# USER MANUAL

Longo programmable controller
LPC-2.O16
Transistor Output module

**Version 5**

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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.O16

# 1 DESCRIPTION

LPC-2.O16 is used as standard 24 V DC digital output module. Module has 16 current protected and galvanic isolated PNP transistor outputs. It can be used in a wide range of operation.

LEDs indicates active signal present on module outputs (refer to the Table 5).

Module is powered from internal BUS or 24 V DC external power supply. Selection can be done with two sets of jumpers.

NOTE: In case of current protection of individual digital output is on (no voltage on individual output when switched on), switch off digital output from main module application software side and after switch it on again. If current protection is still on, investigate what is the reason for this (wrong output connection, short circuit from output to the reference voltage, load shorted, to high capacity load connected to the output ...).

# 2 FEATURES

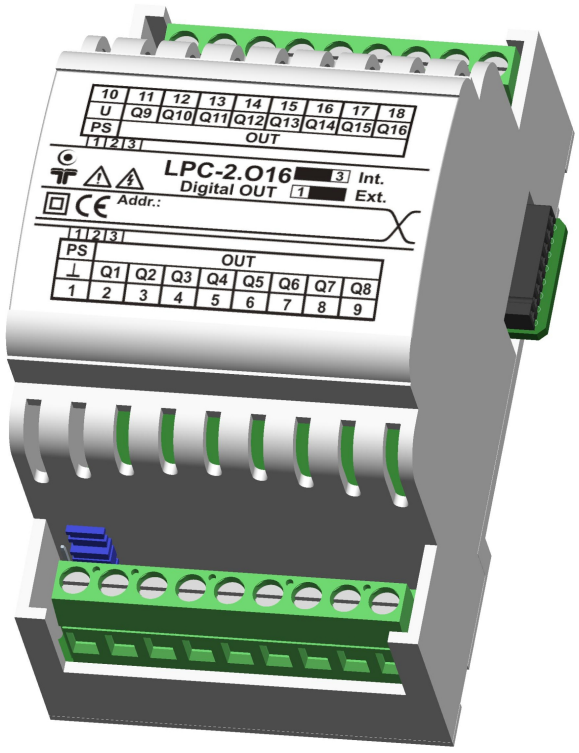



Figure 1: LPC-2.O16 module.

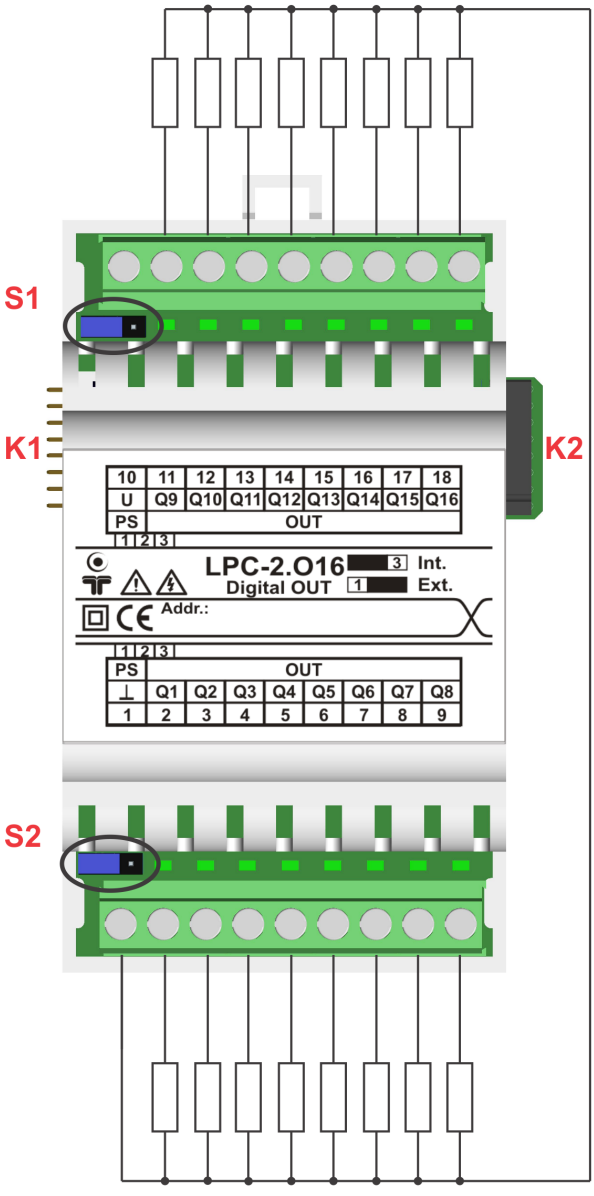
| Table 1: Technical data |
|---|
| 16 standard PNP transistor digital outputs |
| Galvanic isolated |
| Current protected |
| Flexible output for wide use of operation |
| Small dimensions and standard DIN EN50022-35 rail mounting |

