

# HPX STANDARD

## Digitally Controlled Switch Rack



# OPERATING MANUAL



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**EMC COMPLIANCE**


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This product is approved for use in Europe and Australia/New Zealand and conforms to the following standards:

European Norms	Australian / New Zealand Standards
EN 55015	AS/NZS CISPR15
EN 60439-1:2002	AS/NZS 3439.1
EN 60439-3:2002	AS/NZS 3439.3

To ensure continued compliance with EMC Directive 89/336 and the Australian Radiocommunications Act 1992, use only high quality data cables with continuous shield, and connectors with conductive backshells. Examples of such cables are:

DMX: Belden 8102 100% Aluminium foil screen, 65% Copper braid.

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This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation. Changes or modifications not expressly approved by the manufacturer could void the user's authority to operate the equipment.

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It is recommended that all service and repairs on this product be carried out by JANDS PTY LTD or its authorised service agents.

JANDS PTY LTD cannot accept any liability whatsoever for any loss or damage caused by service, maintenance or repair by unauthorised personnel, or by use other than that intended by the manufacturer.

JANDS HPX Series products must only be used for the purpose they were intended by the manufacturer and in conjunction with this operating manual.

Disconnect mains power when not in use.

Designed in Australia / Manufactured in China

**JANDS PTY LTD**

40 Kent Rd  
Mascot NSW 2020  
Sydney Australia

Phone: +61-2-9582-0909

Fax: +61-2-9582-0999

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ACN 001 187 837

Locked Bag 15  
MASCOT NSW 1460  
Sydney Australia

Email: [jandsinfo@jands.com.au](mailto:jandsinfo@jands.com.au)

Web: [www.jands.com.au](http://www.jands.com.au)

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# 1.0 About This Manual

This manual provides general information about the HPX product. The HPX has been designed in a modular format that allows each unit to be factory built to suit the users' particular requirements, and as such the product diagrams within this manual may differ from the actual unit provided.

## 1.1 Important Safety Information

- This product is NOT rated for outdoor use. Ensure the HPX is protected from moisture and is not used in wet areas.
- Output sockets may have dangerous voltages present even when the channels are driven off. Switch off the channel circuit breaker before connecting and disconnecting loads or replacing load lamps.
- The HPX should be properly mounted on a flat stable surface.
- Provide adequate ventilation during use. Do not obstruct airflow around the vents.
- Do not run the power cables under carpet or other insulating substances. Arrange the cables away from traffic areas and where they may become a tripping hazard.
- Inspect the unit for damage prior to each use. If the unit is dropped or damaged in any way it must be inspected by a qualified person before use.
- High voltages are present inside the unit. Do not operate with the lid removed.
- Disconnect from mains supply when not in use.
- No user serviceable parts inside.

## 2.0 Introduction

The HPX is a professional switching product designed to remotely switch mains loads under DMX control. It uses microprocessor-based digital control and provides easy to use in-built test functions and facilities.

Digital control is via the ANSI E1.11 USITT DMX-512-A specification protocol. Control signal to the HPX is via a standard 5-pin socket on the front panel, while the switched outlets and power entry are located on the rear panel. Additionally the HPX may be used to sequence the power to high in-rush loads eg power amplifiers, with a single switch closure controlling activation.

### 2.1 Features

- High brightness display
- Simplified menu operation
- Digital DMX-512 start channel display
- Inbuilt DMX-512 terminator
- Master input controls load sequencing
- Adjustable sequencing delay
- Built-in test facilities and check functions
- Multiple dedicated status indicators
- Three phase power indicator LEDs
- Multiple phase power operation modes
- Low acoustic/electrical noise
- Dual temperature-controlled DC fans
- Temperature monitor
- Rack mounted (3 or 4 rack units)
- Rugged construction
- Operates from mains supplies 100V to 230VAC, 40 to 66Hz

## 3.0 Equipment Description

### 3.1 Front panel layout

Refer to Figure 1 for a description of the front panel controls.



