1 Universe Ethernet Box

User Manual

COOPER Controls

www.coopercontrol.com

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When you open the packaging, you should find these items in the box:

- **1 Universe Ethernet Box**
- Straight connect Ethernet lead
- Power Adapter
- User manual
- CD

If one of these items is missing please contact your local dealer.

Contacting Cooper Controls

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Warranty

Cooper Controls warrants that the product it manufactures and sells will be free from defects in materials and workmanship for a period of 1 year from the date of shipment from an authorized Cooper Controls distributor. If the device proves defective within the respective period, Cooper Controls will repair or replace the defective hardware at its sole discretion. If the failure is due to an operator error the user accepts to pay for any charge relating to the diagnosis of the hardware, faulty parts or shipping from our factory.

Cooper Controls makes no warranty of any kind, express or implied, including without limitation the implied warranties of merchantability and fitness for a particular purpose. In no event shall Cooper Controls be liable for indirect, special or consequential damages.

Opening the unit voids the warranty as described above.

As this product uses ethernet as a communication medium, we cannot officially support applications where the device is used on an existing computer network. We recommend you have a good knowledge of networking infrastructure and IP networking.

Glossary

Art-Net™:	Artistic License network protocol. This is the Artistic License DMX over Ethernet protocol.
Dimmer:	One discretely controlled device or parameter of a device out of 512 possible in the DMX512 protocol. Sometimes also referred to as “Address”, “DMX Channel” or “Output Channel”
DMX:	Digital MultiPlex. The protocol most lighting equipment responds to.
DHCP:	Dynamic Host Configuration Protocol. Generally DMX over Ethernet systems should not use DHCP, but should be manually configured.
ESP:	Enttec Show Protocol. This is the Enttec DMX over Ethernet protocol.
Ethercon:	An RJ45 ethernet connector fitted into an XLR housing
Ethernet:	Many modern lighting consoles use Ethernet as a medium for transmitting DMX lighting control data using protocols such as Art-Net or ESP. This allows lighting data to be carried over existing wiring infrastructure. The 1 Universe Ethernet Box is an interface between Ethernet and DMX to be used in these systems
IP:	Internet Protocol.
IP Address:	The unique identifier for a device communicating on an IP Network
NMU:	Node Management Utility, the software package used to configure the 1 Universe Ethernet Box
PC:	Personal Computer.
RJ45:	Registered Jack 45 – the connector used for Ethernet
Stream:	A DMX512 over Ethernet Universe coming into or leaving the 1 Universe Ethernet Box
Subnet:	A group of 16 consecutive DMX universes is referred to as a sub-net. Not to be confused with the subnet mask.
XLR:	X-Series Latched Rubber – a connector series common in the entertainment industry. The 5 pin variant is used for DMX.
Universe:	512 addresses or slots of control information as conveyed by DMX512 protocol. As a lighting system may have more than 512 discrete things to control, multiple universes may be required. When this is the case, the Universe number will be expressed in 0-255 form for ESP or 0-15 subnet and 0-15 universe # for Art-Net.

Introduction

The 1 Universe Ethernet Box from Cooper Controls provides a universal interface for DMX to Ethernet and Ethernet to DMX conversion.

Firstly, unpack the unit from the box. You will find:

- the 1 Universe Ethernet Box, which is a box containing all the electronics
- an external power supply
- a CD containing the NMU program,
- and this manual.

If you are missing any parts, please contact the dealer through whom you purchased the unit to arrange a solution.

On the front of the 1 Universe Ethernet Box device, you will find :

- RJ45 Ethercon connector for a 10/100 Base-T Ethernet connection
- 4 Status LEDS
- DC 9V input power jack for connecting the included Power Supply

On the back you will find:

- 1 DMX output connector
- 1 DMX input connector

The unit has no power switch and can be left on continuously.

