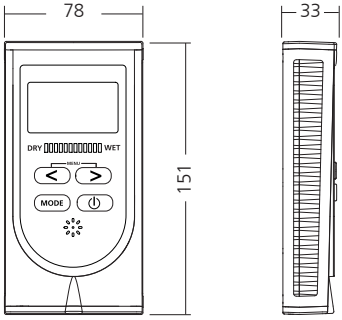


Laserliner®
Innovation in Tools

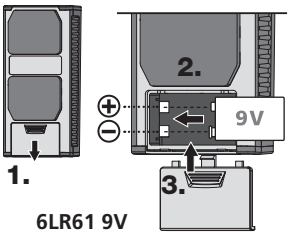
! Read the operating instructions and the enclosed brochure „Guarantee and additional notices" completely. Follow the instructions they contain. Safely keep these documents for future reference.

Function/application:

This material moisture measuring device operates on the impedance measuring principle. Moisture-dependent permittivity of the material is measured between 2 conductive rubber contacts on the underside of the device and this measured value is recalculated internally into % of material moisture based on the material-dependent characteristic. The intended purpose of the device is the non-destructive assessment of moisture content in wood, cement screed, anhydrite screed, aerated concrete, gypsum plaster, cement and lime malm brick.

! The integrated building materials characteristics correspond to the stated construction materials without admixtures. Construction materials will vary from manufacturer to manufacturer, due to the way in which they are produced. This is why, in the event of different product compositions or unfamiliar construction materials, a one-off comparative moisture measurement should be taken using methods that can be calibrated (e.g. kiln-drying method). If different measured values occur, they should either be viewed relatively or the index mode for moisture/drying behaviour should be used.

1

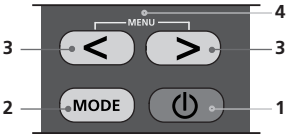


6LR61 9V

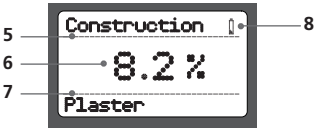
2 ON

3 OFF

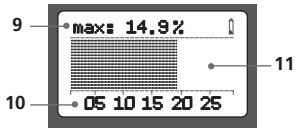
Automatic switch-off after 2 minutes.



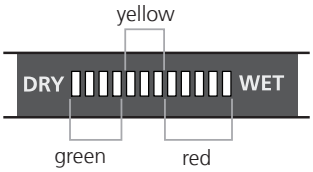
1 ON/OFF
2 Switch between wood, construction material and index modes; confirm selection
3 Navigation buttons
4 Select language



5 Selected material group
6 Measured value as % of relative material moisture
7 Selected material
8 Battery charge



9 Maximum measured value
10 Measurement scale
11 Bar graph

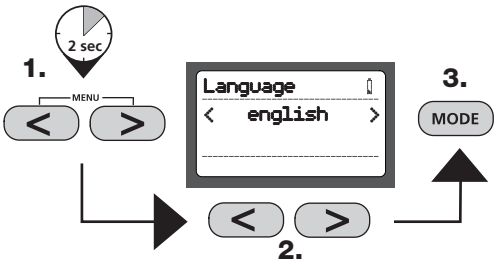


Wet/dry LED display

12-position LED:
0…4 LEDs green = dry
5…7 LEDs yellow = moist
8…12 LEDs red = wet

4 Menu language

Hold the two arrow buttons down simultaneously to access the menu. Now you can use the arrow buttons to set the required language; confirm your selection with "MODE". To exit the language menu, hold down the "MODE" button for two seconds.

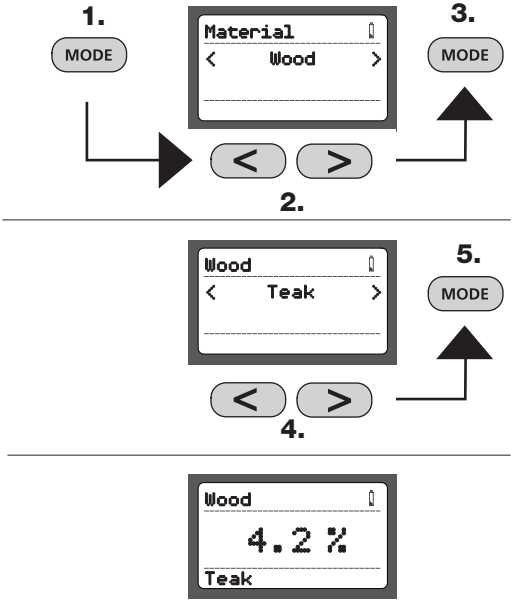


5 Selecting the material

The device features three modes for measuring moisture, depending on the material in question. Press the "MODE" button to view the available types of wood, kinds of construction material and the index mode (which is independent of the material type). Use the arrow buttons to select the relevant material group and confirm your selection by pressing the "MODE" button.

