Schaller
Messtechnik / humimeter.com

Moisture meter

Operating Manual

humimeter PM5

Paper moisture meter

for measuring the absolute moisture content of paper

78.0 °F | 6.16% | 456 kg/m³ | −27.3 td | 0.64 aw | 51.9 %r.H. | 14.8 % abs | 100.4 g/m² |

Version 1.8

Always read this operating manual before using the humimeter PM5!

Your humimeter PM5 at a glance

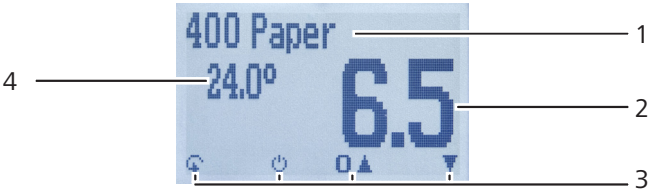
The main unit

No.	Name
1	Button
2	Handle
3	Display
4	USB port (for charging the battery)
5	Reset button
6	LED battery indicator

Rear of the main unit

No.	Name
1	Infrared temperature sensor
2	Sensor bars

The display



No.	Name
1	Calibration curve
2	Moisture content in % (see 7.2 How moisture content is defined for definition)
3	Display symbols
4	Temperature display

The display symbols

Symbol	Name
	Enter
	Up
	Down
	Back
0..9	Enter numbers
A..Z	Enter letters
	Continue / go right
	Left
	Yes
	Auto save

Symbol	Name
	No
	Change input level
OK	OK
	Change menu
	Enter data
	View measurements
	Delete measurements
	On/off button, display light
	Save measured value
	Hold function

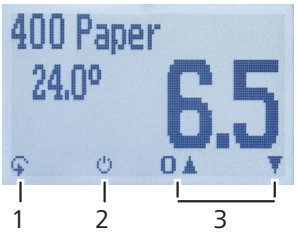
The buttons

The four buttons are designed for navigating the symbols shown on the display. Each of the buttons' functions will be explained in the description of the relevant symbol. The buttons have different functions in the different menus.

The menus

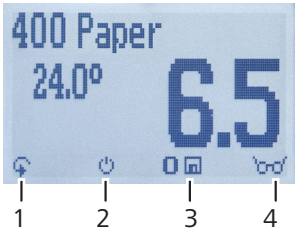
The device has three different menus: product selection, Data Log and main menu.

Product selection menu



No.	Name
1	Change menu
2	Display illumination / device on/off
3	For changing the calibration curve

Data log menu



No.	Name
1	Change menu
2	Display illumination / device on/off
3	Save measured value
4	Show the last recorded values

Main menu

The main menu comprises the following menu items:

- **Edit Logs:**
  Manual Logs, Auto Logs, Clear Logs
- **Print Logs:**
  Last Log, All Logs, Clear Logs
- **Send Logs:**
  Manual Logs, Auto Logs, Clear Logs
- **Options:**
  Bluetooth, Date/Time, Log Time, Adjustment, Language, Unlock, °C/°F, BL On Time, Auto Off Time, Materialcalib., Online Send, Password, Reset
- **Status**

Inhaltsverzeichnis

Your humimeter PM5 at a glance 2

The main unit 2

Rear of the main unit 3

The display 3

The display symbols 4

The buttons 4

The menus 4

1. Introduction 9

1.1 Information about this operating manual 9

1.2 Limitation of liability 9

1.3 Symbols used in this manual 10

1.4 Customer service 10

2. For your safety 11

2.1 Proper use 11

2.2 Improper use 11

2.3 User qualifications 11

2.4 General safety information 12

2.5 Warranty 12

3. On receipt of your device 12

3.1 Taking the device out of its packaging 12

3.2 Making sure that all of the components have been included 12

4. Using the device - Basics 13

4.1 Switching the device on 13

4.2 Automatic Adjustment 13

4.3 Selecting the calibration curve 14

4.4 Taking a measurement 14

4.5 Switching the device off 14

5. The measuring process 15
5.1 Taking a measurement 15
5.1.1 Taking a measurement on a paper or cardboard roll 15
5.1.2 Taking a measurement on a paper or cardboard stack 17
6. Saving your readings 18
6.1 Hold function - Freezing the displayed values 18
6.1.1 Activating the hold function in the options menu 18
6.1.2 Using the hold function 18
6.2 Saving your readings manually 19
6.2.1 Saving individual readings 19
6.2.2 Saving several readings (a measurement series) at the same time 21
6.3 Auto save function (time-based) 22
6.3.1 Activating the auto save function in the options menu 22
6.3.2 Auto save function: Saving measured values 22
6.4 Viewing individual readings 24
6.5 Viewing individual readings from a series of measurements 24
6.6 Deleting all measured values (data log) 25
6.7 Deleting individual measurement series 25
6.8 Deleting individual values from a single series of measurements 26
7. Calibration curves 27
7.1 Selecting the calibration curve 28
7.2 How moisture content is defined 29
8. LogMemorizer 30
8.1 LogMemorizer install/open 30
8.2 Introduction 31
8.3 Establishing the connection 31
8.3.1 USB 31
8.3.2 Bluetooth 32
8.3.3 Check Bluetooth status 32

9. Checking the device's status 33

10. Configuring the device 33

10.1 Turning on Bluetooth 33

10.2 Adjusting the date/time 33

10.3 Selecting a language 34

10.4 Activating options 35

10.5 Deactivating options 36

10.6 Selecting °C/°F 36

10.7 Reducing the device's power consumption 37

10.7.1 Configuring the display illumination time 37

10.7.2 Configuring automatic switch-off 37

10.8 Configuring the material calibration function 37

10.9 Changing the password 38

10.10 Resetting the device to its factory settings 39

11. Cleaning and maintenance 39

11.1 Charging the integrated battery 39

11.2 Resetting the hardware/device 40

11.3 Replacing the sensor bars 41

11.4 Checking the calibration 41

11.5 Adjust the moisture meter 42

11.5.1 Automatic Adjustment 42

11.5.2 Starting the adjustment manually 42

11.6 Care instructions 43

11.7 Cleaning the device 43

12. Faults 44

13. Repair 46

14. Storage and disposal 46

14.1 Storing the device 46

14.2 Disposing of the device 46

15. Device information 47

15.1 EC declaration of conformity 47

15.2 Technical data 51

16. Notes 52

1. Introduction

1.1 Information about this operating manual

This operating manual is designed to enable you to use the humimeter PM5 safely and effectively. It is part of the device, has to be stored nearby and must be easily accessible to users at all times.

All users are required to carefully read and make sure that they have understood this operating manual before using the humimeter PM5. All of the safety and operating instructions detailed in this manual have to be observed to ensure the safety of the device.

1.2 Limitation of liability

All of the information and instructions provided in this operating manual have been compiled on the basis of the current standards and regulations, the state of the art, and the extensive expertise and experience of Schaller Messtechnik GmbH.

