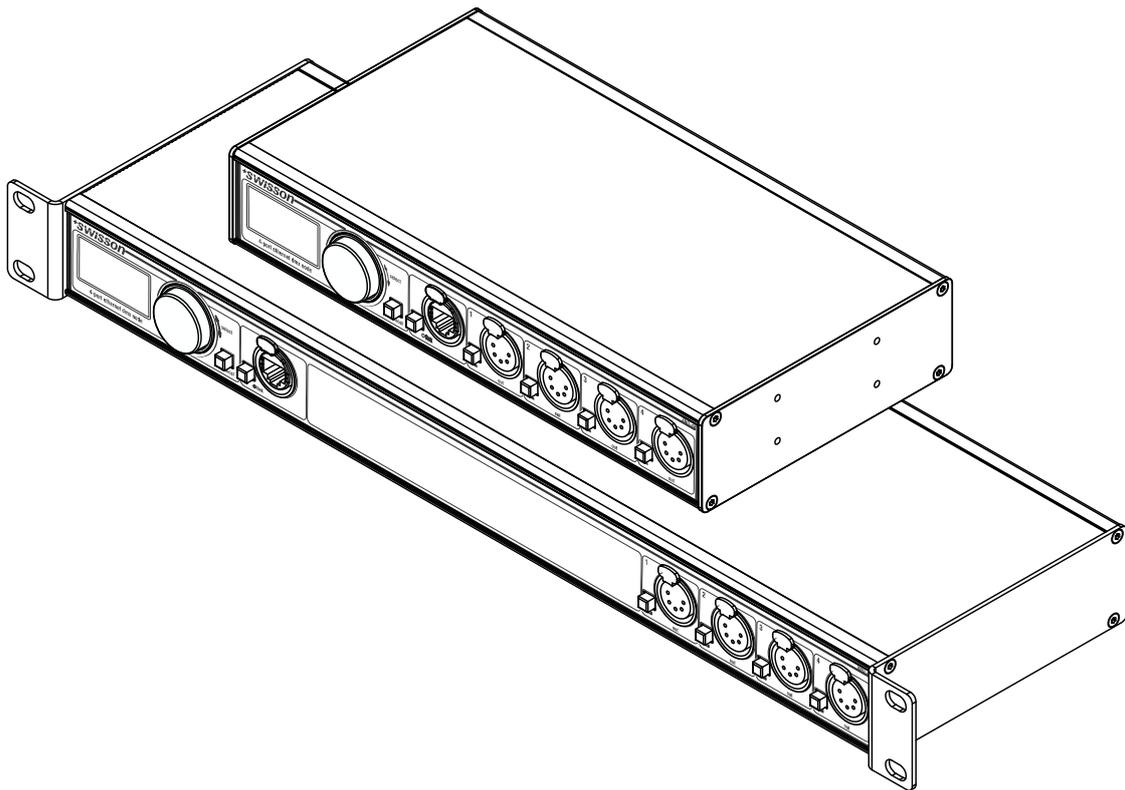


XND-4

4-Port Ethernet DMX Node

User Manual



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Introduction

XND-4 is a user friendly Art-Net to DMX converter supporting the distribution of four universes of DMX via four individually optically isolated DMX outputs. Since most major lighting consoles are capable of transmitting Art-Net data, XND-4 is all you need in order to take advantage of your console's networking capability, allowing you to transmit a vast number of universes over one single network cable. In some cases, users may profit from already existing networking infrastructure.

