Alyseum
More than technology

AL-22 PoE - User's manual

This symbol is intended to alert the user of important operating and maintenance (servicing) instructions in the literature provided with the equipment.

This symbol is intended to alert the user of the presence of uninsulated dangerous voltage within the product's enclosure that may present a risk of electric shock.

1 Caution

Read Instruction: Read and understand all of the safety and operating instructions before using this equipment.

Retain Instructions: The safety instructions should be kept for future reference.

Follow Warnings: Follow all warnings and instructions marked on the equipment or in the user manual.

Avoid Attachments: Do not use tools or attachments that are not recommended by ***Alyseum*** because they may be hazardous.

Installation:

- Choose the installation location of your unit carefully.
- Avoid placing it in direct sunlight or close to a source of heat.
- Also avoid locations subject to vibrations and excessive dust, cold or moisture.

Power Source:

- This equipment should only be operated from the power source indicated on the product.
- When removing the power plug from the wall outlet, always pull directly on the plug, never yank the cord.

Servicing:

- Refer all servicing to qualified service personnel.
- There are no user-serviceable parts inside.
- To prevent the risk of shock, do not attempt to service this equipment yourself because opening or removing covers may expose you to dangerous voltage or other hazards.

WARNING: TO PREVENT FIRE OR ELECTRIC SHOCK HAZARD, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE.

2 Contents

3 What's the AL-22 PoE

The ***Alyseum*** AL-22 PoE is an embedded networked computer Box. It uses the Ethernet network to transport MIDI flows between any compliant hardware or software applications in computers.

A AL-22 PoE allows you to connect 2 MIDI In and 2 MIDI Out ports (up to 4 MIDI cables), simply and in a flexible way.

Of course, the AL-22 PoE can exchange MIDI flows with any AL products (Peer to peer functionnality), and/or with any other product stamped CopperLan.

AL-22 PoE are supplied ready to use, the actual linking is managed via the CopperLan Manager software. This freeware tool is also used to monitor the status of all Copperlan computers and equipment. The AL-22 PoE can be controlled from any computer anywhere in the network.

Another feature of the AL-22 PoE is the P.o.E. standard compliance (P.o.E. stands for **P**ower **o**ver **E**thernet). This standard allows using spare conductors or data conductors in network cable to carry the required power supply for an end device.

The AL-22 PoE is built around a powerful 32-bit processor offering 120 DMIPS.

3.1 Features

- Self-contained interface, 2 MIDI In/Out pairs to CopperLan interface.
- 10-100 Ethernet port. With P.o.E. capabilities
- Auto-MDIX allows the use of straight-trough or cross-over UTP cable.
- peer to peer MIDI transport, on a channel basis, remapping and merging.
- peer to peer MIDI transport without mandating a computer.

3.2 Applications

- Recording studio
- Backstage (Live)
- Broadcast
- Show control & entertainment industry

4 P.o.E.

4.1 Introduction

Rather than using a dedicated power supply connector, the AL-22 PoE receive their operating power trough the RJ45 network connector.

This system is called P.o.E. (**P**ower **o**ver **E**thernet).

Power over Ethernet technology (defined in IEEE802.3af specification) allows Ethernet devices such as the AL-22 PoE, IP telephones, wireless LAN Access Points, Camera and many other appliances to receive power as well as data over existing LAN cabling, without needing to modify the existing Ethernet infrastructure.

Power is inserted in the network by means of a P.o.E. power-supply called a Midspan or it's integrated directly into a device such as a switcher or router and called an Endspan.

Midspan or Endspan can be found in a variety of formats, they can be single or multi-port, stand-alone, DIN-rail or 19" rackmount

For more information on P.o.E. you can surf to http://www.poweroverethernet.com/

4.2 Features

- Only one set of wires to bring to the AL-22 PoE simplify installation and saves space, energy and cost.
- There is no need to pay for an expensive electrician, or delay your installation to meet the electrician's schedule - saves time and money.
- The AL-22 PoE can be easily moved, to wherever you can lay a LAN cable - minimal disruption to the workplace.
- Safer - no mains voltages anywhere.

