

HPC

AirGap™

Digitally Controlled Dimmer Rack



OPERATING MANUAL

Software Version 02.10



EMC COMPLIANCE



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
IEC 60439-1	AS/NZS 3439.1
IEC 60439.3	AS/NZS 3439.3
IEC 60950	AS/NZS 60950

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.

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.

DISCLAIMER

Information contained in this manual is subject to change without notice and does not represent a commitment on the part of the vendor. JANDS PTY LTD shall not be liable for any loss or damage whatsoever arising from the use of information or any error contained in this manual.

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 HPC 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

JANDS PTY LTD

40 Kent Rd

Mascot NSW 2020

Sydney Australia

Phone: +61-2-9582-0909

Fax: +61-2-9582-0999

ACN 001 187 837

Locked Bag 15

MASCOT NSW 1460

Sydney Australia

Email: info@jands.com.au

Web: www.jands.com.au

© JANDS PTY LTD 2011

All rights reserved

Revision 2.0b

31 January 2011

Table of Contents

Table of Contents	2
1.0 About This Manual	3
1.1 Important Safety Information	3
2.0 Introduction	4
2.1 Features	4
3.0 Equipment Description	5
3.1 Front Panel Layout	5
4.0 Getting Started	6
4.1 Connecting Power	6
4.2 Powering Up	6
4.3 Connecting Loads	6
4.3.1 Changing the Channel Configuration	6
4.4 Connecting Control Input	7
4.4.1 Changing the DMX Address	7
4.4.2 DMX Termination	7
5.0 Operation	8
5.1 Menu and Setting Adjustment	8
5.1.1 Root Menu	8
5.1.1.1 Changing the DMX Address	8
5.1.1.2 Displaying the Software Version	8
5.1.2 Cap Function	11
5.1.3 Preheat Function	11
5.1.4 DMX Termination	11
5.1.5 DMX Data Loss	11
5.1.6 DMX Source	11
5.1.7 Automatic Relay Control – Bypass Relay	12
5.1.8 Automatic Relay Control – Isolate Relay	12
5.2 Deep Clear	12
5.3 RDM Facility	13
6.0 Fault Diagnosis	14
6.1 Output protection	14
6.2 Thermal Protection	14
6.3 Neutral-Earth Detection	14
6.4 Fault Finding Guide	15
7.0 Installation	16
7.1 Ventilation	16

7.2	Supply Wiring	16
8.0	Maintenance.....	17
8.1	External Cleaning	17
8.2	Internal Cleaning	17
8.3	Routine Maintenance.....	17
9.0	Technical Data and Specifications	18
9.1	DMX Connector Pinouts.....	19
9.2	RDM Implementation.....	19
9.2.1	Root Device PIDs	19
9.2.2	Sub Device PIDs.....	20

1.0 About This Manual

This manual provides general information about HPC dimmer product fitted with software version 2. 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 HPC 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. AirGap technology does not operate on channels set to dim.
- The HPC 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 thermally insulating materials. 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 HPC is a professional power control product designed primarily for use in performance spaces, but has many additional applications. Each of the 12 channels incorporates a full power dimmer circuit and two high current relays connected as shown in Figure 1.

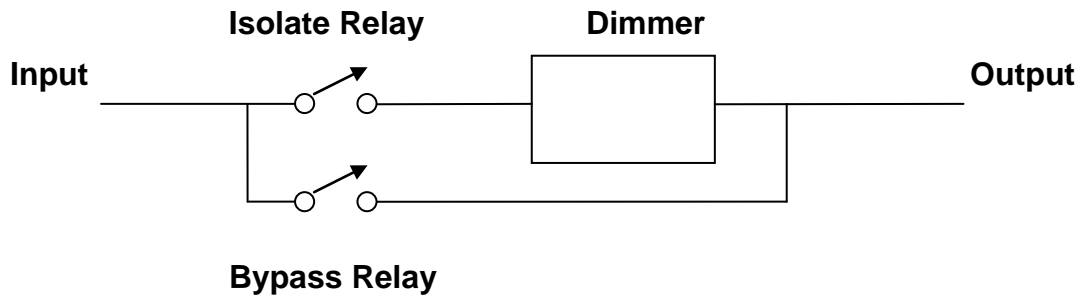


Figure 1: **Channel Organisation**

The “Isolate” relay ensures the output can be fully switched off with a real “air gap” between the input and output, while the “Bypass” relay completely bypasses the dimmer circuitry ensuring a clean undistorted mains output. Hence each channel can be used to safely switch power to non-dimmable loads such as moving lights, LED fixtures, video screens and walls, gobo rotators, fog machines, and other accessories, or alternatively smoothly dim conventional incandescent loads. Channels may be individually set to On, Remote Switch, Remote Dim, or Off.

