Luminex
Lighting Control Equipment

# Ethernet - DMX8 / WiFi

*User Guide V3.x.x*


wyg enabled

Ethernet - DMX8 / WiFi User Guide V3.x.x
Document eth-dmx8-w_man_v3_lumwifi



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# Warranty information

## *Limited warranty*

Unless otherwise stated, your product is covered by a one (1) year parts and labor limited warranty. It is the owner's responsibility to furnish receipts or invoices for verification of purchase, date, and dealer or distributor. If purchase date cannot be provided, date of manufacture will be used to determine warranty period.

## *Returning under warranty*

Any Product unit or parts returned to Luminex LCE must be packaged in a suitable manner to ensure the protection of such Product unit or parts, and such package shall be clearly and prominently marked to indicate that the package contains returned Product units or parts. Accompany all returned Product units or parts with a written explanation of the alleged problem or malfunction.

## *Freight*

All shipping will be paid by the purchaser. Items under warranty shall have return shipping paid by the manufacturer only in the European Union. Under no circumstances will freight collect shipments be accepted. Prepaid shipping does not include rush expediting such as air freight. Air freight can be sent customer collect in the European Union.

Warranty is void if the product is misused, damaged, modified in any way, or for unauthorized repairs or parts.

# General

## *Packaging*

- 1 x Ethernet – DMX8 / WiFi
- 1 x 2dBi antenna
- 1 x User guide + CD Rom

## *Description*

The Ethernet - DMX8 / WiFi is an Ethernet node that serves 8 DMX512 outlets, compatible with the ArtNet protocol.

All 8 outlets are conform to the DMX-512A and can be used as input or output. The Ethernet link is a 10/100BaseT (auto detect) connection on a Neutrik RJ45 Ethercon connector. All configuration can be done over Ethernet through a built in website, or by using the controls on the front end. A bright blue LCD with white text and 5 navigation keys are provided to control the unit. This all comes in a 19" 1 unit high metal housing.

## *Specification*

Model: Ethernet - DMX8 / WiFi
Manufacturer: LUMINEX Lighting Control Equipment

- **Dimensions**

  482 x 183 x 44 (mm)
  19” x 7,2” x 1,75”
  Package: 520 x 235 x 50 (mm)

- **Weight**

  2,5 kg

- **Electrical**

  Voltages: 90 – 260 VAC
  Frequency: 47 – 63 Hz
  Rated power: 20 W
  Fuses: 125V, 500mA, Slow blow only (5mm x 20mm)
  250V, 315mA, Slow blow only (5mm x 20mm)

- **Connectors**

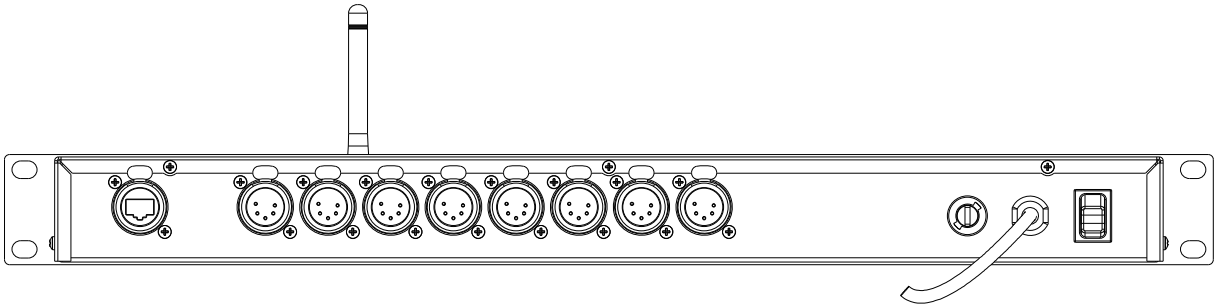
  1 x Neutrik RJ45 Ethercon connector
  8 x Neutrik gold plated 5 pin XLR (female)
  1 X RP-SMA antenna connector

- **Environmental**

  Operating temperature: 0 ~ 60°C (32 ~ 140°F)

# Connectivity

## *Rear panel*



- **Mains**

The device operates with an AC voltage between 90V and 260V within a frequency range of 47Hz and 63Hz.

A fixed power lead with lose cable end is directly connected to the device (no plug/connector). Please use an authorized plug and connect the cores in the mains lead in accordance with the following scheme:

**Green / Yellow:** Earth
**Blue:** Neutral
**Brown:** Live

***!!! This equipment must be earthed !!!***

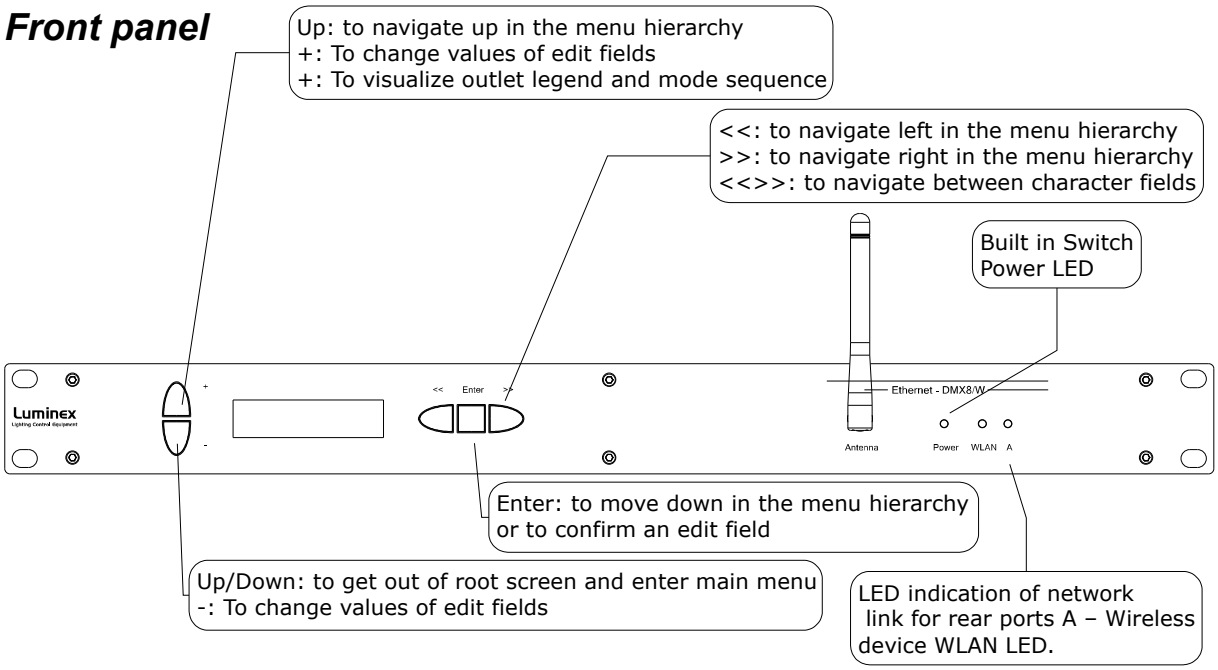
- **DMX input / output**

8 Neutrik 5 pin gold plated female connectors are provided as outlet (input or output).

| ***Connector*** | ***Function*** |
|---|---|
| Pin 1 | Signal common (0 volt) |
| Pin 2 | Data complement (-) |
| Pin 3 | Data true (+) |
| Pin 4 | Not used |
| Pin 5 | Not used |

All outlets are compliant with the DMX512-A timing specification and are terminated and rebiased.

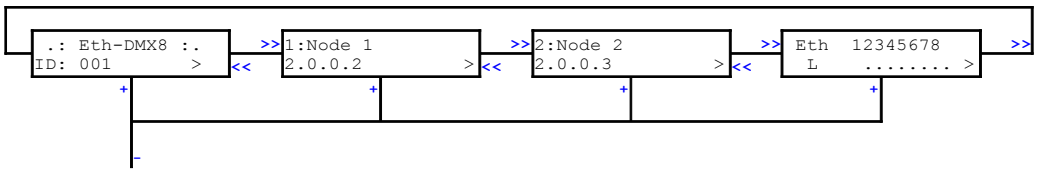
## *Front panel*




The front panel interface is provided with 5 navigation buttons and a bright blue 2 lines, 16 character LCD.

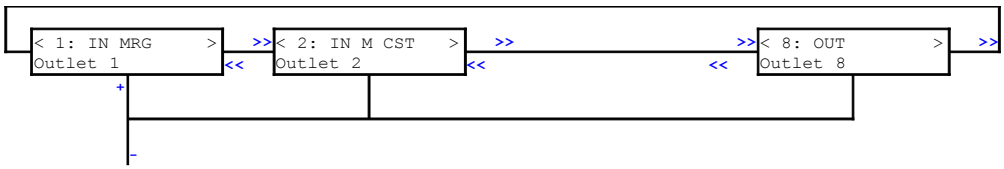
All settings and setup explained in this chapter can also be made by using the built in web pages. See Web interface chapter at page 24.

Four indication screens will rotate continuously on the display with an interval of a few seconds. The unit also returns to these root screens when no button is pressed for 2 minutes.




You can visualize the screen of your choice by simply pressing the right arrow button (>>).

Another indication screens sequence is also available by pressing up arrow button or "+". This sequence displays all outlets legend and mode. This can be very useful for a technician who just need to know what is connected to a dedicated outlet. This sequence is available even if the node is password protected through Web interface.




To get in the configuration menus and to setup the device, press the arrow down or "-" button.

An arrow left or right (<>) in the screen indicates the possibility to navigate with the left right buttons of the front end.

- **Unlock the node**

When the node is set in auto-lock mode or is password protected through the Web interface, it will automatically lock the front end after 2 min of inactivity of front end controls. If you try to change something with front end, the following message "DEVICE LOCKED" will blink.

To unlock the node with no password :

- Hold down up and down arrow button for 2 seconds
- A "HOLD TO UNLOCK" message appears
- "DEVICE UNLOCKED" : the node is unlocked

To unlock the node set with a password :

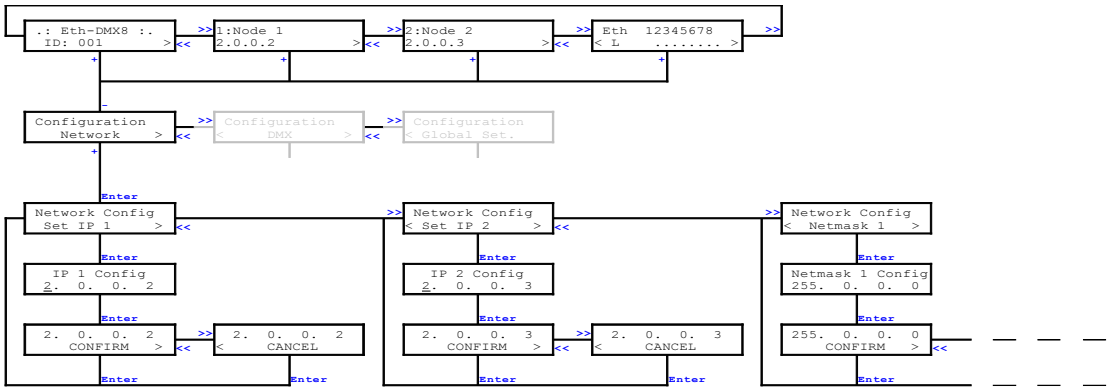
- Hold down up and down arrow button for 2 seconds
- Password has to be set with left and right buttons, change value with up and down buttons.
- Press enter to confirm the password=> the node is unlocked

- **Reset the node (Out of jail)**

This useful function makes it possible to bring the node in a factory default.

1. Power down the unit.
2. Hold down up, down, left and right buttons all together
3. Power on the node.
4. Wait until "Reboot default" message is displayed
5. Release buttons, then press enter to confirm
6. "FACTORY RESTART !! WAIT !!" is displayed
7. The node is now in a factory default: IP: 2.0.0.2 / 2.0.0.3

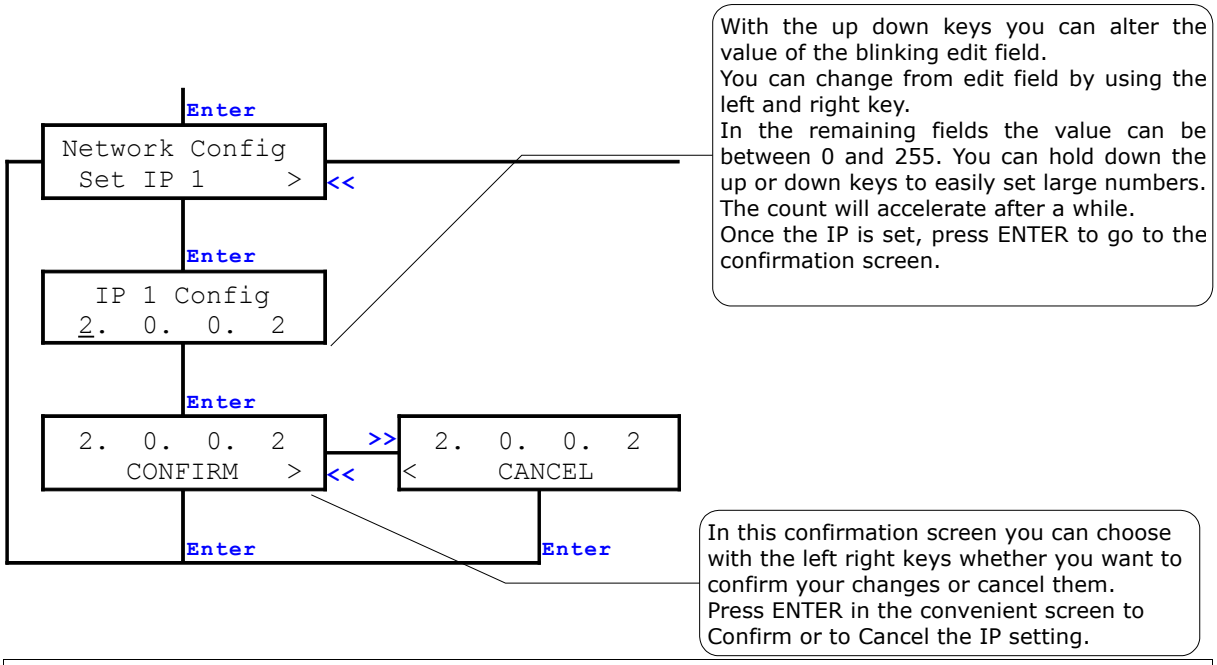
- **Network configuration**




### *IP setting*

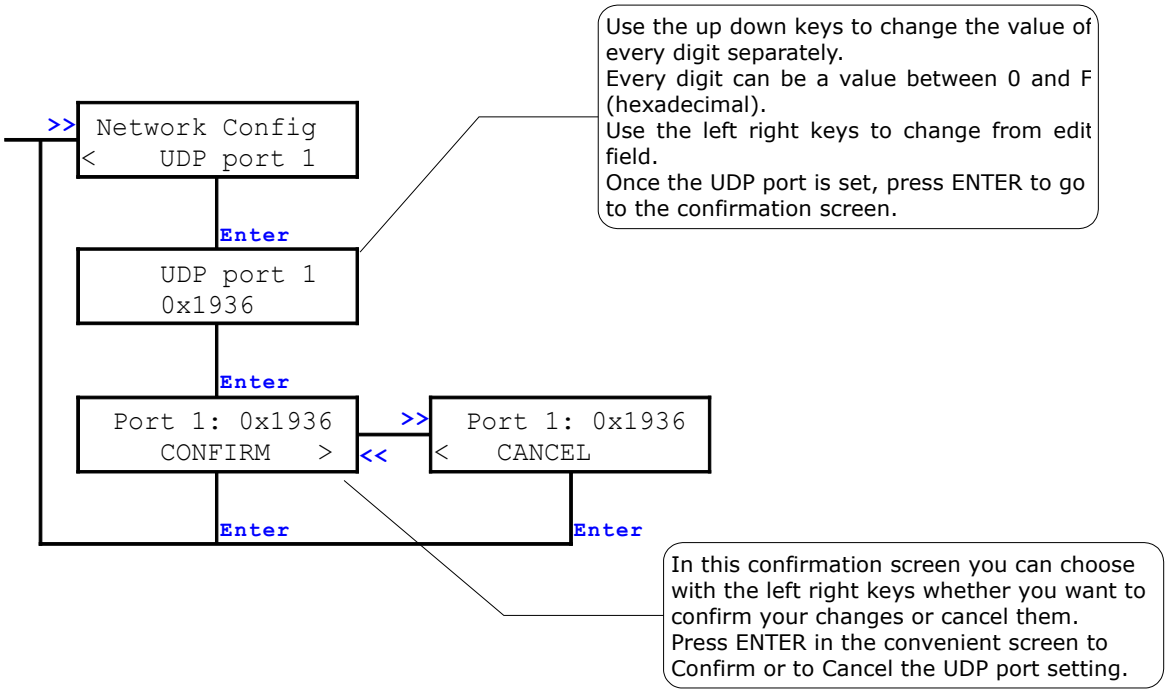
The device uses ArtNet as protocol to distribute multiple DMX lines over Ethernet. Because of the ArtNet specification, the number of outlets is limited to 4 (4 inputs and / or 4 outputs) per node. The Ethernet – DMX8 / WiFi however has 8 outlets. That is why the device uses 2 IP addresses. There are virtually 2 ArtNet nodes running on this one device. This allows us to serve 8 outlets, 4 for every node. Because an ArtNet node is known by it's IP address on a network, we have to provide 2 unique IP addresses (IP 1 and IP 2). However, this provides you to the opportunity to run 2 separate networks on the same device.