Figure.1 HPX front panel layout

1. **Channel output sockets (rear panel):** The output sockets are located on the back panel.
2. **Channel circuit breakers:** If a breaker trips during use ensure the fault has been cleared before resetting.
3. **+ and - buttons:** These buttons select the DMX-512 start channel, are used to move through menus and select functions and change values.
4. **EXIT and MENU/← buttons:** These buttons are used to navigate through the menus and set DMX address.
5. **3-Digit Display:** Indicates currently selected DMX-512 start channel, the menu position, and the various function options.
6. **SIGNAL LED:** Indicates the presence of DMX-512 signals.
7. **ERROR LED:** Flashes in the presence of a fault. In normal operation this LED should be off.
8. **IC LED:** The Internal Control LED Illuminates when control is internal, ie. not from the DMX-512 input.
9. **TERM LED:** Illuminates when the Terminate function is active.
10. **PHASE LEDs:** Three blue LEDs (one for each phase) indicate that the three-phase mains supply is available. Note that all three LEDs should illuminate when power is available regardless of the type of the mains supply used to power the HPX.
11. **DMX IN SOCKET:** Standard 5-pin AXR connector accepts DMX-512 signals from the controller.
12. **DMX LOOP SOCKET:** Standard 5-pin AXR connector links the DMX-512 signals to other Switches or devices.
13. **Channel Switch:** A switch per output channel is used to change the mode of operation of that channel.
14. **Channel LED:** A multicolour LED per output channel is used to indicate the mode and drive level of that channel.

## 4.0 Getting Started

The HPX would normally be rack mounted before any wiring is terminated. Refer to *Section 6.0 Installation* for installation details.

### 4.1 Connecting power

The HPX may be supplied with a mains inlet cable and multipin connector, mains inlet cable and no connector, or with no inlet cable fitted. Refer to *Section 7.2* for details on mains termination connection methods. Always connect to a supply that is protected by fuses or circuit breakers at not more than the specified maximum. Refer to *Section 9.0 Technical Data and Specifications*.

### 4.2 Powering up

Turn on the power and check that the three blue phase power indicator LEDs A, B, and C are illuminated before connecting any loads. If any of the phase LEDs are dim or off, power down and remedy the fault before trying again.

If all is well, power down and connect loads.

### 4.3 Connecting loads

Switch off the channel circuit breaker before connecting and disconnecting loads. Ensure any plugs are pushed firmly into their sockets. The load should be within the specified limits.

#### 4.3.1 Changing the channel configuration

Each HPX channel may be independently configured to switch, turn fully on, or be fully off. To change a channel's configuration:

1. Press the Channel Switch for the channel to be reconfigured. All of the Channel LEDs now flash to indicate the current mode of operation as shown in Table 1.

LED colour	Function
Orange	Switch
Red	Channel fully On
Off	Channel fully Off

Table 1: Channel Indicator functions

2. Continue to press the channel Switch until the required function is indicated by the LED/s.
3. Press and hold the channel switch to record the new setting.

## 4.4 Connecting DMX-512 input

The input signal to the HPX should conform to the ANSI E1.11 USITT DMX-512-A specification. Plug the DMX-512 signal to the “DMX IN” socket. The DMX signal may be daisy-chained to the next DMX receiver via the LOOP connector.

The SIGNAL LED indicates the presence of control data.

The DMX-512 input is protected against extreme over-voltages across any input pins and from any input to chassis. The “terminating” resistor is not protected against over-voltages.

### 4.4.1 Changing the DMX Address

The DMX-512 address is the DMX-512 channel number that will be used to control HPX channel 1. HPX channels 2 and up are controlled from the next DMX-512 channel upward.

To change the DMX-512 address:

1. At the root menu adjust the displayed value using the + and – buttons until it matches the required start channel.
2. Press MENU/←to confirm.

### 4.4.2 DMX Termination

In any DMX-512 system the signal should be terminated at the last HPX or receiver in the chain - the HPX can provide this function. Refer to *Section 5.1.2*.

The TERM LED indicates when the Termination function is active. Note that when termination is active no signal is present at the LOOP connector.

## 4.5 Connecting the Sequence Input

The sequence input can be used to activate channels remotely and in a sequence that minimises inrush currents. The sequence input operates on all channels that have not otherwise been configured on or off via the channel control buttons.

The connector pinouts are shown in section 9.3. To wire a HPX with remote activation:

- Connect pin 1 to pin 8
- Connect pin 2 to pin 7 via a switch

When the switch is closed the HPX will sequentially turn on the outputs starting at channel 1 – the time between steps is set by the “dLY” parameter in the menu.

Note that the switch wiring should be isolated from all other building wiring. Contact Jands for further information.

## 5.0 Operation

This section assumes the HPX has been correctly connected to the mains power supply and a source of DMX-512 control signal.

### 5.1 Menu and setting adjustment

- Pressing MENU/↵ at any time moves up a menu level or confirms a new setting.
- Pressing the EXIT button at any time moves back a menu level with no setting change.
- When adjusting a setting, the display will flash briefly once per second for three seconds. If the MENU/↵ button is pressed within that three seconds, the new value is retained and subsequently takes effect. If no button is pressed within that 3 seconds, or if the EXIT button is pressed within 3 seconds, the setting reverts to the previous value.