The HPC is controlled using DMX-512-A via a standard 5-pin socket on the front panel. RDM functionality is provided to enable remote configuration and status readback via a suitable RDM controller. The dimmed outlets and power entry are located on the rear panel. The HPC provides easy to use in-built test functions and facilities.

2.1 Features

- Relay pair per channel allows full control of all loads, both dimmable and non-dimmable. Automatic relay control optimises safety and efficiency.
- DMX-512 address by start channel
- RDM functionality allow remote configuration and status readback
- Inbuilt DMX-512 terminator
- Two DMX snapshots (scenes)
- Dimming curve set for linear relationship between control input and output power
- Multiple phase power operation modes
- Dual temperature-controlled DC fans
- Temperature monitor and soft thermal cut-out
- Operates from wide mains supplies 100V to 240VAC, 40 to 66Hz

3.0 Equipment Description

3.1 Front Panel Layout

Refer to Figure 2 for a description of the front panel controls.



Figure 2: HPC 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 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 HPC.
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 dimmers or devices.
13. **Channel "Mode" 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 HPC would normally be rack mounted before any wiring is terminated. Refer to *Section 6.0 Installation* for installation details.

4.1 Connecting Power

The HPC dimmer 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 HPC dimmer circuit will drive most incandescent loads as well as pinspots, fans, and dimmable fluorescent tubes. Un-dimmable loads should not be driven from channels configured to dim (see section 4.3.1).

4.3.1 Changing the Channel Configuration

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

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

Table 1: Channel Indicator functions

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.
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.

To record multiple channel configurations at once, repeat steps 1 and 2 until all channels have been configured, then press and hold any channel button to store all channels.

4.4 Connecting Control Input

Where DMX control is to be used, the input signal to the HPC should conform to the specified standard for DMX and RDM. 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.

Where the Ethernet option is fitted, plug the Ethernet data into the front panel connector. The source of control for DMX and RDM must be manually selected via the menu between the front panel DMX connector and the Ethernet connector – refer to Section 5.1.6.

4.4.1 Changing the DMX Address

The DMX-512 address is the DMX-512 channel number that will be used to control HPC dimmer channel 1. HPC dimmer 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 dimmer or receiver in the chain - the HPC can provide this function. Refer to Section 5.1.4.

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

5.0 Operation

This section assumes the HPC 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 HPC dimmer channel 1. HPC dimmer channels 2 and up are controlled from the next DMX-512 channel upward.

To change the DMX address:

