Operating Instructions

Version 1.2

HYDROMETTE

BL A PLUS

EN

GANN MESS- U. REGELTECHNIK GMBH

70839 GERLINGEN SCHILLERSTRASSE 63 INTERNET: http://www.gann.de

Verkauf National: TELEFON 07156-4907-0 TELEFAX 07156-4907-40 EMAIL verkauf@gann.de
Verkauf International TELEFON +49 7156-4907-0 TELEFAX +49 7156-4907-48 EMAIL sales@gann.de

Disclaimer

GANN Mess- u. Regeltechnik GmbH does not make any assurances or warranties with respect to this document and, to the extent permitted by law, limits its liability for breach of any implied warranty to the replacement of this document with another. Furthermore, GANN Mess- u. Regeltechnik GmbH reserves the right to revise this publication at any time without having to notify anyone about such revisions.

The information provided in this documentation includes general descriptions and/or technical characteristics for the performance of the equipment described herein. This documentation cannot be used as a proper assessment of the suitability or reliability of the equipment for a specific application by a user and must not be used as a substitute for such an assessment. It is the responsibility of any such user to carry out an appropriate and complete risk assessment, evaluation and testing of the equipment with regard to his specific application. Neither GANN Mess- u. Regeltechnik GmbH nor any of its partner or subsidiary companies can be made responsible or liable in the event of misuse of the information contained in this document.

All relevant national, regional and local safety regulations must always be observed when installing and using this device. For reasons of safety and to ensure compliance with the documented system data, only the manufacturer is authorised to carry out repairs to components. Failure to observe this information may result in injury or damage to the equipment.

Table of Contents

1 Foreword

1.1 User Description

These instructions are intended for the end user of the product. The end user of the product is a person who has read and understood these operating instructions, is an experienced user of similar devices and is aware of all possible dangers and can act accordingly.

The device may only be used by persons aged 14 and over who have read and understood these operating instructions, are familiar with the operation of similar products and are aware of all possible dangers and act accordingly.

The device is intended for use by persons who have experience with moisture measurements (structural moisture, wood moisture, climate, etc.).

All personnel involved in the operation, installation, inspection and maintenance of the product must be qualified to carry out the associated work. If the personnel concerned do not already have the required knowledge and skills, appropriate training and instruction must be ensured.

All local regulations must be observed.

1.2 Intended Use

The Hydromette BL A plus is a wood moisture measuring device that enables high-precision moisture measurements in wood and wood-based materials by connecting electrodes using resistance measurement.

It also provides non-destructive wood moisture measurement by utilising the dielectric constant/high frequency measuring principle. Various curves can be configured for this measurement through fine adjustment. The measurement is carried out by placing the electrode, which is attached to the back of the device, on the wood to be measured.

It is also possible to determine the fine adjustment of the non-destructive measurement for new curves via a resistance measurement.

The Hydromette BL A plus may only be used to measure moisture in wood and wood-based materials.

1.3 Non-Intended Use

The device is not intended for any applications that are not listed in these operating instructions.

The device, accessories, tools, software, etc. must be used in accordance with these instructions, taking into account the working conditions and the work to be performed. Using the product for work other than that for which it is intended will result in a hazardous situation.

The device may only be used together with the original accessories. The device must only be used within the specified performance limits as described in these instructions.

1.4 Explanation of the General Warnings

The following danger levels are used in this operating manual to indicate potentially dangerous situations and important safety instructions:

Danger Level	Description
 **DANGER**	Danger / Indicates a hazardous situation which, if not avoided, will result in death or serious irreversible injuries.
 **WARNING**	Warning / Indicates a hazardous situation which, if not avoided, could result in death or serious irreversible injuries.
 **CAUTION**	Caution / Indicates a hazardous situation which, if not avoided, could result in minor or moderate injuries.
 **INFORMATION**	Indicates important information.

1.5 General Safety Instructions

It must be ensured that the complete instructions and all safety instructions have been read and understood before using this device.

All instructions must be followed. This prevents accidents that can result in property damage or minor or moderate injuries.

INFORMATION

All safety information and instructions must be kept for future reference and passed on to subsequent users of the product.

The manufacturer shall not be liable for any damage to property or injuries to persons that can be attributed to incorrect handling or non-compliance with the safety instructions. In such cases, the warranty shall be void.

1.5.1 Persons at Risk

Persons with reduced physical, sensory or mental capabilities or lack of experience and knowledge must be supervised or instructed in the safe use of the device and understand the associated hazards.

Children must be supervised to ensure that they do not play with the device. The device is not a toy. There is a risk of swallowing small parts of the device (e.g. battery compartment cover) or an accessory (e.g. TF-Stick, not for all BL device types).

This device is not intended for use by persons with reduced physical, sensory or intellectual capabilities, or lack of experience and/or knowledge.

WARNING

Risk of suffocation, injury or permanent disability. The device must not be used by persons under the age of 14!

Risk of suffocation! Keep packaging away from children.

1.5.2 Preparation and Start-up

Never store or place the device in a location where it can fall or be drawn into water or other liquids.

To avoid the risk of electric shock, never immerse the device in water or other liquids.

Always remove all packaging before operating the device.

WARNING

Fire hazard!
Do not use a damaged device.

In the event of visible damage, strong odours or excessive heating of components, the battery must be removed immediately and the appliance must not continue to be used.

.

1.5.3 Use / Operation

CAUTION

Risk of damage. The device is a highly sensitive measuring instrument. Only use the device in a controlled electromagnetic environment.

Do not let the device drop onto hard surfaces. This can result in malfunctions or functional failures. Normal use of the device, without excluding hazards to the user, cannot be guaranteed.

The device is fragile.

To avoid overheating, the device must not be covered or used near heat sources or direct sunlight and only be used at ambient temperatures between 0 °C and 40 °C.

The device may not be stored or operated in aggressive atmospheres or atmospheres containing solvents!

The measuring device may be operated in residential and commercial areas.

Measurements **must not** be carried out on conductive surfaces.

Static charge - At low humidity levels, static electricity with high voltage can build up, favoured by external circumstances (friction during material transport, high insulation value of the surrounding area), which can lead to strong fluctuations in measured values. Even the instrument operator may - inadvertently - contribute to the build-up of a static charge by the clothing worn. A considerable improvement can be achieved by the operator and the measuring instrument being absolutely still during measuring, as well as by earthing (contact with conducting metal, water or heating pipes, etc.).

1.5.4 Care, Maintenance and Inspection

Remove the battery before cleaning the product. Do not use abrasive cleaning cloths or chemicals to clean the product as these can damage the surface.

Stop using the product in the case of visible damage, strong odours development or excessive overheating of components.

Only use original accessories.

Changes to the device and technical modifications are not permitted without the written consent of the manufacturer.

All connection options and the device itself must not be sprayed directly or indirectly with water when cleaning (connections depend on the device! e.g. BNC-, 2.5 mm, 3.5 mm jack receptacle and mini-USB port).

Our recommendation: To ensure functionality, have all your measuring equipment checked by the manufacturer every 2–3 years (depending on the frequency of use).

1.5.5 Troubleshooting

Do not repair the device yourself. Contact the manufacturer if the device is not functioning properly.

1.5.6 Disposal

Electrical equipment, accessories and packaging must not be disposed of together with household waste (only for EU countries) and must be disposed of in compliance with the European Directive 2012/19/EU on waste electrical and electronic equipment and its implementation in accordance with national law. Electrical equipment that has reached the end of its service life must be collected separately and sent to an environmentally compatible recycling facility.

The WEEE symbol draws attention to the need for disposal.

The device contains a battery. Batteries must not be disposed of with normal household waste. They may contain toxic heavy metals and are subject to the hazardous waste ordinance. For this reason, dispose of the battery at a local collection point for the recycling of waste electrical and electronic equipment. Caution, there is a risk of explosion if the wrong type of battery is inserted. Handle used batteries according to the manufacturer's instructions.

Gann Mess- u. Regeltechnik GmbH accepts no liability for damage caused by non-compliance with the operating instructions or by violation of a duty to care during transport, storage or operation of the instrument, even if this duty to care is not specifically discussed in the operating instructions.

1.6 Specific Warnings

CAUTION

There is a risk of injury from the measuring pins of the electrodes for resistance measurement. There is also a risk of injury due to careless handling when piercing / knocking into the material to be measured. Before the electrode pins are pressed / driven into walls or ceilings (e.g. wooden panels or similar), it is essential to ensure by suitable means that there are no electrical cables, water pipes or other supply lines in this location.

2 Specifications

2.1 Technical Data

Hydromette

Display:	1.54" OLED display
Display resolution:	0.1 % for humidity
Response time:	< 2 s
Storage conditions:	+ 5 to + 40 °C - 10 to + 60 °C (for a short time)
Operating conditions:	0 to + 50 °C - 10 to + 60 °C (for a short time) < 85 % R.H. non-condensing
Power supply:	9-V-block battery
Types that can be used:	Types 6LR61 and Type 6F22
Dimensions:	180 x 50 x 30 (L x W x H) mm
Weight:	approx. 200 g
Protection class:	III
Protection rating:	IP20

2.2 Prohibited Environmental Conditions

- Condensation. humidity continuously too high (> 85% R.H.) and wetness
- Permanent presence of dust and combustible gases, vapours or solvents
- Ambient temperatures continuously too high (> +50 °C)
- Ambient temperatures continuously too low (< 0 °C)

2.3 Transport- & Storage Conditions

The Hydromette may **only be stored in the packaging provided by the manufacturer or available from the manufacturer as an accessory**. The manufacturer shall not accept any liability or warranty for damage that may occur to the device or to the sensor system as a result of non-compliance.

INFORMATION

In particular, **avoid keeping or storing the devices in foams not supplied by the manufacturer**, as these can damage the sensors due to possible outgassing and result in incorrect measurements.

2.4 Measuring Ranges

Resistance measurement:

Wood moisture:	5 … 70 % (depending on type and temperature)
Compensation temperature:	Manual compensation in steps of 1 °C adjustable in the range from -10 °C to 40 °C.

Wood materials:

OSB3 / OSB4:	5.7 … 70.0 % by weight
OSB flame retardant:	5.5 … 24.8 % by weight
LVL 21 mm:	5.0 … 27.0 % by weight
LVL 39 mm:	5.0 … 23.5 % by weight
LVL 69 mm:	5.0 … 21.0 % by weight

Wood fibre insulating materials:

HFD / 110 D:	6.5 … 62.3 % by weight
HFD / 140 D:	5.1 … 60.9 % by weight
HFD / 135-170 W:	5.0 … 54.9 % by weight
HFD / 180-200 D:	5.0 … 59.7 % by weight
HFD / 220-240 W:	5.0 … 58.6 % by weight
HFD / 250-270 W:	7.5 … 54.1 % by weight

Non-destructive measurement:

Wood moisture:	5 to 45 % (depending on type and temperature)
Fine adjustment:	Manual compensation in steps of 0.1 adjustable in the range from 0.0 to 10.0.

3 General Information

3.1 Standards and Directives

This measuring instrument fulfils the requirements of the applicable European and national directives (2014/30/EU) and standards (EN 61010). Appropriate declarations and documentation are held by the manufacturer.

To ensure trouble-free operation of the measuring instrument and operational reliability, the user must carefully read and understand the operating instructions.

3.2 Warranty

The measuring instrument may only be operated under the specified climatic conditions. These are listed in chapter 2.1 "Technical Data of the Hydromette".

This measuring instrument may only be used under the conditions and for the purposes that it has been designed for. Operational reliability and functionality are no longer ensured if the device is modified or adapted. Gann Mess- u. Regeltechnik GmbH shall not be liable for any damage arising from such modifications or adaptations. The risk is borne solely by the user.

The measuring instrument and any accessories may only be properly used as described in these instructions. Keep the device and accessories out of the reach of children!

The device must not be stored or operated in air that is corrosive or contains solvents!

The notes and tables in these instructions regarding permitted or normal humidity conditions in practice and the general definitions of terms have been taken from the specialist literature. Therefore, the manufacturer cannot guarantee the correctness. The conclusions to be drawn from the measurement results depend for each user on the individual circumstances and the knowledge gained from his professional experience.