From ***Configuration network*** press **Enter** to get into ***Network Config, Set IP 1***. Here you can use the left, right keys to choose to configure IP 1, IP 2 or UDP port. Choose ***Set IP 1*** and press **Enter**. The IP edit screen appears with the first digit blinking. The following procedure is similar for IP 2.

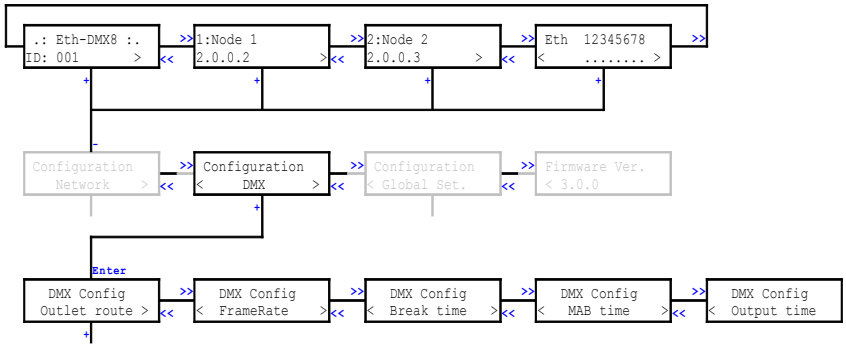


### *UDP ports setting*

The UDP ports are used to indicate the Ethernet ports number on which the network socket has to listen for ArtNet data. 2 UDP ports are available on the node, 1 for four universes. These numbers are indicated in Hex value and the default is 0x1936. These values may only be changed by an experienced network administrator.



- **DMX configuration**




Every DMX outlet can be configured separately as input or output. These inputs and outputs get a DMX line address on ArtNet. It is possible to distribute 256 different DMX lines over ArtNet.

The Ethernet – DMX8 / WiFi runs 2 ArtNet Nodes with outlet 1 to 4 on Node 1 and outlet 5 to 8 on Node 2. Some settings of the DMX outlets are dependent on the Node setting.

The DMX line address (Universe) on ArtNet is a combination of the outlet's Subnet and Subswitch. The Subnet divides the possible range of 256 addresses in groups of 16 addresses. Every outlet has one Subnet setting (from 0x0 – 0xF, 0- 15). And every outlet has a separate Subswitch (from 0x0 – 0xF, 0 – 15). Combined this gives the following result.

The Subnet is the high nibble of the complete address and the Subswitch is the low nibble of the address.

<u>Outlet 1:</u>

Subnet: 0x2 Outlet 1-> Subswitch: 0xC

Result address: 0x2C

In decimal this would be:

Result = (Subnet x 16) + Subswitch

Result address = (2 x 16 ) + 12 = 44

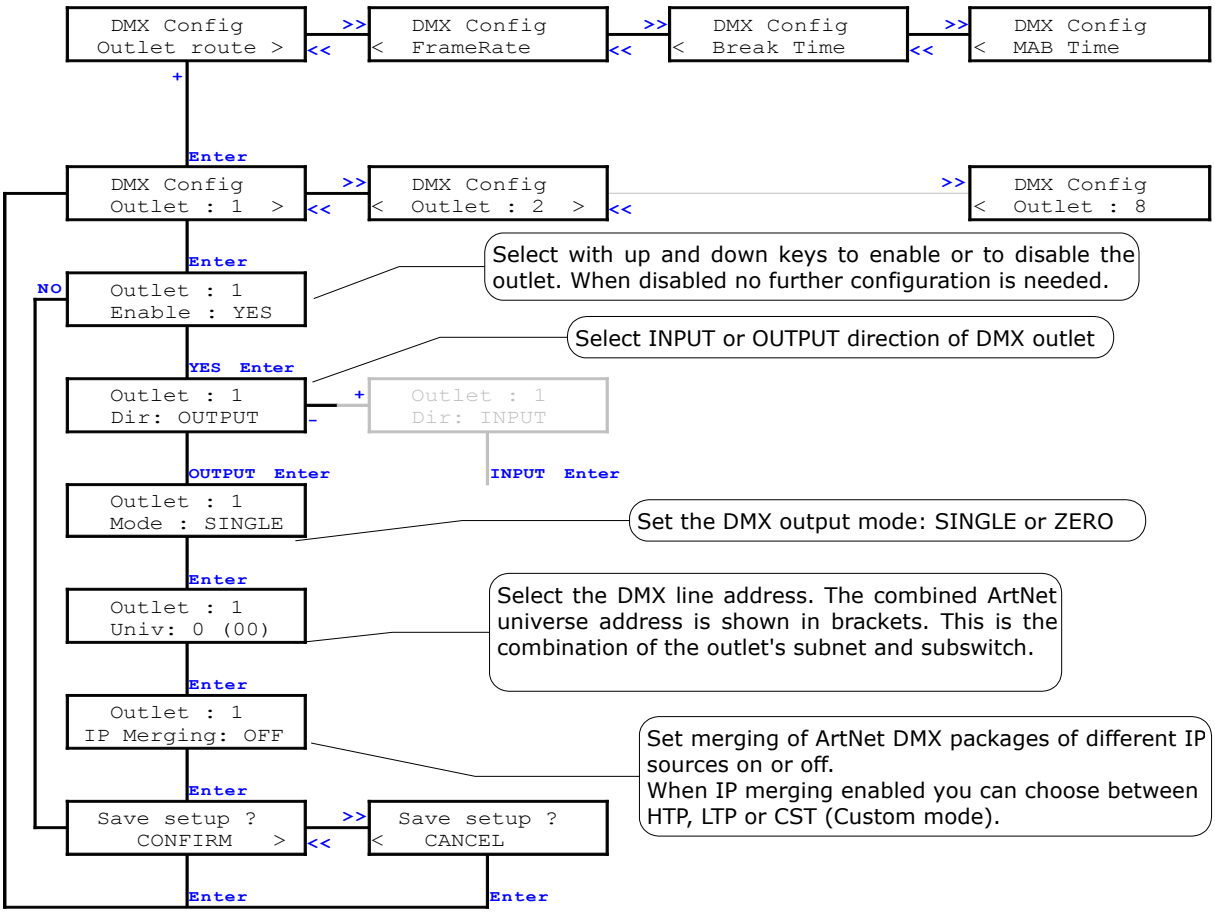
Happily, if you're not used to work on hexadecimal values, the node allows you to set you outlet DMX line in decimal value. The corresponding hexadecimal value will be displayed in brackets.

Example:

### *Outlet route*

➢ DMX output

To setup an outlet as output, follow the following procedure.
Choose ***DMX Config, Outlet route*** press **Enter** and select the outlet with the left right keys.




| ***Enable*** | |
|---|---|
| Yes | Enables the outlet |
| No | Disables the outlet |

| ***Dir (Direction)*** | |
|---|---|
| Output | Sets the outlet as DMX output |
| Input | Sets the outlet as DMX input |

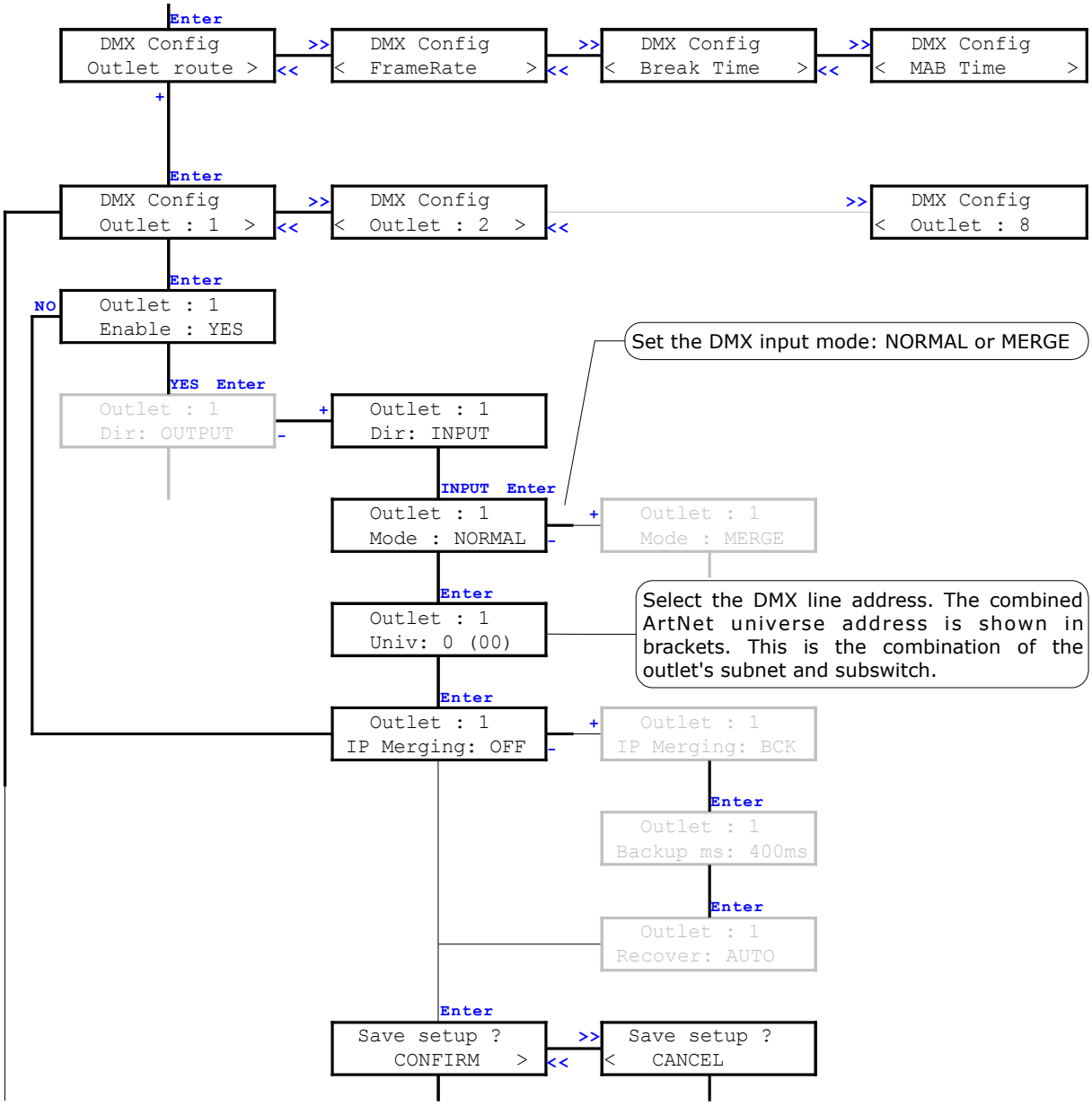
| ***Mode (output)*** | |
|---|---|
| Single | The DMX outlet outputs normal DMX data coming in over ArtNet. |
| Zero | DMX outlet outputs DMX data with all zero values for all 512 channels. |

| ***Univ (Universe)*** |
|---|
| Sets the outlet's DMX line address. ArtNet Hexadecimal value is available in brackets |

| ***IP Merging*** | |
|---|---|
| OFF | Disable the IP merging feature |
| HTP | Merge 2 ArtNet streams set with same universe address; All channels outputted from that outlet will result of a Highest Take Precedence policy between the two first registered ArtNet sources. |
| LTP | Merge 2 ArtNet streams set with same universe address; All channels outputted from that outlet will result of a Last Take Precedence policy between the two first registered ArtNet sources. |
| CUSTOM | Need the use of a Web browser. Create here a complete softpatch, select the 2 ArtNet sources IP addresses and universe addresses to merge. You can affect each kind of merging policy (HTP, LTP, Backup, S1 only, S2 only..) on each channel of the selected outlet. You can also set here the Trigger channel to remotely change theses policies through DMX. |

➢ DMX input

To setup an outlet as input, follow the following procedure.
Choose ***DMX Config, Outlet route*** press **Enter** and select the outlet with the left right keys.




| ***Enable*** | |
|---|---|
| Yes | Enables the outlet |
| No | Disables the outlet |

| ***Dir (Direction)*** | |
|---|---|
| Output | Sets the outlet as DMX output |
| Input | Sets the outlet as DMX input |

| ***Mode (input)*** | |
|---|---|
| Normal | The DMX outlet works as a normal DMX input putting data on ArtNet. |
| Merge | The outlet will be merged with the next outlet. This option is only available for outlet 1, 3, 5 and 7. When this mode is chosen, the next outlet is automatically set as input. Merge policies can be set by configuring the next outlet. (see Merged DMX input) |

| ***Univ (Universe)*** |
|---|
| Sets the outlet's Subswitch to complete the complete universe, or DMX line address of the normal input or the merge result. |

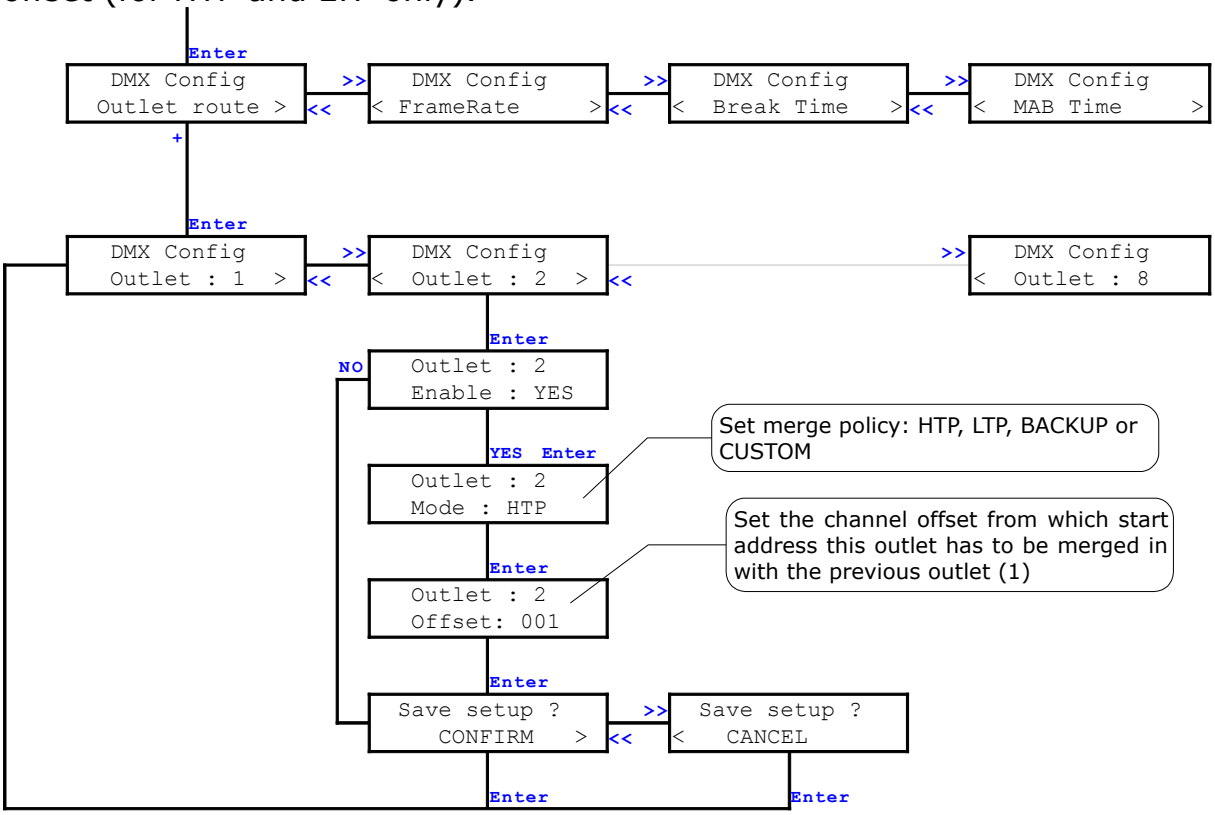
| ***IP Merging*** | |
|---|---|
| Off | The DMX outlet works as a normal DMX input putting data on ArtNet. |
| Bck | The outlet act as networked backup input. It will function as a input backup of the main ArtNet source set with the same universe address. When invalid or no DMX is received from the primary ArtNet source, this outlet will automatically take over. The primary source takes over again as soon as valid data is available again |

| ***Backup ms*** |
|---|
| Set here the time within the node as to wait before switching to the backup outlet (from 400 to 9999ms) in case of primary ArtNet source stream failure. |

| ***Recover*** | |
|---|---|
| Auto | If the failed ArtNet stream is back again on the network, the node will switch back automatically to this previous ArtNet source, and thus disable the backup outlet. |
| Manual | The node will not switch back automatically to the previous ArtNet stream. You'll have to switch yourself to the previous ArtNet stream by using the recover channel patched in the enabled trigger universe. See page 28 |

- Merged DMX input

If one of the odd outlets (1, 3, 5 or 7) is set as merged input, then the corresponding even outlet (2, 4, 6 or 8) is automatically set as input. For this input you have to configure the merging policy and start address offset (for HTP and LTP only).