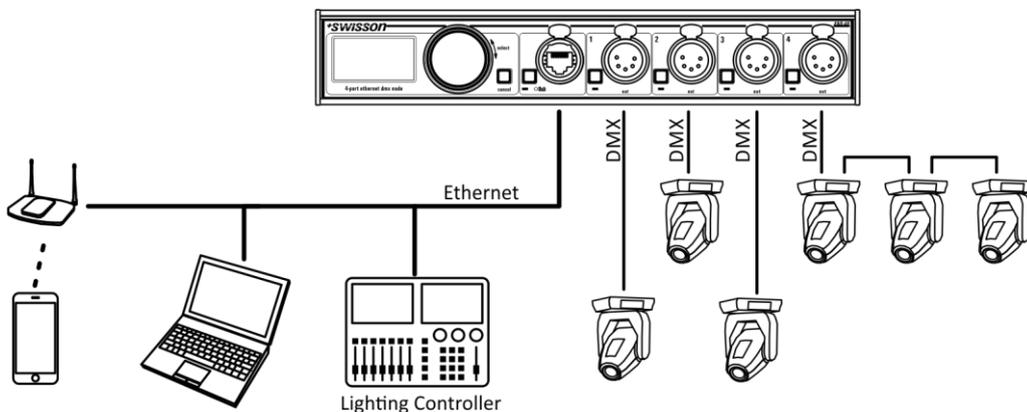
Further, the XND-4 is also perfectly suited to send DMX data to your fixtures from a computer or even from a mobile device. Many light controller programs for PC or Mac support Art-Net output natively and with the help of XND-4's DHCP capability, you can even let your workplace network infrastructure do the network configuration of your XND-4 automatically for you.

With its 128x64 pixels OLED display however, configuring the network and setting up your Art-Net preferences manually is no trouble at all and helpful status information is always at hand.

Applications

- Concert lighting
- Live events
- Multimedia shows
- Theaters
- TV studios
- Theme parks
- Architectural lighting

Typical Application



Unpacking

The XND-4 is packaged in a cardboard box. The following items are included:

- The device.
- This user manual.

Safety Information

It is essential that you read and understand this manual before operating the device and that you follow the instructions given below closely when you set up, connect and use the XND-4. Do not use the device in any way or for any purpose not described in this user manual.

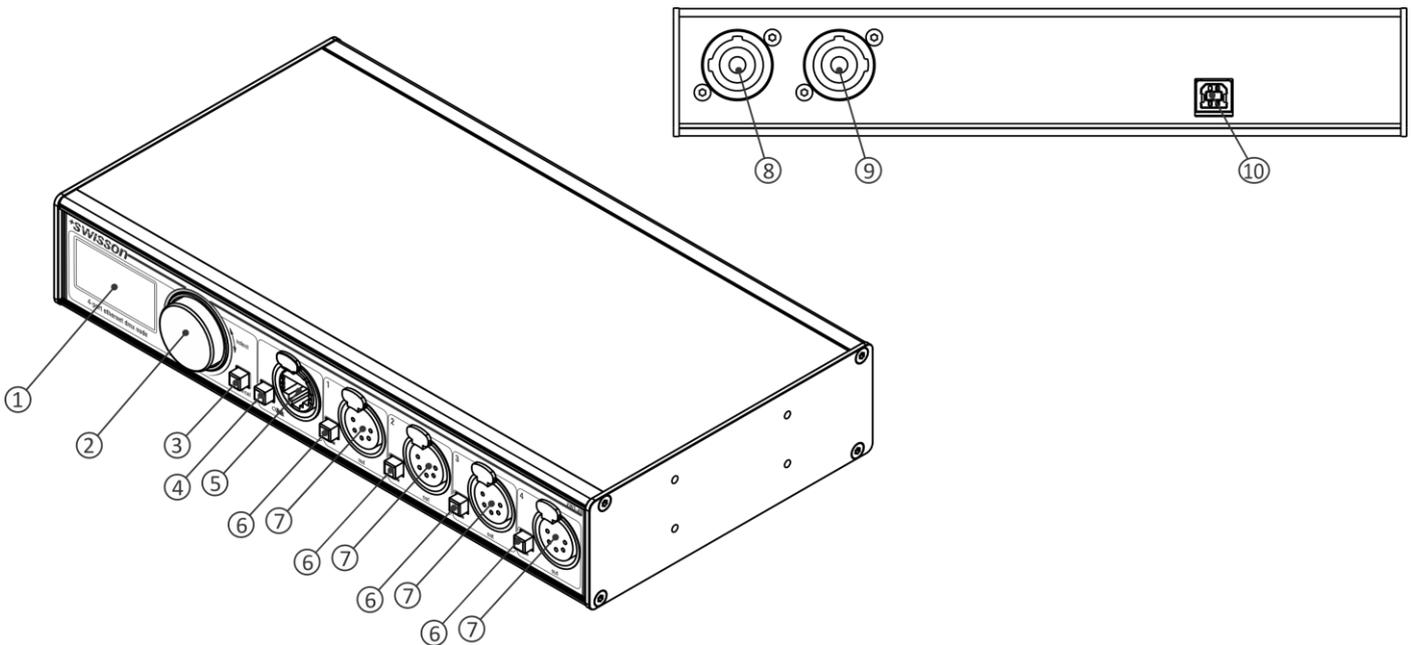
This product is approved for professional use only; it is not intended for household usage. Pay attention to all warnings given in this manual and use this device only in accordance with applicable laws and regulations.

