
PID II QUICK OPERATION

Press the Back key to reach the top menu- the LCD shows “**Theatrelight NZ**”. Softkeys are shown in italics e.g.: “*setup*”.

SETTING DMX PATCH ADDRESSES AND LOCKING THE KEYS

To change the DMX address of any dimmer in any bin:

1. From the top menu, press **Menu** three times to arrive at the Dimmer patch setup menu.
2. Press **▲/▼** to adjust the address. Press **◀/▶** to set 10s, 100s, or the dimmer or bin number.
3. Press **Back** to return to the top menu: the screen shows “Changes saved to flash memory”.
4. To lock the keypad, hold **◀ + ▶ + ▲** for 2 seconds. To unlock the keypad, hold **◀ + ▶ + ▼** for 8 seconds.

SETTING DMX FAIL MODE

To set the DMX Fail Mode of **all** bins in the cabinet, to either “Fade to Black” or “Hold DMX levels”:

1. From the top menu, press **Menu** twice, select “DMX fail mode setup”, press **Menu**.
2. Use **▲/▼** to select the mode, then press “*on*” (**▶**) to set the mode On.
3. Press “*times*” (**Menu**) to enter the DMX fade delay/time menu: use the arrow keys to edit the times.
4. Press **Back** to return to the top menu: the screen shows “Changes saved to flash memory”.

SETTING DIMMER PARAMETERS

To set Test, Min, Max, Non-Dim, Off levels, Curve, Proportional levels, or Softstart time for each dimmer in each bin:

1. From the top menu, press **Menu** twice, select “Dimmer & bin setup”, press “*setup*” (**Menu** key).
2. Use **▲/▼** keys to select the parameter to adjust, then press “*setup*” (**Menu** key).
3. Use **◀/▶** keys to select the dimmer, **▲/▼** to adjust parameters, with softkey “*all*” for all dimmers in all bins.
4. Press **Back** to return to the top menu: the screen shows “Changes saved to flash memory”.

RESETTING PID BIN PARAMETERS

To reset the dimmer parameters of each bin:

1. From the top menu, press **Menu** twice, select “Dimmer & bin setup”, press “*setup*” (**Menu**).
2. Use **▲/▼** to select “Reset Commands”, press “*setup*”, select “Reset Dimmers + DMX”, press “*select*”.
3. Use **▲/▼** and **◀/▶** keys to select Bin number (or All bins), set Bin DMX Start address, press “**OK**” (**Menu**).
4. The screen shows “Resetting all Dimmer and DMX parameters”. Repeat step 3 to set other bins.

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PID II INTRODUCTION

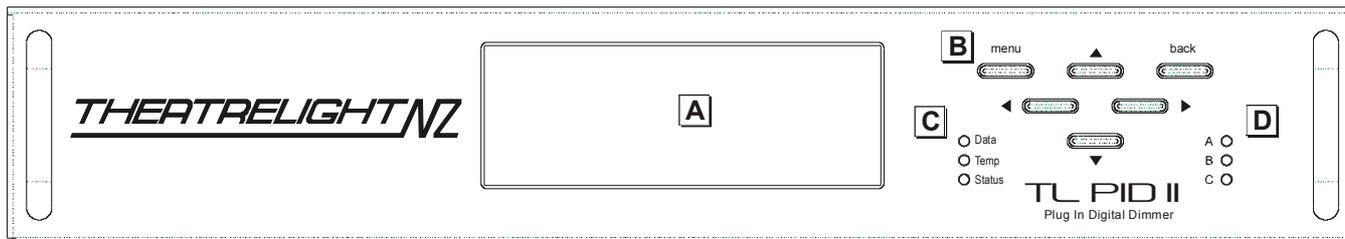
The Theatrelight PID II is a general purpose 19 inch rack-mounting Plug In Dimmer cabinet designed for TV and Film Studios, Theatres, Concert halls, or any venue requiring an intelligent and reliable dimmer installation. The PID II design supersedes the original Theatrelight PID Dimmer, and is based on software and hardware designs already well proven in the Theatrelight products **Nebula**—a 3u high rack-mounting professional dimmer pack, and **Meteor**—a wall mounting Stage or Environmental dimmer. Users familiar with these products will find the menu system and key setup of the PID II intuitive and easy to understand.

The new design uses distributed multiple micro-processors for maximum reliability. Additionally the main CPU needs no expensive back-up system when operating on DMX—in the unlikely event of total failure of the main CPU, all dimmers continue operation without interruption to the show. The redundant power supplies have a proven history in Theatrelight's Nebula and RackPack II designs. The two DMX inputs each present only one, 1/10th standard load to a DMX cable, allowing up to 100 PID cabinets on a single DMX cable. The PID II can also be fitted with DMX-over-Ethernet communication systems for use with Artnet standard control panels, or an optional RS485 system for use with remote keyplate lighting controllers, or as control, reporting, and monitoring gateways. The PID II is available in a number of custom versions of up to 10 bins of 6 plug-in modules in each cabinet. Each module may be of 1, 2 or 4 dimmer channels using SCR, IGBT, or Sinewave dimming methods. PID II firmware is available in a number of different configurations, and with different communications hardware and software according to customer request. Access for wiring and maintenance is carried out from the front of the cabinet—no rear access is necessary. Extended side panels and a lockable hinged front door are also available if required.

PID II FEATURES

- Simple menu system with large 4 line, 20 character auto dimming LCD display at eye height
- Every dimmer may be patched to any DMX address.
- Every dimmer may be set to its own Min, Max, Off, Proportional, Test level, Soft-start Time, and Dimmer Curve
- All dimmer parameters held in non-volatile flash memory
- Redundant temperature controlled cooling fans for low acoustic noise and long life
- Redundant main set-up CPU, and multiple, distributed microprocessors, 1 CPU for every 6 dimmer modules
- Redundant, high reliability power supplies, input 90 volts AC to 265 Volts AC, frequency from 45 to 65 Hertz
- Two Isolated, floating DMX inputs per cabinet, each 1/10th standard load for the whole cabinet
- Two DMX-over-Ethernet inputs per cabinet, and ENet or RS-485 or reporting and building control applications

PID II CONTROL PANEL LEGEND



- A:** Large clear 4 row x 20 character Blue LCD display with white LED backlight for easy readability.
- B:** Simple keyboard and easy to understand menu system allow quick setup of all dimmer functions and parameters.
- C:** The DMX LED shows the presence of DMX signal, and any DMX errors. The TEMP LED shows temperature warnings and other errors, while the Status LED indicates active communications with the dimmer bins or remote controllers.
- D:** A B C LEDs indicate presence of mains power on each phase

PID II OVERVIEW

The following description provides an overview of the capabilities of the PID II.

DIMMER MODULES

Each PID II dimmer module is made from heavy aluminium extrusion, finned for maximum transfer of heat to the cooling airflow. Power semiconductors and filter chokes (where required) are thermally connected to this extrusion for cool operation and maximum reliability. The molded-in handle in the plastic front allows easy exchange of modules when necessary. Dimmer modules plug into a bin motherboard for both mains power and signal connection. Each motherboard carries a dedicated plug-in CPU card responsible for the dimming of the 6 modules in the bin. Dimmer parameters are set in each bin CPU by the keys and LCD of central microprocessor on the control panel (see below), and thereafter each bin CPU runs independently.

Dimmer module types

PID II modules are designed for single, dual, or quad channel dimmers per module. Modules may be fitted with one or two MCBs. Typical normal module types are dual 4kw and dual 6 kW SCR dimmers with varying specification filter chokes. Other types are available such as 4 x 2kw, and up to 1 x 12kw SCR dimmers depending on customer requirement. Generally all 6 modules in a bin should be of the same model. Dimmer modules can be supplied with different standards of filtering, including rise-times to Television Studio standards. The design of the module mechanics and cooling system caters for future IGBT and Sinewave dimmer modules.

Dimmer module LEDS

Front panel LEDs are provided for display of MCB trip status, and to indicate dimmer level:

Power LEDS

Normally if the dimmer MCB is not tripped, the Power LED shows as static green. If the dimmer MCB has tripped due to a short circuit or over-load, the LED flashes bright red. The flashing red LED is easily noticed in a large dimmer room.

Level LEDS

Amber level LEDs provide a convenient indication of dimmer level for each of the dimmers in a module.

BIN ID SETTING

Each bin CPU card (sited at the right of each bin motherboard) has a rotary switch to set the ID number of the bin. Normally this is set at initial installation by Theatrelight technicians along with the hardware DMX/Ethernet selection for both the bin A and B signal inputs. If any bin CPU needs to be replaced, these settings must be duplicated on the replacement CPU card. Bin CPU cards can be accessed by removing the 5th and 6th dimmer modules (with cabinet mains power off).

BIN DIAGNOSTIC LEDES

A set of 3 diagnostic LEDs is sited on the bin motherboard, and can be checked if necessary through the right hand ventilation slots of the right hand dimmer module in each bin. All bin LEDs are initially turned on full at power up, before assuming their correct status.

Bin DMX LED (top)

The Green DMX LED at the top of the group of 3 bin LEDs is continually On if the DMX (or DMX over Ethernet) signal to the bin is free of errors. The LED flashes regularly if the bin cannot see a DMX signal. The LED switches off or flashes irregularly if the bin DMX signal has errors.

Bin Temperature LED (middle)

The Red temperature LED at the centre of the group of 3 bin LEDs is normally off. Two temperature sensors are fitted in every plug-in module, one at the top, and one at the bottom of the module. In the event that the temperature of any sensor reaches 50 degrees C, the LED starts blinking. The LED turns on fully when any sensor in the bin reaches 60 degrees C.

Bin Status LED (bottom)

The Amber Status LED at the bottom of the group of 3 bin LEDs indicates communications activity with the central microprocessor.

CONTROL PANEL

The Control Panel allows setup of all parameters of all dimmers in the cabinet from a central keyboard and LCD located at eye height. This central microprocessor is only required for dimmer set-up—once all dimmer parameters have been set in each bin CPU, the central processor cannot affect the proper operation of the dimmers. Power for the dimmer electronics is supplied by three high reliability 12 volt plug-in switch mode power supplies (one on each phase) located in the control panel drawer. These power supplies are protected by 3 MCBs located at the back of the control panel drawer.

Control Panel LCD display

The large 4 line, 20 character per line Blue LCD display has white LED auto-dimming backlighting, giving excellent contrast and readability under all lighting conditions. The brightness of the display goes to full at the first key press, and reduces after 10 minutes. The display is easily readable across the width of a standard dimmer room.

Control Panel Keys

The Control Panel has a keypad of 6 keys. The key operation is designed to be simple and to allow the operator fast and easy access to all dimmer functions in all bins. The Menu key steps down through the menu tree, while the Back key steps back. The keys Up ▲ , Down ▼ , Left ◀ , and Right ▶ are used for navigation, and to adjust values. In most menus the function

of the key is indicated in the bottom line of the LCD (“softkey”), making for easier understanding. If a value is changed (such as a DMX patch address), the new value will be saved automatically to flash memory after a timeout period of 10 minutes. Alternatively the new value can be saved immediately by pressing the Back key to return to the top menu. The keys may be locked to prevent unauthorised operation.

Control Panel LEDs

Front panel LEDs are provided for display of DMX signal, over-temperature indication, remote control codes, and proper mains presence on Phases A B and C. All LEDs are initially turned on full at power up, before assuming their correct status.

DMX LED

The Green DMX LED is continually On if the DMX (or DMX over Ethernet) signals are free of errors on all bins. The LED flashes Off if a bin DMX signal is disconnected, or if there are errors during communication with that bin.

