

LucchiMeter *Minipalm* model *Instruction Manual*



LucchiMeter Instruction Manual

1. Control Panel



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2. Getting started

1. Connect the power adapter to the LucchiMeter in order to restore the full charge of the battery power pack .

IMPORTANT NOTICE: The LucchiMeter works also with normal alkaline 'AA' batteries. If these are used **NEVER CONNECT THE POWER ADAPTOR.** This could cause battery explosion and severe damage to the machine and to persons nearby.

2. Connect the transmitter probe cable (see image on right) to the "TX" connector on the LucchiMeter



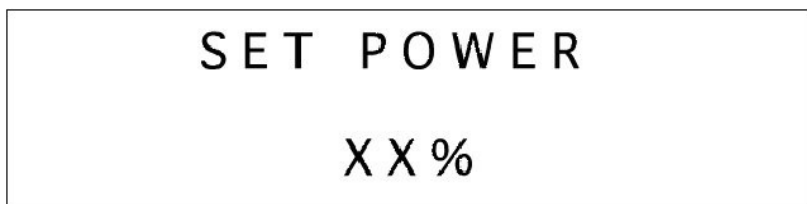
3. Connect the receiver probe cable (see image on left) to the "RX" connector on the LucchiMeter



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4. According to the kind of measurements the user wants to perform, it is necessary to set the ultrasound emission power to the correct level. Power levels can be set between 20% and 100% of the full scale. For violin, bow and small lab measurements, it is advisable to keep the power between 30% and 40%.

To enter 'SET POWER' mode: when the LucchiMeter is on, press either 'UP' or 'DOWN' key. The following screen will be displayed.



Ultrasound pulse power can now be varied using the UP and DOWN keys.

High (->100%) ultrasound pulse power may enable measurement of particularly lengthy or damping samples.

It is better not to use high power levels if not strictly needed to obtain best results. If power control is not used for 5 seconds the device exits the 'SET POWER' screen.

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5. It is now necessary to calibrate the probes.

- Press firmly the probes together
- Keep pressed the LUCCHI key until the screen reads:



- After a few moments the machine will play a 'beep' and the screen will read:



This procedure is also necessary whenever a probe is changed.

You are now ready to exploit the full potential of the LucchiMeter

3. How to perform measurements

When switched on or when LUCCHI key is pressed the LucchiMeter enters measurement mode. CORRECTION and LENGTH parameters set during precedent sessions are used.



L mm XXXX T XXX.X
LUCCHI m/s XXXXX

In this mode the screen shows the parameters: LENGTH, TIME and LUCCHI (1 LUCCHI= 1 m/s) related to the measured sample.

4.Setting the sample length

Push LENGTH key to enter length setup mode. Refer to the following picture.



SET LENGTH
mm XXXX

The UP and DOWN keys will allow to set the length in millimetres (1 mm = 0.04 inch). Keeping pressed UP or DOWN key will increase the scrolling speed of the cursor by 10x. If also the LUCCHI key is then pressed the scroll speed will be increased by a factor of 100. This is valid for both the scrolling directions. To return to measurement mode, push the LUCCHI key or wait 5 seconds.

5. Setting the correction coefficient

Push CORR key to enter correction coefficient setup mode. Refer to the following picture.



The UP and DOWN keys will allow to set the correction coefficient needed to correct particular characteristics of the measured sample (humidity, shape, presence of foreign inclusions into the material). To return to measurement mode, push the LUCCHI key or wait 5".

The LucchiMeter is set to measure wood at average temperature and humidity (20°C temperature and 60% humidity).

To correct wood humidity, measure the humidity percentage into the wood (using a wood humidity tester) and subtract from the found value the number 8 (average humidity value of dry wood).

Set the obtained figure as CORRECTION value. (for ex. If wood humidity is 20%, then set $CORR = (20 - 8) = 12\%$).

6. Low battery

When the rechargeable battery discharges down to 20% of its total capacity the LucchiMeter issues a warning message which is periodically repeated. As the residual capacity reaches 10% the warning is issued more frequently, and around 8% the device shuts down. To restore functionality connect the provided power adapter in whatever moment.