Schaller Messtechnik GmbH does not accept any liability for damage associated with the following, which also voids the warranty:

- Non-observance of this operating manual
- Improper use
- Inadequately qualified users
- Unauthorised modifications
- Technical changes
- Use of unapproved spare parts

This fast measuring procedure can be affected by a range of different factors. For this reason, we recommend periodically checking the device's measurements with a standardised oven-drying method.

We, as the manufacturer, do not accept any liability for any incorrect measurements and associated consequential damage.

1.3 Symbols used in this manual

All of the safety information provided in this manual is shown with a corresponding symbol.

ATTENTION

It is essential to observe this warning. Non-compliance can lead to damage to property or equipment.

Information

This symbol indicates important information that enables users to use the device more efficiently and cost effectively.

CAUTION

It is essential to observe this warning. Non-compliance can lead to injury.

1.4 Customer service

For technical advice, please contact our customer service department at

Schaller Messtechnik GmbH
Max-Schaller-Straße 99
A - 8181 St.Ruprecht an der Raab

Telephone: +43 (0)3178 28899
Fax: +43 (0)3178 28899 - 901

E-mail: info@humimeter.com
Internet: www.humimeter.com

2. For your safety

The device complies with the following European directives:

- Restriction of Hazardous Substances in Electrical and Electronic Equipment (RoHS)
- Electromagnetic compatibility (EMC)

The device corresponds to state-of-the-art technology. However, it is still associated with a number of residual hazards.

These hazards can be avoided through strict observance of our safety information.

2.1 Proper use

- Easy to use device for quickly measuring the moisture content of stacks and rolls of cardboard. The device can be used to perform measurements on rotating rolls.
- Easy to use device for quickly measuring the moisture content of stacks and rolls of paper. The device can be used to perform measurements on rotating rolls.
- The device must only be used for taking measurements on the products defined in the following sections of this manual (see 7. Calibration curves).

2.2 Improper use

- The device must not be used in ATEX.
- The device is not suitable for measuring the moisture content of corrugated board.
- The device is not suitable for measuring the moisture content of individual sheets.
- The device is not waterproof and must be protected from water and fine dust.
- The device is not suitable for measuring the moisture content on statically charged rotating paper rolls.

2.3 User qualifications

The device must only be operated by people who can be expected to reliably take the measurements. The device must not be operated by people whose reaction times may be slowed due to, e.g. the use of drugs, alcohol or medication.

All persons using this device must have read, understood and follow the instructions provided in the operating manual.

2.4 General safety information

The following safety information has to be observed at all times to avoid damage to objects and injury to people:

- Please contact your dealer if any parts of the device have become loose or damaged.

All of the device's technical features have been inspected and tested before delivery. Every device has a serial number. Do not remove the tag with the serial number.

2.5 Warranty

The warranty does not apply to:

- Damage resulting from non-observance of the operating manual
- Damage resulting from third-party interventions
- Products that have been used improperly or modified without authorisation
- Products with missing or damaged warranty seals
- Damage resulting from force majeure, natural disasters, etc.
- Damage from improper cleaning
- Batteries older than six months

3. On receipt of your device

3.1 Taking the device out of its packaging

- Take the device out of its packaging.
- Next, make sure that it is not damaged and that no parts are missing.

3.2 Making sure that all of the components have been included

Make sure that all of the components have been included by checking the package contents against the following list:

- humimeter PM5
- Soft-Case with test plate

- humimeter USB data interface module - USB flash drive with software and USB-cable or download using humimeter.com/software
- Operating manual

Optional accessories:

- Battery operated portable thermal printer (described in a separate operating manual)
- Bluetooth module (described in a separate operating manual)

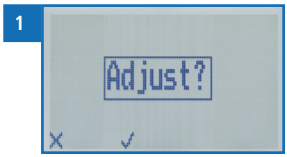
4. Using the device - Basics

4.1 Switching the device on

- Press the ⏻ button for 3 seconds.

» The display will then show the status indicator (see 9. Checking the device's status) for about 3 seconds.

4.2 Automatic Adjustment

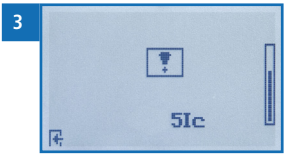


» The display will then show the message **Adjust?** (figure 1).

1. Lift the device up into the air with both hands, holding onto both handles. When doing so, there must be a minimum of 0.5 metres of empty space behind the sensor bars (figure 2).

2. Confirm by pressing ✓.

» The display will now appear as shown in figure 3.



» The bar will run upwards. The device must be held up in the air throughout this entire process,

» which only takes a couple of seconds to complete.

» Once completed, the device will show the measuring window (see "Product selection menu" Page 5).

4.3 Selecting the calibration curve

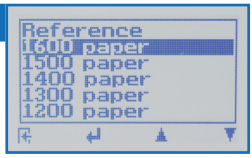
To do so: The device has to be in the product selection menu.

For an overview of the different calibration curves and the criteria for selecting them, please refer to 7. Calibration curves.

Press the ▽ or △ button to move from one calibration curve to the next Or

1. Press the ▽ or △ button for 2 seconds to open the calibration curve overview. (figure 4).
2. Use the arrow keys to move from one calibration curve to the next
3. and keep any of them pressed to scroll through the types.
4. Confirm your selection by pressing ↵ .

4



» The calibration curve you selected will now be shown at the top of the display.

4.4 Taking a measurement

- For information on how to take a measurement, see section 5. The measuring process.

4.5 Switching the device off

To do so: The device has to be in the product selection or Data Log menu. It is not possible to switch off the device when it is in the main menu.

- Press the ⏻ button for 2 seconds.

5. The measuring process

5.1 Taking a measurement

5.1.1 Taking a measurement on a paper or cardboard roll

To do so: The roll has to have a radius of at least 100mm. The correct calibration curve must have been selected.


5

1. Take hold of the device handles on both sides and press it against the long side of the roll with a pressure of approx. 4 kg (figure 5).

2. When doing so, both of the three sensor bars' ends must be firmly resting on the paper or cardboard (figure 6). Make sure that the sensor bars are in a straight line.


6

   » Measurements taken at the front of a roll are not reliable (figure 7).


7

   » Taking a measurement on a rotating roll: Pressing the device against the roll at an angle can damage the paper/board.

3. The device will now instantly display the moisture content and material temperature on the display.

4. For an average moisture content reading or to identify sections on the roll that are too moist or dry, simply move the device along the entire length of the roll.

   » Once the reading has been taken, it can be saved on the device (see 6. Saving your readings).

CAUTION

Risk of burns

Risk of burning fingers on hot material parts. When taking a measurement on a rotating roll, the sensor bars can become very hot.

► Do not touch the sensor bars after taking a measurement on a rotating roll.

CAUTION

Electrostatic discharge

On fast running machines there is the risk of an electrostatic discharge via the device.

► Do not measure statically charged paper rolls.

ATTENTION

Damage to the paper or cardboard

Pressing the device against the rotating roll at an angle can damage the paper/ cardboard.

► Press the sensor bars against the material in a straight line.

5.1.2 Taking a measurement on a paper or cardboard stack

To do so: The stack has to have a minimum height of 50 mm. The paper must have a minimum size of 150 mm x 150 mm. The correct calibration curve must have been selected.

