

DLCP: DALI-2 Application Controller

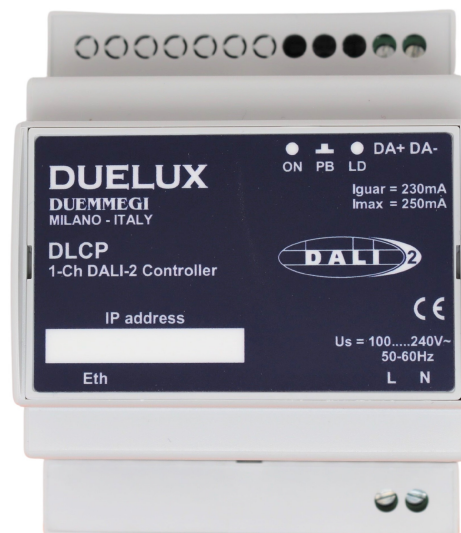
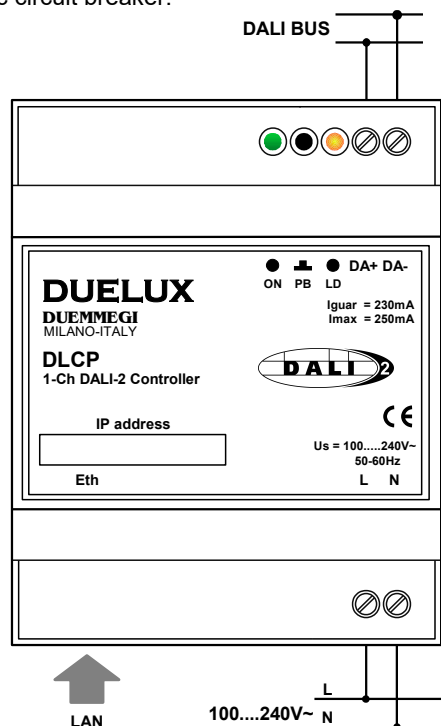
The application controller DLCP allows to manage the operating logic of a DALI-2 system.

Features:

- x DALI-2 certified
- x compliant to IEC 62386-101, -103
- x integrated DALI bus power supply
- x power supply 100...240V~ 50/60Hz
- x manages up to 64 output devices (Control Gear: ballast, LED driver, relay outputs, ...) and up to 64 input devices (Control Devices: sensors, buttons, ...)
- x addressing (commissioning) of connected DALI devices
- x auto detection of connected DALI devices
- x 16 DALI groups
- x 16 ambients with 8 different scenes for each ambient
- x Ethernet connectivity
- x information exchange between different DALI buses through the ETH port
- x simple configuration of the system by creating ambients and assigning groups of lamps, buttons, sensors, relays
- x on-board clock with backup battery for creating scheduling timers
- x button on the module for switching on, off and dimming all the connected lamps even in the absence of programming
- x diagnostic LED

Connection diagram

Provide adequate protection before the L-N terminals of the module, for example by means of a 10A max thermal magnetic circuit breaker.



Technical characteristics

Power supply	100...240 V~, 50-60Hz
MAX power consumption	7.5 W
Number of DALI channels	1
DALI bus power supply	15V
Guaranteed DALI current	230 mA
MAX DALI current	250 mA
Number of DALI groups	16
Number of ambients	16
Number of scenes	8 for each ambient
Connectivity	Ethernet port
Standard protocols	MODBUS TCP/I MODBUS RTU over IP
Proprietary protocol	FXP-XT
DALI-2 compliant according to	IEC 62386-101, IEC 62386-103
Housing	DIN standard 4-unit
Operating temperature	-5 ÷ +50 °C
Storage temperature	-20 ÷ +70 °C
IP rating	IP20

Architecture of DALI-2 system

The DALI-2 system allows to connect, to the same DALI bus, both the lighting devices and presence and light sensors, buttons and generic inputs, see Figure 1. The difference compared to the previous DALI architecture lies in the fact that it becomes possible to connect to the same bus the "input devices", thus making DALI-2 a stand-alone system.

