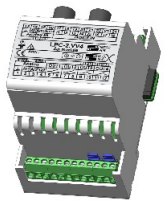

SMARTEH LPC-2.VV4 Longo Programmable Controller User Manual

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Version 3

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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, 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: IEC/EN 61000-6-2, IEC/EN 61000-6-4,
- LVD: IEC 61010-1:2010 (3rd Edition), IEC 61010-2-201:2013 (1st Ed.)

MANUFACTURER:
SMARTEH d.o.o. Poljubinj 114 5220 Tolmin Slovenia

Contents

ABBREVIATIONS

Sorted by order of appearance in document:

dp: Delta P, pressure difference
VAV: Variable air volume
I/O: Input output
NTC: Negative temperature coefficient
LED: Light emitting diode
ERR: Error
PWR: Power
NO: Normally open
NC: Normally closed

DESCRIPTION

LPC-2.VV4 is a differential pressure module with various inputs and outputs integrated. Module is an optional choice to be used in ventilation control systems as VAV and similar.

The LPC-2.VV4 module is powered directly from the LPC-2 main unit. There are two LEDs. Green (PWR) indicates power supply presence, and red (ERR) indicates LPC-2.VV4 module error.

FEATURES

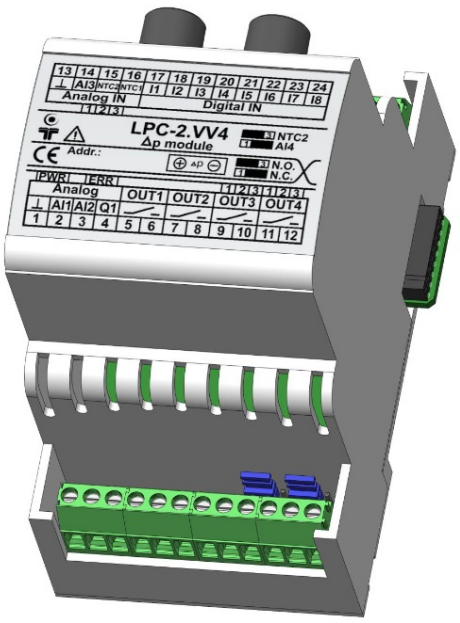


Figure 1: LPC-2.VV4 module

Table 1: Features

Powered from LPC-2 main unit
DeltaP measurement: 0 .. 500 Pa
3 x Voltage analog inputs: 0 .. 10 V
1 x NTC 10k input
1 x NTC 10k / voltage analog input: 0 .. 10 V, jumper selectable
8 x Digital inputs
1 x Voltage analog output: 0 .. 10 V
2 x Relay outputs, NO
2 x Relay outputs, NO / NC, jumper selectable
Standard DIN EN50022-35 rail mounting