8

1. Take hold of the device handles on both sides and press it onto the top of the stack with a pressure of approx. 4 kg (figure 8).

» Measurements taken at the outers sides (front sides) of a stack are not reliable (figure 9).

9

2. When doing so, both of the three sensor bars' ends must be firmly resting on the paper or cardboard. Make sure that the sensor bars are in a straight line.

» The device will now instantly display the moisture content and material temperature on the display.

3. To obtain a reliable average moisture content reading, move the device over the stack and take readings at different points.

» Once the reading has been taken, it can be saved on the device (see 6. Saving your readings).

i Information - Measuring accuracy

This rapid and non-destructive measuring procedure allows you to quickly take moisture readings at a number of different points. When saving the individual readings, the device will automatically calculate the readings' average (see 6.2.2 Saving several readings (a measurement series) at the same time).

i Information - Incorrect readings

Always make sure to select the correct calibration curve for the material you are measuring. This prevents taking incorrect readings (see 12. Faults).

6. Saving your readings

6.1 Hold function - Freezing the displayed values

The device can be configured in such a way that the information being shown on the display will freeze at the touch of a button until a new button is pressed. This function can be very useful when e.g. taking readings in spaces where it is not possible to see the display (e.g. overhead).

6.1.1 Activating the hold function in the options menu

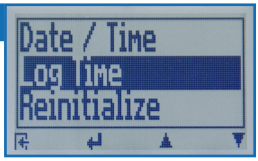
To do so: The device has to be switched on and be in the product selection menu.

1. Press twice or hold for 2 seconds.
2. Select **Options**. To do so, press or and confirm by pressing .
3. Select **Log Time** (figure 10). To do so, press or and confirm by pressing .
4. Select **Hold** (figure 11). To do so, press or and confirm by pressing .

» The setting has been saved.

5. Press to leave the **Options** menu.
6. Press to leave the main menu.

10



11

6.1.2 Using the hold function

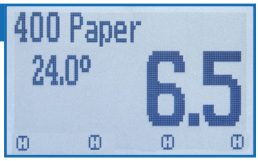
To do so: The device has to be switched on and be in the Data Log menu.

- Press .

» The current reading will be frozen. All of the four symbols will now be displayed as (figure 12).

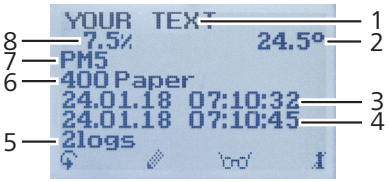
- To reactivate the frozen display, simply press any button.

12



6.2 Saving your readings manually

All of the readings can be saved, edited and viewed on the device. The figure below shows the overview screen of a single saved series of measurements.



No.	Name
1	Name of the measurement series (editable)
2	Temperature (average)
3	Date & start time of the measurement series
4	Date & end time of the measurement series
5	Number of saved readings
6	Calibration curve
7	Device name
8	Moisture content (average)

6.2.1 Saving individual readings

The device can be configured in such a way that the device will save a reading every time a button is pressed. This option (manual save active) is the device's default setting.

Activating the manual save function in the options menu

To do so: The device has to be switched on and be in the product selection menu.

1. Press twice or hold for 2 seconds.
2. Select **Options**. To do so, press or and confirm by pressing .
3. Select **Log Time**. To do so, press or and confirm by pressing .
4. Select **Manual** (figure 13). To do so, press or and confirm by pressing .

13

» The setting has been saved.

5. Press to leave the **Options** menu.

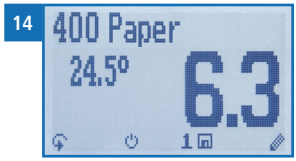
6. Press to leave the main menu.

Using the manual save option

To do so: The device has to be in the data Log menu (see "Data log menu" Page 5).

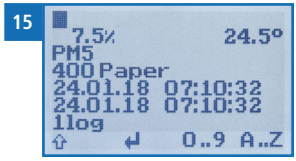
1. Press .

» The display will now appear as shown in figure 14 and the disc symbol will be preceded by the digit one.



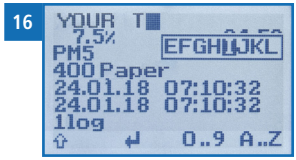
2. Press to enter a name for the saved reading and to finish the measuring process.

» The display will now appear as shown in figure 15.



3. The data you have inputted can be overwritten at any time (only if data has already been entered).

4. Inputting letters:
Press and hold A..Z to quickly scroll to the required letter and either press it for 3 seconds or press to confirm the selected letter (figure 16).



5. Inputting numbers:
Press and hold 0..9 to quickly scroll to the required number and either press it for 3 seconds or press to confirm the selected number.

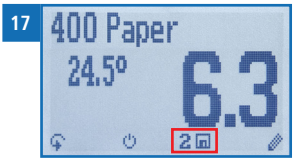
6. Moving forward/back:
Press to switch to another input level. Press or to move forward or back.

7. Confirm your entry by pressing .

» The data you entered has been saved.

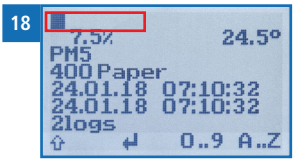
6.2.2 Saving several readings (a measurement series) at the same time

To do so: The device has to be in the data Log menu. (see "Data log menu" Page 5).



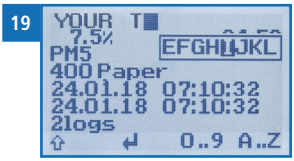
1. Take several readings on a stack or roll (see 5. The measuring process).
2. To save a reading, press as soon as the reading has been taken.

   » The display will now appear as shown in figure 17. This number shows the number of readings that have already been saved.

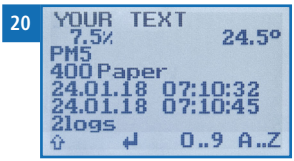


3. Press to enter a name for the saved series of measurements and to finish the measuring process.

   » The display will now appear as shown in figure 18.



4. The data you have inputted can be overwritten at any time (only if data has already been entered).
5. Inputting letters:
   Press and hold A..Z to quickly scroll to the required letter and either press it for 3 seconds or press to confirm the selected letter (figure 19).



6. Inputting numbers:
   Press and hold 0..9 to quickly scroll to the required number and either press it for 3 seconds or press to confirm the selected number.
7. Moving forward/back:
   Press to switch to another input level. Press or to move forward or back.
8. Press to leave the number or letter row.
9. Confirm your entry by pressing .

   » The data you entered has been saved.

6.3 Auto save function (time-based)

The device can be configured in such a way that it will automatically save a reading (log) every 3 seconds. This function is particularly useful when taking readings on rotating rolls to obtain an average value for the entire roll.

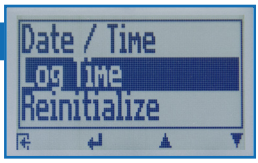
6.3.1 Activating the auto save function in the options menu

To do so: The device has to be switched on and be in the product selection menu.

1. Press twice or hold for 2 seconds.
2. Select **Options**. To do so, press or and confirm by pressing .
3. Select **Auto save time** (figure 21). To do so, press or and confirm by pressing .
4. Select **3 seconds** (figure 22). To do so, press or and confirm by pressing .

