LDALI-3E101-U, LDALI-3E102-U, LDALI-3E104-U

Datasheet #89016920

L-DALI Controllers are multifunctional devices combining constant light control, sunblind control, and gateway functions between LonMark and DALI (Digital Addressable Lighting Interface) systems. With Alarming, Scheduling, Trending, and e-mail notification (AST™) the L-DALI Controller is a perfect solution for DALI lighting systems and for a smooth DALI integration into LonMark Systems.

DALI Network Interface

L-DALI represents a DALI-Master in the DALI network which can interact with DALI-2 multi-sensors and buttons (DALI-2 input devices) in Multi-Master mode. The L-DALI lineup for LonMark Systems features 1, 2, or 4 independent DALI channels. Up to 64 DALI or DALI-2 based luminaries per DALI channel can be controlled individually or via 16 groups. All luminaries are monitored for lamp or ballast defect. In addition up to 16 DALI-2 multi-sensors and up to 64 DALI-2 button inputs are supported per DALI channel.

Built-In DALI Bus Power Supply

All L-DALI models come with a built-in DALI bus power supply. The LDALI-3E101-U and the LDALI-3E102-U can supply each DALI channel with a guaranteed supply current of 230 mA, the LDALI-3E104-U can supply 116 mA per channel. In case of the LDALI-3E104-U an external DALI bus power supply can be added to top up the supply current to 232 mA. External power supplies are available for up to four DALI channels. The DALI bus power can be switched on and off via web interface or LCD UI. Thanks to the switching power supply, these devices can handle input voltages from 85 – 240 V AC, 50/ 60 Hz.

LonMark TP/FT-10 or Ethernet/IP-852 Connection

The L-DALI Controllers provide connectivity in LonMark Systems through IP-852, or TP/FT-10 as well as data exchange through Global Connections. They support comprehensive AST™ functionality (Alarming, Scheduling, and Trending) with e-mail notification. Full L-WEB integration is supported as well. The L-DALI Controllers are equipped with two Ethernet ports including a built-in Ethernet switch.

IoT Integration

The IoT function (Node.js) allows connecting the system to almost any cloud service, either for uploading historical data to analytics services, delivering alarm messages to alarm processing services or operating parts of the control system over a cloud service (e.g., scheduling based on Web calendars or booking systems). Processing Internet information such as weather data in forecast-based control is also possible. Finally, the JavaScript kernel also allows implementing serial protocols to non-standard equipment.

Local Operation and Override

The L-DALI Controllers come with a built-in backlit display (128x64) and a jog dial for local operation and override. Using the local operation, maintenance tasks (DALI device replacement, burn-in mode, etc.) can be executed without the need of any software tool.

Constant Light Control

The integrated Constant Light Controller (LonMark Functional Profile #3050) allows controlling local DALI ballasts and luminaires via the CEA-709 network. It supports various lighting control strategies, presence and lux level based. Several parameters can be used to configure the Constant Light Controller for almost any use case.

Sunblind Control with Constant Light Control Interaction

The integrated Sunblind Controller (LonMark Functional Profile #6111) allows intelligent controlling of blinds connected via SMI (requires LSMI-804) or the

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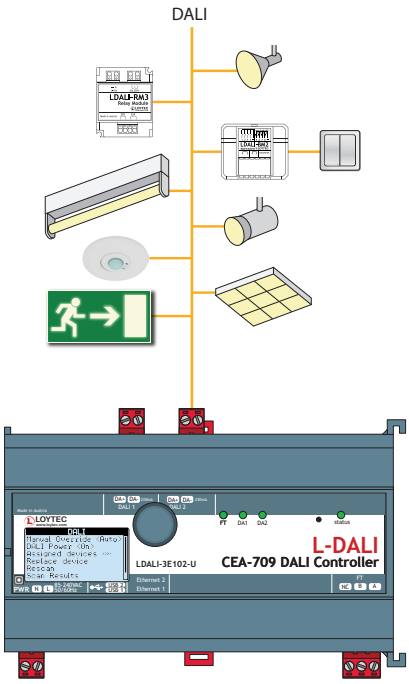

CEA-709 network. It offers effective sun and anti-glare protection through active slat control and slat adjustment according to the sun position. Energy efficiency is ensured by linking room occupancy with sun protection. If a room is unoccupied, the L-DALI Controller opens or closes the sunblinds depending on the thermal requirements. This allows for instance to use the heat of the sun for heating in winter while in summer, the heat from the sun is reduced by the closed blinds to reduce the cooling load.

