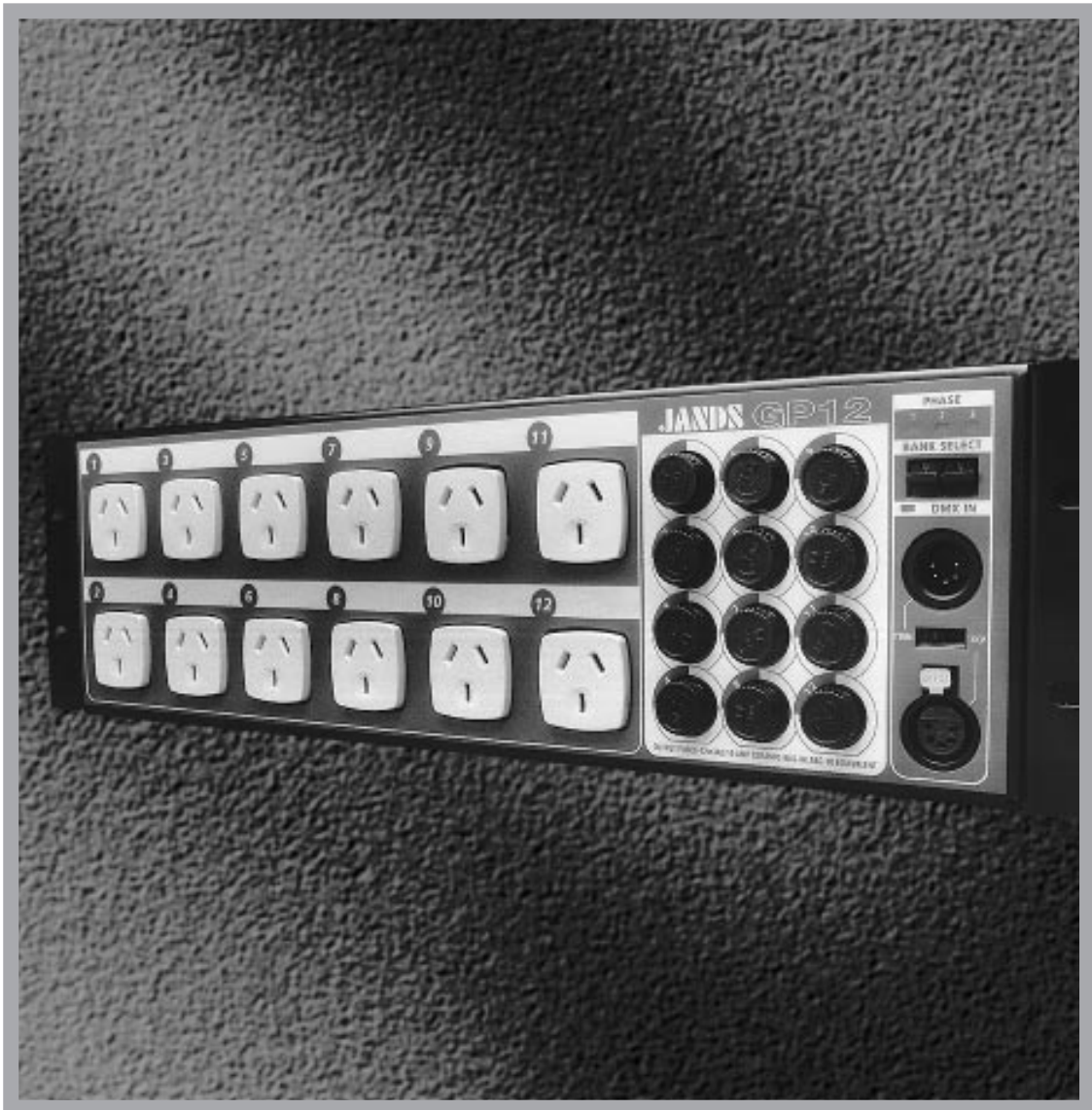


GP12

Digitally Controlled Dimmer Rack



TECHNICAL MANUAL



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1.0 Introduction

The JANDS GP12 is a rugged, high quality, 12 channel, 2.4kVA per channel (10A/240V) dimmer rack specifically designed for demanding touring and theatre applications.