The main advantages are:

- x Easier wiring: only one bus for for lighting, switches and sensors
- x Reduction of overall costs
- x Easier programming because all devices belong to the same system
- x Backward compatibility towards lighting devices with previous DALI protocol

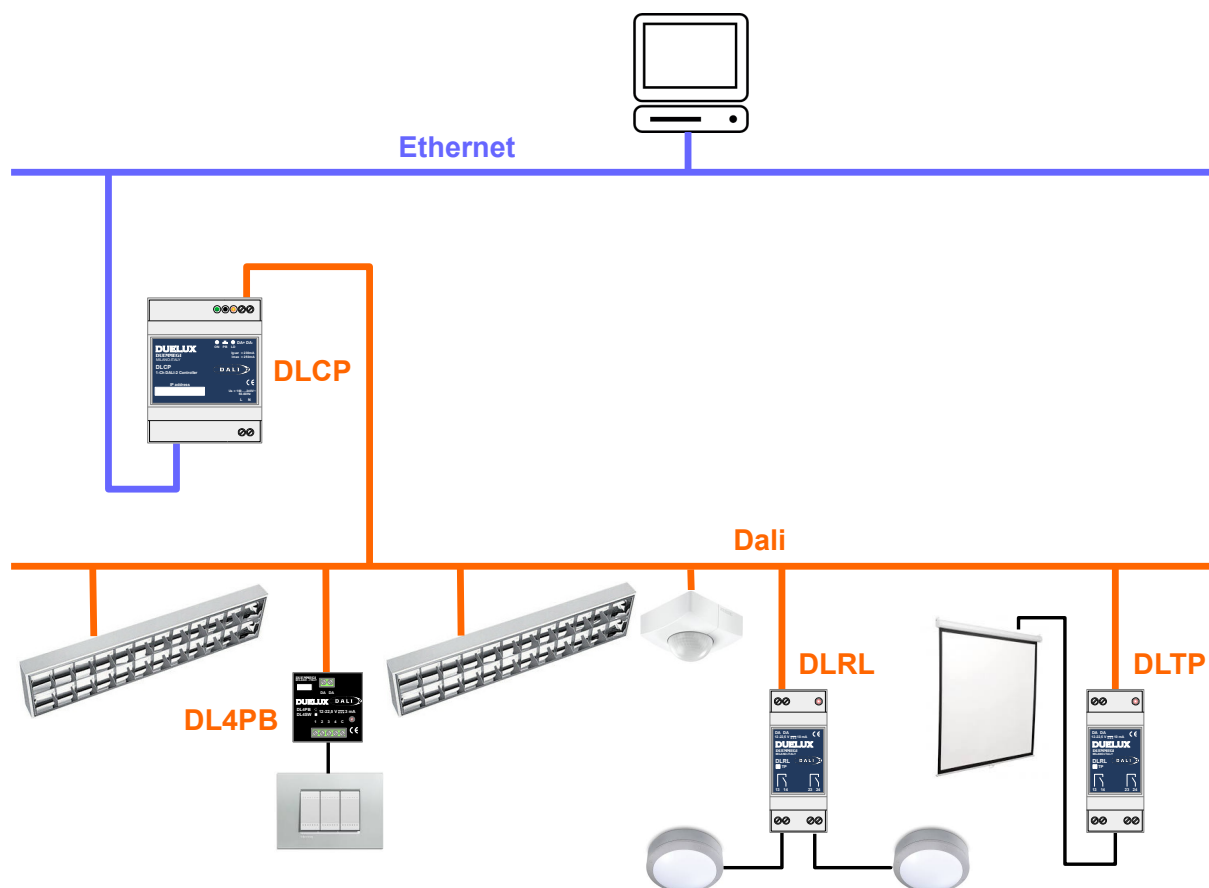


Figure 1: Architecture of DALI-2 system

The Figure 1 shows the architecture of the **DUELUX** system. Both the lighting devices (dimmable or ON-OFF using a DLRL module) and the input devices are connected to the same DALI bus. The operating logic is managed by DLCP controller, which, on the basis of the information collected by sensors and buttons, appropriately controls the output devices according to the loaded program.

