

## Installation Guide

MMTH/PB

# LEDsmart<sup>+</sup>

## Push Button Hour Timer

Programmable between ¼ hour and 7½ hours with built in multi-way control



- Programmable between ¼ hour and 7½ hours, in ¼ hour steps
- Suitable for one-way, two-way, three-way and multi-way control
- MultiMate™ technology allows multi-way control with no extra wires
- Suitable for both retrofit and new installations
- Active only 'two wire' connection - no neutral required
- Override feature to stop the lights turning off automatically
- Advanced warning feature to dim lighting to 50% level for 5 minutes after time out
- Mode to convert from an hour timer to a minute timer
- Programmable maximum level and off state indicator
- Simple 3-step timer interval setting
- Flush and rocker style button options
- Quiet, soft press button – no harsh click
- 1W minimum load

Patent Pending

Registered Design



Designed in Australia to meet  
Australian Standards and  
installation conditions



## Product Item

This guide provides installation, setup and specification information for the LEDsmart<sup>+</sup> Push Button Hour Timer, item number **MMTH/PB**.

## Product summary and capabilities

Designed in Australia, this electronic timer will automatically switch lighting off after the timeout period programmed by the installer.

This high quality, two-wire timer can be connected in parallel to other LEDsmart<sup>+</sup> devices to provide a simple solution to multi-way control.

## Programmable setup functions

Setup functions	Description
<b>Timeout period</b>	The timer allows a duration of ¼ hour and 7½ hours, in ¼ hour increments <i>Default: Timeout period is set to ½ hour</i>
<b>Maximum Brightness</b>	The maximum brightness level provided by the timer can be set to suit customer requirements
<b>Advanced Timer</b>	The advanced timer mode provides an optional advanced warning to the user that the lights will shortly turn off automatically When the advance timer is enabled, at timeout the lights are dimmed to 50% over a 4 second period and are held at this 50% level for 5 minutes. After this 5 minutes, the lights are turned off automatically <i>Default: Advanced Timer Mode is disabled</i>
<b>LED indicators</b>	The timer's white LED indicators can be set to glow on or turn off when the timer is off <i>Default: The white LED indicators are set to glow on when the timer is turned off</i>
<b>Converting from hour to minute timer</b>	If required, this hour timer can be converted to a minute timer, with a timeout settable between 1 minute and 30 minutes, in 1 minute increments
<b>MultiMate™ ON/OFF</b>	MultiMate™ functions can be switched ON or OFF <i>Default: MultiMate™ features are switched on</i>



There are a wide range of LED and CFL lamps available from different manufacturers. The following issues are occasionally seen when used in conjunction with 2-wire dimmer/timer/switch products.

- When switched off, the LED/CFL lights flicker, pulse on/off or do not switch off completely
- When switched off, the LEDsmart<sup>+</sup> LED indicators flicker
- When switching on, the LED/CFL lights have difficulty switch on and the dimmer indicators flicker or pulse

It is recommended to install a Diginet 'Load by-pass' device (Diginet item number **MMBP**) across Load and Neutral terminals to provide improved performance of these lamps.

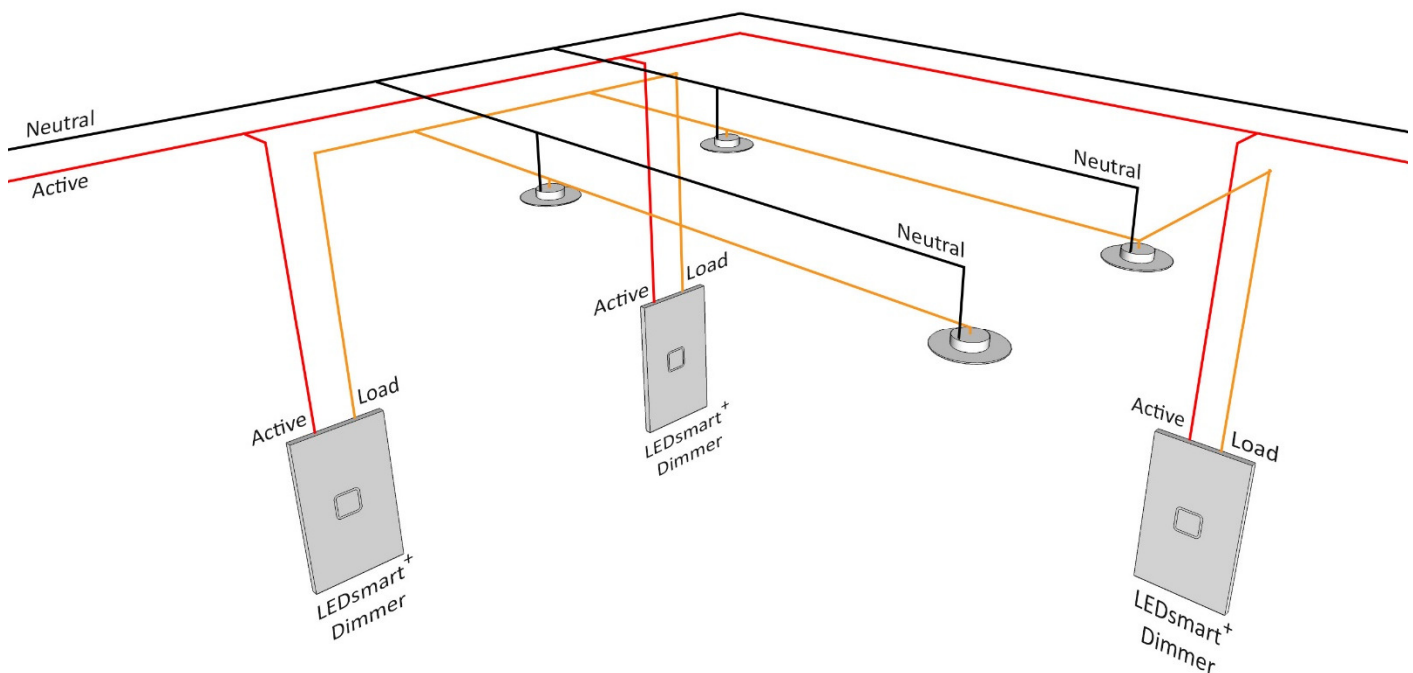
## Multimate™ technology

MultiMate™ is a technology inside Diginet's range of high quality LEDsmart<sup>+</sup> dimmers, timers and electronic light switches. It allows multi-way control of lighting without the need for an expensive control system. MultiMate™ technology is suitable for both new and retrofit installations.

