



i-Series

OPERATOR MANUAL

Version 1.21
September 2007

LSC Lighting Systems (Aust) Pty Ltd
ABN 21 090 801 675

Building 3, 66-74 Micro Circuit,
Dandenong South, Victoria, Australia, 3175

Tel: +61 3 9561 5255
Fax: +61 3 9561 5277

Email: info@lsclighting.com.au
Web site: www.lsclighting.com.au



Table Of Contents

| | | |
|------------|---------------------------------------------------------------|-----------|
| 1.0 | DESCRIPTION | 1 |
| 2.0 | TECHNICAL SPECIFICATIONS | 2 |
| 2.1 | <i>IPAK WITH AUSTRALIAN CONNECTORS FRONT PANEL LAYOUT</i> | 3 |
| 2.2 | <i>IPRO WITH AUSTRALIAN CONNECTORS FRONT PANEL LAYOUT</i> | 3 |
| 2.3 | <i>IPRO WITH INTERNAL SCREW TERMINALS FRONT PANEL LAYOUT</i> | 3 |
| 2.4 | <i>IPRO DOUBLE-SOCKET SHUKO FRONT PANEL LAYOUT</i> | 4 |
| 2.5 | <i>IPRO TWIN BRITISH 15 AMP CONNECTORS FRONT PANEL LAYOUT</i> | 4 |
| 3.0 | GETTING CONNECTED | 5 |
| 3.1 | <i>INPUT SUPPLY</i> | 5 |
| 3.2 | <i>CONTROL INPUT</i> | 6 |
| 3.3 | <i>LOAD CONNECTION</i> | 6 |
| 3.4 | <i>OVERLOAD PROTECTION</i> | 7 |
| 3.5 | <i>INSTALLING THE DIMMER</i> | 7 |
| 4.0 | DIMMER OPERATION | 8 |
| 4.1 | <i>FRONT PANEL CONTROLS</i> | 8 |
| 4.2 | <i>SETTING THE DMX512 ADDRESS</i> | 9 |
| 4.3 | <i>TEST FUNCTION</i> | 10 |
| 4.4 | <i>SCENE STORAGE</i> | 11 |
| 4.5 | <i>CURVE SELECTION</i> | 11 |
| 4.6 | <i>PHASE FAILURE</i> | 12 |
| 4.7 | <i>CONTINUOUS OPERATION</i> | 12 |
| 4.8 | <i>FAN COOLING OPERATION</i> | 13 |
| 4.9 | <i>USER INTERFACE LOCK</i> | 13 |
| 5.0 | SOFTWARE | 14 |
| 5.1 | <i>RESETTING THE DIMMER</i> | 14 |
| 5.2 | <i>SOFTWARE UPGRADES</i> | 14 |
| 5.3 | <i>INSTALLING AND RUNNING CODELINK</i> | 15 |
| 6.0 | COMPLIANCE STATEMENTS | 16 |
| 6.1 | <i>YEAR 2000 COMPLIANCE STATEMENT</i> | 16 |
| 6.2 | <i>CE COMPLIANCE STATEMENT</i> | 16 |
| 6.3 | <i>C TICK COMPLIANCE STATEMENT</i> | 16 |
| 6.4 | <i>DISCLAIMER</i> | 16 |
| 7.0 | COMPANY PROFILE | 17 |

1.0 DESCRIPTION

The LSC **iPAK** and **iPRO** series of dimmers are high quality, high performance digital dimmers designed for wall mounting, truss or hand rail hanging, 19" rack mounting or free standing applications. Both dimmers share the same construction technique, however, the **iPRO** offers extra features above that of the **iPAK**.

All dimmers are constructed utilising a hinged Dimmer Chassis that is connected to an Installation Frame. The Dimmer Chassis houses the electronics, dimmer module cooling fan and in the non-hard-wired versions, houses the DMX512 in and thru and output load connectors. The Installation Frame houses the mounting locations for wall fixing and 19" rack mounting, the input power terminals and in the case of the hard-wired versions, all the output screw terminals and the DMX512 input and thru terminals.

Built around a custom aluminium extruded heatsink that provides central mounting for all major internal components, the overall design concept provides a very efficient air flow path allowing the dimmers to run with a 100% duty cycle. Advancements in electronic componentry, inductor performance and heat dissipation techniques have resulted in a compact, yet well laid-out design that is ideal for transporting and servicing. Great emphasis has been placed on component minimisation, thus resulting in higher reliability.

Each channel is protected by a fast acting Miniature Circuit Breaker (MCB) with LSC's proprietary *Current Control Technology*® to minimise nuisance tripping of the MCBs when high inrush currents are suddenly applied. The added benefit is that lamp filaments are also protected from this shock, thus extending lamp life.

High quality toroidal inductors and filtering circuits minimise the possible interference to other electronic equipment by reducing the harmonic waves produced by phase angled control of the power mains. A low noise fan is used to circulate cool air over the dimming circuitry and the **iPRO** has the added feature of variable fan speed control based on dimmer temperature. That is, the higher the temperature of the dimmer, the faster the fan will run.

Ease of operation is a key element of the **iPAK** and **iPRO** dimmers. The clever use of pushbuttons and easy to read displays allow the user to quickly set the DMX512 address, to drive individual channels at varying levels, to create a 12 channel scene that can be stored in non-volatile memory and to set a choice of up to six different fade curves for each dimmer channel (**iPRO** only).

Ongoing software upgrades are made easy with LSC's **CodeLINK** software up-load option. **CodeLINK** is a program that permits dimmer software upgrades from a PC style computer. Upgrades are available from LSC via the Website (www.lscighting.com.au) or via e-mail (techsupport@lscighting.com.au). Software can then be transferred into the **iPAK** and **iPRO** dimmers via a serial cable link from the PC computer into the DMX512 input connector on the dimmer. Refer to section 5.3 for more detailed instructions.