The measuring instrument may be used in the residential and commercial sectors.

The measuring instrument may only be stored in the packaging provided by the manufacturer or available from the manufacturer as an accessory. The manufacturer accepts no liability for damage that may occur to the device or the sensor system as a result of non-compliance.

Gann Mess- u. Regeltechnik GmbH accepts no liability whatsoever for damage caused by non-compliance with the operating instructions or by breach of the duty of care during transport, storage and handling when operating the device, even if this duty of care is not specifically referred to in the operating instructions.

4 Description oft he Product

The Hydromette BL A plus is a **moisture measuring device** for wood and wood-based materials. The device combines high-precision resistance measurement with the non-destructive capacitive measuring method in one compact device.

There is a BNC socket on the front for measuring the resistance to determine the wood moisture. Various resistance-based electrodes can be connected to this socket.

There is a contact electrode on the back for non-destructive measurement to determine the wood moisture content.

The new ResCap mode combines the accuracy of resistance measurement with the simple handling of the capacitive method. A previously measured resistance value is used as a calibration for the capacitive wood type setting.

A wide range of measuring tasks can be performed by connecting a wide variety of electrodes (see chapter 15 Accessories).

The Hydromette BL A plus offers the following measuring functions:

- Basic measurement (see chapter 8 Basic measurement)
- Average measurement (see chapter 9 Average measurement)
- Batch measurement (see chapter 10 Batch measurement)

A detailed description of the measurement functions can be found in the corresponding sections.

The device offers the option of setting **individual** limit values. If the limit values set by the user are exceeded, a visual warning signal is emitted via a red LED. A message is also shown on the display (see chapter 7.7 Alert).

The display values are shown clearly and with high contrast on the **OLED display**. The additional brightness settings allow the display to be read even in unfavourable lighting conditions..

An internal memory is available for storing data.

The silicone buttons give haptic feedback for important functions.

The Hydromette BL A plus has a **mini-USB port** that can be used to transfer measurement data to a PC or to update the firmware, among other things.

5 Device Layout and Button Assignment

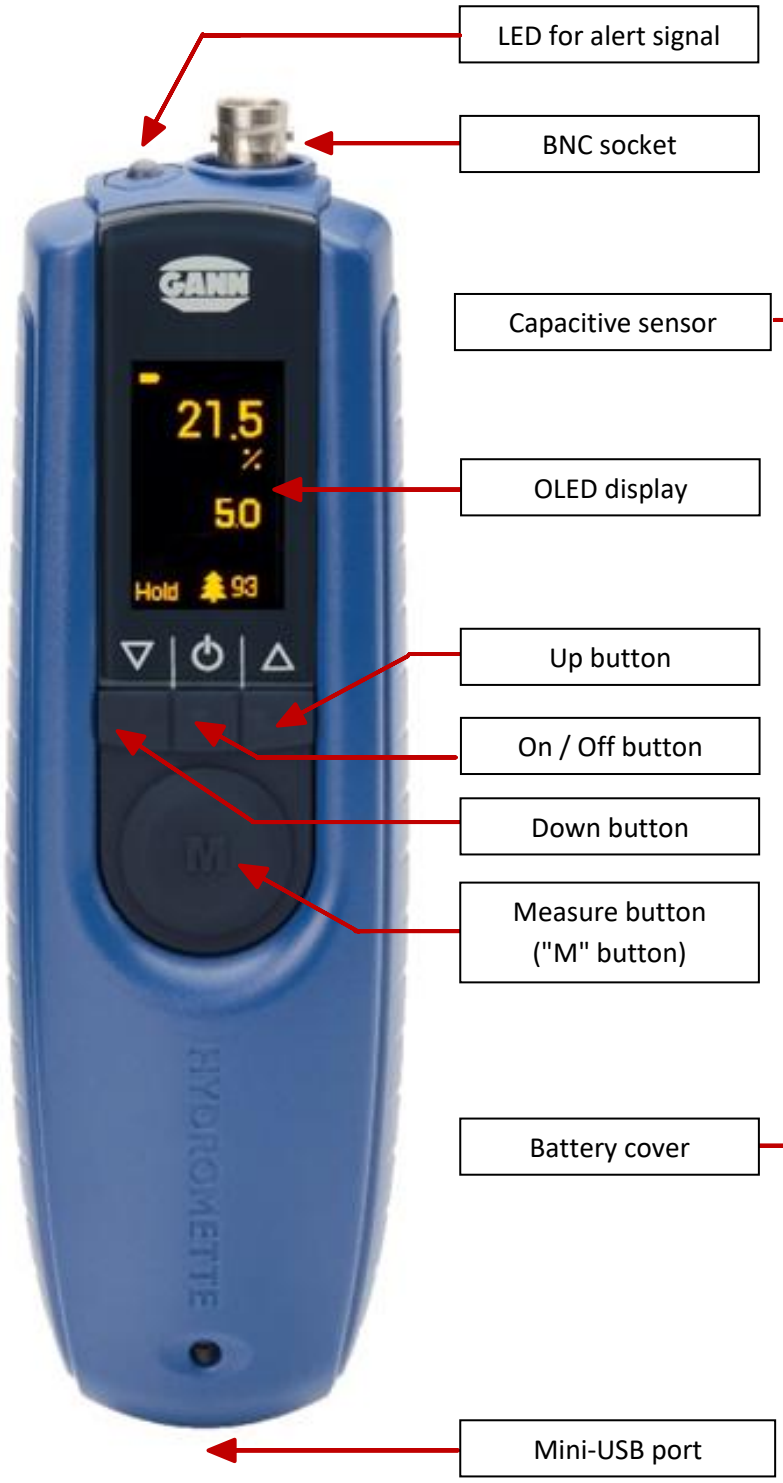


Figure 5-1: Front view of the Hydromette BL A plus

Figure 5-2: Rear view of the hydromette BL A plus

Article no. 30011200

5.1 Display Symbols

5.1.1 Display Symbols: Resistance Measurement

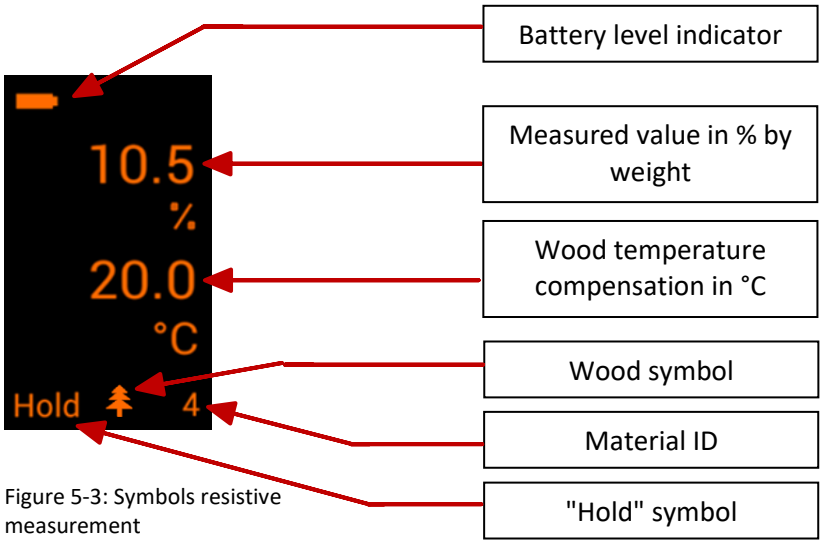


Figure 5-3: Symbols resistive measurement

5.1.2 Display Symbols: Capacitive Measurement

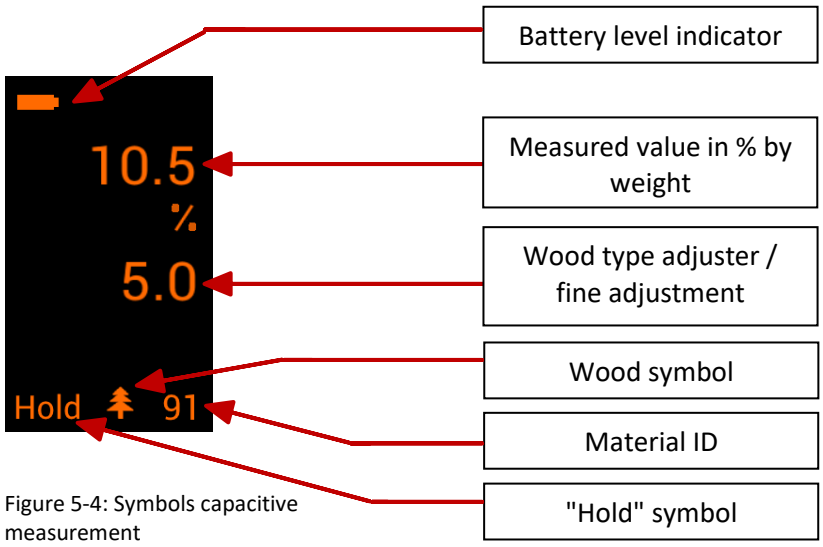


Figure 5-4: Symbols capacitive measurement

5.1.3 **Other Symbols**

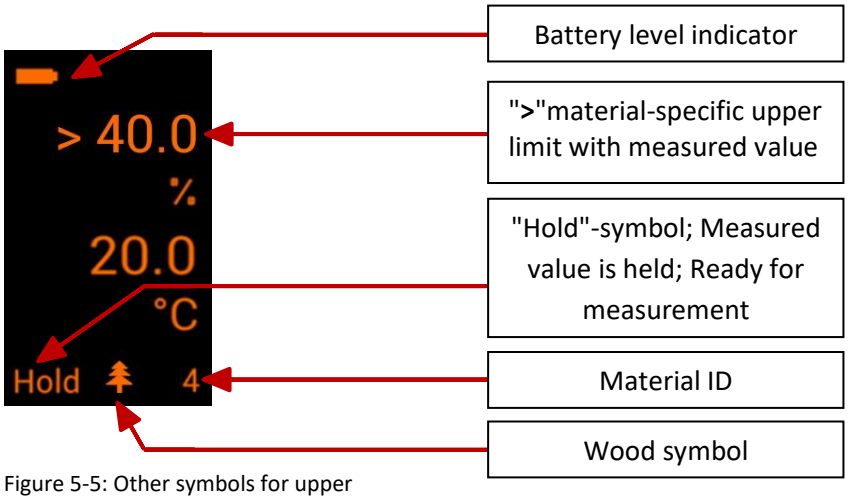


Figure 5-5: Other symbols for upper measuring range

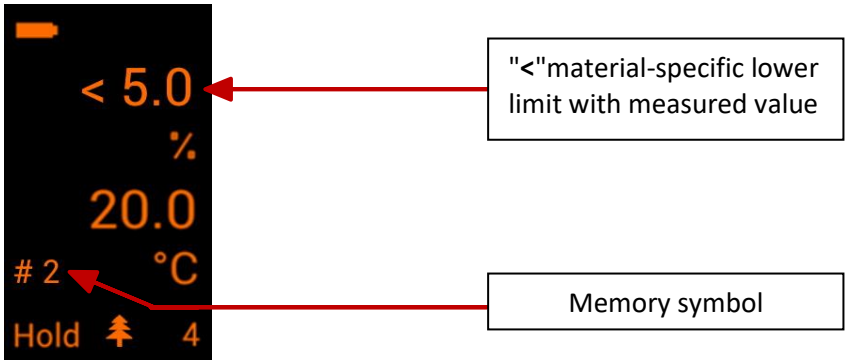


Figure 5-6: Other symbols for lower measuring range

6 Basic Functions

6.1 Switching the Device On and Off

The device is switched on and off by pressing the "**On / Off**" button ⏻.

The GANN logo is shown on the display while the device is starting up. The device name and the installed firmware version are also displayed.

Figure 6-1: Start screen

After switching on, the Hydromette BL A plus always starts in the last menu opened. When the device is started for the first time, the Hydromette starts in the basic measurement mode. From here, you can access other menus by pressing the ***Up*** or ***Down*** buttons.

