

A world map composed of a grid of small grey dots, with a few red dots scattered across the continents.

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PRG NODE

USER MANUAL

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PRG Node User Manual

Version as of: October 19, 2011

PRG part number: 02.9669.0001 E

Production Resource Group
Dallas Office
8617 Ambassador Row, Suite 120
Dallas, Texas 75247
www.prg.com

PRG Node User Manual

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IMPORTANT INFORMATION

Safety Notice

It is extremely important to read ALL safety information and instructions provided in this manual and any accompanying documentation before installing and operating the products described herein. Heed all cautions and warnings during installation and use of this product.

Safety symbols used throughout this manual are as follows:



CAUTION advising of potential damage to product.



WARNING advising of potential injury or death to persons.

WARNING: INSTRUCTIONS FOR CONTINUED PROTECTION AGAINST ELECTRICAL SHOCK

- 1) This equipment is designed for dry locations only. Exposure to rain or moisture may damage the equipment and/or cause injury to persons.
- 2) Disconnect power before servicing.
- 3) Servicing to be performed by qualified PRG personnel only.

WARNING: RF INTERFERENCE

- 1) This is a Class A product. In a domestic environment this product may cause radio interference, in which case, the user may be required to take adequate measures.

Revision History

This manual has been revised as follows:

Version	Release Date	Notes
C	April 4, 2007	Miscellaneous revisions.
D	December 9, 2010	Updated book format.
E	October 19, 2011	Changed product name from "Virtuoso Node" to "PRG Node." Added Vx76 system details. Updated and expanded Art-Net (Series 400) system details. Added Stand-Alone Software Loader instructions.



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INTRODUCTION

About This Guide

This guide provides necessary information regarding product safety, installation, and operation for the following PRG equipment:

- + PRG Node (20.9669.0030)

Familiarizing yourself with this information will help you get the most out of your PRG product.



WARNING: It is important to read ALL accompanying safety and installation instructions to avoid damage to the product and potential injury to yourself or others.

Additional Documentation

For more information regarding the use of Node units in PRG systems, refer to the following PRG manuals:

- + V676™ / V476™ Control Console User Manual (02.9814.0001.xx)
- + Virtuoso® Series Control Console User Manual (02.9651.0001.xx)
- + PRG Series 400® Power and Data Distribution System User Manual (02.9680.0001.xx)
- + PRG Lighting Systems Networking Guide (02.3004.1000.0)

For more information regarding DMX512 systems, refer to the DMX512/1990 & AMX 192 Standards publication available from United States Institute for Theatre Technology, Inc. (USITT).

USITT
6443 Ridings Road
Syracuse, NY 13206-1111 USA
1-800-93USITT
www.usitt.org

For more information regarding Art-Net protocol, refer to the specification for Art-Net II Ethernet Communication Standard available from Artistic Licence Ltd.

Artistic Licence (UK) Ltd (Registered Office)
24 Forward Drive, Christchurch Avenue,
Harrow, Middlesex, HA3 8NT, United Kingdom
+44 (0)20 88 63 45 15 (phone)
+44 (0)20 84 26 05 51 (fax)
www.artisticlicence.com

For additional documentation, please visit our support tech center at: www.prg.com/support



Customer Service

For technical assistance, contact the PRG International Service Center or contact your nearest PRG office. Contact information for all PRG office locations can be found on our website at: www.prg.com/about-us/locations/

PRG Dallas (International Service)

8617 Ambassador Row, Suite 120

Dallas, Texas 75247 USA

Phone: 214.630.1963

Fax: 214.630.5867

Service Fax: 214.638.2125

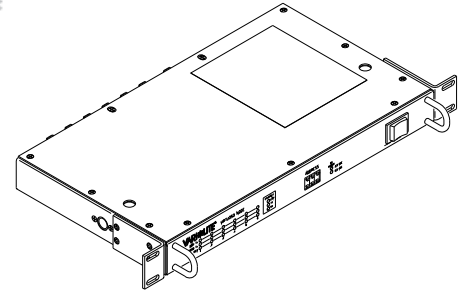
Service Email: orders@prg.com

For additional resources and documentation, please visit our website at: www.prg.com

OVERVIEW

Description

The PRG Node provides a powerful and convenient interface between Vx76, Virtuoso, or Art-Net compatible control consoles, pixel mapping from media servers, and subsequent control equipment which require DMX512 control signals. The unit accepts high level commands in either Vx76, Virtuoso, or Art-Net protocol and converts the data into six universes of DMX512.



Features:

- + Accepts Vx76, Virtuoso, and Art-Net control protocols.
- + Compatible with 10Base-T or 100Base-TX standard signals.
- + Automatic detection and mode configuration according to input signal type when used with either a Vx76 or Virtuoso control console. ¹
- + Can be used as an Art-Net-to-DMX translator device. ²
- + Six DMX512 serial output ports supporting one DMX512 universe each.
- + LEDs indicating Link, TX data, and RX data status for all Ethernet ports.
- + LEDs indicating DMX Tx, RDM Tx, and RDM Rx data status for all DMX ports.
- + Thumbwheel for configuration of the address and Art-Net universe mapping.
- + Neutrik® PowerCon® connector for input AC supply.
- + Front panel DC power status LED.
- + Standard 1U 19" rack mount chassis.

Modes:

The PRG Node unit operates in one of three modes: Vx76, Virtuoso, or Series 400.

- + In Vx76 Mode, the unit will accept Virtuoso protocol and generate DMX512 outputs.
- + In Virtuoso Mode, the unit will accept Virtuoso protocol and generate DMX512 outputs.
- + In Art-Net (Series 400) Mode, the unit will accept Art-Net protocol and convert it to DMX512. In this case, its thumbwheel is used to map a block of Art-Net universes to the six DMX512 outputs.

1. When used with Virtuoso consoles running software v4.3 and earlier, the mode is configured by the placement of a CIC programming jumper. (A procedure for configuring the jumper is included in this manual.)