MultiMate™ technology enables multiple LEDsmart<sup>+</sup> two-wire devices to be wired in parallel when two-way, three-way or multi-way dimming and switching is required. When connected in parallel LEDsmart<sup>+</sup> dimmers allow dimming (and switching) of connected lighting loads from multiple locations without any additional wiring. No strapper wires, dedicated remote switch wiring or 'control bus' is required.

MultiMate™ is a patented technology, developed in Australia by Gerard Lighting.

The wiring example below shows three LEDsmart<sup>+</sup> dimmers connected in parallel to provide three way dimming and switching of four downlights without any additional wiring.



## Products with MultiMate™ technology included

The following products all include MultiMate™ technology and can therefore be connected in parallel to allow multi-way control. Note that different types of MultiMate™ products can be connected in parallel. For example, timers and dimmers can be connected in parallel to control the same group of lights from different locations and/or provide additional functionality.

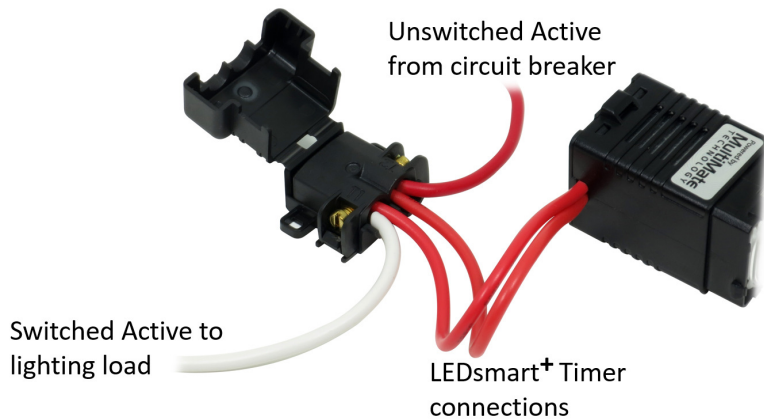
Product Range	Item Number	Type	Description
LEDsmart <sup>+</sup>	MMDM/RT	Dimmer	Rotary Dimmer with built in on / off switch and multi-way control
LEDsmart <sup>+</sup>	MMDM/PB	Dimmer	Push Button Dimmer with built in on / off switch and multi-way control
LEDsmart <sup>+</sup>	MMSW/PB	Switch	Push Button Switch for LED lighting with built in multi-way control
LEDsmart <sup>+</sup>	MMTM/PB	Timer	Push Button Minute Timer programmable between 1 minute and 30 minutes with built in multi-way control
LEDsmart <sup>+</sup>	MMTH/PB	Timer	Push Button Hour Timer programmable between ¼ hour and 7½ hours with built in multi-way control

## Timer installation

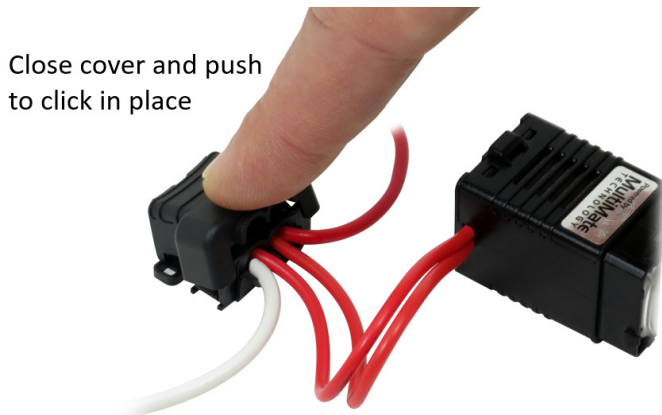
**WARNING – This product must be installed by a suitably qualified installer**

Electric shock may result in serious injury or death. Follow all warnings in this guide and on the product while working in accordance with the latest electrical safety practices for mains-powered electrical equipment.

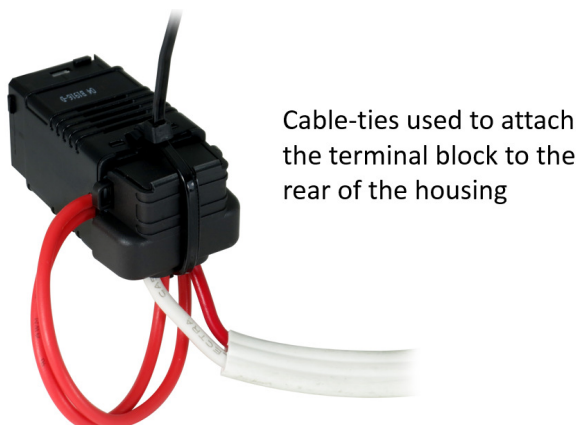
The terminal block included with the timer should be used to carry out the electrical connections, as shown below.