   » The setting has been saved.
5. Press to leave the **Options** menu.
6. Press to leave the main menu.

21



22

6.3.2 Auto save function: Saving measured values

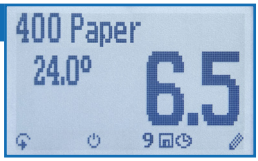
To do so: The device has to be in the Data Log menu (see "Data log menu" Page 55).

1. Press .

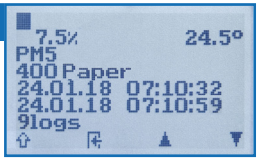
   » The display will now appear as shown in figure 23 and the number of data saves shown in front of the disc symbol will increase by one every 3 seconds, i.e. the device will save a reading every 3 seconds.
2. Press to to finish the measuring process and to enter a name for the saved readings.

   » The display will now appear as shown in figure 24.
3. The data you have inputted can be overwritten at any time.

23



24



4. Inputting letters:
   Press and hold  to quickly scroll to the required letter and either press it for 3 seconds or press  to confirm the selected letter.

5. Inputting numbers:
   Press and hold  to quickly scroll to the required number and either press it for 3 seconds or press  to confirm the selected number.

6. Moving forward/back:
   Press  to switch to another input level. Press  or  to move forward or back.

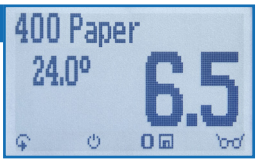
7. Press  to leave the number or letter row.

8. Confirm your entry by pressing  .

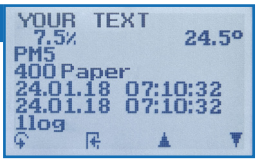
» The data you entered has been saved.

6.4 Viewing individual readings

To do so: You must have saved a reading (e.g. **1 log**).
The display will now appear as shown in figure 25.

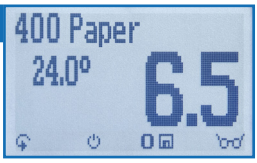


1. Press .
2. Select the required reading. To do so, press or .
   » The display will now appear as shown in figure 26.
   » Press to leave this screen.

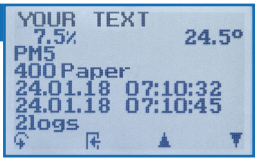


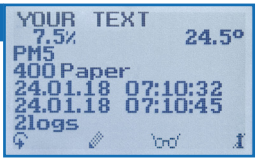
6.5 Viewing individual readings from a series of measurements

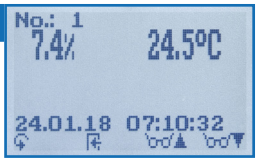
To do so: You must have saved a series of measurements (e.g. **3 logs**).
The display will now appear as shown in figure 27.



1. Press .
2. Navigate to the required measurement series. To do so, press or .
   » The display will now appear as shown in figure 28.
3. Press to switch to another input level.
   » The display will now appear as shown in figure 29.
4. Press again.
   » The display will now appear as shown in figure 30.
5. Navigate to the required reading (**No.: 1, No.: 2, No.: 3**). To do so, press .
6. Press to leave this screen.







6.6 Deleting all measured values (data log)

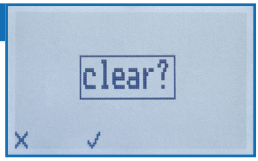
To do so: You must have taken and saved one or several readings.

1. Press twice or hold for 2 seconds.
2. Select **Edit Logs** (figure 31). To do so, press or and confirm by pressing .
3. Select **Clear Logs** (figure 32). To do so, press or and confirm by pressing .
   » The display will then show the message **clear?** (figure 33)
4. Confirm by pressing .
   » The data log has been deleted.
5. Press to leave the **Edit Logs** menu.
6. Press to leave the main menu.

31

32

33

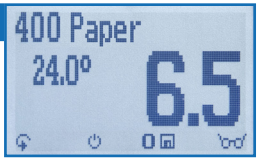


6.7 Deleting individual measurement series

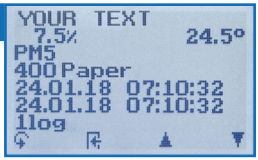
To do so: You must have saved a measured value (e.g. **1 log**) or a series of measurements (e.g. **3 logs**). The display will now appear as shown in figure 34.

1. Press .
2. Select the required reading. To do so, press or .
   » The display will now appear as shown in figure 35.
3. Press to switch to another input level.
   » The display will now appear as shown in figure 36.
4. Press .

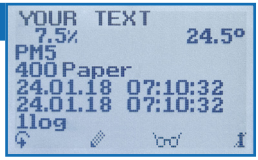
34



35



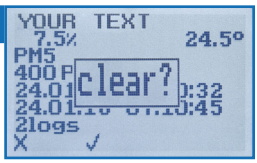
36



» The display will then show the message **clear?** (figure 37).

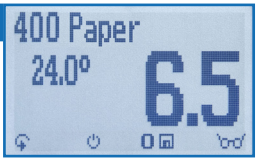
5. Confirm by pressing ✓.

» The value has been deleted.

37


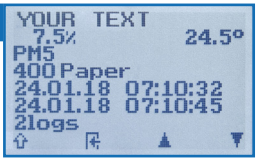
6.8 Deleting individual values from a single series of measurements

To do so: You must have saved a series of measurements comprising at least 2 logs. The display will now appear as shown in figure 38.

38


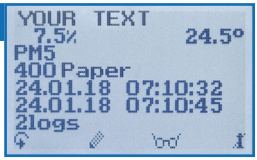
1. Press 👓.
2. Select the required reading. To do so, press ▼ or ▲.

» The display will now appear as shown in figure 39.

39


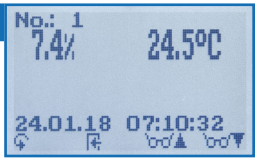
3. Press ↻ to switch to another input level.

» The display will now appear as shown in figure 40.

40


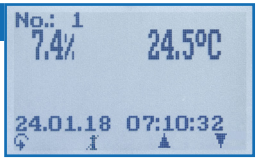
4. Press 👓.
5. The display will now appear as shown in figure 41.
6. Select the required measured value. To do so, press ▼ or ▲.
7. Press ↻ to switch to another input level.

» The display will now appear as shown in figure 42.

41


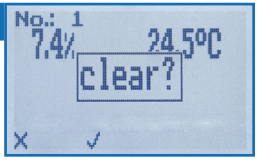
8. Press i to delete the value shown.

» The display will then show the message “clear?” Figure 43.

42


9. Confirm by pressing ✓.

» The value has been deleted.