The GP12 dimmer racks feature microprocessor-based digital control for accurate lighting and inbuilt Test functions.

The user has the ability to select the DMX start number in banks of 12 channels and test selected channels. Other functions also provided include dimmer “soft” start and “Output Hold” - if the rack loses DMX control at any time while running, it defaults to the last received DMX command.

GP12 dimmers feature JANDS’ Ferrodip™ chokes. These chokes provide a risetime in excess of 280 microseconds along with excellent rejection of high frequencies well into the MHz region, a feature lacking in conventional gapped iron-core chokes. This order of noise suppression is particularly important with the increasing number of radio microphones used in today’s productions.

Control signal to the dimmer is via a standard DMX-512 front panel socket. The twelve dimmed outlets are also located on the front panel, while the three phase power entry is located on the rear panel.

Some of the key features of the GP12 dimmers include:

- Rugged convection-cooled design combining steel and aluminium for strength and light weight/heat dissipation ;
- Low profile 3RU free-standing chassis with optional rack mounting front and rear (brackets included);
- Factory-wired and tested 2 metre three phase tail and Clipsal connector;
- Output sockets and fuse holders on front panel for easy access;
- Fuse protection of output devices;
- JANDS Ferrodip™ filter chokes giving rise-times better than 200 µsec;
- Frontpanel indication of three phase supply integrity and industry-standard DMX-512 protocol;
- DMX address selection in Banks of 12 channels;
- DMX signals may be Looped to next dimmer or Terminated with a front panel switch;
- Individual Channel test facility;
- Output Hold system ensures the output levels are maintained if DMX line is severed or control console stops transmitting;
- Mains filters eliminate interference from tone-injection signals;
- “Soft turn-on” at power up extends lamp life and reduces surges on three phase feeders;
- Outputs regulated against mains fluctuations to provide constant intensity and extended lamp life;
- Control curve set for linear control input/output power relationship, suiting the majority of lamps.

2.0 Equipment Description

2.1 Front panel layout

Refer to Fig 2.1 (opposite) for a description of the front panel controls.

1. **Channel output sockets:** The twelve output sockets are each rated at 10 amps.
2. **Channel output fuses:** The channel fuses are also rated at 10 amps. Replace only with a fuse of the same type and rating (10 amp ceramic-filled 3AG. eg. Buss BK/ABC-10).
3. **Bank select switches:** These switches select the DMX start bank and the Test functions.
4. **DMX connectors:** A standard five pin XLR connector inputs control desk DMX512 signals and passes them to other dimmers via the Loop connector. See section 8.1 for wiring details.
5. **DMX IN LED:** A green LED indicates the presence of DMX signals. The brightness of the LED depends on the control desk sending the DMX signal. If there is no DMX signal, the LED will flash at a rate of 2 seconds on - 2 seconds off.
6. **TERMINATE switch:** When the DMX Loop connection is not being used, this switch is used to terminate the DMX line. Line termination prevents spurious triggering from signal reflections on long lines.
7. **PHASE LEDs:** Three red LEDs (one for each phase) indicate that the three phase mains supply is available.

3.0 Getting Started

3.1 Connecting power

The GP12 dimmer is supplied with a two metre, three phase power cable fitted with a Clipsal 56P532 32 amp plug (export models may differ from this configuration).

The plug should be connected to an appropriately rated socket and the retaining lock ring screwed fully home.

WARNING

DAMAGE TO THE CONNECTOR MAY OCCUR IF THE RETAINING LOCK IS NOT IN PLACE.

Turn on the power and check that the three PHASE indicator LEDs are on before connecting any loads. If the PHASE LEDs indicate a fault condition (see section 5), power down and remedy the fault before trying again.

