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HYDRA NODE™

USER MANUAL

Hydra Node™ User Manual
Version as of: August 22, 2024

Production Resource Group
Dallas Office
3110 Roy Orr Blvd, Suite 200
Grand Prairie, Texas 75050
www.prg.com

FOREWORD

Warranty/Repairs

PRG warrants its products for 1 year from the date of shipment, unless otherwise noted on the face hereof in accordance with the following:

1) PRG warrants its products against defects in workmanship and materials, under normal use, for a period of one year from the time of delivery to the Customer. During this period, if any product is found to be defective or fails to operate in accordance with PRG's published specifications for the product in effect as of the date of shipment, PRG will repair or replace the product, subject to the terms of this limited warranty. The warranty will be null and void under the following conditions: (a) improper or inadequate maintenance; (b) unauthorized modifications or misuse; (c) operations outside of environmental specifications for the product.

2) This Warranty does not cover any product or product part damaged by or subject to accident, negligence, alteration, abuse or misuse, or any accessories or parts not supplied by PRG. This Warranty shall not apply to any damage to any product, or product part caused by or due to an act of God, any catastrophe resulting from earthquake, fire, flood, explosion or any other cause beyond the control of PRG. This warranty does not cover "consumable" parts such as fuses, lamps, color media or components which may be warranted directly to the Customer by the original manufacturer. PRG's warranty does not extend to items not manufactured by PRG. Freight terms on warranty repairs are FOB PRG factory in Dallas Texas or other PRG designated repair facility. Collect shipments or freight allowances will not be accepted.

3) PRG's sole responsibility under this warranty shall be to repair or replace at PRG's option such parts as shall be determined to be defective on PRG's inspection. Such repairs may be performed with re-worked or refurbished parts. PRG will not assume any responsibility for any labor expended or materials used to repair any equipment without PRG's prior written authorization. NO OTHER WARRANTY, EXPRESS OR IMPLIED, APPLIES TO THE PRODUCT, INCLUDING BUT NOT LIMITED TO WARRANTY OF QUALITY, FITNESS FOR A PARTICULAR PURPOSE OR MERCHANTABILITY. PRG SHALL NOT BE RESPONSIBLE FOR ANY INCIDENTAL, SPECIAL, GENERAL OR CONSEQUENTIAL DAMAGES, DAMAGES TO PROPERTY, DAMAGES FOR LOSS OF USE, TIME, PROFITS OR INCOME, OR ANY OTHER DAMAGES.

4) The Customer's obligations during the warranty period under this warranty are to notify PRG of any suspected defect and to return the goods prepaid to PRG at PRG's depot in Dallas, Texas or authorized service center. In the event the defect is not covered under the warranty, as determined by PRG at its reasonable discretion, PRG will charge for the parts, materials and labor at rates as in effect from time to time.

5) (a) THIS WARRANTY IS CONTINGENT ON THE CUSTOMER'S FULL AND TIMELY COMPLIANCE WITH THE TERMS OF USE AND PAYMENT SET FORTH HEREIN.

   (b) This written warranty is intended as a complete and exclusive statement of the terms thereof. Prior dealings or trade usage shall not be relevant to modify, explain or vary this warranty.

   (c) To obtain warranty service contact PRG at 214-819-3100, DallasService@prg.com, or via mail at Production Resource Group, 3110 Roy Orr Blvd, Suite 200, Grand Prairie, Texas 75050.

6) For sales outside of North America, the relevant PRG repair location shall be listed on the face of your invoice.

Important Safety Instructions

+ Read these instructions.
+ Keep these instructions.
+ Heed all warnings.
+ Follow all instructions.
+ Do not use this apparatus near water.
+ Clean only with dry cloth.
+ Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
+ Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
+ Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.
+ Unplug this apparatus during lightning storms or when unused for long periods of time.
+ 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.
+ In Europe: The building installation shall be regarded as providing protection in accordance with the rating of the wall socket outlet.
+ In Finland: Laite on liitettävä suojamaadoituskoskettimilla varustettuun pistorasiaan.
+ In Norway: Apparatet må tilkoples jordet stikkontakt.
+ In Sweden: Apparaten skall anslutas till jordat uttag.
+ Minimum distances around the apparatus for sufficient ventilation shall be 1" (2.54cm) on the left and right sides where the air inlet and outlet are located.
+ The ventilation should not be impeded by covering the ventilation openings with items.
+ No naked flame sources should be placed on the apparatus.
+ Apparatus for use in tropical climates.
+ The apparatus shall not be exposed to dripping or splashing. No objects filled with liquids, such as vases, shall be placed on the apparatus.

Revision History

This manual has been revised as follows:

Version	Release Date	Notes
BASIC	August 22, 2024	Initial Release

TABLE OF CONTENTS

INTRODUCTION

About This Manual

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

+ Hydra Node™

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

Additional Documentation

For more information about PRG systems, refer to the following manuals:

+ PRG Lighting Systems Networking Guide (02.3004.1000.0)

For more information about DMX512 and sACN protocols, refer to the following documents available from the American National Standards Institute (ANSI) at www.ansi.org

+ ANSI E1.11 - 2008 (R2013): Entertainment Technology - USITT DMX512-A, Asynchronous Serial Digital Data Transmission Standard for Controlling Lighting Equipment and Accessories
+ ANSI E1.31 - 2009: Entertainment Technology - Lightweight streaming protocol for transport of DMX512 using sACN

The above documents are also available in electronic format free for PLASA members at www.plasa.org

For more information about Art-Net, refer to the following document available from Artistic License Engineering at www.artisticlicence.com:

+ Specification for the Art-Net Ethernet Protocol

Customer Service

For technical assistance, contact your nearest PRG office. Contact information for all PRG offices can be found on our website at: www.prg.com

PRG Dallas (International Service)

3110 Roy Orr Blvd. Suite 200
Grand Prairie, TX 75050 USA
Phone: 214.260.1295
Service Email: s400service@prg.com

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

DESCRIPTION

Overview

The Hydra Node™ from PRG is a powerful and convenient DMX Node that converts sACN or Art-Net to DMX512-A control signals. It can be used as an interface between lighting control consoles, media servers, and other lighting control equipment. The unit, built for the most demanding and critical of show systems, accepts up to 700 total universes of sACN protocol or 80 universes of Art-Net protocol. The Hydra Node has twenty four XLR5 connectors for DMX512-A output/input on the front and three CPC24 connectors for 8-way DMX Snake connections on the rear.