43


7. Calibration curves

Calibration curve	Paper type	Density [kg/m³]
Reference	! Only used for testing the moisture meter!	
200 paper	Tissue, filter paper	200 kg/m³
250 paper	Tissue, filter paper	250 kg/m³
300 paper	Tissue, filter paper	300 kg/m³
350 paper	Tissue, filter paper	350 kg/m³
400 paper	Tissue, filter paper	400 kg/m³
450 paper	Tissue, filter paper	450 kg/m³
500 paper	Low density cardboard	500 kg/m³
550 paper	Low density cardboard	550 kg/m³
600 paper	Very low density paper	600 kg/m³
650 paper	Low density paper	650 kg/m³
700 paper	Low density paper	700 kg/m³
750 paper	Corrugating medium, fluting, Schrenz	750 kg/m³
800 paper	Newsprint	800 kg/m³
850 paper	Kraft liner, brown	850 kg/m³
900 paper	Kraft liner, white, top; test liner, brown	900 kg/m³
950 paper	Test liner, white; copying paper	950 kg/m³
1000 paper	Copying paper, LWC uncoated	1,000 kg/m³
1050 paper	Satin-finish copying paper	1,050 kg/m³
1100 paper	Satin-finish copying paper	1,100 kg/m³
1200 paper	LWC calendered	1,200 kg/m³
1300 paper	Brochure paper	1,300 kg/m³
1400 paper	Brochure paper	1,400 kg/m³
1500 paper	High density brochure paper	1,500 kg/m³
1600 paper	Very high density brochure paper	1,600 kg/m³

7.1 Selecting the calibration curve

Due to the wide range of different types of papers in use, there are no default calibration curve categories. The humimeter PM5's readings are based on a paper stack or roll densities, which is why density is the decisive factor for the different calibration curves.

The calibration curve overview contains suggestions for different paper types and their associated densities [kg/m³].

If you wish to obtain very precise moisture content readings, please take a one-off comparative measurement with your online moisture content analyser or the standardised oven-drying method (ISO 287). To do so, proceed as follows:

1. Gauge your paper (roll or stack) density in relation to values for the different calibration curves shown above and take a number of moisture readings using the calibration curve most likely to deliver realistic values.

2. Next, record the actual moisture content reading obtained through your online

$$\text{Density}\left[\frac{\text{kg}}{\text{m}^3}\right] = \frac{\text{Grammage}\left[\frac{\text{g}}{\text{m}^2}\right]}{\text{Thickness paper sheet [mm]}}$$

$$\text{Density}\left[\frac{\text{kg}}{\text{m}^3}\right] = \frac{\text{Weight paper roll [kg]}}{\text{Volume paper roll [m}^3\text{]}}$$

$$\text{Density}\left[\frac{\text{kg}}{\text{m}^3}\right] = \frac{\text{Weight paper pile [kg]}}{\text{Volume paper pile [m}^3\text{]}}$$

   moisture analysis or perform a reference moisture content analysis in accordance with EN ISO 287.

3. Compare the readings recorded for the different calibration curves with those of the actual moisture content established using the reference measurement. From now on, always use the calibration curve that most closely matches the reference measurement.

» Note: You can change the calibration curve name to a name of your choice (e.g. to the name of the paper). For more information on doing so, please contact your dealer.

7.2 How moisture content is defined

The device measures and shows a material's moisture content. The moisture content readings it displays are calculated in relation to the material's overall mass:

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

M_n: Mass of the sample with average moisture content

M_t: Mass of the sample with zero moisture content

%MC: Moisture content (in accordance with EN ISO 287)

8. LogMemorizer

Note: Your device is equipped with the optional USB port or Bluetooth module.

8.1 LogMemorizer install/open

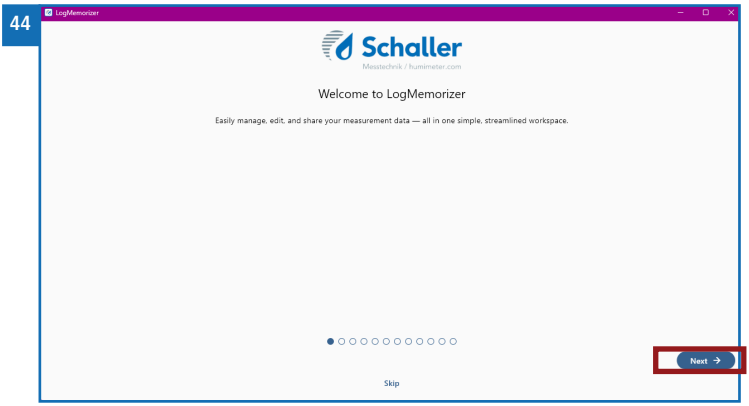
1. Install LogMemorizer on your PC or as an app on your smartphone. Alternatively, use LogMemorizer as a web app in your browser - no installation required.
   Note: The web app is only for viewing measurement data that has already been uploaded to the cloud.

   » Download LogMemorizer from humimeter.com/software or scan the following QR codes for your applications.

Desktop version	Android app	iOS app	Web app

2. Open LogMemorizer after installation.

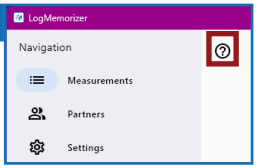
   » The interactive introduction will appear.



8.2 Introduction

Follow the introduction by clicking “Next.” This will help you learn all the important features. After the introduction, you will be taken to the user interface.

45



» You can access the introduction again at any time by clicking the “?” icon.

8.3 Establishing the connection

Note: A connection can only be established via LogMemorizer. Before you can transfer measurement data, you must establish a connection between LogMemorizer and your humimeter. Make sure the humimeter is turned on before establishing the connection.

1. Open LogMemorizer on your PC.
2. Go to “Select Source.”
3. Select the interface that your device has here.

8.3.1 USB

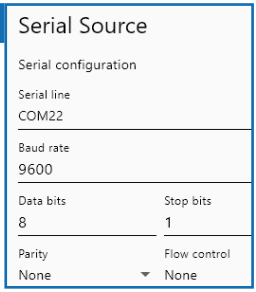
Note: Install the USB driver before using LogMemorizer with the optional USB interface.

1. Plug the USB Mini-B connector into the humimeter.
2. Select your humimeter under “Connection.” Do not change the baud rate unless instructed to do so by the manufacturer.
3. Click “Apply.”

» The connection has now been established.

46

47

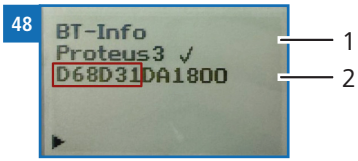


8.3.2 Bluetooth

1. LogMemorizer automatically starts searching for Bluetooth devices.
2. The humimeter devices you find will be shown in a list.
   » The first 6 numbers of the Bluetooth MAC address are displayed for easier identification (**see** Check Bluetooth status).
3. Click on your humimeter.
4. Confirm the connection.

8.3.3 Check Bluetooth status

1. Press twice or hold for 2 seconds.
2. Go to **Options/Bluetooth/Info**. To do this, press or and confirm by clicking .
   » The status indicator appears on the display **humimeter**.
   » The display shows the following information:



No.	Description
1	Name of the Bluetooth module
2	MAC address of the Bluetooth module

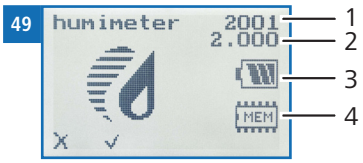
3. Confirm by clicking .
4. Press , to close the main menu.

