

User manual



Building moisture meter **humimeter GF2**

version 1.2_en

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2014

Evaluation scale of measuring value

For some calibration curves, the measuring value shown on the display is evaluated in 4 different increments. This evaluation scale bases on the experience of Schaller GmbH. As the increments can differ according to the craft resp. business, a plausibility check is recommended.

At increasing moisture, the 4 increments are:

dry -> optimum -> moist -> wet

According to the measured material the evaluation scale differs!

Design of GF2 basic device (article no. 12853)



Measuring procedure GF2 basic device

To switch on the instrument, press the  key for three seconds.

After showing the logo, the measuring window opens and the current measuring values are displayed.

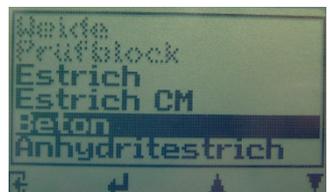


Now you can select the desired calibration curve by pressing  or . The calibration curves saved in the device can be found in the list below.



List of calibration curves

Pressing the  or  key in the measuring window for at least 3 seconds, a list with all available calibration curves appears. Select your sort by pressing  or  and confirm by pressing the  key.



Look for some representative positions that are suitable for monitoring the floor screed moisture. The thickness of concrete in these places has to be at least 30mm.

Please make sure that there are no pipes, electric cables or iron gratings in that area. Metal objects within the measuring field of 30mm lead to incorrect measuring values.

Before measuring, clean the measuring area with a broad scraper. The measuring device has to rest on the concrete with its full surface without any air space. The measuring area must not be polluted by grit.

Select the calibration curve that best fits your material to measure using the arrow keys. For a list of material types and corresponding densities, please see the chart below.

Please ensure that the measuring instrument has nearly the same temperature than the material to measure.

Press the measuring instrument with downward measuring surface with a pressure of approx. 4kg onto the cleaned measuring area. The water content is displayed in the measuring window immediately.

The interpretation of the shown floor screed water content needs the experience of the user as well as the recommendations of the floor screed producer.

The thickness of floor screed can differ. The humimeter GF2 always measures the supreme layer of 30 mm.

If the thickness of the floor screed is less than 30 mm, iron gratings, heating pipes and other metal can cause an incorrect measuring value. Therefore please look for a measuring position without any metal in the measuring field.

The moisture meter displays an average value of a layer of 30 mm. The moisture of deeper layers may be considerably higher than that value.

The water content of deeper layers can only be determined by the CM method or in a drying chamber.

List of calibration curves

calibration curve	description	density	measuring range
floor screed	cement screed normally compacted	approx. 2000kg/m ³	0.5 to 4.5%
CM floor screed	cement screed normally compacted conversion CM %	approx. 2000kg/m ³	0.2 to 4.0%
concrete	concrete normally compacted	approx. 2400kg/m ³	0.5 to 5.0%
anhydrite floor screed	anhydrite floor screed normally compacted	approx. 2600kg/m ³	0.5 to 5.0%
aerated concrete	blocks of aerated concrete	300 kg/m ³ to 800kg/m ³	4 to 20%
spec. floor scre	cement screed lowly compacted	<1800kg/m ³	0.5 to 4.5%
special concrete	concrete lowly compacted	<2200kg/m ³	0.5 to 5.0%
drywall 12.5mm	drywall 12.5mm thickness		0.1 to 4%
drywall 15.0mm	drywall 15.0mm thickness		0.1 to 4%
light conc.brick	concrete bricks	<2100kg/m ³	0.2 to 3.0%
concrete bricks	concrete bricks	approx. 2200kg/m ³	0.2 to 2.5%
heavy conc. bricks	concrete bricks	>2300kg/m ³	0.2 to 1.5%
Digit		-----	0 - 100%
reference	! only for device check!	-----	-----

Information regarding measurements with GF2 basic device

Screed and concrete

The degree of drying and the moisture dispersal can differ significantly. Therefore we recommend to find out the wettest area by effecting a large number of measurements with the humimeter GF2. Then knock off the bottom layer of the wettest area and effect a final evaluation by drying in a drying chamber or via a CM device.



density ranges:

concrete:	between 2200kg/m ³ and 2600kg/m ³
special concrete:	less than 2200kg/m ³
floor screed:	between 1800kg/m ³ and 2200kg/m ³
special screed:	less than 1800kg/m ³
anhydrite floor screed:	2600kg/m ³

CM method

Another common method of determining the moisture **of the bottom layer of screed** is the CM method. The accuracy of the CM method depends on various parameters and is not suited for a comparison with the humimeter GF2 resp. for material calibration. In the following chart of producers of CM devices you can find comparative values of measurements in drying chamber in weight% to CM% for some concrete types. Please find comparative values for other concrete types in the user manual of your CM device.

CM calibration curve

The CM floor screed calibration curve is a conversion from water content into CM %. The measurement values of this calibration curve are guidance values and do not replace the CM method. However, via the non-destructive measuring process of the GF2 the measurement is simplified. Subsequently a CM measurement according to the norm is recommended!

cement screed	weight %	1.8	2.2	2.7	3.2	3.6	4.1	4.5	5.0
	CM %	0.7	1.0	1.4	1.8	2.1	2.5	2.9	3.2
anhydrite floor	weight %	0.1	0.3	0.6	1.0	1.4	1.8	2.2	2.5
	CM %	0.1	0.3	0.6	1.0	1.4	1.8	2.2	2.5
concrete B15,B25,B35	weight %		1.3	1.9	2.5	3.2	3.8	4.4	5.0
	CM %		0.3	0.8	1.3	1.7	2.2	2.7	3.2

If your CM device shows a cement screed moisture value of 1.8 CM%, this value corresponds to 3.2 weight% corresponding to the norm method in the drying chamber.

Drywall

For measuring drywall, press the humimeter GF2 with its full surface and a pressure of approx. 4 kg on the outside of the drywall. There must not be any metal or anything similar in an area of **50mm** behind the drywall.



Concrete brick

For measuring concrete bricks, press the humimeter GF2 with its full surface and a pressure of approx. 4 kg on an even area of the brick. Make sure that the whole measuring area of the device rests on the brick!

Light concrete bricks: < 2100kg/m³

Heavy concrete bricks: > 2300kg/m³



Aerated concrete

For measuring aerated concrete, press the humimeter GF2 with its full surface and a pressure of approx. 4 kg on an even area of the block.



Digit calibration curve

The digit calibration curve offers a dimensionless measuring range from 0 to 100, which corresponds to the total measuring range of the device. This calibration curve is destined for measuring special material.

The digit calibration curve is also suitable for detecting water or damp areas in the wall. The higher the shown value, the wetter the measured area.

very dry: 0%

very wet: 100%

NOTE: Also electric cables or pipes can cause a high digit value.

Menu level overview



Type selection menu



Store menu



Main menu

Switch lower
Switch upper
Open this menu/Enter

Next calibration curve
Previous calibration curve
Power off

Show last log
Enter new log
Power off

<p><i>Edit Logs</i></p> <ul style="list-style-type: none"> Manual Logs Auto Logs Clear Logs <p><i>Print Logs</i></p> <ul style="list-style-type: none"> Last Logs All Logs Clear Logs <p><i>Send Logs</i></p> <ul style="list-style-type: none"> Manual Logs Auto Logs Clear Logs 	<p><i>Options</i></p> <ul style="list-style-type: none"> Date/Time Emission ratio Datalog Time Language Unlock °C/°F Calib. Userlevel BL ON time Auto Off time Materialcalib. Setting Password Reset <p><i>Status</i></p>
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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 GF2 can be checked using the optionally available proof plate (article no. 10003). 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 „digit“ using the arrow keys. Hold the humimeter GF2 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 **18.5**. If the shown value is out of this range, you have to carry out a calibration (see instructions below).