The **iPAK** and **iPRO**'s compact design and rugged construction, make them ideal for schools, churches, convention and exhibition centres, the Broadcast Industry and generally anywhere good quality entertainment dimming products are needed.

2.0 TECHNICAL SPECIFICATIONS

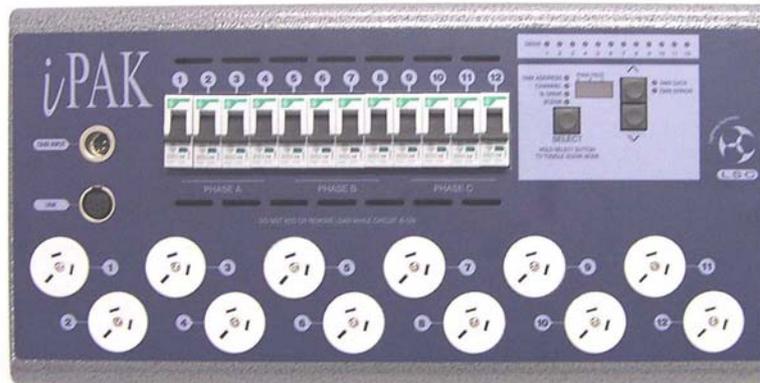
| | iPAK | iPRO | iPRO/6 |
|----------------------------------------|------------|------------|------------|
| Number of Dimmer Channels | 12 | 12 | 6 |
| Rating per Dimmer Channel | 10 Amps | 13 Amps | 25 Amps |
| Individual Channel Circuit Breakers | Yes | Yes | Yes |
| Circuit Breaker breaking capacity | 6000 Amps | 6000 Amps | 6000 Amps |
| Current Control Technology© | Yes | Yes | Yes |
| Dimmer Curve selection per Channel | No | Yes | Yes |
| Scene Storage | Yes | Yes | Yes |
| Power Switching Circuitry | Soft-Fired | Hard-Fired | Hard-Fired |
| Power-up in last known state | Yes | Yes | Yes |
| Channel Output Level mimic LEDs | Yes | Yes | Yes |
| Data OK and Error LEDs | Yes | Yes | Yes |
| Inductor Rise Time (peak to peak) | 200-250µs | 200-250µs | 200-250µs |
| Fan Cooling System Control | Two Speed | Variable | Variable |
| External software upgrading facility | Yes | Yes | Yes |
| DMX512 input and link-thru connectors | Yes | Yes | Yes |
| 50/60 Hz Frequency Auto-Selection | Yes | Yes | Yes |
| 100/120 Volt Power input (Factory set) | Yes | Yes | Yes |
| 220/240 Volt Power input (Factory set) | Yes | Yes | Yes |
| Meets CE and C Tick requirements | Yes | Yes | Yes |

DIMENSIONS: 484(w) x 250(h) x 220(d) (iPAK/A, iPRO/A, iPRO/T, iPRO/6)
 484(w) x 330(h) x 220(d) (iPRO/SE)
 484(w) x 400(h) x 220(d) (iPRO/UK)

WEIGHT: (unpacked) - 17kg (packed) - 20kg (iPAK/A, iPRO/A, iPRO/T, iPRO/6)
 (unpacked) - 19kg (packed) - 26kg (iPRO/SE)
 (unpacked) - 21kg (packed) - 26kg (iPRO/UK)

CONSTRUCTION: Corrosion resistant steel finished in powder coating with rear-screened polycarbonate front panel. Front chassis is hinged to the rear mounting frame.

2.1 iPAK with Australian Connectors Front Panel Layout



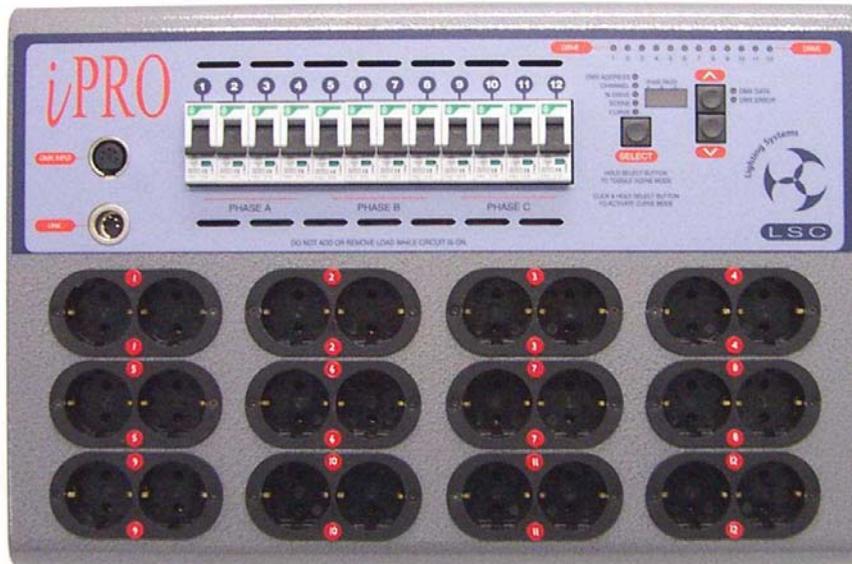
2.2 iPRO with Australian Connectors Front Panel Layout



2.3 iPRO with internal Screw Terminals Front Panel Layout



2.4 iPRO Double-socket Shuko Front Panel Layout



2.5 iPRO Twin British 15 Amp Connectors Front Panel Layout



3.0 GETTING CONNECTED

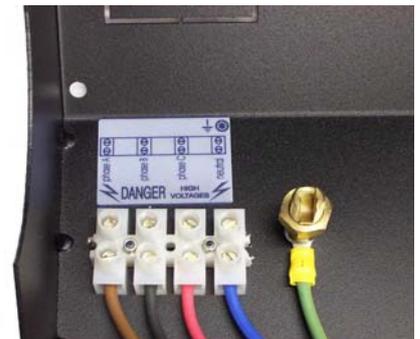
3.1 Input Supply

The **iPAK** dimmer can accept up to a 40 Amp 3 phase, neutral and earth input supply, whereas the **iPRO** dimmer can accept up to a 52 Amp 3 phase, neutral and earth input supply. Connecting to a lesser value supply, such as a 32 Amp or a 40 Amps per phase respectively, will limit the dimmers overall output accordingly.

