Artistic Licence

dataLynx II

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.
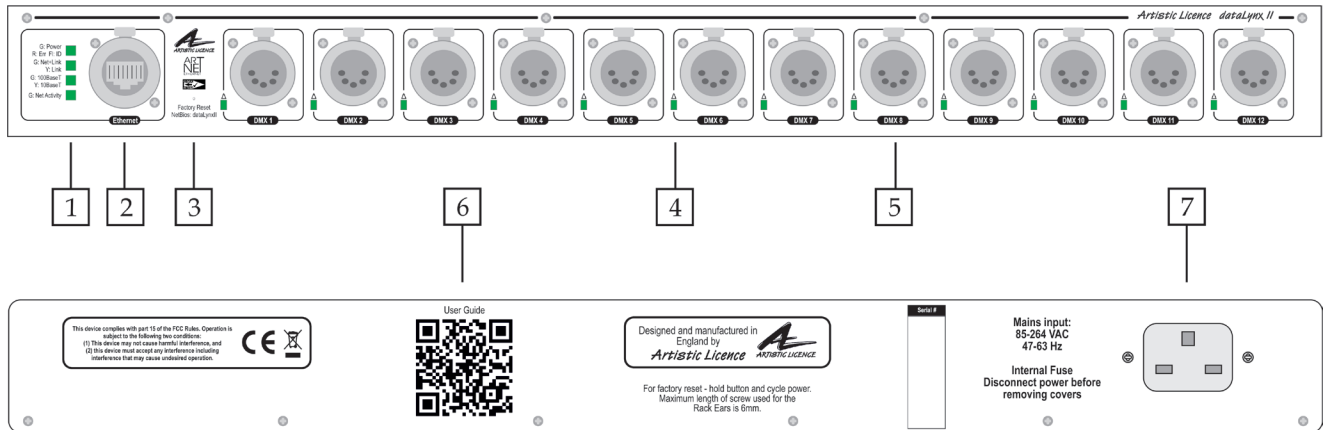
Please recycle all packaging.

Download the user guide by scanning the following QR code:

Connections

Ref.	Type	Description
1	LED	Indicators for Ethernet
2	Data Connection	Ethernet RJ45
3	Configuration	Factory reset button
4	LED	DMX indicator
5	Data Connection	DMX port
6	Information	User Guide QR
7	Power Connection	Universal Mains input

Mounting Diagram
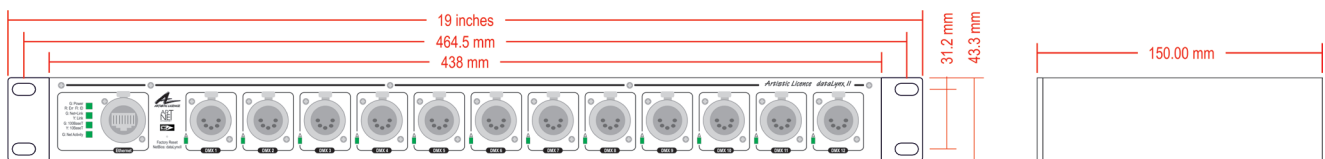
Product Overview

dataLynx II is a rack-mounted Ethernet-to-DMX512 gateway. It converts 12 universes of Art-Net (supports all versions up to Art-Net 4) or sACN ethernet into DMX512/RDM

Configuration is achieved over the network using the internal web-server or DMX-Workshop (free-of-charge software available from Artistic Licence). DHCP is supported for automatic IP address allocation.

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

dataLynx II can be mounted in a 19" 1U rack enclosure using the supplied rack ears. It is supplied with a standard IEC connector.

dataLynx II extreme

dataLynx II extreme offers all the features of the standard product. The extreme model additionally provides surge protection. This feature is aimed at protecting the product and connected equipment against voltage surges of the type generated by lightning. The protection is sacrificial which means that after a certain number of protection events, the protection circuitry will be destroyed (see the datasheet).

dataLynx II extreme is an ideal solution for the sort of harsh environments that may be encountered in live touring, or permanent installations such as bridges or towers.

