MERLIN®
TECHNOLOGY

Measuring Technique - Biomass

USER MANUAL

BIOMASS MOISTURE METER
MERLIN® EVO-CHIPS

Measuring Technique

Better Business Conditions.

Design of the device

Measuring procedure

1. For a correct measurement please ensure that the device has the same temperature than the wood chips (+/-3°C). For that reason, let your EVO-CHIPS adjust to the surrounding temperature of the material for at least half an hour before measuring.

2. Switch on the device: Press the ⏻ **key for 3 seconds.**

3. Change the calibration curve: Press one time the ↻ key and then the ▲ or ▼ key. The name of the calibration curve can be seen at the head of the display.

4. Plug the probe of your EVO-CHIPS straight into the wood chips. It is not allowed to load the measuring head incorrect or drop it down!

5. **Now the display shows the water content.** Left hand the temperature of the material is displayed.

6. To save the results in the save menu press the 🖫 (▲ button). The storage was successful when the number in front of the symbol 🖫 increased. To reach the store menu please press (↻) until the 🖫 appears.

7. To name the saved results press the ✎ button.

Calibration curves

Calibration curves	Declaration	Measuring range
Wood chips	Standard wood chips	10 - 50 %
Coarse chips	Coarse wood chips	10 - 50 %
Industrial chips	Industrial wood chips	10 - 50 %
Test block	*! Only for testing the EVO-CHIPS with the test block !*	

- **Wood chips:** standard chips of wood (forest wood chips) according to standard EN 14961 class **P16, P31.5** and **P45**.
- **Coarse chips:** for coarse wood chips **P45 or P31.5 but with fewer fines.**
- **Industrial chips:** for industrial chips of wood **without barks and fines** (similar **P45 or P63**)

Definition of wood chips classes

The stated numbers refer to the particle size that goes through round gaps of the corresponding diametres (e.g. P16: 16 mm).

- **P16** minimum 75% of the bulk is between 3,15 and 16 mm
- **P31.5** minimum 75% of the bulk is between 8 and 31,5 mm
- **P45** minimum 75% of the bulk is between 8 and 45 mm
- **P63** minimum 75% of the bulk is between 8 and 63 mm

Compression of wood chips

The EVO-CHIPS is calibrated for normally compressed wood chips. If the measured wood chips are compressed to a much lesser or greater extent, this will cause measuring imprecisions. Normally compressed wood chips are defined in norm EN 15103 (determination of the bulk density).

Determination of the material reference moisture

The principle is a comparison measurement with the dehydration method according to EN14774. Take the measured sample and weigh it. Dry it out in an oven and weigh it again.

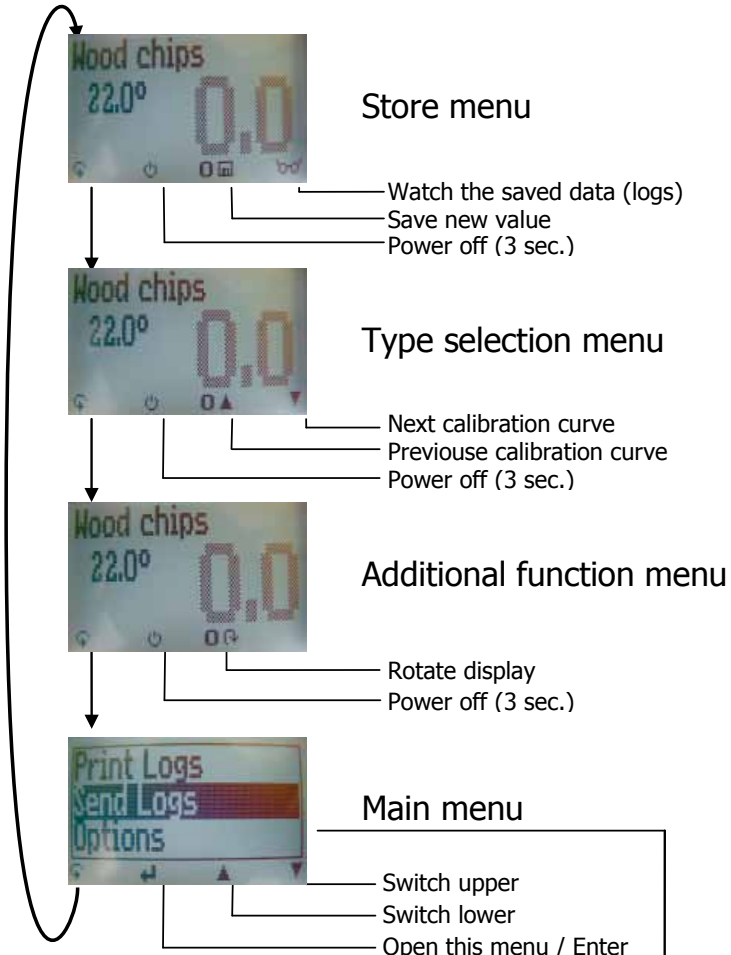
$$\%F = \frac{M_n - M_t}{M_n} \times 100$$

