Artistic Licence

artLynx RJ45

User Guide

Please read these instructions before using the product.

This product has been designed & manufactured for professional use only.
It should only be installed by a suitably qualified technician and in accordance with electrical regulations in the country of use.

Unless directed in the instructions there are no user serviceable parts inside the outer case of this product.

Always disconnect from the power supply when not in use.

Any specific IP rating, where appropriate, is given in the instructions. Unless otherwise stated this product is designed for indoor use only. If used outdoors it MUST be installed in an appropriate IP rated cabinet. Do not allow this product to be exposed to rain or moisture. Do not allow liquid to penetrate the product.
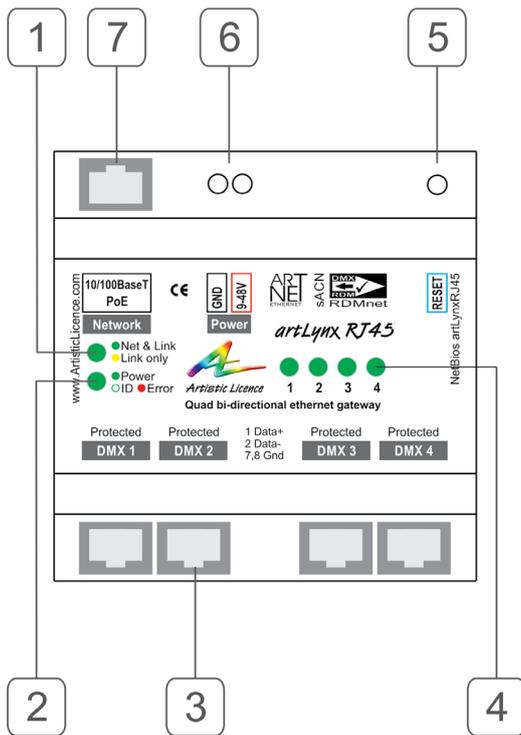
Please recycle all packaging.

Download the user guide by scanning the following QR code:

Connections

Ref.	Type	Description
1	LED	Network indicator
2	LED	Power / Identify indicator
3	Data Connection	DMX port
4	LED	DMX indicators
5	Configuration switch (located under cover)	Squawk (single press) OR Factory reset (hold down and cycle power)
6	Power input	12-48 VDC
7	Data/PoE Connection	RJ45

Mounting Diagram

Internal Earth and Isolation

The following table summarises the internal signal common interconnection and isolation.

Circuit	Description	
DMX512 Outputs	Type:	Floating
	Pin 1:	Connected to Internal Logic Ground
Internal Logic Ground	Isolated from PoE, DC power and Ethernet port.	

Product Overview

artLynx RJ45 is a DIN-rail mounted bidirectional gateway. It converts 4 universes of Art-Net (supports all versions up to Art-Net 4) or sACN ethernet into DMX512/RDM. The product also supports DMX to Art-Net/sACN conversion.

artLynx RJ45 is configurable via its internal web-browser or by using DMX-Workshop (free-of-charge software available from Artistic Licence). DHCP is supported for automatic IP addressing.

artLynx RJ45 offers high levels of electrical protection. All outputs are protected against mains electrocution (international voltages including UK 3-phase) and are self-healing.

A handy factory reset switch enables the default settings to be restored - simply hold down and cycle the power. Alternatively, a single press of this button sends a 'squawk' message over the network to the console. This enables the gateway to be easily physically located.

artLynx RJ45 supports RDM Integrity, a software product from Benjamin Electric Co. designed for testing RDM compliance.

Summary of Key Features

- 10/100BaseT, all RJ45 connectors
- Art-Net, sACN, RDMnet LLRP compatible
- 4 bidirectional DMX512 ports, compatible with all variants of DMX, including DMX512-A.
- RDM (E1.20 - 2010) compatible
- Power, Ethernet and DMX port LEDs
- Factory reset and Squawk button
- PoE compatible (IEEE 802.3af - 2003)
- Configurable using internal web-browser or DMX-Workshop
- DHCP supported, default IP 2.x.y.z
- All outputs protected against continuous connection to 425 VAC (self-healing)
- Failsafe mode
- RDM Integrity supported

Power

artLynx RJ45 can be powered from either an external PSU (12-48 VDC) or with PoE. The latter requires a suitable ethernet switch for the power source, such as Art-Switch PoE4.

Please note that the product should be powered via EITHER the DC power input or ethernet PoE, but not both (there is no option to failover from one power source to the other if both are connected).