Calibration

If the deviation at the calibration check has been too high, you can correct that by effecting a zero point adjustment.

For that please proceed as follows:

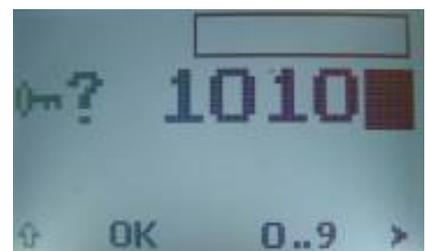
Press the very left key twice to reach the menu level. Navigate to the menu item „Options“ using the arrow keys. Confirm by pressing the **↵** button.



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. You can find the serial number on the top right edge of the display a short time after switching on the instrument, or on the sticker in the battery slot.



Press the third button as long as the black bar shows the first digit of the 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 GF2 in one hand up in the air and make sure that nothing stands behind the black measuring plate. Now press 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 picture shown on the right disappears automatically.



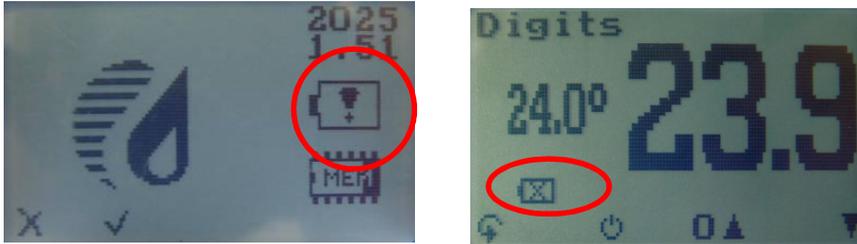
Changing the batteries

Your new device is provided with batteries. For inserting resp. changing the batteries, please proceed as follows:

- 1.) First of all remove the rubber protection cover. For that, hold the rubber protection cover at the upper side and pull it over. If your humimeter is provided with an optional USB port, you have to remove the protection cap before.
- 2.) Press with one finger onto the arrow of the battery cap and pull it back.
- 3.) Remove the empty batteries.
- 4.) Put four new **1.5 Volt AA Alkaline batteries** in the device. Make sure that the position of the battery poles is correct.
- 5.) Press down the batteries and close the cap.
- 6.) Mount the rubber protection cover again.



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 humimeter device for a longer period, remove the batteries. For eventual resulting damages we cannot provide any warranty.



Operating the instrument

Switching on: Press  for three seconds.

Changing the calibration curve: press  or .

Setting date and time:

two times  - *Options – date / time*

Set date and time using the button , according to the format indicated (JJ.MM.TT). After entering the year, press the button  for entering the month and  again for entering the day. For changing from date to time also press the button . After finishing, press  for saving the entered data.

Datalog

Select your desired interval in the menu *Options – Log Time* using the arrow keys, and confirm by pressing . Now the symbol  appears in the store menu. By pressing this  symbol you can activate the AutoLog.

Info: In order to save battery power at a log interval of 1 minute or longer the device switches off automatically during the waiting time and activates again for saving the logs!

For completing the AutoLog, switch on the device (if necessary) and press the  button. If you want to add supplier's data press the  button. Supplier's data can also be entered on the PC subsequently.

Switching on the display lighting

Press the  key briefly; the display lighting switches off automatically after approx. 20 seconds. Pressing any key activates the display lighting again, and the period for switching off again is prolonged to four minutes (The display lighting time can be modified in menu level *Options – BL ON Time*).

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. (The turn-off time can be modified in menu level *Options – Auto Off Time*.)

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 humimeter automatically starts the main menu. Activate 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 optional USB interface)

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.

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



Starting the data transfer on the humimeter:

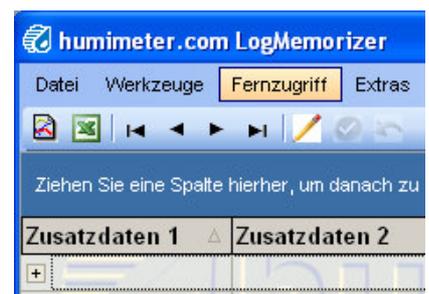
Press the  key until you reach the menu (see image on the right). Then choose „Send Logs“ and confirm by pressing the  key. Now choose „Manual Logs“ or „Auto logs“ and confirm with  again. All saved logs will be sent to your PC.



Starting the data transfer on your PC:

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

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.

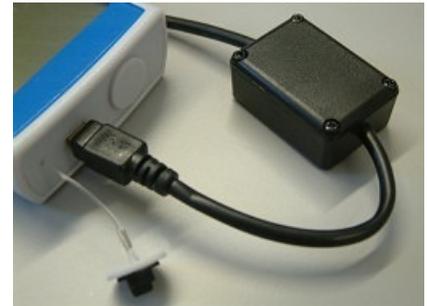


For the basic adjustments of the software please look through the LogMemorizer instructions on USB flash drive.



Print saved data (only possible with optional USB interface)

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. At first plug in this side of the connector having the plastic casing closer to the end at the humimeter. 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). Choose „Print Logs“ and confirm by pressing .



Now you can select a print of the last saved measuring series or of all saved measuring series (logs).



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



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

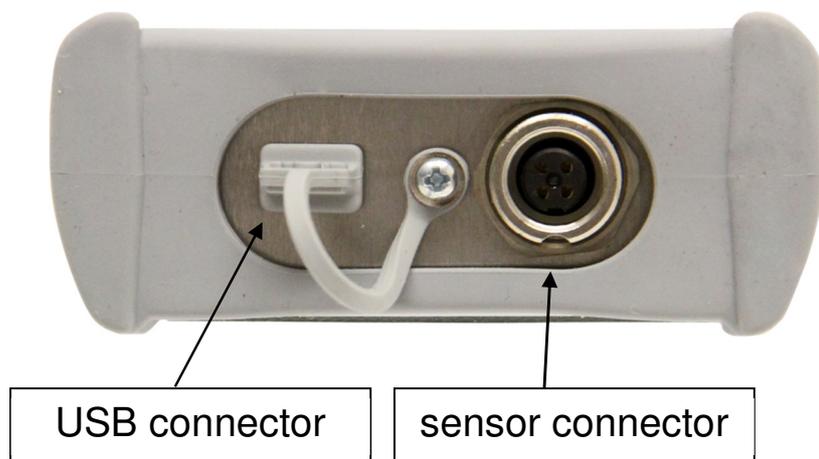
Changing the sensor

Plug in the desired sensor (if necessary screw off the other sensor before). The device automatically recognizes which sensor is active and provides the corresponding calibration curves.

Info: using 2 sensors at the same time is not possible!!

Changing the sensor in detail:

If an external sensor is mounted, screw off this sensor and put it into the plastic case again. If no external sensor is plugged in, the internal building moisture sensor with its corresponding calibration curves is active. When plugging in a sensor, please pay attention to the polarity. The female and the male connector have a notch (resp. a lug) which allow the plugging in only in the right position. The sensor must not be plugged in by force. This may cause mechanical resp. electrical consequential damages. Take care that the external sensors are fixed strongly. The sensors are not waterproof. Protect the sensors from strong dust exposure.



Design GF2 external conductance electronics (article no. 13141)



Information for measuring with GF2 external conductance electronics

This external conductance electronics is necessary to connect the optionally available conductance sensors to the humimeter GF2. The calibration of the conductance electronics box can only be effected by Schaller GmbH.

The electronics box article no. 13141 includes a connection cable article no. 12881, for connecting the conductance sensor with the electronics box. This cable can be used for all external conductance sensors.