Optionally, the sunblind and light control applications of a room or an area can be linked together. As both applications control the light available in the room this holistic approach assures maximum comfort and energy efficiency.

In addition to the constant light and sunblind control, any mathematical calculation and function or logical operation (Boolean algebra) can be created on the device and process all available data points.

Device Configuration via Tool or Web Interface

The device configuration, commissioning, and parameterization is done either with the configuration tool software (used as stand-alone tool or as LNS® plug-in) or via the integrated web server.

EnOcean, OPC and Modbus

Wireless EnOcean sensors and buttons can be integrated via the optional L-ENO EnOcean interface. To use the L-DALI with an existing SCADA solution all runtime values and parameters can be accessed via OPC (XML/DA and UA) and Modbus TCP.

Advanced DALI Functions

- **DALI Sensors**

  The L-DALI Controllers support the integration of DALI-2 multi-sensors for presence detection and light level recognition. In addition to the LOYTEC DALI-2 multi-sensor LDALI-MS2, DALI-2 sensors of many well-known manufacturers can be used.

- **DALI Buttons**

  For manual operation, DALI-2 push button couplers, like the LDALI-BM2, DALI-2 operation panels, and IR remote controls can be integrated into the system. Their functionality can be configured individually. In addition to controlling lighting via DALI (dimming, scene recall, etc.) and sunblinds via SMI (up, down, etc.), button press events can be propagated in the building network, triggering other, non-lighting related building automation functions.

- **DALI Relay Modules**

  Standard loads in the power grid can be controlled via DALI using DALI relay modules, like the LDALI-RM3 or LDALI-RM4.

- **DALI Color Control**

  The L-DALI allows controlling DALI luminaires with colour control functionality (DT8). Both, tunable white (Tc) and full RGB color control (RGBWAF and xy-coordinate) are supported. Light color can either be changed automatically, via manual operation (e.g. buttons) or via the network.

- **Auto Burn-In for fluorescent Lamps**

  Fluorescent lamps must be operated about 100 hours with 100 % brightness before they may be dimmed. This burn-in process is monitored by L-DALI for each lamp. After 100 hours burn-in time, the lamp's constant light control is enabled.

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- **Automatic Test of Emergency Lighting Systems**

  In DALI emergency lighting systems based on IEC 62386-202, L-DALI can be used for testing the system. The results can be logged.

- **Collection of important Operational Parameters**

  For maximum transparency in the lighting system, L-DALI can record the operating hours of each lamp and also the energy consumption (calculated).

- **DALI Device Replacement made easy**

  Defective DALI ballasts can easily be replaced directly on the L-DALI Controller (LCD and jog dial) or via the web interface. No software tool is necessary.

LonMark Interface

The L-DALI Controller maps information from the DALI network to Network Variables (NVs) to control DALI ballasts or display operating states including DALI sensor occupancy and lux level information. L-DALI Controller for LonMark Systems can be connected either to an Ethernet/IP channel (LonMark IP-852) or a TP/ FT 10 channel. The provided static NV interface includes the following profiles:

- Lamp Actuator #3040
- Light Sensor #1010
- Occupancy Sensor #1060
- Constant Light Controller #3050
- Sunblind Controller #6111
- Open Loop Sensor (button) #1

All data points are available in a tree structure on the integrated web server to be displayed or set using a web browser.