Safety Precautions

- **Disconnect the device from the AC power supply before removing any cover or part, including fuses, even when not in use.**
- **Ensure that the device is electrically connected to ground (earth).**
- **Use only a source of AC power supply that complies with local building and electrical regulations and which has both overload and ground-fault (earth fault) protection.**
- **Before using the device, check that the power distribution equipment and cables are in perfect condition and rated for the current required by all connected devices.**
- **Isolate the device from power supply immediately if the power cable or the power plugs are in any way damaged, defective or wet, or if they show signs of overheating.**
- **Do not expose the device to rain or moisture.**
- **Do not operate the device if any cover or component is missing, damaged or deformed.**
- **Refer any service operation not described in this manual to Swisson.**
- **Provide unrestricted airflow around the device.**
- **Do not operate the device if the ambient temperature exceeds 55°C (131°F).**
- **Do not modify the device in any way not described in this manual or install other than genuine Swisson parts.**
- **Do not attempt to bypass any fuse. Replace any defective fuse with one of the specified type and rating only.**
- **When suspending the device, ensure that the supporting structure and all hardware used can hold at least 10 times the weight of all devices suspended together.**
- **When suspending the device, install a secondary attachment such as a safety cable that is approved by an official body such as, e.g. TÜV (German Technical Monitoring Association), a safety attachment for the total weight it secures. The safety cable must comply with EN 60598-2-17 section 17.6.6 and be capable of bearing a static suspended load 10 times the weight of the device.**
- **Make sure that any external cover and rigging hardware is securely fastened.**
- **Provide an adequate clearance underneath the work area and a stable platform whenever installing, servicing or moving an overhead device.**

- Do not use the device in areas where it is exposed to direct sunlight.
- Do not use the device in areas that are considered to be “highly inflammable”.

Device Overview



1. OLED display.
2. Encoder wheel / [OK] button. The encoder is primarily used for selecting menu items by turning the knob. It also functions as a push button. This manual refers to this button simply as [OK] button or [OK].
3. [Cancel] button.
4. Ethernet port button [E].
5. Ethernet port (RJ45 Neutrik etherCON socket).
6. Output port buttons [1] – [4]. These push buttons are used to change to which universe the respective output is connected. An output port status LED showing status information is located directly below each of those buttons.
7. Signal output ports 1 – 4.
8. Neutrik powerCON input socket.
9. Neutrik powerCON output socket.
10. USB type-B socket for firmware updates.

Mains Connection

The user must supply a suitable power cable. He may then either hard-wire the power cable to the building's electrical installation, providing an easily accessible power on/off switch close to the device, or install on the power cable a grounding-type (earthed) mains plug that is suitable for the local power outlets, following the power plug manufacturer's instructions. Consult a qualified electrician, if you have any doubts about the proper installation.

A blue *Neutrik powerCON NAC3FCA* cable mount connector must be used to supply power at the XND-4's power input socket.

Warning! For protection against dangerous electrical shocks, the device must be grounded (earthed). The local AC power source must be supplied with both overload and ground-fault (earth fault) protection.

Important! Only attach or remove a Neutrik powerCON connector while it is connected to the mains to apply or cut power in an emergency situation, as by doing so may cause arcing at the terminals that will damage the connectors.

Power Outlet

Warning! The total current load of all devices connected to the AC mains power outlet of the XND-4 must not exceed 19.8 amperes.

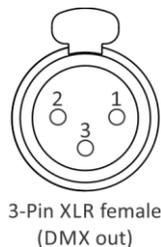
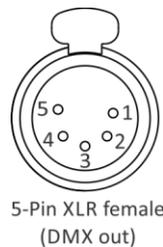
- A power cable that meets the requirements specified in the safety instructions section of this manual must be used to connect the XND-4 to AC mains power and to connect other devices to the power outlet.
- A light-grey Neutrik powerCON NAC3FCB cable-mount connector must be used to draw AC mains power from the XND-4's power outlet.
- No matter what the AC mains power voltage is, the current drawn by all the devices that draw AC mains power from the power outlet of an XND-4 must not exceed a total of 19.8 amperes.