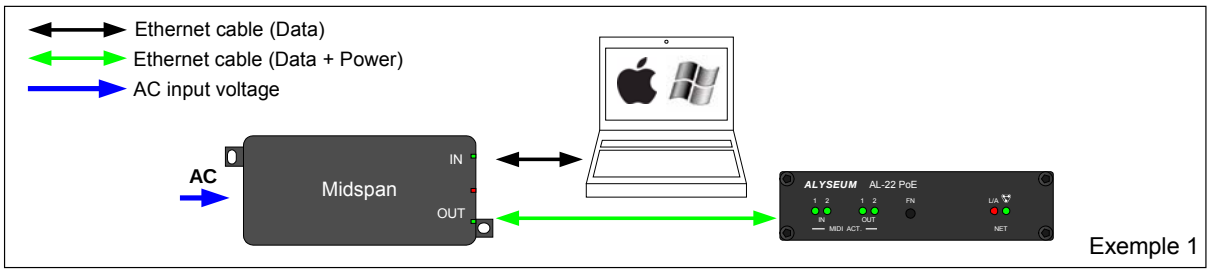
- A UPS can guarantee power to multiple AL-22 PoE, located at different position during mains power failure..
- P.o.E. use lower voltage (48 Volts) for a safe use
- P.o.E. support upto 100 meters cable lenght
- P.o.E. support hot swap (Insert and remove)
- Midspan or Endspan. Both use a signature detection before turning ON the power in the cable, which means no P.o.E. device can be destroyed by inadvertaned connections

NB: that connecting a AL-22 PoE directly to a simple (non P.o.E.) switch/computer will simply not work, since these devices do not provide the necessary power over the network cable.

Any IEEE802.3af compliant Midspan or Endspan can also be used.

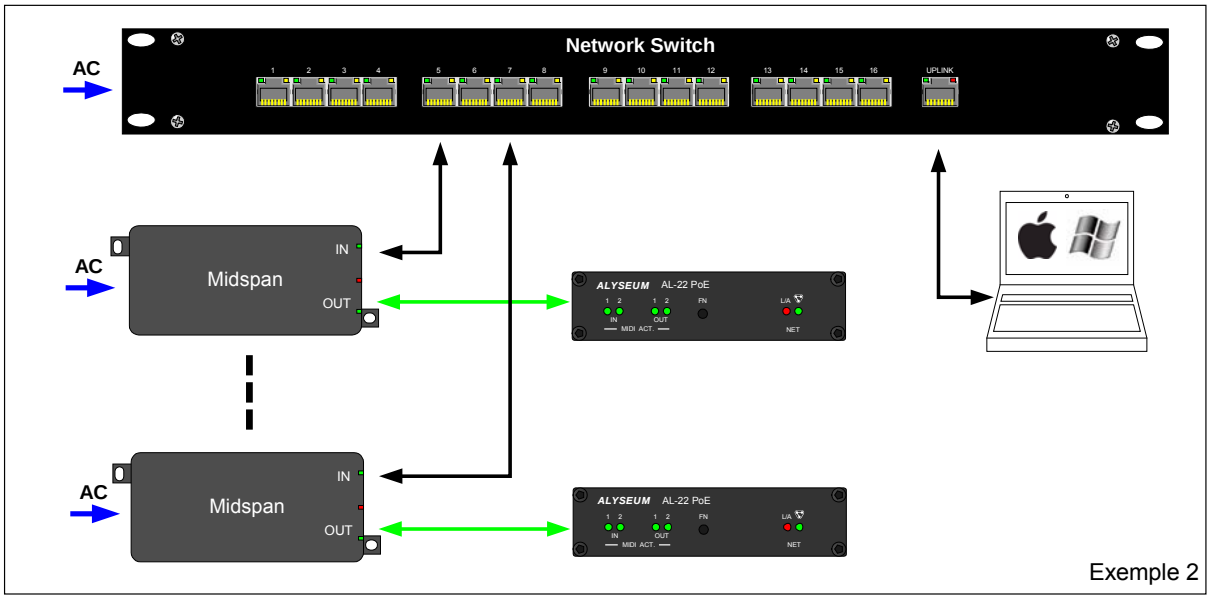
4.3 Exemple:

4.3.1 Exemple 1: Use a Midspan



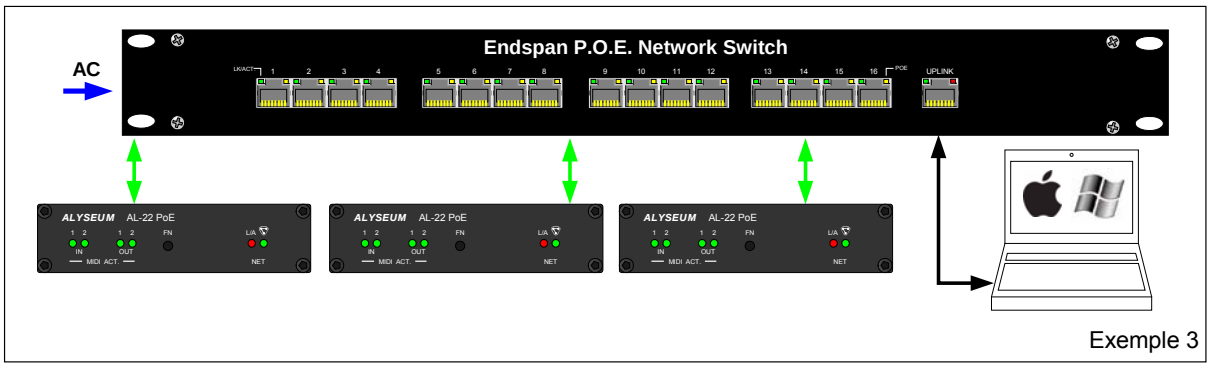
Exemple 1

4.3.2 Exemple 2: Use a Switcher with Midspan



Exemple 2

4.3.3 Exemple 3: Use a Switcher integreating Endspan



Exemple 3

5 Hardware AL-22 PoE

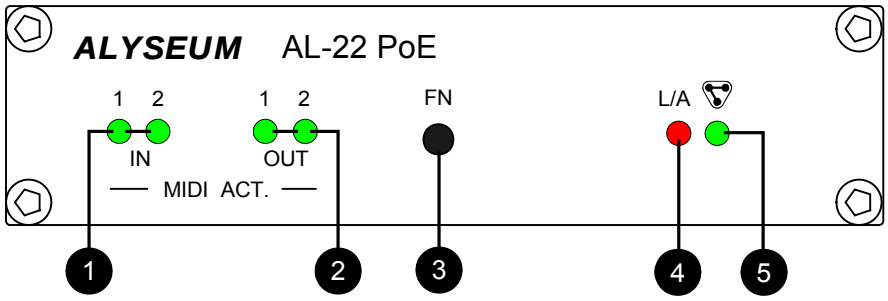
5.1 Package content

- 1 AL-22 PoE device
- User's manual access card
- 1 Short LAN Cable

5.2 Options

Check on http://www.alyseum.com/accessories

5.3 Front panel description



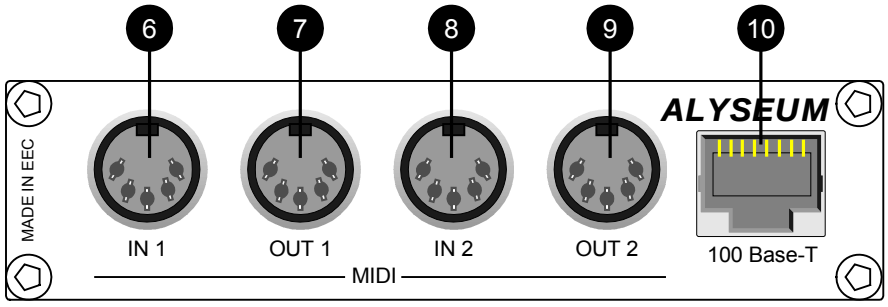
1. Green LED – MIDI In activity, port 1 and 2
2. Green LED – MIDI Out Activity, port 1 and 2
3. Push Button – Function
4. Red LED – Link/Activity on the Ethernet network

LK/ACT Mode	LED Pattern
No connection	OFF
LINK established	ON
Network activity	ON with OFF pulses

5. Green LED – CP activity

CP activity Mode	LED Pattern
Firmware Upgrade ready	Slow blinking
Firmware Upgrade activity	Fast blinking
CP establishing connection	OFF with ON pulses
CP Activity	ON with OFF pulses

5.4 Rear panel description



6. DIN41524 (5 pin) – MIDI In port 1
7. DIN41524 (5 pin) – MIDI Out port 1

8. DIN41524 (5 pin) – MIDI In port 2
9. DIN41524 (5 pin) – MIDI Out port 2
10. RJ45 – Ethernet connector – 10/100 Base-T with PoE capabilities

5.5 Specifications

- Dimensions (W x H x D): 116 x 29 x 71 mm
- Weight: 0,18 Kg
- Rugged aluminum case with laser engraving
- Power requirements: PoE (IEEE802.af) - Class 1

6 Software AL-22 PoE

6.1 Merging function

Connecting two or more sources to the same destination, realizes a merging functions.