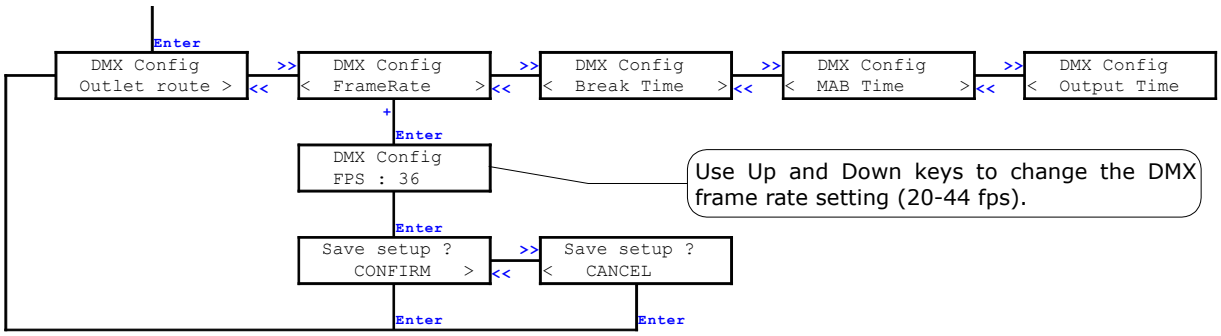

| ***Enable*** | |
|---|---|
| Yes | Enables the outlet |
| No | Disables the outlet |

| ***Mode (merged)*** | |
|---|---|
| HTP | Merges the channels from this outlet starting at the offset into the previous outlet input, using Highest Takes Precedence (HTP) policy. The highest value of 2 merged channels will be used. |
| LTP | Merges the channels from this outlet starting at the offset into the previous outlet input, using Latest Takes Precedence (LTP) policy. The latest changed values will end up in the merge result. |
| BACKUP | This outlet will function as a input backup of the previous outlet. When invalid or no DMX is received on the primary (previous) outlet, this outlet will automatically take over. The primary outlet takes over again as soon as valid data is available again. |
| CUSTOM | This mode requires the use of a Web browser. It is the most complete one as all policies listed above are available for each channel. A complete softpatch can thus be created by using the table available through the built-in Web server. See page 28 for more details. |

| ***Offset*** |
|---|
| Sets the offset address of where the merging of the second outlet has to start. This option is not applicable in BACKUP and mode. |

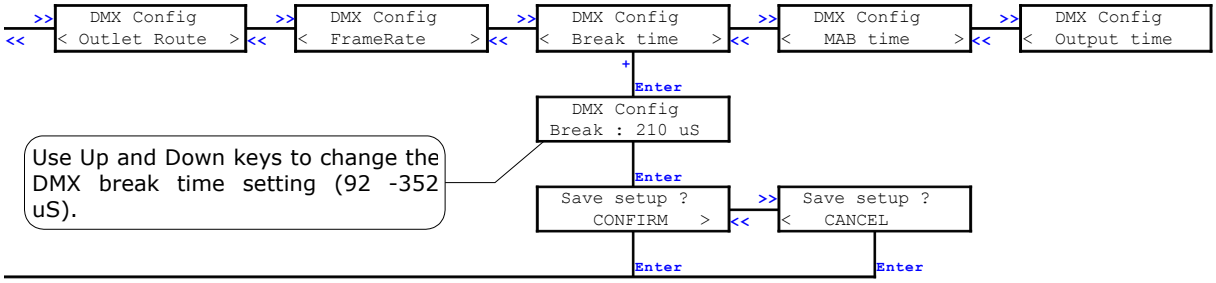
### *Frame rate setting*

The frame rate setting determines the DMX refresh rate. The refresh rate is set for all outlets similar. The frame rate can be set from 20 to 40 FPS (Frames Per Second).



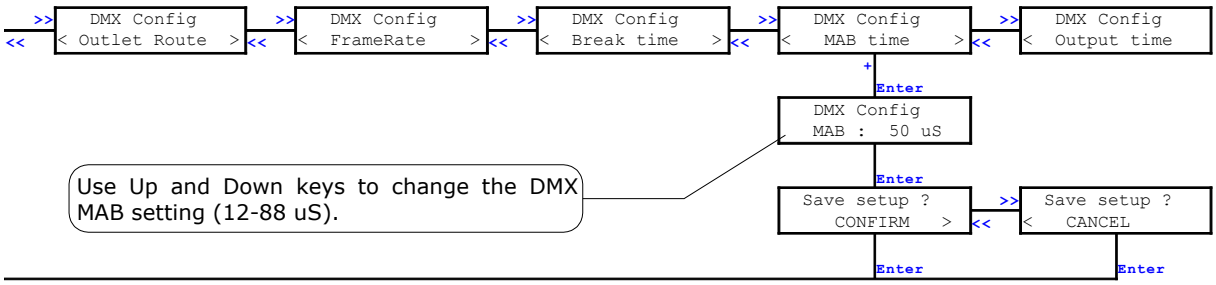

### *Break time setting*

The break time of the DMX signal can be set from 92 – 352 us. This is the idle time between 2 DMX packets of 512 channels.



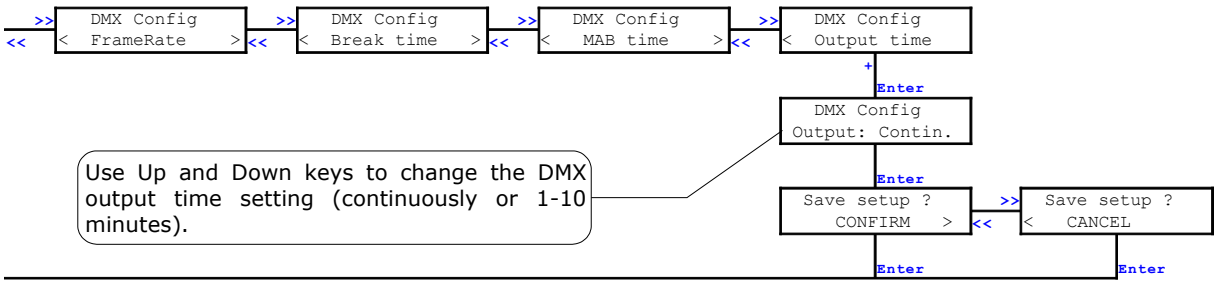

### *Mark After Break (MAB) time setting*

The MAB time of the DMX signal can be set from 12 – 88 us. This is the time after the idle time to indicate a new DMX packet start.

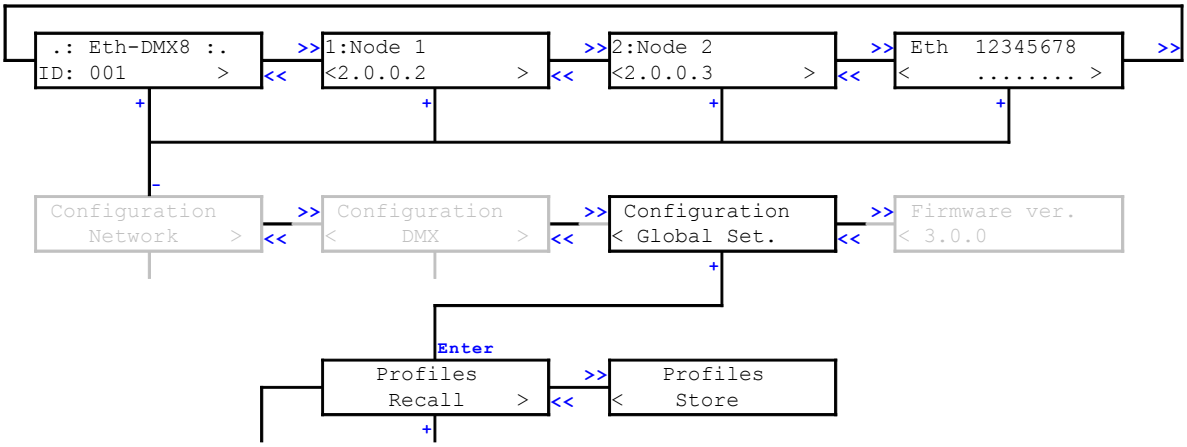


### *DMX output time setting*

The DMX output time is used to set the amount of time an output has to transmit its latest received DMX data from ArtNet onto the DMX outlets. The output time can be set continuously or from 1 – 10 minutes.



- **Global settings**



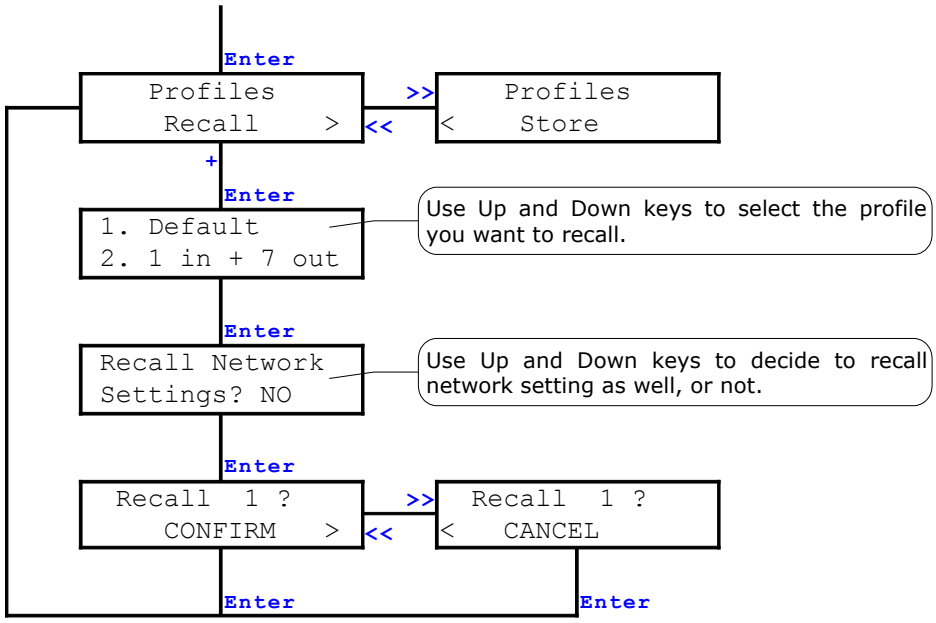

The global settings contains the Profile Manager. Here you can recall and save complete routings and network settings into a profile.

Space is provided to hold 40 different profiles. Already 11 most used profiles are provided with the firmware.

| | ***Profile*** | ***Description*** |
|---|---|---|
| 1 | Default | All outlets as disabled output |
| 2 | 1 in + 7 out | 1 input at 0(00) and 7 outputs starting at 1(01) to 7(07) |
| 3 | All out 0 | All outlets as single output starting at 0(00) to 7(07) |
| 4 | All out 8 | All outlets as single output starting at 8(08) to 15(0F) |
| 5 | All in 0 | All outlets as normal input starting at 0(00) to 7(07) |
| 6 | All in 8 | All outlets as normal input starting at 8(08) to 15(0F) |
| 7 | 1.7 Hub | 1 input and 7 output all at 0(00) |
| 8 | 2x1.3 Hub | 2 inputs and 3 outputs for every input at 0(00) and 1(01) |
| 9 | 4 x MergeHtp | 4 x 2 merged inputs in HTP mode at 0(00) to 3(03) |
| 10 | 4 x MergeLtp | 4 x 2 merged inputs in LTP mode at 0(00) to (03) |
| 11 | 4 x Backup | 4 x 2 backup inputs at 0(00) to 3(03) |

### *Recall profile*

To recall a profile, apply the following procedure.
Choose ***Global Set., Profiles Recall*** and press **Enter.**



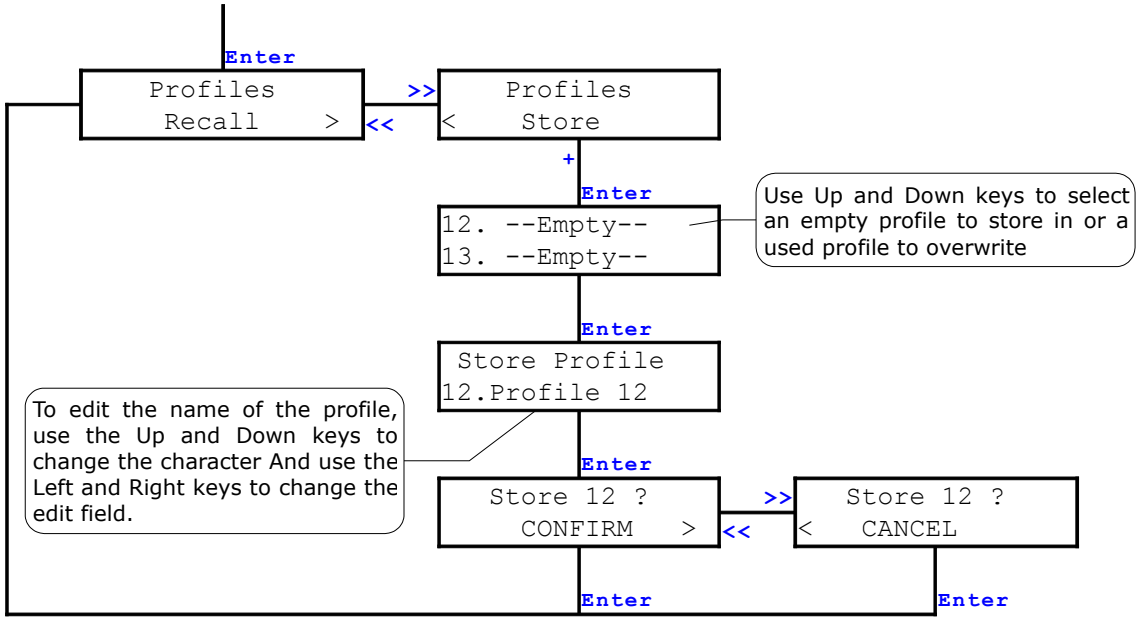

Choose the profile you want to recall. All empty profiles are marked like this: "--Empty--"

When recalling an empty profile, no changes will occur. The menu won't ask to confirm anything, it will only exit the recall menu.

When a valid profile is chosen the device will ask to recall network settings or not. When network settings are recalled, the IP and UDP port settings will be modified as well to default values. So if you do not want to touch you're already configured network setting say NO here.

### *Store profile*

To store a profile, apply the following procedure.
Choose ***Global Set., Profiles Store*** and press **Enter.**



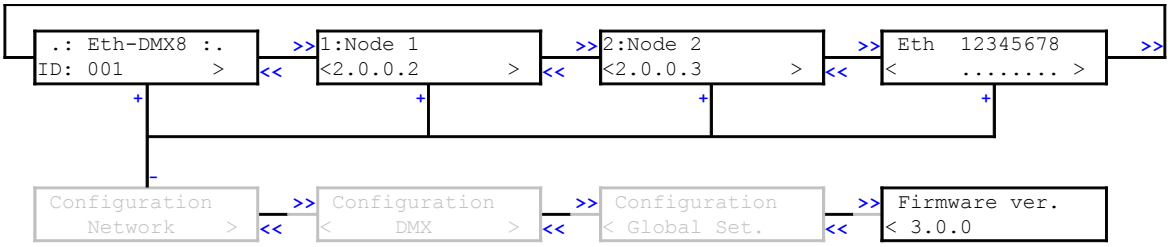

Select an empty profile to store the profile, or choose the profile you want to overwrite.

When an empty profile is chosen, the device will ask to edit the profile name. By default it will come up with "profile " followed by the profile number.

When an already used profile is chosen the device will come with the existing name. You can edit the name or just go on by pressing enter.

When you want to save over an existing profile, you'll obviously see "OVERWRITE" instead of "STORE" in the confirm window. Be aware that overwritten profiles can't be recovered in any way.

### *Firmware version*




This screen quickly display the firmware version running on the node.

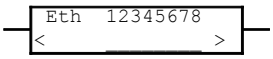
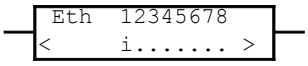
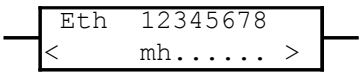
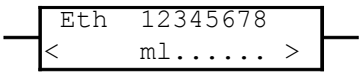
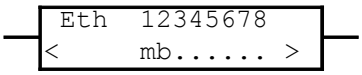
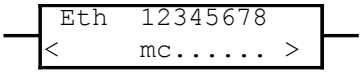
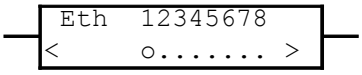
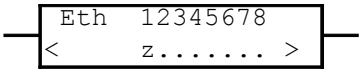
This can be useful to check if you're running the latest version.

