

User manual



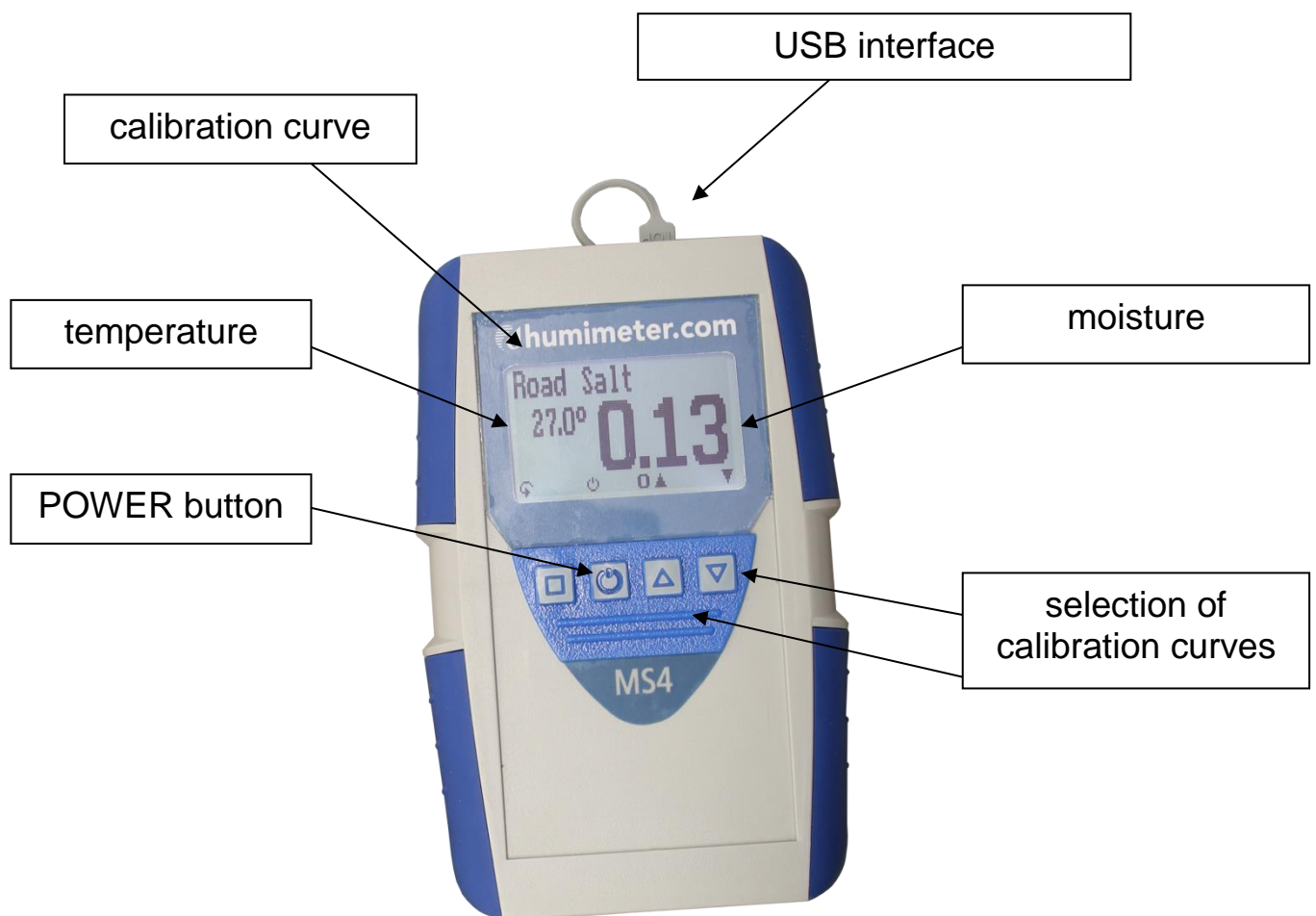
moisture meter for road salt **humimeter MS4**

Version 1.4_en
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2017

Start-up

Your humimeter MS4 moisture meter for determination of moisture of road salt is delivered with loaded accumulator and can be used immediately. Switch on the device by pressing the power button (⏻) for 3 sec. Now the display starts glowing. During the startup for a short time the serial number, the software version, the battery state and the free space on your memory are displayed. After that the humimeter MS4 is ready to use. For switching off the device, press the power button (⏻) for 3 sec. If you do not push any button for 4 minutes, the device switches off automatically.

