

LT 2000

LINE TESTER

LEVEL GENERATOR - SELECTIVE LEVEL METER - REFLECTOMETER

ALL IN ONE HANDHELD BATTERY-POWERED PACKAGE !

ATEN has developed this easy to operate and cost effective instrument for field operation, to verify the quality of copper pair for analog and digital transmission up to **2 Mbit/s**.

The **LT2000** can perform following measurements:

NOISE - LEVEL - ATTENUATION - CROSSTALK - RETURN LOSS

for various transmission systems:

•Base band •160 Kbit/s •1,5 Mbit/s •2 Mbit/s •HDSL •ADSL



APPLICATIONS

NOISE & LEVEL METER

With one **LT2000** at one side of the line.

ATTENUATION METER

With two **LT2000** at the opposite sides of the line.

CROSSTALK METER

- With one **LT2000** at one side of the lines;
- With two **LT2000** at the opposite sides of the lines.

RETURN LOSS METER

With one **LT2000**, to measure the level of echo-signal caused from the impedance mismatching of the line.

LONGITUDINAL BALANCE METER

With one **LT2000** and a special adapter, to measure the balance attenuation of the line referred to ground or other conductor.

SPECIAL FEATURES

- **AUTOMATIC MEASUREMENTS IN SWEEP MODE**
 - **RMS Noise level** readout on programmed wide-band;
 - **Return loss**: frequency & level readout of min. and max. echo level;
 - **Near Cross-talk**: frequency & level readout of min. and max. cross level.
- **INTERCOMM** facility between a local and remote user, using the line under test.



General

- Case.....: ABS.
- Connections.....: • input connector "RX" triple banana jack (a-b-Gnd);
 • input/output connector "TRX" triple banana jack (a-b-Gnd);
 • polarized connector for external supply and batteries charger;
 • RJ-45/4 connector for headset interface.
- Display.....: alphanumeric LCD - 4 lines x 16 characters.
- Keypad.....: micro-switches under polyester membrane film.
- Power supply.....: • NiMh internal rechargeable batteries (green), ≥ 3 hours of operating time;
 • external: 11 to 32 Vdc / 1,5 to 0,6 A.
- Ambient temperature.....: operating: $0 \div 50^\circ \text{C}$; storage: $-10 \div 60^\circ \text{C}$.
- Dimensions.....: 100 x 40 x 210 mm.
- Weight.....: < 1 Kg.

Level Generator

- Output impedances.....: < 10 Ω , 150 Ω (120 or 135 Ω on request), 600 Ω balanced ($\approx 5\mu\text{F}$ series).
- Output frequency bands.....: 200 Hz \div 2 MHz.
- Resolution.....: 1 Hz from 200 Hz up to 10 kHz; 100 Hz from 10 kHz up to 2 MHz.
- Frequency accuracy/stability.....: $\leq \pm 50$ ppm.
- Harmonic distortion.....: ≤ 0.5 %.
- Output level.....: 0.0 dBm \pm 0.2 dB @ 10 kHz.

Output Level accuracy vs. frequency (referred to 10 kHz):

	-2 \div -1 dB	-1 \div -0.5 dB	-0.5 \div -0.2 dB	± 0.1 dB	± 0.3 dB
Zo Out 600 Ω			200 Hz	800 Hz	800 kHz
Zo Out 120+150 Ω	200 Hz	300 Hz	600 Hz	2 kHz	800 kHz
					2000 kHz

Selective Level Meter

- Input impedances.....: 150 Ω (120 or 135 Ω on request), 600 Ω , ≥ 200 k Ω balanced ($\approx 5\mu\text{F}$ series).
- Tunable frequencies.....: tracking with TX frequency (200 Hz \div 2 MHz).
- Resolution.....: 1 Hz from 200 Hz up to 10 kHz; 100 Hz from 10 kHz up to 2 MHz.
- Tuning accuracy / stability.....: $\leq \pm 50$ ppm.
- Selectivity ($f_0 \geq 800$ Hz).....: ≤ -0.5 dB @ ± 30 Hz f_0 ; ≥ -50 dB @ ± 500 Hz f_0 .
- Level measurements.....: absolute (dBm) and relative (dBr).
- Input range.....: $\leq -100 \div +5$ dBm / resolution: 0.1 dB.
- Hybrid circuit - Return Loss.....: ≥ 40 dB with nominal load.
- Noise floor (TX off).....: ≤ -100 dBm @ 600 Ω ; ≤ -95 dBm @ 120+150 Ω .
- Intrinsic cross talk.....: ≤ -90 dBm @ 1.000 MHz.

Freq. image / spurious rejection : ≥ 60 dB ($f_0 \geq 800$ Hz).

Level accuracy vs. input level (referred to 10 kHz):

		----- TX OFF ----->					
		± 0.3 dB	± 0.2 dB	± 0.5 dB	± 1 dB	± 2 dB	
Zo In	600 Ω	+5 dBm	0 dBm	-70 dBm	-85 dBm	-95 dBm	-100 dBm
Zo In	120+150 Ω	+5 dBm	0 dBm	-70 dBm	-80 dBm	-90 dBm	-95 dBm

Level accuracy vs. frequency (referred to 10 kHz / 0 dBm):

		$-2 \div -1$ dB	$-1 \div -0.5$ dB	$-0.5 \div -0.2$ dB	± 0.1 dB	± 0.3 dB
Zo Out	600 Ω			200 Hz	800 Hz	800 kHz
Zo Out	120+150 Ω	200 Hz	300 Hz	600 Hz	2 kHz	800 kHz
						2000 kHz

