
L-MBUS20/L-MBUS80TM

M-Bus Level Converter

User Manual

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Abbreviations

M-Bus.....	Meter-Bus
RXD	Receive Data
TXD.....	Transmit Data

1 Introduction

1.1 Overview

The L-MBUS20 and L-MBSU80 are level converters between RS-232 level or TTL level UART signals and an M-Bus network. The L-MBUS must be connected to an M-Bus master interface. The L-MBUS20 can read up to 20 M-Bus slave devices and the L-MBUS80 can read up to 80 M-Bus slave devices.

1.2 Scope

This document covers L-MBUS devices.

2 Hardware Installation

2.1 Enclosure

The L-MBUSxx enclosure according to DIN 43880 is 107 mm wide and prepared for mounting on rails according to DIN 50022 (see Figure 1).

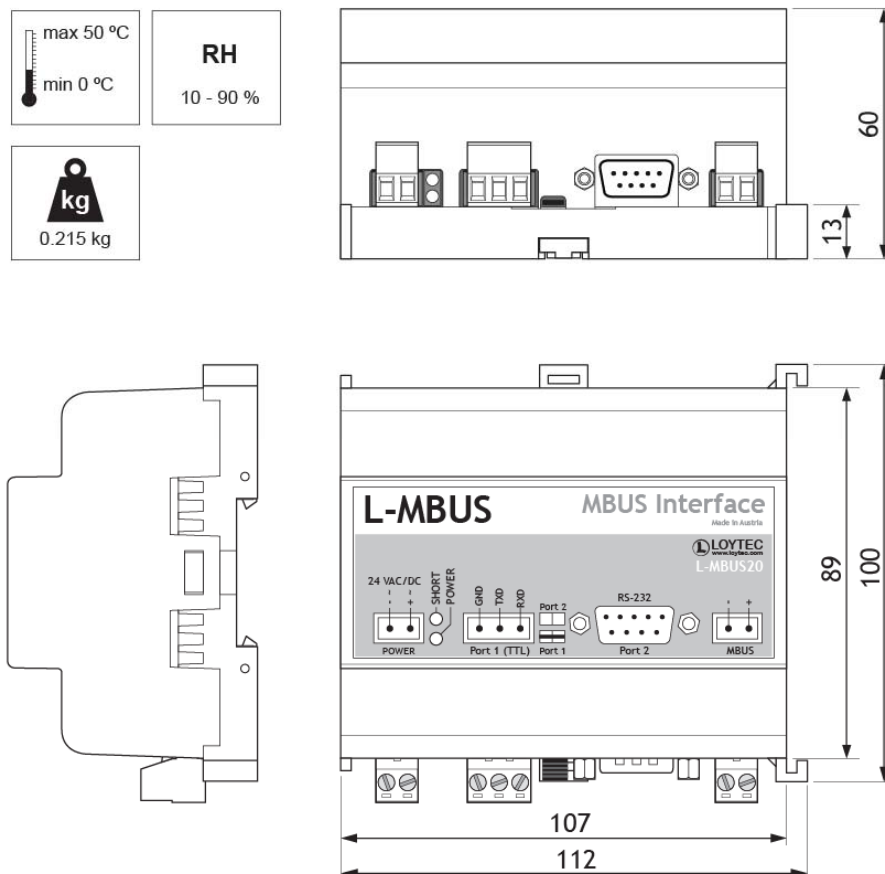


Figure 1: L-MBUSxx Enclosure (dimensions in mm)

2.2 Product Label

The product label on the side of the L-MBUSxx contains the following information (see Figure 1):

- L-MBUS20 or L-MBUS80 Order Number,
- Serial Number with bar-code (SER#),
- Production Date.

Unless stated otherwise, all bar codes are encoded using “Code 128”. An additional label is also supplied with the L-MBUSxx for documentation purposes.

2.3 Mounting

The device comes prepared for mounting on DIN rails following DIN 50 022. The device can be mounted in any position. However, an installation place with proper airflow must be selected to ensure that the L-MBUSxx’s temperature does not exceed the specified range (see Chapter 4).