DMX Connections

Depending on the version, the XND-4 is equipped with 5-pin or 3-pin XLR connectors or with Neutrik etherCON RJ45 connectors.

XLR Connectors

Pin	Connection
1	Com
2	Data -
3	Data +
4	Not connected
5	Not connected



RJ45 Connectors

Pin	Connection
1	Data +
2	Data -
3	Not connected
4	Not connected
5	Not connected
6	Not connected
7	Com
8	Com
Shield	Earth

Each output port is individually optically isolated.

Settings and Menu

General Navigation

The encoder wheel (see page 7) is the primary means for navigating through the menus. Most of the menus arrange items vertically. In those menus, turn the encoder clockwise to select the item below the currently selected item or turn the encoder counter clockwise to select the item above the currently selected item. In menus that arrange items horizontally (e.g. text fields), clockwise means “to the right” and counter clockwise means “to the left”.

Other than that, the encoder wheel also functions as a push button. This button is generally used to confirm a selection or to navigate to a selected submenu. This manual will also refer to pushing the encoder knob as “push [OK]” or “push the [OK] button”.

On the right side of the encoder knob, you can find the [Cancel] button (depicted on page 7), which is generally used to dismiss a selection or to exit a menu.

By keeping the [Cancel] button pressed for at least two seconds, you can always navigate to the Home Screen. From the Home Screen, the menu is launched by simply pushing the [OK] button.

The following notation is used to describe locations in the menu: *Home > Menu > Sub menu > ...*

For example, the manual could say “navigate to *Home > Menu > Art-Net*”. This can be read as follows:

Keep [Cancel] pressed for 2 seconds to reach the Home Screen.

XND-4				
IP Address	192.168.10.168			
Net	0		Sub-Net	0
Art-Net Universes				
0	1	2	3	

Then, press [OK] to get to the menu.

MENU	
Network	
Art-Net	
Outputs	
Device Settings	
Restore Default Settings	

Select *Art-Net* using the encoder wheel.

MENU	
Network	
Art-Net	
Outputs	
Device Settings	
Restore Default Settings	

After pressing [OK] again to confirm the selection, the Art-Net settings menu is displayed.

ART-NET SETTINGS	
Net	
Sub-Net	
Name	
Short Name	

Home Screen

XND-4				
IP Address	192.168.10.168			
Net	0		Sub-Net	0
Art-Net Universes				
0	1	2	3	

Home Screen of an XND-4 configured to a custom IP address (192.168.10.168) with Art-Net universe addressing information displayed in decimal.

XND-4				
IP Address	2.169.0.18			
Net	14h		Sub-Net	Ah
Art-Net Universes				
0h	1h	2h	3h	

Home Screen of an XND-4 configured to its default Art-Net IP address with Art-Net universe addressing information displayed in hexadecimal.

XND-4				
IP Address	10.169.0.18			
Net	14h		Sub-Net	Ah
Art-Net Universes				
0h	1h	Off	Fh	

Home Screen of an XND-4 configured to its alternative Art-Net IP address with Art-Net universe addressing information displayed in hexadecimal.

The Home Screen shows the IP address of the node as well as the current Art-Net net and the Art-Net sub-net of the node. The numbers at the bottom of the screen display the 4-bit Art-Net universe of each of the output ports. The left most number corresponds to the universe of output 1.

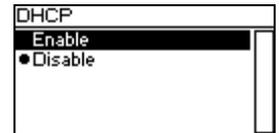
Network Settings

The network settings can be found under *Home > Menu > Network*.

NETWORK SETTINGS	
DHCP	
Static Settings	

DHCP

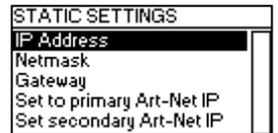
Navigate to *Home > Menu > Network > DHCP* in order to enable or disable DHCP (Dynamic Host Configuration Protocol). Choose *Enable*, if you want to have your network configured by a DHCP server. This would typically be the case, if you connect the XND-4 to a home or office network.