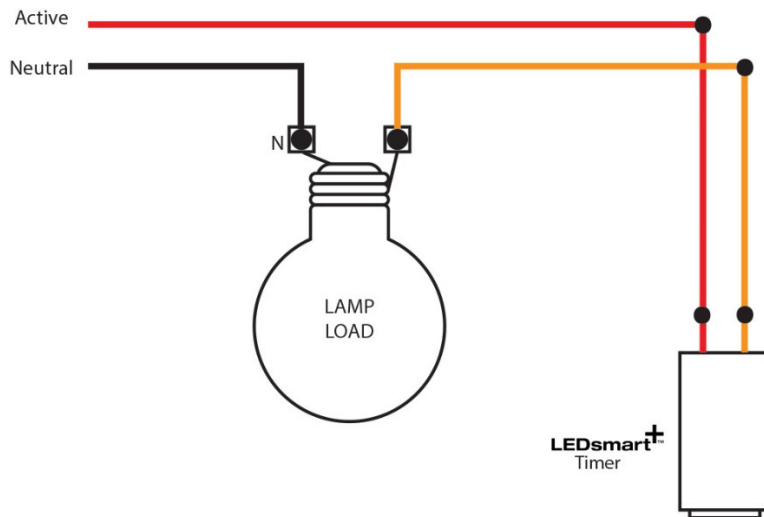
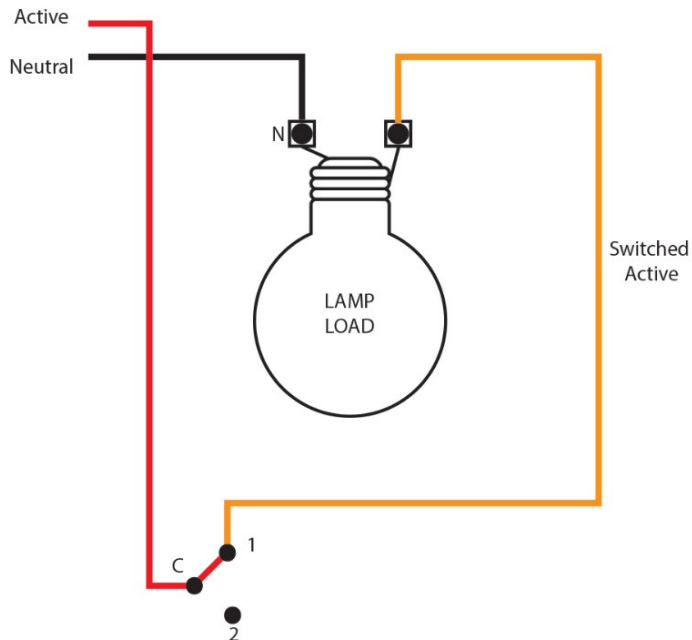
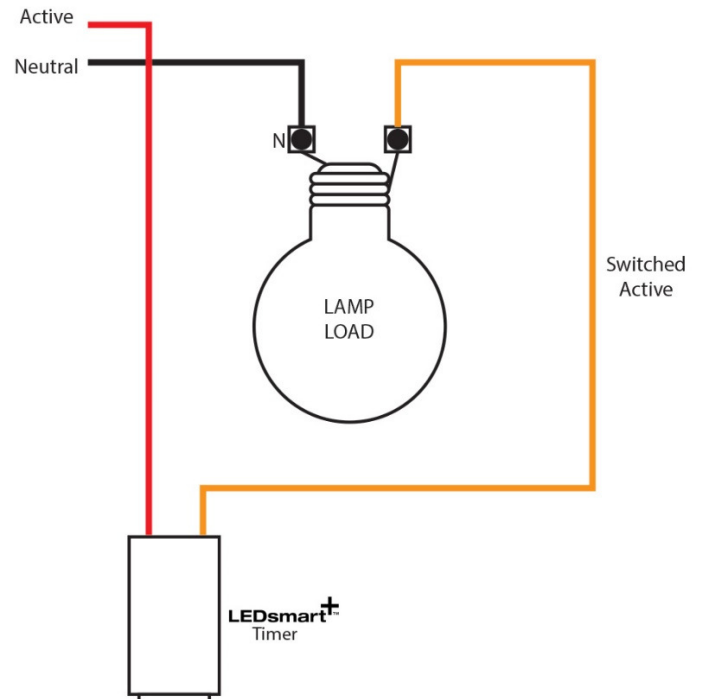


Once the connections have been made, the terminal cover is closed to ensure the screw terminals are not exposed.



The terminal block can then be cable-tied to the rear of the timer housing utilising the two loop holes.

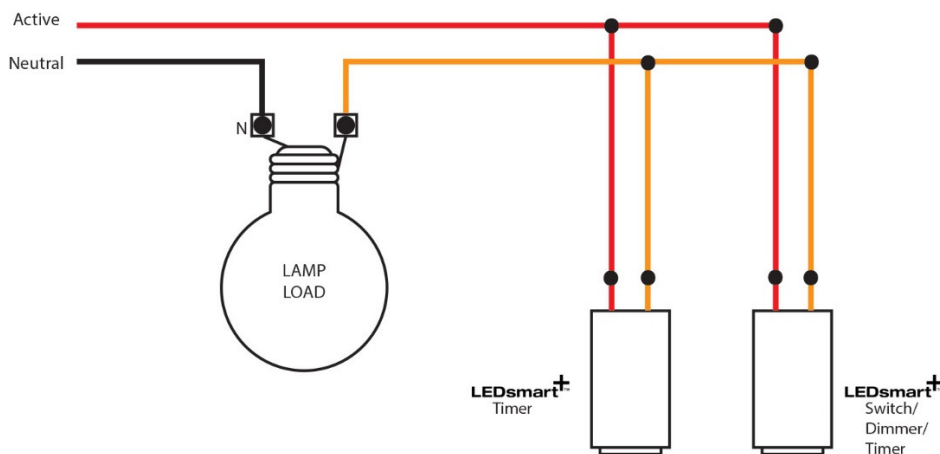


**Wiring for one-way timer****New Installation – one-way timer****Replacing existing standard one-way switch with an LEDsmart<sup>+</sup> Timer****Existing one-way switching****Replacement LEDsmart<sup>+</sup> Timer**

## Wiring for two-way LEDsmart<sup>+</sup> device control

To achieve two-way control using LEDsmart<sup>+</sup> products, they are connected in parallel. Note any LEDsmart<sup>+</sup> products can be connected in parallel. For example an LEDsmart<sup>+</sup> push button timer and dimmer can be connected in parallel to provide two-way control.

