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Operating manual
Electronic Moisture Analyser

KERN MLS_D

Version 1.2
02/2017
GB

MLS_D-BA-e-1712

GB

KERN MLS_D

Version 1.2 02/2017

Operating manual

Electronic Moisture Analyser

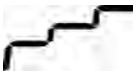
English

Contents

English

English

1 Technical data

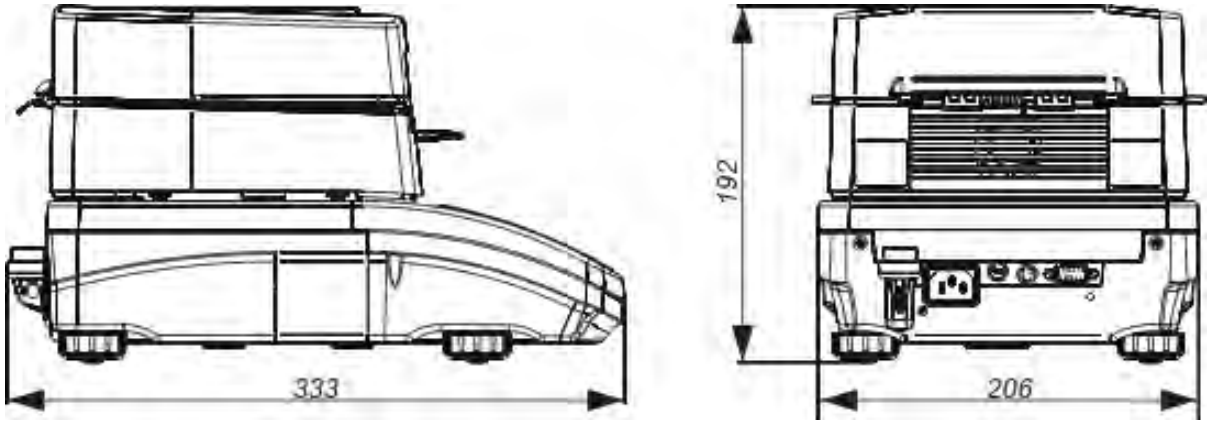
Data	MLS 50-3D
Radiator type	Infrared (400 W)
Temperature range	max. 160°C
Maximum load (Max)	50 g
Readability (d)	1 mg
Display accuracy Weighed portion < 1.5 g	0.01 %
Display accuracy Weighed portion > 1.5 g	0.001 %
Recommended adjustment weight, not added (class)	50g (F1)
Sample size	max. 50 g
Max. height of sample	20 mm
Warm-up time	4 h
Heating profiles	 Standard drying
	 Step-by-step drying
	 Quick drying
	 Gentle drying
Repeatability for originally weighted in quantity ~ 2 g	± 0.1 %
Repeatability for originally weighted in quantity ~ 10 g	± 0.02 %
Repeatability in weighing mode (= standard deviation)	0.001g
Environmental conditions	• +10°C….+40°C ambient temperature • max 80% air humidity non-condensing

English

Shut-down criteria	➢ Automatic switch-off (weight loss per unit of time– 5 settings) ➢ Automatic free switch-off criterion (weight loss per unit of time, user defined) ➢ Time controlled switch-off (1 min – 99h 59 min) ➢ Manual switch-off by pressing stop key	
Sample dishes included	10 items (Ø 90 mm, h = 8mm)	
Result display	Moisture [%] = Weight loss from starting weight (SW)	0 – 100 %
	Dry mass [%] = Residual weight (RW) left from starting weight (SW)	100 – 0 %
	ATRO[%] [(SG – RG) : RG] x 100%	0 – 999 %
	Residual weight	[g]
Dimensions	Housing 206 x 333 x 192 mm	
	Available drying chamber 120 x 120 x 20 mm	
Net weight	4.9 kg	
Electric Supply	230V 50 Hz AC	

English

1.1 Dimensions



2 Device overview

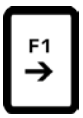
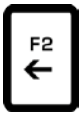
Pos.	Designation
1	Heating hood
2	Viewing panel
3	Infrared lamp
4	Sample dish
5	Windshield
6	Removal aid
7	Display
8	Keyboard
9	Adjustable foot

English

2.1 Keyboard overview

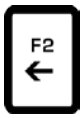
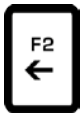
Button	Function
REPORTS	• Shortcut to data base <Drying reports>
UNITS	• Switch over display of result • Exit menu • Cancel
MENU	• Invoke setup menu
ON OFF	• Switch machine on/off
DATA BASE	• Data base menu
F	• Shortcut to basic functionality - Download method from database - Login - Enter tare - Select tare from database - Print header - Print footer - Variable 1 - Variable 2 - Changeover function: Weighing mode⇆ moisture determination mode
TARE INSERT	• Taring • Add data record
START STOP	• Start / finish drying and measuring process

English

	• Shortcut key for frequently recurring functions and settings (For configuration see chap. 8.3.10 / chap.15.5) • Scroll display from left to right
	• Shortcut key for frequently recurring functions and settings (For assignation see chap. 8.3.10 / chap. 15.5). • Scroll display from right to left
	• Select product from product database • Scroll backwards in menu • Scroll through digits and alphabet one by one in reverse order • Decrease flashing digit
	• Define drying parameters • Scroll forward in menu • Scroll through digits and alphabet in forward sequence • Increase flashing digit
	• Data output to external device (weighing mode) • Confirm / store settings
	• Zeroing • Data record deletion

English

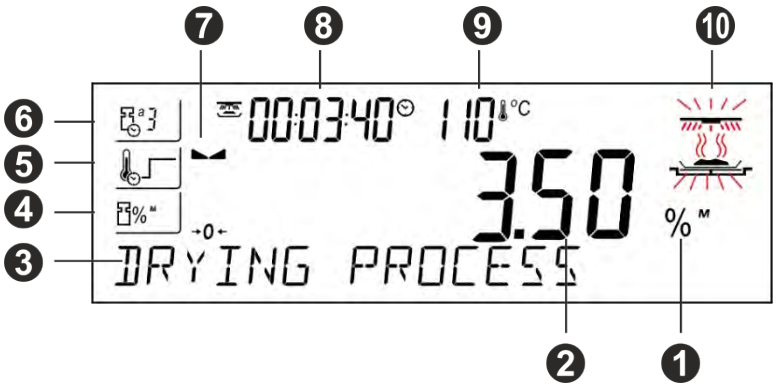
2.1.1 Numeric entry

Button	Designation	Function
	Navigation button ↑	Increase flashing digit Scroll through digits and alphabet in forward sequence
	Navigation button ↓	Decrease flashing digit Scroll through digits and alphabet in reverse sequence
	Navigation button →	Digit selection to the right
	Navigation button ←	Digit selection to the left
	Navigation button ↵	Confirm entry
		Cancel input

English

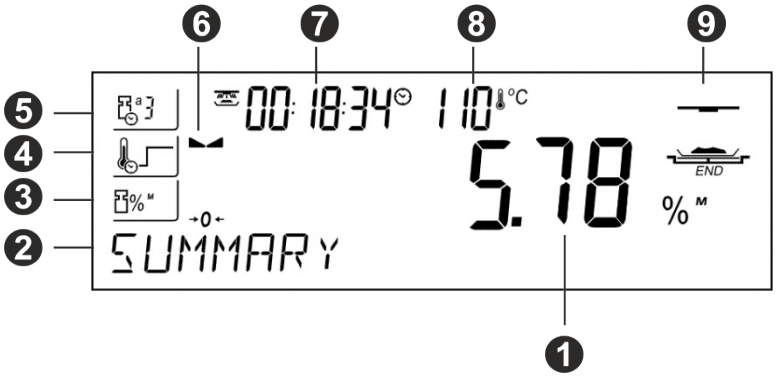
2.2 Overview of display

During drying:



1. Display in % moisture
2. Subtotal
3. Information bar – drying process enabled
4. Enabled result display
5. Enabled heating profile
6. Enabled switch-off criterion
7. Stability display
8. Previous drying time
9. Current temperature
10. Status display – drying process enabled

When drying is finished:



1. Final result in result display selected
2. Information bar – final result
3. Enabled result display
4. Enabled heating profile
5. Enabled switch-off criterion
6. Stability display
7. Drying period
8. Current temperature
9. Status bar – drying process finished

English

3 Basic Information (General)

3.1 Proper use

The device purchased by you is designed for a fast and reliable determination of material moisture in liquid, porous and solid materials by applying the method of thermogravimetrics.

3.2 Improper Use

Impacts and overloading exceeding the stated maximum load (max) of the device, minus a possibly existing tare load, must be strictly avoided.
Balance may be damaged by this.
Never operate device in explosive environment. The serial version is not explosion protected.
The structure of the balance may not be modified. This may lead to incorrect weighing results, safety-related faults and destruction of the balance.
The balance may only be used according to the described conditions. Other areas of use must be released by KERN in writing.

3.3 Warranty

Loss of warranty due to

- Our conditions in the operation manual are ignored
- The appliance is used outside the described uses
- Changing or opening instrument
- Mechanical damage and damage caused by media, liquids
- Natural wear and tear
- The appliance is improperly set up or incorrectly electrically connected
- The measuring system is overloaded

3.4 Monitoring of Test Resources

In the framework of quality assurance the measuring-related properties of the balance and, if applicable, the testing weight, must be checked regularly. The responsible user must define a suitable interval as well as type and scope of this test. Information is available on KERN's home page (**www.kern-sohn.com**) with regard to the monitoring of balance test substances and the test weights required for this. In KERN's accredited DKD calibration laboratory test weights and balances may be calibrated (return to the national standard) fast and at moderate cost.

4 Basic Safety Precautions

4.1 Pay attention to the instructions in the Operation Manual

⇨ Carefully read this operation manual before setup and commissioning, even if you are already familiar with KERN balances.

⇨ All language versions contain a non-binding translation. The original German is binding.

4.2 Symbols used in the operating instructions

	Please pay due attention to information denoted by the signal words CAUTION or WARNING as well as a warning pictogram.
WARNUNG! **WARNING!**	The signal word WARNING indicates a hazardous situation where disregard of the safety information may result in fatal or severe injury.
VORSICHT! **CAUTION!**	The signal word CAUTION indicates a hazardous situation where disregard may result in minor injury.
HINWEIS ***NOTICE***	NOTE (or LOOK OUT) indicates actions that may result in damage to property.
	This symbol indicates helpful information.
⇨	Call to action. This prompts you to perform certain operations

English

4.2.1 Warning pictograms

High voltage

Chemical burn / corrosion

General hazard

Fire or explosion

Poisoning

Hot Surface

4.3 Personnel training

The instrument may only be operated and maintained by trained personnel.

4.4 Danger Information

WARNING!

- The moisture analyser is used to analyse the moisture content of materials. This instrument must be used exclusively for this purpose. Any other usage may cause a risk to personnel, damage to the instrument or other material damage.
- The moisture analyser should be used mainly for the drying of aqueous substances.
- The moisture analyser may not be used in a hazardous area.
- Do not use the moisture analyser in an explosive environment.
- The operation and maintenance of the moisture analyser is restricted to trained competent specialist staff.
- Carefully read this operation manual before setup and commissioning, even if you are already familiar with KERN instruments.
- Never make any modifications or design changes to the equipment whatsoever. Always use original spare parts and accessories.
- Make sure that liquids cannot penetrate the interior of the device, the terminals at the rear of the device and the connected peripherals (such as printer, PC). If you spill liquid on the device, disconnect it immediately.
  Afterwards do not operate the moisture meter and have it checked by a competent KERN stockist before any further use.

Hazards during and after measuring

- Ensure correct installation of all components, see chap. 6.2
- Careful when removing the sample. The sample itself, the sample dish and the heating unit may be very hot.
- Use the sample retainer at all times as it allows safe working and prevents burns.
- Individual parts of the case (e. g. the ventilation grids) may heat up considerably during operation.

English

CAUTION!

The moisture analyser operates using heat!

- ☞ Maintain sufficient space in the environment of the instrument to prevent heat build-up (distance from the instrument 20cm, upwards 1m).
- ☞ The heat extractor of the sample must never be covered, blocked, taped up or altered in any other way.
- ☞ Never place combustible materials on, under or next to the instrument, as the environment of the instrument heats up to a high temperature.
- ☞ Careful when removing the sample. The sample itself, the sample dish and the heating unit may be very hot.

CAUTION!

Fire or explosion

- ☞ Explosive, easily flammable samples and samples that go into a chemical reaction when subjected to heat, may not be analysed with the moisture analyser.
- ☞ If in doubt, conduct a risk analysis.
- ☞ Select a drying temperature for samples of this kind that is low enough to prevent ignition or explosion.
- ☞ Wear safety goggles.

WARNING!

Substances that contain toxic or corrosive ingredients, produce toxic gases when drying, cause irritation (eyes, skin, airways), induce nausea or result in death

- ☞ Sample materials emitting toxic substances must be dried with a special extraction system in place. Create an environment that prevents the inhalation of vapours hazardous to health.

WARNING!

Substances that liberate corrosive gases when heated up (such as acids)

- ☞ In that case, work with smaller sample amounts as the liberated gases may condense on cooler casing parts and later cause corrosion.

English

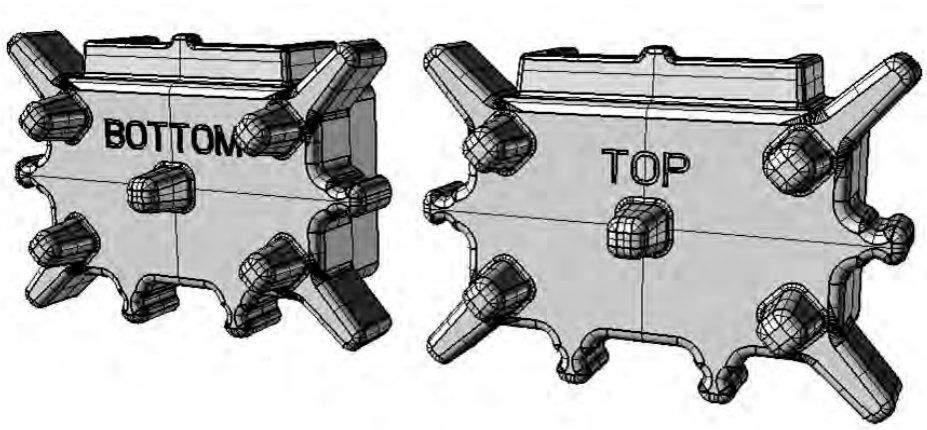
5 Transport and storage

5.1 Testing upon acceptance

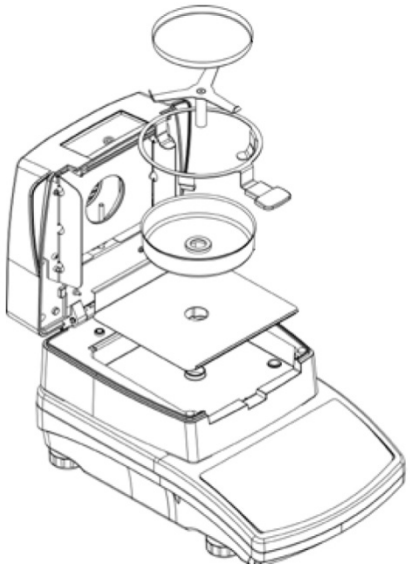
When receiving the appliance, please check packaging immediately, and the appliance itself when unpacking for possible visible damage.

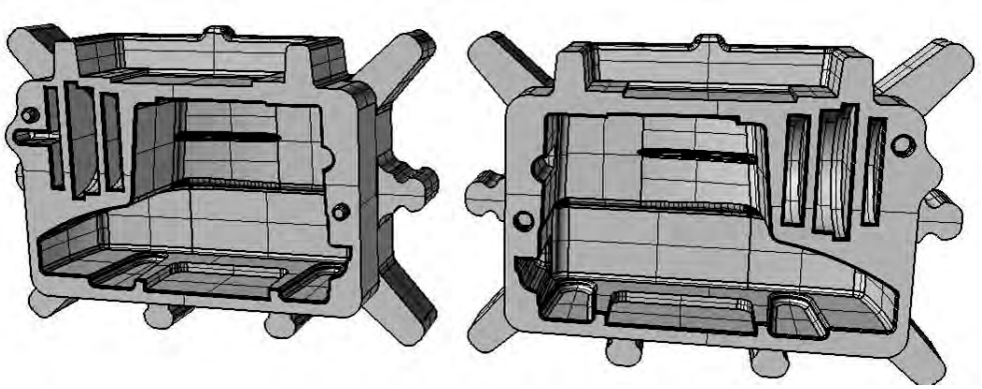
5.2 Packaging / return transport

- ⇨ Keep all parts of the original packaging for a possibly required return.
- ⇨ Only use original packaging for returning.

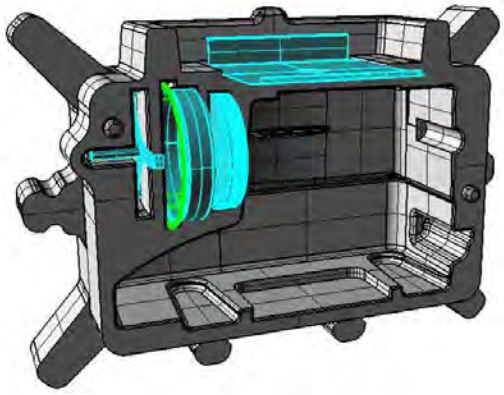


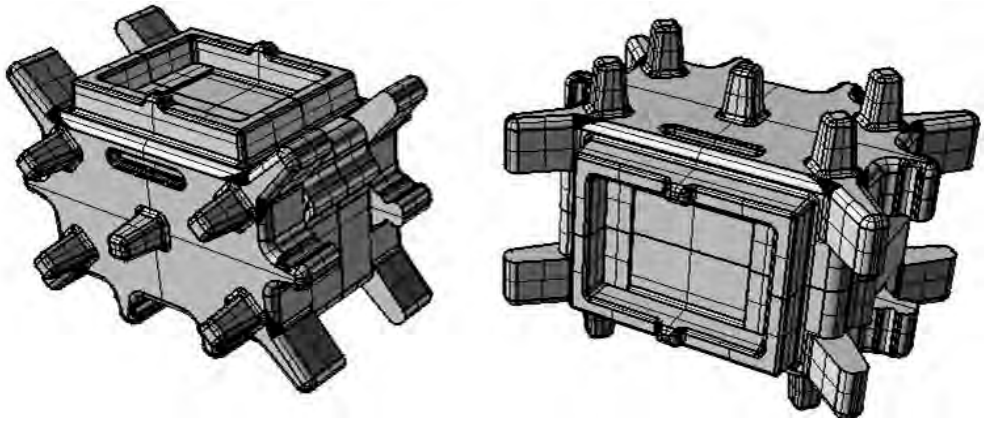
- ⇨ Prior to dispatch disconnect all cables and remove loose/mobile parts.

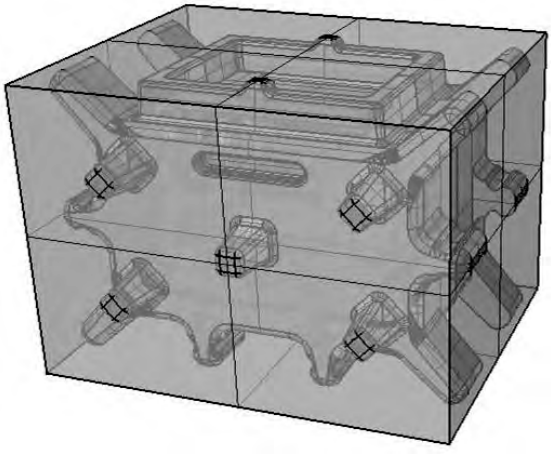




⇨ Secure all parts against shifting and damage.







6 Unpacking, Setup and Commissioning

6.1 Installation Site, Location of Use

The instrument is designed to achieve reliable weighing results under normal conditions of use.
You will work accurately and fast, if you select the right location for your balance.

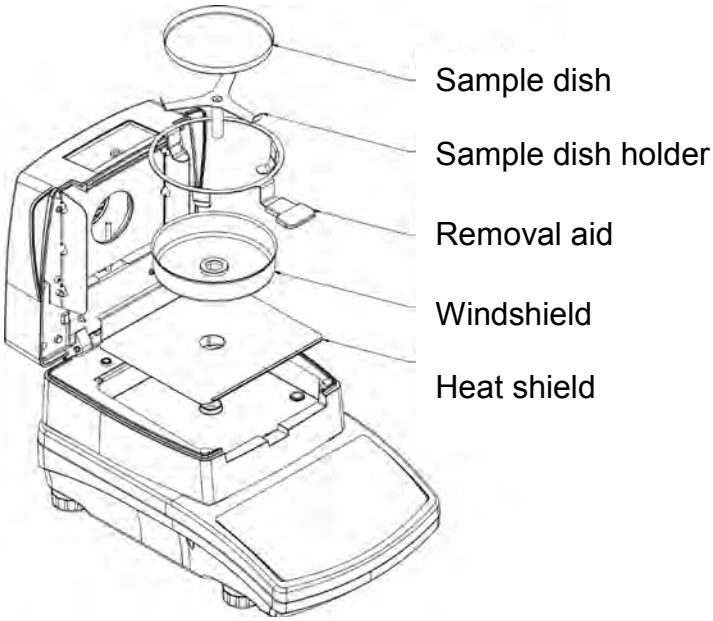
On the installation site observe the following:

⚠	Remove explosion prone and easily flammable material in the immediate vicinity. Emerging vapours, sample dish and all parts of the sample chamber are hot!
⚠	Protect the instrument against direct draughts due to open windows and doors.
⚠	Avoid extreme heat and temperature fluctuations e.g. due to installation next to radiators.
⚠	Do not expose the instrument to extreme dampness for longer periods of time. Non-permitted condensation (condensation of air humidity on the instrument) may occur if a cold instrument is taken to a considerably warmer environment. In this case, acclimatize the disconnected instrument for ca. 2 hours at room temperature.
⚠	Avoid direct sunlight
⚠	The air humidity should be between 45% and 75%, non-condensing.
⚠	Sufficient distance from heat-sensitive materials in area around instrument.
⚠	Protect the instrument against high humidity, vapours and dust,
⚠	Major display deviations (incorrect weighing results) may be experienced should electromagnetic fields (e.g. due to mobile phones or radio instruments), static electricity accumulations or instable power supply occur. Change location or remove source of interference.
⚠	Avoid static charging of the material to be weighed, weighing container and windshield
⚠	Place the instrument on a firm, level surface.
⚠	Avoid jarring during weighing.

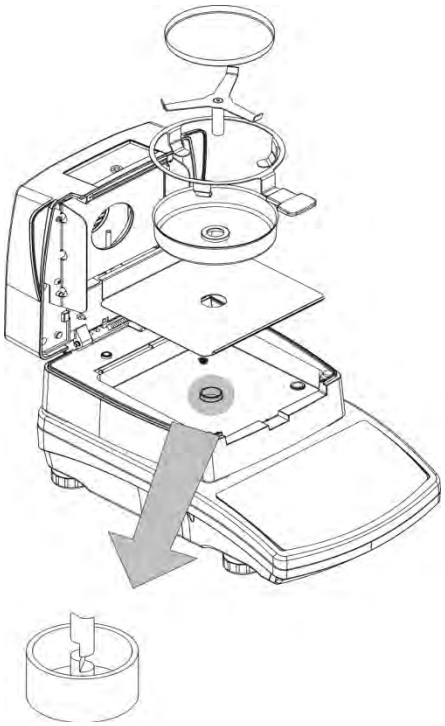
English

6.2 Unpacking and placing

Take the moisture meter carefully out of its packaging, remove the plastic jacket and install it at the designated work space.
The moisture meter is supplied part-assembled. Control whether the delivery is complete immediately after unpacking the individual parts and assemble the separate component parts according to the enclosed diagram.



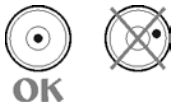
Attach the sample dish holder carefully and rotate it until it locks. The mandrel has a special cut-out that ensures a definite position for the sample dish holder in relation to the removal tool.

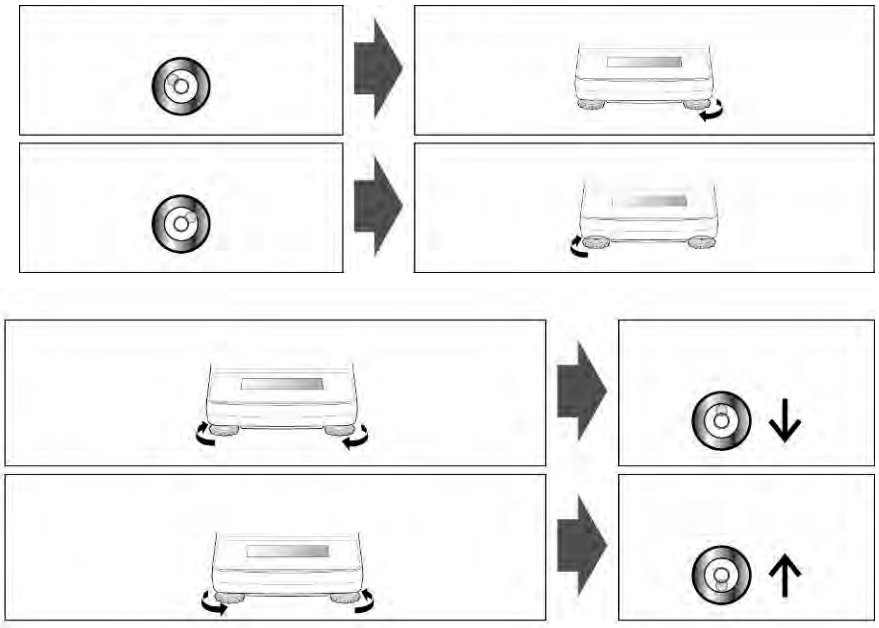


6.3 Levelling

Precise alignment and stable installation are a precondition for repeatable results. To compensate for minor unevenness or tilts of the base, level the instrument.

⇨ Level instrument with foot screws until the air bubble of the water balance is in the prescribed circle.





⇨ Check levelling regularly

6.4 Scope of delivery / serial accessories:

- Moisture content analyser, see illustration chap. 2
- 10 sample dishes
- Power cable
- Operating manual

6.5 Mains connection

Power supply is provided via the supplied mains cable.

Check, whether the voltage acceptance on the scales is set correctly. Do not connect the scales to the power grid unless the information on the instrument (sticker) matches the local mains voltage.

The instrument must be connected to a standard socket with earth terminal (PE). Do not eliminate the protective effect by using an extension lead without earth terminal. For power supplies from power grids without earth terminals call a specialist to establish equivalent protection according to the relevant installation regulations.

Important:

Does the rating match the standard local mains current?

- ➢ Do not connect if mains voltages are different!
- ➢ If matching, connect the scales.

6.6 Commissioning

6.6.1 Connection to power supply

Connect the instrument by using the supplied power cord to the power supply.
The instrument will perform a self-test, briefly showing the software version. Wait until basic configuration appears:

6.6.2 Switching on and off

The instrument will be switched on continuously when connected to the power supply. Use the **ON/OFF** key to switch the display on and off.

To **switch on** the display, press the **ON/OFF** key.
Wait until basic configuration appears.

To **switch off**, press the **ON/OFF** button again. In the process the instrument will be changing to ready position.

When in ready position, the instrument will be ready for operation immediately after switching on without requiring any warming up time.

6.6.3 Initial Commissioning

In order to receive precise weighing results from electronic balances, the instrument unit must have reached its operating temperature (see warming-up time chapter 1).
For this warm-up period the scale must be connected to the power supply.
The accuracy of the balance depends on the local acceleration of gravity.
Strictly observe hints in chapter Adjustment.

6.6.4 Selecting user language

German is set as the display's language upon delivery. For setting additional languages see chap. 9.

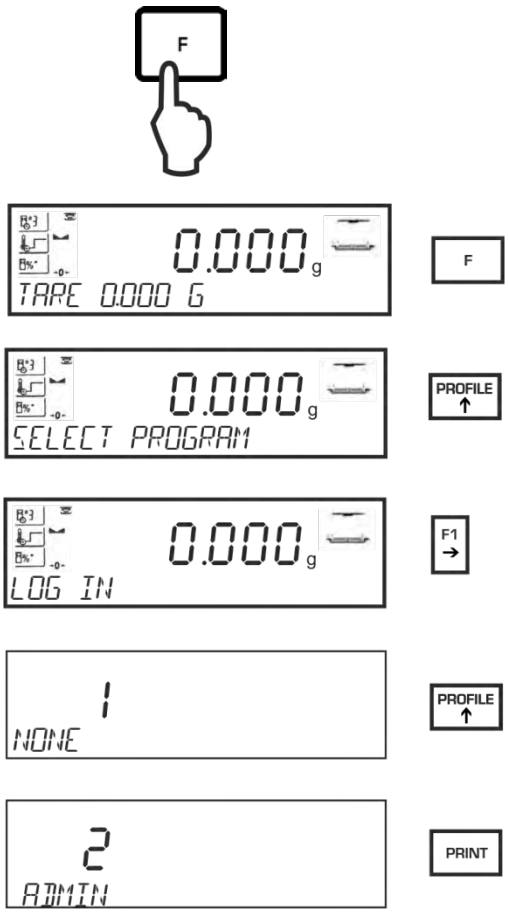
6.6.5 First Log In

During the dispatch, in the scales there is no user's profile available (setting <none>). For <USER> authorization profile is assigned for <none user> setting, see chapter 14.1. The access to the menu and data base is limited.
In order to obtain full access to the menu and data base, the user has to log in as the administrator.
If you wish to protect your settings against unauthorised access, create a password-protected user profile, see chap. 14.1.1.
The user database <User> allows you to create 100 user profiles with specific settings and user rights, see chap.14.1.

English

Log In operation:

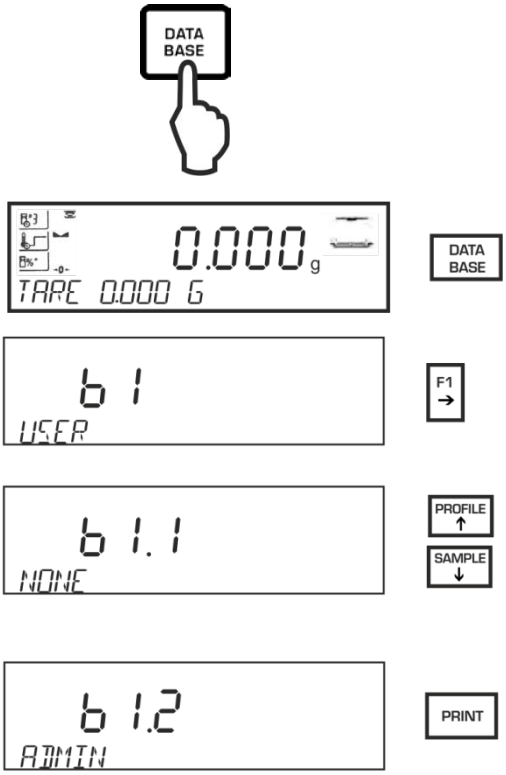
There are several keys available for logging in such as the **F**-key, **DATABASE**-key or one of the shortcut keys **F1** or **F2** (provided they are assigned to <LOG IN>).



⇨ Use the navigation keys to select ADMIN.

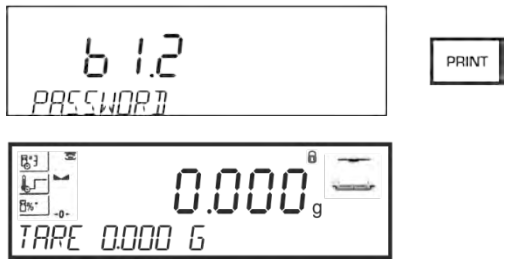
⇨ Reply to the question for the password by means pushing PRINT button.

The icon will be shown on the display as long as the user profile is enabled.