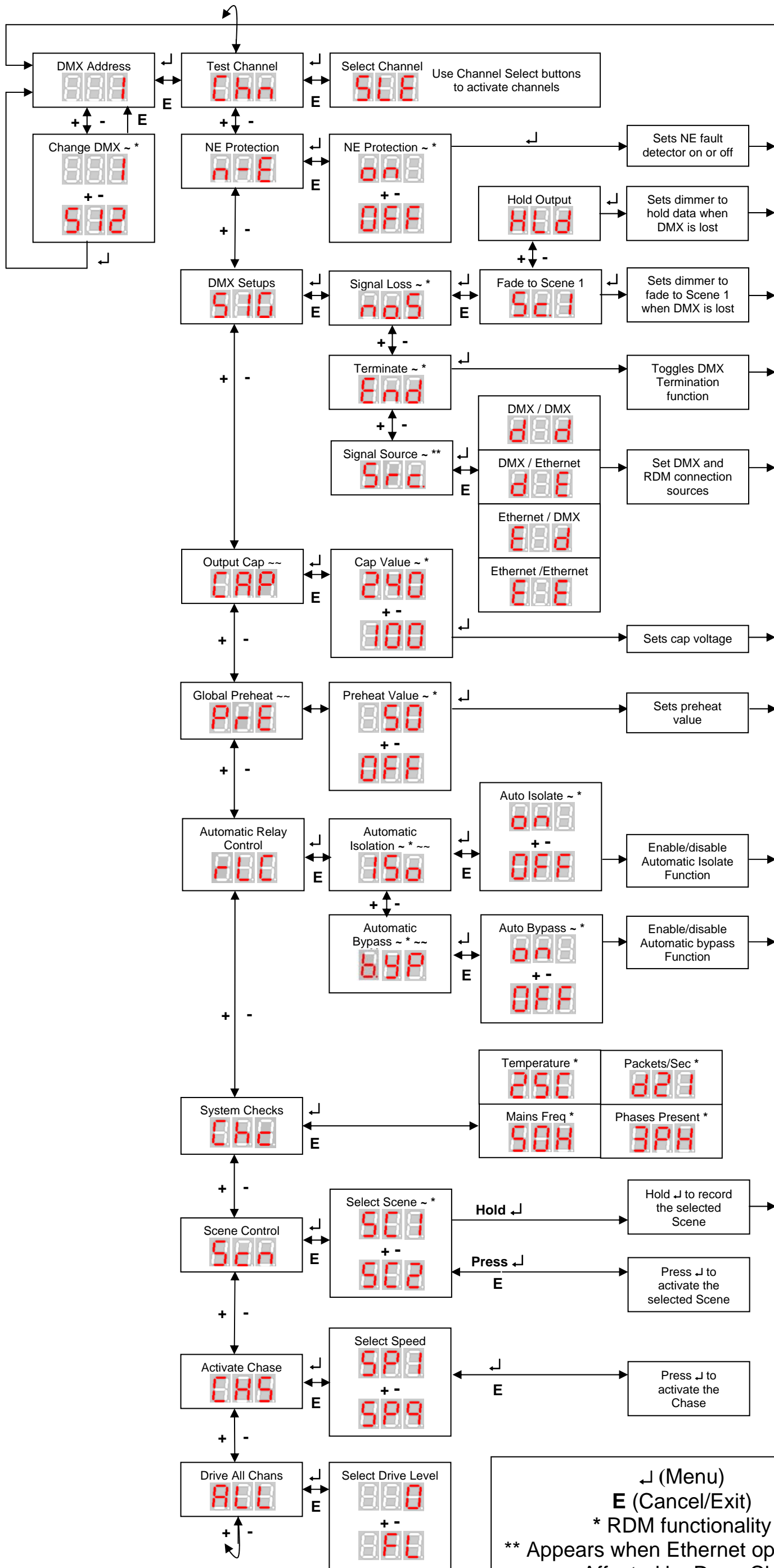
1. At the root menu adjust the displayed value until it matches the required start channel. level
2. Press MENU/↵ to save the new setting.

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. While the Exit button is held the display scrolls with the following data:

- The software version and date
- The internal PCBs found
- The RDM UID

Additionally when EXIT is pressed the channel configuration is indicated on the channel LEDs.



↓ (Menu)
 E (Cancel/Exit)
 * RDM functionality
 ** Appears when Ethernet option fitted
 ~ Affected by Deep Clear
 ~~ Individual channel control available

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	NO.S	HLD	Set the HPC to hold the current output upon loss of DMX data
SIG	NO.S	SC.1	Set the HPC to fade to Scene 1 upon loss of DMX data
SIG	END		Toggle the DMX terminate function. The TERM LED indicates when the terminate function is active.
SIG	SRC	D D	Level and RDM via DMX connector
SIG	SRC	D E	Level via DMX connector and RDM via Ethernet connector
SIG	SRC	E D	Level via Ethernet connector and RDM via DMX connector
SIG	SRC	E E	Level and RDM via Ethernet connector
CAP	240-100		Cap the maximum output voltage. 240 = 240V nominal operation.
PRE	OFF-50		Set the Preheat level
RLC	BYP	---	Some channels have Bypass enabled and some don't
RLC	BYP	ON	Relay bypass will automatically activate
RLC	BYP	OFF	Relay bypass will not automatically activate
RLC	ISO	---	Some channels have Isolate enabled and some don't
RLC	ISO	ON	Relay Isolate will automatically activate
RLC	ISO	OFF	Relay Isolate will not automatically activate
CHC	24.C		Display the internal measured temperature in degrees Celsius
CHC	D.21		Display the DMX packet rate (per second)
CHC	3.PH		Display the number of connected phases. Note that 2.PH is displayed when 1 or 2 phase power is connected.
CHC	50.H		Display the mains frequency
SCN	SC1		Press MENU/← to play Scene 1. Press and hold MENU/← to record Scene 1.
SCN	SC2		Press MENU/← to play Scene 2. Press and hold MENU/← to record Scene 2.
CHS	SP1-SP9		Activate the chase and set the rate
ALL	0-FL		Drive all channels in 10% increments

Table 2: Menu Function Reference

5.1.2 Cap Function

The Cap function is used to scale the output voltage of all channels from the maximum of 240V. This may be used to extend lamp life or allows other voltage loads to be run, such as 230V or 120V lamps.

