USER MANUAL

Longo programmable controller
LPC-2.A01 module

Version 5

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User manual

Document Version: 005
July 1, 2012

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 230 VAC 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, we offer warranty for 24 months from date of sale to end buyer. 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 61000-6-2 (EN 50082), EN 61000-6-4 (EN 50081)
- LVD: IEC 61131-2
- Vibrations and climatic-mechanical: EN 60068-2-6, EN 60068-2-27, EN 60068-2-29

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.A01 module

1 DESCRIPTION

LPC-2.A01 module has a lot of settings to customize the application. It's general purpose is to measure analog values and generate output analog signals.

Module is powered from internal BUS.

Each input or output can be configured as voltage or current type through correspondent jumper. Inputs have an additional setting for its second terminal voltage. If signal is sourced from outside active device, then jumper is set to GND. In this case input measures the analog value in reference to GND. Otherwise, if NTC or other passive sensor is connected to input, jumper should be set to +10V. If a two wire current device is connected, jumper should be set to +24V (+16V±10%). There are two jumpers: bottom one is common for first four inputs, top one for last two inputs (refer to Table 2 and Table 3).

The lowest power consumption of LPC-2.A01 module is achieved with ground referenced inputs and voltage type outputs.

NOTE: For proper system configuration and data allocation please refer to LPC Composer software help menu.

2 FEATURES

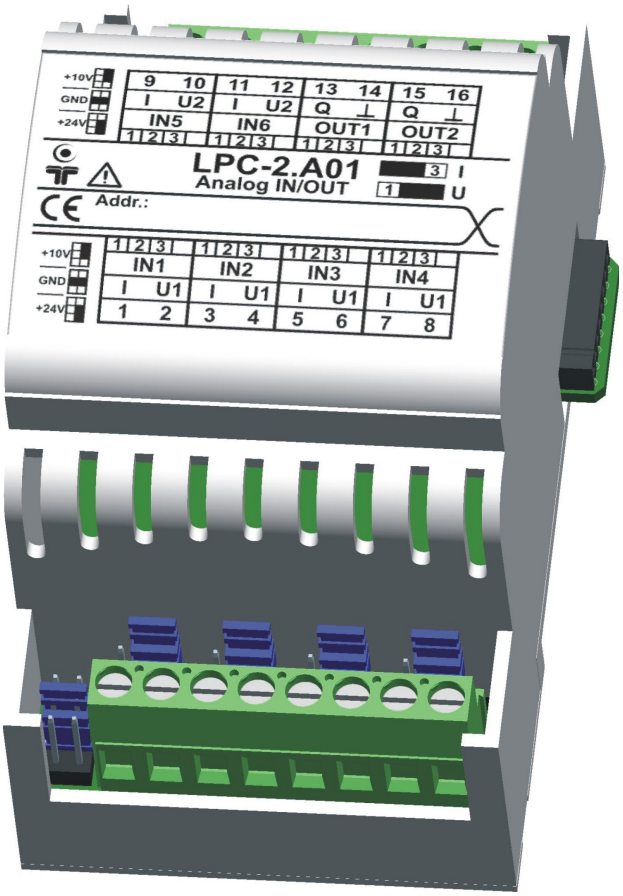


Figure 1: LPC-2.A01 analog module

Table 1: Technical data
2 analog outputs
6 analog inputs
Voltage or current input / output set with jumper
Voltage / current input range: 0..10 V / 0..20 mA @ < ±0.5 % / < ±1 % meas. error of full scale
Voltage / current output range: 0..10 V / 0..20 mA @ ±1 % / ±3 % accuracy of full scale value
On input connector ground reference GND, 24 VDC (+16 VDC ± 10%) or 10 VDC internal supply is provided (jumper configurable)
Each input and output can be set as current or voltage type (jumper configurable)
Standard DIN EN50022-35 rail mounting

