

ACT6 Digital Dimmer

Operations Manual



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Introduction

Strand Lighting ACT6 DIGITAL dimmer packs are compact, wall mounting dimming units, designed for use in conjunction with lighting control consoles as part of entertainment or architectural lighting installations.

Specifications

Power Requirements

Voltage: 200 - 260 Volts AC. Frequency: 50 - 60 Hz.

Three phase + Neutral + Earth

ACT6 DIGITAL dimmer packs must be Earthed for safety in use.

Dimming Capacity

ACT6 DIGITAL

Each pack contains six dimmers with two socket outlets per dimmer.

Maximum load 10A per dimmer - total 60A per dimmer pack.

Minimum load 60W per dimmer.

Dimmer Output Connections

ACT6 DIGITAL packs are available with a variety of socket outlets to suit different operating conditions and national standards.

Two sockets per dimmer are fitted as standard

Control Inputs

USITT DMX512(1990) multiplexed digital control, via 5 pin XLR connector.

8 PIN DIN Analogue input connector

Physical Dimensions (unpacked)

Height: 90 mm.

Width: 485 mm.

Depth: 395 mm.

Weight: 12Kg (approximately)

Environment (Operating)

Temperature: 0°C - 37°C.

Relative humidity: 0% - 90%.

Condensation level: Zero.

ACT6 DIGITAL packs are suitable only for use in a dry, internal environment.

Protection

Classification

IP20 (EN60529).

Equipment Class

Class 1.

Installation

WARNING

Hazardous voltages are used in ACT6 DIGITAL dimmer packs. Ensure that the mains supply is isolated before opening the equipment for installation or servicing.

Dimmer packs should be installed and serviced only by suitably qualified personnel.

ACT6 DIGITAL Dimmer racks are designed for wall mount installation.

In order to enhance the reliability of the dimmers, it is recommended that they are operated within the following environmental limits:

Temperature: 15°C - 25°C
Relative Humidity: 60% - 80%
Condensation level: Zero

ACT6 DIGITAL dimmers are designed such that Earth leakage currents are minimised, allowing their use on mains power supplies protected by 30mA Residual Current Devices. However, utilising RCD protection in dimming installations may present problems. The dimmers may emit a slight buzzing noise when in operation. They should be installed away from areas where such noise would be undesirable.

The physical dimensions of an ACT6 DIGITAL dimmer pack are shown in Figure 1.