The provided battery allows a continuous use of 18 hours. The LucchiMeter informs the user of the recharge completion, and the complete charge requires 3 hours.

CAUTION: If the tester will be switched on during the recharge phase, the proceeds interrupts.

A complete charge is strongly advised before use 'on the field'.

If the LucchiMeter is left ON while displaying 'OVER' (not performing a useful measurement) it will automatically switch itself off after 5 minutes.

Please use only the provided power supply! Never use a charger which is not approved by LucchiCremona.

7. Technical Data

Measurement Precision..... +/- 0.16 microseconds
Power Supply..... 6-9 Vdc max.
Power Consumption..... 0,3 A
Operation on Battery..... 18 hours

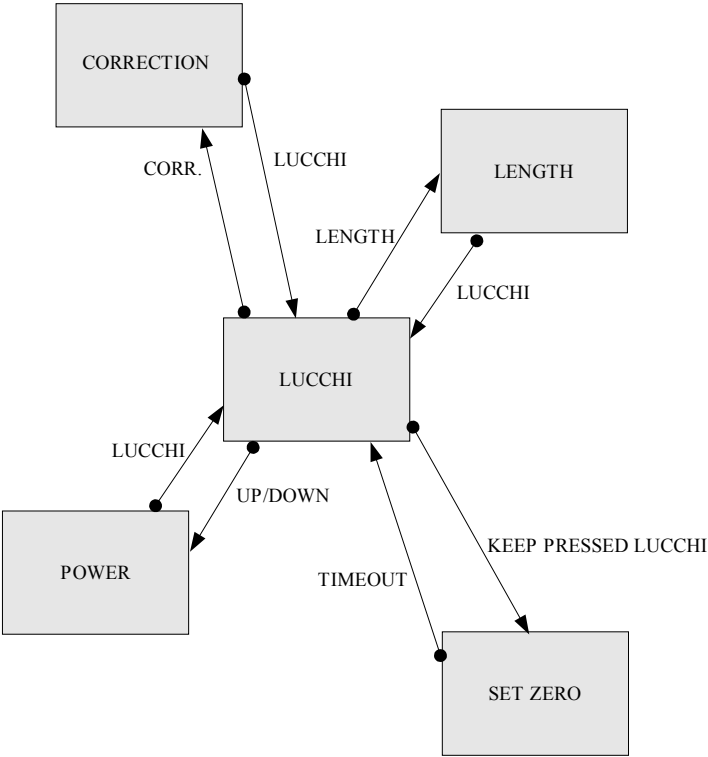
Measurable Data

Sound Speed..... metres/second
Time..... microseconds

Connections

TX..... output to transmitter probe
RX..... input from receiver probe

8. Menu Navigation



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9. Operational Tips

- Keep the probes always pressed with a constant force.
- Avoid to measure samples shorter than 50-100 mm, the “measurement errors” increases a lot with little distances. If it's unavoidable, remember that your measurements won't be totally reliable.



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SOME KINDS OF WOOD

MATERIALS	MINIMUM	MAXIMUM
SPRUCE	4.350	6.300
PERNAMBUCO WOOD	4.350	6.130
ZAPATERO AMARANTO	4.650	5.480
SNAKE WOOD	4.000	5.300
GUAYACO	4.500	5.700
FLAMED MAPLE	3.300	5.200
BRASIL WOOD	4.200	4.950
EBONY	3.140	4.000
ITALIAN BOXWOOD	3.300	3.900

10. Useful Formulae

Sound Speed = Space / Time (LucchiMeter measures this parameter)

Density = Weight / Volume

Resonance Coefficient (Q) = Speed / (100 x Density)

The Resonance Coefficient of a substance indicates its vibrational capability

We give to you the Q values for some substances:

Norway Spruce for violins: Q_{max} = 213, Q_{min} = 60

Aluminium for vibraphones: Q_{max} = 23 (maximum for metals)

Carbon fiber: Q_{max} = 59

Lead: Q_{max} = 1.3



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