### New Installation – two-way LEDsmart<sup>+</sup> device control

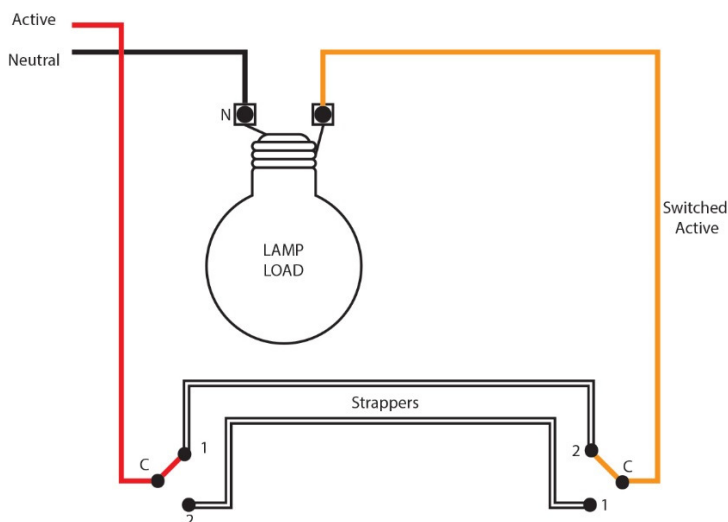


Two-way control using a LEDsmart<sup>+</sup> timer and a dimmer, switch or another timer. Note these two-wire devices are simply connected in parallel.

### Replacing existing two-way switching with two-way LEDsmart<sup>+</sup> control

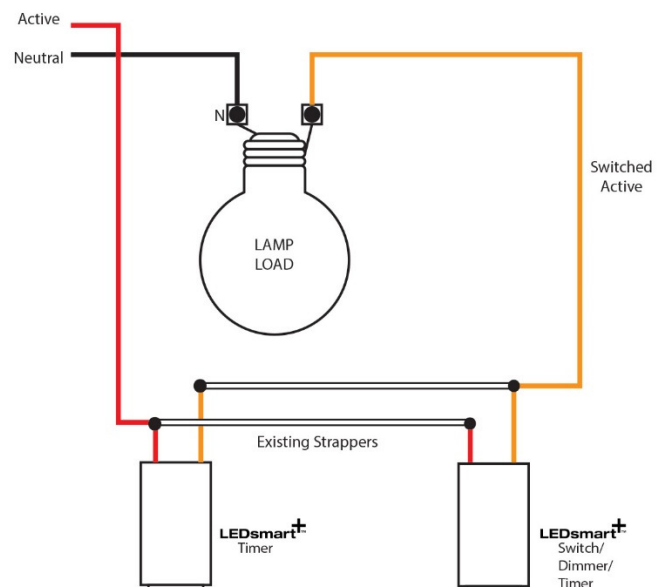
When replacing existing two-way switching with two-way control using LEDsmart<sup>+</sup>, the existing two-way 'strapper' wires can be re-used. No new wiring is required. See the wiring diagrams below.

#### Existing two-way switching



Traditional two-way switching using standard rocker switch mechanisms and strappers between the switches.

#### Replacement two-way LEDsmart<sup>+</sup> control



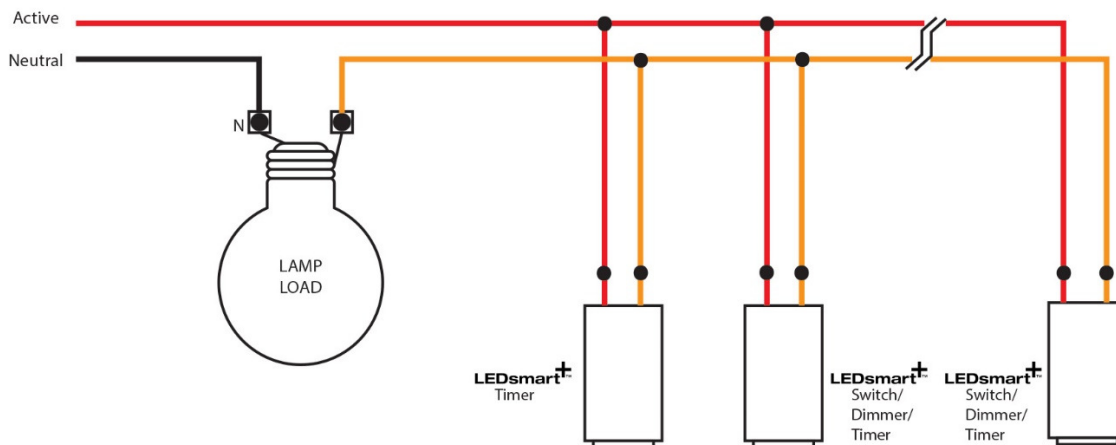
Rocker switches replaced with LEDsmart<sup>+</sup> devices using the existing strapper wires. No new wiring required.

## Wiring for multi-way LEDsmart<sup>+</sup> device control

To achieve multi-way control using LEDsmart<sup>+</sup> products, the required LEDsmart<sup>+</sup> products are connected in parallel.

The diagram below shows the required wiring for three-way control using LEDsmart<sup>+</sup> devices. If more than three-way control is required, further LEDsmart<sup>+</sup> devices are simply wired in parallel.