A bullet point is shown next to the currently active setting. Use the encoder wheel to choose the desired setting and confirm by pressing [OK] in order to change the setting.

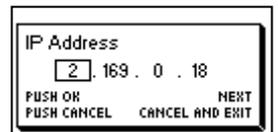
Static Settings

All settings under *Home > Menu > Network > Static Settings* apply only if DHCP is disabled and are ignored otherwise. From this menu, you can choose the IP address, the netmask and the gateway address to be used when DHCP is disabled.



IP Address

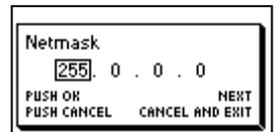
Use this menu item in order to configure the device's IP address. When the IP address configuration dialog is opened, it will look just like the dialog depicted to the right. A box encircling the first number indicates that the first number is selected. While the first number (byte) of the IP address is selected, use the encoder wheel in order to choose the desired value for the first byte of the address, then push [OK] to confirm your selection. The next number will become selected allowing you to configure the second number. Simply repeat the same steps for the remaining numbers. After confirming the value of the last byte, the dialog will be closed and the new settings will be applied.



Netmask

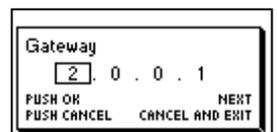
In order to configure the netmask, use the same procedure as for configuring the IP address.

The netmask is used internally to compute the network address from the IP address. XND-4 does this by computing the bitwise AND of each byte with the corresponding byte of the IP address. The bitwise AND of the first byte of the IP address and the first byte of the netmask is the first byte of the network address and so on.



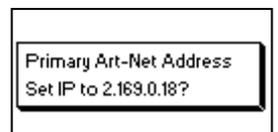
Gateway

In order to configure the default gateway address, use the same procedure as for configuring the IP address or the netmask. If the network data sent by the node needs to be routed, you may want to set this address to the address of your router. In most cases however, this setting is not relevant.



Set to Primary Art-Net IP

After navigating to the menu item *Home > Menu > Network > Static Settings > Set to primary Art-Net IP*, a dialog as shown on the right will appear. Press [Cancel] to abort or press [OK] in order to apply the following settings:



... *Static Settings > IP Address* is set to the primary Art-Net IP address (2.X.Y.Z). The values X, Y and Z are computed from the device's MAC address.

... *Static Settings > Netmask* is set to 255.0.0.0.

Set to Secondary Art-Net IP

As *Set to Primary Art-Net IP*, but sets network settings to the following values:

... *Static Settings > IP Address* is set to the secondary Art-Net IP address (10.X.Y.Z).

... *Static Settings > Netmask* is set to 255.0.0.0.

Art-Net Settings

Node wide Art-Net settings can be configured under *Home > Menu > Art-Net*.

Net

In order to adjust the Art-Net net of the node, navigate to *Home > Menu > Art-Net > Net* and adjust the number using the encoder wheel. Once the desired number has been selected, push [OK] to apply the new setting or press [Cancel] to abort.

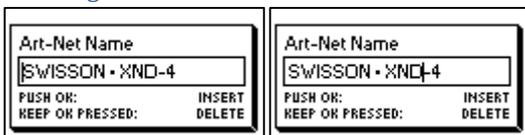
Sub-Net

The sub-net is configured under *Home > Menu > Art-Net > Sub-Net* in the same way net is configured.

Name

The device name can be viewed and edited under *Home > Settings >*

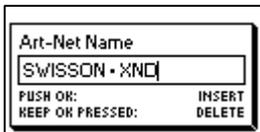
Deleting Text



In order to delete a text line or a part of it, position the cursor immediately to the left of the first character you want to have deleted.

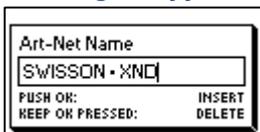


Then keep [OK] pressed and turn the encoder clockwise until all of the text that you wish to delete appears highlighted.

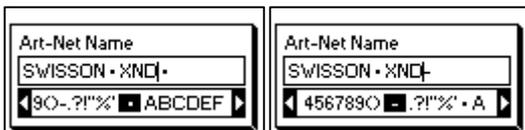


As you release the [OK] button, the highlighted text is removed.