SFP variant

dataLynx II can be optionally ordered with an SFP input slot, which supports gigabit connections (N.B. SFP input module is not included).

Summary of Key Features

- 10/100BaseT RJ45 (Ethercon) input
- SFP model additionally supports gigabit
- 12 DMX512 ports, compatible with all variants of DMX, including DMX512-A
- Art-Net 4 and sACN compatible
- RDM (ANSI E1.20 - 2010) compatible
- Power, Ethernet & DMX port LEDs
- Failsafe mode
- All outputs protected against continuous connection to 425 VAC (self-healing)
- Default IP address 2.x.y.z
- Configurable using internal web-browser or DMX-Workshop
- DHCP supported
- IEC power connector
- RDM Integrity supported
- Factory reset and Squawk button
- Standard and extreme models feature protected outputs (can withstand any international mains voltage)
- extreme model additionally features electrical surge protection

Power Supply & Earthing

The internal power supply requires an input in the range 90-250 VAC with an Earth connection. The mains fuse should only be replaced with a 3.15A slow blow fuse.

The table below summarises the internal Earth interconnection and isolation.

(Please note that we use the term Earth-Ground to avoid international confusions. In Europe Earth-Ground is called Earth; in the USA Earth-Ground is called Ground).

Circuit	Description	
Chassis	Bonded to Earth-Ground	
DMX512 Ports	Type	Ground referenced
	Pin 1	Connects to Internal Logic Ground
	Shell	The connector shell is connected to chassis
Ethernet	Type	Transformer isolated
	Screen	Connects to Earth-Ground via 75 Ohm resistance & 100 pF capacitance, as specified in IEEE standard
Internal Logic Ground	Connects to Earth-Ground via 10 Ohm resistance	

Ethernet Connection

dataLynx II has an RJ45 (Ethercon) connection on the front panel. The product supports the latest Art-Net release (Art-Net 4) and sACN (the standard managed under ESTA E1.31). dataLynx II requires Cat 5 cable or better and supports 10BaseT and 100BaseT.

Ethernet Indicators
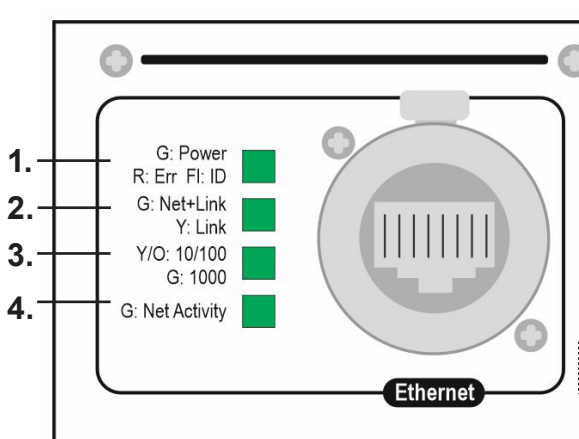
The front panel features 4 LED indicators: 1) Power; 2) Net+Link; 3) 10/100/1000BaseT; 4) Net Activity. These give different informational signals depending on whether the product is booting up or in operational mode:

During boot-up

- Power

  - Slow flashing green (1Hz) = booting normally

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

During operation

- Power

  - 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

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

  - Green = Art-Net or sACN detected

- 10/100/1000BaseT

  - Yellow = Ethernet link is 10BaseT

  - Orange = Ethernet link is 100BaseT

  - Green = Ethernet link is 1000BaseT

- Net Activity

  - Green = No network data

  - Occulting Green = Network data

- All indicators

  - Off = mute command received

**The Power LED will flash continuously when the Identify command is sent by DMX-Workshop. This enables dataLynx II 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 Outputs

dataLynx II can convert a maximum of 12 Universes of data. Each port has a 5-pin XLR female output connector.

DMX512 Wiring

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

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

All outputs are electrocution protected against continuous connection to 425 VAC (self-healing).

DMX Indicators

Each port has an individual LED indicator. During operation, the LEDs illuminate green to show DMX activity.

