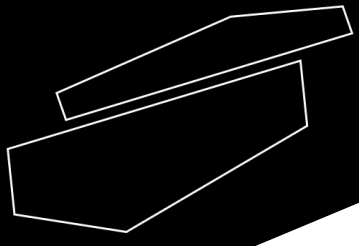
METRIA

Analytical balance Metria, TOUCH

Please read the User Manual carefully before use and follow all operating and safety instructions!



User Manual

english

Table of Contents

1 Product Information

1.1 Product Brief

Analytical balance Metria, TOUCH is an analytical laboratory balance, enhanced user experience with new premium features, flexibility for use in a wide range of environments and applications. This high-resolution balance is designed and intended for use only in laboratories and indoor areas under normal atmospheric conditions. It was developed specifically for the exact determination of the mass of materials in liquid, paste, powder or solid form. It could be widely used in industry, agriculture, commerce, schools, scientific research and other institutions.

1.2 Application Advice/Technical Support

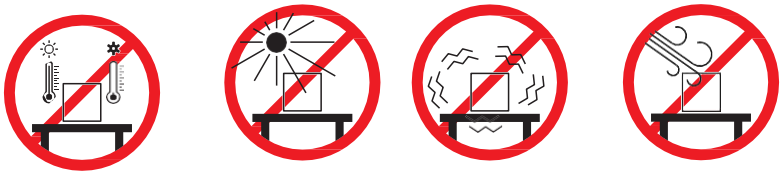
Please contact the local distributor or seller for application advice and technical support.

2 Safety Information

Personnel need to have read and understood this user manual, including the safety instructions. Improper use or handling can, however, result in damage and/or injury. Any improper use or operation of the balance, i.e. that is not consistent with the instructions, will result in forfeiture of all claims under the manufacturer's warranty.
Any balance usage that does not conform to the instructions in this manual results in forfeiture of all claims under the manufacturer's warranty.

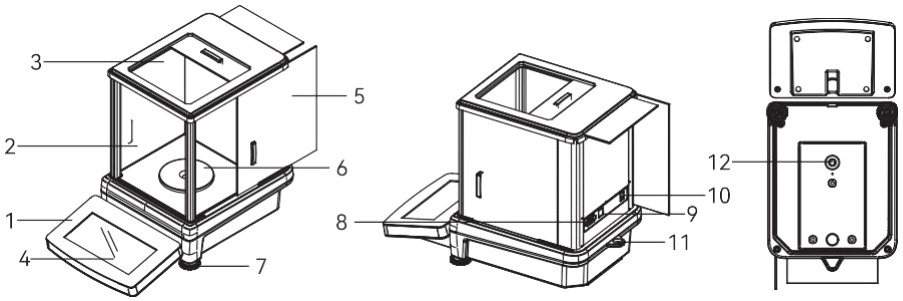
Danger of explosion!
Do not use this equipment in hazardous areas where have explosive materials.

- Make sure that the voltage rating printed on the AC adaptor is identical to your local mains voltage.
- Do not operate the balance if its housing or AC adaptor including any of the connections are damaged. Immediately disconnect the damaged equipment from the power by pulling the plug to turn off the power.
- Do not expose the balance and the accessories to extreme temperatures, aggressive chemical vapors, moisture, shocks, vibration, or strong electro-magnetic fields. Observe the conditions of operation described in the Specifications!
- The operator shall be solely responsible for any modifications to the equipment and for connecting any cables or equipment not supplied by the manufacturer. Please only use original accessories.
- If glass breaks, there is a risk of injury posed by cuts on glass edges.
- Lay the cables where they pose no risk of causing someone to trip.



Avoid temperature fluctuations | Avoid direct sunlight | Avoid vibrations | Avoid strong drafts

3 General View of the Equipment



Pos.	Function
1	Control panel
2	Front panel draft shield
3	Top door draft shield
4	Touch screen
5	Side door draft shield (right/left)
6	Weighing pan
7	Leveling feet
8	RS232 interface
9	USB-B port
10	DC jack
11	Bubble level
12	Below weighing (optional)

4. Using the Balance

4.1 Choosing a location

Choose a location that is not subject to the following negative influences:

- Heat (heater or direct sunlight)
- Drafts from open windows, AC systems, and doors
- Vibrations during weighing
- Heavy traffic areas (personnel)
- Excessive moisture
- Electromagnetic fields

4.2 Warm-up Time

To ensure accurate results are delivered, the balance must warm up for at least 30 minutes after initial connection to the power supply. Only after this time will the device have reached the required operating temperature.