Status LED

The Amber Status LED indicates communications activity with the bins, or the Remote control communications network (dependent on software version).

Phase A B C LEDs

Green LEDs A B C indicate correct presence of mains power on each phase.

Temperature/Error LED

The red temperature/error LED is normally Off. In the event that the temperature of any sensor in the plug-in modules in the cabinet reaches 50 degrees C, the LED starts blinking. The LED turns on fully when the temperature reaches 60 degrees. If any module reaches 70 degrees the PID forces a fade out of the module dimmer channel/s over 7 seconds. Levels are restored again over 7 seconds when the sensor temperature drops below 70 degrees. Other module levels are not affected. The LED flashes briefly if a checksum error is detected during bin communication. This LED also flashes to draw attention to other bin and power supply errors (see page 37) in combination with error information on the LCD screen.

COOLING

The PID II cabinet is cooled by three long life fans, with fan speed controlled by the temperature of the hottest dimmer in the cabinet. If no dimmer requires cooling, the fans are turned off. The preferred cooling method for the PID II cabinet is for cool, filtered air to be supplied under slight pressure by ducts to the fan box at the top of the PID cabinet. This air can be conveniently sourced from, for example, air exhausted from the auditorium or studio, and it should be below 30 degrees C. After passage through the dimmer cabinet, the warmed air is exhausted through slots in the front of the dimmer modules into the dimmer room. This arrangement maintains the dimmer room under positive air pressure as in a “clean room”, minimises the build-up of dust in the dimmer electronics, and allows unobstructed access to the front of the dimmer cabinet. In warm

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climates, the heated air can be allowed to escape through a simple non-return valve to the outside. Alternatively in cooler climates the heated air can be re-circulated back to the auditorium if required. Although not recommended, the cabinets can be supplied with reversed fans if specified at time of order. Dimmer cabinets should be mounted in a position where fan noise cannot interfere with a performance.

POWER SUPPLY

The PID II is designed to be supplied with power mains of 90 to 265 volts AC, 3 phase and Neutral (Star), 45 to 65 Hz. Each PID cabinet must be properly earthed. As the PID II is fitted with aluminium busbars, only tin or zinc plated mains lugs should be used with an approved contact grease such as "Noalox" (Ideal).

DMX CONTROL

DMX-512 control is commonly used in Theatre and TV for lighting control. One DMX line or "Universe" addresses a maximum of 512 dimmers. Each dimmer bin can be selected to one of two DMX universes from the master keypad.

DMX Patch Addresses

Every dimmer in the cabinet may be set to its own DMX address. Using this built in patch system allows great flexibility in matching dimmers to loads- if a large number of loads are required to be controlled together, any number of dimmers (even all dimmers in the cabinet) can be controlled by a single DMX channel. The DMX address may be set to be any number between 1 and 4096 to ease the task of calculating dimmer numbers in multiple DMX universe systems.

DMX Fail Modes

The PID II provides two options in case the DMX signal fails, or the DMX signal is turned off, as for example when the control panel is turned off at the end of a show. The options are

Fade to blackout- after a delay time, all dimmers in the cabinet are faded to blackout. Both the delay time and the fade time are programmable from Instant to 30 minutes.

Hold last DMX levels- the last valid DMX levels are held until the next valid DMX input, or the cabinet is switched off

REMOTE CONTROL

The dimmers of the PID may also be optionally controlled by RS-485 signal or Ethernet when supplied with optional software. In this case the Status LED indicates remote control communications as well as bin communications.

DIMMER PARAMETERS

The dimmer channels in the PID II have a number of parameters which may be set individually for each dimmer. As incorrect setting of these parameters can prevent the dimmers from working as expected, care must be taken when setting them up.

Test and Set Dimmer levels

Normally each dimmer is controlled from the DMX line or RS-485/Ethernet line where fitted. However the Test/Set options allow each dimmer to be set to a level which *overrides all control inputs from any source*. This override level can be set to any level between Off and Full. An "All" function allows all Test/Set levels in the cabinet to be set at the same time. Each dimmer can also be flashed instantly to Full for identification. The "All" function may also be used with Flash, allowing all dimmers in a bin to be flashed to Full at the same time. The option of flashing of all dimmers in the cabinet is not provided as the instant current surge could trip the supply MCBs in many installations.

The Test functions are of use during set-up to help check lamps or wiring problems without the use of a control panel. The function is also useful where lights such as orchestra or working lights must be left on permanently.

Minimum and Maximum Dimmer levels

Each dimmer may be set to its own minimum level, and its own maximum level. The "All" function allows all minimum or all maximum levels in the whole cabinet to be set at the same time.

The minimum setting can be used to keep lamp filaments warm for fast response time, or for example to maintain lighting at a minimum level of illumination, a requirement often needed by orchestra lighting and working lights.

The maximum setting can be used for example to prolong lamp life, which is very sensitive to over-voltage conditions. For this reason, the maximum setting has higher priority than the minimum setting.

As both Minimum and Maximum levels may be set to anywhere from Off to Full, care needs to be taken in setting these levels.

Dimmer curves

Each dimmer in the PID may be set to a number of dimmer curves. Curves fitted as standard are:

Incandescent: The Incandescent dimmer curve is suitable for most Theatre and TV applications using incandescent bulbs whether normal tungsten or tungsten halogen type. The curve is specially tailored to provide linear apparent light under these conditions.

Non-Dim: The Non-Dim curve selection is for use with loads which must be switched on and off, such as motors, smoke machines, and other effects. Each dimmer using the Non-Dim curve switches on at a user programmable Non-Dim level (see below): any control level at this level or above will switch the dimmer to Full instantly. Once On, the dimmer will stay on until the control level goes 5% below the Non-Dim level. An "All" function allows all Non-Dim switch levels in the cabinet to be set at

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the same time. The Non-Dim facility may be combined with the Minimum and Maximum settings to switch the dimmer output between any two selected output voltages.

Television: A modified Incandescent dimmer curve suitable for adjusting the colour temperature of incandescent bulbs in TV or Film studios. This curve is not intended to be used as a linear dimming curve in normal theatre work.

Fluorescent: This curve is suited to dimming mains ballasted fluorescent lamps fitted with filament transformers and pulse ballasts. The flicker apparent at low dim levels can be controlled by setting the Off level (see below).

Neon: This curve is suited to dimming neon discharge tubes fitted with pulse ballasts. The flicker apparent at low dim levels can be controlled by setting the Off level (see below).

Linear Power: This dimmer curve outputs linear RMS power against DMX level for use when the PID is used to control heating elements in ovens etc.

Linear Phase Angle: This dimmer curves outputs linear phase angle against DMX level where necessary.

The "All" function allows all dimmer curves in the whole cabinet to be set at the same time. Other curves, or custom dimmer curves may be included by arrangement with Theatrelight.

Non-Dim levels

When the dimmer curve is set to Non-Dim as described above, the Non-Dim switching level may be programmed individually for each dimmer between the levels of 10 and 90%. The "All" function allows all levels in the whole cabinet to be set at the same time.

Off levels

For all dimmer curves, the Off Level may be programmed individually for each dimmer. If the *control level* is below this level, the dimmer is off; above this level the dimmer follows the normal selected dimmer curve. The "All" function allows all levels in the whole cabinet to be set at the same time. The Off Level is of most use in controlling unwanted flicker of Fluorescent and Neon tubes at low levels.

Proportional Dimmer levels

Each dimmer may be set to its own proportional level. The "All" function allows all levels in the whole cabinet to be set at the same time.

The proportional level acts as a master over the incoming dimmer control level. For example if the proportional level is set at 50%, the dimmer level will always be at half of the fader setting on the control panel. The proportion level setting may be used to balance the light output of luminaires set to the same DMX address, which is useful in balancing cyclorama floodlights. The setting may also be used to proportionally control the maximum output from the dimmer for example where 110 volt Par cans are used on a 220-240 volt mains supply.

The proportional setting has a higher priority than the maximum setting. As the Proportional level may be set anywhere from Full to Zero, care needs to be taken in setting the level.

Softstart Fade Times

Each dimmer may be set to its own softstart fade time. The "All" function allows all softstart times in the whole cabinet to be set at the same time. A softstart fade up limits the inrush current into cold tungsten filament bulbs. This initial current may be as much as 12 times the normal working current of the filament—limiting this current greatly prolongs lamp life.

The softstart time for each dimmer can be set from 0 to 1 second in 100 millisecond steps. A shorter time gives a faster response; a longer time gives longer lamp life. For most stage lighting requirements, a time of 100 to 400 milliseconds (0.1 to 0.4 seconds) is suitable, while for larger film and TV Studio incandescent bulbs in the range of 5 to 12 kilowatts, a time of up to 1 second will greatly prolong lamp life and reduce running costs. The softstart time is applied after processing of Non-Dim switch levels. This allows limiting high starting currents during start-up of capacitor-start motors or other capacitive loads. If this facility is not required, then Non-Dim channels should have their softstart times set to zero. Note that an initial softstart time of 2 seconds is applied to all channels after the PID II cabinet is powered on (excepting Non-Dim channels).

DIMMER SETTINGS PRIORITY

The dimmer settings described above are processed in a fixed priority. Levels are processed and passed to the dimmers in the following order of increasing priority:

1/ The DMX control level (or the Fail DMX control level if the DMX signal is not present) and the Scenes or Preset levels (if fitted) for that dimmer are mixed on an HTP (Highest Takes Precedence) basis.

2/ If the **Test/Set level** for the dimmer is set between Off (0) and Full (F) (or flashed), the Test/Set level replaces the dimmer level. If no Test level is set for that dimmer (-), no change is made. All Test/Set levels are set disabled after the Reset command.

3/ If the control level is below the **Off Level** set for that dimmer, the control level is set zero. If the control level is above the Off Level, no change is made. All Off Levels are set zero after the Reset command.

4/ If the dimmer curve is set to **Non-Dim**, the control level will be switched to Full if over the Non-Dim level, and switched off if under. The Non-Dim level may be set anywhere between 10% and 90%. All Non-Dim levels are set to 50% after the Reset command.

5/ If the **Minimum level** for the dimmer is set above 0%, the dimmer level cannot be lower than that level. If the Minimum setting is 0% for that dimmer, no change is made to the level. All Minimum levels are set zero after the Reset command.

6/ If the **Maximum level** for the dimmer is set below 100%, the dimmer level cannot be higher than that level. If the Maximum setting is 100% (F) for that dimmer, no change is made. Giving Minimum and Maximum a higher priority than Non-

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Dim permits switching between any two voltages to suit the application. All Maximum levels are set to 100% (F) by the Reset command.

Note that the normal Incandescent curve is used to define any Minimum or Maximum voltage limits imposed on dimmers selected to Non-Dim.

7/ If the **Proportional level** for the dimmer is set lower than 100%, the control level for that dimmer is multiplied by the Proportional level. If the Proportional Level for the dimmer is set to 100% (F), no change is made. All Proportional levels are set to 100% (F) by the Reset command.

8/ Finally, the **Softstart Time** setting limits the fade up rate of each dimmer channel. If the Softstart time is set to zero for that dimmer, no change is made to the fade up rate. The Softstart time applies only to the Up fade rate—it does not affect the Down fade rate of the control level applied to any dimmer. All Softstart times are set to 300msec by the Reset command.

9/ The phase On time for each dimmer is then calculated from the final dimmer level according to the **Dimmer Curve** programmed for that dimmer. All dimmer curves are reset to Incandescent by the Reset command.