Ethernet Connection

artLynx RJ45 has an RJ45 ethernet connector and supports Art-Net 4 and sACN (ESTA E1.31). artLynx RJ45 requires Cat 5 cable or better and supports 10BaseT and 100BaseT.

DMX Outputs

artLynx RJ45 can convert a maximum of four Universes of DMX512 data. There are 4 DMX/RDM ports with RJ45 connectors.

The DMX512-A standard specifies that Cat5 cable can be used to carry DMX data. The table below shows which cores should be used. It is recommended that Cat5E cable is used. RDM data uses the same connections as the DMX512 data.

All outputs are electrocution protected against continuous connection to 425 VAC.

Failsafe mode

Failsafe mode allows the user to define what the DMX outputs will do in the event that network data or connectivity is lost. Failsafe mode triggers after loss of either network data for 7 seconds or loss of ethernet link.

The options are:

- Do nothing, *i.e.* hold last state (products with serial nos. up to 163 work this way)
- Output all channels at zero
- Output all channels at full
- Output a recorded failsafe scene

Failsafe mode is configured using our free DMX-Workshop software. Failsafe mode also operates at boot up, so if the gateways power on and there is no controller, they will execute failsafe.

DMX512 Wiring

RJ45 Pin	Function	Cable Colour	XLR Pin	Colour
7 & 8	COM	White/Brown & Brown	1	**Black**
2	DMX -	Orange	2	**Blue**
1	DMX +	White/Orange	3	**Red**

DMX Inputs

Any of the DMX ports can be set to receive DMX and generate either Art-Net or sACN. Configuration is achieved with either DMX-Workshop or the web browser.

When receiving DMX, the LED port indicator illuminates to show that data is being received.

Universe Addressing

The universe (Port Address) is used to uniquely identify the DMX data on the network.

Art-Net allows universe numbers in the range 0-32767.

sACN allows universe numbers in the range 1-65535.

> For the avoidance of cross-protocol confusion, users are advised to number universes from 1.

Configuration

Configuration is achived via the internal web server or via DMX-Workshop.

In order to restore the product to its factory default state, hold down the reset button (under the terminal guard) and cycle the power.

Web-Server

To configure artLynx RJ45 via the internal web-server, either type in the IP address of the product or, if your web-browser supports NetBios, then enter the name: artLynxRJ45. To find the IP address, use DMX-Workshop. The home screen is shown on the next page. For an explanation of the settings, please see below.

IP Settings

The IP settings for the product are displayed in the top section of the screen. The Edit control allows the static IP, subnet mask and gateway to be configured. DHCP operation can be selected via DMX-Workshop.

The indicator meanings are as follows:

- Online: Green = live connection between browser & product; Red = connection lost
- Power: Green = powered; Flashing green = Identify; Red = Fault
- Net: Yellow = Link; Green = Art-Net or sACN activity

Port Settings

The settings for each DMX port can be configured via the web-browser using the following columns:

- Port: The DMX port number
- Input: Tick to set as DMX input
- DMX: Green shows changing data
- RDM: Tick to enable RDM
- Delta: Tick to enable delta transmission (DMX frames are only sent when network data changes)
- Universe: Set the universe (port address) for this output
- Rate: Sets the DMX refresh rate:
  - High = 24 ms frame time
  - Medium = 32 ms frame time
  - Slow = 48 ms frame time
- Protocol: Select either Art-Net or sACN control over this output

- Merge: Select HTP or LTP merge when 2 controllers send data to this port (for more information, see 'Merging' section on page 8).

- Priority (*active if IP & sACN are selected*): Set the Priority number (1-200) that is used when converting DMX to sACN