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
- 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.

Universe, Sub-Net and Net

Each universe being transmitted over ethernet needs to be distinguishable from other universes on the same network. For universe numbers up to 256 (the maximum limit of Art-Net II), this is achieved by setting the (4-bit) Universe and Sub-Net numbers (see 'Configuration' opposite).

In contrast, Art-Net 3/4 and sACN can carry up to 32768 and 65536 universes respectively. To handle these large values, the concept of a 16-bit port address including a 'Net' field is introduced. The port address of each DMX512 universe is a number composed of the (Net)+(Sub-Net)+(Universe).
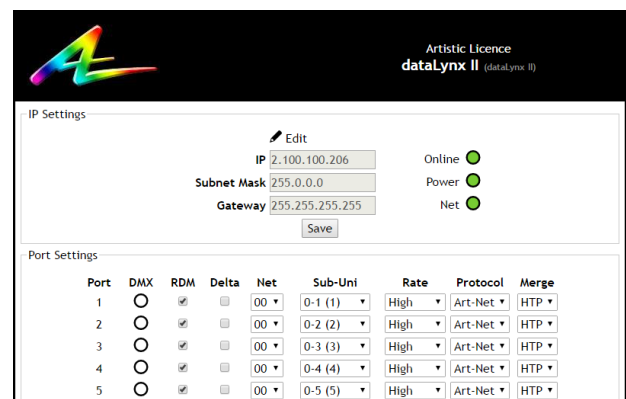
Configuration

By default, each port of dataLynx II has a sequential universe number starting from zero. There are two ways of remotely configuring the product:

1) Using the product's internal web-server

2) Using DMX-Workshop (free-of-charge network management software from Artistic Licence.

In order to restore the product to its factory default state, use a pin to hold down the reset button on the front panel (see Connections diagram) and cycle the power.

Web-Server

To configure dataLynx II 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: dataLynxII. To find the IP address, use DMX-Workshop or type "ping 2.255.255.255" in a command line window. The home screen is shown 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
- 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)
- Net, Sub-Uni: Set the port address for this output
- 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).

| Rate	Frame time
High	24 ms
Medium	32 ms
Slow	48 ms

DMX refresh rate settings

DMX-Workshop

DMX-Workshop™ is a software application that runs on Windows XP / 7 / 8 / 10. It is a fully featured network management, analysis, configuration and diagnostics tool for Art-Net networks.

When dataLynx II 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 in the screen-shot below.
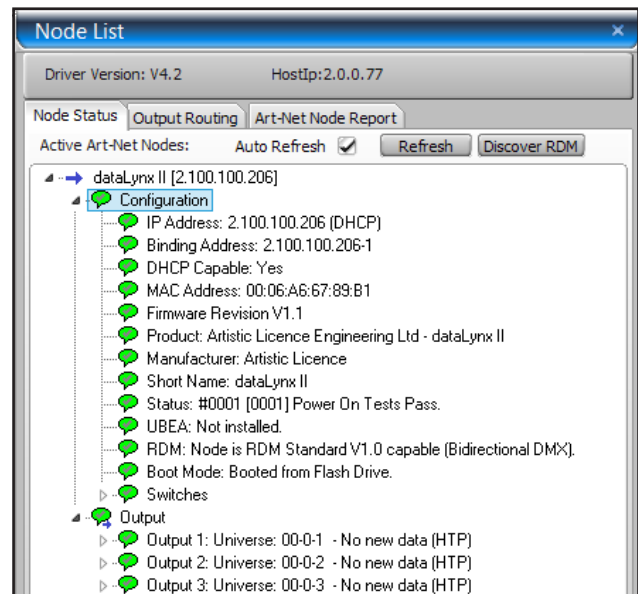
Right-clicking on any entry brings up a menu that offers various functionality:

- The 'Configure Node' option enables configuration of the Universe, Sub-Net and Net values. It also allows the user to give the device a short and long name.
- '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, locate or mute for the front panel LED indicators. Normal is the default behaviour, locate causes the selected port 'Stat' LED to flash, and mute turns off all the LEDs.

