TEST SAMPLE EXTRACTOR FL-MIKRO-LAB COMPACT WITH MEASURED VALUE EVALUATION LAPTOP / PC

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TECHNICAL DATA

TEST SAMPLE EXTRACTOR FL-MIKRO-LAB COMPACT:

Dimensions	H: 115 mm; ∅ of the sample container: 110 mm
Cover	Highly resistant anodized aluminium
Weight	2,2 kg
Temperature Range of the material to measure	0-80°C
Volume	168 cm^3
Connection Cable	5x0,25 mm2 shielded; Length: 2 meters

SYSTEM REQUIREMENTS OF EVALUATION PC:

Operation System	WIN 2000 / NT / XP
Serial Interface	1x RS 232 (COM-PORT)

FL-DIGI-SMART:

Dimensions	H: 75 mm, W: 122 mm, D: 120 mm
Power Supply	110 - 230 VAC (+ 10%), 50/60 Hz
Measure Range	0-XX.X % (depending to the measured medium)
No. of Calibration Graphs	unlimited
Accuracy	depending to measure range and material (approx. +/- 0,3%)
Temperature Range	0-50° C

MICROWAVE MOISTURE PROBE:

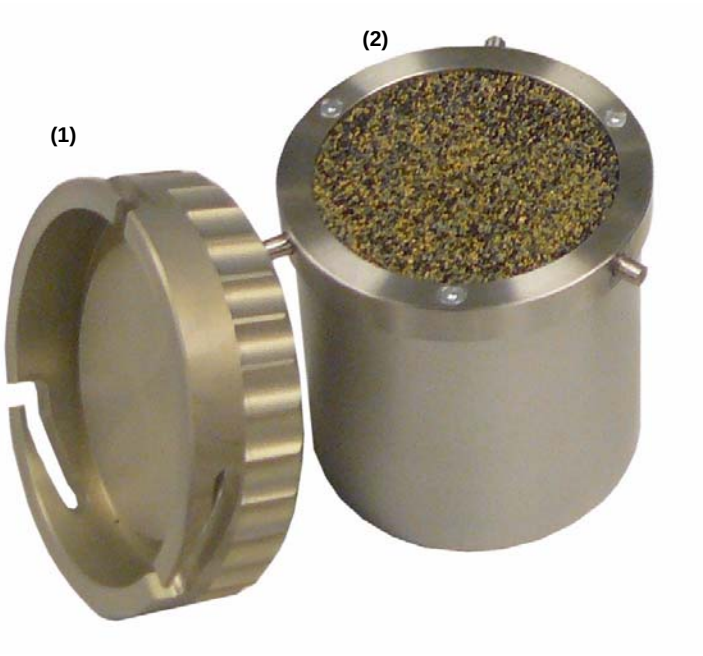
Dimensions of the Probe	∅ 75 mm; Length: 90 mm
Weight	0,85 kg
Power Supply	+24 V DC (+/- 25 %)
Power Absorption	3 VA
Temperature Range	0-80°C
Frequency	433,92 MHz
Outputs analog	2 analog outputs 0-20 mA
Cover	Solid Aluminium

1. TEST SAMPLE EXTRACTOR FL-MIKRO-LAB COMPACT

1.1 CONSTRUCTION

Probennehmer FL-Mikro-Lab mit LAPTOP / PC

The Test Sample Extractor FL-MIKRO-LAB COMPACT is 2-part constructed.



Upper Part

The upper part **(1)** consists of a clasp cover.

Lower Part

The Microwave Moisture Probe is installed in the lower part **(2)** and is connected to the evaluation unit with the probe's measure cable.

1.2 MEASUREMENT OPERATION

Generals

Before real moisture values can be displayed, a calibration (see 2.4 - Calibration) has to be proceeded or a pre-calibrated calibration graph has to be operated. When measuring material with different ingredients and grain structure, you have to take several calibration graphs. You have to make sure the correct calibration graph is chosen in the evaluation PC when starting the measurement. Calibration curves without limit can be stored.

