

QUICK START GUIDE

1. Software Installation

Insert the shipped USB flash drive into your PC. Use Windows Explorer to access the USB flash drive and start the installation. You need administrator rights to install the driver you require.

2. Start-up

Connect the DALI Master to your PC via USB and then connect the power cord to the power supply. You can then start using the kit right away. The lamp will start glowing white. Then run the DALI Master software. You have several different DALI Colour Control features to choose from.

3. xy control

The xy colour mode lets you select every point in the standardized CIE colour system. Select the desired colour position or colour temperature directly in the CIE graph.

for red	(x = 0.67, y = 0.33)	for candlelight	(x = 0.55, y = 0.41)
for blue	(x = 0.14, y = 0.08)	for warm white	(x = 0.45, y = 0.41)
for green	(x = 0.21, y = 0.71)	for neutral white	(x = 0.37, y = 0.37)

The DALI protocol states that the x and y values are directly transferred to one or several operating devices. It is also possible to store scenarios with the desired xy values and brightness directly on the LDB-314 device.

4. Tc control

The Tc colour mode lets you select any point along the black body curve. This makes it possible to control any colour temperature between 1700 and 8000 Kelvin.

for soft white	for neutral white	for daylight white
< 3300 K	3300 K – 5300 K	> 5300 K

The DALI protocol states that the colour temperature is directly transferred to one or several operating devices. It is also possible to store scenarios with the desired colour temperature and brightness directly on the LDB-314 device.

5. Primary_N

The Primary_N mode gives you direct access to each individual LED channel on a DALI address. The main function of this operating mode is calibrating individual colour channels. It is technically possible to control colour in this mode; however, it is not common practice. Nevertheless, in Primary_N mode it is possible to set the individual colours consecutively in order to achieve a smooth transition between two colour positions. The output channels are calibrated during lamp production. This allows for a colour control that can be reproduced regardless of the LEDs in use.

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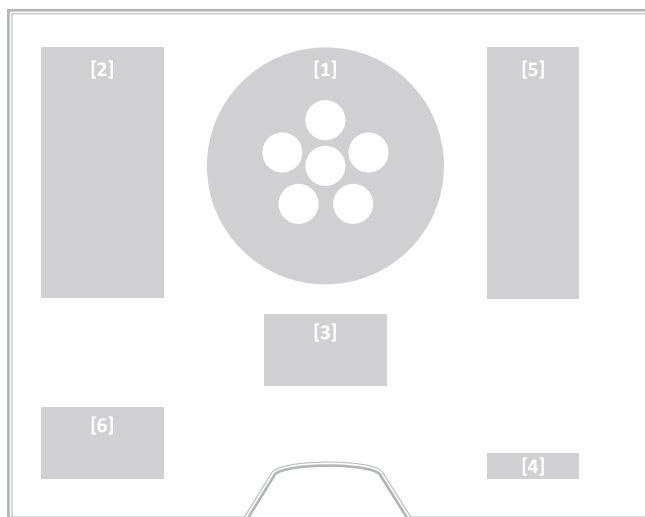
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DALI COLOUR CONTROL
DEVELOPMENT KIT

CONTENTS

Your kit should contain the following items:

- CANDELED LLE-314 Light Engine [1]
- CANDELED LDB-314 LED Driver [2]
- CANDELED LDM-1 DALI Master [3]
- USB flash drive [4]
- USB cable [5]
- For UK version: UK adapter [6]



WARNING!

The devices can be operated once they have been installed. Ensure that the devices are never in use in the kit for more than two hours at a time. If you are planning to use the products for a longer period of time or for lighting purposes, disconnect the LED Driver and the LED Engine and dismantle the components from the kit. Then you can reconnect the elements and operate the device again. Only then should you switch the device on again. The LED Engine is suitable for long-term use once dismantled or installed as a downlight on the ceiling.

DALI

DALI (Digital Addressable Lighting Interface) is the access protocol used in conjunction with operating devices for lamps in building automation. DALI has been standardised by the IEC according to IEC 62386. The standard is made up of general IEC 62386-1xx requirements, special requirements for IEC 62386-2xx devices and special requirements for IEC 62386-3xx input devices, which are still in the process of being standardised.

DALI is currently undergoing a transition from Edition 1 to Edition 2. Mistakes that were made in the past have now been rectified and handy new features have been added.

None of the backwards compatibility has been lost in the switch from Edition 1 to Edition 2. Furthermore, it is still possible to develop and sell products entirely on the basis of Edition 1.