Connectivity

The interfacing to an optional supervisor is guaranteed by the presence, on the DLCP controller, of an Ethernet port, through which it is possible to access the DALI field. The standard protocols supported are "MODBUS TCP/IP" and "MODBUS RTU over IP"; moreover it is possible to communicate via proprietary protocol FXP-XT.

The same Ethernet port connected to a LAN equipped with a WiFi access point makes it possible to control the system via APP on smartphones and tablets; the user can therefore change the operating parameters of the system as desired (e.g. set point of the light level, activation and deactivation of outputs, etc.).

The Ethernet port also allows to exchange some information between different DALI buses connected to the same network, see Figure 2; this information can be digital points (e.g. a button on bus 1 turns off all the lights on several different buses), or analog values (e.g. a sensor on bus 3 that controls the light on bus 1).

The Ethernet port also allows to exchange information between DALI buses and other systems connected to the same network (e.g. **CONTATTO** and **Domino**), see Figure 3.

Amount of DALI-2 devices

DLCP controller allows to manage, from a logical point of view, up to 64 output devices (ballast, LED driver, etc.) and up to 64 input devices (push button interfaces, sensors, etc.). This is the limit of the DALI-2 protocol which provides, in fact, a maximum of 64 addresses for each of the two categories.

The DALI-2 standard also specifies that the maximum current supplied on a bus does not exceed 250mA.

While most of the output devices have a consumption < 2mA as they are powered by an external source (e.g. 230V~), the input devices supplied by the bus itself, for example sensors, need more current and this it is declared in the specific manual as number of DALI devices (for example 2 DALI devices mean 4mA).

Therefore the total number of devices that can be connected depends not only on the maximum number of logical addresses, but also on the achievement of the maximum available current. It is therefore recommended, when designing the system, to take into account the current consumption declared for the connected devices.