⇨ Use the navigation keys to select <ADMIN>

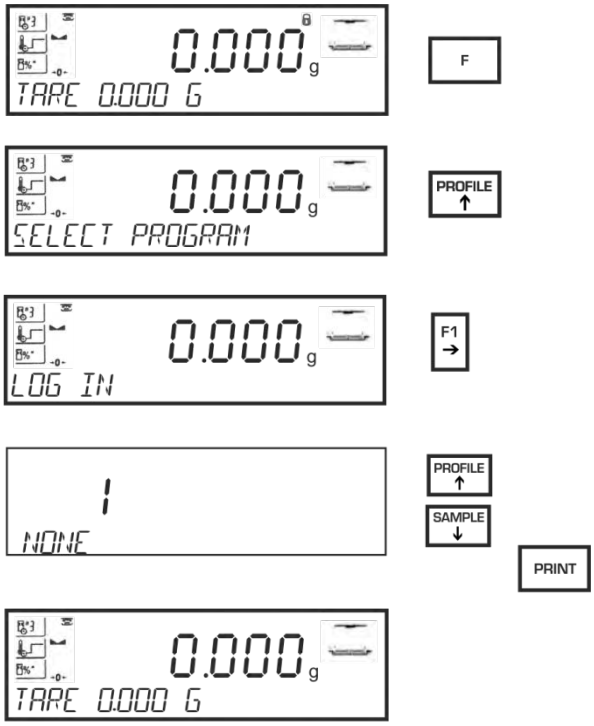
⇨ Reply to the question for the password by means pushing PRINT button.



The icon will be shown on the display as long as the user profile is enabled.

English

Logout:



The symbol disappears

6.7 Peripherals

Before connecting or disconnecting of additional devices (printer, PC) to the data interface, always disconnect the balance from the power supply.
With your balance, only use accessories and printers by KERN, as they are ideally tuned to your balance.

7 Setup menu

For general settings for the instrument go to the setup menu.

7.1 Menu structure

The menu is subdivided into seven menu blocks (P1 – P7).

In order to obtain the full access to the menu, the user has to log in as the administrator.

P1	Adjustment	
	P1.1 External adjustment	see chap. 11.1.1
	P1.2 User adjustment	see chap. 11.1.2
	P1.3 Temperature adjustment	see chap. 11.2.2
	P1.4 Temperature test	see chap. 11.2.1
P2	Working mode	
	P2.1 Weighing	Available settings see chap. 8.3
	P2.2 Moisture determination	Available settings see chap. 15.5
P3	Communication	see chap. 17
	P3.1 COM 1	
P4	Equipment	see chap.
	P4.1 Computer	see chap. 18.1
	P4.2 Printer	see chap. 18.2
	P4.3 Barcode reader	see chap. 18.3
P5	Print-outs	
	P5.1 Adjustment report	see chap. 12.1
	P5.2 Printout draft header	see chap. 12.2.1
	P5.3 GLP report	see chap. 12.2.2
	P6.4 Printout draft footer	see chap. 12.2.3
	P6.5 Measurement report	see chap. 12.3
	P5.6 User defined report 1	see chap. 12.4
	P5.7 User defined report 2	
	P5.8 User defined report 3	
	P5.9 User defined report 4	
	P5.10 Variable 1	see chap. 12.5
	P5.11 Variable 2	

English

P6	General parameters	
	P6.1 Operator language	see chap. 9
	P6.2 Access level for menu access	
	P6.3 Key sound	
	P6.4 Backlighting for display	
	P6.5 Sleep mode	
	P6.6 Auto off	
	P6.7 Set date	
	P6.8 Set time	
	P6.9 Format date	
	P6.10 Format time	
P7	Info	see chap. 10
	P7.1 Weighing scale ID no.	
	P7.2 Model name	
	P7.3 Software version status	
	P7.4 Temperature environment	
	P7.5 Temperature sample chamber	
	P7.6 Print device settings	

7.2 Navigation in the menu

Call up menu	Press MENU and the first menu block “P1 CAL“ will appear.
Select menu block	Use the navigation key PROFILE ↑ to select the individual menu blocks one by one. Use the navigation key PROFILE ↑ to scroll down. Use the navigation key SAMPLE ↓ to scroll up.
Select menu item	Confirm selected menu block by F1 →. The first menu item of the selected menu block will be shown. Use the navigation key PROFILE ↑ to select individual menu items one by one. Use the navigation key PROFILE ↑ to scroll down. Use the navigation key SAMPLE ↓ to scroll up.
Select setting	Confirm selected menu item with F1 → and the current setting will be shown.
Change settings	Use the cursor keys to change to the available settings. Use the navigation key PROFILE ↑ to scroll down. Use the navigation key SAMPLE ↓ to scroll up.
Confirm setting / back to menu	Either confirm by pressing the PRINT ↵-key or reject by pressing the UNITS-key.
Exit menu	Press UNITS
Return to weighing mode	Press UNITS repeatedly.

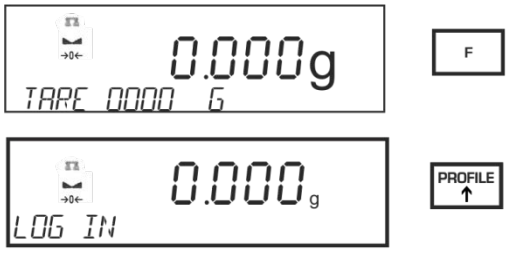
English

8 Weighing mode

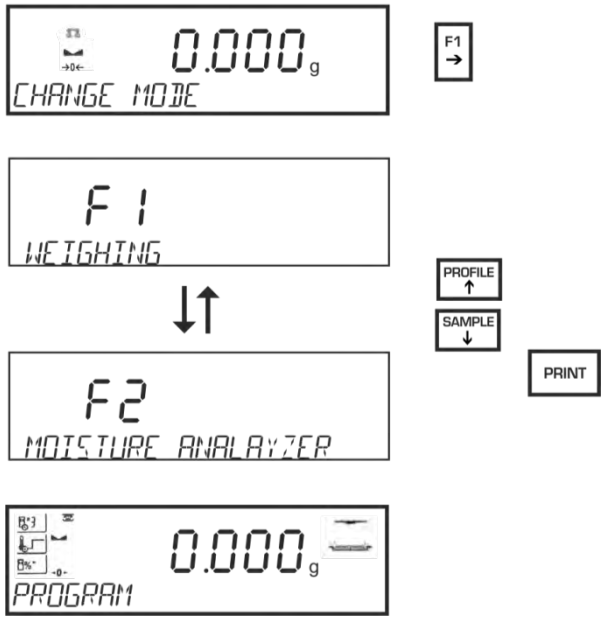
How to perform a simple weighing process is described in the chap. 8.2 ”Weighing“. Apart from the processing steps (simple weighing, zero setting, taring) described there, the instrument offers additional options that allow you to customise the “weighing“ application to your requirements; for available settings see chap. 8.3

8.1 Changeover function weighing mode ⟺ Moisture analysing mode

If weighing mode is not enabled, select as described below.



⇨ Press PROFILE repeatedly until <CHANGE MODE> is shown.



8.2 Weighing

For warm-up time required for stabilisation (see chap. 1).

8.2.1 Simple weighing

- ⇨ Check zero display [→0←] and set to zero by →0← DELETE if required.
- ⇨ Place load on sample dish
- ⇨ Wait until the stability display appears (▬).
- ⇨ Read weighing result.

After pressing PRINT ↵ you can save the weighing value and print it if an optional printer is connected.

8.2.2 Zeroing

In order to obtain optimal weighing results, reset to zero the balance before weighing. Zero setting is restricted to the range of ± 2% max. For values greater than ± 2% max error message “Err2“ will appear.

- ⇨ Unload the balance
- ⇨ Press →0← DELETE, zero display as well as indicator →0← will appear.

8.2.3 Weighing with tare

➢ **Taring**

The dead weight of any weighing container may be tared away by pressing a button, so that the following weighing procedures show the net weight of the goods to be weighed.

⇨ Place weighing container on the sample dish

⇨ Wait until the stability display appears (▬), then press TARE INSERT.
Zero display and indicator (**Net**) appear. The weight of the container is now internally saved.

⇨ Weigh the material.

⇨ Wait until the stability display appears (▬).

⇨ Read net weight.

- When the balance is unloaded the saved taring value is displayed with negative sign.
- Do not tare negative values! Attempts of taring negative values will result in error message “Err 3”.
- The taring process can be repeated any number of times. The limit is reached when the whole weighing range is exhausted.
- You can assign the tare weight to a product in the database. Tare weight will be loaded automatically as soon as product is selected; see chap. 14.2.1**.**

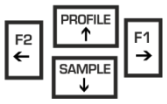
➢ **Automatic tare function**

As long as the auto tare function is enabled <P2.1.2 AUTOTARA YES > the first load placed will be saved as tare weight, see chap. 8.3.6

➢ **Numerical input of tare (PRE-TARE)**

Condition:
Shortcut key F1 or F2 has the assigned function <ENTER TARE>, see chap. 8.3.10

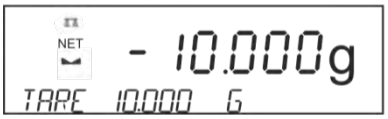
⇨ Press shortcut key and the screen used to enter the tare value will appear.



⇨ Enter known tare value by operating the navigation keys (See chap. 2.1.1) and confirm by 

.

⇨ The display will return to weighing mode. The entered weight will be saved as tare weight; the indicator (net) and the tare weight including negative sign will appear.



⇨ Position the filled weighing container.

⇨ Wait until the stability display appears (▬).

⇨ Read net weight.

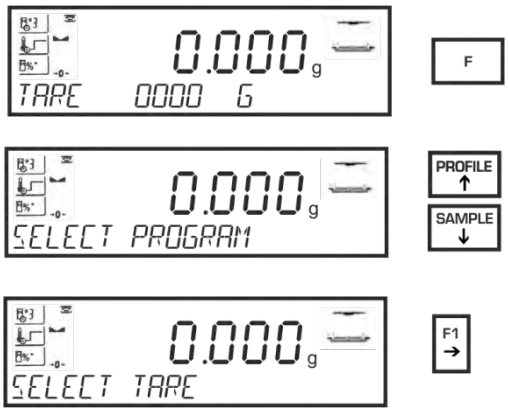
English

➢ **Downloading container weight from database**

⇨ Press shortcut key (F1, F2) that has the function <SELECT TARE>assigned. (See chap. 8.3.10)

or

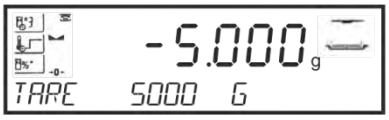
⇨ After pressing [F], select function <SELECT TARE>.



The screen used to select the tare memory will appear.

⇨ Use the navigation keys to select the desired data record and confirm by [PRINT].

⇨ The display will return to weighing mode; the indicator (net) and the selected container weight including negative sign will appear.



i	➢ For creating container weight in database see chap. 14.4.1

➢ **Delete tare**

⇨ Unload weighing plate and press [→0← DELETE].
The (**Net**) indicator turns off, the zero display appears.

8.3 Settings <P2.1 WEIGH>

i	Navigation in menu see chap. 7.2

Menu structure:

Menu item	Parameters	Available settings / explanation
P2.1.1 READOUT	**P2.1.1.1 Filter**	EXTRA FAST Weighing scale reacts very sensitively and very fast, very stable place of installation.
		FAST Weighing scale reacts sensitively and fast, stable place of installation.
		MEDIUM Standard – normal ambient conditions
		SLOW Weighing scale reacts insensitively and slowly, unstable place of installation.
		VERY SLOW Weighing scale reacts very insensitively and very slowly, very unstable place of installation.
	P2.1.1.2 Confirmation of result (weighing speed)	PRECISE Stoppage control precise, unstable place of installation
		FAST Stoppage control fast, very stable place of installation
		FAST + PRECISE Stoppage control fast + precise, stable place of installation
	P2.1.1.3 Auto zero	Selectable yes / no
	P2.1.1.4 Last digit	ALWAYS Last decimal place shown
		NEVER Last decimal place hidden
		WHEN STABLE Last decimal place shown for stable weighing values only
	P2.1.1.5 Environment	STABLE
		UNSTABLE

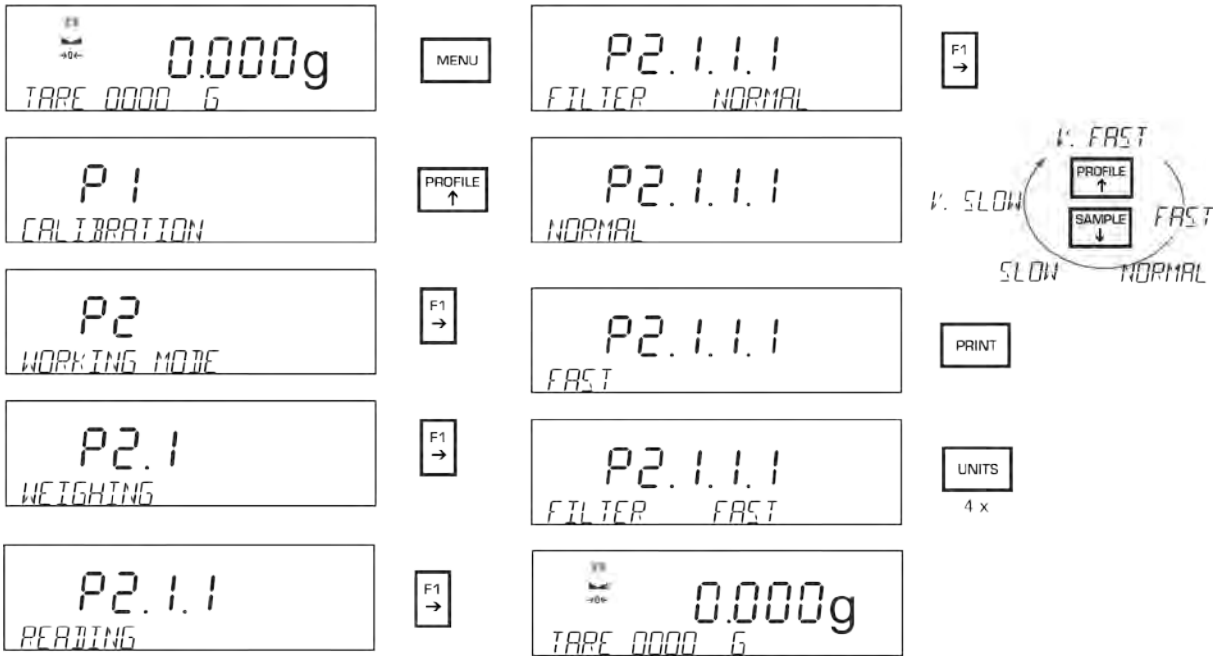
English

P2.1.2 AUTOTARA	Selectable yes / no	
P2.1.3 PRINTOUT MODE (Default PRINT-key)	**P2.1.3.1 MODE**	ALL Report will be issued immediately after pressing the PRINT-key, irrespective of whether the weighing value has been stable or not
		IF STABLE Issue after pressing the PRINT-key not before weighing value has become stable
		AUTO Automatic data output on exceeding set minimum weight <P2.1.3.2 Auto threshold>
	P2.1.3.2 AUTOTHRESHOLD for autom. tare and autom. operation	Input minimum weight for automatic output: Weighing value issued automatically if current weighing value exceeds entered minimum value. The next weighing value will not be issued unless the weighing value has meanwhile dropped below the entered weighing value.
P2.1.4 INFORMA-TION	Options: TARE, NET, GROSS, USER, PRODUCT, STNFO, NONE	
P2.1.5 SPECIAL INFO [STNFO]	Special information – random text, max 19 characters	
P2.1.6 Shortcut keys	F1	Options: NONE / LOGIN / ENTER TARE / SELECT TARE / PRINT HEADER / PRINT FOOTER / VARIABLE 1, 2 /m CHANGE MODE
	F2	

When working with user management please ensure that all settings for the “Weighing“ application are saved under the enabled user profile. Each user can select his/her settings for this application. For that reason, ensure that the correct user profile is selected when you make changes to settings.

8.3.1 <P2.1.1.1> Filter
Adaptation to weighing type and ambient conditions

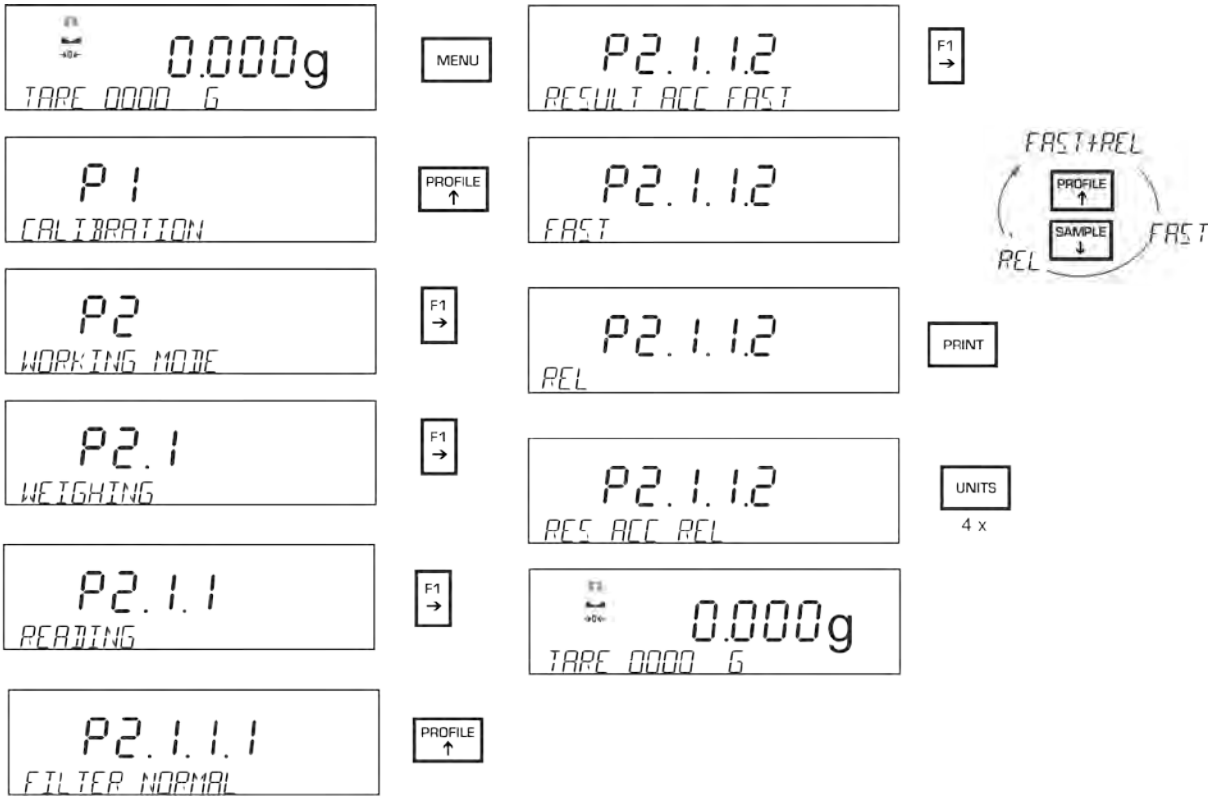
Please note that data processing based on higher stability will always result in deceleration of reaction times while acceleration of reaction times will have a negative effect on stability, that is, the higher the filter level, the longer the reaction time.



English

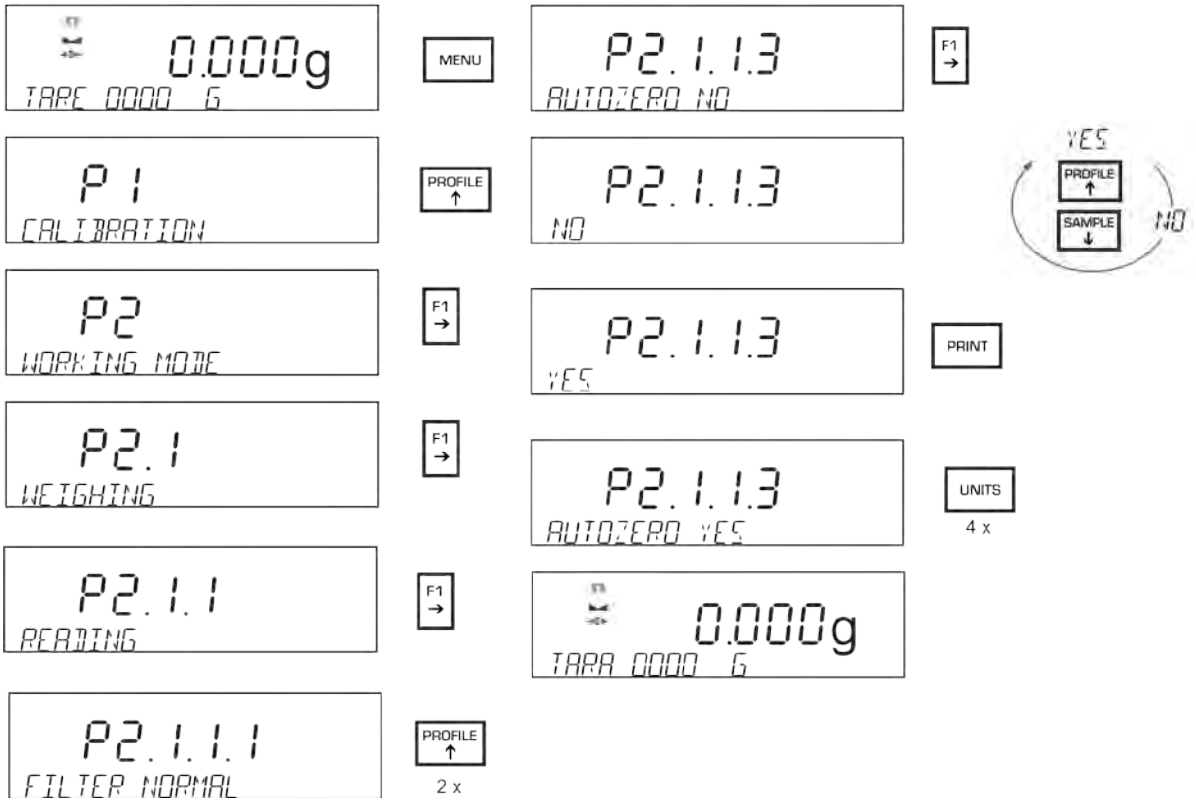
8.3.2 <P2.1.1.2> Stoppage control indication

This setting defines how quickly the instrument considers a measured value as stable and then releases it.



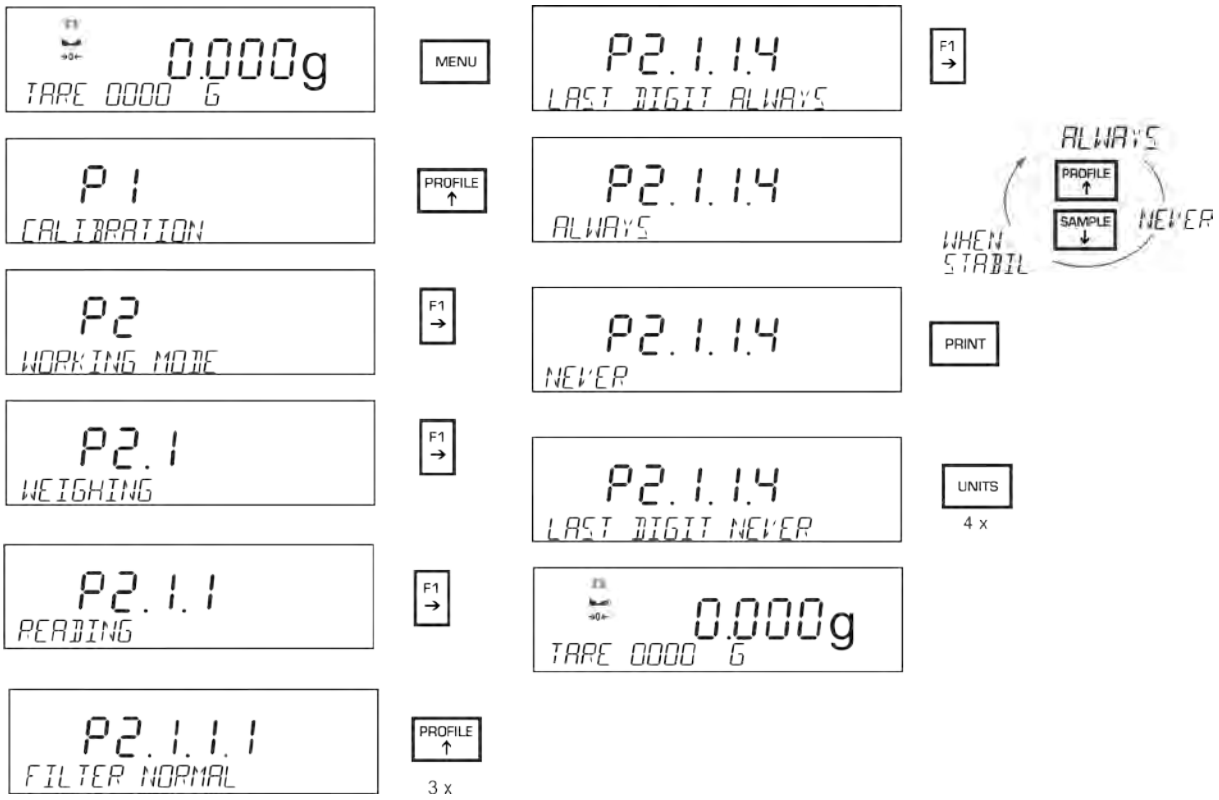
8.3.3 <P2.1.1.3> Auto zero function

This function is used to tare minor weight fluctuations automatically (such as negligible contamination of weighing tray). When this function is enabled it is ensured that every weighing activity starts at zero.
In the event that small quantities are removed or added to the material to be weighed, incorrect weighing results can be displayed due to the “stability compensation“! (e.g. slow flow of liquids from a container placed on the balance, evaporating processes).
When apportioning involves small variations of weight, it is advisable to switch off this function.



8.3.4 <P2.1.1.4> Hide last digit of display

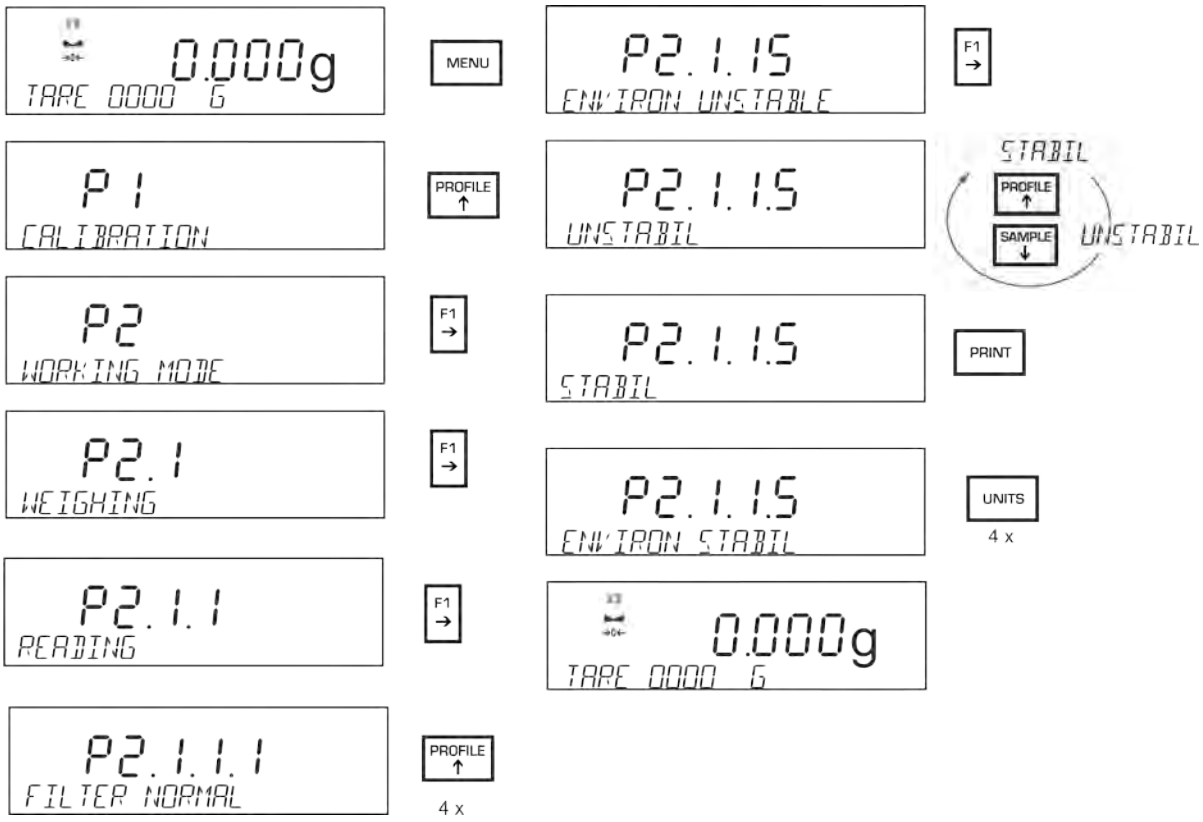
Readability may be reduced by one digit on the instrument, as required. The last decimal place will be rounded and removed from the display.



English

8.3.5 <P2.1.1.5> Environment

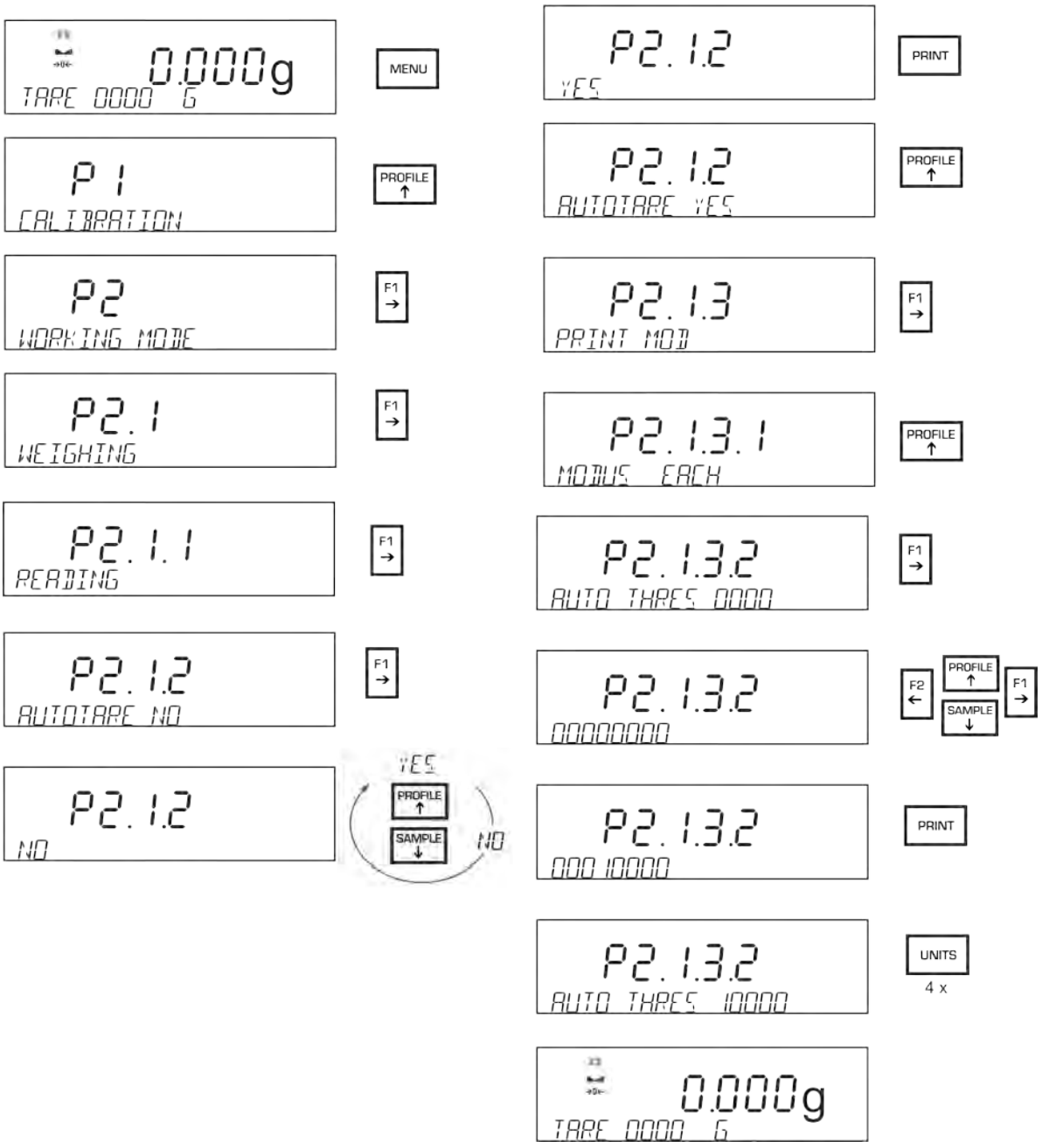
This function allows you to adjust the weighing scale optimally to ambient conditions.
In a stable environment (for instance absence of drafts and vibrations) select setting <STABLE>.
In an unstable environment with permanently changing conditions select setting <UNSTABLE >.