There are a number of possible entry points in the Installation Frame to connect the incoming three phase supply. For hard-wired installations, there are two large knock-out panels located on the upper left hand region. These knock-out panels can easily be removed using heavy-duty cutters and allows wiring to enter and exit the dimmer via cable ducting on top of the installation frame, or direct through a wall cavity at the rear of the frame. For portable or installation situations where a flexible three phase tail and plug are required, a 32mm diameter hole exists on the upper left side panel of the Installation Frame. A hole plug is supplied to cover this hole when the product is shipped. By removing this plug, a correct size metal or plastic strain-relief gland can be fitted to secure the three phase tail to the chassis. Termination of the three phase wiring to the internal terminal blocks, should be undertaken by a qualified electrician.

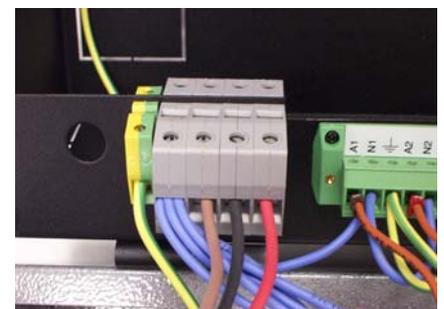


Connection is Three Phase Star, however other versions such as single phase(s), two phase and Three Phase Delta wiring are available upon request from the factory. Contact LSC Lighting Systems or your nearest Distributor for further information.



It is imperative that the supply Circuit Breakers to the dimmers are rated equal, if not lower than the dimmer's phase capacity. Correct connection of the Neutral must be maintained, otherwise serious damage could occur to the dimmer or loads connected to the dimmer.

Phase failure is indicated on the front panel by individual LED's for each phase. Refer section 4.6 for more detail.



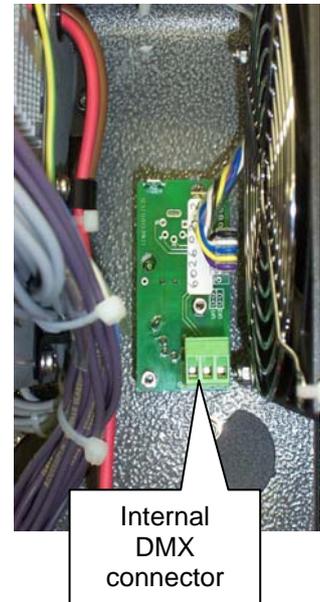
3.2 Control Input

The dimmers are designed primarily to accept control signals conforming to the DMX512/1990 protocol. Connection is made through the DMX512 Input connector located on the front panel. A Thru connector located next to the Input, allows the connection of the dimmer to other DMX512 devices downstream. The Thru connection is passive and allows for the pass through of the DMX512 signal, even if there is no power to the dimmer.

The iPRO/T model has all DMX512 connections internally wired to a 4mm² pressure clamp screw terminal connector. However the LINK connector on the front panel remains as this still allows for software upgrades as detailed in Section 5.2.

LED's on the front control panel indicate the condition of the incoming DMX data. Valid data is indicated with a Green "DMX data" LED. Bad data is indicated with a Red "DMX error" LED.

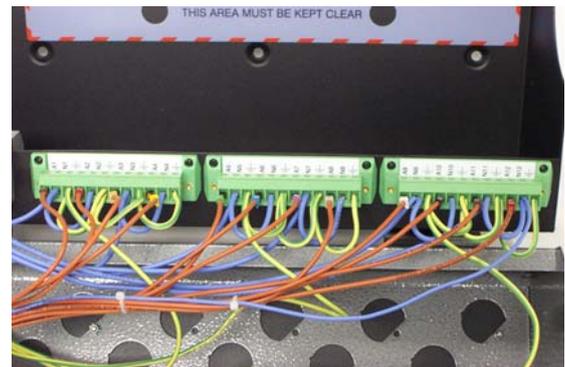
It is advisable that if this dimmer is the last DMX512 device in a long data stream, then connect a "Terminator" in the "Thru" connector to stop any possibility of reflections on the DMX512 Network. The "Terminator" can be a mating plug with a 120 Ohm resistor soldered between pins 2 and 3.



3.3 Load Connection

The **iPAK/A** dimmer is only available as an Australian version, providing twelve 10 Amp HPM No. 38 Sockets, whereas the **iPRO** dimmers offer a wide selection of output load connectors to suit the many applications and countries that these dimmers are sold to. For Australian versions, the **iPRO/A** is supplied with twelve 15 Amp HPM No. 38 Sockets, whereby the **iPRO/6A** is supplied with six 25 Amp HPM No. 38 Sockets to suit the higher current capacity per circuit. For European versions, twelve Shuko 2 x 16 Amp Sockets (**iPRO/SE**) or 24 x 15 Amp UK sockets can be fitted (**iPRO/UK**).

The hard-wired version of the **iPRO** is supplied with three detachable load connectors. Each connector contains four dimming circuits where each circuit consists of three (Active, Neutral, Earth) 4mm² pressure pad screw terminals.



