



SMARTEH[®]
LIVING SYSTEMS

USER MANUAL

- ▶ Longo programmable controller
LPC-2.MB1
M-Bus module

Version 1

Written by SMARTEH d.o.o.
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User Manual

Document Version: 1
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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.MB1

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1 ABBREVIATIONS

M-Bus	Meter Bus
RX	Receive
TX	Transmit
UART	Universal Asynchronous Receiver-Transmitter



2 DESCRIPTION

LPC-2.MB1 is Meter Bus (M-Bus) Master communication module. It can communicate with up to 20 M-Bus slave devices.

LPC-2.MB1 is controlled and powered from the main module (e.g. LPC-2.MC9) via Right internal bus.



3 FEATURES

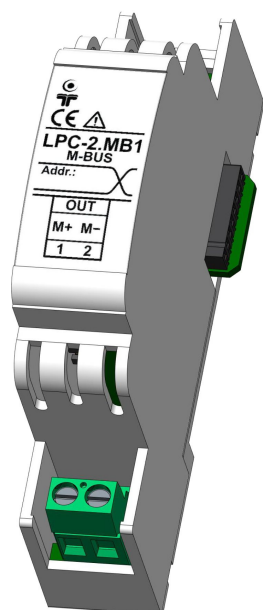


Figure 1: LPC-2.MB1 module

Table 1: Technical data
M-Bus port
Supplied from main module
Small dimensions and standard DIN EN50022-35 rail mounting



4 OPERATION

Module parameters can be read or written via Smarteh IDE software.

4.1 Parameters

Input

I2C session counter [I2C_Session_Cnt]: It changes after successful data transmission with master controller.

Type: USINT

Raw to engineering data: 0 .. 255 → 0 .. 255

Receive counter [Rx_Counter]: It changes if new data in Rx_Buffer is available.

Type: USINT

Raw to engineering data: 0 .. 255 → 0 .. 255

Received data length [Rx_Data_Len]: Number of data bytes in Rx Buffer.

Type: UINT

Raw to engineering data: 0 .. 65535 → 0 .. 65535

Received telegram status [Rx_TLG_Status]: Status of received telegram.

Type: USINT

Raw to engineering data: xxxxxxx0 → No telegram timeout
 xxxxxxx1 → Telegram timeout
 xxxxxx0x → No data (byte) timeout
 xxxxxx1x → Data (byte) timeout
 xxxxx0xx → No parity error
 xxxxx1xx → Parity error
 xxxx0xxx → No framing error
 xxxx1xxx → Framing error
 xxx0xxxx → No data overflow
 xxx1xxxx → Data overflow

Receive reception status [Rx_Reception_Status]: Status of reception.

Type: USINT

Raw to engineering data: 0 → No reception
 1 → Reception in progress



- 2 → Reception ended (timeout)
- 3 → Reception ended (data received)
- 11 → Error in reception

Maximum receive timeout [Rx_Max_Timeout]: Maximal timeout between received data bytes in received telegram.

Type: UINT

Raw to engineering data: 0 .. 65535 → 0 .. 65535 μs

Bus status [Bus_Status]: Bus status.

Type: USINT

Raw to engineering data: xxxxxxx1 → Sudden bus load decrease
xxxxxx1x → Sudden bus load increase
xxxxx1xx → Normal load exceeded
xxxx1xxx → Short circuit detected
xxx1xxxx → Power off due to bus overload

Receive buffer [Rx_Buffer_{1..270}]: Receive buffer with content received over M-Bus. It contains 270 variables, e.g. Rx_Buffer_1, Rx_Buffer_2...

Type: USINT

Raw to engineering data: 0 .. 255 → 0 .. 255

Output

UART speed [UART_Speed]: Selector of baudrate.

Type: USINT

Raw to engineering data: 0 → 300
1 → 600
2 → 1200
3 → 2400
4 → 4800 (default)
5 → 9600
6 → 19200
7 → 38400
other → 4800



UART parity [UART_Parity]: Selector of parity.

Type: USINT

Raw to engineering data: 0 → Even
 1 → Odd
 2 → None
 other → Even

Received telegram timeout [Rx_TLG_Timeout]: Telegram timeout for receiving data.

Type: UINT

Raw to engineering data: 0 → No timeout
 other → Timeout value (in ms)

Received data timeout [Rx_Data_Timeout]: Data timeout for receiving data.

Type: UINT

Raw to engineering data: 0 → No timeout
 other → Timeout value (in μ s)

Received data length [Rx_Data_Len]: Expected length of data to be received.

Type: UINT

Raw to engineering data: 1 .. 270 → Number of expected data.
 other → AUTO (receive data until timeout
 or buffer is full)

Transmitted data length [Tx_Data_Len]: Number of bytes to transmit.

