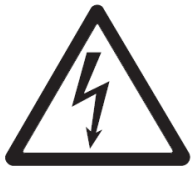
Precisa 321LG SERIES ELECTRONIC BALANCES

Operating Instructions

Precisa

CAUTION

Warning of a possibly dangerous situation which can lead to less severe injuries or damage.



CAUTION

1. The balance may only be used with the power adaptor supplied exclusively for use with this balance.
2. Before plugging in the power adaptor, make sure that the operating voltage stated on the power adaptor agrees with the mains voltage. If not, please refer to the Customer Service.
3. If the power adaptor or its cable is damaged, the balance must immediately be disconnected from the electricity supply (pull out the power adaptor). The balance may only be operated with a power adaptor in perfect condition.
4. If there is any reason to believe that it is no longer possible to operate the balance without danger, the balance must immediately be unplugged from the electricity supply (pull out power adaptor) and secured against inadvertent operation.

NOTE

5. It is a precision instrument， only used in dry and stable environment，and put the balance on a solid, firm and preferably vibration-proof, horizontal base.
6. Any wild fluctuation of airflow or temperature may lead to unstable weighing results.
7. Please don’t use any sharp objects to touch the display.
8. Do not open the balance housing, if opened secretly, the warranty will become invalid. If you have questions, please contact with us.
9. The balance may only be used with the accessories and options supplied by Precisa

Contents

1. Overview

Precisa Gravimetrics provides 40 years of knowledge and experience in precision balance technology and manufacturing. Made in Switzerland. Precisa with its weighing technology is one of the three world leading manufacturers in the precision and analytical area! Precisa products are prime examples of Swiss perfection and reliability. They are tried and tested in both demanding laboratory environments and industrial applications, and are subject to rigorous quality controls throughout the entire manufacturing process. Precisa invests continuously in developing new technologies and employs a highly qualified team. The result is a state-of-the-art range of precision instruments for the most exacting demands.

Precisa 321 LG series electronic balances are co-created by Precisa and Shanghai balance team, equipped with 5 inch color touch screen, a friendly design interface, detachable draft shield with no framework, front level indicator, intelligent compensation, fully automatic built-in self calibration system.

1）Precisa unique MFR Sensor has high precision and quick response，reduce the cost of maintenance
2）5 inch color touchscreen with friendly interface design offers easy and fast operation of applications.
3）All new electronic circuit design with high-speed CPU can help to get the stable and reliable weighing results quickly.
4）Optional automatic internal calibration system performs according the change of time or temperature to ensure accuracy and reliability.
5）A front level Indicator, getting your instrument back to the correctly levelled position easily and quickly
6）Detachable draft shield with no framework for easy cleaning and working.
7）In production, Temp Compensation and Robot testing make sure the accuracy and long-term stability.
8）RS232 and USB host port are easily accessible and make it simple to load data from the balance to PC directly with a simple cable.
9）Built in Weighing/Counting/Density determination/Percent weighing/Animal weighing/Free conversion and many applications
10）A real-time clock function keeps accurate time, it also have 3Q, GLP/GMP compliance capabilities.

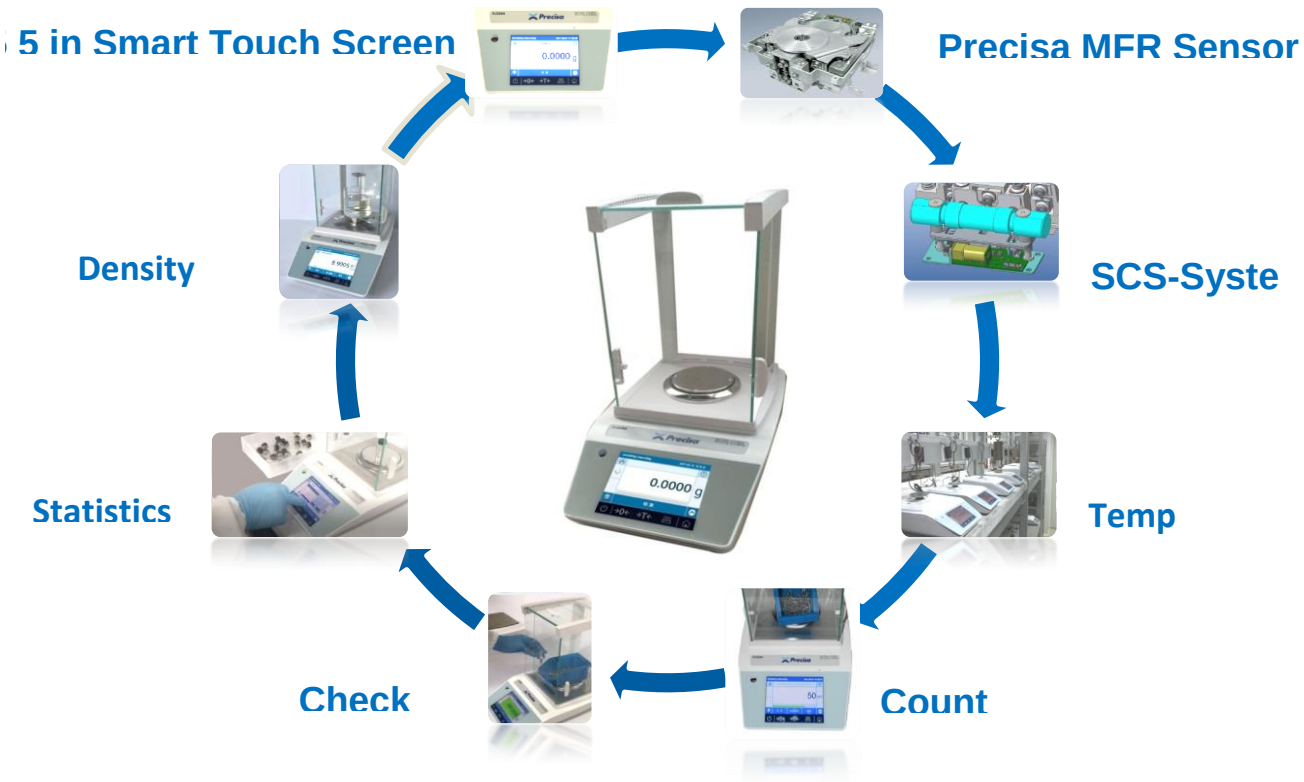


Fig1.1 Product main functions

1.1. Main structure

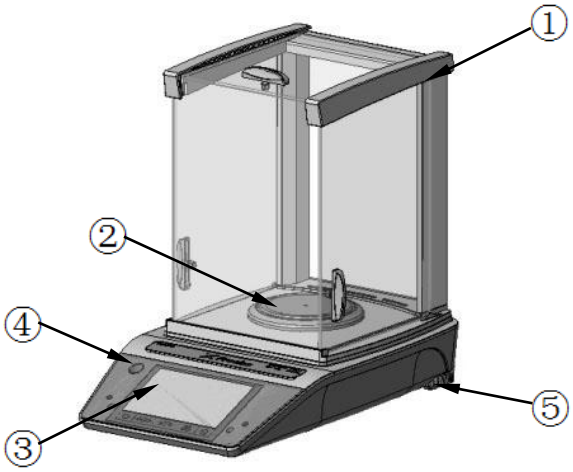


Fig 1.2 Structure of the balance（A series）

No.	Description
1	Draft shield
2	Weighing pan
3	Touch screen
4	Bubble level
5	Adjustable feet
6	Data interface
7	USB interface
8	Socket for power supply

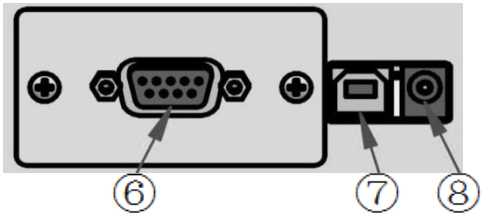


Fig 1.3 Interface of the balance

1.2. Main features and functions

- Color touch screen, Language: Chinese/English
- Zero tracking
- Overload protection
- Overload warning
- Self-Linearization System
- SCS Automatic calibration
- RS232 data interface
- User management
- Unit：g/ mg/ct
- Weighing
- Piece counting
- Percent weighing
- Animal weighing
- Net total application
- Free conversion
- Check weighing
- Statistics
- Density determination
- Below balance weighing

1.3. Environment and conditions

321 LG series electronic balances can divide to four series of A, M, C, D, they mean different actual scale interval. For example, A is for analytical balances (d=0.1mg), M is for precision balances (d=1mg), which is the last letter in the balance model names. The numbers before actual scale interval stands for the maximum capacity. Maximum capacity, actual scale interval, verification scale interval and some other production information will be printed on the label with balances.

Below are the operation conditions:

- Working Voltage

– 100V～240V; 50Hz～60Hz

- Power Consumption

– Without external facility 18W

– RS232/V24 interface

– USB interface

- Operating Environment

– Temperature: 5～40℃

– Relative Humidity: 25%～85%, Non-Freezing

Please contact your technique adviser if you have any questions or need technical information details.