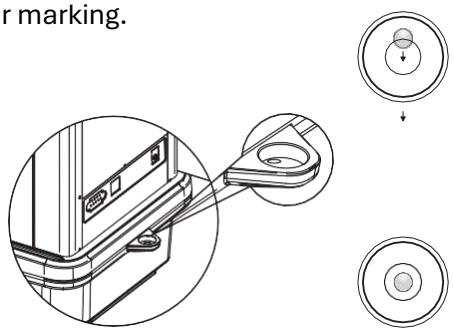
Important: When a verified balance of accuracy class ① (for use in legal metrology) is connected to the mains power, it must warm up for at least one hour before operation.

4.3 Leveling the Balance

The balance is equipped with a conventional level indicator, located to the left of the display. The position of the air bubble in the indicator shows whether or not the balance is correctly leveled.

To level the balance:
Twist both front leveling feet to center the air bubble within the circular marking.

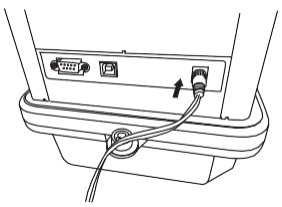
Bubble Position	Adjustment Required
Bubble right above	Clockwise rotate two leveling feet
Bubble right below	Counterclockwise rotate two leveling feet
Bubble left	Counterclockwise rotate left leveling foot, clockwise rotate right foot
Bubble right	Counterclockwise rotate right leveling foot, clockwise rotate left foot

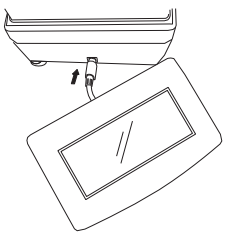


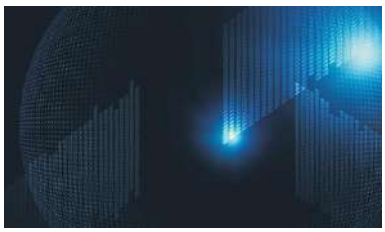
4.4 Switching the Balance On/Off

Check the voltage rating on the AC adapter's type plate. Make sure that the voltage rating printed on this unit matches the local supply voltage at the place of installation.

If the stated supply voltage does not comply with the local supply voltage or this no suitable AC adapter available: Do not use the AC adapter, only use original AC adapters.





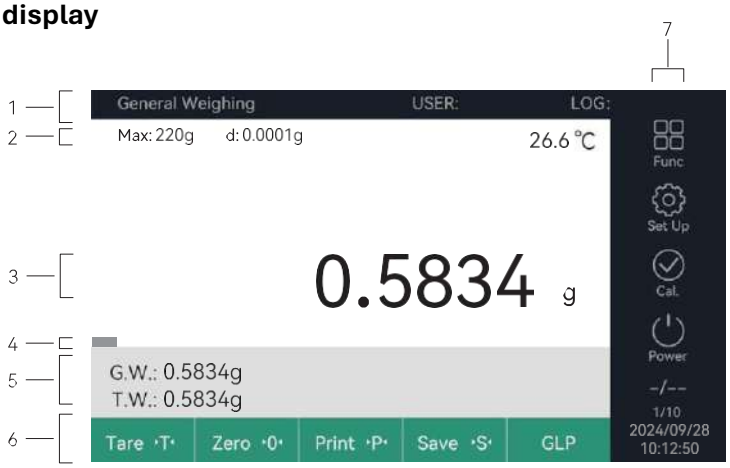


Connect the terminal with the balance

Display will show standby picture

Touch the screen, you can see the software version V1.01 in this processing. Balance will enter the weighing screen.

4.5 Touch screen display



1. Top bar includes the information of current selected item, USER quick access, reading log.

2. Metrology line (additional info for maximum capacity Max and the verifications cale interval e appear on verified balances, and temperature display)

3. Current measurement value.

4. Bar graph: scaled measurement value display (percentage weighing capacity)

5. Gross weight, Tare weight and some calculation result

6. Toolbar with currently available button: Tare, Zero, and possibly Print (data output), Save (data save) and GLP printout.

7. Side bar, with currently available button: Func (function application), Set up, Cal. (calibration), Power, 1/10 (0.0001g and 0.00001g alternative), time setting area.

4.5 List of applications

Press Function button

General Weighing
This is the standard application that appears when the balance is first switched on. Use this application to determine the weight of a sample within the device's specific weighing range.

Piece Counting
Use this application to determine the number of parts of approximately equal weight. The weight of a counted reference sample is calculated and then the objects with unknown piece count are weighed. The balance displays the number of parts and the piece weight.

Dynamic Weighing (Animal Weighing)
Weigh unstable samples. Use a balance to read the average value of unstable output during the weighing process.