Automatic measurements in sweep mode

- Automatic measurements.....:
- **Noise (or Level)**: - frequency & level readout of min. and max. noise level; - RMS noise level readout on programmed wideband;
 - **Return-loss**: frequency & level readout of min. and max. echo level;
 - **Near Cross talk**: frequency & level readout of min. and max. cross level;

- Operating programmable bands.....:
- **“base band”** from 200 Hz min. to 10 kHz max. (100; 200; 400; 1000 Hz selectable step)
 - **“high band”** from 10 kHz min. to 2 MHz max. (0.1; 0.2; 0.4; 1; 2; 4; 10 and 20 kHz selectable step)

- Sweep generator.....:
- **“base band”** from 200 Hz min. to 10 kHz max. (100; 200; 400; 1000 Hz selectable step)
 - **“high band”** from 10 kHz min. to 2 MHz max. (0.1; 0.2; 0.4; 1; 2; 4; 10 and 20 kHz selectable step)

Supplied accessories

- Ac power supply and batteries recharger
- Instruction manual

Optional accessories



LT01 - Softpack carrying case



LT02 - Headset



LT03 - BNC to Triple Banana Jack Adapter



LT04 - Banana / Crocodile cable



LT05 - Fixed Balanced Attenuator:
3 or 6 or 10 or 20 or 30 or 40 dB
150 Ω (120 or 135 Ω on request) and 600 Ω



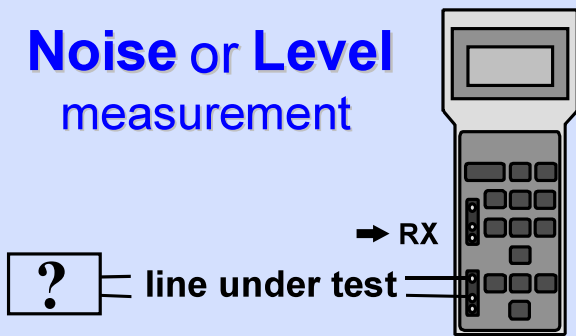
LT06 - Balance Measure Adapter:
150 Ω (120 or 135 Ω on request) and 600 Ω



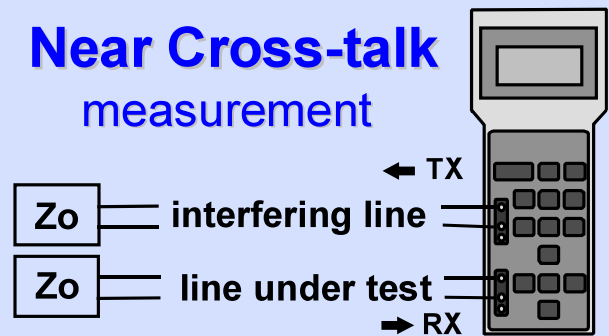
LT07 - Resistive Termination:
150 Ω (120 or 135 Ω on request) or 600 Ω .

LT2000 - Field application

Noise or Level measurement

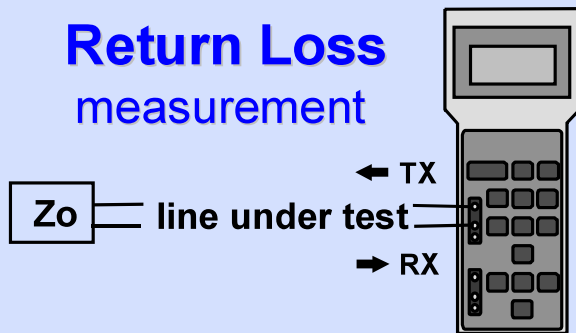


Near Cross-talk measurement



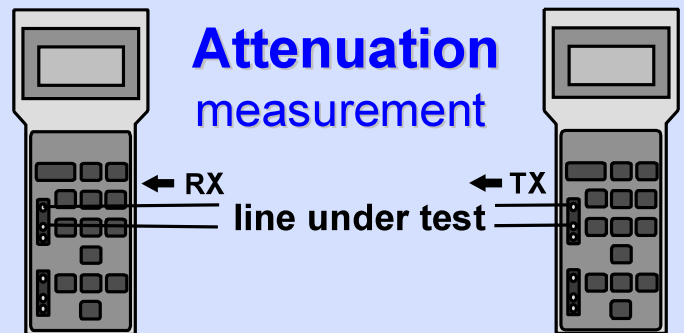
Z_o = nominal termination 150 (120 or 135) or 600 Ohm

Return Loss measurement

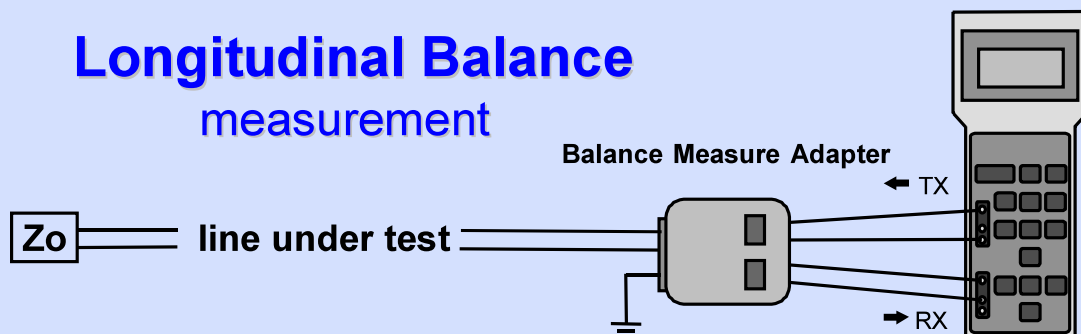


Z_o = nominal termination 150 (120 or 135) or 600 Ohm

Attenuation measurement



Longitudinal Balance measurement



Z_o = nominal termination 150 (120 or 135) or 600 Ohm



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