Features

- DALI integration into LonMark Systems
- Supports up to 64 DALI ballasts and 16 DALI groups per DALI channel
- Supports up to 16 DALI sensors per DALI channel
- Supports up to 64 DALI buttons per DALI channel
- Integrated DALI bus power supply
- Manual operation using the jog dial and local access to information about device status and data points in clear text and symbols
- 128x64 graphic display with backlight
- Built-in web server for device configuration
- Test and assignment of DALI devices via the web interface
- Replacement of DALI devices without additional software tools via LCD and jog dial
- Supports the control of standard loads in the power grid via LDALI-RM3 Relay Modules
- Integrated Constant Light Controller
- Integrated Sunblind Controller
- Supports DALI-2 devices (drivers and input devices)
- Support DALI color control (DT8 tunable white & full color control)
- Supports lamp burn-in mode
- Supports periodic testing of DALI emergency lights
- Integrated DALI Protocol Analyzer
- Compliant with CEA-709, CEA-852 and ISO/IEC 14908-1 standard (LonMark System)
- Network connection either with TP/FT-10 or IP-852 (CEA-852 Ethernet)
- Alarming, Scheduling, and Trending (AST™) locally or embedded in L-WEB (building management)
- Node.js support for easy IoT integration (e.g. Google calendar, Alexa & friends, multimedia equipment,…)
- Event-driven e-mail notification
- Supports Local and Global Connections
- Stores customized graphical pages
- Visualization of customized graphical pages through LWEB-900 (building Management), LWEB-803 (Monitoring and Control), or LWEB-802 (Web Browser)
- Stores user-defined project documentation
- Dual Ethernet/IP interface
- Built-in OPC XML-DA and OPC UA server
- Modbus TCP (Master or Slave)
- Supports SMI (Standard Motor Interface) through LSMI-804
- Connection to EnOcean wireless devices via LENO-80x Interface
- Supports WLAN through LWLAN-800 Interface
- Supports LTE through LTE-800 Interface

CEA-709/DALI Controller

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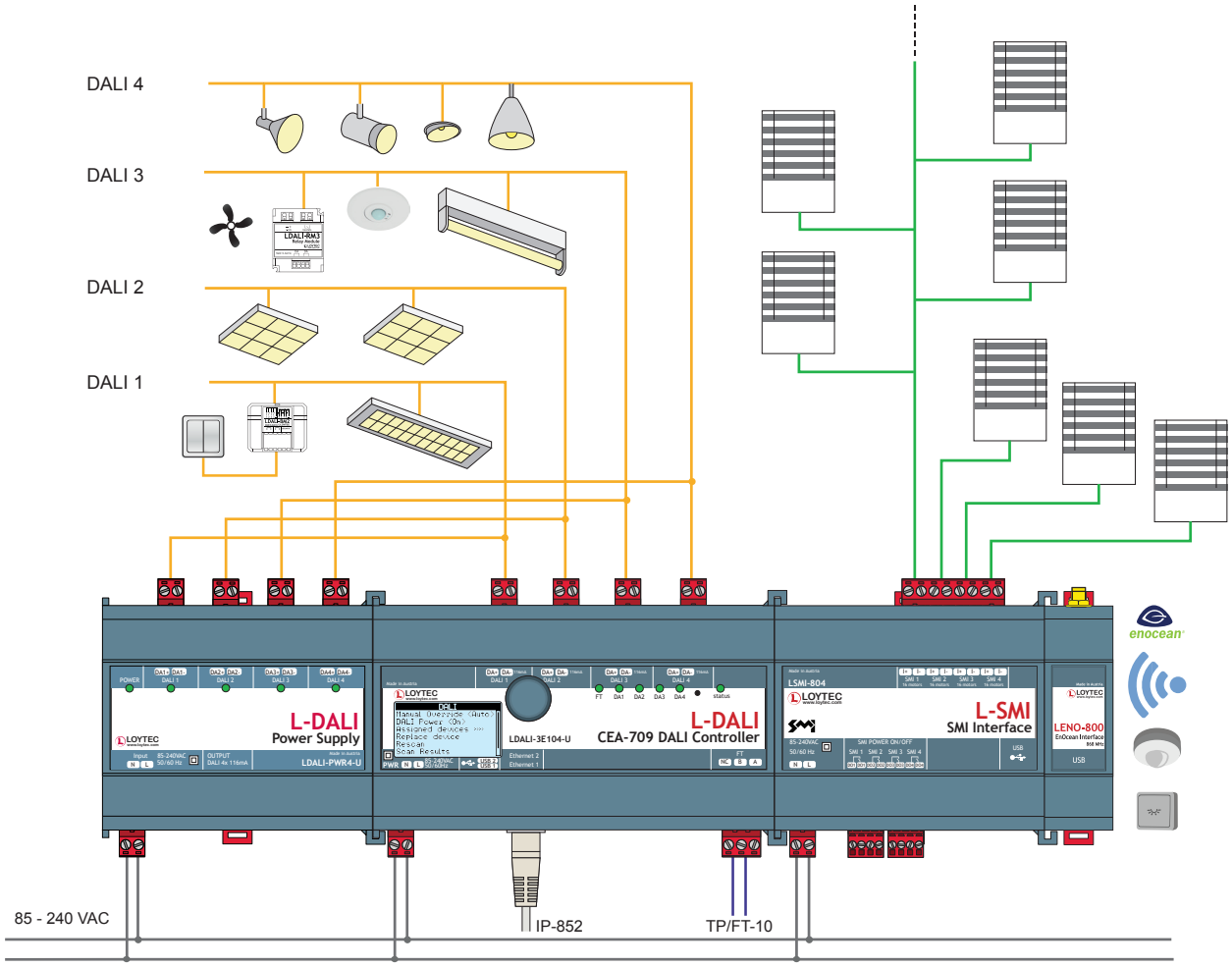