3 INSTALLATION

3.1 Connection scheme example

Figure 2: Connection scheme example

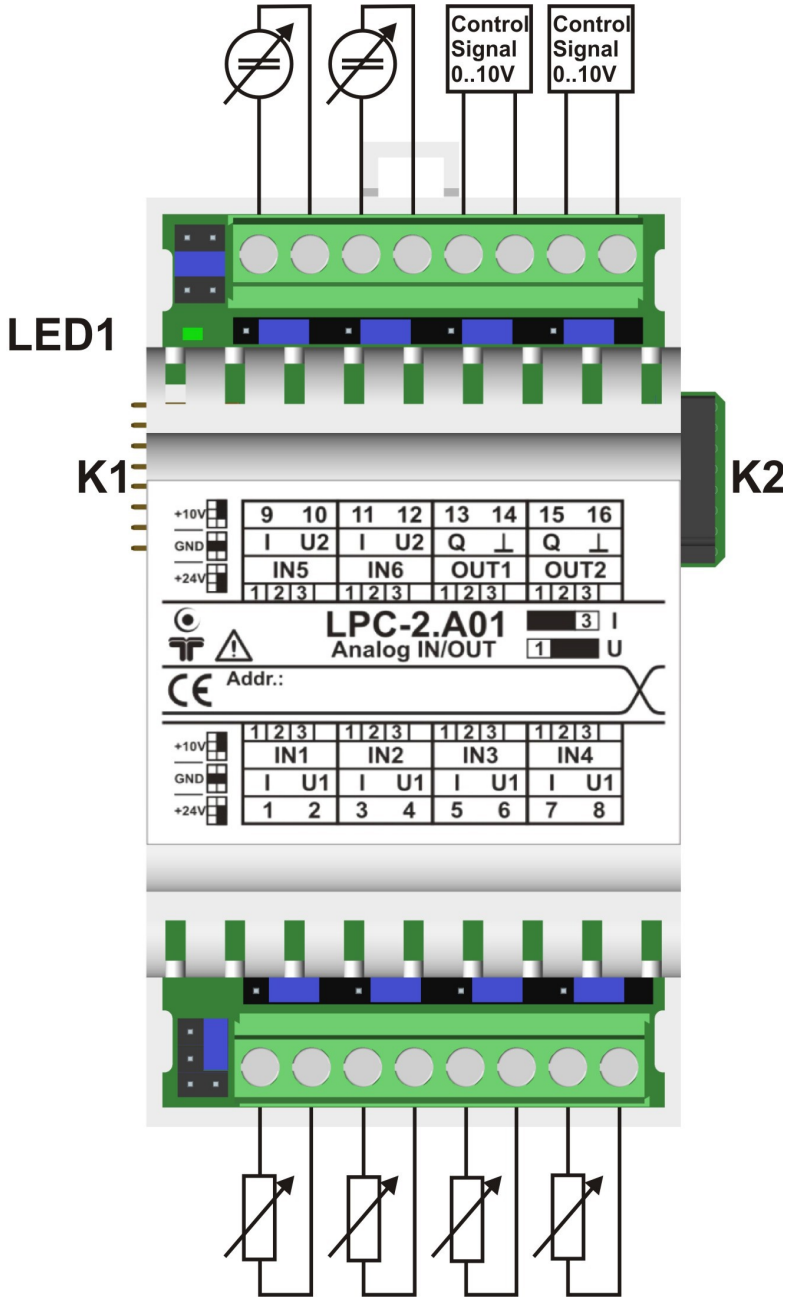


Table 2: Inputs[1]

	GND	+10V	+24V	set as voltage	set as current
IN1.1 (I)				analog input 0..10 V R_{in}= 10.7 kΩ	analog input 0..20 mA R_{in}= 182 Ω
IN1.2 (U1)[2]	GND	+10 VDC	+16 VDC ± 10%		
IN2.3 (I)				analog input 0..10 V R_{in}= 10.7 kΩ	analog input 0..20 mA R_{in}= 182 Ω
IN2.4 (U1)[2]	GND	+10 VDC	+16 VDC ± 10%		
IN3.5 (I)				analog input 0..10 V R_{in}= 10.7 kΩ	analog input 0..20 mA R_{in}= 182 Ω
IN3.6 (U1)[2]	GND	+10 VDC	+16 VDC ± 10%		
IN4.7 (I)				analog input 0..10 V R_{in}= 10.7 kΩ	analog input 0..20 mA R_{in}= 182 Ω
IN4.8 (U1)[2]	GND	+10 VDC	+16 VDC ± 10%		
IN5.9 (I)				analog input 0..10 V R_{in}= 10.7 kΩ	analog input 0..20 mA R_{in}= 182 Ω
IN5.10(U2)[3]	GND	+10 VDC	+16 VDC ± 10%		
IN6.11 (I)				analog input 0..10 V R_{in}= 10.7 kΩ	analog input 0..20 mA R_{in}= 182 Ω
IN6.12(U2)[3]	GND	+10 VDC	+16 VDC ± 10%		

Table 3: Outputs[1]

		set as voltage	set as current
OUT1.13 (Q)		analog out 0..10 VDC	analog out 0..20 mA
OUT1.14 (⊥)	GND		
OUT2.15 (Q)		analog out 0..10 VDC	analog out 0..20 mA
OUT2.16 (⊥)	GND		