Density Determination (optional accessory BAAC-A75-001 needed)
Use this application to determine the density of solid and liquid samples using a density set based on the buoyancy method. The density is determined using Archimedes' Principle.

Percent Weighing
This application is used to determine the percentage share or the percentage difference of the sample related to a reference weight.

Accumulation
Totalize weight values. You can save up different components' weight and get total weight and average weight.

Unit conversion
Select different unit for different weighing.

5 Calibration and Adjustment

To achieve the highest accuracy possible, regularly calibrate and adjust the balance.

- Daily after switching on the balance.
- Each time the balance is leveled.
- Each time ambient conditions have changed (temperature, humidity, or air pressure).
- Each time the balance is set up at a new location or moved in its current location.

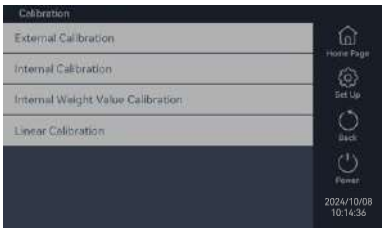
Tips: please run calibration function under General Weighing window.

5.1 Use an external Calibration weight

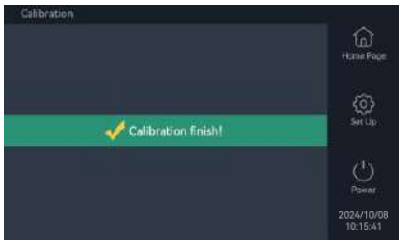
An external calibration weight is required for this function. Please note the tolerance of the calibration weight being used.

- Make sure that the weighing pan is empty.
- Select to **Zero - 0** the balance
- Press the Cal button to access the calibration function.

The calibration window appears.
Click **"External Calibration"** to access the external calibration process.



According to the weight value appeared, put the corresponding weight on the balance pan.
(e.g. BAMT-220-001 will use a 200g

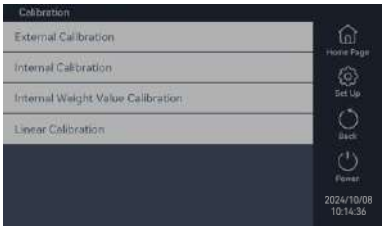


When **"Calibration finish!"** appears, please remove the weight on the pan, external calibration complete.

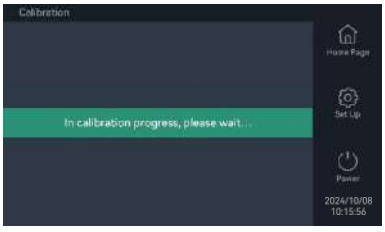
5.2 Use an internal Calibration weight

The balance is fitted with an internal calibration weight in the housing. This calibration weight is automatically placed on the balance by a motor during internal calibration and adjustment.
Ensure that the balance is stable, the draft shield is closed (if applicable) and the weighing pan is empty.

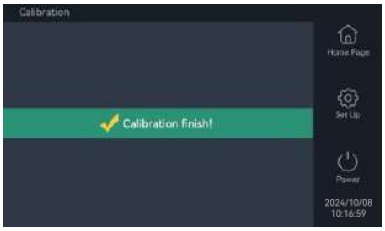
Select to Zero - 0 the balance
Press the Cal button to access the calibration function



The calibration window appears.
Click **"Internal Calibration"** to access the internal calibration process.



Balance will calibrate automatically, please wait for the calibration process to finish.



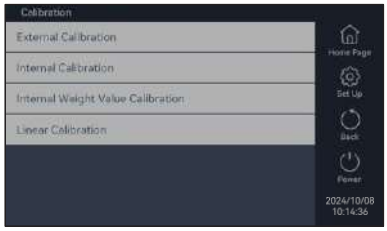
When **"Calibration finish!"** appears, please remove the weight on the pan, external calibration complete

5.3 Internal weight value calibration

The purpose of re-writing internal weight value is to eliminate the deviation between user's weight and balance internal weight.

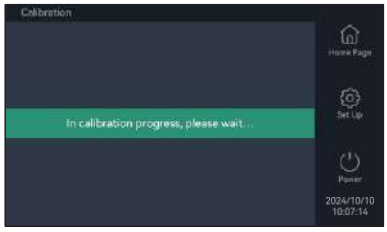
Select to **Zero - 0** the balance

Press the Cal. button to access the calibration function

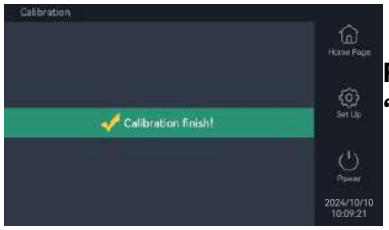


The calibration window appears.
Click **"Internal Weight Value Calibration"** to access the Internal Weight Value calibration process.

