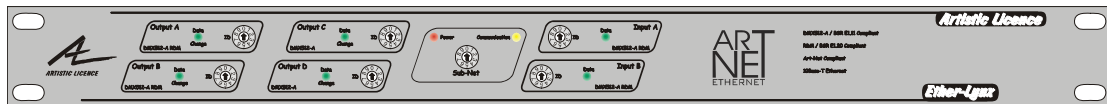


Ether-Lynx User's Guide



ART
NET
ETHERNET



Artistic Licence (UK) Ltd.

Revision V1.6

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I N T R O D U C T I O N

Overview

The Ether-Lynx is a 1RU rack mount solution to the transfer of large amounts of lighting data over a wide area. Ether-Lynx uses a 10BaseT Ethernet link for this purpose.

Ether-Lynx can translate two DMX512 inputs into Ethernet and simultaneously translate Ethernet into four DMX512 outputs.

DMX512 Inputs

The DMX512 inputs accept all flavours of DMX (pre and post 1990 and DMX512-A). A receive data indicator is provided for each input.

The indicator illuminates when good DMX512 is detected.

The input is optically isolated from the output, chassis and mains earth. This is of particular benefit in removing earth loop problems in large installations and outdoor events.

The DMX512 input is not terminated, but connected to a passive loop through connector. If the Loop Through facility is not required, a terminator (Stock Code DMX-Term5) should be fitted.

Input connection is via a male 5 pin Neutrik XLR connector.

DMX512 Outputs

The DMX512 outputs comply with all revisions of the DMX512 standard and are optimised for DMX512-A.

The outputs are continuously refreshed irrelevant of whether input data is available. The outputs are connected via 5 pin Neutrik female XLR's wired to the USITT standard.

Each output is provided with an indicator, the indicator illuminates to show that *changing* data is being transmitted.

Outputs C & D are equipped with electronics for the RDM - Remote Device Management standard. Units with a serial number 177 or above use RDM draft V1.0. New updates for the Ether-Lynx can be downloaded from www.ArtisticLicence.com and installed to an Ether-Lynx using the DMX-Workshop application.

The outputs are Ground Referenced (Pin 1 connects to chassis).

Art-Net Ethernet

The Ethernet port connects via a screened Neutrik Ethercon connection.

Network wiring may use either UTP or STP cable.

The screen connection of the Ethercon is connected to chassis and mains earth via a 100 ohm resistor.

Power over Ethernet is neither supported nor connected.

Device Operation

The Ether-Lynx is designed to transfer DMX512 data over a network.

There are two main interconnection scenarios:

1. Point to Point - In this scenario only two Ether-Lynx are used. They can be connected together directly using a cross-over Ethernet cable.
 2. Network - In this scenario three or more Ether-Lynx are used. The Ether-Lynxs are all individually connected to a standard data hub using straight wired network cable.
-

Network Sharing

The Art-Net protocol used by Ether-Lynx is based on the TCP/IP protocol. This means that it will coexist on the same network as any other standard Ethernet protocol. This is of particular benefit when adding Ether-Lynx distribution into an existing site that already contains a network.

However, some consideration must be given to the available bandwidth of the network. Art-Net uses a compression algorithm that ensures that the minimum bandwidth is used when DMX512 inputs are not changing. However, a fast changing DMX512 input will use about 3% of the bandwidth available on 10BaseT.

The system installer must ensure that if a shared network is used, enough bandwidth is available to ensure that the DMX512 data is not delayed by heavy network traffic.

Network Indicators

The Network Communication indicator is illuminated when Ether-Lynx recognises valid Art-Net data from the network connection.

System Setup

The entire system is setup with seven rotary controls on the front panel. The controls consist of:

1. Sub-Net - This wheel selects one of the sixteen possible sub-nets available in the Art-Net protocol. Two or more Ether-Lynx must be set to the same subnet in order to communicate. The sub-net can be considered as a 'box address'.
2. Input Address - Each DMX512 input has an input address wheel. This wheel selects one of the sixteen DMX universes available on each subnet.
3. Output Address - Each DMX512 output has an output address wheel. This wheel selects one of the sixteen DMX universes available on each subnet.

DMX data is simply transferred from one Ether-Lynx to another by setting the subnets to the same value and then matching the input address to the output address.

The front panel controls can be set remotely using the network administration software: DMX-Workshop. This program is free of charge and can be downloaded from www.ArtisticLicence.com

When set remotely, the front panel controls are disabled. Any attempt to adjust the controls will result in no action other than the related indicator flashing.

Splitter Operation

The output addresses can be set to identical values if required, to produce identical DMX512 outputs both on the same Ether-Lynx or across the network.

Clashing Inputs

If the input address wheels are set to the same value, the DMX512 data received will be merged on a highest takes precedence (Htp) basis.