Visit our Web site to download the latest firmware : [www.luminex.be](http://www.luminex.be)

- **Status indication**

Four indication screens will rotate continuously on the display with an interval of a few seconds. The unit also returns to these root screens when no button is pressed for 2 minutes.

One of these screens shows the status of the configured outlets.

| ***Screen*** | ***Description*** |
|---|---|
|  | There is no outlet configured as input and there is no outlet outputting DMX data. All outlets are showing **_** |
|  | Outlet 1 is configured as a normal input. The status indication on outlet 1 will continuously change between **.**, **i** and **I** |
|  <br>  <br>  <br>  | Outlet 1 is configured as Merged input together with outlet 2 in Htp mode. The status of outlet 1 will continuously change between **.**, **m** and **M** indicating MERGE.<br>The status of outlet 2 will continuously change depending the mode of the merging:<br>Htp: **.**, **h** and **H**<br>Ltp: **.**, **l** and **L**<br>Backup: **.**, **b** and **B**<br>Custom: **.**, **c** and **C** |
|  | Outlet 1 is configured as a single (normal) output. The status indication on outlet 1 will continuously change between **.**, **o** and **O** |
|  | Outlet 1 is configured as a zero output (continuously outputting DMX zero values for all 512 channels). The status indication on outlet 1 will continuously change between **.**, **z** and **Z** |

## *Home*

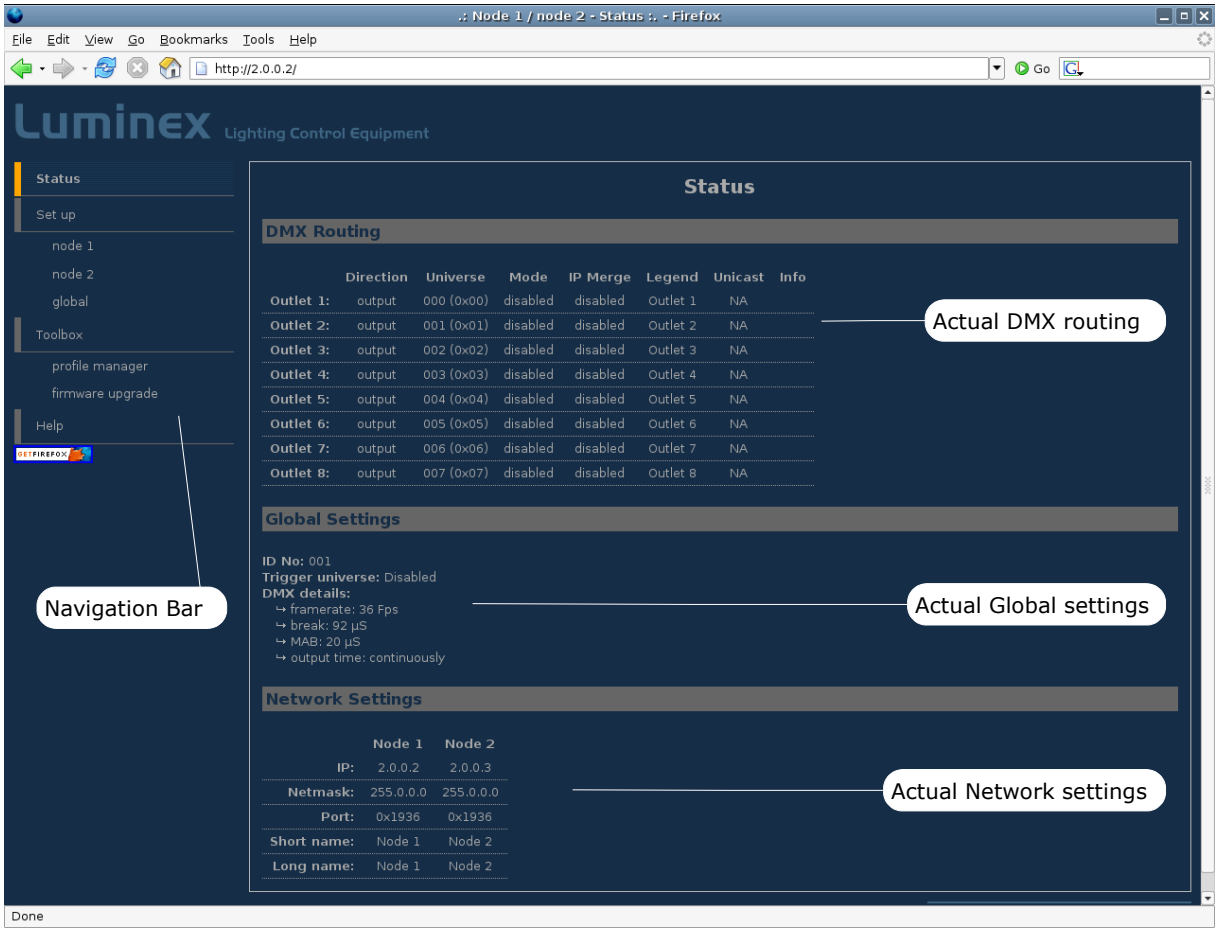
The complete device can be configured from an intuitive web interface. You just have to browse to one of the IP addresses mentioned in the root screen sequence.

Make sure that you computer, you use to browse, is setup in the correct network address range (IP 2.x.x.x or 10.x.x.x and subnet 255.0.0.0).

When you're not using a complete network setup (Ethernet switches, hubs, routers, WLAN, ...), you can also use a cross Ethernet cable to directly connect to one unit.

After all connections and setup on the computer are completed, open your favorite web browser and enter the IP address you want to reach in the URL field.

Http://2.0.0.2/




You'll end up at the status page of the device. This page has a complete overview of the device settings.

The overview shows the actual DMX and network setting / routing of the complete device.

## *Setup*

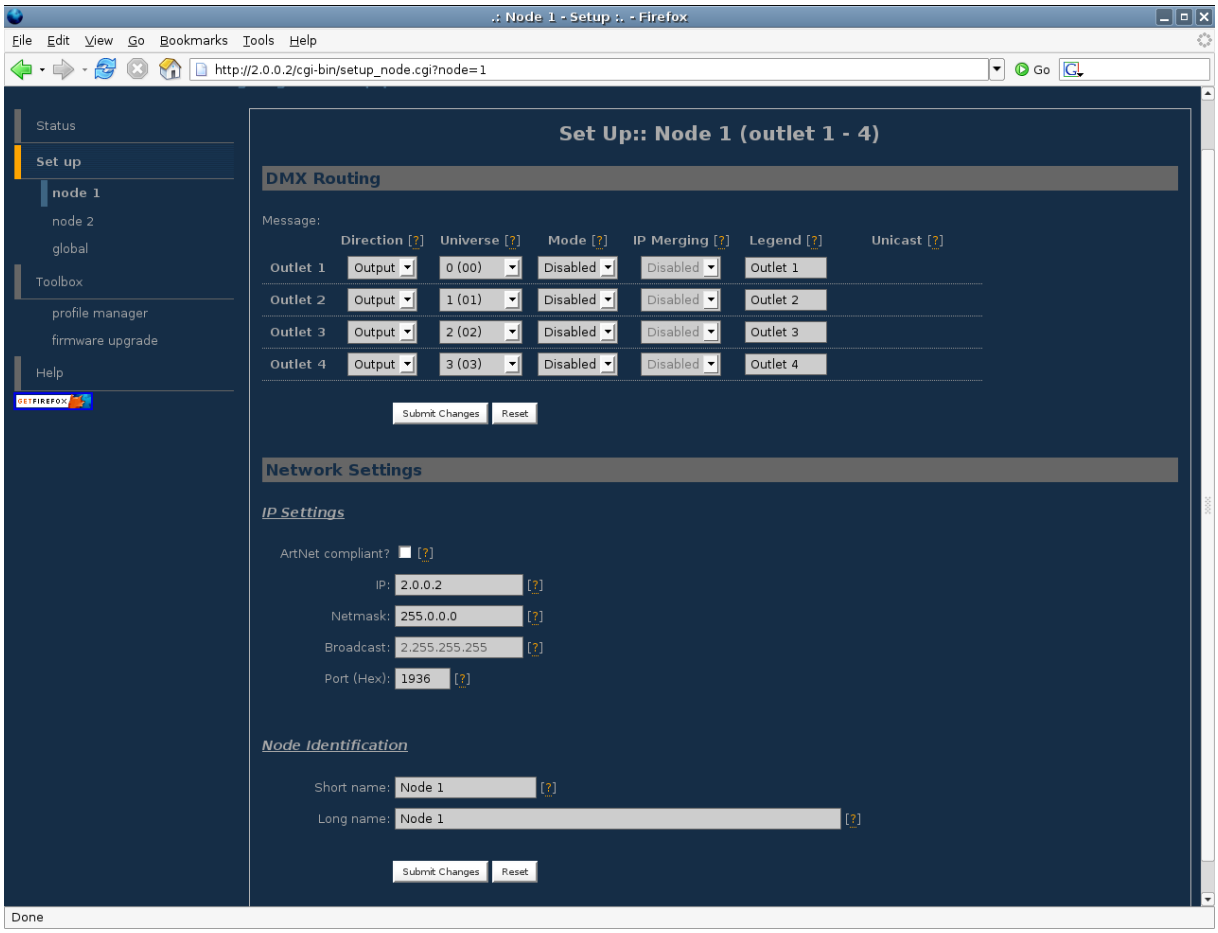
Choose one of the items in the sub menu to setup the device.

Once in a setup page, help is available on almost every field title. Just click on the question mark next to the topic. A pop up frame will display the overall information of each term displayed on the Web interface.

- **Node 1 & 2**

To setup node 1 or 2 click on the appropriate sub menu item in the Setup navigation bar (Node 1, Node 2).

Node 1 is to setup outlet 1 to 4 and node 2 to setup outlet 5 to 8. This is indicated on top of the page.




This is the one of the main settings page. You can setup every single outlet of the node 1 , as input or output. Select the outlet's direction, mode and universe. Here you can also change the IP address, Netmask, port and the ArtNet short and long name indication.

Same settings are available for outlets 5 to 8 by clicking on “Node 2” in the left navigation menu.

- **DMX Routing**

To better understand the use of all features, let's define each category of this menu:

**Direction** : Set the direction you need to the outlet, either Input or Output. Depending your selection, some features won't be available in the other categories.

**Universe** : Select the universe number. The left column number represents the decimal value, the right column number the Hexadecimal one. Setting the universe number through Web interface avoids the user to set Subnet and subswitch settings separately.

**Mode** : According to the direction you set on the outlet, this menu offers several mode :

Input : Disabled : Outlet is disabled, better for node performance.

Normal : Outlet set as normal input

Merge : Allow to merge 2 DMX streams.

When an odd outlet is configured as a merged input (1,3,5,7), the corresponding outlet (2,4,6,8) will be automatically set as input as well.

Output : Disabled : Outlet is disabled, better for node performance.

Zero : Send all channels with a zero value (for maintenance only)

Single: Normal output.

**IP Merging** : This special feature allows you to merge 2 different DMX or Artnet streams through the network. The merging policy will be mainly applied on the DMX Output, except for IP backup.

**Legend** : Set a legend to the outlet, useful to remind yourself what's connected to that outlet.

**Unicast** : Artnet is a broadcast protocol, which means that each packet sent from a single source will be received by all actives equipment on the network. Unicast provides you to cast you data to a selected IP address, resulting in a lower use of bandwidth.

All setting that are not applicable for the actual setting will be grayed out or marked as N/A (Not Applicable).

- **Merging Policies :**

The Ethernet-DMX 8 firmware offers enhanced merging policies that fits to all kind of setup, even the most complex one !
4 available merging policies can be applied on your DMX network, in 2 main setup categories :

Local merging : 2 different DMX streams are merged on the same physical device (Node). The merging policy will be mainly set on Inputs.

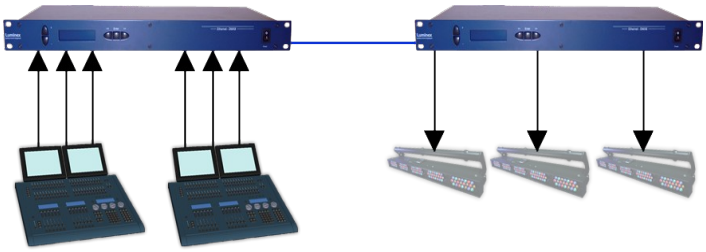


*Illustration 1: Local DMX merging*

IP Merging : This special feature allows you to merge 2 different DMX or Artnet streams through the network. The merging policy will be mainly applied on the Output, except for IP backup.

Available policies :

- HTP : Highest Take Precedence; Commonly used to merge dimmer channels
- LTP : Latest Take Precedence; Better suited when using moving lights
- Backup : set one of the 2 outlets as a backup input
- Custom : This is the most complete and efficient policy. This mode offers you to choose what policy to apply for each channel of each universe, and also to create a complete custom soft patch. By more, the merging policy can be remotely triggered by DMX.

The available policies differs if you use either inputs or outputs :

***Inputs (Local mode)***

| | ***Direction*** | ***Universe*** | ***Mode*** |
|---|---|---|---|
| Outlet 1 | Input | 0(00) | Merge |
| Outlet 2 | Input | Ch1 | HTP, LTP, Backup, Custom |

In this example, the selected mode is "**Merge**". The second outlet will automatically be set as a merged input. You will not be able to configure a universe address for the second outlet, as the merged result will end at the universe address of the first outlet (primary input). Instead of

universe you will be able to set the starting DMX channel address (1-512). This indicates from which channel address the second input has to be merged in. This offset is only available when using **HTP** or **LTP** policies. Those rules will be applied on all channel of the universe.

If you choose "**Backup**", a small blue icon will appears on the left side of "Outlet 2" label; then click on it, a pop up frame appears :

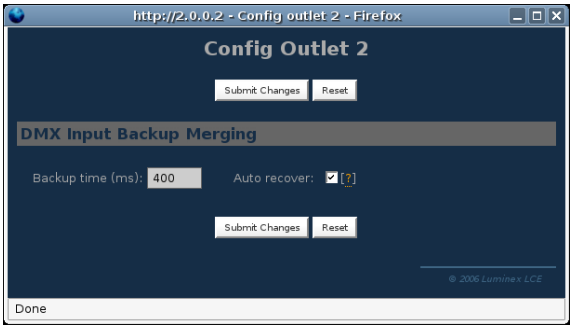



*Illustration 2: DMX Input backup merging*

This menu lets you choose the backup time (from 400 to 9999ms). This time represents the delay from which the node will automatically switch to the backup outlet when invalid or no DMX is received anymore on the primary outlet.

Tick the box if you want the node to auto-recover as soon as valid data is available again on primary connector.

If you tick off the box, you will have to enable the trigger universe and select a recover channel (page Error: Reference source not found).

If you choose "**Custom**" policy, a small blue icon will also appear on the left side of "Outlet 2" label; then click on it, a new pop up frame appears :

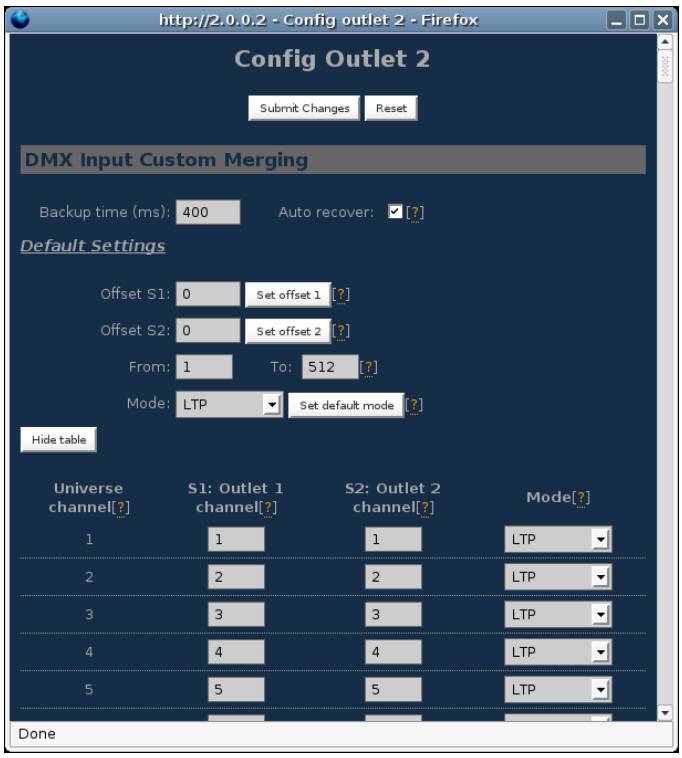



*Illustration 3: Custom DMX input merging*

Click on "**Show Table**" button to see the complete soft patch available for this outlet.