- Label: Editable field for port name

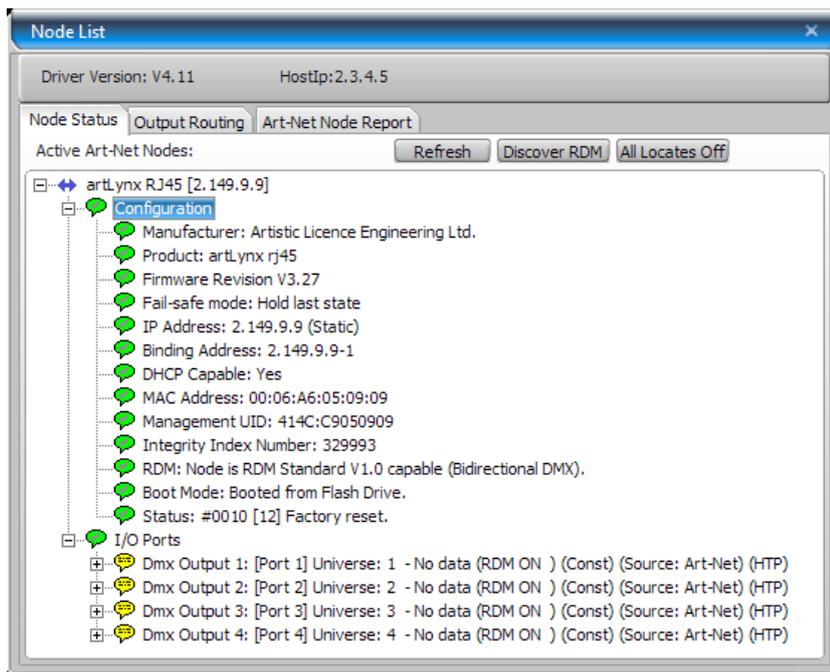Figure: artLynx RJ45 internal web server

The settings are explained above.

DMX-Workshop

DMX-Workshop™ is a network management, analysis, configuration and diagnostics tool for lighting networks. You can download the free software from the product page.

When artLynx RJ45 is connected to a computer running DMX-Workshop, it should be detected and displayed as an Art-Net node (click the 'Node List' tab to verify this). The node can be expanded to show the configuration and DMX output information, as shown below.

Squawk

On a complicated network it is not always easy to relate what is showing on screen to the physical location of the nodes. A single press of the factory reset button on artLynx RJ45 causes the product to send a message over the network to the console.

Figure: artLynx RJ45 as viewed in DMX-Workshop

Right-clicking on any entry brings up a menu that offers various functionality:

- The 'Configure Node' option enables configuration of the universe number (port address), protocol (Art-Net or sACN), sACN priority, failover mode, product name and port labels.

- 'Copy to clipboard' enables all the node information to be pasted into a support request email.

- 'Merge Controls' (selectable only on individual DMX outputs) enables the choice of LTP (latest takes preference) or HTP (highest takes preference) merge modes.

- 'Indicators' enables selection of normal, identify or mute for the LED indicators. Normal is the default behaviour, identify causes the power LED to flash, and mute turns off all the LEDs.

- 'RDM Devices' offers options for device discovery and configuration.

- 'Advanced' leads to 'Programme Upload' and 'Configure IP Address and DHCP' as described opposite.

IP Address Configuration

Choosing the 'Configure IP Address' in the 'Advanced' menu brings up a window that shows the IP and Subnet Mask.

The IP uniquely identifies any nodes or controllers on a network, while the Subnet Mask defines which part of the IP represents the network address and which part represents the node address. For example, a Subnet Mask of 255.0.0.0 means that the first byte of the IP defines the network address and the remaining 3 bytes define the Node address.

By default, the product has a static IP address in the range 2.x.x.x. There are situations in which the user may wish to change this - for example, a 192.168.x.x address is generally used in office environments.

A useful additional feature is the ability to enable automatic IP address allocation on networks controlled by a DHCP server (check the 'Enable DHCP' box to activate).

Merging

artLynx RJ45 is able to merge two streams of data to a DMX output. Depending on the settings, merge can operate as HTP/LTP or Priority.

In HTP (highest takes precedence), the levels of each channel in the two streams are compared and the highest value is used.

In LTP (latest takes precedence), the levels of each channel in the two streams is compared to the output; if there is a change, that level is output.

In Priority, the sACN Priority field defines which universe will be output.

Art-Net

If two streams from different IP addresses are directed to the same Port-Address, merging will occur. If more streams are directed to the same Port-Address, they will be ignored.

sACN

Merging can operate with both unicast and multicast data.

If two streams from different IP addresses are directed to the same universe, the priority field is checked and the stream with the highest priority is output. If the priority field in both streams is identical, merging will occur.

If additional stream(s) are directed to the same universe, any additional stream with higher priority will take precedence. If the priority is identical to the merging streams, it will be ignored.

Please refer to Application Note "Gateway: Merging DMX, Art-Net and sACN" for more information.

All merge operations require an active ethernet connection.

Table: Merging operation

	Source A	Source B	Condition	Output
1	Art-Net	Art-Net	From different IP addresses.	Merge of A + B (HTP or LTP as per user selection)
2	sACN	sACN	With identical priorities	Merge of A + B (HTP or LTP as per user selection)
3	sACN	sACN	With different priorities	Source with highest priority
4	DMX input converting to Art-Net	DMX input converting to Art-Net		Merge of A + B (HTP or LTP as per user selection)
5	DMX input converting to sACN	DMX input converting to sACN	With identical priorities	Merge of A + B (HTP or LTP as per user selection)
6	DMX input converting to sACN	DMX input converting to sACN	With different priorities	Source with highest priority
7	DMX input converting to Art-Net	Art-Net		Merge of A + B (HTP or LTP as per user selection)
8	DMX input converting to sACN	sACN	With identical priorities	Merge of A + B (HTP or LTP as per user selection)
9	DMX input converting to sACN	sACN	With different priorities	Source with highest priority

DMX Input

A DMX input can be merged with an Art-Net stream, an sACN stream or another DMX input.

