LED lighting is becoming more widely used and are set to become the dominant light source of the future.

All LED lamps need an associated driver unit to limit the current driving the LED. Some newer lamps integrate the driver into the base of the lamp but many use a separate driver unit. There are two types of LED drivers;

1) Constant current, generally used for high wattage LEDs where the LEDs are wired in series.

2) Constant voltage where low wattage LEDS are wired in parallel.

The following list shows the different control options available from Rako.

1. Constant current single channel 18w.

2. Constant current three channel 36w.

3. Constant voltage single channel 50w.

4. Constant voltage three channel 90w.

5. 0-10v/DSI/DALI (for drivers requiring a control signal).

6. DMX (for drivers requiring a DMX control input).

7. Mains dimmed.

8. Non dimmed switching

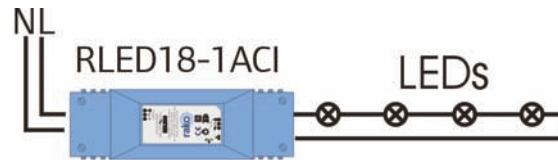9. Mains dimmed low voltage MR16 lamps (not recommended).

With modules designed for 3 colour LEDs the raise/lower buttons act as cycle start/stop buttons controlling a scrolling cycle through the 4 colours assigned to each of the scene buttons.
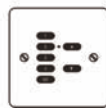
CONTROL METHOD 1 - Rako's wireless constant current 18w driver can be set to different current settings to suit the LEDs being controlled.

Options - 350mA, 500mA, 600mA and 700mA.

Up to 10 LEDs can be wired in series to a maximum of 18w.

NL

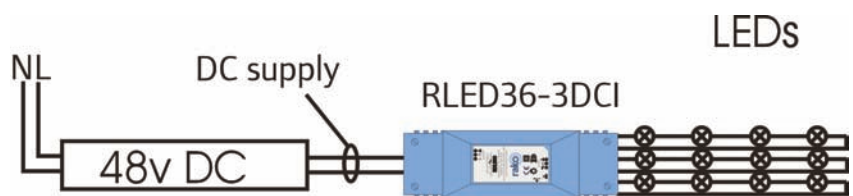RLED18-1ACI   LEDs

Single channel 18w LED Driver

Controlled from Rako wireless panel or wired system via Rako Bridge

CONTROL METHOD 2 - Rako's constant current 3 channel 36w driver is designed to control 3 colour RGB LED fittings.

The module works in conjunction with a DC power supply between 12-48v and up to 36w.

The different colours are wired in series to a maximum of 12 and not exceeding 12w on any one channel.

NL   DC supply   LEDs
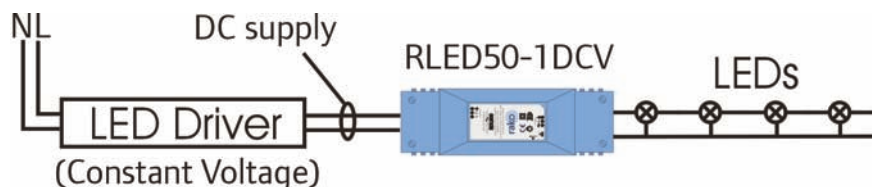RLED36-3DCI

48v DC

3 channel RGB constant current 36w LED Driver

Controlled from Rako wireless panel or wired system via Rako Bridge

CONTROL METHOD 3 - Dimming constant voltage single channel 50w.

Light fittings using constant voltage LEDs generally use a standard DC power supply. These power supplies have a fixed output and Rako's RLED receiver fits between the power supply and the LEDs.
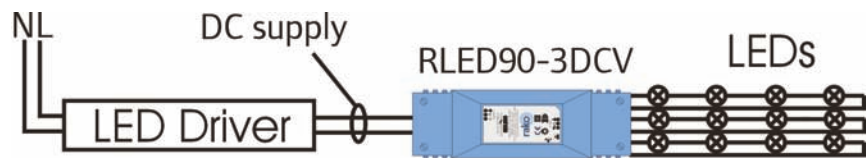
NL   DC supply   RLED50-1DCV   LEDs

LED Driver
(Constant Voltage)

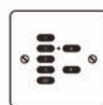Controlled from Rako wireless panel or wired system via Rako Bridge

CONTROL METHOD 4 - Dimming constant voltage 3 channel 90w.