The **iPAK** is a soft-fired dimmer, and as such, is suitable for most resistive type loads. The **iPRO** is a hard-fired dimmer meaning it is very suitable for resistive loads as well as most inductive loads such as fans, motors, ballasts and dimmable fluorescent tubes. Care should be taken when driving inductive loads as not all of these types of loads can be dimmed. If you are in doubt to the dimmers suitability for the intended application, please consult LSC Lighting Systems or your nearest Distributor for further information.

Under all circumstances during the operation of the dimmer, it is highly advisable not to connect or disconnect the load while live, to prevent potential damage to the dimmer, the load connectors or to the load itself.

3.4 Overload Protection

Each dimmer is fitted with twelve (six) fast acting Miniature Circuit Breakers (MCB's), one for every output channel. Under normal operating conditions the MCB's pass the rated current and will only trip when there is an overload through the dimmer circuit. Likewise, if there is a short circuit on the load or faulty wiring on the load side, the MCB will trip to protect the internal components of the dimmer.

The MCB's are located on the front panel of the dimmer allowing quick visual access to which channel has a fault or overload condition. Dimmer channels can be manually disabled by switching off the MCB for that particular channel. This is particularly useful for those occasions where a genuine fault has occurred.

3.5 Installing the Dimmer

The **iPAK** and **iPRO** dimmers are one of the most versatile dimmers on the market, offering no less than four different installation options. The dimmers can be floor or bench mounted; hung from lighting bars or handrails; mounted to walls; or fastened to 19" rack systems.

The angled bottom of the Installation Frame allows the dimmer to sit angled on a floor, bench or table top. This is ideal for portable situations where the dimmer can be placed in awkward positions to allow easy interconnection to the load circuits. In this scenario we recommend great care is taken so power and data leads and the connecting load circuits do not create an operational hazard to others.



On the top of the Dimmer Chassis, three 12mm holes are provided for the attachment of two 2" Hook (C) clamps and a safety chain. The holes are positioned to allow the centre of gravity of the dimmer to be directly underneath. To fit the Hook clamps, the two screws holding the Dimmer Chassis to the Installation Frame need to be removed and the Dimmer Chassis hinged forward. From the inside fit two bolts to fasten the Hook clamps to the top of the Dimmer Chassis. There are two holes, one on the top left and one on the upper side left of the Chassis, that allow the connection of a rated safety chain.

The rear panel of the dimmer has provisions for mounting to walls and other upright structures. In this situation care must be taken not to mount the dimmer close to other dimmers or objects, such that the side air vents of the dimmer may be impeded. Allow a minimum of 150mm clearance on either side of the dimmer. The eight holes on the outer side of the rear chassis allows the dimmer to be fastened to a 19" rack frame.

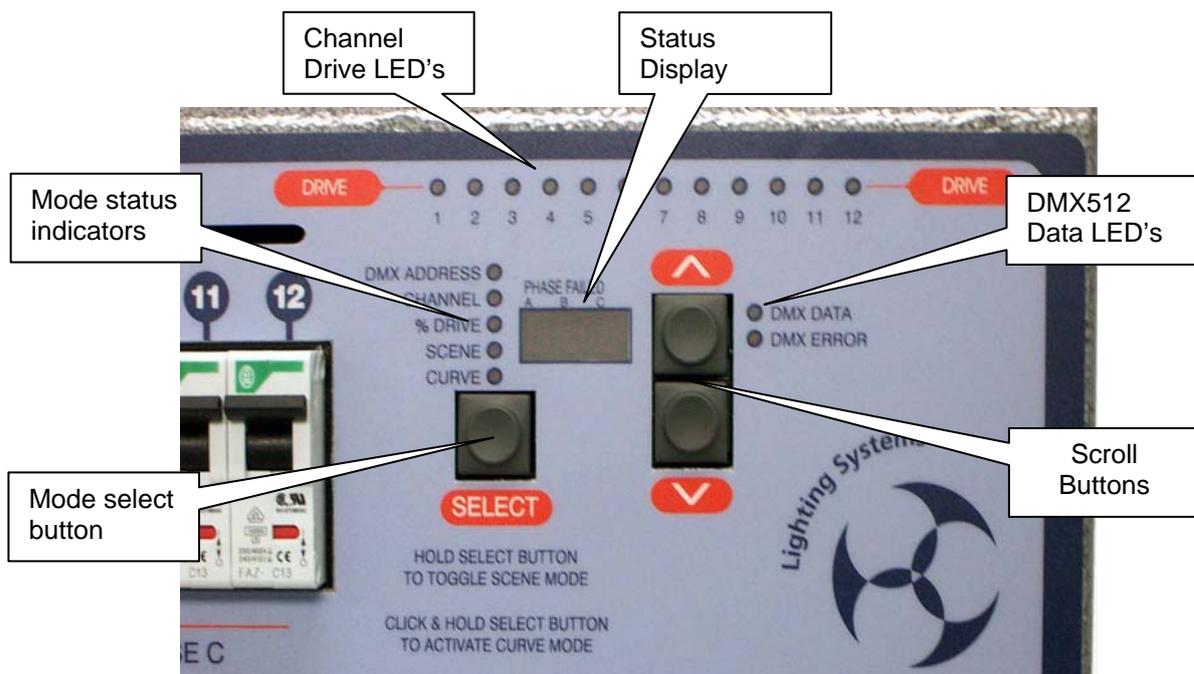


4.0 DIMMER OPERATION

4.1 Front Panel Controls

Good product design generally relates to good user interface and providing a well laid out, concise, easy-to-read control panel is the key. The design of the **iPAK** and **iPRO** dimmers concentrated very heavily on this principle and the end result has produced an easy to use control panel that allows very quick access to all functions and indicators that show the exact status of the dimmers.