9. Checking the device's status

1. Press twice or hold for 2 seconds.
2. Select **Status**. To do so, press or and confirm by pressing .

» The display will then show the status indicator **humimeter**.

» The display will show the following information (figure 52):



No.	Name
1	Serial number
2	Software version
3	Battery status
4	Memory status

3. Confirm by pressing .
4. Press to leave the main menu.

10. Configuring the device

10.1 Turning on Bluetooth

The information on Bluetooth is provided in a separate operating manual.

10.2 Adjusting the date/time

1. Press twice or hold for 2 seconds.
2. Select **Options**. To do so, press or and confirm by pressing .

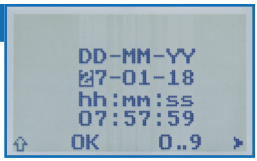
3. Select **Date/Time**. To do so, press or and confirm by pressing .

» The display will now appear as shown in figure 53.

» The format for the date is **DD-MM-YY** (Day-Month-Year).

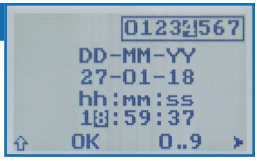
» The format for the time is **hh:m:ss** (hour:minutes:seconds).

50



4. Inputting numbers:
Press and hold 0..9 to quickly scroll to the required number and either press it for 3 seconds or press to confirm the selected number (figure 54).

51



5. Moving forward:
To move forward between **DD-MM-YY** and **hh:mm:ss**, press .

6. Moving back:
Press to switch to another input level. To move backward between **DD-MM-YY** and **hh:mm:ss**, press .

7. Confirm the date/time by pressing OK.

» The settings have been saved.

8. Press to leave the **Options** menu.

9. Press to leave the main menu.

10.3 Selecting a language

1. Press twice or hold for 2 seconds.

2. Select **Options**. To do so, press or and confirm by pressing .

3. Select **Language**. To do so, press or and confirm by pressing .

4. Navigate to the required language. To do so, press or and confirm by pressing .

» The setting has been saved.

5. Press to leave the **Options** menu.

6. Press to leave the main menu.

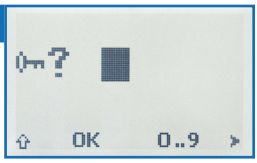
10.4 Activating options

To do so: Some of the options must be deactivated.

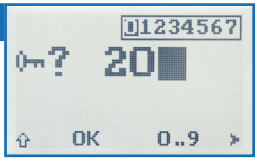
1. Press twice or hold for 2 seconds.
2. Select **Options**. To do so, press or and confirm by pressing .
3. Select **Unlock**. To do so, press or and confirm by pressing .

   » The display will now appear as shown in figure 55.

   » On delivery, the four-digit password is the device's serial number.



4. Inputting numbers:
   Press and hold 0..9 to quickly scroll to the required number and either press it for 3 seconds or press to confirm the selected number (figure 56).



5. Moving back:
   Press to switch to another input level.
   To move back, press .
6. Confirm the four-digit password by pressing OK.

   » The setting has been saved.

   » The **°C/°F**, **BL On Time**, **Auto Off Time**, **Materialcalib.**, **Online Send**, **Password**, **Reset** options are now activated.

7. Press to leave the **Options** menu.
8. Press to leave the main menu.

10.5 Deactivating options

Once the device has been switched restarted, the **°C/°F**, **BL On Time**, **Auto Off Time**, **Materialcalib., Online Send, Password, Reset** options will be deactivated again.

10.6 Selecting °C/°F

To do so: All of the options must be activated (see 10.4 Activating options).

1. Press  twice or hold for 2 seconds.
2. Select **Options**. To do so, press  or  and confirm by pressing  .
3. Select **°C/°F**. To do so, press  or  and confirm by pressing  .
4. Navigate to the required temperature scale, i.e. Celsius (**°C**) or Fahrenheit (**°F**). To do so, press  or  and confirm by pressing  .

   » The setting has been saved.

5. Press  to leave the **Options** menu.
6. Press  to leave the main menu.

10.7 Reducing the device's power consumption

10.7.1 Configuring the display illumination time

To do so: All of the options must be activated (see 10.4 Activating options).

1. Press  twice or hold for 2 seconds.
2. Select **Options**. To do so, press  or  and confirm by pressing  .
3. Select **BL On Time**. To do so, press  or  and confirm by pressing  .
4. Select the required display illumination period (30 seconds, 2 minutes, 5 minutes, 10 minutes). To do so, press  or  and confirm by pressing  .

» The setting has been saved.

5. Press  to leave the **Options** menu.
6. Press  to leave the main menu.

10.7.2 Configuring automatic switch-off

To do so: All of the options must be activated (see 10.4 Activating options).

1. Press  twice or hold for 2 seconds.
2. Select **Options**. To do so, press  or  and confirm by pressing  .
3. Select **Auto Off Time**. To do so, press  or  and confirm by pressing  .
4. Select the period of time you want the device to stay switched on (3 minutes, 5 minutes, 10 minutes). To do so, press  or  and confirm by pressing  .

» The setting has been saved.

5. Press  to leave the **Options** menu.
6. Press  to leave the main menu.

10.8 Configuring the material calibration function

The type calibration function is described in a separate operating manual.

10.9 Changing the password

To do so: All of the options must be activated (see 10.4 Activating options).

1. Press  twice or hold for 2 seconds.
2. Select **Options**. To do so, press  or  and confirm by pressing  .
3. Select **Password**. To do so, press  or  and confirm by pressing  .

   » The display will show the current password.

4. Overwrite the current password. To do so, press and hold  to quickly scroll to the required number and either press it for 3 seconds or press  to confirm the selected number.

   Moving back:
   Press  to switch to another input level.
   To move back, press  .

5. Confirm the new four-digit password by pressing  .

   » The setting has been saved.

6. Press  to leave the **Options** menu.
7. Press  to leave the main menu.

10.10 Resetting the device to its factory settings

To do so: All of the options must be activated (see 10.4 Activating options).

1. Press  twice or hold for 2 seconds.
2. Select **Options**. To do so, press  or  and confirm by pressing  .
3. Select **Reset**. To do so, press  or  and confirm by pressing  .

» The display will then show the message **Reset?** (figure 57).

4. Confirm by pressing  .

» The device will now be reset to its factory settings. All of your personal settings will be lost.

» The display will show the status indicator **humimeter** (figure 58).

» Resetting the device will not affect the saved measuring values.

54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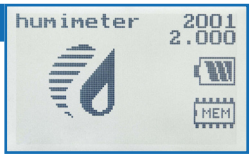

11. Cleaning and maintenance

Regularly cleaning and maintaining the device will ensure that it will have a long service life and stay in good condition.

11.1 Charging the integrated battery

The device constantly monitors the charge level of the integrated battery. The current battery status is shown on the status screen. If the battery's charge is very low, the battery symbol will be shown with an exclamation mark. In that case, the battery must be charged immediately (figure 59).

This warning symbol will also be shown on the measuring screen (figure 60).