This version is the same as that described above but will control 3 sets of LEDs and is designed for 3 colour LED fittings.
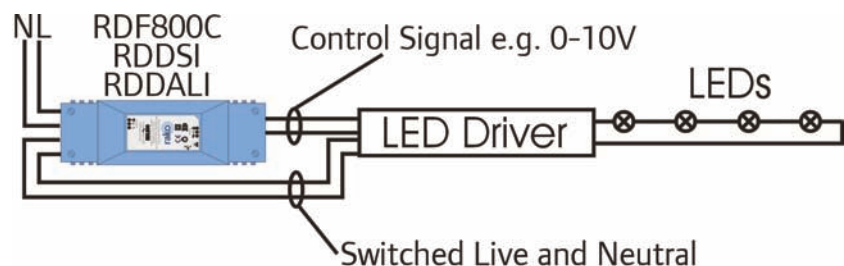
NL DC supply RLED90-3DCV LEDs

LED Driver
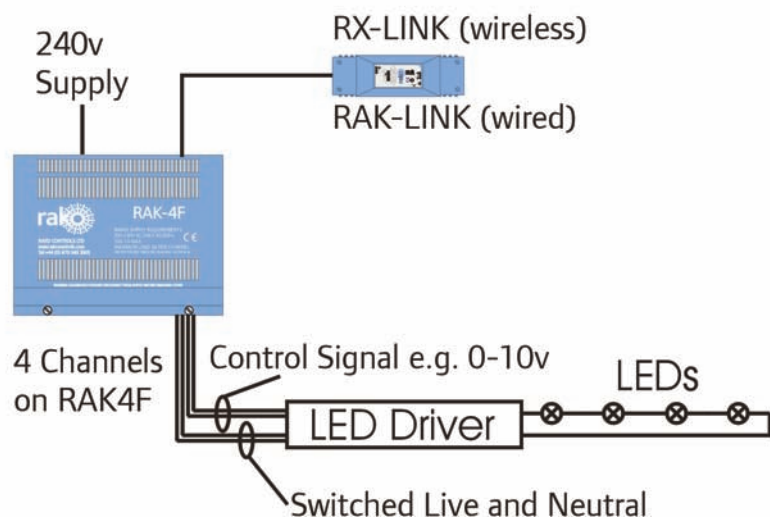
3 channel RGB constant voltage 90w LED Driver

Controlled from Rako wireless panel or wired system via Rako Bridge

CONTROL METHOD 5 - Dimming - Drives requiring control signal.

A number of LED drivers can be dimmed via a control signal, either 0-10V analogue or DSI/DALI digital. In addition to the mains wiring a control pair is required between controller and driver. Each output on a RAK-4F can be selected to provide any of the three options, when using Rako modules the RDF800-C is for use with 0-10V drives, RDDSI for DSI drives and RDDALI for DALI drives.
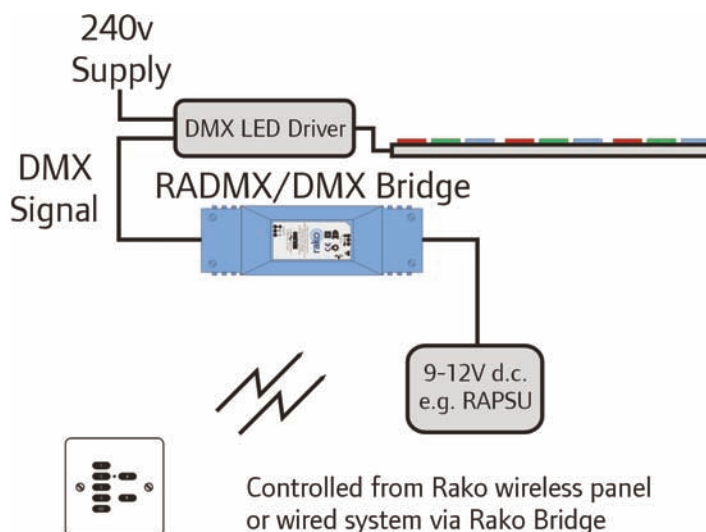
NL RDF800C RDDSI RDDALI Control Signal e.g. 0-10V LEDs

LED Driver

Switched Live and Neutral

Controlled from Rako wireless panel or wired system via Rako Bridge

240v Supply RX-LINK (wireless)

RAK-LINK (wired)