Beware that MIDI does not allow merging every type of message at any time. Merging two sysex messages may lead to unpredictable results.

More informations on our application note: http://www.alyseum.com/download.

6.2 Establish connections

It is possible to connect any source to any destination, as a whole virtual cable or according to message type.

Establishing connections is done from the connection tab of the CopperLan Manager software application.

To connect a whole virtual cable, select the appropriate source device and click on the MIDI connector icon. You complete the operation by selecting a destination. All messages appearing at the source will be transferred to the destination without any filtering or remapping.

Instead of connecting a whole cable content, it is allowed to connect individually one or more message types according to the following split:

1. Note and Controller messages on a channel basis – these are channel messages
   Any of the 16 MIDI channels content can be linked separately
2. Clock messages (incl. clock control and song position messages)
   Any clock from any source can be connected to any destination. Note that MIDI destinations can only accept a single clock whereas CopperLan destinations can accept many.
3. Other messages (Sys)
   This selection covers all messages to the exception of messages in categories 1 and 2 hereabove. This linking is essentially used for Sysex and MTC messages.

It is meaningful to only connect sources and destinations of adequate messages type (e.g. Sys to Sys). However, it is allowed to connect any source channel to any destination channel, effectively realizing a channel remapping.

More informations on our application note: http://www.alyseum.com/downloads

6.3 Function push button (FN)

This button gives access to three functions:

6.3.1 Panic

A short press (less than a half second) sends various messages to all destinations connected to the box.

These messages are meant to stop hanging notes and reset various settings such as to resume normal use.

Connections are unaffected by the panic function.

This function can be diseable via the CopperLan Manager.

6.3.2 Save settings

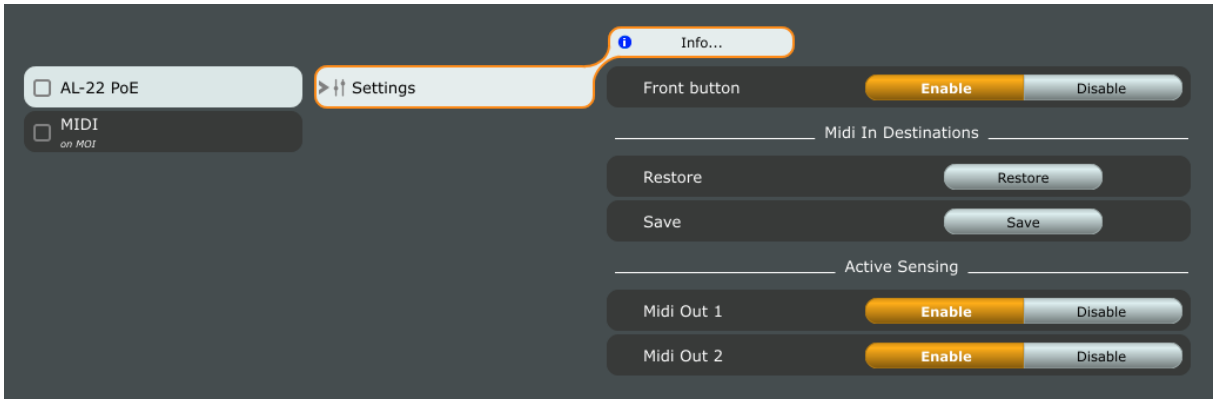
A long press (over 1 second) will store in non-volatile memory all current settings of the box, including the connections.

6.3.3 Manual firmware upgrade mode

Press and hold the FN button while turning ON the AL-22 PoE .

When the LED blinks slowly, release the FN button. Now, the AL-22 PoE is in Firmware upgrade mode (see 5.5)

6.4 Settings



Five settings for each CV Input are done via the CopperLan Manager (Editor tabs)

1. Enable or disable the front button FN (Exemple: protect your AL-22 against unauthorized users).
2. Restore originals MIDI In connections.
3. Save MIDI In destinations.
4. Enable or disable the active sensing on MIDI Out 1.
5. Enable or disable the active sensing on MIDI Out 2.

