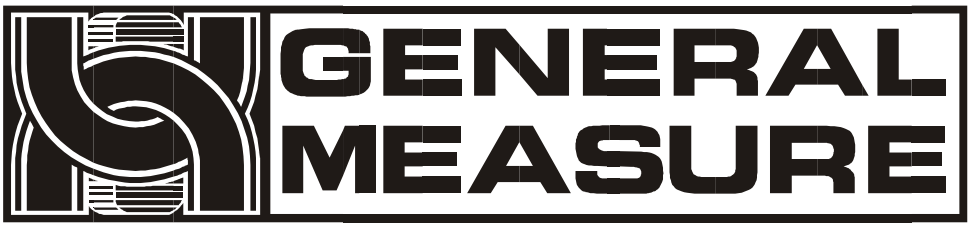


Checkweigher

User's Manual

Model no.: GM-C001

Contents

1 About this manual

Read the user manual before connecting and switching on the device. You will find information on how to get maximum performance from the device as well as how to avoid possible hazards.

This manual explains how to operate and set the device.

1.1 Safe-keeping

This manual is an integral part of the device and must be kept next to it, easily accessible for all personnel.

If the device is resold, the complete user manual must be provided with it.

1.2 Target group

The device must be operated by trained personnel. This means that the operator must be familiar with the content of this manual. Installation, servicing and repairs must be performed by qualified personnel.

1.3 Symbols used

The following symbols are found in this manual:

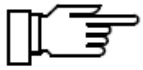
⇨ Text with arrow prompts you to carry out an action.

Position number in figure.

[**Start belt**] Text in bold within [] describes a physical button.

<OK> Text in bold within < > describes a key in operation interface..

”**Display**” Text in bold within “ ” indicates the display text.

	Rules must be followed.

Prerequisites have a gray background.

1.4 Warning notices

DANGER 	The signal word above the symbol indicates the risk level: Source of danger with high risk with imminent danger for human! The consequences are: - critical injuries - severe damage to health

CAUTION	Source of danger, improper use! Cause damage to property.

2 Introduction

Description:

a) 10inch TFT screen and Humanistic operating interface
b) RS485 communication to connect with printer, ink-jet printer and computer
c) Available USB port to output data for analysis and management

Key Features:

- Support upto 50pcs product parameters
- Save upto 1,000,000pcs weight value
- Supply inquiry and statistic analysis function
- Adjustable belt speed from HMI
- Multiple level password protection

2.1 Structure

The checkweigher is available in different structure.

1. Display and operating unit: 10 " touch screen
2. Electric control cabinet
3. Support
4. Input belt
5. Weighing belt
6. Output belt
7. Arm rejector
8. Foot screws

The specifications of checkweigher list in Table 2-1.

Model No.		GM-C001
Weighing Capacity		0.5g ~ 100gs / package
Scale Division		0.05g
Precision		≥ ±0.2g
Weighing Speed		≤ 180pcs / minute
Products size	**Length**	44mm ~ 200mm
	Width	20mm ~ 80mm
	Height	10mm ~ 120mm
Transfer belt speed		5m ~ 76m / minute
Weighing platform size		250mm(Length) x 100mm(Width)
Weighing platform height		750mm ± 30mm
Check weigher size		1080mm(Length) x 530mm(Width) x 910mm(Height)
Power Supply		AC220V ± 10%, Single Phase, 50 / 60Hz,1000VA
Working Condition		TEMP 5~40℃ RH<95%
Protection Level		IP54
Material of Construction		Stainless steel 304

2.2 Intended use

- The device can be used for checking the weight of packaged foodstuffs or goods.
- It can be used in industrial or commercial fields.
- It can be used in potentially explosive areas.
- The goods to be checked must be fed to the scales via the device transport belt.
- The packages need to be fed continuously to the device with regular intervals between the packages.
- The packages must be positioned on the centre of the belt when they are transported over the scales.

2.3 Operating conditions

Do not install or commission equipment until the operating conditions have been fulfilled:

- Temperature and air humidity:

Temperature: -10~40℃

Maximum humidity: 90% R.H without dew

- Vibration-free installation area

Vibrations can affect measurements made by the scales. During production, avoid, for example, fork-lift truck activity near the device.

- Align horizontally

To ensure the precision of the scales, it is of absolute necessity that the device is aligned horizontally.

- Draft

Drafts can affect the measurements made by the scales. If required, use the hood over the weighing belt.

- Air convection

Free air convection must be able to form around the unit in order to avoid inadmissible heating.

- Supply voltage

Power supply: 180-260VAC, 50Hz±10%

- Electrical charge

Packages may not be charged electrically when being transported to the transport belts.

- Trained personnel:

Only trained personnel can maximize the performance of the device and avoid risks.

- Written permission for changes:

Modifications to the devices require our prior written consent.

Please contact us or our competent customer service points if you have any doubts concerning the practical application of these conditions.

2.4 **Warranty**

We do not accept any liability for damages resulting from:

- Non-compliance with our operating conditions and user's manual.
- Unauthorized installation.
- Defective electrical installation by the customer.
- Structural changes to our equipment.
- Incorrect operation.
- Backup not executed.
- Natural wear and tear.

Note: Guarantee is not given if defects/damage occur as a result of utilization by person we have not authorized.

Check that our products are handled correctly and repeat training if necessary.

3 Safety instructions

3.1 Trained Operator

The device must be operated by people who have been instructed in the operating procedure.

The operator must understand the safety instructions in this manual.

Even though the device is equipped with all the required safety installations, injuries to the operating personnel or damage to property is possible if the safety instructions are not heeded.