# 3 INSTALLATION

## 3.1 Connection scheme

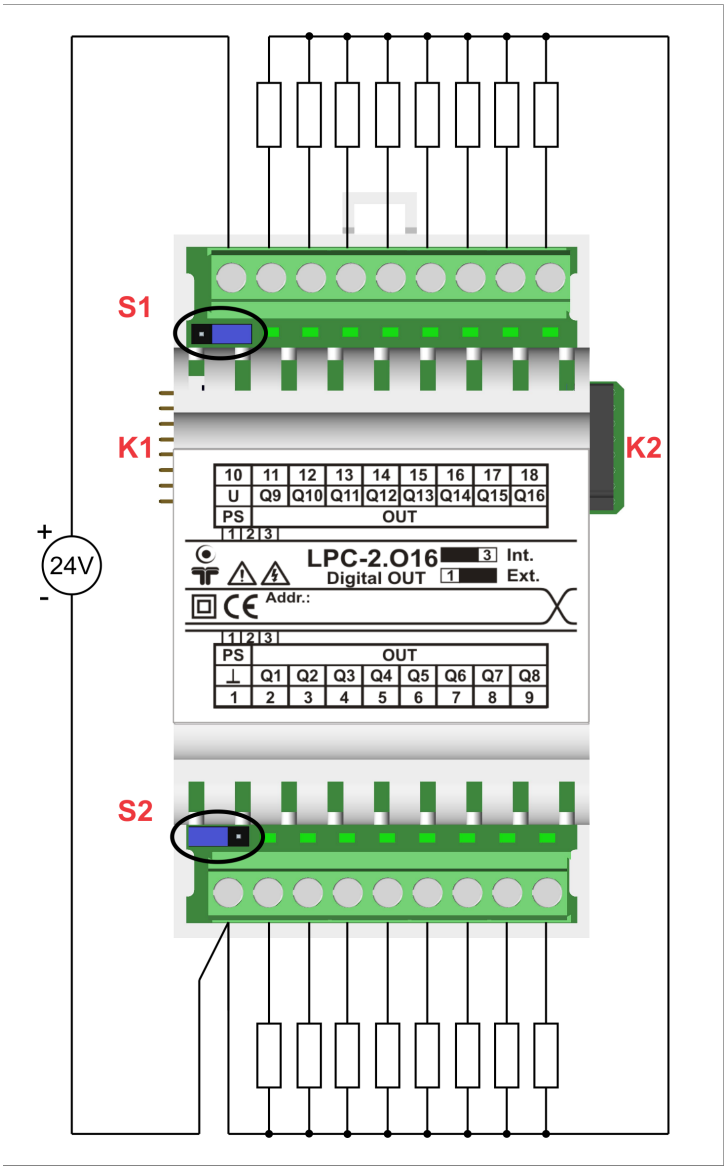
**Figure 2: Connection scheme for internally supplied**

| JUMPER POSITION | |
|---|---|
| S1 ■ 3<br>S2 ■ 3 | Set as internally supplied output (Int.) |



## Figure 3: Connection scheme for externally supplied

| JUMPER POSITION | |
|---|---|
| S1 1 | Set as externally supplied output (Ext.) |
| S2 3 | Set as internally supplied output (Int.) |



| Table 2: OUT[1] | | |
|---|---|---|
| | Set as internally supplied output (Int.)<br>NOTE: digital outputs sum current can not exceed 100 mA | Set as externally supplied output (Ext.)<br>NOTE: digital outputs sum current can not exceed 4 A |
| PS.1 (⊥) | Internal reference to + 24 V DC digital outputs | External reference to + 24 V DC digital outputs |
| OUT.2 (Q1) | Digital output, 24 V DC / 100 mA | Digital output, 24 V DC / 500 mA |
| OUT.3 (Q2) | Digital output, 24 V DC / 100 mA | Digital output, 24 V DC / 500 mA |
| OUT.4 (Q3) | Digital output, 24 V DC / 100 mA | Digital output, 24 V DC / 500 mA |
| OUT.5 (Q4) | Digital output, 24 V DC / 100 mA | Digital output, 24 V DC / 500 mA |
| OUT.6 (Q5) | Digital output, 24 V DC / 100 mA | Digital output, 24 V DC / 500 mA |
| OUT.7 (Q6) | Digital output, 24 V DC / 100 mA | Digital output, 24 V DC / 500 mA |
| OUT.8 (Q7) | Digital output, 24 V DC / 100 mA | Digital output, 24 V DC / 500 mA |
| OUT.9 (Q8) | Digital output, 24 V DC / 100 mA | Digital output, 24 V DC / 500 mA |
| PS.10 (U) | Not connected | + 24 V DC / 4 A input |
| OUT.11 (Q9) | Digital output, 24 V DC / 100 mA | Digital output, 24 V DC / 500 mA |
| OUT.12 (Q10) | Digital output, 24 V DC / 100 mA | Digital output, 24 V DC / 500 mA |
| OUT.13 (Q11) | Digital output, 24 V DC / 100 mA | Digital output, 24 V DC / 500 mA |
| OUT.14 (Q12) | Digital output, 24 V DC / 100 mA | Digital output, 24 V DC / 500 mA |
| OUT.15 (Q13) | Digital output, 24 V DC / 100 mA | Digital output, 24 V DC / 500 mA |
| OUT.16 (Q14) | Digital output, 24 V DC / 100 mA | Digital output, 24 V DC / 500 mA |
| OUT.17 (Q15) | Digital output, 24 V DC / 100 mA | Digital output, 24 V DC / 500 mA |
| OUT.18 (Q16) | Digital output, 24 V DC / 100 mA | Digital output, 24 V DC / 500 mA |