Following is a brief explanation of the switches and displays.



Channel Drive LEDs These 12 LEDs indicate the channel output status and will glow proportionately to the level of output being generated. In SCENE mode, these LEDs are used to build the desired output levels for the scene to be stored. When the scene is recalled these LEDs will correspond to the output levels stored in memory.

Mode Select Button This button is used to alter the dimmer's status by allowing the operator to set the DMX512 address, drive individual channel at varying levels, create a scene to be stored in memory and individually set different dimmer curves for each channel (iPRO only).

Mode Status Indicators These LEDs indicate which mode the dimmer is operating in.

Scroll Buttons These up and down buttons allow the operator to adjust the DMX512 address, channel number and channel output level, in either a up (increment) or down (decrement) direction.

Status Display The 3 digit display can indicate the current DMX512 address, channel number and the channel output level. The output of the display is dependent on which mode the dimmer is currently in. Under other conditions the display will also scroll prompt and error messages.

Data Indicators These two LEDs indicate good or bad data being received by the dimmer.

4.2 Setting the DMX512 Address

The dimmer is designed to be controlled by an external DMX512 transmitting device. The DMX512 protocol allows for the high speed transmission of 512 channels of digital data and allows for up to 32 devices to be connected to each DMX512 stream. To enable each device to receive its own relevant information off this DMX512 stream, a DMX512 Start Address is allocated to each device. In other products, this start address is selectable on the device by either switches or thumbwheels and the number displayed corresponds to the first channel of the device.

If the **iPAK** and **iPRO** twelve channel dimmers have the start address set for "001", then the dimmers will respond to the first twelve channels of information on the DMX512 stream. Likewise if the start address is set for "025", then the dimmers will respond to channels 25 to 36 on the DMX512 stream. If two or more devices have the same address setting, these devices will respond to exactly the same data. Care must be taken when setting up all equipment on the same DMX512 network. All data on the DMX512 stream can pass through the dimmer and onto the next device, when the thru connector is utilised. Similarly the six channel **iPRO**'s respond in the same way, except they only use the six channels of information on the DMX512 stream that pertains to them as set by the address number.

When the dimmer is powered up for the first time, it will automatically be in the DMX512 Address mode and display channel 1 as its starting address. The user can then set the desired start address by pressing the increment(^) or decrement(v) Scroll Buttons. If you decrement from channel 1, the next setting will be 512. To scroll quickly to your desired start address, press and hold the increment or decrement button. The display will then speed up and scroll through the channel numbers.

To increase the start address in banks (groups of 12 for 12 channel dimmers and groups of 6 for 6 channel dimmers.), press the button quickly once and then press and hold. If the dimmer start address is currently at "1", then to select the next bank (start address number 13 (7)), press the increment button quickly once and then press again and hold. The display will then indicate ""b-2"(Bank number 2) and then it will display channel "13" ("7"). Repeat this step to move to the next bank. To move the start address backwards in groups of 12 (6), repeat the instructions above using the decrement button.

Once the DMX512 Address has been set, this will be stored in the dimmer's memory. (*Note: The DMX512 address will only be committed to memory approximately 5 seconds after the last address change.*) If the dimmer is powered down and then powered back up, the dimmer will resume at its last known DMX512 setting.

The Data Indicators show the exact status of the DMX512 signal as it relates to that particular dimmer. When the DMX512 connector is plugged into the dimmer and signal is being received, the green data LED will glow to indicate good data being received by the dimmer. If bad data is being received, the red LED will glow. In some instances, the green and red LEDs will intermittently come on and off. This indicates that the data being received is "dirty", in that it is sometimes valid and then becomes invalid.

If the DMX512 input connector is fitted and no LEDs are glowing, this can indicate two things. The first is that the transmitting device has ceased transmitting and the second could mean that the signal is no longer reaching the dimmer due to a fault up line. In both cases, the dimmers will sense the loss of signal and then hold the last known DMX512 state that it received, until the DMX512 data stream is restored or until the dimmer is powered down.

4.3 Test Function

4.3.1 Driving Channels

A very useful feature found on most LSC dimmers is the ability to individually or group select channels and drive the outputs from 0 to 100%, without a control device being connected. This is particularly useful when doing onstage focussing, pre-heating of lamps or general dimmer testing.

To activate, press the Mode Select Switch until the “Channel” LED illuminates. Press the Scroll Buttons until the desired channel is reached. The corresponding channel number will be displayed in the Status Display. At this stage all channels can be activated by pressing the increment Scroll Button once quickly and then pressing and holding until “ALL” is displayed. The “ALL” mode will stay active until either the increment or decrement Scroll Button is pressed. Press the Mode Select Switch to move the function to “% Drive”. Again use the Scroll Buttons to adjust the channel(s) output level. The output is displayed as a percentage of the total output, that is “60” is 60% of the output. To adjust another channel, repeat this process by pressing the Mode Select Switch to “Channel” and selecting the next channel. If loads are not to be driven during this stage, they can be isolated by switching the channel MCB off.

The Scroll Buttons can be used to scroll quickly through the “Channel” and “% Drive” levels by either of two methods:

- i) Pressing and holding down the increment or decrement button will move the channel number or output level by a rate that begins slow and then speeds up.
- ii) Pressing the increment or decrement button once quickly and then pressing and holding will snap the output level to either its maximum or minimum setting.

4.3.2 Chase Test Mode

Another useful test feature, is the ability to set the dimmer to sequentially fade through all its channels. In essence, it appears as a single channel chase that fades each channel up and then down. To activate this, select “Channel” on the Mode Selection Switch and then press both Scroll Buttons for less than two seconds and release. The Status Display will show the last known channel number entry and will then automatically scroll through the channels. The “Channel” LED will pulse to indicate that the dimmer is in this *chase test* mode. The output level will default to zero, however pressing the Mode Selection Switch will activate the “% Drive” mode. Use the Scroll Buttons to adjust and set the output level. Press either one of the Scroll Buttons to stop the chase and subsequent presses will increment or decrement the channels. To resume the chase, press both Scroll Buttons quickly.