2.4 Connectors, LEDs, Wiring

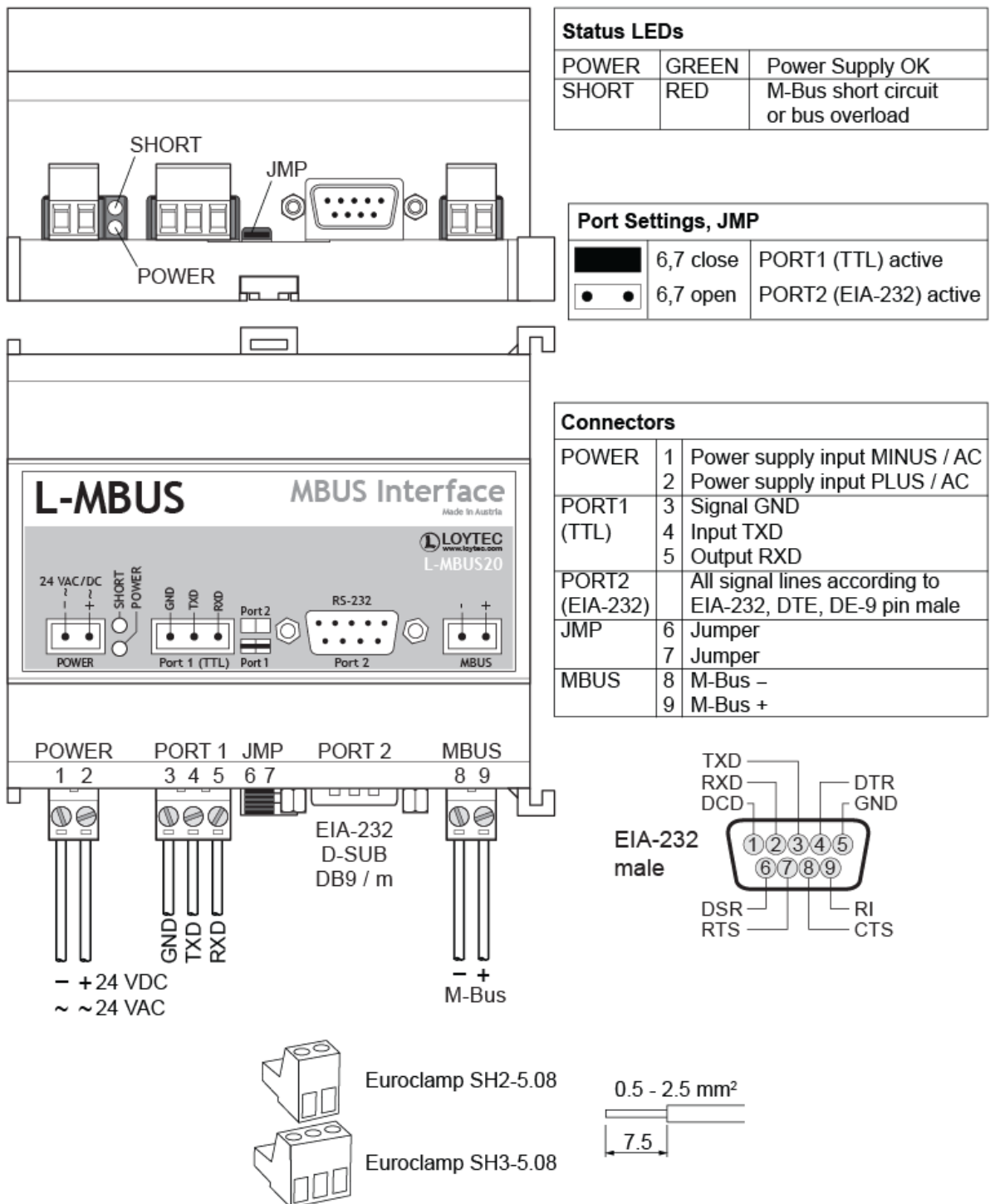


Figure 2: L-MBUSxx connectors, LEDs, wiring

2.5 LED signals

2.5.1 Power LED

The L-MBUSXX power LED lights up green when power is supplied to terminals "POWER".

2.5.2 Short LED

The L-MBUSXX is equipped with a red Short LED (see Figure 2). This LED is normally off.

If the M-Bus is shorted or overloaded, the Short LED lights up red.

2.6 Operating Mode

The L-MBUSxx level converter can be connected to

- a) RS-232 level UART interface
- b) TTL level UART interface

The selection is done with the jumper JMP according to the table below.

Jumper JMP	Function
Installed	TTL level interface is active
Not Installed	RS-232 level interface is active

Table 1: L-MBUSxx jumper setting for operating mode selection.