Put corresponding weight, e.g.:
If the screen shows 200.0000, place **200g weights** on the scale pan.



Waiting for the process to be completed



Remove the weight when the screen shows
"Calibration finish"

5.4 Linear Calibration

This part needs Administrator permissions. Please consult the manufacturer or local distributors for access.

6 System settings

6.1 Accessing the Menu of settings

Press **Set up** button to access System settings.

The Menu of setting appears. You will see different settings:
Sensitivity, Filter level, Zero (zero tracking), Baud rate, Print.
You can set the balance by touching different settings.
System Default Setting – Low

6.2 Change settings

6.2.1 Sensitivity

Press **“Sensitivity”** to set the balance sensitivity.
There are four different choices:
High, Medium-High, Medium, Low — touch different phrase to get different setting.
System Default Setting – Low

6.2.2 Filter Level

Press **“Filter Level”** to set the balance speed.
There are four different choices:
High, Medium-High, Medium, Low — touch different phrase to get different setting.
System Default Setting – Low

6.2.3 Zero Tracking

Press **“Zero”** to set the balance Zero tracking.
There are six different choices:

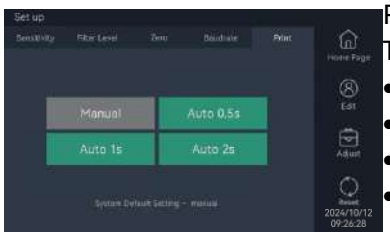
Value	Meaning
0	Disable
1	Within 1 graduation
2	Within 2 graduation
3	Within 3 graduation
4	Within 4 graduation
5	Within 5 graduation

System Default Setting – 3

6.2.4 Baud Rate

Press **“Baudrate”** to set the balance Baud rate.
There are four different Baud rate options:
1200, 2400, 4800, 9600
System Default Setting – 1200

6.2.5 Print

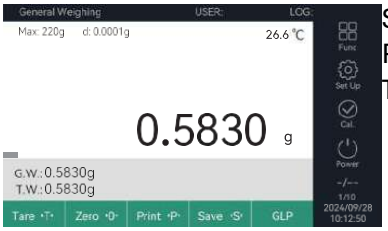


Press **“Print”** to set the balance print.
There are four different print methods:

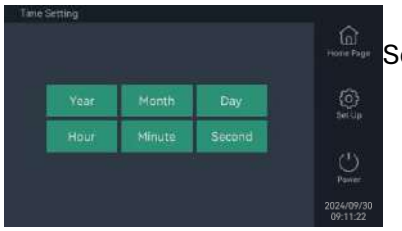
- **Manual** – manual print
- **Auto 0.5s** – auto print at 0.5s interval
- **Auto 1s** – auto print at 1s interval
- **Auto 2s** – auto print at 2s interval

System Default Setting – manual

6.2.6 Date and Time



Set the date and time.
Press the **area of date and time** (right bottom corner).
The balance will enter date and time setting.



Select **Year, Month, Day, Hour, Minute, second** to configure.

System Default Setting:

Please do not change the System Default Setting without consulting the manufacturer or distributor.

6.2.7 User setting

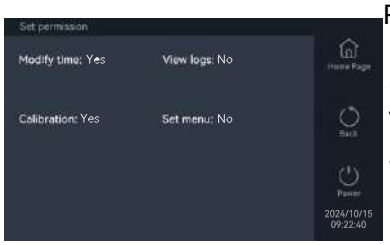
User permission setting can be found here.

Press **Edit** in the setup window, will enter into **User setting**

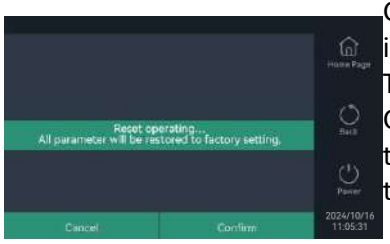
Admin has all permissions
→ Press **Admin** to set the admin password

Set new password and confirm
⚠ Please set the admin password first when you use the balance.

Press **User 1, 2, 3** to enter into **Password and Permission setting**



Press **“Yes”** or **“No”** to set user permissions for:
Modify time
Calibration
View logs
Set menu



Click the **Factory recovery** icon in the bottom right corner of the settings interface.
The balance prompts that the factory settings can be restored. Click the OK button, and all system parameters of the balance will be restored to their initial state. If you need to restore the factory settings, please consult the manufacturer or local dealer first.