4.3.3 Pre-Heat

Prior to a show’s performance, it is highly recommended to pre-heat the filaments in the fixtures to prevent sudden thermal shock to the lamp, thus reducing the possibility of damage or shortened lamp life. To activate the pre-heat function select “ALL” on “Channel” mode and then drive the outputs to around 8 to 10%. This level should allow sufficient current through the filament to glow slightly, but not produce any noticeable light output on the stage. A time span of 10 to 15 minutes should be enough to warm most types of theatrical lamps. To set a permanent pre-heat, refer to section 4.4 Scene Storage and create a scene that will activated when the dimmer is powered up.

Two things to consider while in the Test Function mode. If a DMX512 controller is connected to the dimmer and begins to transmit, the incoming signal will work on a HTP (Highest Takes Precedence) basis with anything that is set on the dimmer’s control panel. That is, if the dimmer is currently set for pre-heat at 10% and the incoming signal has channel data greater than 10%, then the dimmer will output the higher value. Likewise, if the incoming signal drops to 0%, then the output will be at 10%, the pre-heat level. Secondly, if power to the dimmer drops out and is then restored, the dimmer will automatically start at the DMX512 Address mode. All previous settings will be lost.

4.4 Scene Storage

This function provides the capability to create a single 12 (6) channel scene using the front panel controls and then store this into the dimmer's memory for recall at any point while the dimmer is switched on.

To activate the Scene function, press and hold the Mode Select Switch until the "Scene" LED illuminates. The LED will now begin to pulse off and on, indicating the Scene function is activated. The "Channel" LED is also activated (on) at this time indicating the dimmer is now ready to start creating the scene. Using the Mode Select Switch allows the operator to toggle between the "Channel" and "% Drive" modes, whilst the Scroll Buttons allow the selection of the channel number and output level respectively. Once a channel level is set, repeat the above steps to move to the next channel, thus creating the desired scene (group of channels).

The scene is automatically stored in the dimmer's non-volatile memory, meaning that any changes to the scene will over write the existing stored memory. Similarly any new scenes created will automatically write over the previous stored scene. (*Note: The scene is committed to memory approximately 5 seconds after the last change.*)

If power is switched off or disconnected while the dimmer is in Scene mode, when power is restored, the dimmer will resume in its last known state – "Scene". Any stored scenes are also retained in memory when power is switched off and can be accessed when power is restored.

To exit Scene mode, press and hold the Mode Select Switch until the "Scene" LED goes out.

4.5 Curve Selection

This function is only available on the **iPRO** range of dimmers and allows for an individual fade curve selection on any or all dimmer channels. Six different curves are available and are displayed as follows on the Status Display.

| | | |
|-------------------|--------------|-------|
| S LAW | displayed as | "C1" |
| SQUARE LAW | displayed as | "C2" |
| CUBE LAW | displayed as | "C3" |
| QUAD LAW | displayed as | "C4" |
| 120V CURVE | displayed as | "120" |
| NON-DIM SWITCHING | displayed as | "non" |

The S, SQUARE, CUBE and QUAD Laws are variations on the dimmers fade response to suit performance characteristics of various types of lamps. The 120V curve is primarily for use with 120 Volt Par 64 lanterns and equates to a standard "S Law" curve for 120 Volt lamps. If this curve is selected take particular note that only 120 Volt lamps can be connected, up to a maximum of 10 Amps per dimmer channel. **LSC Lighting Systems (Aust) Pty. Ltd. takes no responsibility for any possible damage to lamps operated in this mode.**

The NON-DIM curve provides the facility for channels to operate as electrical switches. This is ideal for motor control, smoke machines and other special effects. When activated the dimmer channel will switch on (100% output) when the fader level reaches 60% and switches off (0% output) when the controlling fader level drops to 40%.

To activate the Curve function, double click and hold the Mode Selection Switch until the "Curve" LED illuminates and begins to pulse off and on. The word "Cur" will be visible in the Status display, indicating the Curve function is activated. Press the Mode Selection Switch again. The "Curve" LED will continue to pulse and the "Channel" LED will be illuminated. Using the Scroll Buttons, increment or decrement to move to the channel required. Press the Mode Selection Switch again. The "Channel" LED will go out, the "Curve" LED will stay on full (not pulsing) and the display will show "C1" – the S Law curve, or the last setting previously stored.

The S Law is the factory default setting for all dimmers. In the case of the **iPAK**, all channels are permanently set to the S Law and cannot be changed.

Use the Scroll Buttons to select the desired curve. Once chosen, press the Mode Selection Switch to select the next channel. Repeat all steps above until the set up is complete. To store this setup, press and hold the Mode Selection Switch and the dimmer will exit the Curve function and store the curve set up into memory. The "Curve" LED will remain on, indicating that stored curve set ups are present in the dimmer.

In the event of power down and power then being restored, the dimmer will remember its stored curve set up. *(Note: The Curve Setup will only be committed to memory approximately 5 seconds after the last curve change. The S Law is the factory default setting for all LSC dimmers.)*

4.6 Phase Failure

In the event of a supply phase failure or disconnection, the **iPAK** and **iPRO** dimmers will indicate to the operator which phase has dropped out or moved out of specification. The latter means that under certain circumstances, the supply voltage and /or frequency may move outside the acceptable operating specification and will appear as a fault to the dimmer.