Design of humimeter MS4

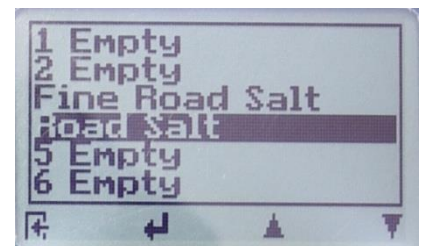
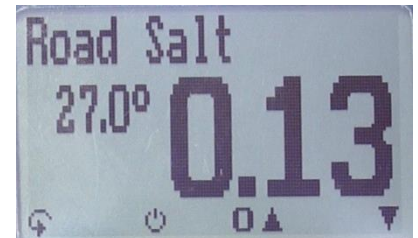


Measuring procedure

1. To ensure accurate measuring results, it is necessary that the moisture meter nearly has the same temperature than the material to measure. For that, we advise to store the moisture meter and the material to measure in the same place for at least 30 minutes before measuring.
2. Switch on the device by pressing the power button (⏻) for 3 sec.



3. Select the right calibration curve using the buttons ▲ or ▼. The name of the calibration curve is shown at the top of the display. To enter the list of calibration curves, press one of the arrow keys for 3 seconds.





4. Hold the device in one hand and press it onto the material to measure with gentle compacting pressure (4.0 kg). The contact-free temperature sensor on the back side must not be covered.



Now the display shows the water content and temperature. To get an average moisture value or to detect moist areas, just move the instrument across the material.

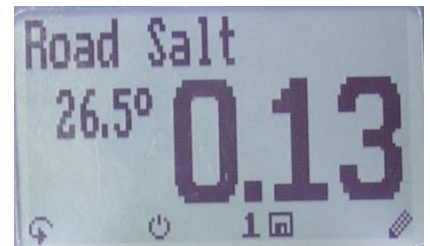
Please note:

The humimeter MS4 shows an average value of the material covered by the sensor plate, the maximum measuring depth is 30mm. Please ensure a minimum material thickness of 50mm below the sensor!

5. 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 the left (◀) button.