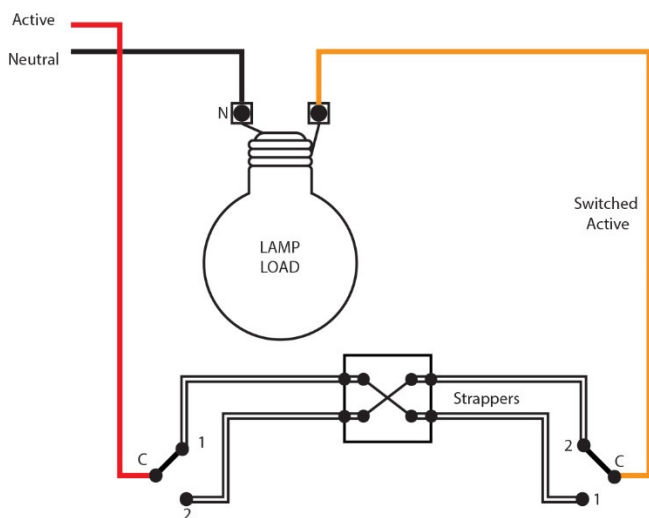
### New Installation – LEDsmart<sup>+</sup> multi-way device control



Three-way control using LEDsmart<sup>+</sup> devices. Note that each two-wire LEDsmart<sup>+</sup> device is simply connected in parallel.

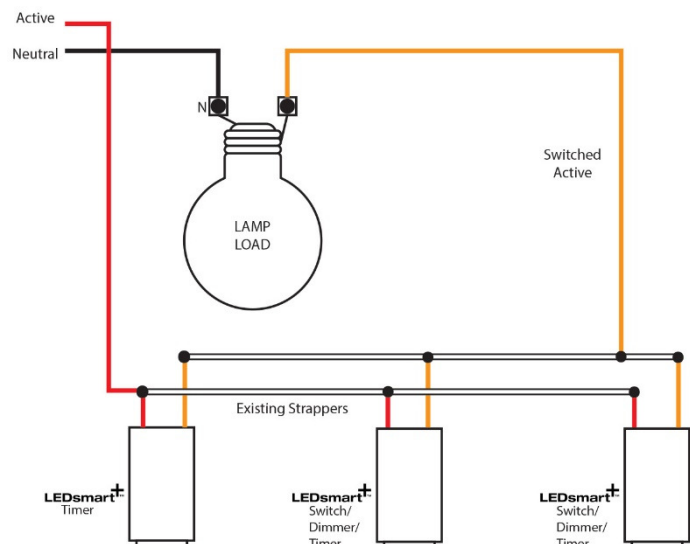
### Replacing existing multi-way switching with LEDsmart<sup>+</sup> multi-way control

#### Existing three-way switching



Traditional three-way switching using two rocker switches and one intermediate switch, with strappers between the switches.

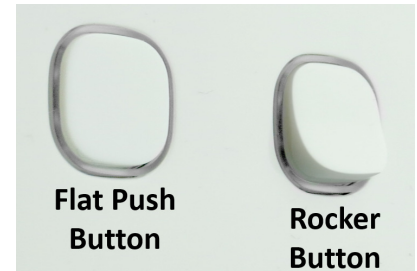
#### Replacement three-way LEDsmart<sup>+</sup> control



Rocker switches and intermediate switch replaced with LEDsmart<sup>+</sup> devices. The existing strappers are used to connect the devices in parallel. No new wiring is required.

## Rocker and flat push buttons

Two different styles of push buttons are included in the timer packaging, rocker and flat push button styles. These are interchangeable, depending on customer preferences.



## Coloured Bezels

The timer's LED indicators are white and the pre-fitted bezel provides a white glow around the timer button. Interchangeable blue, green and orange bezels rings are also included with the timer. These can be used to change the colour of the LED indicators to match customer colour preferences and/or to more easily identify different LEDsmart<sup>+</sup> devices on the same grid plate.



## Installing LEDsmart<sup>+</sup> devices into Clipsal Saturn™ or Clipsal Saturn Zen™ wall plates

Adaptor kits are available separately to enable LEDsmart<sup>+</sup> devices to be installed into Clipsal Saturn™ or Clipsal Saturn Zen™ wall plates. Order codes are as follows.

DGACCESSPK2	Adaptor kit for LEDsmart <sup>+</sup> Push Button devices
DGACCESSPK3	Adaptor kit for LEDsmart <sup>+</sup> Rotary dimmers

## Timer Setup

The LEDsmart<sup>+</sup> push button timer has a number of useful functions which can easily be set up by entering setup mode and following the four easy steps.

**The TIMEOUT PERIOD should always be setup. The other settings are optional, depending on the application. To set the timeout period now, go to the next page.**

## Timer Setup Functions

Function	See Part
Setting the <b>Timeout period</b>	See page 9
Setting <b>Maximum Brightness</b>	See <b>online guide</b>
Setting <b>Advanced Timer Features</b>	See <b>online guide</b>
Setting <b>Off State LED Feature</b>	See <b>online guide</b>
Converting from hour to minute timer	See <b>online guide</b>
Setting <b>MultiMate™ Mode</b>	See <b>online guide</b>
Factory Defaults <b>Reset</b>	See <b>online guide</b>

### Online Guide

Full details on setting all the available LEDsmart<sup>+</sup> functions can be found at the Diginet website here [www.diginet.net.au/diginet-ledsmart-plus-timer-installation-information](http://www.diginet.net.au/diginet-ledsmart-plus-timer-installation-information)

or simply scan the QR code below with your smart device to go to this page



## A: Entering Setup Mode

If the timer has been powered up for **LESS THAN 30 MINUTES** see **A1** below.

If the timer has been powered up for **MORE THAN 30 MINUTES** see **A2** below.



Once in Setup Mode, options are selected by a series of 'clicks' of the push button. Each 'click' should be approximately 1 second after the previous click.