Measurement Sequence

- Make sure the correct calibration curve is chosen (see 2.2. Operation Panel / Protocolling) with the evaluation computer.
- Pay attention the material sample to be measured is homogeneously mixed.
- Fill the probe container until the upper edge and wipe off excess material with a ruler.
- Put on the cover clasp and twist it off.
- Start the measurement with the evaluating computer. Pay attention that seperate calibration curves are chosen with different materials to measure (see 2.4 Calibration). The measurement takes about 5 seconds and is running automatically after touching the START field. When the measurement is finished, the %-moisture value can be read.
- Open the clasp of the sample container after the measurement for emptying. Make sure no material is remaining in the sample container nor on the probe's surface.

1.3 CLEANING

Make sure no material remains are soiling the test sample extractor nor the probe's measure surface after emptying the FL-MIKRO-LAB COMPACT. Material remains can be removed with a brush or air pressure. Material stockings on the probe's surface can be removed with common household cleaners (e.g. scouring agents). Heavy soiling can be removed with a high pressure cleaner.

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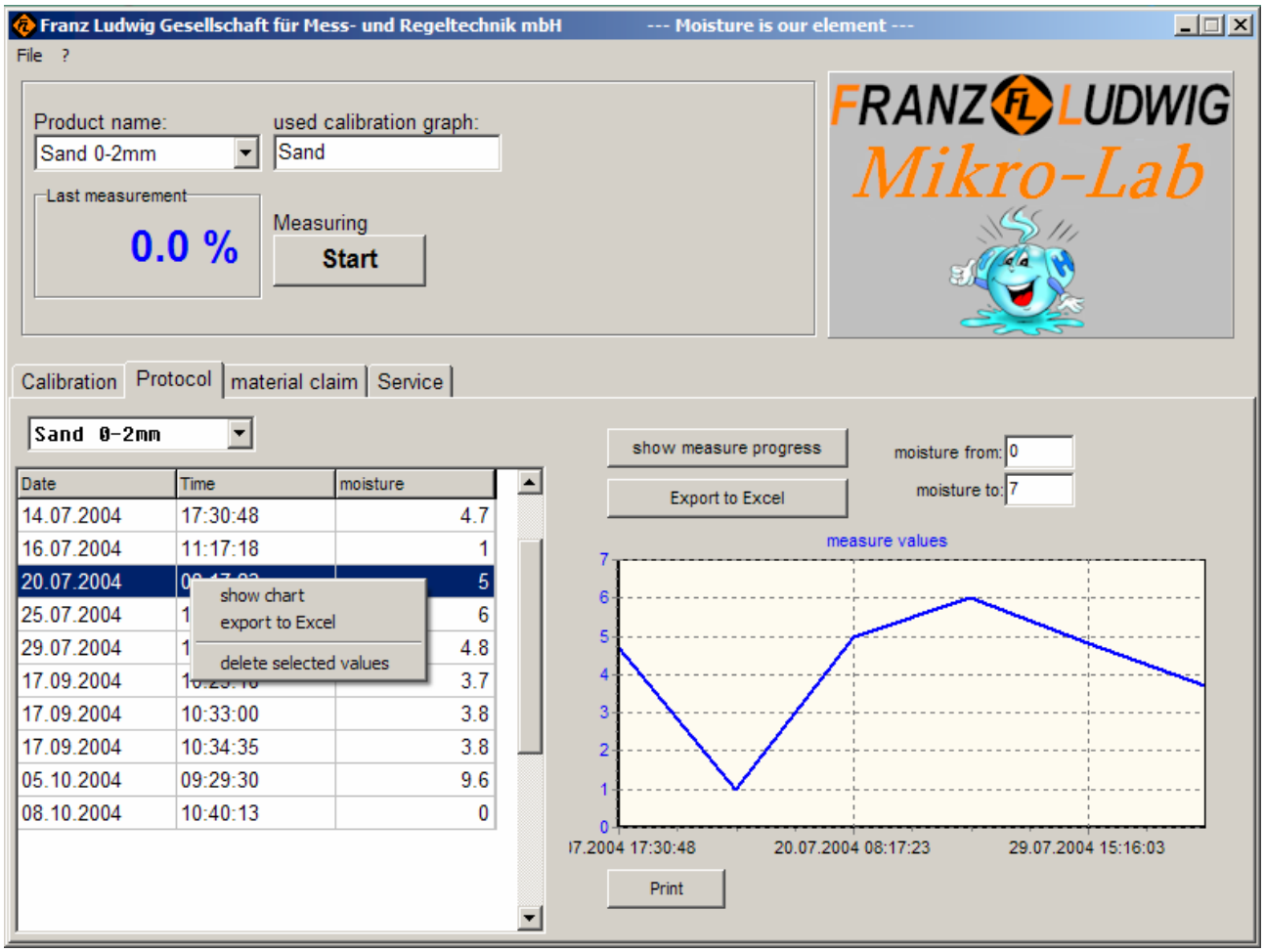
2. MEASURED VALUE EVALUATION VIA LAPTOP/PC