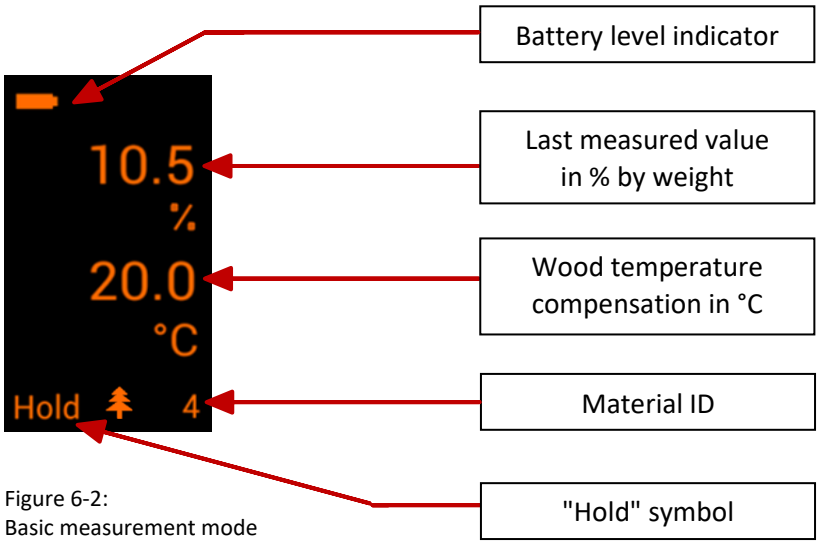


Figure 6-2:
Basic measurement mode

6.2 Menu Guidance

The device must be switched on in order to make menu selections. Starting from the measurement menu, you can access other menus by pressing *the* "***Up***"or "***Down***" *buttons*.

Each menu selection must be confirmed by briefly pressing the **"*M*"** button. To leave a menu, either confirm the (changed) menu selection by pressing the 'Measure' button or select the **"*Return*"** symbol using the "***Up***" or "***Down***" buttons and confirm by pressing the **"*M*"** button.

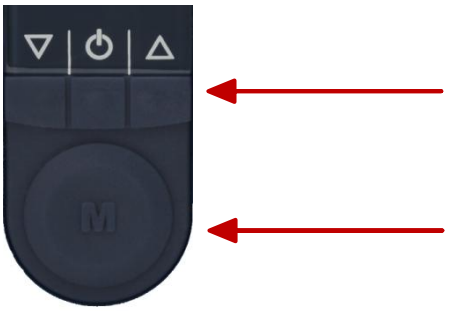


Figure 6-3: Button assignment

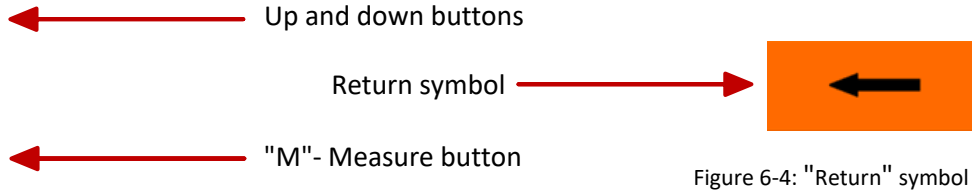


Figure 6-4: "Return" symbol

Menu selection overview:

1. **Measuring Menu** (Main Menu): The measuring process can be performed here.
2. **Settings:**
   - **Wood type**:
     - ○ Selection of the different wood types for the resistance measurement.
     - ○ In this menu, the **measurement mode of the non-destructive measurement** can also be selected by selecting the corresponding material ID.
   - **Wood temperature**: Setting the wood temperature for compensation during resistance measurement.
   - **Fine adjustment (wood type adjuster)**: Selection of the type of wood for non-destructive measurement.
   - **Adjustment of the resistance measurement:** The resistance measurement of the Hydromette can be readjusted here using the test adapter for wood moisture.
   - **Brightness**: Setting the display brightness.
   - **Language**: Setting the menu language.
   - **Alert**: Setting the limit value for an optical warning signal.
3. **Average value:** An average of up to five measurements can be output here.
4. **Batches:** Activation or deactivation of storage in batches. Measurements that have already been saved can be viewed and / or deleted.
5. **Memory:** Contains the last ten measurements that were not saved in batches.
6. **ResCap**: Enables fine adjustment of the non-destructive measurement by means of a wood moisture measurement using the resistance measurement.

6.3 Automatic Switch-Off

If no button is pressed within approx. 90 seconds, the device switches off automatically. The current values are retained and are displayed after the device is switched on again.

6.4 Battery Status

The battery symbol indicates the battery charge status on the measurement screen. The three possible battery states are described in Table_6_4. If the battery voltage is very low, the display becomes darker during measurement. In addition, measured values may be falsified during measurements as the battery can no longer supply the current required for a correct measurement. For this reason, the battery must be replaced when the 'low battery' symbol appears on the display.

A list of battery types that can be used can be found in chapter "2.1 Technical Data of the Hydromette".

The device serial number is also located in the battery compartment.

	Optimum battery voltage.
	Battery voltage OK. All functions available without restriction. It is not necessary to change the battery.
	Battery voltage very low. Functions only available to a limited extent. Battery must be replaced.

Table_6_4: Battery symbols

INFORMATION

Under no circumstances should you use the mini-USB interface to charge an empty battery – the device does not have a charging circuit. It is only supplied with the typical USB voltage. No measurements are possible when the USB connection is plugged in.

7 Settings

The parameters and functions of the device are adjusted in the settings. The individual menus are explained below.

You can access the settings by pressing the ***up*** or ***down button*** on the measurement screen and then selecting the "Settings"menu item and confirming with the ***measurement button***.

Figure 7-1: Button assignment

7.1 Material Selection

The desired material can be selected in this menu by selecting the corresponding material ID or wood type.

Figure 7-2: Selection of the wood type

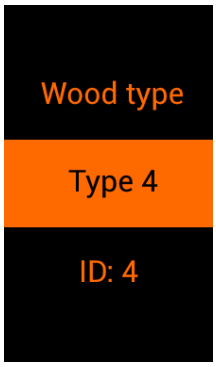


Figure 7-3: Selection of the material ID

The following materials are available for resistance measurement:

Material designation	Material ID	Material designation	Material ID
Type 1	1	OSB3 / OSB4	541
Type 2	2	OSB flame retardant	542
Type 3	3	HFD / 110 D	543
Type 4	4	HFD / 140 D	544
Type 5	5	HFD / 135-170 W	545
Type 6	6	HFD / 180-200 D	546
Type 7	7	HFD / 220-240 W	547
Larch	212	HFD / 250-270 W	548
Pine	207	LVL 21 mm	549
KLB Spruce	373	LVL 39 mm	550
Douglas fir	158	LVL 69 mm	551

Table 7-1: Available materials

OSB: Oriented Strand Board

HFD: Wood fibre insulation materials (listed according to bulk density and manufacturing process):

D=Dry / W=Wet

LVL: Laminated Veneer Lumber

Several types of wood are grouped in grades 1 to 7. The corresponding material assignment is made using the wood type table supplied with the device. Additional specific measurement curves for wood-based materials are also available. The "Material selection" menu item is not available for batch measurements for which at least one measured value has already been saved. This means that measurements of different materials cannot be saved in a list.

A wood type table is enclosed with the instrument on delivery.

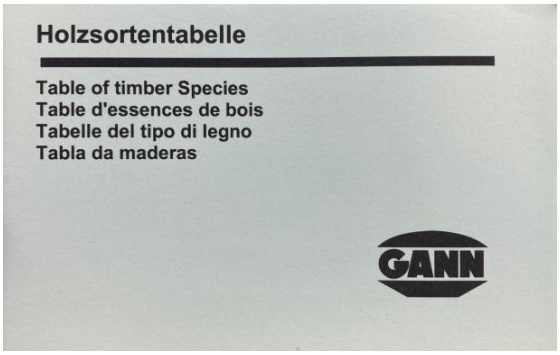


Figure 7-4: Front of wood type table

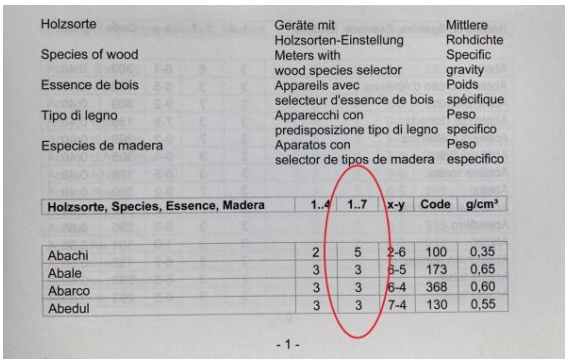


Figure 7-5: Using the wood type table

The following settings are available for **capacitive measurement**.

Material designation	Material ID
Standard measurement ("Normal")	91
Rough sawn wood ("Rough")	92
Thin material thickness ("Thin")	93

Figure 7-6: Selection of the wood type

Figure 7-7: Selecting the material ID for the capacitive measurement

Please observe both the notes on selecting the wood types in chapter 7.3 Fine adjustment (only non-destructive measurement) and the application notes on capacitive measurement in chapter 14.6 Using the Hydromette BL A plus - capacitive!

7.2 Compensation Temperature ((Resistance Measurement only)

The menu for setting the compensation temperature is only available if a wood type has been selected for the resistance measurement.

The material temperature is entered in 1 °C steps. The temperature compensation of the measured value is always carried out with the temperature displayed in measuring mode. A wood temperature between -10 °C and 40 °C can be set using the ***up*** and ***down buttons***. The value is changed in steps of five by pressing and holding the ***up*** or ***down button***.

The wood temperature compensation can be adjusted for each measurement in batch measurements. While a batch is activated, the wood temperature compensation setting is assigned to this batch. This means that when the selected batch is deactivated, the wood temperature compensation is reset to the set value for the basic measurement. When a batch is activated, the wood temperature compensation is set to the wood temperature compensation last used in the active batch (see temperature compensation table in section 16.3).

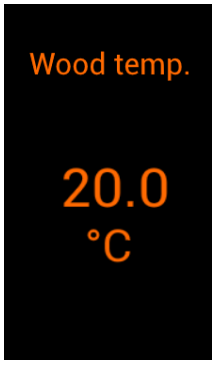


Figure 7-8: Setting the wood temperature compensation

7.3 Fine Adjustment (Non-destructive Measurement only)

Measurement mode ⇨ Settings ⇨ **Fine-tune**

The type of wood for the non-destructive measurement can be selected here. The menu for setting the wood type selector is only available if a setting for non-destructive measurement has been selected beforehand (standard measurement "Normal": Material ID 91 / Rough sawn wood "Rough": Material ID 92 / Thin material thickness "Thin": Material ID 93).

The wood type setting is entered in steps of 0.1, in a range of 0.0 - 10.0. Material settings can be taken from the wood type table for non-destructive measurement (see Appendix Chapter 16.3 Wood type table for non-destructive measurement).

Figure 7-9: Setting the wood type adjuster

7.4 Adjusting the Resistance Measurement

Measurement mode ⇨ Settings ⇨ **Adjustment**

The adjustment point of the resistance measuring circuit can be checked using a wood moisture test adapter (order no. 31006070). If the value measured by the Hydromette deviates from the test value (printed on the test adapter) outside the tolerance, readjustment is required. This can be carried out via the "Adjustment" menu item. To adjust the device, the wood moisture test adapter must be connected to the Hydromette BL A plus using the MK 8 measuring cable. The electronic adjustment takes place after the start confirmation. Once the adjustment process has been completed, feedback is shown on the display as to whether the adjustment was successful. The adjustment is independent of the active material.

Figure 7 10: Adjustment process of the resistance measurement

A defective measuring cable, a missing or defective test adapter or a defect in the measuring circuit can cause an adjustment to fail. In this case, the device parameters are reset to the values before the adjustment.

Figure 7-11:: Error message if calibration of the resistance measurement fails

7.5 Brightness

The brightness setting allows you to increase or decrease the brightness of the display. Three brightness levels are available for this, with level 1 being the darkest and level 3 being the brightest. Please note that the longer the brightness of the display, the shorter the battery life. The activated setting is indicated by a dot.