If all is well, power down and connect loads before re-powering.

3.2 Connecting loads

The standard output connectors are twelve Clipsal 415P 10 amp sockets (export models may differ from this configuration).

Plug the lamps into the front panel sockets. The GP12 will drive lamps from 40 watts up to 2400 watts, including inductive loads such as Hotspots and fans. Fluorescent tubes may also be dimmed if they are of the dimmable type.

3.3 Connecting DMX-512 input

The dimmer input signal should conform to the USITT DMX-512 1990 specification. The DMX input connects to the DMX IN socket on the front panel and may be daisy-chained to the next dimmer via the LOOP socket. The green DMX IN LED indicates the presence of DMX signals.

Refer to Section 8.2 for DMX pin connections.

3.4 Power-up sequence

When powering up, the following sequence should be used:

1. First the control desk;
2. Then any softpatches and/or DMX receivers;
3. Finally the dimmers, preferably one at a time starting from the first dimmer rack in the DMX loop.

This procedure minimises the risk of producing the lighting equivalent of an audio “thump” and prevents damage to lamps, dimmers, and other controlled devices.

Use the reverse procedure when powering down.

4.0 Dimmer Operation

This section assumes the dimmer has been correctly connected to three phase power and a source of DMX input signals.

4.1 Operating modes

The GP12 has two operating modes:

1. **DMX mode:** the dimmer is controlled from an external DMX-512 control console,
2. **Test mode:** the dimmer is controlled by the internal microprocessor.

4.1.1 DMX mode

In this mode, the DMX Bank Select switches are used to select which bank of 12 channels from the 512 possible DMX-512 channels will control the GP12.

See Table 4.1 (below) for a list of banks and their corresponding channels.

Decide which bank of channels is required, and rotate the selector switches to the desired setting.

For example, if DMX channels 25 to 36 are desired (ie. bank 3), set selectors to "03". GP12 channel #1 is now DMX channel #25.

In other words, a GP12 with this setting ignores DMX channels 1 to 24 and 37 to 512, and only decodes channels 25 to 36 as it's dimmer information.

Setting the Selectors to "00" turns OFF the dimmer outputs.

BANK	CHANNELS	BANK	CHANNELS	BANK	CHANNELS	BANK	CHANNELS
00	OUTPUTS OFF	11	121 - 132	22	253 - 264	33	385 - 396
01	1 - 12	12	133 - 144	23	265 - 276	34	397 - 408
02	13 - 24	13	145 - 156	24	277 - 288	35	409 - 420
03	25 - 36	14	157 - 168	25	289 - 300	36	421 - 432
04	37 - 48	15	169 - 180	26	301 - 312	37	433 - 444
05	49 - 60	16	181 - 192	27	313 - 324	38	445 - 456
06	61 - 72	17	193 - 204	28	325 - 336	39	457 - 468
07	73 - 84	18	205 - 216	29	337 - 348	40	469 - 480
08	85 - 96	19	217 - 228	30	349 - 360	41	481 - 492
09	97 - 108	20	229 - 240	31	361 - 372	42	493 - 504
10	109 - 120	21	241 - 252	32	373 - 384	43	505 - 512

Table 4.1 DMX bank / channel allocation

4.1.2 Test mode

In this mode, the GP12's internal controller is used to drive the dimmer channels. It is accessed by setting the Selector switches to banks between "44" and "99". No DMX control is necessary, but a control signal may be left connected if desired.

This mode is split into two sections with individual channel testing from banks "44" to "59" and group channel testing from banks "60" to "99". The first section is not level controllable and each channel is driven to full.

Refer to Table 4.2.