The Hydra Node unit by default will function with minimal configuration. The node will convert sACN or Art-Net to DMX512-A and output data according to how the ports are configured. The node requires no complicated network settings which allows for rapid and pain-free deployment.

The Hydra Node also has advanced configuration settings that can be fully customized for even the most demanding of systems. Settings such as IP address, Subnet Mask, DMX Input/Output, HTP or LTP Merging, and DMX Refresh Rate can all be configured locally via the local touchscreen display or remotely through PRG's S400 ToolsFX software.

The Hydra Node includes a touchscreen display for configuring the unit and checking system status. The menu system is easily navigated, allowing configuration of the Node IP address, configuration of DMX512-A outputs/inputs, real-time monitoring of DMX512-A data on each output, and display of network error information.

Features:

+ Accepts up to 700 universes of sACN (e1.31).
+ Accepts up to 80 universes of Art-Net.
+ RDM compatible.
+ Simple network configuration with optional advanced features.
+ Powerful merging options (HTP or LTP).
+ Two (2) Ethernet input ports supporting Art-Net and/or sACN sources.
+ Twenty four (24) DMX512-A output ports supporting one (1) DMX512-A universe each.
+ All DMX512-A output ports can be used as DMX input ports (must use a XLR5 M-M turnaround).
+ Three (3) CPC (Amphenol CPC24F) multi-pin DMX512-A output/input, mirrored from front panel connectors.
+ LEDs indicating status for all ports.
+ Configurable via local Touchscreen Display or PRG's S400 ToolsFX application.
+ Standard 3U 19" rack mount chassis.
+ Power on/off button mounted on front panel.
+ Neutrik® TRUE1 connector in/thru.
+ 100 to 240 VAC, 47 to 63 Hz operation.

Controls and Indicators

The Hydra Node contains the following components:

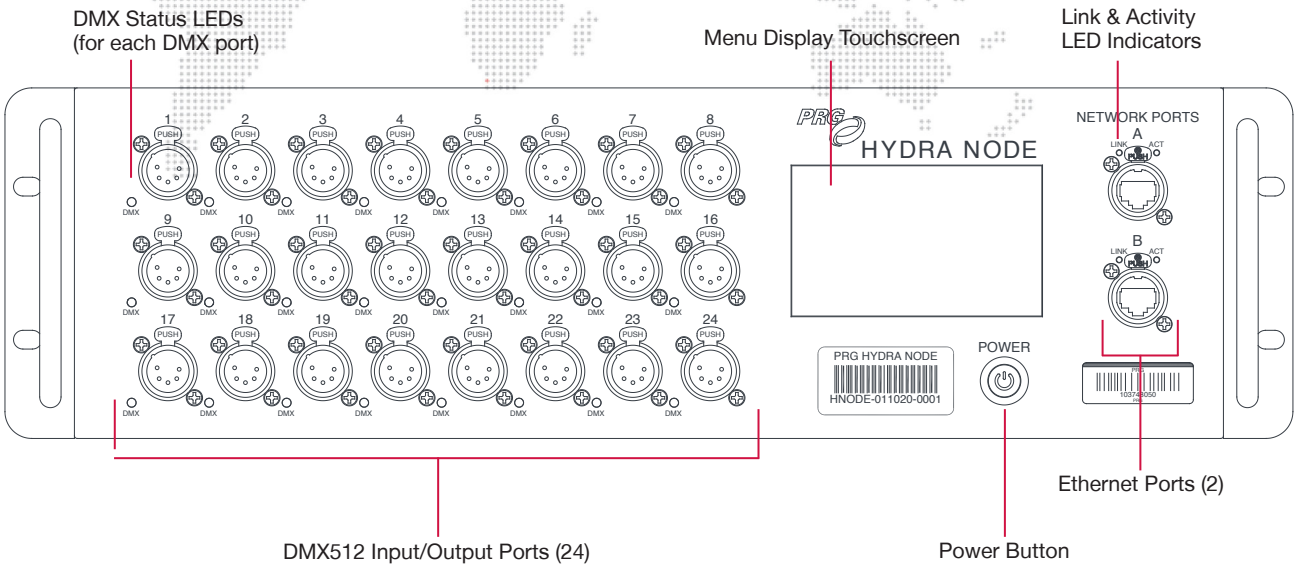


Figure 1: Controls and Indicators - Front Panel

Note: The Hydra Node's two Ethernet ports are internally switched. The device must be powered on for data to be passed through the Ethernet ports.