2. The Art-Net-to-DMX translator feature requires Virtuoso software v5.5 or greater.

Included Items

The following illustration shows all items included with the PRG Node .

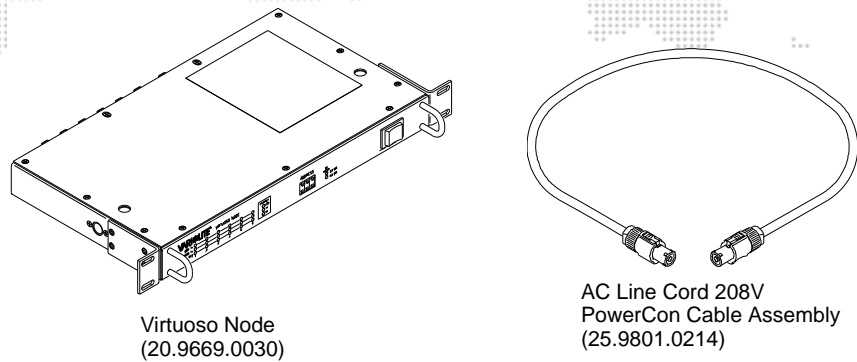


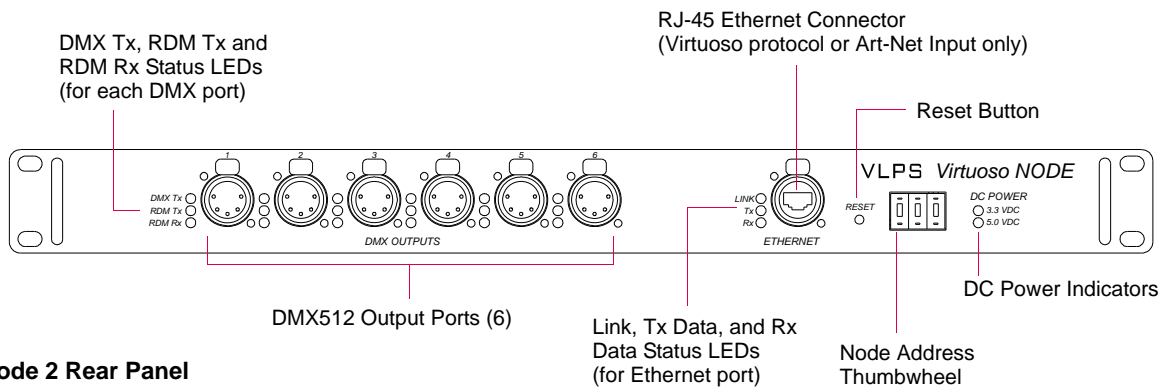
Figure 1: Included Items

Controls and Indicators

The PRG Node has been released in two different versions. The operation is identical, however, the location of some connectors and LEDs are different.

Node 2 Model

Node 2 Front Panel



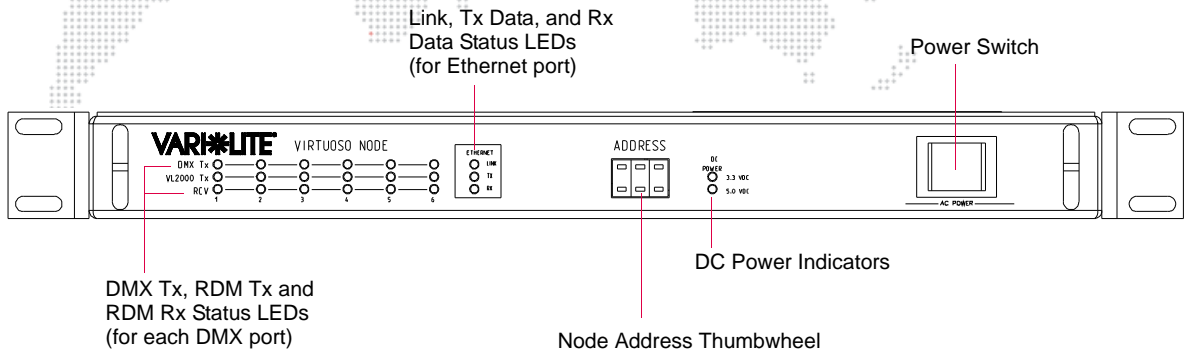
Node 2 Rear Panel



Figure 2: Controls and Indicators (Node 2)

Node 1 Model

Node 1 Front Panel



Node 1 Rear Panel

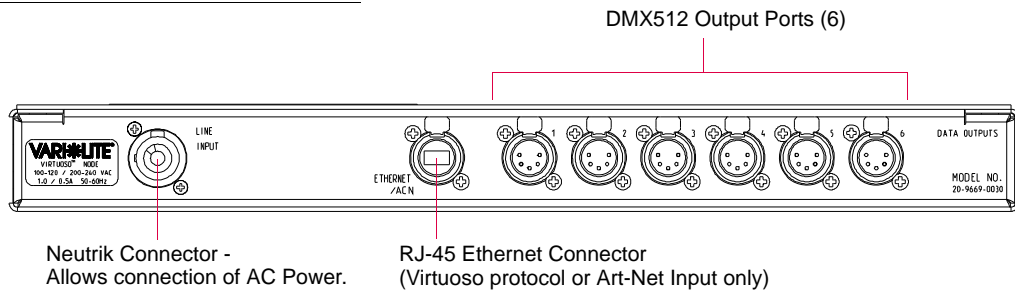


Figure 3: Controls and Indicators (Node 1)

INSTALLATION

System Options

Vx76

In the Vx76 configuration, one or two Vx76 control consoles may be connected to one or more PRG Node units.

Guidelines:

- + When connecting two Vx76 consoles and multiple PRG Node units, a 100Mb Ethernet switch or hub *must* be used. Standard CAT5e Ethernet cables should be used in this configuration. Refer to the illustration below.
- + The **Vx76 Mode** of operation is used in this configuration. Refer to "**Operating Modes**" on page 16.