1.4. Technical data

Table1.1 Technical Index

Model	LG120A	LG220A
Maximum Capacity	120g	220g
Minimum Capacity	0.01g	
Actual Scale Division	0.0001g	
Repeatability Deviation	Corresponding absolute value of the maximum allowable	
Accuracy		
Stable Time (typical)	1~3s	
Pan Diameter (mm)	Φ90	
Dimensions(B×L×H,	381×228×340	
Net Weight(kg)	6.8	
Overall Dimensions	520×390×680	
Total Weight(kg)	10	
Warm-up Time	3h	
Notes：e=10d， e: Verification scale interval. Overload warning value= Max+9e		

Table1.1 Technical Index（Continued）

Model	LG320M	LG620M	LG2200C	LG3200C	LG4200C	LG6200C
Maximum Capacity	320g	620g	2200g	3200g	4200g	6200g
Minimum Capacity	0.02g	0.1g	0.5g	0.5g	0.5g	0.5g
Actual Scale Division Value(d)	0.001g		0.01g			
Repeatability Deviation	Corresponding absolute value of the maximum allowable					
Accuracy	Ⅱ					
Stable Time (typical)	1~3s		1~2s			
Pan Diameter (mm)	135×135		170x170			
Dimensions(B×L×H, mm)	381×228×131		381×228×92			
Net Weight(kg)	4.8					
Overall Dimensions	500×370×305					
Total Weight(kg)	6					
Warm-up Time	1h					
Notes：e=10d， e: Verification scale interval. Overload warning value= Max+9e						

Table1.1 Technical Index（Continued）

Model	**LG3200D**	**LG6200D**	**LG10200D**
Maximum Capacity	3200g	6200g	10200g
Minimum Capacity	5g	5g	5g
Actual Scale Division Value(d)	0.1g		
Repeatability Deviation	Corresponding absolute value of the maximum allowable		
Accuracy	Ⅱ		
Stable Time (typical)	1~2s		
Pan Diameter (mm)	200×200		
Dimensions(B×L×H, mm)	381×228×92		
Net Weight(kg)	4.8		
Overall Dimensions	500×370×305		
Total Weight(kg)	6		
Warm-up Time	1h		
Verification scale interval e	e=d	e=10d	
	e: verification scale interval. Overload warning value= Max+9e		

Notes：Internal calibration option is only for A/M Series.

2. Installation

2.1. Unpacking

The balances of LG Series are delivered in an environmentally-friendly package, specifically developed for this precision instrument, which provides optimal protection for the balance during transportation.

Fig2.1 Unpacking

NOTE
Retain the original packaging in order to avoid transportation damages when shipping or transporting the balance and to allow the balance to be stored in the best conditions if it is out of operation for an extended period.

In order to avoid damage, attention must be given to the following points when unpacking the balance:

- Unpack the balance quietly and carefully. It is a precision instrument.
- When outside temperatures are very low, the balance should first be stored for some hours in the unopened transport package in a dry room at normal temperature, so that no condensation settles on the balance when unpacking.
- Check the balance immediately after unpacking for externally visible damage. If you should find transport damages, please inform your services representative immediately.
- If you won't work with the balance at once after purchase, please put the balance in place with dry and constant temperature.

  Read through these operating instructions, even if you already have experience with balances, before you work with the balance and pay attention to the safety recommendations.

2.2. Delivery list

Please check the packing list after unpacking.

Fig 2.1 Delivery list

Different parts for different models			
No.	**Description**	**No.**	**Description**
1	Balance	6	Operating instructions
2	Weighing pan	7	Warranty card
3	Protective ring	8	Weights(only for A series)
4	Scale-pan support（only for M,C,D series）	9	Draft shield accessories (only for A series)
5	Power Adapter	10	Other options（printers）

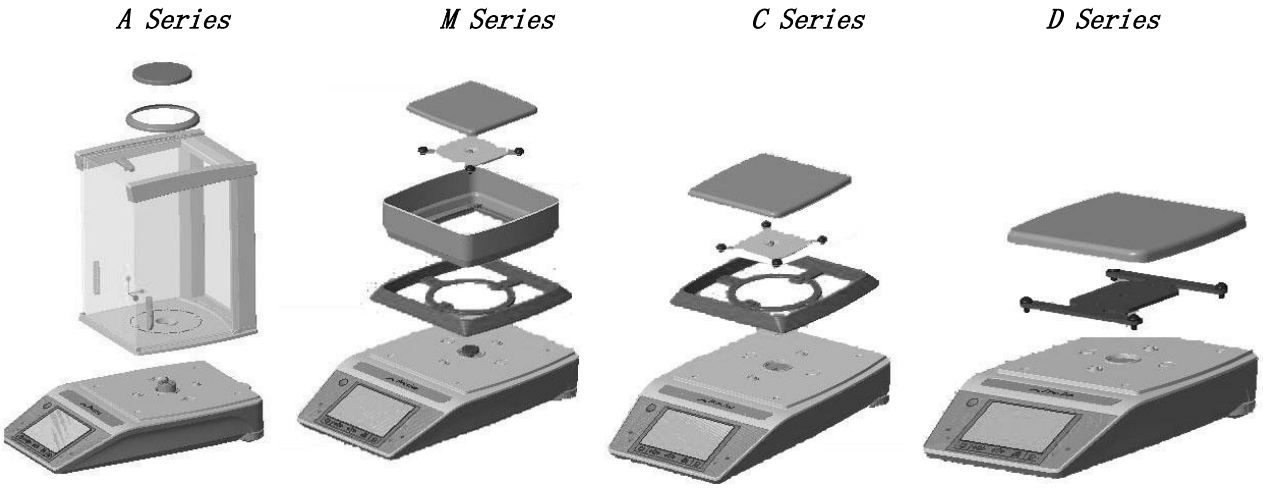


Fig2.2 Main Structures

2.3. Assembly

The balance is delivered in partly dismantled condition. Assemble the individual components in the following sequence.

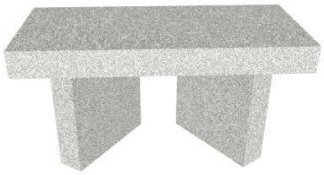
- Install the dust-protection cover on the balance
- Install the windshield as well as the protective ring with the two screws supplied
- Place the scale-pan holder in position and add the weighing pan
- Insert the power adaptor cable plug into the socket at the rear of the balance.
- Please refer to Part 10 for ordering other options like printers

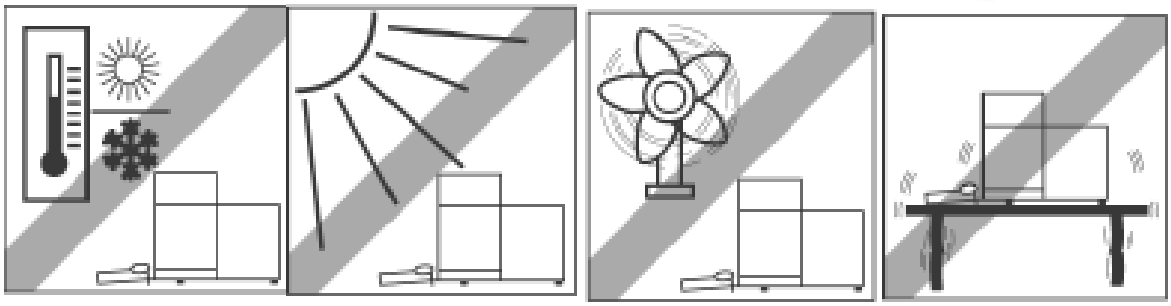
NOTE
A screwdriver is required for assembly. All parts must fit together easily. Do not apply force. Customer service will be pleased to help you with any problems.

2.4. Application conditions

The balance location must be chosen in such a way as to guarantee perfect functioning of your balance, so that the allowable ambient conditions and the following prerequisites are met:

- Put the balance on a solid, firm and preferably vibration-proof, horizontal base
- Make sure that the balance cannot be shaken or knocked over
- Protect from direct solar radiation
- Avoid drafts and excessive temperature fluctuations





NOTE

With difficult environment-conditions (where the balance may be easily shaken or subject to vibration) the balance can nevertheless provide accurate results through suitable adjustment of the stability control (see 4.2.2 Weighing Setting)

2.5. Checking the mains voltage

The following Safety recommendations must be observed when connecting the balance to the mains:

DANGER

The balance may only be operated with the power adaptor supplied.
Check before connecting the power adaptor to the mains supply, that the operating voltage stated on the power adaptor agrees with the local mains voltage.
If the operating voltage is not the same as the mains voltage, the power adaptor must on no account be connected to the mains supply. Contact the customer service.

2.6. Levelling

To function properly, the balance must be precisely horizontal.
The balance is fitted with one “bubble level” and two adjustable feet for level-control, with the aid of which it is possible to compensate for small height differences and/or unevenness in the surface on which the balance is standing.
The two screw feet must be adjusted so that the air bubble is precisely in the center of the sight glass of the level bubble.

Incorrect Correct

Fig 2.3 Correct leveling with the aid of the level bubble

NOTE
In order to get exact measurements, the balance must be carefully levelled again for each relocation.

2.7. Calibration

Since the Earth's gravity is not the same everywhere, each balance must – in accordance with the underlying physical weighing principle – be adjusted to compensate for the gravity at each location. This adjustment process, known as “calibration”, must be carried out on initial installation or relocation. In order to get exact measurements, it is recommended moreover, that the balance should also be calibrated intermittently during the weighing operation.

NOTE
The balance must be calibrated after each installation and relocation. You can follow the standard calibration interval when compliance with GLP operation.