LEVEL DISPLAYS

The LCD screen may be set to read out a number of operating conditions.

Bin DMX levels

The LCD displays the latest bin DMX levels before modification by any Test, Minimum or Maximum settings etc. The current bin number may be changed while in this menu.

Bin dimmer levels

The LCD displays the final control level applied to the chosen dimmer curve the dimmers in the bin. This level shows the level modified by the following settings: Test, Min, Max, Non-Dim, Off, Proportional, and Softstart. The current bin number may be changed while in this menu.

Dimmer AC output voltage

The LCD displays the RMS output voltage of the dimmers of the current bin. The current bin number may be changed while in this menu. All dimmer and MCB AC voltages readings (below) are dependent on correct calibration.

Module MCB status

The LCD displays the MCB status (on or off) of the MCBs of the current bin. Holding the Menu key down in this mode shows the AC volts present on the dimmer side of the MCB. The current bin number may be changed while in this menu.

Mains voltage and frequency

The LCD displays the RMS voltage on Phases A, B, and C, and the frequency in Hertz of each phase. Voltages are shown to the nearest volt, and frequency to the nearest 0.1 Hz. Each phase voltage may be individually calibrated against a known accurate RMS voltmeter. Mains and bin AC calibration levels are held permanently in flash memory.

Maximum temperatures

The LCD displays the current temperature of each bin in the cabinet. The bin temperature is calculated as the highest module temperature in each bin. All temperatures are in degrees Centigrade.

Bin temperature history

The LCD displays the temperature history for the bin. The current bin number may be changed while in this menu. The readouts for the bin are the temperature Now, the temperature 30 minutes, one hour, and two hours ago, and the temperature averaged over the last 2 hours. Timing is re-started at power on. Also displayed is the current maximum temperature of all modules in the cabinet, with the module number and bin number at that temperature.

Module temperatures

The LCD displays the current temperature of each module in the bin, and is the highest of the two thermal sensors fitted in the module. The current bin number may be changed while in this menu. While in this menu, pressing the Menu key provide a Fan test to Full function.

TLNet Receive Data

The LCD displays the first 27 values of the received data present on the bin communications network. This display is for setup and diagnostic use only.

TLNet Transmit Data

The LCD displays the first 27 values of the transmitted data present on the bin communications network. This display is for setup and diagnostic use only.

RESETTING DIMMER DEFAULT PARAMETERS

The dimmer parameters in each bin may be reset to default values. These default values are described in the next section.

PID II DEFAULT PARAMETERS

The range and values of the different parameters of each dimmer after a Reset Bin command are described below. All parameters are held in permanent flash memory.

DMX PATCH ADDRESSES	Range	After Reset	Notes
DMX Patch addresses	n/u, 1-4096	1, 2, 3...	Addresses > 512 have (N x 512) subtracted
DMX FAIL MODES	Range	After Reset	Notes
Fade to Black	On/Off	Off	After <i>Reset All</i> only (not <i>Reset Bin</i>)
Fade to Black delay/fade times	Instant-30 minutes	5 mins/30 secs	After <i>Reset All</i> only (not <i>Reset Bin</i>)
Hold Last Levels	On/Off	On	After <i>Reset All</i> only (not <i>Reset Bin</i>)
DIMMER SETTINGS	Range	After Reset	Notes
Test/Set Levels	Disabled, 0-100%	Disabled	<i>Must be disabled for normal dimmer levels</i>
Minimum Levels	0-100%	0%	<i>Must be <100% for normal dimmer levels</i>
Maximum Levels	0-100%	100%	<i>Must be >0% for normal dimmer levels</i>
Non-Dim levels	10-90%	50%	Hysteresis = +0%, -5%
Off levels	0-90%	0%	Hysteresis = +0%, -1%
Dimmer curve	In,ND,TV,FI,Ne,LP,LA	In	In = Incandescent, ND = Non-Dim
	TV =TV/Film colour temp control, FI, Ne = Fluo/Neon discharge tubes, LP/LA = Linear Power/Linear Phase Angle		
Proportional Levels	0-100%	100%	<i>Must be >0% for normal dimmer levels</i>
Soft Start Times	0-1.0 second	300 msec	Up time only (Down time always instant)
KEY LOCK	Range	After Reset	Notes
Key Lock	On/Off	Off	Only accessible in Top Menu Level

PID II POWER INSTALLATION

The PID II cabinet like all SCR dimmers is an inherent generator of EMI (Electro-magnetic Interference) and requires careful installation following good wiring and earthing practice. The potential for acoustic and EMI problems with a dimmer installation increases with the number of dimmers. Involving professional assistance with proven experience is highly recommended. The following points should be considered in order to achieve reliable operation, and to ensure minimum EMI in other equipment such as audio and video equipment in Theatres and TV Studios:

SUPPLY TRANSFORMER

1. Obtain professional advice from a consultant who has a proven record in specifying dimmer transformers.
2. Locate the supply transformer as close as possible to the dimmer cabinets (allowing for acoustic noise).
3. TV Studios and larger theatres must use dedicated transformer(s) for the dimmer installation.

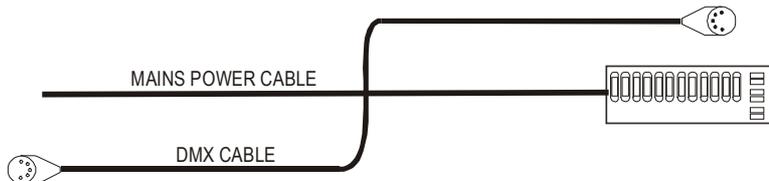
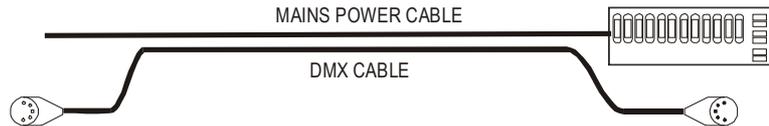
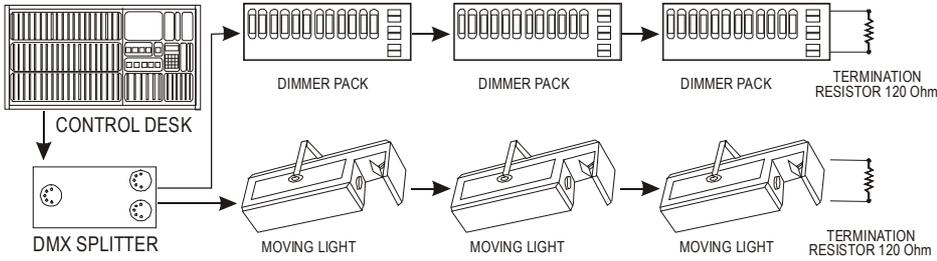
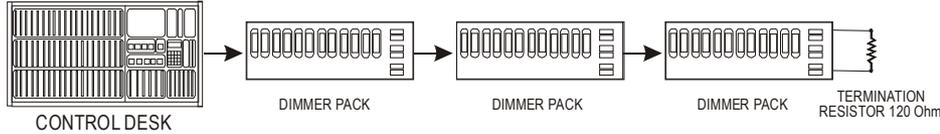
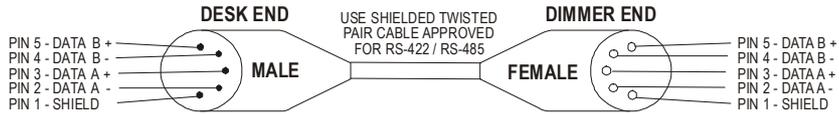
SUPPLY CABLING PRACTICE

1. Keep the distance between the transformer(s), switchboards and dimmer cabinets as close as possible.
2. Any spacing between the phase wires and the neutral wire results in high inductance, and high conducted and high radiated EMI. To minimise EMI always keep mains supply phase and neutral wires parallel and tightly bunched together through all paths of the cable run, including paths through switch-boards.
3. On small installations use Neutral-Screen cable to minimise inductance and radiated EMI.
4. On installations too large for available Neutral-Screen sizes, use closely bound insulated cables.
5. Never space supply mains cables apart, or use spaced solid bus-bar systems for a dimmer mains supply.
6. Use neutral conductor(s) that total at least 1.5 times the area of any phase conductor.

LOAD CABLING AND EARTHING PRACTICE

1. Install the dimmers as close as possible to the lighting loads (allowing for acoustic noise).
2. Do not use common neutrals to the loads. Each dimmer load should have its own phase and neutral pair.
3. Each load pair should be twisted closely together to minimise inductance and radiated EMI.
4. As distances from dimmer to load in a theatre or TV Studio can be considerable, cable size should be planned for a specified minimum voltage drop, not for current capacity.
5. Dimmer load cables are a source of EMI—keep load cables clear of all other power and data cables. Always run load cables in earthed steel (*not plastic*) conduit or trunking for low EMI where possible.
6. Ensure all equipment is safely earthed. All earth wires must be able to carry the expected fault current.
7. If local regulations permit, use a single point earth-neutral bond in the building. Using multiple earth-neutral bonds (eg E-N links in sub-distribution boards) may result in part of the neutral current flowing through the earth wiring—*any current in the earth wiring may cause interference in audio and video systems.*

16 PID II OPERATION

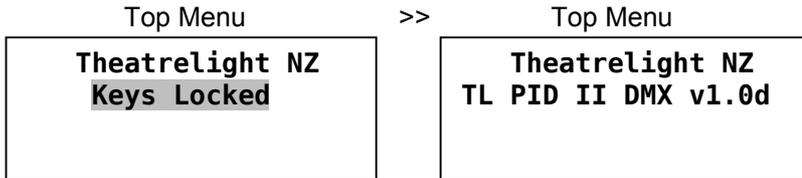


PID II DMX INSTALLATION

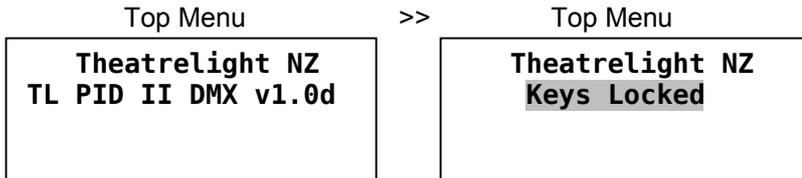
As the DMX512 communication system has no built error checking, any DMX512 wiring installation must follow proper practice to achieve reliable operation. The following points (but not limited to) need to be considered for any DMX512 installation.