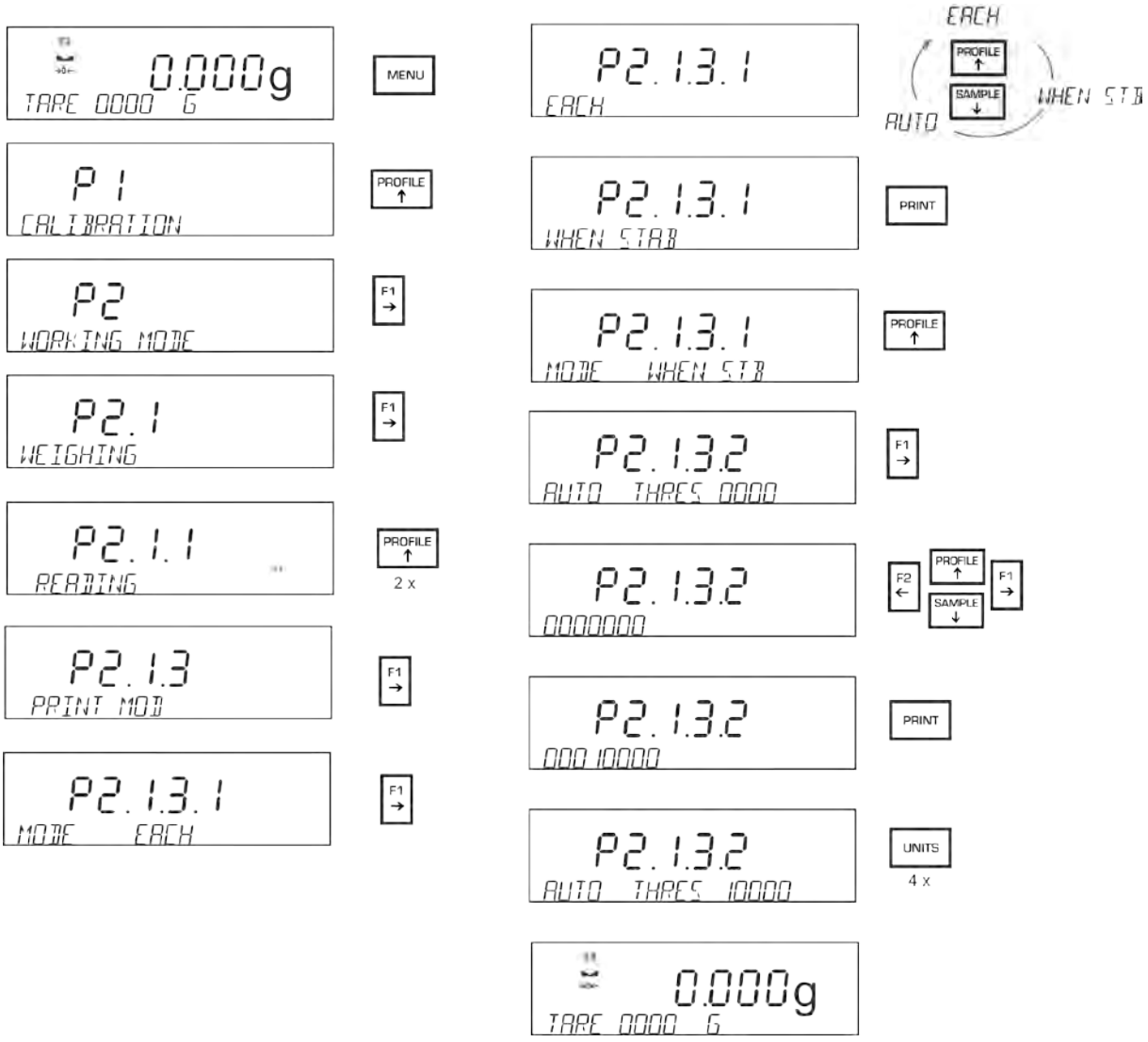
English

8.3.6 <P2.1.2 > AUTOTARE / <P2.1.3.2> AUTOTHRESHOLD

The automatic tare function will automatically save the first stable weighing value as tare value.
Parameter <P2.1.3.2> AUTOTHRESHOLD is used to define which minimum weight has to be put on before automatic taring takes place.
Further automatic taring will only take place when the display drops below the value set for the auto threshold.



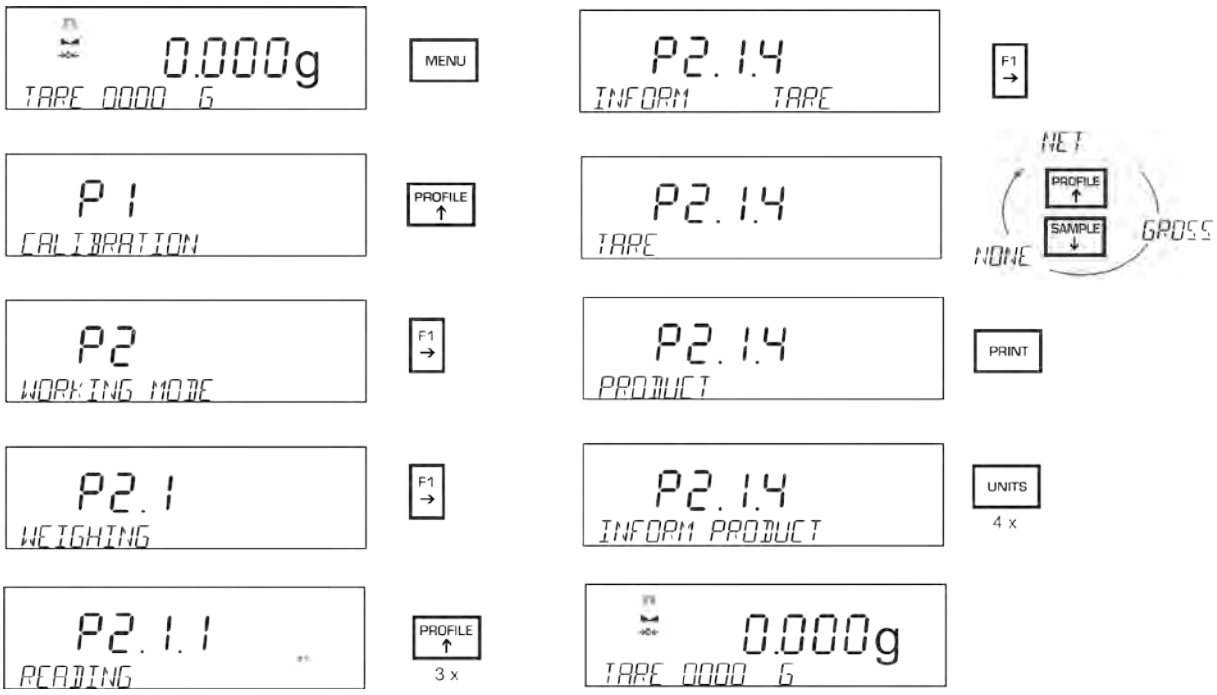
8.3.7 <P2.1.3.1> Default for PRINT-key / <P2.1.3.2> AUTOTHRESHOLD



English

8.3.8 <P2.1.4> Information bar

This function is used to define which additional information is to be shown on the bar at the lower edge of the display.



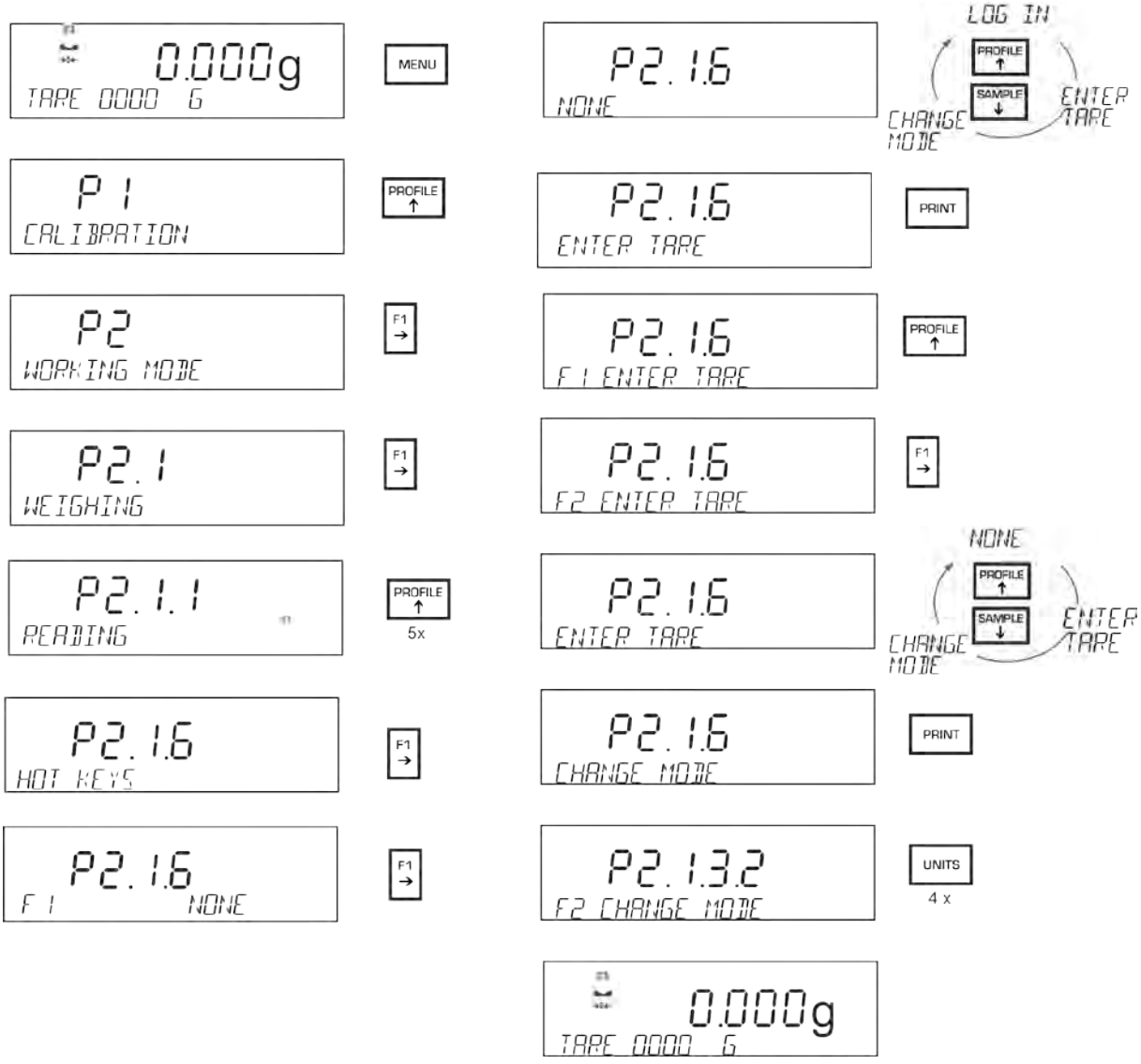
English

8.3.9 <P2.1.5> Special information

This function is used to define user specific information. This will be shown on the bar at the lower edge of the display when function <P2.1.4 SINFO> is enabled.

8.3.10 <P2.1.6> Assigning shortcut keys

Shortcut keys F1 and F2 allow direct access to frequently required functions and settings. Tap the respective key and the function assigned for the two keys under this menu item will be executed.

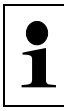


English

9 General parameters < P 6 OTHER>

This is where the parameters influencing the operation of the weighing scale are set, such as operator language, date / time display, key sounds, brightness of display etc.

Menu structure:



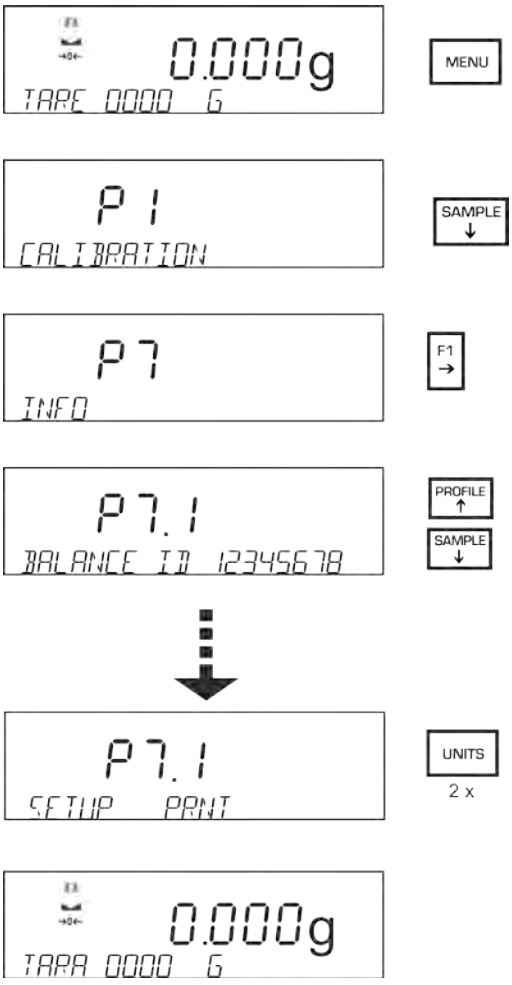
Navigation in menu see chap. 7.2

Menu item	Available settings / explanation
P6.1 LANGUAGE	Operator language selectable: Deutsch/Espanol/Francais/Turk/Cesky/Italiano/Magyar/Polski/English
P6.2 AUTHORISATIONS	Authorisation level selectable: ADMIN / OPERATOR / MASTER OPERATOR
P6.3 KEY SOUND	Options: YES/NO
P6.4 BACKLIGHT	Backlighting for display, brightness adjustable: NONE / 10 ⇆ 100 (dark ⇆ bright)
P6.5 SLEEP MODE	When set to sleep mode, the instrument will switch off the backlighting after a set period of time, provided no loads were put on the weighing platform and no keys were pressed during this time. Backlighting will be restarted the moment any key is pressed or a change in weight takes place. Options: none, 0.5, 1, 2, 3, 5 minutes
P6.6 AUTO SWITCH OFF	When the function is enabled, the display will be switched off automatically and the time shown after a set time of inactivity. In the process the instrument will be changing to ready position. When in ready position, the instrument will be ready for operation immediately after switching on without requiring any warming up time. To restart the instrument, press ON/OFF. Options: none, 1, 2, 3, 5, 10 minutes
P6.7 DATE	Setting date
P6.8 TIME	Set time

English

P6.9 DATE FORMAT (on reports)	Options: YYYY.MM.DD / YYYY.DD.MM / DD.MM.YYYY / MM. DD.YYYY
P6.10 TIME FORMAT (on reports)	Options: 12H / 24H The **AM** or **PM** format will be printed on the report together with the time.

10 Display device information < P 7 INFO>



Identification number
⇕
Model designation
⇕
Software issue
⇕
Current ambient temperature
⇕
Current temperature sample chamber
⇕
Print device parameters

English

11 Adjustment < P1 ADJUSTMENT >

11.1 Adjust balance

As the acceleration value due to gravity is not the same at every location on earth, each balance must be coordinated - in compliance with the underlying physical weighing principle - to the existing acceleration due to gravity at its place of location (only if the balance has not already been adjusted to the location in the factory). This adjustment process must be carried out for the first commissioning, after each change of location as well as in case of fluctuating environment temperature. To receive accurate measuring values it is also recommended to adjust the balance periodically in weighing operation.

- Observe stable environmental conditions. A warming up time (see chapter 1) is required for stabilization.
- Carry out adjustment with placed sample dish. Ensure that no objects are within the sample dish.
- Carry out adjustment as near as possible to the balance's maximum weight (recommended adjustment weight see chap. 1). Weights of different nominal values (>30% max) may be used for adjustment but are not optimal for technical measuring. Info about test weights can be found on the Internet at: http://www.kern-sohn.com.

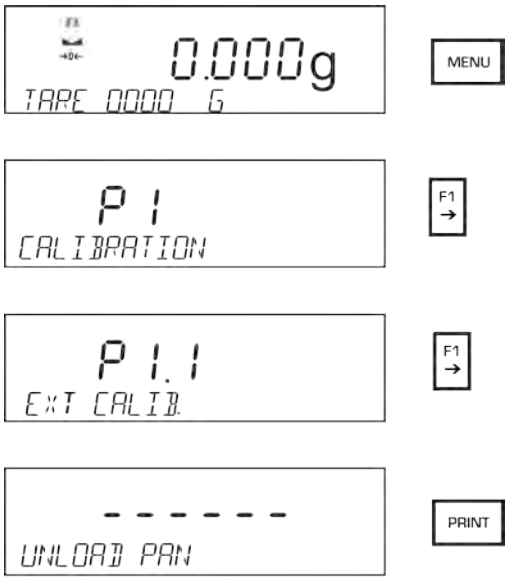
Menu structure < P1 ADJUSTMENT >:

Navigation in menu see chap. 7.2

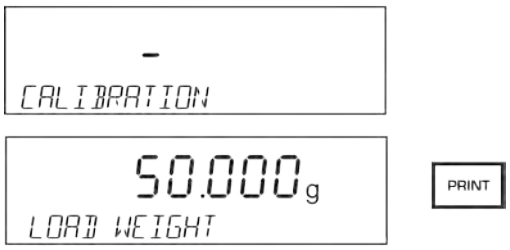
Menu item	Explanation
P1.1 EXT JUST	External adjustment weighing value
P1.2 USER ADJUSTMENT	External adjustment using user defined adjustment weight
P1.3 THERM CAL	Adjust temperature for sample chamber
P1.3 TEMPERATURE TEST	Check temperature of sample chamber

11.1.1 < P1.1 EXT JUST > Adjustment using external weight

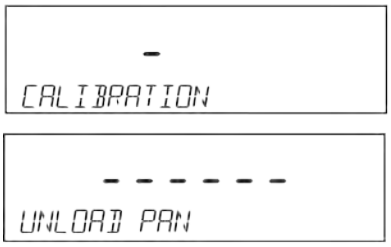
⇨ Call menu item < P1.1 EXT JUST >



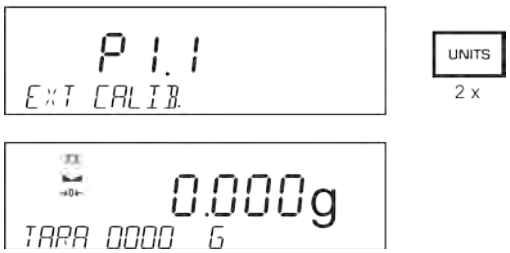
⇨ Ensure that there are no objects on the sample dish. Press PRINT key and wait until the weighing value for the required adjustment weight is shown.



⇨ Place the required adjustment weight carefully in the centre of the sample dish and press the **PRINT** key. Wait until “REMOVE LOAD“ is shown.



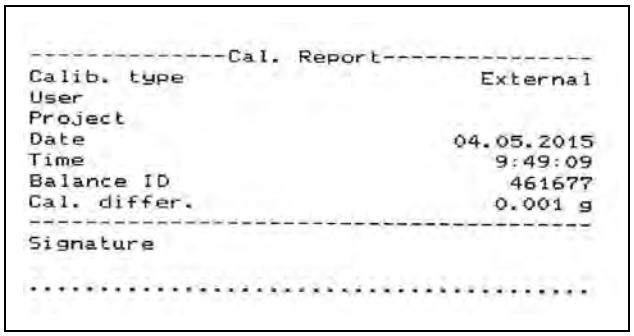
⇨ Take away adjustment weight. If the adjustment was successful, this will be followed by automatic return to the menu.



English

⇨ The adjustment report will be printed automatically if an optional printer is connected.
For defining adjustment report, see chap. 12.1 / <P5.1 Adjustment report>.

Printout example KERN YKB-01N:



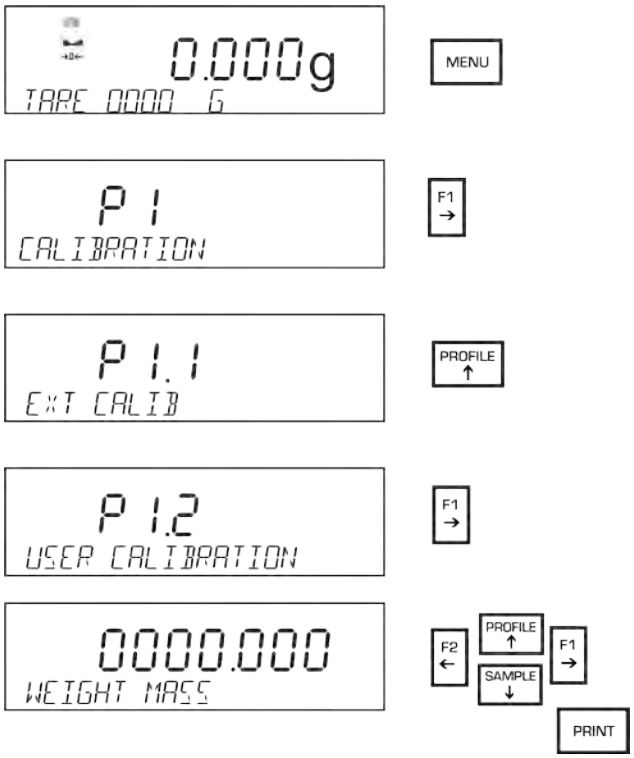
```
----------Cal. Report----------
Calib. type                External
User
Project
Date                    04.05.2015
Time                       9:49:09
Balance ID                  461677
Cal. differ.              0.001 g
-------------------------------------
Signature

.....
```

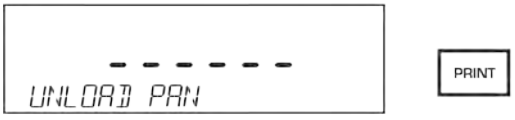
English

11.1.2 < P1.2 USER ADJUSTMENT >
Adjustment using user defined external weight

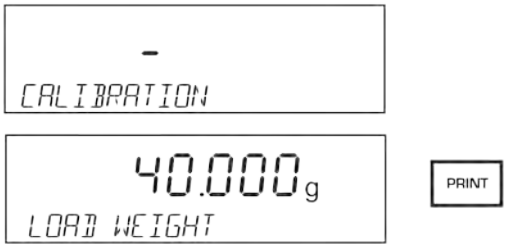
⇨ Call menu item < P1.2 USER ADJUSTMENT >



⇨ Use navigation keys to enter rated value of desired adjustment weight (>30% max) (See chap.2.1.1) and confirm by pressing the PRINT-key.

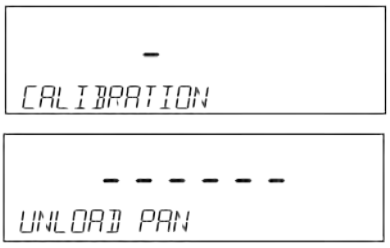


⇨ Ensure that there are no objects on the sample dish. Press PRINT key and wait until the weighing value for the required adjustment weight is shown.

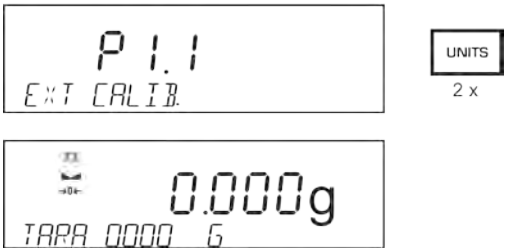


English

⇨ Place the required adjustment weight carefully in the centre of the sample dish and press the PRINT-key. Wait until “REMOVE LOAD“ is shown.



⇨ Take away adjustment weight. If the adjustment was successful, this will be followed by automatic return to the menu.

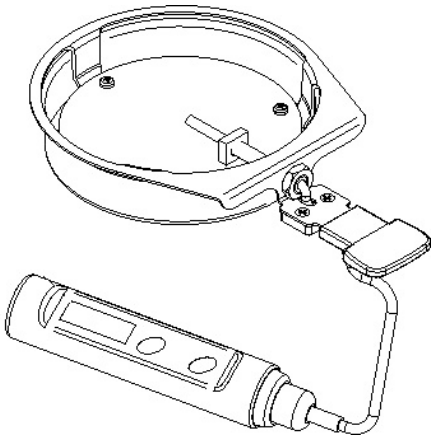


⇨ The adjustment report will be printed automatically if an optional printer is connected.
For defining adjustment report, see chap. 12.1 / <P5.1 Adjustment report>.

11.2 Calibrating / adjusting heating module

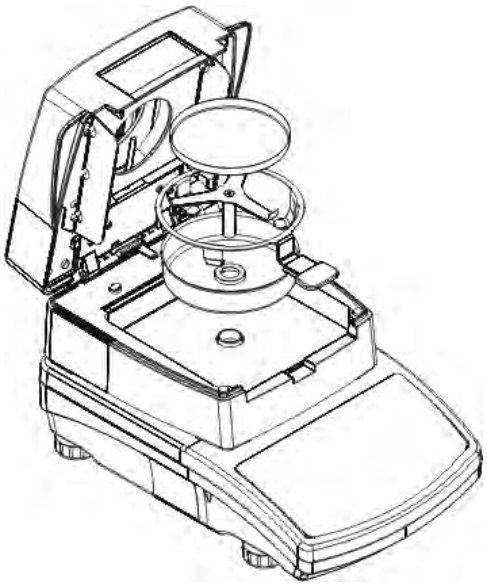
11.2.1 < P1.4 TEMPERATURE TEST > temperature calibration

We recommend performing occasional tests of the instrument's temperature value, using the optional temperature calibration set **KERN MLB-A12**.



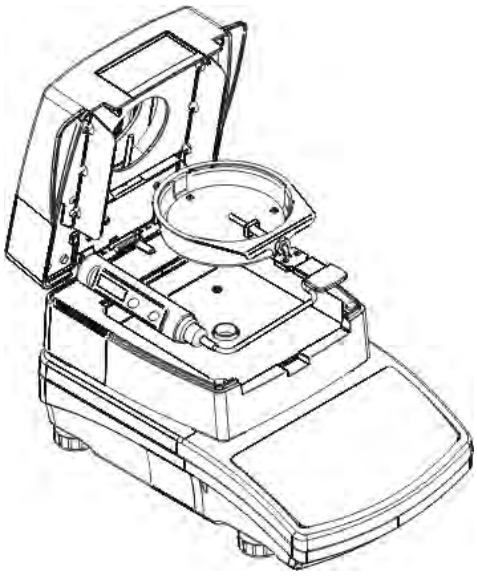
Before you do this, allow the device to cool down for at least 3 hours after the last heating phase.

Preparation:



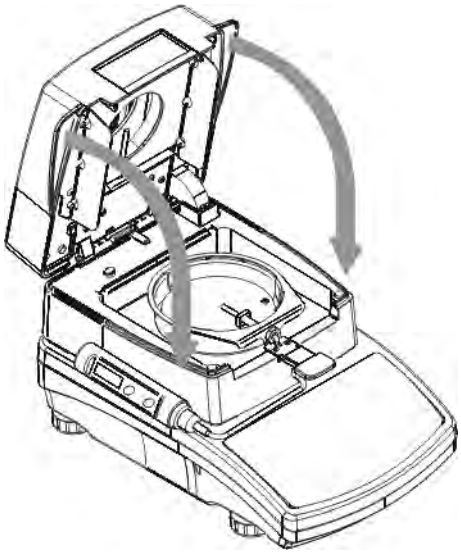
⇨ Switch off instrument.

Remove sample dish, dish holder, removal aid and windshield.



⇨ Install the temperature-calibration set acc. to fig.

⇨ Switch on instrument.

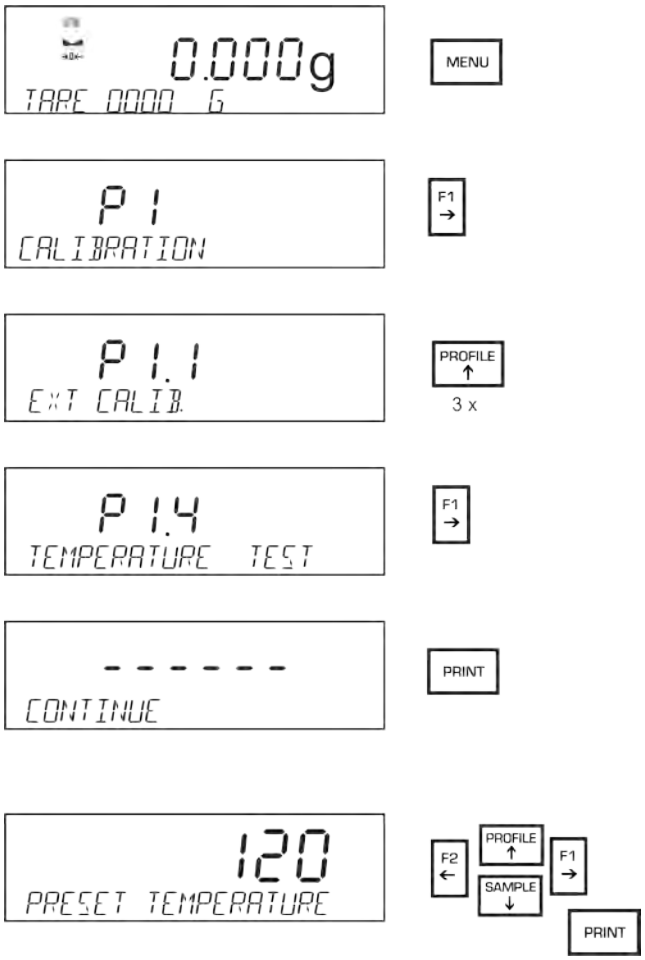


⇨ Close heating hood and carry out temperature calibration as described in the following.

⇨ On the temperature calibration set switch-on the digital thermometer by the ON/OFF button.

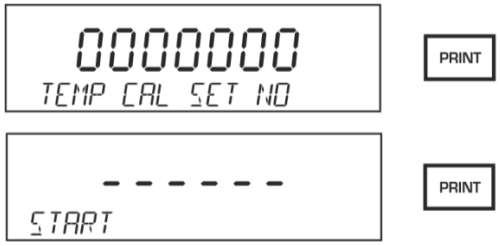
Begin temperature calibration:

⇨ Call menu item < P1.4 TEMPERATURE TEST >



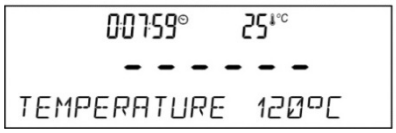
⇨ The display to enter the temperature value to be tested will appear. The active digit is flashing.
Use the navigation keys to select the desired temperature and confirm by pressing the PRINT-key.

