DCDA-33M

EN Dimming actuator

Characteristics

- DCDA-33M is a dimming unit designed to dim single-color and RGB LED light sources controlled by variable current.
- The actuator has three independent channels and each output channel is individually addressable and controllable.
- DCDA-33M actuator can be controlled from the bus BUS, DALI or DMX.
- When controlling the unit from the buses BUS and DMX, also the fourth virtual channel can be supported to control overall brightness (BUS - switching in iDM3, DMX - switch long press of PRG).
- DCDA-33M can directly control from the system iNELS where the communication interface is the installation BUS.
- If for controlling, a communication interface DALI or DMX is used, it is possible to use the master unit EMDC-64M.
- The supply voltage of the dimming unit must be at least 4V higher than the expected output voltage on the load (see graph).
- Setting the communication interface and addresses of actuators is performed using DIP switches:
  a) switch No. 1
  - In the upper position determines DALI or BUS
  - In the lower position determines DMX

  b) switch No. 2 (if that switch 1 is in the upper position)
  - In the upper position determines DALI
  - In the lower position determines BUS
- Using the control buttons on the front panel, you can manually control the output.
- The input circuits of communication interfaces are optically isolated from the supply voltage connected lamp unit, and is therefore resistant to electromagnetic interference.
- DCDA-33M in 3-module is designed for panel mounting on DIN rail EN60715.

General instrucions

CONNECTION TO THE SYSTEM, INSTALLATION BUS

iNELS3 peripheral units are connected to the system through the BUS installation. Installation BUS conductors are connected to the terminal units to BUS+ and BUS- terminals, wires cannot be interchanged. For installation of BUS it is necessary to use a cable with a twisted pair of wires with a diameter of at least 0.8 mm, the recommended cable is iNELS BUS Cable, whose features best meet the requirements of the BUS installation. Bearing in mind that in terms of all the properties iit is it is possible in most cases also use the cable JYSTY 1x2x0.8 or JYSTY 2x2x0.8, however it is not recommended as the best option. In the case of a cable with two pairs of twisted wires it is not possible to use the second pair of the other for modulated signal due to the speed of communications; it is not possible within one cable to use one pair for one segment BUS and the second pair for the second segment BUS. For installation of BUS it is vital to ensure that it is kept at a distance from the power lines of at least 30 cm and must be installed in accordance with its mechanical properties. To increase mechanical resistance of cables we recommend installation into a conduit of suitable diameter. Topology installation of BUS is free except for a circle, each end of the BUS must terminate at terminals BUS+ and BUS-. While maintaining all the above requirements, the maximum length of one segment of the installation BUS can reach up to 550 m. Due to the data communication and supply of units in one pair of wires, it is necessary to keep in mind the diameter of wires with regards to voltage loss on the lead and the maximum current drawn. The maximum length of the BUS applies provided that they comply with the tolerance of the supply voltage.

OUTPUT BUS DALI AND DMX

DALI is a two wire BUS and polarization-independent BUS. EMDC-64M converter has a power supply (16 V / 250 mA) DALI BUS implemented inside and it must not be connected to any external source. For the management of DALI BUS no exact cable type is recommended, but it is important to keep some installation conditions. For DALI BUS lines up to 100 m it is recommended to use a min. conductor size of 0.5 mm^2. To manage from 100 - 150 m min. cross section of 0.75 mm^2 and more than 150 m it is recommended to use min. 1.5 mm^2. Management of more than 300 m is not recommended. The voltage drop at the end of the installation shall not be greater than 2 V. In the case of a 5-pin cable, be sure to avoid confusion with the management of the BUS line power. BUS connection topology is arbitrary and need not be terminated. DMX was developed as a digital interface for the control of effect lighting. BUS topology is strictly linear and must be terminated at both ends of the resistor with a nominal value of 120 Ω. With EMDC-64M this can be done by shorting the ends of adjacent terminals TERM and A. In general, when you install DMX BUS follow all RS485 installation requirements. When using repeaters you can control up to 64 receivers. Ideally, the range may be up to 1200 m.