2.1 SOFTWARE INSTALLATION

Exceed SETUP.EXE and follow the directions. An Icon is automatically generated on the desktop.
After starting the program go to the „SERVICE“-page and enter the password „55124“, than confirm with „OK“.
Set now your language and the used Com-Port of your laptop/pc.

2.2 OPERATION PANEL / PROTOCOLLING

At the upper edge the currently chosen product („product name“) and the corresponding calibration graph chosen are displayed. After touching the „START“-button a measurement is done with this calibration graph and the current moisture value is displayed in the field „measured value“ after 5 sec. The measured value is simultaneously stored in the protocolling menu.



At the lower edge the chosen „protocolling menu“ is shown. All products measure results are displayed depending to date and time. The requested product is chosen in the product name field (here: and 0-2 mm). It is necessary to choose the recording period before the measure value course can be displayed graphically:

Left mouse key	- marks the beginning of the range
Left mouse key + pressed shift key	- marks the end of the range

Afterwards the measured value graph can be displayed graphically when touching the „Show Measure Progress” field. When touching „Export to Excel“-field the marked range is changed in an excel-compatible data format and automatically opened in Excel so all data can even be shown on other systems. The moisture range to be displayed in the diagram can be set when using the fields „Moisture from“, „Moisture to“. When deleting a marked table part, press the right mouse key and „Delete selected Values“. The displayed measured value diagram or the depending measured values or both can be printed on a connected printer with „Print“.

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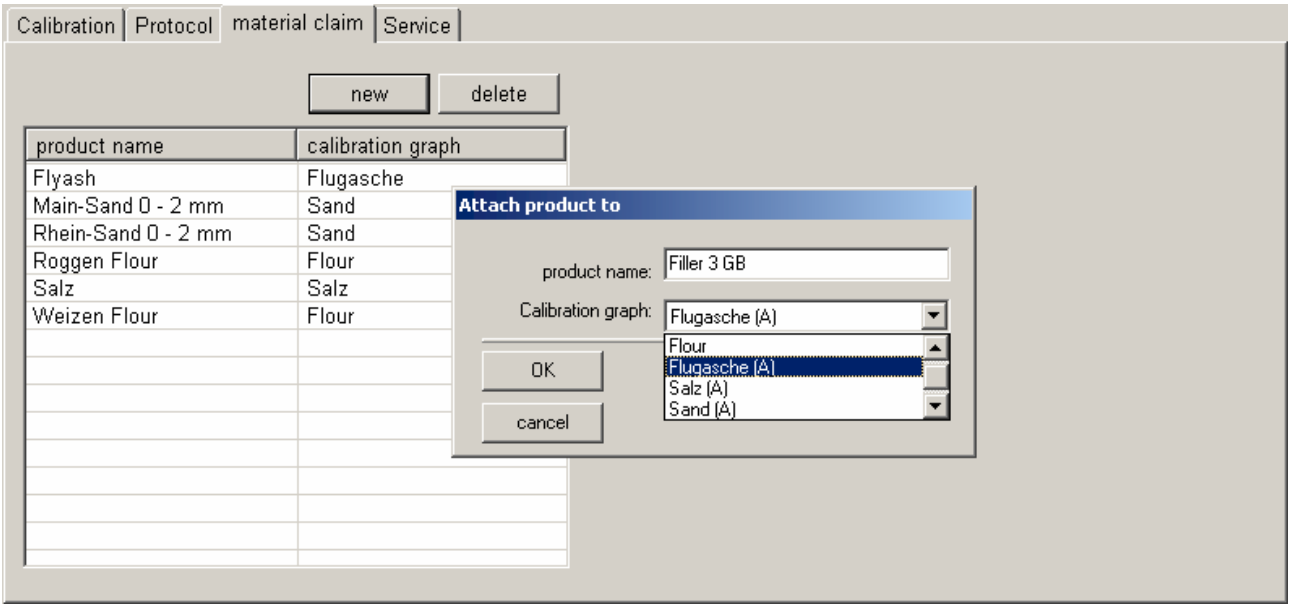
2.3 MATERIAL ASSIGNMENT