<i>SELECTOR SWITCHES</i>	<i>CHANNEL UNDER TEST</i>	<i>OUTPUT LEVEL</i>
44	CHANNEL 1	FULL
45	CHANNEL 2	FULL
46	CHANNEL 3	FULL
47	CHANNEL 4	FULL
48	CHANNEL 5	FULL
49	CHANNEL 6	FULL
50	CHANNEL 7	FULL
51	CHANNEL 8	FULL
52	CHANNEL 9	FULL
53	CHANNEL 10	FULL
54	CHANNEL 11	FULL
55	CHANNEL 12	FULL
56 - 59	FACTORY USE	-----

Table 4.2 TEST MODE - INDIVIDUAL CHANNEL SELECTION

The second section is level controllable, the level being set by the right hand Selector switch. The left-hand Selector switch changes the grouping. Refer to Table 4.3.

<i>SELECTOR SWITCHES</i>		<i>CHANNEL GROUPING</i>	<i>CHANNEL LEVEL</i>
<i>LEFT</i>	<i>RIGHT</i>		
6	0-9	CHANNELS 1-4 ON (PHASE A)	0-9
7	0-9	CHANNELS 5-8 ON (PHASE B)	0-9
8	0-9	CHANNELS 9-12 ON (PHASE C)	0-9
9	0-9	CHANNELS 1-12 ON	0-9

Table 4.3 TEST MODE - GROUP SELECTION

5.0 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,

40 Kent Rd

Mascot NSW 2020

Australia

5.1 Output protection

Output protection consists of a ceramic-filled fuse on each channel. These 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.

The purpose of the fuse is to protect the dimmer's output devices from short-circuit loads and faulty wiring looms, and save on expensive repairs. At the same time, the blown fuse indicates to the operator a load fault that requires immediate attention.

WARNING

ALWAYS TURN OFF POWER BEFORE REPLACING FUSES!

Fuses MUST only be replaced with the same type and rating or the warranty will be invalidated. The correct fuse is a 10 amp ceramic-filled 3AG. eg. Buss BK/ABC-10. Only this fuse type provides complete protection for the dimmer, and is available from authorised JANDS distributors.

5.2 Output faults

If a short-circuit lamp or output cable is plugged into the dimmer, the fuse will rupture within hundredths of a second to disconnect the fault from the dimmer. In nearly all circumstances, this is quick enough to prevent damage to the output devices.

In some circumstances however, a triac failure may be experienced, although these devices are usually quite reliable and robust. If a triac does fail, it will either turn a channel on to full (triac short-circuit), or turn it off (triac open-circuit). If a triac fault should occur, that channel may be isolated by unplugging the connected load and removing the fuse.

5.3 DMX faults

The GP12 dimmer features an “Output Hold” facility that “remembers” the last received DMX message. In the event of a cable being unplugged or severed, the GP12 dimmer rack will continue to output the “Held” DMX levels until a new DMX message is provided.

The **DMX IN** LED will “flash” slowly if the DMX signal is removed.

5.4 Phase fault indication

The three green **PHASE** LEDs will show when all three power input phases are present.

WARNING

IF ONE OR MORE PHASE LEDS IS OFF, IMMEDIATELY DISCONNECT POWER TO THE DIMMER AND CHECK THE MAINS SUPPLIES AND WIRING BEFORE RE-CONNECTING POWER TO THE DIMMER.

5.5 Overheating

A GP12 running at full power will get quite warm to the touch. This is normal.

The entire back panel is a cast aluminium heatsink that transfers heat from the chokes and triacs to the surrounding air. As the GP12 is a convection-cooled dimmer, it is very important that adequate ventilation is provided when in use, particularly around the back panel and the upper and lower vent slots.