### A1: Timer has been powered up via mains 240Vac for LESS THAN 30 MINUTES

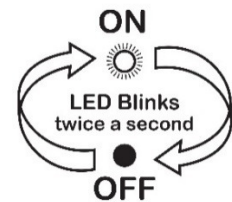
- Step 1 Press and hold the button for 10 seconds  
Note: Connected lights will dim up or down, this is normal

**Press & Hold!**



- Step 2 The white LED Indicators will blink ON/OFF twice per second. This indicates that the timer is now in Setup Mode

Note: If more than one LEDsmart<sup>+</sup> hour timer is connected in parallel (see pages 5-7), all these timers will now enter setup mode. The blink ON/OFF will also be seen on all other LEDsmart<sup>+</sup> hour timers connected in parallel



In the unlikely event that other LEDsmart+ devices connected in parallel do not enter setup, exit and try again.

- Step 3 The timer is ready for the settings to be adjusted as required. Go to the relevant setup function instructions



### A2: Timer has been powered up via mains 240Vac for MORE THAN 30 MINUTES

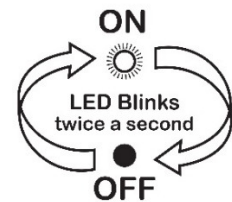
- Step 1 Press and hold the button for 30 seconds  
Note: This resets the Setup Entry time back to 10 seconds (for the next 30 minutes)  
Note: Connected lights will dim up or down, this is normal

**Press & Hold!**



- Step 2 The white LED Indicators will blink ON/OFF twice per second. This indicates that the timer is now in Setup Mode

Note: If more than one LEDsmart<sup>+</sup> hour timer is connected in parallel (see pages 5-7), all these timers will now enter setup mode. The blink ON/OFF will also be seen on all other LEDsmart<sup>+</sup> hour timers connected in parallel



In the unlikely event that other LEDsmart+ devices connected in parallel do not enter setup, exit and try again.

- Step 3 The timer is ready for the settings to be adjusted as required. Go to the relevant setup function instructions



## B: Setting the Timeout Interval

The hour timer allows a timeout duration of ¼ hour to 7½ hours in increments of ¼ hour.

Out of the box (factory defaults), the time out interval is set to ½ hour.

To change the time out interval from the default ½ hour, follow the steps below.

Step 1 Enter into the timer **Setup Mode - See PART A**

**Setup Mode!**

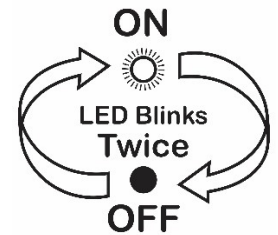


Step 2 Click the push button **2 times**

Note: To cancel/exit do nothing for 30 seconds

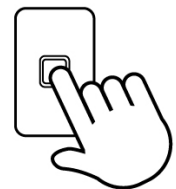


Step 3 The LED Indicator will **blink 2 times**



Step 4 To set the time out interval, push and hold the button and count the number of blinks. **Each blink of the indicator adds ¼ hour to the timer**

**Adjust!**



Step 5 When the number of blinks counted is equivalent the total timeout period required, release the button

The time out interval is saved and setup will exit automatically

Note

- During normal use the indicator will blink when the timer is turned on to indicate it is in time out mode
- Trying to select a time interval of 0 will result in setting ½ hour timeout
- The timeout period on Hour Timers connected in parallel need to be set individually. The same timeout is not automatically set across units

**Release!**



## Specifications

Nominal Line Voltage Amplitude Range	220-240Vac
Line Voltage Frequency	50Hz Nominal (47 – 53Hz)
Load Brightness Control Range	0% to 100% (typical for LED loads)**
Rated Load	Refer Compatible Loads table (below)
Minimum Load	1W
Maximum cable distance from any LEDsmart <sup>+</sup> device to the parallel junction point	50m (for example, two dimmers could be separated by up to 100m provided that the maximum distance from the furthest dimmer to the parallel junction point is no more than 50m)



\*\* Some LED lights do not turn off completely when used with two wire devices such as LEDsmart<sup>+</sup>. This is due to the small amount of current which flows through the device to the load when switched off. The result with some LED light sources can be a small amount of light output when the LEDsmart<sup>+</sup> is in the off position. If this occurs, it is recommended that a Diginet 'Load by-pass' device (Item **MMBP**) is added to the lights / LEDsmart<sup>+</sup> installation.

## Compatible Load Types

Load Symbol	Load Types	Max. Load	Notes
	Dimmable LED Lamps	400W	The LED driver must be dimmable. Maximum permitted number of drivers is 400W divided by the driver nameplate power rating. Due to variety of LED lamp designs, maximum number of LED lamps is also dependent on power-factor result when connected to dimmer.
	Electronic Transformers	400W	
	Standard iron-core transformers	250W	Due to variety of transformer designs, max LV lighting load is also dependent on transformer efficiency.
	Toroidal iron-core transformers	300W	
	Incandescent	350W	
	Dimmable CFLs	400W	Due to the variety of CFL designs, the maximum number is make/model dependent.

## Incompatible Load Types

The switch is designed to **switch lighting loads only**. It is not suitable for switching ceiling sweep fans, exhaust fans or other non-lighting devices which require an air-break type switch.

## Multi-Gang De-Rating

Number of times per plate	De-rating factor
1	No de-rating
2	0.85
3	0.7
4	0.55
5	0.4
6	0.25

In applications where multiple LEDsmart<sup>+</sup> devices are installed in a multi-gang plate, a de-rating factor is applied to the maximum load as follows.

### De-rating Example

Two LEDsmart<sup>+</sup> devices installed in a wall plate. The maximum LED load which can be connected to each device = 400W x 0.85 = 340W per device.

### **Warranty**

This product is covered by a two-year warranty against manufacturing defects. This warranty is provided in addition to consumer guarantees covered by Australian Consumer Law.

