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## SATELLITE QUICK OPERATION

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Connect Mains and Load connections. Make sure the unit is properly earthed. Switch on and set all front panel MCBs on.

### **SETTING THE DMX START ADDRESS**

The current DMX Start Channel is shown on the thumbwheel on the front panel. To change the start address:

1. **Press the buttons above or below the digits to change the DMX Address**
2. **Ensure DMX and Remote Control modes are On- set Dipswitches 7 and 8 Down.**

Setting all digits at zero disables DMX

### **SETTING DIM / NON-DIM**

Pairs of dimmers may be set to Dim or Non-Dim (switch) mode:

1. **To set Dimmers 1 and 2 to Non-Dim/Dim mode: set Dipswitch 4 Up/Down.**
2. **To set Dimmers 3 and 4 to Non-Dim/Dim mode: set Dipswitch 5 Up/Down.**
3. **To set Dimmers 5 and 6 to Non-Dim/Dim mode: set Dipswitch 6 Up/Down.**

### **SETTING SOFTSTART**

To set the Softstart mode for all dimmers (Softstart **On** prolongs lamp life - Softstart **Off** gives faster on time):

1. **To set Instant/Softstart mode for all Dimmers: set Dipswitch 3 Up/Down.**

### **SETTING WARM AND LIMIT LEVELS**

To set Warm level (minimum- 5%) or Limit Level (maximum- 90%) for all dimmers :

1. **To set Warm Off/On for all Dimmers: set Dipswitch 1 Up/Down.**
2. **To set Limit Off/On for all Dimmers: set Dipswitch 2 Up/Down.**

### **SETTING TEST LEVELS**

To set Test levels for all dimmers:

1. **Set Dipswitch 8 Up to Test mode.**
2. **To test Dimmers 1- 6 Off/On set Dipswitches 1 – 6 Up/Down.**
3. **To test All Dimmers Off/On set Dipswitch 7 Up/Down.**

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## SATELLITE INTRODUCTION

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The Theatrelight Satellite is a general purpose dimmer pack for use in clubs, small theatres, touring troupes, or any venue requiring a simple reliable dimmer installation. The Satellite is very simple to set up and use

The design uses the latest microprocessor and components chosen for reliability and long MTBF (Mean Time Before Failure). The isolated DMX input presents only 1/10 th standard loading, reducing the possibility of DMX errors. Additionally, zero-crossover noise filters ensure correct triggering and immunity to mains interference even in the most adverse environment. The Satellite can work on any frequency from 45 Hertz to 65 Hertz The Satellite is available in a number of versions with a variety of output socket configurations. Special socket versions can be made to order.

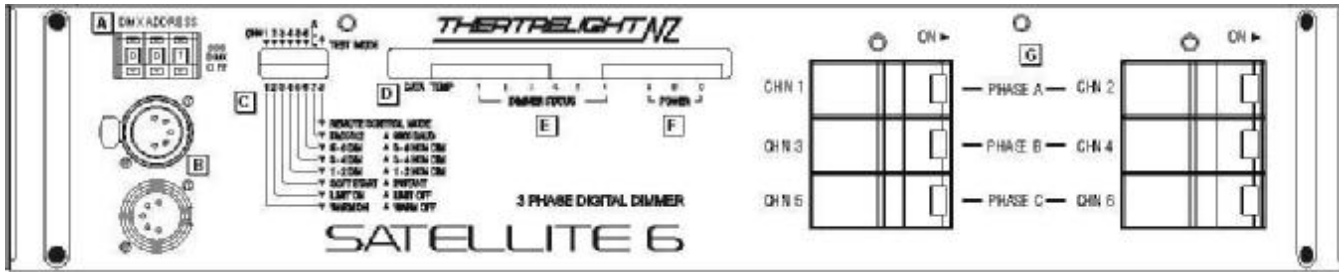
### **SATELLITE FEATURES**

- **Simple and easy to use**
- **Programmable DMX Start address by thumbwheel**
- **Warm (Minimum) , Limit (Maximum) levels**
- **Test mode for each dimmer**
- **Soft-start Time or Instant for all dimmers**
- **Dim or Non-Dim modes for each pair of dimmers**
- **Protection by Thermal/Magnetic circuit breakers**
- **Amorphous iron powder toroidal chokes for low EMI**
- **High immunity to Mains interference and low DMX signal**
- **Isolated, floating DMX input, 1/10 th standard RS-485 load**