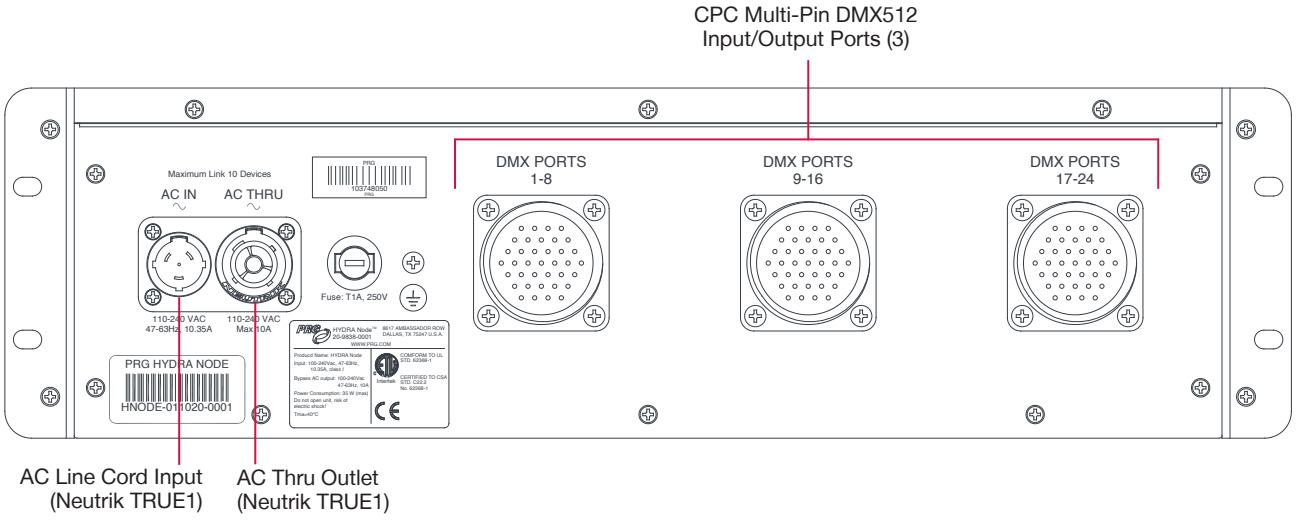


Figure 2: Controls and Indicators - Rear Panel

Note: CPC Ports on the rear panel are substitutes for standard DMX ports on the front panel, not additional universes. Ports with the same number (e.g. DMX Port 1 and Channel 1 of CPC Port 1-8) must not be used simultaneously. Optional CPC24 to CPC14 splitters are available upon request.

INSTALLATION

AC Input/Thru

At rear panel, connect the AC Line Cord Power Cable to the AC IN outlet.

The AC THRU outlet may be used to tap power for additional Hydra Nodes using the included TRUE1 Jumper Cable. (Do not exceed the 10A maximum total input current to the device.)

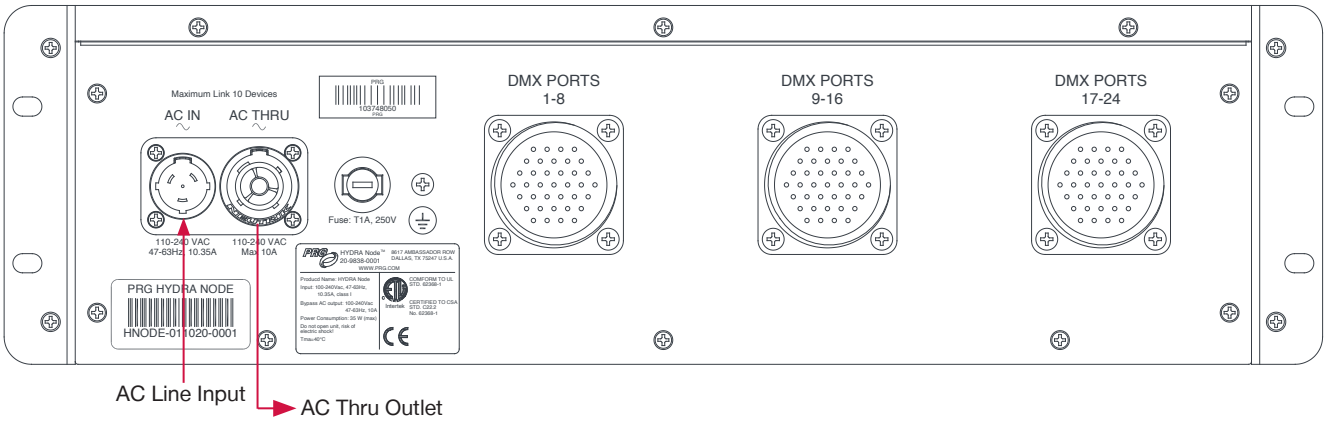


Figure 3: Connecting AC Input and Thru Cables

Power Up Procedure

To power up the Hydra Node:

Step 1. Connect AC input cable on the rear panel.

Step 2. Toggle the power on/off button mounted on the front panel.

MENU CONTROLS

Using the Menu Display

The Hydra Node includes a menu system for configuring the unit and checking system status. The menu system can be navigated using the touchscreen display available on the front of the unit.

General Screen layout:

+ Title Bar - provides current screen title and node label.
+ Status and Controls - provides system status information and controls for configuring the node.
+ Back Button - provides navigation control.
  - Pressing the Back button will return to the previous screen.

