

The LDALI-PLC4 controllers are powerful, freely programmable lighting controllers, which can be programmed by L-STUDIO. With Alarming, Scheduling, Trending and e-mail notification (AST™) the LDALI-PLC4 controller is a perfect solution for DALI lighting systems with application requirements not covered by the standard application of the non-programmable L-DALI controllers.

### Built-In or External DALI Power Supply

The LDALI-PLC4 Controller needs an external DALI power supply to power up the DALI network. Power supplies are available for single channel or up to four channel DALI networks.

### DALI Network Interface

The LDALI-PLC4 device is equipped with 4 independent DALI channels. Up to 64 DALI-based luminaires per DALI channel can be controlled individually or via 16 groups. All luminaires are monitored for lamp or ballast defect. L-DALI represents a DALI-Master in the DALI network which can interact with selected DALI multi-sensors in Multi-Master mode.

### 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 in primary plant control.

### 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.

### Freely Programmable

The LDALI-PLC4 can be programmed using the L-STUDIO programming tool. It can be programmed using IEC 61499 for integration into the L-ROC system and IEC 61131 for stand-alone operation.

### Connectivity

The LDALI-PLC4 controller provides connectivity functions to concurrently integrate CEA-709 (LonMark Systems), BACnet, KNX, and Modbus subsystems. LonMark Systems can be integrated via IP-852 (Ethernet/IP). BACnet integration is supported through BACnet/IP (Ethernet/IP) or BACnet MS/TP (RS-485), KNXnet/IP and Modbus TCP via Ethernet/IP.

The gateway functionality allows data communication between all communication technologies available on the device. Different technology data points are mapped through Local Connections on the device. The mapping of different technology data points on distributed devices is supported by Global Connections.

Each LDALI-PLC4 is equipped with two Ethernet ports. It can either be configured to use the internal switch to interconnect the two ports or every port is configured to work in a separate IP network.

When the Ethernet ports are configured for two separate IP networks, one port can be connected for instance to a WAN (Wide Area Network) with enabled network security (HTTPS) while the second port can be configured to be connected to an insecure network (LAN) where the standard building automation protocols like BACnet/IP, LON/IP, or Modbus TCP are present. These devices also feature firewall functionality of course to isolate particular protocols or services between the ports.

## Programmable DALI Controller

# LDALI-PLC4

Using the internal switch, a daisy chained line topology of up to 20 devices can be built, which reduces costs for network installation. The IP switch also allows the setup of a redundant Ethernet installation (ring topology), which increases reliability. The redundant Ethernet topology is enabled by the Rapid Spanning Tree Protocol (RSTP), which is supported by most managed switches.

The LDALI-PLC4 provides fully featured AST™ functionality (Alarming, Scheduling, and Trending) and can be integrated perfectly into the L-WEB System.

### Device Configuration via Tool or Web Interface

The device configuration, commissioning, and parameterization is done either with the configuration tool software or via the integrated web server.

### EnOcean, SMI and LIOB/IP

Wireless EnOcean sensors and buttons can be integrated via the optional L-ENO EnOcean interface. For sunblinds the LSMI-804 extension module allows the integration of up to four SMI channels. Physical I/Os can be integrated through L-IOB I/O Modules via LIOB-IP.

### Advanced DALI Functions

- **DALI Sensors**

The LDALI-PLC4 Controllers support the integration of DALI multi-sensors for presence detection and light level recognition. In addition to the LOYTEC DALI multi-sensor LDALI-MS2, DALI sensors of well-known manufacturers can be selected from a list of tested devices.

- **DALI Push Button**

For manual operation, DALI push button coupler and IR remote controls can be integrated into the system. The function executed when a button is pressed is freely programmable in the program logic.

- **DALI Relay Modules**

Standard loads in the power grid can be controlled via DALI using DALI Relay Modules.

- **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.

- **Automatic Test of Emergency Lighting Systems**

In DALI emergency lighting systems, 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**