⇨ Use the navigation keys to enter the admissible deviation and confirm by pressing the PRINT-key.

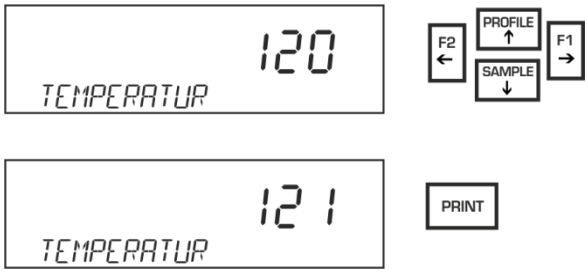


⇨ Use the navigation keys to enter the serial number for the temperature calibration set and confirm by pressing the PRINT-key.

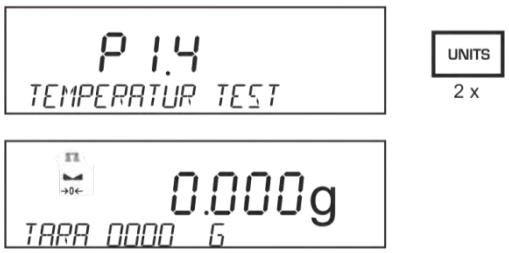
⇨ Confirm request “START“ by pressing the PRINT-key. The instrument will be automatically heated to the set temperature. The current temperature and the elapsed time will be indicated in the display.
The procedure lasts 8 minutes.



⇨ The display for entering the temperature of the external thermometer will be displayed. Use the navigation keys to enter the temperature value and confirm by pressing the PRINT-key.



⇨ The test result will be issued automatically on the connected printer. Press the UNITS-key to return to menu / weighing mode.



Printout example KERN YKB-01N:

```
------------Temperature test------------
User
Date                                04.05.2015
Time                                  11:03:05
ScaleType                               MAR_NP
Balance ID                              461677
Temp. cal. set no                       461677

Preset temperature                      120°C
End temerature.                         120°C
Measured temperature.                   121°C
Permissible error                     +/- 3°C
Status                                      OK
----------------------------------------
Signature

.......................................
```

i	If admissible deviation is exceeded / not reached we recommend performing temperature adjustment (function “P1.3“), see chap. 11.2.2.

11.2.2 < P1.3 THERM CAL >Temperature adjustment

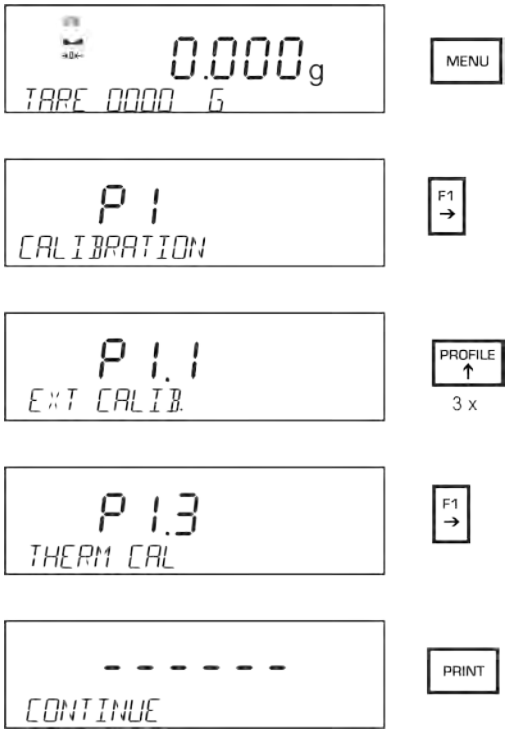
If admissible deviation is exceeded / not reached during temperature calibration (function P1.4) the instrument can be adjusted as described below.

Before you do this, allow the device to cool down for at least 3 hours after the last heating phase.

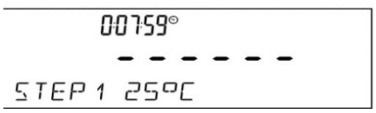
Preparing / installing the temperature calibration set (MLB-A12), see chap. 11.2.1

Start temperature adjustment:

⇨ Call menu item < P1.3 THERM CAL >



⇨ Press the PRINT-key, and temperature calibration for the first item will be started.



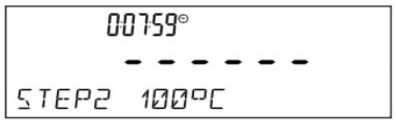
⇨ Temperature calibration for the first point takes 8 min.

Read temperature on the external thermometer.

English

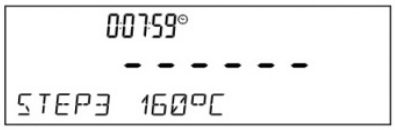
⇨ If the two values do not match, correct with the help of the navigation keys.

⇨ Confirm with the **PRINT** button, the second heat-up phase is started.
The current temperature and the elapsed time will be indicated in the display.



⇨ Temperature calibration for the second point takes 8 min.
Read temperature on the external thermometer. If the two values do not match, correct with the help of the navigation keys.

⇨ Confirm with the **PRINT** button, the third heat-up phase is started.
The current temperature and the elapsed time will be indicated in the display.



⇨ Temperature calibration for the second point takes 8 min.
Read temperature on the external thermometer. If the two values do not match, correct with the help of the navigation keys.

⇨ Confirm by pressing the PRINT-key and the instrument will return to the menu.
Press UNITS key to return to weighing mode.

English

12 Defining reports < P5 PRINTOUTS >

12.1 Adjustment report <P5.1>

This menu item is used to define which information is to be printed for the adjustment reports.

Settings standard report <P5.1 ADJUSTMENTREPORT>:

⇨ Navigation in menu see chap. 7.2

⇨ Any information accepted with **<yes>** will be printed.

Menu item	Available settings / explanation
<P5.1.1>DRAFT	Enter name for draft, max 16 characters. Numerical input, see chap. 2.1.1.
<P5.1.2> TYPE OF ADJUSTMENT	Type of adjustment carried out, yes / no
<P5.1.3> USER	Print name of logged in user, yes / no
<P5.1.4> DRAFT	Print name of draft, yes / no
<P5.1.5> DATE	Print date of adjustment, yes / no
<P5.1.6> TIME	Print name of adjustment, yes / no
<P5.1.7> ID WEIGHING SCALE	Print serial number, yes / no
<P5.1.8> DEVIATION ADJ.	Print deviation from last adjustment, yes / no
<P5.1.9> LINES	Print lines used to separate signature, yes / no
<P5.1.10> SIGNATURE	Insert signature block for report, yes / no

Printout example 1 (KERN YKB-01N):

Menu item	Adjustment
P5.1.2	yes
P5.1.3	yes
P5.1.4	yes
P5.1.5	yes
P5.1.6	yes
P5.1.7	yes
P5.1.8	yes
P5.1.9	yes
P5.1.10	yes

Report

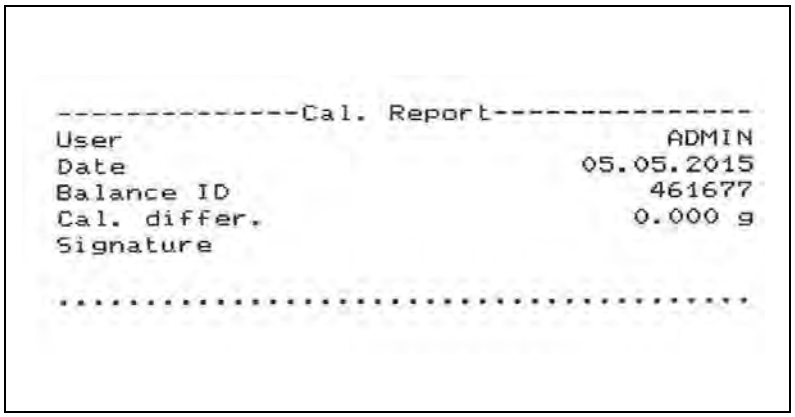
```
----------Cal. Report----------
Calib. type              External
User                        ADMIN
Project                  PROJEKT1
Date                  05.05.2015
Time                     10:22:11
Balance ID                 461677
Cal. differ.             0.000 g
---------------------------------
Signature

.................................
```

Printout example 2 (KERN YKB-01N):

Menu item	Adjustment
P5.1.2	no
P5.1.3	yes
P5.1.4	no
P5.1.5	yes
P5.1.6	no
P5.1.7	yes
P5.1.8	yes
P5.1.9	no
P5.1.10	no

Report



English

12.2 Weighing report

This menu item is used to define which information is to be printed on standard weighing reports.

- ⇨ Navigation in menu see chap. 7.2
- ⇨ The menu has three submenus that can be used to define the settings for the header, the settings for recording of weighing results and the settings for the footer.
- ⇨ Any information accepted with **<yes>** will be printed.
- ⇨ These settings only apply to weighing mode.

12.2.1 Define header<P5.2>

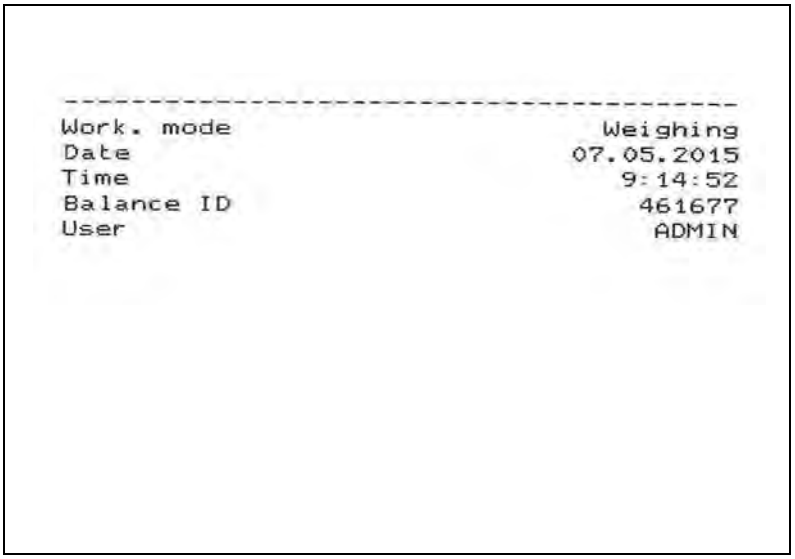
This submenu is used to define which information is to be printed on the header for weighing reports. To print a header, press shortcut key **F1** or **F2** (provided these are assigned to <Print header>) or press the **F**-key and then select <Print header>.

Menu item	**Available settings / explanation**
<P5.2.1> LINES	Insert dashed separating line, yes / no
<P5.2.2> OPERATING MODE	Print name of operating mode for application, yes / no
<P5.2.3> DATE	Print current date, yes / no
<P5.2.4> TIME	Print current time, yes / no
<P5.2.5> WEIGHING SCALE TYPE	Print weighing scale type, yes / no
<P5.2.6> ID WEIGHING SCALE	Print serial number, yes / no
<P5.2.7> USER	Print name of logged in user, yes / no
<P5.2.8> PRODUCT	Print name of selected product, yes / no
<P5.2.9> VARIABLE 1	Print variable 1, yes / no
<P5.2.10> VARIABLE 2	Print variable 2, yes / no Define variable, see chap. 12.5
<P5.2.11> SPACE LINE	Print space line, yes / no
<P5.2.12>ADJUSTMENT REPORT	Print report for last adjustment, yes / no For adjustment report settings see chap. 12.1
<P5.2.13> SPECIAL PRINTOUT	Position user defined printout on header. Options: NONE / SP. PRINTOUT 1 / SP. PRINTOUT 2 / SP. PRINTOUT 3 / SP. PRINTOUT 4 / For creating special printouts see chap. 12.4

Printout example (KERN YKB-01N):

Menu item	Adjustment
P5.2.1	yes
P5.2.2	yes
P5.2.3	yes
P5.2.4	yes
P5.2.5	no
P5.2.6	yes
P5.2.7	yes
P5.2.8	no
P5.2.9	no
P5.2.10	no
P5.2.11	yes
P5.2.12	no
P5.2.13	none

Report



English

12.2.2 Print weighing result / define GLP report<P5.3>

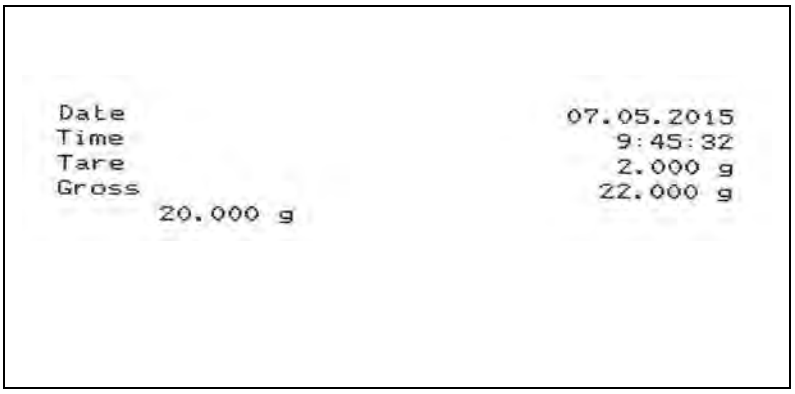
Quality assurance systems require printouts of weighing results as well as of correct adjustment of the balance stating date and time and balance identification.
To print a GLP report, press the PRINT-key.

Menu item	**Available settings / explanation**
<P5.3.1> DATE	Print current date, yes / no
<P5.3.2> TIME	Print current time, yes / no
<P5.3.3> USER	Print name of logged in user, yes / no
<P5.3.4> PRODUCT	Print name of selected product, yes / no
<P5.3.5> VARIABLE 1	Print variable 1, yes / no Define variable, see chap. 12.5
<P5.3.6> VARIABLE 2	Print variable 2, yes / no Define variable, see chap. 12.5
<P5.3.7> NET	Print net weight value of current weighing activity
<P5.3.8> TARE	Print tare value of current weighing activity
<P5.3.9> GROSS	Print gross weighing value of current weighing activity
<P5.3.10> CURRENT RESULT	Print weighing value of current unit
<P5.3.11> ADJUSTMENT REPORT	Print report for last adjustment, yes / no For adjustment report settings see chap. 12.1
<P5.3.12> SPECIAL PRINTOUT	Options: NONE / SP. PRINTOUT 1 / SP. PRINTOUT 2 / SP. PRINTOUT 3 / SP. PRINTOUT 4 /

Printout example (KERN YKB-01N):

Menu item	Adjustment
P5.3.1	yes
P5.3.2	yes
P5.3.3	no
P5.3.4	no
P5.3.5	no
P5.3.6	no
P5.3.7	yes
P5.3.8	yes
P5.3.9	yes
P5.3.10	none

Report



12.2.3 Define footer<P5.4>

This submenu is used to define which information is to be printed on the weighing report's footer. To print the footer, press shortcut key **F1** or **F2** (provided these are assigned to <Print footer>) or press the **F**-key and then select <Print footer>.

Menu item	**Available settings / explanation**
<P5.4.1> OPERATING MODE	Print name of operating mode for application, yes / no
<P5.4.2> DATE	Print current date, yes / no
<P5.4.3> TIME	Print current time, yes / no
<P5.4.4> BALANCE TYPE	Print weighing scale type, yes / no
<P5.4.5> ID BALANCE	Print serial number, yes / no
<P5.4.6> USER	Print name of logged in user, yes / no
<P5.4.7> PRODUCT	Print name of selected product, yes / no
<P5.4.89> VARIABLE 1	Print variable 1, yes / no; For defining variable see chap. 12.5
<P5.4.9> VARIABLE 2	Print variable 2, yes / no Define variable, see chap. 12.5
<P5.4.10> LINES	Insert dashed separating line, yes / no

English

12.3 Measurement report “moisture determination“ <P5.5>

This menu item is used to define which information is to be printed for standard reports.

- ⇨ Navigation in menu see chap. 7.2
- ⇨ The menu has three submenus that can be used to define the settings for the header, the settings for recording of weighing results and the settings for the footer.
- ⇨ Any information accepted with **<yes>** will be printed.
- ⇨ These settings apply to moisture determination mode only

12.3.1 Define header <P5.5.1>

This submenu is used to define which information is to be printed on the measurement report’s header. The header is printed automatically at the start of drying.

Menu item	Available settings / explanation
<P5.5.1.1> DATE	Print current date, yes / no
<P5.5.1.2> TIME	Print current time, yes / no
<P5.5.1.3> BALANCE TYPE	Print weighing scale type, yes / no
<P5.5.1.4> ID BALANCE	Print serial number, yes / no
<P5.5.1.5> USER	Print name of logged in user, yes / no
< P5.5.1.6.> PRODUCT	Print name of selected product, yes / no
< P5.5.1.7.> PROGRAM	Print selected drying program, yes / no
< P5.5.1.8> DRY.PARAMETER	Print selected drying parameters, yes / no
< P5.5.1.9> VARIABLE 2	Print value of variable 1, yes / no For defining variable see chap. 12.5
< P5.5.1.10> VARIABLE 2	Print value of variable 2, yes / no
< P5.5.1.11> STARTING WEIGHT	Print sample weight before drying, yes / no
< P5.5.1.12> SPACE LINE	Print space line, yes / no
< P5.5.1.13> SPECIAL PRINTOUT	Position user defined printout on header. Options: NONE / SP. PRINTOUT 1 / SP. PRINTOUT 2 / SP. PRINTOUT 3 / SP. PRINTOUT 4 / For creating special printouts see chap. 12.4

12.3.2 Print measured values <P5.5.2>

This menu item is used to define whether interim values are to be printed including time at selected intervals.

Menu item	Available settings / explanation
<P5.5.2.1> TIME/RESULT	Print measured value including time, yes / no For defining issue intervals see chap. 15.1.1

12.3.3 Define footer<P5.5.3>

This submenu is used to define which information is to be printed on the measurement report's footer. The header will be printed automatically at the end of the drying process.

Menu item	Available settings / explanation
<P5.5.5.3.1> STATUS	Status at end of drying process: Finished / cancelled
<P5.5.5.3.2> DRY.TIME	Print overall duration of drying process, yes / no
<P5.5.5.3.3> FINAL WEIGHT	Print dry weight, yes / no
<P5.5.5.3.4> RESULT	Print final result in selected unit, yes / no
<P5.5.5.3.5>SPACE LINE	Print space line, yes / no
<P5.5.5.3.6> SIGNATURE	Insert signature block for report, yes / no
<P5.5.5.3.7> SPECIAL PRINTOUT	Position user defined printout on footer. Options: NONE / SP. PRINTOUT 1 / SP. PRINTOUT 2 / SP. PRINTOUT 3 / SP. PRINTOUT 4 / For creating special printouts see chap. 12.4

English

12.3.4 Example of measurement report printout (KERN YKB-01N)

----------Drying process report----------		
Date	08.05.2015	*Current date*
Time	11:12:30	*Current time*
User	Admin	*Name of logged in user*
Product		*Selected product*
Program	Corn flakes	*Selected drying program*
Dry. param		*Selected drying parameters*
Dry. mode	Standard	*Selected heating profile*
	125°C	*Drying temperature (desired value)*
Auto off	Auto3	*Selected switch-off criterion*
	1mg/60s	
Result	M	*Selected result display*
Interval	30s	*Output interval*
Start mass	5.877 g	*Start weight*
0:00:00	0.000 %M	*Measured value for each output interval*
0:00:30	0.357 %M	
0:01:00	? 2.042 %M	
0:01:30	4.050 %M	
0:02:00	? 5.683 %M	
0:02:30	6.908%M	
0:03:00	7.334 %M	
0:03:30	7.368 %M	
0:04:00	7.368 %M	
0:04:130	7.368 %M	
Status	Completed	*Status "End of drying process"*
Drying time	0:04:13	*Overall duration of drying process*
End mass	5.444 g	*Residual weight in grams*
Result	7.368 %M	*End result in selected unit*
Signature		
.....		
.....		

Head line

Measured values

Footer line

English

12.4 User defined data output < P5.6 SPECIAL PRINTOUT >

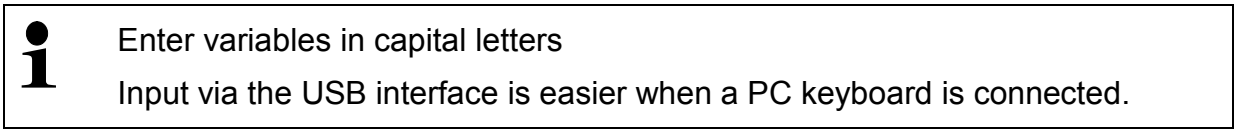
Menu <P5> is used to define up to four different special printouts (<P5.6> - <P5.9>) not exceeding 160 characters each.
Apart from the entry of continuous text (For numeric input see chap. 2.1.1) the menu contains the following variables:

General variables:

%%	Printout of 1 character "%" (i.e. in order to print out one character %, two %% must be entered)
%V	Net weight in current unit
%N	Net weight in standard unit
%G	Gross weight in current unit
%T	Gross weight in standard unit
%D	Current date
%M	Current time
%I	Balance ID-no.
%R	Program no.
%P	Project number.
%U	User no.
%F	Current working mode
%C	Date and time of last adjustment
%K	Type of last adjustment
%S	Current product selected
%Y	Deviation from last adjustment
%1	For defining variable 1, variable see chap. 12.5
%2	For defining variable 2, variable see chap. 12.5

Print related variables:

\\	Printout of 1 character " / " (i.e. in order to print out one character /, two // must be entered)
\C	CRLF (carriage return line feed) line beginning next line
\R	CR (carriage return) line beginning
\N	LF (line feed) next line
T	Tabulator
\F	Paper feed (for PCL printers)
\0	End character string
%E	Cut off paper for EPSON printer



Enter variables in capital letters

Input via the USB interface is easier when a PC keyboard is connected.

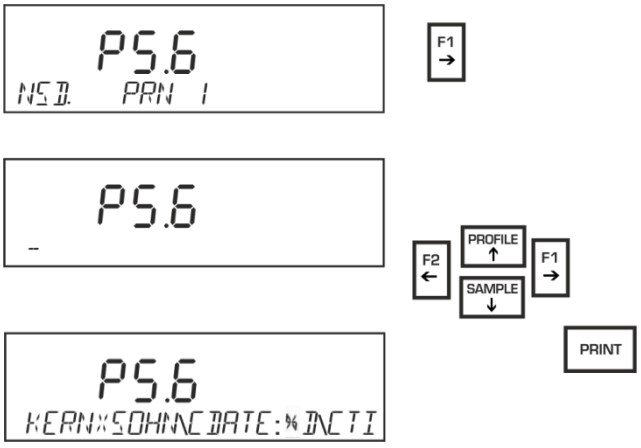
English

Example of text input in weighing mode:

KERN∗SOHN
DATE: <current date>
TIME: <current time>
MASS: <current net weight in standard unit>
******SIGNATURE:

Input:

⇨ Activate desired menu item P5.6 – P5.9 (special printout 1 -4) and enter your text; for numeric input see chap. 2.1.1



or enter on PC

⇨ Confirm your entry by pressing the PRINT-key and the instrument will return to menu.
Press UNITS key to return to weighing mode.

12.5 Universal variables

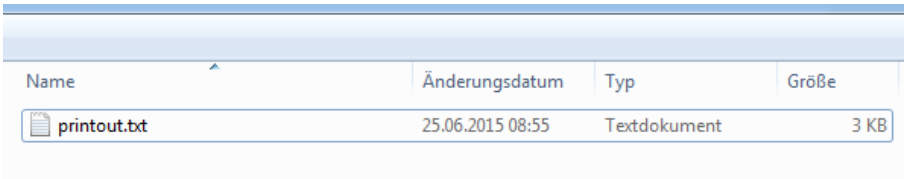
Menu items P5.9 and P5.10 are used to define the content (such as batch number) for VARIABLE1 and VARIABLE2 (max. 32 characters).
The principle applied for the entry is identical to that of special printouts; see chap. 12.4.

13 Saving measurement reports digitally to USB storage device

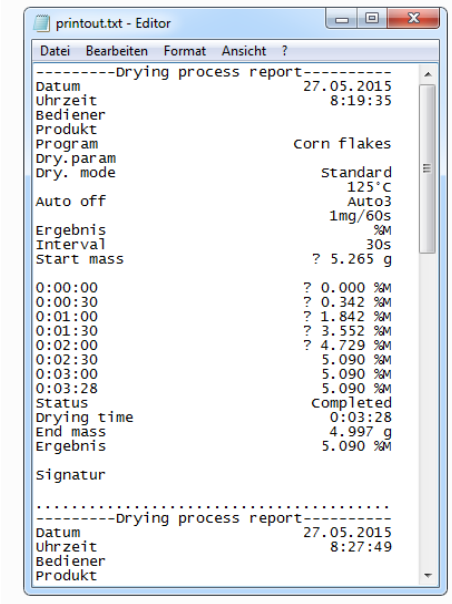
This option allows you to save drying reports and weighing results as a text file to a USB storage device and to print these data via a printer connected to the PC.

Procedure:

- ⇨ Insert USB storage device in USB port and <IEI IMPORT / EXPORT> will be displayed. Operate the UNITS-key to return to working mode.
- ⇨ Go to <P4.2.1 devices / printer / port> menu and select <USB-STICK>; see chap.18.2.
- ⇨ The weighing results will be exported after pressing the PRINT-key, the drying reports automatically at the end of the drying process, as text file (printout.txt.) to the USB storage device.
- ⇨ Use the ON/OFF-key to save data as file. Do not remove the USB storage device until then and connect it to the PC.



- ⇨ Open printout.txt., edit as required and, when necessary print on a printer connected to the PC.



- ⇨ Additional reports will be added to the same folder on reconnecting the USB storage device.

English

14 Data bases

In order to obtain the full access to all data bases, the user has to log in as the administrator.

Available databases:

- **User <b1>** 100 User
- **Product <b2>** 1000 Products
- **Programs <b3>** 100 Drying programs
- **Tare values <b4>** 100 Container weights
- **Weighing processes** 1000 Weighing results (alibi memory)
- **Drying reports** 1000 Drying reports

General data record operations for databases <b1> - <b4>:

Activate database menu (For navigation in menu see chap. 0)

Add new data record to database

Delete selected data record in database

14.1 User database

The user database **< b1 Operator / User >** allows you to create 100 user profiles with specific settings and access rights.

The user management has provisions for users with different rights, the administrator and several users.
The **administrator** has full access to the menu and database. He/she is the only one who can create new users and assign individual user rights.
A user on the other hand cannot make use of all the functions and has limited rights that are defined in the user profile.

Authorisation level	**Available rights and functions**
USER	⇨ Start and carry out weighing processes. ⇨ Define universal variables ⇨ Export weighing data ⇨ View data from the database ⇨ Access to the following functions: < P2.1.1 Reading > < P6 Others> except <Date / Time>
ADVANCED	⇨ Start and carry out weighing processes. ⇨ Access to the following functions: < P2 Operating modes> < P2.1.1 Reading > < P3 Communication> < P4 Devices> < P6 Others> except <Date / Time>
ADMIN	The administrator is authorised to use all functions and has all rights of access. There is only one administrator.

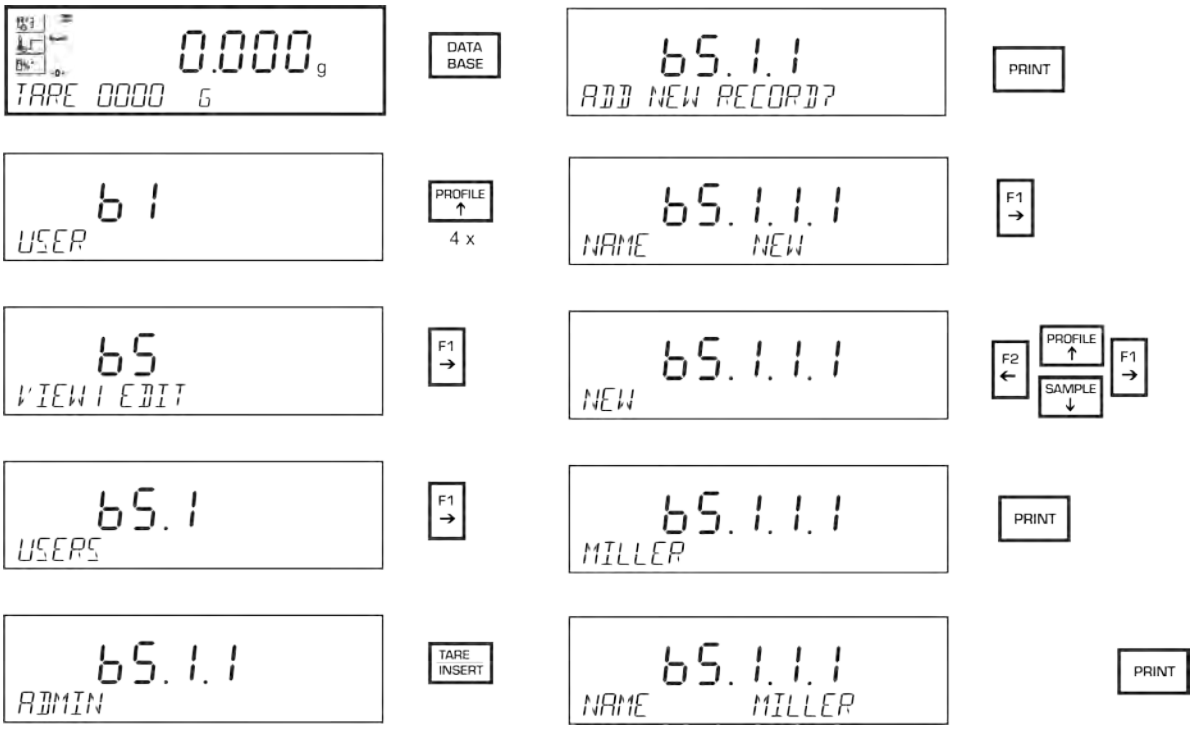
English

14.1.1 Create new user

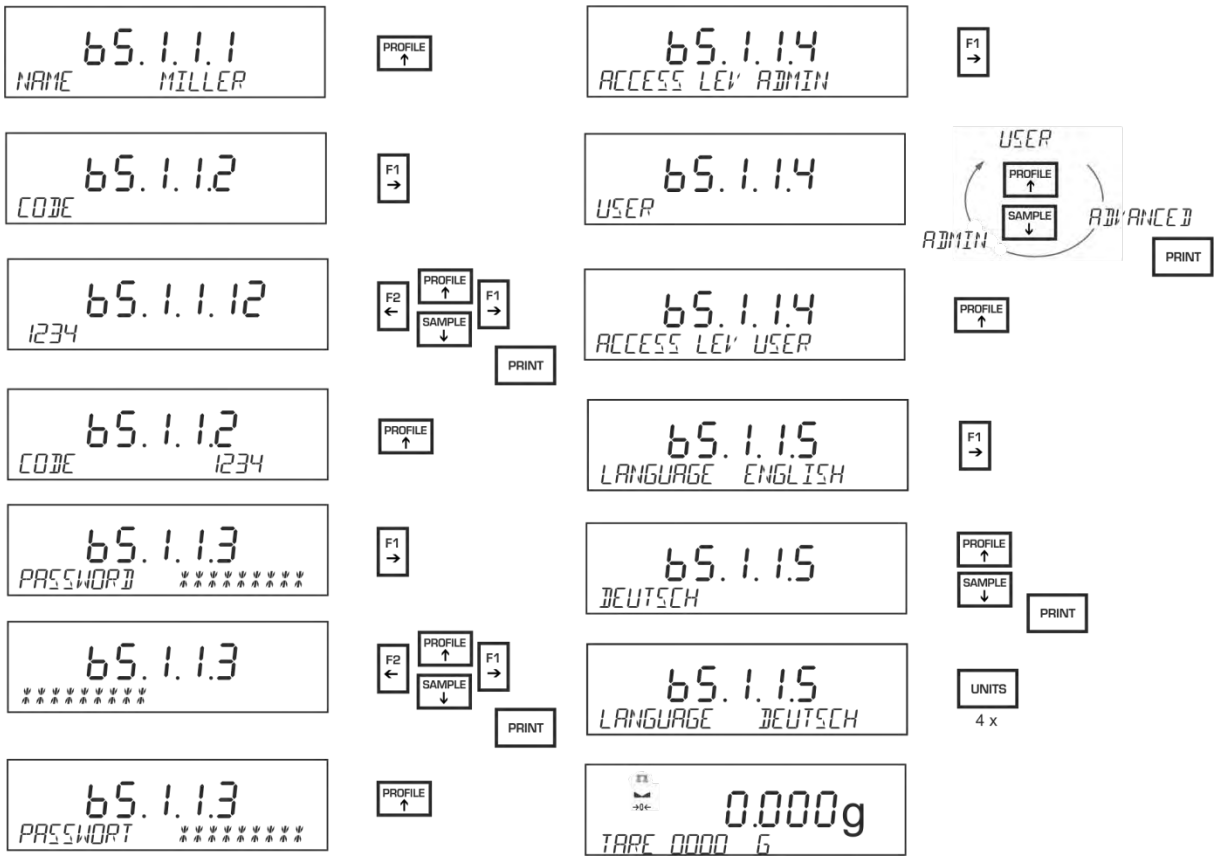
The following data can be entered for each user:

NAME	max. 30 characters, CODE max 6 characters
PASSWORD	max. 8 numbers
AUTHORISATIONS	User, master user, administrator
LANGUAGE	Deutsch/Espanol/Francais/Turk/Cesky/Italiano/Magyar/ Polski/English

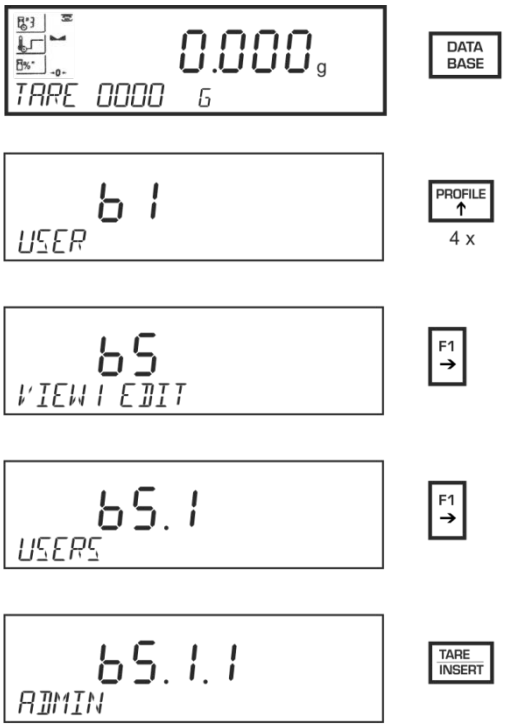
⇨ **Define user name**



⇨ **Define user code, password, authorisation and language**



14.1.2 Delete user

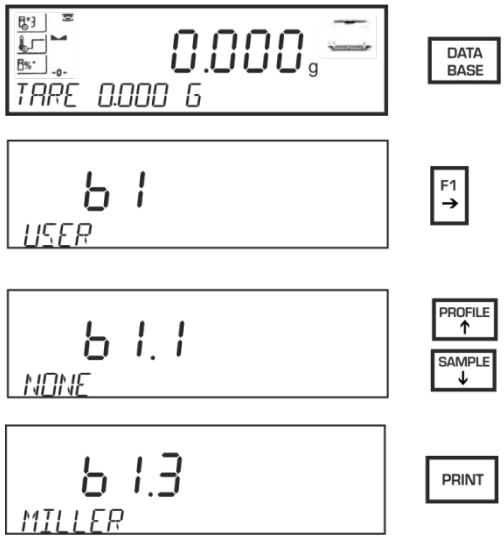


English

⇨ Operate the navigation keys to select the user and delete by pressing →0← DELETE.