The menu tree is shown in Figure 2. The function of each menu option is described in Table 2.

#### 5.1.1 Root Menu

The root menu is displayed when the Exit button has been pressed sufficient times such that the DMX-512 start channel is displayed. A number of functions are available at the Root Menu as detailed in the following sections.

##### 5.1.1.1 Changing the DMX Address

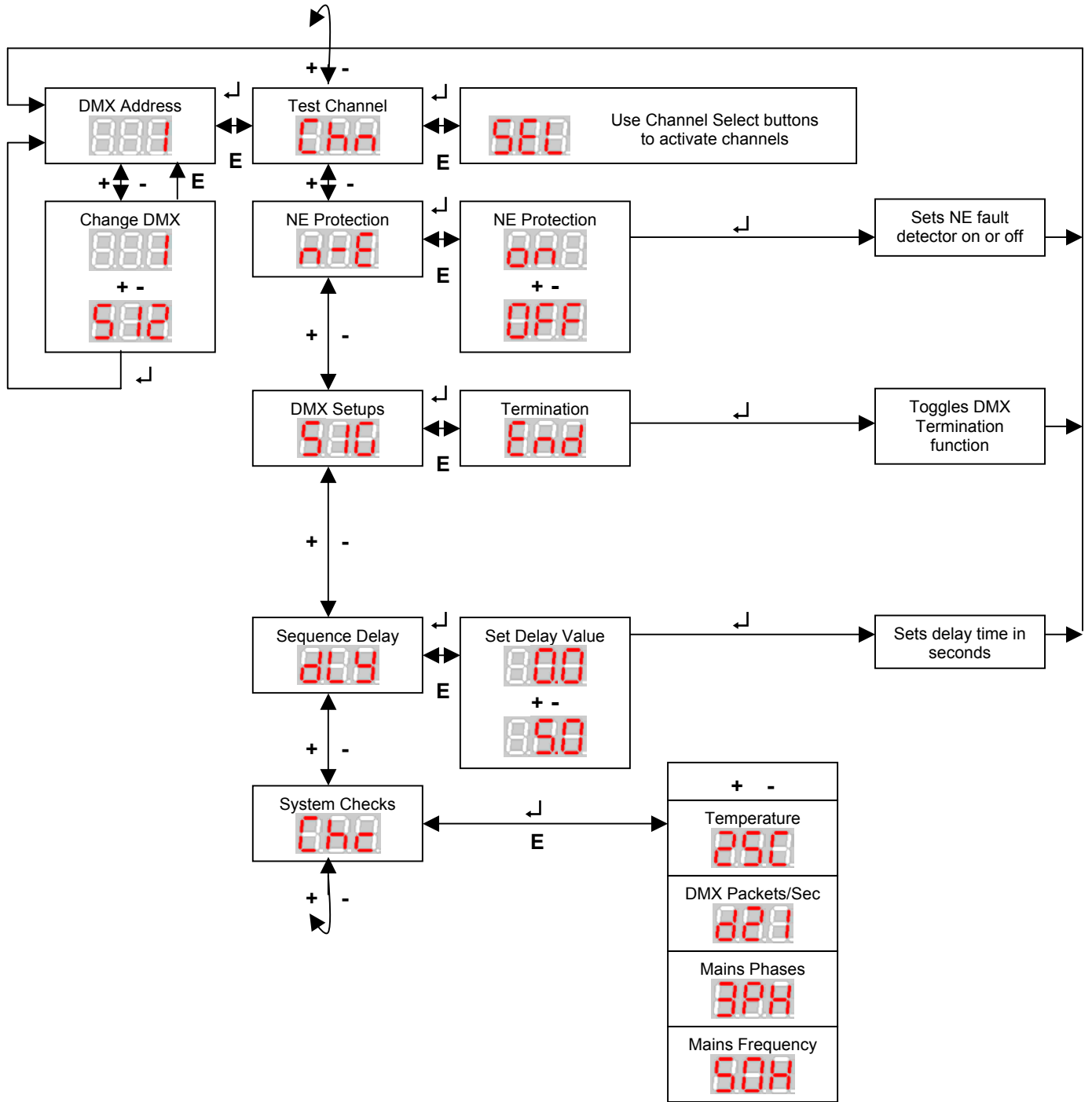
The DMX address is the DMX-512 channel number that will be used to control HPX channel 1. HPX channels 2 and up are controlled from the next DMX-512 channel upward.

To change the DMX address:

1. At the root menu adjust the displayed value using the + and – buttons until it matches the required start channel.
2. Press MENU/↵ to confirm.