5.6 Fault finding guide

FAULT SYMPTOM	POSSIBLE CAUSE	REMEDY
Fuse blows when desk channel flashed to full or near full	Large incandescent load Excessive load	Use desk's Preheat facility Reduce channel loading
Fuse blows after prolonged operation	Excessive load Lamp or wiring fault	Reduce channel loading Check lamps and wiring
Fuse blows immediately when channel is driven	Output short Triac short	Check lamps and wiring Factory service
One channel flickers when dimmed Same load flickers on another channel	DMX source problem Faulty dimmer channel Insufficient or very inductive load	Softpatch another desk fader Replace desk Factory service Connect 100W lamp in parallel
Radio interference	Faulty choke	Factory service
All channels flicker when dimmed	Incorrect DMX protocol / wiring Mains control tones exceed limits	Replace DMX source / wiring Contact factory

6.0 Installation

The GP12 dimmers are designed to be either free-standing units or installed in standard 19" wide racks. These racks should have adequate ventilation for airflow around the rear of the dimmers. Fully enclosed racks could cause overheating problems when used for extended periods on full load.

It is highly recommended for all applications, but particularly for touring applications, that the rear of the dimmer is also supported when mounted in racks.

Several sets of mounting brackets are supplied with each dimmer, and are suitable for use in standard JANDS 13RU racks. The supplied brackets are: front mounting brackets, rear mounting brackets, and extender pieces.

The GP12 dimmers may also be wall-mounted utilising the front mounting bracket attached to the rear of the dimmer.

6.1 Front rack mounting

To mount the GP12 dimmers in standard 13RU racks:

- First remove the four M4 screws from the left side of the chassis. Attach the front mounting bracket using the same four screws. See Figure 6.1 below.
- Repeat the above procedure for the right side of the chassis.
- Slide the dimmer chassis into the rack and attach to the front mounting rails of the rack with four M6 screws.

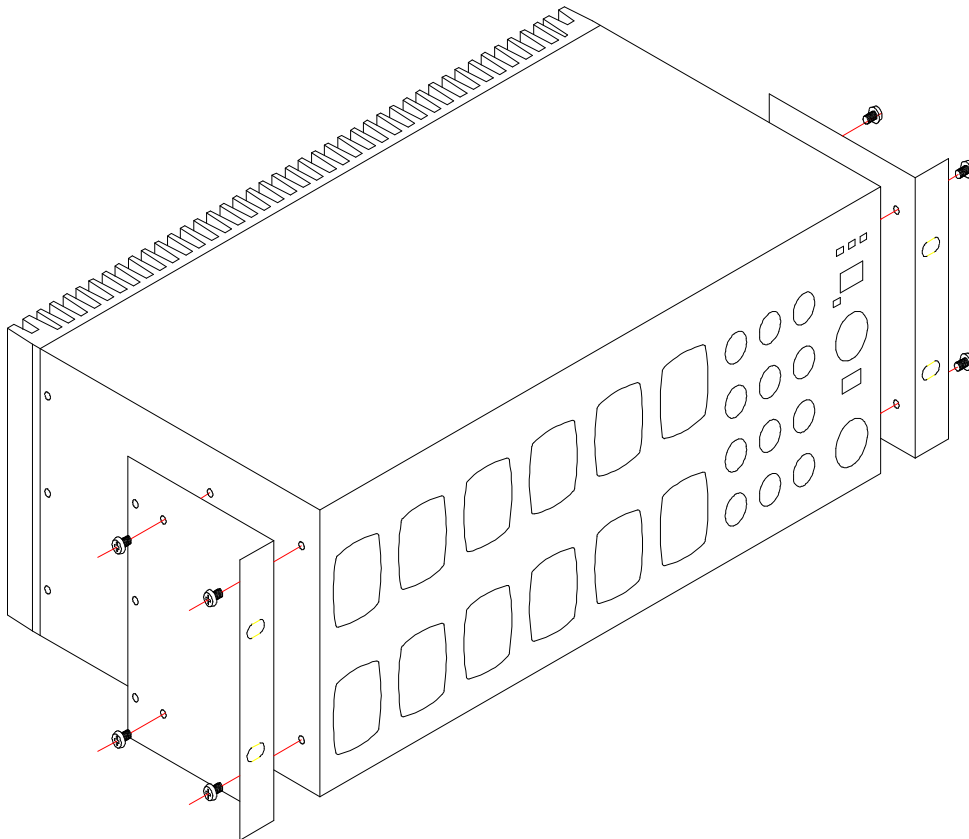


Figure 6.1 Using the front rack mounting ears

6.2 Rear rack supports

To support the rear of the dimmer installed in a rack, the rear rack mounting brackets must be used with the extender pieces.