7 Weighing

7.1 General Weighing

Tare ›T‹

Use this application to determine the weight of a sample within the device's specific weighing range (see "Specifications").

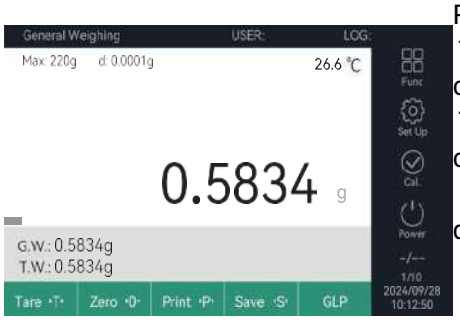
Place an empty container on the balance, if weighing with containers. Select "T" to tare the balance.

- The balance displays zero again after being tared.
- The tared value is subtracted from the overall weighing range of the balance.
- The balance can be tared throughout its entire weighing range.

Zero ›0‹

Remove the load from the balance.

Select "0" to zero the balance.
All weight values are measured based on these zero points (zero within ± 4% of the weighing range around the zero point).



Place the sample on the weighing pan.
The measured value can be read as soon as the weight value stops changing and the unit is displayed.
The balance stability is displayed as soon as the weighing result is constant within a defined range.
Until stability is reached, the measured value is shown in gray on the display and only turns black once the balance is deemed stable.

g → g

7.2 Density determination

The density of solids can be determined using the buoyancy method. The density is determined using Archimedes' Principle. The upward buoyant force exerted on a body immersed in a fluid is equal to the weight of the fluid the body displaces.
Calculation Basis for Density Determination
Density determination using the buoyancy method is based on the following formula:

ρ = Density of sample
p1 = Density of buoyancy liquid
Wa = Weight of sample in air
W1 = Weight of sample in liquid

Buoyancy:
ρ = (Wa / (Wa - W1)) × p1

A density determination kit is required for this function.
Mount the density determination kit on the balance and prepare it as described in the kit instructions.

Steps:

1. Attach the sample holder to the frame of the density determination kit.

2. Fill the beaker in the density determination kit with the buoyancy liquid. Ensure that the sample holder is sufficiently immersed in the liquid to hold the sample later.

3. After fixing the density kit, press “Tare”.

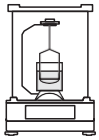
Press **Func** to enter the function screen.
Select **Density Determination** in the list

The density application appears
→ Press **Density Determination** symbol in the side bar

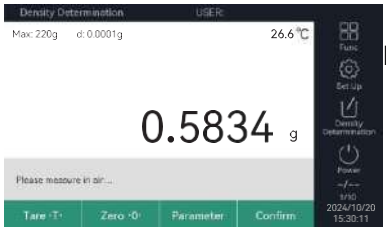
Select form of object (solid):
Liquid, **Solid**, **Gold (K)**, or **Powder**
Note: Gold (K) and Powder density should be customized

Select **“Parameter”** to set the **density of the buoyancy liquid**
e.g., for water use **1.0**
Confirm and return to the density weighing screen

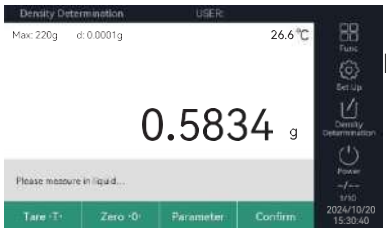
Place the sample on the weighing pan above on the frame of the density determination kit



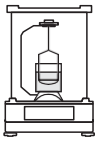
→ The screen shows the **weight in air**



Press "Confirm" to record weight in air.



Display prompts: **"please measure in liquid"**.



Remove the sample from the weighing pan and place it in the sample holder of the density determination kit using forceps.
(Ensure that the sample is completely submerged in the buoyancy liquid and that no air bubbles have formed on the sample.)

The weighing display shows the step Weight in medium
Press **"Confirm"**

The balance calculates the density of the sample and displays this value being two independent measures with names:
Weight W1 (in air): 0.5834 g
Weight W2 (in liquid): 0.5082 g

Print ·P· Print the result
Exit Exit density determination function

7.3 Piece Counting

Use this application to determine the number of parts of approximately equal weight. The weight of a counted reference sample is calculated and then the objects with an unknown piece count are weighed. The balance displays the number of parts and the piece average weight.

Select **Piece Counting** in the list

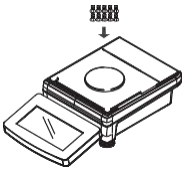
The Counting application appears.