The save is done automatically.

6.5 Firmware Upgrade software

Upgrading the firmware is done via the network.
This is done automatically through the CopperLan Manager via an internet connection.

7 About

7.1 Ethernet

Alyseum products rely on Ethernet to transport data; compared to other solutions (USB, IEEE1394, ...) Ethernet offers many advantages:

- Available on all computer platforms
- No real limit in cable length and node connections.
- Full Duplex.
- Very high bandwidth and low Latency.
- Frees the computer of the MIDI flow handling of USB/Firewire interfaces
- Embedded devices can work without any computer in the network
- Peer to peer capability.
- Full electrical isolation between machines, preventing audio hum due to ground loops.
- Low cost, ubiquitous and reliable infrastructure.

7.1.1 Note about Wi-Fi use

Using these products via Wi-Fi is possible but not guaranteed. Wireless transmissions are subject to perturbations that require data resending which implies unavoidable delays which are inconvenient for real-time musical purposes.

This is why Alyseum only guarantees good performance when using wired network.

7.1.2 Tips for a efficient Ethernet Network

The performance of an Ethernet network is always related to the weakest link.

- Use the WI-FI only for the web, Email, ... and the wired network of your computer for the CopperLan and audio streaming
- For large installations, use an additional network card in your computer to create a network dedicated only for CopperLan and audio streaming
- For large installations , preferably use Gbit Ethernet switches to guarantee a better data exchange
- Avoid Ethernet HUBs as these create collisions in messages that could hamper the overall network performance

7.2 CopperLan

CopperLan offers many advantages for the Musician:

- Self configuring & Plug and Play.
- Zero network knowledge
- Connectivity guaranteed with any hardware/Software supporting MIDI and/or CopperLan.

CopperLan offers also many advantages for the technician:

- No IP addresses, thanks to an address abstraction layer.
- Protocol and networking system for command & control + streaming management.
- Decentralized work distribution and storage – every CopperLan equipment incorporates its own server.
- Very low processing and memory footprint compared with IP protocol for light embedded product.

CopperLan manages MIDI in a more powerful and flexible than any other technology available. The benefit of having its own dedicated protocol surpasses the afterthought solutions relying on TCP/UDP-IP in terms of speed and user-friendliness.

8 Miscelleanous

8.1 Disclaimer

8.2 Maintenance

Switch Off the power before maintenance.

Do not attempt to clean the unit with chemical solvents (thinner, benzine or alcohol) as this might damage the finish. Use only a clean, dry cloth.

8.3 Static Electricity, ESD

Electrostatic discharge (ESD) can cause malfunction and/or damage to electronic devices if discharged into the device.

Despite the built-in ESD protections in every ***Alyseum*** product, ESD might build up at levels that could harm your equipment.

8.3.1 Standard symbols for ESD advertising

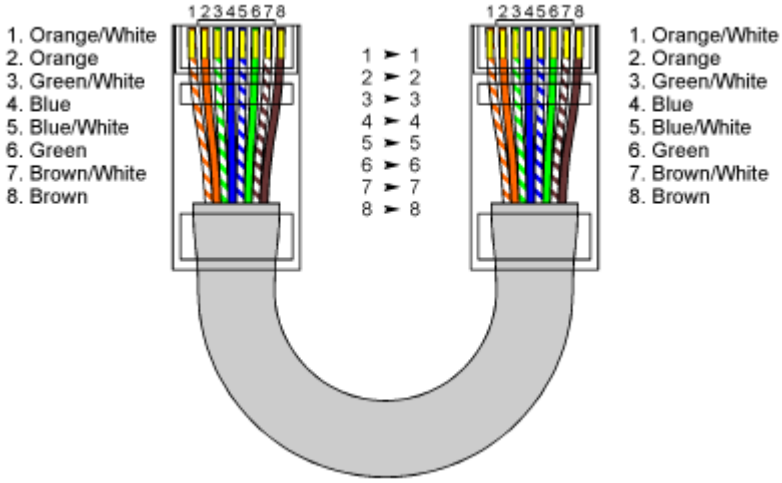
8.3.2 Some tips and precautions for ESD sensitive environment

- Make sure to discharge any built-up static electricity from yourself and your device before touching or connecting one device to another
- Ground yourself by touching an earth grounded metal surface before handling your device and other equipments.
- For fixed installations, put the device in a grounded metallic rack.
- Ensure air relative humidity is minimum 60%.
- Install ESD specific prevention items, such as grounding mats.
- Reduce movement speed on handling or (dis)connecting devices
- Avoid carpet or other synthetic flooring

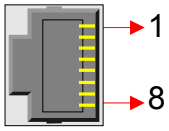
8.4 How to wiring the Ethernet cable ?