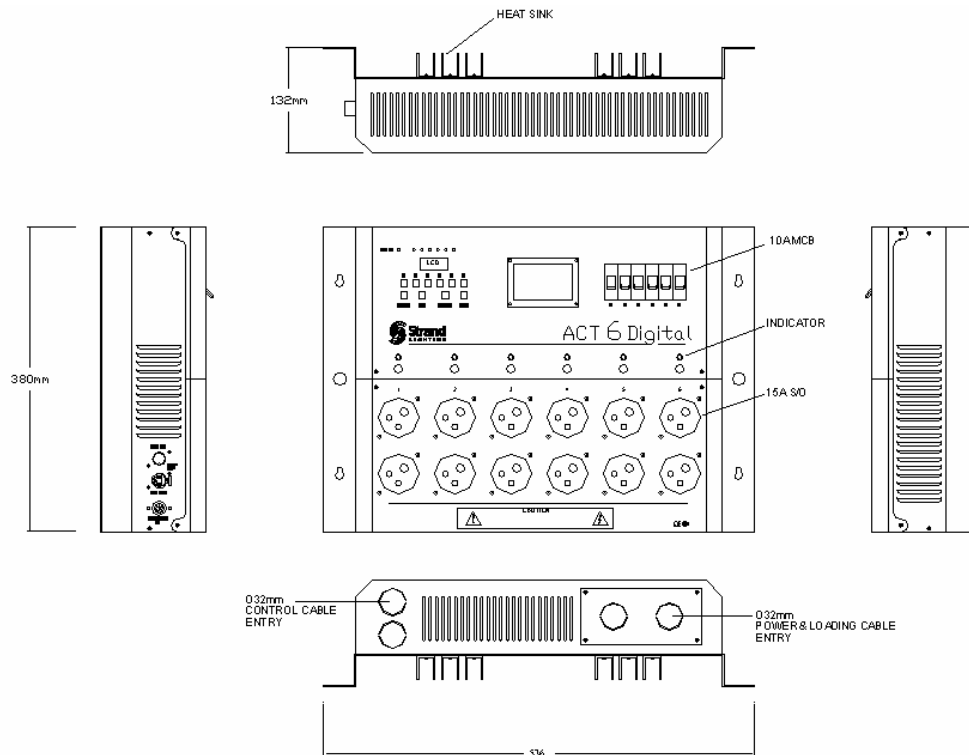


Figure 1

Mains Power Input Connections

ACT6 Digital dimmer packs require a nominal mains input at 230V 50Hz AC. This supply may be either single or three phase (star only), depending on the method of connection. In either case separate Neutral and Earth conductors are required.

WARNING

ACT6 Digital dimmer packs must be Earthed for safety in operation.

In all cases, the Neutral conductor must have the same (or greater) rating, and cross-sectional area, as the Phase conductor(s).

(Triac and thyristor dimmers operate using 'phase control', which renders the 'balancing' of loads across phases - and thus a reduction in Neutral currents - impossible).

ACT6 Digital dimmer packs should be connected to their mains supplies via adequately rated cable, plugs and sockets. Power input connectors must be rated at 60A (or more) for single phase operation, or 20A (or more) for three phase operation. These ratings may only be reduced if the devices protecting the mains supply are selected to limit the current drawn to the rating of the connectors. Racks should be fed from a fused supply.

It is strongly recommended that the mains supply to the dimmers is taken via a local isolating switch, so that the supply may be easily disconnected for plugging and unplugging of load connectors and for service or maintenance.

All cables and protection equipment must be selected and installed in accordance with locally prevailing electrical regulations.

Mains Cable Entry

The mains input cable will enter the pack via the bottom panel.

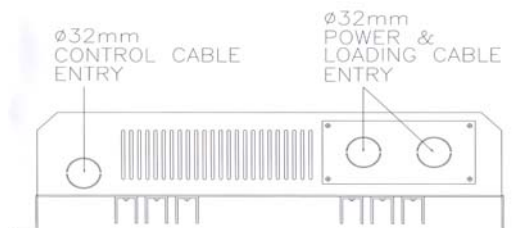


Figure 2

Open the lower hinged Panel at the front. This is secured to the main body by two cap screws located at the front.

A 32mm diameter hole is provided at the bottom right of the dimmer pack to permit the mains cable to pass through. This hole should be fitted with an appropriately sized cable gland if used. Alternative, the bottom cover plate can be removed for direct trunking entry.

Data Cable Entry

If required, direct termination of data cables is possible. Data cables can be fed through the cable entry holes provided on the bottom left hand side.

Mains Cable Termination (Without RCD)

The mains input is connected at a set of screw terminal blocks, situated inside the pack, at the bottom, towards the right hand side (looking from the front of the pack). The terminals will accept cables of up to 10 mm² in size. If it is required to connect an ACT6 DIGITAL dimmer pack to a single phase supply, the link bar supplied with the pack should be used to join the three phase terminals together, as follows (refer to right-hand diagram in Figure 4):