1. **Always use a good quality shielded twisted pair cable suitable for the DMX512/RS485 communications to standard ANSI E1.11-2004.**
 2. **Use good quality 5 pin XLR connectors, and wire them as in the top drawing opposite.**
 3. **Each PID II cabinet has two DMX inputs “A” and “B”: twin pair cable must be used if the “DMX B” input is required.**
 4. **Do not connect the shield to earth or the XLR metal body.**
 5. **Do not disconnect the shield wire at one or both ends of a DMX512 cable.**
 6. **DMX512 wiring must be a daisy chain, starting at the control console and looping from device to device. The signal must not have any splits or T connections, except when using an electronic splitter.**
 7. **The last device in the line should be terminated with a 120 ohm resistor to prevent reflections.**
 8. **Keep DMX512 cables at least 600mm away from parallel power and dimmer load cables. Cross load or mains cables at right angles to DMX cables.**
 9. **For lowest interference install DMX512 cabling in its own earthed steel (*not plastic*) conduit or trunking.**
 10. **While the DMX512/RS485 standard allows for up to 32 devices on a line, keep the number well below this to ensure reliability. (This figure may be extended to 100 Theatrelight PID II cabinets if no other devices are on the same DMX line).**
 11. **The use of isolated DMX512 splitters is recommended. These allow the signal to split into several legs, making cabling simpler and ensuring that failure of one device or cable does not fail the whole system.**
 12. **After any large permanent installation, all DMX wiring should be tested with an oscilloscope or DMX diagnostic tool to check adequate signal levels with minimum distortion, noise and reflections.**
- **DMX512 splitters re-shape and buffer the received DMX. Isolated splitters also help to prevent issues caused by earth loops and heavy loading. Electronic splitters may be cascaded. Theatrelight DMX Splitters are available as an 8 channel 19 inch, 1 U rack mounting configuration, or as a 4 channel stand-alone portable version.**

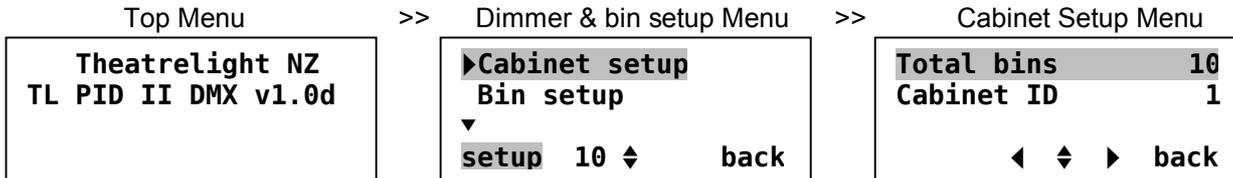
Unlocking the keys:



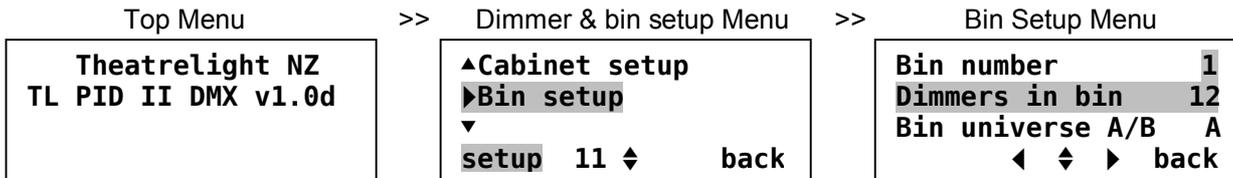
Locking the keys:



Setting the total number of bins in the cabinet:



Reading the number of dimmers in each bin:



PID II INITIAL SETUP

All PID II cabinets need an initial setup at installation. The instructions below assume a start from the top menu level—pressing the Back key several times always goes to top menu: the screen shows “**Theatrelight NZ**”, together with the model, number of channels and the software version. If the keys are locked, the LCD will show “Keys Locked”.

UNLOCKING THE KEYS

The keys may be unlocked as follows:

1. **To unlock the keypad, hold ◀ + ▶ + ▼ until the message “Keys Locked” disappears (about 8 seconds).**
2. **Release all keys: the screen shows “Changes saved to flash memory”.**

LOCKING THE KEYS

After changing any settings, you can disable the keys to prevent unauthorised changes as follows.

1. **Press the Back key several times to reach the top menu. This also saves the latest changes.**
2. **To lock the keypad, hold ◀ + ▶ + ▲ until the message “Keys Locked” appears (about 2 seconds).**
3. **Release all keys: the screen shows “Changes saved to flash memory”.**

All the following examples need the keys to be unlocked.

SETTING THE TOTAL NUMBER OF BINS IN THE CABINET

At installation of each dimmer cabinet, it is necessary to initialise the number of bins of dimmers in each cabinet:

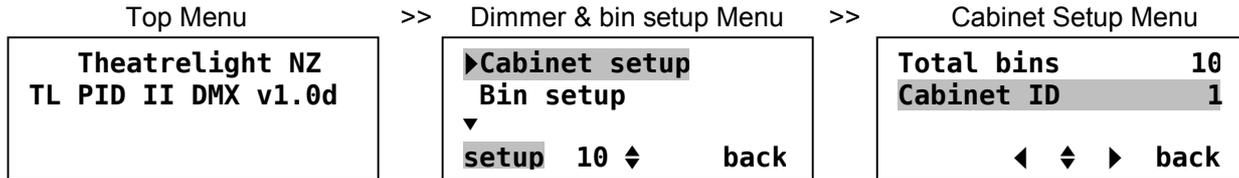
1. **From the top menu, press Menu twice, select “Dimmer & bin setup”, press Menu.**
2. **Press ▲/▼ to select “Cabinet Setup” (line 10), press Menu.**
3. **Press ▲/▼ to adjust the number of bins in the cabinet (usually 8 or 10 bins for standard cabinets)**
4. **Press Back until you reach the top menu: the screen shows “Changes saved to flash memory”.**

READING THE NUMBER OF DIMMERS IN EACH BIN

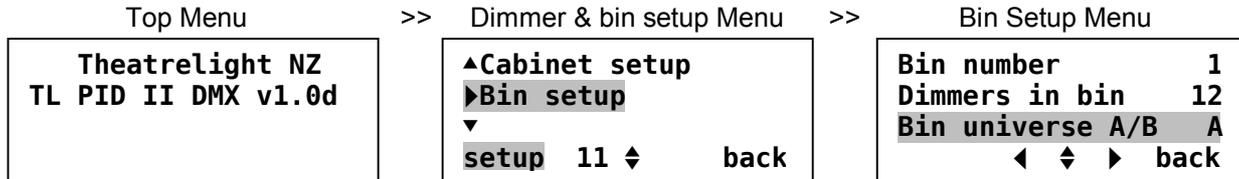
The number of dimmers in each bin is fixed by the firmware of each Bin CPU. These settings can be checked on the LCD display. To read the number of Dimmers in each Bin:

1. **From the top menu, press Menu twice, select “Dimmer & bin setup”, press Menu.**
2. **Press ▲/▼ to select “Bin Setup” (line 11), press Menu.**
3. **Press ▲/▼ to adjust “Bin number”: the number of dimmer is displayed in the line “Dimmers in Bin”.**
4. **Repeat step 3 to read the bin numbers in other bins. (“Error” is shown if a bin does not respond).**
5. **Press Back until you reach the top menu.**

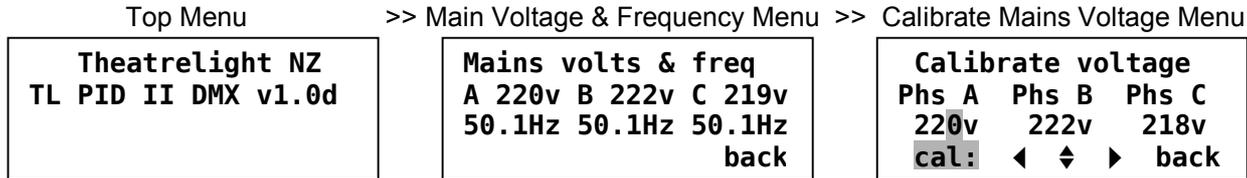
Setting the cabinet ID:



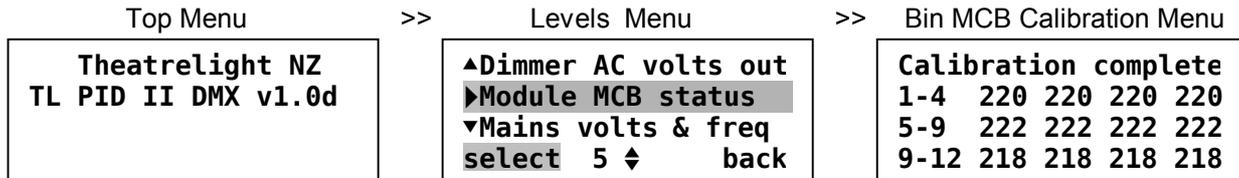
Setting bins to DMX universe “A” or “B”:



Calibrating mains voltage :



Calibrating module MCB voltage:



SETTING THE CABINET ID

A unique cabinet ID number needs to be allocated to each cabinet for use with the optional reporting software where fitted:

1. From the top menu, press Menu twice, select “Dimmer & bin setup”, press Menu.
2. Press ▲/▼ to select “Cabinet Setup” (line 10), press Menu.
3. Press Right ▶ to move the cursor to “Cabinet ID”, press ▲/▼ to adjust the ID number (must be unique)
4. Press Back until you reach the top menu: the screen shows “Changes saved to flash memory”.

SETTING BINS TO DMX UNIVERSE “A” OR “B”

Each bin can be selected to use either of two DMX universes A or B from the two DMX inputs selectable on each Bin CPU. Once the Bin CPU A and B links are setup to input either DMX or Ethernet (where fitted), the bin DMX A/B selection can then be controlled from the Main CPU as follows:

1. From the top menu, press Menu twice, select “Dimmer & bin setup”, press Menu.
2. Press ▲/▼ to select “Bin Setup” (line 11), press Menu.
3. Press ▲/▼ to adjust “Bin number”, press ▶ to move to “Bin Universe A/B”.
4. Press ▼ to set the bin to DMX universe “A”, press ▲ to set the bin to DMX universe “B”.
5. Repeat steps 3 and 4 to adjust the bin number to set the DMX universe “A” or “B” for other bins.
6. Press Back until you reach the top menu: the screen shows “Changes saved to flash memory”.

CALIBRATING AC VOLTAGE READINGS

Voltage calibrations are hidden commands, and only necessary at installation. To re-calibrate all AC voltages:

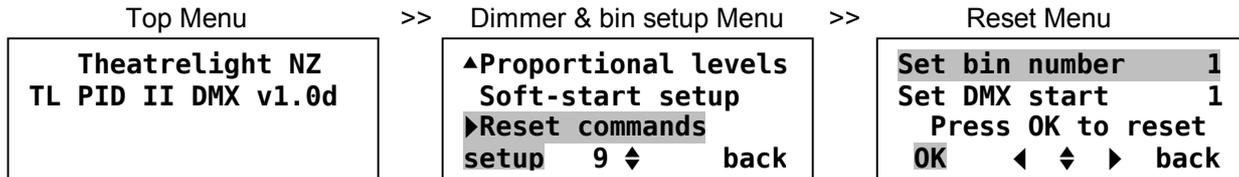
1. From the top menu, press Menu once, select “Voltage and Frequency” (line 6), press Menu.
2. Press Menu again to access the (hidden) calibration menu.
3. Press Left ◀ or Right ▶ to select the phase, then press Up▲ or Down▼ to adjust the voltage display to agree with a properly calibrated RMS voltmeter *on the same phase*. When done, press Back to reach the top menu

Whenever the mains AC volts calibration is changed, the MCB AC volts calibration for *each bin* must be re-set. Continue:

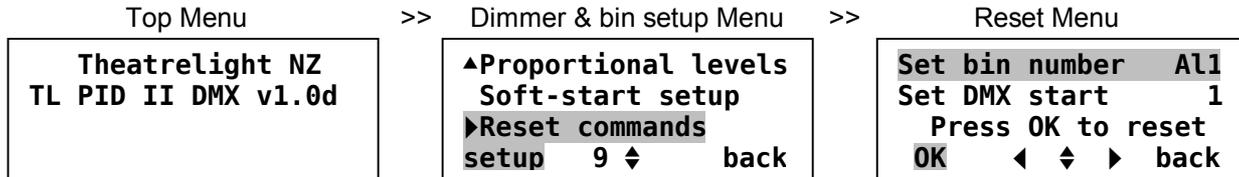
4. From the top menu, press Menu once, select “Module MCB status” (line 5), press Menu.
5. Press ▲/▼ to select each bin, then hold the Menu key to show the AC volts on each module's MCBs.
6. While holding Menu, press Back to re-calibrate the bin. Repeat steps 4 and 5 for other bins.
7. To save the new calibration values, press Back until you reach the top menu.