⇨ Confirm query “DELETE“ by pressing the PRINT-key and the display will return to menu. Press UNITS key to return to weighing mode.

14.1.3 Activating users



⇨ Select the desired user by means of navigation buttons.

⇨ Using the navigation buttons, enter the saved password and confirm it by means of pushing PRINT button, see chapter 2.1.1 „Entering numerical values”. The selected user's profile shall be read.

14.2 Product database

The product database **< b2 Product / Product >** allows you for up to 1000 products to enter the following data

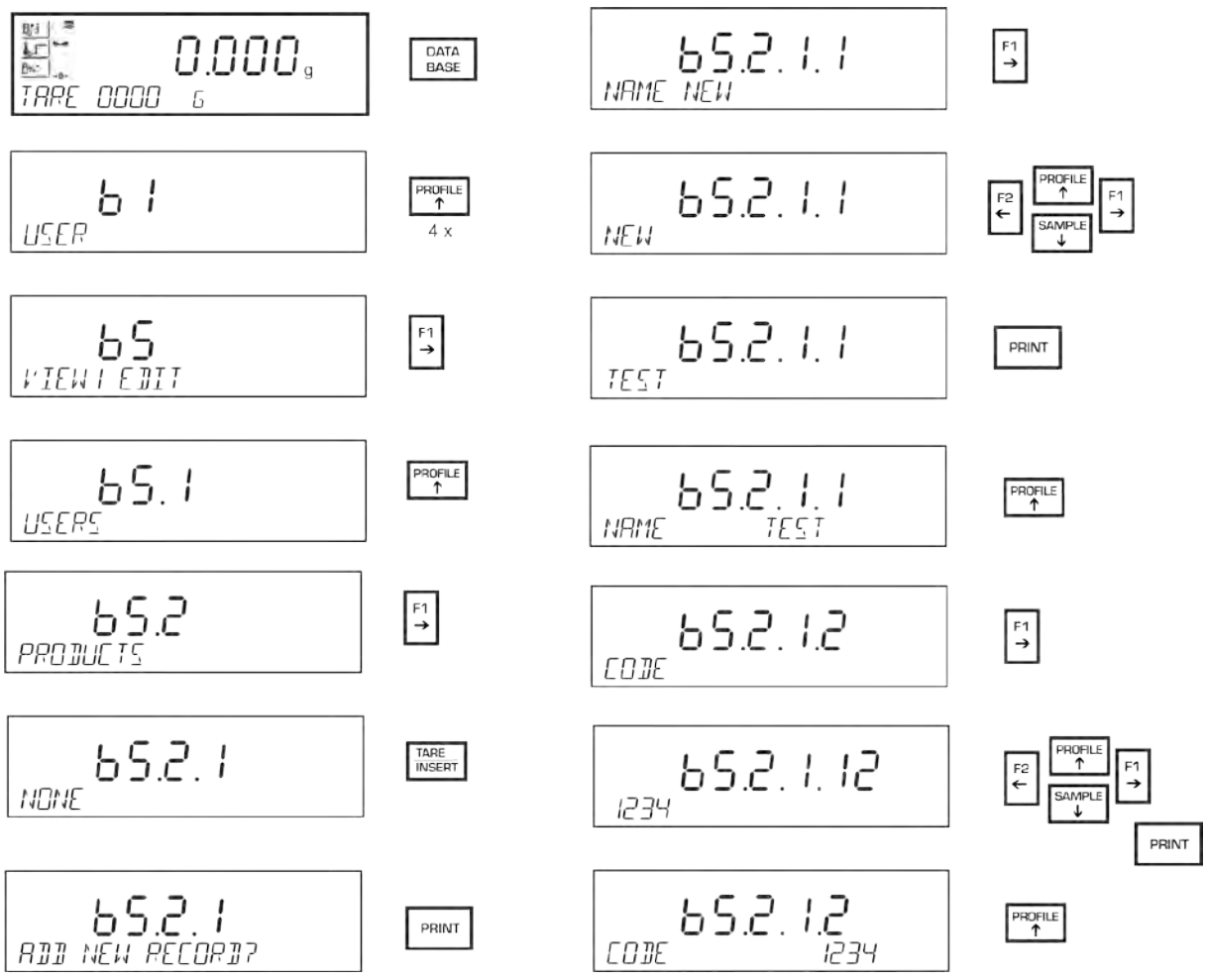
NAME	max. 30 digits
CODE	max. 6 digits
EAN	max. 16 digits
WEIGHT	Product weight
TARA	Container weight
PROGRAM	Select drying program from list

For deleting product see chap. 14.1.2

English

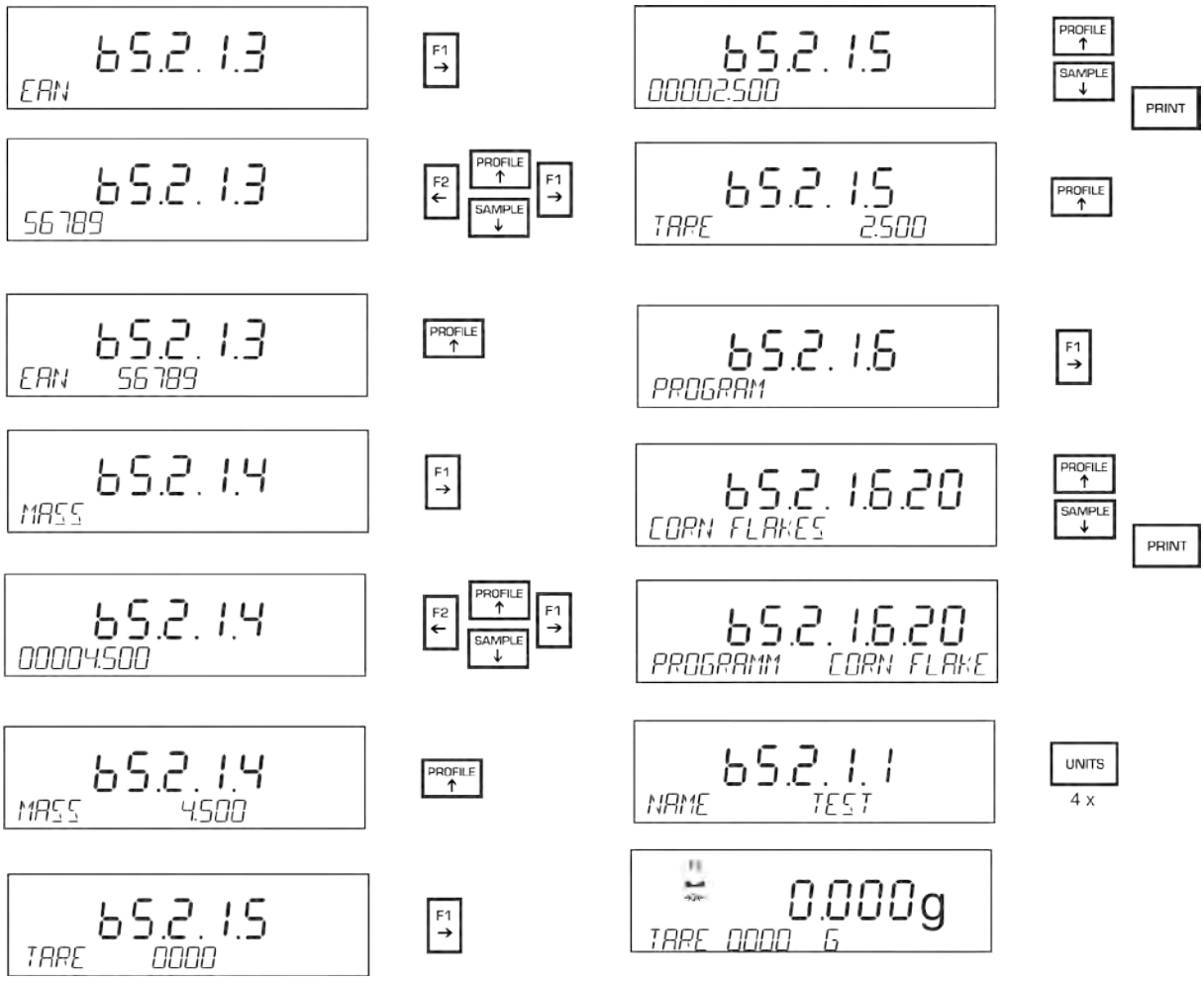
14.2.1 Create new product

⇨ **Define product name**



English

⇨ Defining EAN, product weight, container weight and drying program



14.3 Drying programs

The database **< b3 programs >** allows you to enter the following data for 100 different drying programs:

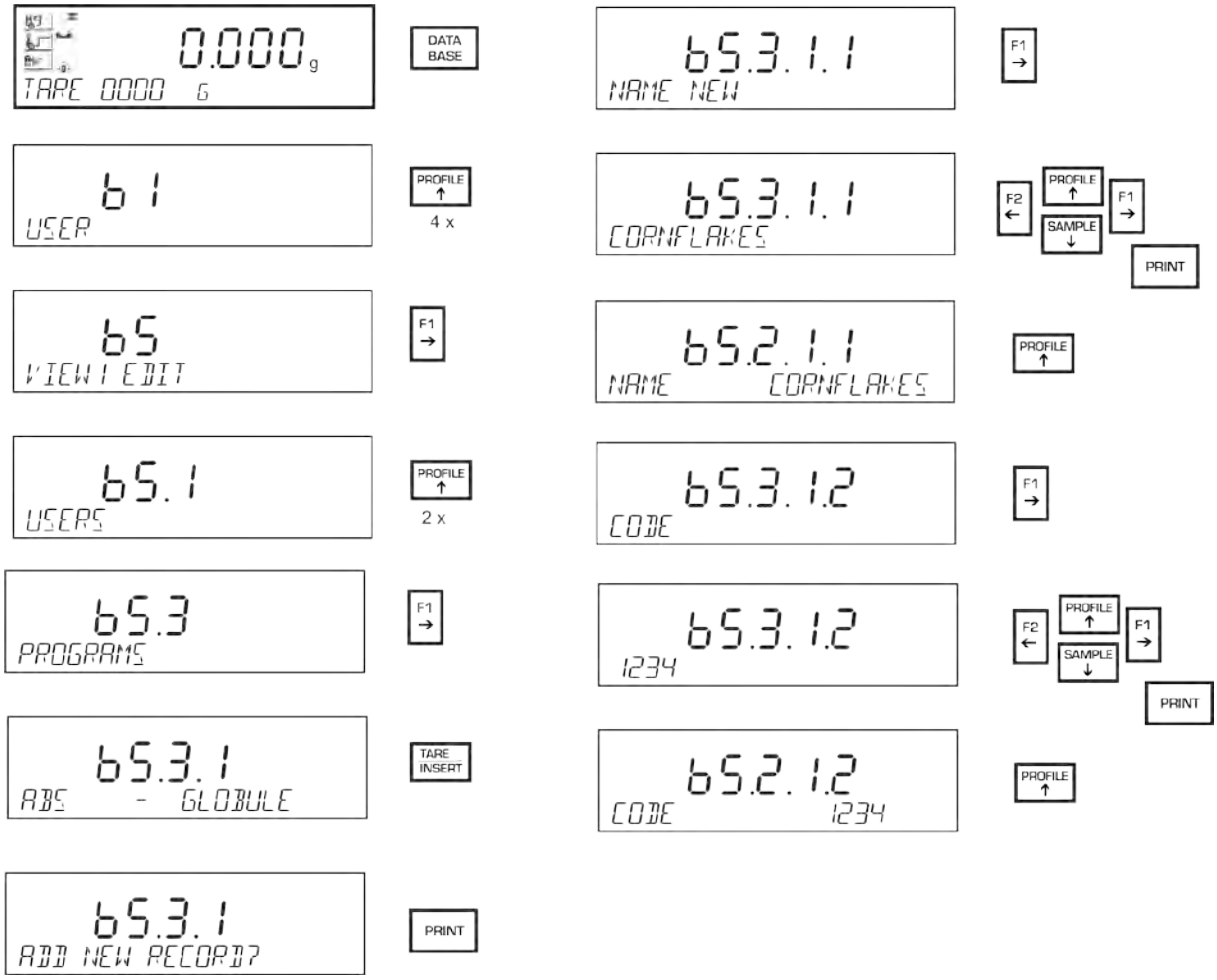
NAME	max. 30 digits
CODE	max. 6 digits
PROFILE	max. 16 digits
WEIGHT	Product weight
TARA	Container weight
PROGRAM	Select drying program from list

- The database comes with 92 factory-set drying programs.
  The application of a specific drying program is outside the control of KERN & Sohn. Therefore no responsibility is taken for the recommended settings.
- For editing drying programs see chap. 14.3.2
- For deleting drying programs see chap. 14.1.2
- Invoke the drying programs, see chap. 15.2
- If the memory is full no new drying programs will be stored until an existing stored program has been deleted.

English

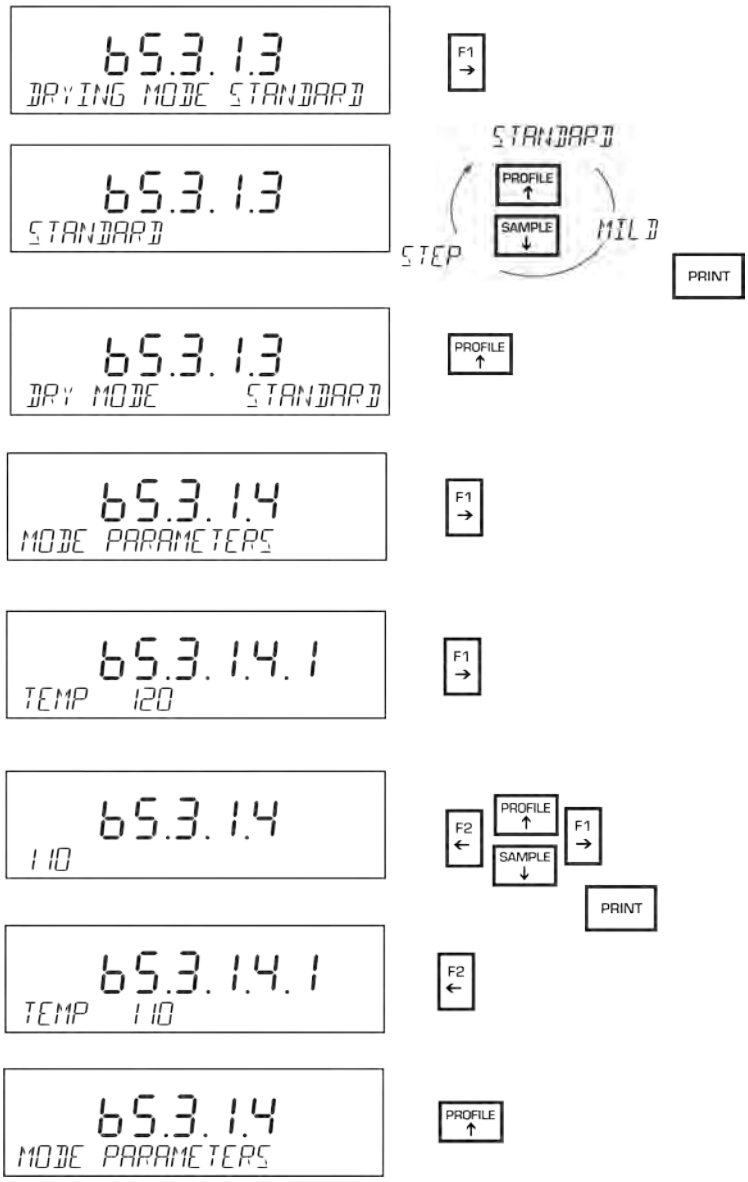
14.3.1 Creating a new drying program

⇨ **Define program name**



English

⇨ Define heating profile and drying temperature



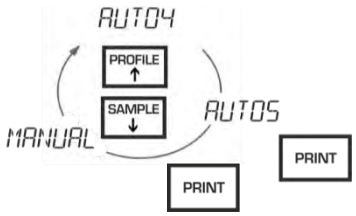
English

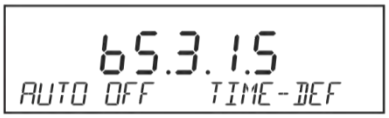
⇨ **Define switch-off criterion**

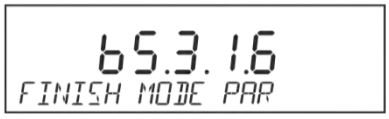
The following options are available:

AUTO 1	Automatic switch-off (loss of weight per time unit)
AUTO 2	
AUTO 3	
AUTO 4	
AUTO 5	
MANUAL	Manual switch-off (stop key)
TIME-DEF	Time controlled switch-off
DEFINED	Automatic freely selectable switch-off

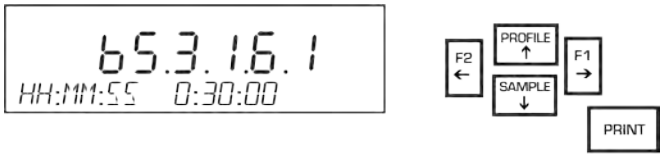
Example of settings for “time controlled switch-off:



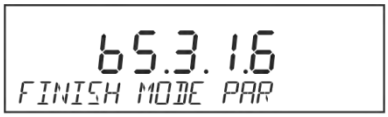


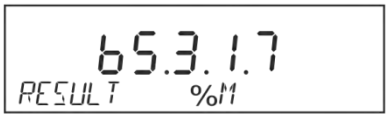


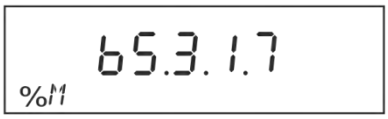
English

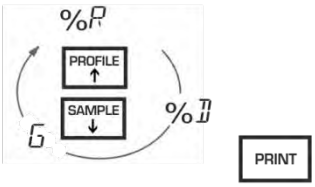


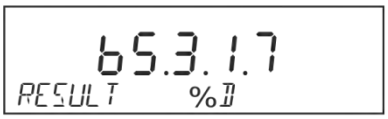
⇨ **Define result display**



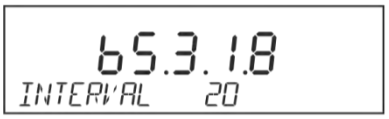


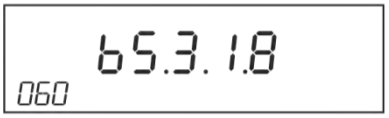


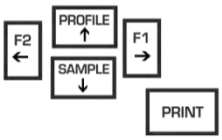


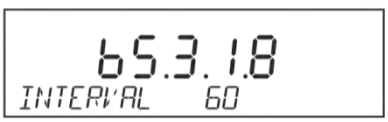


⇨ **Define output interval**

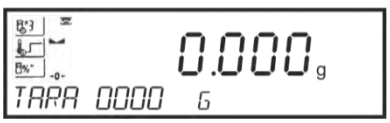








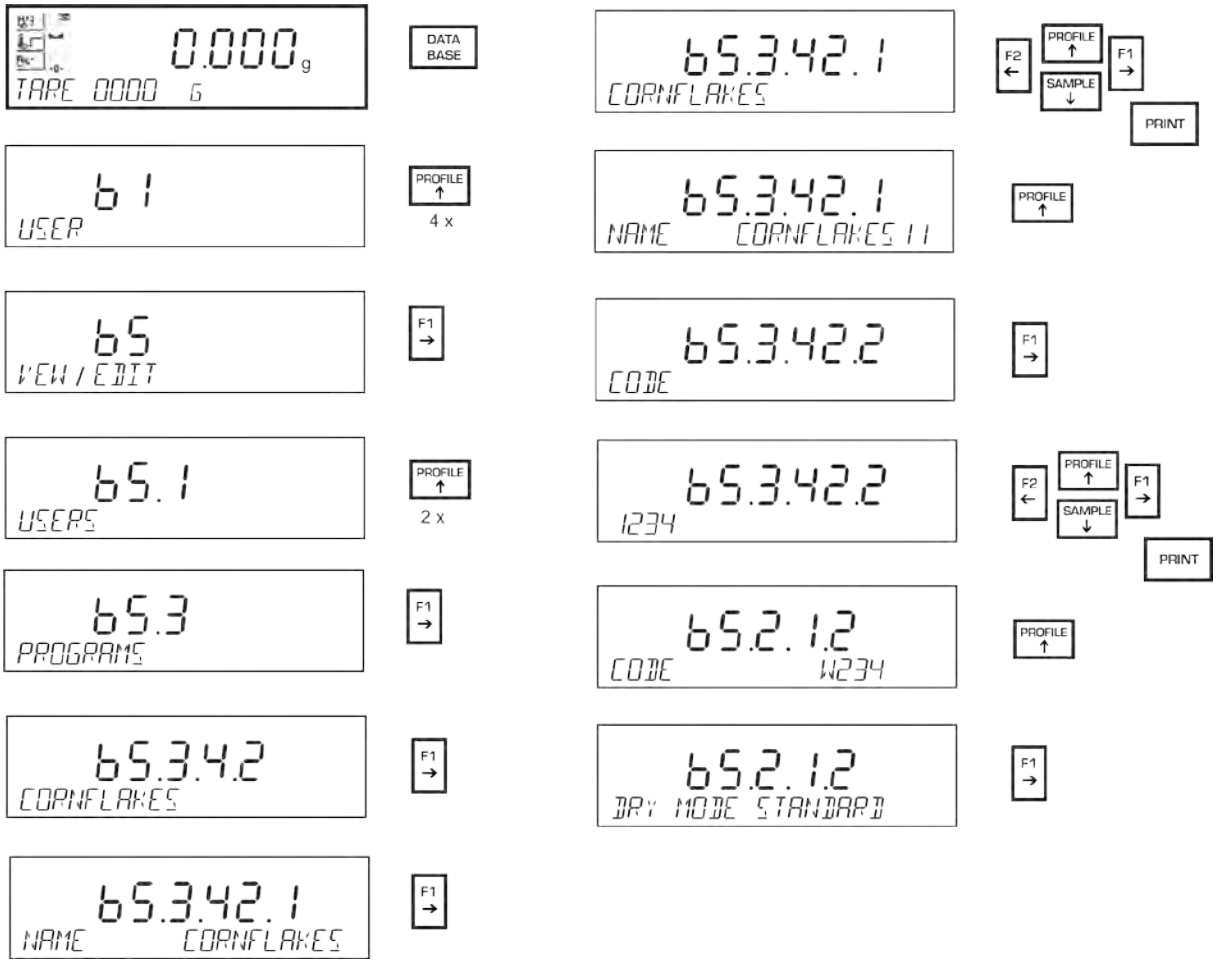
UNITS
4 x



DATA BASE

English

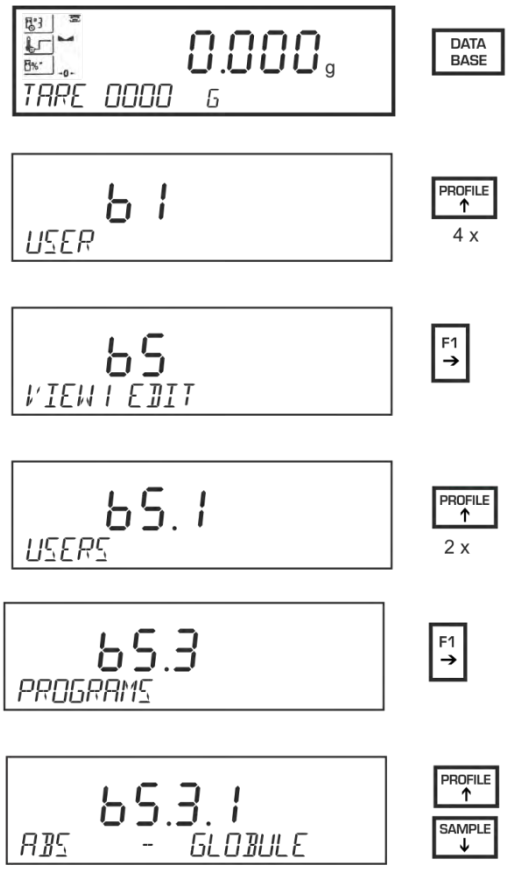
14.3.2 Edit stored drying program



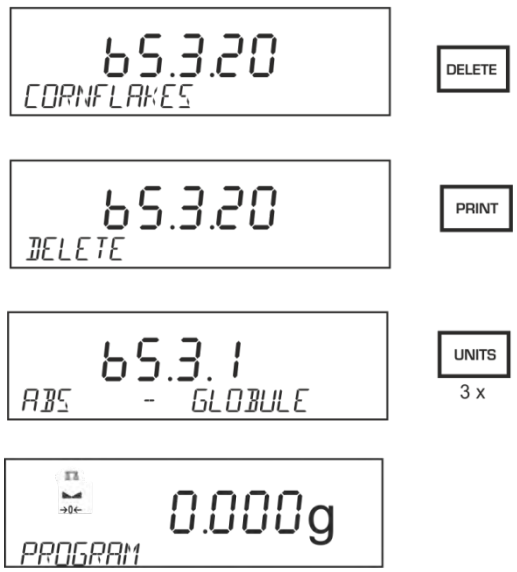
⇨ For editing additional parameters such as heating profile, drying temperature, switch-off criterion, result display and output intervals see chap. 14.3.2

English

14.3.3 Deleting a drying program



⇨ Use the navigation keys to select a program (such as cornflakes) and delete by →0← DELETE.



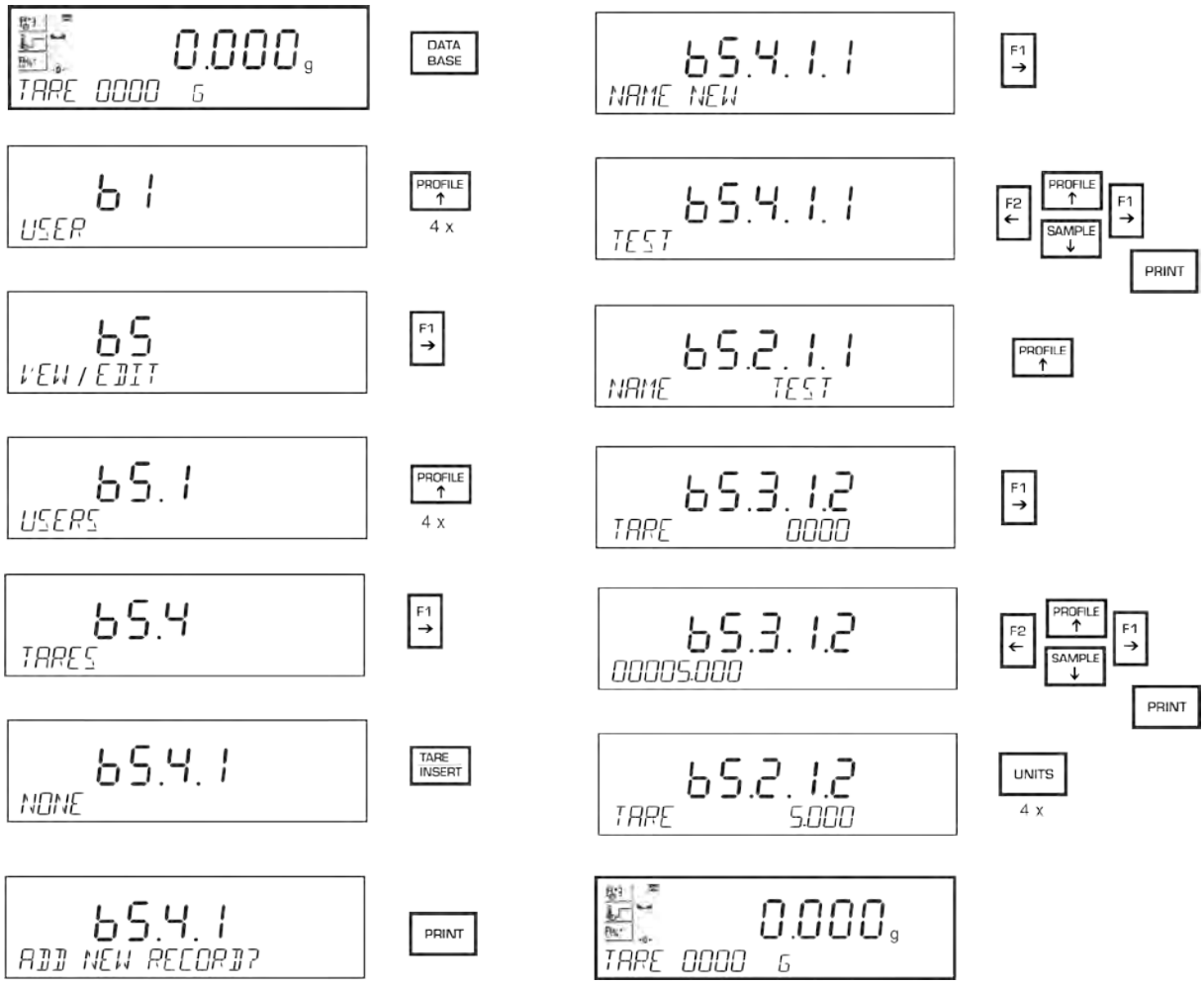
⇨ Confirm query “DELETE“ by PRINT and the display will return to the menu. Press UNITS key to return to weighing mode.

