# USER MANUAL

Longo programmable controller
LPC-2.I16
Digital Input module

**Version 3**

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Written by SMARTEH d.o.o.


User Manual

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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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## Longo programmable controller LPC-2.I16

# 1 DESCRIPTION

LPC-2.I16 is used as digital input module for voltage free (dry) contacts connection or standard digital input module for connection to 24 V DC external sources. 16 channels are available for input connection. Selection of the type of lower and upper 8 inputs, voltage free or external source, can be done with two sets of jumpers. Inputs are galvanic isolated from the rest of the LPC-2 system. It can be used in a wide range of operation where sensors and devices connected to the LPC-2.I16 module provide dry contacts or 24 V DC signals required for inputs activation.

LEDs indicate state of contact or active signal present on corresponding module input (refer to the Table 6).

Module is powered from internal BUS.

# 2 FEATURES

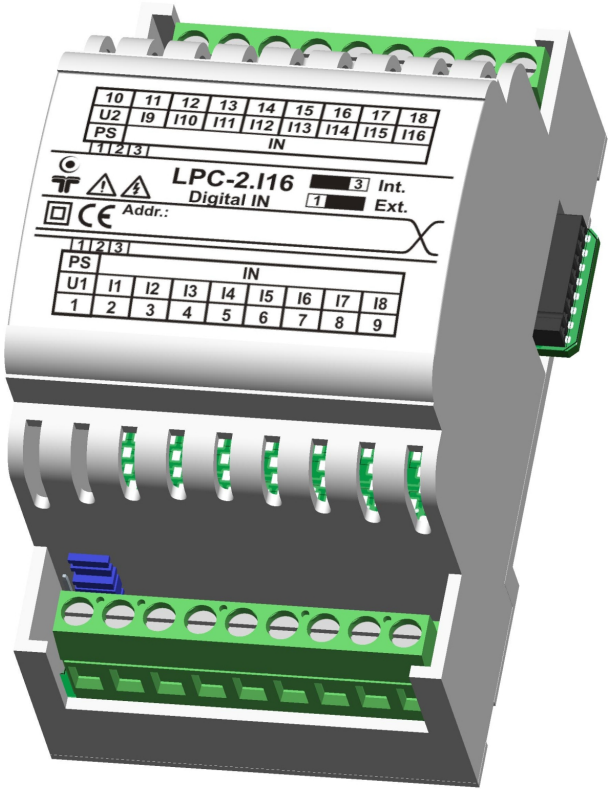


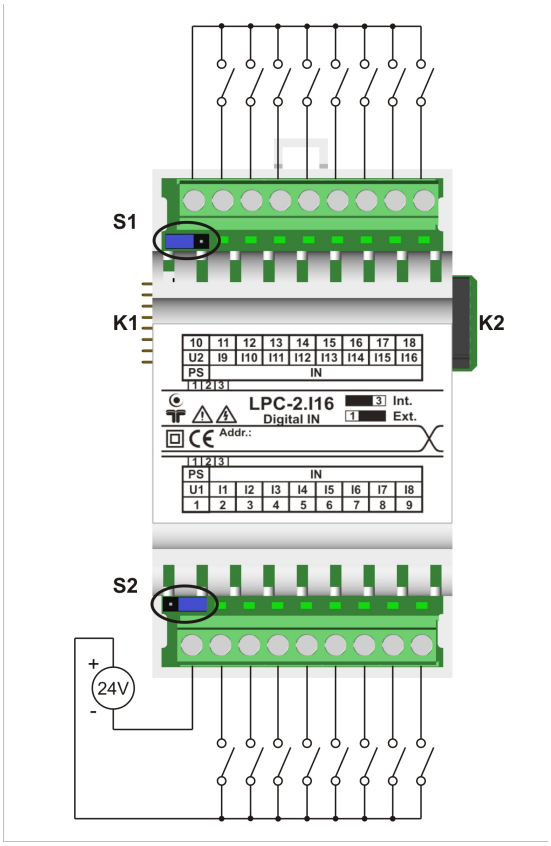

Figure 1: LPC-2.I16 module.

| Table 1: Technical data |
|---|
| 16 voltage free or standard digital inputs |
| Galvanic isolated |
| Flexible inputs for wide use of operation |
| Standard DIN EN50022-35 rail mounting |