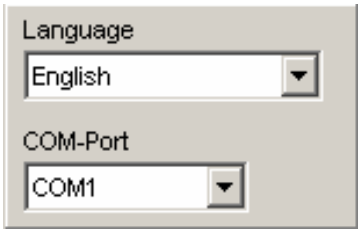


In the menu „Material Claim“ the pre-set calibration graphs are assigned to certain products. You can assign one calibration graph to as many products as you would like. For a new assignment, press „NEW“. The „Attach Product To“ window opens. Enter first the name of the product to be measured in „Product Name“. Than choose an existing calibration graph in the field „CALIBRATION GRAPH“. (Pre-calibrated calibration graphs are named with „A“). The assignment is stored with “OK”.
With new material, no calibration graph has been taken before, a calibration has to be proceeded first (see 2.4. - CALIBRATION). If an assignment in the table has been marked with the right mouse key, it can be deleted when touching the DELETE-button.
ATTENTION: All already protocolled measured values of this assignment are deleted, too!

PROBE CHECK: Point 3.2 CHECKING OF MEASURING PROBE

LANGUAGE: The requested language can be set

COM-PORT: Assign a COM-PORT



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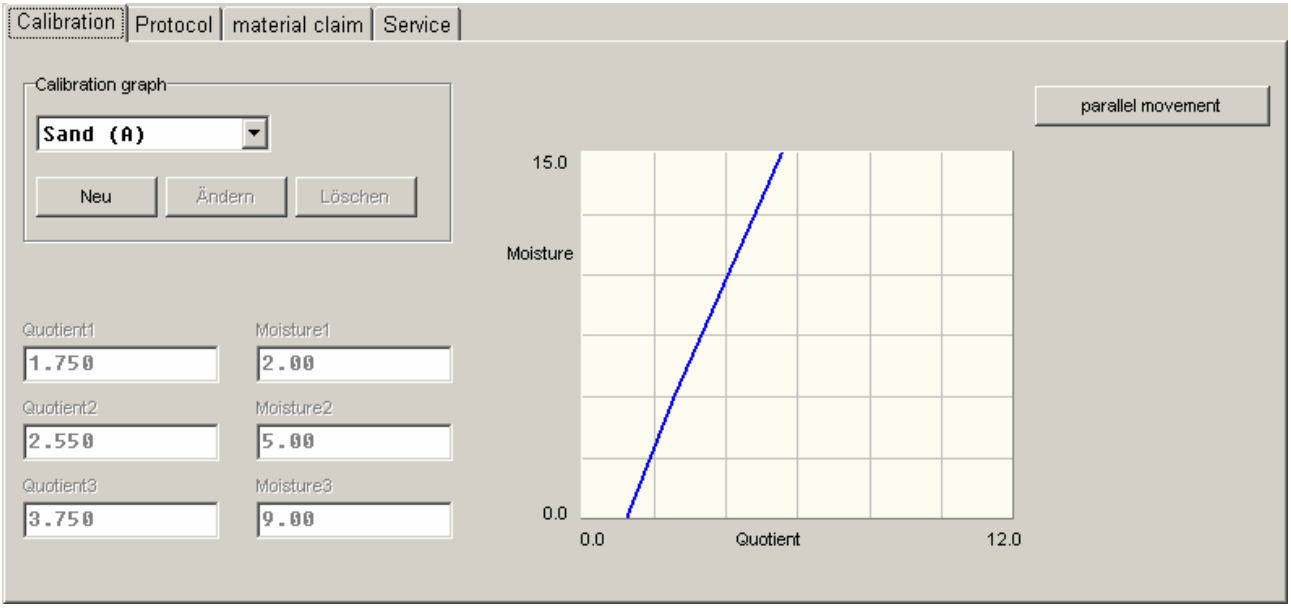
2.4 CALIBRATION

For evaluating of realistic %-moisture-values, the FL-MIKRO-LAB COMPACT has to be calibrated first. If materials with very different compound and grain structure should be measured, it is recommended to take several calibration graphs. You can take as many calibration graphs as you like.