14.4 Container weights

The product database **< b4 TARA >** allows you to enter settings for 100 container weights.
to enter the following data

NAME	max. 30 digits
TARA	Container weight

14.4.1 Creating a new container weight



- For downloading container weight from database see chap. 8.2.3
- For deleting container weight see chap. 14.1.2

English

14.5 Weighing results

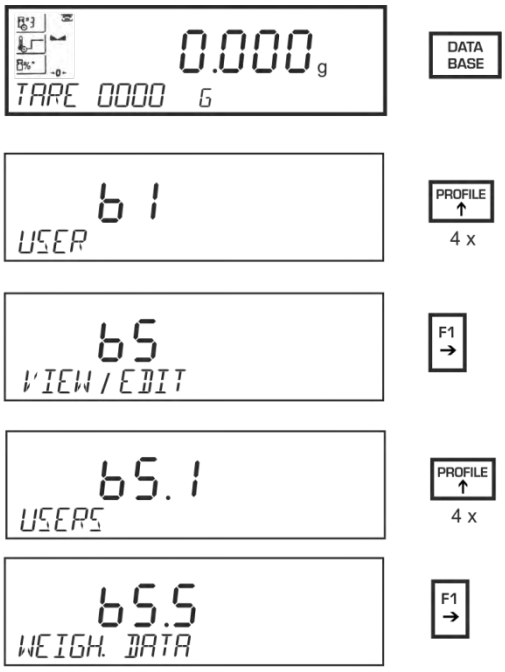
The database **< b5.5 weighing processes >** is not editable. Data is saved automatically on pressing the PRINT-key. These data records are available for viewing by the user and can be printed or exported to a USB storage device.
The database allows you to store 1000 weighing results.
If the memory is full, data records will be overwritten one by one, starting with the first data record.

The following data are stored in addition to the weighing result:

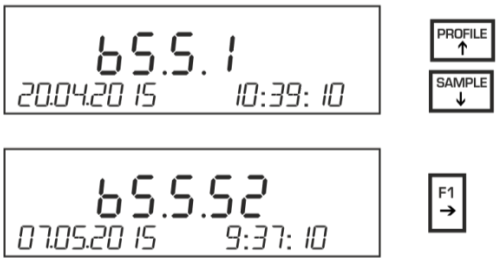
- Date of measurement
- Time of measurement
- Weighing results
- Container weight
- Product Name
- Logged-in user
- Enabled working mode
- Value of variable one and two

> Data records of weighing results cannot be deleted.

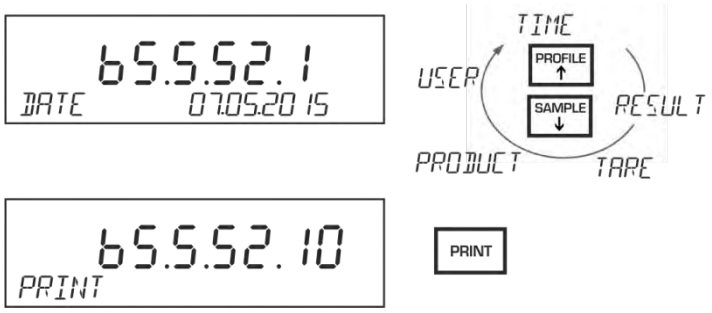
Activate a data record:



⇨ The first weighing result <b5.5.1> including date / time will be displayed. Each weighing result is stored under a sequential number on form <b5.5.n>. Use the navigation keys to select a weighing result.



⇨ Additional information on the selected weighing result is available when you press the F1-key. The navigation keys allow you to select and view the respective data. When you select <Print> and then press the PRINT-key, data will be issued to an optional printer. The content of the data output depends on the settings in menu <P5.3 GLP>, see chap. 12.2.2.



Printout example (KERN YKB-01N):

Date	18.05.2015
Time	11:12:30
User	Admin
Product	
Tare	
Gross	
----------Cal. report.----------	
User	
Date	08.05.2015
Balance ID	461677
Cal. Diff	0.000 g
Signature	

⇨ Press UNITS-key repeatedly to return to menu / weighing mode.

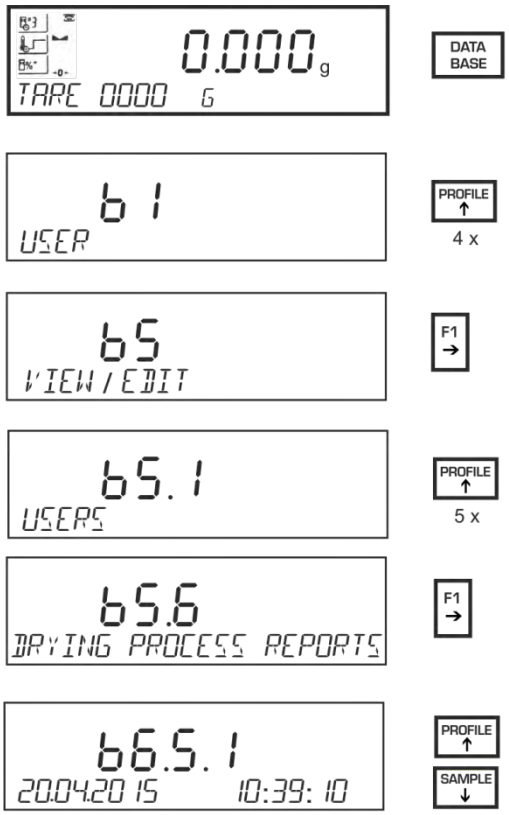
14.6 Drying reports

The database **< b5.6 DRYING PROCESS REPORTS>** allows you to store 1000 drying process reports. If the memory is full, data records will be overwritten one by one, starting with the first data record.
Data will be stored automatically at the end of every drying process. These data records are available for viewing by the user and can be printed or exported to a USB storage device.

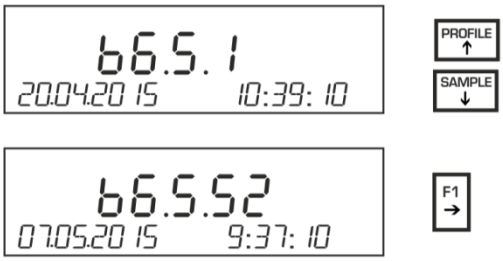
The following data will be stored in addition to the end result:

- Date of measurement
- Time of measurement
- Initial weight of sample
- Status at end of drying process: Finished / cancelled
- Drying time
- Remaining weight of sample
- Result
- Product
- User
- Program
- Value of variable one and two

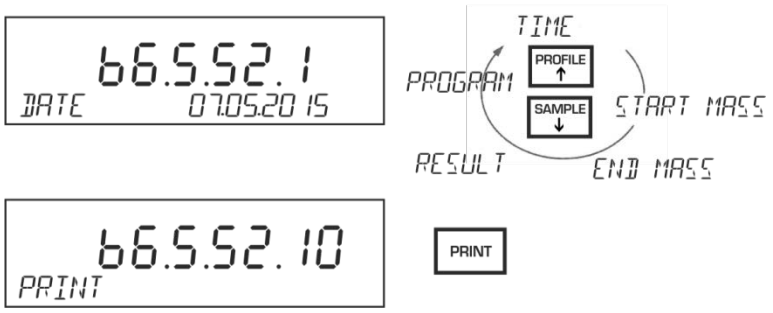
Activate a data record:



⇨ The first drying process report <b5.6.1> will be displayed including date / time. Every drying process report will be saved under a sequential number to form <b5.6.n>. Operate the navigation keys to select a drying process report.



⇨ Further information on the selected drying process report is available on pressing the F1-key. The navigation keys allow you to select and view the respective data. When you select <Print> and then press the PRINT-key, data will be issued to an optional printer.



English

Printout example (KERN YKB-01N):

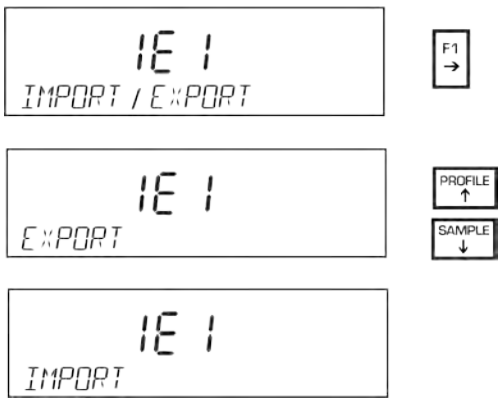
----------Drying process report----------	
Date	08.05.2015
Time	11:12:30
User	Admin
Product	
Program	Corn flakes
Dry. param	
Dry. mode	Standard 125°C
Auto off	Auto3 1mg/60s
Result	M
Interval	30s
Start mass	5.877 g
0:00:00	0.000 %M
0:00:30	0.357 %M
0:01:00	? 2.042 %M
0:01:30	4.050 %M
0:02:00	? 5.683 %M
0:02:30	6.908%M
0:03:00	7.334 %M
0:03:30	7.368 %M
0:04:00	7.368 %M
0:04:130	7.368 %M
Status	Completed
Drying time	0:04:13
End mass	5.444 g
Result	7.368 %M
Signature	
.....	

- Press UNITS-key repeatedly to return to menu / weighing mode.
- Data records for drying process reports cannot be deleted.

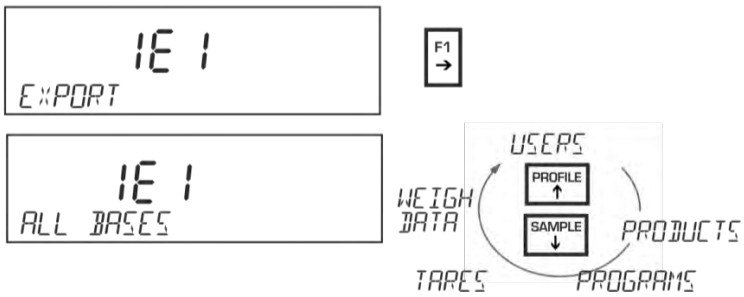
14.7 Export / import databases to USB storage device

This option allows you to copy / transfer the databases “products“, “user“ and “tare“ from one balance to another.

⇨ Connect USB storage medium to USB port.



⇨ Operate the navigation keys to select option <Import> or <Export>



⇨ Operate the navigation keys to select the database to be imported / exported and confirm by pressing the PRINT-key:
OPERATOR
PRODUCTS
PROGRAMS
TARE
WEIGHING PROCESSES (not recorded)
DRYING PROCESS REPORTS (not recorded)
PARAMETERS
ALL DATABASES

⇨ Press UNITS-key repeatedly to return to menu / weighing mode.

i	Weighing results and drying process reports cannot be imported.

15 Moisture analysis

For ensuring that the device is in moisture determination mode see chap. 8.1

The device provides a great variety of setting options that allow you to adapt a drying process to your sample.
The operating concept of the moisture analyser is based on the drying programs. A drying program comprises the following parameters per crying process:

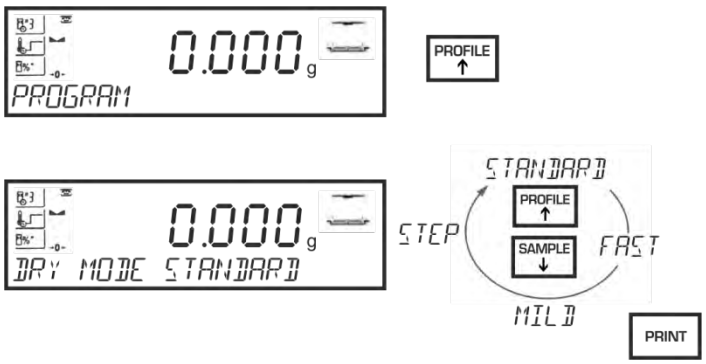
- Name of drying program
- Heating profile
- Shutoff criterion
- Result display

The moisture analyser comes with a factory-set database containing drying programs for various products. To start a drying program you may either apply one of the default drying programs or, when necessary, adapt its parameters to your own requirements; see chap. 0.
In the event that none of the drying programs available in the database is meeting your requirements, you can create your own program and save it to the database.
It is of course possible to start measuring without the application of the database. To that end, set the parameters manually according to sample requirements, see chap. 15.1.1.

15.1 Moisture determination without using the database

15.1.1 Setting drying parameters

1. Select heating profile



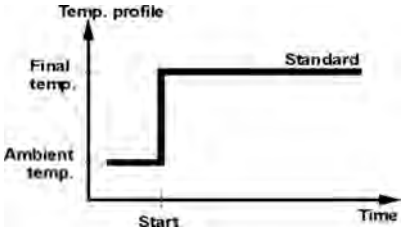
To adapt the drying characteristics optimally to the sample to be used, four different heating profile options are available:

STANDARD, FAST, GENTLE, STEP

Operate the navigation keys to select the desired heating profile and confirm by pressing the PRINT-key. The settings (drying period, temperature) below depend on the heating profile selected.

Standard drying <STANDARD>

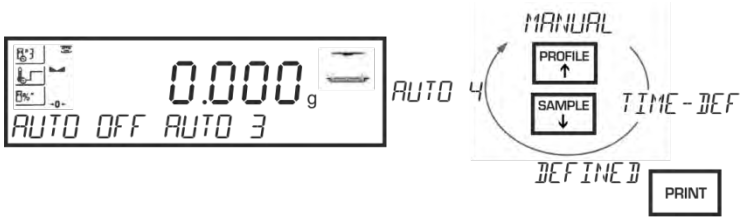
This heating profile is suitable for most samples. The sample will be heated to the set drying temperature, available range 35°C -160°C



⇨ Confirm selection <STANDARD> by pressing the PRINT-key and the screen for entering the drying temperature will appear. The active digit is flashing

⇨ Use the navigation keys to select the desired temperature and confirm by pressing the PRINT-key. The screen used to select the switch-off criterion will be shown (See step 2).

English

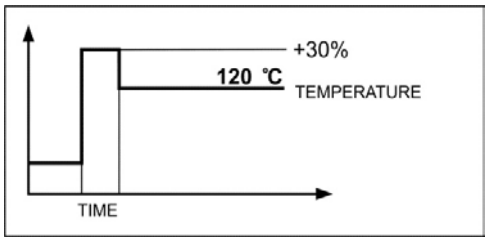


Quick dry <FAST>

This heating profile is suitable for sample with high moisture content (such as liquids).

The temperature will initially rise very fast after the start and for a selectable period of time will exceed the set drying temperature (such as 120°C) by 30%. That way the latent heat will be compensated, thereby accelerating the drying process.

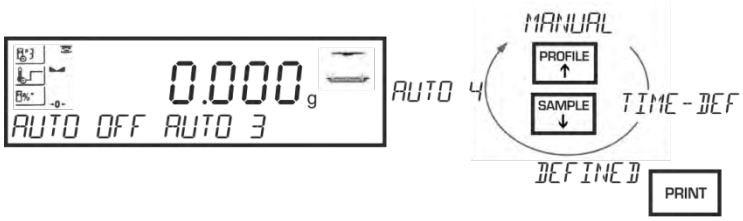
Then the temperature is controlled down to the set value.



⇨ Confirm selection <FAST> by pressing the PRINT-key. The screen used to enter for how long the set temperature is to be exceeded will appear. The active digit is flashing

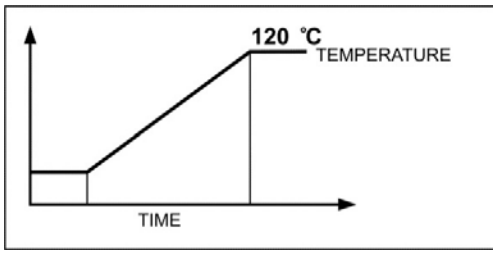
⇨ Operate the navigation keys to select the period of time and confirm by pressing the PRINT-key. The screen used to enter the drying temperature will appear. The active digit is flashing.

⇨ Operate the navigation keys to select the temperature and confirm by pressing the PRINT-key. The screen used to select the switch-off criterion will be shown (See step 2).



Gentle drying <GENTLE>

This heating profile is suitable for gentle drying of substances prone to skin formation (such as easily liquefiable substances or substances containing sugar). Skin formation affects the evaporation of trapped moisture. The temperature will be increased continuously and will not reach the set drying temperature (such as 120°C) before the so-called ramp duration has lapsed. The ramp, that is, the time to pass from the start of drying to reaching the drying temperature is selectable.

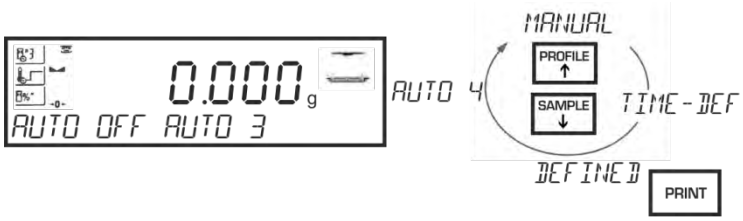


⇨ Select <GENTLE> and confirm by pressing the PRINT-key. The display to enter the ramp duration appears. The active digit is flashing

⇨ Operate the navigation keys to select the period of time and confirm by pressing the PRINT-key. The screen used to enter the drying temperature will appear. The active digit is flashing.

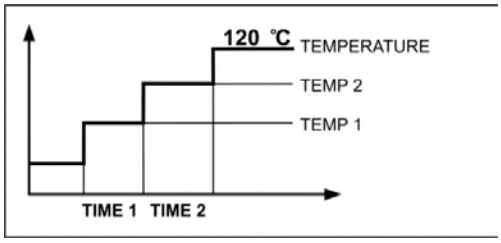
English

⇨ Operate the navigation keys to select the temperature and confirm by pressing the PRINT-key. The screen used to select the switch-off criterion will be shown (See step 2).



Step drying <STEP>

This heating profile is suitable for the drying of substances comprised of several components (such as essential oils) that volatilize at different temperatures or substances exhibiting special behaviour during heating. There are 3 steps available for selection. In every case, drying temperature and duration are freely selectable for the individual steps. The switch-off criterion finishes measurement after the last step.



⇨ Select <STEP> and confirm by pressing the PRINT-key. The screen used to enter the drying duration for the first step will appear. The active digit is flashing.

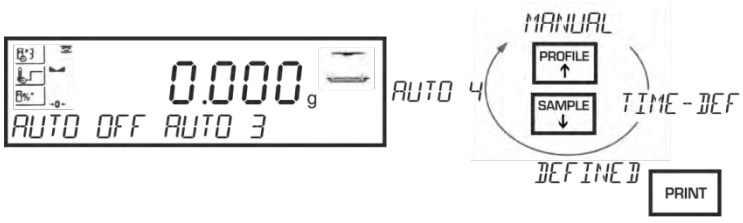
⇨ Operate the navigation keys to select duration and confirm by pressing the PRINT-key. The screen used to enter the drying temperature for the first step will appear. The active digit is flashing.

⇨ Operate the navigation keys to select the drying temperature and confirm by pressing the PRINT-key. The screen used to enter the drying duration for the second step will appear. The active digit is flashing.

⇨ Operate the navigation keys to select duration and confirm by pressing the PRINT-key. The screen used to enter the drying temperature for the second step will appear. The active digit is flashing.

⇨ Operate the navigation keys to select duration and confirm by pressing the PRINT-key. The screen used to enter the drying temperature for the third step will appear. The active digit is flashing.

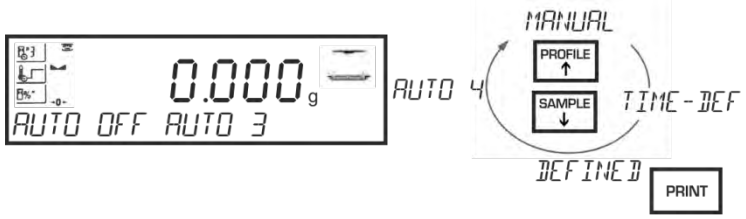
⇨ Operate the navigation keys to select the temperature and confirm by pressing the PRINT-key. The screen used to select the switch-off criterion will be shown (See step 2).



English

2. Selecting switch-off criterion

A switch-off criterion defines under which conditions the device should cancel the drying process. Switch-off criteria save continuous time controls and manual cancelling of drying processes. Furthermore they ensure that measurements are always finished under the same conditions, thereby providing repeatable measurements.



Selectable settings suitable as switch-off criteria include:

<AUTO 1 – AUTO 5>	Automatic switch-off (loss of weight per time unit)
<DEFINED>	Automatic free switch-off criterion (weight loss per time unit, user defined)
<TIME-DEF>	Time controlled switch-off
<MANUAL>	Manual switch-off by pressing stop key

English

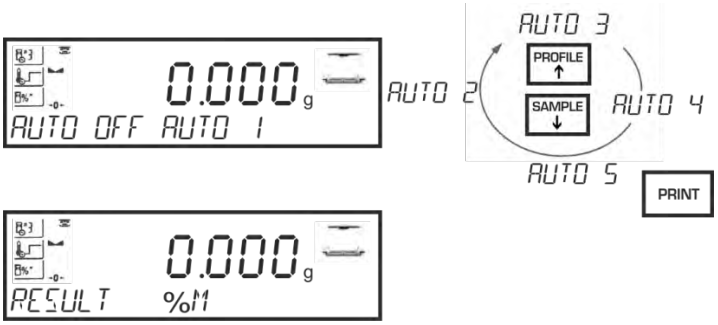
Automatic switch-off

This switch-off criterion is based on a weight loss per time unit. As soon as the medium weight loss drops below the desired value per unit of time, the measurement will be finished automatically.

There are five selectable settings providing default invariable weight loss per time unit:

AUTO 1	1mg weight loss in 10s	Setting for fast drying samples or for relatively inaccurate quick measurements intended to determine a certain trend only
AUTO 2	1mg weight loss in 25s	
AUTO 3	1mg weight loss in 60s	This setting is used for most samples.
AUTO 4	1mg weight loss in 90s	Setting for slowly drying samples prone to skin formation (trapped moisture).
AUTO 5	1mg weight loss in 120s	

⇨ Operate the navigation keys to select the suitable setting <AUTO 1 - AUTO 5> and confirm by pressing the PRINT-key. The screen used to select the result display will be shown (See step 3).



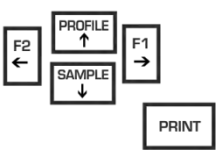
English

Automatic freely selectable switch-off

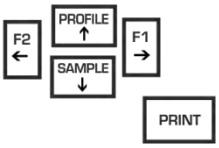
If none of the five switch-off criteria AUTO 1 – AUTO 5 meets your requirements, the device provides an option that allows you to define your own switch-off criterion (weight loss and unit of time freely selectable).

This switch-off criterion, too, is based on the weight loss per unit of time. As soon as the medium weight loss drops below the desired value per unit of time, the measurement will be finished automatically.

⇨ Operate the navigation keys to select <AUTO OFF DEFINED> and confirm by pressing the PRINT-key. The display to enter the weight loss appears.



⇨ Operate the navigation keys to define the weight loss (1 – 10 mg) and confirm by pressing the PRINT-key. The display to enter the time appears. The active digit is flashing.

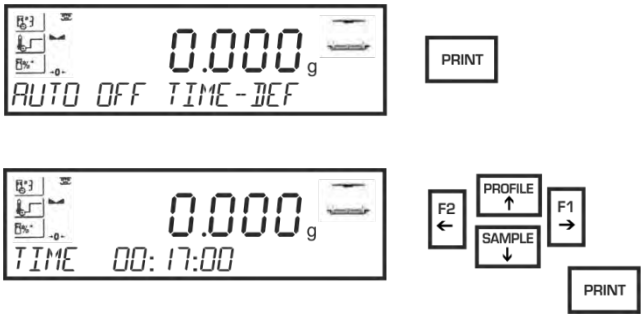


⇨ Operate the navigation keys to enter the time (10 to 120 s) and confirm by pressing the PRINT-key. The screen used to select the result display will be shown (See step 3).

Time controlled switch-off

When this switch-off criterion is selected the measurement will continue until the set drying time has lapsed (max. time 99h 59 min).

⇨ Operate the navigation keys to select <TIME - DEF> and confirm by pressing the PRINT-key. The screen used to enter the drying duration will appear.



⇨ Operate the navigation keys to enter the time (10 to 120 s) and confirm by pressing the PRINT-key. The screen used to select the result display will be shown (See step 3).

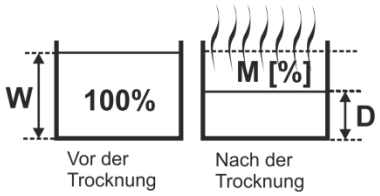
English

3. Selecting result display

This parameter is used to define which unit is to be used for the display and printout of the measured result.

The following settings are available for result display:

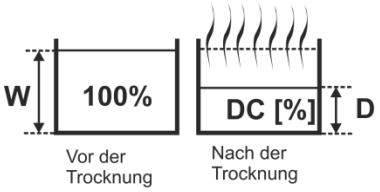
% M: Moisture content



Display shows the moisture content of the sample as a percentage of the wet weight
(W = wet weight = starting weight = 100%)

$$\textbf{M}\ [0\ldots\text{-}100\%] = \frac{\text{Wet weight } \textbf{W} - \text{Dry weight } \textbf{D}}{\text{Wet weight } \textbf{W}} \times 100\%$$

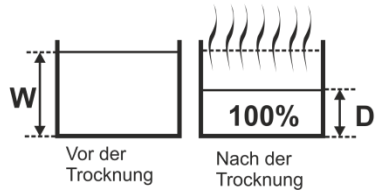
% D: Dry material content



Display shows dry material content (DC) of sample as a percentage of the wet weight
(W = wet weight = starting weight = 100%)

$$\textbf{DC}\ [100\ldots0\%] = \frac{\text{Dry weight } \textbf{D}}{\text{Wet weight } \textbf{W}} \times 100\%$$

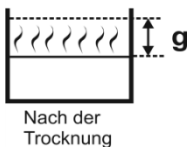
% R: ATRO dry content



The wet weight of the sample will be shown as a percentage of the dry weight
(D = dry weight = final weight =100%)

$$\textbf{ATRO}\ [100\ldots1000\%] = \frac{\text{Wet weight } \textbf{W}}{\text{Dry weight } \textbf{D}} \times 100\%$$

G: Residual weight in grams



Display shows the weight of the sample in grams.

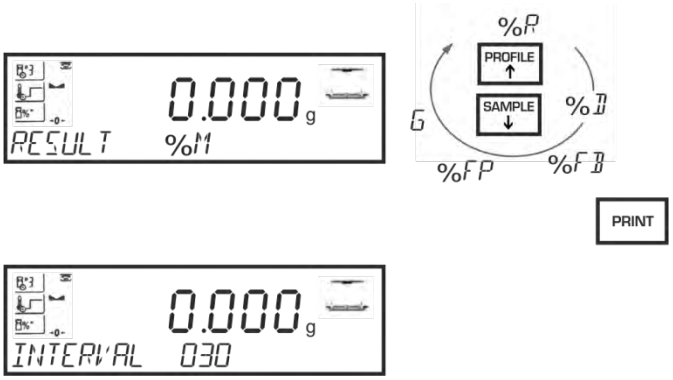
% FB

Not documented

% FP

Not documented

⇨ Operate the navigation keys to select the switch-off criterion and confirm by pressing the PRINT-key. The screen used to define the output interval will appear (See step 4.).



4. Selecting output interval

This screen is used to set the interval in which the interim results are to be printed.

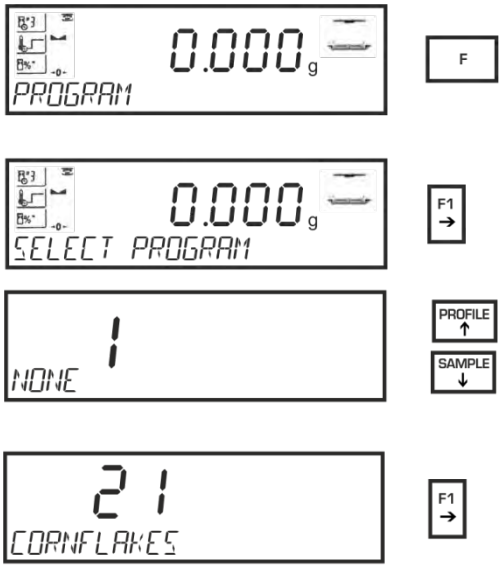
⇨ Operate the navigation keys to select the interval (0 - 120s) and confirm by pressing the PRINT-key.

⇨ This concludes the definition of drying parameters. Confirm query “SAVE“ by pressing the PRINT-key or cancel by pressing the UNITS-key.
After you have saved your data all parameter settings will be applied to the drying process and displayed on screen. (For carrying out drying see chap. 15.3)

15.2 Moisture determination with the help of the database

> ➢ You may download any drying program, as required, either from the program database (See chap.14.3) or the product database. (14.2).
>
> ➢ You can assign the F1 or F2 keys as shortcuts for fast access to this function <SELECT PROGRAM>, see chap. 15.5.

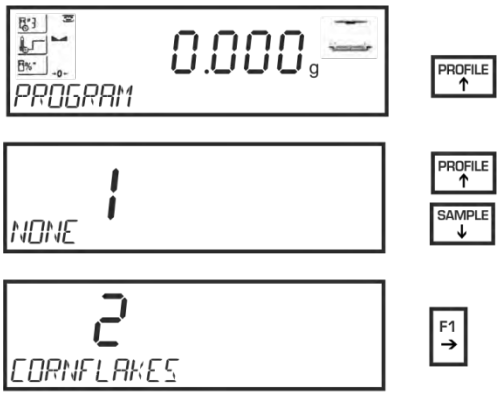
Downloading a drying program from the program database:



⇨ Operate the navigation keys to select the desired drying program, for instance cornflakes, and confirm by pressing the F1-key.

⇨ The display will return to the application window. The selected drying program will be displayed on the information bar (provided this has been enabled in menu P2.2.2>, see chap.15.5). All parameters saved for this program are now enabled for measurement (For carrying out drying see chap. 15.3).

Downloading a drying program from the product data database:



⇨ Operate the navigation keys to select the desired product such as cornflakes and confirm by pressing the F1-key.

⇨ The display will return to the application window. The drying program assigned to the product will be loaded and displayed on the information bar (provided it is enabled in the menu <P2.2.2>, see chap. 15.5).
All parameters saved for this program are now enabled for measurement (Carrying out drying see chap. 15.3).

☞ Defining and saving your own drying program see chap. 14.3.