Press **Piece Counting** symbol on the side bar Piece **Counting**

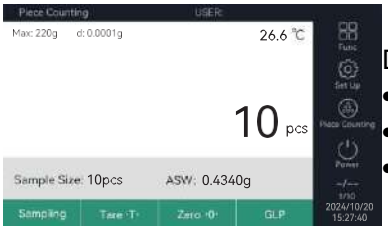
Choose sample size (e.g.: 10 pcs), select 10 pcs as reference sample quantity.

Back to weighing display
Sample size: 10 pcs
ASW (Average Sample Weight): 0.0000 g

Select “0” to **Zero - 0** the balance if necessary

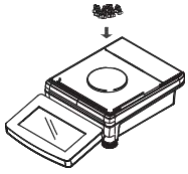


Place the set number of reference samples on the weighing pan.
Select **Sampling**



Display shows:

- **10 pcs**
- Sample Size: **10 pcs**
- ASW (Average Sample Weight): **0.4340 g**



Place the sample with unknown piece count on the weighing pan.

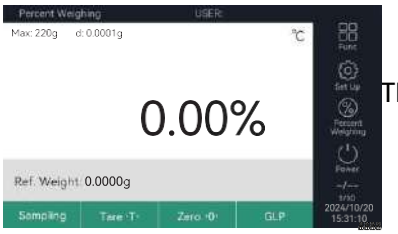
The piece count is calculated and displayed.

GLP Press **GLP** to print the result in GLP format.

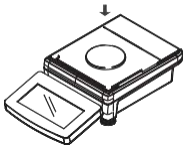
7.4 Percent Weighing

This application is used to determine the percentage share or the percentage difference of the sample related to a reference weight.

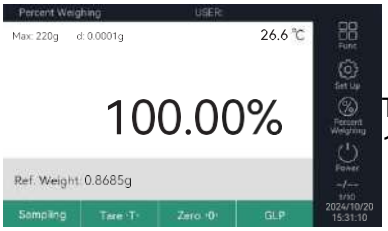
Select **Percent Weighing** (%) in the list



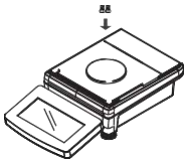
The percent weighing application appears.



Select “0” to **Zero - 0** the balance if necessary



Place the reference sample on the weighing pan and press **“Sampling”.**
The display shows:
100.00%



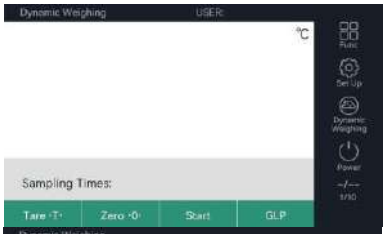
Remove the reference sample and place the unknown sample on the weighing pan.

The balance shows the percentage of the sample based on the reference sample.

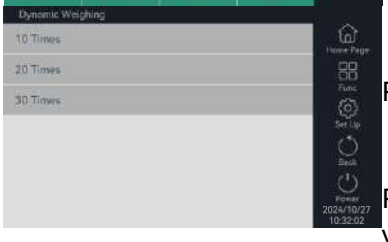
7.5 Dynamic Weighing

Weight unstable samples. Use a balance to read the average value of unstable output during the weighing process.

Select **Dynamic Weighing** in the list

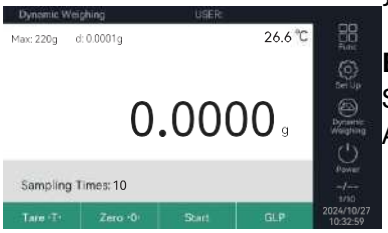


The Dynamic Weighing application appears

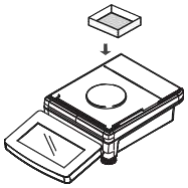


Press **Dynamic Weighing** button on side bar.

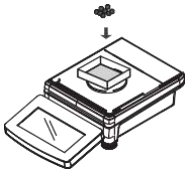
Press **"Dynamic Weighing"** button on side bar, select how many times you want to test (e.g. 10 times)



Back to weighing display
Sample size: 10 pcs
ASW (Average Sample Weight): 0.0000 g



Place a container on the weighing pan.
→ Press **Tare - T** to tare the balance



Place the reference dynamic sample in the container

Press **"Start"** to read the weight 10 times, you can press **"End"** to stop the process.

Display shows final reference sample weight after reading 10 times

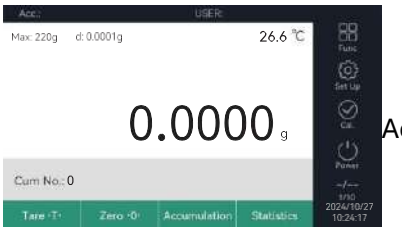
Print the result

Exit Dynamic Weighing function

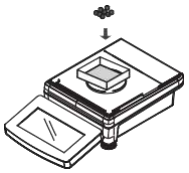
7.6 Accumulation

Totalize weight values. You can save up different components' weight and get total weight and average weight. Max you can save 99 components.