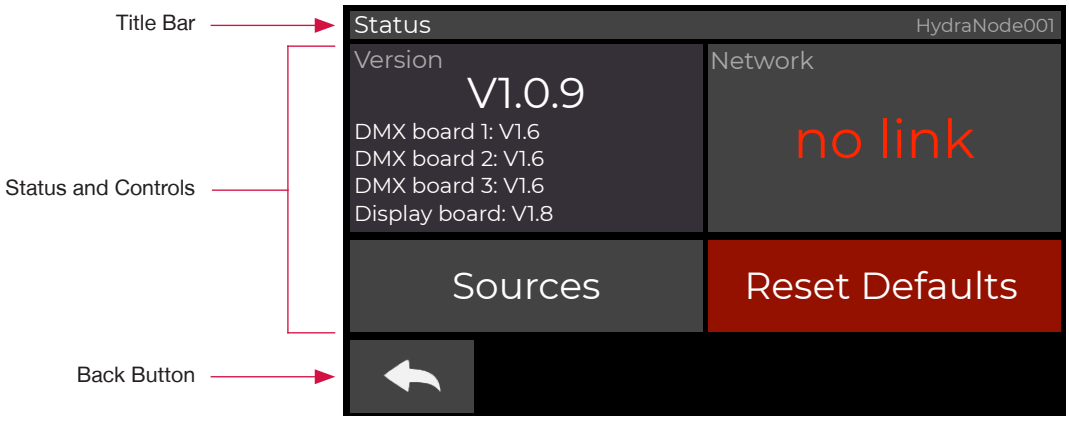


Figure 4: Menu Display Layout

Alpha and Numeric keypads provide a method for configuring the node:

Keypad Alpha:

Keypad Numeric:

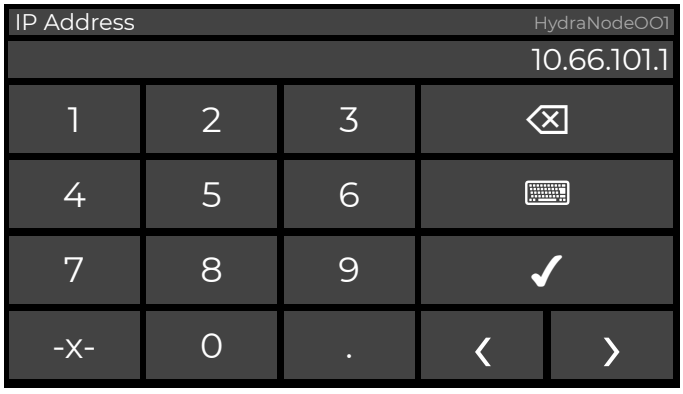


Figure 5: Alpha and Numeric Keypads

Refer to the following sections for information about each of the menu screens.

Home

When the Hydra Node is powered on, it will open by default to the home menu.

From here, users can navigate to the main configuration displays:

+ **Configuration:** Set Global Port and Networking Options
+ **Status:** View Firmware Version and Network Status
+ **Port Monitor:** Configure a single port's options and view DMX universe channel values

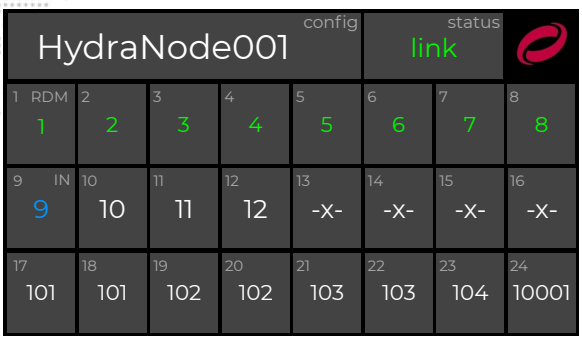
The Port Status Display shows the connectivity status of each DMX port. The color of the port's label will adapt based on the following system:

+ **Green:** The port is set to output and is transmitting data.
+ **Blue:** The port is set to input and is receiving data.
+ **White:** The port is not transmitting or receiving data.
+ **-x-:** The port has not been assigned to a DMX universe.

The DMX Status LEDs on the Node's front panel show the function status of each DMX port. The color of the port's LED will adapt based on the following system:

+ **Green:** The port is set to output and is transmitting data.
+ **Blue:** The port is set to input and is receiving data.
+ **White:** The port has RDM enabled.
+ **Red:** The port has an error.
+ **Off:** The port is inactive.

Home:



Network Configuration

Press “config” on the Home display to enter the Network Configuration menu. Use the menus below to adjust Network options or enter the Global Port Configuration menu.

IP Address

+ Press “IP Address” to set the node’s address using the numeric keypad.
+ Select the check mark to finish setting the node’s address.

Subnet Mask

+ Press “Subnet Mask” to set the node’s subnet mask using one of three options.

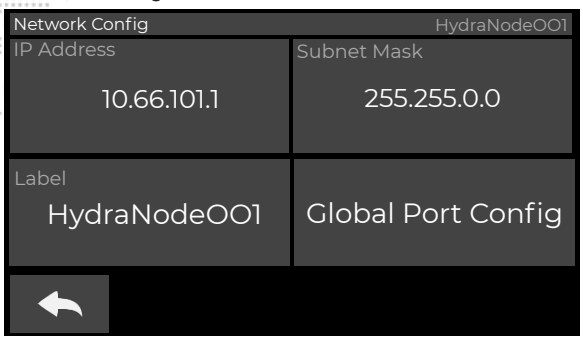
Node Label

+ Press “label” to set a name for your Hydra Node. This name will be visible at the top of your node’s display and on networked devices.
+ Select the check mark to finish setting the node’s label.

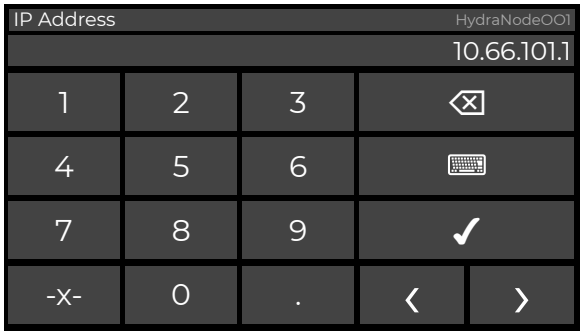
Global Port Config

+ Press “Global Port Config” to enter the Global Port Configuration menu and:
  - Format alpha/numeric universe display.
  - Set DMX merge priority.
  - Set DMX output rate.
  - Enable/Disable RDM control.