Calibration curves conductance sensor

calibration curve	description	density	measuring range
brick			1.0 to 30%
gypsum			0.5 to 14%
lime mortar			0.5 to 10%
lime gypsum plaster		approx. 1150kg/m ³	0.1 to 10%
lime cement plaster		approx. 1250kg/m ³	0.4 to 10%
lime plaster		approx. 1450kg/m ³	0.8 to 10%
cork			4.0 to 30%
cellulose	injected insulation material	approx. 55kg/m ³	10.0 to 40%
Digit		-----	0 to 100
test block	<i>! Only for checking the instrument !</i>	-----	-----

Calibration curves for plaster

Due to the multitude of diverse plastering mixtures, the calibration curves have been determined based on a selection of various plastering mixtures of different producers, which have been summarised in the above mentioned main groups of plaster.

The curves have been determined in plastered condition. It is not possible to measure the powder or not processed plaster!

Measuring value wood moisture

At delivery, the humimeter GF2 indicates the **wood moisture**. This means that no conversion from water content is necessary. On request, the device can also determine the **water content**. This has to be effected in the factory. Please contact support@humimeter.com.

Wood moisture

The wood moisture defines the amount of water contained in the wood, related to its **dry weight**.

Example: 0.6 kg wood + 0.4kg water:

0.6 kg correspond to 100%, that means that 0.4 kg water add up to a moisture content of 66.7 %.

Water content

The water content defines the amount of water contained in the wood, related to its **total weight**. Example with same data: 1 kg wood, 40% water content: The wood consists of 0.4 kg water and 0.6 kg wood.

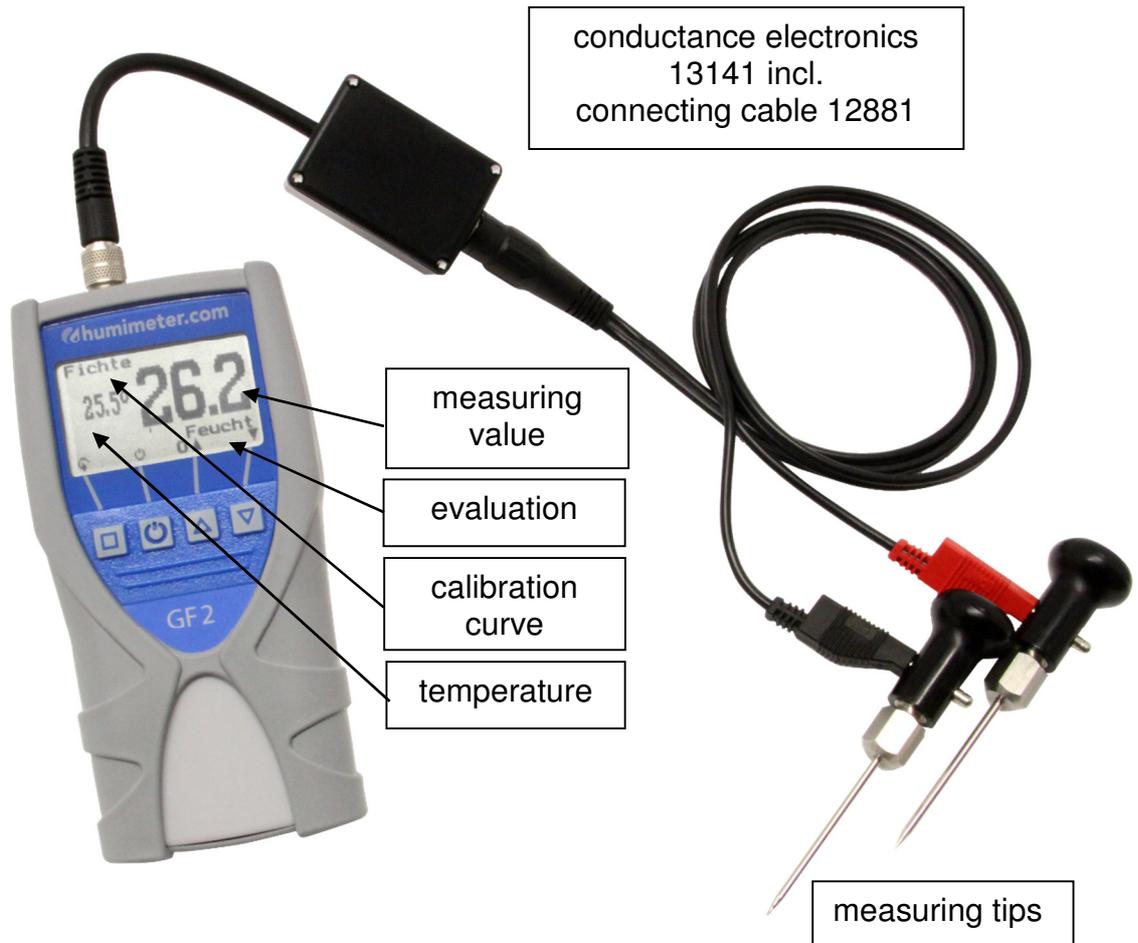
Wood types

Main Group	Sub groups							
Beech	Rubber	Eucalyptus						
Oak	Mahogany	Wenge						
Alder	Acacia	Alstonia	Birch	European chestnut	Horse chestnut	Cherry Tree	Walnut	Okan
Ash	Keruing							
Spruce								
Pine	Balsa	Yew Tree	Stone Pine					
Larch	Maple	Douglas Fir	Hemlock	Cotton Wood	Elm			
Fir	Ceiba	Linden						
Willow	Pear	Hickory	Olive wood	Ramin	Teak			

Measuring range: The minimum measuring range of the humimeter GF2 is 9% wood moisture. If the wood moisture is below 9%, the measurement may reveal incorrect values.

Description: The measuring window of the humimeter GF2 shows the calibration curves named in the main group. If you want to measure a wood type not mentioned in the main group, please look for your wood type in the sub groups of the above list and choose the corresponding main group (e.g. if you want to measure cottonwood you have to choose the main group larch).

Design GF2 plug-in electrodes (article no. 13011)



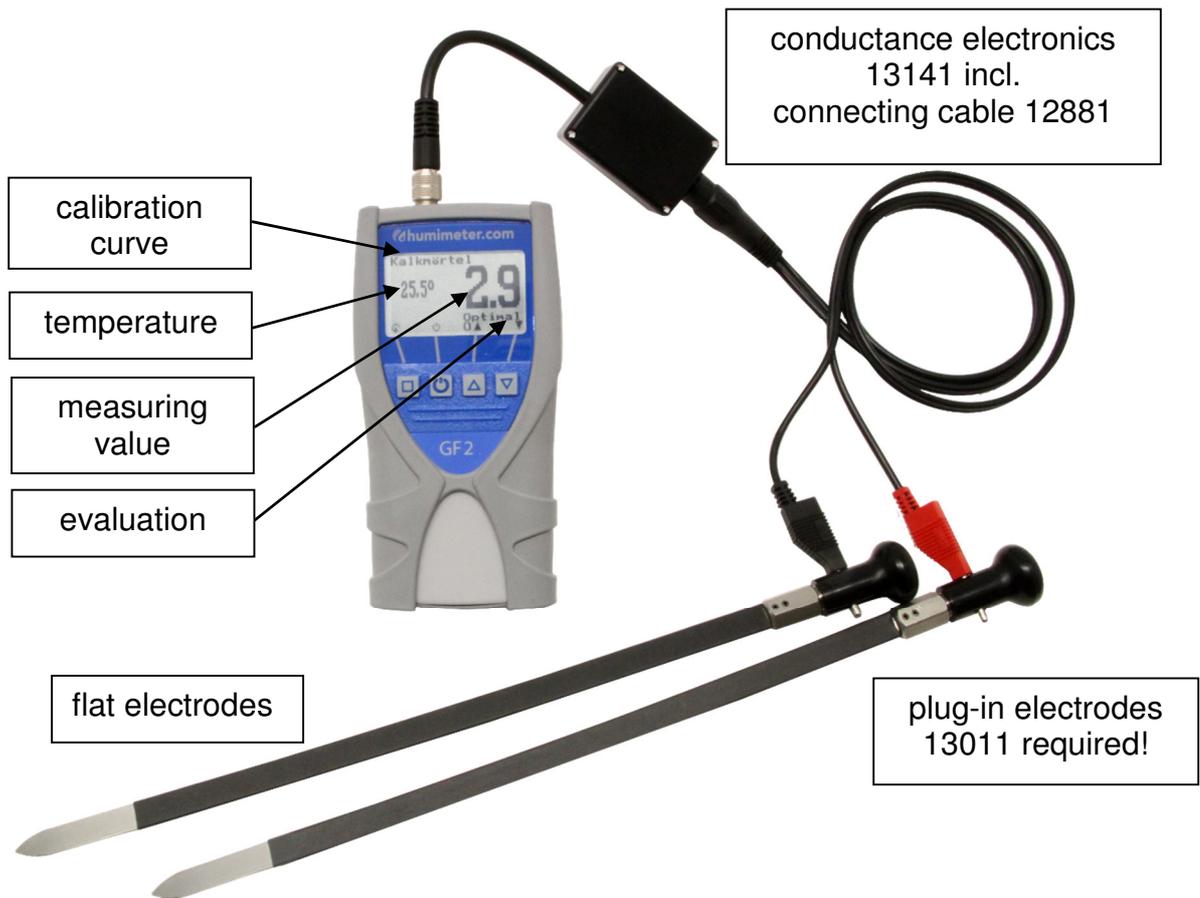
Information for measuring with GF2 plug-in electrodes:

The plug-in electrodes are used for determining the water content of hardened and set building materials. The distance between the two electrodes should be approx. 10 cm.

The electrodes are also used for connecting the flat electrodes article no. 13012.



Design GF2 pair of flat electrodes (article no. 13012)



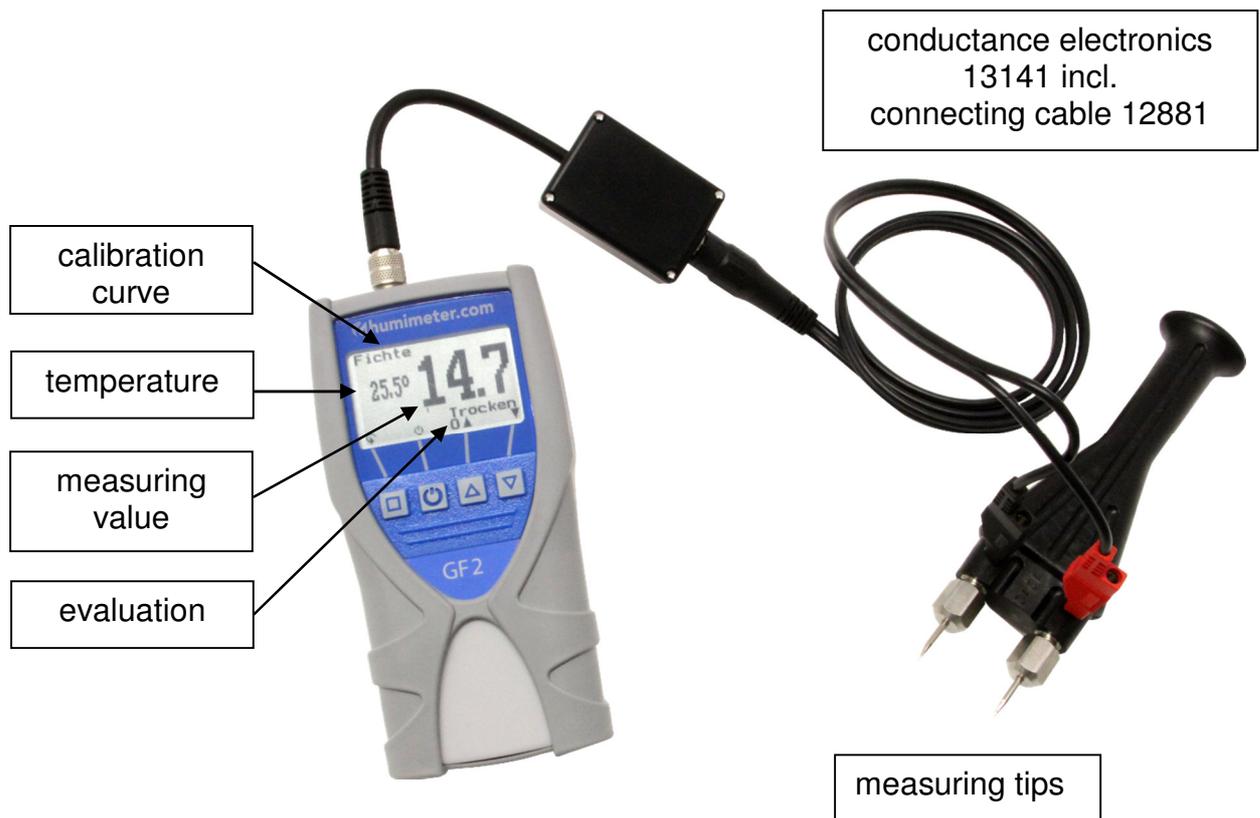
Information for measuring with GF2 flat electrodes:

The flat electrodes are used for detecting moisture in expansion joints and edge joints. Furthermore the moisture in the insulation or in the fill can be measured. The flat electrodes have to be inserted with a distance of 10 cm to each other.

NOTE: the flat electrodes are equipped with a shrink hose which ensures the measurement only at the naked tips. A damage of the shrink hose may cause incorrect measurement values!



Design GF2 hand electrode (article no. 12847)



Information for measuring with GF2 hand electrode

The hand electrode can be used for measuring different materials like plaster, gypsum or wood. Simply connect the conductance electronics to your humimeter device and the hand electrode to the conductance electronics. Then plug in the measuring tips of the hand electrode into the material to measure. The calibration curve "Digit" shows a unit-less value, which can be used for detecting wet areas in special material types.



Design GF2 hammer (article no. 12630)



Information for measuring with GF2 hammer

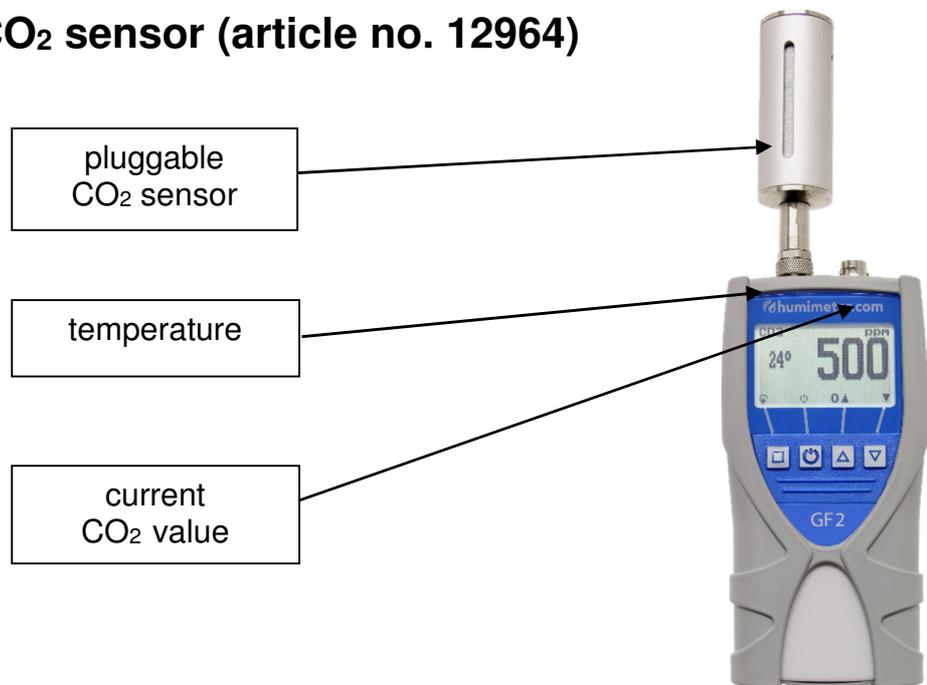
The GF2 hammer is used for measuring the water content in timberwork, for example in the roof framework. With this hammer the delivered measuring tips can easily be deeply inserted into the wood.