##### 5.1.1.2 Displaying the software Version

To display the software version press and hold the EXIT button while the Root Menu is displayed. Note that when EXIT is pressed the channel configuration is indicated on the channel LEDs.



↵ (Menu)      Move right  
 E (Cancel/Exit)      Move left

Figure 2: Menu Tree

First Level	Second Level	Third Level	Description
Chn	-	-	Use channel select buttons drive channel/s to full
n-E	On-off	-	When ON the N-E fault detector is enabled
SIG	End	-	Toggle the DMX terminate function. The TERM LED indicates if the terminate function is active.
dly	0.0-5.0	-	Set the delay between activations when sequencing (in seconds)
Chc	24.C	-	Display the internal measured temperature in degrees Celcius
CHC	D.21	-	Display the DMX packet rate (per second)
Chc	3.PH	-	Display the number of connected phases. Note that <b>2.PH</b> is displayed when 1 or 2 phase power is connected.
Chc	50.H	-	Display the mains frequency

Table 2: Menu Function Reference

### 5.1.2 DMX Termination

Any long DMX-512 data line must be terminated at the end for correct operation, and the HPX provides this function. Selecting the “**End**” option toggles the terminate function. The TERM LED on the front panel indicates when the DMX-512 is terminated.

Note that no signal is present on the DMX OUT socket when the terminate function is active.

### 5.1.3 Deep Clear

The HPX includes a deep clear facility to enable the internal processor to be reset to the factory default settings. In general this should not be required however if necessary the following procedure should be followed:

1. Turn HPX power off
2. Press and hold the “+” and “-“ buttons
3. Turn the HPX power on
4. Release the buttons held in step 1.
5. Press the MENU/←button.

## 6.0 Fault Diagnosis

### NOTE

**Contact your authorised JANDS Distributor for repairs or servicing.**

**In Australia refer all repairs to an authorised JANDS service agent or return the faulty unit in suitable packaging to:**

**JANDS ELECTRONICS Service Dept,**

**26 Kent Rd**

**Mascot NSW 2020**

**Australia**

### 6.1 Output protection

Each of the output circuits is protected by a fast-acting thermal/magnetic circuit breaker. These breakers are designed to pass the rated current, but will disconnect the output circuit for any overload condition (the larger the overload, the quicker the disconnection). If a circuit breaker trips there's either a fault which should be rectified or the channel is overloaded.

### 6.2 Thermal protection

The HPX continuously monitors the internal heatsink temperature. If the temperature rises above the predefined limit the HPX will shut down the outputs, however this should only be necessary if there is inadequate ventilation or if the ambient temperature is above the rated maximum.

Refer to *Section 7.1 Ventilation* regarding HPX ventilation requirements.

### 6.3 Neutral-Earth Detection

The HPX includes a fault detector that monitors the Neutral-Earth (N-E) voltage – in normal operation there should be little or no voltage difference between the Neutral and Earth. If the voltage exceeds a predetermined amount the outputs are turned off. The N-E fault detector may be disabled by the user in the menu.

## 6.4 Fault finding guide

FAULT SYMPTOM	POSSIBLE CAUSE	REMEDY
Breaker trips	Excessive load	Reduce channel loading
	Load or wiring fault	Check loads and wiring
	Poor ventilation	Increase air flow to HPX vents
	Faulty HPX	Service HPX
NE Error on display	Poor Earth or Neutral connection	Check supply wiring. Disable N-E detector in menu.
Erratic DMX operation	Incorrect DMX protocol / wiring	Replace DMX source / wiring
	Un-terminated DMX line	Activate Terminate facility on the last HPX
Signal LED flickers	Faulty DMX wiring/connections	Repair
	Faulty console	Repair
	Faulty HPX	Service HPX
Error LED flashing	Over-temperature	Improve HPX ventilation
Error LED on continuously	Recent over-temperature	Improve HPX ventilation
	DMX control errors	Check DMX wiring, console
	HPX memory corrupt	Deep Clear HPX
	Software failure	Service HPX
No signal at DMX Loop output	Terminate facility active	De-activate Terminate facility
HPX shuts down	HPX very hot	Increase air flow to HPX vents

## 7.0 Installation

The HPX is designed for use in 19 inch racks or a 19 inch bar frame, and occupies 3 or 4 rack units. The HPX is supplied with rear rack mounting support brackets, which provide additional support for touring applications.

The mains supply power cable entry is located at the rear right side of the rack when viewed from the front. Ensure adequate access to the power plug when mounting HPX's in racks.

### 7.1 Ventilation

All HPX's must have adequate ventilation during use. Fully enclosed equipment racks will cause overheating problems.