- 'RDM Devices' offers options for device discovery on RDM networks.
- 'Advanced' leads to 'Programme Upload' and 'Configure IP Address'. These are described in more detail below.

IP Address Configuration

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

The IP address 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. In a Subnet Mask of 255.0.0.0 the first byte defines the network address and the remaining three 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 of dataLynx II is the ability to enable automatic IP address allocation on networks controlled by a DHCP server (check the 'Enable DHCP' box to activate this feature).

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 dataLynx II causes the product to send a message over the network to the console. This should help you find it!

Merging

dataLynx II is able to merge two streams of data to a DMX output. The method of merging will be either HTP or LTP.

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.

The selection of LTP vs HTP can be set on a per output basis using either the web browser or via Art-Net using DMX-Workshop.

The arbitration of merging differs depending on the selected lighting protocol:

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.
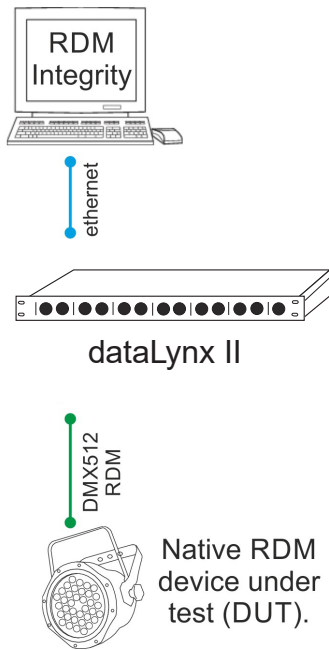
RDM Integrity

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 dataLynx II to unlock its powerful RDM and Art-Net testing capabilities, as shown in the diagram on the next page.
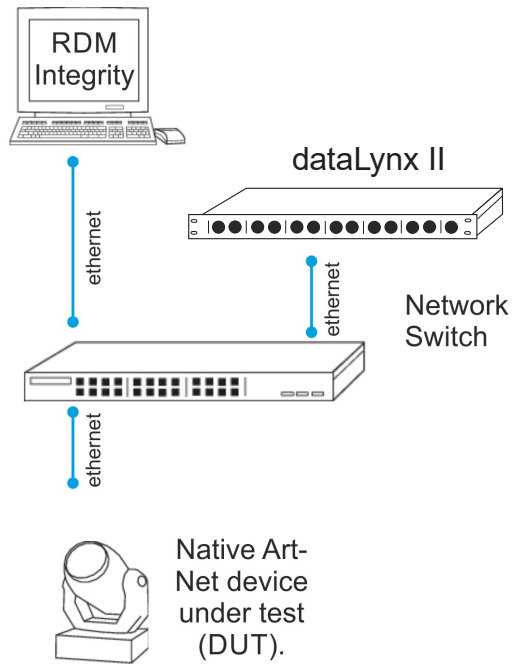
RDM Integrity Application Diagram

Testing a native RDM device

RDM Integrity

ethernet

dataLynx II

DMX512 RDM

Native RDM device under test (DUT).

In this example the Artistic Licence gateway dataLynx II 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

RDM Integrity

dataLynx II

ethernet

ethernet

Network Switch

ethernet

Native Art-Net device under test (DUT).

In this example the Artistic Licence gateway dataLynx II 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.