Note that the Cap level may be individually set for a channel by selecting that channels "Mode" button when in the cap menu. If this is the case when the menu is entered the display will show "---".

5.1.3 Preheat Function

The Preheat function is used to inject a small amount of power into the lamps when the control level is set to zero. This provides a small amount of energy to heat the lamp filament and so minimise thermal shock if they are flashed to full. This may extend lamp life and reduce the surge on the mains supply at the expense of an increase in system power consumption.

Adjust the level until the lamps start to glow, then slowly reduce it until the lamps just go dark.

Note that the Preheat level may be individually set for a channel by selecting that channels "Mode" button when in the Preheat menu. If this is the case when the menu is entered the display will show "---".

This function is ignored for channels set On or to Switch.

5.1.4 DMX Termination

Any long DMX-512 data line must be terminated at the end for correct operation, and the HPC 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.

5.1.5 DMX Data Loss

The HPC can be configured to hold the current output or dim to Scene 1 when DMX-512 data is interrupted. To set the dimmer to fade to Scene 1, select "SC.1" in the "NO.S" menu. To set the dimmer to hold the current output, select "HLD" in the "NO.S" menu.

Note that in both cases the HPC will turn all DMX controlled outputs off if data is not restored within 10 minutes.

5.1.6 DMX Source

When the Ethernet module is fitted, the source of DMX and RDM can be assigned between the existing 5 pin DMX connector and the optional Ethernet connector. It is possible to select between the 4 possible combinations - refer to the following table. The left digit indicates the source of level information while the right digit indicates the source of RDM information.

Display Setting	DMX Channel Level Data is received on:	RDM Control Data is received on:
D D	Front panel DMX connector	Front panel DMX connector
D E	Front panel DMX connector	Ethernet Option connector
E D	Ethernet Option connector	Front panel DMX connector
E E	Ethernet Option connector	Ethernet Option connector

5.1.7 Automatic Relay Control – Bypass Relay

Each channel of the HPC includes relay that when activated bypasses the dimmer circuit. The HPC includes a automatic bypass mode that activates the Bypass relay if the channel is dimmed to full for more than about 60 seconds. The bypass relay is immediately deactivated should the level drop below full. This mode can be globally activated/deactivated via the “RLC” -> “BYP” option in the menu.

Note that the Automatic Bypass function may be individually enabled for each channel by selecting that channels “Mode” button when in the Bypass menu. If this is the case when the menu is entered the display will show “---”.

The Bypass relay does not activate for channels where the Cap value does not equal 240.

5.1.8 Automatic Relay Control – Isolate Relay

Each channel of the HPC includes relay that is used to Isolate the dimmer circuit. The HPC includes an isolate activation mode that automatically activates the Isolate relay if the channel is dimmed to zero for more than about 60 seconds. This mode can be activated/deactivated for all channels via the “RLC” -> “ISO” option in the menu.

Note that the Automatic Isolate function may be individually enabled for each channel by selecting that channels “Mode” button when in the Isolate menu. If this is the case when the menu is entered the display will show “---”.

The Isolate relay does not activate for channels where the preheat is set to anything other than 0.

5.2 Deep Clear

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

5.3 RDM Facility

RDM is a specification for a protocol that enables a RDM “controller” to set and alter parameters within a RDM “device” via the DMX-512 connection. An RDM system consists of one RDM controller and at least one RDM device. The HPC is an RDM device.

The HPC includes RDM commands that enable most of the parameters in its menu to be altered and to change the function of each channel between On, Off, Dim, and Switch. Refer to Section 9.2 for further information regarding the RDM commands implemented by the HPC.

In general a RDM controller should automatically “discover” the HPC (and any other connected/powered devices) when it’s turned on. If not, ensure RDM Discovery is enabled in the controller, power up the HPC, and re-initiate Discovery on the controller. Refer to the operation manual for the controller regarding how to use it to read/alter HPC parameters.

When using the DMX connection, all RDM commands are received on pins 2 and 3 of the DMX cable.

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 PTY LTD Service Dept,

2-26 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 HPC dimmers feature temperature-controlled fan cooling. As the internal temperature of the dimmer increases, the fan speed also increases. The inlet and exhaust areas of the chassis must be kept clear while the HPC is on.

The HPC continuously monitors the internal heatsink temperature. As the temperature approaches the rated maximum the internal processor attempts to reduce the heat build up by reducing the output levels. If the temperature continues to rise the dimmer will shut down the output drive, 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 HPC ventilation requirements.