The calibration can be set in Configuration Menu. According to the models, can be operated by external calibration or automatic calibration.（Please refer to the Part 4.2.5 “User mode”）

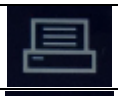
Fig 2.1 Suggestion on use of balance weight

OIML international standard weight (Class) tolerance table							
Quality \ Class	E1 (±mg)	E2 (±mg)	F1 (±mg)	F2 (±mg)	M1 (±mg)	M2 (±mg)	M3 (±mg)
1mg	0.002	0.006	0.02	0.06	0.2	-	-
2mg	0.002	0.006	0.02	0.06	0.2	-	-
5mg	0.002	0.006	0.02	0.06	0.2	-	-
10mg	0.002	0.008	0.025	0.08	0.25	-	-
20mg	0.003	0.01	0.03	0.1	0.3	-	-
50mg	0.004	0.012	0.04	0.12	0.4	-	-
100mg	0.005	0.015	0.05	0.15	0.5	1.5	-
200mg	0.006	0.02	0.06	0.2	0.6	2	-
500mg	0.008	0.025	0.08	0.25	0.8	2.5	-
1g	0.01	0.03	0.1	0.3	1	3	10
2g	0.012	0.04	0.12	0.4	1.2	4	12
5g	0.015	0.05	0.15	0.5	1.5	5	15
10g	0.02	0.06	0.2	0.6	2	6	20
20g	0.025	0.08	0.25	0.8	2.5	8	25
50g	0.03	0.1	0.3	1	3	10	30
100g	0.05	0.15	0.5	1.5	5	15	50
200g	0.1	0.3	1	3	10	30	100
500g	0.25	0.75	2.5	7.5	25	75	250
1kg	0.5	1.5	5	15	50	150	500
2kg	1	3	10	30	100	300	1000
5kg	2.5	7.5	25	75	250	750	2500
10kg	5	15	50	150	500	1500	5000
20kg	10	30	100	300	1000	3000	10000
50kg	25	75	250	750	2500	7500	25000

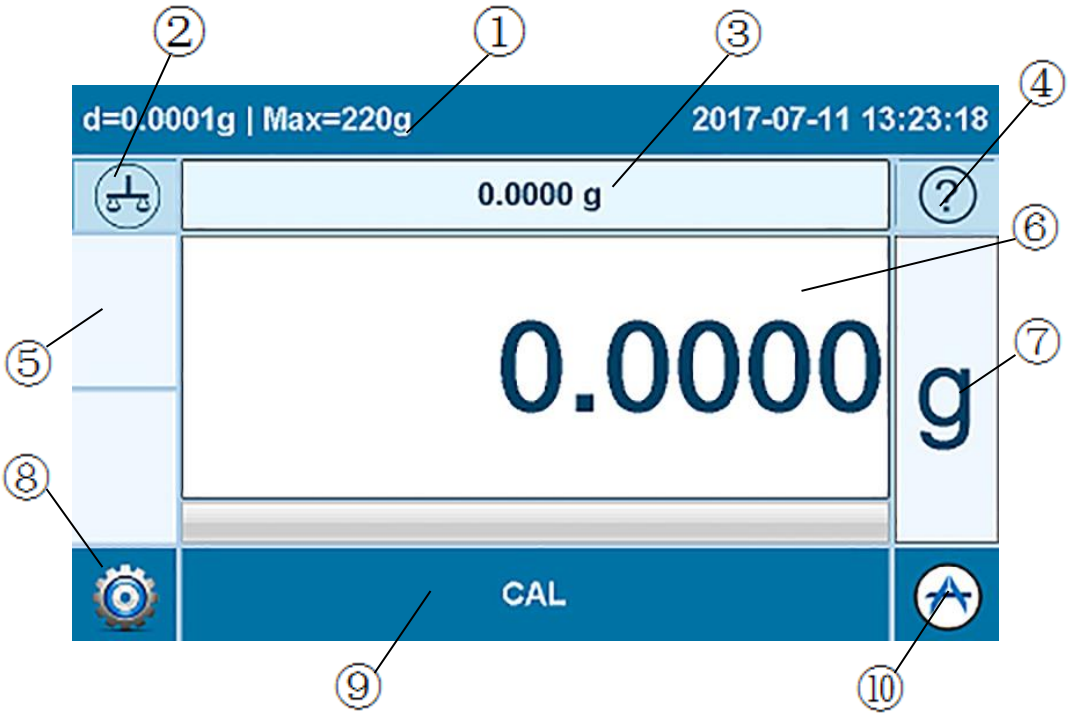
Accuracy	Weight Class
0.1g	F1
0.01g	F1
1mg	F1
0.1mg	E2
0.01mg	E2
1μg	E2
0.1μg	E2

3. Operation

3.1. Key operation

No.	Key	Name	Function
①		《Switch on/off》	Switch on/off
②		《Zero》	Zero
③		《Tare》	Tare
④		《Home Page》	Back to home page
⑤		《Print》	Print

3.2. Main interface（Weight application）



No.	Function
1	Information
2	Application
3	Auxiliary information
4	Help
5	Status
6	Weight display
7	Unit
8	Setting
9	Calibration
10	Switch application

Notes：Display will be different when using different applications

3.3. Switching on the balance

Press  to switch on the balance，the balance carries out a self-diagnosis in order to check the most important functions. After completion of the start-up process (approximately ten seconds), “Zero” appears in the display. The balance must warm-up before weighing according to technical requirements.

There need to calibration before operation, please refer to the Part 3.4.

3.4. Calibration

Balance calibration generally includes internal calibration and external calibration. Calibration can

be set in the setting menu for the balance with internal calibration.

3.4.1.Internal calibration

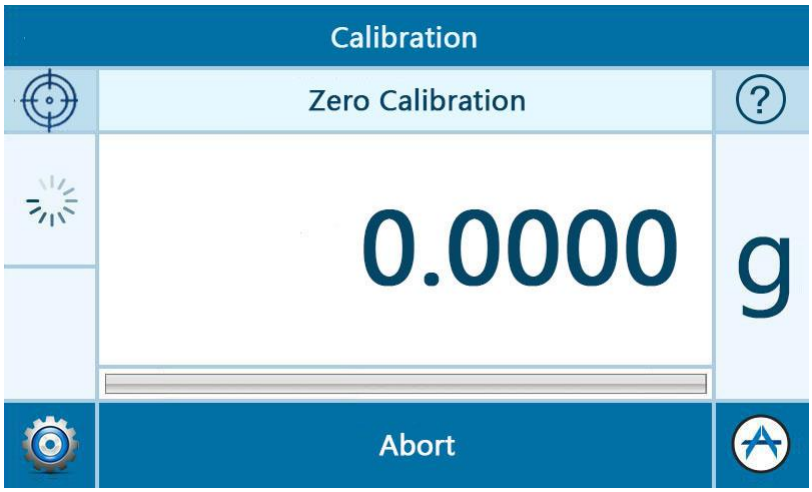
Press the key “Cal”,balance will do the calibration automatically.

Remark：Internal calibration in only for the A series balances with SCS，for the calibration setting, please refer to the Part 4.2.5 “User mode”.

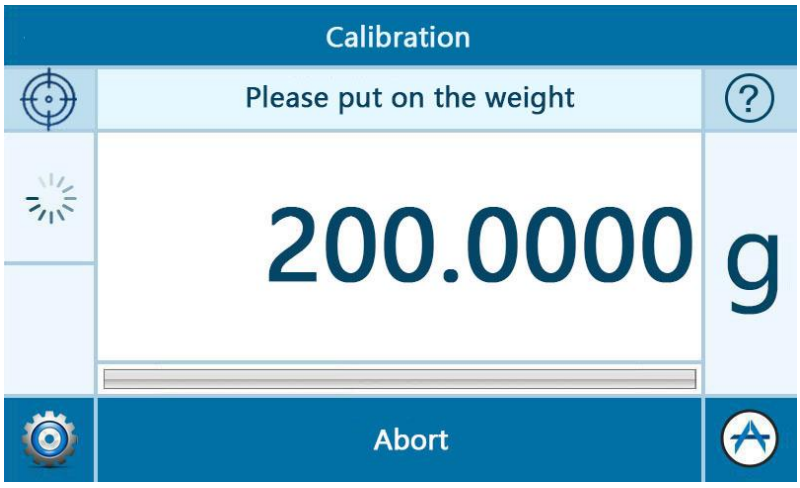
3.4.2.External calibration

Press “CAL” to the calibration interface，and operate according to the indications on the screen.

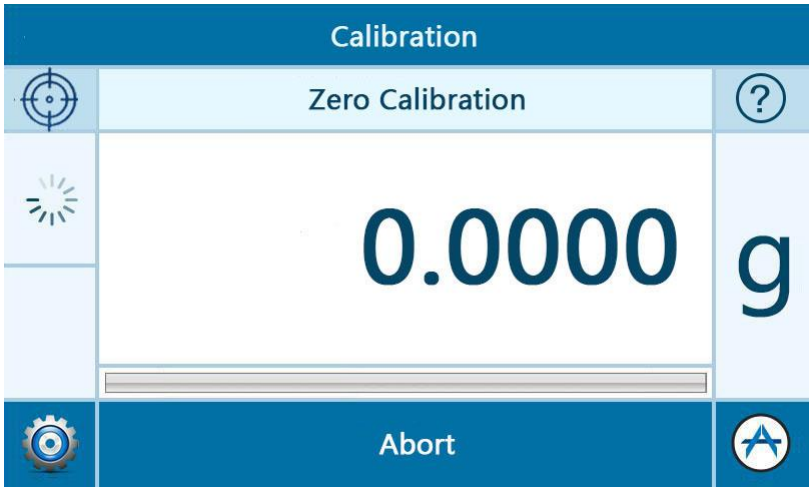
1) Take away all the objects to be weighed on the pan.