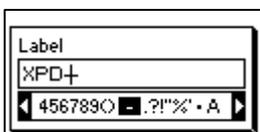
Inserting or Appending Text



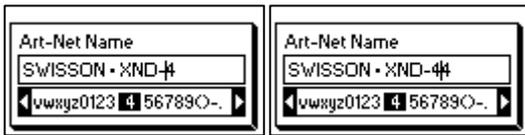
To append or insert text, move the cursor to the position where you want to add your text.



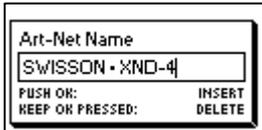
Then push the [OK] button and select a character to add.



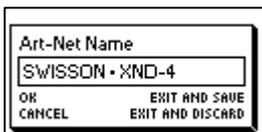
Confirm your selection by pressing [OK].



Repeat the above steps for the remaining characters. Then, press [Cancel] to finish inserting characters.



Press [Cancel] again to quit the editor.



Press [OK] to store the changes or press [Cancel] to discard all changes.

Short Name

The short name can be viewed and edited under *Home > Menu > Art-Net > Short Name*. Editing the short name is done in the same way the name is edited.

Output Settings and Information

For each output port, there is an output port settings menu under *Home > Menu > Outputs > Output [1-4]*. E.g. the menu for output 1 is under *Home > Menu > Outputs > Output 1*. The output settings menu contains the items described below.



Enable/Disable

Under *Enable/Disable*, a selection list is presented to you with the following options:

- *Enable*: The port is enabled.
- *Disable*: The port is turned off.

A bullet point is shown next to the currently active setting. Use the encoder wheel to select the desired setting and push [OK] in order to apply the setting.

Merge Mode

Under *Merge Mode*, a selection list is presented to you with the following options:

- *HTP*: Highest takes precedence. If for a given DMX channel data has been received from two sources, the higher value is used.
- *LTP*: Latest takes precedence. If for a given DMX channel data has been received from two sources, LTP merging uses the value of whichever source was the last to change the value it has sent for that given channel.

Merging is applied when more than one Art-Net controller sends data for the same port. If more than two controllers send data for the same port, only two controllers are taken into account.

A bullet point is shown next to the currently active setting. Use the encoder wheel to select the desired setting and push [OK], in order to apply the setting.

Failure Behaviour

Under *Failure Behaviour*, a selection list is presented to you with the following options:

- *Off*: The output will stop sending DMX, after no updates for the universe of the output have been received for 6 seconds.
- *Hold Last Look*: The output will continue to send the last look even if no updates are received.

A bullet point is shown next to the currently active setting. Use the encoder wheel to select the desired setting and push [OK] in order to apply the setting.

Universe

In order to adjust the universe of output port X, navigate to *Home > Menu > Outputs > Output X > Universe*. This screen can also be reached by pressing the corresponding output port button (button [1] – button [4], see page 7).

Output Port 3		
Status	No DMX	UNIVERSE
Net	20	2
Sub-Net	10	
Sub-Uni	162	

This screen provides essential information about the DMX output and allows for changing its Art-Net universe.

Use the encoder wheel for changing the universe of the given output port. Once the desired universe appears on the screen, push OK to use this universe or press cancel to revert to the previously configured universe.

Please note that while the universe (large number on the right hand side of the display) is being edited but has not yet been stored, its background lights up and the number is displayed in its inverted colour about once every second. If that is the case and you just want to see the actually configured universe number, simply press [Cancel].

On the left hand side of the screen, the following information is displayed on four lines:

- The first line displays the output port status, which can be *No DMX*, *Off*, *Hold* or *DMX OK*:
 - *No DMX* means that the port is enabled, but no DMX is being sent.
 - *Off* means that the port is currently disabled.
 - *Hold* means that the port is currently sending a look which has been received before, but no updates have been received for at least 6 seconds.
 - *DMX OK* is to let you know, that the port is sending DMX data and recent updates have been received.

- The other lines display the Art-Net net, the Art-Net sub-net and the Art-Net sub-uni of the port. The Art-Net sub-uni is computed from the sub-net and the universe of a port as $16 \times \text{sub-net} + \text{universe}$. Some controllers address the Art-Net universe as a single number in the range of 0 to 255. Sub-uni corresponds to that number.

In order to work with Art-Net I and Art-Net II controllers, Art-Net net needs to be set to 0.

