   Click **Set** to apply the new network settings and reboot the Matrox NRG device. This will result in a power cycle of all connected devices.

8   (Optional) Click **Launch Webpage** to open your default browser and go to the Matrox NRG user interface.

Your Matrox NRG device is set to the specified static IP address.

Updating Matrox NRG

You can remotely update the Matrox NRG units on your network by using the Matrox NRG updater application *NRGupdater.exe*. The updater application is in the zip file you download from the Matrox website and extract to your computer.

1 Make sure your Matrox NRG units are connected to the network as described in "Connecting Matrox NRG to your network" on page 13.

2 From the Matrox website (www.matrox.com/en/video/apps/drivers/home), download the zip file *NRGUtils_<release number>.zip*, and extract the contents to a folder on your computer.

3 From the extracted folder, run *NRGupdater.exe.*

The updater application opens with the IP address field displaying all zeros (0).
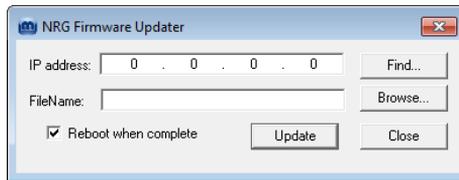
4 If you know your Matrox NRG unit's IP address, type it in the **IP address** field, then continue to step 5. If you do not know your Matrox NRG unit's IP address, click **Find** to search for devices on the same subnet, select the unit you want to update, then click **OK**.

5 Click **Browse**, go to the extracted folder that you created in step 2, then select the update file (e.g. *NRG_1.0.123_APP.s19*).
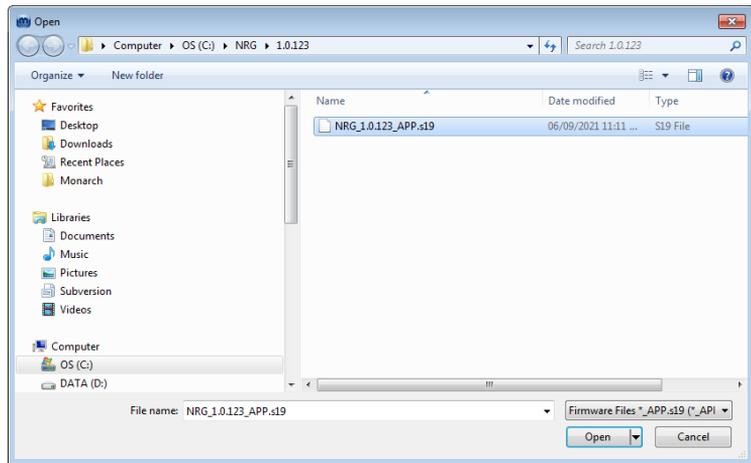
6 Select or clear **Reboot when complete**.

If selected, the Matrox NRG will automatically reboot when the update is complete, causing all connected devices to perform a power cycle.

7 Click **Update**.

8 When done, click **Close**.

Your Matrox NRG unit has been updated.

Connecting to the Matrox NRG user interface

To control Matrox NRG, you connect to it via a web-based user interface. You must know the unit's IP address to connect.

If you have the Matrox NRG-5-2DB model (i.e. two NRG units on the tray), each unit has its own dedicated IP address. When you connect to one of the units, you will see an "A" or "B" as a suffix to the device name. This suffix corresponds to the NRG unit's place on the tray which is also marked with A or B.

1 Connect Matrox NRG to your network as described in "Connecting Matrox NRG to your network" on page 13.

2 Open a web browser (Google Chrome is recommended) and go to the IP address of your Matrox NRG unit. If you see a warning that the website is not secure, you can disregard it and proceed.

If you don't know your NRG unit's IP address, you can use the Matrox NRG updater application to find it (see "Connecting Matrox NRG to your network" on page 13).

3 Log in to Matrox NRG with your password. If this is your first time logging in, you will be prompted to set your password. Passwords must be at least eight characters long, and include at least one number, one upper case letter, and one lower case letter.

The Matrox NRG page opens.

4 For more information on how to use the Matrox NRG user interface, click the **Help** link.

You are ready to use Matrox NRG.

Validating your Matrox NRG setup

After connecting your NRG device, we recommend you validate your connection setup and network discovery before you continue.

Description of LEDs

The LEDs on your device provides information to help you troubleshoot. The following describes the LED on your NRG device.

Front of device

LED color	What it means
No LED (black)	Device isn't powered.
Green (solid)	Both power supplies are functioning normally.
Green (slow blink)	A power supply is not functioning.

Back of device

LED color	What it means
12V connectors: No LED (black)	Output is disabled.
12V connectors: Green (solid)	Output is enabled and functioning normally.
12V connectors: Red (solid)	Output is malfunctioning.

Network connector

The network connectors on your product use indicator lights (LEDs) to provide information on the network activity and presence. The following describes the different network connector LEDs.

Speed   Network activity
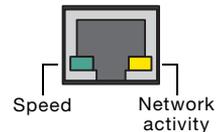
LED color	Network activity	Network presence
No LED (black)	No network activity detected (network cable unplugged).	Transmitting at 10/100 BASE-T.
Green (flashing)	Network activity detected.	—
Amber (solid)	—	Transmitting at 100 Mbps.