6. To name the saved results press the  button.



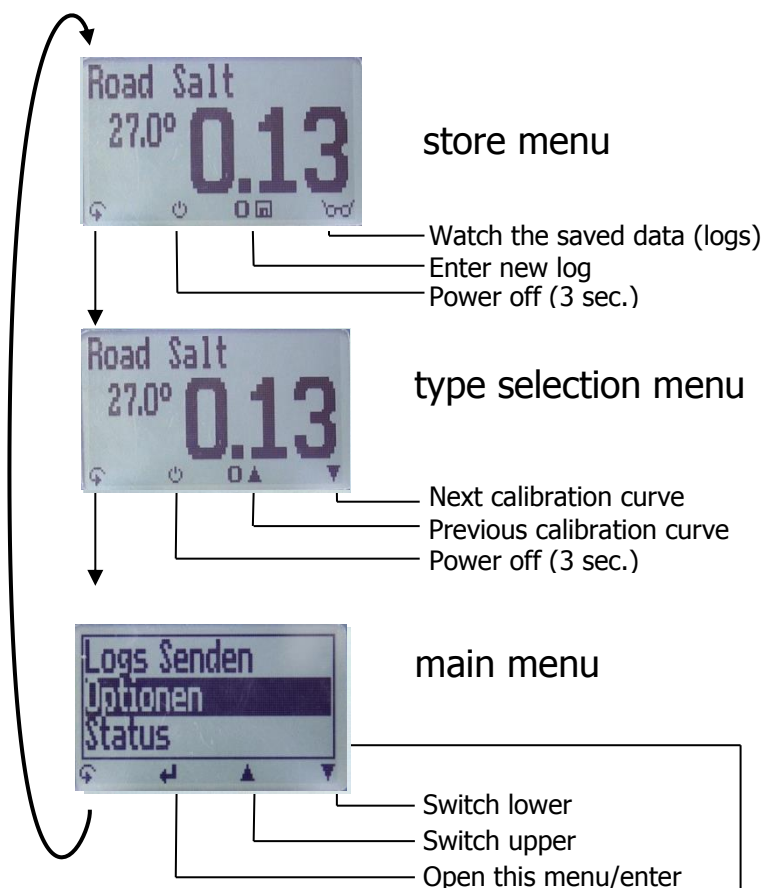
List of calibration curves

name	grain size	measuring range
1 Empty		
2 Empty		
Road Salt fine	<1,5mm	0.00 % - 3.00 %
Road Salt coarse	>1,5mm	0.00 % - 3.00 %
5 Empty		
6 Empty		
reference	For moisture meter check only!	

Road Salt fine:

Calibration curve for standard NaCl road salt (brine salt) !

Menu level overview



Overview main menu

<i>Edit Logs</i>	<i>Options</i>
Manual Logs	Date/Time
Auto Logs	Datalog Time
Clear Logs	Language
	Unlock
<i>Print Logs</i>	°C/°F
Last Logs	Userlevel
All Logs	BL ON time
Clear Logs	Auto Off time
<i>Send Logs</i>	Materialcalib.
Manual Logs	Password
Auto Logs	Reset
Clear Logs	SN.
<i>Options</i>	Logo
<i>Status</i>	Admin

Keypad symbols

Measuring window:

	Rolling Menu
	Power ON / OFF
	Switch upper
	Switch lower
	Save
	Hold
	Autolog
	Watch saved data
	Enter supplier's data

Menu:

	Enter
	Switch upper
	Switch lower
	Exit
	Enter numbers
	Enter letters
	Next or right
	Left
	Yes
	No
	Shift
	OK

Checking of calibration

The calibration of your humimeter MS4 can be checked using the proof plate in your wooden case. For this procedure, the device has to show a temperature between 18.0 and 24.0°C.

Switch on the instrument and select the calibration curve „reference“ using the arrow keys. Hold the humimeter MS4 in one hand and press it onto the grey proof plate with a compacting pressure of 4kg.




The shown measuring value should range between **17.5** and **19.0**. If the shown value is out of this range, you have to carry out a calibration (see instructions below).


Calibration

By a zero point adjustment you can correct a too high deviation at the calibration check.

For that please proceed as follows:

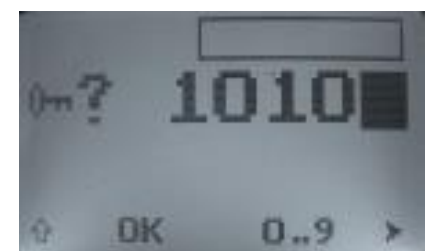
Press the left key twice to reach the menu level. Navigate to the menu item „Options“ using the arrow keys. Confirm by pressing the  button.




Select the menu item „Calibrate“ using the arrow keys and confirm by pressing .




This menu item has to be unlocked. For that you have to enter the 4-digit serial number of your humimeter MS4. You can find the serial number on the top right edge of the display a short time after switching on the instrument.



Press the third button until the black bar has reached the first digit of your serial number. After a waiting time of a few seconds the device accepts the entered digit. Now the other 3 digits have to be entered. When the 4-digit number has been entered correctly (see picture), press the  button to confirm.