The table summarises the merging operation.

IGMP

sACN uses IGMP (Inter Gateway Management Protocol) to efficiently route data. Two versions of IGMP exist: IGMPv2 and IGMPv3.
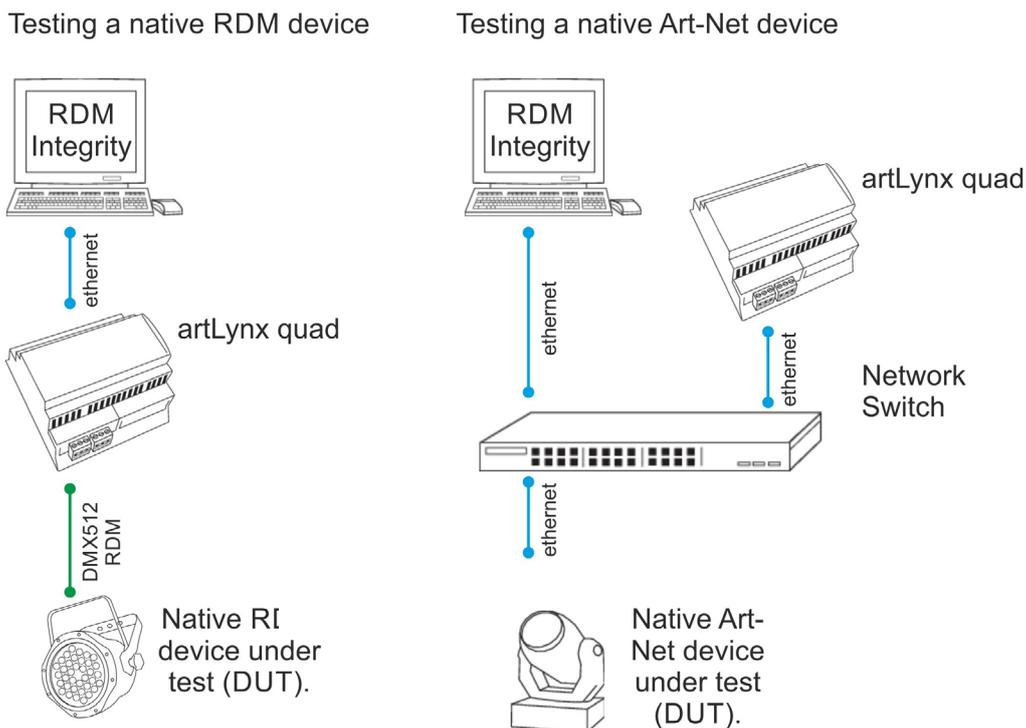
IGMPv2 is the most widely supported by ethernet switch manufacturers. Artistic Licence products containing firmware version v3.39 and higher support IGMPv2. Earlier firmware supports IGMPv3. The firmware version can be looked up via the product's web browser interface or via DMX-Workshop.

RDM Integrity

RDM Integrity is a software product from Benjamin Electric Co. designed for testing RDM compliance. The product is targeted at manufacturers and developers wishing to ensure that their products are compliant before being placed on the market. It provides a simple pass, advisory, warning or fail assessment, along with decoded data that allow quick identification of any problems.

Customers who have purchased RDM Integrity can use artLynx RJ45 to unlock its powerful RDM and Art-Net testing capabilities, as shown in the diagram below.

Testing a native RDM device

In this example the Artistic Licence gateway "artLynx quad" is used to route native RDM data from the DUT, to Integrity.
It also operates as a dongle to unlock the RDM Integrity software.

Testing a native Art-Net device

In this example the Artistic Licence gateway "artLynx quad" is used as dongle to unlock the network features of the RDM Integrity software.
RDM Integrity is then used to analyse the RDM data carried over Art-Net.

LED indication

artLynx RJ45 features various LED indicators, which give different informational signals depending on whether the product is booting up or in operational mode. The meanings are explained below.