This re-calibration must be repeated for each bin in the cabinet. All bin MCBs must be *on* to be re-calibrated.

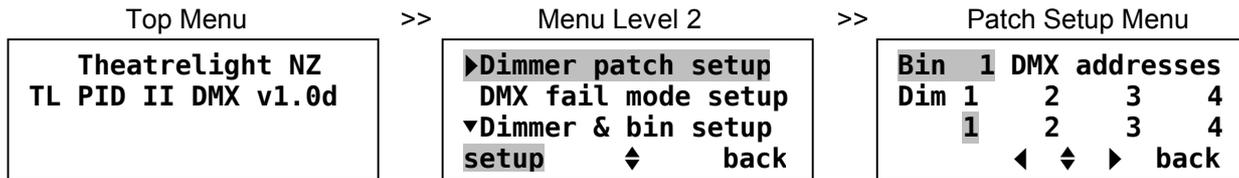
Resetting a bin to default parameters:



Resetting all bins to default parameters:



Setting DMX patch addresses:



SETTING AND DISPLAYING DIMMER PARAMETERS

Once the number of bins in the cabinet, the dimmers per bin read and checked, and the DMX A/B selection have been initialised, you can quickly reset the start DMX address and other parameters of all dimmers in a bin, or of all dimmers in the cabinet if required. Then you can display or edit any individual dimmer's DMX address, or its Min, Max, Off, Proportional, or Test level, or its Soft-start Time, or Dimmer Curve, or view other values such as dimmer levels, temperatures etc.

SETTING ALL DIMMER PARAMETERS TO DEFAULTS

To reset all DMX and dimmer parameters in each bin, or all bins in the cabinet to default settings:

1. **From the top menu, press Menu twice, select “Dimmer & bin setup”, press Menu.**
2. **Press ▲/▼ to select “Reset Commands” (line 9), press Menu.**
3. **Press ▲/▼ to select “Reset dimmers and DMX”, press Menu.**
4. **Press ▲/▼ to select the Bin number to reset, or “All” to reset All bins.**
5. **Press Right ► to move the cursor to the DMX Start address for the bin (or the cabinet if All bins).**
6. **Press ▲/▼ to adjust the DMX Start address, ◀ / ▶ to adjust tens and hundreds for speed.**
7. **Press “OK” (the Menu key).**

The screen flashes the Bin number and the DMX Start number for 2 seconds while the bin is reset. Resetting **All** bins can save time if all DMX addresses in the cabinet are required to be in order—each bin's DMX Start address is automatically incremented by the numbers of dimmers in each bin through all the bins in the cabinet. The dimmer parameters are reset to default values described under the heading **PID parameters** on Page 14. “Error” is shown if a bin does not respond.

When the screen stops flashing, the Reset menu returns:

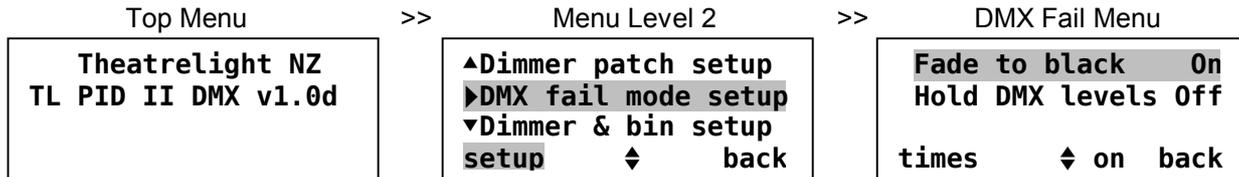
8. **Reset other bins to different DMX Start addresses if required.**
9. **Press Back until you reach the top menu: the screen shows “Changes saved to flash memory”.**

SETTING DMX PATCH ADDRESSES

To edit the DMX address of any dimmer in any bin:

1. **From the top menu, press Menu three times. The screen shows the current bin, and the DMX patch.**
2. **Press ▲/▼ to adjust the DMX address, ◀ / ▶ to adjust tens and hundreds for speed, or other dimmers.**
3. **To adjust the bin number down, press Left ◀ until the cursor is over the 100s column of the first dimmer in the bin—pressing Left ◀ again then decrements the bin number with each press, giving fast bin access.**

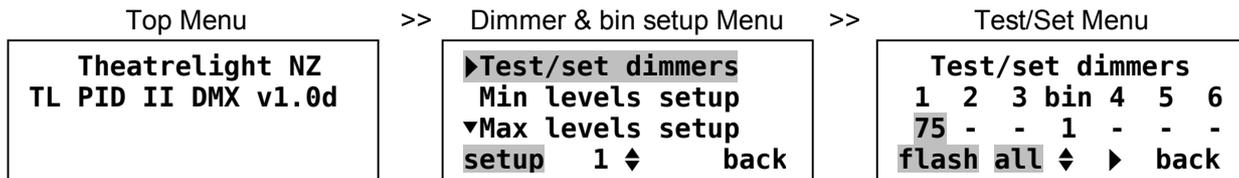
Setting DMX fail mode:



Setting DMX fail mode times:



Testing or setting dimmer levels:



4. **To adjust the bin number up, hold Right ▶ : the cursor steps quickly through the dimmers and bins—release the key when the bin number is the one you want to edit.**
- For large loads such as cyclorama lighting, you can set any number of dimmers to the same DMX address

SETTING DMX FAIL MODE AND DMX FAIL MODE TIMES

To set the DMX Fail Mode for **all** dimmers in the cabinet to either “Fade to Black” or “Hold DMX levels”:

1. **From the top menu, press Menu twice, select “DMX Fail Mode”, press *setup* (the Menu key).**
2. **Press Up▲ or Down▼ to select the mode, then press “on” (Right ▶) to set the mode On.**

To set the DMX Fail Mode times for **all** dimmers in the cabinet (Fade to Black mode only):

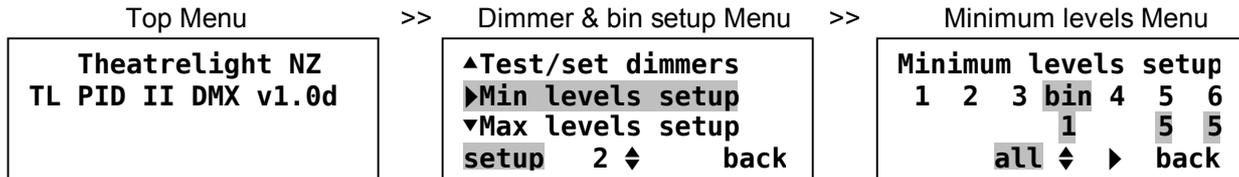
1. **While In the Fail Mode Menu above (with Fade to Black mode set On), press “*times*” (Menu).**
 2. **Press Left ◀ or Right ▶ to select the Delay or Fade times, then press Up▲ or Down▼ to set the time.**
 3. **Press Back until you reach the top menu: the screen shows “Changes saved to flash memory”.**
- DMX Fail mode and fade times (if set to Fade to Black mode) apply to all dimmers in the cabinet

TESTING OR SETTING DIMMER LEVELS

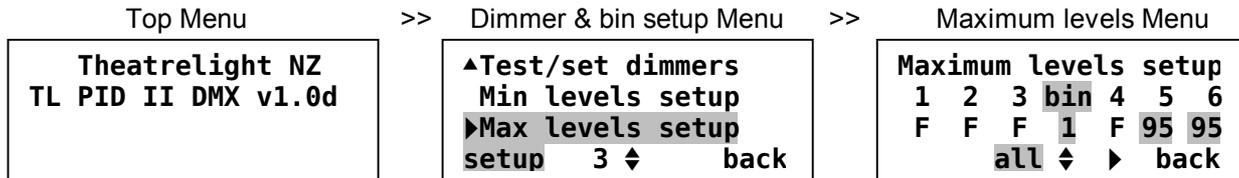
Test/Set levels take over control from any input DMX or other control level. You can also use this mode to temporarily flash levels to Full for identification or test. To set Test/Set levels for each dimmer, or all dimmers in the cabinet, or to flash dimmers:

1. **From the top menu, press Menu twice, select “Dimmer & bin setup”, press Menu.**
2. **Select “Test/set dimmers”, press Menu.**
3. **Press Left ◀ or Right ▶ to select the dimmer, Up▲ or Down▼ to adjust the level.**
4. **Press “All” (Left key) with Up▲ or Down▼ to adjust the Test levels of all dimmers *in the cabinet*.**
5. **Press “Flash” (Menu key) to flash the dimmer for identification (and turn off all other dimmers in the bin)**
6. **Hold down “Flash” (Menu key) then press “All” (Left key) to flash on all dimmers in the bin (*not the cabinet*).**
7. **Press Back until you reach the top menu: the screen shows “Changes saved to flash memory”.**

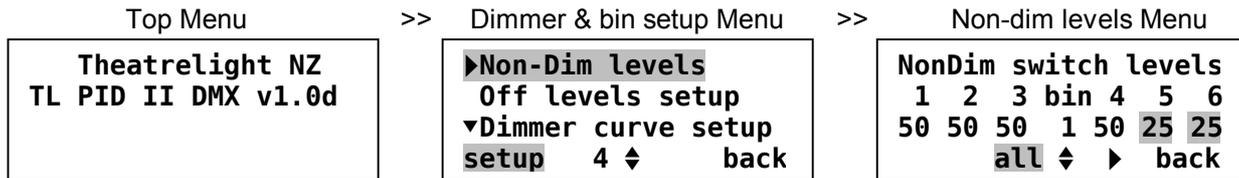
Setting dimmer minimum levels:



Setting dimmer maximum levels:



Setting non-dim levels:



SETTING DIMMER MINIMUM AND MAXIMUM LEVELS

To set Minimum levels for each dimmer, or all dimmers in the cabinet:

1. From the top menu, press Menu twice, select “Dimmer & bin setup”, press Menu.
2. Select “Min levels setup”, press Menu.
3. Press Left ◀ or Right ▶ to select the dimmer, Up ▲ or Down ▼ to adjust the level.
4. Press “All” (Left key) with Up ▲ or Down ▼ to adjust the levels of all dimmers *in the cabinet*.
5. Press Back until you reach the top menu: the screen shows “Changes saved to flash memory”.

To set Maximum levels for each dimmer, or all dimmers in the cabinet:

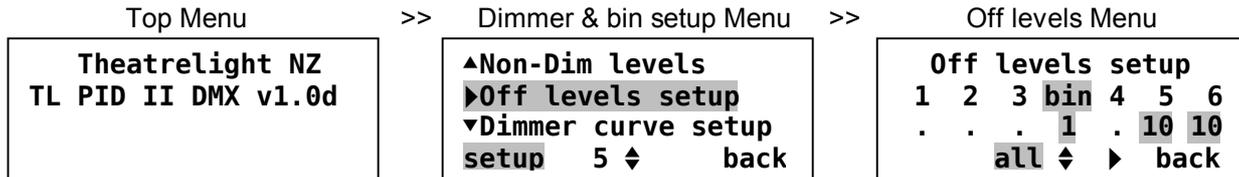
1. From the top menu, press Menu twice, select “Dimmer & bin setup”, press Menu.
1. Select “Max levels setup”, press Menu.
2. Press Left ◀ or Right ▶ to select the dimmer, Up ▲ or Down ▼ to adjust the level.
3. Press “All” (Left key) with Up ▲ or Down ▼ to adjust the levels of all dimmers *in the cabinet*.
4. Press Back until you reach the top menu: the screen shows “Changes saved to flash memory”.