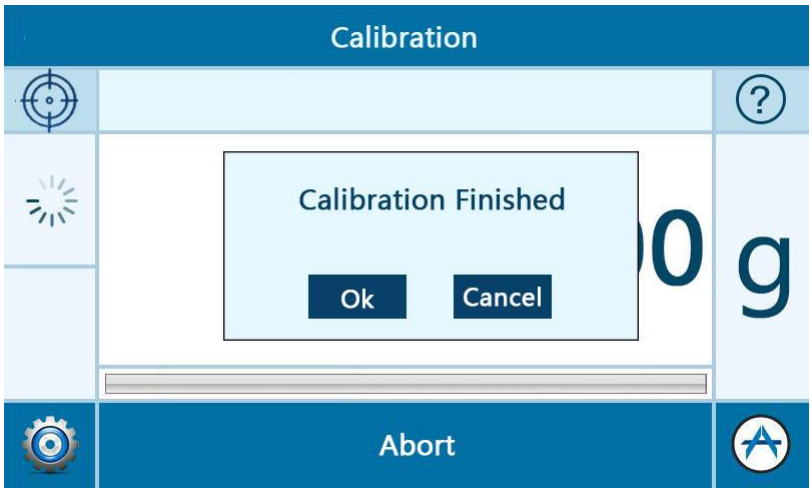
2) Put the standard weights on the pan according to the indication.



3) Remove the calibration weight from the weigh pan again



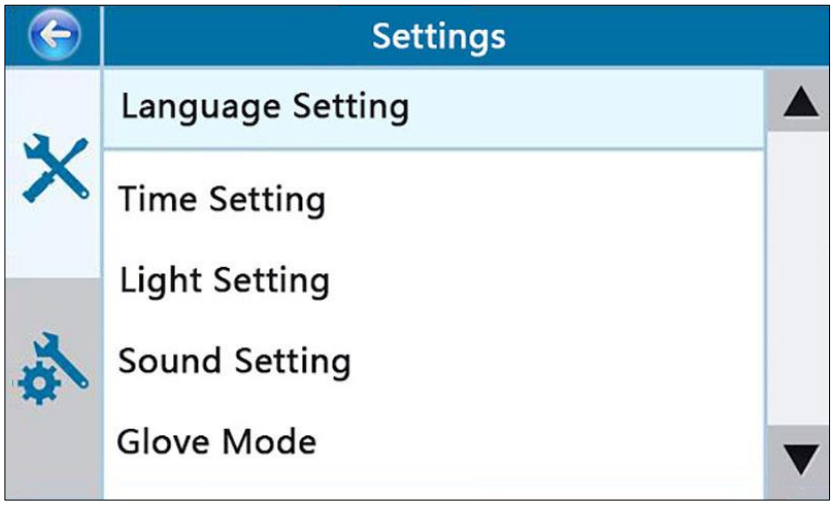
4) It will remind to exit when the calibration is finished.



4. Settings

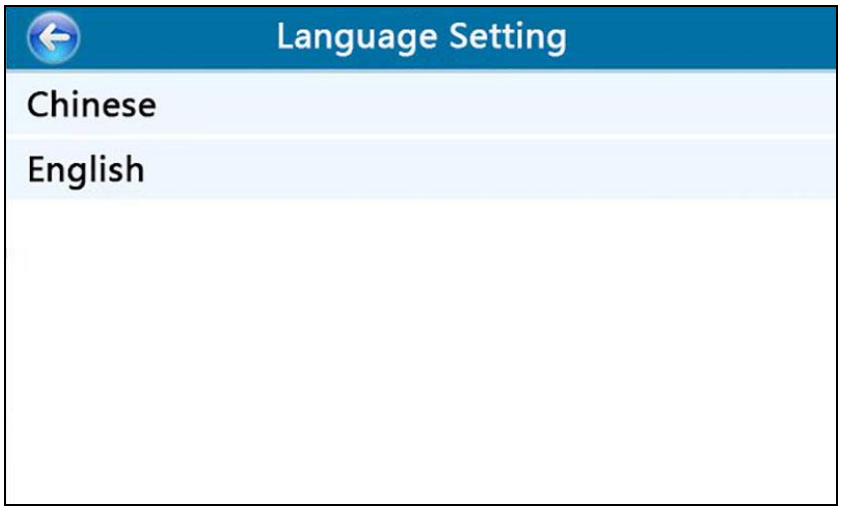
The setting menu includes quick setting and basic setting.

4.1. Quick setting



4.1.1.Language

➢ Enter the interface as shown below, choose the language you need.

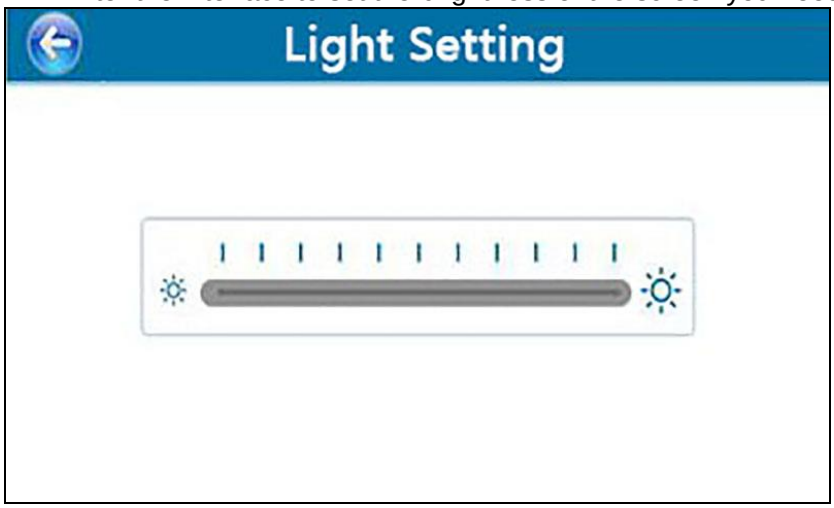


4.1.2.Date and time

➢ Enter the interface to set the date and time you need.

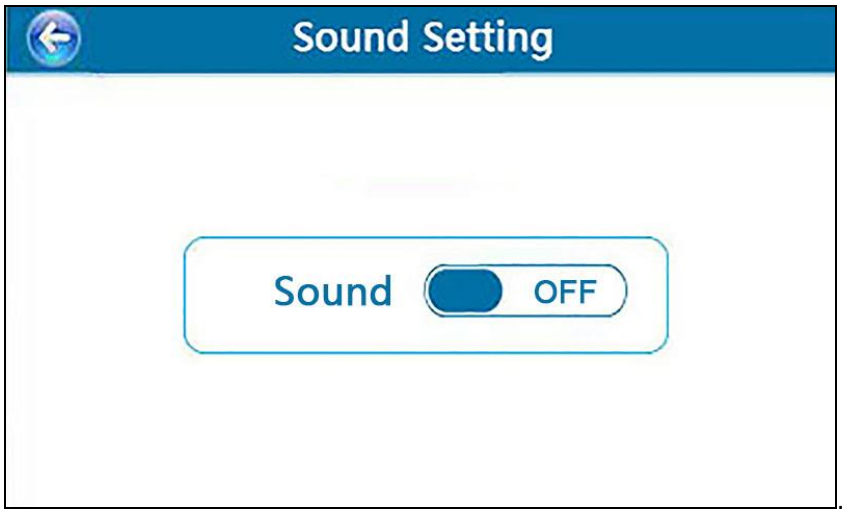
4.1.3.Brightness

- Enter the interface to set the brightness of the screen you need.



4.1.4.Key tone

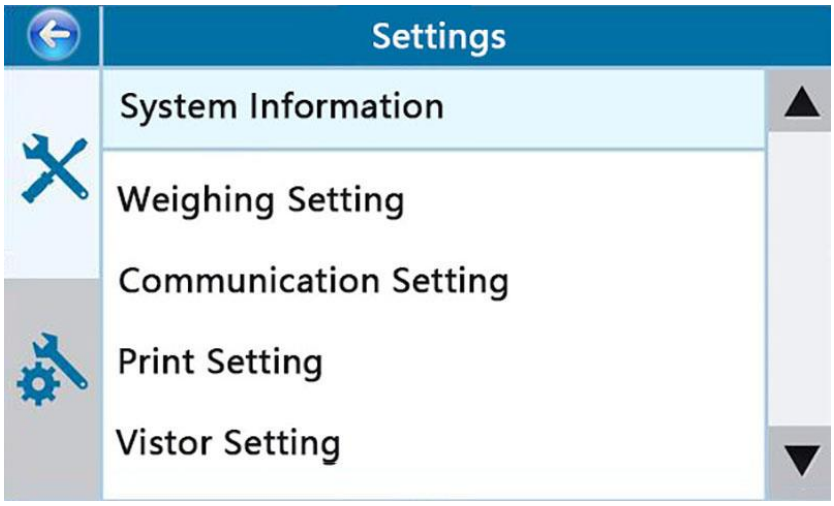
- Enter the interface of sound setting to set the key tone.