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**FRONT PANEL LEGEND**


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- A:** DMX address thumbwheel switch. If set 000, DMX input is disabled
- B:** DMX In and Through connectors, 5 pin XLR type
- C:** Dipswitch for setting Warm, Limit, Softstart, Test and Dimmer curve parameters
- D:** The DMX LED shows the presence of DMX signal, and any errors. The TEMP LED shows the internal temperature,
- E:** Dimmer level LEDs mimic the dimmer level for each of the 6 dimmers
- F:** A B C LEDs indicate presence of mains power on each phase
- G:** Thermal/Magnetic Circuit Breakers (MCBs) protect each dimmer in the event of a lamp failure or load short circuit.

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## SATELLITE OVERVIEW

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The following description provides an overview of the capabilities of the Satellite.

### **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 Satellite may be set to any start address in this range:

#### **DMX Start Address**

The DMX Start Number for the pack may be set to any number between 1 and 512. The start number means the DMX address which Dimmer 1 responds to. DMX addresses of the following dimmers are then set automatically: the address of Dimmer 2 to the DMX Start number plus 1, and so on. The Satellite is programmed to ignore all DMX packets except those using a value of zero for DMX Channel 0.

#### **DMX Disable**

DMX control may be disabled by setting the DMX Start Address to zero. The Satellite then ignores all DMX control levels.

#### **DMX Fail Mode**

In the event that the DMX signal fails, or the DMX signal is turned off the Satellite holds the last valid DMX levels are held until the next valid DMX input, or the pack is switched off.

#### **Baud Rate**

In the event that the Satellite is required to be operated from a computer via RS-485, the baud rate may be changed from the standard DMX baud rate of 250Kbps to 9600 baud. The DMX 1990 standard applies except for the change in baud rate.

### **DIMMER PARAMETERS**

The dimmer channels in the Satellite have a number of parameters which may be changed by means of the dipswitch on the front panel.

#### **Testing Dimmer levels**

Normally each dimmer receives control from the DMX inputs. However the Test options allow each dimmer to be set to a level which overrides the DMX input. An "All" function allows all Test levels to be set at the same time.

The Test functions are of use during set-up to help check lamps or wiring problems without the use of a control panel.

## 4 SATELLITE OPERATION

### **Warm and Limit Dimmer levels**

All dimmers may be set to a fixed minimum level of 5%, and to a fixed maximum level of 90%. The minimum setting can be used to keep lamp filaments warm for fast response time. The maximum setting can be used for example to prolong lamp life, which is very sensitive to overvoltage conditions.

### **Dimmer curves**

Each pair of dimmers may be set to Incandescent or Non-Dim (switch) mode. A custom dimmer curve may be included by arrangement with Theatrelight.

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

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 60%: 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 levels goes below 40%.

### **Softstart Fade Times**

All dimmers may be set to Instant, or to Softstart mode. 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. A shorter softstart time gives a faster response; a longer time gives longer lamp life. For most stage lighting requirements, a time of 200 to 400 milliseconds (0.2 to 0.4 seconds) is suitable. The Satellite softstart time is set at 200 milliseconds. Note that an initial softstart time of 2.5 seconds is applied to all channels after the Satellite is powered on (excepting Non-Dim channels). The dimmer off time is not affected by the softstart setting.

## **LEDS**

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

### **DMX LED**

The Green DMX LED is on continually On if DMX is enabled and the DMX signal is good. The LED turns off if DMX is enabled (thumbwheel set to a valid address) but the DMX signal is disconnected. The DMX LED switches off or flashes irregularly if the DMX signal has errors, or if the DMX signal is wrongly phased. Disabling DMX by setting the thumbwheel to 000 sets the DMX LED off regardless of the state of the DMX signal.

**Temperature LED**

The Red temperature LED is normally off. In the event that the internal temperature of the Satellite reaches an unsafe level, the LED turns on, and the dimmer levels are faded to zero over 10 seconds. The levels are faded in again over 10 seconds when the temperature drops back to a safe level.

