USER MANUAL

LLT-1.L01 Longo Line tester

Version 1

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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 230 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 61131-2,
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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LLT-1.L01 Longo Line tester

1 INTRODUCTION

LLT-1 tester is used for quick checking all kind of LON FT-10 78 kbps based network topologies (bus, loop, star,…), primarily build with CAT5+ cabling. Device is simple to use, without previous extended knowledge of Lonworks technology. For proper operation (when testing network traffic), testers must work in pair, like transmitter-master and receiver-slave. When only cable line shorted is checking, than transmitter-master device is enough.

LLT-1 tester can check cabling, when network is not in operation (no traffic on network) and can also test cabling when network is busy (traffic on network).

There are four important information diagnosed by the device:

- Line shorted,
- Signal level,
- Test OK,
- Test FAULT.

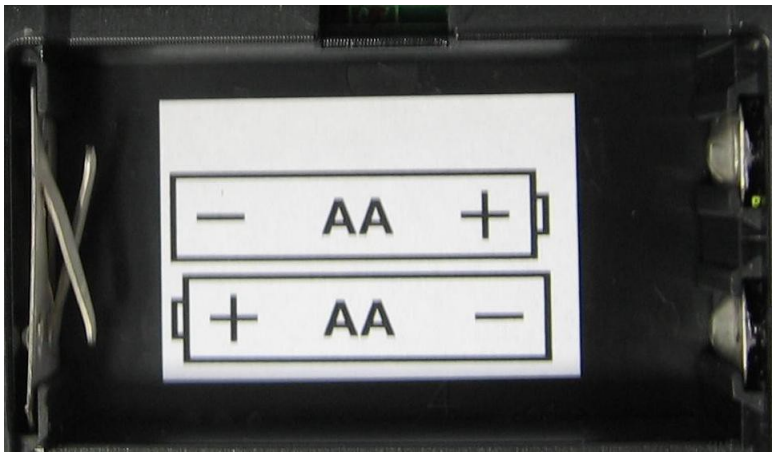
LLT-1 tester can also be used like “line simulator”. With internal DIP switches 200 m of CAT5+ line can be simulated.

Picture 1: Symbolic picture of LLT-1 tester (Master and Slave Unit).

2 GETTING STARTED USING LLT-1 TESTER

2.1. Installing batteries

LLT-1 tester is powered from internal batteries (AA type) or external power adapter (both included together with LLT-1 tester). On back side of LLT-1 tester you can find information, how to install batteries correctly (see picture below).



Picture 2: Label on back side of LLT-1 tester

IMPORTANT: When using internal batteries, take care, that are installed correctly. In case of wrong orientation, LLT-1 tester can be damaged.

NOTE: If you meet problems to switch On LLT-1 tester while operating with batteries, check if they are installed correctly and charged.

WARNING: Using external power adapter will not charge the internal batteries, if they are installed. You have to charge batteries before use with appropriate charger (for example: GP PowerBank Quick 2)

2.1 Switch On/Off

If you want to switch on LLT-1 tester, you have to press and hold *Power* button (see picture below) for approx. 1 sec., until power LED is not ON. Than you can release button and power LED must be on. All other LED's will also blink at the same time. Now LLT-1 tester is switched on and ready for operation.

Picture 3: Power button.

NOTE: Switch On/Off sequence is same for Master and Slave LLT-1 tester.

3 START TO TEST NETWORK

With LLT-1 tester following tests can be done on the LON network: line shorted, signal level and transmit/receive operation.

3.1 Testing line shorted using LLT-1 Master tester

After power up, LLT-1 tester will start automatically and continuously checking if line is shorted. If so, red LED will lit (see picture below).

Picture 4: Line shorted.

NOTE:

Before testing connect pair of tested line to any A and/or B terminal on LLT-1 tester.

LLT-1 tester detects CAT5+ line A and B as not shorted, if resistance between line A and line B on LON network is higher than 600ohm. Make sure that all LON nodes are AC coupled to the tested network.

Even LLT-1 tester shows line shorted, transmit/receive operation may be ok. In this case check also signal level (see chapter 3.2). If signal level is OK (LED not lit), means that network is working on the limit and further investigation is needed.

During this test LLT-1 Slave unit can also be attached to tested LON network.

IMPORTANT: Test is valid only, if there is no DC power supply on tested network (for example: if LON nodes in the same time are also powered through the network).

3.2 Testing signal level

IMPORTANT:

To perform this test both Master and Slave LLT-1 tester must be attached to the tested LON network and power must be switched ON on both units.

Instruments (Master and Slave) must be connected on both sides of tested line pair of the LON network under test.

When transmit/receive test is in progress (see chapter 3.3 below) also signal level is measuring and reporting the status. If signal level is under limit (normal limit is 400 mVpp), red LED will be on (see picture below).

Picture 5: Signal level.

3.3 Testing trasmit/receive operation

IMPORTANT:

To perform this test both Master and Slave LLT-1 tester must be attached to the tested LON network and power must be switched ON on both units.

Instruments (Master and Slave) must be connected on both sides of tested line pair of the LON network under test.

There are two modes of operation to test transmit/receive operation. In single mode packet of test sequence is send once, while in continuous mode packets of test sequences are sending periodically.