4.1.5.Glove mode

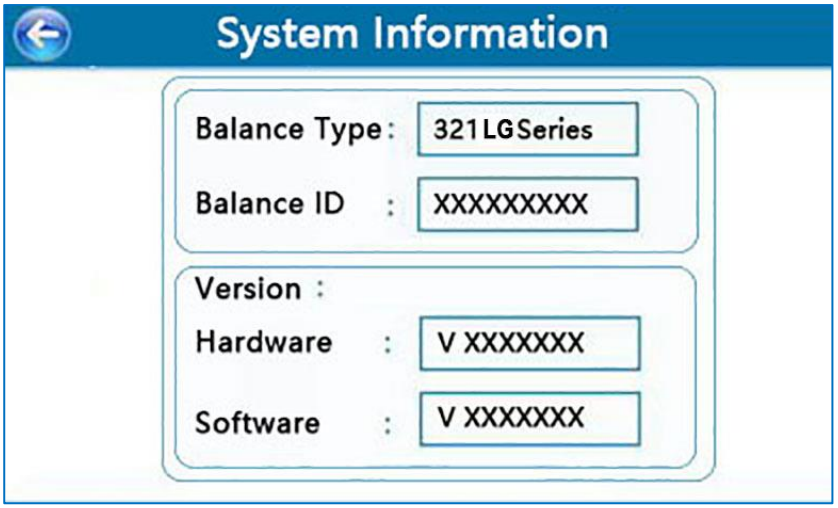
- Enter the interface of glove mode to set the screen sensitivity.

4.2. General setting



4.2.1.System information

- Enter the information interface to check the balance information.



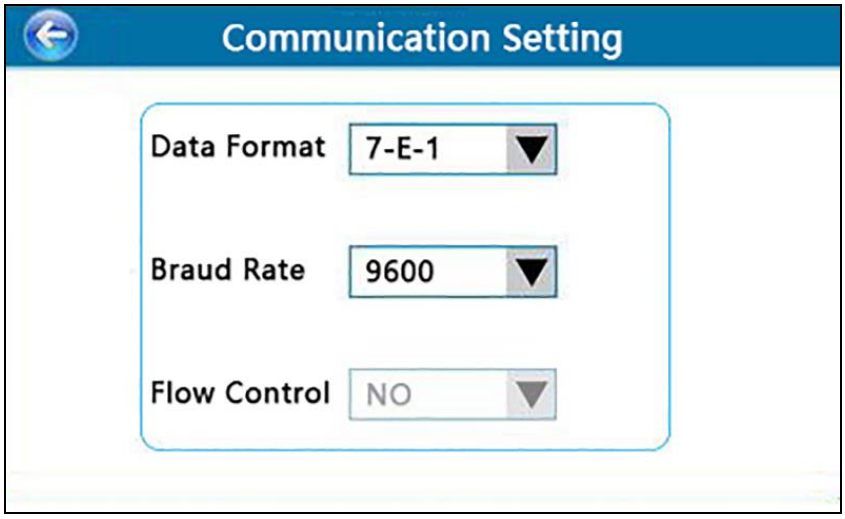
4.2.2.Weighing setting

- Enter weighing setting to make the relevant settings.

- Environment Stability：
  Setting according to environment stability, default: Medium
  Option：High, Medium, Low
- Weighing Stability：
  Setting according to weighing time, default: Normal
  Option：Fast, Normal, Slow, Extra-slow
- Automatic Zero
  Zero-Tracking Function, default: ON
  Option：ON/OFF

4.2.3.Communication setting

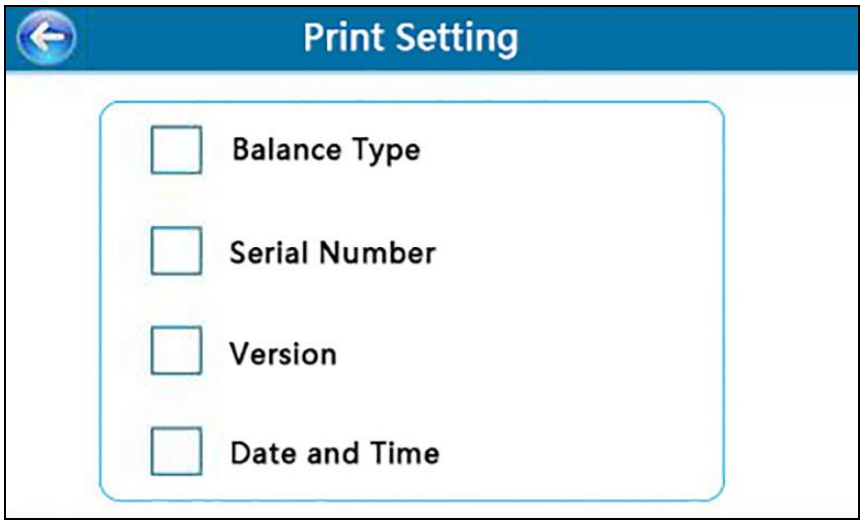
➢ Enter communication setting to make the relevant settings.



Data Format：7-E-1, 7-O-1, 7-N-2, 8-N-1, 8-E-1, 8-O-1
Baud Rate：4800, 9600, 19200, 38400, 57600, 76800, 115200

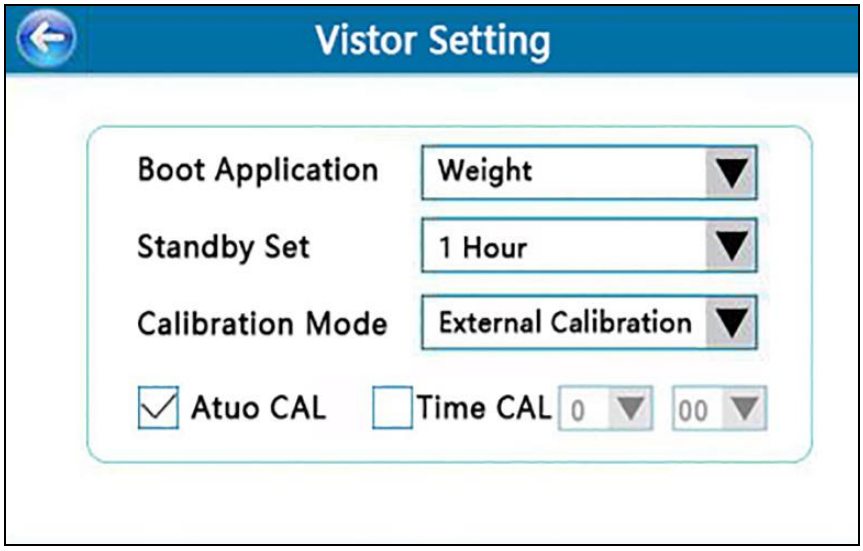
4.2.4.Print setting

➢ Enter print setting to make the relevant settings.



4.2.5.Visitor setting

➢ Enter visitor setting to make the relevant settings.



1） Boot Application

Set defaulted boot application according to user’s requirements.

2） Standby Setting

Set auto standby time according to user's request. If you activate the automatic standby mode, the balance will automatically switch to standby (power saving function) after the last weighing or keystroke. Press the power button  to switch on from the standby mode to the weighing mode.

3） Calibration Mode：

Internal & External Calibration

Defaulted mode: Internal Calibration (With SCS device), External Calibration (Without SCS device)

4） Auto CAL：Enabled when the Internal Calibration mode is selected.

Enabled/Disabled

Auto calibration according to temperature change(Triggered by 2℃ change of temperature)

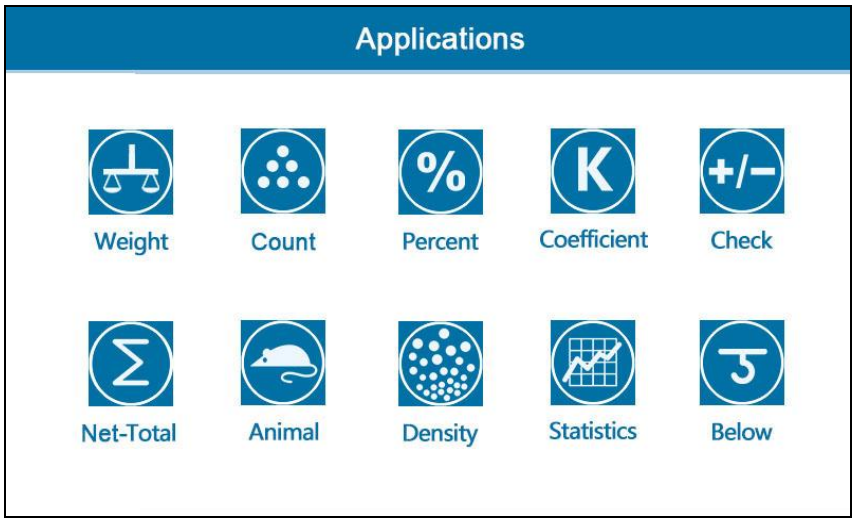
5） Time Calibration：Only enabled after the internal calibration is selected

Enabled/Disabled

Auto calibration according to time setting

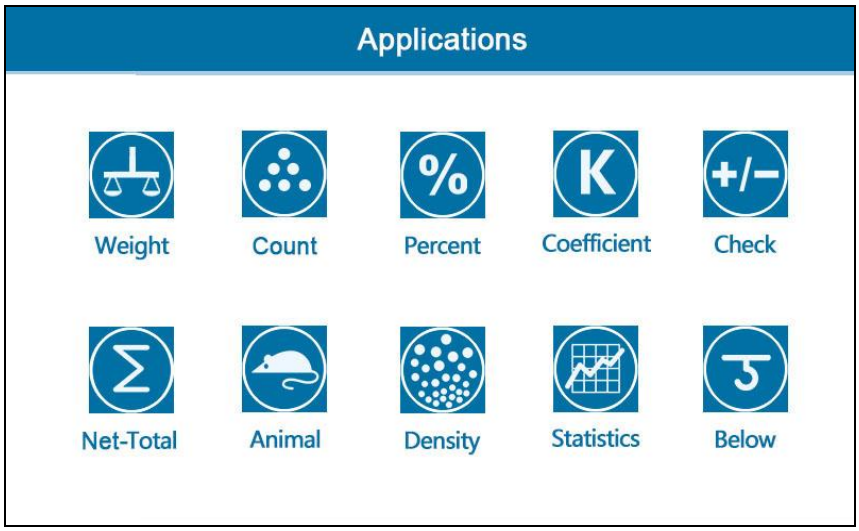
5. Applications

➢ Press the key《 》 to enter the application menu and select the application you need. Press the key 《 》 to return to main interface.