Three small red LEDs are located in the top of the Status Display and labelled "A", "B" and "C" for phases 1, 2 and 3 respectively. A LED will flash for the respective phase number when it has failed or been disconnected. If this fault condition occurs, it is highly recommended to shut down the dimmer and correct the fault as soon as possible.

The dimmer's control electronics is powered by all three phases, so in the event of any two phases failing, the electronics will continue to operate.

4.7 Continuous Operation

The **iPAK** and **iPRO** dimmers are designed to operate at 100% Duty Cycle, they will supply full rated load to all outputs continuously. Under these conditions the dimmer's ventilation is critical and good clearance around the dimmer is essential to prevent obstruction to the airflow in and out of the dimmer chassis.

LSC recommends a general clearance of 150mm on either side of the dimmer and 200mm at the front of the dimmer.

4.8 Fan Cooling Operation

Both dimmers use high quality ball bearing DC fans to extract hot air from the internals of the dimmer. These fans have been chosen to operate at high temperatures and produce low level audible noise. A temperature sensor is fitted to monitor the temperature of the internal heatsink and vary the fan speed in the following manner:

- The fan on the **iPAK** dimmer will run at half speed for temperatures up to 50°C and then full speed for temperatures over this limit.
- The fan for the **iPRO** dimmer will activate when the heatsink temperature reaches 40°C and then increase fan speed in a linear fashion as heatsink temperature increases.
- On both models, the outputs will be automatically shut off when the heatsink temperature reaches 105°C and a message **“too hot”** will scroll across the display. The dimmer will automatically reconnect the outputs when the temperature of the heatsink cools to 90°C. The fan will run at full speed during this cool down period. Dependant on ambient temperatures, this cool down period is generally between five to ten minutes.
- If the temperature sensor fails for whatever reason, the electronics of the dimmer will drive the fans to full speed as a default state. So if the fans are running at full speed when you know the dimmer is running cool, then this will generally mean there is a problem in the sensor circuitry.

4.9 User Interface Lock

The front panel User Interface settings may be locked to protect against accidental pressing of the scroll or selection push buttons or interference from unauthorised personnel.

Note: If an error occurs while the User Interface Lock is active (on), the error messages will scroll across the Status display, but the buttons will still be inactive. You will need to unlock the User Interface to respond to the error.

4.9.1. Locking the User Interface panel

To lock the User Interface panel, the dimmer must be in the “Drive” state of the following three modes. Failure to be in this mode, will result in the user not being able to lock the User Interface panel. The three modes are: a) Channel Drive mode – refer section 4.3.1. b) Scene Drive mode – refer section 4.4. and c) Channel Chase Drive mode – refer section 4.3.2.

Press and hold both Scroll Buttons for five seconds. You will enter the Reset function as described in Section 5.1. The following message will then scroll across the Status Display – **“sys reset inc – yes dec – no”**. INC means the increment(\wedge) Scroll Button and DEC means the decrement(\vee) Scroll Button. Press the decrement button to move to the next menu. This will bring up a new message on the Status Display – **“total reset inc – yes dec – no”**. Press the decrement button to move to the next menu. The next message on the Status Display will be for the User Interface lock – **“UI loc inc – yes dec – no”**. Press the increment button to lock the User Interface panel.

The Status Display will now scroll the following message – **“UI loc active”**. If you select “no”, then the dimmer will return to the condition it was in when you started.

4.9.2 Unlocking the User Interface panel

To unlock the User Interface panel, press and hold all three push buttons simultaneously for 5 seconds. This will return the dimmer to the operating state that was active prior to locking the User Interface panel.

5.0 SOFTWARE

5.1 *Resetting the Dimmer*

The **iPAK** and **iPRO** dimmers can perform two types of reset.

- a) *System Reset* - saves all stored information, including the DMX512 Start Address into its memory and then does a power down and re-boot of the electronic circuitry. This is useful to reset the dimmer without disconnecting power and maintain all stored memories.

To do a System Reset, press and hold both Scroll Buttons for five seconds. This can be activated from any mode the dimmer is in. The following message will then scroll across the Status Display – “**sys reset inc – yes dec – no**”. INC means the increment(∧) Scroll Button and DEC means the decrement(∨) Scroll Button. Press the increment button to do the System Reset.

- b) *Total Reset* - clears all stored memory and then does a power down and re-boot of the electronic circuitry. This reset returns the dimmer back to its original default position when it left the factory. The DMX512 Start Address defaults back to “1”, the Scene Storage is blank and the curve setting for each channel is defaulted to the “S Curve”.

For a Total Reset, repeat all the steps to do a System Reset, but press the decrement button to say “No” to the System Reset. This will bring up a new message on the Status Display – “**total reset inc – yes dec – no**”. Press the increment button to do the Total Reset. At this point if you do not wish to proceed with the Total Reset, press the decrement button to exit.

5.2 *Software Upgrades*

Future Software upgrades are possible by returning the Dimmer to LSC Lighting Systems (Aust) Pty. Ltd. or its distributors, or by the **CodeLINK** option.

CodeLINK is a PC based software program that allows the uploading of Software releases to the dimmer from a PC style computer or laptop. Latest Software releases will be available via email at techsupport@lsclighting.com.au or from downloading at LSC’s Web site – www.lsclighting.com.au. Included with the **CodeLINK** option is a serial cable that connects the computers serial port to the DMX512 input connector on the dimmer, a 3.5” floppy disk containing the latest software and an instruction sheet.

Using the spare two pins on the DMX512 connector, new data can be sent from the PC or Laptop to update the dimmers ROM (Read Only Memory).