SETTING NON-DIM LEVELS

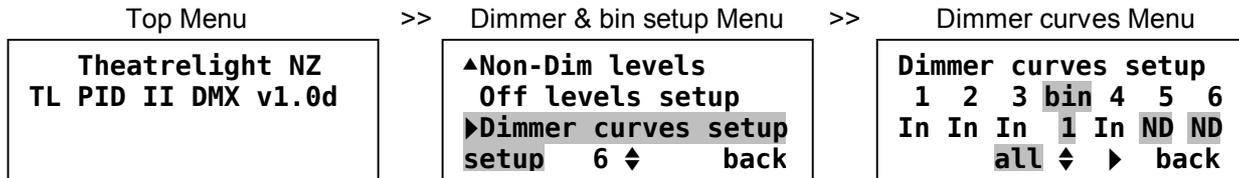
To set Non-Dim levels for each dimmer, or all dimmers in the cabinet:

1. From the top menu, press Menu twice, select “Dimmer & bin setup”, press Menu.
2. Select “Non-Dim levels” (line 4), press Menu.
3. Press Left ◀ or Right ▶ to select the dimmer, Up ▲ or Down ▼ to set the level.
4. Press “All” (Left key) with Up ▲ or Down ▼ to adjust the levels of all dimmers *in the cabinet*.
5. Press Back until you reach the top menu: the screen shows “Changes saved to flash memory”.

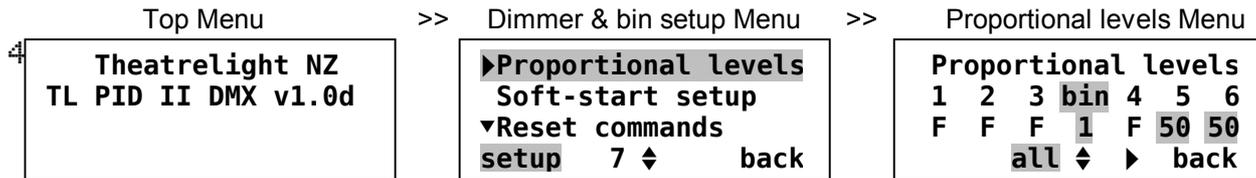
Setting off levels:



Setting dimmer curves:



Setting proportional levels:



SETTING OFF LEVELS

To set Off levels for each dimmer, or all dimmers in the cabinet:

1. From the top menu, press **Menu** twice, select “Dimmer & bin setup”, press **Menu**.
2. Select “Off levels” (line 5), press **Menu**.
3. Press **Left** ◀ or **Right** ▶ to select the dimmer, **Up** ▲ or **Down** ▼ to set the level.
4. Press “All” (Left key) with **Up** ▲ or **Down** ▼ to adjust the levels of all dimmers *in the cabinet*.
5. Press **Back** until you reach the top menu: the screen shows “Changes saved to flash memory”.

SETTING DIMMER CURVES

To set the Dimmer Curve for each dimmer, or all dimmers in the cabinet:

1. From the top menu, press **Menu** twice, select “Dimmer & bin setup”, press **Menu**.
2. Select “Dimmer curve setup” (line 6), press **Menu**.
3. Press **Left** ◀ or **Right** ▶ to select the dimmer, **Up** ▲ or **Down** ▼ to set the curve.
4. Press “All” (Left key) with **Up** ▲ or **Down** ▼ to adjust the curves of all dimmers *in the cabinet*.
5. Press **Back** until you reach the top menu: the screen shows “Changes saved to flash memory”.

Dimmer curves available are In = Incandescent, ND = Non-Dim, TV =Television/Film colour temperature control, Fl, Ne = Fluorescent, Neon discharge tubes, LP = Linear Power, LA = Linear Phase Angle.

SETTING PROPORTIONAL LEVELS

To set Proportional levels for each dimmer, or all dimmers in the cabinet:

1. From the top menu, press **Menu** twice, select “Dimmer & bin setup”, press **Menu**.
2. Select “Proportional levels” (line 7), press **Menu**.
3. Press **Left** ◀ or **Right** ▶ to select the dimmer, **Up** ▲ or **Down** ▼ to set the level.
4. Press “All” (Left key) with **Up** ▲ or **Down** ▼ to adjust the levels of all dimmers *in the cabinet*.
5. Press **Back** until you reach the top menu: the screen shows “Changes saved to flash memory”.

Setting soft-start times:

Top Menu

```

Theatrelight NZ
TL PID II DMX v1.0d
    
```

>> Dimmer & bin setup Menu >>

```

▲Proportional levels
▶Soft-start setup
▼Reset commands
setup 8 ⚡ back
    
```

Soft-start Menu

```

S/Start times x100ms
 1 2 3 bin 4 5 6
 3 3 3 1 3 10 10
    all ⚡ ▶ back
    
```

Displaying bin DMX levels:

Top Menu

```

Theatrelight NZ
TL PID II DMX v1.0d
    
```

>> Levels Menu >>

```

▲Setup menus
▶Bin DMX levels
▼Bin dimmer levels
select 2 ⚡ back
    
```

Bin DMX Levels Menu

```

DMX levels bin 1 ⚡
A 1-4: 10 15 35 45
B 1-4: F . . F
C 9-12: 50 50 50 50
    
```

Displaying bin final dimmer levels:

Top Menu

```

Theatrelight NZ
TL PID II DMX v1.0d
    
```

>> Levels Menu >>

```

▲Menu/setup
  Bin DMX levels
▶Bin dimmer levels
select 3 ⚡ back
    
```

>> Bin Final Dimmer Levels Menu

```

DIM levels bin 1 ⚡
A 1-4: 10 15 35 45
B 1-4: F { { F
C 9-12: 50 50 50 50
    
```

Displaying dimmer output voltages:

Top Menu

```

Theatrelight NZ
TL PID II DMX v1.0d
    
```

>> Levels Menu >>

```

▶Dimmer AC volts out
  Module MCB status
▼Mains volts & freq
select 4 ⚡ back
    
```

>> Dimmer AC Volts out Menu

```

Dimmer vac bin 1 ⚡
D 1▶ 229 150 106 189
D 5▶ 078 0 214 167
D 9▶ 0 0 159 180
    
```

SETTING SOFT-START TIMES

To set Soft-start times for each dimmer, or all dimmers in the cabinet:

1. From the top menu, press Menu twice, select “Dimmer & bin setup”, press Menu.
2. Select “Soft-start setup” (line 8), press Menu.
3. Press Left ◀ or Right ▶ to select the dimmer, Up ▲ or Down ▼ to adjust the time.
4. Press “All” (Left key) with Up ▲ or Down ▼ to adjust the times of all dimmers *in the cabinet*.
5. Press Back until you reach the top menu: the screen shows “Changes saved to flash memory”.

DISPLAYING BIN DMX LEVELS

To display the input DMX levels for each dimmer in any bin (100msec update):

1. From the top menu, press Menu once, select “Bin DMX levels” (line 2), press Menu.
 2. Press ▲/▼ to select the Bin number. The display shows the input DMX levels of the selected bin.
 3. Press Back to reach the top menu.
- Bins of 4 channel modules show DMX (and final dimmer) levels as "bin 1L" (levels 1-12) or "bin 1H" (levels 13-24).

DISPLAYING BIN DIMMER LEVELS

Bin Dimmer levels are the actual final dimmer levels after Test, Min, Max, and other parameters have been applied to the input control level. To display the final dimmer levels for each dimmer in any bin (100msec update).

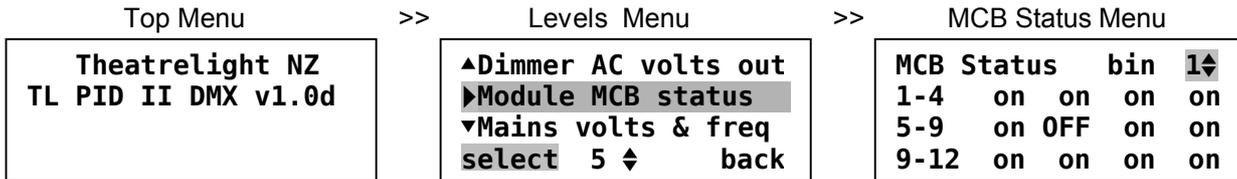
1. From the top menu, press Menu once, select “Bin dimmer levels” (line 3), press Menu.
2. Press ▲/▼ to select the Bin number. The display shows the final dimmer levels of the selected bin.
3. Press Back to reach the top menu.

DISPLAYING DIMMER OUTPUT VOLTAGES

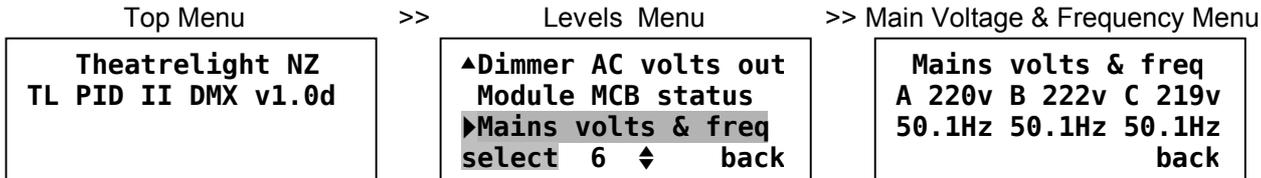
To display the output voltages (max 255v) of the dimmers in any bin (100msec update):.

1. From the top menu, press Menu once, select “Dimmer AC Volts Out” (line 4), press Menu.
 2. Press ▲/▼ to select the Bin number. The display shows the dimmer AC output voltages of the selected bin.
 3. Press Back to reach the top menu.
- Correct levels of dimmer AC output voltages are dependent on mains and bin calibration (see page 21).
 - If the final dimmer level is Off, a high dimmer vac reading indicates no load is connected, or the load is open circuit.

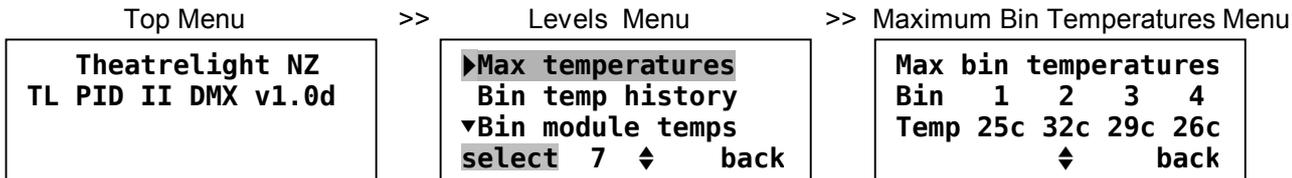
Displaying module MCB status:



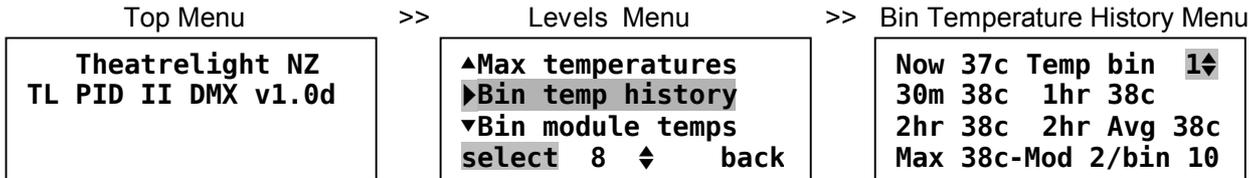
Displaying mains voltage and frequency:



Displaying maximum bin temperatures:



Displaying bin temperature history:



DISPLAYING MODULE MCB STATUS OR VOLTAGE

To display the MCB status (on/off) or voltage (max 255v) of the MCBs in each module of any bin (100msec update):

1. **From the top menu, press Menu once, select “Module MCB status” (line 5), press Menu.**
 2. **Press ▲/▼ to select the bin. The display shows the on/off status of the MCBs in the bin.**
 3. **Pressing the Menu key at this point shows the AC volts on each MCB. Press Back to reach the top menu.**
- The correct reading of dimmer MCB voltages is dependent on mains and bin calibration (see page 21).