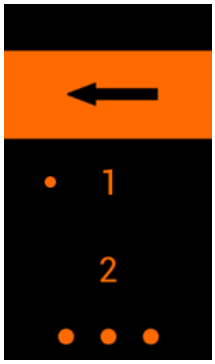


Figure 7-12: Brightness setting selection menu

7.6 Language

The menu language is set in the language menu. You can choose between German, English, Italian, French and Spanish.

7.7 Alert

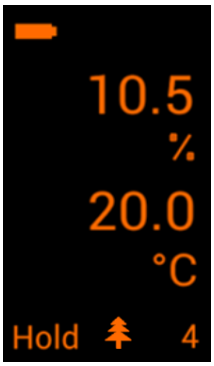
Material moisture limit values are set in this menu. These are checked during basic and batch measurement. The limit value is regarded as a maximum value, if it is exceeded, an optical warning signal (red LED) and a visualisation appears on the display..
This alarm function is activated or deactivated as required. The limit values are set between 5.0 and 70.0 (or the specific limits of the types) using the up and down buttons. The alarm values are entered in 0.1 steps. The value is changed in 0.5 steps by pressing and holding the up or down button. A limit value within the permissible measuring range can be set for individual types of wood. A separate value can be set for each material.

Figure 7 13: Selection menu for limit values and alarm messages

Figure 7 14: Limit value selection

8 Basic Measurement

The basic measurement is the standard measurement function. This is suitable for quick measurements that do not require documentation of the results. The last 10 measured values are simply stored in a ring memory (see also the "Memory'"chapter). If limit values are exceeded or undercut, an acoustic alarm is emitted and a visualisation is shown on the display.



After switching on for the first time, the device is in the measurement menu, i.e. the basic measurement. From here, you can access the other menus by pressing the **"Up"** or **"Down" buttons**. In the measurement menu, the last measured values are displayed according to the material setting with the corresponding units and the "Hold" note.

Figure 8-1: Screen view of basic measurement

8.1 Measuring Process

A new measurement is started by pressing the **"M"** button *(> 2 seconds).* During the measurement process, the **"Hold"** symbol disappears from the display. After releasing the **"M"** button, the measured value is held and automatically saved in the ring memory. The oldest stored value is overwritten. The **"Hold"** symbol is displayed again.

INFORMATION

For a reliable measurement result, the measurement button must be pressed for at least two seconds. If the material is very dry, the measuring button must be pressed for up to eight seconds.

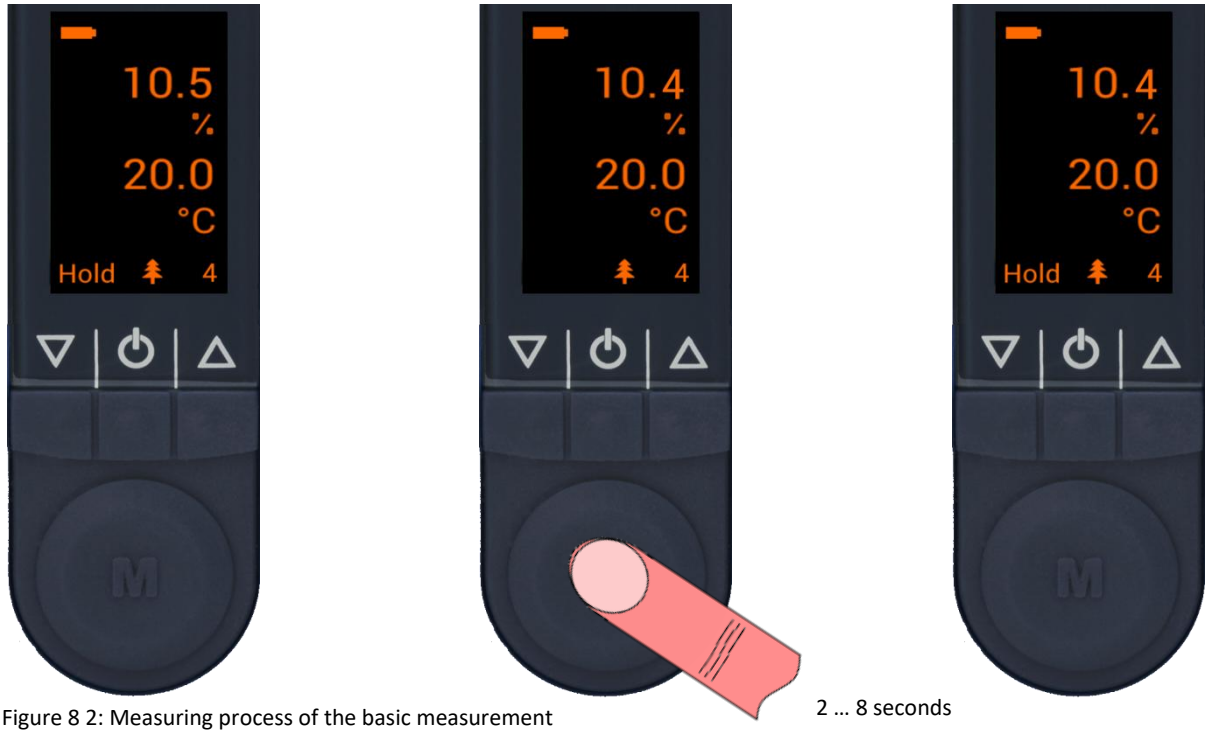


Figure 8 2: Measuring process of the basic measurement

8.2 Query the last Ten Measured Values

Measurement mode ⇨ **Memory**

The measurements of the basic measurement are stored in a ring memory. The last 10 measured values are automatically saved and assigned to memory locations "#1" - "#10". The last measured value is stored in memory location "#1". The memory is structured as a ring memory. As soon as an eleventh measured value is recorded, the oldest measured value in memory location "#10" is automatically removed from the memory.

The measured values are displayed with #1...#10, where #1 corresponds to the last measured value and #10 is the furthest in the past.

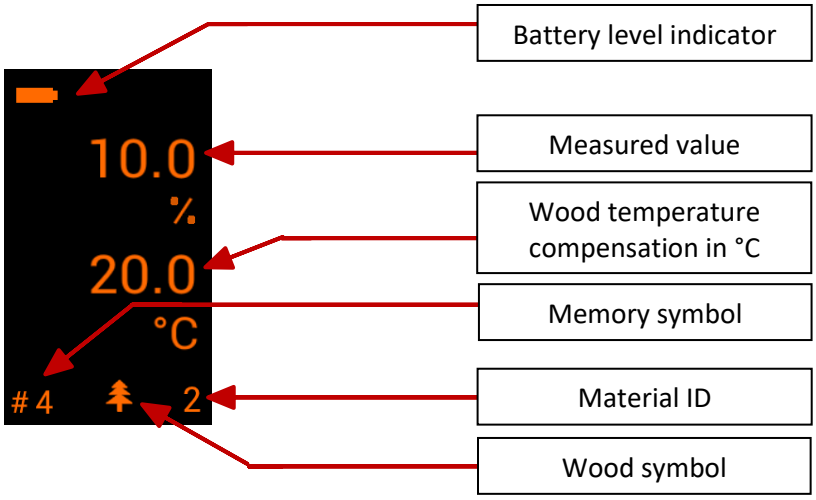


Figure 8-3: Exemplary representation of a measured value in the ring memory

9 Average Measurement

The average value measurement offers the option of recording up to five measured values and immediately displaying the average value of the recorded measured values. The recorded values cannot be saved. This measurement function is therefore mainly suitable for gaining a short-term overview and recording measured values on the fly. In addition, this function makes it easier to determine a reference value when comparative measurements are to be carried out on unknown materials or multi-layer structures - see chapter Comparative measurement.

9.1 Measuring Process

The active position is signalled by a flashing measured value. The measurement process is started by pressing the ***measurement button***. As long as the ***measurement*** button is pressed, the measured value is updated. If the *measurement* button is released, the last measured value remains and the selection automatically jumps to the next position. An existing value is overwritten by a new measurement at the same position.

Use the ***up*** *and* ***down buttons*** to navigate through the positions. Wood temperature compensation / wood type selector and the material ID are displayed in the bottom to the right-hand side of the screen. The average value is shown at the bottom of the display and is updated during the measurements.

When the average value measurement is exited, the recorded measured values are deleted. In the event of an automatic switch-off, the measured values are retained when the device is restarted.

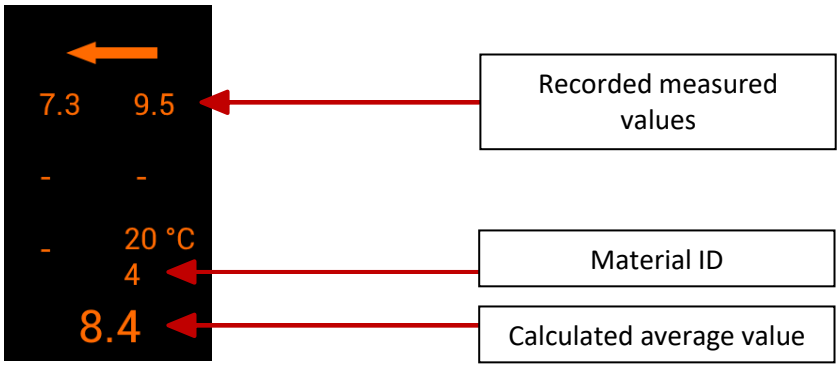


Figure 9-1: Average measurement

10 Batch Measurement

With batch measurement, the measured values are saved in batches. Five batches are available to the user on the device's internal memory. 50 measurements can be saved per batch. Press the up and down buttons to navigate through the batch menu. The number of measurements already saved is displayed next to the batch number. If a batch is active, it is marked with a dot. Batches only contain measured values of a single material ID. The material ID can only be changed as long as there are no saved measured values in the batch. The wood temperature compensation and the fine adjustment can be set individually for each measurement. They are saved separately for each measured value.

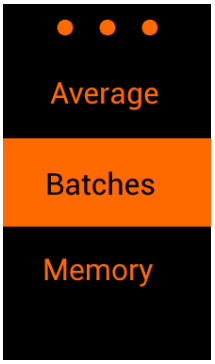


Figure 10-1: Batch menu

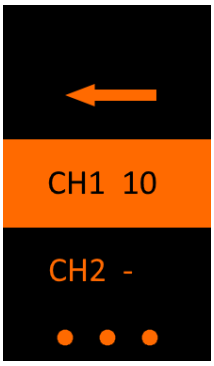


Figure 10-2 Selecting the batch

If an attempt is nevertheless made to change the material ID within an active batch, the message 'Material: Batch active' appears. If the material ID is really to be changed, a new batch must be activated. The wood temperature compensation can be adjusted as with the basic measurement and is saved together with the wood moisture value during measurements.

10.1 Measuring Process

The measurement process is started by pressing the ***measurement button***. As long as the ***measurement button*** is pressed, the measured values are updated. If the ***measurement button*** is released, the displayed value is written to the batch memory and the displayed number of stored measured values is increased by one. While a batch is active, no measured value is written to the ring memory.

10.2 Options in the Batch Menu

10.2.1 Activite / Deactivate Batch

Measurement mode ⇨ **Batches** ⇨ **CH (*)** ⇨ **Activite / Deactivate**

(*) stands for a batch number between 1 and 5

Batches are activated and deactivated in the batch menu. Only **one** batch can be active at a time. Activating a batch deactivates another batch if it was active.

INFORMATION

As long as a batch is activated, the device is in the "Batch measurement" measuring function. If the device is to be switched back to the "Basic measurement" measurement function, the active batch must first be deactivated.