dataLynx II Application Diagram

RGB Pixels

PSU/DMX-RDM interface

Art-Net Controller e.g. Colour-Tramp

Art-Net

dataLynx II
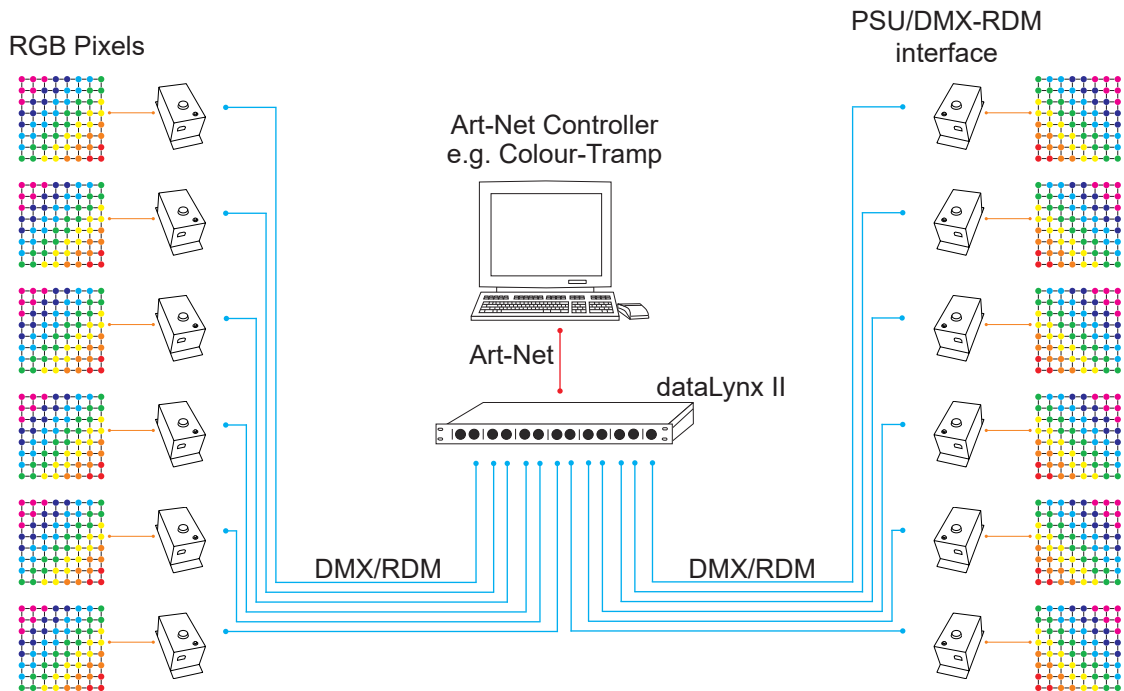
DMX/RDM

DMX/RDM

In this example, dataLynx II converts Art-Net from a Colour-Tramp controller into DMX/RDM data. This is fed into intelligent power supplies for use with an LED pixel product.

dataLynx II Specification

Mechanical

- Housing: 19" 1U rack enclosure
- Material: metal
- Overall dimensions: 1U (H) x 19" (W) x 150 mm (D)
- Weight: 2.8 kg
- Mounting: desktop or 19" rack
- 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: 90-250 VAC
- Input connector: IEC C13 male
- Input power (max): 30 W
- Duty cycle: 100% @ 25°C
- Input fuse: Internal 3.15A slow blow
- DC fuse: internal resettable fuse for control electronics

Ethernet

- Type: 10/100BaseT
- SFP model additionally supports gigabit (SFP module not included)
- Isolation: 1 kV, PoE: n/a

DMX512 Outputs

- Output mode: ground referenced
- Output isolation: n/a
- Output ESD protection: 15 kV
- Electrocution protection: 425 VAC continuous (self-healing)
- Output surge protection (extreme only):

  - GDT conforming to IEC61643-311 (sacrificial)

  - Max IDC: 30,000A (8/20uS) 1 operation; 20,000A (8/20uS) 10 operations; 20A (10/1000uS) 1500 operations

Control

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

Data Connections

- RJ45 Ethercon (1 no.)
- XLR5 DMX outputs (12 no.)

  - optionally XLR3 or XLR8 connectors

LED Indication

- Power / Ethernet Link & Activity / Speed / DMX Activity

Configuration

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

Package Contents

- dataLynx II
- IEC mains lead
- Rack-ears

Ordering Info

- Product code:

  - dataLynx ii xlr3/5/8

  - dataLynx ii extreme xlr3/5/8

  - dataLynx ii SFP xlr5

  - dataLynx ii SFP extreme xlr5

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 CE, FCC, 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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Due to our policy of continuing product improvement specifications are subject to change without notice