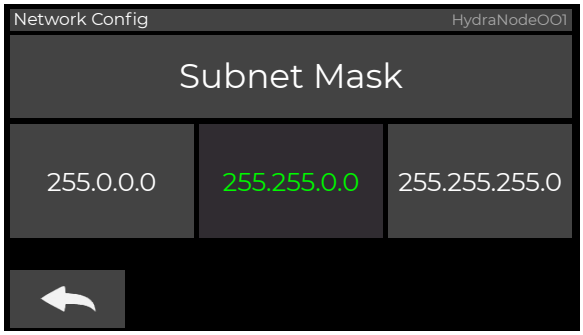
Network Configuration:



IP Address:



Subnet Mask:



Label:

Global Port Configuration

Use the menus below to globally configure options for all 24 ports on your Hydra Node. Select the check mark to finish and confirm.

Universe Format

+ Press “universe format” to set the node’s format option when displaying DMX universe labels.
  - **Numeric:** 1, 2, 3...
  - **Alpha:** A, B, C...

Rate

+ Press “rate” to set the node’s DMX output rate.
  - Select “no change” to retain the current settings, either set globally or at each port.
  - In Pixel Sync mode, all 24 ports output new data in the same DMX frame. This is optimized for syncing static pixel products but can affect the performance of automated fixtures. Set the frame rate to a fixed speed option if lag or steppy-ness occurs.

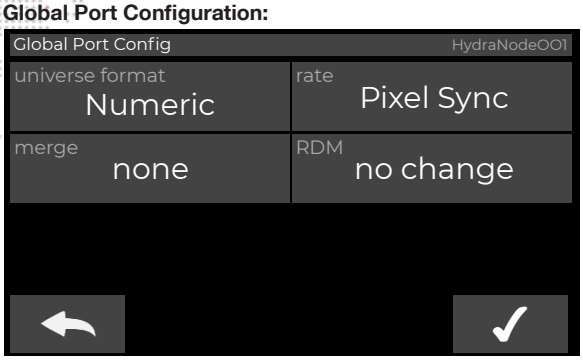
Merge

+ Press “merge” to set the node’s priority option when receiving DMX information from multiple sources.
  - **HTP, “Highest Takes Precedence”:** The node will prioritize the largest value received for any given DMX Channel.
  - **LTP, “Latest Takes Precedence”:** The node will prioritize the most recent value received for any given DMX Channel.
  - **None:** The node will not merge DMX values.
+ Please note that the Hydra Node observes sACN priority levels and will only merge data with matching priorities.
+ The Hydra Node will merge a maximum of 4 incoming sources.

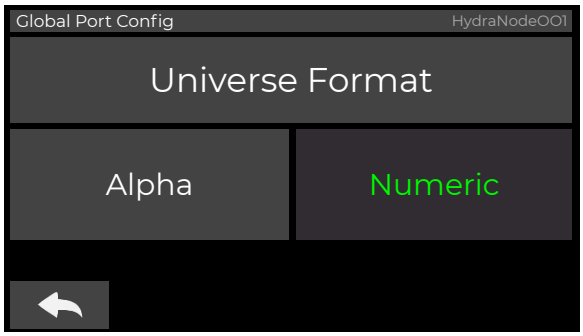
RDM

+ Press “RDM” to enable or disable RDM control from the node.
  - Select “no change” to retain the current settings, either set globally or at each port.

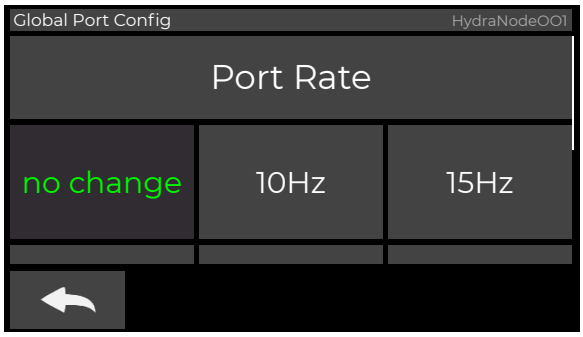
Global Port Configuration:



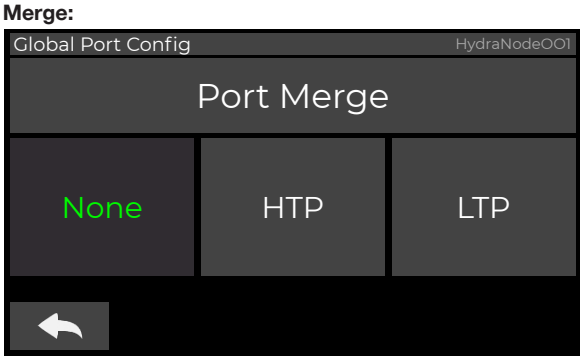
Universe Format:



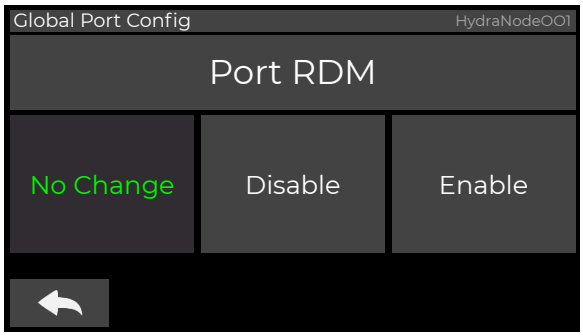
Rate:



Merge:



RDM:



Status

Press “status” on the Home display to enter the node’s Status display. Use the menus below to view the node’s firmware versions and network status.