If you want to build your own Ethernet cable, dont worry, use CAT5 cable, RJ45 connectors and a crimping clamp.

The maximum lenght for a single cables is 120 meters

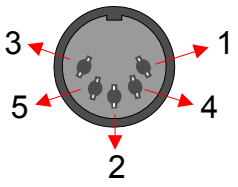


Pin	Function
1	TX+
2	TX-
3	RX-
4	Spare cable
5	Spare cable
6	RX+
7	Spare cable
8	Spare cable



8.5 How to wiring a MIDI cable ?

Pin	Function
2	Ground
4	Data +
5	Data -

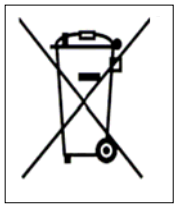


8.6 Statement and Agency Compliance

8.6.1 WEEE (for EU countries)

Waste **E**lectrical and **E**lectronic **E**quipment (Directive 2002/96/EC)

(applicable for E.U. Customers or others countries with separate collection systems)



1. This marking shown on the product or its literature, indicates that it should not be disposed with other household wastes at the end of its working life.
2. To prevent possible harm to the environment or human health from uncontrolled waste disposal, please separate this from other types of wastes and recycle it responsibly to promote the sustainable reuse of material resources.
3. Household users should contact either the retailer where they purchased this product, or their local government office, for details of where and how they can take this item for environmentally safe recycling.

8.6.2 RoHS Compliance (for EU countries)

Alyseum products complies with the European Union restriction of the use of certain hazardous substances in electronics equipment, (RoHS directive 2002/95/EC)

The RoHS directive prohibits the sale of certain electronic equipment containing some hazardous substances such as Mercury, Lead, Cadmium, Hexavalent chromium and certain Flame-retardants (PBB & PBDE) in the European Union.

http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:32002L0095:EN:HTML

8.6.3 CE (for EU countries)

CE

Alyseum products complies with the requirements of European Directive 89/336/EC.

8.7 Warranty and repair

Alyseum warrants to you, the original purchaser, that each of its products will be free from defects in materials and workmanship for a period of two years from the date of purchase.

This warranty does not apply to any products which have been repaired or altered by other than repair personnel authorized by ***Alyseum***, or which have been subject to ESD, moisture, abuse, accident or improper installation and using.

Alyseum assumes no liability as a consequence of such events under the terms of this Warranty.

Please consult your dealer for more details.

8.8 Revision history

Issue	Date	Comments
1.5	24 December 2012	First release
1.8	December 2013	Migration CP Manager 1.26. Add options chapter

8.9 MIDI Chart

AL-22 PoE MIDI IMPLEMENTATION CHART ver.1.0. 2012-12-10

Function		Transmitted	Recognized	Remarks
Basic Channel	**Default**	1-16	1-16	pass-through
	Changed	--	--	via network mapping
Mode	**Default**	--	--	not applicable
	Messages	X	X	pass-through
	Altered	--	--	not applicable
Note Number		0-127	0-127	pass-through
Velocity		X	X	pass-through
After Touch	**Keys**	X	X	pass-through
	Channels	X	X	pass-through
Ptch Bend		X	X	pass-through
Control Change		X	X	pass-through
Prog. Change True#		X	X	pass-through
System exclusive		X	X	pass-through
System Common	**Song Position**	X	X	pass-through
	Song Select	X	X	pass-through
	Tune Request	X	X	pass-through
System Realtime	**Clock**	X	X	pass-through
	Commands	X	X	pass-through
Aux Messages	**Local On/Off**	X	X	pass-through
	All Notes Off	X	X	pass-through
	Active Sensing	O	X	Via CopperLan
	System Reset	O	O	
Notes				