DISPLAYING MAINS VOLTAGE AND FREQUENCY

To display the voltage (max 255v) and frequency of phases A, B, and C of the supply mains (100msec update):

1. **From the top menu, press Menu once, select “Voltage and Frequency” (line 6), press Menu.**
 2. **Press Back to reach the top menu.):**
- The correct reading of mains AC voltages is dependent on mains calibration (see page 21).

DISPLAYING MAXIMUM BIN TEMPERATURES

To display the current maximum temperature of each bin in the cabinet:

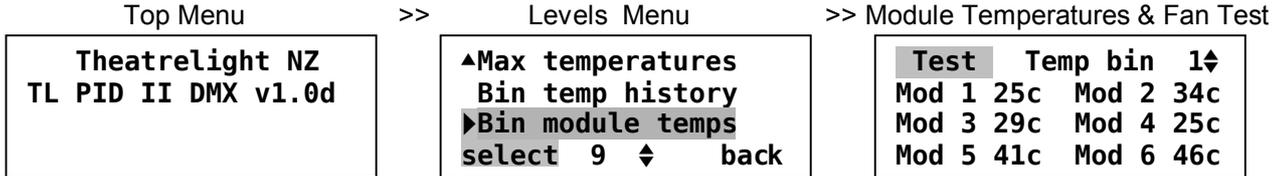
1. **From the top menu, press Menu once, select “Max temperatures” (line 7), press Menu.**
 2. **Press ▲/▼ to change the page of Bin numbers. The display shows the temperature of the bins.**
 3. **Press Back to reach the top menu.**
- The bin temperature displayed is the highest temperature of any module in the bin.

DISPLAYING BIN TEMPERATURE HISTORY

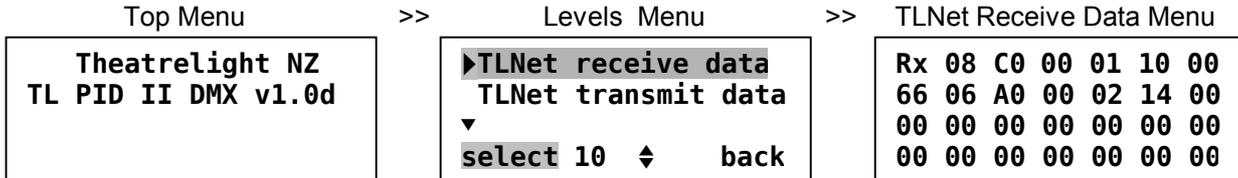
To display the temperature history for each bin in the cabinet (100msec update):

1. **From the top menu, press Menu once, select “Bin temp history” (line 8), press Menu.**
 2. **Press ▲/▼ to change the Bin—the display shows the temperature history of the selected bin.**
 3. **Press Back to reach the top menu.**
- Temperature display codes (see opposite): **Now**: highest module temperature now; **30m** / **1hr** / **2hr**: highest module temperatures 30 minutes ago, 1 hour ago, and 2 hours ago; **2 hr Avg**: average highest module temperature over the last 2 hours; **Max 38-Mod 2/Bin 10**: highest current module temperature of all modules in the cabinet: 38 degrees, found in Module 2 of Bin 10.

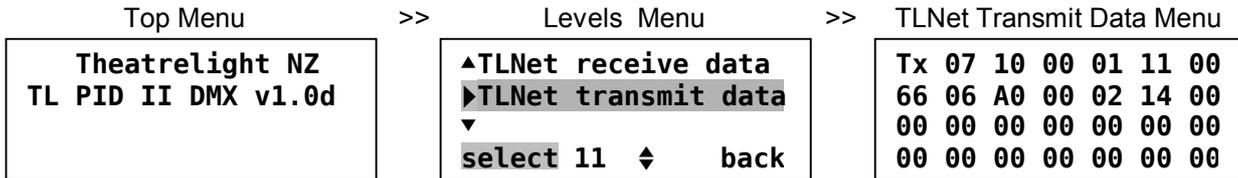
Displaying bin module temperatures:



Displaying TLNet receive data :



Displaying TLNet transmit data:



DISPLAYING BIN MODULE TEMPERATURES

To display the current temperature of the modules in the selected bin (100msec update), and the cabinet fan level:

1. **From the top menu, press Menu once, select “Bin module temps” (line 9), press Menu.**
 2. **Press ▲/▼ to select the Bin number. The display shows the current temperature of each module in the bin (as the highest of the two sensors in each module), and the current level of the fans.**
 3. **Press Back to reach the top menu.**
- While in this menu, holding the Menu key will test the fans at full speed.

DISPLAYING TLNET RECEIVE AND TRANSMIT DATA

To display the TL Net received data for the cabinet communications (for diagnostic purposes only):

1. **From the top menu, press Menu once, select “TLNet Receive Data” (line 10), press Menu.**
2. **The display shows the first 27 values of the received data.**
3. **Press Back to reach the top menu.**

To display the TL Net transmitted data for the cabinet communications (for diagnostic purposes only):

1. **From the top menu, press Menu once, select “TLNet Receive Data” (line 11), press Menu.**
 2. **The display shows the first 27 values of the transmitted data.**
 3. **Press Back to reach the top menu.**
- The latest TLNet data can also be read at any time by holding the Back key and pressing the Up key (for Transmit data), or the Dn key (for Receive data). The data display is updated while Up or Dn remain pressed, and frozen when released. The previous menu display is restored when the Back key is released.
 - Note that any changes made to PID parameters, will be saved automatically 10 minutes after the last key press.

Bin response error display:

Top Menu

**Theatrelight NZ
TL PID II DMX v1.0d**

>>

Error display

**Theatrelight NZ
ERROR
Bin 10: No response**

Bin DMX error display:

Top Menu

**Theatrelight NZ
TL PID II DMX v1.0d**

>>

Error display

**Theatrelight NZ
ERROR
Bin 10: DMX error**

Phase fail error display:

Top Menu

**Theatrelight NZ
TL PID II DMX v1.0d**

>>

Error display

**Theatrelight NZ
ERROR
Phase A fail**

Power supply fail error display:

Top Menu

**Theatrelight NZ
TL PID II DMX v1.0d**

>>

Error display

**Theatrelight NZ
ERROR
Power Supply A fail**

ERROR DISPLAYS

In the top menu display, the LCD displays a number of errors as described below:

Bin response error display

If any bin fails to respond during a scan of all bins in the cabinet, a “No response” error message (see opposite) is flashed on the LCD together with the ID number of the bin which failed to respond. At the same time the red Temperature/Error LED is flashed On to draw attention to the fault (this LED will also flash if a checksum error is detected).

This fault will show not only on bin CPU errors, but also if the total bins per cabinet setting (see page 19) exceeds the number of bins present, or if any bin CPU ID setting (see page 5) is incorrect.

Bin DMX error display

If any bin responds with a DMX error during a scan of all bins in the cabinet, a “DMX error” message (see opposite) is flashed on the LCD together with the number of the bin. At the same time the red Temperature/Error LED is flashed On to draw attention to the fault.

This fault will show not only on DMX errors, but also for example if the bin is set to DMX B when no data is present on the DMX B input to the cabinet.

Phase fail error display

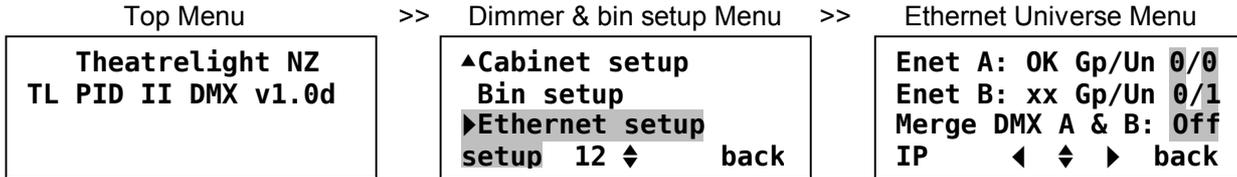
If any of the three mains phase supplies fails, a “Phase A/B/C fail” error message (see opposite) is flashed on the LCD. At the same time the red Temperature/Error LED is flashed On to draw attention to the fault.

Power supply fail error display

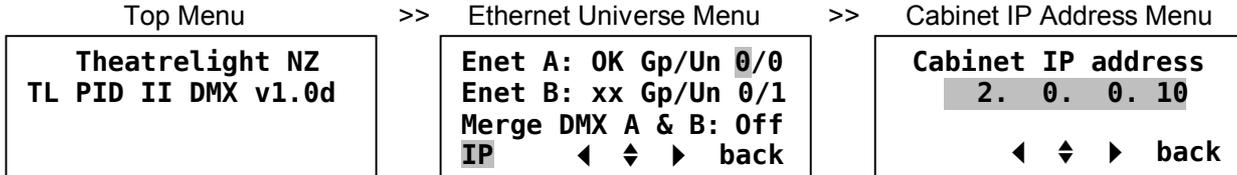
If any of the three 12 volt power supplies housed in the CPU drawer fails, a “Power Supply A/B/C fail” error message (see opposite) is flashed on the LCD. At the same time the red Temperature/Error LED is flashed On to draw attention to the fault.

- These error messages are displayed only in the top menu. If a number of errors occurs at the same time, the individual error messages are displayed one after the other on the LCD screen.

Setting the DMX-over-Ethernet universes:



Setting the IP Address :



ETHERNET OPTION

SETTING THE DMX-OVER-ETHERNET UNIVERSES

When the DMX over Ethernet option is fitted, either or both of the bin universes A or B can be sourced from the PID II Art-Net compatible receiver. If the DMX A/B Select links on the bin CPU cards are set to Enet, then the dimmers in the bin receive their control signal from broadcast Artnet packets. To select the A or B DMX-over-Ethernet universes:

1. **From the top menu, press Menu twice, select “Dimmer & bin setup”, press Menu.**
 2. **Press ▲/▼ to select “Ethernet Setup” (line 12), press Menu.**
 3. **Press ▲/▼ to select the “Enet A” DMX Group/Universe to the “Enet A” line for all bins.**
 4. **Press Right ▶ then ▲/▼ to select the “Enet B” Group/Universe to the “Enet B” line for all bins.**
 5. **Press Right ▶ then ▲/▼ to set DMX Merge On/Off. When merge is On, both DMX A and B levels will go to the highest level input from the two selected ArtNet universes (on a highest takes precedence basis).**
 6. **Press Back until you reach the top menu: the screen shows “Changes saved to flash memory”.**
- Group and Universe selections range from 0-9, A-F for 16 selections of each. The selections are saved permanently in flash memory in the PID II Enet card. The "OK"/"xx" status is updated if valid packets for the selected Group/Universe are received within 1 second of a change in the selection. Note "Group" is termed "Subnet" by some manufacturers.
 - PID II bin dimmer levels selected to Enet are updated immediately a valid packet is received. This implementation in the PID II removes the transmission delay usual with DMX, giving faster response to changing control panel levels.