Features

- 1 DMX port with Male and Female 5 pin connectors
- Setup done through Node Management Utility
- Supports ESP and Art-Net protocols for DMX over Ethernet

Limitations

As the 1 Universe Ethernet Box is reliant on Ethernet, if you are using an existing computer network and sharing the traffic between your lighting control system and other functions, you may increase your exposure to potential delays in data propagation, or a drop in the update rate. Specific strategies for better implementing such large networks can be planned in consultation with Cooper Controls engineers if your application's scope warrants it.

Basic Concept

While it has tremendous flexibility, right out of the box the 1 Universe Ethernet Box is factory configured to be a DMX OUTPUT device, running on Art-Net Universe 0,0. It can be either output or input, however, and can use any possible universe in Art-Net or ESP modes. It has configurable IP address as well. Use the free utility program, Node Management Utility, to change configurations.

Connector pin out

DMX OUT:

Pin 1: Ground
Pin 2: Data -
Pin 3: Data +
Pin 4: NC
Pin 5: NC

DMX IN :

Pin 1: Ground
Pin 2: Data -
Pin 3: Data +
Pin 4: NC
Pin 5: NC

Power Supply :

DC 9v, Center Positive

Getting Started

When you power up the 1 Universe Ethernet Box for the first time, the default factory profile will be as follows:

DMX Port:

This will be set to be an Output by default.

Ethernet Channels:

Out of the box, it will be bound to Universe 0, 0. This is also known as the first DMX Universe. There are 255 possible DMX over Ethernet universes from which you can select one. These are also referred to as Streams in the Node Management Utility.

LEDs

1 Status: This LED will blink when the 1 Universe Ethernet Box is operating normally. If the LED is on and does not blink it means the 1 Universe Ethernet Box is in fault, this could be due to a failed firmware upgrade. You may need to scan your network with NMU and re flash the firmware.

If the LED off and you have power to the unit please contact Cooper Controls support.

2 Port Direction: The LED will be ON when the port is in Output mode and off when the port is in input mode.

3 Ethernet Link: This LED will be ON when there is an Ethernet Link.

4 Ethernet Activity: This LED blinks when there is activity on the Ethernet network.

NMU configuration

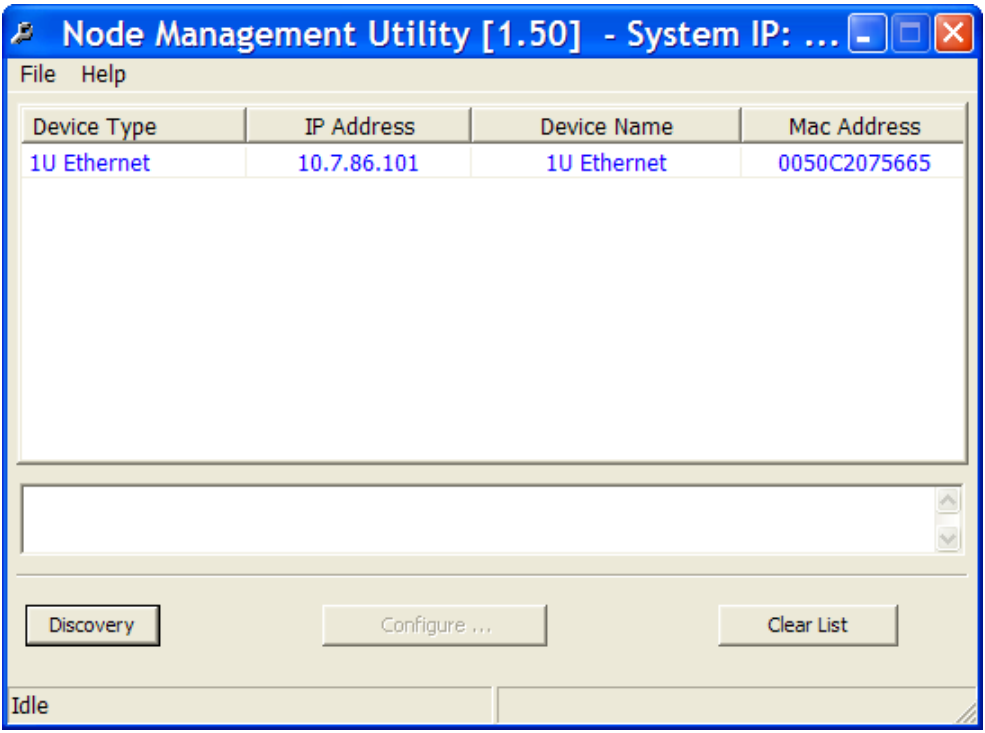
NMU (Node Management Utility) is the free Windows and OSX application used to manage compatible DMX over Ethernet nodes.
NMU bypasses all your TCP/IP settings allowing you to reconfigure nodes in a plug and play fashion, how ever they are configured.