- Attach the two extender pieces to the rear of the dimmer chassis with three M4 screws on each side before mounting the chassis in the rack.
- Screw both rear rack mounting brackets to the rear rack supports with M6 screws.
- Screw each extender piece to its rear mounting bracket with a pair of M6 screws.

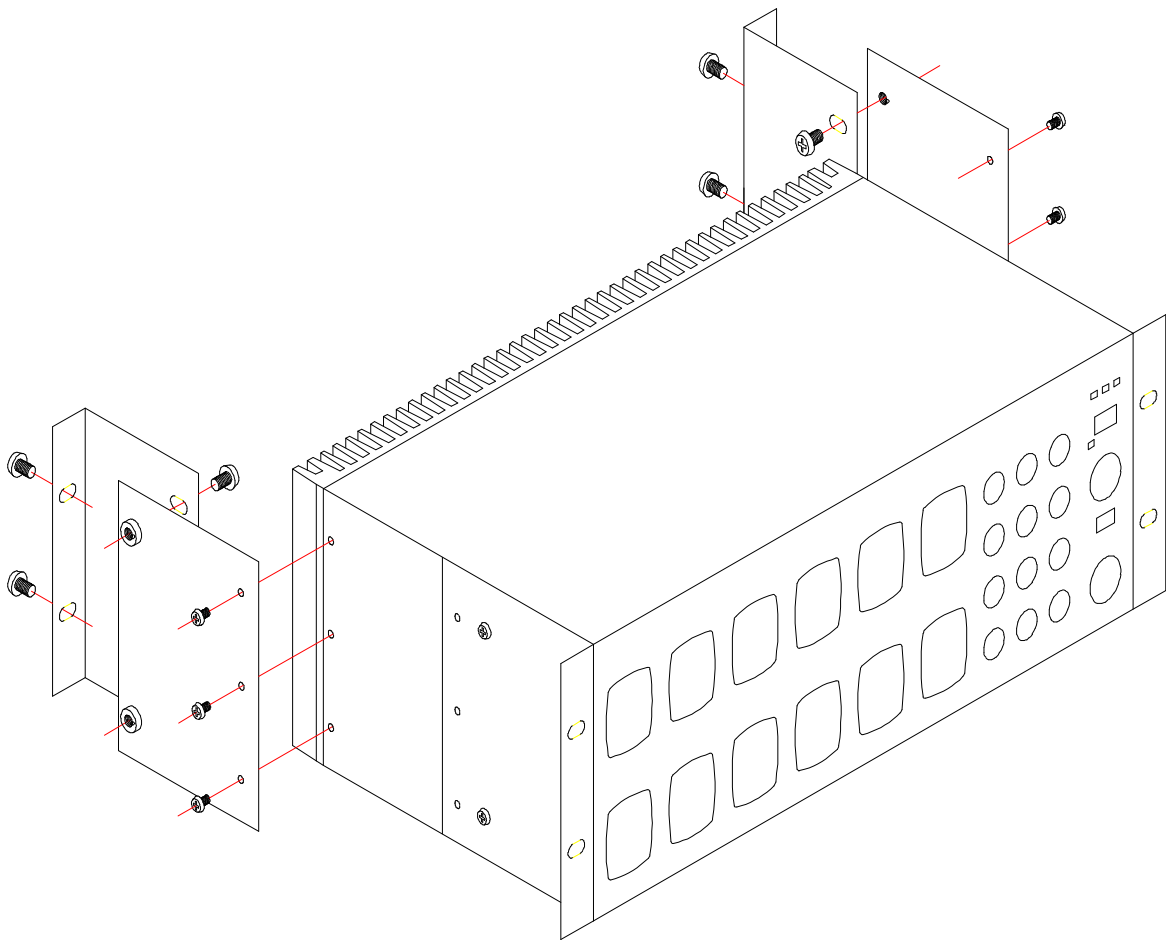


Figure 6.2 Using the rear rack supports

6.3 Wall mounting

The GP12 dimmers may also be wall mounted using the front mounting brackets attached to the rear of the chassis. See Figure 6.3 below.