Figure 10-3: Activite batch

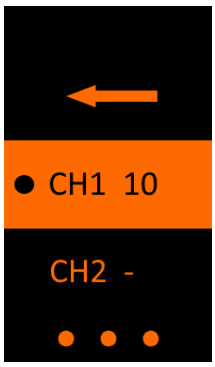


Figure 10-4: Selection of the batch

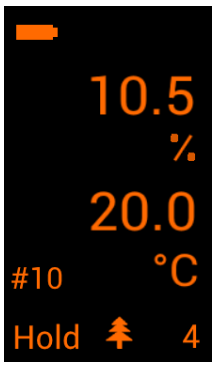


Figure 10-5: Batch measurement mode

10.2.2 View Measured Values

Measurement mode ⇨ **Batches** ⇨ **CH (*)** ⇨ **View data**

(*) stands for a batch number between 1 and 5

With the ***up*** *and* ***down buttons*** can be used to navigate through the individual measured values.

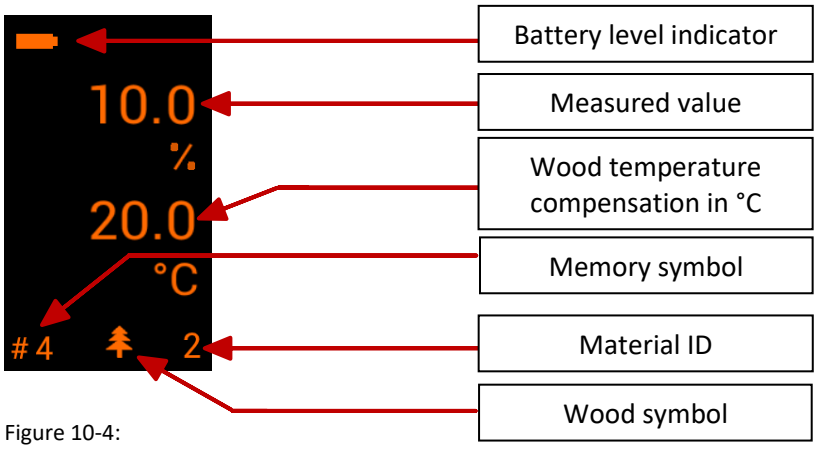


Figure 10-4:
Saved measured values in batch

10.2.3 Delete Measured Values in Batches

Delete last measured value in batch

Measurement mode ⇨ **Batches** ⇨ **CH (*)** ⇨ **Del last v.**

(*) stands for a batch number between 1 and 5

Deletes the last recorded measured value of the selected batch.

Delete complete batch

Measurement mode ⇨ **Batches** ⇨ **CH (*)** ⇨ **Del. batch**

(*) stands for a batch number between 1 and 5

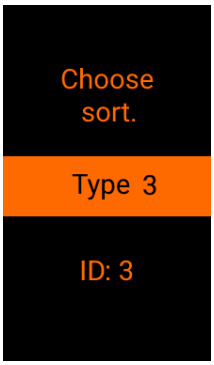
Deletes all measured values of the selected batch.

11 ResCap Mode

The ResCap mode offers the option of carrying out a very high precision resistance measurement and then adjusting the setting of the non-destructive measurement to the measured material. To do this, the electrode pins for the resistance measurement must be driven approx. 20 mm into the material. The measuring device should then be placed on this measuring point and the capacitive measurement adjusted to it.

INFORMATION

We recommend determining the measuring point **before** starting ResCap mode. The resistance measuring electrode must be attached there and connected to the measuring device. Use the wood type table to determine the appropriate setting recommendation.

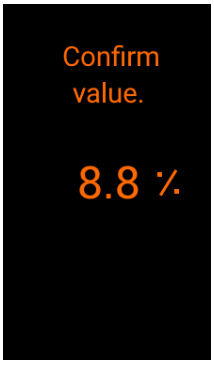


After selecting the ResCap mode, the wood type for the resistance measurement must first be selected and confirmed by briefly (<1 second) pressing the measurement button.

Figure 11-1: ResCap mode – Choose type

The display shows "Start RES measurement". Pressing the measurement button again briefly (<1 second) automatically starts the resistance measurement.

Figure 11-2: ResCap mode - Start RES measurement



It is not necessary to press the measuring button again, the measured value is constantly updated automatically. Only when this is stable (this can take between 2 and 8 seconds depending on the wood moisture content) is it confirmed by pressing the measurement button again *briefly (<1 second*), saved and used for the adjustment to the capacitive measurement..

Figure 11-3: ResCap mode –Confirm value

The display shows "Put device on the measuring point..." The measuring electrode for the resistance measurement must now be removed from the measuring point. The measuring device is now placed on this measuring point with the support electrode on the back of the device, whereby the handling instructions for capacitive wood moisture measurement (see chapter 14.6) must be observed. Press the measurement button again *briefly (<1 second)* to start the adjustment to the capacitive measurement.

Figure 11-4: ResCap mode –
Put device on the measuring point …

The display shows "Value is being calculated". The measuring device now automatically starts to approach a suitable fine adjustment. This process can take up to 10 seconds. The hand of the user should always remain on the device during this time.

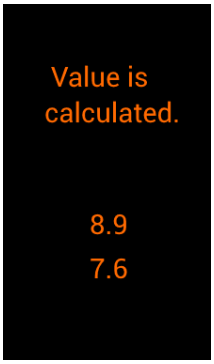


Figure 11-5: ResCap mode – Value is calculated

If the adjustment is successful, a tick appears as confirmation. Pressing the measurement button *briefly (<1 second*) completes the ResCap mode function and the device automatically switches to the capacitive measurement menu. This allows non-destructive measurement with the determined setting of the wood type adjuster for the selected wood type.

Figure 11-6: ResCap mode - successfully completed

Due to the smaller measuring range of the non-destructive measurement, it is possible that an error message will appear if a limit value is exceeded. If this is the case, the entire process is cancelled. This can occur with very dry or very wet wood, for example. Another possible cause of error can be too low a bulk density during capacitive measurement (especially with wood fibre insulation materials).

INFORMATION

In ResCap mode, it should be noted that moisture near the surface has a greater influence on the measurement result during non-destructive measurement than moisture in the core of the wood. Therefore, the best result is obtained when the moisture in the wood is equalised.

To prevent the influence of the resistance electrode and the measuring cable on the non-destructive measurement, the resistance electrode should always be removed from the wood and the measuring cable disconnected from the measuring device. If the wood moisture content deviates significantly from the adjustment point (> 10% difference to the adjustment point), the precision of the measurements decreases. However, a generalised statement is still possible. Areas of knots and twists, as well as bark or cambium, must be avoided during non-destructive measurement.

12 Installation of the PC-Software GANN Dialog Pro

The system requirements for the PC software GANN Dialog Pro are as follows:

- Operating system Windows 7 / Windows 8 / Windows 10 / Windows 11
- 2 GB free hard disk space
- 4 GB RAM memory
- USB-port
- Minimum screen resolution 1280 x 800 (1920 x 1080 is recommended)
- Internet connection for software downloads, updates and upgrades

The PC software GANN Dialog Pro is available for download free of charge at the following link:

http://download-ota.gann.de/dlg

Detail information about the PC software GANN Dialog Pro can be found in the associated user manual.

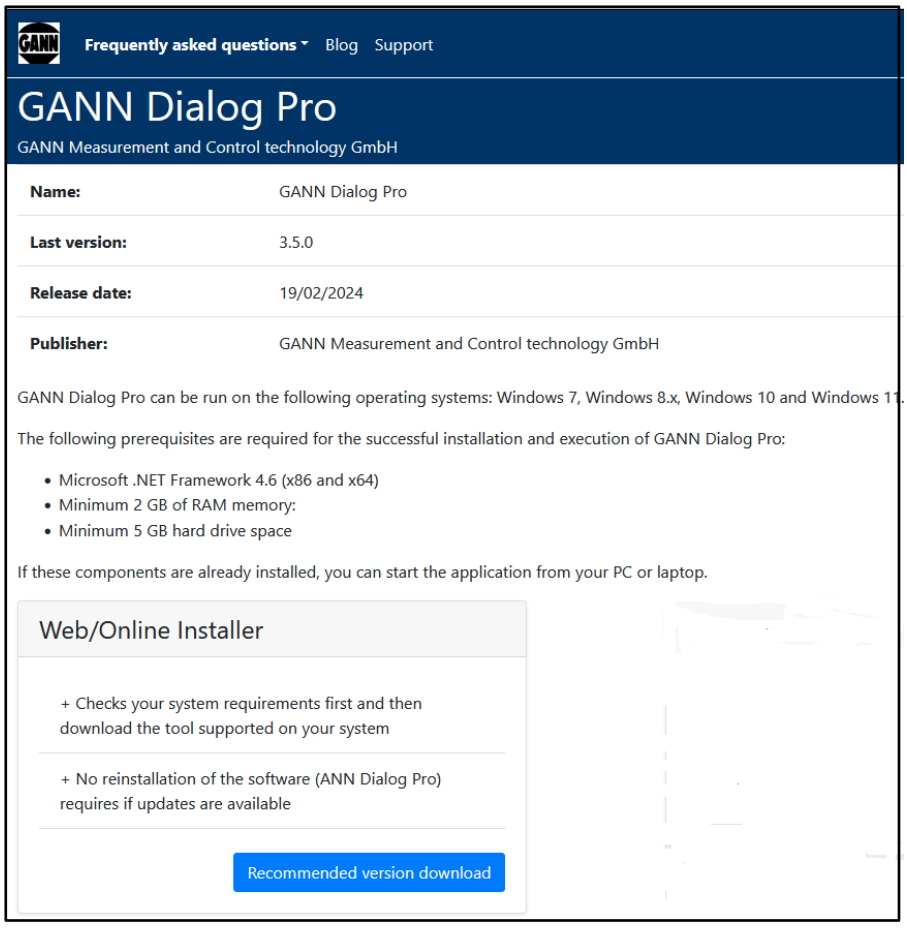


Figure_12_1: Download of the PC software GANN Dialog Pro

If you click on the "Download recommended version" button, you will be asked whether you want to download the software. Confirm this with "Save file" to start the download. Perform the installation steps of setup.exe.

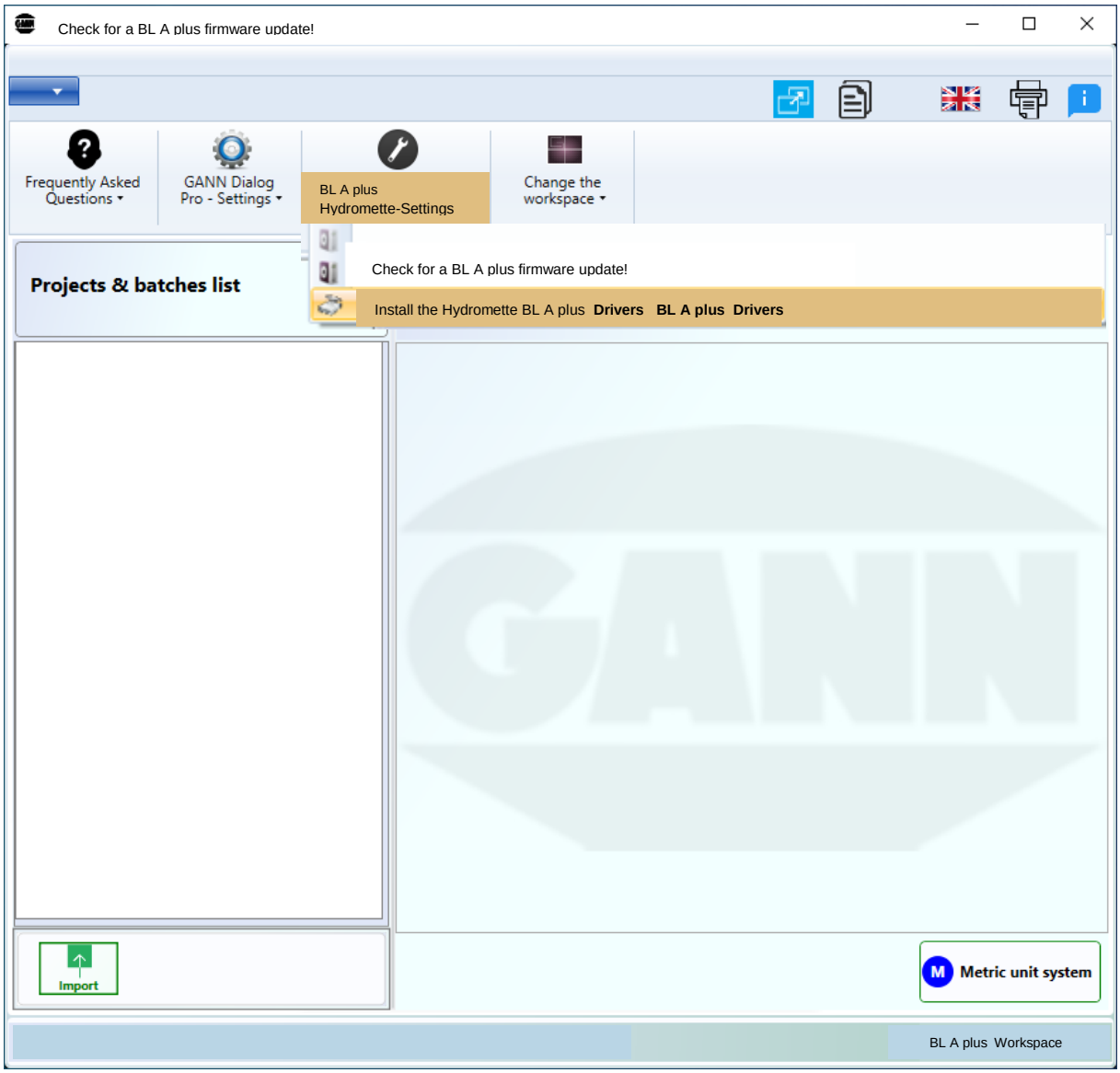


Figure_12_2: Download device drivers of the Hydromette BL A plus

To download the device drivers, the working range of the desired Hydromette must first be selected in the menu item "Select working range".