1. Loosen all three phase terminals.
2. Place incoming cable inside terminals and tighten securely.

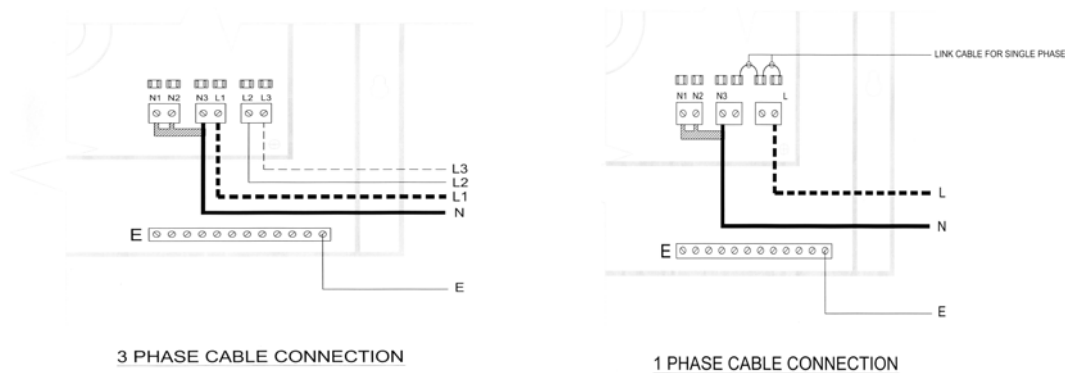


Figure 4 Mains Termination (without RCD)

WARNING

Do NOT fit the link bar when the pack is connected to a three phase supply

Mains Cable Termination (With RCD)

The ACT6 DIGITAL is designed to house a three phase RCD (optional) if required. To install the RCD, simply remove the cover plate located at the top centre of the units (adjacent to the mains breaker). Open the top panel and secure the RCD unit onto the DIN rail. Terminate the mains cable as shown in Figure 5.

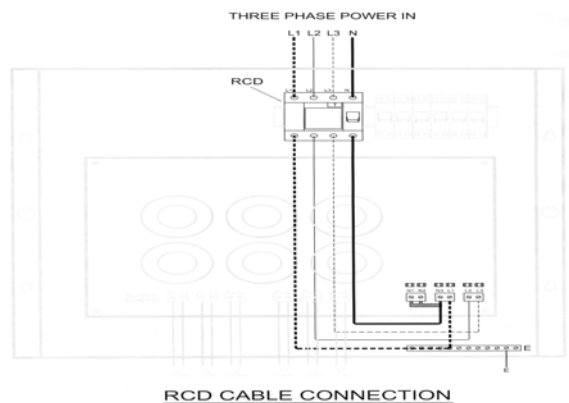


Figure 5 Mains Termination (with RCD)

1. Prepare the cable for connection by stripping back the insulation as shown in Figure 6, and pass it through the cable gland.

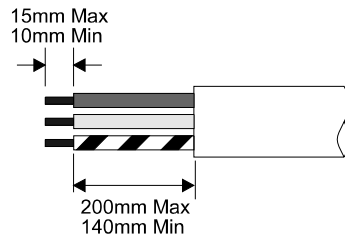


Figure 6. - Mains Cable Preparation

2. Connect the cable ends to the appropriate terminals, ensuring that the retaining screws are sufficiently tight. Also ensure that Neutral link bar is put back to its original position linking the three N points together.
3. Close the Hinged Panel and tighten the retaining screws. Tighten the cable gland to secure the cable.
4. Carry out a Portable Appliance Test or other electrical safety test(s), subject to local regulations.

Protection

The mains supply to each dimmer pack must be protected against external overload. Appropriate fuse or circuit breaker ratings are 20A for a three phase supply. If the available mains supply is not capable of providing the full rated currents, the protection device rating must be reduced accordingly; it will not be possible to use the dimmers with their maximum rated loads.

Protection systems on the supply to each dimmer pack should limit the potential fault current level to 1500A or less.

Power Distribution

To achieve correct Earthing and mains power distribution, it is recommended that all dimmers and lighting control equipment within the installation should draw mains power from one central distribution point. This should be as close as possible to the mains power intake for the site or building. The wiring from the distribution point to the lighting equipment should ideally be used for supplying power to the lighting equipment alone, and not to other appliances or equipment.

ACT6 DIGITAL Dimmers must be properly Earthed, both for safety and to ensure correct operation.

It is essential that all Earth connections within the overall installation are at the same potential. If this is not the case, circulating currents may be generated in signal earth connections, possibly leading to fluctuating light levels and (in some extreme cases) damage to wiring or equipment.