With its increased stability and new features, we would thoroughly recommend switching to Edition 2.

DALI Colour Control

DALI Colour Control is standardised according to IEC 62386-209. It enables you to set the colour temperature (Tc colour temperature) and/or colour location (xy colour), regardless of the light source. This forms the basis of the CIE colour system.

It is possible to directly control the individual colours of a lamp using special commands (Primary_N). This can be useful for developing a lamp (ascertaining the luminous power of individual channels or developing temperature). You can also calibrate a lamp (fully automatically) during the production stage or when replacing a lamp in the field, by connecting it to other DALI commands. Calibrating the electronic ballast with the lamp marries the two devices in such a manner that it is possible to control the colour location of all lamps in a certain area at the same level, even if the lamps or LEDs have been produced by different manufacturers or are from different production batches ('binning problem' in LEDs).

The sturdiness of the control, the colour fastness and the accuracy of reproduction are particularly notable features.

If you are using a DALI Colour Control lamp, you no longer need to know the light colour required for your specific situation in advance. Quite the opposite. The light installation can be dynamically and flexibly adjusted over time or to suit the function of the premises.

The light planner switches between daylight and candlelight at the touch of a button. This is not a spasmodic jump, but a smooth transmission that can even be stretched out over a whole day, so that entirely new fields of use or light installations can be implemented. Users have the option of switching directly from a warm and cosy lighting scenario to something much more invigorating. It is possible to save and produce scenarios both manually and automatically.

Technical data

LLE-314 Light Engine

The LLE-314 Light Engine is based on the CANDELED LLP-314 LED board. Both devices are designed for use in conjunction with the DALI LDB-314 electronic ballast. It is possible to display the entire CIE colour space, including the Planck curve, thanks to the integrated RGBW LEDs.

The LED board has the following technical specifications:

▪ 6x CREE XLAMP MCE4CT-A2-KPEJ-5A	▪ Wire stripping length 6 – 7 mm (or 0.24 – 0.28 in.)
▪ RGBW HIGH POWER LEDs	▪ Common anode
▪ Up to 700 mA per channel	▪ Passive (control with constant current)
▪ Thermal resistance PCB: 1.3 W/mK	▪ 105 mm diameter
▪ Board thickness: 1.55 mm,	▪ Wire cross-section 0.2 mm ² to 0.75 mm ² (or 24 AWG to 18 AWG)
▪ WAGO PCB terminal 2060-402/403	

The Light Engine heat sink is designed for use in suspended ceilings with a 30 W power output.

LDB-314 LED Driver

The LDB-314 is a four-channel DALI Colour Control LED converter for use in conjunction with passive high power LED modules containing up to 24 LEDs. The total output power should not exceed 30 W. Dimming and colour/colour temperature adjustment are performed via the DALI input. The input is voltage-proof up to 250 V, polarity protected and, when compared to the output voltage, better insulated in accordance with VDE regulations. The LEDs are controlled with a constant current. The maximum current per channel can be preset in four stages. The LDB-314 is housed in a plastic case that measures 163 mm x 83 mm x 32 mm (LxWxH) xy colour position and the colour temperature are controlled in accordance with IEC 62386-209 as the DALI standard. An alternative version of the product makes it possible to control the LED output channels directly via individual DALI addresses (four-address DALI).

The combination of white light and RGB LEDs makes it possible to display the entire CIE colour space along with an equally high colour rendering index. The output channels are calibrated during lamp production. This allows for a colour control that can be reproduced regardless of the LEDs in use.

The LDB-314 has the following technical specifications:

▪ 4 PWM output channels	▪ 220 – 240 V AC, 50 – 60 Hz
▪ DALI connection is voltage-proof up to 250 V	▪ 1 – 6 LEDs per channel
▪ 30 W output power	▪ Double isolation according to SELV
▪ Constant LED current: 350 mA, 500 mA, 700 mA, 1050 mA adjustable (protection degree SELV)	
▪ Protective features: short-circuit proof, open circuit-protected, overload protection, primary fuse	

LDM-1 DALI Master

The LDM-1 DALI Master is designed for use in the laboratory or in lamp production. The DALI bus voltage is generated via the 5 V USB supply using a DC/DC converter.

This means DALI can supply a current of 15 V up to a level of 50 mA. The simple USB communication protocol lets users create their own management software for testing and production purposes.

CANDELED is also happy to develop specific software on request.