This display is also used to reset the node to its default settings.

Network Status

+ View the status of your node’s connectivity:
  - **“link”:** Your device has a successful connection to other devices on your network.
  - **“no link”:** Your device is not connected to any other devices on your network.
+ Press “Network” to view the following information regarding your device’s network:
  - **Configurable:** IP Address, Subnet Mask, Label
  - **Native:** MAC Address, RDM UID
+ Configurable information must be edited in the Network Configuration menu.

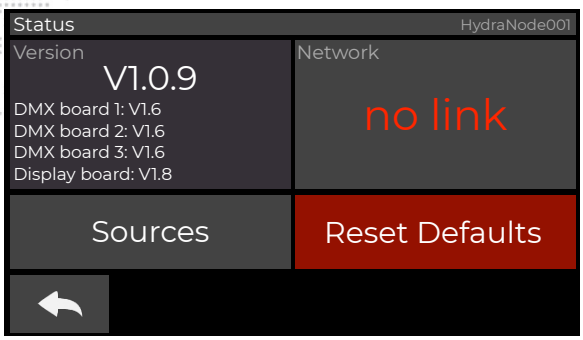
Sources

+ Press “Sources” to view the following information about devices connected on your network:
  - **Universe:** View each DMX universe in which your node is receiving or transmitting data.
  - **Source:** View the IP Address of the device receiving or transmitting data in that universe.
  - **Type:** View whether the data in that universe is traveling over sACN or Art-Net.
  - **Direction:** View if the data in that universe is being input to or output from your node.

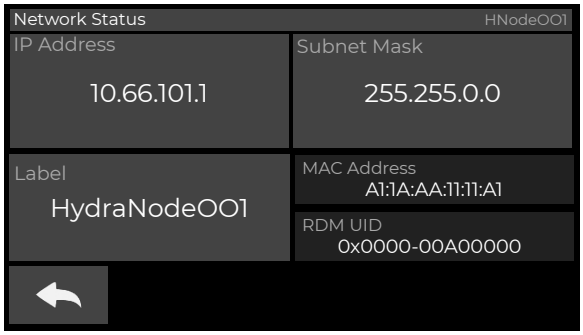
Reset Defaults

+ Press “Reset Defaults” to confirm and restore all default settings on your Hydra Node

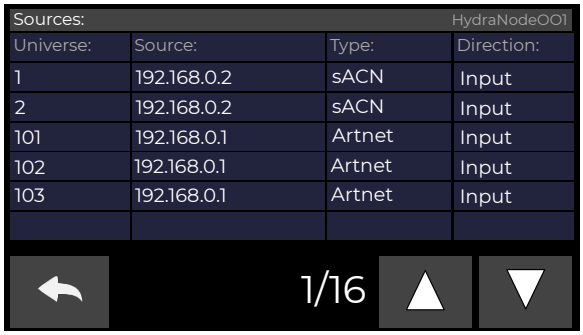
Status:



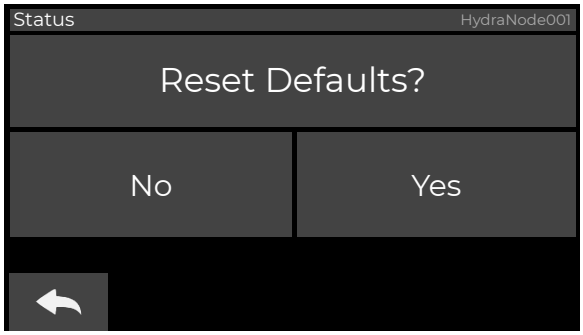
Network Status:



Sources:



Reset Defaults:

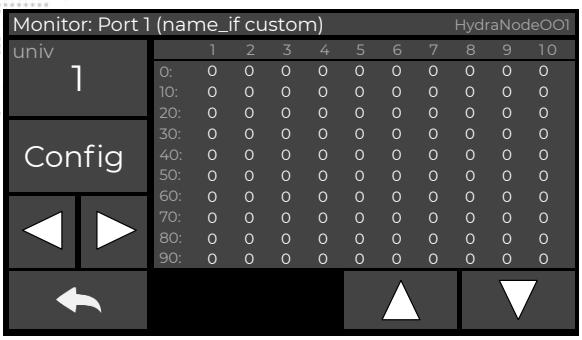


Port Monitor

Press on any of the Universe labels on the Home display to enter that port's monitor display.

Use the Left/Right arrows the page through each of the 24 ports on your node.

Port Monitor:



Universe Label

+ View the Universe to which the port is configured.

DMX Matrix

+ View the DMX values being transmitted or received over all 512 channels in the universe.
  - Values will read as "-x-" if the port is not successfully receiving or transmitting in its configured universe.
+ Use the Up/Down arrows to page to higher/lower DMX channels, respectively.

Port Configuration

+ Press "Config" to enter the Port's Configuration menu and:
  - Set the port to Input/Output.
  - Configure the port to a specific DMX universe.
  - Label the port.
  - Set DMX output rate.
  - Enable/Disable RDM control.

Port Configuration

Use the menus below to configure options for the selected DMX port on your Hydra Node.

Use the arrows to page through each of the 24 ports on your node.

DMX Direction

+ Press “direction” to set the port’s direction as:
  - **Input:** The node will receive DMX information through the selected port.
  - **Output:** The node will transmit DMX information through the selected port.

Universe

+ Press “universe” to configure the port to a specific DMX universe using the numeric keypad.
+ Select the check mark to finish configuring the port’s universe.