# 3 INSTALLATION

## 3.1 Connection scheme

**Figure 2: Connection scheme**



| Table 2: IN[1] | | |
|---|---|---|
| | Int. Set as voltage free (dry) contact input (Int.) | Ext. Set as standard digital input for 24 V DC external source (Ext.) |
| PS.1 (U1) | + 24 V DC / 50 mA output | Reference to 0 .. 24 V DC digital inputs |
| IN.2 (I1) | Digital input, 0 .. 24 V DC | Digital input, 0 .. 24 V DC |
| IN.3 (I2) | Digital input, 0 .. 24 V DC | Digital input, 0 .. 24 V DC |
| IN.4 (I3) | Digital input, 0 .. 24 V DC | Digital input, 0 .. 24 V DC |
| IN.5 (I4) | Digital input, 0 .. 24 V DC | Digital input, 0 .. 24 V DC |
| IN.6 (I5) | Digital input, 0 .. 24 V DC | Digital input, 0 .. 24 V DC |
| IN.7 (I6) | Digital input, 0 .. 24 V DC | Digital input, 0 .. 24 V DC |
| IN.8 (I7) | Digital input, 0 .. 24 V DC | Digital input, 0 .. 24 V DC |
| IN.9 (I8) | Digital input, 0 .. 24 V DC | Digital input, 0 .. 24 V DC |
| | Int. Set as voltage free (dry) contact input (Int.) | Ext. Set as standard digital input for 24 V DC external sources (Ext.) |
| PS.10 (U2) | + 24 V DC / 50 mA output | Reference to 0 .. 24 V DC digital inputs |
| IN.11 (I9) | Digital input, 0 .. 24 V DC | Digital input, 0 .. 24 V DC |
| IN.12 (I10) | Digital input, 0 .. 24 V DC | Digital input, 0 .. 24 V DC |
| IN.13 (I11) | Digital input, 0 .. 24 V DC | Digital input, 0 .. 24 V DC |
| IN.14 (I12) | Digital input, 0 .. 24 V DC | Digital input, 0 .. 24 V DC |
| IN.15 (I13) | Digital input, 0 .. 24 V DC | Digital input, 0 .. 24 V DC |
| IN.16 (I14) | Digital input, 0 .. 24 V DC | Digital input, 0 .. 24 V DC |
| IN.17 (I15) | Digital input, 0 .. 24 V DC | Digital input, 0 .. 24 V DC |
| IN.18 (I16) | Digital input, 0 .. 24 V DC | Digital input, 0 .. 24 V DC |

| Table 3: Digital input specification for voltage free (dry) contact | | |
|---|---|---|
| I1 .. I16 | "Off" ($R_{SW}$ > 40 kΩ)<br>"On" ($R_{SW}$ < 5 kΩ)<br>Max. input frequency = 20 Hz | Voltage free (dry) contact input |
| I1..I16 | $R_{in}$ = 4.7 kΩ<br>"Off" ($U_{in}$ < 2 V DC)<br>"On" ($U_{in}$ > 15 V DC)<br>Max. input voltage = 35 V DC<br>Max. input frequency = 20 Hz | External 24 V DC voltage source input |

| Table 4: K1 | | |
|---|---|---|
| Internal BUS | Data & DC power supply | Connection to I/O module |

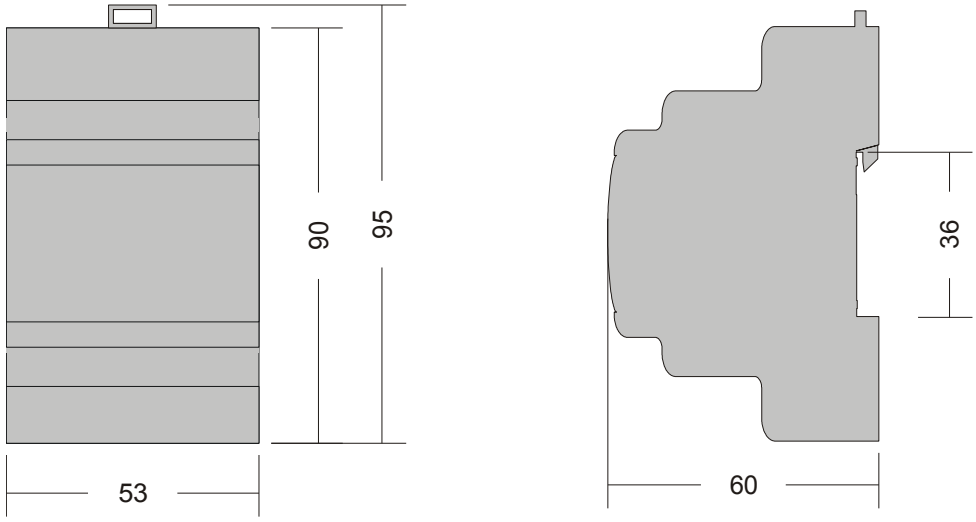
1 Wires connected to the module must have cross sectional area at least 0.75 mm$^2$. Minimum temperature rating of wire insulation must be 85 °C.

