



SMARTEH[®]
LIVING SYSTEMS

USER MANUAL

- ▶ Longo programmable controller
LPC-2.DX1
Relay module

Version 2

Written by SMARTEH d.o.o.
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User Manual

Document Version: 2
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STANDARDS AND PROVISIONS: Standards, recommendations, regulations and provisions of the country in which the devices will operate, must be considered while planning and setting up electrical devices. Work on 100 .. 240 V AC network is allowed for authorized personnel only.

DANGER WARNINGS: Devices or modules must be protected from moisture, dirt and damage during transport, storing and operation.

WARRANTY CONDITIONS: For all modules LONGO LPC-2 - if no modifications are performed upon and are correctly connected by authorized personnel - in consideration of maximum allowed connecting power, warranty of 24 months is valid from the date of sale to the end buyer, but not more than 36 months after delivery from Smarteh. In case of claims within warranty time, which are based on material malfunctions the producer offers free replacement. The method of return of malfunctioned module, together with description, can be arranged with our authorized representative. Warranty does not include damage due to transport or because of unconsidered corresponding regulations of the country, where the module is installed.

This device must be connected properly by the provided connection scheme in this manual. Misconnections may result in device damage, fire or personal injury.

Hazardous voltage in the device can cause electric shock and may result in personal injury or death.

NEVER SERVICE THIS PRODUCT YOURSELF!

This device must not be installed in the systems critical for life (e.g. medical devices, aircrafts, etc.).

If the device is used in a manner not specified by the manufacturer, the degree of protection provided by the equipment may be impaired.

Waste electrical and electronic equipment (WEEE) must be collected separately!

LONGO LPC-2 complies to the following standards:

- EMC: EN 61000-6-3:2007 + A1:2011, EN 61000-6-1:2007, EN 61000-3-2:2006 + A1:2009 + A2: 2009, EN 61000-3-3:2013
- LVD: IEC 61010-1:2010 (3rd Ed.), IEC 61010-2-201:2013 (1st Ed.)

Smarteh d.o.o. operates a policy of continuous development. Therefore we reserve the right to make changes and improvements to any of the products described in this manual without any prior notice.

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Index

Longo programmable controller LPC-2.DX1

1 ABBREVIATIONS.....	1
2 DESCRIPTION.....	2
3 FEATURES.....	3
4 OPERATION.....	4
4.1 SmartehIDE Parameters.....	5
5 INSTALLATION.....	6
5.1 Connection scheme.....	6
5.2 Mounting instructions.....	8
6 TECHNICAL SPECIFICATIONS.....	10
7 MODULE LABELING.....	11
8 CHANGES	12
9 NOTES.....	13



1 ABBREVIATIONS

DC	Direct Current
AC	Alternating Current
RX	Receive
TX	Transmit
UART	Universal Asynchronous Receiver-Transmitter
NO	Normally Open
PLC	Programmable Logic Controller



2 DESCRIPTION

LPC-2.DX1 is a relay output module with inrush current protection and galvanic isolated output. It can be used in a wide range of operation. It is suitable to be used with inductive or capacitive loads (e.g. reflectors, contractors, motors).

LED indicates active signal present on module output and fuse status.

LPC-2.DX1 is controlled and powered from the main module (e.g. LPC-2.MU1, LPC-2.MC9, ...) via Right internal bus.



3 FEATURES

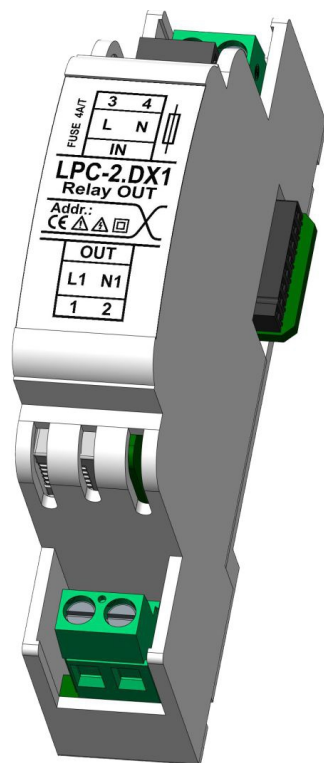


Figure 1: LPC-2.DX1 module

Table 1: Technical data

Relay digital output with make contacts (NO), inrush current limited, galvanic isolated

Signal LED

Blown fuse detection

Supplied from main module

Small dimensions and standard DIN EN50022-35 rail mounting



4 OPERATION

LPC-2.DX1 module can be controlled from main PLC module (e.g. LPC-2.MC9, LPC-2.MM1). Module parameters can be read or written via Smarteh IDE software.