- **Offset S1 & S2** : Enter a value for the desired offset of the starting channel for outlets 1 or 2; example, for channels 1 to start on the third channel, enter 3.
- **From – To** : this range let you quickly set the policy you need on the channel range of your choice. example, if you need HTP policy on channels 23 to 145, enter 23 in the "**From**" field and "145" in the "**To**" field. Then select the HTP policy in the "**Mode**" drop down list, then press "**Set Default Mode**".
- Notice that following policies are available for each channel:

  **Zero**, **HTP**, **LTP**, **S1 only (Source 1 only)**, **S2 only (Source 2 only)**, **S1 as Backup (Source 1 as backup)**, **S2 as Backup (Source 2 as Backup)**.

The left column represent the resulting universe channel number streamed to the network. S1 column represents Source 1 channels and S2 column source 2 channels. It's thus easy to understand that you can create your own soft patch by entering the channels of your choice in one of theses column.

Once your patch is created, click submit to close the window, then click submit again on the node page to record your settings.

***Inputs (IP Merging)***

| | ***Direction*** | ***Universe*** | ***Mode*** | ***IP Merging*** |
|---|---|---|---|---|
| Outlet 1 | Output | 0(00) | Single | Disabled |
| Outlet 2 | Output | 1(01) | Single | Disabled |
| Outlet 3 | Input | 0(00) | Normal | Backup |
| Outlet 4 | Input | 0(01) | Normal | Backup |

This mode can be very useful in such an application.

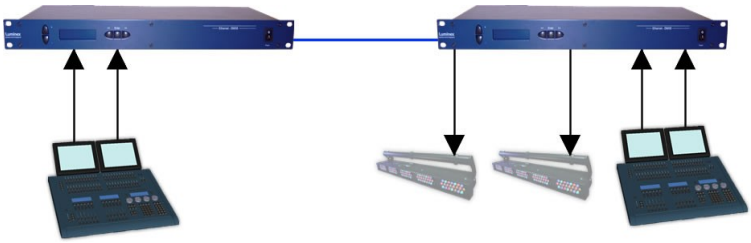


*Illustration 4: IP Merging*

The right side lighting desk is used as a backup desk on stage. This means that the right side node will automatically switch to theses outlets if no ArtNet packets are available on the selected universes (in that case universe 0 and 1). Select your backup time in the small pop up frame by clicking the left blue icon, then submit your changes.

***Outputs (IP Merging)***

| | ***Direction*** | ***Universe*** | ***Mode*** | ***IP Merging*** |
|---|---|---|---|---|
| Outlet 1 | Output | | Single | HTP, LTP, Custom |
| Outlet 2 | Output | | Single | HTP, LTP, Custom |
| Outlet 3 | Output | 2(02) | Disabled | |
| Outlet 4 | Output | 3(03) | Disabled | |

This mode can be very useful in the case of 2 control sources located in different places in the network wants to control the same DMX device in the same time.

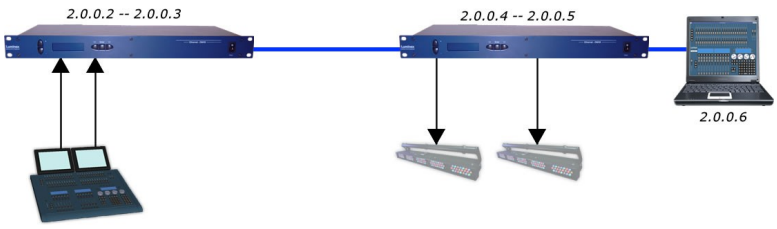



*Illustration 5: Output IP merging*

In this setup, the right lighting software (S2) is used in the same time as the left lighting desk (S1). Both streams are merged through the final output on the right node.

The IP Merging mode provides the following policies when an outlet is set as output:

- HTP, for all outlet channels
- LTP, for all outlet channels
- Custom, to create a complete soft patch, to set merging policy for every single channel by IP source and to use the enhanced trigger system. Once Custom is selected, the universe number will disappear in the outlet's universe setting row.

If you choose “Custom”, click on the blue icon left sided to the “Outlet” label. A pop up frame appears:

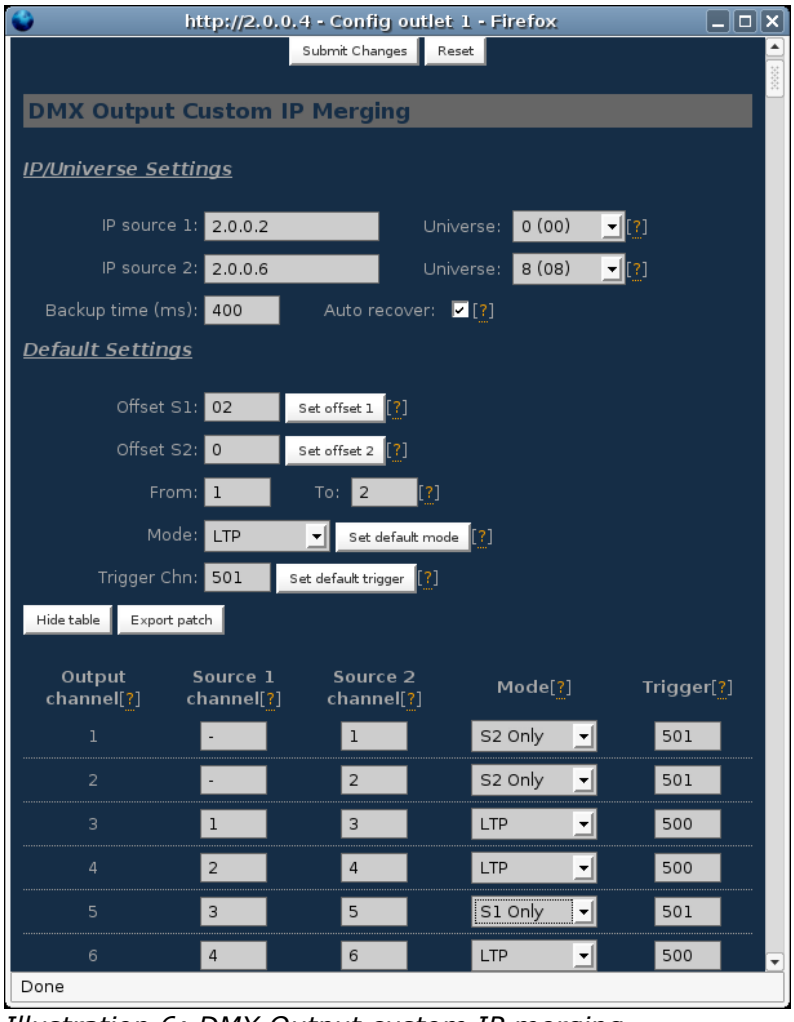



*Illustration 6: DMX Output custom IP merging*

You can find in this pop up frame similar features as when using the

custom merging on outlets set as inputs (page 28).

The main difference is about the following points :

- **IP Source 1 & 2** : Here you can enter the 2 IP addresses assigned to your 2 control source. In case you don't know one of your source IP address, simply enter 0.0.0.0 in the address field.
- **Universe** : Here you can select the universes number streamed by your control source. This feature is very useful if the 2 sources don't use the same universe number.
- **Trigger channel**. This feature allows you to remotely change the merging policy of one or several dedicated channels through a single DMX value. From anywhere on the network, you can by example swap from a "LTP" merge to a "S2 only" policy simply by using a different DMX trigger channel value. Enter here the DMX channel you want to use to remotely takeover control of the merging rule. Once you've selected that channel, you'll need to reach the" Global" web page of the node to enable and select your Trigger universe. You'll also need to patch or assign a DMX trigger channel to your control source; here is the DMX chart of the Luminex DMX trigger channel :

| | |
|---|---|
| 0 - 7 | Do nothing |
| 8 - 15 | Zero out |
| 16 - 23 | HTP merge |
| 24 - 31 | LTP merge |
| 32 - 39 | Source 1 only |
| 40 - 47 | Source 2 only |
| 48 - 111 | Reserved |
| 112 - 119 | Source 1 as backup |
| 120 - 127 | Source 2 as backup |
| 128 - 255 | Do nothing |

**Note** :Never forget if you control the trigger channel from more than one source to press "Do nothing" once you've selected the desired value. Indeed, if you send 2 different values from 2 different sources for the trigger channel, the node won't stop swaping between those values, what results in a big slowing down of the node processing power.

### *Recover channel*

If you have set one of a node outlet in IP backup mode, the node will swap automatically to this outlet in case of DMX failure from the primary source. Once the primary source is back again available, the node will automatically swap back to that source if set in Auto-recover mode. We all know that it can be useful to decide when to swap back to the primary source (booting time of the desk + loading the right cue in case of desk failure). Tick off the auto-recover box in the pop up window if you decide to work in manual recover mode. Then you'll have to enable the trigger universe in the "Error: Reference source not found" Web page and choose a recover channel. You now have the opportunity to choose to recover whether each outlet one by one or all outlet in one shot.

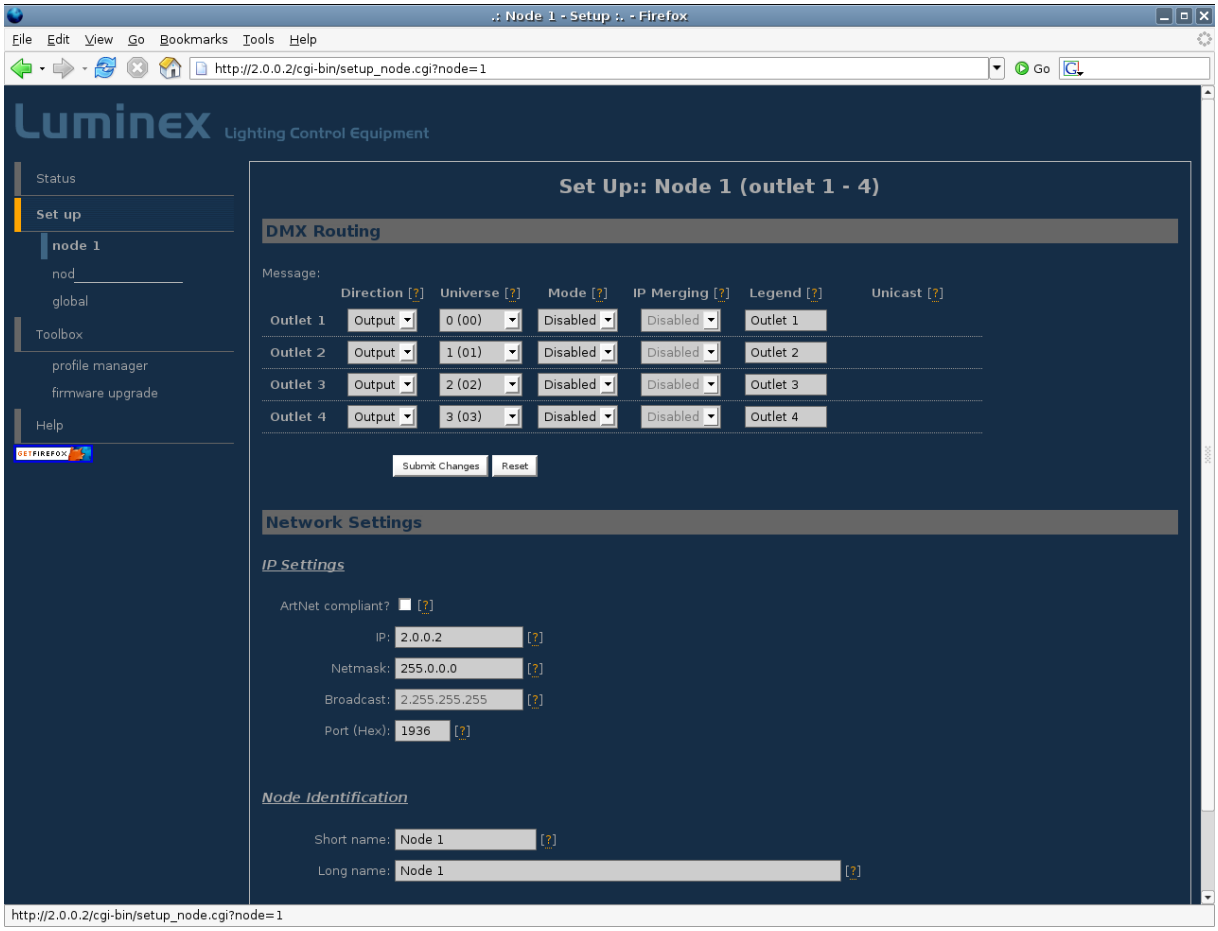
Here is the Luminex recover channel DMX chart :

| | |
|---|---|
| 0 - 7 | Do nothing |
| 8 - 15 | Recover outlet 1 |
| 16 - 23 | Recover outlet 2 |
| 24 - 31 | Recover outlet 3 |
| 32 - 39 | Recover outlet 4 |
| 40 - 47 | Recover outlet 5 |
| 48 - 55 | Recover outlet 6 |
| 56 - 63 | Recover outlet 7 |
| 64 - 71 | Recover outlet 8 |
| 72 - 79 | Recover all outlets |
| 80 - 255 | Do nothing |

***Patch files :***

All those soft patches can be recorded or loaded from or to the node by using “Load Patch” or “Export patch” buttons. Luminex node recognize .txt files. These are “TAB” separated files which can be edited using spreadsheet software (Excel, OO Calc,...)

## *Network settings*




## *IP Settings*

You can enter here the desired ArtNet IP address and Netmask you want to use. If you're not confident with ArtNet IP setting, tick the "ArtNet compliant?" box for the node to warn you in case of mistake. ArtNet IP addresses usually looks like 2.x.x.x or 10.x.x.x.

You're not obliged to work with ArtNet IP addresses. If you wish to work with usual IT IP addresses as 192.168.x.x, there's no problem for you to set such address on the node. Please remember that your node will thus not be visible on the network from devices set with conventional ArtNet IP addresses (2.x.x.x or 10.x.x.x).

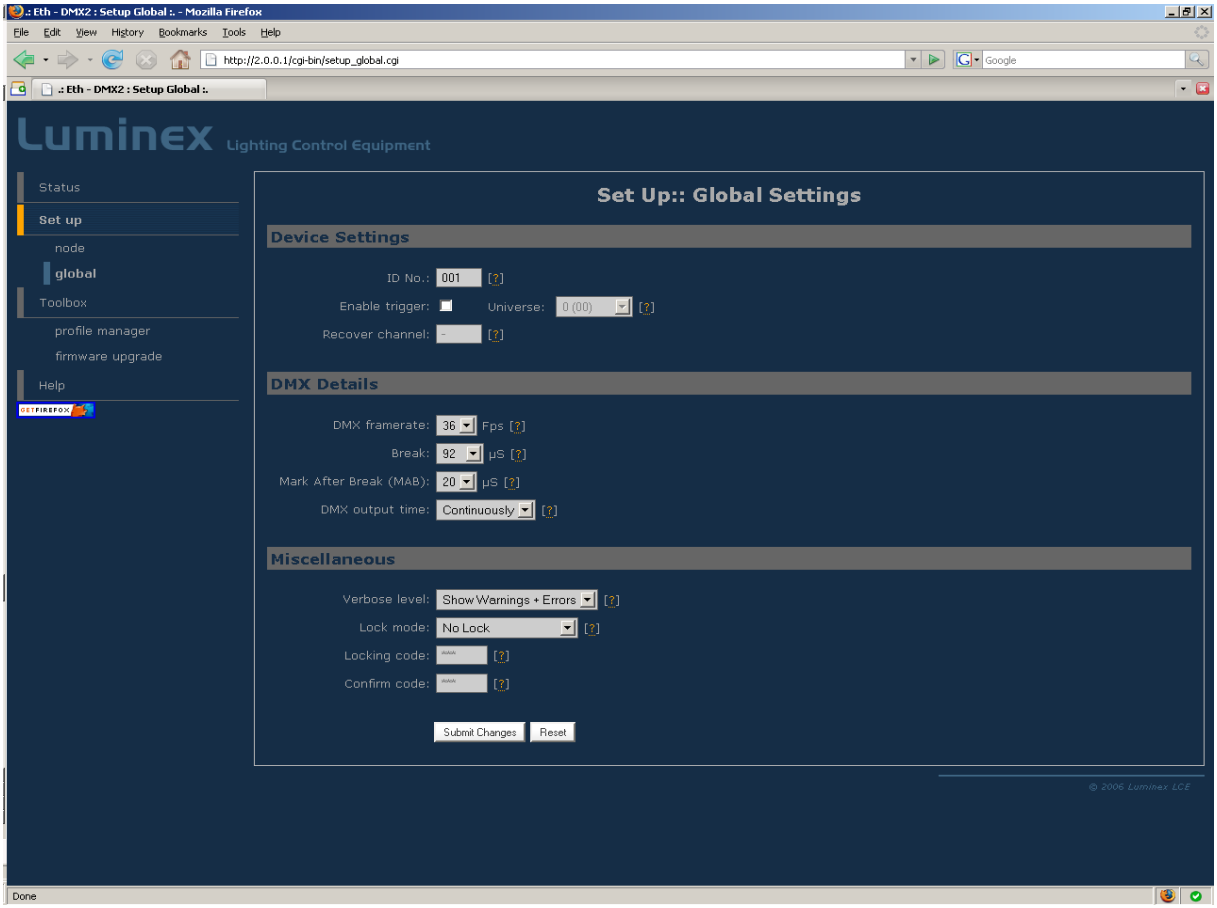
The Port field allows you to change the UDP port used on the network to transmit your UDP ArtNet packets. Luminex recommend no to change this value.