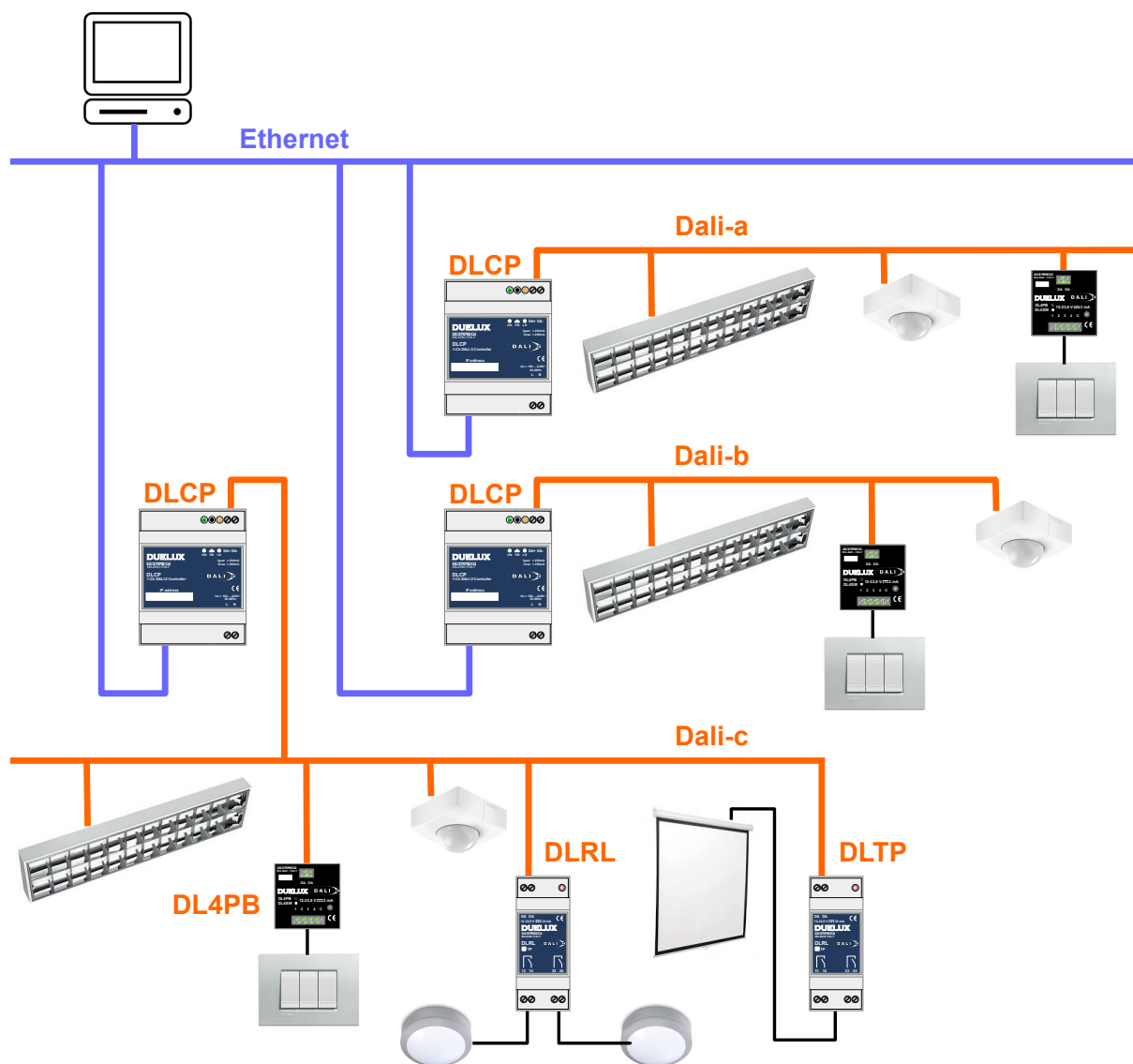


Figure 2: Connectivity between different DALI buses

Shutdown mechanism when short circuit occurs on DALI bus

If a short circuit occurs between DA+ and DA- for more than 610ms, the output is turned off; after 2s the output is switched on again and, if still short-circuited for more than 610ms, switched off again. Subsequent attempts occur every 14s, until the short circuit is removed.


Diagnostics

The DLCP module provides for diagnostic signaling by means of the LEDs named ON (green) and LD (yellow/red). The ON LED is lighted when DLCP is properly powered. The LD LED signals activity on the bus as follows:

- x flashing yellow: indicates the transmission of a message on the DALI bus by DLCP (during very fast procedures it may appear steady)

- x steady red: indicates a fault on the DALI bus, generally a short circuit or in any case an overload beyond the maximum allowed current; in this case it is necessary to check the bus connections
- x alternating flashing yellow/red: indicates that, through DLCPTools in the /webupload.htm page, DLCP is updating its firmware
- x flashing red: indicates that DLCP has received an IDENTIFY command from the DALI bus

Push-button

A button  with the following functions is available near the DALI bus terminal block:

- x switching all connected output devices (lamps) ON and OFF by short pressing

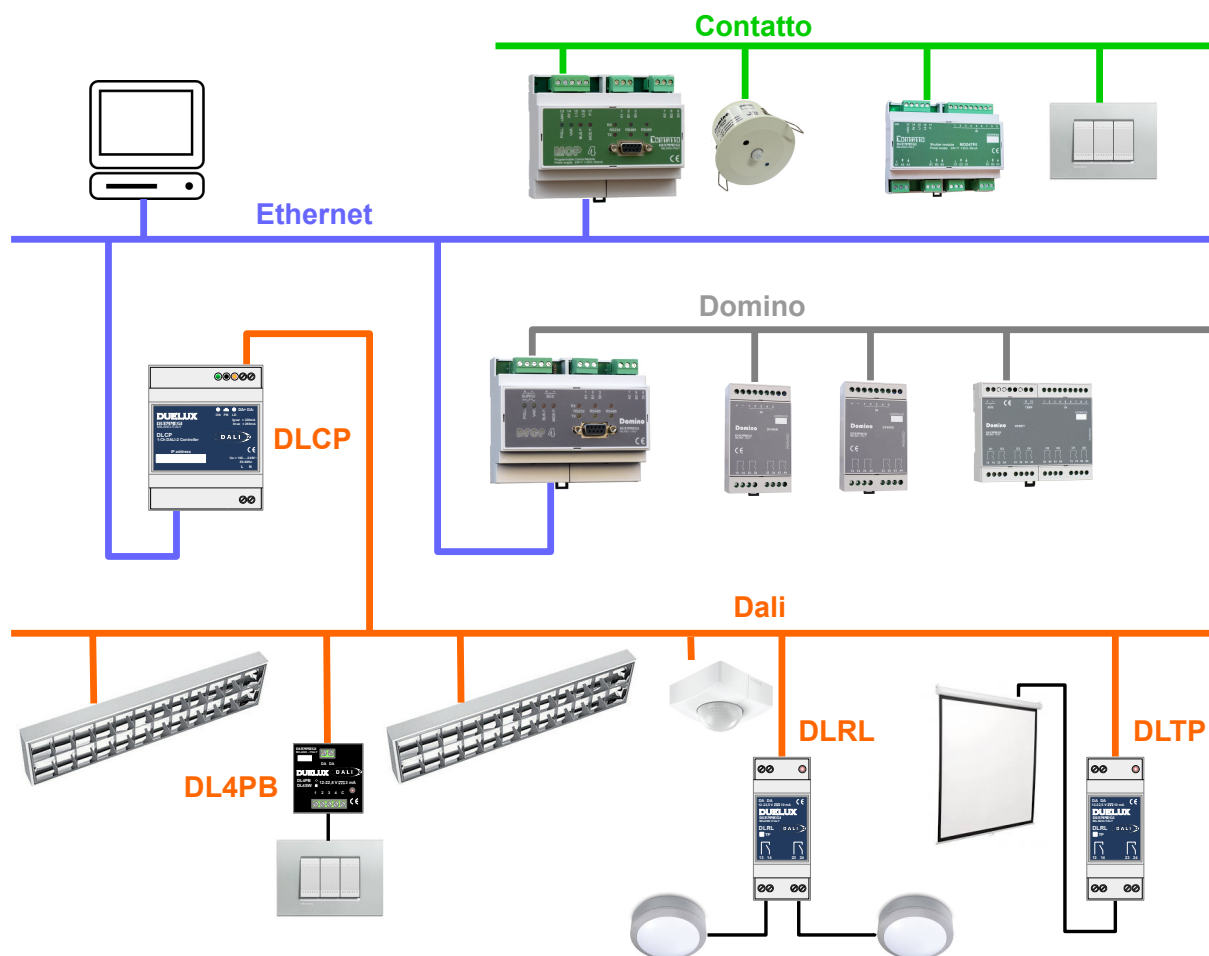


Figure 3: Connectivity to other systems

- x dimming, if allowed, of all connected output devices (lamps) by long pressing
- x restoring the factory configuration of the ETH communication parameters

Regarding the last point above, the factory configuration reset takes place by following these steps:

- 1) turn off DLCP
- 2) press and hold the button
- 3) turn on DLCP: the LD LED starts blinking yellow
- 4) keep the button pressed until the yellow LED stops flashing (about 20 seconds)
- 5) release the button

Note: This recovery procedure is only valid for DLCP FW versions equal to or greater than 1.1.