INSTALLATION

Connection scheme

Figure 2: Connection scheme example

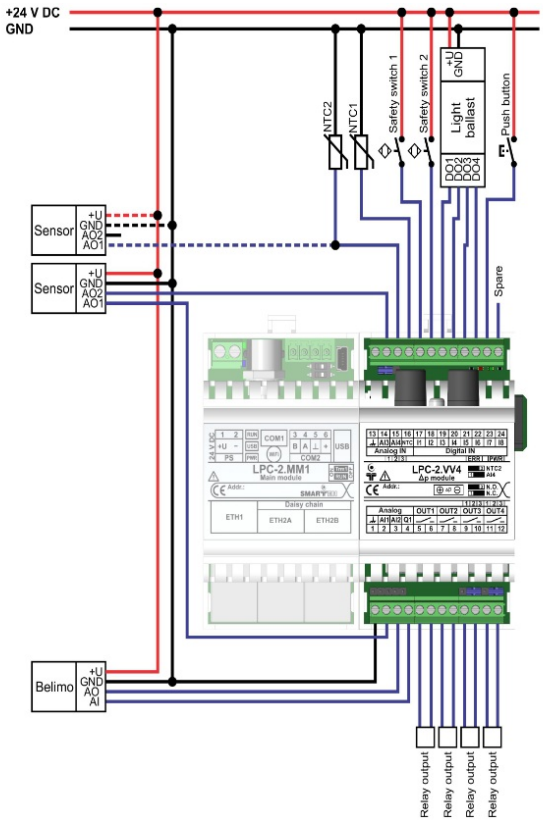


Figure 3: Connection scheme

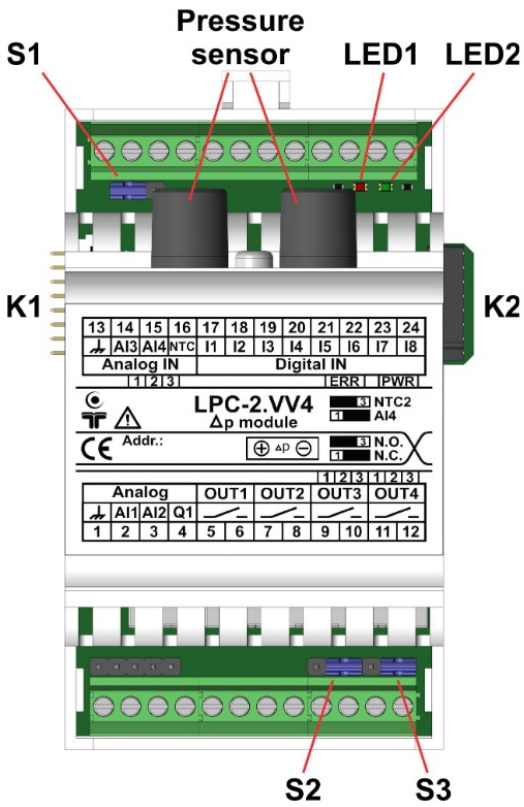


Table 2: Analog		
Analog.1	⏚	EGND
Analog.2	AI1	Analog input 0 .. 10 V
Analog.3	AI2	Analog input 0 .. 10 V
Analog.4	Q1	Analog output 0 .. 10V

Table 3: Pressure sensor		
DeltaP.+	Positive pressure	Delta pressure up to 500 Pa
DeltaP.-	Negative pressure	Delta pressure up to 500 Pa

Table 4: OUT		
OUT1.5 OUT1.6	Voltage free contacts	Normally open relay output
OUT2.7 OUT2.8	Voltage free contacts	Normally open relay output
OUT3.9 OUT3.10	Voltage free contacts	Jumper S2: ▬ 3 Normally Open relay output Jumper S2: 1 ▬ Normally Closed relay output
OUT4.11 OUT4.12	Voltage free contacts	Jumper S3: ▬ 3 Normally Open relay output Jumper S3: 1 ▬ Normally Closed relay output

Table 5: Analog IN		
Analog IN.13	⏚	EGND
Analog IN.14	AI3	Analog input, 0 .. 10 V
Analog IN.15	AI4	Jumper S1: NTC 10k Jumper S1: Analog input 0 .. 10 V
Analog IN.16	NTC	Analog input, NTC 10k

Table 6: Digital IN		
Digital IN.17	I1	Digital input, 0 .. 24 V DC
Digital IN.18	I2	Digital input, 0 .. 24 V DC
Digital IN.19	I3	Digital input, 0 .. 24 V DC
Digital IN.20	I4	Digital input, 0 .. 24 V DC
Digital IN.21	I5	Digital input, 0 .. 24 V DC
Digital IN.22	I6	Digital input, 0 .. 24 V DC
Digital IN.23	I7	Digital input, 0 .. 24 V DC
Digital IN.24	I8	Digital input, 0 .. 24 V DC

Table 7: K1 & K2		
K1	Internal BUS	Data & DC power supply

K2	Internal BUS	Data & DC power supply

Table 8: LEDs		
LED1: red	ERR, Communication status	ON: communication fault OFF: communication OK
LED2: green	PWR, Power supply status	ON: power supply OK OFF: power supply missing or power off

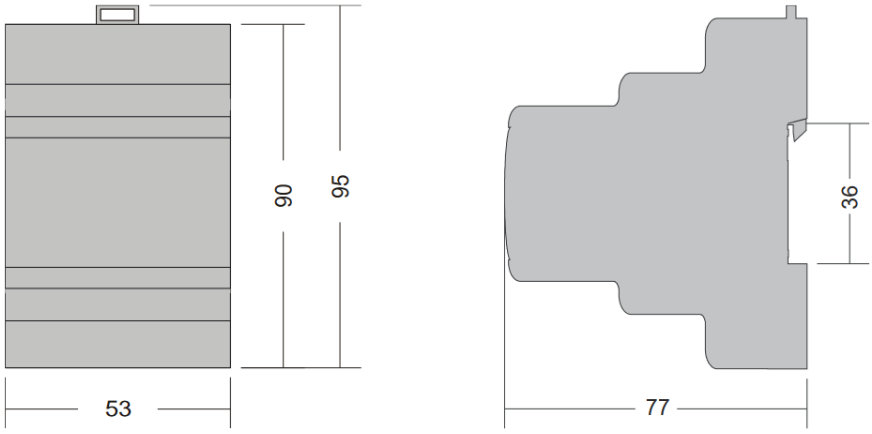
* NOTE: Special care must be taken in case of usage inductive character loads, e.g. contactors, solenoids, or loads that draw high inrush currents, e.g. capacitive character load, incandescent lamps. Inductive character loads cause over-voltage spikes at output relay contacts when they are switched off. The use of appropriate suppression circuits is advised.

Loads that draw high inrush currents may cause the relay output to be temporarily overloaded with the current above its allowed limits, which may damage the output, even though that steady-state current is within the allowed limits. For that type of load, the use of an appropriate inrush current limiter is advised.

Inductive or capacitive loads influence the relay contacts by shortening their working life period or can even permanently melt contacts together. Consider using another type of digital output e.g. triac.

Mounting instructions

Figure 4: Housing dimensions



Dimensions in millimeters.