Table 4: K1

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

Table 5: K2

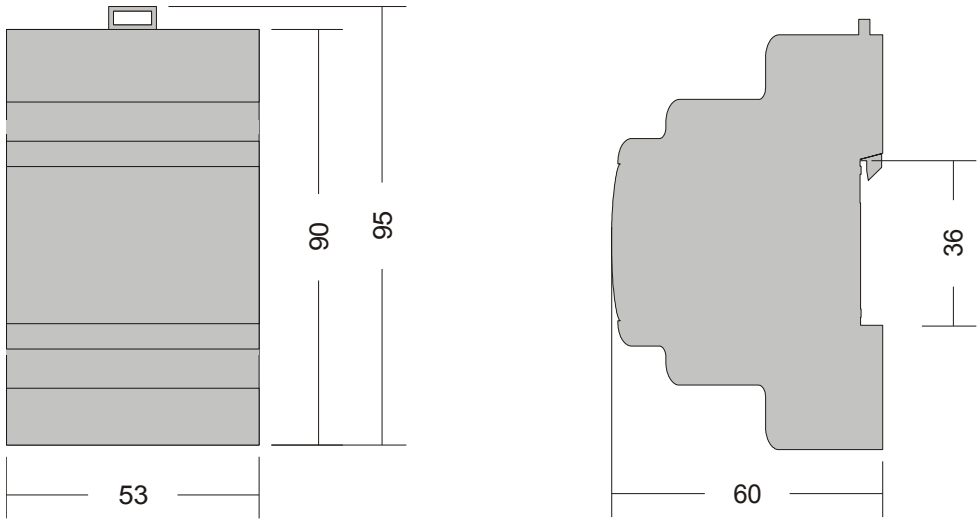
Internal BUS	Data & DC power supply	Connection to I/O module

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.
2 Pins IN1.2, IN2.4, IN3.6 and IN4.8 are always on the same potencial selected through correspondent jumper.
3 Pins IN5.10 and IN6.12 are always on the same potencial selected through correspondent jumper.

Table 6: LED1		
Status	Green LED: indicates A01 state	On: OK Blink: A01 in fault state

3.2 Mounting instructions

Figure 3: 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.A01 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 devices and sensor wires according to the connection scheme in Figure 2.
5. Switch ON main power supply.
6. Green LED should switch on according to the Table 6.

Dismount in reverse order. For mounting/dismounting modules to/from DIN rail a free space of at

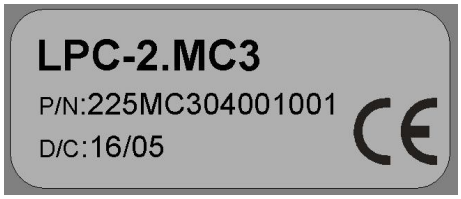
least one module must be left on the DIN rail.

NOTE: LPC-2.MC3 main control 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 (MC3 sample):



Label 2 (MC3 sample):

Label 1 description:

1. **LPC-2.MC3** is the full product name.
2. **P/N:225MC3040001001** is the part number.
   - **225** – general code for product family,
   - **MC3** – short product name,
   - **04001** – sequence code,
     - 04 – year of code opening
     - 001 – derivation code
   - **001** – version code (reserved for future HW and/or SW firmware upgrades).
3. **D/C:16/05** is the date code.
   - **16** – week and
   - **05** – year of production.

Label 2 description:

1. **S/N:MC3-S9-0500000190** is the serial number.
   - **MC3** – short product name,
   - **S9** – user code (test procedure, e.g. Smarteh person xxx),
   - **0500000190** – year and current stack code,
     - 05 – 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 5: Technical specifications		
Power supply	from internal BUS	
Number of analog inputs	6	
Number of analog outputs	2	
Connection type	screw type connector for stranded wire 0.75 to 2.5 mm^2	
Max. power consumption	5 W	
	analog input / output type	
	voltage	current
Max. current consumption	1 mA per input	20 mA per input
Max. current consumption	20 mA per output	20 mA per output
Analog input measuring error of the full scale value	< ±0.5 %	< ±1 %
Analog output accuracy of the full scale value	±1 %	±3 %
Load resistance for analog outputs	R > 500 Ω	R < 500 Ω
Analog input range	0..10 V	0..20 mA
Analog output range	0..10 V	0..20 mA
Max. transition time per channel	1 s	
Max. total source current from +10V supply terminals	20 mA	
Max. total source current from +24V supply terminals	120 mA	
ADC resolution	min. 3900 levels	
DAC resolution	min. 450 levels	
Dimensions (L x W x H)	90 x 53 x 60 mm	
Weight	90 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	

CHANGES

The following table describes all the changes to the document.

Date	V.	Description
31.3.2006	003	The initial version, issued as *LPC-2.A01 module UserManual*.
4.5.2009	004	Update graphic
11.5.2010	005	Updated warranty permanence.

NOTES