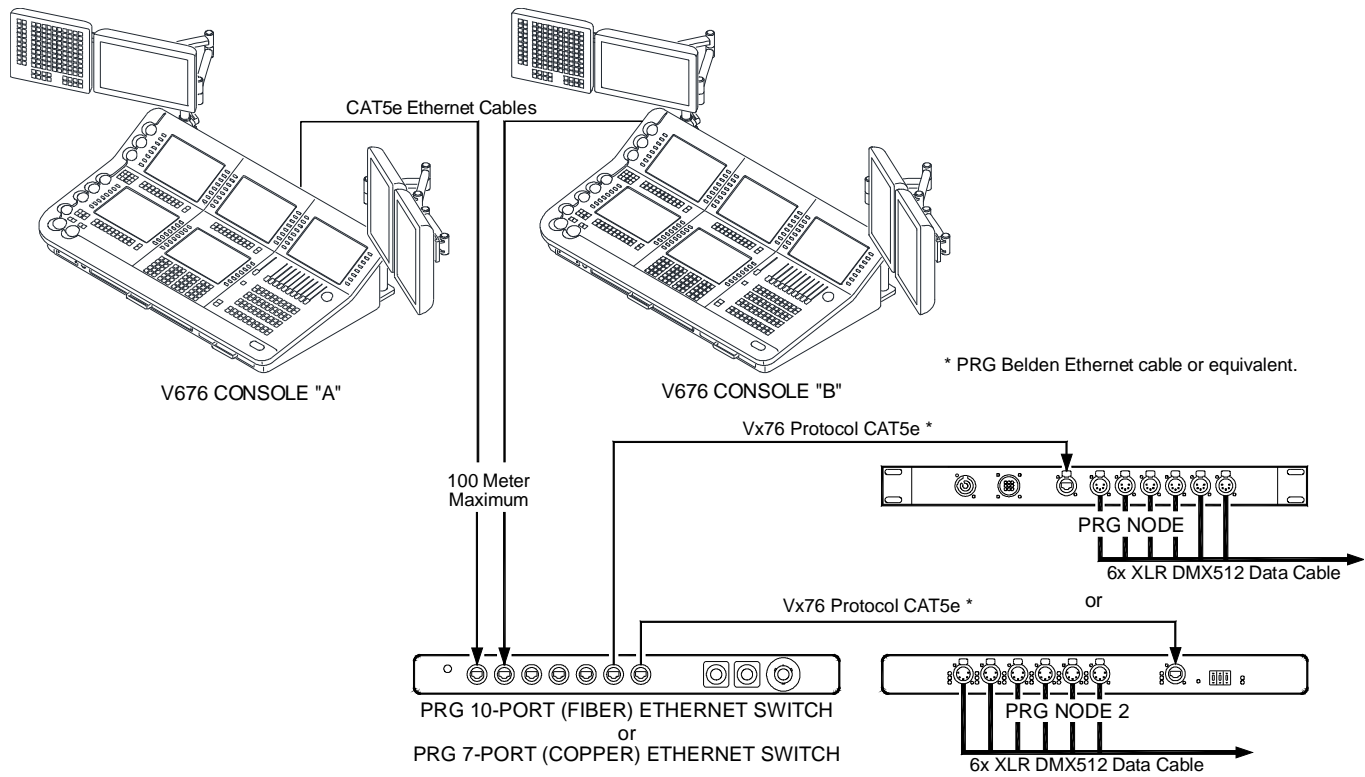


Figure 4: Vx76 Configuration Example

Virtuoso Standard Ethernet

In the Virtuoso Standard Ethernet configuration, one or two Virtuoso control consoles may be connected to one or more PRG Node units.

Guidelines:

- + When connecting one Virtuoso console and one PRG Node, an Ethernet Crossover cable (25.9651.0566) *must* be used instead of an Ethernet switch or hub.
- + When connecting two Virtuoso consoles and multiple PRG Nodes, a 100Mb Ethernet switch or hub *must* be used. Standard CAT5e Ethernet cables should be used in this configuration. Refer to the illustration below.
- + When used with Virtuoso consoles running software v4.3 and earlier, this configuration requires a programming jumper be set to the "Normal Ethernet" position (refer to "[Setting CIC Programming Jumper for Virtuoso Ethernet Operation](#)" on page 12).
- + The **Virtuoso Mode** of operation is used in this configuration. Refer to "[Operating Modes](#)" on page 16.