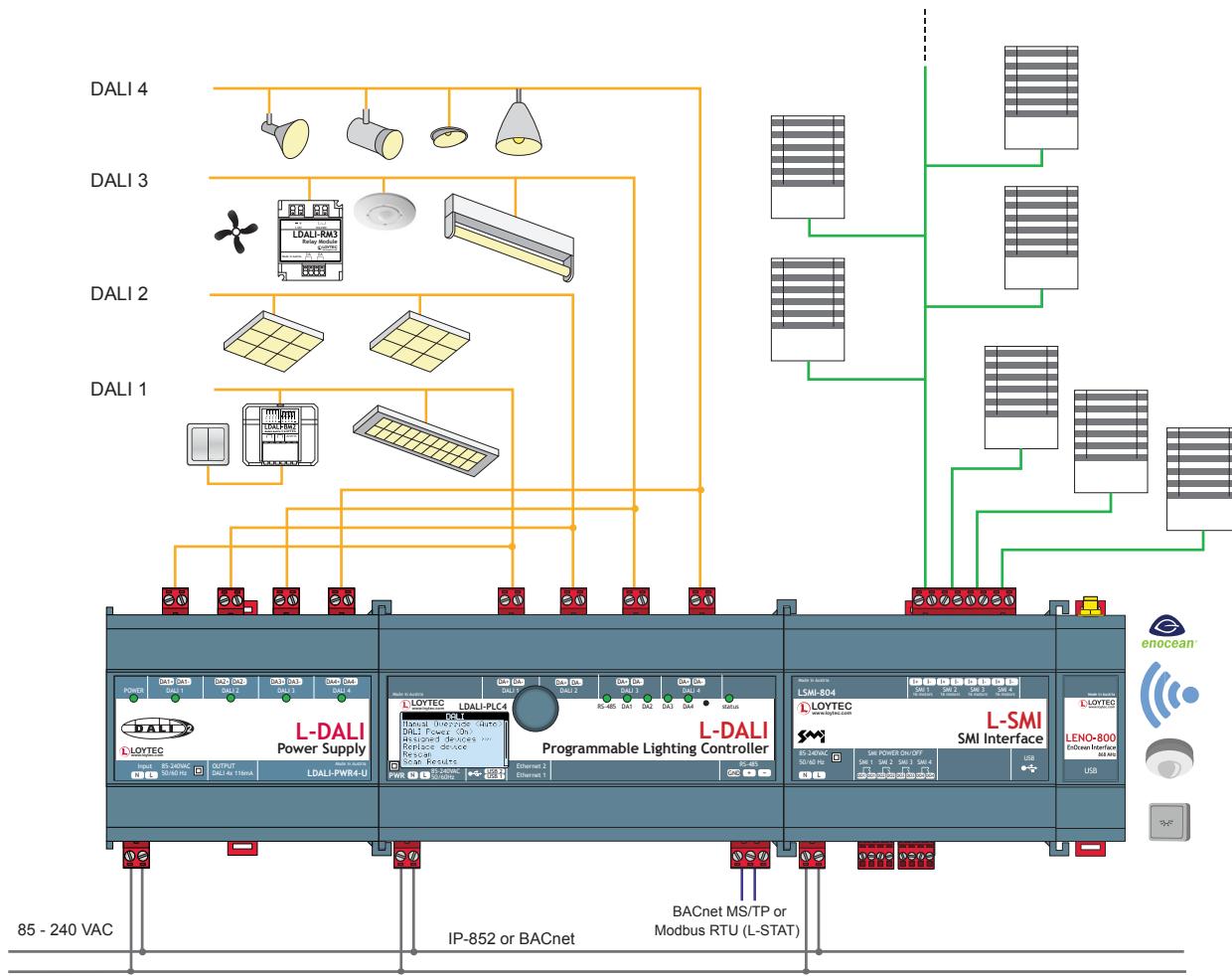
Defective DALI ballasts can easily be replaced directly on the L-DALI Controller (LCD and jog dial) or via the web interface. No software tool is necessary.

## Features

- IEC 61131-3 and IEC 61499 programmable with L-STUDIO
- 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 push buttons per DALI channel
- 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 on 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-RM1/LDALI-RM3 Relay Modules
- Supports lamp burn-in mode
- Supports periodic testing of DALI emergency lights
- Integrated DALI Protocol Analyzer
- Physical inputs and outputs with L-IOB I/O Modules
- Compliant with CEA-709, CEA-852, and ISO/IEC 14908 Standard (LonMark System)
- Support of dynamically created or static NVs
- Support of user-defined NVs (UNVTs) and Configuration Properties (SCPTs, UCPTs)
- KNXnet/IP
- Gateway functions including Smart Auto-Connect™
- Modbus TCP and Modbus RTU (L-STAT only)
- Compliant with ANSI/ASHRAE 135-2012 and ISO 16484-5:2012 standard
- Supports BACnet/IP or BACnet MS/TP
- BACnet Client Function (Write Property, Read Property, COV Subscription)
- B-BC (BACnet Building Controller) functionality, BTL certified
- 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
- Built-in OPC XML-DA and OPC UA server
- 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 switched or separated Ethernet ports
- Supports SMI (Standard Motor Interface) through LSMI-804
- Connection to EnOcean wireless devices via LENO-80x Interface
- Supports WLAN through LWLAN-800 Interface