## ***Node identification*** :

Enter here a small and long name to easily identify your node on the network through a Web interface, ArtNet compliant softwares or Luminex LumiNet monitor.

- **Global**

Some global settings can be altered by clicking Global in the Setup sub menu. Device Settings




Here you can change the device's ID number which is indicated on LumiNet monitor.

You can also enable the Trigger universe to remotely control your merging policy through any DMX source. The node will listen to the specified universe entered in the universe field.

You can set your Recover channel if you use the manual recovery mode (page 28, 32).

### *DMX details*

The DMX frame rate setting for all outlets. This can be set from 20 to 44 frames per second.

DMX Break time can be set from 92 – 352 us

DMX Mark After Break (MAB) time can be set from 12-88 us

DMX Output time can be set to 1 – 10 minutes or continuously. This time sets how long an output remains outputting it's last DMX levels after no valid DMX packet came in for that particular universe on ArtNet.

### *Miscellaneous*

This part is about security and warnings :

- **Verbose level** : Select if you want to see error messages on the front end LCD or the Web interface.
- **Lock Mode**: select the security level you want to be applied on your Ethernet-DMX8 /W front end. Auto lock will force the Node to lock all wheels encoders and switches after 2 minutes of front end inactivity.

  Password protected mode will guide you to set a password into the "locking code" field. Once the node is locked, you'll have to enter the 4 digit password through front end buttons or through Web interface password field.

  Read the "Unlock the node" chapter to see the complete procedure.

## *Toolbox*

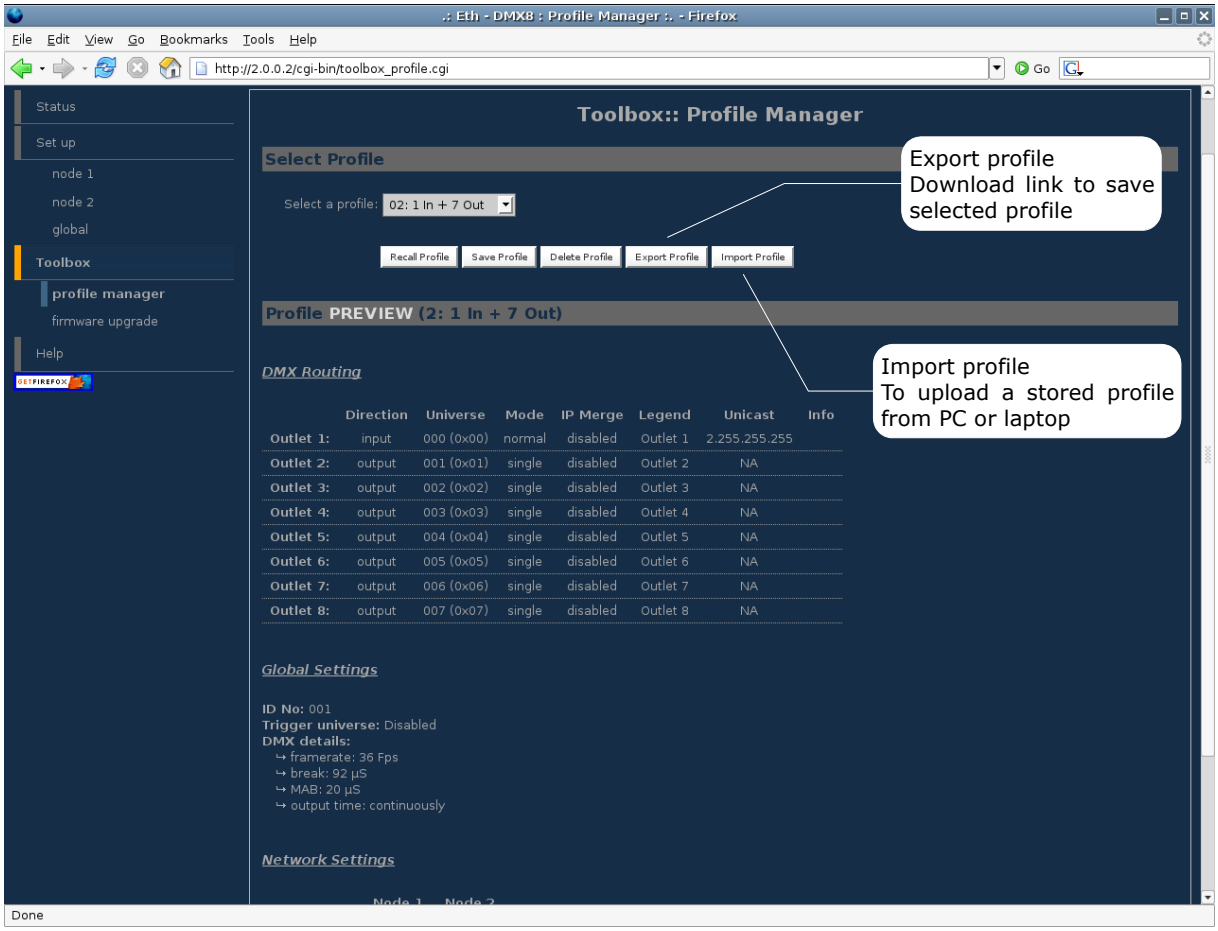
When clicking on Tools in the navigation bar, a sub menu appears. Choose one of the items in the sub menu.

- **Profile manager**

The profile manager is able to store 40 profiles. All profiles are stored on the device.

A preview of the complete configuration stored in a profile is shown when a profile is selected from the drop down list. When an empty profile is selected, no preview will be shown.

Once a profile is selected you can choose to recall it, to save actual settings as a profile, or to delete the profile.




When recalling a profile, an other page will appear to ask whether to recall your network settings as well or only the outlet routings.

When saving a profile a next page will ask you to fill in a profile name.

- **Firmware upgrade**

The firmware upgrade page allows you to select a downloaded firmware file and upload it to the device.

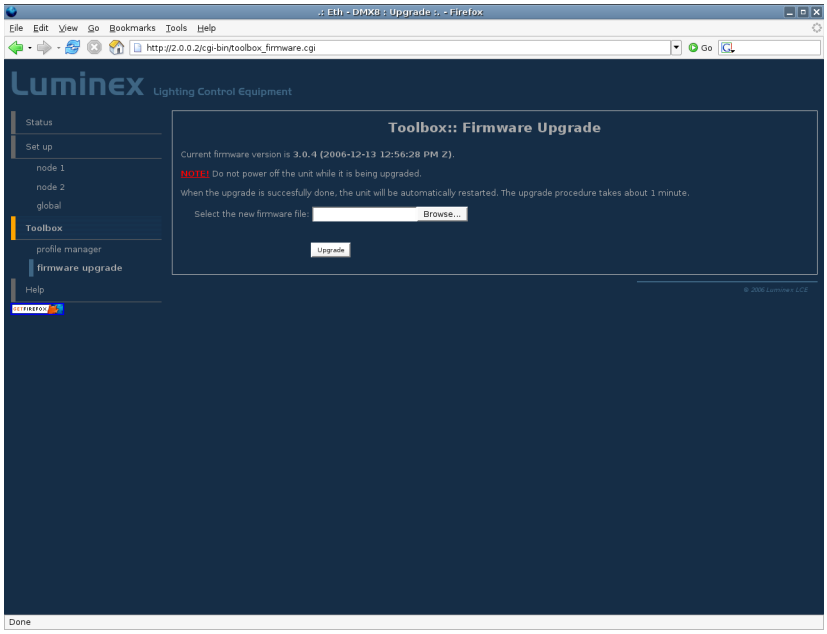
This page shows the actual firmware version running on the unit below the file upload field.

The latest firmware file can always be downloaded from the Luminex web pages.

Http://www.luminex.be

To install the firmware on the Ethernet-DMX8 / WiFi follow these steps:

1. Download the .zip file and save it on your hard disk.
2. Extract the .zip file.
3. Please read the "ChangeNote.txt" for latest release changes.
4. Browse to the device its IP address with your favorite web browser.
5. Click Toolbox -> Firmware upgrade.
6. Browse to the extracted upgrade file on your hard disk (upgrade_eth_dmx8w.tgz).




7. Select the file and press on the "Upgrade" button.
8. The upgrade file will be sent to the device.
9. Wait until the device has rebooted.
10. Enter the IP number of the device in your browser and check at Toolbox -> Firmware upgrade if the current version is set to the right version number. If the number is the same as mentioned with the file than the upgrade has succeeded.

# Wireless

The Ethernet DMX8/W is the wireless edition of the Ethernet DMX8 gateway, allowing you to transport your ArtNet DMX stream through a 802.11a/b/g wireless link, and to connect other 802.11 compatible devices such as PDA or computer to your Wireless DMX network.

The Ethernet DMX8/W comes with an on-board wireless device which offers you multiple configurations (access point, client) depending of your needs.

The Ethernet DMX8/W offers you all the Ethernet DMX8 features plus the ability to transfer your data wireless, meaning you have access to the merging, spliting, backup features on a wireless tool !

System requirements for configuration :

- a computer with Windows, Macintosh, or Linux based operating system with an installed Ethernet adapter
- an Internet web browser such as Internet Explorer or Mozilla Firefox (recommended) with JavaScript enabled
- a Cat.5 (or Higher) network cable

## *Wireless basics*

### Installation considerations

Keep in mind that the number, thickness and location of walls, celling, trees, rivers, or other objects that the wireless signal must pass through, may limit the range. Typical ranges vary depending on the types of materials and background RF (radio frequency) noise in your show place. The key to maximizing wireless range is to follow these basic guidelines:

1. Always use a wireless system only when it is **NOT** possible to run DMX cable.
2. Keep in mind that Ethernet IEEE 802.11 system can cause or receive interferences from :
    - Other 802.11 systems, using for show or not.
    - If you are using 2,4Ghz cordless phones, X-10 equipment or other security systems, ceiling fans, your wireless connection can be degraded. Try changing your channel on the Ethernet

DMX8/W access point to avoid interferences.

- Keep your product away at least 1-2 meters from electrical devices that generate RF noise, like microwaves, Monitors, electric motors, Bluetooth devices.
- Sometimes some football stadium floodlight ballast can cause interferences on 2,4Ghz systems.
- Sometimes some radars systems can cause interferences on 5Ghz systems.

3. Keep the number of walls and celling between 2 or more Ethernet DMX8/W and other wireless devices such PDA to a minimum – each wall or ceiling can reduce your Ethernet DMX8/W's range from 1-30 meters.
4. Be aware of the direct line between devices. A wall that is 0.5 meters thick, at a 45 degree angle appears to be almost 1 meter thick! Try to make sure that devices are positioned so that the signal will travel line of sight for better reception.
5. building materials make a difference – a solid metal door or aluminum studs may have a negative effect on range. Try to position Ethernet DMX 8/W so that the signal passes through dry wall or open doorway and not other materials
6. By default, the Ethernet DMX8/W comes with 1 omni directional 2 Dbi antennas. To cover longer distances that these antenna offers, Luminex recommend to use high gain antenna such as directional or omni directional antenna. Pay attention to the type of connector fixed on the antenna. Please contact Luminex or your local distributor for more information.
7. Always keep in mind when setting a wireless DMX network with one or more Ethernet DMX8/W to have the clearest view between the devices.
8. Antennas Orientation – Try different antenna orientations for the Ethernet DMX8/W. Try to keep the antenna at least 1m away from the wall or other objects. Always pay attention the polarization of the antenna you're using. Please refer to the antenna manual.

## *Set the Ethernet DMX8/W Wireless device*

To firstly configure your node 8/W wireless device, you need to use a web browser through your computer connected to the node 2/W.

**Web Browser:**

Using the Web browser means you have to set up your computer in the same IP range than the Ethernet DMX8/W wireless device. It also means that you can reach the access point from any operating system (Windows, Mac or Linux). The Ethernet DMX8/W access point is factory set up with the IP address 2.1.0.1, subnet mask 255.0.0.0.

To set your computer IP address, follow this procedure :

To set a static IP address:

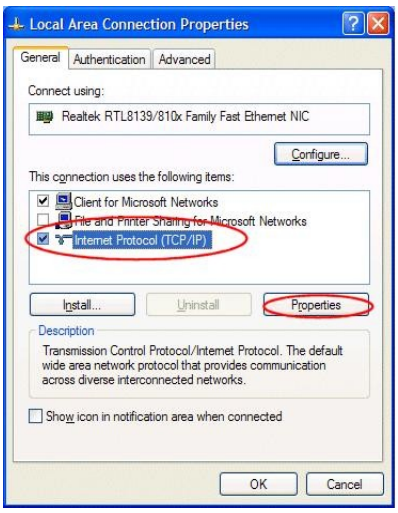
1. Open Windows **Start** menu.
2. Open **Control Panel**.
3. Classic view: Open **Network Connections**
   Category view: Select **Network and Internet Connections**, and then **Network Connections**.
4. Double-click on your active **LAN or Internet connection**.
5. Click **Properties**.

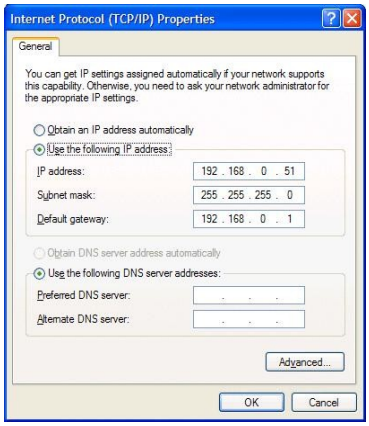
This opens the Local Area Connections Properties window.

6. In the **General** tab, highlight the **Internet Protocol (TCP/IP)** item, and click **Properties**.

This opens the Internet Protocol (TCP/IP) Properties window.

7. In the General tab, click **Use the following IP address**, and enter:

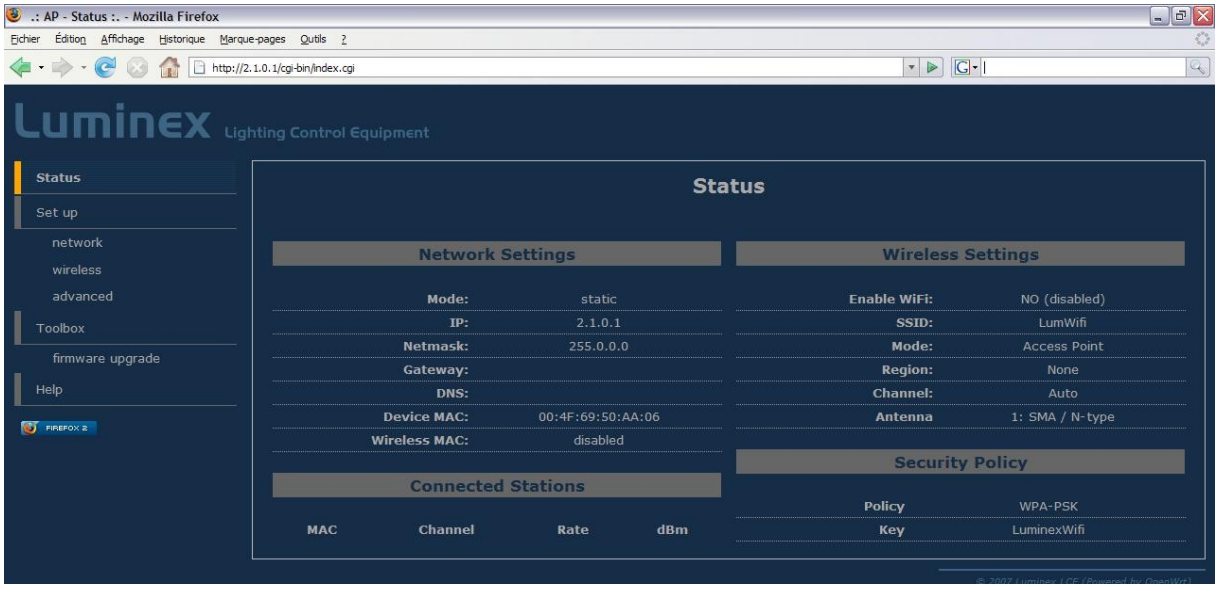



- IP address. The static IP address you want to assign to this computer (must be different than the access point one, i.e 2.1.0.2.
- Subnet mask. Same subnet mask used by your wireless device.