| Table 5: K2 | | |
|---|---|---|
| Internal BUS | Data & DC power supply | Connection to I/O module |

| Table 6: LED1 – LED16 | | |
|---|---|---|
| Status | Digital input state when set as voltage free (dry) contact input: | "On" : I1 up to I8 connected to U1,<br>I9 up to I16 connected to U2<br>(contact closed)<br><br>"Off" : I1 up to I8 not connected to U1,<br>I9 up to I16 not connected to U2<br>(contact opened) |
| Status | Digital input state when set as external 24 V DC voltage source input: | "On": Input voltage present between I1 up to I8 and U1,<br>Input voltage present between I9 up to I16 and U2<br><br>"Off": Input voltage not present between I1 up to I8 and U1,<br>Input voltage not present between I9 up to I16 and U2 |

## 3.2 Mounting instructions

**Figure 3: Housing dimensions**




Dimensions in milimeters.

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.I16 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 digital inputs wires according to the connection scheme in Figure 2.
5. Switch ON main power supply.

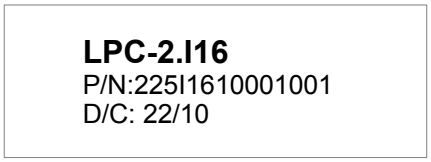
Dismount in reverse order. For mounting/dismounting modules to/from DIN rail a free space of at least one module must be left on the DIN rail.

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.

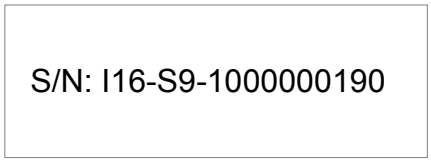
## 3.3 Module labeling

**Figure 4: Labels on housing**

Label 1( LPC-2.I16 module sample):




Label 2( LPC-2.I16 module sample):




***Label 1 description:***

1. **LPC-2.I16** is the full product name**.**
2. P/N:225**I1610**001001 is the part number.
   - **225** – general code for product family,
   - **I16** – short product name,
   - **10001** – sequence code,
     - 10 – year of code opening,
     - 001 – derivation code,
   - **001** – version code (reserved for future HW and/or SW firmware upgrades).
3. D/C:**22**/10 is the date code.
   - **22** – week and
   - **10** – year of production.

***Label 2 description:***

1. **S/N:I16-S9-1000000190** is the serial number.
   - **I16** – short product name,
   - **S9** – user code (test procedure, e.g. Smarteh person xxx),
   - **1000000190** – year and current stack code,
     - 10 – year (last two cyphers),
     - 00000190 – current stack number; previous module would have the stack number 00000189 and the next one 00000191.

# 4 TECHNICAL SPECIFICATIONS

| Table 7: Technical specifications | |
|---|---|
| Power supply | from internal BUS |
| Power consumption | 2.5 W |
| Number of digital inputs | 16 |
| Input threshold when set as voltage free (dry) contact input | ”On”: <5 kΩ<br>“Off”: >40 kΩ |
| Input threshold when set as external 24 V DC voltage source input | “On” ($U_{in}$ > 15 V DC)<br>“Off” ($U_{in}$ < 2 V DC) |
| Connection type | screw type connector for stranded wire 0.75 to 2.5 $mm^2$ |
| Dimensions (L x W x H) | 90 x 53 x 60 mm |
| Weight | 100 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 |
| Protection class | IP 30 |

# 5 CHANGES

The following table describes all the changes to the document.

| Date | V. | Description |
|---|---|---|
| 30.6.2010 | 001 | The initial version, issued as *LPC-2.I16 module UserManual*. |

# 6 NOTES