This way eventual construction defects or moisture problems can easily be detected and corrected previously.

Optionally, measuring tips with isolated shaft are available. These tips allow the measurement in a certain defined depth (article no. 11482).



Design GF2 CO₂ sensor (article no. 12964)



Information for measuring with GF2 CO₂ sensor

With this sensor resp. calibration curve the air quality can be measured. The measuring range is up to 5000ppm (parts per million).

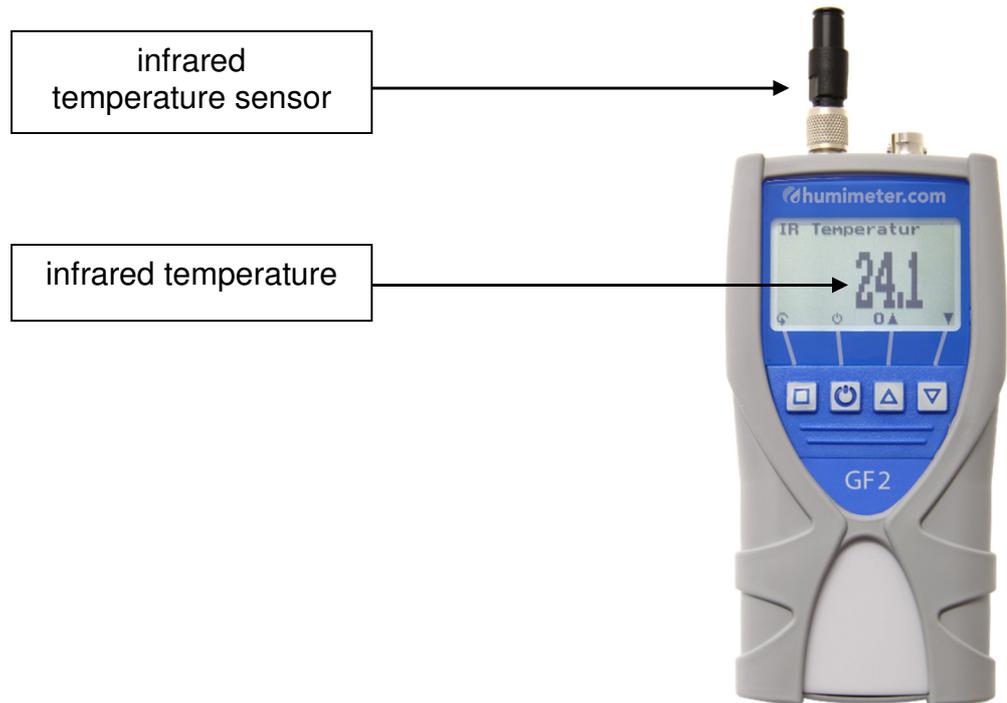
By putting on and tightening the sensor is activated. The CO₂ sensor measures in intervals of 15 seconds.

The CO₂ value is the essential criterion for evaluating the air quality.

The following chart shows the correlation of measuring value and well being:

CO ₂ value	possible occurrence	effect
400	fresh ambient air	comfortable
1000	ventilated classroom	limit of comfortableness
2000	classroom – windows mostly closed	declining concentration
3000	classroom – windows closed	headache

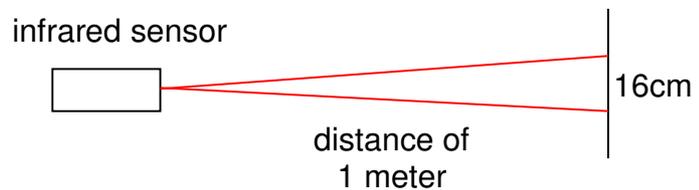
Design GF2 infrared temperature sensor (article no. 12513)



GF2 infrared temperature sensor

Shows the current temperature of the object beamed by the sensor. The sensor has a 1:10 optics, which means a measuring area of 16 cm at a distance of 1 meter.

Info: The sensor is not suited for measuring brilliant or reflective materials!



Changing the emission ratio:

2 times  - Options – Emission ratio

The infrared temperature measurement depends on the emission ratio of the material to measure. This value can be modified according to the measured material. The standard value entered is 0.950 (for concrete and floor screed).

material	emission ratio
wood	0.940
concrete, floor screed	0.950
asphalt	0.950
gypsum	0.925

Information for measuring air humidity and temperature

IMPORTANT: temperature adjustment!

To demonstrate the importance of temperature adjustment between measuring device and material to measure, the following chart shows the measuring error at a temperature difference of only 1°C / 1.8°F with various surrounding temperatures.

	10°C (50°F)	20°C (68°F)	30°C (86°F)
10%r.F.	±0.7%	±0.6%	±0.6%
50%r.F.	±3.5%	±3.2%	±3.0%
90%r.F.	±6.3%	±5.7%	±5.4%

At room temperature (20°C/ 68°F) and a supposed moisture value of 50% r.h. a temperature difference of 1°C / 1.8°F adds up to a measuring error of 3.2% r.h. A temperature difference of 3°C / 5.4°F leads to a measuring error of more than 10%.

Further examples can be found in the h-x diagram of Mollier.

Relative air humidity

indicates the relation between the current water vapour pressure and the maximum possible water vapour pressure (called saturation vapour pressure)

The relative humidity shows the degree the air is saturated with water vapour. For example:

50% relative humidity indicates that at the current temperature and the current pressure the air is saturated with water vapour for half of its value, 100 % relative humidity means that the air is totally saturated. When the air has more than 100 % of relative humidity, the excessive moisture would condense or form fog.

Dew point temperature

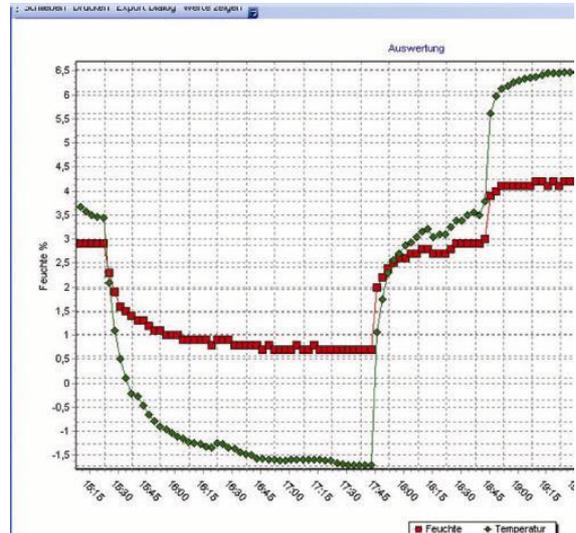
The dew point indicates that temperature the not completely saturated air has to reach in order to be completely saturated with water vapour. If the room with the current relative humidity is cooled down to the dew point temperature, the water vapour begins to condense.