Hold the humimeter MS4 in one hand up in the air and make sure that nothing stands behind the sensor plate. Then confirm the query “Calibrate?” by pressing the second button () with one finger.

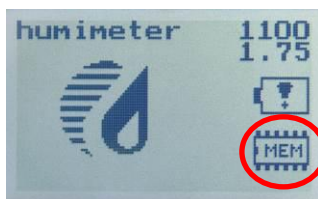
The calibration procedure will take a few seconds. During that time, the instrument has to be held up in the air and the measuring field must NOT be touched.



The device is ready when the shown picture on the right disappears automatically and the measuring window is shown again.

Battery charge








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 charged IMMEDIATELY.



Charging the batteries

Connect the provided USB cable to the device and the other end of the cable to a PC or another USB charging adapter. It takes about 6 hours to charge the completely discharged batteries. Please make sure that the **temperature during the charging process is between 0°C and 45°C**, as otherwise the batteries may be destroyed.



Operating the instrument

- Switching on: Press  for three seconds.
- Setting date and time: two times  -> Options -> date/time
- Saving: Press the  button to save the shown measuring value. To name the saved results press the  button.
- Hold: Select the menu item „Options“, then select „datalog time“. Activate the Hold function there and change to the measuring window again. When the  symbol is pressed, the shown measuring value is frozen on the display until another button is pressed.
- Display lighting: Press the  key briefly; the display lighting switches off automatically after approx. 30 seconds. The lighting is activated automatically when pressing any button.
- Switching off: Press the  key in the measuring window for 5 seconds. The instrument switches off after releasing the key. The instrument switches off automatically after approx. four minutes.
- Measuring range: If the measuring value is blinking in grey, the measuring range has been exceeded. In this case the measuring accuracy is decreasing.



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.

Device maintenance instructions

To provide a long life of your device please do 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 may damage the device.

The instrument is protected against splash water (IP64). Keep it in dry areas, don't leave it in the rain!

Transfer saved data to the PC




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

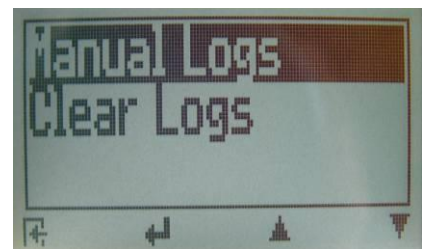
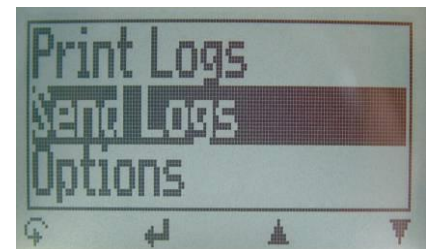
Start the LogMemorizer software on your PC and switch on your humimeter BM2.

The data transfer can be started on your humimeter or on the software.



Starting the data transfer on the humimeter:

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.



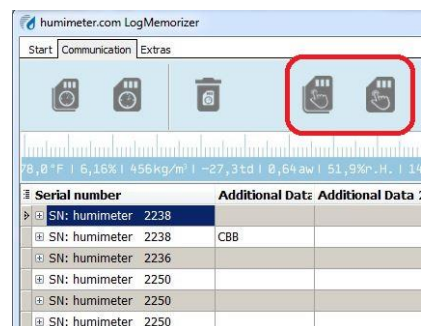
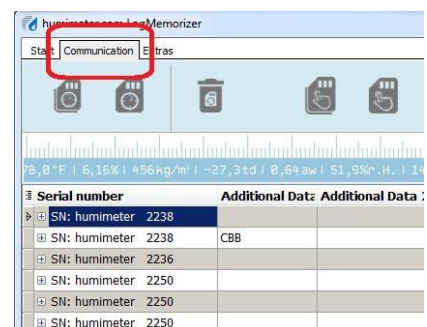
Starting the data transfer on your PC:

Press the button „communication“ in the LogMemorizer software. A menu with several options opens (see image below).