Single mode test:

Push test button once (see picture below) to start single testing mode => blue LED will lit for approx. 3 sec. After this time, result of the test will be shown. Green LED (Test OK) or red LED (Test FAULT) will lit until next test will be started (push test button once again).

Picture 6: In single mode of testing press “TEST” button once and LLT-1 tester will shows the result as “TEST OK” or “TEST FAULT”.

Continuous mode test:

Press and hold test button for approx. 3 sec, until blue LED start blinks. After each blink, test result will be shown. Green LED (Test OK) or red LED (Test FAULT). After each error appeared, the red LED (test FAULT) will blink one time more comparing previous blinking.

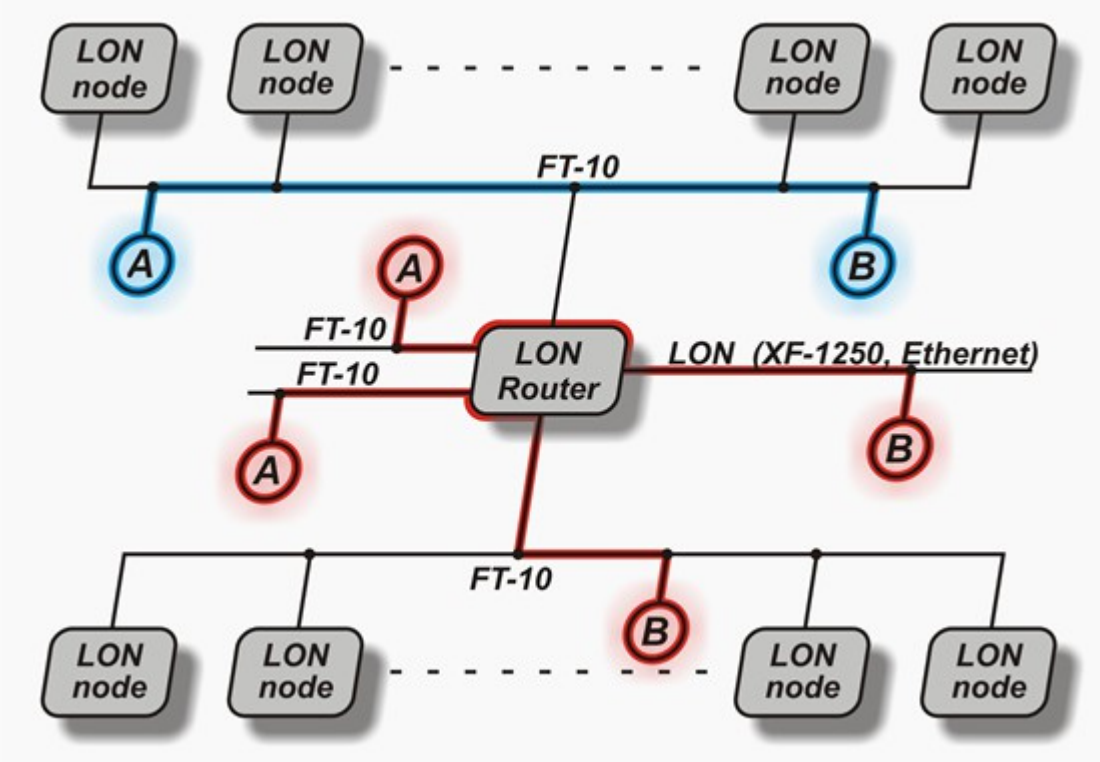
Picture 7: In continuous mode of testing press “TEST” button for approx. 3 sec. and LLT-1 tester will shows the result as “TEST OK” or “TEST FAULT”.

Example:

- If 1 error appears during test, the same indication will be shown on red LED (Test FAULT LED will blinks once).
- If 3 errors appear during test, the same indication will be shown on red LED (Test FAULT LED will blinks three times).
- If more than 7 errors appear during test, Test FAULT LED will lit continuously.

Starting with next **single** or **continuous** test will clear current test status of green LED (Test OK) or red LED (Test FAULT).

3.4 Where to connect LLT-1 Master and Slave tester



Blue marks show valid connection of LLT-1 Master (A) and Slave (B) testers while red marks show invalid one.

General rule is, that only one Master and Slave pair of LLT-1 testers must be used on one FT-10 channel. Testing through routers, repeaters, gateways,… or to same/different type of channels (like XF-1250) is not supported.

3.5 Detailed description of testing trasmit/receive operation

When testing transmit/receive operation, from LLT-1 Master tester network output variables are sent. Those variables are re-sent from other (LLT-1 Slave tester) tester back to LLT-1 Master tester, which now acts like receiver:

- If all received values are the same, then green LED (Test OK) starts to lit.
- If only one value is not the same, then red LED (Test FAULT) starts to blink (after each error appeared, the LED will blink one time more comparing previous blinking. If more then 7 errors appear, LED will lit continuously.)

NOTE:
There is no retransmission, if error appears. Means, test variables are sent only ones.
After transmit, LLT-1 tester will wait in receiving mode for 3 sec. After this time tester will report result of the test (OK or FAULT).

4 CHANGES

The following table describes all the changes to the document.

Date	V.	Description
01.02.14	001	The initial version, issued as *LLT-1.L01 Longo Line tester UserManual*.

5 NOTES