Select Accumulation Σ in the list

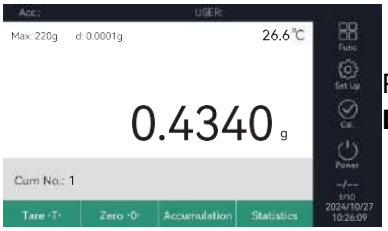


Accumulation application appears



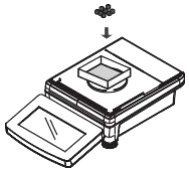
Select “0” to **Zero - 0** the balance if necessary

Place the first component on the weighing pan



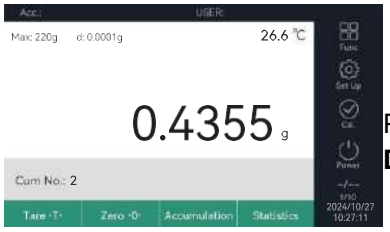
Press **“Accumulation”** to save the first component weight,

Display shows: 0.4340 g



TARE: Remove the first component and tare the balance.

Place the second component on the weighing pan.



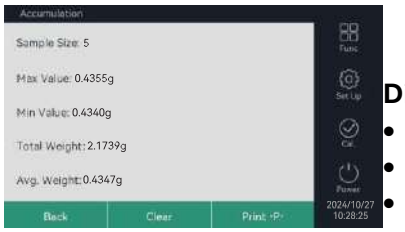
Press **“Accumulation”** to save the second component weight.

Display shows: 0.4355 g

Statistics

Continue this procedure with additional components.

– To view the statistical data, select the **“Statistics”** button on the weighing display.



Display shows:

- Sample Size: 5
- Max Value: 0.4355 g
- Min Value: 0.4340 g
- Total Weight: 2.1739 g
- Avg. Weight: 0.4347 g

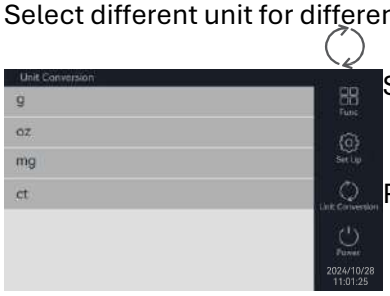
Back To switch back to see the last display

Print To print the result

Clear To Clear all data

7.7 Unit Conversion

Select different unit for different weighing.



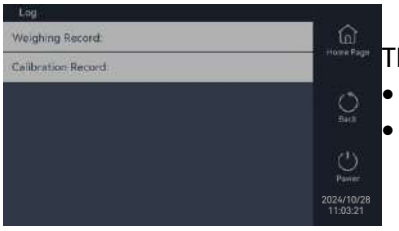
Select **Unit Conversion** in the list.

Press to change the unit.

8 Log

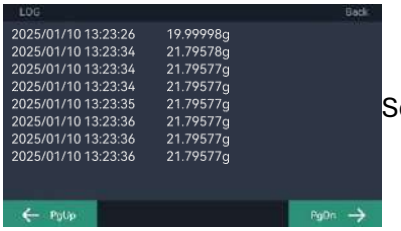
Weighing record and Calibration record can be saved.

Select **LOG** on top bar

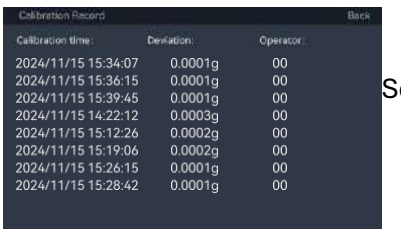


There are two options:

- **Weighing Record**
- **Calibration Record**



Select **Weighing Record** to view the weighing data.



Select **Calibration Record** to view the calibration data.

9 GLP – Compliant Printout

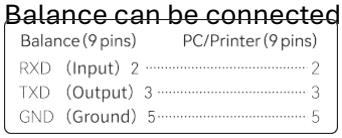
The device information, ID, current date and weighing result can be printed in GLP header, the signature will be printed in GLP footer.

```
GLP header
   - Date and Time:
   - Balance ID:
   - Balance Name:
   -User Name:
   - Count Quantity:
    - Gross:
    - Net:
    - Tare:
    - AwP:
    - Sample Size:

    GLP footer
    - Signature:
    - Verified By:
```

10 RS232C Port Specification

Balance can be connected with RS232 interface.