EMC wood

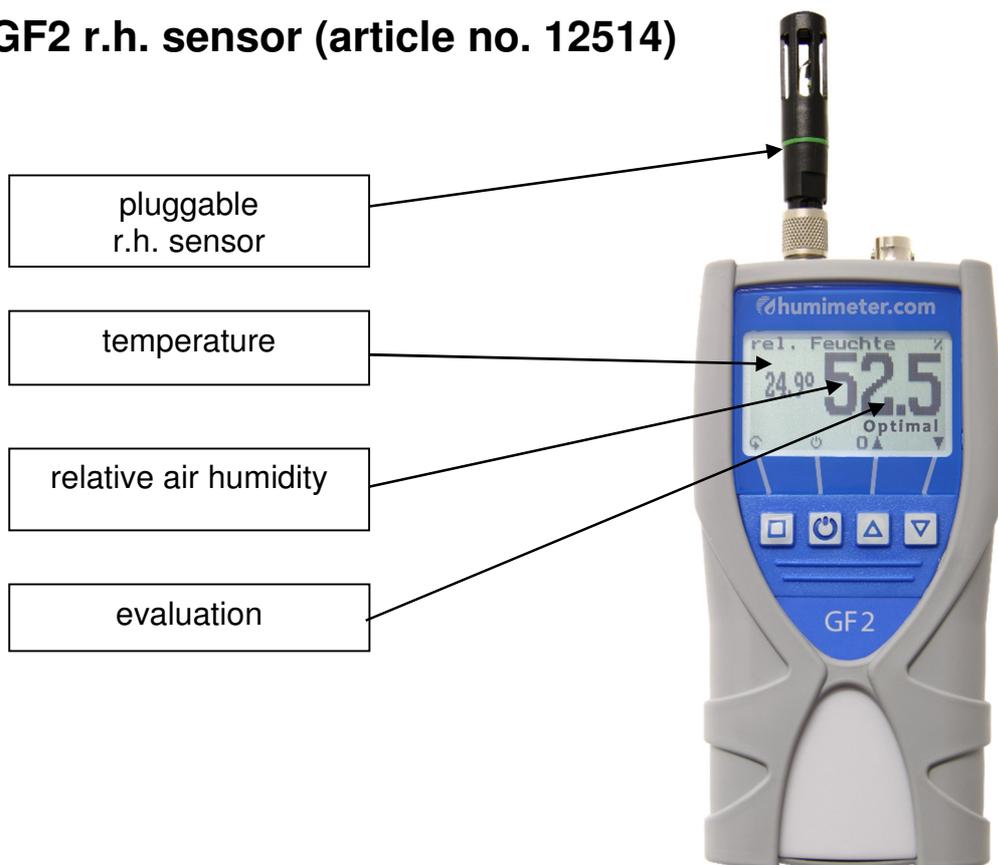
shows the equilibrium moisture content of wood (for timber stored under these conditions) in % wood moisture and the temperature in the selected unit (°C or °F). If wood is stored over a long time under these conditions, it reaches the shown water content.

Climate control resp. climate record

Via the integrated datalog as well as the optionally available PC interface it is possible to save climate data at defined intervals over a certain period. This data can also be transmitted to the PC, where it can be filed and evaluated graphically.



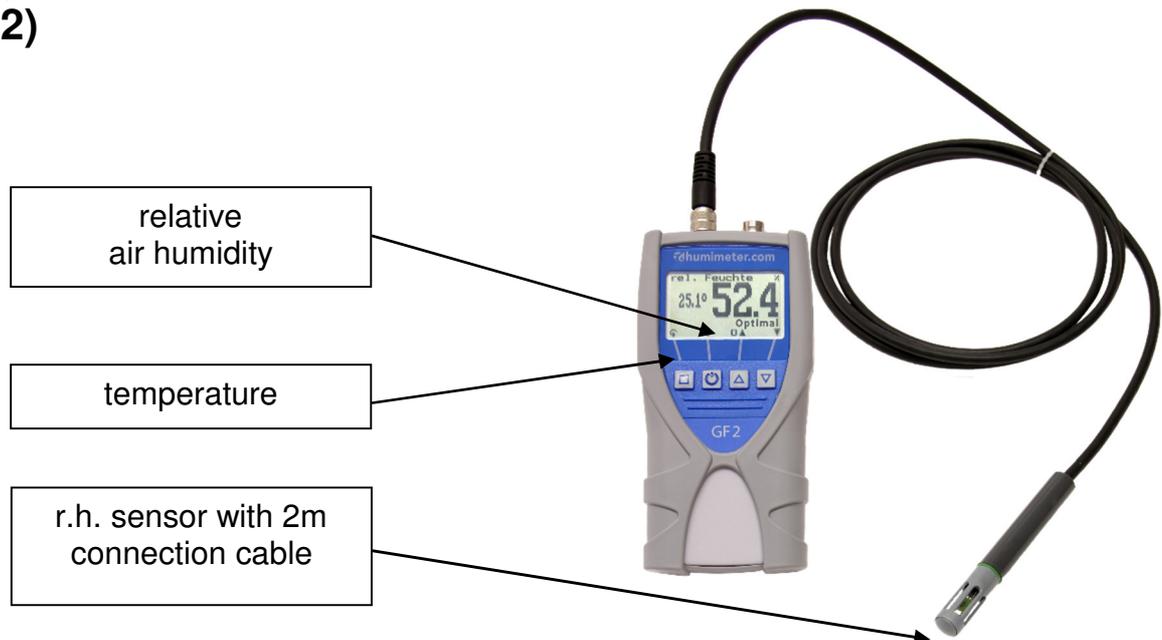
Design GF2 r.h. sensor (article no. 12514)



Information for measuring with GF2 r.h. sensor

This sensor is ideal for using as data logger in a room, for determining the average relative humidity and temperature. Using this sensor, for example the appearance of mould can be detected in advance and counteractions can be taken. The determination of the dew point temperature can reveal an eventual creation of condensed water at an early stage.

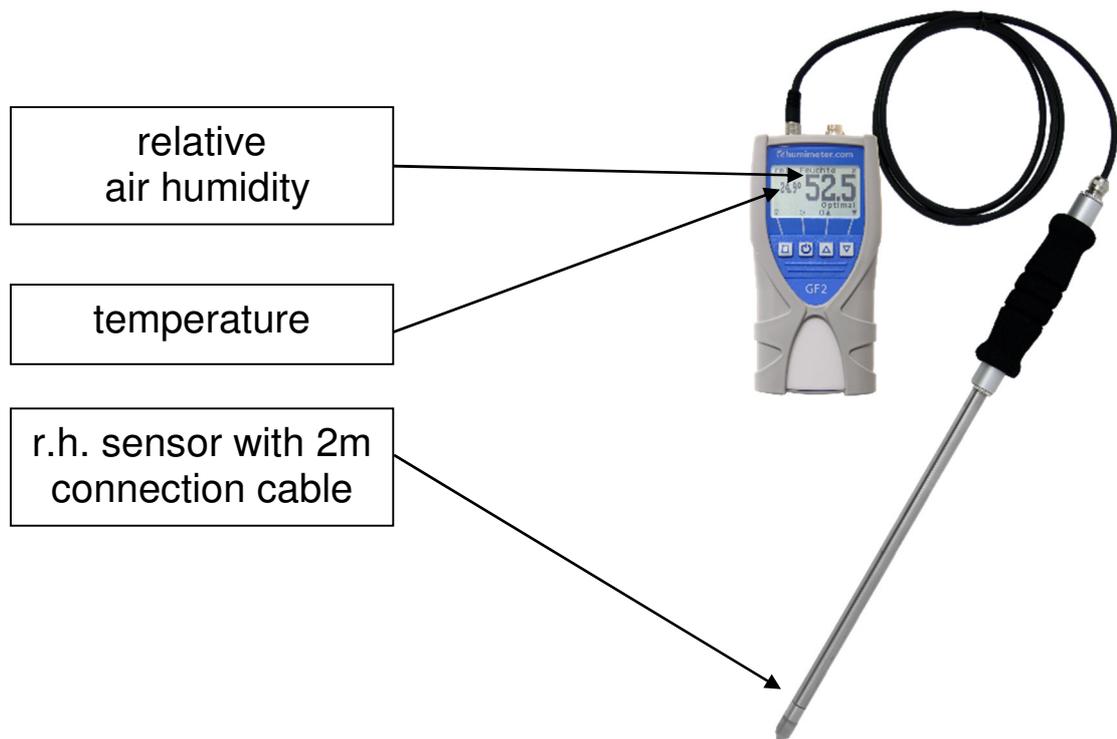
Design GF2 r.h. sensor with 2m connection cable (article no. 12032)



Information for measuring with GF2 r.h. sensor with 2m connection cable

Same functions as article no. 12514. Furthermore, the 2 m connection cable offers the possibility to install the sensor in a remote position. The sensor can also effect automatic measurements in adjustable measuring intervals. The measuring data can subsequently be analysed and graphed at a PC.