LPC-2.DX1 module can also be controlled by the remote input output main module (e.g. LPC-2.MU1).

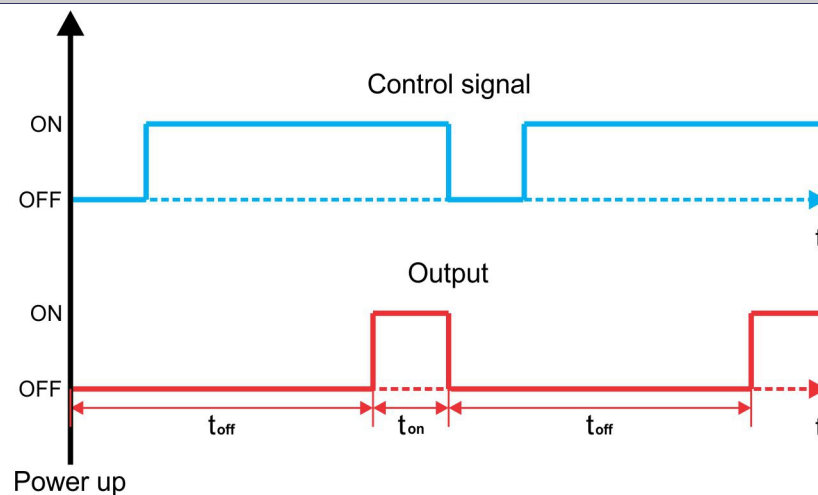
WARNING: Upon activation of the output, current flows through the NTC thermistor, limiting inrush current. Consequently, the NTC thermistor heats up during output activation. To ensure reliable operation, the time between output cycles must be sufficient to allow the NTC thermistor to cool down completely.

The software-defined minimum time delay between output deactivation and reactivation is set to 20 seconds. However, this timeout value is not intended to be the maximum limit. It serves as a reminder to consider the cooling requirements of the NTC thermistor when designing the operational cycle of your application.

Refer to the included time graph for a visual representation of the output ON delay (t_{off}) after device power up and the ON delay (t_{off}) between output cycles.

In case the temperature measured by the measuring NTC thermistor exceeds 80°C, the output will be deactivated.

Figure 2: Output ON-delay



4.1 SmartehIDE Parameters

Input

Internal temperature [DX1_x_ai_internal_temp]: Internal temperature measurement on the PCB.

Type: UINT

Raw to engineering data: 0 .. 65535 → 0 .. 655.35 °C

Fuse status [DX1_x_di_fuse_status]: Fuse digital input status.

Type: BOOL

Raw to engineering data: 0 → Fuse blown
1 → Fuse OK

Output

Relay digital output [DX1_x_do_out]: Relay digital output status.

Type: BOOL

Raw to engineering data: 0 → Digital output OFF
1 → Digital output ON



5 INSTALLATION

5.1 Connection scheme

Figure 3: Connection scheme

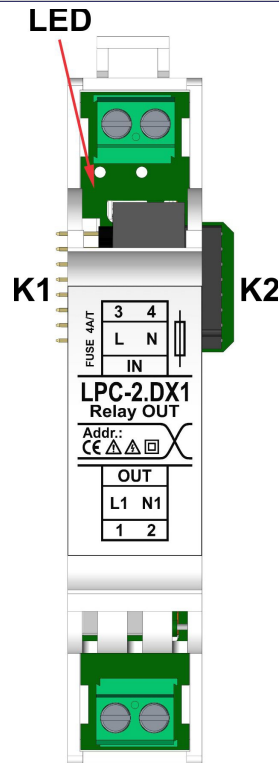


Table 2: IN

IN.3	L	Power supply input - line, 100 .. 240 V AC, 50/60 Hz
IN.4	N	Power supply input - neutral, 100 .. 240 V AC, 50/60 Hz