2.7 Terminal Layout and Power Supply

The L-MBUSXX provides pluggable screw terminals to connect to the network as well as to the power supply. The screw terminals can be used for wires of a maximum thickness of 1.5 mm²/AWG12. The device can either be DC or AC powered. The connectors are shown in Figure 2

Terminal	Function
1,2	Power Supply 24 VDC or 24 VAC
3,4,5	TTL level UART interface to M-Bus master
8,9	M-Bus network connector
PORT2	RS-232 level UART interface to M-Bus master

Table 2: L-MBUSxx Terminals

2.8 Wiring

2.8.1 Wiring of TTL level interface Port 1

If the L-MBUSxx is connected to an M-Bus master with TTL level interface e.g. LINX-120, LINX-121, LINX-220, LINX-221, LROC-150, the wiring must be done as shown below. Make sure jumper JMP is installed. The maximum cable length is 0.3 m.

PORT 1	Function
3	TTL level GND
4	TTL level TXD (input)
5	TTL level RXD (output)

Table 3: Connecting the L-MBUSxx via TTL level UART interface Port 1.

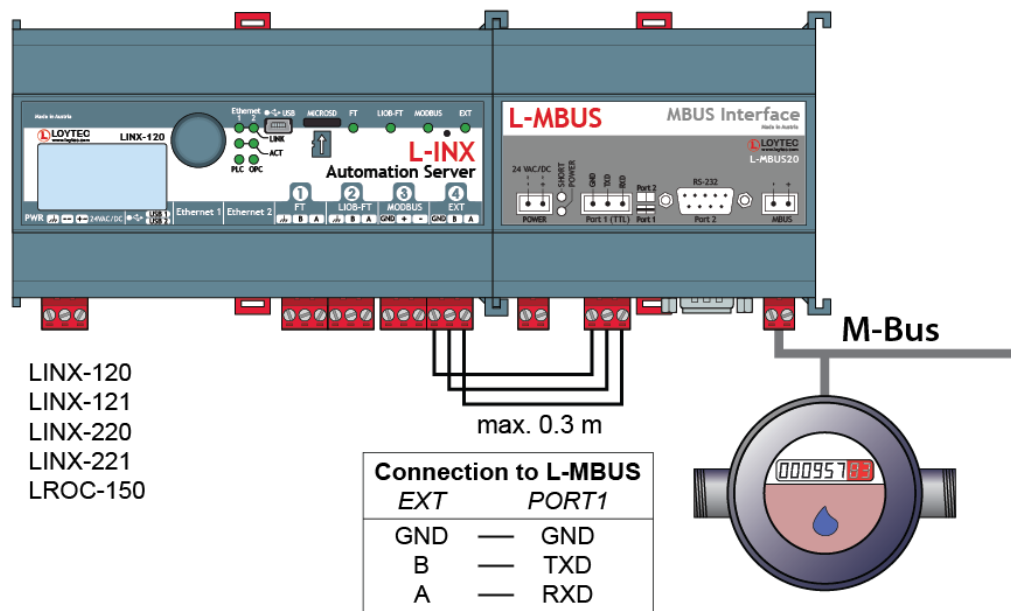


Figure 3: Wiring of L-MBUSxx with TTL level interface M-Bus master.

2.8.2 Wiring of RS-232 level interface Port 2

If the L-MBUSxx is connected to an M-Bus master with RS-232 level interface the wiring must be done as shown below. A null-modem cable is required to connect the L-MBUSxx to a PC or a LINX-100, LINX-101, LINX-110, LINX-111, LINX-200, LINX-201, LINX-210, LINX-211. Make sure jumper JMP is removed. The maximum cable length is 1 m.