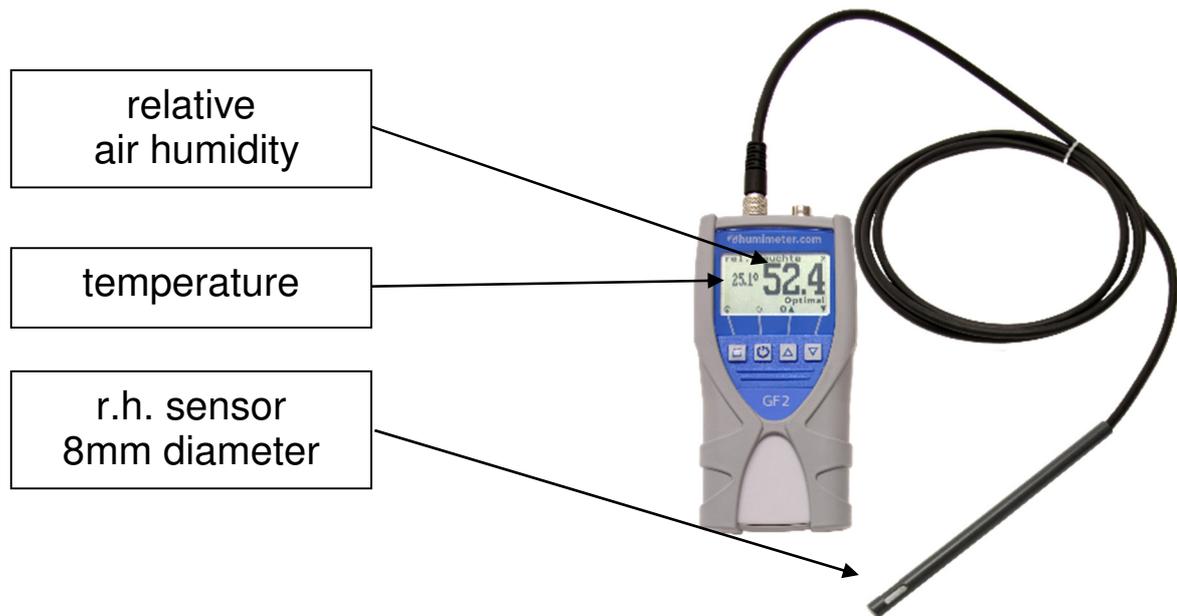
Design GF2 r.h. sensor with 2m cable and 0.3 meter stainless steel tube with steel sinter cap (article no. 12004)



Information for measuring with GF2 r.h. sensor with 2m cable and 0.3 meter stainless steel tube with steel sinter cap (article no. 12004)

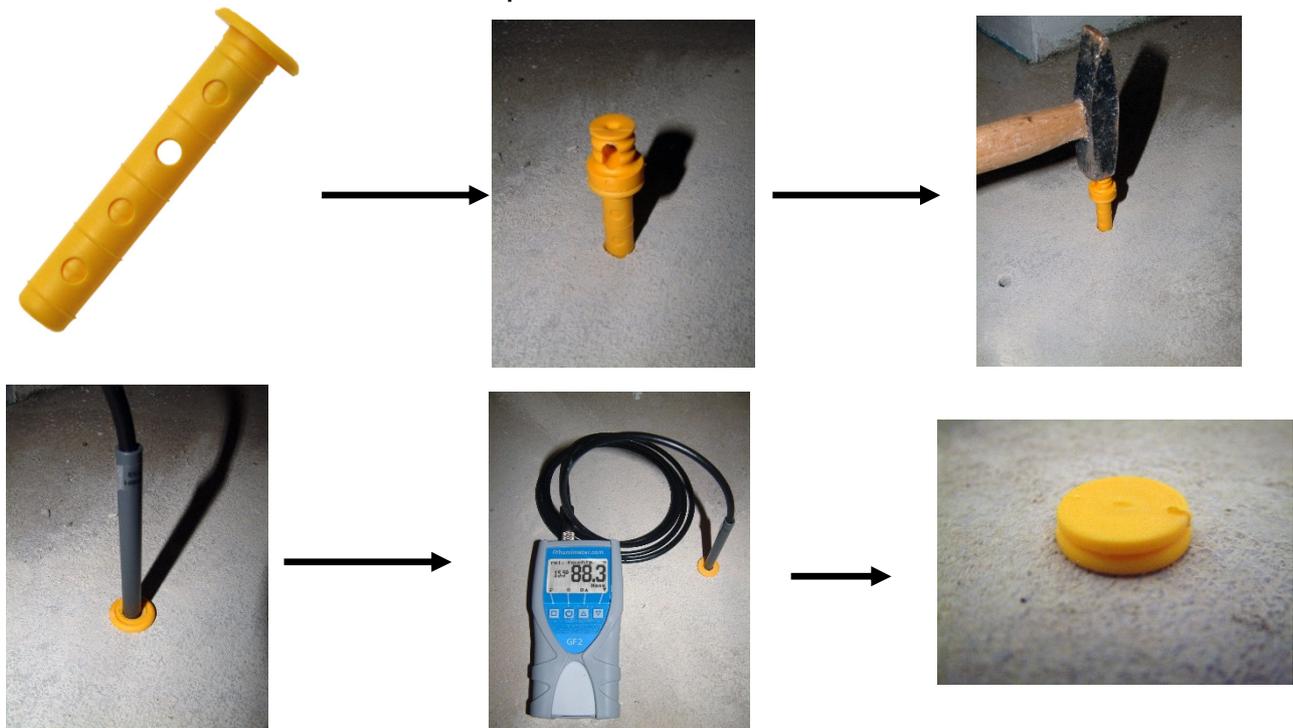
Same functions as article no. 12032. Furthermore, the robust stainless steel tube offers the possibility to determine relative air humidity and temperature also in the brickworks. For detecting potential problems of condensation in the brickworks or connection joints, also the dew point in the brickworks can be determined. For that, drill a hole of 12 mm diameter at the position you want to measure and insert the sensor as airtight as possible. The sensor can also effect automatic measurements in adjustable measuring intervals. The measuring data can subsequently be analysed and graphed at a PC.

Design GF2 r.h. sensor with 1m cable and plastic sensor tube Ø8mm (article no. 13159)



Information for measuring with GF2 r.h. sensor with 1m cable and plastic sensor tube Ø8mm (article no. 13159)

With the aid of these measuring bushes, the relative air humidity in the floor screed can be determined. The measuring bush has to be opened at the desired measuring depth with the hammering aid. Drill a hole of 12 mm diameter in the floor screed and insert the measuring bush using the hammering aid. Then insert the sensor into the bush and let it adjust for approx. half an hour. For measuring at a later date, the measuring bush should be closed with the cap.