13 USB Communication with a PC

The software "GANN Dialog Pro" must be installed before the Hydromette BL A plus is connected to a PC (see chapter 12, Figure 12_1). GANN Dialog Pro includes the associated device drivers, which must also be installed (see chapter 12, Figure 12_2).

If the Hydromette is connected to a PC with a Windows operating system when it is switched off, the Hydromette starts in USB mode. No measurements can be performed during the communication with the PC. The GANN Dialog Pro software now provides the possibility to update the firmware of the Hydromette BL A plus via the Internet. It can also be used to transfer saved measured values. After disconnecting the USB cable, the Hydromette remains in USB mode. The Hydromette will only restart in standard mode after it has been switched off and switched on again.

The USB connection must not be disconnected during the communication with the PC!

INFORMATION

If the connection is disconnected during a firmware update, the Hydromette BL A plus can no longer be started. In this case, the problem can be solved by reconnecting to a PC and installing the firmware. If it is not possible to install firmware on the device after several attempts, GANN Support must be contacted.

Figure 13-1: USB data transfer

14 Application Notes

14.1 Comparative Measurement or Reference Measurement

With this type of measurement, almost all (set) building materials or mixed materials or mixed structures can be measured comparatively. It is important that these measurements are only carried out on the same materials or structures.

A deliberately dry spot must be determined on the structure to be measured. Select up to 5 measuring points within an imaginary square with a side length of approx. 20 cm. A dry sample of material with minimum dimensions of 20x20x5 cm can also be used as a reference. When measuring using a sample piece, it is important that this measurement is carried out on a non-conductive surface (e.g. polystyrene). The mean value is now to be calculated from these up to 5 measured values. This forms the reference value for the dry condition of the material or structure. Larger areas can thus be analysed using increased display values, e.g. with regard to the maximum moisture or the extent of moisture damage, and a two-dimensional moisture profile can be created. Drying progress can also be checked and observed by repeating measurements at defined measuring points.

When assessing the display values using the **capacitive measuring method**, it should be noted that metal in the substrate (iron armouring, cables, pipes, plaster rails, etc.) can lead to an increase in the measured value depending on the overlap height. Furthermore, it must be ensured that the minimum distances of 8–10 cm to corners, angles and edges are observed. Measurements in drilled holes or mortises are always incorrect measurements and cannot be used for assessment. Please note that digit measurements taken with devices with a measuring range of 0–100 digits and devices with a measuring range of 0–200 digits are not comparable.

When assessing the display values using the **resistance-based measuring method**, it is essential that you use suitable means to ensure that there are **no** electrical cables, water pipes or other supply lines in this location **before** drilling holes for probes or before knocking electrode pins into walls, ceilings, floors, etc.

INFORMATION

Digit readings obtained using the resistance-based measurement methods are not comparable with digit readings obtained using the capacitive measurement method.
Digit values are non-dimensional measured values and no real humidity values in per cent (%)! For this reason, the measured values are displayed in digits WITHOUT %!

14.2 General Information on Wood Moisture Measurement

The wood moisture in the GANN Hydromettes® is displayed in per cent by weight (wt.-%) in relation to absolutely dry wood (bone-dry).

If wood is stored for extended periods in a given climate it assumes a moisture content corresponding to this climate, which is also termed equilibrium moisture or **equilibrium wood moisture** (see chapter 16.2). When the equilibrium moisture is reached the wood does not give off or absorb any further moisture for constant ambient climatic conditions. The wood moisture equilibrium in the winter months is approx. 6.0% to 7.5% wood moisture (corresponds to 30–40% rel. humidity and 20-25 °C) and in the summer months approx. 10.5% to 13.0% (corresponds to 60–70% rel. humidity and 25 °C).

Wood shrinks when it gives off moisture to the surrounding air below the fibre saturation range. In contrast, wood swells when it absorbs moisture from the surrounding air below the fibre saturation range.

14.3 Notes on resistance-based Measuring Wood Moisture

The GANN Hydromettes works by measuring electrical resistance or conductivity, a principle which has been well-known for many years. This process is based on the fact that electrical resistance is highly dependent on the amount of moisture in the wood. The conductivity of oven-dried wood is very low, or the resistance is so high that no current worth mentioning can flow. The more water that is present, the greater the conductivity of the wood, or the lower the electrical resistance.

Above the fibre saturation point (from approx. 30% wood moisture), the measurement loses accuracy as the wood moisture increase, depending on the type of wood, bulk density and wood temperature. At low wood moisture levels below 10% or at low air humidity levels, **static electricity** with high voltage can build up, favoured by external circumstances (friction during material transport, high insulation value of the surrounding area), which can lead to strong fluctuations in measured values. The operator of the measuring instrument can also unintentionally contribute to the build-up of static charge from the users clothing. A significant improvement can be achieved by ensuring the operator and the measuring instrument remain completely still during the measuring process and by earthing (by touching conducting metal, water or heating pipes, etc.).

In order to achieve the qualitatively best possible measurement results, the wood used for the sample should be measured at multiple points. For this purpose, the electrode pins must be pressed or hammered in at right angles to the fibre direction up to at least 1/4 and at most 1/3 of the total wood thickness. To avoid measurement errors and the risk of the measuring pins breaking, the fastenings of the electrode pins must always be tightened properly and the area between the pin holders must be kept clean.

With uninsulated pins, the measured value is formed at the wettest point (the driven in / pressed-in electrode pins). If the moisture distribution in the wood is homogeneous, this means measuring the entire depth between the driven in / pressed-in pins.

Please note that:

- in order to determine any increased core moisture, the electrode pins must be driven in approx. 1/3 of the entire wood thickness.
- particularly in the case of moisture ingress from outside. e.g. rain or condensation, only the increased surface moisture is measured, regardless of the penetration depth.

The **temperature of the wood to be measured** has a major impact on the electrical wood moisture measurement. The electrical resistance of wood changes not only with the water content, but also with the temperature. Assuming a constant water content, the resistance decreases with increasing temperature, whereas decreasing temperature results in an increase. This temperature dependence is not constant but increases with increasing wood moisture.

It is not possible to measure frozen wood above 20 % moisture content.

Simple wood moisture measuring instruments are generally designed for a wood temperature of 20°C, so that if there are deviations from this temperature value, the display no longer corresponds to the actual wood moisture. At temperatures < 20°C the wood moisture values displayed are too low, at temperatures > 20°C they are too high. It is therefore necessary to correct the values obtained using an appropriate correction table. Various GANN Hydromettes® are already equipped with such temperature compensation, i.e. the wood temperature can be set directly on the measuring instrument and is automatically taken into account in the wood moisture display. For measuring instruments that do not have such **temperature compensation**, you can roughly calculate a measured value deviation of approx. 1 % wood moisture for every 10°C deviation from 20°C, provided the wood is dry. In addition, the GANN Hydromettes® have a wood temperature compensation table in the appendix of the operating instructions.

14.3.1 Test Adapter for resistance-based Wood Moisture Measurement

The test adapter for checking the wood moisture measuring section, available under order no. 31006070, can be used to check the functionality of the device and any existing accessories such as the MK 8 measuring cable or the M 18, M 19 and M 20 electrodes.

Depending on the device used, the measuring pins of the instrument must be held directly to the sockets of the test adapter or the device must be connected to the MK 8 measuring cable and the 4 mm plugs of the cable plugged into the sockets of the test adapter. If an electrode is also to be tested, connect the cable to the electrode and hold the pins of the electrode to the sockets of the test adapter.

Select the (material) setting on the measuring instrument that corresponds to the imprint on the test adapter or the description in the operating instructions for the test adapter. No active sensor may be connected.

14.4 Notes on capacitive Wood Moisture Measurement

Non-destructive wood moisture measurement is based on determining the electrical capacitance as a function of the dielectric constant of the object being measured. During the measurement, water molecules are polarised by applying an electric field. The dielectric constant of water is very high compared to wood and is therefore the main factor in the measurement result.

The bulk density of the wood has a measurable influence on the measured variable. With a higher bulk density, a higher dielectric constant can be expected. It is known that the bulk density is sometimes subject to considerable fluctuations, even within the same type of wood, but these are incorporated linearly into the measurement result. The devices using this measuring method therefore have correction options for different bulk densities. This categorisation is based on the classification of the respective type of wood according to the average gross density

14.5 Using the Hydromette BL A plus – Resistive

When measuring wood moisture, the two measuring pins of the Hydromette must be pushed / hammered into the wood to be measured at right angles to the fibre direction. When removing them, light prying movements can be used at right angles to the grain to loosen the pins. Please refer also to the notes on wood moisture measurement in Sections 14.2 and 14.3. A wood type table can be found in the appendix.

Figure 14.1: Wood moisture measurement – perpendicular to direction of fibres

INFORMATION

For a reliable measurement result, the measurement button must be pressed for at least two seconds. If the material is very dry, the measuring button must be pressed for up to eight seconds.

14.5.1 M 20 Drive-in Electrode

The M 20 drive-in electrode is made of impact-resistant plastic and is suitable for measuring wood thicknesses of up to 50 mm. When the drive-in electrode M 20 is first delivered, 10 replacement pins of 16 and 23 mm length are included in the delivery.

The two electrode pins of the drive-in electrode must be pressed or hammered into the wood to be measured at right angles to the fibre direction. When removing them, light prying movements can be used at right angles to the grain to loosen the pins.

To change the electrode pins, the coupling nut must be unscrewed. The pins can then be simply replaced. Where possible, the coupling nuts should be tightened before beginning a measurement using a spanner (WAF 12) or pliers. Loose electrode pins tend to break more easily and cause unstable measured values.

If thicker wood is to be measured, the electrode pins can be replaced with a suitably longer version. With increasing tip length, however, increased danger of breakage or bending (particularly when pulling out) must be expected. It is therefore recommended to use the M 18 ram-in electrode for thicker or particularly hard woods.

With uninsulated pins, the measured value is formed at the wettest point (the driven in electrode pins). If the moisture distribution in the wood is homogeneous, this means measuring the entire depth between the driven-in pins.

INFORMATION

Please note that:

-- In order to determine any increased core moisture, the electrode pins must be driven in approx. 1/3 of the entire wood thickness.

- Particularly in the case of moisture ingress from outside, e.g. rain or condensation, only the increased surface moisture is measured, regardless of the penetration depth.

