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SCAN

the technical data

Detailed mounting and programming manual instruction inside the packaging

DALI-PWM LED RGB controller

SDL-11

ø60 Mounting in a Ø60 junction box

Mounting indoor only

The SDL-11 controller is a LED RGB controller designed to operate in lighting installations by means of DALI protocol (Digital Addressable Lighting Interface). The controller operates as a SLAVE device in a lighting installation and requires control by a MASTER controller compatible with DALI protocol. MASTER system as a software must support devices produced according to the PN-EN 62386-209 standard with the "Primary N" type colour coding in DT8 device standard. SDL-11 is mounted in Ø60 junction boxes. The device is equipped with three transistor outputs with a maximum current load of 2,5 A operating with the PWM modulation. Wide range of nominal supply voltage 10÷48 V DC allows to control the majority of available LED RGB lighting sources (LED tapes, LED modules and voltage controlled LED lighting fittings). Address programming in the SDL-11 module is possible only in the automatic mode (by means of the DALI controller).

Device is compatible with DALI standard.

zamel

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10÷48 V DC / 0,3 W; IP20
weight: 27 g

RGB DALI LED controller
TYPE: SDL-11

5 903669 042075

The symbol means selective collecting of electrical and electronic equipment. It is forbidden to put the used equipment together with other waste.

Declaration of Conformity is at **www.ledix.pl**

Made in Poland

SDL-11 EN Ver. 01

zamel

10÷48 V DC

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DALI-PWM LED RGB controller

SDL-11

www.ledix.pl

DESCRIPTION

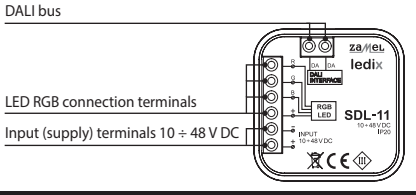
The SDL-11 controller is a LED RGB controller designed to operate in lighting installations by means of DALI protocol (Digital Addressable Lighting Interface). The controller operates as a SLAVE device in a lighting installation and requires control by a MASTER controller compatible with DALI protocol. MASTER system as a software must support devices produced according to the PN-EN 62386-209 standard with the "Primary N" type colour coding in DT8 device standard. SDL-11 is mounted in Ø60 junction boxes. The device is equipped with three transistor outputs with a maximum current load of 2,5 A operating with the PWM modulation. Wide range of nominal supply voltage 10÷48 V DC allows to control the majority of available LED RGB lighting sources (LED tapes, LED modules and voltage controlled LED lighting fittings). Address programming in the SDL-11 module is possible only in the automatic mode (by means of the DALI controller). The "Primary N" standard colour coding based on the PN-EN 62386-209 standard controls directly the luminous flux intensity in each of the three output channels (R, G, B).

It is possible to adjust a required colour and to change its luminous intensity by a proper change of R, G, B parameters.

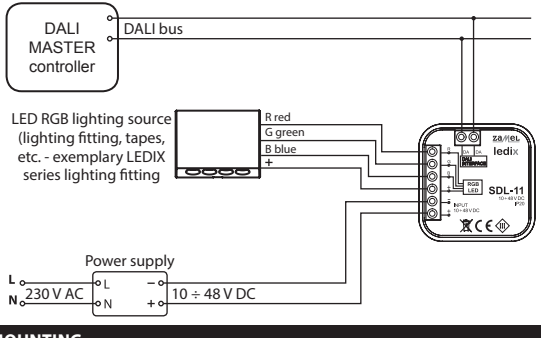
TECHNICAL DATA

Nominal supply voltage:	10 ÷ 48 V DC
Power consumption during stand-by mode:	< 0,3 W
Number of channels:	3
Channel output element:	3 x MOSFET transistor (displays the ground)
Channel maximum current:	2,5 A
Control type:	PWM modulation
PWM control resolution:	16-bit
PWM frequency:	250 Hz
Colour coding:	"Primary N" standard consistent with EN62386-209
Device type on the bus:	8 (DT8)
Address programming:	automatic (only by means of MASTER system)
Number of terminal clamps:	8
Cross-section of connection cables:	0,2 ÷ 2,5 mm²
Operating temperature range:	-10 ÷ +55 °C
Operation position:	free
Casing mounting:	Ø60 junction box
Casing protection degree:	IP20
Protection class:	III
Dimensions:	47,5 x 47,5 x 20 mm
Weight:	0,027 kg
Reference standard:	EN 62386-102, PN-EN 62386-209

APPEARANCE



DIAGRAM



MOUNTING

CAUTION! Connection of this device to a single-phase installation must be installed in accordance with standards valid in a particular country. Installation, connection and control should be carried out by a qualified electrician staff, who act in accordance with the service manual and the device functions.