NMU V1.34 supports the 1 Universe Ethernet Box starting with the V1.0 firmware.

To employ the NMU, follow this set of instructions:

1. If you have not already done so, install the program from the included CD, or download and install this application from the Cooper Controls website
2. Ensure that your 1 Universe Ethernet Box is hooked up physically by Ethernet cable to the same physical network as the computer on which you will run the NMU.

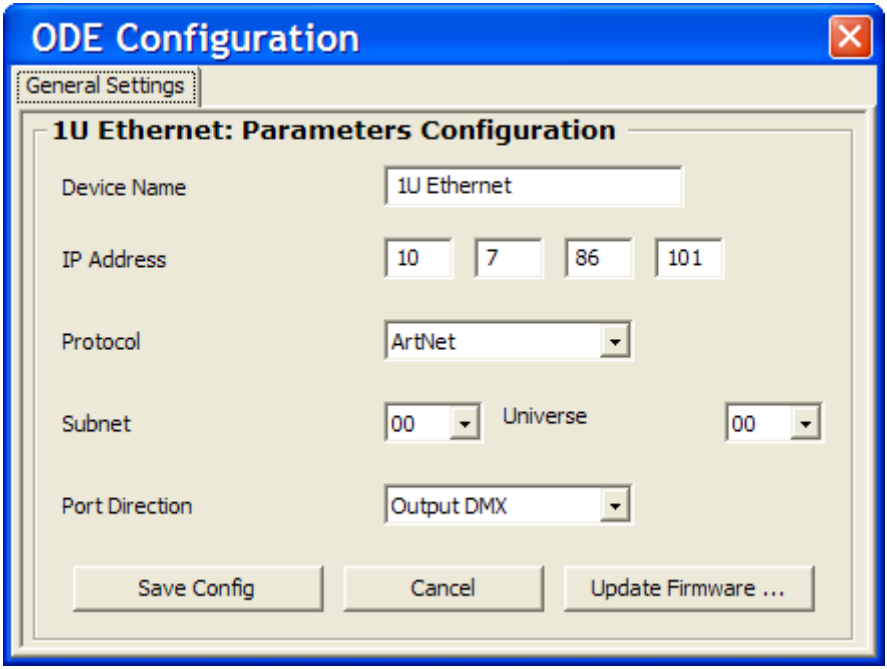
   This can be done directly to the port on your computer or through a switch.. When you plan to use multiple 1 Universe Ethernet Boxes you will need to use a switch.
3. Start the application.
4. Press the Discovery button.



5. Select an 1 Universe Ethernet Box from the list of devices shown (your screen will differ from example shown here to some degree).