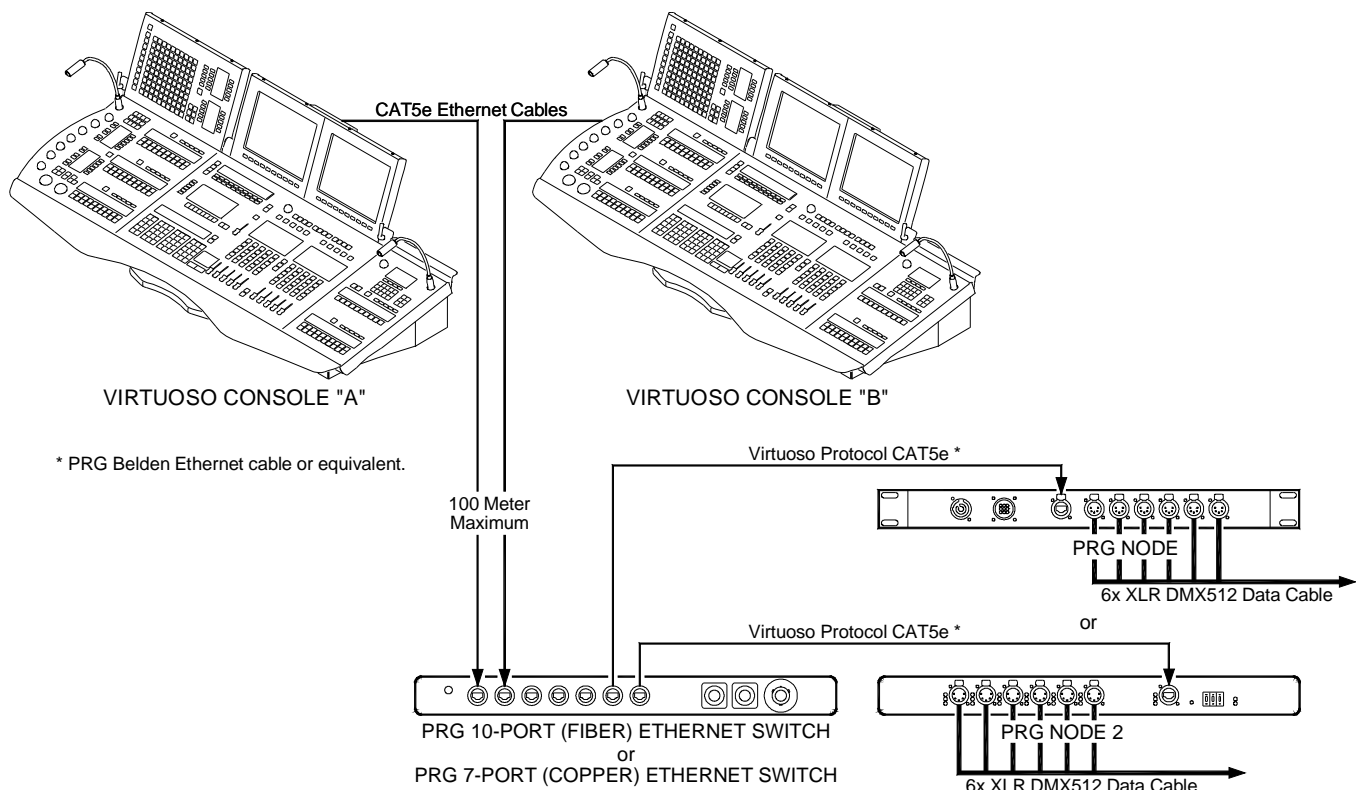


Figure 5: Virtuoso Standard Ethernet Configuration Example

Virtuoso NIF

In the Virtuoso NIF configuration, one or two Virtuoso control consoles may be connected to one or more PRG Node units through a NIF (Network Interface).

Guidelines:

- + When connecting one Virtuoso console/NIF and one PRG Node, an Ethernet Crossover cable (25.9651.0566) *must* be used instead of an Ethernet switch or hub.
- + When connecting two Virtuoso consoles/NIFs and up to three PRG Nodes, a 100Mb Ethernet switch or hub *must* be used. Standard CAT5e Ethernet cables should be used in this configuration. Refer to the illustration below.
- + The **Virtuoso Mode** of operation is used in this configuration. Refer to "**Operating Modes**" on page 16.

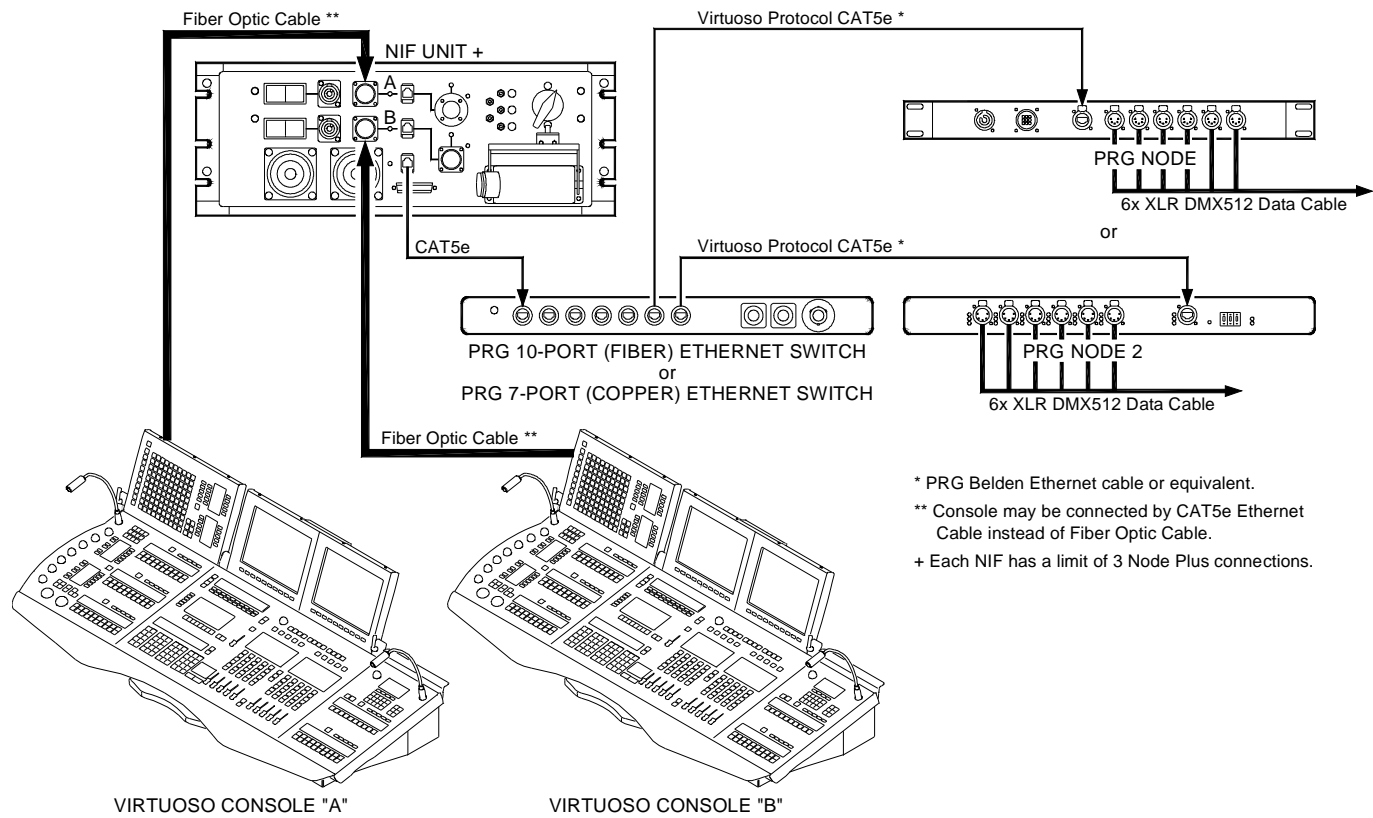


Figure 6: Virtuoso NIF Configuration Example

Art-Net (Series 400)

In the Series 400 (Art-Net) configuration, an Art-Net compatible control console may be connected to one or more PRG Node units.