### **Trademarks**

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Fax: 1300 95 3257

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## INTRODUCTION

LEDsmart+ dimmers, timers, switches and occupancy sensors include MultiMate™ technology. These devices have revolutionised multiple point control of lighting whilst using conventional wiring practices.

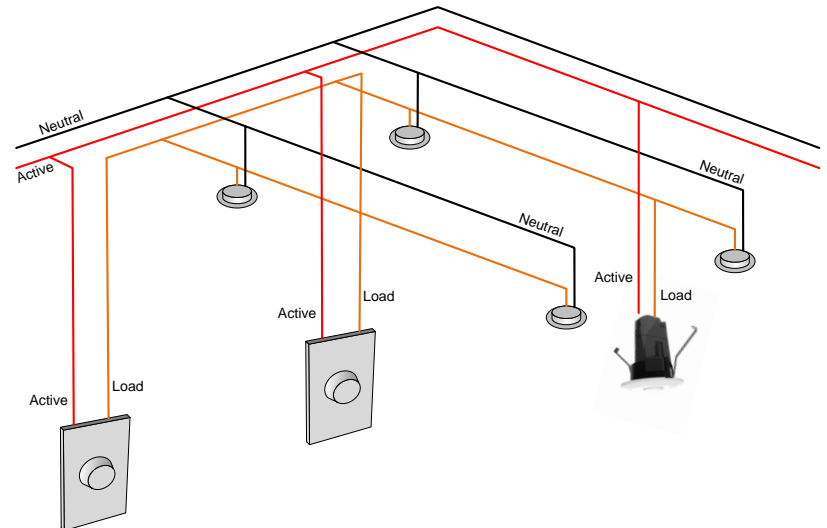
Even when not used for multi-way control, their superior compatibility with LED lighting loads makes them the best wall plate lighting controls in the market.

## MULTIMATE™ TECHNOLOGY

MultiMate™ is the technology inside the range of high quality LEDsmart+ dimmers, timers, switches and occupancy sensors. It allows multi-way control of lighting loads without the need for an expensive control system. MultiMate™ technology is suitable for both new and retrofit installations.

MultiMate™ technology enables multiple LEDsmart+ two-wire devices to be wired in parallel when two-way, three-way or multi-way dimming and switching is required.

When connected in parallel, LEDsmart+ dimmers, timers, switches and occupancy sensors allow dimming and switching of connected lighting loads from multiple locations without any additional wiring. No strapper wires, dedicated remote switch wiring or control bus is required.



## HOW MULTIMATE™ WORKS

MultiMate™ products use a patented method of communicating with each other using the mains wiring. By this means dimmers, timers, switches and occupancy sensors can communicate on/off, level, and settings to other LEDsmart+ products on the same circuit.

## INSTALLATION

In normal cases, existing switches can be removed and replaced by MultiMate™ dimmers, timers, switches and occupancy sensors. Please refer to the installation instructions for common wiring methods used for 1-way, 2-way, 3-way and other configurations.

## TROUBLESHOOTING

Like all products, sometimes there can be problems caused by the electrical behaviour of the building wiring, or that of the lighting loads. This document describes some cases found from real-world product experience and their solutions.

Each of the following pages describes a problem and solution. In some case additional product(s) may be required.

## APPLICABLE PRODUCTS

Dimmers:	MMDM/PB & MMDM/RT
Timers:	MMTM/PB & MMTH/PB
Switches:	MMSW/PB
Occupancy Sensors:	MMSE/PR

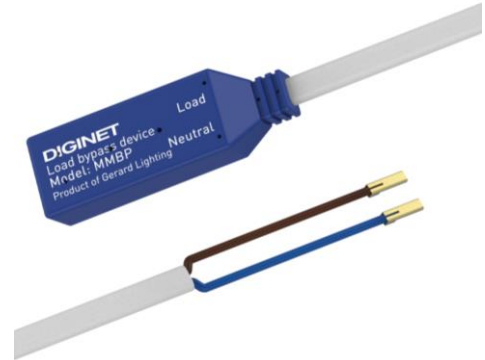
## FLICKERING OR FLASHING WHEN OFF OR AT LOW DIMMING LEVELS

Modern LED lighting has revolutionised high brightness low power lighting.

Unfortunately, some LED loads can have problems with dimmer compatibility. This can be observed when lamps flicker or flash when set to low dimming levels or when a MultiMate™ device is set to the OFF condition.

The MMBP load bypass is wired across the lamp. It will resolve almost all issues associated with dimming of LED lighting, including:

- Lamp glow when turned off;
- Flickering or pulsing of the lamp when turned off or to low dimming levels; and
- Flickering or pulsing of the dimmer LED status indicators.



### Solutions for lamp flickering at low dimming levels

Solution 1: Use the setup functions of the dimmer, timer, switch or occupancy sensor to adjust the MINIMUM dimming level to a higher value. Refer to the product installation guide for details.

Solution 2: Fit a load bypass device – order code MMBP.

Solution 3: In extreme cases, both the MMBP and a raised minimum level may be needed.

### Solutions for flickering or pulsing of dimmer LED status indicators.

Solution 1: Fit a load bypass device (MMBP).

Solution 2: Newer model dimmers introduce CLM mode. Use the setup guide for your product and activate CLM mode.