Device Settings and Information

Address Display Mode

Under *Address Display Mode*, a selection list is presented to you with the following options:

- *Decimal*: Art-Net net, Art-Net sub-net, Art-Net universe and Art-Net sub-uni are displayed as decimal numbers.
- *Hexadecimal*: Art-Net net, Art-Net sub-net, Art-Net universe and Art-Net sub-uni are presented as hexadecimal numbers with a trailing h (e.g. F3h).

A bullet point is shown next to the currently active setting. Use the encoder wheel to select the desired setting and push [OK], in order to apply the setting.

Screen Saver

Under *Screen Saver*, a selection list is presented to you with the following options:

- *Enable*: Screen saver is enabled.
- *Disable*: Screen saver is disabled.

A bullet point is shown next to the currently active setting. Use the encoder wheel to select the desired setting and push [OK] in order to apply the setting.

Please refer to the section *Screen Saver* on page 16 for more details about the behaviour of the screen saver.

Mute LEDs

Under *Mute LEDs*, a selection list is presented to you with the following options:

- *Mute*: All status indicator LEDs of the device remain dark regardless of the device's status.
- *Unmute*: The status indicator LEDs behave as described under *Status LEDs* on page 15.

A bullet point is shown next to the currently active setting. Use the encoder wheel to select the desired setting and push [OK] in order to apply the setting.

Device Information

The following information about the device is available under *Home > Menu > Device Settings > Device Information*.

Model

The device model is reported as "XND-4" for all variants of the XND-4.

Boot Software

The full version number of the boot software.

Firmware

The full version number of the firmware.

Hardware

The hardware revision.

MAC Address

The MAC address of the node's Ethernet interface.

Restore Default Settings

The default settings can be restored under *Home > Menu > Restore Default Settings*. In this menu, you will be asked whether you want to continue restoring all settings. Push [OK] to confirm or [Cancel] to abort.

This function will restore all settings to the defaults:

- Name: SWISSON XND-4
- Short name: XND-4
- Art-Net net: 0
- Art-Net sub-net: 0
- All outputs enabled
- Art-Net universe output 1-4: 0-3
- Failure behaviour (all outputs): Hold last look
- Merge mode (all outputs): HTP
- IP address: 2.X.Y.Z (primary Art-Net IP address)

- Netmask: 255.0.0.0
- Address display mode: Decimal
- LEDs: Unmuted
- Screen saver: Enabled

Ethernet Port Status Information

This screen is reached by pressing the Ethernet port button [E], which is located right next to the Ethernet port. See *Device Overview* on page 7 for more precise information about the location of this button.

Ethernet	
Link Up	100 Mb/s
Duplex	Full
IP Address	2.169.0.18
Netmask	255.0.0.0

This screen shows the following information about the status of the Ethernet port on four lines:

- The first line below the title shows whether the link is up or down and what the current connection speed is (10 Mb/s or 100 Mb/s).
- The next line informs whether the link is full or half duplex if a link is established.
- The last two lines display the currently configured IP address and the currently configured netmask.

Status LEDs

All LEDs can be muted, in which case they stay dark independently of the device's status. The information below applies when the LEDs are not muted (unmuted). Please refer to Mute LEDs on page 14 for more information about muting and unmuting the LEDs.

Selected Port

When a port is selected, the port's status LED flashes in white for 0.1 seconds once every 0.2 seconds. The DMX output ports and the Ethernet port can be selected using the push button next to the port. Further, the DMX output ports can also be selected via the menu (*Home > Menu > Outputs > Output [1-4] > Universe*).

Not Selected DMX Output Port

If a DMX output port is not selected, the port's status LED provides the following information:

- It shows the output port status for at least 0.7 seconds every second using the following colour coding:
 - Red: Not sending DMX data, but the port is enabled.
 - Yellow: Sending last look, but did not receive an update for at least 6 seconds.
 - Green: Sending DMX data, receiving updates.
 - Black: Port is disabled / turned off.
- The LED lights up white for 0.3 seconds every second, if the node is highlighted.

Ethernet Port (Not Selected)

The status LED lights up for 0.3 seconds every second, if the node is highlighted.

On the right hand side of the status LED, there is also a link LED, which lights up in green, if an Ethernet link has been established. Traffic is indicated by short interruptions.