- Insert three M4 screws through the three holes in the mounting bracket and screw into the three M4 holes on each side of the chassis adjacent to the heatsink.
- Attach the brackets to the wall with the four large mounting holes, taking care not to damage or kink the power cable.

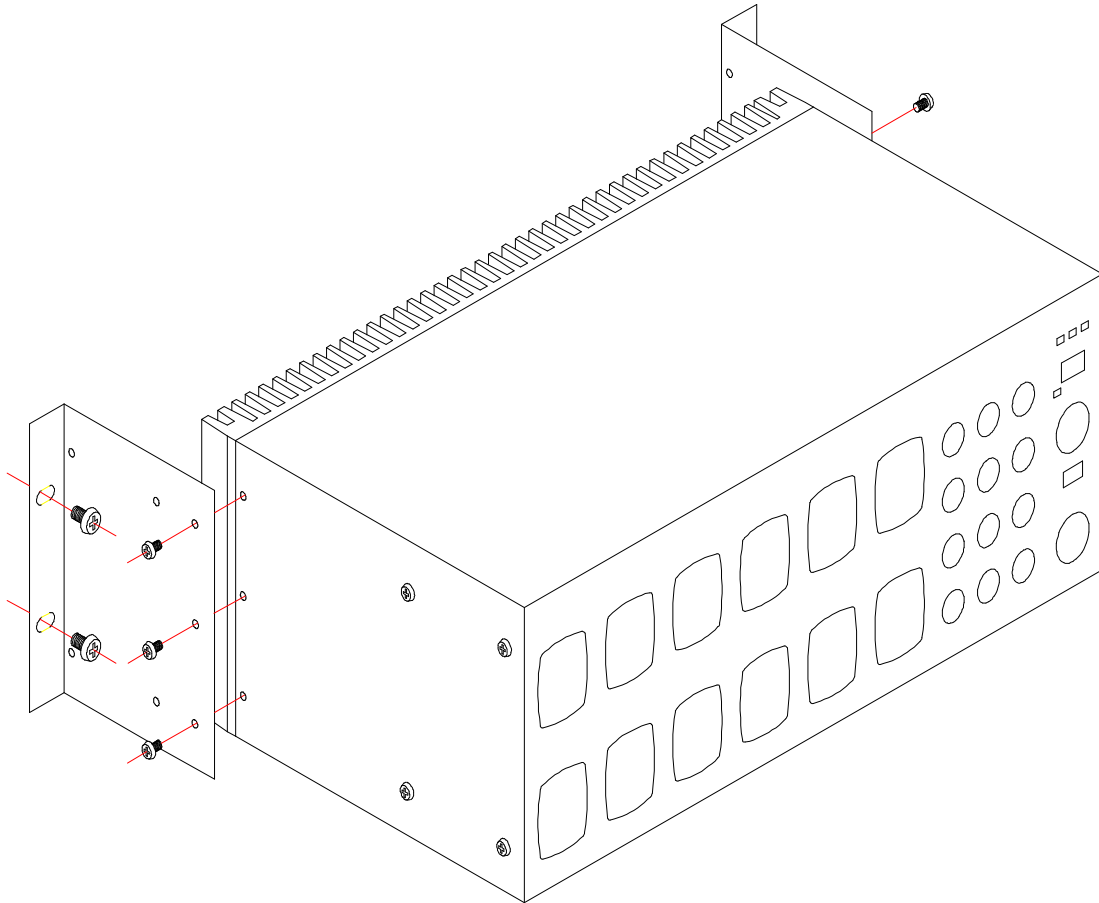


Figure 6.3 Using the front brackets for wall mounting

7.0 Maintenance

With care, the GP12 dimmer will require little or no maintenance.