EXTERNAL SWITCH OR CIRCUIT-BREAKER AND EXTERNAL OVERCURRENT PROTECTION: The unit is allowed to be connected to installation with over current protection that has nominal value of 16 A or less.

RECOMMENDATION ON SWITCH OR CIRCUIT-BREAKER PROTECTION: There should be two poles main switch in the installation in order to switch off the unit. The switch should meet the requirements of standard IEC60947 and have a nominal value at least 6 A. The switch or circuit-breaker should be within easy reach of the operator. It should be marked as the disconnecting device for the equipment.

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

The modules must be installed in enclosure with no openings. Enclosure must provide electrical and fire protection The shall withstand dynamic test with 500 g steel sphere from distance is 1.3 m and also static test 30 N. When installed in enclosure, only authorized person can have a key to open it.

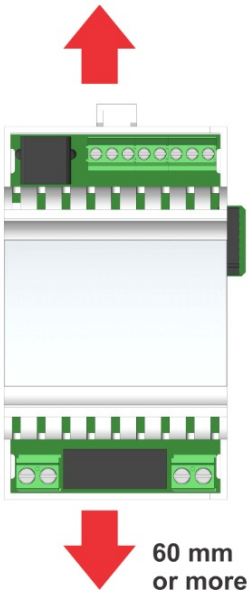
Mounting instructions:

1. Switch OFF main power supply.
2. Mount LPC-2.VV4 module to the provided place inside an electrical panel (DIN EN50022-35 rail mounting).
3. Mount other modules. Mount each module to the DIN rail first, then attach modules together through K1 and K2 connectors.
4. Connect wires to the connectors according to the connection scheme. Recommended/Highest tightening torque is 0.5 / 0.6 Nm (4.42/5.31 lbf in)
5. Connect power supply wires to the connector according to the connection scheme. Recommended/Highest tightening torque is 0.5 / 0.6 Nm (4.42/5.31 lbf in)
6. Switch ON main power supply.
7. Power (PWR) green LED should switch on. Red LED (ERR) should switch off.

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. A disconnect device shall be incorporated in the field wiring.

NOTE: 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 must be considered before module mounting.

Module labeling

Figure 6: Label

Label (sample):

XXX-N.ZZZ
P/N: AAABBBCCDDDEEE
S/N: SSS-RR-YYXXXXXXXXX
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,
   - **CCDDD** – sequence code,
   - **CC** – year of code opening,
   - **DDD** – derivation code,
   - **EEE** – version code (reserved for future HW and/or SW firmware upgrades).
3. **S/N: SSS-RR-YYXXXXXXXXX** – serial number.
   - **SSS** – short product name,
   - **RR** – user code (test procedure, e.g. Smarteh person xxx),
   - **YY** – year,
   - **XXXXXXXXX**– 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**

TECHNICAL SPECIFICATIONS

Table 9: Technical specifications

Power supply	from LPC-2 main module
Power consumption	0.5 W
DeltaP measurement range	500 Pa
DeltaP accuracy of full scale span	± 0.4 %
Dimensions (W x H x D)	90 x 53 x 77 mm
Weight	120 g
Maximum altitude	2000 m
Mounting position	all directions
Ambient temperature	0 to 50 °C
Ambient humidity	max. 95 %, no condensation
Transport and storage temperature	-20 to 60 °C
Protection class	IP 20
CE marking	yes

Table 10: Analog IN/OUT Technical specifications

Analog voltage input range	0 .. 10 V
NTC input type	NTC 10 kΩ
Analog input AI1, AI2, AI3, AI4, NTC 10k measuring accuracy on full scale range	± 1%
Analog input resistance	11 kΩ
Load resistance per analog output	R > 500 Ω
Analog voltage output Q1 range	0 .. 10 V
Analog voltage output measuring accuracy on full scale range	± 2%
Max. analog output current	20 mA

Table 11: Digital IN/OUT Technical specifications

Digital input voltage range	0 .. 28 V DC
Digital input threshold	ON: > 7 V DC
	OFF: < 3 V DC
Digital input resistance	8 kΩ
Digital output max. current per channel	DC: 48V, 1A 30V, 3A

SPARE PARTS

For ordering spare parts following Part Numbers should be used:

LPC-2.VV4 module	
LPC-2.VV4	P/N: 225VV422001001

Main modules	
LPC-2.MM1	P/N: 225MM123001001
LPC-2.MM2	P/N: 225MM223001001

CHANGES

The following table describes all the changes to the document.

Date	V.	Description
12.04.24	3	Updated Table 9.
19.02.24	2	Chapter 2 and figure 2 updated.
27.09.23	1	The initial version, issues as *LPC-2.VV4 User Manual*.

Documents / Resources

	**SMARTEH LPC-2.VV4 Longo Programmable Controller** [pdf] User Manual LPC-2.VV4 Longo Programmable Controller, LPC-2.VV4, Longo Programmable Controller, Programmable Controller, Controller

References

- **User Manual**