In a situation where the earth is provided via the supply Neutral, it is very important that the control console and dimmers are powered from one central point. This should be the point at which the equipment Earths are connected to the supply Neutral and to Earth itself.

If in doubt, please consult a Strand Lighting office or an approved Service Provider.

Wall Mounting

The ACT6 DIGITAL dimmer pack is designed for wall mounting. To prevent overheating of wall-mounted dimmers when in use, a clear mounting space of 250mm is required between adjacent pairs of dimmer packs as shown in Figure 7. Do not Block the ventilation holes situated on the sides and top of the dimmer pack.

The unit is supplied with fixing brackets for wall mounting applications. Care should be taken to adequately secure the unit to any surface to which it is mounted and that the surface is suitable for this application.

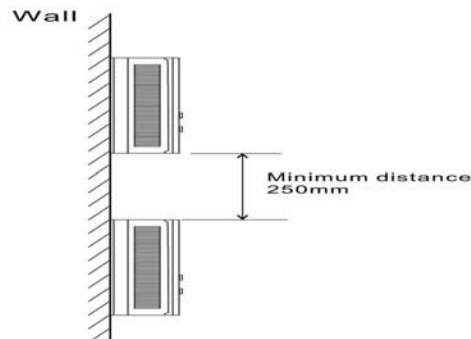


Figure 7

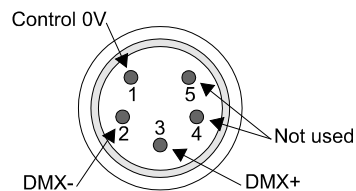
Control Input

The ACT6 DIGITAL will accept two different control inputs:

DMX512

The DMX512 input will accept a multiplexed digital control signal which conforms to USITT specification DMX512 (1990). Details of this specification are available from USITT on request.

The DMX control input is via a five-pin male XLR type connector. Pin connections are shown in Figure 8. A five-pin female XLR connector is also fitted to allow a series of ACT6 DIGITAL packs (or other DMX equipment) to be daisy chained together.

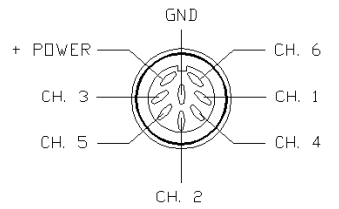


View of front
of dimmer unit

Figure 8

Analogue

The analogue input on the dimmer pack will accept a signal from any 0 - +10VDC analogue controller. The pinout for the controller is illustrated in Figure 9 below:

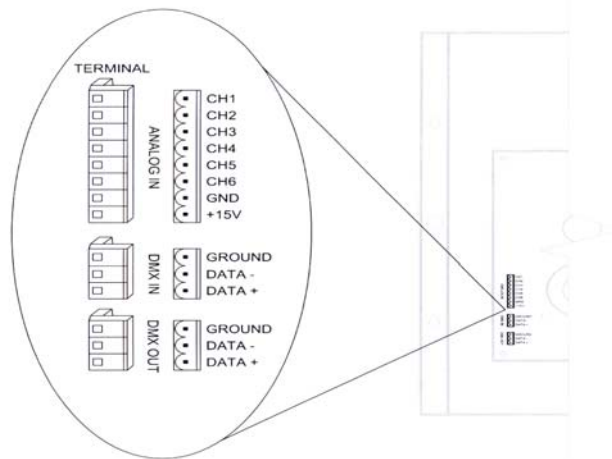


ANALOGUE IN PIN ASSIGNMENT

Figure 9

Data cable termination

When required, data cables (both DMX and Analogue) can be terminated directly to the termination blocks provided inside the ACT6 DIGITAL. The internal data cable termination positions are as shown in Figure 10.



CONTROL CABLES ASSIGNMENT (INTERNAL)

Figure 10

Dimmer Outputs

Dimmer output connections are by means of socket outlets on all styles of ACT6 DIGITAL dimmer packs, except the terminal strip version. Two sockets are fitted per dimmer.

When operating from a three phase supply, dimmers 1 and 2 are connected to phase 1, dimmers 3 and 4 to phase 2, and dimmers 5 and 6 to phase 3.