☞ Editing a saved drying program see chap. 14.3.2

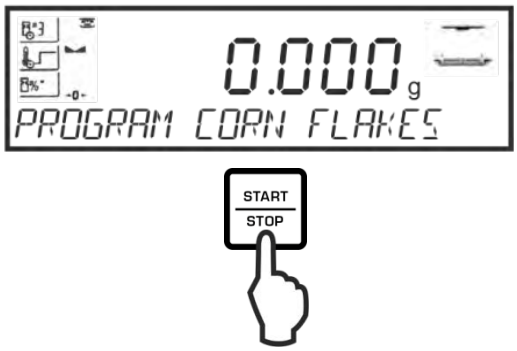
☞ Deleting a drying program see chap. 14.3.3

English

15.3 Carrying out drying and measuring processes

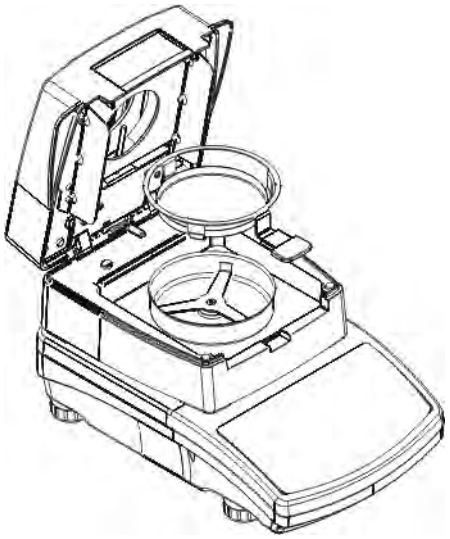
In order to obtain exact results, the instrument must have reached its operating temperature (see warm-up time chap. 1). For this warm-up time the instrument must be connected to the power supply.

⇨ You can either define drying parameters as described in chap. 15.1.1 or download a drying program suitable for the product from the database, see chap. 15.2.
The enabled drying parameters will be displayed along the left edge of the screen as pictograms.

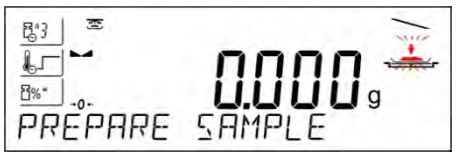


⇨ Press **START/STOP**-key and follow the instructions on the information bar and status display.

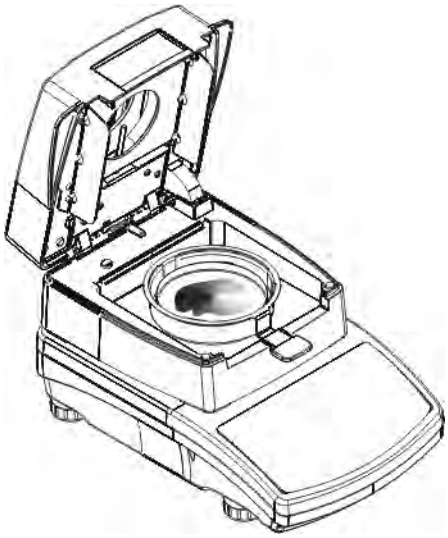
⇨ Place removal aid with empty sample dish on the sample dish retainer. Make sure that the sample dish is resting flat on the sample dish retainer. Use the sample retainer at all times as it allows safe working and prevents burns.



⇨ Close heating hood and tare.

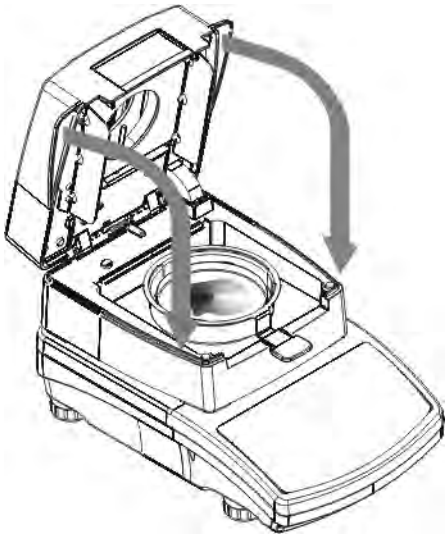


⇨ Open heated cover.
Distribute sample evenly on the sample dish.

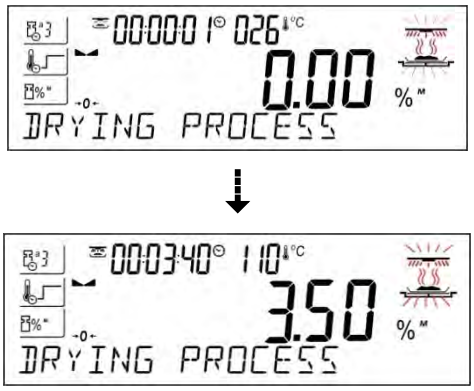


English

⇨ Close heating cover.



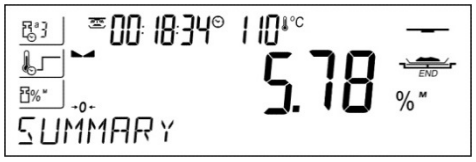
⇨ The drying and measuring process will start automatically. The drying parameters defined beforehand will now take control of the operation. The header, followed by the current interim results will be printed according to selected output interval if an optional printer is connected (Printout example see chap. 12.3.4).



⇨ You can watch the drying process on the display screen.
The current temperature, lapsed time as well as the current interim result will be continuously updated and displayed.

Use the UNITS-key to change the display of the various result readouts.

⇨ Measuring will be finished as soon as the set switch-off criterion has been met.
The status display will show “END“ and the information bar “SUMMARY“.
The result will be shown on the set result display.



The header will be printed if an optional printer is connected (For example of printout see chap. 12.3.4).

⇨ The displayed values will be deleted on opening the heating hood with the exception of the current temperature.

⇨ Remove sample using a removal aid.
Caution: Sample dish and all parts of the sample chamber are hot!

⇨ Start the next measurement by pressing the START/STOP-key.

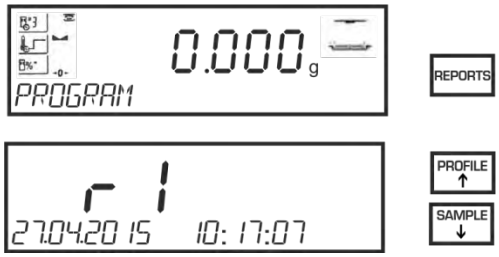
☞ You can cancel the measuring process at any time by pressing the START/STOP-key.
For performance press the START/STOP-key and confirm query by pressing the PRINT-key.

☞ To interrupt measuring for a short period you can lift the heating hood (for instance for stirring).

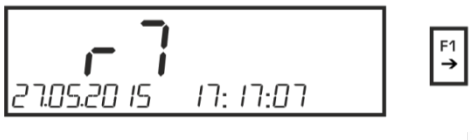
15.4 Drying reports

At the end of the drying process 1000 drying reports will be saved automatically to the database **< b5.6** DRYING **PROCESS REPORTS>**, see chap. 14.6.

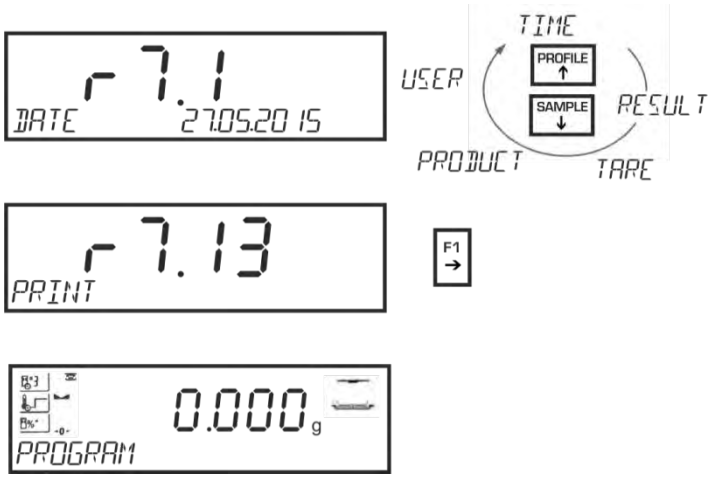
Apart from activating data records in the database menu (See chap. 14.6.), this key REPORTS also allows you fast access to all drying reports.



⇨ Press REPORTS-key. The first drying report <r.1> including date / time will be displayed. Every drying report will be saved under a sequential number. Operate the navigation keys to select a drying process report.



⇨ Further information on the selected drying process report is available on pressing the F1-key. The navigation keys allow you to select and view the respective data. If <PRINT> is selected and confirmed, output will take place to an optional printer (For example of printout see chap. 14.6) .



⇨ Press UNITS-key repeatedly to return to menu / weighing mode.

15.5 Device settings <P2.2 MOISTURE ANALYSER>

Menu structure:

> Navigation in menu see chap. 7.2

Menu item	Available settings / explanation		
P2.2.1 TEMP UNIT °C	Options: °C, °F		
P2.2.2 INFORMATION	Options: PROGRAM, TARE, NET, GROSS, OPERATOR, PRODUCT, STNFO, NONE		see chap. 8.3.8
P2.2.3 SPECIAL INFO [STNFO]	Special information – random text, max 19 characters		see chap. 8.3.9
P2.2.4 ABBREVIATIONS (SHORTCUT KEYS)	**P2.2.4.1** [F1]	Options: NONE / SELECT PROGRAM / LOGIN / ENTER TARE / SELECT TARE / PRINT HEADER / PRINT FOOTER / VARIABLE 1, 2 / CHANGE MODE	see chap. 8.3.10
	P2.2.4.2 [F2]		

English

16 General information concerning moisture analysis

16.1 Application

In all cases where moisture is added to or removed from products, a fast determination of the moisture content is of enormous importance. For countless products the moisture content is not only a quality feature but also an important cost factor. Very often fixed limits for moisture content apply to the trade in industrial or agricultural goods as well as chemical or food products which are defined by terms of delivery and general standards.

16.2 Basics

Moisture does not only mean water but includes all substances that evaporate when heated up. In addition to water this includes,

- Fats
- Oils
- Alcohol
- Solvent
- etc...

There are various methods to analyse moisture in a product.
KERN MLS uses a method called thermogravimetrics. In accord with this method, the sample is weighed before and after heating, determining the material moisture by looking at the difference.
The conventional drying chamber method follows the same principle, with the exception that this method requires a considerably longer measuring period. . In accord with the drying chamber method, the sample is heated from the outside to the inside by a hot air current, so as to remove the moisture. The radiation applied in the KERN MLS penetrates mainly the sample in order to be transformed inside it into heat energy that is, warming from the inside to the outside. A minor amount of radiation is reflected by the sample, a reflection that is less in dark samples than in light-coloured ones. The depth of penetration of the radiation depends on the permeability of the sample. In samples of low permeability the radiation only penetrates the outer layers of the sample, possibly resulting in imperfect drying, incrustation or burning. For that reason the preparation of a sample is of great importance.

16.3 Adjustment to existing measuring method

KERN MLS frequently replaces a different drying method (such as drying cabinet) as easier operation achieves shorter measuring periods. For that reason the conventional measuring method must be matched to the KERN MLS in order to achieve comparable results.

- Performing parallel measurements
  Lower temperature setting for KERN MLS than for drying cabinet method
- Result of KERN MLS does not match reference
  - Repeat measurement with changed temperature setting
  - Vary shutoff criterion

16.4 Preparing a sample

Prepare one sample at a time for measuring. This prevents the sample from exchanging moisture with its surroundings. If several samples have to be taken at the same time, they should be packed in airtight boxes so that they do not undergo changes during storage.
To receive reproducible results, spread the sample thinly and evenly on a sample dish.
Patchy spreads will produce inhomogeneous heat distribution in the sample to be dried resulting in incomplete drying and increased measuring time. Sample clusters generate increased heating of the upper layers resulting in combustion or incrustation. The high layer thickness or possibly arising incrustation makes it impossible for the moisture to escape from the sample. Due to this residual moisture, measured results calculated in this way will not be comprehensible or reproducible.

Preparing a sample from solids:

- Spread powdery or grainy samples evenly on the sample dish.
- Grind coarse samples using a mortar or a shredder. When grinding the sample avoid any heat supply as this may cause loss of humidity.

Preparing a sample from liquids:

For liquids, pastes or melting samples we recommend to use a glass fiber filter. The glass fiber filter has the following advantages:

- even distribution thanks to capillary attraction
- no formation of droplets
- fast evaporation due to a greater surface

16.5 Sample material

Easy to determine are usually samples with the following characteristics:

- Grainy to powdery, pourable solids
- Thermally stable materials, emitting the moisture to be determined easily without other substances evaporating at the same time
- Liquids that vaporize to leave a dry substance without developing a film

Difficult to determine may be samples that are:

- Glutinous or sticky
- Become incrusted easily or tend to form a film
- Decompose easily under the influence of heat or emit various elements

16.6 Sample size / originally weighted in quantity

Drying times, as well as achievable accuracy, are significantly influenced by sample distribution. In the course of this arise two opposed requirements:
The lighter the originally weighted in quantity, the easier it is to achieve shorter drying times. However, the heavier the originally weighted in quantity, the more accurate a result.

16.7 Drying temperature

Bear in mind the following factors when setting the drying temperature:

Surface of the sample:
Compared with powdery or grainy samples, liquid and spreadable samples have a smaller surface for the transmission of heat energy.
The use of a glass fibre filter improves the heat application.

Colour of sample:
Light-coloured samples reflect more heat radiation than dark ones and therefore require a higher drying temperature.

Availability of volatile substances:
The better and faster the water or other volatile substances can be disposed, the lower a drying temperature is required. If water is difficult to get to (e. g. in synthetics), it has to be calcined at high temperatures (the higher the temperature, the higher the water vapour pressure).
Results equivalent to other moisture analysing methods (e. g. drying chamber) can be achieved by experimentally optimising the setting parameters such as temperature, heating level and shutoff criteria.

16.8 Recommendations / Guidelines

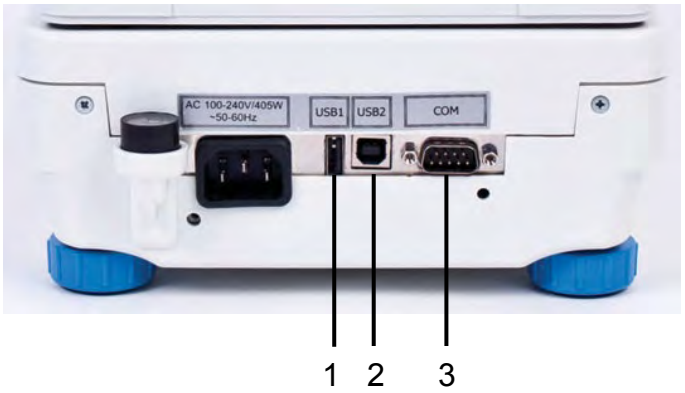
Prepare standard sample:
- Crush sample, as required, and spread it evenly in the aluminium dish.

Prepare special samples:
- For sensitive or hard to spread test materials (e. g. mercury) a glass fibre filter is available for use.
- Spread sample evenly on glass fibre filter and cover is with a second glass fibre filter.
- The glass fibre filter is also useful as a protection when splashing materials are dealt with (each splash falsifies the final result).

You will find examples taken from actual use in our application manual, available from the KERN home page (www.kern-sohn.com).

17 Communication / setup menu < P3 >

Available interfaces:

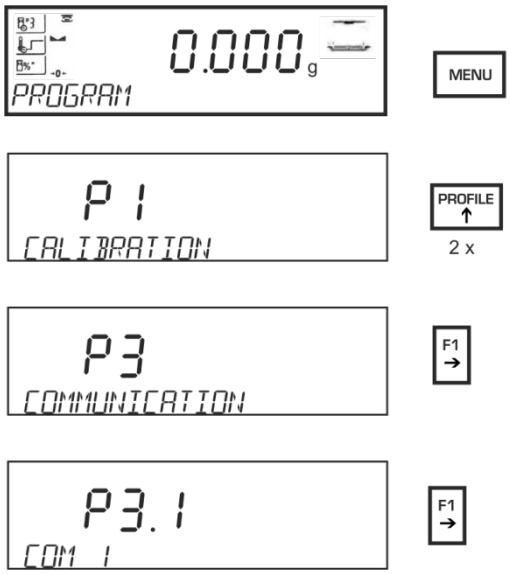


1. COM 1 (RS-232)
2. USB type B (Connection to printer or PC).
3. USB type A
   (Connection to USB storage device, barcode scanner or PC keyboard)

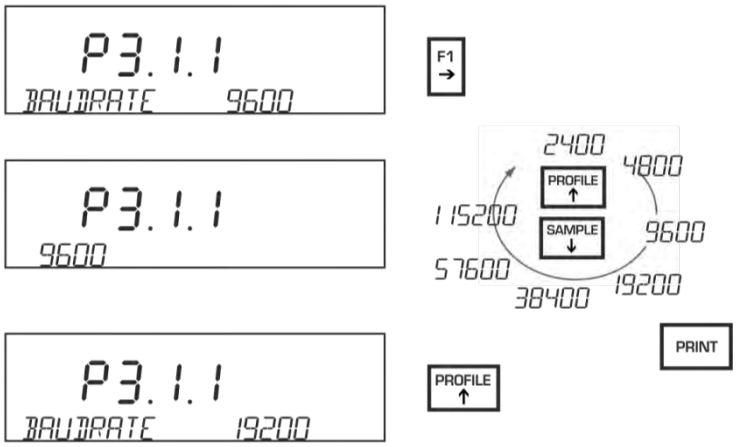
Configure the interface according to peripheral and desired function, see chap. 17.1 (the parameters of USB ports are non-configurable).

17.1 Configure RS-232 interface

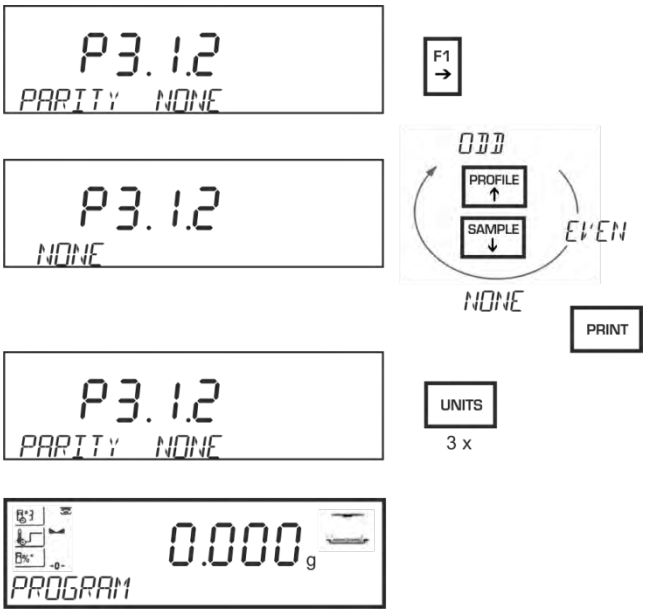
⇨ Go to the communication menu <P3> and select the interface <COM 1> to be configured:



⇨ After selecting <COM 1> use the navigation keys to select communication parameter baud rate.



⇨ After selecting the baud rate select the next communication parameter <Parity>.



17.2 USB interfaces

17.2.1 USB type A

The USB type A interface is used to connect a USB storage device, barcode scanner or PC keyboard.

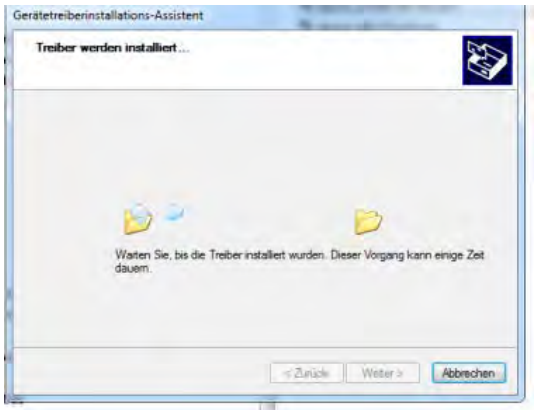
A USB storage medium allows you to export / import weighing data (See chap. 14.7), save measurement reports digitally and to print them on a printer connected to the PC (See chap. 13)

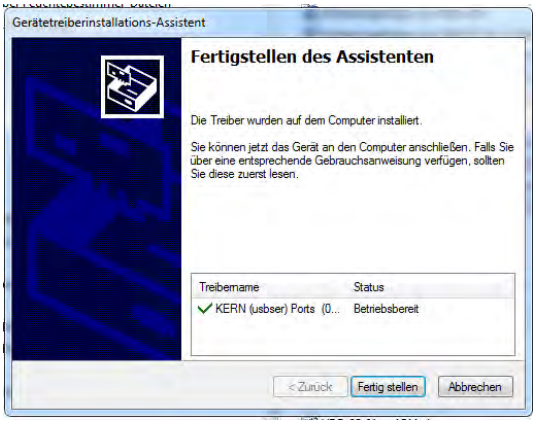
17.2.2 USB type B (PC connection)

Connect device via USB:

- ⇨ Disconnect device from power supply.
- ⇨ Install USB driver; available from our KERN Homepage **www.kern-sohn.com**, / Downloads. Select the driver version compatible with your system and execute the exe-file.

Click on Dialogue <Next> and installation for the driver will commence.



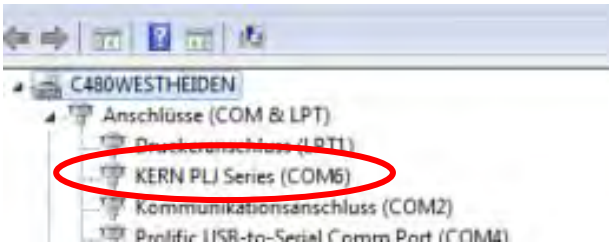


To finish installation, click on <Finish>.

⇨ Connect USB cable to moisture analyser and USB port on your computer.

Wait until the Screen Installation Assistant appears on the screen.

⇨ Activate the device manager.
The new virtual COM port for the device will be shown when clicking on “Connections“. Correct entry is indicated by the name “KERN PLJ Series“.



⇨ Select the displayed COM port such as COM6 according to the transmission software.
We recommend our transfer software ‘Balance Connection KERN SCD 4.0‘ for the import of data to a PC program.

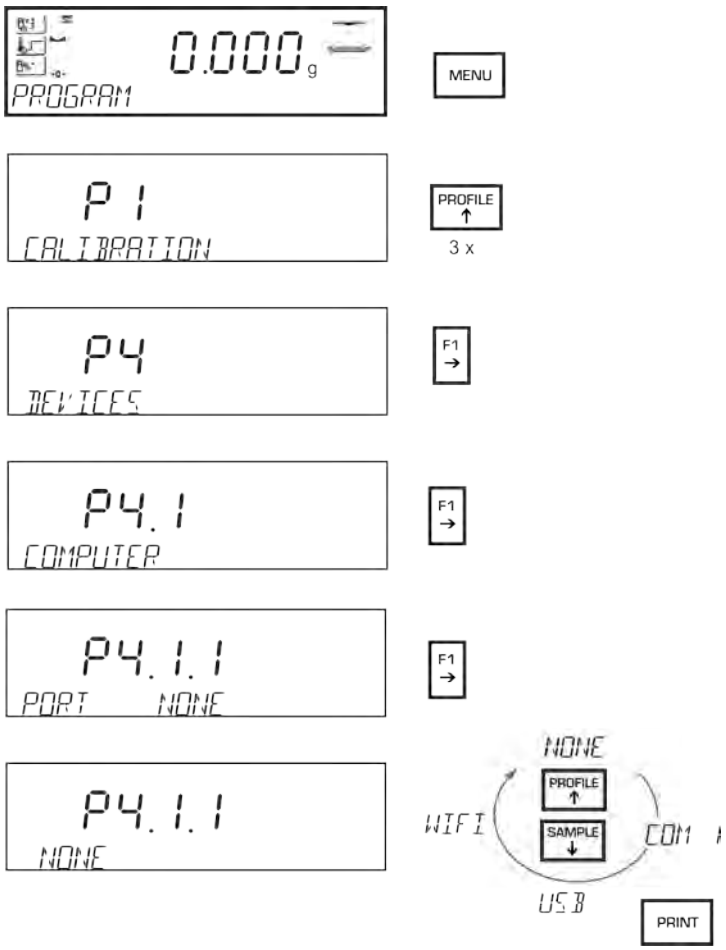
⇨ Go to menu **<P4.2.1 Devices / Printers / Port>** and select **<USB-PC>**, see chap. 18.2.

English

18 Devices / setup menu < P4 >

18.1 Continuous data transmission for remote control commands < P4.1 Computer >

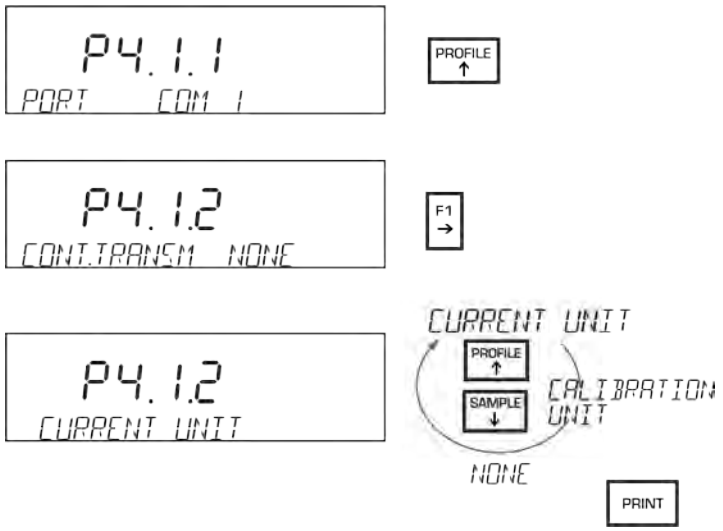
1. Select interface <P4.1.1>



⇨ Operate the navigation keys to select the interface which is to be used for the connection of the device to the PC.
Selectable:
COM 1: RS 232
USB: Type B
WIFI: Not documented

2. Select type of continuous data transmission <P4.1.2>

⇨ Use the PROFILE-key to select the screen used for setting continuous data transmission.



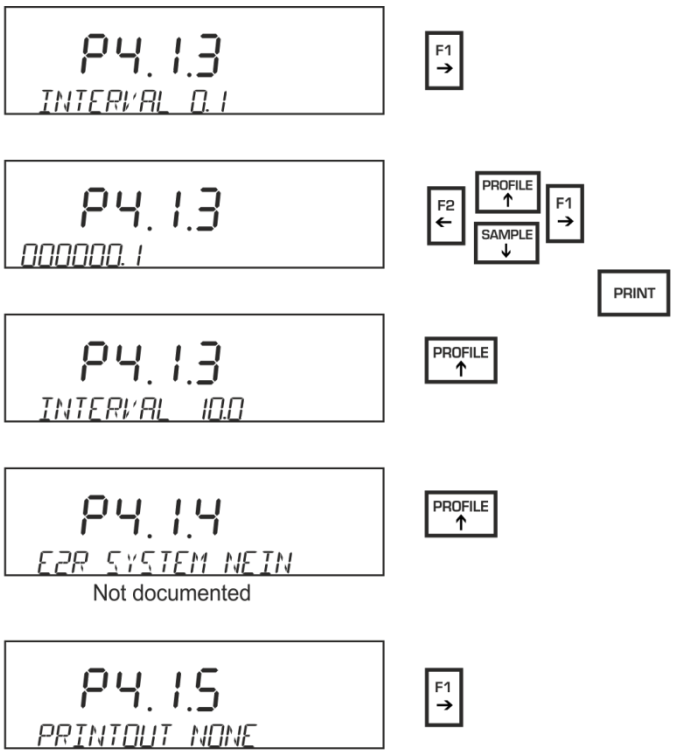
⇨ Operate the navigation keys to go to the screen used to enter the desired setting and confirm by pressing the PRINT-key. Options:

<NONE>	Continuous data transmission disabled
<CURR.UNIT>	Continuous data transmission in current unit
<CAL.UNIT>	Continuous data transmission in adjustment unit

English

3. Select output interval <P4.1.3>

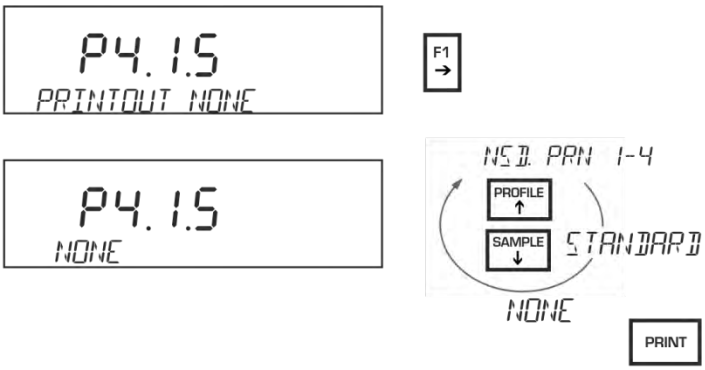
⇨ Operate the PROFILE-key to select the screen used to set the output interval for continuous data transmission.



English

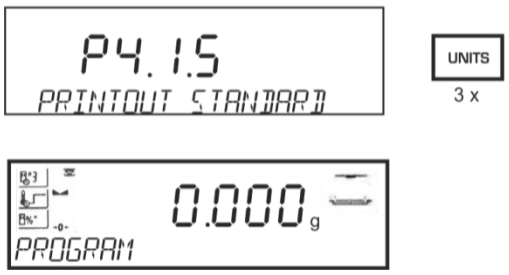
4. Select report type <P4.1.5>

⇨ Operate the PROFILE-key to select the screen used to select the report type.



⇨ Operate the navigation keys to go to the screen used to enter the desired setting and confirm by pressing the PRINT-key. Options:

<NONE>	None
<STANDARD>	Standard report
<SPCPRINT 1>	User defined report:
⬇	Special printout 1 - 4, for definition see chap. 12.4
<SPCPRINT 4>	

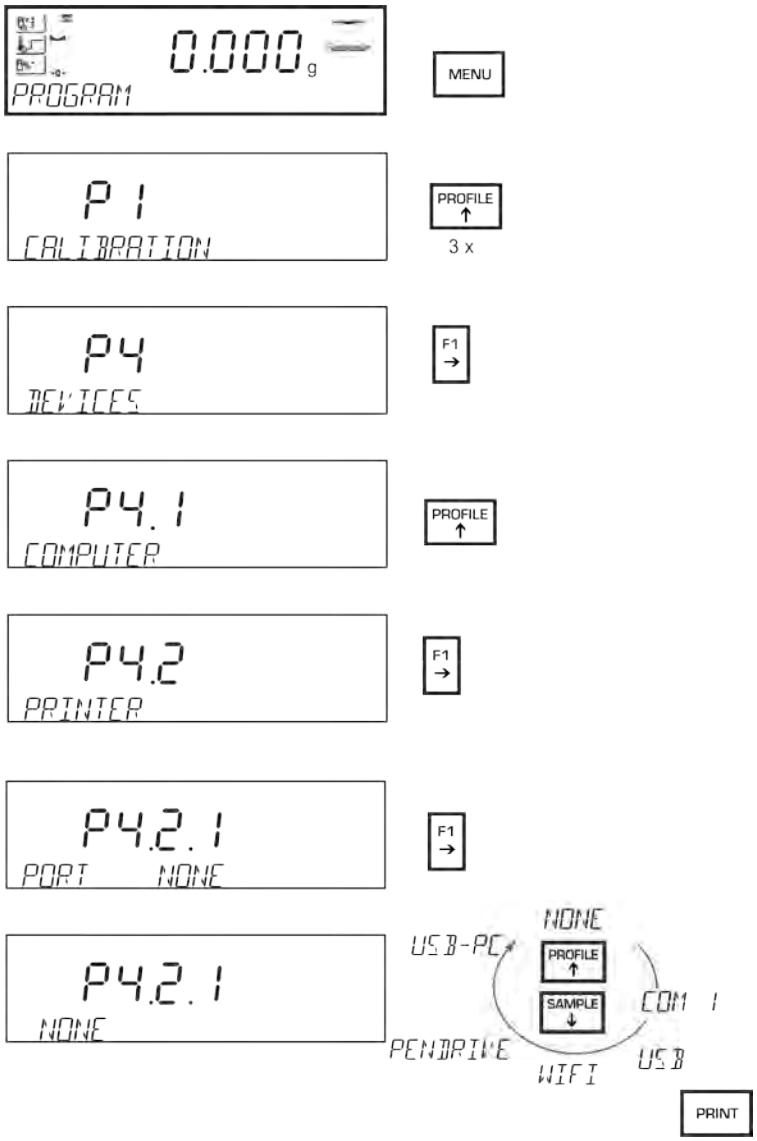


English

18.2 Data transmission after pressing the PRINT-key < P4.2 Printer >

Go to menu item <P4.2> to select and configure the interface for output after pressing the PRINT-key. The content of the data output is defined under < P5 Printout >, see chap. 12.