During boot-up

- Power LED

    - Slow flashing green (1Hz) = booting normally

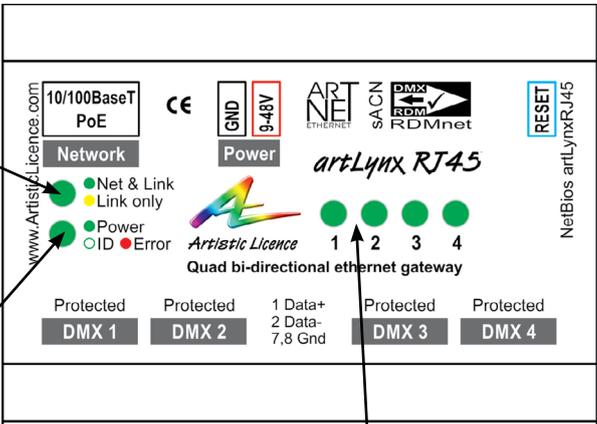   - Slow alternating green/red (1Hz) = factory start (settings cleared)

During operation

- Power LED

    - Static green = powered, normal operation

    - Fast flashing green (5Hz) = identify**

    - Occulting green = remote programming command received

    - Static red = fault condition

    - Fast alternating green/red (5Hz) = product is not commissioned (return for service)

- Net & Link LED

    - Yellow = network link established (but no lighting data)

    - Green = Art-Net or sACN detected

- LEDs 1, 2, 3 & 4

    - Green = Data activity

- All indicators

    - Off = mute command received

Net & Link LED:

OFF = Not connected

Yellow = Connected but no lighting data

Green = Art-Net / sACN on network

Power LED:

OFF = Not connected

Green (solid) = Good power

Green (flashing) = Identify**

Red = Fault condition

**The Power LED will flash continuously when the Identify command is sent by DMX-Workshop. This enables artLynx RJ45 to be easily distinguished on a network containing multiple nodes.*

This LED will also blip briefly in response to any programming command received via the network.

DMX LEDs:

OFF = No data is being sent to this port

Green = Lighting data is being output on this port

artLynx RJ45 Specification

Mechanical

- Housing: DIN rail case
- Material: Lexan plastic, UL94-V0 rated
- Overall dimensions: 90 mm (H) x 88 mm (W) x 62 mm (D)
- Weight: 0.15 kg
- Mounting: 35 mm DIN Rail or Surface Mount
- Country of manufacture: UK

Environmental

- Operating temperature: 0°C to 40°C
- Storage temperature: -10°C to +50°C
- Operating relative humidity (max): 80% non-condensing
- IP rating: IP20 indoor use only
- Certification: CE, WEEE, RoHS
- Warranty: 2-year (return to base)

Power & Electrical

- Input voltage: 12-48 VDC
- Input connector: 2-pin screw terminal
- DC Power: 2.5W quiescent
- DC Power: 5W driving terminated DMX512 cable
- PoE Power: Negotiates Class 2 (3.84W – 6.49W)
- DC fuse: internal resettable fuse for control electronics

Ethernet

- Type: 10BaseT and 100BaseT
- Isolation: 1 kV
- PoE: supported (IEEE 802.3af - 2003)

DMX512 Ports

- Output mode: floating
- Output isolation: n/a
- Output ESD protection: 15 kV
- Electrocution protection: 425 VAC continuous connection (self-healing)

Control Protocols

- Ethernet: Art-Net, sACN, RDMnet LLRP
- Output: DMX512, DMX512 (1990), DMX512-A, RDM V1.0 (E1.20 - 2010)
- Input: DMX512, DMX512 (1990), DMX512-A

Data Connections

- RJ45 ethernet (1 no.)
- DMX ports: RJ45 (4 no.)

LED Indication

- Power / Network Activity / DMX Activity

Configuration

- Internal web-browser or DMX Workshop
- Manual factory reset / squawk button

Package Contents

- artLynx RJ45

Ordering Info

- Product code: artLynx RJ45

Accessories (not included)

- PSU-24-0.75-FER
- Art-Switch PoE4 & PSU-48-1-DR (powers up to 4 x artLynx RJ45)

Warranty

All products are covered from date of purchase by a two-year return to base warranty.

By return to base, we mean that the customer is responsible for all costs of transport to and from Artistic Licence.

Returns will not be accepted without prior authorisation. In order to discuss a request to return goods, please email:

Sales@ArtisticLicence.com

Compliance

All Products manufactured or sold by Artistic Licence Engineering Ltd are fully compliant with the appropriate UKCA, CE and RoHS regulations. Product specific information is available on request.

Waste Electrical & Electronic Equipment (WEEE)

Artistic Licence is a member of a WEEE compliance scheme and will happily recycle any of our products that you, at your expense, return to us.

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specifications are subject to change without notice