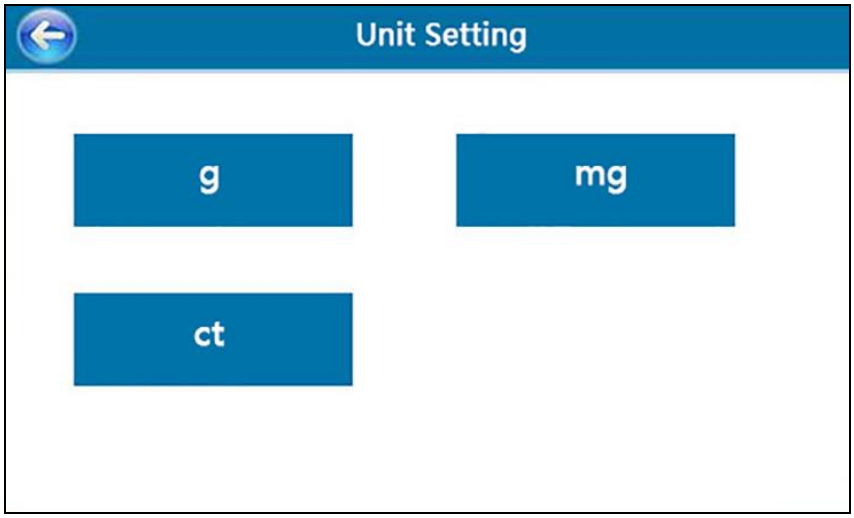


5.1. Weight

➢ Press the key《 》 in the applications interface to enter **Weight** application.



➢ Press the key “unit” to enter the following interface for unit change.



5.2. Count

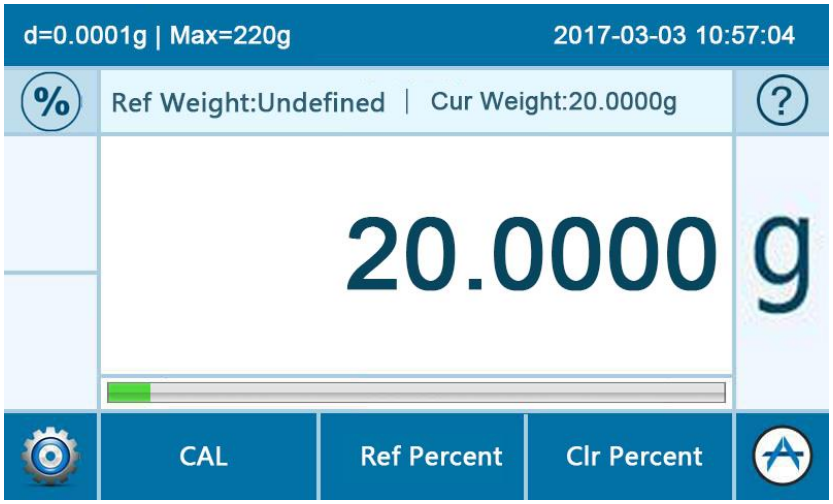
➢ Press the key 《 》 in the applications interface to enter **Count** application.

Step 1: press the key “Ref Count” to select the reference quantity of the current weighing product
Step 2: press the key “Confirm” to return to the count interface, the current product weight converted to reference number automatically
Step 3: measure the sample and make counting.

Step 4: press the key "Clr Count", the count automatically converted to weight.

5.3. Percent

➢ Press the key 《%》 in the applications interface to enter **Percent** application.



Step 1: press the key "Ref Percent", the current weight is set to 100%

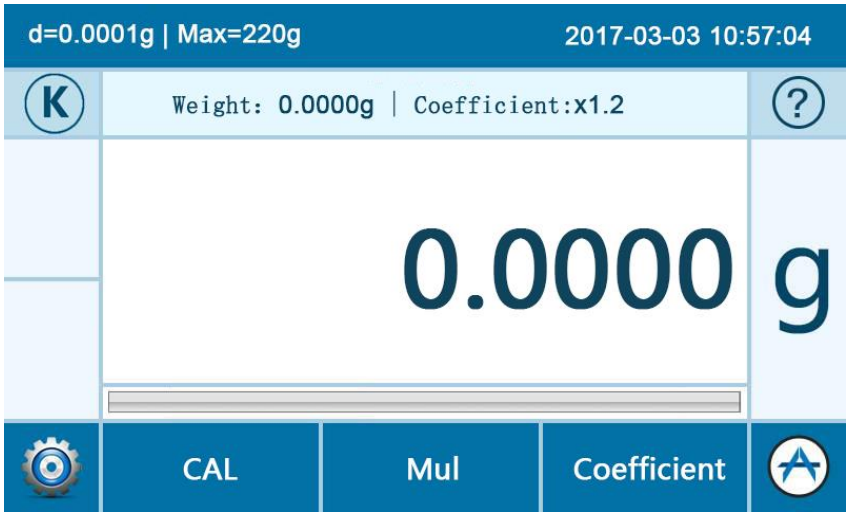
Step 2: Weighing any sample, the weight is automatically converted to percentage based on reference weight.

Step 3: press the key "Clr Percent" to automatically convert the percentage to the weight display.

5.4. Coefficient

➢ Press the key 《K》 in the applications interface to enter **Coefficient** application.

Step 1: Press the middle button, alternatively select the coefficient conversion way, to multiply or to divide, meanwhile, the auxiliary information bar displays the corresponding state. The middle button alternates between "multiple" and "divide".



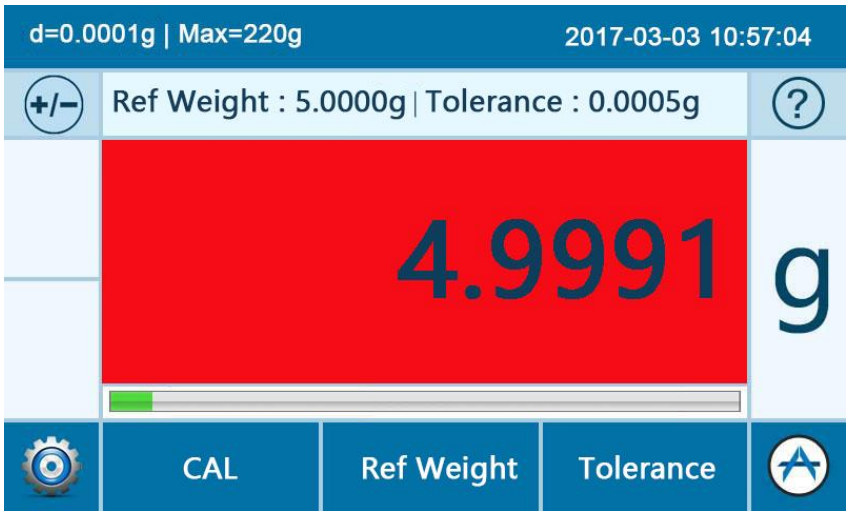
Step 2: Press the key “Coefficient”, enter the coefficient that need to be converted.

5.5. Check

➢ Press the key 《+/-》 in the applications interface to enter **Check** application.

Step 1: Press the middle button "weight", input reference weight.

Step 2: Press the key "Tolerance", enter the reference limit, which can be inputted as the percentage of reference weight or absolute tolerance according to the requirements, check the actual weight according to the check setting, three cases of overload, normal, or under load, correspond to three colors of yellow, green and red as the background display.



5.6. Net-Total

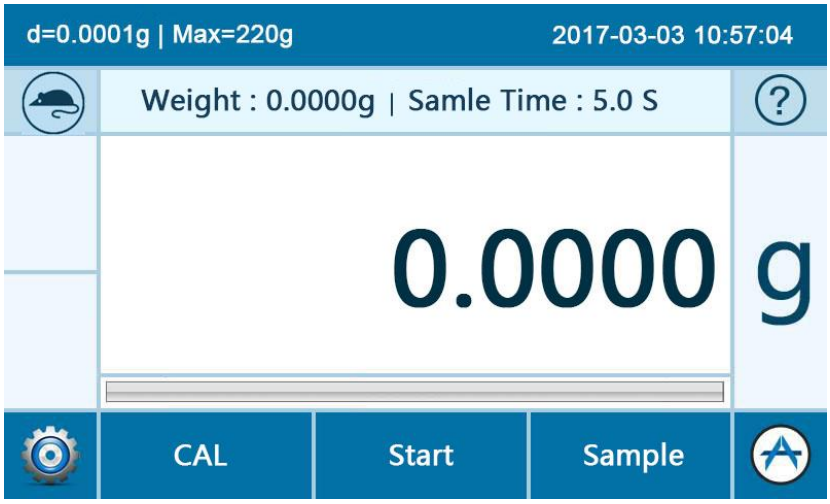
➢ Press the key《Σ》 in the applications interface to enter **Net-Total** application.

Step 1: Place the first sample, press the key “Save”, the weighing data is saved and the balance is tared at the same time, you can put the second sample to save the weight, and so on. The program will calculate the cumulative weight and the auxiliary information bar will update cumulative weight and last weighing data.

Step 2: press the key “View”, you can see each weighing data, weighing time and date, cumulative weight, etc., and displayed in a list, easy to view and print. Press the key “Clear” to clear the measurement records, press the key “Return” to return to “Net-Total” interface.