Table 3: OUT

OUT.1	L1	Power supply output - line, 100 .. 240 V AC, 50/60 Hz
OUT.2	N1	Power supply output - neutral, 100 .. 240 V AC, 50/60 Hz

Table 4: Fuse

Fuse	4A (T-slow)	Cartridge fuse 5x20 mm
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Table 5: LED

LED: green	Status LED	<p>ON: Output switched ON and power on output</p> <p>OFF: Output switched OFF and no power on output</p> <p>Blinking: No power on output, fuse blown or no voltage on input</p>
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Table 6: K1

Internal BUS	Data & DC power supply	Connection to I/O module
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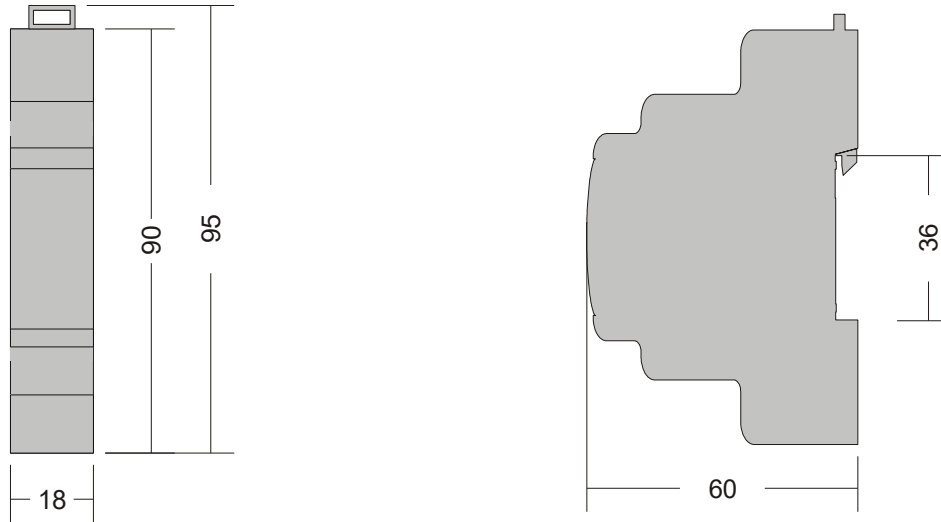
Table 7: K2

Internal BUS	Data & DC power supply	Connection to I/O module
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5.2 Mounting instructions

Figure 4: Housing dimensions



- Dimensions in millimeters.



All connections, module attachments and assembling must be done while module is not connected to the main power supply.

Mounting instructions:

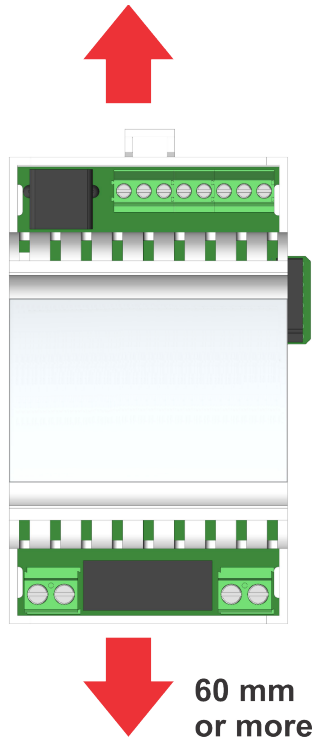
1. Switch OFF main power supply.
2. Mount LPC-2.DX1 module to the provided place inside an electrical panel (DIN EN50022-35 rail mounting).
3. Mount other LPC-2 modules (if required). Mount each module to the DIN rail first, then attach modules together through K1 and K2 connectors.
4. Connect input and output wires according to the connection scheme in Figure 2.
5. Switch ON main power supply.

Dismount in reverse order. For mounting/dismounting modules to/from DIN rail a free space of at least one module must be left on the DIN rail.