WARNING

DO NOT ALLOW THE ENTRY OF LIQUIDS OF ANY SORT INTO THE DIMMER CHASSIS.

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

DO NOT spray liquids onto the front panel.

DO NOT use solvents for cleaning the front panel.

8.0 Technical Data and Specifications

PARAMETER	GP12
No. of Channels:	12
Input Power Requirements:	3 Phase plus Neutral and Earth 415 Volts AC Phase-Phase 40 Amps / Phase Full size (40 A) Neutral conductor
Max Power / Channel:	2.4 kW
Max Dissipation:	<24 W/chan (<300 W total)
Max Ambient Temp:	45°C
Control Signal:	DMX-512 (1990) Protocol
DMX Connectors:	AXR-5-21B, AXR-5-22B
Test Function Level:	Individual channels @ 100% Group channels @ 10% steps
LED Indicators:	DMX in; Phases A, B, and C
Output Protection:	12 x 10 Amp 3AG ceramic fuses
Control fuses:	3 x 63 mA M205 internal fuses
Power cable:	2 metre tail with Clipsal 56P532 plug (Australia only)
Size (mm):	482 (w) x 133 (h) x 255 (d)
Output Connectors:	1 x 10 Amp Clipsal 415 per channel (Australia only)
Weight:	16 kg nett

8.1 DMX connector pin-outs

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

8.2 DMX bank allocations

BANK	CHANNELS	BANK	CHANNELS
00	OUTPUTS OFF	22	253 - 264
01	1 - 12	23	265 - 276
02	13 - 24	24	277 - 288
03	25 - 36	25	289 - 300
04	37 - 48	26	301 - 312
05	49 - 60	27	313 - 324
06	61 - 72	28	325 - 336
07	73 - 84	29	337 - 348
08	85 - 96	30	349 - 360
09	97 - 108	31	361 - 372
10	109 - 120	32	373 - 384
11	121 - 132	33	385 - 396
12	133 - 144	34	397 - 408
13	145 - 156	35	409 - 420
14	157 - 168	36	421 - 432
15	169 - 180	37	433 - 444
16	181 - 192	38	445 - 456
17	193 - 204	39	457 - 468
18	205 - 216	40	469 - 480
19	217 - 228	41	481 - 492
20	229 - 240	42	493 - 504
21	241 - 252	43	505 - 512

8.3 Test function settings

<i>SELECTOR SWITCHES</i>		<i>CHANNEL UNDER TEST</i>	<i>OUTPUT LEVEL</i>
44		CHANNEL 1	FULL
45		CHANNEL 2	FULL
46		CHANNEL 3	FULL
47		CHANNEL 4	FULL
48		CHANNEL 5	FULL
49		CHANNEL 6	FULL
50		CHANNEL 7	FULL
51		CHANNEL 8	FULL
52		CHANNEL 9	FULL
53		CHANNEL 10	FULL
54		CHANNEL 11	FULL
55		CHANNEL 12	FULL
56 - 59		FACTORY USE	-----

<i>SELECTOR SWITCHES</i>		<i>CHANNEL GROUPING</i>	<i>OUTPUT LEVEL</i>
<i>LEFT</i>	<i>RIGHT</i>		
6	0-9	CHANNELS 1-4 ON (PHASE A)	0-9
7	0-9	CHANNELS 5-8 ON (PHASE B)	0-9
8	0-9	CHANNELS 9-12 ON (PHASE C)	0-9
9	0-9	CHANNELS 1-12 ON	0-9

8.4 Mains wiring colour codes

Phase A	Brown
Phase B	White
Phase C	Black
Neutral	Blue
Earth	Green/Yellow

BLANK

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