Specifications

Type	LDALI-3E101-U	LDALI-3E102-U	LDALI-3E104-U
Dimensions (mm)	159 x 100 x 75 (L x W x H), DIM035		
Installation	DIN rail mounting following DIN 43880, top hat rail EN 50022		
Power supply	85-240 V AC, 50/60 Hz, typ. 7.5 W	85-240 V AC, 50/60 Hz	
Operating conditions	0 °C to 40 °C, 10 – 90 % RH, noncondensing, degree of protection: IP40, IP20 (terminals)		
DALI channels	1	2	4
Integrated DALI bus power supply	16 V DC 230 mA guaranteed supply current 250 mA max. supply current		16 V DC 116 mA guaranteed supply current 125 mA max. supply current
Interfaces	2 x Ethernet (100Base-T): OPC XML-DA, OPC UA, LonMark IP-852*, Modbus TCP, HTTP, FTP, SSH, HTTPS, Firewall, VNC, SNMP 1 x TP/FT-10* (LonMark system) 2 x USB-A: WLAN (needs LWLAN-800), EnOcean (needs LENO-80x) SMI (needs LSMI-804), LTE (needs LTE-800) ** Either LonMark IP-852 or TP/FT-10*		
LonMark Profile	Lamp Actuator #3040, Light Sensor #1010, Occupancy Sensor #1060, Constant Light Controller #3050, Sunblind Controller #6111 Open loop sensor (button) #1		
Tools	L-INX Configurator, and configuration via web interface		

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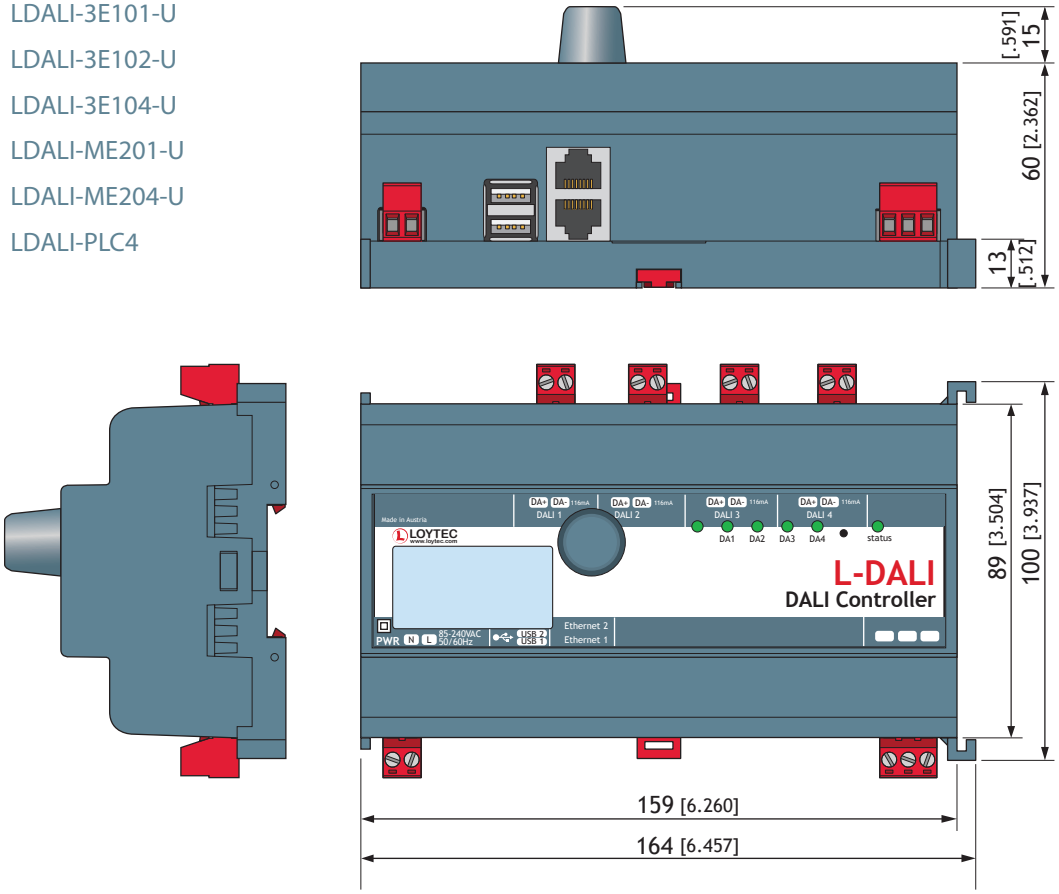
Resource limits			
DALI ballasts per DALI channel	64	LonMark calendars	1 (10 patterns) per DALI channel
DALI groups per DALI channel	16	LonMark schedulers	16 per DALI channel
DALI sensors per DALI channel	16	LonMark alarm servers	1 per DALI channel
DALI push buttons per DALI channel	64	Trend logs	512 (4 000 000 entries, ≈ 60 MB)
Scene control	16 scenes per DALI group	Data points in trend log	1 000
Maths objects	100	E-mail templates	100
Alarm logs	10	Number of L-WEB clients	32 (simultaneously)
OPC data points	10 000	Modbus data points	2 000
Connections (Local/Global)	2 000 / 250	Number of EnOcean devices	100
Address table entries	512 (non-ECS mode: 15)	EnOcean data points	1 000
SMI devices (per channel)	16		