NOTE: LPC-2 main module should be powered separately from other electrical appliance connected to LPC-2 system. Signal wires must be installed separately from power and high voltage wires in accordance with general industry electrical installation standard.

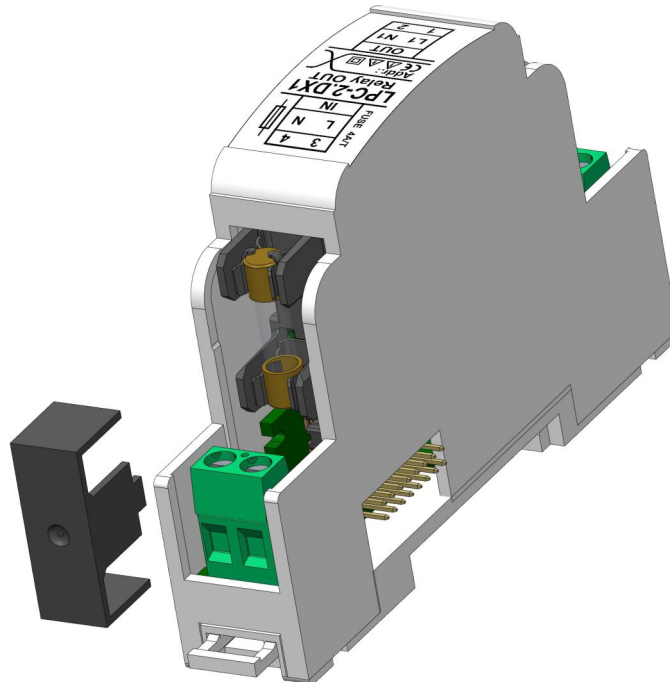


Figure 5: Minimum clearances



The clearances above must be considered before module mounting.

Figure 6: Fuse replacement



6 TECHNICAL SPECIFICATIONS

Table 8: Technical specifications

Power supply	From the main module via internal bus
Max. power consumption	0.5 W
Rated input voltage	100 .. 240 V AC, 50/60 Hz
Maximum operating current	4 A
SW-defined minimum OFF time ¹	20 s
Fuse	4 A (T-slow), 250 V, Cartridge fuse 5x20 mm
Connection type	screw type connectors for stranded wire 0.75 to 2.5 mm ²
Dimensions (L x W x H)	90 x 18 x 60 mm
Weight	70 g
Ambient temperature	0 to 50 °C
Ambient humidity	max. 95 %, no condensation
Maximum altitude	2000 m
Mounting position	vertical
Transport and storage temperature	-20 to 60 °C
Pollution degree	2
Overvoltage category	II
Electrical equipment	Class II (double insulation)
Protection class	IP 30

¹ Software-defined minimum time between switching off and switching on the output again.



7 MODULE LABELING

Figure 7: Label

Label (sample):

XXX-N.ZZZ
 P/N: AAABBBCCDDDEEE
 S/N: SSS-RR-YYXXXXXXXXXX
 D/C: WW/YY

Label description:

1. **XXX-N.ZZZ** - full product name.
 - **XXX-N** - Product family
 - **ZZZ** - product
2. **P/N: AAABBBCCDDDEEE** - part number.
 - **AAA** - general code for product family,
 - **BBB** - short product name,
 - **CCDD** - sequence code,
 - **CC** - year of code opening,
 - **DD** - derivation code,
 - **EEE** - version code (reserved for future HW and/or SW firmware upgrades).
3. **S/N: SSS-RR-YYXXXXXXXXXX** - serial number.
 - **SSS** - short product name,
 - **RR** - user code (test procedure, e.g. Smarteh person xxx),
 - **YY** - year,
 - **XXXXXXXXXX** - current stack number.
4. **D/C: WW/YY** - date code.
 - **WW** - week and
 - **YY** - year of production.

Optional

1. **MAC**
2. **Symbols**
3. **WAMP**
4. **Other**





8 CHANGES

The following table describes all the changes to the document.

Date	V.	Description
10.05.24	1	The initial version, issued as <i>LPC-2.DX1 module UserManual</i> .





9 NOTES