Plug tops used for dimmer output connections must be of the correct type to match the socket outlets.

It is important that plugs are wired correctly. Figure 11 shows the various types of socket outlets fitted to ACT6 DIGITAL dimmer packs.

E = EARTH
 N = NEUTRAL
 L = LIVE

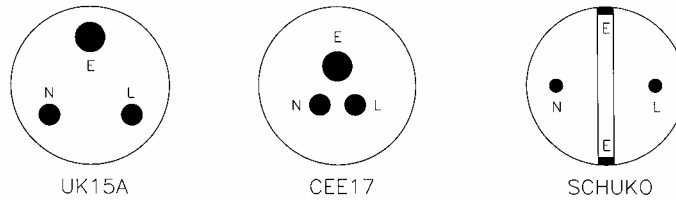


Figure 11

Load Cables Termination (Terminal version only)

The load cables will enter the pack via the same bottom panel as the mains input. A separate 32mm diameter hole is provided at the bottom right of the dimmer pack to permit the load cables to pass through. This hole should be fitted with an appropriately sized cable gland if used. Alternately, the bottom cover plate can be removed for direct trunking entry.

The load cables are connected to a set of screw terminal blocks, situated inside the pack, at the bottom center area. The terminals will accept cables of up to 10 mm² in size. Load wires should be connected as shown in Figure 12):

1. Loosen all load terminals.
2. Place the appropriate load cables inside terminals and tighten securely.

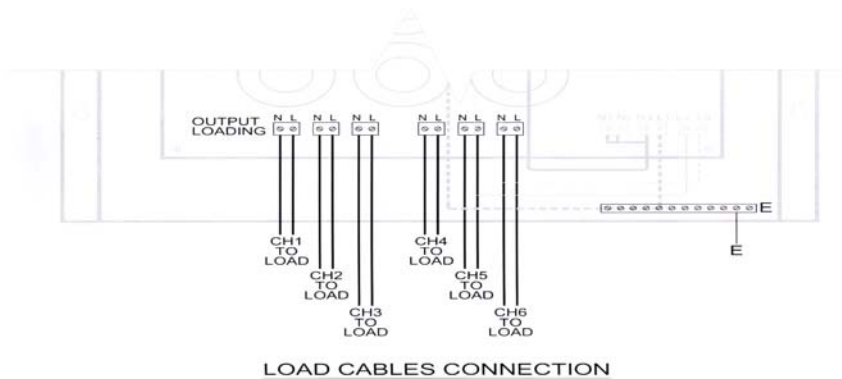


Figure 12

Service and Maintenance

ACT6 DIGITAL dimmer packs do not require routine maintenance other than external cleaning. However, in common with all electrical equipment, they should be periodically checked to ensure that they remain in good condition. Any repairs or maintenance to the internal electronics, or other circuitry, should be carried out only by authorised Strand Lighting Service personnel or approved Service Providers.

Safety Tests

ACT6 DIGITAL dimmer packs are subjected to safety inspections and tests prior to despatch from the Strand Lighting factory.

If, as part of routine maintenance, the packs are to be subjected to electrical safety tests applied using a 'standard' Portable Appliance Tester, the following points should be observed:

The nature of the electronic dimmer circuits means that an 'insulation test' using a voltage in the order of 500V will give a result of approximately 1.7M Ω . Although this may *appear* as a test failure, the apparently low resistance is normal for an ACT6 DIGITAL dimmer pack and is *not* due to failing insulation. **User safety is not at risk.**

(Any reading below 1.5M Ω indicates a problem which must be investigated).

Caution

A high voltage 'Flash' test must not be applied to an ACT6 DIGITAL dimmer pack.

A high current Earth continuity test must not be applied to the signal ground pins of the control input connector(s).

Dimmer Load Test Facility

To test the basic operation of any dimmer, press the Test button. This will switch the dimmer to full on. The switch operates in a push-on, push-off manner.

The Test LED indicator illuminates to show that the switch is ON.