14.5.2 M 20-HW 200/300 Stick-in Electrode Pair

If the hex nuts with standard electrode pins on the M 20 electrode are removed, they can be replaced with the M 20-HW electrode pins. These must be fastened tightly!

For measurements in shavings and wood wool, it is advisable to compact the material to be measured a little. To do so, wood shavings should be pressed together with a weight of approx. 5 kg. No compression is necessary for balls of wood wool.

14.5.3 M 20-OF 15 Surface Measuring Caps

The surface measuring cap pair M 20-OF 15 is used in conjunction with the M 20 electrode for resistance-based measurement of moisture on surfaces without damaging the material being measured. In the area of wood moisture, it can be used to measure workpieces that have already been processed or to measure veneers or multi-layer parquet / multi-layer planks. Before measuring,

the two hexagon nuts on the M 20 electrode must be unscrewed and replaced with the surface measuring caps. For measurement, the two contact surfaces must be pressed onto the workpiece to be measured at right angles to the fibre direction. It is important to ensure that the elastic transducers are pressed firmly onto the surface but that the metal holders do NOT touch the material to be measured (contact pressure approx. 3 kg). The measuring depth is approx. 2–5 mm, therefore several veneer layers must be placed on top of each other, especially when measuring veneers.

Surface measurements should only be made with wood moisture levels under 30 %!

When measuring stacks of veneer, to expose the measuring point, the veneer is lifted and not pulled over the remaining stack (avoid friction: electrostatic charge!).

Any wood particles adhering to the measuring surface must be regularly removed. If the elastic, plastic measurement sensors are damaged, they can be reordered (no. 31004316) and glued on using standard cyanate-based instant adhesive.

14.5.4 M 20-DS 16 und M 20-DS 16-i Conversion Kit

The M 20-DS 16 conversion kit is used to measure the moisture content of wood up to 30 mm thick. The particularly thin pins (1.6 mm [Ø]) leave barely visible puncture marks in the material (e.g. skirting boards or veneers).

The M 20-DS 16-i conversion kit reduces the impact of surface moisture during measurement. If other electrode nuts are used, the measured values can be falsified by surface contact (e.g. the measuring pins are driven in too deeply). The insulated electrode nuts are also very suitable for measuring wood fibre insulation boards.

To use a conversion kit, first unscrew the coupling nuts of the electrode with standard electrode pins. The hexagon nuts and matching pins can then be easily replaced. Where possible, the coupling nuts should be tightened before beginning a measurement using a spanner (WAF 12) or pliers. Loose electrode pins tend to break more easily and cause unstable measured values.

14.5.5 M 19 Stick-in Electrode

The stick-in electrode M 19 is made of impact-resistant plastic and is suitable for measuring finished thermal insulation composite systems (e.g. wood fibre insulation materials). The initial delivery of the stick-in electrode M 19 includes 10 Teflon-insulated electrode pins, each 60 mm long.

To change the electrode pins, the coupling nut must be unscrewed. The pins can then be simply replaced. Where possible, the coupling nuts should be tightened before beginning a measurement using a spanner (WAF 12) or pliers. Loose electrode pins tend to break more easily and cause unstable measured values.

The stick-in electrode M 19 can be pushed through the plaster into the external thermal insulation composite system (using a hammer if necessary). To protect the Teflon coating, you can also pre-drill with a drill bit (2.5 mm [Ø]) if necessary.

INFORMATION

Do not completely drive in the electrode pins! To rule out the effects of surface moisture and avoid measurement errors, there should be a gap of at least 1–2 mm between the plaster surface and the hexagon nut.

The electrode support made of special plastic can be reordered as a spare part (order no. 31003509).

14.5.6 M 18 Ram-in Electrode

The ram-in electrode M 18 is made of corrosion-resistant V2A steel and is suitable for (depth) measurements in up to 180 mm thick or hard wood, wood fibre insulation materials and wood composites. When first delivered, the ram-in electrode M 18 is supplied with 10 replacement pins of 40 and 60 mm length (not insulated).

The two electrode pins of the ram-in electrode must be driven to the required measuring depth crosswise to the grain direction with a slide hammer. Pulling out the electrode pins is also done with the slide hammer with the impact direction upwards.

To change the electrode pins, the coupling nut must be unscrewed. The pins can then be simply replaced. Where possible, the coupling nuts should be tightened before beginning a measurement using a spanner (WAF 12) or pliers. Loose electrode pins tend to break more easily and cause unstable measured values.

With uninsulated pins, the measured value is formed at the wettest point (the driven in electrode pins). If the moisture distribution in the wood is homogeneous, this means measuring the entire depth between the driven-in pins.

INFORMATION

Please note that:

- In order to determine any increased core moisture, the electrode pins must be driven in approx. 1/3 of the entire wood thickness.

- Particularly in the case of moisture ingress from outside, e.g. rain or condensation, only the increased surface moisture is measured, regardless of the penetration depth.

Teflon-insulated electrode pins in lengths of 45 mm (order no. 31004550) or 60 mm (order no. 31004500) are available as special accessories for the M 18 ram-in electrode, each containing 10 pieces. These are suitable for measuring wood thicknesses of up to approx. 120 mm and enable precise zone and layer measurements in wood with widely varying moisture distribution (e.g. surface moisture, water pockets).

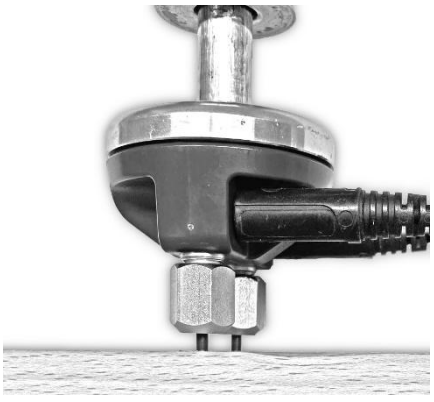


Figure 14-2: Use of Teflon-insulated pins

INFORMATION

Do not completely drive in the electrode pins! To rule out the effects of surface moisture and avoid measurement errors, there should be a gap of at least 1–2 mm between the wood surface and the hexagon nut.

The electrode support made of special plastic can be reordered as a spare part (order no. 31003509).

14.6 Using the Hydromette BL A plus - Capacitive

The active measuring electrode is located in the upper area of the back of the device. To prevent the hand of the user from influencing the measuring process, the device may only be held in the lower area of the housing both during measurement and during the function check.

The device must be placed completely on the wood to be measured. During the measuring process, the hand of the user must also be placed on the wood to be measured. Please also observe the instructions for measuring wood moisture in chapters 14.2 and 14.4.

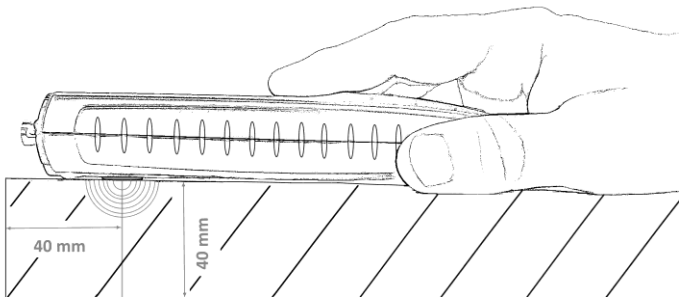


Figure 14-3: Correct handling for capacitive measurement

INFORMATION

Under no circumstances should the device be touched near the active measuring electrode during measurement or inspection.

A new measurement is started by pressing the **"M"** button *(> 2 seconds).*

Do not measure in the area of branches and twists or through bark or cambium.

Measurements with a capacitive wood moisture meter must not be taken on a conductive surface (e.g. metal).

The penetration depth of the capacitive measuring field is approx. 20 mm. This allows the non-destructive measurement of wood thicknesses of up to 40 mm. For wood thicknesses of less than 40 mm (e.g. veneers, mouldings, etc.), either place several layers on top of each other until a minimum thickness of 40 mm is reached, or select the option for thin material thicknesses in the menu (material ID: 93). If material ID 93 is selected, there must be air or e.g. Styrodur below the measuring point.

For correct measurement, please also refer to the chapters "Material selection", "Fine adjustment" (only non-destructive measurement) and the corresponding "Wood type table for non-destructive measurement" in the appendix.

15 Accessories

Wood moisture test adapter (order no. 31006070)

Test adapter for wood moisture, for check of wood moisture measuring instruments with accessories.

M 20 drive-in electrode (order no. 31003300)

The drive-in electrode M 20 is made of impact-resistant plastic and is suitable for measuring wood thicknesses of up to 50 mm (e.g. sawn timber, chipboard, wood fibreboard). When the drive-in electrode M 20 is first delivered, 10 replacement pins of 16 and 23 mm length are included in the delivery.

Reorder electrode pins, packaging unit 100 pieces:

- 16 mm long (order no. 31004610) with 10 mm penetration depth

- 23 mm long (order no. 31004620) with 17 mm penetration depth

Reorder cap nut, packaging unit 1 piece:

- order no. 31003510

M 20-HW 200/300 stick-in electrode pair

The stick-in electrode pair is suitable for measuring in chips, wood wool and bulk materials. The stick-in electrodes can only be used in conjunction with the M 20 drive-in electrode.

The electrode pins are available in two lengths:

- length 200 mm x Ø 4 mm (order no. 31004350)

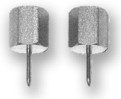
- length 300 mm x Ø 4 mm (order no. 31004355)

M 20-OF 15 surface measuring caps (order-no. 31004315)

The surface measuring cap pair is suitable for moisture measurements on surfaces without damaging the material to be measured in conjunction with the M 20 electrode (e.g. veneers, solid or multi-layer parquet). Depth effect 2–5 mm.

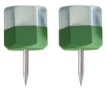
Reorder plastic transducer, packaging unit 4 pieces:

- order no. 31004316



M 20-DS 16 conversion kit (order no. 31004310) and **M 20-DS 16-I conversion kit** (order no. 31004311) in conjunction with drive-in electrode M 20.

The M 20-DS 16 conversion kit is used to measure the moisture content of wood up to 30 mm thick. The particularly thin pins (1.6 mm [Ø]) leave barely visible puncture marks in the material (e.g. skirting boards or veneers).



The M 20-DS 16-i conversion kit reduces the impact of surface moisture during measurement. The insulated electrode nuts are also very suitable for measuring wood fibre insulation boards.

M 19 stick-in electrode (order no. 31003400)

The stick-in electrode M 19 is made of impact-resistant plastic and is suitable for measuring finished thermal insulation composite systems (e.g. wood fibre insulation materials).

The initial delivery of the stick-in electrode M 19 includes 10 Teflon-insulated electrode pins, each 60 mm long.

Reorder electrode pins with insulated stem, packaging unit 10 piece:

- 45 mm long (order no. 31004550) with 25 mm penetration depth

- 60 mm long (order no. 31004500) with 40 mm penetration depth

Reorder cap nut, packaging unit 1 piece:

- order no. 31003510

Reorder electrode holder, packaging unit 1 piece:

- order no. 31003509

Ramm-Elektrode M 18 ram-in electrode (order-no. 31003500)

The ram-in electrode M 18 is made of corrosion-resistant V2A steel and is suitable for (depth) measurements in up to 180 mm thick or hard wood, wood fibre insulation materials and wood composites.

When first delivered, the ram-in electrode M 18 is supplied with 10 replacement pins of 40 and 60 mm length (not insulated).

Reorder electrode pins (not insulated), packaging unit 100 pieces:

- 40 mm long (order no. 31004640) with 34 mm penetration depth

- 60 mm long (order no. 31004660) with 54 mm penetration depth

Recorder electrode pins with insulated stem, packaging unit 10 pieces:

- 45 mm long (order no. 31004550) with 25 mm penetration depth

- 60 mm long (order no. 31004500) with 40 mm penetration depth

Reorder cap nut, packaging unit 1 piece:

- order no. 31003510

Reorder electrode holder, packaging unit 1 piece:

- order no. 31003509

MK 8 measuring cable - length 1 m (order no. 31006210)

For connection of electrodes for resistance measurement

Connection cable MK 26 – Length: 1.80 m (order no. 31016920)

For device connection with a USB port.