Port Name

+ Press “port name” to assign a custom label to the port. The label will display in the Title Bar of the port’s monitor display
+ Select the check mark to finish configuring the port’s label.

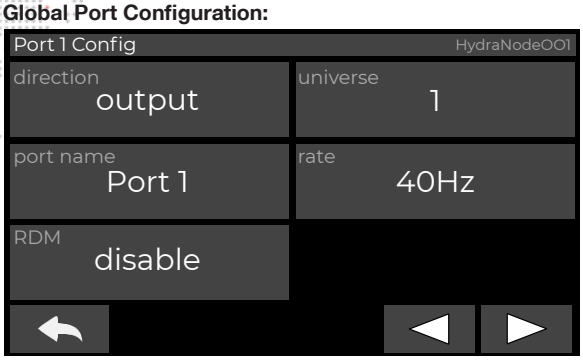
Rate

+ Press “rate” to set the port’s DMX output rate.
  - In Pixel Sync mode, all 24 ports output new data in the same DMX frame. This is optimized for syncing static pixel products but can affect the performance of automated fixtures. Set the frame rate to a fixed speed option if lag or steppy-ness occurs.

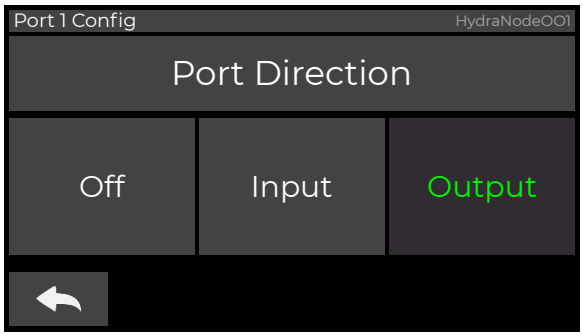
RDM

+ Press “RDM” to enable or disable RDM control from the port.

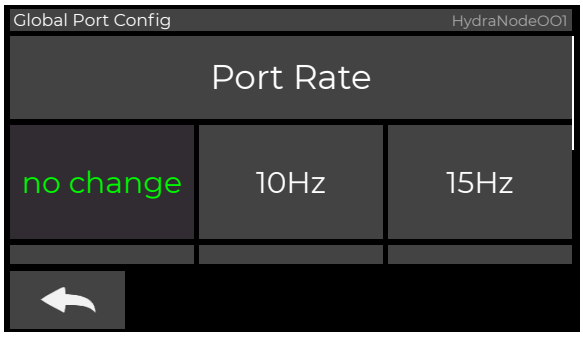
Global Port Configuration:



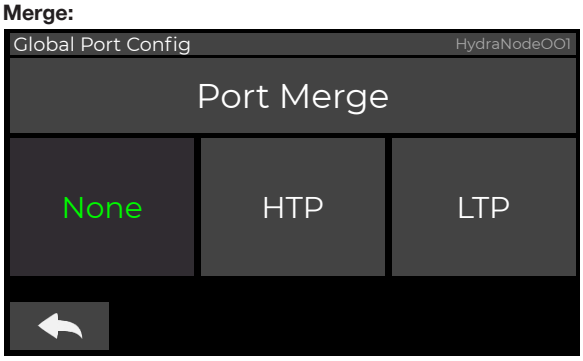
Port Direction:



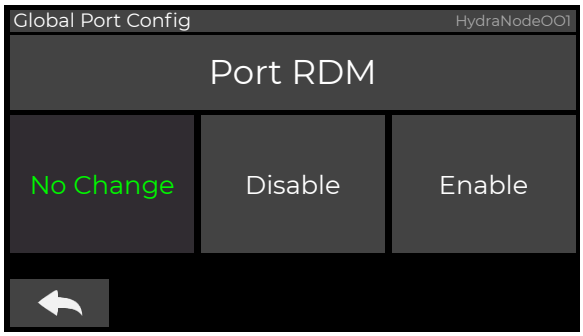
Rate:



Merge:



RDM:



UPDATING SOFTWARE

Instructions

Warning: Updating Hydra Node software requires resetting defaults on the node. Ensure configuration is documented if updating a device actively being used on show site.

Note: Hydra Node should be disconnected from network data and connected directly to the computer running S400 Tools when updating software.

Step 1. Connect an Ethernet cable between the Hydra Node and computer running S400 Tools. Ensure both the computer and node IP addresses are set in the 10.66.x.x range with a subnet mask of 255.255.0.0.

Step 2. Open S400 Tools and open the Configuration window.

Step 3. The connected Hydra Node will be displayed. Confirm the current software version. If Status Coloring is enabled, the device name will be colored yellow if the software needs to be updated; see Figure 6.

Step 4. Turn on Enable Edit.

Step 5. Right-click on the device name and select Update SW; see Figure 7.

Step 6. Click OK in the confirmation window.

Step 7. The software will be uploaded to the Node. It can take 2-3 minutes for the Node to acknowledge the update and begin updating. The Node will disappear from the configuration screen during this time. Do not touch the screen on the Node during this time.

Note: The Hydra Node updates the DMX boards one at a time followed by the Display board. Allow all four updates to complete before attempting to configure the Node.

Step 8. Once the update is complete, reset the Node to defaults locally in the Status screen.

Step 9. Power cycle the Node. It is then ready to be configured.