rako RAK-4F

4 Channels on RAK4F Control Signal e.g. 0-10v LEDs

LED Driver

Switched Live and Neutral

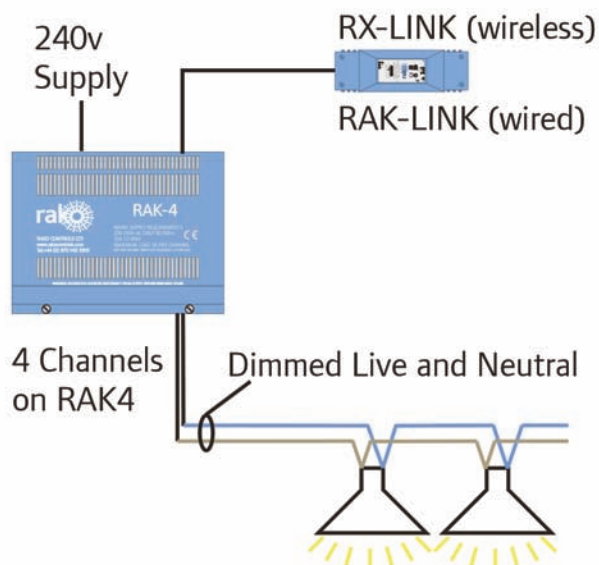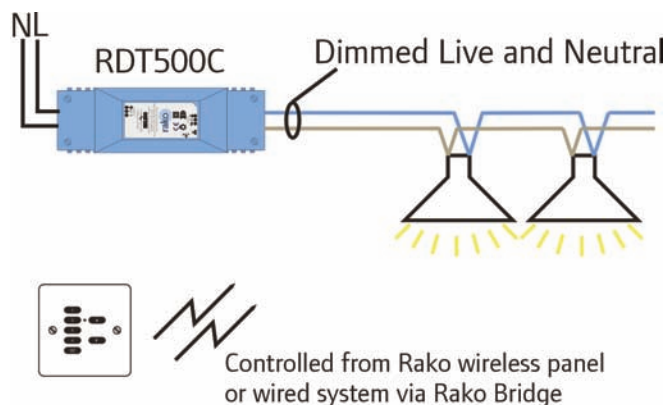## CONTROL METHOD 6 - DMX controlling DMX LED driver.

Many fittings with three colour LEDs use a driver that requires theatrical control method called DMX . Rako's RADMX unit is used to control these DMX drivers for wireless systems or DMX Bridge for wired.

CONTROL METHOD 7 - Mains dimming.

LED fittings designed to work from conventional mains dimming (typically GU10 type) can be controlled using Rako dimmer modules. In the majority of cases these lamps perform better using trailing edge dimmers such as the RDT500-C, RDT1200-C and RAK4 dimmers. There are a small number of these lamp types that perform better when dimmed with leading edge dimmers such as the RDL series dimmers or RAK4L. The performance of this style of lamp varies considerably, both depending on the manufacturer and wattage. Rako tests any lamps sent as samples and the results are documented on the sheet 'Table of LED's'.
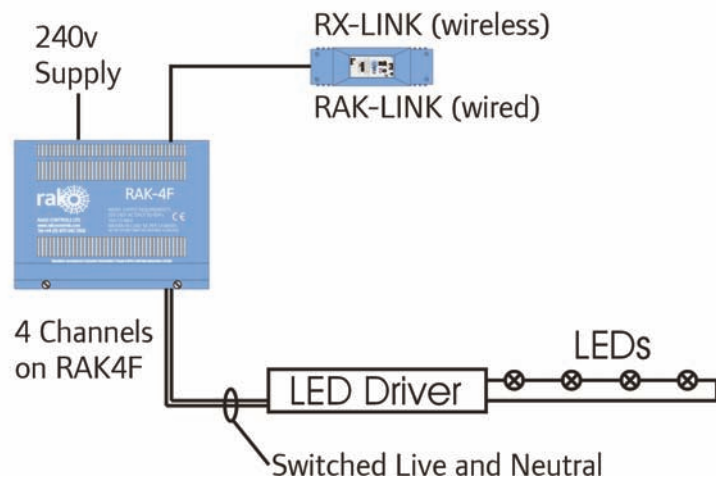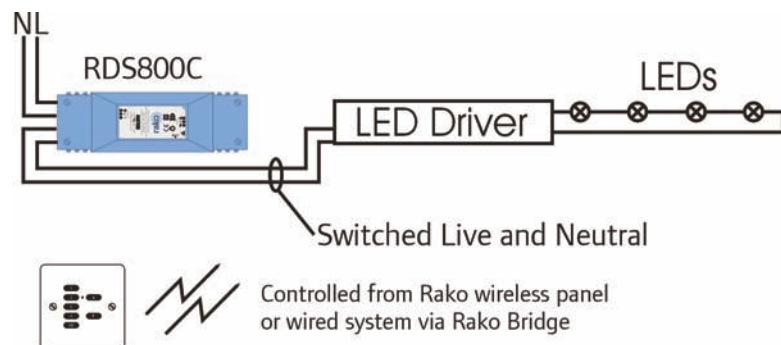
It should be noted that due to the way in which these LED lamps take their power during the mains cycle many require a significant de-rating factor to be applied when calculating a suitably sized dimmer. In some cases these may be as high as 10x (i.e. 500w dimmer rating 50w of nominal lamp load).

CONTROL METHOD 8 - Non dimmed Switching.

LED fittings that have a non-dimmable driver can be controlled using Rako's RDS800C module or RAK4-T and RAK4-F rack options.

CONTROL METHOD 9 - Mains dimmed low voltage MR16 replacement LEDs (Not Recommended).

These lamps are designed to retrofit in a previous 12v tungsten halogen installation. They are designed to work with low voltage lighting transformers. These transformers however have varying requirements for acceptable dimming, such as having minimium loadings. As the transformer adds another variable into the equation this method can be somewhat hit-and-miss.