Guidelines:

- + When connecting an Art-Net compatible console and multiple PRG Nodes, a 100Mb Ethernet switch or hub *must* be used. Standard CAT5e Ethernet cables should be used in this configuration. Refer to the illustration below.
- + The Art-Net (Series 400) Mode is used in this configuration. Refer to "Operating Modes" on page 16.

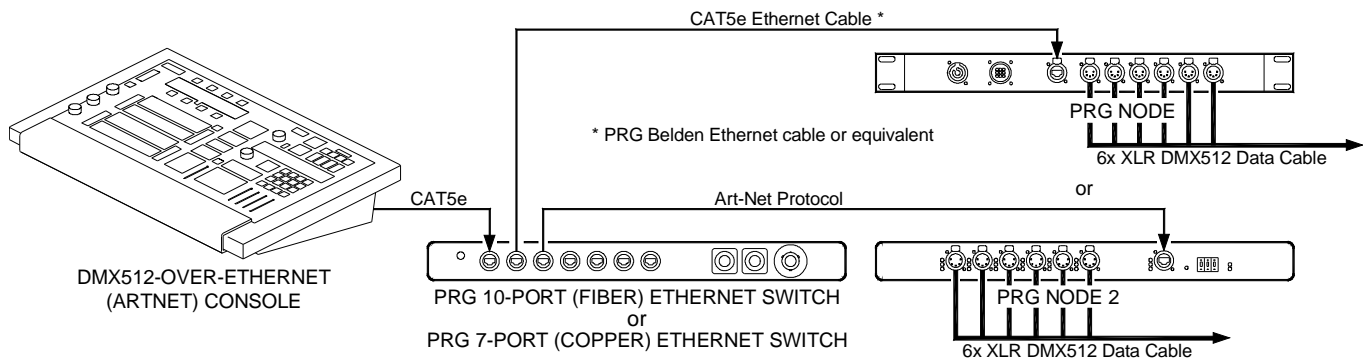


Figure 7: Series 400 (Art-Net) Configuration

AC Input

Connect the AC Line Cord power cable assembly to the rear panel Neutrik® PowerCon® connector.

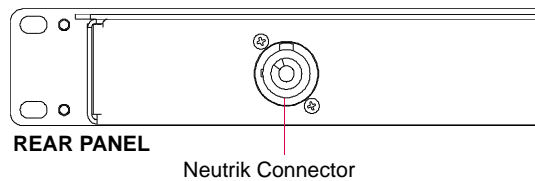


Figure 8: Connecting AC Input Cable

Power Up Procedure

To power up the PRG Node and set its address:

- Step 1. Using thumbwheel, set Node starting address. Ensure that addresses are unique among all Nodes in system.
- Step 2. Apply power:
 - a. For Node 1 models, apply power by setting power switch to On position.
 - b. For Node 2 models, once the AC input cable is connected and power is applied, the unit will receive power. (It does not have a power on/off switch.)

CONFIGURATION

Setting CIC Programming Jumper for Virtuoso Ethernet Operation

When using a PRG Node in the Standard Ethernet configuration, where the Virtuoso console is running software version 4.3 or earlier, a CIC programming jumper must be set for Ethernet system operation. (Refer to "Virtuoso Standard Ethernet" on page 9.)

To set programming jumper:

- Step 1. Open Virtuoso console lid.
- Step 2. At CIC board, install programming jumper at header J23 marked "NORMAL ETHERNET."
- Step 3. Repeat procedure for all consoles connected to the system.

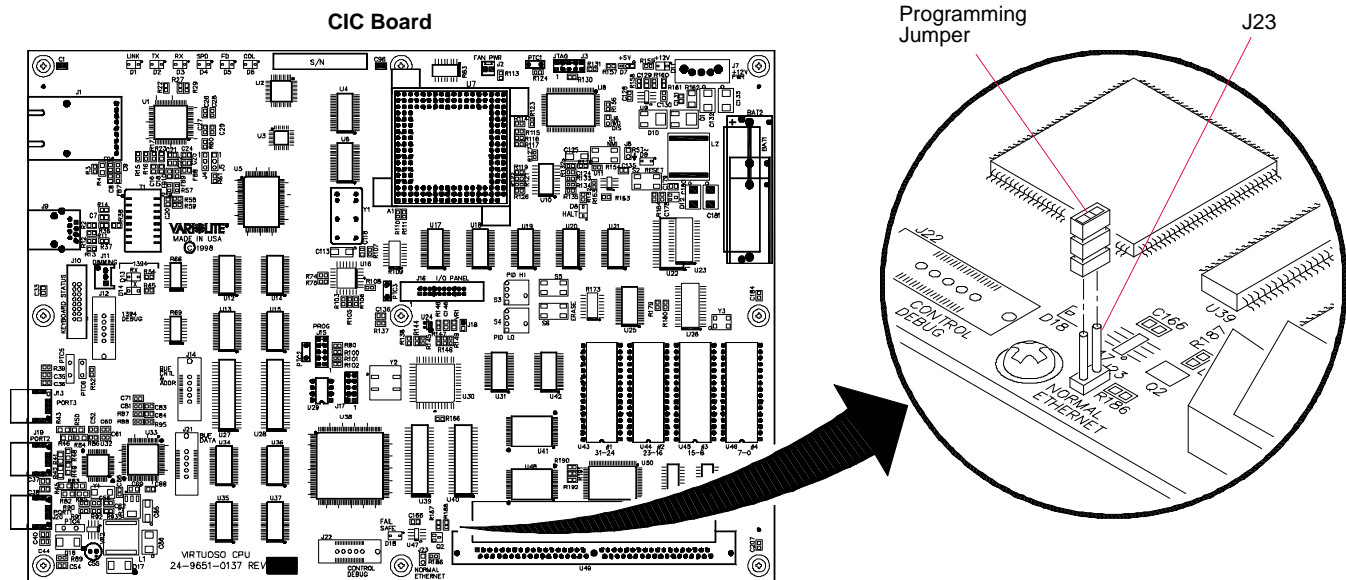


Figure 9: Installing CIC Programming Jumper (Only with Virtuoso v4.3 or Earlier)