1. Disconnect power supply by the phase fuse, the circuit-breaker or the switch-disconnector combined to the proper circuit.
2. Check if there is no voltage on the connection cables by means of a special measuring equipment.
3. Install the power supply to 230 V AC.
4. Connect the cables with the correct SDL-11 terminals in accordance with the installing diagram.
5. Mount SDL-11 in the Ø60 junction box.
6. Switch on the power supply from the mains and check if the device operates properly.

FUNCTIONING

COLOUR REPRESENTATION

For the SDL-11 controller and according to DALI standard the PWM parameter for each output is the 16-bit value. The most significant bit MSB (bits from 9 to 16) is recorded in the DTR1 register and the least significant LSB (bits from 1 to 8) in the DTR0 register of the SLD-11 device.

16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1

The channel, the PWM parameter will be assigned to (written to DTR1 and DTR0 registers), is selected by entering a correct address into the DTR2 register.

Addresses assigned to channels for the SDL-11

Channel	Address	Parameter value in DTR2
R	0	0x00h
G	1	0x01h
B	2	0x02h

Addresses assigned to channels for the SDL-11 controller:

Parameter values in DTR0, DTR1, DTR2 registers	Description
DTR2 » 0x00h Channel (0) DTR1 » 0xFFh DTR2 » 0x01h Channel (1) DTR1 » 0x00h DTR2 » 0x02h Channel (2) DTR1 » 0x00h	**Red** colour setting (R)
DTR2 » 0x00h Channel (0) DTR1 » 0x00h DTR2 » 0x01h Channel (1) DTR1 » 0xFFh DTR2 » 0x02h Channel (2) DTR1 » 0x00h	**Green** colour setting (G)
DTR2 » 0x00h Channel (0) DTR1 » 0x00h DTR2 » 0x01h Channel (1) DTR1 » 0x00h DTR2 » 0x02h Channel (2) DTR1 » 0xFFh	**Blue** colour setting (B)
DTR2 » 0x00h Channel (0) DTR1 » 0xFFh DTR2 » 0x01h Channel (1) DTR1 » 0xFFh DTR2 » 0x02h Channel (2) DTR1 » 0xFFh	**White** colour setting (R+G+B)

LUMINOUS FLUX INTENSITY CHANGE (BRIGHTENING / DIMMING)

The luminous flux intensity in SDL-11 controllers is realised by entering correct PWM parameter values for a particular RGB controller output.

An example of luminous flux intensity change for red (R):

Parameter values in DTR0, DTR1, DTR2 registers	Description
DTR2 » 0x00h Channel (0) DTR1 » 0xFFh DTR2 » 0x01h Channel (1) DTR1 » 0x00h DTR2 » 0x02h Channel (2) DTR1 » 0x00h	Luminous flux intensity – 100% Parameter value in DTR1 register - 255 (0xFF)
DTR2 » 0x00h Channel (0) DTR1 » 0x80h DTR2 » 0x01h Channel (1) DTR1 » 0x00h DTR2 » 0x02h Channel (2) DTR1 » 0x00h	Luminous flux intensity – 50 % Parameter value in DTR1 register – 128 (0x80)
DTR2 » 0x00h Channel (0) DTR1 » 0x01h DTR2 » 0x01h Channel (1) DTR1 » 0x00h DTR2 » 0x02h Channel (2) DTR1 » 0x00h	Luminous flux intensity – 1 % Parameter value in DTR1 register – 1 (0x01)

An example of luminous flux intensity change for white:

Parameter values in DTR0, DTR1, DTR2 registers	Description
DTR2 » 0x00h Channel (0) DTR1 » 0xFFh DTR2 » 0x01h Channel (1) DTR1 » 0xFFh DTR2 » 0x02h Channel (2) DTR1 » 0xFFh	Luminous flux intensity – 100% Parameter value in DTR1 register - 255
DTR2 » 0x00h Channel (0) DTR1 » 0x80h DTR2 » 0x01h Channel (1) DTR1 » 0x80h DTR2 » 0x02h Channel (2) DTR1 » 0x80h	Luminous flux intensity – 50 % Parameter value in DTR1 register – 128 (0x80)
DTR2 » 0x00h Channel (0) DTR1 » 0x01h DTR2 » 0x01h Channel (1) DTR1 » 0x01h DTR2 » 0x02h Channel (2) DTR1 » 0x01h	Luminous flux intensity – 1 % Parameter value in DTR1 register – 1 (0x01)

FUNCTIONING

COMMAND SEQUENCE TO SET THE LIGHTING COLOUR

The sequence of commands must be sent by the MASTER controller one by one with an interval >150 ms.