**Dimmer Mimic LED**

The Dimmer Mimic LEDs indicates the level of each of the 6 dimmers- if the LED is Off the dimmer is Off. Each LED fades to Full as the dimmer fades to full.

**Phase A B C LEDs**

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

**COOLING**

The Satellite is cooled by a long life, low voltage fan. The fan remains on for 10 minutes after load current has dropped to zero to prevent heat buildup in the case.

Air is blown into the Satellite case from the side, and the warmed air exhausted through slots in the other side. This arrangement allows the operator to provide a cool filtered air supply under pressure into a rack cabinet so as to minimise the build-up of dust in the dimmer electronics. The air supply must be designed to supply cool air to the input side.

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**DMX AND DIMMER PARAMETERS**

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The range of the different parameters of the Satellite are described below.

**DMX SETTINGS**

	<b>Range</b>	<b>Notes</b>
DMX Start Channel	Off, 1-512	Off = 000. Valid DMX address is 1 to 512
Baud Rate	250 kbaud, 9600 baud	DMX standard is 250 kbaud

**DMX FAIL MODE**

	<b>Range</b>	<b>Notes</b>
Hold Last Levels	Default on	

**DIMMER SETTINGS**

	<b>Range</b>	<b>Notes</b>
Test/Set Levels	Disabled, On	Set by dipswitch
Minimum Levels	Off, 5%	Set by dipswitch
Maximum Levels	Off, 90%	Set by dipswitch
Non-dim setup	Incandescent or Non-Dim	Set by dipswitch
Soft Start Times	instant, 200 msec	Set by dipswitch. Up time only (Down time always instant)

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## SATELLITE OPERATION

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Ensure that Mains and Load connections are connected correctly, and make sure the unit is properly earthed.

### **CONNECTING A DMX CABLE**

The standard 5 pin XLR connector wiring using shielded twisted pair cable is as follows:

1. **Connect the shield to pin 1.**
2. **Connect the black wire to pin 2 (DMX -)**
3. **Connect the red wire to pin 3 (DMX +)**

The wiring must be correctly phased for proper operation, and the shield must be connected. You can link a large number of Satellite dimmer packs together since each represents just 1/10 th of a standard RS-485 load. Do not use a star connection- connect all packs in a line for best signal. Remember to terminate the line with a 120 ohm resistor at the last pack.

### **SETTING THE DMX START ADDRESS**

The current DMX Start Channel is shown on the thumbwheel on the front panel. To change the start address:

1. **Set Remote Control mode On by setting Dipswitch 8 Down.**
2. **Set DMX-512 mode On by setting Dipswitch 7 Down.**
3. **Press the button above or below the thumbwheel digits to change the DMX Address. Note that setting all digits at zero disables DMX.**

If the DMX Start Address is set between 1 and 512, and the DMX signal is good, the DMX LED will come on. The DMX Start address may be changed at any time- the address changes instantly.

### **SETTING DIM / NON-DIM**

Each pair of dimmers (1 and 2, 3 and 4, 5 and 6) may be set to Dim or Non-Dim (switch) mode:

1. **To set Dimmers 1 and 2 to Dim mode: set Dipswitch 4 Down.**
2. **To set Dimmers 1 and 2 to Non-Dim: set Dipswitch 4 Up.**
3. **To set Dimmers 3 and 4 to Dim mode: set Dipswitch 5 Down.**
4. **To set Dimmers 3 and 4 to Non-Dim: set Dipswitch 5 Up.**
5. **To set Dimmers 5 and 6 to Dim mode: set Dipswitch 6 Down.**
6. **To set Dimmers 5 and 6 to Non-Dim: set Dipswitch 6 Up.**

### **SETTING SOFTSTART**

Softstart **On** prolongs lamp life - Softstart **Off** gives faster on time. To set the Softstart time of 200 milliseconds for all dimmers.

1. To set Softstart mode for all Dimmers On: set Dipswitch 3 Down.
2. To set Instant mode for all Dimmers On: set Dipswitch 3 Up.