M_n: Mass with average moisture content

M_t : Mass of the dried sample

%F: Calculated absolute moisture

Menu level overview



Overview main menu

Edit Logs	*Options*
Manual Logs	Date / Time
Clear Logs	Log Time
Print Logs	Language
Last Log	Unlock
All Logs	°C / °F
Clear Logs	o Userlevel
Send Logs	BL On Time
Manual Logs	Auto Off Time
Clear Logs	Materialcalib.
Options	Password
Status	Reset

Keypad symbols

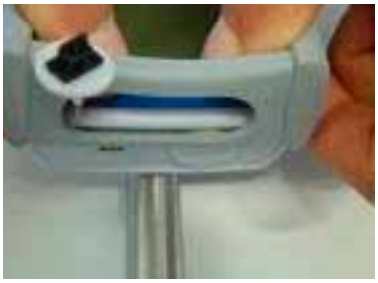
Measuring window:

- Rolling Menu
- Power ON / OFF
- Switch upper
- Switch lower
- Save
- Hold
- Watch the saved data
- Suppliers data can be added
- Rotate display

Menu:

- Enter
- Switch upper
- Switch lower
- Exit
- 0..9 Enter numbers
- A..Z Enter letters
- Next or right
- Left
- Yes
- No
- Shift
- OK OK

Changing batteries



Your new device is provided with batteries.

Please find enclosed the manual for fitting and changing of batteries:

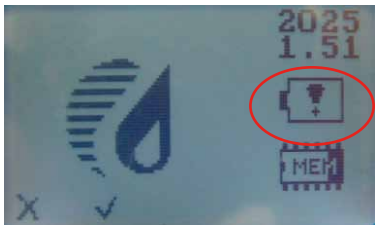
1.) At first remove the rubber protective housing. For that, hold the rubber housing at the upper side and pull it over. If your meter is provided with an optional USB port, you have to remove the protection cap before.

2.) Press with your finger onto the arrow of the battery cap and pull it back.

3.) Remove the empty batteries.

4.) Put four new batteries in the device. Make sure that the position of the battery poles is correct.

5.) Press down the batteries and close the cap.



If the battery symbol appears in the measuring window resp. if a critical charge of battery is shown in the status, the batteries have to be changed IMMEDIATELY. If you do not use your EVO-CHIPS device for a longer period, remove the batteries. For eventual resulting damages we cannot provide any warranty.

List of calibration curves

Pressing the ▲ or ▼ key in the measuring for at least 3 seconds and a list with all available sorts will appear. Select your sort by pressing ▲ or ▼ and confirm it with the ↵ key. The measurement will continue automatically.

Running the instrument

Switch on: Press the ⏻ key for 3 seconds

Set the clock: Press 3 times the ⚙ key -> Options -> Date/Time

Save measuring value: Save the measuring value by pressing the button below the 🖫 symbol. The storage was successful when the number in front of the symbol 🖫 increased. To name the saved results press the ✎ button.

Hold measuring value: At first activate the function in the menu Options -> Datalog time by choosing “Hold”. Then press the left key until H appears. Press the H key. The measuring value remains on the display until another button is pressed.

Display lighting: Press the ⏻ key; Backlight will turn off automatically after 30 seconds. Backlight will be activated by pressing any key.

Power off: Press the ⏻ key for 5 seconds; the device will be switched off when you leave the key. The device also switches off automatically when no key is pressed for 4 minutes.

Measuring range limit: If the measuring value is blinking, the valid measuring range is exceeded. In this case the accuracy will be decreasing.