Screen Saver

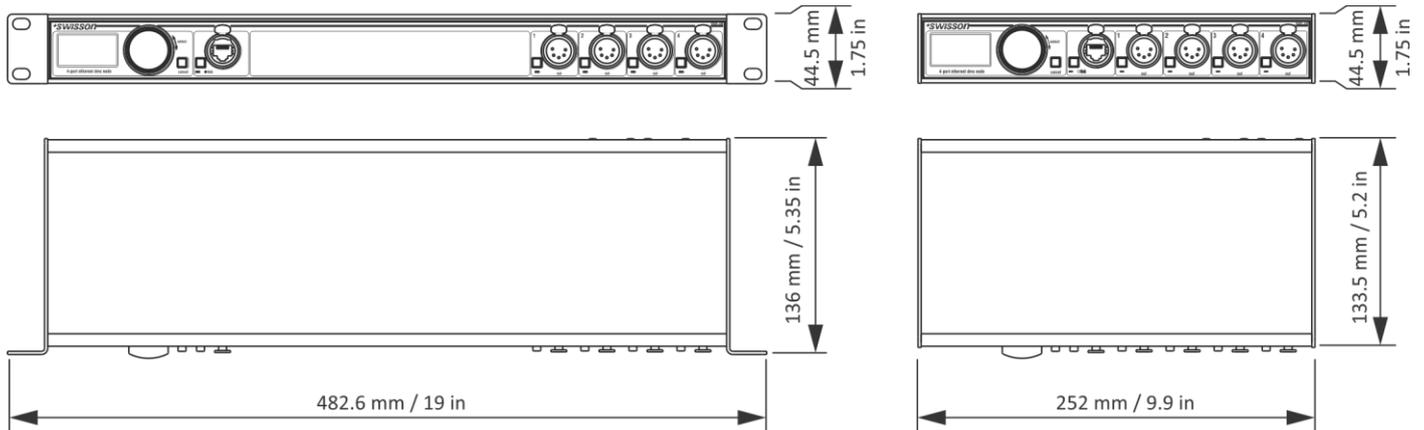
The OLED display will automatically turn itself off when no user input is received for 40 seconds in order to improve the durability of the product, if the screen saver is enabled. Once the display is turned off, it can be turned on again by pushing any button or by turning the encoder wheel by one unit in any direction.

The screen saver can be enabled or disabled under *Home > Menu > Device Settings > Screen Saver*, as described under Screen Saver on page 16.

Firmware Updates

Firmware updates will be provided on the product page on the Swisson website. For updating the firmware, a PC with Windows (Vista or later) and a USB A to B cable (USB printer cable) is required. Please refer to the separate documentation also provided on the product web page for details about the process of updating the product's firmware.

Technical Data



Ambient temperature -30°C...55°C (-22°F...131°F)

AC power 100 - 240 V nominal, 50/60 Hz

Typical power consumption 7 W

Ethernet 10BASE-T / 100BASE-TX, auto negotiating, auto MDI-X

Network protocols Art-Net I, II and 3

DMX ANSI E1.11

Electrical standard signal ports EIA-485

Dimensions Rack Mountable Models

Depth 136 mm (5.35 in)

Width 482.6 mm (19 in)

Height 44.5 mm (1.75 in)

Weight 1.6 kg (3.53 lb.)

Dimensions Box Models

Depth 133.5 mm (5.2 in)

Width 252 mm (9.9 in)

Height 44.5 mm (1.75 in)

Weight 1.1 kg (2.43 lb.)

Ordering Information

Standard Versions, Boxes

10 48 10	XND-4B3	4-port Ethernet DMX node, box version, 3-pin XLRs
10 48 11	XND-4B5	4-port Ethernet DMX node, box version, 5-pin XLRs
10 48 12	XND-4B8	4-port Ethernet DMX node, box version, RJ45 etherCON

Standard Versions, Rack Mountable

10 48 20	XND-4R3	4-port Ethernet DMX node, rack mountable, 3-pin XLRs
10 48 21	XND-4R5	4-port Ethernet DMX node, rack mountable, 5-pin XLRs
10 48 22	XND-4R8	4-port Ethernet DMX node, rack mountable, RJ45 etherCON

Credits

LwIP

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