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 3: Digital outputs specification | | |
|---|---|---|
| Q1..Q16 | “Off” No voltage on output pin<br>“On” Voltage on output pin<br>Max. output frequency = 20 Hz | Digital output state |

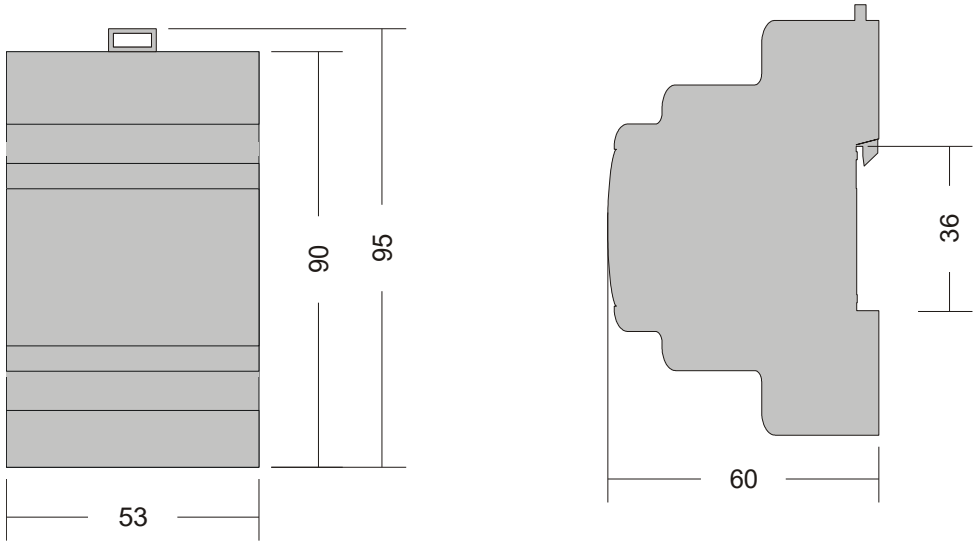
| Table 4: K1 | | |
|---|---|---|
| Internal BUS | Data & DC power supply | Connection to I/O module |

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

| Table 6: LED1 - LED16 | | |
|---|---|---|
| Status | Digital output state | On: voltage on output pin<br>Off: no voltage on output pin |

## 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.O16 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 output wires according to the connection scheme in Figure 2.
5. Switch ON main power supply.

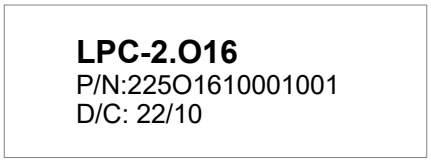
Dismount in reverse order. For mounting/dismounting modules to/from DIN rail a free space of at least one module must be left on the DIN rail.

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.

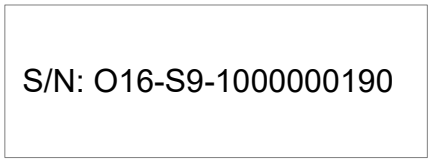
## 3.3 Module labeling

**Figure 4: Labels on housing**

Label 1(sample):




Label 2 (sample):




***Label 1 description:***

1. **LPC-2.O16** is the full product name.
2. **P/N:225O1610001001** is the part number.
   - **225** – general code for product family,
   - **O16** – 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:O16-S9-1000000190** is the serial number.
   - **O16** – 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 6: Technical specifications | |
|---|---|
| Power supply, selected by jumpers | from internal BUS |
| | external 24 V DC |
| Power consumption | power supply from internal BUS, max. 12 W |
| | 24 V DC external power supply, max. 1 W |
| Rated output voltage | power supply from internal BUS, 20 .. 28 V DC |
| | 24 V DC external power supply, 20 .. 28 V DC |
| External 24 V DC power supply (U) | 20 .. 28 V DC / Max. current 4 A |
| Max. output current | 500 mA, short circuit proof |
| Max. load capacitance | 10 µF |
| Number of digital outputs | 16 |
| Connection type | screw type connector for stranded wire 0.75 to 2.5 $mm^2$ |
| Dimensions (L x W x H) | 90 x 18 x 60 mm |
| Weight | 120 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 |
|---|---|---|
| 30.06.10 | 1 | The initial version, issues as *LPC-2.O16 module UserManual*. |
| 03.03.16 | 3 | Updated pictures and power consumption note. |
| 30.01.19 | 4 | Technical updates. |
| 18.07.23 | 5 | Updated Figure 3: Connection scheme for externally supplied. |

# 6 NOTES