Programming: DLCPTools

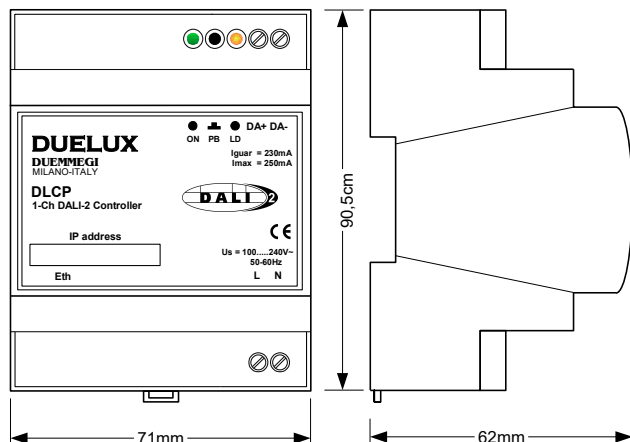
The programming of a **DUELUX** system does not need any software to be installed, because the programming tool, called DLCPTools, is web-based and integrated in the DLCP controller itself; this makes it possible to manage programming also from PCs with different operating systems but also from devices other than PCs, therefore Tablet and SmartPhone, both IOS and ANDROID. What it is needed is simply one of the browsers that are commonly installed on the preferred device, so there is no need to install any APP.

DLCPTools also provides a window in the browser that allows to view the virtual "map" of the field, then the levels of lighting devices, the states of digital inputs (buttons, motion and presence sensors, switches, consents) and analog values of the sensors of light.

DLCPTools can generate reports of the configuration for each ambient; this report is basically a table that summarizes, for each ambient, the scenes that have been defined and the logic that has been set up.

For details on programming and using DLCPTools, refer to the specific manual.

Dimensions



Correct disposal of this product



(Waste Electrical & Electronic Equipment)

(Applicable in the European Union and other European countries with separate collection systems). This marking on the product, accessories or literature indicates that the product should not be disposed of with other

household waste at the end of their working life. To prevent possible harm to the environment or human health from uncontrolled waste disposal, please separate these items from other types of waste and recycle them responsibly to promote the sustainable re-use of material resources. Household users should contact either the retailer where they purchased this product, or their local government office, for details of where and how they can take these items for environmentally safe recycling. This product and its electronic accessories should not be mixed with other commercial wastes for disposal.

Installation and use restrictions

Standards and regulations

The design and the setting up of electrical systems must be performed according to the relevant standards, guidelines, specifications and regulations of the relevant country. The installation, configuration and programming of the devices must be carried out by trained personnel.

The installation and the wiring of the bus line and the related devices must be performed according to the recommendations of the manufacturers (reported on the specific data sheet of the product) and according to the applicable standards.

All the relevant safety regulations, e.g. accident prevention regulations, law on technical work equipment, must also be observed.

Safety instructions

Protect the unit against moisture, dirt and any kind of damage during transport, storage and operation. Do not operate the unit outside the specified technical data.

Never open the housing. If not otherwise specified, install in closed housing (e.g. distribution cabinet). Earth the unit at the terminals provided, if existing, for this purpose. Do not obstruct cooling of the units. Keep out of the reach of children.

Setting up

The physical address assignment and the setting of parameters (if any) must be performed by the specific softwares provided together the device or by the specific programmer. For the first installation of the device proceed according to the following guidelines:

- Check that any voltage supplying the plant has been removed
- Assign the address to module (if any)
- Install and wire the device according to the schematic diagrams on the specific data sheet of the product
- Only then switch on the 230Vac supplying the bus power supply and the other related circuits

Applied standards

This device complies with the essential requirements of the following directives:

IEC 62386-101, IEC 62386-103

2014/30/UE (EMC)

2014/35/UE (Low Voltage)

2011/65/UE (RoHS)

Note

Technical characteristics and this data sheet are subject to change without notice.