Rotate display: This function rotates the

complete display. If you press the button ▲ in the additional function menu the display will rotate.

Activation of the “super user” function

2 times ↻ - *Options* – Unlock

Enter the 4-digit password by using the ▲ button (standard is the 4-digit serial number) and confirm by pressing the ↵ button.

Changing the Userlevel

Changing from advanced user to single user:

Make sure that you have activated the “super user” functions according to the instructions above. Afterwards change to the menu and choose „Options“.

In the submenu please select „o Userlevel“ (2 times ↻ - *Options* – o *Userlevel)*

Confirm by pressing the ↵ button. Now the single user is activated.

Changing from single user to advanced user:

Keep both the buttons ▲ and ▼ pressed directly after switching on the device. Your EVO-CHIPS automatically starts the main menu. Activate the the “super user” functions according to the instructions above.

Navigate to “*Options* – o *Userlevel”* and confirm by pressing the ↵ button.

Transfer saved data to the PC

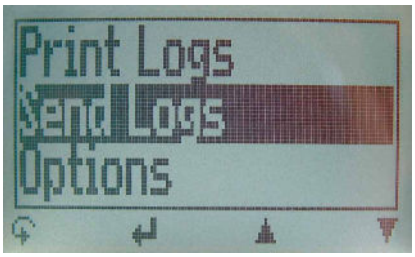
(Only possible with EVO-CHIPS USB interface module)

To send your saved logs to the PC, connect the EVO-CHIPS device to your PC using the USB cable that was delivered with your device. Carefully loose the protection cap on your EVO-CHIPS and plug in the USB mini B connector. The bigger connector has to be connected to a USB slot on your PC.

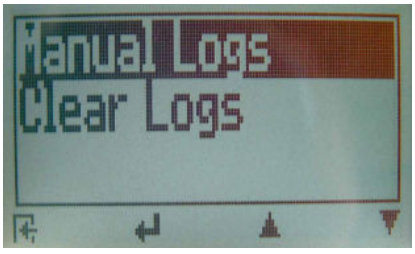
Start the LogMemorizer software on your PC and switch on your EVO-CHIPS.

The data transfer can be started on your EVO-CHIPS or on the software.

<u>Starting the data transfer on the EVO-CHIPS:</u>

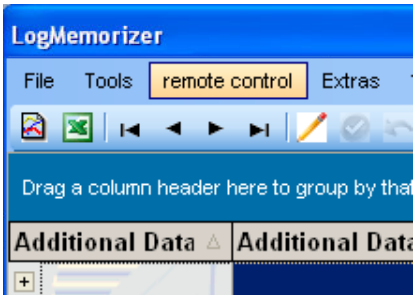


Press the ↻ key until you reach the menu (see image on the right). Then choose „Send Logs“ and confirm by pressing the ↵ key. Now choose „Manual Logs“ and confirm with ↵ again. All saved logs will be sent to your PC.



<u>Starting the data transfer on your PC:</u>

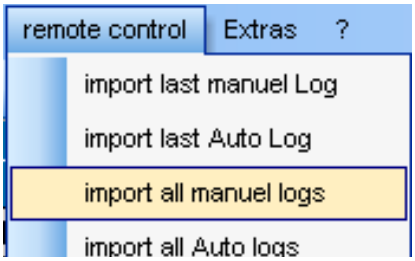
Press the button „remote control“ in the LogMemorizer software. A drop-down menu with several options opens (see image below).



For transferring the data you can select „Import last manual log“ (the last saved measuring series is transferred) or „Import all manual logs“ (all saved logs are transferred). If you click on one of these menu items, the transfer

starts immediately.

For the basic adjustments of the software please look through the instructions on the LogMemorizer CD.