Product information

Power input

Input voltage	100 - 240V a.c.
Input frequency range	47 - 63 Hz
Input current	5 - 2.5A

Power consumption

With no load on power outputs	Single-density unit: 10.2W Dual-density unit: 20.4W
With every output loaded	Single-density unit: 25W Dual-density unit: 50W

Power outputs

Number of output channels	5
Output connector type	DIN 4-pin female
Output voltage	12V d.c.
Current per channel	Output 1: 3A Outputs 2 to 5: 5A
Output power per channel	Output 1: 36W Outputs 2 to 5: 60W
Ripple and noise	12V d.c.= 120mv (P-P) (Power-Supply data)
Overcurrent protection per channel	Output 1: 3.2A Outputs 2 to 5: 5.2A

I/O control

Mechanical control ⚠	Power-on switch
External LEDs	Power
	1 LED per PSU module
	Ethernet
	5 power status LEDs[*]
Communication protocol	Ethernet
Communication speeds	10/100 Mbps
Communication security	SSH, SSL, HTTPS, certificate support
Communication (other)	DHCP, Static IP, password protection
Control connector	DB-9 male, open drain
	Maximum sink current and voltage = 20V d.c. / 0.75A
	12V typical
Control output functions	One (1) latched GPIO output
	Password reset

* Shows the status of the 12V power outputs.

General

Overall dimensions (LxWxH)	1 RU (19 x 11.45 x 1.75 inches)
Dimensions of NRG unit on tray (LxWxH)	8.5 x 9.6 x 1.7 inches
Weight	Single unit: 2500 g
	Single unit with packaging: 3500 g
	Dual unit: 4450 g
	Dual unit with packaging: 5450 g
Cooling	Using Internal PSU fan, one per module
MTBF	L10 = 56000 hours @ 40 ºC

Environmental

Temperature, operational	Operating: 0 to 50 °C (32 to 122 °F)
Temperature, non-operational storage and transportation	-20 to 80 °C (-4 to 176 °F)
Humidity, operational (indoor)	20 to 80% (non-condensing)
Humidity, non-operational storage and transportation	10% to 90% (non-condensing)
Atmospheric pressure, operational	660hPa (3,000 meters / 9,842 feet) to 1013hPa (0 meters / 0 feet)
Atmospheric pressure, non-operational and transportation	192hPa (12,000 meters / 39,370 feet) to 1013hPa (0 meters / 0 feet)

EMC / Safety

Emissions	FCC part 15 class A, CISPR 32 (EN 55032) class A, ICES-003 class A
Harmonic current	IEC/EN 61000-3-2
Immunity	CISPR 35 (EN55035)
Safety approvals	CAN/CSA C22.2 No. 62368-1-14; UL 62368-1 (2014); IEC 62368-1 (Edition 2.0); EN 62368-1:2014+A11:2017

GPIO pinouts

The following GPIO pinouts are on DB-9 (the control connector). Each control pinout is open-collector controlled.

- Control 0: DB-9 pin 1 (shows power supply failure status).

- Control 1: DB-9 pin 2 (internal use only).

- Control 2: DB-9 pin 8 (internal use only).

- Control 3: DB-9 pin 6 (internal use only).

- Password reset: DB-9 pin 9 (must be connected to ground for a reset condition).

- Ground: DB-9 pin 5.

- DB-9 pins 3, 4, and 7 are not connected.

The GPIO has a tally output connection on the DB-9 connector, controlled by software, and can be used to sink DC current to signal a condition or event. See the functional diagram below:

DB9 GPIO circuit

Software Ctl

Output (sinking)

Common

Load 0.75 amp Max.

+

12 VDC typical
20 VDC Maximum
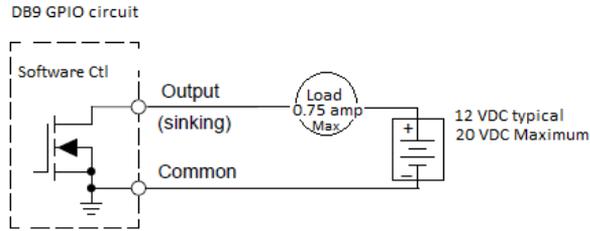
Users must be careful not to exceed the maximum electrical specification for the GPIO of 20V d.c. and 0.75 A. For example, using a 12V d.c. power source, the minimal load resistance should be 16 Ohms as per Ohm law.

Pinout mapping

The connector pins are mapped on the DB-9 connector as follows:

Pin 1   Pin 5

GPIO

Pin 6   Pin 9
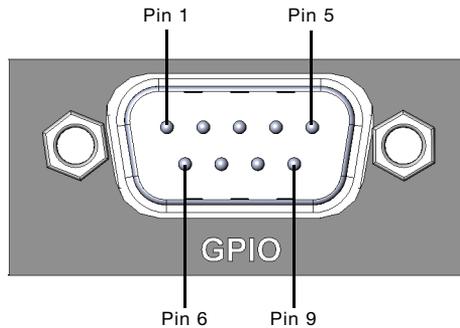
Customer support

Matrox web

Our web site has product literature, press releases, technical material, a sales office list, trade show information, and other relevant material. Visit the Matrox website at www.matrox.com/video.

Technical support

Matrox values your business and offers professional support for your Matrox product.

If your product was purchased through a Matrox dealer, contact your dealer for product support. This is the quickest and most effective method of technical assistance. Your dealer is familiar with your complete system.

If your product was purchased through Matrox, contact your Matrox representative or visit our technical support Web site at www.matrox.com/video/support.

Information we need

Please give a complete description of the problem, and include:

- Matrox product serial number, model number, revision number, and firmware number.
- Source specifications.

View your warranty information

Matrox makes warranty information available on the Matrox site (www.matrox.com/video/en/support/warranty/).

View the third party software notices

Matrox makes third party software notices and/or additional terms and conditions available on the Matrox site (https://thirdpartylicenses.matrox.com).

Register your Matrox product

Please register online (www.matrox.com/en/video/apps/registration/login) for customer support, new product announcements, and information on special offers and upcoming events.