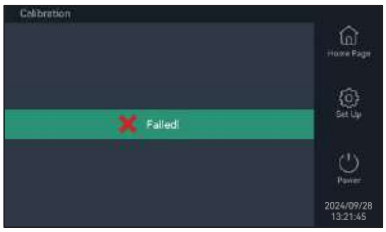
- The baudrate by default is 9600 bps (see Baudrate setting)
- Data format: 10 bits, 0 as start bit, 1 as stop bit, 8 digits (ASCII code) – No odd and even numbers adjusting
- Data output: by default is continuous mode. The data output mode can be changed into press output, timing output and continuous output (see Data output setting).

Output data format

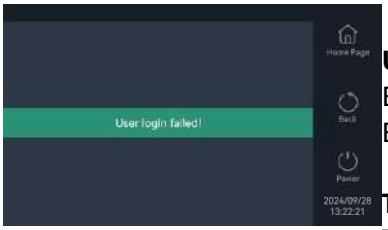
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Type or data	Data	Data	Data	Data	Data or dot	Data or dot	Data	Data	Data	Unit	Unit	Unit	Return	Line feed

11 Error Messages in Applications

Overload protect
The object weight exceeds the balance Max capacity.
Remove the object, select a weighing object within the range.



Calibration Failed
When display prompt to put weight but not put corresponding weight.
Calibration again and put corresponding weight.



User login Failed
Enter wrong password
Enter correct password again

Tare Failed
The display shows **Press 0**
Scale pan without load, press Zero.

Zero Failed
Display shows **Press T**
The load exceeds weighing range around the zero point (>4%)

12 Specification

12.1 Components

Component	Quantity
BAMT Balance	x1
Detachable touch screen indicator 7”	x1
Weighing Pan	x1
Adapter	x1
Calibration weight	x1
Manual Instruction	x1
Glove	x1

12.1 Model – Specific Data

- **Capacity:** 0–220 g
- **Readability:** 0.1 mg
- **Stable Time:** 1.5 s
- **Preheating:** 30–60 mins
- **Weighing Units:** g/mg/ct/oz
- **Min Weight:** 10 mg
- **Repeatability:** ±0.1 mg
- **Linearity:** ±0.2 mg
- **Interface:** RS232/USB
- **Pan Size:** Ø90 mm
- **Packing Size:** 445 mm × 320 mm × 520 mm
- **Net Weight (N.W.):** 6.25 kg
- **Power:** AC110 V–240 V

Nota importante para los aparatos electrónicos vendidos en España

Instrucciones sobre la protección del medio ambiente y la eliminación de aparatos electrónicos:

Los aparatos eléctricos y electrónicos marcados con este símbolo no pueden ser eliminados en forma de residuos urbanos.

De conformidad con la Directiva 2012/19/UE, los usuarios de la Unión Europea de aparatos eléctricos y electrónicos, tienen la posibilidad de devolver sus RAEE para su eliminación al distribuidor o fabricante del equipo después de la compra de uno nuevo. La eliminación ilegal de aparatos eléctricos y electrónicos es castigada con multa administrativa.

Remarque importante pour les appareils électroniques vendus en France

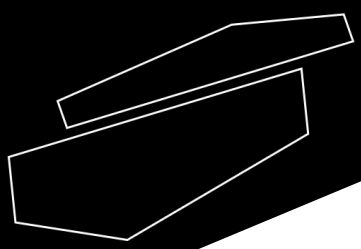
Informations sur la protection du milieu environnemental et élimination des déchets électroniques :

Les appareils électriques et électroniques portant ce symbole ne peuvent pas être jetés dans les décharges.
En réponse à la règlementation, Labbox remplit ses obligations relatives à la fin de vie des équipements électriques de laboratoire qu'il met sur le marché en finançant la filière de recyclage de ecosystem dédiée aux DEEE Pro qui les reprend gratuitement (plus d'informations sur www.ecosystem.eco).
L'élimination illégale d'appareils électriques et électroniques est punie d'amende administrative.

Nota importante per le apparecchiature elettroniche vendute in Italia

Istruzioni sulla protezione ambientale e sullo smaltimento dei dispositivi elettronici:

Le apparecchiature elettriche ed elettroniche contrassegnate con questo simbolo non possono essere smaltite come rifiuti urbani.
In conformità con la Direttiva 2012/19 / UE, gli utenti dell'Unione Europea di apparecchiature elettriche ed elettroniche hanno la possibilità di restituire i propri RAEE per lo smaltimento al distributore o al produttore di apparecchiature dopo averne acquistato uno nuovo. La rimozione illegale di apparecchiature elettriche ed elettroniche è punibile con una sanzione amministrativa.



www.labbox.com