### **SETTING LIMIT LEVELS**

To set Limit level (maximum level of 90%) for all dimmers (Limit On prolongs lamp life):

1. To set Limit for all Dimmers On: set Dipswitch 2 Down.
2. To set Limit for all Dimmers Off: set Dipswitch 2 Up.

### **SETTING WARM LEVELS**

To set Warm level (minimum level of 5%) for all dimmers (Warm keeps the filaments hot which prolongs lamp life and gives faster on time):

1. To set Warm for all Dimmers On: set Dipswitch 1 Down.
2. To set Warm for all Dimmers Off: set Dipswitch 1 Up.

### **SETTING TEST LEVELS**

To set Test levels for all dimmers:

1. Set Dipswitch 8 Up to Test mode.
2. To test Dimmers 1- 6 Off/On set Dipswitches 1 – 6 Up/Down.
3. To test All Dimmers Off/On set Dipswitch 7 Up/Down.

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## MAINTENANCE

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To keep your Satellite working well take note of these points:

- Keep the dimmer pack in a clean air environment: dust is detrimental to electronic insulation and fan life.
  - Ventilate dimmer cabinets and dimmer rooms adequately: heat is detrimental to electronic components.
  - Use a damp cloth to keep the dimmer pack clean. Do not use solvents, or solvent based pens.
  - Touring dimmer packs should travel in a sturdy road case with adequate protection from dust and vibration.
  - Use rear support plates on each dimmer pack when touring.
  - Take care that all power connections are firmly screwed down when operating the dimmer pack.
  - Ensure the dimmer packs are properly earthed to a low impedance earth system.
  - Use DMX splitters/reconditioners to ensure a clean DMX signal.
  - Terminate the last pack in the DMX line with a 120 ohm resistor for reliable operation.
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## SPECIFICATIONS

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### **Construction**

Epoxy powder coat over zinc plated steel case. Legend silk-screened in solvent and abrasion resistant two pot epoxy ink. Chassis is 2u high, 19 inch rack wide, with removable mounting wings. Rear support wings are available for touring cabinets

### **Electronics**

Flash microprocessor. Digitally controlled SCRs or Triacs, depending on model. The circuitry uses long-life 105 degree rated capacitors.

### **MCBs**

6KA rated MCBs provide full overload and shortcircuit protection of power devices.

### **Filtering**

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

### **Cooling**

Long life low voltage fan.

### **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 Satellite presents 1/10<sup>th</sup> normal RS-485 unit load, allowing reliable DMX operation.

### **DMX Splitters**

DMX-512 splitters can be supplied by Theatrelight for larger installations.

### **Power supply**

Input: 100- 120 or 220-240 VAC according to model. 1, 2 or 3 phase and Neutral, 45 to 65 Hz. Power consumption at no load is less than 5 watts. Reliable operation of SCR dimmer packs requires a low impedance power supply.

### **External connections**

Output: 6 or 12 channel Triac and SCR versions, and 6 and 3 channel SCR versions, available in various current ratings

Terminations: Moving cage terminals, or cable input with socket outputs depending on model and destination country

DMX Control Input: DMX-512 via 5 Pin XLR In/Thru connectors. Optional 3 pin connectors available to order.

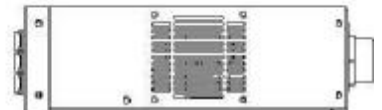
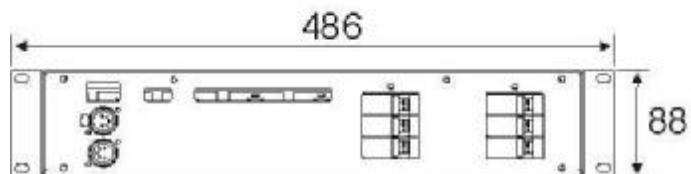
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**DIMENSIONS**

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Weight = 8Kg



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**GLOSSARY OF THEATRE LIGHTING TERMS**

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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	Mode in which 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 channel or 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
SEQUENCE	A repetitive pattern of lighting changes.
SHOW	A performance. In the Nova, a Scenemaster which stores a sequence of cues of recorded levels.
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 bidirectional 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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