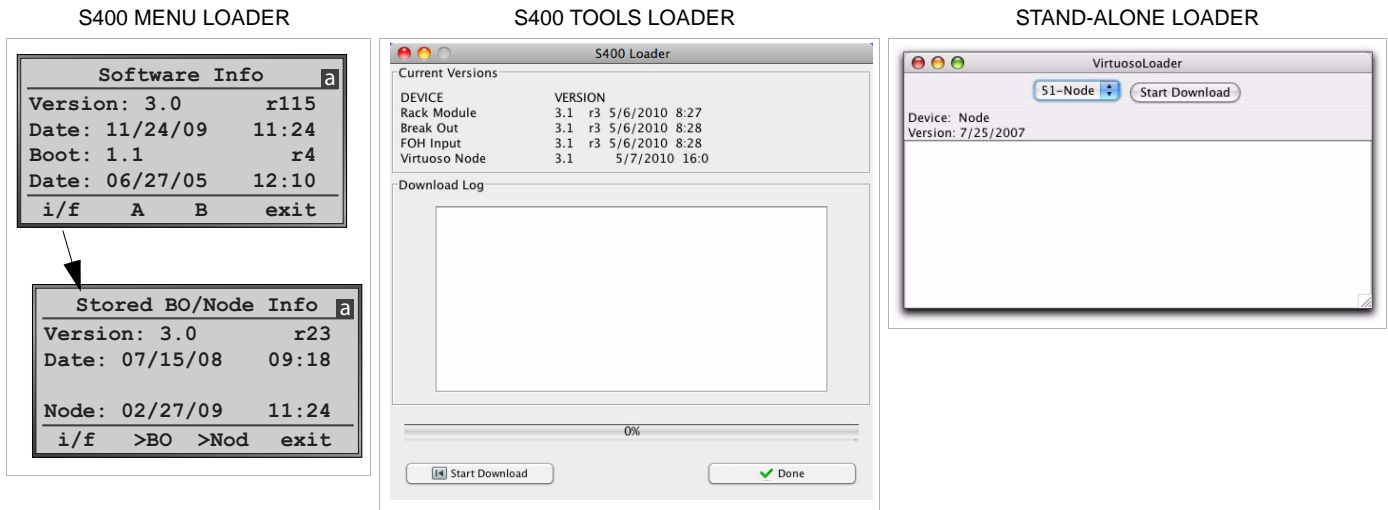
Software Initialization

The Node requires different software to run in each type of system/mode configuration.

The Virtuoso and Vx76 consoles will automatically update the Node software when it is connected to the system. However, when used with Art-Net, the Node software must be loaded with Series 400 software.

The Series 400 software should always be loaded in the shop. This can be accomplished by one of three methods:

- + Series 400 Menu Loader (Breaker Module). Refer to the Series 400 System User manual for instructions.
- + S400 Tools Application (S400Loader). Refer to the Series 400 Tools User manual for instructions.
- + Stand-Alone Loader (VirtuosoLoader). Refer to "[Stand-Alone Software Loader](#)" on page 17.



CAUTION! Since the Virtuoso and Vx76 systems will update the Node software automatically, be careful not to connect a Series 400 loaded Node to a console network or else the Series 400 software will be replaced!



Working Around Performance Limitations

The embedded processor in the Node has limitations with its buffering and communication processing, and often cannot keep up with modern computers that send data packets very close together.

In a Virtuoso or Vx76 system, the Node is doing all the calculations to generate DMX512 for the control channels patched to it. In cases where large numbers of fixtures generating intensity-based traffic - such as LEDs - are patched to the Node, the processing limitations will become evident during fast effects across many channels. A typical symptom would be effects not keeping up or continuing to run after being stopped on the console.

In an Art-Net system, the Node is receiving network DMX512 packets and outputting the information on the DMX ports. The limitation here is in the Node's limited available network packet buffering. If the network packets for consecutive Art-Net universes are spaced less than about 100 microseconds apart, the Node may drop some of the packets since they are being sent faster than the Node can receive and process them. A typical symptom would appear as temporary freezes in the DMX outputs. (Note that this is generally not a problem when the universes are input to the network by multiple sources.)

Suggestions:

- + Virtuoso/V676 Control Systems - The maximum number of control channels patched to a given Node should not exceed 250 where there are a large number of LED fixtures patched to the Node.
- + Art-Net Systems - Configure the Art-Net source to increase the time between consecutive network packets, or to interleave/alternate the universes in a different order. Most of the fast Art-Net devices allow adjustment of their Art-Net output timing, so this can help to resolve any problems.
- + Spread out the universes mapped to a single Node, since the Node can discard unneeded universes more quickly than processing mapped universes. For example, it is better to map every third universe to a Node instead of a string of six consecutive universes.
- + As a general rule, limit the maximum number of universes a Node must process to four (4).

CAUTION! Since there can be quite a bit of variation in Art-Net controllers, it is always a good idea to test the controller with all networking gear and Art-Net devices prior to a show situation!

Vx76/Virtuoso Console Setup

When using a PRG Node with a PRG Vx76 or Virtuoso console, the Node can be set up using the console's DMX Setup window.