Taking of a new calibration graph

Prepare two material samples with different moistures. The moisture values have to be known and should serve the upper and lower part of the moisture range to measure (The material sample with the lower moisture should be higher than '0'.)

Example:

Moisture Range to measure	0 % - 10 %
Material sample 1	2 %
Material sample 2	6 %

- After clicking the NEW field, a window opens and the name of the calibration graph can be entered.
- With the mouse or the TAB change into the field FIRST MOISTURE VALUE. Enter here the lower moisture value (2 from the example).
- Fill the FL-MIKRO-LAB COMPACT with the first sample and pull the hand wheel down. The needle has to stop at a scale position which has to be pre-set in advance. We recommend scale position 1 until 2. Products with high condensing should be condensed to one of the lower scale positions.
- Start the measurement with START.
- After approx. 5 seconds you are asked to enter the 2nd moisture value (e.g. 6).
- Fill the sample extractor with the second probe, condense the material and start the 2nd measurement.
- After 5 seconds the calibration is done. Touch OK to return to the calibration mode.
- The calibration graph can now be assigned to a product at the point MATERIAL CLAIM.

Important:

All measurements with this product have to be processed with the same pressure (same scale position) during the further calibration as well as in the later measure operation.

2.6 MENU LANGUAGE

You have the possibility to set the language at tab "MATERIAL CLAIM":

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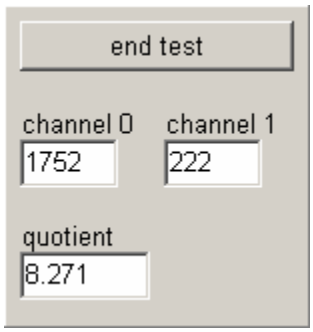
3. ERROR DETECTION

3.1 INEXACT MEASURE RESULTS

- Calibration has been done?
- Did you take several material specific calibration curves for the measuring of very different materials (compound, structure)?
- Did you assign the corresponding calibration curve to the product designation?
- Soiling and build-ups on the probe's measure surface and the inner sample container are impossible?
- Has the FL-MIKRO-LAB COMPACT been filled completely before measurement?
- Is the material sample to measure homogeneously mixed every time?
- Are the moisture values reliable evaluated with the calibration or the comparative measurement through reference system (ex. Drying oven)? You probably have to proced control dryings.

3.2 CHECKING OF MEASURING PROBE

At tab MATERIAL CLAIM you have the possibility to get the probe's measure channels displayed when touching the button PROBE CHECK. The displaying of the probe's measure channels K0 and K1 allows the function checking of the microwave moisture probe. Take off the upper and the middle part
if the FL-MIKRO-LAB COMPACT. Start a measure process with uncovered probe. The value of channel 0 has to
lay around 2000 (+/- 500). The value of channel 1 has to lay around 3800 (+/- 500). The value of channel 1 should go down to approx. 400 (+/- 200). Should the values of your probe lay out of this range, please contact one of our technicians for further steps. The Q-value (quotient value) is a linking up with K0 and K1 and indicates the non-calibrated measured value.



3.3 INTERFERENCY OF ISM-FREQUENCIES

Radio frequency devices use particular ISM-Frequencies (Industrial Scientific and Medical), which are international prescribed.
Our Microwave Moisture Probe, which counts as this type of device, is operated inside the frequency range from 433,05 to 434,79 MHz. Radio frequency ranges are utilized in many commonly known devices. As an example of these devices:

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- Radio Alarm Systems - Vehicle Opener
- Mobile Transmitters - Garage door Opener
- Remote Controls - Wireless Movement Detectors

On account to the huge number of ISM-Devices it can lead to mutual influences or interferences, if they are operated in direct environment. The radio signals might be received from others as the expected receiver. To avoid each kind of interferences, we recommend, that your other operating ISM-devices, which use the range from 433,05 – 434,79 MHz as well, not be used in immediate vicinity of our Microwave Moisture Probes resp. be laid out for other ISM-Frequencies. This goes especially for possible danger zones as for example cranes, roll-doors, buckle conveyor belts, e.g. In researches and tests, which had been done by us and outside institutes, have been found out, that the from us used frequency range from 433,05 to 434,79 MHz is the most advantageous to get reliable and accurate Moisture Measurement with our Microwave Moisture Probes.

Please feel free to contact us. We look forward to answer any questions you may have.

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