For transferring the data you can select „get last manual log“ (the last saved measuring series is transferred) or „get all manual logs“ (all saved logs are transferred).

If you click on one of these buttons, the transfer starts immediately.


For the basic adjustments of the software please look into help file. Press F1 key to change to that help files.






Print saved data (logs)

(only with optionally available printer)

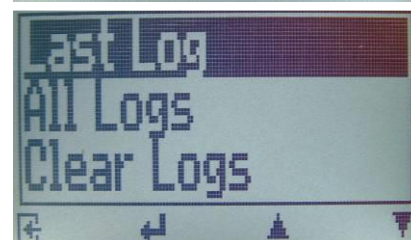
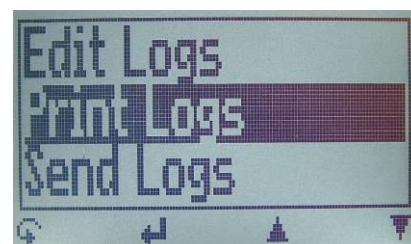
To print your saved data, connect the device to the printer using the printer cable that was delivered with your device. Carefully loose the protection cap on the humimeter MS4. At first plug in the side of the connector with the close plastic casing at the humimeter MS4. Then switch on the device.

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 humimeter until you reach the menu (see image on the right). Select „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.



[illegible]

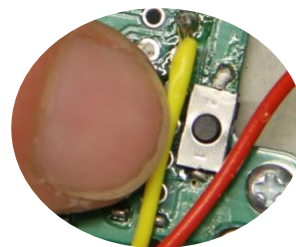
[illegible]

Hardware Reset

In case that your humimeter device does not respond to any key press or cannot be switched on any more, you can carry out a hardware reset. Please make sure that the accumulator has been charged before starting the following procedure:

Remove the blue plastic handle by sliding it off. Open the moisture meter by pulling the two half sides apart. Then push the small push button on the right upper edge of the moisture meter. Now the humimeter will restart. Put the two sides together again. (Do not use any force, if it is not possible to put the sides together easily, flush them again and try again.)

If the humimeter is not restarting, please contact your technical support.



Technical data

Measuring depth	max. 30mm
Minimum material thickness	50mm
Calibration curves	6
Resolution	0.01 % water content; 0.5 °C/°F
Measuring range	0.00 – 3.00%
Temperature range	-10 °C to +50 °C (0.5 °C), 14 to 122 °F (0.5 °F)
Operating temperature	0 °C to 50 °C, 32 to 122 °F
Storage temperature	-20 °C to +60 °C, -4 to 140 °F
Memory	approx. 10.000 values
Temperature compensation	automatically
Menu languages	English, German, French, Italian, Spanish, Russian
Power supply	Li-Ion battery 1800mAh (for 60 to 100 operating hours)
Current consumption	60mA (with light)
Display	128 x 64 matrix display, lighted
Dimensions	145 mm x 95 mm x 28 mm
Weight	265g (incl. battery)
Degree of protection	IP 64
Scope of supply	MS4 with integrated battery, user manual, wooden case (incl. proof plate), USB interface incl. cable and PC software
Optional	Bluetooth module, portable printer

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 Schaller GmbH (www.humimeter.com) or your dealer.

Common reasons for incorrect measurements

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

The material temperature has to be between 0 and +50°C (32 and 122 °F).

- ***Discrepancy in temperature between device and material***

Please ensure that the device and the material under test are being stored at the same temperature before measuring. A high temperature difference has a negative effect on the stability of the measurement results.

- ***Wrong calibration curve***

Double-check the correct selection of the calibration curve before measuring.

- ***Compacting pressure is too low***

Ideal is a compacting pressure of 4 kg.

- ***Interfering material***

Electrically conductive material or little stones have a negative effect on the accuracy of your measurement and can damage your sensor plate. Make sure that there is no such material in an area of 10 cm below the sensor plate.