## L-STUDIO 3.0 Licenses

Type	LDALI-PLC4
Programming, Tools	L-STUDIO (IEC 61131-3 and IEC 61499 based), L-INX Configurator and configuration via web interface
License	L-STUDIO: included L-LOGICAD: n/a



## Specifications

Type	<b>LDALI-PLC4</b>		
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 VAC, 50/60 Hz		
Operating conditions	0 °C to 40 °C, 10 – 90 % RH, non condensing, degree of protection: IP40, IP20 (terminals)		
DALI channels	4		
Interfaces	2 x Ethernet (100Base-T): OPC XML-DA, OPC UA, LonMark IP-852, BACnet/IP*, LIOB-IP, KNXnet/IP, Modbus TCP (Master or Slave),	1 x RS-485 (ANSI TIA/EIA-485): BACnet MS/TP*, or Modbus RTU (L-STAT only)	2 x USB-A: WLAN (needs LWLAN-800), EnOcean (needs LENO-80x)

\* Either BACnet/IP or BACnet MS/TP

Resource limits			
Order number	Product description		
Total number of data points	30 000	LonMark Alarm Servers	1
OPC data points	10 000	E-mail templates	100
BACnet objects	2 000 (analog, binary, multi-state)	Math objects	100
BACnet client mappings	5 000	Alarm logs	10
BACnet calendar objects	25	KNXnet/IP data points	1 000
BACnet scheduler objects	100 (64 data points per object)	Connections (Local / Global)	2 000 / 250
BACnet notification classes	32	Number of L-WEB clients	32 (simultaneously)
Trend logs (BACnet or generic)	512 (4 000 000 entries, ≈ 60 MB)	L-IOB I/O Modules	24
Total trended data points	1 000	Number of EnOcean devices	100
CEA-709 network variables (NVs)	1 000	EnOcean data points	1 000
CEA-709 Alias NVs	2 000	DALI Channels	4
CEA-709 External NVs (polling)	2 000	DALI Ballasts per channel	64
CEA-709 address table entries	1 000 (non-ECS mode: 15)	DALI Groups per channel	16
LonMark Calendars	1 (25 calendar patterns)	DALI Sensors per channel	16
LonMark Schedulers	100	DALI Buttons per channel	64
LDALI-PLC4	Freely programmable DALI 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-MS1	DALI multi-sensor (motion detection, brightness sensor, IR sensor)		
LDALI-MS2	DALI multi-sensor (presence detection, lux sensor, IR receiver, temperature sensor, humidity sensor, 3 digital inputs)		
LDALI-BM1	Quadruple DALI pushbutton coupler		
LDALI-BM2	Quadruple DALI pushbutton coupler		
LDALI-RM1	DALI Relay Module 8 A		
LDALI-RM2	DALI Relay Module 8 A, Analog Interface 1 – 10 V		
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		
LSTAT-800-G3-Lx	Network Thermostat, black front, white enclosure, Modbus, NFC, temperature, rel. humidity, ext. switch/NTC, IR receiver, Buttons (Lx)		
LSTAT-801-G3-Lx	Network Thermostat, front black, white enclosure, Modbus, NFC, temperature, rel. humidity, ext. switch/NTC, occupancy, IR receiver, Buttons (Lx)		
LSTAT-802-G3-Lx	Network Thermostat, front black, white enclosure, Modbus, NFC, temperature, rel. humidity, ext. switch/NTC, occupancy, IR receiver, CO2, Buttons (Lx)		
LSTAT-800-G3-L20x	Network Thermostat, white front, white enclosure, Modbus, NFC, temperature, rel. humidity, ext. switch/NTC, IR receiver, Buttons (Lx)		
LSTAT-801-G3-L20x	Network Thermostat, white front, white enclosure, Modbus, NFC, temperature, rel. humidity, ext. switch/NTC, occupancy, IR receiver, Buttons (Lx)		
LSTAT-802-G3-L20x	Network Thermostat, white front, white enclosure, Modbus, NFC, temperature, rel. humidity, ext. switch/NTC, occupancy, IR receiver, CO2, Buttons (Lx)		
LSTAT-80x-CUSTOM	Customized Network Thermostat, minimum quantity 100 pieces, enclosure G2: black, G3: white; custom print Lx, including 2 working samples, lead time 10 weeks		
LSMI-804	Standard Motor Interface for 64 motors, 4 SMI channels via USB		

## 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