After saving all necessary data, carry out the following command 'type8_activate'.

```
/*colour setting R*/
DTR1 » 0xff                    //enter PWM values for channel R
DTR0 » 0x00
DTR2 » 0x00                    //enter channel R address into the DTR2 register
ENABLE DEVICE TYPE X » 0x08    //unlock X type device (for RGB type 8)
QUERY APP EXT Cmd234 » 0x00    //command 'set temporary primary N dimlevel' for channel 0 (R)

/*colour setting G*/
DTR1 » 0xff                    //enter PWM values for channel G
DTR0 » 0x00
DTR2 » 0x01                    //enter channel G address into the
                                 DTR2 register
ENABLE DEVICE TYPE X » 0x08    //unlock X type device (for RGB type 8)
QUERY APP EXT Cmd234 » 0x01    //command 'set temporary primary N dimlevel' for channel 1 (G)
/*colour setting B*/
DTR1 » 0xff                    //enter PWM values for channel B
DTR0 » 0x00
DTR2 » 0x02                    //enter channel B address into the DTR2 register
ENABLE DEVICE TYPE X » 0x08    //unlock X type device (for RGB type 8)
QUERY APP EXT Cmd234 » 0x02    //command 'set temporary primary N dimlevel' for channel 2 (B)

/*type8_activate (type 8 device activation)*/
ENABLE DEVICE TYPE X » 0x08
QUERY APP EXT Cmd2262
```

- **Description of applied commands:**
- **DTR**1 – enter of parameter values into DRT1 register – **command 273**
- **DTR0** – enter of parameter values into DRT0 – register – **command 257**
- **DTR2** – enter of parameter values into DRT0 – register – **command 274**
- **ENABLE DEVICE TYPE X** – unlock X type device (X – device number) 8 for RGB – **command 272**
- **QUERY APP EXT Cmd234** – set temporary primary N dimlevel, channel N number saved in DTR2 register – command 234
- **ENABLE DEVICE TYPE X** – unlock X type device (X – device number) 8 for RGB – **command 272**
- **QUERY APP EXT Cmd226** – activation – **command 226**

DEFAULT SETTING

In case of SDL-11 it is not possible to set parameters as Fade Time, Fade Rate. A particular colour is changed with a time constant of 150 ms. The Power on Colour (colour after power supply is switched on) and System Failure Colour (during system failure) parameters have a default setting:

Power on Colour – green colour, brightness 100%

ADDRESSING

The addressing depends on the applied control module (DALI MASTER) the SDL-11 module cooperates with. Typically, the addresses are automatically assigned to modules following the sequence. It is possible to change the address and the name of the SDL-11 controller by means of the DALI MASTER controller. There is no possibility to set addresses manually by means of the SDL-11 device.

SAFETY DEVICE

The (OUT) output of SDL-11 is equipped with surge voltage and overload protections. In case of a small overload the temperature protection reacts in limiting the output power (lowering the PWM level to 5%). In case of high overload (160 – 190% Pn) or short circuit there is a complete output power supply cut off till the overload / short circuit is eliminated (recurring).

REMARKS

1. The SDL-11 controller can be supplied with 10 V to 48V DC. The power supply voltage and the power supply output must be adjusted to the nominal supply voltage and power consumption of a lighting source connected to the SDL-11 output terminals.
2. Use a two-wire cable of 0,5÷1,5 mm2 diameter to connect SDL-11 with DALI bus. The length of the cable should not exceed 300 m (permissible voltage drop on the bus 2 V).
3. In case of DALI MASTER controllers if there is no own bus power supply, it is required to apply an additional bus power supply (typical 16 V ±5%) connected to the DA line.
4. DALI bus lines are resistant to polarity inversion.
5. In case of high loads and long distance connections between the power supply - DALI module and DALI module and the load it is recommended to properly select the cross-section of cables. Permissible voltage drop is 0,5 V.
6. Maximum of 64 modules can be connected to a single DALI bus. It must be taken into account already during the design phase.
7. The SDL-11 controller is designed to be mounted in a Ø60 junction box. It is recommended to use deep junction boxes (62 mm) or pocket junction boxes. The controller can also be mounted in a lighting fitting due to its small dimensions. The device is designed to be mounted only indoor. In case of outdoor mounting, an additional casing is required with a minimum protection degree (IP54) and proper ventilation.