6. The configure button will now be enabled; press it to continue.

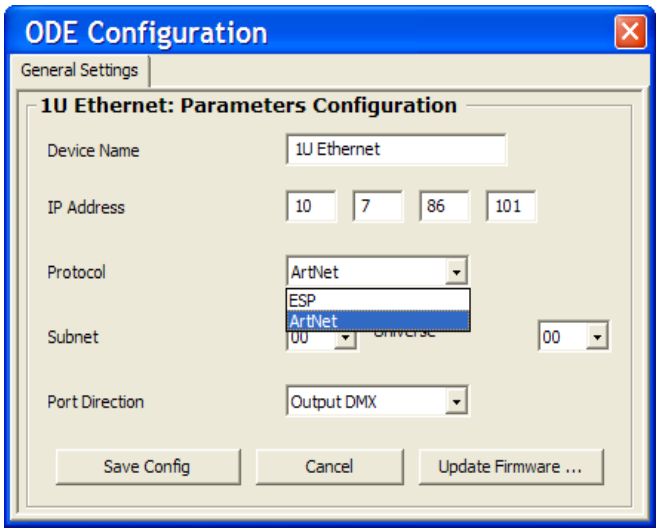
7. The 1 Universe Ethernet Box Configuration Window will appear. It contains the controls needed to make all possible changes to the 1 Universe Ethernet Box's configurations.



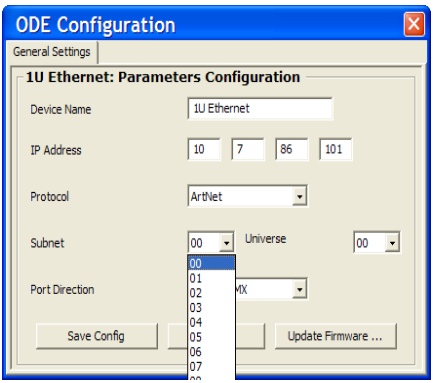
8. At your option, you may choose to enter a new name for the 1 Universe Ethernet Box in the Device Name blank. Calling it “Truss 1” or “Onstage Dimmers Universe” may be convenient to your application, for instance.

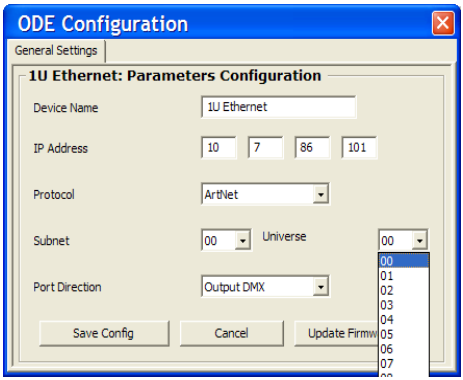
9. If you need to adjust the IP Address for your application, it may be done here. While many users can expect the 1 Universe Ethernet Box to work fine with factory default IP, some networks will be a bit trickier. If it works for you as is, don't bother changing anything here, but if you're trying to troubleshoot, a valuable tip would be to choose an IP which is similar in the first 3 numbers (but distinct in the last) from other elements of your lighting system. For further information about this consult a Network Manager or IT expert who knows your local Ethernet setup well.

10. Choose which protocol you wish to use, between Art-Net (default) and Enttec Show Protocol (or ESP). The ESP may be quicker and easier to set up, but Art-Net is supported very widely by other hardware and software, so you have both options available.

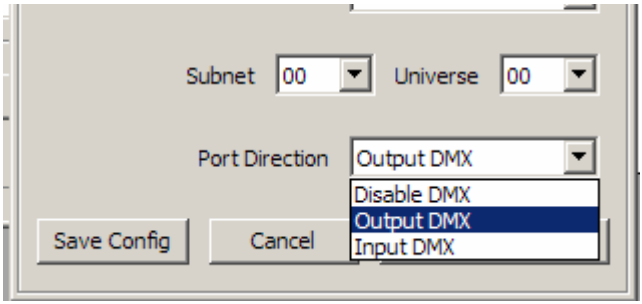


11. Assign your 1 Universe Ethernet Box to a Subnet and Universe in the Art-Net range of possible locations. If you only have one 1 Universe Ethernet Box, the default of 0,0 may be suitable, but when multiple devices are used then take care as to which you assign where, and consider labeling the outside of the box, perhaps with tape and a permanent marker, or by using a plastic stick-on label, so that you can deploy and troubleshoot it easily.