5.7. Animal

➢ Press the key《》 in the applications interface to enter **Animal** application.

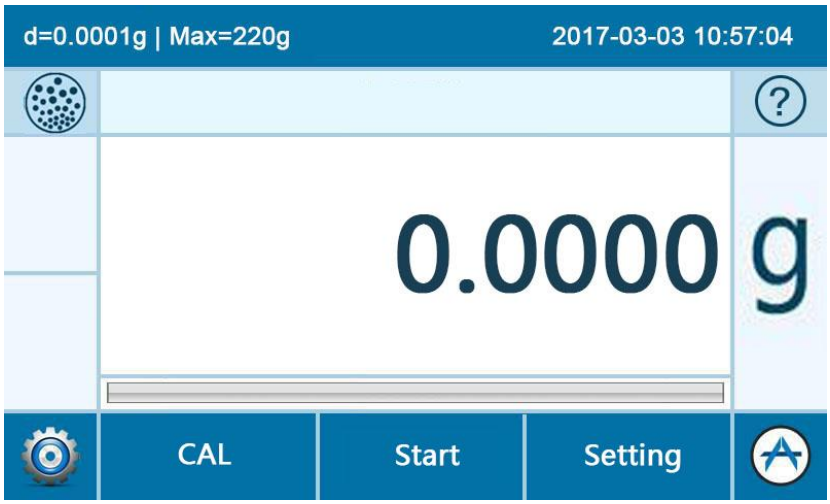


Step 1: Press the key "sample", set the sampling time (3~10 seconds), press “confirm” to return to the main interface.

Step 2: Press the key "Start", the program samples and calculates the final weight within the sampling interval.

5.8. Density

➢ Press the key《 》 in the applications interface to enter **Density** application.



➢ **Measurement of solid density**

Step 1: Press the key ”Setting” for the relevant settings.

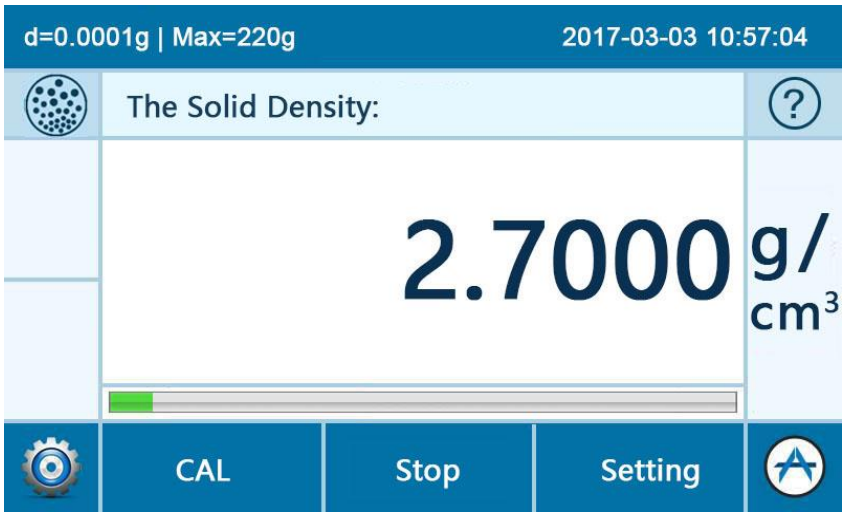
Step 2: Enter the liquid temperature, assisted liquid selection: distilled water, alcohol or custom, when choosing custom, need to input the known liquid density, all setting is completed, press the "OK" key to return.

Step 3: Back to the density measurement interface, press the key "Tare" and press "Next” according to the auxiliary information bar prompt.

Step 4: Weigh the solid in the air and press “Next” when the weighing data is stable.

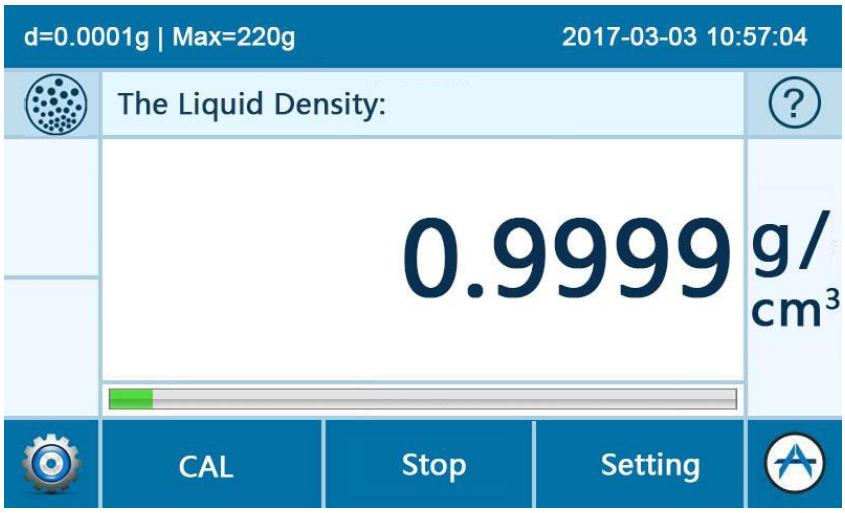
Step 5: Weigh the solid in the liquid and press “Next” when the weighing data is stable.

Step 6: The solid density is displayed in the main interface, press “Stop” to go back to the main interface of the density measurement.



➢ **Measurement of liquid density**

Step 1: Press the key ”Setting” for the relevant settings.
Step 2: Enter the liquid temperature, when setting is completed, press the "OK" key to return.
Step 3: Back to the density measurement interface, press the key "Tare" and press "Next” according to the auxiliary information bar prompt.
Step 4: put the sinker in the air and weigh it. Press “Next” after the weighing data is stable.
Step 5: put the sinker in the liquid and weigh it. Press “Next” after the weighing data is stable.
Step 6: the liquid density is displayed in the main interface, press “Stop” to go back to the main interface of the density measurement.



5.9. Statistics

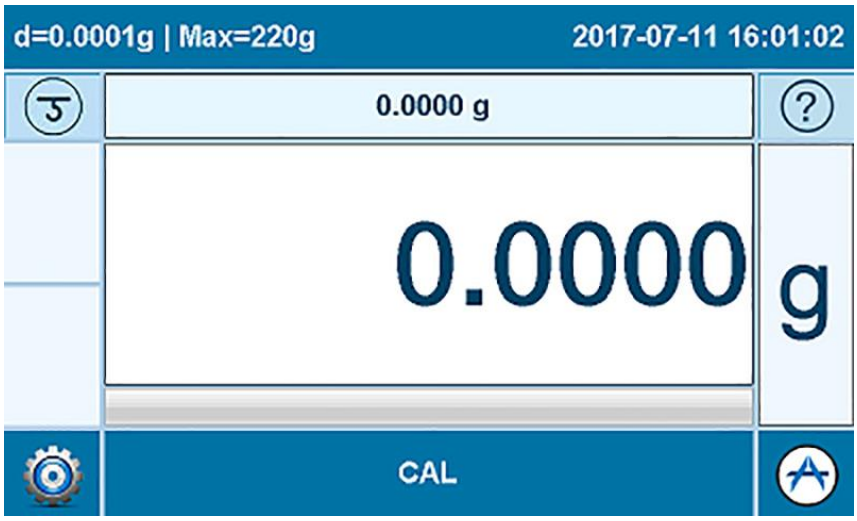
➢ Press the key《 》 in the applications interface to enter **Statistics** application.

Step 1: Place the first sample, press the key “Save”, the weighing data is saved, you can put the second sample to save the weight, and so on. The program will calculate the cumulative weight and the auxiliary information bar will update cumulative weight and last weighing data.

Step 2: press the key “Report”; you can see each weighing data, weighing time and date, cumulative weight, etc., displayed in a list and the statistics report in the right column, easy to view and print. Press the key “Clear” to clear the measurement records and statistics report, press the key “Return” to return to “Statistics” interface.

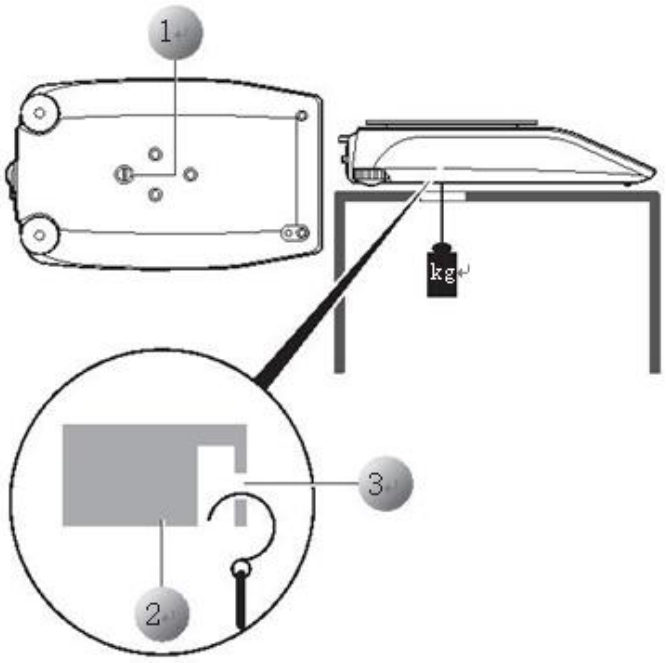
5.10. Below

➢ Press the key 《 》 in the applications interface to enter **Below** application.