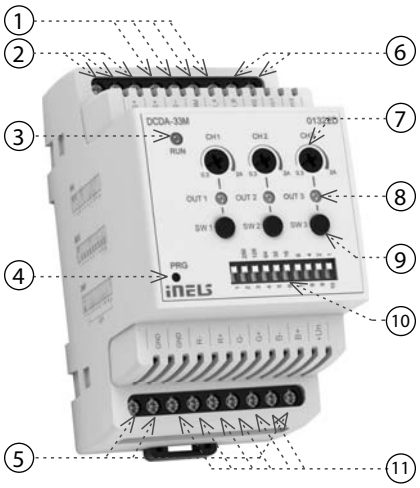
CAPACITY AND CENTRAL UNIT

It is possible to connect to the central unit CU3-01M or CU3-02M two independent BUSes by means of terminals BUS1+, BUS1- and BUS2+, BUS2-. It is possible to connect to each BUS up to 32 units, so it is possible to connect directly to the central unit a total of 64 units. It is necessary to comply with the requirement of a maximum load of one BUS line - maximum up to 1000 mA current. It is the sum of the rated currents of the units connected to the BUS line, other units can be connected using the units MI3-02M, which generate further BUS. These are connected to the CU3 unit via the system bus EBM and you can connect a total of 8 units via EBM bus to the central unit MI3-02M.

SUPPLYING THE SYSTEM

For supplying power to system units, it is possible to use the power sources of ELKO EP titled PS3-100/ iNELS. We recommend backing up the system with backup batteries connected to the source of PS3-100/iNELS (see sample diagram of connecting the control system).

Description of device



1. Terminals for connecting DMX
2. Terminals for connecting BUS
3. Supply voltage / communication indication
4. Setting DMX RGB/RGBM *
5. Supply terminals for device and LED light source
6. Terminals for connecting DALI
7. Maximum power settings - LED light source
8. Output mode indicatuon
9. Manual control output by briefly pressing (ON/OFF)
10. Setting input / address
11. Terminals for connecting LED

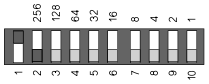
* Setting of the RGB/RGBM PRG button is only possible in DMX mode (first DIP switch is down). Setting RGB/RGBM mode BUS is done with iDM3 software.

Switching RGB/RGBM by long press of PRG:
- set to address 0
  - RGB mode - RUN LED flashes 1x
  - RGBM mode - RUN LED flashes 2x
- set the address other than 0
  - RUN LED lights (ok) to change flashes
  - RUN LED flashes - no DMX signal
  - RUN LED flashes 2x - turn signal DMX