Set up

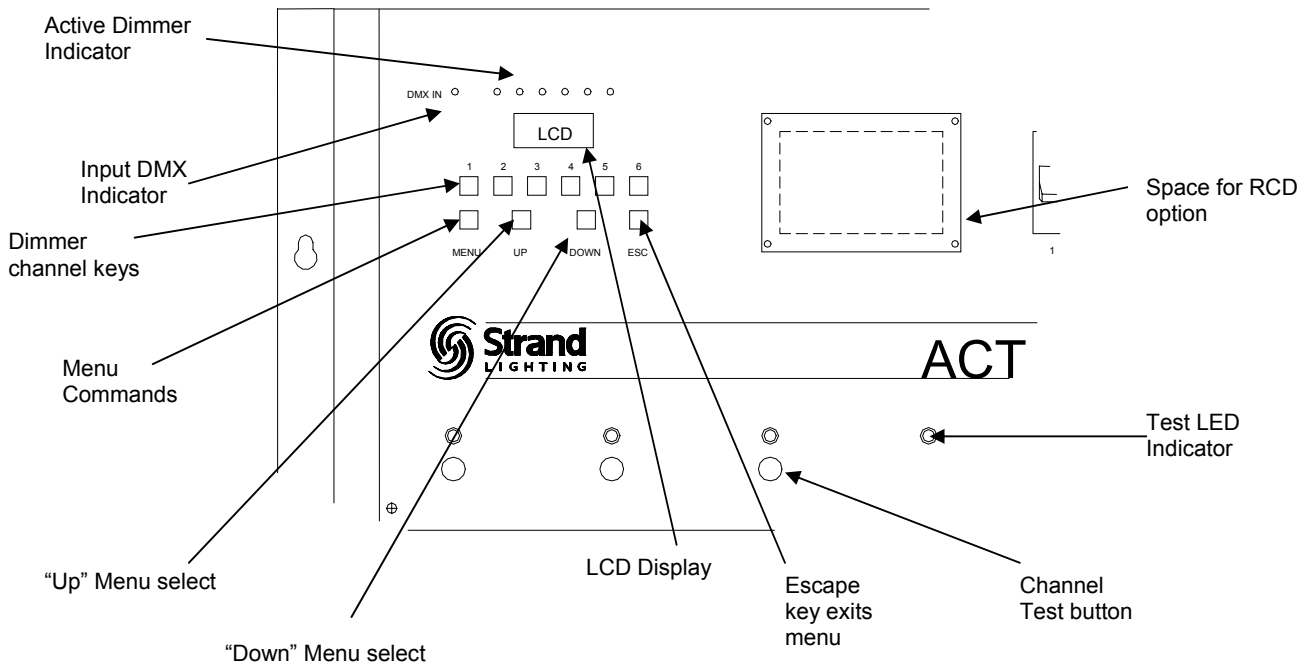


Figure 13 Set up keys and displays

The ACT6 DIGITAL dimmer pack offers a selection of set up and configuration features that are accessed from the front panel using the four set up keys and LCD Display. Menu and setting selections are made with the MENU key followed by the Up and Down keys. To exit any menu press the ESC escape key. Note that the displayed setting prior to ESC key press will be recorded, no confirmation key press is required.

DMX Fail

This menu is to select what action the dimmer pack should follow on loss of DMX or DMX absence. The dimmer pack can be set either to accept the analogue input as back up or alternatively hold the last scene when DMX fail. If an analogue signal is the only control source, the DMX fail menu must be set to Analog.

Press **Menu** once to access the DMX fail menu. Use the **Up** and **Down** keys to select either DMX fail hold or DMX fail Analog. Press ESC key to confirm your selection and exit from the menu.

Start DMX Address/ Dimmer Patch

This menu is to set either the DMX start address if the dimmer channels are used sequentially or each DMX address can be patched individually to each dimmer channel.

Press the **Menu** key once and press the **Up** key once to access the DMX Address menu. Press the Menu key again followed by the **Up** and **Down** keys to select either “DMX Address Start” or “DMX Address independent” menu.