SETTING THE IP ADDRESS

The IP address of the cabinet should not be changed after initial factory setup. In case this is necessary, it may be carried out as follows:

1. **From the top menu, press Menu twice, select “Dimmer & bin setup”, press Menu.**
 2. **Press ▲/▼ to select “Ethernet Setup” (line 12), press Menu twice to view the IP address**
 3. **Press Left ◀ or Right ▶ to select the IP address digit, hold Left ◀ , then press ▲/▼ to edit the digit.**
 4. **Repeat steps 3 and 4 to adjust other IP address digits.**
 5. **Press Back until you reach the top menu: the screen shows “Changes saved to flash memory”.**
- You should consult the operators manual of your control panel to install a Local Area Network for DMX over Ethernet.
 - "Art-Net" is a trademark of Artistic License UK, who have placed the "Art-Net" data protocol in the public realm.

MAINTENANCE

To keep the equipment working well take note of these points:

- Keep the cabinet in a clean air environment: dust is detrimental to electric connections, insulation, and fan life.
- Ventilate dimmer cabinets and dimmer rooms adequately: heat is detrimental to electronic components.
- Use a damp cloth to keep the cabinet and module fronts clean. Do not use solvents.
- Take care that all power connections are firmly screwed down.
- Ensure all dimmer cabinets are properly earthed to a low impedance earth system.
- Use DMX splitters/re-conditioners to ensure a clean DMX signal.
- Terminate the last cabinet in the DMX line with a 120 ohm resistor for reliable operation.

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PID II revision notes:

April 2010: PID Manual v F, main cpu v3.3, bin cpu v 3.1- changed dimmer temps to module temps; added 4 chn module dimming; added Red LED flash on checksum error ; TL Net data now 28 bytes.; added live TLNet update using Back + Up/Dn keys.

June 2010: PID Manual v G, main cpu v3.4, bin cpu v 3.1- Added Ethernet Group selection, Extended sides for 96 and 120 chn cabinets.

SPECIFICATIONS

CONSTRUCTION

Cabinet: Theatrelight proprietary design 19 inch equipment rack cabinet:, with custom aluminium extrusions

Panels: Powder coated zinc plated steel construction

Dimmer modules: Custom aluminium extrusions, glass filled high temperature plastic module front.

Legend: Silk-screened in solvent and abrasion resistant two pot epoxy ink.

FORM

6 Plug-in modules per dimmer bin, each module of 1, 2, or 4 dimmers. Standard cabinets available in 5, 8 or 10 bins high.

WIRING ACCESS

Wiring access is from the front of the cabinet with modules and bins support metal removed. Extended side panels are available where load cables require more space in high density installations. A lockable hinged door front is also available.

ELECTRONICS

LCD: Large 4 line, 20 character display, STN Blue with auto-dimming super-bright white LED backlight.

Keys: “Alps” brand gold plated computer keys with custom moulded keycaps.

CPU: Main redundant microprocessor with multiple distributed bin microprocessors with internal EEPROM for long life storage of all dimmer parameters. Digitally controlled SCR, IGBT or Sinewave dimming modules fitted depending on model. The internal power supplies are rated at 90 vac to 265 vac, 45 to 65 hertz, and use long-life 105 degree rated capacitors.

MCBs

6KA rated Module MCBs provide full overload and short-circuit protection of power devices.

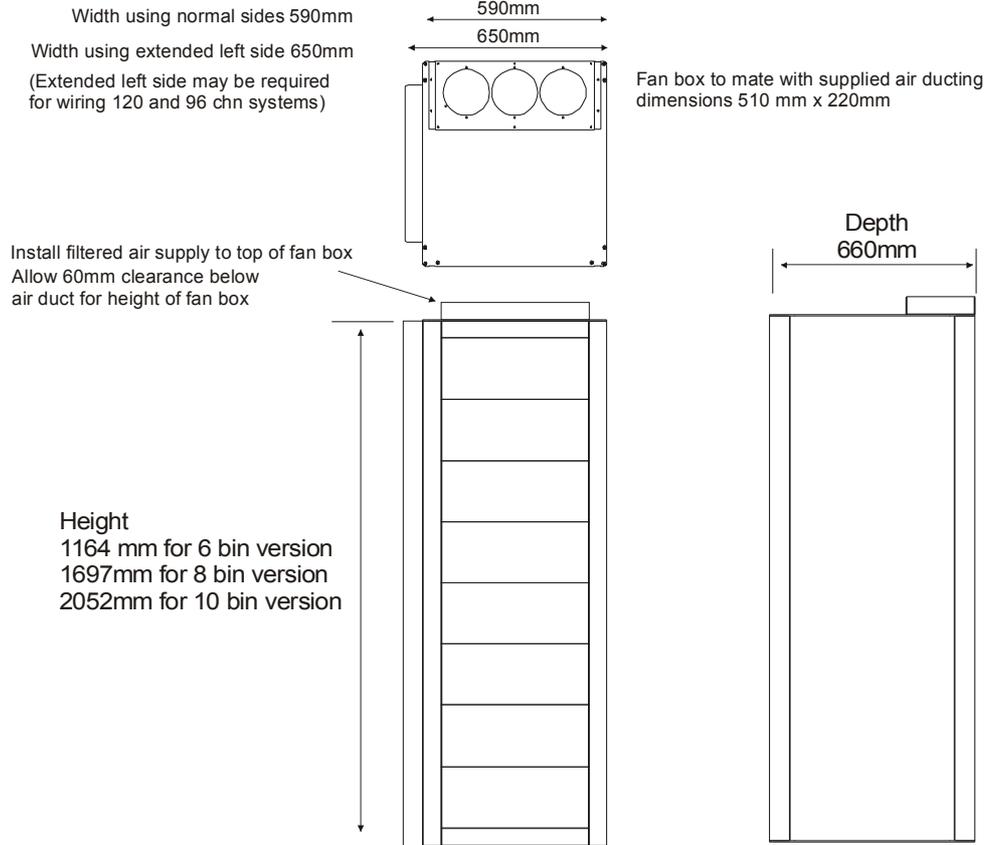
FILTERING

SCR dimmers use Iron powder toroidal chokes for linear current rise and minimum EMI. Theatrelight can provide filtering to customer specification on request.

COOLING

Three, long life AC fans are temperature controlled for maximum cooling. To minimise dust build-up in the cabinet, the recommended cooling system requires a continual supply of cooled, filtered air via air ducting to the top of cabinet, exhausting through the dimmer modules at the front of the cabinet.

DIMENSIONS



Install all mains supply and load cables under false floor

ENVIRONMENTAL SPECIFICATION

Ambient temperature extremes: 0 - 35° C

Recommended ambient temperature: 10 - 30° C

Relative humidity: 10 - 90% non-condensing

General conditions: Office level cleanliness. Cabinets must be acoustically isolated from performance areas due to dimmer and fan noise. Not suitable for exterior use.

DMX CONNECTION

USITT DMX-512 1990 Digital multiplex system requiring twin twisted shielded cable approved for RS-422/485 of up to 600 metres. Dimmer refresh rate is every 22 milliseconds. Each PID cabinet presents 1/10th normal RS-485 unit load, allowing up to 100 dimmer cabinets on a single DMX line.

DMX SPLITTERS

DMX-512 splitters can be supplied by Theatrelight for larger installations. The splitter re-shapes and buffers the received DMX and drives a number of isolated floating DMX transmitters. Splitters may be cascaded. Theatrelight DMX Splitters are available in an 8 channel 19 inch, 1 U rack mounting configuration, or as a 4 channel stand-alone portable version.

POWER SUPPLY

Input: 90 to 265 volts AC, 1, 2 or 3 phase and Neutral, 45 to 65 Hz. Power consumption at no load is less than 10 watts.

EXTERNAL CONNECTIONS

Mains input: to heavy duty studs on full height busbars, under floor cable entry, front cable access.

Load outputs via DIN rail moving cage terminals, under floor cable exit, front access.

DMX Control Input: via Neutrix brand gold plated 5 Pin XLR In/Thru connectors on back of slide-in Main CPU tray.

Ethernet Control Input (where fitted): via RJ45 connectors on back of slide-in Main CPU tray.

RS-485 Control Input (where fitted): via RJ 45 connectors on back of slide-in Main CPU tray.

GLOSSARY

ADD MODE	Mode in which pressing a channel Flash key adds the channel to the other lighting.
ANALOGUE	A smooth changing voltage (as opposed to digital)
BLACKOUT	All lights out on stage.
BLIND	Not showing on stage.
BO	Blackout; all lights out on stage.
BPM	Beats per minute: applied to music rhythms.
CHANNEL	One of the controlled output lines from a lighting desk; or a dimmer channel.
CHASE	A repetitive pattern of lighting changes.
CROSS-FADE	A smooth change from one lighting state to another.
CUE	An action or time event which results in new lighting on stage; the lighting state following the cue
DBO	Dead Black-out: no light on stage.
DIMMER	A power controller which changes the brilliance of lights connected to it.
DIPLESS	Applied to a cross-fade where a dimmer up at the same level on both the new and the old lighting states does not change level during the cross-fade.
DMX-512	A method of transmitting dimmer levels digitally over a two wire cable. (Digital MultipleX, 512 dimmers)
EEPROM	Electrically Erasable Programmable Read Only Memory: otherwise know as Flash Memory.
EMI	Electro-Magnetic Interference. Electrical noise.
ERASE	To clear and reset the memory.
FADER	A slider control.
FADE TIME	The time taken to complete a fade from full off to full on.
FLASH KEY	Any key which flashes a channel or scene to Full. Sometimes called Bump keys (USA).
GRAND MASTER	A master fader which controls the final output levels of a lighting desk.
HTP	Highest Takes Precedence: the highest command level is used as the controlling level

KILL	Turn off a light.
KILL MODE	If Kill is on, pressing a Flash key turns off all other lighting. Sometimes called Solo or Swap mode.
LCD	Liquid Crystal Display
LED	Light Emitting Diode.
LEVEL	The brightness of a dimmer as a number from 0 (off), to 10 (full on), or from 0% to 100%.
LTP	Latest Takes Precedence: the latest command level is used as the controlling level
MASTER	A fader which has overall control of a number of levels or some other major function.
MCB	Miniature Circuit Breaker- a re-settable current protection device.
MIMIC DISPLAY	A display often using Light Emitting Diodes (LEDs).
NON-DIM	A dimmer set to Non-dim acts like a switch: on or off
PRESET	A row of faders representing all the channels in a scene; to set up faders in advance of a cue.
PREVIEW	To view a set of recorded levels without showing on stage.
SCENE	A recording which stores a single set of all channel levels.
SCENEMASTER	A master fader which controls the playback of a scene of recorded levels.
SCR	Silicon Controlled Rectifier. A unidirectional power switch used in dimmers
SEQUENCE	A repetitive pattern of lighting changes.
SHOW	A performance. In Theatrelight control panels, a Scenemaster which stores a sequence of cues.
SOFTSTART	A minimum fade up time programmed into a dimmer to enhance lamp life.
SOLO MODE	Another name for Kill mode.
SNAP FADE	An instant change from one lighting state to another.
STEP	To change from one scene or cue to another. Also, one scene of a Show or Chase.
TRIAC	A bi-directional power switch. Dimmers using triacs should be used with care on inductive loads.
USITT	United States Institute of Theatre Technicians. Arbiters of the DMX-512 standard.

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