- Step 1. At console, patch DMX fixtures and assign a DMX universe.
- Step 2. At **Setup** menu, select **DMX Setup**. (DMX Setup window will open.)
- Step 3. Select desired DMX universe.
- Step 4. Enter Node thumbwheel address in "Thumb" field and select Node output (1-6) in pop-up menu.
- Step 5. Click **Set** button to assign universe to selected Node output.
- Step 6. If patching sequential Nodes and outputs, pressing the [Return] button on the keyboard will auto increment the patch. If not sequential, repeat Steps 3 through 5.

Setup	Operation	Data
System Config		⌘K
Settings		
Calibrate Screen		
Ethernet & Front Panel		
Plan View		⌘B
Patch		⌘T
3D Location		
DMX Setup		
Log		⌘L
Media Setup		

DMX Universe (A-ZZ)
Must be assigned to a
DMX Host (Node, etc.)

DMX512 channel
assignments for
selected universe

Orange highlights
show DMX channel
range for selected
fixtures

Node Address

DMX Output of Node

Enable/Disable Patch Editing

Set Button -
Press to enter current settings
and advance to the next line

Troubleshooting

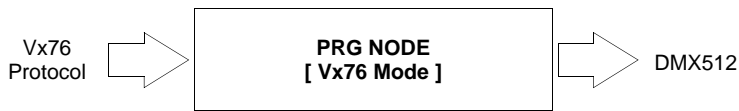
Symptom	Indication	Remedy
Node locks up during power up.	Ethernet Rx and Tx LEDs do not flash, no control of luminaires.	Turn power switch off and then back on.
Node online, but no control.	Appears in Virtuoso configuration window, but channels are not online.	Incorrect patch: verify Node address and that universes are set to 'Node' not 'Con' in DMX Setup window.

OPERATION

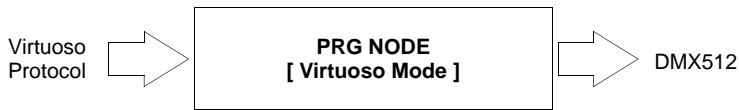
Operating Modes

The PRG Node unit operates in one of three modes: Vx76, Virtuoso, or Art-Net (Series 400). The mode will depend on the system setup.

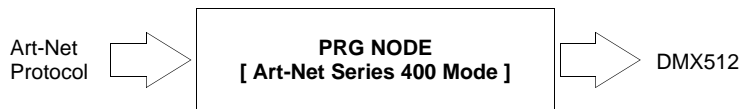
- + **Vx76 Mode** - In this mode, the unit will accept Vx76 protocol and generate DMX512 output.



- + **Virtuoso Mode** - In this mode, the unit will accept Virtuoso protocol and generate DMX512 output.



- + **Art-Net (Series 400) Mode** - In this mode, the unit will accept Art-Net protocol and convert it to DMX512. (When used with the Series 400 rack, the Node will follow the selected A, B, or C system.)



Art-Net (Series 400) Operation

A Node running Virtuoso software v5.5 or greater will also function as an Art-Net-to-DMX512 convertor. In this case, the thumbwheel switch determines the base Art-Net universe number, and the corresponding six Art-Net universes will be output on the DMX512 ports, if available. As a S400 input device, the Node also uses the current system to determine its output. For example, if the thumbwheel switch is set to 010 and the current system is A, DMX port 1 will output Art-Net universe 10a, port 2 universe 11a, etc.

The thumbwheel switch can be configured to allow the same universe to be outputted on multiple ports:

- + 0-255 = Six single universes (at the switch offset). Example: TW=2, DMX=2/3/4/5/6/7
- + 300-555 = Three pairs of universes at the switch offset - 300. Example: TW=308, DMX=8/8/9/9/10/10
- + 600-855 = Two triplets at switch offset - 600. Example: TW=621, DMX=21/21/21/22/22/22
- + 900-999 = All outputs for single universe at offset - 900. Example: TW=909, DMX = 9/9/9/9/9/9 (this only works for 100 universes).

CAUTION! The Node will disable any Art-Net output if it sees Vx76 or Virtuoso protocol on the network.

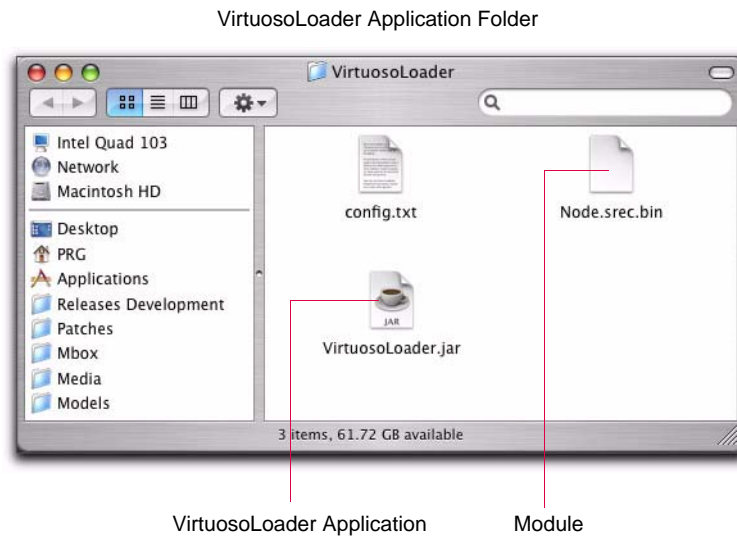
STAND-ALONE SOFTWARE LOADER

Overview

The Virtuoso and Vx76 consoles will automatically update the Node software when it is connected to the system. However, the stand-alone loader application (VirtuosoLoader) may be used in place of the console to update the Node. (The application works the same as the console's update software feature in the Version Info window.)

When used with Art-Net, the Node software must be loaded with Series 400 software. This can be done using the VirtuosoLoader.