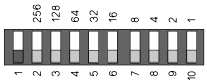
Setting the DIP switches



Setting the DALI communication interface - Switch 1 and 2

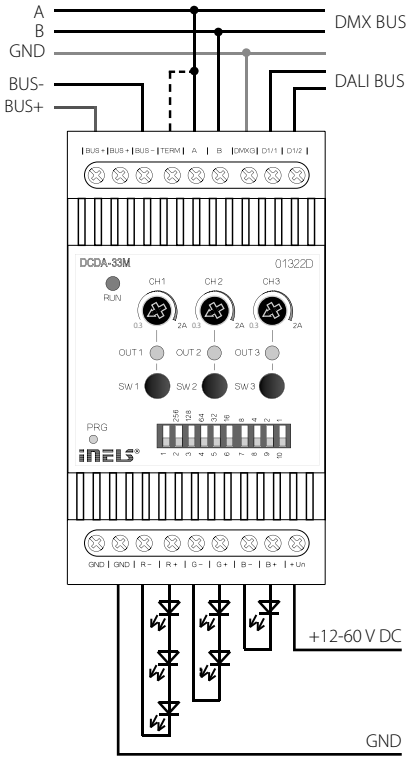


Setting the BUS communication interface - Switch 1 and 2



Setting the DMX communication interface - Switch 1
Setting address - Switch 2-10

Connection



Technical parameters

DCDA-33M

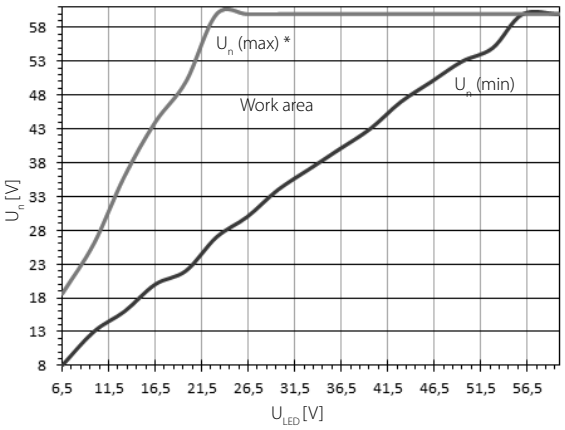
Power supply	
Supply terminals:	Un+, GND
Supply voltage:	12 - 60 V
Consuption:	min. 0.5 W, max. 165 W
Supply voltage from BUS / tolerance:	27V DC, -20 / +15 %
Outputs	
Dimming load:	LED chips controlled by variable streams or alternatively multiple LED chips connected in series
Number of channels:	3
Rated current:	350 mA - 2 A
Output power:	3x 50 W
Output voltage:	6.5 - 55 V
Switching voltage:	Un
Output indication	LED OUT1, OUT2, OUT3
- light:	ON
- short:	flashing
- no light:	OFF
Control	
DALI:	1200 bit/s, 250 mA
BUS:	compatible with iNELS3, consumption < 4 mA
DMX:	250 kbit/s, 512 channels, control RGB(M) 3(4) channels
Operating conditions	
Relative humidity:	max. 80 %
Operating temperature:	-20 .. +50 °C
Storage temperature:	-30 .. +70 °C
Protection degree:	IP20 device, IP40 mounitg in the switchboard
Overvoltage category:	II.
Pollution degree:	2
Operating position:	vertical
Installation:	into switchboard on DIN rail EN60715
Implementation:	3-MODULLE
Dimensions and weight	
Dimensions:	90 x 52 x 65 mm
Weight:	135 g

Warning

Before the device is installed and operated, read this instruction manual carefully and with full understanding and Installation Guide System iNELS3. The instruction manual is designated for mounting the device and for the user of such device. It has to be attached to electro-installation documentation. The instruction manual can be also found on a web site www.inels.com. Attention, danger of injury by electrical current! Mounting and connection can be done only by a professional with an adequate electrical qualification, and all has to be done while observing valid regulations. Do not touch parts of the device that are energized. Danger of life-threat! While mounting, servicing, executing any changes, and repairing it is essential to observe safety regulations, norms, directives and special regulations for working with electrical equipment. Before you start working with the device, it is essential to have all wires, connected parts, and terminals de-energized. This instruction manual contains only general directions which need to be applied in a particular installation. To ensure correct function of the dimmer, its cooling is important. The dimmer is cooled by natural and forced convection, but it is necessary in a rack or in a junction box to ensure adequate air flow. In case the air access is restricted, cooling must be ensured by a fan. Rated operating ambient temperature is 50 °C. It is always necessary to keep a gap on each side of the dimmer with a minimum width of at least one module. In the course of inspections and maintenance, always check (while de-energized) if terminals are tightened and air flow is sufficient.

Expected voltage on one LED

Dependence U_{LED} [V] with U_n [V]



* Do not exceed U_n (max)!

	U_{LED}[V] for I=350 mA	U_{LED} [V] for I=2 A
Green:	3 V	3.5 V
Red:	2.1 V	3.1 V
Blue:	2.9	3.4 V
White:	3 V	3.4 V
Yellow:	2.2 V	2.9 V
UV LED:	3.5 V	4.1 V
IR LED:	1.8 V	2.3 V
AMBER:	2.1 V	2.9 V

The principles connecting the LED light sources to the unit DCDA-33M:

- Before connecting the LED utilising a potentiometer regulate the flow to the respective channel to a minimum.
- The DCDA-33M is designed for serial or series-parallel connection of LED chips connected without precipitating resistance.
- Never connect one LED chip (or two LED chips) alone! This will destroy these LED chips. Always connect a series of at least three LED chips, so that the condition $U_{LED} \geq 6.5$ V is realised, depending on the source. It is necessary that the LED chips are in the working area, see graph U_{LED} with U_n. For a general overview the table is used to calculate the voltage drop on a single LED chip.
- While connecting the LED chips measure the size of current through the ammeter and using a potentiometer to set the desired value.
- Where the documentation of the LED chip specifies a voltage higher than 6.5 V. The LED chip can be attached to a DCDA-33M separately.
- Curves in the graph above, determine the limits of the LED.
- *Example: An LED chip can be used for an 18 V power with a voltage drop from 6.5 - 14.5 V. This corresponds e.g. Serial wiring 3-5 pcs green LED chips (LED chip loss is 3 V, see table, the resultant voltage is thus 9-15 V) per channel. Chart conditions must always be met for the smallest U_{LED} from 3 channels units.*
- With a series-parallel connection of LED chips, always connect the same number of LED chips in each parallel branch.
- ATTENTION! U_n(max) curve exceed! This can destroy the LEDs!
- Un voltage may be lower than U_n(min), but if it is not possible to set the output to set the desired current LED chip (chips) may not light at all.
- Individual channels can be combined to increase the current up to 4 or 6 A.