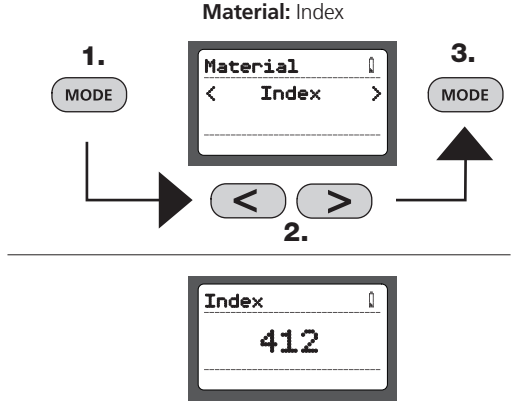
Depending on your selection you will now be presented with a variety of woods or construction materials, which can also be selected using the arrow buttons and confirmed via the "MODE" button. Complete lists of all these materials can be found in the tables on the next page.

Once the material has been selected, the chosen mode will appear at the top of the display and the corresponding material at the bottom. The current measured value as a % of the material moisture can be read from the centre of the display.



6 Index mode

Index mode is used to rapidly locate moisture with comparative measurements, without a direct output of material moisture in %. The output value (0 through 1000) is an indexed value that increases as material moisture becomes greater. Measurements made in index mode are independent of material type and particularly useful with materials for which no characteristics are stored. When comparative measurements reveal strongly deviating values, the course of moisture in the material can be localized quickly.



7 Tables of materials

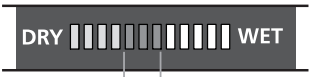
Types of construction material		
Cement screed	Plaster	Concrete
Anhydrite screed	Aerated concrete	Lime malm brick

Types of wood		
Afrormosia	Elm	Redwood
Afzelia	Hemlock	Robinia
Alaska cedar, yellow cedar	Iroko	Silver fir
Ash	Khaya mahogany	Silvertop or black ash
Aspen	Larch	Sitka spruce
Basralocus	Light red meranti	Small-leaved lime
Birch	Limba	Spruce
Black alder	Longleaf pine	Swiss pine
Black maple	Mahogany	Sycamore
Black walnut	Merbau	Teak
Blue catalpa tree	Mesquite	Walnut
Buckeye	Mutenye	White ash
Cedar	Oak	White beech
Cherry mahogany	Pecan	White meranti
Cherry, American	Pine	White oak
Cherry, European	Plum wood	Yellow birch
Common beech	Red cedar	
Dark-leaved willow	Red elm	
Douglas fir	Red maple	
Eastern white pine	Red oak	

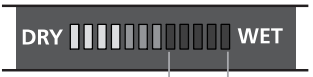
8 Wet/dry LED indicator

In addition to numeric measurement display in % of relative material moisture, the LED display also provides a material-dependent evaluation of moisture. The LED display bar becomes larger, from left to right, with increasing moisture content. The 12-position LED display is subdivided into 4 green (dry), 3 yellow (moist) and 5 red (wet) segments. Wet material causes an additional acoustic signal.

Green = dry

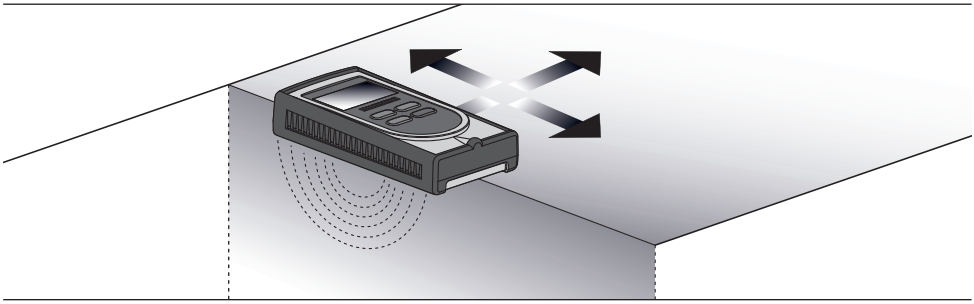


Yellow = moist



Red = wet

! The classification „dry“ means that materials in a heated room have reached a balanced moisture level and are thus suitable for further processing.