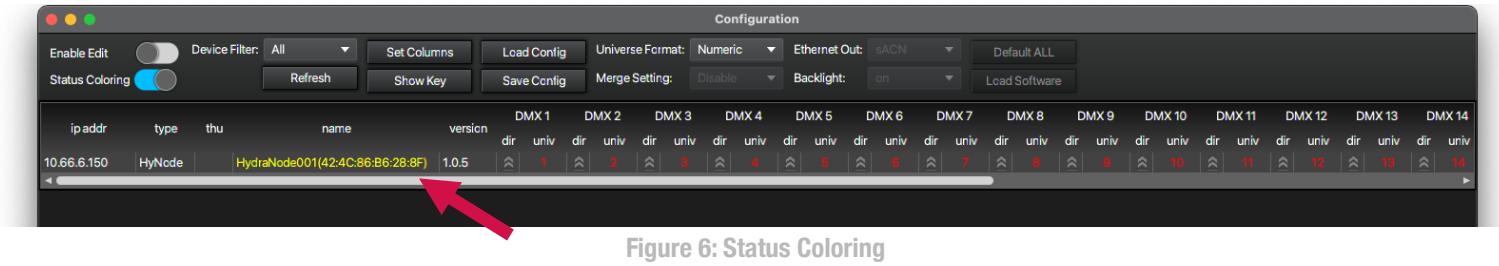


Figure 6: Status Coloring

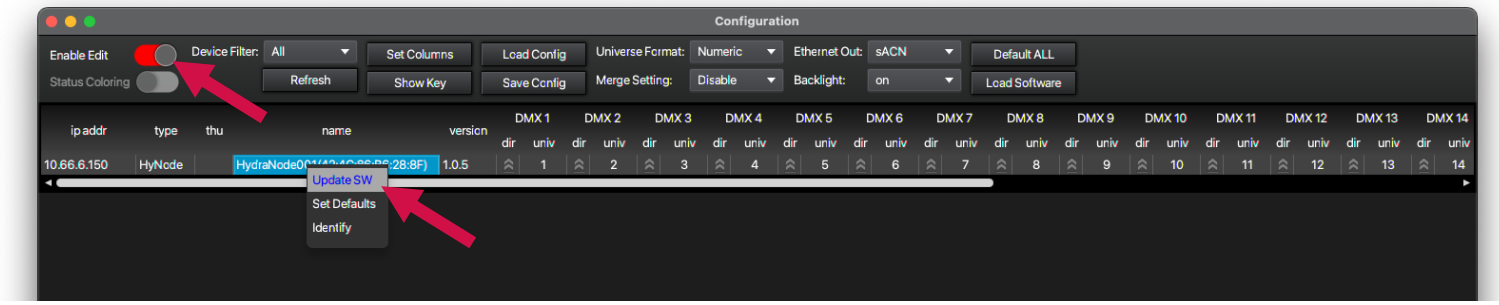


Figure 7: Enable Edit and Update SW

SPECIFICATIONS

Technical Specifications

Power Requirement:	100 to 240 VAC, 47 to 63 Hz Operation, 10.25A, 35W max.
Cooling:	Forced air with ultra-quiet chassis fan
Input/Output:	Two DMX-over-Ethernet ports carrying up to 700 universes over sACN or 80 universes over Art-Net.
	Twenty-four standard DMX512-A serial input/outputs, each carrying one DMX512-A universe.
	Three CPC Multi-Pin DMX512-A input/outputs, mirroring front panel connectors.
Power Thru:	Additional loads may be connected up to a 10A total input current.
Comm Indicators:	LEDs indicating Link and Activity data for all Ethernet outputs, and DMX status for each DMX port.
Control:	Built-in Menu Display touchscreen.
Housing:	Standard 3U 19” rack-mount chassis, 10.5” deep.
Weight:	15.4 lbs.
Compliance:	MET & FCC approvals.

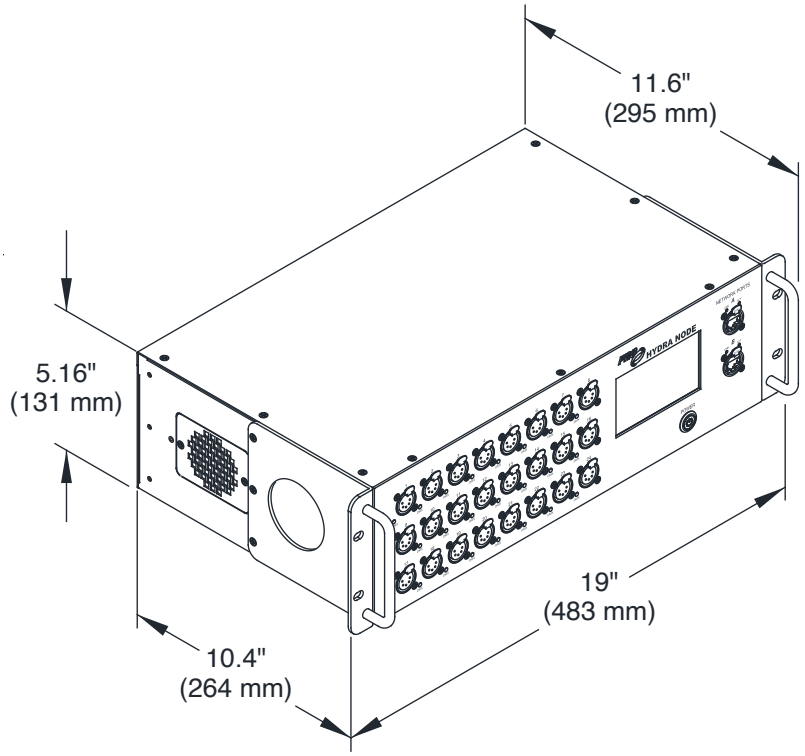


Figure 8: Hydra Node Dimensions

Notes

Hydra Node™ User Manual

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Production Resource Group
Dallas Office
3110 Roy Orr Blvd, Suite 200
Grand Prairie, Texas 75050
www.prg.com