6.3 Neutral-Earth Detection

The HPC 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 in the menu.

6.4 Fault Finding Guide

FAULT SYMPTOM	POSSIBLE CAUSE	REMEDY
Breaker trips	Excessive load	Reduce channel loading
	Lamp or wiring fault	Check lamps and wiring
	Poor ventilation	Increase air flow to HPC side vents
	Faulty HPC	Service HPC
One channel flickers when dimmed	DMX source problem	Softpatch another console fader Service console
	Faulty HPC channel	Service HPC
Same load flickers on another Channel	Insufficient or very inductive load	Connect >100W incandescent lamp in parallel
NE Error on display	Poor Earth or Neutral connection	Check supply wiring. Disable N-E detector in menu (6.3)
All Channels flicker when dimmed	Incorrect DMX protocol / wiring	Replace DMX source / wiring
	Un-terminated DMX line	Activate Terminate facility on the last HPC (5.1.4)
	Mains control tones exceed limits	Contact factory
Signal LED flickers	Faulty DMX wiring/connections	Repair
	Faulty console	Repair
	Faulty HPC	Service HPC
RDM doesn't work at all	Controller has RDM disabled or not configured correctly	Reconfigure controller
	Controller does not conform to the published RDM standard	Check specification for the controller version of RDM
	HPC RDM source not correctly set	Change source setting (5.1.5)
	Intermediate equipment (eg DMX splitter) not RDM compatible	Check specs of all other equipment
RDM operation erratic	DMX line unterminated	Terminate the DMX line
	Poor DMX wiring	Replace DMX wiring
Specific RDM feature doesn't work	Feature not supported by either HPC or Controller	Check specs for supported commands (9.2)
Channel/s don't respond to DMX	Channels set to On or Off	Change channel mode (4.3.1)
	Level source incorrectly set	Change source setting (5.1.5)
Error LED flashing	Over-temperature	Improve HPC ventilation
Error LED on continuously	Recent over-temperature	Improve HPC ventilation
	DMX control errors	Check DMX wiring, console
	HPC memory corrupt	Deep Clear HPC
	Software failure	Service HPC
No signal at DMX Loop output	Terminate facility active	De-activate Terminate facility
Channels wont drive to full	CAP function enabled	Change CAP Setting in menu
	HPC very hot	Increase air flow to HPC vents
All channels glow	Preheat set too high	Reduce preheat level
HPC shuts down	HPC very hot	Increase air flow to HPC vents

7.0 Installation

The HPC is designed for use in 19 inch racks or a 19 inch bar frame, and occupies 3 or 4 rack units. The HPC 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 HPC's in racks.

7.1 Ventilation

The HPC dimmer is fan-cooled, with the air intake at the right and air exhaust at the left when viewed from the front. Equipment racks must have adequate ventilation for the side-to-side airflow. Fully enclosed racks will cause overheating problems.

Racks must allow **at least 100 square centimetres** of air venting per HPC 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 HPC's operational reliability.

HPC's may be stacked in racks without intervening rack spaces as long as the racks are adequately vented at the sides. Racks of HPC'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.

The inlet air temperature must not exceed the specified maximum ambient air temperature.

7.2 Supply Wiring

The HPC 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.

The HPC must have its labelled terminals connected to the supply phases as indicated in Table 3.

Supply Type	HPC 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: HPC Power Supply Connections

8.0 Maintenance

With care, the HPC 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.

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

1. ISOLATE POWER to the dimmer (by disconnecting the power cable or locking off the mains supply isolator).
2. Remove the lid.
3. 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.
4. When the fan and internals are clean, replace the lid and screws, and re-connect the power cable.

8.3 Routine Maintenance

Installed HPC's should be routinely flushed of dust at six- to twelve-month periods. Touring HPC'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	SPECIFICATION
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
Rated Output Current	10 Amps or 20 Amps per channel
Minimum Power/Channel	25W
Maximum Dissipation	<24 W/channel
Electric Shock protection	SELV
System Earth Type	MEN
Output Protection	Thermal/magnetic circuit breakers
Maximum Ambient Temperature	40°C
Maximum Altitude	2000m
Over-temperature cutout	Soft limit starts at 92°C, Full cutout at 100°C
Control Signal	ANSI E1.11:2004 DMX-512-A ANSI E1.20:2006 RDM
DMX Input	5 pin AXR male / female
Snapshot Scenes	2
Test Function Level	Individual Channels @ 100% All Channels @ 10% steps
LED Indicators	SIGNAL, ERROR, TERM, IC Phases A, B, and C
Ingress protection	IP20
Internal Separation	Form 1
Environment	B
Size (mm)	478 (w) x 133 (h) x 355 (d)
Weight	Depends on as built configuration
Rack mounting requirements	Three 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 Pinouts