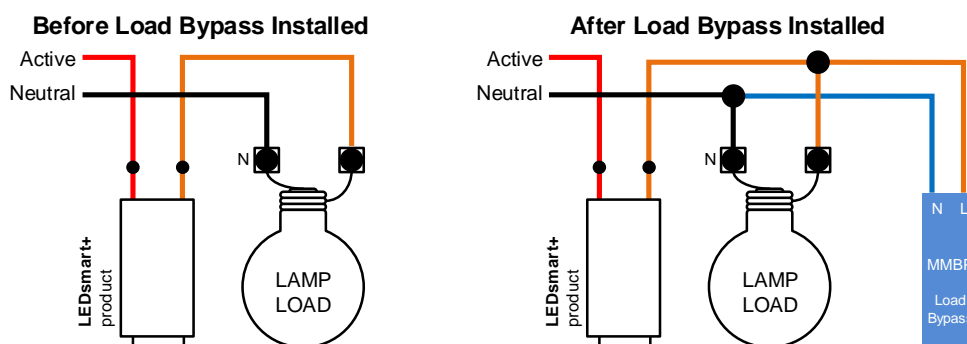
Solution 3: In extreme cases, both the MMBP and enabling CLM mode may be needed.

### Solutions for lamp flickering or flashing when turned OFF

Fit an MMBP load bypass. It is designed for this issue. Similar products are also available from other manufacturers.

### How to install the MMBP load bypass device

The MMBP load bypass device is installed **in parallel with the load, across the switched Active and Neutral**, as shown in the diagram below.



**Caution: Do not wire the MMBP across the dimmer terminals. This will not be effective.**

## CROSSTALK

Crosstalk happens when several MultiMate™ circuits are installed in the same building, and adjustments on one circuit cause interference on another circuit. The interference may be observed as:

- Lighting changes on one circuit cause lighting changes (on / off / change of level) on some other circuit; or
- Lighting changes on one circuit cause another circuit to turn off.



If a lighting load is flickering or flashing at low dimming levels or when turned off (and no dimmer / timer / switch is being adjusted) the most likely cause is a poorly designed lighting load. In that case, please refer to the section “Flickering or flashing when off or at low dimming levels”.

### Causes

If the mains supply has a high source impedance, this can cause crosstalk: where the communication of one set of dimmers interferes with adjacent dimmers – especially if the different dimmer circuits share a common active feed to the same switch plate.

Reasons for High source impedance may include one or a combination of:

- Old substation or local step-down transformer running close to maximum capacity;
- Long cable run from step down transformer to building;
- High resistance terminations on active feeds and/or neutral returns; and
- Neutral returns from a common active feed having significantly different run lengths back to the switchboard – good practice would be to link together neutral returns from a common active feed as close as possible to the loads.

A best practice is for wiring from the distribution panel to the multi-way control location to use twin & earth cabling, keeping active & neutral together for as long as possible. This results in the lowest supply impedance. Long runs of single-cable active wiring and separate neutral wiring should be avoided.

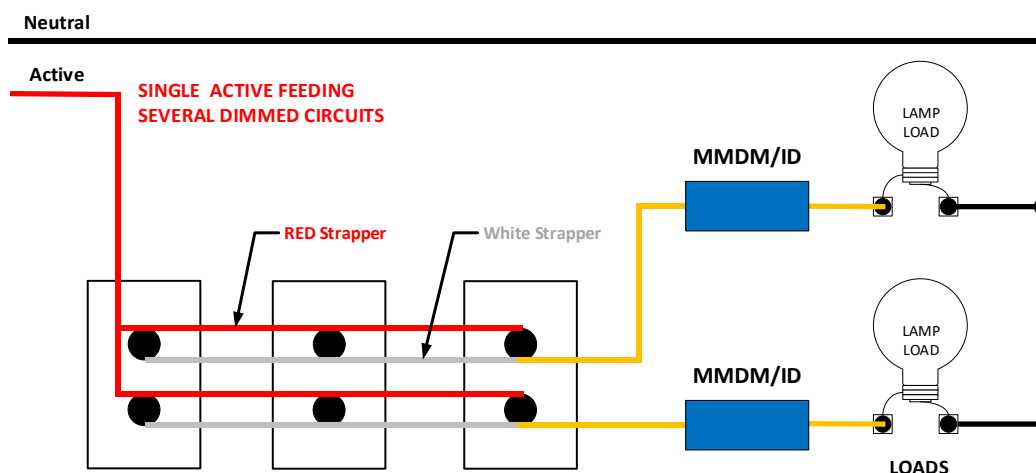
### Solution when the Multi-way function is not required

If the multi-way dimming function is not being used: follow the directions in the product Setup Guide to disable the MultiMate™ operation. This prevents the dimmer / timer / switch / sensor from sending and receiving the MultiMate™ commands.

Change this setting for all affected dimmers in the building when multi-way dimming is not needed.

### Solution when the Multi-way function is required

When the multi-way dimming function is required, an inline MMDM/ID Inductive Decoupler may be required – these should be connected between the last dimmer in the control chain and the load.



## FANS, FLUORESCENT LIGHTING AND NON-DIMMABLE LOADS

MultiMate™ dimmers, timers, switches and occupancy sensors are designed to control dimmable lighting loads.

Sometimes these products need to control non-dimmable loads, for example fluorescent lighting, non-dimmable LED lamps, or bathroom exhaust fans.

Direct wiring of these loads to MultiMate™ products may cause incorrect function of the load or the MultiMate™ product.

### To Control fans and non-dimmable loads

The MMSR MultiMate™ Slave Relay presents a dimmable load to MultiMate™ devices. When the dimmer level exceeds a threshold, the relay is operated and switches on a non-dimmable load.

Combinations loads are possible on a dimmer: a dimmable LED load may be used on the same circuit as non-dimmable loads. In this case, when the dimmer level is higher than a threshold, the relay is operated to switch the non-dimmable load(s) on and the dimmable load will continue to respond normally. This is shown in the wiring diagram below.



### Properties of the MMSR Slave Relay

The Slave Relay has voltage-free contacts, and is rated at 10AX. SELV load control is possible when using the isolating barrier that is included.

The Slave Relay is suitable for use with trailing edge phase control dimmers. The Slave Relay can satisfy the load requirements of LEDsmart+ dimmers / timers / switches or occupancy sensors by itself. Using an additional dimmable lighting load is optional.

### How to wire in the MMSR Slave Relay