Order number	Product description
LDALI-3E101-U	CEA-709/DALI Controller, AST, Sunblind Controller, 1 DALI channel, integrated DALI power supply
LDALI-3E102-U	CEA-709/DALI Controller, AST, Sunblind Controller, 2 DALI channels
LDALI-3E104-U	CEA-709/DALI Controller, AST, Sunblind Controller, 4 DALI channels
LDALI-PWR2-U	DALI power supply unit for 2 DALI channels
LDALI-PWR4-U	DALI power supply unit for 4 DALI channels
LDALI-MS2	DALI multi-sensor (presence detection, lux sensor, IR receiver, temperature sensor, humidity sensor, 3 digital inputs)
LDALI-BM2	Quadruple DALI pushbutton coupler
LDALI-RM3	DALI Relay Module 10 A, Analog Interface 0 – 10 V and 1 – 10 V
LDALI-RM4	DALI Relay Module 10 A, Analog Interface 0 – 10 V and 1 – 10 V, “spud-mount”
LENO-800	EnOcean Interface 868 MHz Europe
LENO-801	EnOcean Interface 902 MHz USA/Canada
LENO-802	EnOcean Interface 928 MHz Japan
LWLAN-800	Wireless LAN Interface IEEE 802.11bgn
LSMI-804	Standard Motor Interface for 64 motors, 4 SMI channels via USB
LTE-800	USB LTE Interface

Dimensions of the devices in mm and [inch]

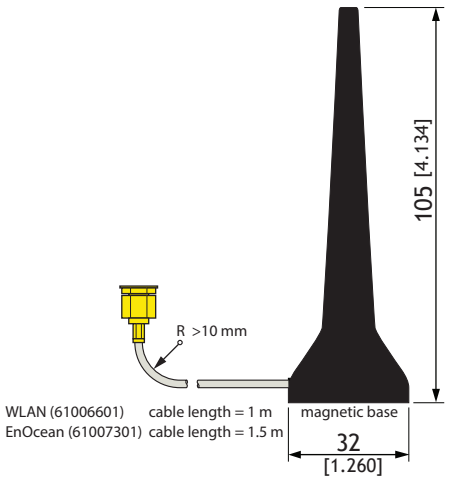
DIM035

LDALI-3E101-U
LDALI-3E102-U
LDALI-3E104-U
LDALI-ME201-U
LDALI-ME204-U
LDALI-PLC4



DIM036

WLAN Antenna 2.4 GHz
EnOcean Antenna 868 - 928 MHz



SCALE 1 : 2
10 0 20 40 60 80 100 mm