Select Start DMX address

When in the “DMX Address Start” menu, press the **Menu** key once, the start address is now displayed. Use the **Up** and **Down** keys to select the start address (1 – 512) for the dimmer pack. When complete, press the **ESC** key 3 times to return the menu back to home position.

Set independent dimmer patch

When in “DMX Address Indep” menu, press the **Menu** key once, the dimmer Channel # is now flashing, Use the **Up** and **Down** keys to select the dimmer channel (1 – 6) and then press the **Menu** key again. Now the DMX address will flash, Use the **Up** and **Down** keys to select the DMX address (1 – 512) to be assigned to the dimmer channel. After selecting the DMX address, press the **ESC** key and the selected patch will be recorded and the LCD display will show the next dimmer channel. Repeat the above process until all channels are set. When complete, press the **ESC** key 3 times to return the menu back to the home position.

Minimum Level

This menu is to set the minimum output level of all or selected dimmers. Press the **Menu** key once and press the **Up** key twice to access the “Minlevel” menu. Press Menu again follow by the **Up** and **Down** keys to select either the “Minlevel All” menu for all dimmers or “Minlevel Indep” menu for a single dimmer.

Set Minimum Level for all

When in the “Minlevel All” menu, press the **Menu** key once, the minimum level will be displayed as a percentage. Use the **Up** and **Down** keys to select the minimum level (0 to 50%) for all dimmers. When complete, press the **Esc** key 3 times to return the menu back to home position.

Set Minimum Level for Single Channel

When in the “Minlevel Indep” menu, press the **Menu** key once, the dimmer Channel # is now flashing, Use the **Up** and **Down** keys to select the dimmer channel (1 – 6) to be set and then press the **Menu** key again. Now the percentage min level will flash, Use the **Up** and **Down** keys to select the desired Min Level (0 – 50%). Press the **ESC** key and the selected Min Level will be recorded and the display will show the next dimmer channel. Repeat the above process until all channels are set. When complete, press **ESC** key 3 times to return the menu back to the home position.

Set Curves

This menu is used to select a dimmer curve for any or all the dimmers in a system. There are four dimmer curves available to choose from, Linear, Non-Dim, Square law and User define Low end cut off. Press the **Menu** key once and press the **Up** key 3 times to access the “Curve” menu. When the Curve menu is shown, press the Menu key again followed by the **Up** and **Down** keys to select either the “Curve All” menu for all dimmers or the “Curve Indep” menu for a single dimmer.

Set Curve for all Dimmer

When in the “Curve All” menu, press the **Menu** key once, then use the **Up** and **Down** keys to select one of the four curves. If Low-cut is selected, press the **Menu** key again to show the user defined value. Use the **Up** and **Down** keys to adjust the cut off voltage (10-99V). When complete, press the **Esc** key 3 times to return the menu back to home position.

Set Curve for Single Channel

When in the “Curve Indep” menu, press the **Menu** key once, the dimmer Channel # will start flashing, use the **Up** and **Down** keys to select the dimmer channel (1 – 6) to be set. Press the **Menu** key again followed by the **Up** and **Down** keys to select the preferred curve. If Low-cut is selected, press the **Menu** key again to show the user defined value. Use the **Up** and **Down** keys to adjust the cut off voltage (10-99V). Press the **ESC** key and the selected value will be recorded and the display will show the next dimmer channel. Repeat the above process until all channels are set. When complete, press the **ESC** key 3 times to return the menu back to home position.

Set Dimmer Level without a Console

When a control console is not available, the dimmer levels on ACT6 DIGITAL dimmer systems can be individually set to a desired level using the front panel keys.

Set all Dimmer Levels

Pressing and holding either the **Up** or **Down** key will change the level of all dimmers. An individual dimmer bar graph on the LCD display will change accordingly to show the dimmer levels.

Set single Dimmer Level

Press and hold the desired dimmer channel button together with either the **Up** or **Down** key to change the dimmer level of the selected dimmer channel. The individual dimmer bar graph for the selected dimmer on the LCD display will change accordingly to show the dimmer level.

- END -

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