DMX512 Pin Data

The DMX512 input is connected to the male 5 pin XLR on the rear panel.

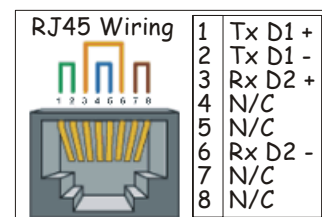
Cable connection is as follows:

Pin 1	Protective ground	Connect to cable screen
Pin 2	Data complement	Connect to twisted pair wire
Pin 3	Data true	Connect to twisted pair wire
Pin 4	Not used	
Pin 5	Not used	

Ethernet Pin Data

Ether-Lynx are connected using screened 8 pin RJ45 connectors. When connecting two Ether-Lynx together, a simple cross-wired cable can be used. To connect more that two Ether-Lynx together, an Ethernet Data Hub will be required.

Pin	Function	Wire to pin # for two Ether-Lynx operation
Screen	Protective ground	Screen
Pin 1	Transmit +	3
Pin 2	Transmit -	6
Pin 3	Receive +	1
Pin 4	N/C	7
Pin 5	N/C	8
Pin 6	Receive -	2
Pin 7	N/C	4
Pin 8	N/C	5



Power Supply

The internal power supply requires a 90-240V AC input with an earth connection. The mains fuse should only be replaced with a 3.15A Slow Blow.

Earthing

The following table summarises the internal earth interconnection and isolation:

Please note that we use the term Earth-Ground to avoid international confusion. In Europe Earth-Ground is called Earth, in the USA Earth-Ground is called Ground.

Circuit	Description	
Chassis	Bonded to mains earth.	
DMX512 Inputs (including Loop Through)	Type:	Isolated.
	Pin 1:	Connects to internal isolated circuit. No connection to Earth-Ground.
	Shell:	The connector shell is connected to chassis. However no electrical connection should be made to the shell.
DMX512 Outputs	Type:	Grounded.
	Pin 1:	Connected to Earth-Ground.
	Shell:	The connector shell is connected to chassis.
Ethernet	Type:	Transformer Isolated.
	Screen:	Connects to Earth-Ground via 100 ohm resistance.
Internal Logic Ground	Connects to Earth-Ground via 100 ohm resistance.	

Art-Net

Art-Net is a TCP/IP based Ethernet protocol developed by Artistic Licence.

In an attempt to assist in standardisation, the Art-Net protocol has been put into the public domain so that any other manufacturer may freely use the protocol. The specification document can be downloaded from the Artistic Licence web site at:
www.ArtisticLicence.com

Jumpers

Three internal jumper settings provide the following functionality:

Jumper	State	Description
JP9	Closed	Select the secondary Art-Net IP of 10.x.y.z.
	Open	Select the primary Art-Net IP of 2.x.y.z.
JP10	Closed	Invert low byte of IP address.
	Open	No Affect
JP7	Closed	Cancel all remote IP and netmask programming. Revert to settings defined by JP9, JP 10.
	Open	None.
JP8	Closed	No RDM functionality.
	Open	RDM V1.0 Draft enable on outputs C & D.

Wheel Codes

As the Ether-Lynx can be programmed to operate on non-standard IP addresses, it is sometimes useful to override these settings.

To do this, set all of the front panel wheels to the 'F' setting. Cycle the power. The Ether-Lynx will then respond on the standard Art-Net addresses as defined by JP9, JP10 above.

This operation is identical to closing JP7 and cycling the power, it simply saves opening the case.

Boot Signatures

When Ether-Lynx starts, the front panel LED displays are used to feedback status and error codes as described below.

The LED signatures occur after the normal sequencing of the LEDs during initialisation.

LED State	Description
All Flash twice.	A remote programmed IP or netmask is in use.
TX A & Power flashing.	Fault on DMX transmit 1. This is most likely caused by a faulty DMX cable.
TX B & Power flashing.	Fault on DMX transmit 2. This is most likely caused by a faulty DMX cable.
TX C & Power flashing.	Fault on DMX transmit 3. This is most likely caused by a faulty DMX cable.
TX D & Power flashing.	Fault on DMX transmit 4. This is most likely caused by a faulty DMX cable.
Alternately flashing. Power & COM. RX A on. TX A flashing.	Master SRAM Fault *
Alternately flashing. Power & COM. RX A on. TX B flashing.	Master Dual Port SRAM Fault *
Alternately flashing. Power & COM. RX A on. TX C flashing.	Master EEPROM Fault *
Alternately flashing Power & COM. RX B on. TX A flashing.	Slave SRAM Fault *
Alternately flashing. Power & COM. RX B on. TX B flashing.	Slave Dual Port SRAM Fault *
Alternately flashing. Power & COM. RX B on. TX C flashing.	Slave EEPROM Fault *
* = Contact Artistic Licence for advice.	

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