Racks must allow **at least 100 square centimetres** of air venting per HPX at each side of the rack, level with the intake and exhaust slots. Additional venting area will serve to further reduce internal temperatures and will enhance the HPX's operational reliability.

HPX's may be stacked in racks without intervening rack spaces as long as the racks are adequately vented at the sides. Racks of HPX's must be placed such that one rack does not breathe the hot exhaust of the rack next to it. Allow at least 300mm (12") between racks unless duty cycles are light.

### 7.2 Supply Wiring

The HPX has been designed to run from commonly found star power systems, ie. where a neutral is available. The incoming mains supply must be protected at not more than the specified maximum.

When no cable is supplied, the HPX must have its labelled terminals connected to the supply phases as indicated in Table 3.

Supply Type	HPX Power Terminal						Notes
	A	B1	B2	C	N	E	
Two wire (A + N)	A	A	A	A	N	E	Link terminals A, B1, B2, and C
Three Wire (2A + N)	A	A	B	B	N	E	Remove link between B1 and B2
Four Wire (3A+N)	A	B	B	C	N	E	Insert link between B1 and B2

Table 3: HPX Power Supply Connections

## 8.0 Maintenance

With care, the HPX will require little or no maintenance. However periodic electrical safety checks may be required by law in some countries.

### 8.1 External Cleaning

If the front panel requires cleaning, wipe with a mild detergent on a damp soft cloth.

NO NOT allow liquids into the chassis.

DO NOT spray liquids onto the front panel.

DO NOT use solvents for cleaning the front panel.

### 8.2 Internal Cleaning

The HPX will require little internal maintenance other than periodic flushing to prevent the fan and air-path becoming clogged with dirt or fluff.

- ISOLATE POWER to the Switch (by disconnecting the power cable or locking off the mains supply isolator).
- Remove the lid.
- Blow clean the fan and internals with compressed air from left to right.
- DO NOT "spin" the fan with compressed air - the blades may break off.
- When the fan and internals are clean, replace the lid and screws, and re-connect the power cable.

### 8.3 Routine Maintenance

Installed HPX's should be routinely flushed of dust at six- to twelve-month periods. Touring HPX's may need a more rigorous maintenance routine, which should include:

- Inspection of chassis for evidence of impact damage and physical abuse
- Inspection of outlets for wear and damage
- Inspection of power cable for wear and damage
- Electrical checking of ground integrity from power cable to chassis
- Electrical checking of ground integrity from power cable to outlet grounds
- Flushing of dust build-up
- Testing the operation of all front panel switches and breakers

A Neutral-Earth test may show a low reading. This is normal and is a consequence of the N-E voltage detector detailed in *Section 6.4*.

# 9.0 Technical Data and Specifications

PARAMETER	HPX
Active-Neutral Supply Voltage	100-230VAC ±10%. Full size neutral required
Supply Frequency	40-66Hz
Supply Protection	10K Amps
Rated Insulation Voltage	430VAC Phase to Phase, 250VAC Phase to Neutral
Minimum Power/Channel	0W
Maximum Ambient Temp	40°C
Output Protection	Thermal/magnetic circuit breakers
Control Signal	ANSI E1.11 USITT DMX-512-A specification
DMX Input	5 pin AXR male / female
Test Function Level	Individual Channels
LED Indicators	SIGNAL, ERROR, TERM, IC Phases A, B, and C
Ingress protection	IP20
Size (mm)	478 (w) x 133 (or 178) (h) x 451 (d)
Weight	14 kg net
Rack mounting requirements	3 (or 4) x 19" rack spaces / standard spacing for mounting holes Ventilation required at sides of rack Power inlet at rear right (looking from front of unit) Rear access required for patching outputs

## 9.1 DMX connector pin-outs

PIN No	CONNECTION (DMX IN)	CONNECTION (LOOP)
1	SHIELD	SHIELD
2	IN-	OUT-
3	IN+	OUT+
4	DMX Loop pin 4	DMX In pin 4
5	DMX Loop pin 5	DMX In pin 5

## 9.2 Sequence connector pin-outs

PIN No	Control RJ45
1	Input A
2	Input B
3	NC
4	NC
5	NC
6	NC
7	+5
8	GND

## 9.3 Socapex connector pin-outs

PIN No	Socapex 1	Socapex 2
1	A1	A2
2	N1	N2
3	A3	A4
4	N3	N4
5	A5	A6
6	N5	N6
7	A7	A8
8	N7	N8
9	A9	A10
10	N9	N10
11	A11	A12
12	N11	N12
13	E1	E2
14	E3	E4
15	E5	E6
16	E7	E8
17	E9	E10
18	E11	E12
19	NC	NC