8. Click **OK**.

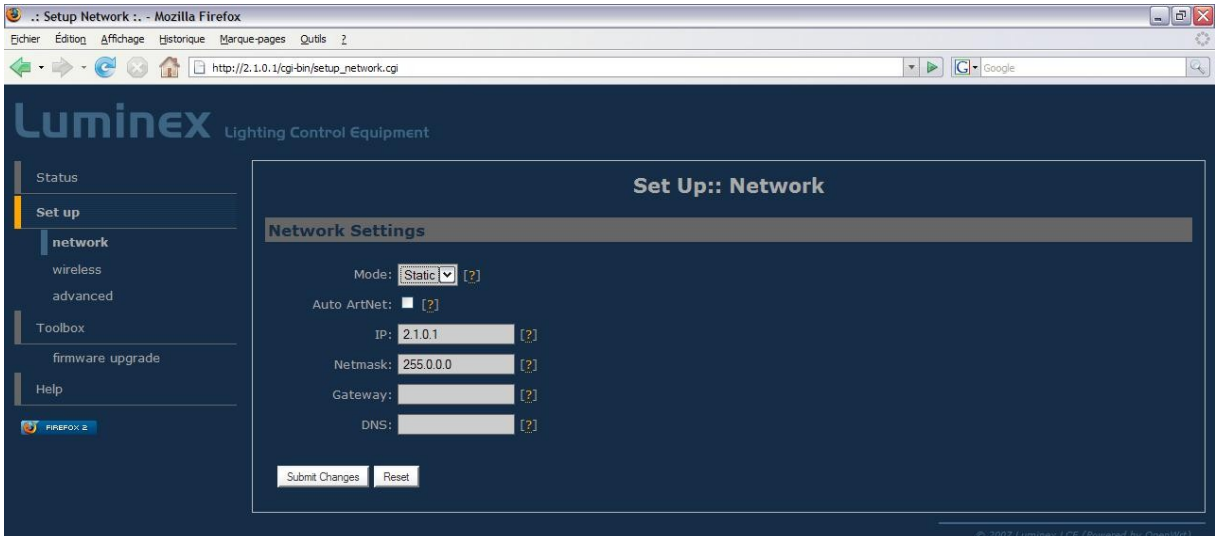
Once you've set your computer IP address, connect your computer to the Ethernet DMX8/W with a CAT.5 cable, launch your favorite web browser and type the IP address 2.1.0.1 in the address field. You've just reached the Ethernet DMX8/W wireless device Web page.




This page gives you a summary of the wireless device configuration. Each

of this parameters will be explain in the following pages.

Click on the “Network” link on the left handed column.




## Network

Here you can set all network parameters for your wireless device.

Description

**Mode**:

Static: this mode means you'll enter manually the device IP address

**DHCP**: DHCP stands for Dynamic Host Configuration Protocol, that means your wireless device will receive its network configuration through a DHCP server. This mode requires a running DHCP server on your network.

**Auto**: Tick that case if you wish the wireless device to auto assign its own IP address. You'll be able to recover this IP address through LumiNet Monitor V.2.

**IP**: Enter here the wireless device IP address.

**Note**: *If you need to assign static IP address to the devices in your network, please remember that the IP address for each device must be in the same IP range as all the devices in the network. Each device must also have the same subnet mask. For example: Assign the first device an IP address of 2.1.0.1 and a Subnet Mask of 255.0.0.0, the second device an IP address of 2.1.0.2 and a subnet mask of 2550.0.0.0 and so on. Devices that are not assigned with the same IP address may not be visible on the network.*

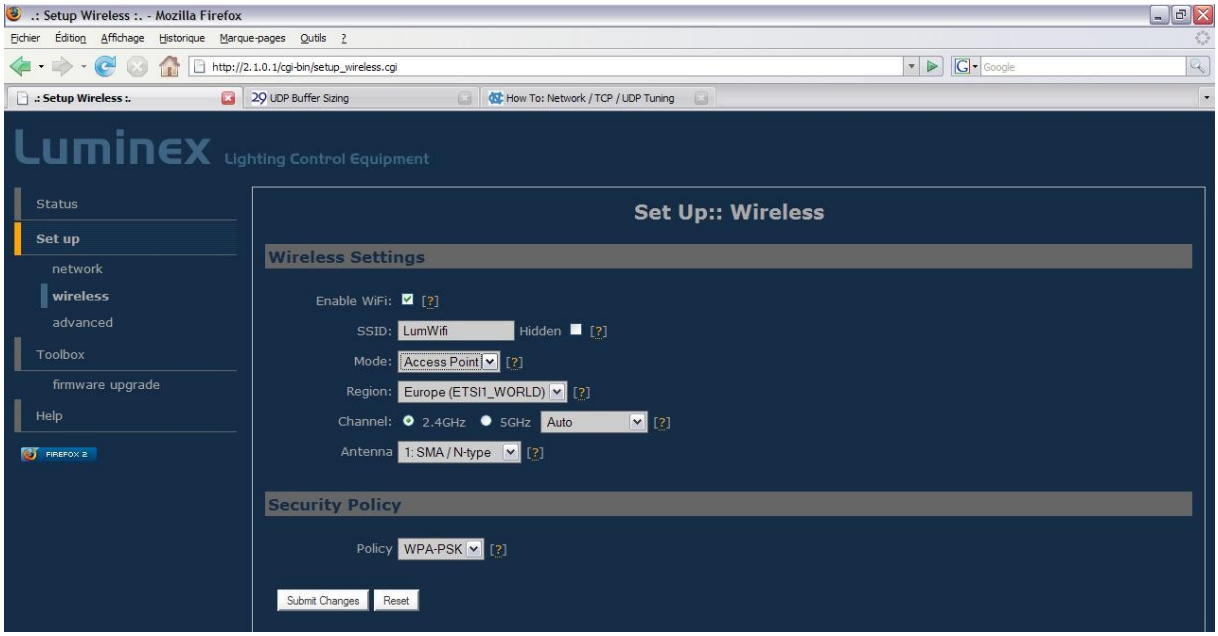
**Subnet Mask**: 255.0.0.0 is the default subnet Mask. All devices on the network must have the same subnet mask to communicate on the network.

**Gateway**: Sets the AP default gateway address in your LAN.

**DNS**: Sets the primary Domain Name Service Server for translating the domain name into IP address.

Press Submit when you've finished.

### Wireless settings




Description:

**Enable Wifi**: Tick that box if you wish to switch off the radio. This can be very useful when you wish to use two or more wireless nodes as wired node connected to a switch. This prevents to create broadcast storms.

**SSID**: (Service set Identifier) LumWifi is the default setting. The SSID is a unique name that identifies a network. All devices on a network must share the same SSID name in order to communicate on the network. If you choose to change the SSID can be up to 32 characters in length.

**Mode**: Default is "Client". This menu define the way your device operates. Luminex Wireless systems use a centralized infrastructure, that means one or several clients connected to a main access point. Even for a two units link (point to point), you will need an Access point and a client.

If you wish your wireless device to act as a client, a "Site Survey" hyperlink will appear as soon as you'll have submit the new settings.

**Region**: Select the Region where you wish to use the unit. This setting influences the available channels. As the standard for 802.11 differs for countries across the world respectively it's the responsibility of the user to familiarise themselves with the available local frequencies and to work

with them accordingly.

**Channel**: You first here have to choose either to work with 2.4Ghz or 5Ghz frequencies. As more and more 2.4Ghz devices are used all over the world, it can be very useful to swap to this frequency range which is much more quieter.

Auto is the default channel.

Using a fixed channel is better suited for a reliable connection between 2 Ethernet DMX8/W. However, it can be sometimes very useful to be able to change the channel number on the fly for your whole network, so the Ethernet DMX8/W or Ethernet DMX2/W used as access point will be set up with a static channel, and the client ones with an auto-assigned one (Auto).

Also, use the auto channel mode can let the node select the best frequency to use to avoid interferences. When the Node 8/W is set as a client, you'll not be able to change the frequency neither the channel, as it will scan automatically for the frequency used by the access point sharing the same SSID.

**Antenna**: Select the antenna or connector you wish to use : select SMA/N-Type if you want to use the front end connector of your node 8/W

**Security Policy**:

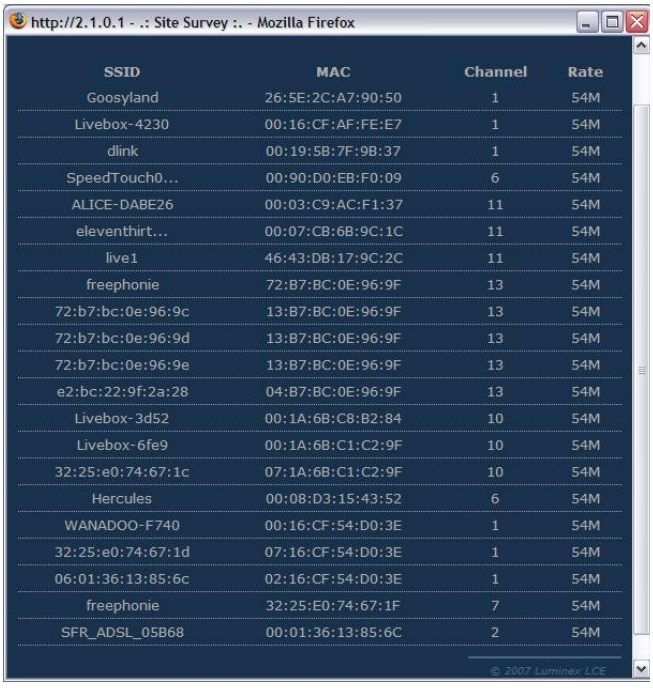
None – No security Policy.

WPA-PSK Encryption*:* Use WPA-PSK (Wi-Fi Protected Access with Pre-Shared Key) to obtain a better security policy. Luminex as already entered a default passphrase to use with this encryption. This value is viewable on the status page. WPA-PSK is the default policy. Luminex use a WPA-PSK TKIP encryption.

Once done, click on the "**Submit**" button.

### Site Survey

It can be sometimes very useful to scan a wireless network if you don't remember what SSID you've set earlier in the access point you want to connect to. If you've set one of your wireless devices as a client, reach the "wireless" web page and click on the "Site Survey" hyperlink.

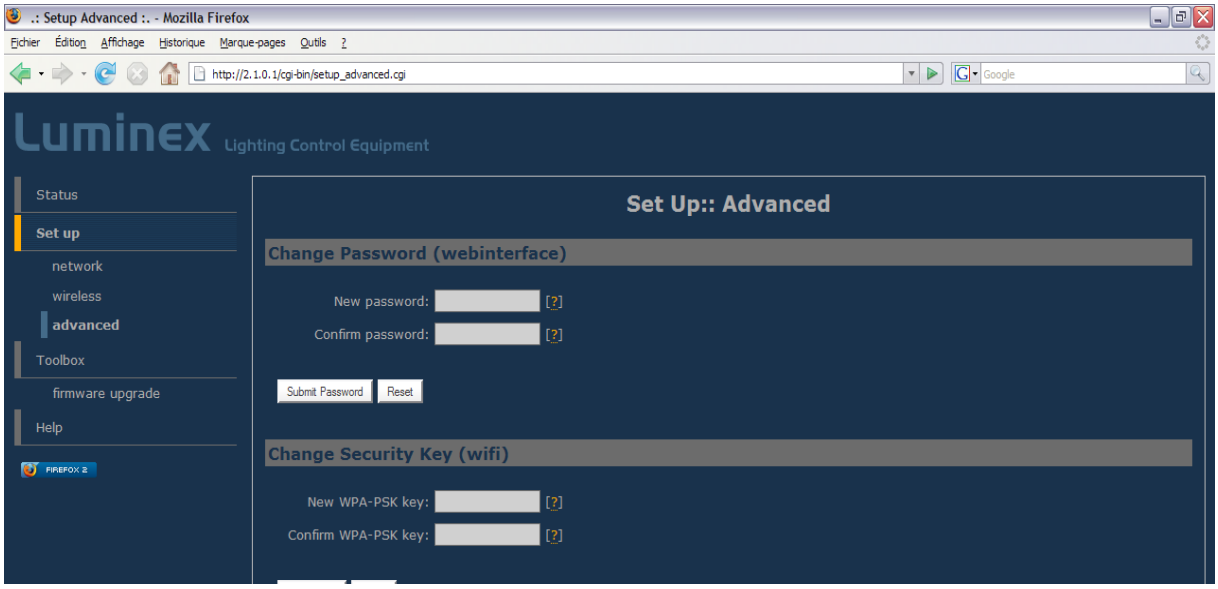



A list of available wireless networks appears. You can now copy/paste the SSID you wish to use for your client node.

**Advanced :**

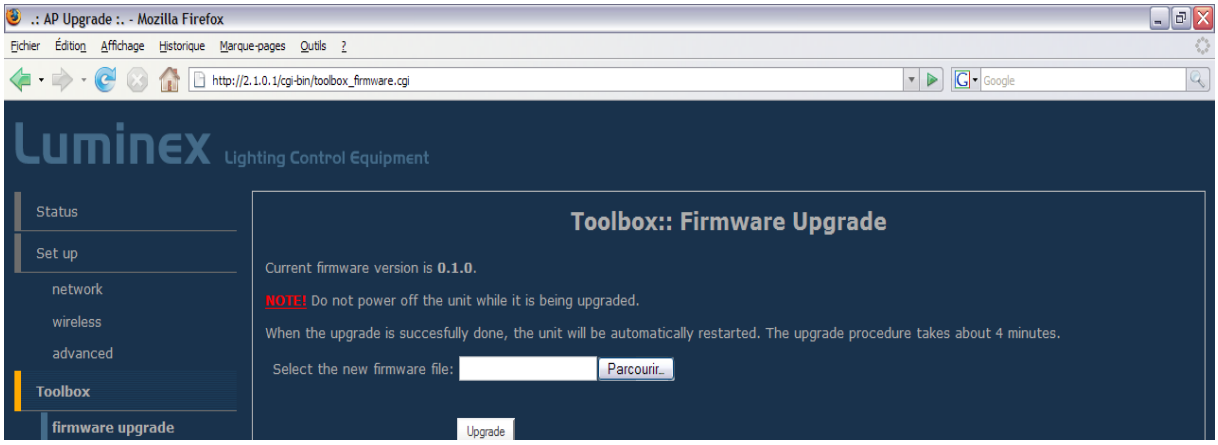
Here you can easily set a password to secure the access of your wireless device web interface. Please remind that a login window will appear for your to enter your password into the password field. The password is minimum 6 alpha-numeric characters long.

If you do not wish to use the default encryption passphrase, you can also enter here a new passphrase for your WPA-PSK encryption. Please keep in mind you'll have to share the same passphrase with all the devices running the same SSID. The key is 63 alpha-numeric characters long.




**Firmware upgrade:**

Click on the "browse" button and select the corresponding firmware. The firmware is available on Luminex Website, section -> Support.

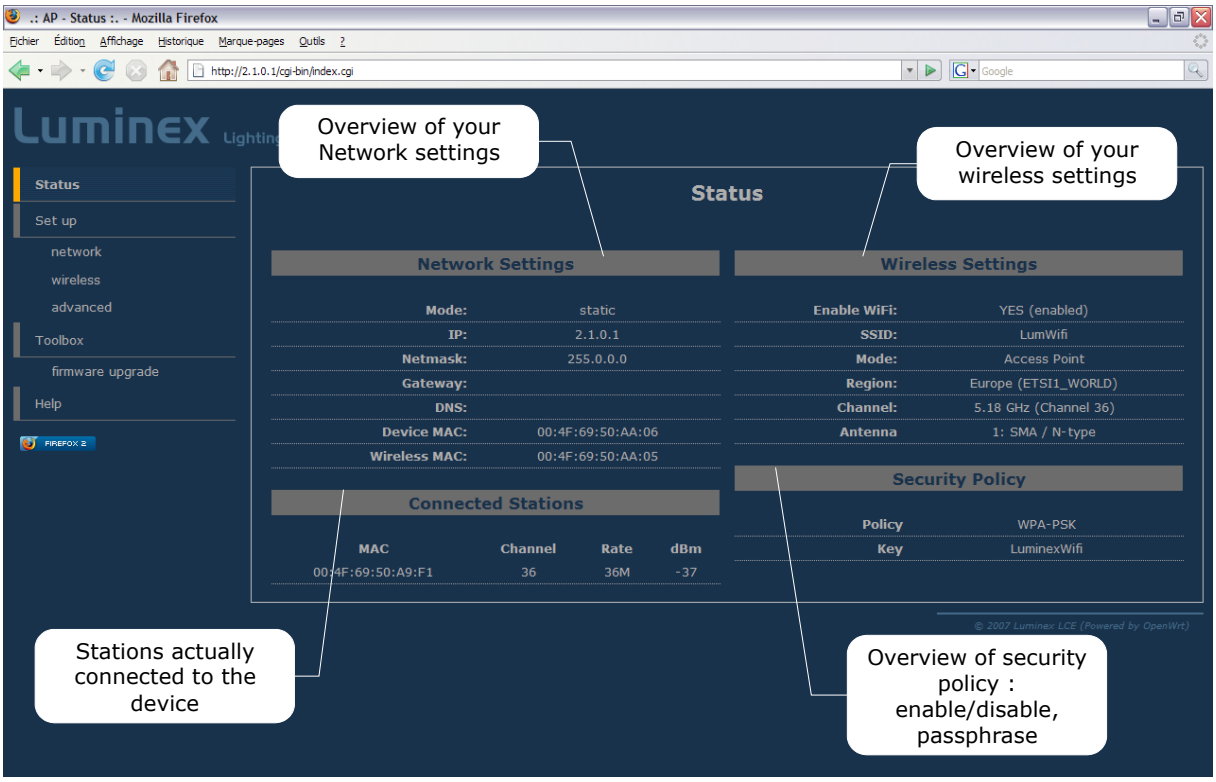


The wireless device will reboot with its new configuration.