1. To charge the battery, insert the supplied USB cable into the USB Mini B port on the humimeter PM5.

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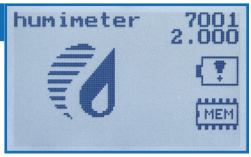

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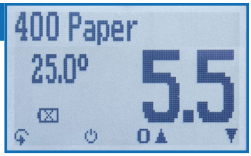

2. Next, connect the cable to a computer or USB adaptor/charging cable connected to the mains (e.g. from a mobile phone) (figure 61).

» The battery will now start charging.
» The LED will be blue while the battery is charging.
» The LED will switch off as soon as the battery is fully charged.
» Charging the battery can take up to 6 hours.

58

CAUTION

Fire hazard

There is a risk of fire if the battery is charged incorrectly.

► The battery must only be charged using original accessories and in accordance with the specifications detailed in this operating manual. The environmental temperature has to be between 0 °C and +45 °C.

The use of damaged cables or chargers or charging the battery in damp environments can result in electric shock, fire and injury. Make sure the temperature is between 0 °C and +45 °C when charging the battery as other temperatures can destroy the battery. Make sure the mains and USB cable are properly connected.

As the device's user, you are responsible by law for properly disposing of all used batteries, which must not be disposed of as domestic waste (Battery Directive).

11.2 Resetting the hardware/device

The device will go into battery protection mode if the battery's charge is very low to prevent it from being completely drained. Once that happens, the device can only be restarted once the battery has been recharged and the hardware has been reset.

The hardware/device can also be reset if the device has stopped operating for some reason. To do so:

- Fully charge the battery (until the LED goes out).
- Press the reset button on the device with a toothpick or straightened paper clip (figure 62).
- Do not use excessive force to press the reset button, which is very easy to operate.
- The device will restart as soon as the reset button has been pressed.

59

11.3 Replacing the sensor bars

Taking readings on rotating rolls causes the metal bars to wear. This is because the paper or cardboard acts like sandpaper and causes abrasion.

If the metal bars are badly worn, they have to be replaced.

60

1. To do so, order the "Spare sensor bar set for humimeter PM5", item no. 14098 from your dealer or Schaller Messtechnik GmbH.
2. Switch off the device (if switched on).
3. Remove the three screws by which the bars are attached to the device with a Torx T20 screwdriver.

61

4. Remove the three worn metal bars (figure 64).
5. Fit the three new metal bars. When attaching the new bars, make sure they are straight. Fasten the bars by tightening the screws (Torx T20 screwdriver). Make sure that the screws (M4x8) are inserted straight. Do not use a torque in excess of 2.6 Nm to tighten the screws (figure 65).

62

6. Switch on the device and run the self-calibration function.

11.4 Checking the calibration

The device's calibration should be checked every four weeks. When doing so, use the test plate supplied with the device.

To do so: The device and the test plate must be at a temperature between 20.0 °C and 26.0 °C. In addition, there must be no metal or other electrically conductive materials underneath the test plate.

1. Place the soft-case on top of, e.g. a wooden table. (The soft-case must not be placed on top of or above metal.)
2. Switch on the device and run the self-calibration function.

3. Use the arrow keys to select "Reference" under calibration curve (see 4.3 Selecting the calibration curve).

4. Take hold of the device handles on both sides and press it onto the top of the grey test plate inside the soft-case with a pressure of approx. 4.0 kg (figure 66).

» The moisture content reading shown must be between 14.5 and 15.5. (The moisture reading will be displayed in black) (figure 67).

» If the moisture value is outside this range, in which case it will be displayed in grey (figure 68), the moisture meter has to be calibrated (see 11.5 Adjust the moisture meter).

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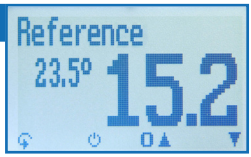

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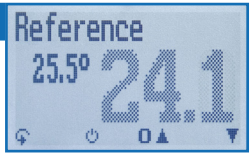

11.5 Adjust the moisture meter

11.5.1 Automatic Adjustment

See 4.2 Automatic Adjustment

11.5.2 Starting the adjustment manually

1. Press twice or hold for 2 seconds.

2. Select **Options**. To do so, press or and confirm by pressing .

3. Select **Reinitialize**. To do so, press or and confirm by pressing .

» The display will then show the message **Adjust?** (figure 70).

4. Lift the device up into the air with both hands, holding onto both handles. When doing so, there must be a minimum of 0.5 metres of empty space behind the sensor bars (figure 71).

5. Confirm by pressing .

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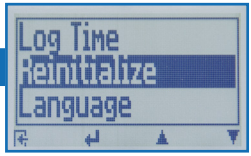

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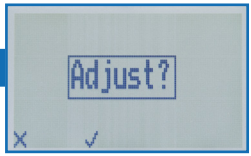

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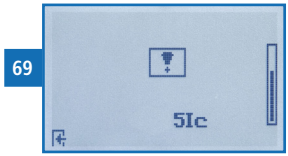
» The display will now appear as shown in figure 72.

» The bar will run upwards. The device must be held up in the air throughout this entire process,

» which only takes a couple of seconds to complete. When completed, the display will look as shown in figure 69.



6. Press and then to return to the product selection level.

11.6 Care instructions

- Do not leave the device out in the rain. The device is not waterproof.
- Do not expose the device to extreme temperatures.
- Protect the device from strong mechanical shocks and loads.

11.7 Cleaning the device

ATTENTION

Do not clean with fluids

Water or cleaning fluid getting inside the device can destroy the device.

► Only clean with dry materials. (With the exception of the sensor bars.)

Sensor bars

The metal sensor bars can be cleaned with a cloth and cleaning alcohol.

Infrared sensor

Do not touch the infrared sensor. Only clean by gently and carefully blowing air on it. (Do not use compressed air.)

12. Faults

If the measures listed below fail to remedy any faults or if the device has faults not listed here, please contact Schaller Messtechnik GmbH.

Fault	Cause	Remedy
Measuring error	The temperature of the material being measured is too low or high. I.e. the material's temperature is lower than 0 °C or higher than +80 °C.	The temperature of the material being measured has to be between 0 °C and +80 °C.
	Wrong calibration curve	Check whether you have selected the right calibration curve (product) before taking a reading. (See 7.1 Selecting the calibration curve)
	Material stack is not high enough	The stack of paper or cardboard being measured has to be at least 50 mm high.
	Reading taken in the wrong place, e.g. at the front of a roll	All readings must be taken by resting the sensor bars on the long side of the roll
	Incorrect contact pressure	Press the device against the paper or cardboard with a pressure of approx. 4 kg.
	Metal or similar conductive materials in the device's measuring range	Remove all metal or other conductive materials from the device's measuring range (the device is not suitable for measuring moisture in metal-coated paper).
	Graphite paper	The device is not suitable for measuring moisture in paper containing graphite.