12. If you're choosing to employ ESP protocol, your universe assignment is a single step procedure with 256 choices in a single pull-down list.
13. Select whether you need to output or input DMX information (or disable it in rare instances) with the Port Direction setting.
14. Once you have it all set up the way you'd like, click on Save Config button to send this information to the device.

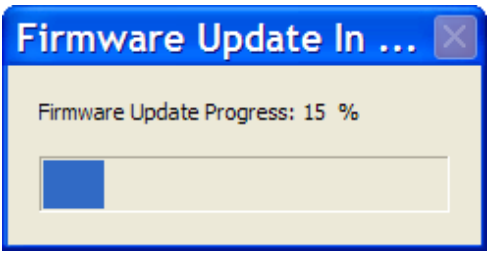


15. You can then close the application and use the 1 Universe Ethernet Box right away. Congratulations, you're done!

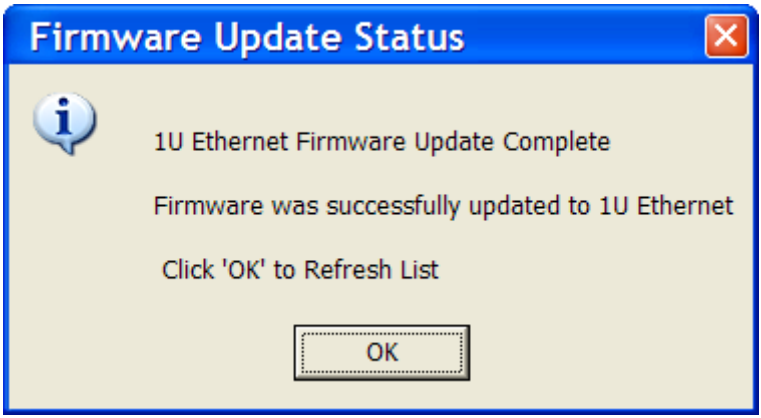
Updating the Application firmware

To update the firmware on the 1 Universe Ethernet Box, you can perform a simple operation inside the NMU program. Follow Steps 1-7 as described above in the NMU configuration section. Then click the button at the bottom for Firmware Update.

A small progress window will pop up showing the percentage of completion achieved as the procedure happens.



When it reaches 100% another window will alert you that it successfully completed this operation and that you can Cick OK to refresh the list of devices which the NMU can see.



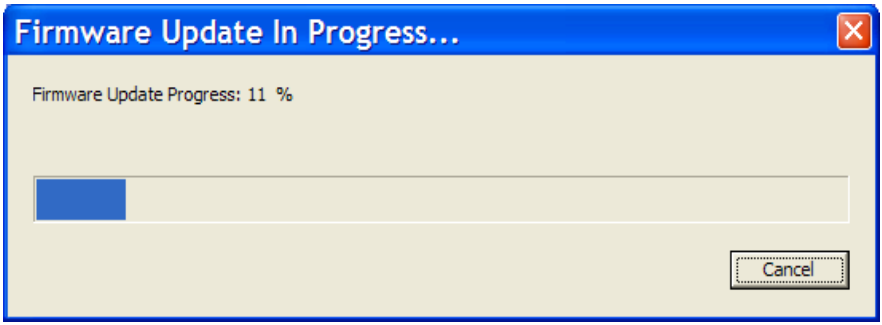
After you click the OK button, the update procedure is completed.

Emergency Firmware update

In some rare cases, there firmware might become corrupted and support may instruct you to force a firmware update, this is the procedure.

Please Click on File->1 Universe Ethernet Box Emergency Firmware Recovery

Select the file, then power the 1 Universe Ethernet Box



The firmware update may take a few seconds to start.

Once finished you will see