**NOTE**: Please remind that once the wireless device reboot, its new IP address will change to 2.1.0.1, netmask : 255.0.0.0

### Status page

The status give a good overview of your whole wireless device configuration.




Each section (Network settings, Wireless settings and Security policy) reminds you your actual settings. Please refer to each dedicated section in this manual for detailed explanation.

The Connected station section shows you the number of wireless devices connected to the wireless device you're managing.

**MAC address** : Wireless MAC address of the connected station

**Channel** : Channel used by the connected device

**Rate** : Throughput available between the 2 stations

**dBm** : Strength of signal of incoming packets from the station (in Decibel per milliwatts)

### Reseting the Ethernet DMX8/W wireless device

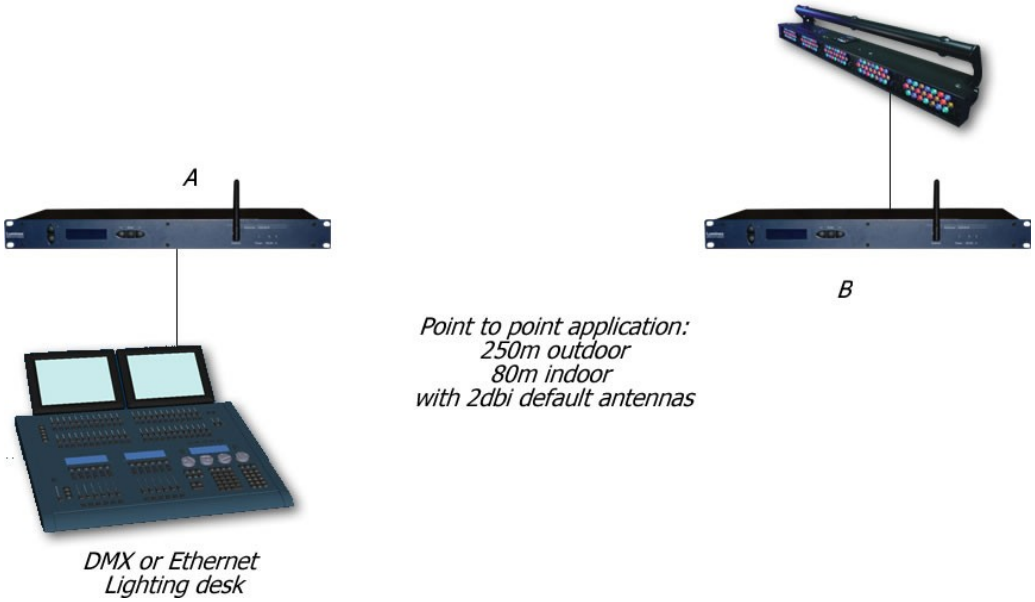
It can be sometimes useful to start on a default wireless device configuration, by example when the Ethernet DMX8/W has be rented and a user has set a password on it. To reload the factory set up of the Ethernet DMX8/W, please use the front end display, and follow this procedure:

- enter the main menu by pressing "-"
- Press ">" button to reach "Global settings" menu, and press enter
- Press ">" to reach "RESET ACCESS POINT" menu, press enter
- Confirm by pressing Enter
- the wireless device is now rebooting

  Please remind thus the default factory IP address (2.1.0.1). It is also possible to reset the wireless device through LumiNet monitor V.2

## *Application examples*

### Point to point



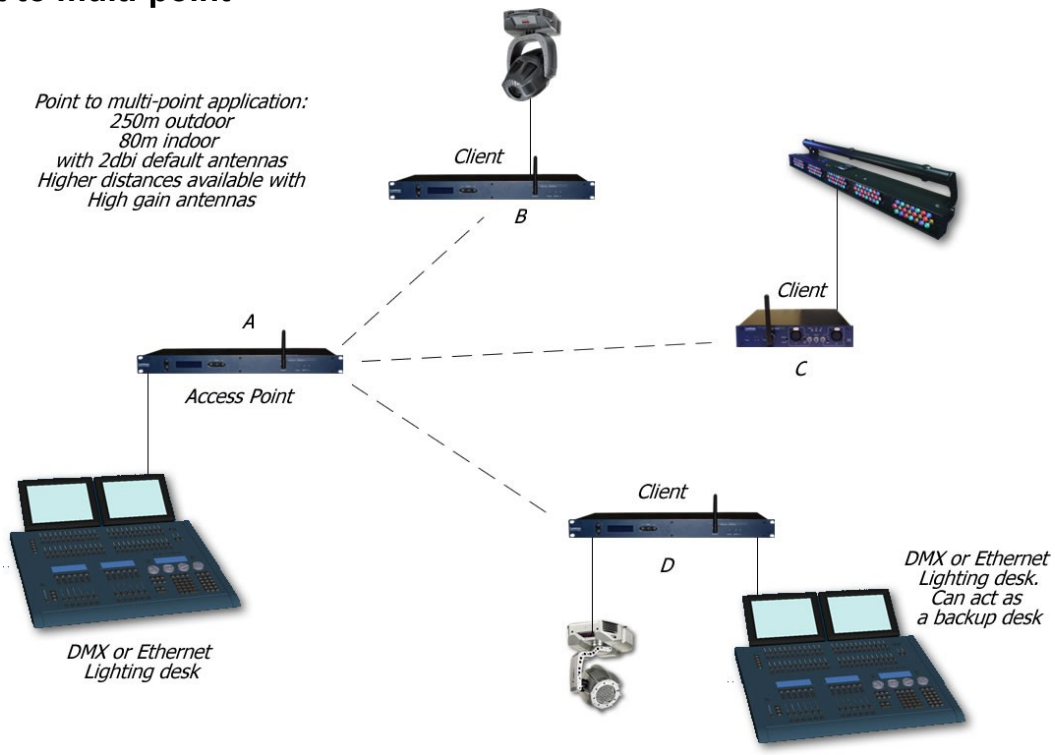

In that case we create a point to point link between 2 Ethernet DMX8/W nodes, usually used to cross a river, between two buildings or to distribute DMX data were you can't run DMX cables.

Thanks to the DMX8/W new firmware, you can plug a second desk to the B Ethernet DMX8/W and run it as a backup desk, or as a second desk controlling lights linked to the A Ethernet DMX8/W.

**Always keep in mind you can't stream more than 8 universes between two Ethernet-DMX 8/W on a 5Ghz link, 4 universes on a 2.4Ghz link, 8 universes on a 2.4Ghz link in unicast mode !**

By default , both nodes wireless devices comes with a client firmware, so to create a link, switch one of the 2 node wireless device to an access point mode to create a link (refer to the "mode" section ).

**Point to multi-point**




In that case we create a point to multi-point link between 4 Ethernet DMX8/W nodes.

By default , both nodes wireless devices comes with a client firmware, so to create a link, switch one of the 4 node wireless device to an access point mode to create a link (refer to the "mode" section ).

**Always keep in mind you can't stream more than 8 universes between two Ethernet-DMX 8/W on a 5Ghz link, 4 universes on a 2.4Ghz link, 8 universes on a 2.4Ghz link in unicast mode !**
**You can't stream more than 2 universes between a Node 2/W and a Node 8/W. For instance, you can run 8 universes from a Ethernet-DMX 8/W to 4 Ethernet-DMX2/W, with unicast mode enabled. Each wireless link will composed of 2 universes.**

The use of wireless bi-directionality and the enhanced features of the node 8/W allows you to work in a two way system, meaning that you can control lights attached to B from a desk attached to D.

For multipoint or point to point configurations, pay attention for each Ethernet DMX2/W or Ethernet DMX8/W to run the same SSID and the same channel.

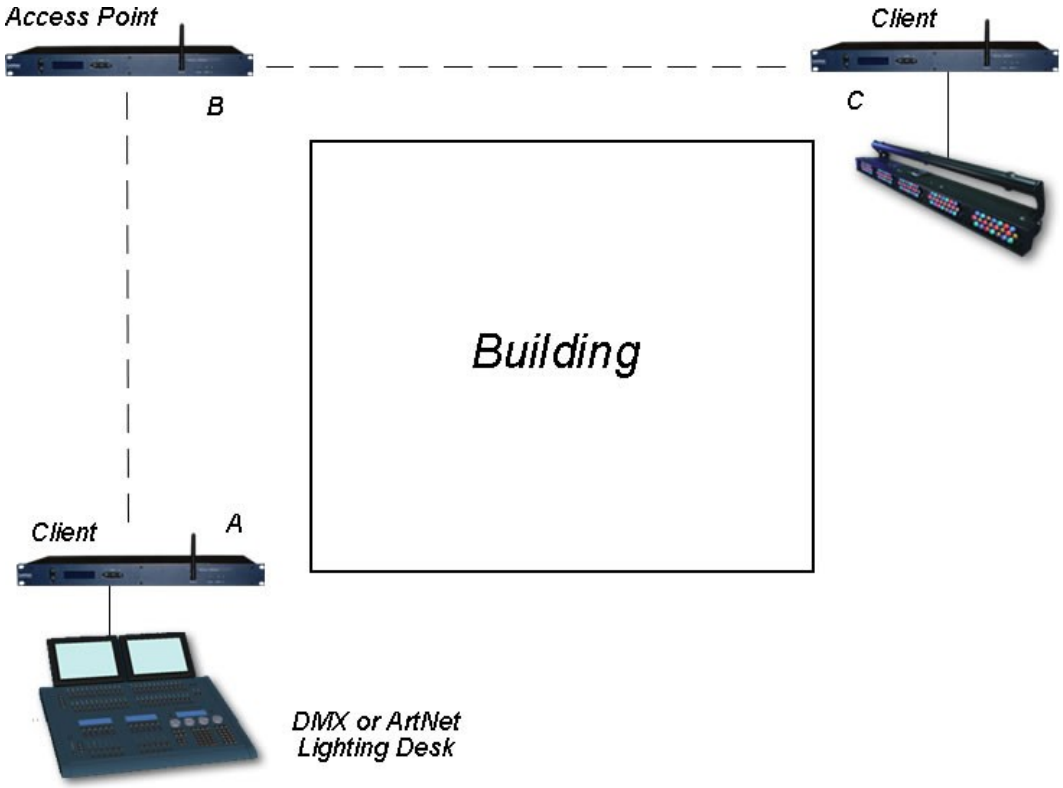
If you run your show in a very disturbed environment, it can be useful to set your main Node (A in this example) with a static channel, and all the others node with a dynamic channel, allowing you to change your complete network channel "on the fly".

To connect other wireless devices such as Laptop or PDA, set theses devices in the same IP range and connect them to the A Ethernet DMX8/W through their own wireless connection wizard.

Keep in mind that the working distances between other wireless devices to Ethernet DMX8/W depends of their radio emitting power & receiving sensibility .

### Repeater

It can be useful to use a wireless system for a non line of site situation. But regarding environmental situation (buidings, water, trees..), using a repeater can sometimes be the only only fashion to achieve your project. To do so, you can use a Node 8/W and set its wireless device to act as an access point ( Node B on the drawing). The 2 others nodes will be set as clients. Thus they now communicate through the centralized access point.

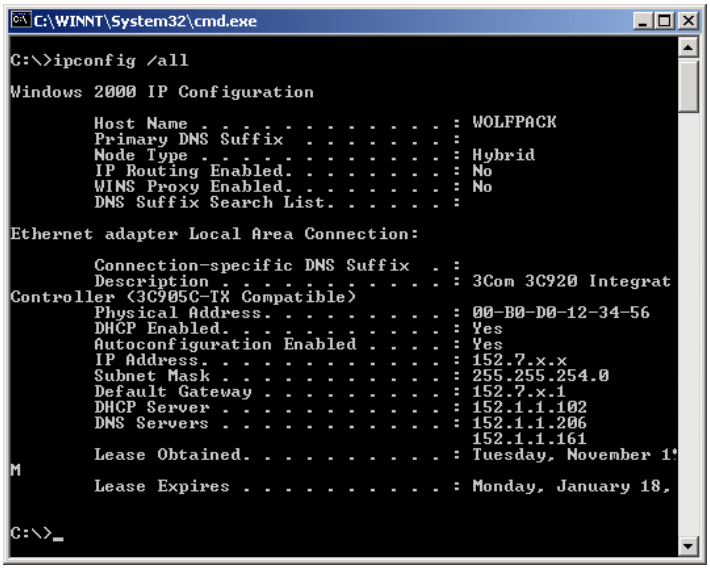


## *Tools :*

### *Checking your computer IP address:*

to quickly know your IP address with Windows 2000/XP, go to Start>Run> type CMD> ipconfig /all

All the information about our IP addresses appears, each interface is detailed:

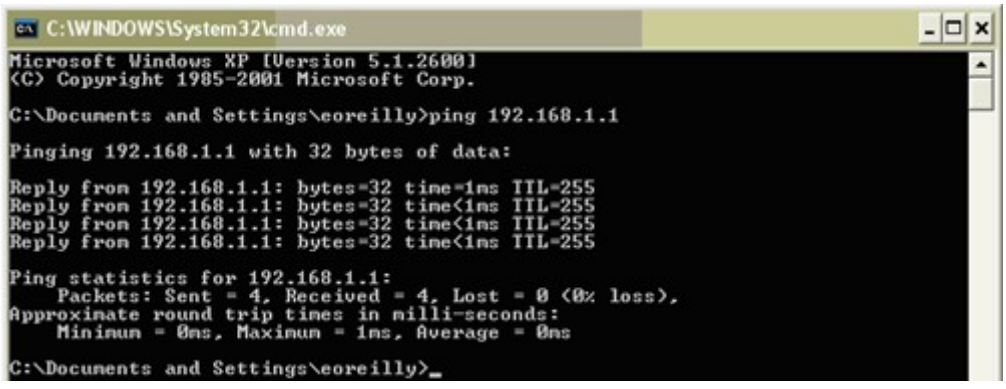



**Checking the connection**

This tips can help you to check your Ethernet connection (wired or wireless) between your computer and your Ethernet DMX8/W.

**Ping** is a computer network tool used to test whether a particular Ethernet is reachable across an IP network. Ping works by sending "echo request" packets to the target host and listening for "echo response" replies. Using interval timing and response rate, ping estimates the round-trip-time and packets loss rate between hosts.

To do a ping test, go to Start>Run>Type CMD> Type Ping followed by the IP address of the device you want to reach



## Specifications (Wireless Device):

## Standards :

- IEEE 802.11a/b/g IEEE 802.3
- IEEE 802.1x
- IEEE 802.3u

## External Antenna Type:

- 2.0 dB gain with reverse SMA connector

## Safety Emissions:

- FCC CE
- UL DGT
- TELEC/JTEC SRRC/CCC

## **Data Rates** (With automatic Fall back)

- 802.11a : 54, 48, 36, 24, 18, 12, 9, 6 Mbps
- 802.11g : 54, 48, 36, 24, 18, 12, 9, 6 Mbps
- 802.11b : 11 ,5.5, 2, 1 Mbps

## Frequency range

**802.11b/g :**

- USA (FCC): 2.412GHz~2.462GHz
- Europe (ETSI): 2.412GHz~2.472GHz
- Japan (TELEC):2.412GHz~2.483GHz

**802.11a**

- U-NII : 5.15 - 5.35 GHz - 5.725 - 5.825 Ghz
- ISM: 5.725 - 5.850 Ghz
- DSRC: 5.850 – 5.925GHz
- Europe (ETSI) : 5.15 - 5.35 GHz - 5.47 - 5.725 Ghz
- Japan (TELEC) : 4.90 - 5.00 GHz - 5.03 - 5.091 Ghz- 5.15 - 5.25 GHz

Modulation Techniques:

- 11a Orthogonal Frequency Division Multiplexing
- 11g Orthogonal Frequency Division Multiplexing (64QAM, 16QAM, QPSK, BPSK)
- 11b Direct Sequence Spread Spectrum (CCK, DQPSK, DBPSK)

## Transmitter output power:

- 802.11b: 20 dBm 802.11a: 17 dBm 802.11g: 17 dBm

## Environnemental:

- Operating temperature: 0~60C
- Operating Humidity (non condensing): 20~80%
- Storage temperature: -20~65°C
- Storage humidity: 95% Max

# Additional Documentation

All additional documentation can be downloaded from our web pages in the support section.

Http://www.luminex.be

--> Support