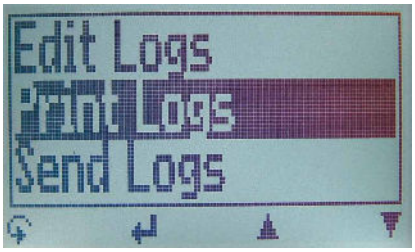
Print saved data

(Only possible with EVO-CHIPS USB interface module in combination with MERLIN thermo printer)

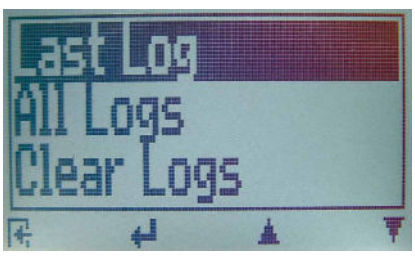
To print your saved data, connect the device to the printer using the printer cable that was delivered with your device. Carefully loose the protection cap on the EVO-CHIPS. At first plug in the side of the connector with the close plastic casing at the EVO-CHIPS. Then switch on the device.

Not till then the other side of the cable has to be plugged in at the printer. Switch on the printer by pressing ⏻. Now the green LED is blinking. If it does not blink, please change the batteries and try again.

Press the ↶ button at your EVO-CHIPS until you reach the menu (see image on the right). Choose „Print Logs“ and confirm by pressing ↵.



Now you can select if you want to print the last saved measuring series or all saved measuring series (logs).



Confirm by pressing ↵ again. The selected logs are printed out now.

To save paper, please think of clearing the data storage regularly.

Device maintenance instructions

To provide a long life of your device please does not expose it to strong mechanical loads or heat e.g. dropping it or direct sunlight exposure. Clean your device using a dry cloth. Any kind of wet cleaning damages the device.

It is not allowed to load the measuring head incorrect (stress, bending), other wise it can be broken. Plug and remove the insertion probe of your EVO-CHIPS straight into the wood chips.

The instrument is not rainproof. Keep it in dry areas. When the device isn't used for a longer period (2 months) or when the batteries are empty, they should be removed to prevent a leakage of the battery acid.

Exemption from liability

For miss-readings and wrong measurements and of this resulting damage we refuse any liability. This is a device for quick determination of moisture. The moisture depends on multiple conditions and multiple materials. Therefore we recommend a plausibility check of the measuring results. Each device includes a serial number and the guarantee stamp. If those are broken, no claims for guarantee can be made. In case of a faulty device, please contact MERLIN Technology GmbH (www.merlin-technology.com) or our dealer.

Most common reasons for miss readings

- ***Product temperature out of application range***

  Material **below 0°C** resp. **above +40°C** (32 to 104 °F) may cause faulty measurements. The storage of cold material in a warm storage area usually creates condensed water which may lead to major measuring errors.

- ***Not adjusted material under test***

  Please ensure that the device and the material under test are being stored at the same temperature (+/-3°C) before measuring. A high temperature difference has a negative effect on the stability of the measurement results.

- ***Wrong calibration curve***

  Before you measure your sample, double check the correct selection of the calibration curve.

- ***Wet or mouldy material***

- ***Frozen measuring materialWater film at the measuring head***

  After measuring wet material a water film can arise on the sensor head. This could lead to a too high result in the following measurement. After measuring wet material clean both plastic parts accurately with a dry cloth.

It is not allowed to load the measuring head incorrect (stress, bending), other wise it can be broken. Plug and remove the insertion probe of your meter straight into the wood chips. Do not move the EVO-CHIPS crosswise to the insertion direction after plugging in. Do not drop the measuring head or use it for any ulterior purposes. **A broken measuring head is no case of warranty!**

Technical data

Resolution of the display	0.5% water content 0.5°C temperature
Measuring range	10% to 50% water content
Operation temperature	0°C up to +40°C
Storage temperature	-20°C to +60°C
Temperature compensation	Automatically
Power supply	4 pcs. 1.5 Volt AA Alkaline batteries (900 measurements)
Auto Switch OFF	After app. 4 minutes
Current consumption	60mA (with light)
Display	128 x 64 matrix display, lighted
Dimensions	1155 x 75 x 45 mm
Weight	830g (including batteries)
Degree of protection	IP 40
Scope of supply	4 x 1.5Volt AA Alkaline Batteries
Options	Test block for EVO-CHIPS
	EVO-CHIPS USB data interface modul for connection to PC
	Thermo printer runs by battery (only with USB data interface)

Risk of injury by measuring head!
Keep away from children!

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MERLIN® Technology GmbH – Hannesgrub 40 – 4910 Ried im Innkreis – AUSTRIA
Tel +43 (0) 7752 71966 – Fax +43 (0) 7752 71988 – office@merlin-technology.com
merlin-technology.com