16 Appendix

16.1 Material-Table

Material designation	Material ID	Material designation	Material ID
Type 1	1	OSB3 / OSB4	541
Type 2	2	OSB flame retardant	542
Type 3	3	HFD / 110 D	543
Type 4	4	HFD / 140 D	544
Type 5	5	HFD / 135-170 W	545
Type 6	6	HFD / 180-200 D	546
Type 7	7	HFD / 220-240 W	547
Larch	212	HFD / 250-270 W	548
Pine	207	LVL 21 mm	549
KLB Spruce	373	LVL 39 mm	550
Douglas fir	158	LVL 69 mm	551

OSB: Oriented Strand Board
HFD: Wood fibre insulation materials (listed according to bulk density and manufacturing process):
D=Dry / W=Wet)
LVL: Laminated Veneer Lumber

16.2 Equilibrium Wood Moisture Table

Wood Moisture Equilibrium					
	Air temperature in °C				
	10 °C	**15 °C**	**20 °C**	**25 °C**	**30 °C**
Relative air humidity	**Wood moisture content**				
20%	4.70%	4.70%	4.60%	4.40%	4.30%
30%	6.30%	6.20%	6.10%	6.00%	5.90%
40%	7.90%	7.80%	7.70%	7.50%	7.50%
50%	9.40%	9.30%	9.20%	9.00%	9.00%
60%	11.10%	11.00%	10.80%	10.60%	10.50%
70%	13.30%	13.20%	13.00%	12.80%	12.60%
80%	16.20%	16.30%	16.00%	15.80%	15.60%
90%	21.20%	21.20%	20.60%	20.30%	20.10%

16.3 Wood Temperature Compensation Table

Wood temperature in °C	Measured values													
	4	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**
-10	7.0	8.5	9.5	11.0	12.0	13.5	14.5	16.0	17.0	18.5	19.5	20.5	22.0	23.0
- 5	6.5	7.5	9.0	10.0	11.0	12.5	13.5	15.0	16.0	17.5	18.5	19.5	20.5	22.0
0	6.0	7.0	8.5	9.5	10.5	11.5	13.0	14.0	15.0	16.5	17.5	18.5	19.5	21.0
+ 5	5.5	6.5	7.5	8.5	9.5	11.0	12.0	13.0	14.0	15.0	16.5	17.5	18.5	20.0
+10	5.0	6.0	7.0	8.0	9.0	10.5	11.5	12.0	13.0	14.0	15.5	16.5	17.5	19.0
+15	4.5	5.5	6.5	7.5	8.5	9.5	10.5	11.5	12.5	13.5	14.5	15.5	16.5	18.0
+20	4.0	5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	14.0	15.0	16.0	17.0
+25	3.5	4.5	5.5	6.5	7.5	8.5	9.5	10.5	11.5	12.5	13.5	14.5	15.5	16.5
+30	3.0	4.0	5.0	6.0	7.0	8.0	9.0	9.5	10.5	11.5	12.5	13.5	14.5	15.5
+35	2.5	3.5	4.5	5.5	6.5	7.5	8.5	9.0	10.0	11.0	12.0	13.0	14.0	15.0
+40	2.5	3.5	4.0	5.0	6.0	7.0	7.5	8.5	9.5	10.5	11.5	12.0	13.0	14.0
+45	2.0	3.0	3.5	4.5	5.5	6.5	7.5	8.0	9.0	10.0	11.0	11.5	12.5	13.0
+50	2.0	2.5	3.0	4.0	5.0	6.0	7.0	7.5	8.5	9.5	10.5	11.0	12.0	12.5
+55	1.5	2.5	3.0	4.0	5.0	5.5	6.5	7.0	8.0	9.0	9.5	10.5	11.5	12.0
+60	1.0	2.0	2.5	3.5	4.5	5.0	6.0	6.5	7.5	8.5	9.0	10.0	10.5	11.5
	real wood moisture in %													

Wood temperature in °C	Measured values												
	18	**19**	**20**	**21**	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**
-10	24.5	25.5	27.0	28.0	29.5	30.5	32.0	33.0	34.5	35.5	36.5	38.0	39.0
- 5	23.0	24.0	25.5	26.5	28.0	29.0	30.5	31.5	32.5	34.0	35.0	36.0	37.0
0	22.0	23.0	24.5	25.5	26.5	27.5	29.0	30.0	31.0	32.5	33.5	34.5	35.5
+ 5	20.5	21.5	23.0	24.0	25.0	26.0	27.5	28.5	29.5	31.0	32.0	33.0	34.0
+10	19.5	20.5	22.0	23.0	24.0	25.0	26.0	27.0	28.0	29.5	30.5	31.5	32.5
+15	19.0	20.0	21.0	22.0	23.0	24.0	25.0	26.0	27.0	28.0	29.0	30.0	31.0
+20	18.0	19.0	20.0	21.0	22.0	23.0	24.0	25.0	26.0	27.0	28.0	29.0	30.0
+25	17.0	18.0	19.0	20.0	21.0	22.0	23.0	24.0	25.0	26.0	27.0	27.5	29.0
+30	16.5	17.0	18.0	19.0	20.0	21.0	22.0	23.0	24.0	25.0	25.5	26.5	27.5
+35	16.0	16.5	17.5	18.0	19.0	20.0	21.0	22.0	23.0	24.0	24.5	25.5	26.5
+40	15.0	15.5	16.5	17.5	18.5	19.5	20.0	21.0	22.0	23.0	23.5	24.5	25.5
+45	14.0	15.0	15.5	16.5	17.5	18.5	19.0	20.0	21.0	22.0	22.5	23.5	24.5
+50	13.5	14.5	15.0	16.0	17.0	18.0	18.5	19.5	20.5	21.0	22.0	22.5	23.5
+55	13.0	13.5	14.5	15.0	16.0	17.0	17.5	18.5	19.5	20.0	21.0	21.5	22.5
+60	12.5	13.0	14.0	14.5	15.5	16.5	17.0	18.0	19.0	19.5	20.5	21.0	22.0
	real wood moisture in %												

16.4 Wood Type Table for non-destructive Measurement

Abachi 5.0	Ebano africano 9.0	Nussbaum, franz 7.0
Abedul..... 6.5	Ebène d'Afrique 9.0	Nyankom.....7.0
Abete del Canada..... 5.5	Ebenholz..... 9.0	Oak.....7.5
Abetina rosso..... 5.0	Ebony, African..... 9.0	Oak, White 8.0
Aboudikro 8.0	Eiche..... 7.5	Obeche.....5.0
Abura 7.0	Eiche, weiß amerik..... 8.0	Palo brasil.....8.5
Acero bianco..... 6.0	Epicéa..... 5.0	Pernambouc.....8.5
African Walnut..... 6.5	Epicéa du Nord..... 5.0	Pernambuc.....8.5
Ahorn 6.0	Erable 6.0	Pezzo 5.0
Alder 6.5	Erle 6.5	Pin à lensens 7.0
Alno..... 6.5	Esche 8.0	Pin maritime.....5.0
Alvies..... 4.5	European Maple..... 6.0	Pin sylvestre 5.5
Ameneiro 6.5	Faggio..... 8.0	Pinie 5.0
American Maple 8.5	Fichte 5.0	Pino albar 5.5
Arce..... 6.0	Fichte, nordisch..... 5.0	Pino da incense 7.0
Ash 8.0	Framiré..... 7.0	Pino silvestre.....5.5
Aulne commun..... 6.5	Frassino 8.0	Plum Tree 7.0
Ayous 5.0	Frêne 8.0	Prugno.....7.0
Bahia 7.0	Fresno 8.0	Pruneaulier.....7.0
Beech 8.0	Haya 8.0	Prunier 7.0
Betulla finlandese 6.5	Hemlock 5.5	Ramin 8.0
Birch, Northern 6.5	Hêtre 8.0	Rotbuche.....8.0
Birke, nordisch 6.5	Idigbo 7.0	Rovere 7.5
Björk..... 6.5	Iroko..... 6.0	Samba 5.0
Bouleau du Nord..... 6.5	Kambala 6.0	Sapele.....8.0
Brasilholz..... 8.5	Kiefer, nordisch..... 5.5	Sapeli-Mahagoni 8.0
Brazilwood 8.5	Kirschbaum 6.0	Sapelli.....8.0
Buche 8.0	Laerk..... 6.5	Sapin de Douglas.....6.0
Carballo..... 7.5	Larch..... 6.5	Scots Pine 5.5
Carolina Pine..... 7.0	Larice..... 6.5	Seekiefer 5.0
Cedar, red 1.0	Lärche..... 6.5	Seraya, blanc.....6.5
Cembra Pine..... 4.5	Limba..... 5.5	Seraya, White.....6.5
Cerezo..... 6.0	Limbo 5.5	Sipo 6.0
Cerisier, americain 7.0	Lime..... 8.0	Swiss Pine.....4.5
Chêne..... 7.5	Linde..... 8.0	Tiglio.....8.0
Chêne, blanc 8.0	Maple 6.0	Tilleul.....8.0
Cherry 6.0	Melèze 6.5	Tilo 8.0
Cherry, American 7.0	Meranti, blanc..... 6.5	Tsuga du Canada 5.5
Ciliegio 6.0	Meranti, Dark Red..... 7.0	Utile.....6.0
Ciliegio tardive 7.0	Meranti, rouge foncé 7.0	Verzino 8.5
Cirmulo 4.5	Meranti, White..... 6.5	Walnut, European 7.0
Ciruelo comun..... 7.0	Merisier..... 6.0	Wawa 5.0
Corina..... 5.5	Niangon..... 7.0	Wenge.....9.0
Dibetou 6.5	Noce africano..... 6.5	White Afara.....5.5
Douglas Fir 6.0	Noce commune..... 7.0	Whitewood 5.0
Douglasia 6.0	Nogal..... 7.0	Zimbro.....4.5
Douglasie 6.0	Northern Pine 5.0	Zirbelkiefer.....4.5
Ebano..... 9.0	Noyer commun 7.0	Zwetschgenbaum.....7.0

16.5 General Concluding Remarks

The notes and tables in these operating instructions on permitted or normal humidity conditions in practice and the general definitions of terms have been taken from the specialist literature. No responsibility can therefore be taken by the manufacturer of the measuring device for the correctness of this information.

The conclusions to be drawn from the measurement results are related to the individual conditions and the knowledge from professional experience for each user. In cases of doubt, for example concerning the permitted moisture content in coating or screed substrates when laying floor coverings it is recommended to contact the manufacturer of the coating or floor covering and to take account of the recommendations of the trade associations/guilds.

Please note:

The instructions for use for the device and any accessories should be carefully observed, as supposed simplifications in handling often lead to measurement errors.

-Subject to technical changes- Status: March 2025

GANN MESS- U. REGELTECHNIK GMBH
70839 GERLINGEN SCHILLERSTRASSE 63 INTERNET: http//www.gann.de
Verkauf National: TELEFON 0 71 56-49 07-0 TELEFAX 0 71 56-49 07-40 E-MAIL: verkauf@gann.de
Verkauf International: TELEFON +49-71 56-49 07-0 TELEFAX +49-71 56-49 07-48 E-MAIL: sales@gann.de

17 EU Declaration of Conformity

CE

Document no. / order no.: 30011200

Product identifier: **HYDROMETTE BL A plus**

We declare that the hand-held meter and related accessory correspond with the protection requirements and if used according to their intended purpose, comply with the requirements of the directives:

☒ **2014/30/EU** **EMC Directive**

☒ **2011/65/EU** **RoHS**

Applied harmonized standards:

☒ EN 61326-1 : 2013 General EMC requirements

☒ EN IEC 63000 : 2018 Restriction of hazardous substances

This declaration is given in responsibility for:

Gann Mess- und Regeltechnik GmbH

Schillerstr. 63

70839 Gerlingen

Germany

issued by:

name: Michael Gann

Position in the company of manufacturer: Managing Director

Place / date: Gerlingen, 12 December 2024

(Legally valid signature)