1. Selecting interface <P4.2.1>

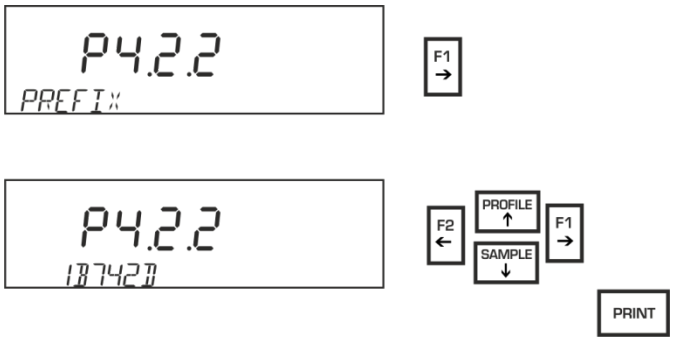


⇨ Operate the navigation keys to select the interface to be used for data transmission.

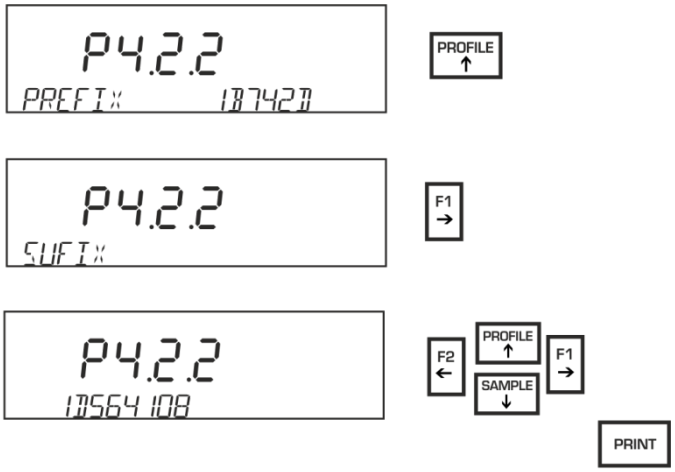
Options:

<NONE>	None
<COM 1>	Standard printer interface RS 232
<USB>	USB port type B for EPSON and PCL printer
<WIFI>	Not documented
<USB-Stick>	USB port type A, connection USB storage device. For saving measurement reports see chap. 13
<USB PC>	USB port type B, PC port in connection with transmission software (such as KERN SCD 4.0)

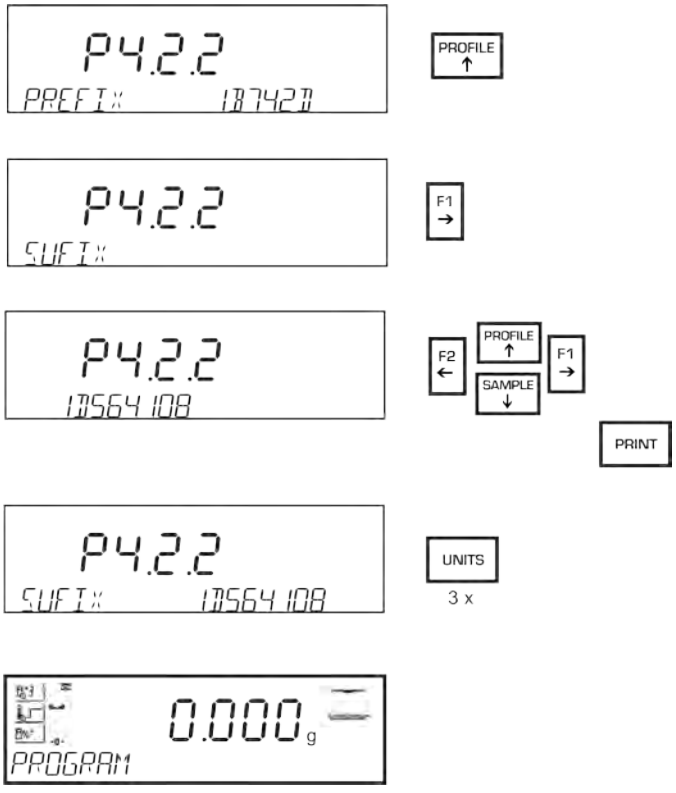
2. Enter values (hexadecimal) for prefix / suffix <P4.2.1>



⇨ Operate the navigation keys to enter the control code for the start of the report and confirm by pressing the PRINT-key.
Operate the PROFILE-key to select the screen used for entering the suffix.

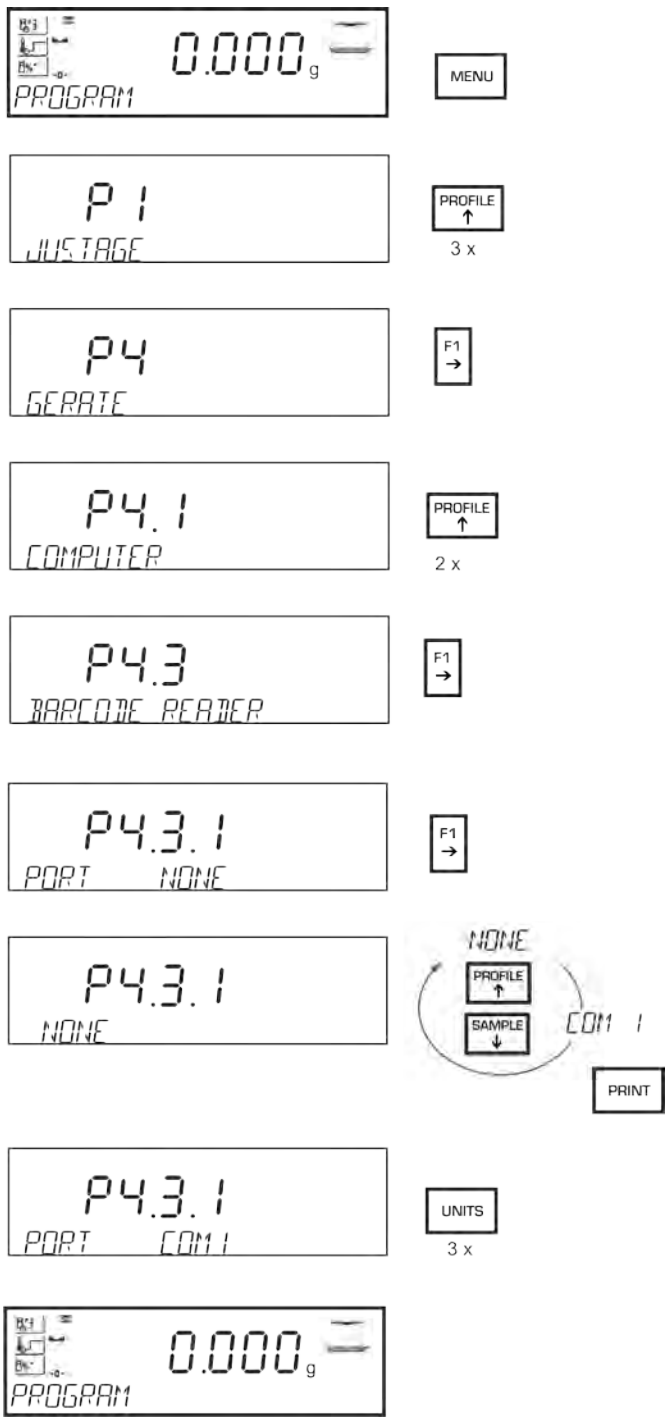


⇨ Operate the navigation keys to enter the control code for the end of the report. (such as paper section) and confirm by pressing the PRINT-key.



18.3 < P4.3 Barcode Scanner >

Go to menu item <P4.3> to select the interface for the connection of a barcode scanner.



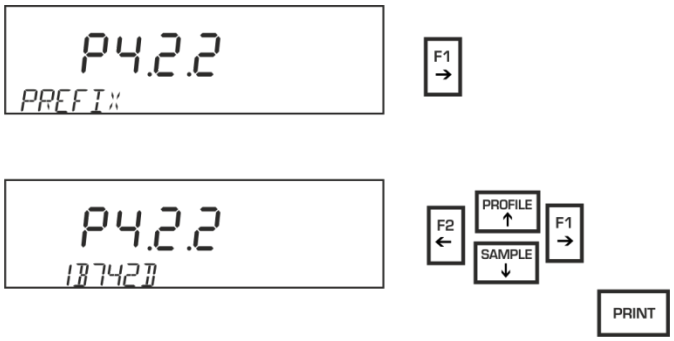
⇨ Operate the navigation keys to select the interface to be used for data transmission.

English

Options:

<NONE>	None
<COM 1>	Standard printer interface RS 232
<USB>	USB port type B for EPSON and PCL printer
<WIFI>	Not documented
<USB-Stick>	USB port type A, connection USB storage device. For saving measurement reports see chap. 13
<USB PC>	USB port type B, PC port in connection with transmission software (such as KERN SCD 4.0)

3. Enter values (hexadecimal) for prefix / suffix <P4.2.1>



⇨ Operate the navigation keys to enter the control code for the start of the report and confirm by pressing the PRINT-key.
Operate the PROFILE-key to select the screen used for entering the suffix.

19 Communication with external devices (printers / PC)

The following options are available for data exchange via RS 232C interface or USB to external devices.

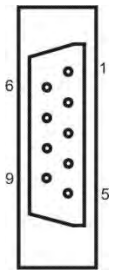
- **Manual** - After pressing the PRINT-key
- **Automatic** - After the display has become stable
- **Continuous** - When function is enabled or via remote control command

The following conditions must be met for communication between the moisture analyser and external devices:

Disconnect moisture analyser from the power supply and connect to the appliance interface with a suitable cable. Faultless operation requires an adequate KERN interface cable.

Communication parameters of the RS 232 interface (Baud rate, bits and parity) of moisture analyser and external devices must match, see chap. 17.1.

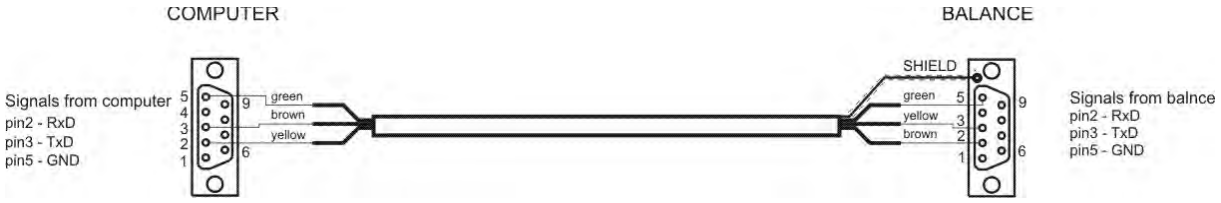
19.1 Pin assignation of RS 232 interface (front view):



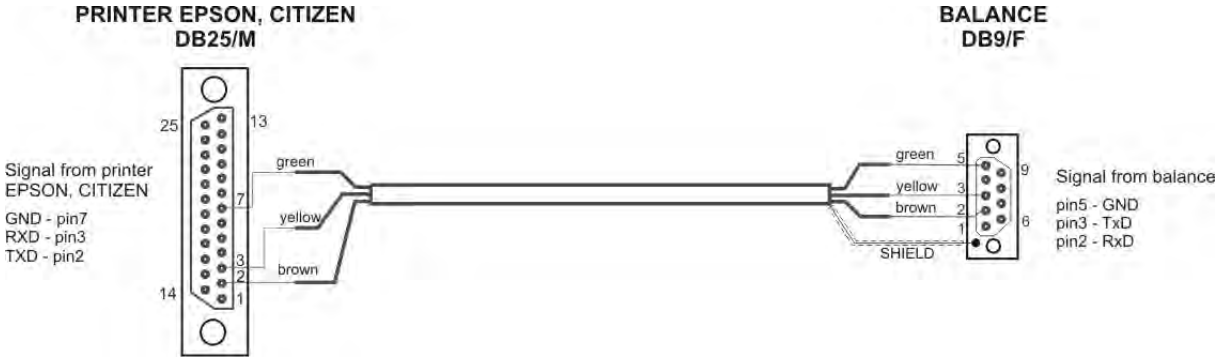
Pin2 - RxD
Pin3 - TxD
Pin5 - GND

19.2 Interface cable:

⇨ Balance – PC 9-pole



⇨ Weighing scale - printer (CITIZEN, EPSON) 25-pin



⇨ Balance - printer

3 (TxD)	**1** (RxD)
5 (GND)	**3** (GND)
7 - 8 jumpered	

19.3 Data transmission format

1. After pressing the PRINT-key

1	2	3	4-12	13	14-16	17	18
Stability	␣	Signs	Measuring Value	␣	Unit	CR	LF

Stability symbol	[␣] stable
	[?] instable
	[^] overload
	[v] underload
Signs	[␣] positive values
	[**-**] negative values
Measuring Value	9 characters with right alignment
Unit	3 characters with left alignment

Example (stable / positive weighing value):

␣␣␣␣␣␣ 1 8 3 2 . 0␣g␣␣*CR LF*

2. Via remote control command

1-3	4	5	6	7	8-16	17	18-20	21	22
Command	␣	Stability symbol	␣	Signs	Measuring Value	␣	Unit	CR	LF

English

Command	1 - 3 characters
Stability symbol	[␣] stable
	[?] instable
	[^] overload
	[v] underload
Signs	[␣] positive values
	[**-**] negative values
Measuring Value	9 characters with right alignment
Unit	3 characters with left alignment

19.4 Interface commands

Subsequent commands will be detected by the weighing scale.

Commands	Function
Z	Zeroing
T	Taring
OT	Retrieve tare value
UT	Set tare value
S	Send stable weighing value in standard weighing unit
SI	Send weighing value immediately in standard weighing unit
SIA	Send weighing values for all platforms in default unit immediately
SU	Send stable weighing value in current weighing value
SUI	Send weighing value immediately in current weighing unit
C1	Start continuous output in standard weighing unit
C0	Stop continuous output in standard weighing unit
CU1	Start continuous output in current weighing unit
CU0	Stop continuous output in current weighing unit
NB	Enter serial number
K1	Lock device keyboard
K0	Unlock device keyboard
SS	Press simulation “PRINT key“
OMI	List of available operating modes
OMS	Set operating mode
OMG	Search for operating mode
BP	Operate audio signal
PC	Send all implemented commands
BN	Enter device type
RV	Enter program version
A	Set auto zero
EV	Set ambient conditions
FIS	Set filter
ARS	Set stop control indication
LDS	Set decimal place
ER	Send code of last error message

Complete command with CR/LF characters.

English

19.5 General reply format

Commands	Function
XX␣A *CR LF*	Command accepted, executing command was started
XX␣D *CR LF*	Execution of previously started command was completed (Only occurs after XX_A)
XX␣I *CR LF*	Valid command but at present cannot execute command
XX␣^ *CR LF*	Valid command but range limit was exceeded
XX␣v *CR LF*	Valid command but range limit not reached
XX␣OK *CR LF*	Command accepted and executed
ES␣ *CR LF*	Invalid entry
XX␣E *CR LF*	Time limit for stabilisation of weighing scale display was exceeded.

ℹ	**XX**	Command such as Z = zero
	␣	Space character (20h, 0x20)

19.6 Detailed information on communication reports

19.6.1 Zeroing

Command: **Z** *CR LF*

Possible answers:

Z␣A *CR LF*	Command accepted, executing command was started
Z␣D *CR LF*	Execution of previously started command was completed
Z␣A *CR LF*	Command accepted, executing command was started
Z␣^ *CR LF*	Valid command but space character range was exceeded
Z␣A *CR LF*	Command accepted, executing command was started
Z␣E *CR LF*	Time limit for stabilisation of weighing scale display was exceeded
Z␣ *CR LF*	Valid command but at present cannot execute command

19.6.2 Taring

Command: **T** *CR LF*

Possible answers:

T␣A *CR LF*	Command accepted, executing command was started
T␣D *CR LF*	Execution of previously started command was completed
T␣A *CR LF*	Command accepted, executing command was started
T␣^ *CR LF*	Valid command but tare range was exceeded
T␣A *CR LF*	Command accepted, executing command was started
T␣E *CR LF*	Time limit for stabilisation of weighing scale display was exceeded
T␣I *CR LF*	Valid command but at present cannot be executed

19.6.3 Retrieve tare value

Command: **OT** *CR LF*

Response:

1	2	3	4 - 12	13	14 - 16	17	18	19
O	**T**	**␣**	Tare	**␣**	Unit	**␣**	*CR*	*LF*

Tare value: - 9 characters with right alignment
Unit: - 3 characters with left alignment

i	The tare value is always issued using the adjustment unit

19.6.4 Set tare value

Command: **UT␣TARA** *CR LF*, (**TARA** = Tare value)

Possible answers:

UT␣OK *CR LF*	Command executed
UT␣I *CR LF*	Valid command but at present cannot be executed
ES *CR LF*	Invalid entry

i	Set tare value: • Mark decimal place with decimal point • Without weighing unit

19.6.5 Send stable weighing value in standard weighing unit

Command: **S** *CR LF*

Possible answers:

S␣A *CR LF*	Command accepted, executing command was started
S␣E *CR LF*	Time limit for stabilisation of weighing scale display was exceeded
S␣I *CR LF*	Valid command but at present cannot be executed

1	2-3	4	5	6	7-15	16	17-19	20	21
S	␣	Stability symbol*	␣	Signs	Weight	␣	Unit	CR	LF

Example:

S CR LF	Sent command: Send stable weighing value in standard weighing unit
S ␣ A CR LF	Command accepted, executing command was started
S␣␣␣␣ -␣␣␣␣␣␣ 8 . 5 ␣g␣␣*CR LF*	Command executed Weighing value will be issued in default weighing unit

	Stability symbol*	
	?	instable (3Fh, 0x3F)
	␣	stable (20h, 0x20)

19.6.6 Send weighing value immediately in standard weighing unit

Command: **SI CR LF**

Possible answers:

SI␣I *CR LF*	Valid command but at present cannot be executed

1	2	3	4	5	6	7-15	16	17-19	20	21
S	**I**	**␣**	Stability symbol	**␣**	Signs	Weight	**␣**	Unit	CR	LF

Example:

S I *CR LF*	For sent command see chap. 19.4
S I␣?␣␣␣␣␣␣1 8 . 5␣k g␣*CR LF*	Command executed Weighing value will be issued in default weighing unit

19.6.7 Send stable weighing value in current weighing value

Command: **SU** *CR LF*

Possible answers:

SU␣A *CR LF* **SU␣E** *CR LF*	Command accepted, executing command was started
	Time limit for stabilisation of weighing scale display was exceeded
SU␣I *CR LF*	Valid command but at present cannot be executed
SU␣A *CR LF*	Command accepted, executing command was started

1	2	3	4	5	6	7-15	16	17-19	20	21
S	**U**	**␣**	Stability symbol	**␣**	Signs	Weight	**␣**	Unit	CR	LF

Example:

S U *CR LF*	For sent command see chap. 19.4
S U _ A *CR LF*	Command accepted, executing command was started
S U␣␣␣-␣␣1 7 2 . 1 3 5␣N␣␣*CR LF*	Command executed Weighing value will be issued in the current weighing unit.

19.6.8 Send weighing value immediately in current weighing unit

Command: **SUI** *CR LF*

Possible answers:

SUI␣I *CR LF*	Valid command but at present cannot be executed

1	2	3	4	5	6	7-15	16	17-19	20	21
S	**U**	**I**	Stability symbol	␣	Signs	Weight	␣	Unit	CR	LF

Example:

S U I *CR LF*	For sent command see chap. 19.4
S U I ?␣-␣␣␣5 8 . 2 3 7␣k g␣CR LF	Command executed Weighing value will be issued in the current weighing unit

19.6.9 Start continuous output in standard weighing unit

Command: **C1** *CR LF*

Possible answers:

C1␣I *CR LF*	Valid command but at present cannot be executed
C1␣A *CR LF*	Command accepted, executing command was started
	Weighing values will be issued in the default weighing unit

1	2	3	4	5	6	7-15	16	17-19	20	21
S	**I**	␣	Stability symbol	␣	Signs	Weight	␣	Unit	CR	LF

19.6.10 Stop continuous output in standard weighing unit

Command: **C1** *CR LF*

Possible answers:

C0␣I *CR LF*	Valid command but at present cannot be executed
C0␣A *CR LF*	Command accepted, executing command was started

19.6.11 Start continuous output in current weighing unit

Command: **CU1** *CR LF*

Possible answers:

CU1␣I *CR LF*	Valid command but at present cannot be executed
CU1␣A *CR LF*	Command accepted, executing command was started
	Weighing values will be issued in the current weighing unit

1	2	3	4	5	6	7-15	16	17-19	20	21
S	**U**	**I**	Stability symbol	␣	Signs	Weight	␣	Unit	CR	LF

19.6.12 Stop continuous output in current weighing unit

Command: **CU0** *CR LF*

Possible answers:

CU0␣I *CR LF*	Valid command but at present cannot be executed
CU0␣A *CR LF*	Command accepted, executing command was started

19.6.13 Press simulation “PRINT key“

Command: **SS** *CR LF*

The command **SS CR LF** is used to save the weighing process directly to the database, followed by a printout where an optional printer is connected.

19.6.14 Enter serial number

Command: **NB** *CR LF*

Possible answers:

NB␣A␣”x“ *CR LF*	Command accepted, executing command was started
NB␣I *CR LF*	Valid command but at present cannot be executed

”x“: Serial number of device

19.6.15 Lock device keyboard

Command: **K1** *CR LF*

Possible answers:

K1␣I *CR LF*	Valid command but at present cannot be executed
K1␣OK *CR LF*	Command accepted, executing command was started

19.6.16 Unlock device keyboard

Command: **K0** *CR LF*

Possible answers:

K0␣I *CR LF*	Valid command but at present cannot be executed
K0␣OK *CR LF*	Command accepted, executing command was started

19.6.17 List of available operating modes

Command: **OMI** *CR LF*

Possible answers:

OMI␣ CR LF **n_description“ CR LF** **n_description“ CR LF** **OK** *CR LF*	Command accepted, available operating modes will be shown
OMI␣I *CR LF*	Valid command but at present cannot be executed

n Number of operating mode
1 – Weighing mode
17 – Moisture determination mode

19.6.18 Set operating mode

Command: **OMS** *CR LF*

Possible answers:

OMS ␣OK CR LF	Valid command
OMS ␣E *CR LF*	No parameter or incorrect format
OMS ␣I *CR LF*	Valid command but at present cannot be executed

19.6.19 Search for operating mode

Command: **OMG** *CR LF*

Possible answers:

OMG␣n␣OK CR LF	Command accepted, number of current operating mode will be shown
OMG␣I *CR LF*	Valid command but at present cannot be executed

n Number of operating mode
1 – Weighing mode
17 – Moisture determination mode

19.6.20 Send all implemented messages

Command: **PC** *CR LF*

Response:

PC_A_"Z, T, S, SI, SU, SUI, C1, C0, CU1, CU0, NB, K1, K0, SS, OMI, OMS, OMG, BP, PC "

19.6.21 Enter program version

Command: **RV** *CR LF*

Possible answers:

RV␣A␣"x" *CR LF*	Command accepted, executing command was started
RV␣I *CR LF*	Valid command but at present cannot be executed

"x": Program version

Example:

RV␣*CR LF*
Reply for program version „r3.0.9":
RV␣A␣"r3.0.9" *CR LF*

19.6.22 Set auto zero

Command: **A␣**n*CR LF*

Possible answers:

A␣OK CR LF	Valid command
A␣E *CR LF*	No parameter or incorrect format
A␣I *CR LF*	Valid command but at present cannot be executed

n Parameter for auto zero
1 – disabled
2 – enabled

Example:

A␣1*CR LF* *Enable auto zero*
Response:
A␣OK *CR LF* *Auto zero enabled*

19.6.23 Set ambient conditions

Command: **EV␣**n*CR LF*

Possible answers:

EV␣OK CR LF	Valid command
EV␣E *CR LF*	No parameter or incorrect format
EV␣I *CR LF*	Valid command but at present cannot be executed

n Parameter for setting ambient conditions
0 – Environment stable
1 – Environment unstable

Example:

EV␣1*CR LF* *Set environment to stable*
Response:
EV␣OK *CR LF* *Set environment to stable*

19.6.24 Set filter

Command: **FIS␣**n*CR LF*

Possible answers:

FIS␣OK CR LF	Valid command
FIS␣E *CR LF*	No parameter or incorrect format
FIS␣I *CR LF*	Valid command but at present cannot be executed

n Parameters for setting reaction speed
1 – very fast
2 – fast
3 – medium
4 – slow
5 – very slow

Example:

FIS ␣3*CR LF* *Set medium filter*
Response:
FIS ␣OK *CR LF* *Medium filter set*

19.6.25 Set stop control indication

This setting defines how quickly the instrument considers a measured value as stable and then releases it.

Command: **ARS␣**n*CR LF*

Possible answers:

ARS␣OK CR LF	Valid command
ARS␣E *CR LF*	No parameter or incorrect format
ARS␣I *CR LF*	Valid command but at present cannot be executed

n Parameter for setting stoppage control indication
1 – fast
2 – fast and precise
3 – precise

Example:

ARS␣2*CR LF* *Stoppage control indication to fast + precise*
Response:
ARS␣OK *CR LF* *Stoppage control indication set to fast + precise*

19.6.26 Set last decimal place

Command: **LDS␣**n*CR LF*

Possible answers:

LDS␣OK CR LF	Valid command
LDS␣E *CR LF*	No parameter or incorrect format
LDS␣I *CR LF*	Valid command but at present cannot be executed

n Parameter for setting last decimal place
1 – always
2 – never
3 – when stable

Example:

LDS␣1*CR LF* *Set last decimal place to always show*
Response:
LDS␣OK *CR LF* *Last decimal place set to always show*

19.6.27 Send code of last error message

Command: **ER␣**n*CR LF*

Possible answers:

ER␣A␣x CR LF	Valid command
ER␣I *CR LF*	Valid command but at present cannot be executed

n Error message

Example:

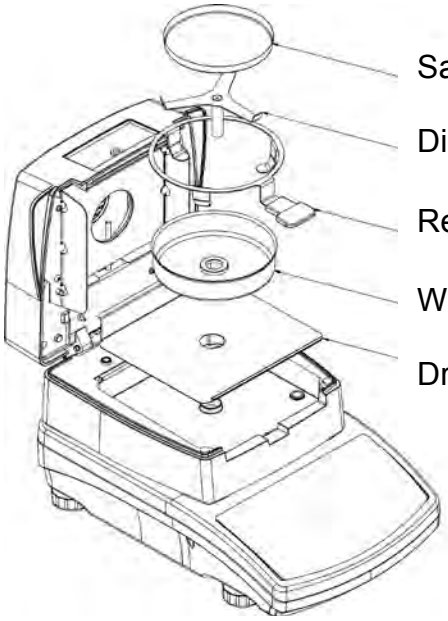
ER␣2*CR LF* *Show last error message*
Response:
ER␣A␣*"Err3"* *Error message "Err3" ➡ tare range exceeded*

20 Servicing, maintenance, disposal

Before any maintenance, cleaning and repair work disconnect the appliance from the operating voltage.

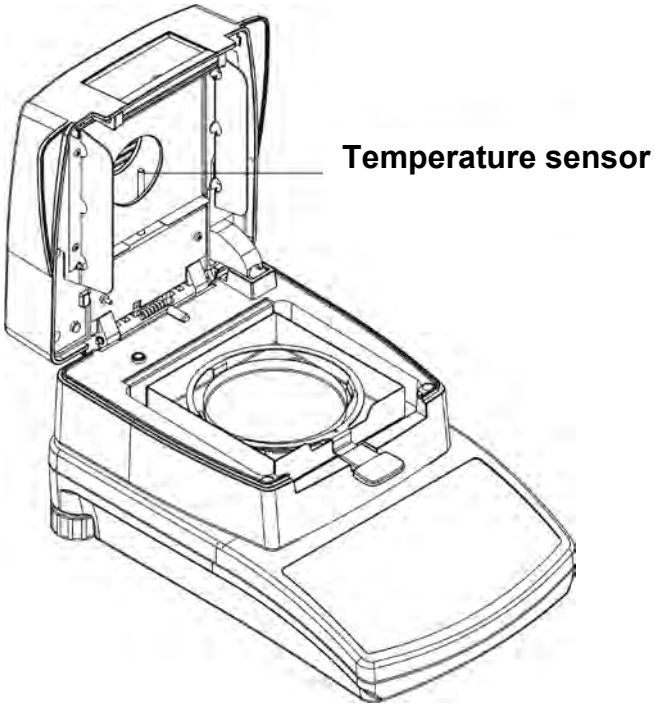
20.1 Cleaning

☞ Only carry out cleaning tasks when the equipment has cooled down.



Open heating hood and remove all parts in the right order and clean.
Please do not use aggressive cleaning agents (solvents or similar agents), but a cloth dampened with mild soap suds. Ensure that no liquid penetrates into the device. Polish with a dry soft cloth.
Loose residue sample/powder can be removed carefully with a brush or manual vacuum cleaner.

Clean temperature sensor



Clean the same way, as described above. Ensure the emitter is not touched or damaged in any way.

20.2 Servicing, maintenance

- ⇨ The appliance may only be opened by trained service technicians who are authorized by KERN.
- ⇨ Ensure that the balance is regularly calibrated, see chap. Monitoring of test resources.

20.3 Disposal

- ⇨ Disposal of packaging and appliance must be carried out by operator according to valid national or regional law of the location where the appliance is used.

21 Troubleshooting guide / error messages

Possible causes of errors:
In case of an error in the program process, briefly turn off the balance and disconnect from power supply. The weighing process must then restart from the beginning.

Fault	Possible cause
Display is not lit up.	• The display unit is not switched on. • The mains supply connection has been interrupted (mains cable not plugged in/faulty). • Power supply interrupted. • Fuse has blown
The display does not change when a sample is being loaded	• Sample dish / dish holder is fitted incorrectly.
The weight display changes constantly / the stability display does not appear.	• Sample dish has contact with wind protection device or heating hood. • Draught/air movement • Table/floor vibrations • Electromagnetic fields / static charging (choose different location/switch off interfering device if possible)
Incorrect measuring result	• Check adjustment • No resetting to zero before loading the sample
Measurement is taking too long	• Incorrect shut-down criteria set
Measurement is not reproducible	• Sample is not homogenous • Drying time is too short • Drying temperature too high (e.g. oxidation sample material, boiling point of sample exceeded) • Temperature sensor soiled or defective
Drying does not start	• Heating hood open • The mains supply connection has been interrupted (mains cable not plugged in/faulty).

Error messages:

Err2	Value beyond zero range
Err3	Value beyond tare range
Err8	Time limit exceeded for process, tare or reset to zero
ZERO	Error AD transformer
FULL	Weighing range exceeded
LH	Initial weight error

Should other error messages occur, switch balance off and then on again. If the error message remains inform manufacturer.

22 Declaration of conformity

To view the current EC/EU Declaration of Conformity go to:

www.kern-sohn.com/ce