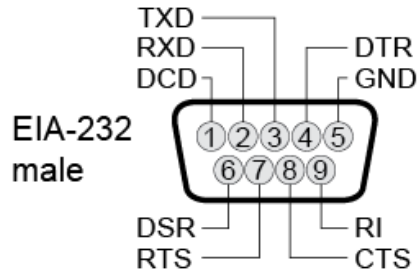
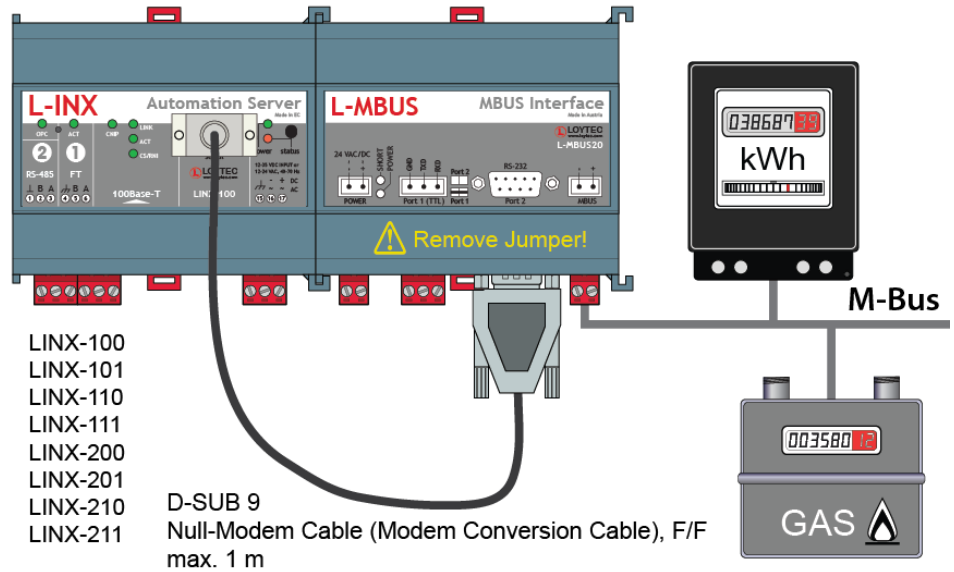


Figure 4: Connecting the L-MBUSxx via RS-232 level UART interface Port 2.



When the L-MBUSxx is used with other M-Bus master devices other than the LOYTEC LINX or LROC devices please make sure that the M-Bus master device will ignore received characters while it transmits M-Bus data packets. The L-MBUS might send out valid or invalid characters on Port2 while it transmits M-Bus data packets on the M-Bus port.

2.8.3 Wiring M-Bus network

Depending on the bitrate the following total length of network wiring is possible.

Bitrate	Total Wiring Length in [m]
300	< 12000 m
2400	< 4000 m
9600	< 1000 m

Table 4: M-Bus total wiring length.

Since the quiescent current of M-Bus devices generate a voltage drop along the M-Bus cable the maximum distance from an M-Bus slave device to the L-MBUSxx is limited as follows for a JYSTY nx2x0.8 cable.

Number of devices on M-Bus network	Max. distance in [m]
5	6500 m
10	5000 m
20	3100 m
80	750 m

Table 5: M-Bus maximum distance for M-Bus slave from L-MBUSxx on JYSTY nx2x0.8.

The polarity is irrelevant for M-Bus networks.

3 Troubleshooting

3.1 Technical Support

LOYTEC offers free telephone and e-mail support for our L-MBUSXX product. If none of the above descriptions solves your specific problem please contact us at the following address:

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4 Specifications

4.1 L-MBUSxx

4.1.1 Physical and Electrical Specifications

Characteristics	Value
Supply Voltage	24 VDC or 24 VAC \pm 10%
Power Consumption	L-MBUS20: 0.45 A @ 24 VDC L-MBUS80: 0.65 A @ 24 VDC
Max number of M-Bus slaves	L-MBUS20: 20 L-MBUS80: 80
In rush current	up to 950 mA @ 24 VDC
Operating Temperature (ambient)	0 °C to + 50 °C
Humidity (non condensing) operating	10 to 90% RH @ 50°C
Humidity (non condensing) storage	90% RH @ 50°C
Enclosure	Installation enclosure 6 TE, DIN 43 880
Environmental Protection	IP 40 (enclosure); IP 20 (screw terminals)
Installation	DIN rail mounting (EN 50 022) or wall mounting with optional DIN rail
Supported bit rates	300 bits/s – 9600 bits/s
Bus quiescent current	L-MBUS20: 0-30 mA L-MBUS80: 0-120 mA
Resistance to short circuit on M-Bus	continuous
Over current protection Level:	L-MBUS20: 190 mA L-MBUS80: 310 mA
Minimum switch off time:	100 ms
Bus voltage when idle	35 V \pm 5%

Table 6 Physical and Electrical Characteristics.

5 Order Information

5.1 L-MBUSxx

Currently there are 2 product versions available.

Model	Description
L-MBUS20	M-Bus level converter for up to 20 M-Bus slave devices.
L-MBUS80	M-Bus level converter for up to 80 M-Bus slave devices.

Table 7 Order Information

6 Revision History

Date	Version	Author	Description
2010-05-10	1.0	DL	Initial revision V1.0