Sorts (calibration curves) GF2 air humidity and temperature sensor

calibration curve	description	unit	measuring range
rel. humidity	relative air humidity	%rh	0 to 100%
dew point	dew point	°C resp. °F	-55 to +60°C resp. -67 to 140°F
EMC wood	wood equilibrium moisture content	%EMC	2 to 30% (wood moisture)

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.

The **measuring probes must not be stressed improperly** (pressure, bending); the nails have to be driven in only in straight direction and also be removed in straight direction again.

Clean your device using a dry cloth. Any kind of wet cleaning damages the device.

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 misreadings 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 our dealer.

Technical data humimeter GF2 (article no. 12853)

Building moisture sensor:

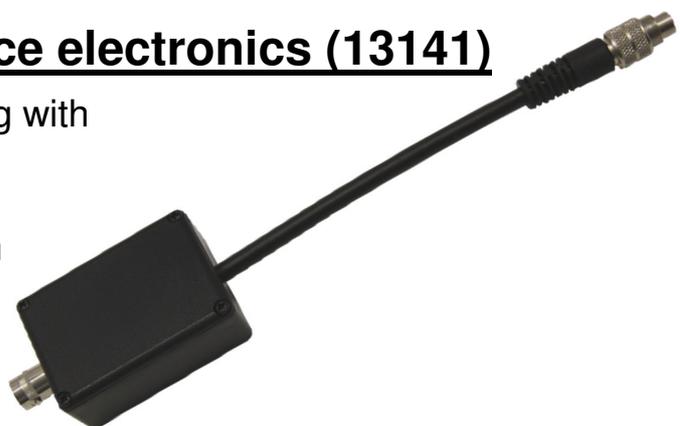
Measuring depth	30 mm
Minimum material thickness	30 mm
Resolution	0.1% water content ; 0.1°C ; 0.3°F
Measuring range	0% to 100% water content (dependent on the material)
Operating temperature	0°C to +50°C
Storage temperature	-20°C to +60°C
Temperature compensation	automatically
Menu languages	English, German, French, Italian, Spanish, Russian
Power supply	4 pcs. of 1.5Volt AA <u>Alkaline</u> batteries (900 measurements)
Auto Switch Off	after approx. 4 minutes (adjustable)
Current consumption	60 mA (with light)
Display	matrix display, lighted
Dimensions	150 x 75 x 30 mm
Weight	270g (with batteries)
Degree of protection	IP 40
Scope of supply	humimeter GF2, 4 pcs. of 1.5Volt AA Alkaline batteries, rubber protection cover

GF2 external conductance electronics (13141)

Required accessory for measuring with
external conductance sensors

Dimensions: 50 x 35 x 20 mm

Weight: 40g



GF2 Pair of plug-in electrodes (13011)

Required accessory:	13141
Resolution of the display:	0.1% water content 0.5°C temperature
Measuring range:	dependent on the material
Weight:	65g



GF2 Pair of flat electrodes (13012)

Required accessory:	13141, 13011
Resolution of the display:	0.1% water content 0.5°C temperature
Measuring range:	dependent on the material
Weight:	140g



GF2 hand electrode (12847)

Required accessory:	13141
Resolution of the display:	0.1% water content 0.5°C temperature
Measuring range:	dependent on the material
Weight:	120g



GF2 hammer (12630)

Required accessory:	13141
Resolution of the display:	0.1% water content 0.5°C temperature
Measuring range:	dependent on the material
Weight:	1500g



GF2 CO₂ sensor (12964)

CO₂ range: 0 to 5000ppm (resolution 1ppm)
Calibration: 0 to 5000ppm
(±50ppm + 3% of measuring value at 25°C)
Measuring interval: approx. 15 seconds
Weight: 90g



GF2 infrared temperature sensor (12513)

Temperature °C: -25 to 125°C (resolution 0.1%)
Temperature °F: -13 to 257°F (resolution 0.3%)
Weight: 10g



GF2 pluggable r.h. sensor (12514)

rel. air humidity: 0 to 100% r.h. (resolution 0.1%)
Calibration: 10 to 90% (±2.0% r.h. at 25°C)
Temperature °C: -10 to +60°C (resolution 0.1°C; ±0.3°C at 25°C)
Temperature °F: 14 to 140°F (resolution 0.3°F; ±0.5°F at 77°F)
Weight: 10g



GF2 r.h. sensor with 2m cable (12032)

rel. air humidity: 0 to 100% r.h. (resolution 0.1%)
Calibration: 10 to 90% (±2.0% r.h. at 25°C)
Temperature °C: -10 to +60°C (resolution 0.1°C; ±0.3°C at 25°C)
Temperature °F: 14 to 140°F (resolution 0.3°F; ±0.5°F at 77°F)
Weight: 110g



GF2 r.h. sensor with 2m cable with stainless steel tube (12004)

rel. air humidity: 0 to 100% r.h. (resolution 0.1%)
Calibration: 10 to 90% ($\pm 2.0\%$ r.h. at 25°C)
Temperature °C: -10 to +60°C (resolution 0.1°C; $\pm 0.3^\circ\text{C}$ at 25°C)
Temperature °F: 14 to 140°F (resolution 0.3°F; $\pm 0.5^\circ\text{F}$ at 77°F)
Weight: 270g



GF2 r.h. sensor with 2m cable and plastic sensor tube (13159)

rel. air humidity: 0 to 100% r.h. (resolution 0.1%)
Calibration: 10 to 90% ($\pm 2.0\%$ r.h. at 25°C)
Temperature °C: -10 to +60°C (resolution 0.1°C; $\pm 0.3^\circ\text{C}$ at 25°C)
Temperature °F: 14 to 140°F (resolution 0.3°F; $\pm 0.5^\circ\text{F}$ at 77°F)
Weight: 100g

Optional: measuring bushes (13239)



!IMPORTANT! Please read

Most common reasons for measuring errors

- In case of dew on the measuring device resp. on the external sensor make sure to wait until they are completely dry again. Switching on resp. using a dewy device may lead to wrong measuring results and in the worst case may destroy the device.
- Direct sunlight exposure causes the display of wrong temperature and resulting wrong water content.
- A temperature difference between measuring device and material to measure strongly influences the measuring value. Therefore let the device adjust to the surrounding temperature.
- Wrong calibration curve: double-check the selection of the right calibration curve

Most common reasons for measuring errors: building moisture

- It is obligatory that the measuring instrument rests on an even measuring area without any air space! In addition, the measuring area has to be cleaned from sand or anything similar.
- The measuring depth is 30 mm. Deeper layers with a possibly higher water content cannot be measured!
- Calibrated for hardened and conditioned building materials
- Electric cables, insulation or iron gratings in the measuring field lead to measuring errors!
- Wrong calibration due to changed material composition because of various additives e.g. insulation material, chemical substances

Most common reasons for measuring errors: infrared temperature

- Wrong emission ratio: see chart on page 23 or other appropriate source
- Polluted sensor: clean the sensor with light compressed air
- Incorrect distance to the measuring object and therefore too large measuring spot
- A measurement at glass can lead to reflexion, and according to the incident angle the illuminated object is measured.

Most common reasons for measuring errors: air humidity

- Sunlight or other sources of heat or cold which do not correspond to the surrounding temperature
- Measuring errors due to too short conditioning -> see page 24
- Dripping or sprayed water
- Irreversible damage of the sensor due to aggressive gases
- Danger of condensation because of changing temperature
- Polluted moisture sensor
- Foreign objects on the sensor: remove with light and dry compressed air.

Most common reasons for measuring errors: CO₂ measurement

- Breathing air at the sensor strongly influences the measuring result.
- For long-time measurements regularly check the battery condition.