CodeLINK Cable connections

| Signal | DMX512 Male 5 pin AXR | Comms port 9p Female D-Type |
|--------|--------------------------|--------------------------------|
| GND | 1 | 5 |
| Tx | 4 | 3 |
| Rx | 5 | 2 |

5.3 *Installing and Running CodeLINK*

1. Check all components are included in the option kit. If anything is missing from the kit, contact your point of purchase.
2. Close any open applications on your computer for the duration of the upgrade process.
3. Create a sub-directory on the Hard Disk. Running the upgrade direct from the floppy may cause problems.
4. Insert the floppy and copy contents to your new sub-directory. The disk will contain the following files:
 - **CodeLINK.exe** *upgrade utility*
 - edimcode.bk3 *latest version of edim software for upgrade*
 - upgrade1.bat *command to upgrade from COM1 port*
 - upgrade2.bat *command to upgrade from COM2 port*
 - **CodeLINK.doc** *Word file instruction sheet*
5. Connect the **CodeLINK** cable between the **Comms** port on your computer and the **DMX512** input connector on the dimmer.
6. Turn the power to the dimmer **OFF**.
7. Type in the execute command "**upgrade1**" if connected to Comms port 1, or "**upgrade2**" for Comms port 2.
8. Press **ENTER**.
9. Turn the power to the dimmer **ON**.
10. The upgrade process will now automatically begin. The Mode Status Indicators will now flash sequentially and the Status Display will now count from "1" to "409". When the display reaches 409, the download process is complete and will restart the dimmer. The start up message will display the latest software version just installed.

Do not turn off the dimmer until the start up message has been displayed.
11. Disconnect the **CodeLINK** cable and the dimmer is now ready for normal operation.

6.0 COMPLIANCE STATEMENTS

6.1 Year 2000 Compliance Statement

Following is a definition of Year 2000 Conformity Requirements as defined by the British Standard DISC PD2000-1. "Year 2000 Conformity shall mean that neither performance nor functionality is affected by dates prior to, during, or after the Year 2000. In particular:

- Rule 1** No value for current date will cause any interruption in operation.
- Rule 2** Date-based functionality must behave consistently for dates prior to, during and after the Year 2000.
- Rule 3** In all interfaces and data storage, the century in any date must be specified either explicitly or by unambiguous algorithms or inferencing rules.
- Rule 4** Year 2000 must be recognised as a Leap Year."

The iPRO dimmers have been tested and found to comply with the above definitions.

6.2 CE Compliance Statement

The iPAK and iPRO range of dimmers from LSC Lighting Systems (Aust) Pty. Ltd. have been designed and tested to the European Committee for Electrotechnical Standardization (CENELEC) standard for professional entertainment dimmers – EN55015 (Lighting).

6.3 C Tick Compliance Statement

Current Australian Communication Authority regulations do not require C Tick compliance for three phase apparatus, however compliance with the European CE Norms generally far exceeds that required for C Tick certification. To this end LSC has based its compliance on the CE Norms.

6.4 Disclaimer

LSC Lighting Systems (Aust) Pty. Ltd. has a corporate policy of continuous improvement, covering areas such as product design and documentation. In light of this policy, some detail contained in this manual may not match the exact operation of your product.

In any event, LSC Lighting Systems (Aust) Pty. Ltd. can not be held liable for any direct, indirect, special, incidental, or consequential damages or loss whatsoever (including, without limitation, damages for loss of profits, business interruption, or other pecuniary loss) arising out the use or the inability to use this product for its intended purpose as expressed by the manufacturer and in conjunction with this operating manual.

Servicing of this product is recommended to be carried out by LSC Lighting Systems (Aust) Pty. Ltd. or its authorised service agents. No liability will be accepted whatsoever for any loss or damage caused by service, maintenance or repair by unauthorised personnel. In addition servicing by unauthorised personnel may void your warranty.

LSC Lighting Systems (Aust) Pty Ltd supplies the enclosed information in good faith. LSC Lighting Systems (Aust) Pty Ltd makes no representations or warranties with respect to the contents or use of this manual and specifically disclaims any implied warranties of merchantability or fitness for any particular purpose. Our policy is one of continual improvement and we reserve the right to change circuitry, specifications or mode of operation of circuitry without obligation to notify any person or entity of such revisions or changes.

7.0 COMPANY PROFILE

The LSC name is synonymous within the Entertainment Lighting Industry for producing leading edge lighting control products that are innovative, stylish and functional.

Furthermore, its dedication to developing products that are inherently reliable and easily serviceable, has enhanced LSC's reputation with owners and operators alike. A great deal of pride is instilled in the people who design, manufacture and sell LSC products, whereas every sale is regarded as not just a purchase, but an important element in cementing a long term relationship with each customer .

The product range is diverse and covers control desks, digital dimmers and a comprehensive selection of DMX512 and power distribution equipment. LSC has forged a reputation for many years as a pioneer in DMX512 technology and this will be further enhanced with the release of new products over the next twelve months.

Products are distributed through a worldwide sales network of over 56 Distributors in 34 Countries and users of LSC equipment range from the high profile corporate/professional client to churches, museums, schools, amateur theatre groups, convention and exhibition industries, broadcast industry, production and rental companies - basically anywhere good entertainment lighting is required.

A program of new and upgraded products will see the company develop into one of the world's most respected and preferred suppliers of high quality Lighting Control Systems.



e-Series – featuring the ePAK, ePRO and e1220 rackmount 6 and 12 channel digital dimmers



maXim – advanced lighting consoles in 5 models from 12 to 120 faders, up to 1024 DMX channels with moving light control



i-Series – featuring the iPAK and iPRO range of professional installation dimmers.



monoPAK – single unit portable dimmer



DELTA – DMX512 data splitters and Power Distribution Products.

DNA – range of isolated inlets, outlets and power supply's for distributing DMX512.



e24 – 24 channel dimming system with patch bay, monitoring and mains distribution



TDS – 48 channel dimming system with patch bay, digital monitoring and mains distribution