Type: UINT

Raw to engineering data: 0 .. 270 → 0 .. 270 bytes

Transmit counter [Tx_Counter]: Transmit data only when counter changes.

Type: USINT

Raw to engineering data: 0 .. 255 → 0 .. 255

Transmit buffer [Tx_Buffer_{1..270}]: Transmit buffer with content to send over M-Bus. It contains 270 variables, e.g. Tx_Buffer_1, Tx_Buffer_2...

Type: USINT

Raw to engineering data: 0 .. 255 → 0 .. 255



5 INSTALLATION

5.1 Connection scheme

Figure 2: Connection scheme

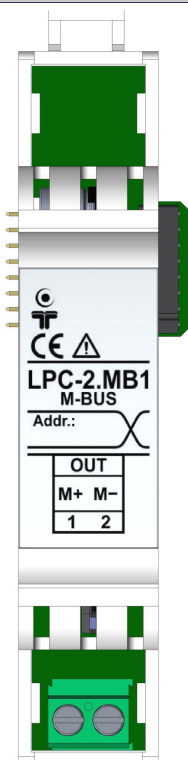


Table 2: OUT¹

OUT.1	M+	M-Bus positive
OUT.2	M-	M-Bus negative

Table 3: K1

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

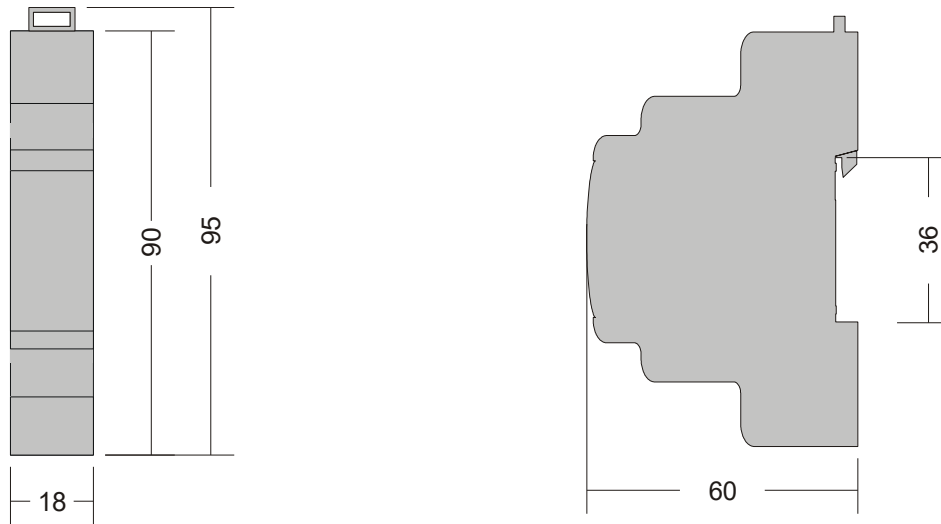
Table 4: K2

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



5.2 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:

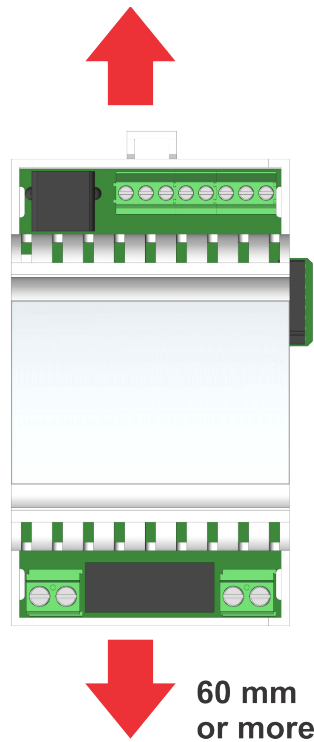
1. Switch OFF main power supply.
2. Mount LPC-2.MB1 module to the provided place inside an electrical panel (DIN EN50022-35 rail mounting).
3. Mount other LPC-2 modules (if required). Mount each module to the DIN rail first, then attach modules together through K1 and K2 connectors.
4. Connect input 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 4: Minimum clearances



The clearances above must be considered before module mounting.



5.3 Module labeling

Figure 5: 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,
 - **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-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**



6 TECHNICAL SPECIFICATIONS

Table 5: Technical specifications

Power supply	from main module via internal bus
Max. power consumption	7 W
Connection type	screw type connector for stranded wire 0.75 to 1.5 mm ²
Dimensions (L x W x H)	90 x 18 x 60 mm
Weight	60 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



7 CHANGES

The following table describes all the changes to the document.

Date	V.	Description
21.09.2020	1	The initial version, issued as <i>LPC-2.MB1 module UserManual</i> .





8 NOTES