9 Application notices

– place the conducting contacts completely on the material to be measured, pressing them down evenly and lightly to achieve good contact
– measured surface should be free of dust and dirt
– keep at least a 5 cm distance from metal objects
– metal pipes, electric lines and reinforcing steel can falsify measurement results
– make measurements at several locations on the surface

10 Determining material moisture

Due to the differing constitution and composition of materials, specific application notices are to be followed for their moisture assessment:

Screed: This device also measures through tiles, linoleum, vinyl and wood but these coverings will influence the measurements. The resulting value is therefore to be viewed as a relative value to localise moisture and moisture paths.

Plaster: This device also measures through wallpaper and paint but not through metal (foils). Though measurements may be influenced by such coverings, the moisture in walls can be readily picked up by differences in moisture. This enables conclusions to be drawn with respect to damage to insulation, vapour barriers or masonry, for example.

Wood: The measurement should be made with the length of the device in parallel with the grain of the wood. The measured depth in wood is 30 mm maximum but does vary somewhat with differing wood densities. Measurements made on thin wood boards should, if possible, be made on a stack of these boards as otherwise the measurement will be too low. Measurements made on installed wooden structures are influenced by the structural conditions and their chemical treatments (e.g. paints) with various materials. Thus such measurements should only be viewed relatively. Nevertheless, the differences in moisture distribution are very good for localising moist places as an indication of damage, e.g. in insulation.

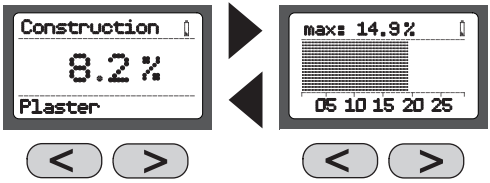
Greatest accuracy is reached between 6 % and 30 % material moisture. In very dry wood (< 6 %) irregular moisture distribution can be detected, in very wet wood (> 30 %) saturation of the wood fibres begins.
Material relative moisture reference values, in %, for use with wood:

– Outdoor usage:	12 % … 19 %
– Use in unheated rooms:	12 % … 16 %
– In heated rooms (12 °C … 21 °C):	9 % … 13 %
– In heated rooms (> 21 °C):	6 % … 10 %

Example: 100% material moisture for 1 kg of wet wood = 500 g water.

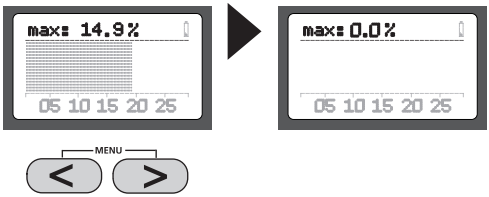
11 Bar graph display

The display can be toggled between measured values and a bar graph by pressing the arrow buttons. The bar moves from left to right as the moisture level increases. The maximum value is also calculated. The arrow buttons can be used to switch back to the measured value display at any time.



12 MAX value

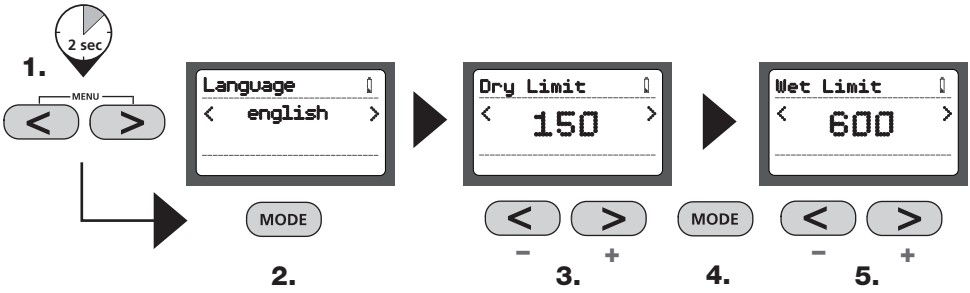
The MAX value is the maximum measured value within a single measurement. Press both arrow buttons at the same time to reset the MAX value to zero. Do make sure that the rubber electrodes on the rear of the device do not come into contact with the material being measured or with your hands when you press these buttons.