Fault	Cause	Remedy
Incorrect adjustment (the exclamation mark on the display does not go away)	There is an object/material behind the sensor plate (during adjustment)	Hold the device up into the air - make sure your fingers do not touch the sensor plate.
Worn (abraded) sensor bars	Taking readings on rotating rolls causes the metal bars to wear more quickly	Replace the sensor bars' metal bars. (See 11.3 Replacing the sensor bars)
Data transfer to Log-Memorizer failed	Interface has not been configured	The interface only has to be configured once. To do so, press the F1 key on your computer and read the Help file for your Log-Memorizer program.
The device doesn't switch on	Battery empty	Charge the battery. (See 11.1 Charging the integrated battery).
	Battery deeply discharged	Charge the battery and then reset the device (perform a hardware reset). (See 11.2 Resetting the hardware/device)
The device doesn't respond to any operating commands	Software has crashed	Reset the device (perform a hardware reset). (See 11.2 Resetting the hardware/device)

13. Repair

If your humimeter needs repair, please pack it securely for transport and send it to:
Schaller GmbH
Max-Schaller-Straße 99
A - 8181 St.Ruprecht an der Raab

Download the repair form at humimeter.com/reparatur. Please fill out the form completely and enclose it with your package. This will allow us to clearly identify your repair request and process it quickly.

WARNING

For safety reasons, deeply discharged, damaged, or swollen rechargeable or non-rechargeable batteries are not allowed to be sent. Rechargeable and non-rechargeable batteries must be removed from the device before sending.

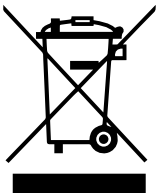
14. Storage and disposal

14.1 Storing the device

The device must be stored as follows:

- Do not store outdoors
- Store in a dry and dust-free place
- Protect the device from sunlight
- Avoid mechanical shocks/loads
- Storage temperature: -20 °C to +60 °C

14.2 Disposing of the device



Devices marked with this symbol are subject to Directive 2012/19/EU of the European Parliament and of the Council of 4 July 2012 on waste electrical and electronic equipment (WEEE).
If the device is being operated outside the European Union, the national regulations on the disposal of such devices that apply in the country of use must be observed.Electronic devices must not be disposed of as domestic waste. The device must be disposed of appropriately using appropriate collection systems.

15. Device information

15.1 EC declaration of conformity

CE KONFORMITÄTSERKLÄRUNG
DECLARATION OF CONFORMITY

Name/ Adresse des Herstellers: *Name/ address of manufacturer:*	**Schaller Messtechnik GmbH** **Max-Schaller-Straße 99** **A – 8181 St. Ruprecht**
Produktbezeichnung: *Product designation:*	**humimeter**
Typenbezeichnung: *Type designation:*	**PM5**
Produktbeschreibung: *Product description*	**Messgerät zur Bestimmung des Wassergehalts in Papier und Karton** ***Measuring instrument for determining the water content in paper and board***

Das bezeichnete Produkt erfüllt die Bestimmungen der Richtlinien:

The designated product is in conformity with the European directives:

EMV - Richtlinie 2014/30/EC	***EMC Directive 2014/30/EU***
RoHS - Richtlinie 2011/65/EG	***RoHS-Directive 2011/65/EU***

Die Übereinstimmung des bezeichneten Produktes mit den Bestimmungen der Richtlinien wird durch die vollständige Einhaltung folgender Normen nachgewiesen:

Full compliance with the standards listed below proves the conformity of the designated product with the provisions of the above-mentioned EC Directives:

EN 61326–1:2013	Elektrische Mess-, Steuer-, Regel- und Laborgeräte - EMV-Anforderungen *Electrical equipment for measurement, control, and laboratory use – EMC requirements*
EN IEC 63000:2019-05 *ersetzt / replaced* **EN 50581:2012**	Technische Dokumentation zur Beurteilung von Elektro- und Elektronikgeräten hinsichtlich der Beschränkung gefährliche Stoffe. *Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances.*

Für das angeführte Produkt ist eine vollständige Dokumentation mit Betriebsanleitung in Originalfassung vorhanden.

For the mentioned product a complete documentation with manual of instruction in original version is available.

Bei Änderungen, die nicht vom Hersteller spezifiziert sind, verliert diese Konformitätserklärung die Gültigkeit.

In case of any changes not agreed upon with the manufacturer, this declaration of conformity loses its validity.

St. Ruprecht a.d. Raab, 31.07.2022

Schaller Messtechnik / humimeter.com
Schaller Messtechnik GmbH
Max - Schaller - Straße 99
AT - 8181 St. Ruprecht a. d. Raab
www.humimeter.com | info@humimeter.com

Bernhard Maunz
Rechtsverbindliche Unterschrift des Ausstellers
Legal binding signature of the issuer

UK CA

DECLARATION OF CONFORMITY

Name/ address of manufacturer:	**Schaller Messtechnik GmbH** **Max-Schaller-Straße 99** **A – 8181 St. Ruprecht**
Product designation:	**humimeter**
Type designation:	**PM5**
Product description:	**Measuring instrument for determining the water content in paper and board**

The designated product is in conformity with the following directives:

- **Electromagnetic Compatibility Regulations 2016 Great Britain**
- **RoHS-Directive 2011/65/EU Directive on the restriction of the use of certain hazardous substances in electrical and electronic equipment**

Full compliance with the standards listed below proves the conformity of the designated product with the provisions of the above-mentioned Directives:

EN 61326–1:2013	Electrical equipment for measurement, control, and laboratory use – EMC requirements
EN IEC 63000:2019-05 replaced **EN 50581:2012**	Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances.

For the mentioned product, a complete documentation with manual of instruction in original version is available.

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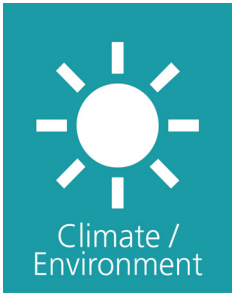
St. Ruprecht a.d. Raab, 31.07.2022

Bernhard Maunz
Legal binding signature of the issuer

15.2 Technical data

Display resolution	0.1% moisture content, 0.1 °C/°F temperature
Measuring range	1% to 25% moisture content
Operating temperature	0 °C to +80 °C
IR sensor measurement angle	90°
Storage temperature	-20 °C to +60 °C
Temperature compensation	Automatic
Data memory	Up to 10,000 measuring values
Measuring depth	50 mm
Minimum material thickness	50 mm
Paper density range	200 kg/m³ to 1600 kg/m³
Power supply	LI-Ion 1,800 mAh battery (60 to 100 operating hours)
Battery charging time	Up to 6 h
Current consumption	60 mA (incl. display illumination)
Menu languages	German, English, French, Italian, Spanish, Portuguese, Czech, Polish, Russian, International
Display	128x64 illuminated matrix display
Device dimensions	254 x 138 x 70 mm
Soft-case dimensions	540 x 380 x 120 mm
Device weight	850 g
Weight of device + soft-case	2900 g
Device IP rating	IP 40

16. Notes



Schaller Messtechnik develops, produces and sells professional moisture meters and turnkey solutions.

Schaller Messtechnik GmbH
Max-Schaller-Straße 99, A - 8181 St. Ruprecht an der Raab, Austria
Tel +43 (0)3178 - 28899, Fax +43 (0)3178 - 28899 - 901
info@humimeter.com, www.humimeter.com