Objects which, because of their size or shape, cannot be put on the scale can be weighed by means of below-balance weighing.
Proceed as follows:

- Turn off the balance.
- Remove the weighing pan and the pan holder than turn the balance upside down.
- Remove the screw (1) on the underside of the balance.
- Hang the hook for weighing below (available as an accessory, see chapter 6 "Accessories") into the aperture (3) of the metal casting (2).
- Place the balance over an opening.
- Replace the pan holder and the weighing pan.
- Level the balance (see chapter 2.6 "Levelling")
- Switch on the balance.
- Hang the object to be weighed on the hook and carry out the weighing.



⚠ WARNING
Take care that the hooks used for the below-balance weighing are stable enough to hold the goods Which you wish to weigh.

NOTE
Take care that no dirt or moisture can get into the balance with the weighing pan removed. After completing the below-balance weighing, the opening in the floor of the balance must be closed again (dust protection).

6. Error messages and correction

6.1. Troubleshooting

The following table shows faults and their possible causes. If you cannot clear the fault using the table, Please contact the Customer Service.

Table 6.1 Troubleshooting

Fault	Possible reason
Weight display is not bright	● Balance not switched on ● Connection to power adaptor is interrupted ● Power supply has failed (interruption to current) ● The power adaptor is defective
Display “∧∧∧∧∧”	● The weight range has been exceeded (Observe information on the maximum weight range)
Display “∨∨∨∨∨”	● The weight range is below the range of the balance (Scale pan or scale pan holder missing)
The weight display fluctuates continuously	● The draft is too strong at the balance location ● The balance support is vibrating or varying ● The scale pan is touching a foreign body ● The environment stability and weighing stability setting is not right ● The material being weighed is absorbing moisture ● The material being weighed is being blown away or is evaporating ● Strong temperature variations in the material being weighed
Results of weighing are clearly incorrect	● The balance was not correctly tared ● The balance is not correctly levelled ● The calibration is no longer correct ● There are strong temperature variations
The display flashes continuously during calibration	● The balance location is not stable enough (Interrupt calibration with «Cancel» and relocate the balance in a better position) ● Use of an imprecise calibration weight (only applies to external calibration)

NOTE

If the balance goes wrong, there is no description of the error in the function information. Please call the maintenance engineer.

7. Maintenance and assurance

The balance must be treated carefully and cleaned regularly. It is a precision instrument.

⚠ DANGER

For maintenance work, the balance must be separated from the power supply (remove power adaptor plug from socket). Also ensure that the balance cannot be reconnected to the power supply during the work by a third party.
Take care during cleaning that no liquid penetrates into the balance. If liquid is spilt on the balance, the plug must immediately be disconnected from the electricity supply and must only be used again after it has first been checked by a Service Engineer.
The connections of the balance and the power adaptor must not come into contact with liquids.

Regularly dismantle the weighing pan and the weighing pan holder and remove any dirt or dust from under the weighing pan and on the balance housing with a soft brush or a soft, lint-free cloth, moistened with a mild soap solution.
The weighing pan and the holder can be cleaned under running water. Take care that both parts are completely dry before they are re-installed on the balance.

⚠ CAUTION

Never use solvents, acids, alkalis, paint thinners, scouring powders or other aggressive or corrosive chemicals for cleaning, since these substances attack the surfaces of the balance housing and can cause damage.

According to the relevant laws and regulations of the country, we promise to provide the following services based on the purchase invoice.
1. Product warranty for 12 months since the date of purchase
2. The following range is out of free service:

- The damage caused by user's own maintenance or non-designated repairing sites;
- No purchase invoice and altered invoice;
- Damage by abnormal voltage, water (fire) disaster and other external factors;
- Failure to comply with the requirements of the instructions;
- Damage by irresistible factors.

3. For that which doesn't belong to free service scope, we will provide service for you sincerely.
Regular maintenance by Shanghai Precision Balance Instrument Co., Ltd. will ensure the function and reliability of balance in a few years and will also extend the service life of the balance.

8. Transport and shipping

8.1. Transport

Your balance is a precision instrument. Treat it with care.
Avoid shaking, severe impacts and vibration during the transportation.
Take care that there are no signification temperature fluctuations during the transportation and that the balance does not become damp (condensation).

NOTE
The balance should preferably be dispatched and transported in the original packaging to avoid transportation damage.

8.2. Storage

If you would like to take the balance out of service for an extended period, disconnect it from the electricity supply and clean it thoroughly (see chapter 7 "Maintenance and Assurance") and store it in a place which meets the following conditions:
No violent shaking and vibrations
No significant temperature fluctuations
No direct solar radiation
No moisture

NOTE
The balance should preferably be stored in the original packaging, since this provides optimum protection for the balance.

9. Data transfer

For data-transfers to peripheral devices, the balance is equipped with an RS232/V24-interface.
Before the data-transfer, the RS232 interface must be matched with the one in the peripheral device in the balance configuration menu (see chapter 4.2.3 "Communication setting").

- Handshake

The handshake is set to “NO“ (none) at the factory. It can be set to software handshake „XON-XOFF“, or to hardware handshake “HARDWARE“.

- Baud rate

Possible baud rates: 4800, 9600, 19200, 38400, 57600, 76800, 115200.

- Parity

Possible parity: 7-E-1, 7-O-1, 7-N-2, 8-N-1, 8-E-1, 8-O-1.

Pos.	0	1	2	3	4	5	6	7	8	9	10
7-even-1	SB	1.DA	2.DA	3.DA	4.DA	5.DA	6.DA	7.DA	PB	SP	-
7-odd-1	SB	1.DA	2.DA	3.DA	4.DA	5.DA	6.DA	7.DA	PB	SP	-
7-no-2	SB	1.DA	2.DA	3.DA	4.DA	5.DA	6.DA	7.DA	1.SP	2.SP	-
8-no-1	SB	1.DA	2.DA	3.DA	4.DA	5.DA	6.DA	7.DA	8.DA	SP	-
8-even-1	SB	1.DA	2.DA	3.DA	4.DA	5.DA	6.DA	7.DA	8.DA	PB	SP
8-odd-1	SB	1.DA	2.DA	3.DA	4.DA	5.DA	6.DA	7.DA	8.DA	PB	SP

SB: Start bit PB: Parity bit
DA: Data bit SP: Stop bit

- Display

```
S   D7 D6 D5 D4 D3 D2 D1 D0   U U U
```

The data-transfer takes place in ASCII code:

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	...	...	...
B	**B**	**B**	**S**	**D7**	**D6**	**D5**	**D4**	**D3**	**D2**	**D1**	**DP**	**D0**	**B**	**U**	**...**	**CR**	**LF**

B Blank (space)
S Sign (+, –, space)
DP Decimal point
D0...D7 Digits
U ... Unit (only if the weight is stable, otherwise no unit is sent)
CR Carriage return
LF Line feed

NOTE

Unused positions are filled with spaces. The decimal point DP can be between D0 and D7.
If the value format is user defined, the format is not as mentioned above!

9.1. Connection scheme

Standard, duplex connection including lines for optional hardware handshake with the peripheral device

Balance	DB 9 female	D25 / D9	Peripheral device
RS 232 out	2 ——→	3 / 2	RS 232 in
RS 232 in	3 ←——	2 / 3	RS 232 out
GND	5 ——	7 / 5	GND
CTS	4 ←——	20 / 4	DTR (only needed for hardware handshake)
DTR	8 ——→	5 / 8	CTS (only needed for hardware handshake)

9.2. Remote control-commands

Command	Function
ACKn	Acknowledge n = 0 off; n = 1 on
CAL	Start calibration
D.....	Describe weight display (right-aligned)
DN	Reset weight display
@.....	Describe Info display
@N	Reset Info display
N	Reset balance
OFF	Switch off balance
ON	Switch on balance
PDT	Print out date and time
PRT	Print function, like pressing the «**PRINT**» key
PST	Print status report
Pn (ttt.t)	Set print mode: n = 0 individually print each value (unstable) n = 1 Individually print each value (stable) n = 2 Print after change of load n = 3 Print after each integration period n = 4 Print on time basis in s (ttt.t)
R%k	Set current weight = 100% with k = 0...7 decimal places (k = A: use automatic positioning of decimal point)
REF%k rrr	Set reference weight rrr for 100% with k = 0...7 decimal places (k = A: use automatic positioning of decimal point)
Rnnn	Set current weight = nnn items
REFrrr	Set reference weight rrr for 1 item
Sn	Set stability n n = 0 low n = 1 medium n = 2 high
SDTttmmjjhhmmss	Set date and time (German) (Tag, Monat, Jahr, Stunde, Minute, Sekunde)
SDTmmddyyhhmmss	Set date and time (English) (Month, Day, Year, Hour, Minutes, Seconds)
T (ttt)	Tare or set tare to a specific value
Uxnn	Set unit x (1...4) of the balance with nn (0 = g, 1 = mg, 2 = kg, ...)
UxS	Switch balance to unit x (1...4)
ZERO	Zero balance (provided weight is stable and within the zero position range)

10. Options and accessories

Table 10.1（Common Options）

Description	Part Number
Epson Thermal Printer,TM-T82（Roll Paper Involved）	350-1000-009
Printer Cable,DB9-DB25（For Thermal Printer）	10005027
Wire Printer,CK SF-T40S-K（Roll Paper Involved）	10005022
Printer Cable,DB9-DB25（For Wire Printer）	10000287

Sales/Service：Techcomp Precision Balances (Shanghai) Co., Ltd.
Precisa Gravimetrics AG
Manufacturer：Techcomp Precision Balances (Shanghai) Co., Ltd.
(Precisa –Shanghai factory）

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http://www.precisa.com

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