13 Setting the wet/dry threshold values in index mode

The wet/dry LED indicator is programmed in line with the relevant material characteristics so the LEDs also provide information about whether the material should be classified as dry, moist or wet.
However the values in index mode, which is independent of the material type, are output on a neutral scale whose value increases as the moisture level rises. The LED indicator can be specifically programmed for index mode by defining the end values for "dry" and "wet". The difference between the value set for "dry" and that set for "wet" is converted and displayed by the 12 LEDs.

Hold the two arrow buttons down simultaneously to access the menu. Press the "MODE" button to set the value for "dry" (Dry Limit). Press "MODE" again to set the value for "wet" (Wet Limit). Hold the "MODE" button down for two seconds to exit the menu again.



! This moisture measuring device is a sensitive tool. This means that the measurement results may be subject to slight deviations when someone touches the device with their hand or when contact is broken between the device and the material being measured. However, contact with the user's hand forms the basis for calibrating the measuring device, so we recommend holding onto the device whilst taking your measurements.

! Die Funktion und die Betriebssicherheit ist nur dann gewährleistet, wenn das Messgerät im Rahmen der angebenen klimatischen Bedingungen betrieben wird und nur für die Zwecke eingesetzt wird, für die es konstruiert wurde. Die Beurteilung der Messergebnisse und die daraus resultierenden Maßnahmen liegen in der Verantwortung des Anwenders, je nach der jeweiligen Arbeitsaufgabe.

Technical data	
Measurement principle	Impedance measuring principle via integrated rubber electrodes
Material characteristics	6 building materials characteristics 56 wood characteristics
Measurement range/Accuracy	Cement screed: 0% ... 4.5% / ± 0.5% Anhydrite screed: 0% ... 3.1% / ± 0.5% Plaster: 0% ... 9% / ± 0.5% Aerated concrete: 0% ... 48% / ± 1% Concrete: 0% ... 5% / ± 0.5% Lime malm brick: 0% ... 10% / ± 0.5% Wood: 0% … 60% / ± 2% (6% … 30%)
Permissible operating temperature	0 … 40°C
Permissible storage temperature	-10°C … 60°C
Permissible max. relative humidity	85%
Power supply	1 x 6LR61 9 V
Battery service life	14 h continuous measurement
Automatic switch-off	After 2 min.

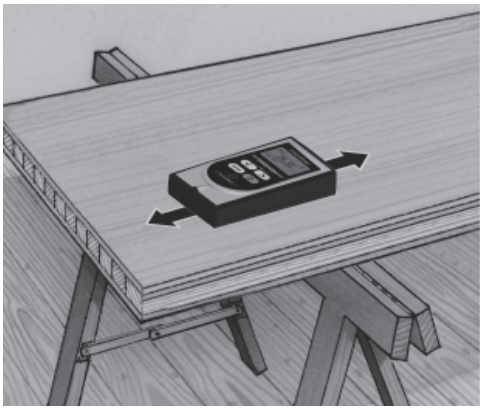
Technical revisions reserved. 04.10

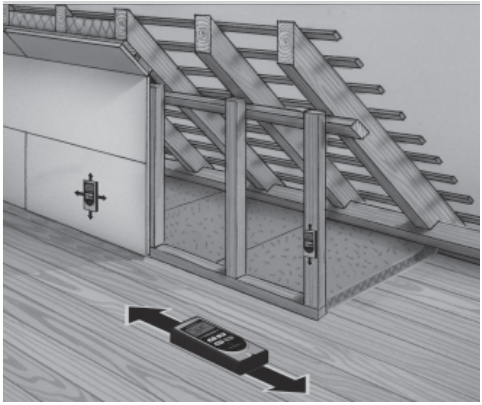
EU directives and disposal

This device complies with all necessary standards for the free movement of goods within the EU.

This product is an electric device and must be collected separately for disposal according to the European Directive on waste electrical and electronic equipment.

Further safety and supplementary notices at: **www.laserliner.com/info**





SERVICE

Umarex GmbH & Co KG
– Laserliner –
Möhnestraße 149, 59755 Arnsberg, Germany
Tel.: +49 2932 638-300, Fax: +49 2932 638-333
laserliner@umarex.de

082.033A Rev.0410

Umarex GmbH & Co KG
Donnerfeld 2
59757 Arnsberg, Germany
Tel.: +49 2932 638-300, Fax: -333
www.laserliner.com

Laserliner®
Innovation in Tools