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 RDM Implementation

9.2.1 Root Device PIDs

Get	Set	PID	Notes
-	-	DISC_UNIQUE_BRANCH	
	✓	DISC_MUTE	
	✓	DISC_UN_MUTE	
✓	✓	DEVICE_LABEL	
✓		STATUS_MESSAGES	Supported: STS_OVERTEMP STS_PHASE_ERROR STS_DIM_PANIC STS_JANDS_NEUTRAL_EARTH_FAULT (0x8000)
✓		STATUS_ID_DESCRIPTION	For: STD_JANDS_NEUTRAL_EARTH_FAULT (0x8000)
✓	✓	QUEUED_MESSAGE	
✓		SUPPORTED_PARAMETERS	
✓		PARAMETER_DESCRIPTION	
✓	✓	DEVICE_LABEL	
✓		DEVICE_INFO	
✓		DEVICE_MODEL_DESCRIPTION	
✓		MANUFACTURER_LABEL	
✓	✓	FACTORY_DEFAULTS	Will always report 0 on Get
✓		SOFTWARE_VERSION_LABEL	
✓	✓	DMX_START_ADDRESS	
✓		SLOT_INFO	1 per channel: ST_PRIMARY,

			SD_INTENSITY
✓		SLOT_DESCRIPTION	"Chn-xx"
✓		SENSOR_DEFINITION	4: Temperature, Frequency, DMX rate, Phases
✓		SENSOR_VALUE	
✓	✓	IDENTIFY_DEVICE	Animates display. Will time out
	✓	RESET_DEVICE	0x01 & 0xFF – Result in warm reset
	✓	CAPTURE_PRESET	Scenes 1,2 Preset 0x0001, 0x0002
✓	✓	PRESET_PLAYBACK	Scene 1,2 Preset 0x0000 = Off 0x0001 = Scene 1 0x0002 = Scene 2 Level 0x00 - 0xFF supported
✓	✓	JANDS_HPC_NE_FAULT_DETECT_MODE	Pid=0x8080, Pdl=1, 0x00=Off, 0x01=On
✓	✓	JANDS_HPC_DMX_PROTECT_MODE	Pid=0x8082, Pdl=1, 0x00=Off, 0x01=On
✓	✓	JANDS_HPC_DMX_LOSS_MODE	Pid=0x8084, Pdl=1, 0x00=Hold, 0x01=Fade to Scene1
✓	✓	JANDS_HPC_PREHEAT_LEVEL	Pid=0x8086, Pdl=1, 0x00=Off, 0x01 - 0x32 = Level
✓	✓	JANDS_HPC_OUTPUT_CAP_VALUE	Pid=0x8088, PDL=1, 0x00=100%, 0x01 - 0x0C = -5%/step
✓	✓	JANDS_HPC_DMX_TERM_MODE	Pid=0x808A, Pdl=1, 0x00=Off, 0x01=On

9.2.2 Sub Device PIDs

One sub device per HPC channel (12 total)

Get	Set	PID	Notes
✓		SUPPORTED_PARAMETERS	
✓		DEVICE_MODEL_DESCRIPTION	Channel dependent
✓		MANUFACTURER_LABEL	Same as root
✓		DEVICE_INFO	
✓		SOFTWARE_VERSION_LABEL	Same as root

✓	✓	DMX_PERSONALITY	7 personalities to controls dimmer channel mode (see user manual for details): 1 = Off 2 = On 3 = Dmx Switch 4 = Dimmer: Relay Control FULL 5 = Dimmer: Relay Control BYPASS 6 = Dimmer: Relay Control ISOLATE 7 = Dimmer: Relay Control NONE
✓		DMX_PERSONALITY_DESCRIPTION	Off, On, Dimmer, Switch
✓	✓	JANDS_HPC_PREHEAT_LEVEL	Pid=0x8086, Pdl=0x1, 0x0=Off, 0x1=0x32 = Level for sub-device./ channel
✓	✓	JANDS_HPC_OUTPUT_CAP_VALUE	Pid=0x8088, PDL=0x1, 0x0=100%, (no output cap limit) 0x1-0xC = -5% / Step For sub-device / channel