The VirtuosoLoader application will update the connected devices according to the software update *.bin module(s) contained within its folder. For example, the "Node.srec.bin" module as shown below:



Using the VirtuosoLoader Application

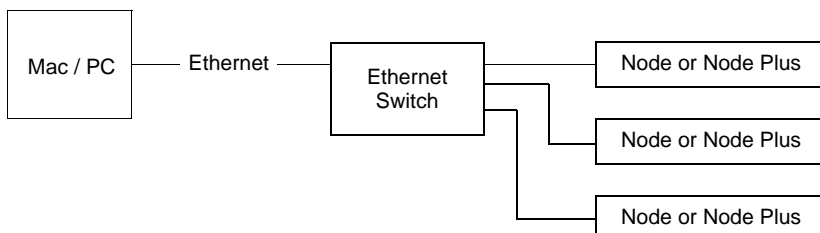
The VirtuosoLoader application will run on any Windows® or Macintosh® computer. However, it may be necessary to install Java Runtime if the jar file does not run on your computer. It is available from www.java.com.

Step 1. Connect computer to devices using one of the following methods:

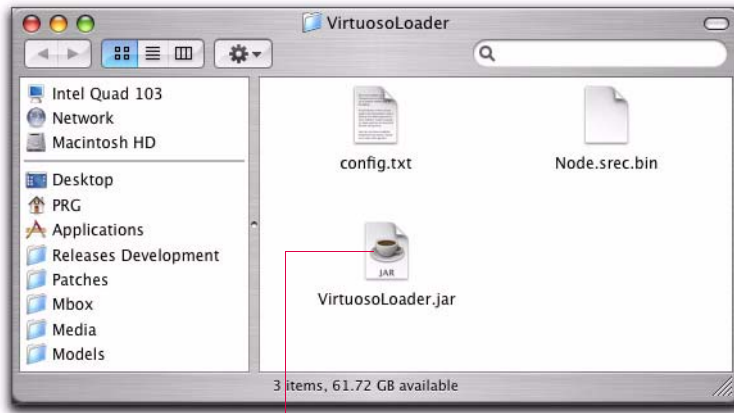
SINGLE DEVICE



MULTIPLE DEVICES

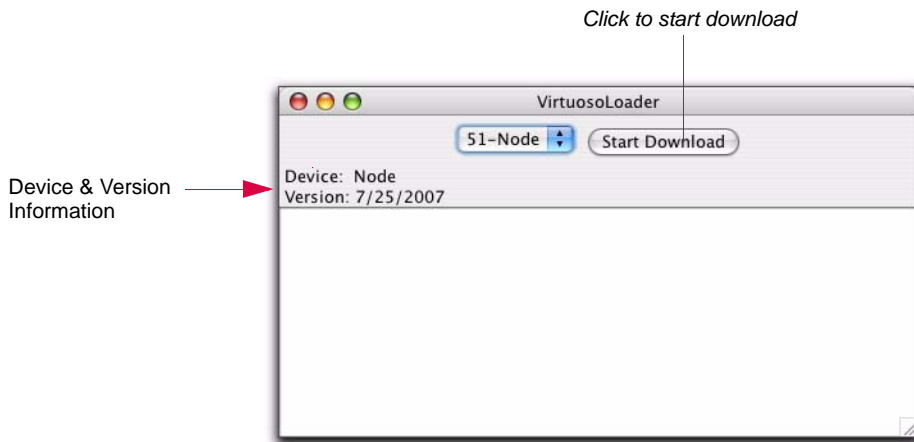


- Step 2. Download or copy the VirtuosoLoader application folder to your computer.
- Step 3. Open VirtuosoLoader folder and double-click "VirtuosoLoader.jar" file. (This is a stand-alone Java application.)



VirtuosoLoader Application

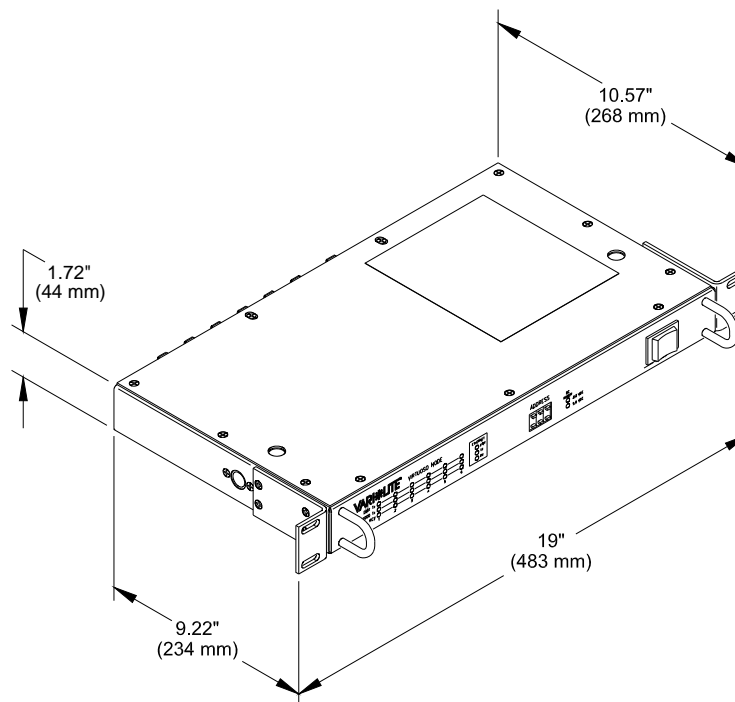
- Step 4. Click **Start Download** button. The module will update all connected devices.



SPECIFICATIONS

Technical Specifications

POWER REQUIREMENT:	90-265VAC, 50/60Hz.
CURRENT DRAW:	Approximately 15 watts, dependent on line voltage.
COOLING:	Convection.
OPERATING TEMP:	-20C to 50C
INPUT:	One control signal input which is fed from a console providing either Virtuoso or DMX-over-Ethernet (Art-Net) protocol.
OUTPUT:	Six (non-isolated) standard DMX512 serial outputs, each carrying one DMX512 universe.
HOUSING:	Standard 1U 19" rack mount chassis.
WEIGHT:	4.5 lbs (2.04 kg)





Notes



PRG Node User Manual

Version as of: October 19, 2011

PRG part number: 02.9669.0001 E



Production Resource Group
Dallas Office
8617 Ambassador Row, Suite 120
Dallas, Texas 75247
www.prg.com