3.2 Protective and safety devices

3.2.1 Main switch

The main switch is on the side of the switch cabinet. Switch the device off at the main switch in the following situations:

- In the event of impending risk.
- When cleaning and maintenance work is being carried out on the outside of the control cabinet.

DANGER 	Electrical voltage in the control cabinet even when the main switch is switched off ! Risk to life from an electrical charge. Before carrying out work in the control cabinet, cut off power and disconnect the power connector. Work in the control cabinet must be carried out by qualified trained personnel.

3.3 Sources of risk related to the system

3.3.1 Components that start automatically

The device is designed for fully-automatic operations.

During fully-automatic operation, the transport belts and rejector, for example, can be switched on and off automatically.

⇨ Keep fingers, hands or long hair away from the moving parts of the device.

⇨ Switch off the device by using main switch before carrying out cleaning and maintenance work.

3.3.1.1 Conveyor belts

Do not place any objects on the transport belts and do not use the transport belts as a storage facility.

3.3.1.2 Rejector

Once the device is switched on, do not grab items in the rejector working area.

If necessary, install a protective hood over the rejector.

Pusher: Ensure that the height between pusher and belt is not more than 4 mm.

This setting makes sure that you cannot jam your fingers when the pusher pulls away.

3.3.2 Rotating parts

The belt drive contains rotating parts. To avoid body part, hair or clothing being caught and pulled into the machine, follow the instructions below:.

Wear closely fitting clothes.

Do not wear necklaces, ties, or similar accessories.

Wear a hair net if you have long hair.

4 Human machine interface

HMI with Touch Screen gives friendly access to information interaction between user and checkweigher. The most frequently used interface of this device is the main interface. Press key on main interface can enter sub interfaces. The sub interfaces share same structure. Here give introduction of the main interface and structure of sub interface.

4.1 Main interface

The main interface contains the following parts:

1. Authorization level

Indicates which level the current user belongs to. The device has three different authorization levels:

Operator, having the access to daily work;

Technician, having the access to calibration and production parameter configuration;

General Measure, manufacture level, having full access to all parameters.

2. Stable sign

When current weight is stable, this sign comes up.

3. Zero sign

When current weight is zero, this sign comes up.

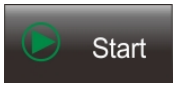
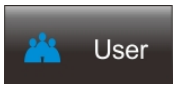
4. Current weight

The weight output by the device.

5. Time information

Gives information of date and time.

6. Operation keys

	<Setup>	Entrance of product parameter and calibration.
	<Zero>	Set current weight to zero.
	<Start>	Start the weight checking process.
	<Stop>	Stop the weight checking process.
	<Data>	Weighing information.
	<User>	Change current user.
	<Product>	Change to check products.
	<Alarm clear>	Please refer Table 9-1 for alarm information.

7. Checking result

Over: Times of over tolerance products

Pass: Times of qualified products

Under: Times of under tolerance products

8. Basic information

Product information and test result includes:

PD ID: Product identity.

Name: Product name.

Nominal weight: Nominal weight of the product.

Upper deviation: Upper limited weight value.

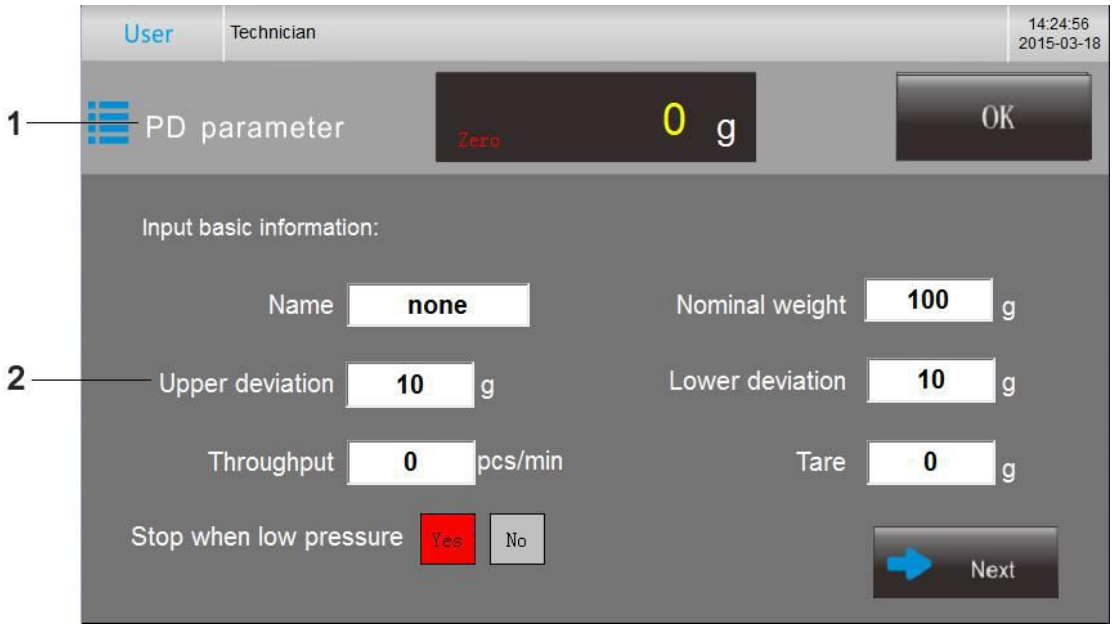
Lower deviation: Lower limited weight value.

Throughput: Throughput of the product.

Checked: Numbers of products checked.

4.2 Sub interface

The sub-interfaces have same structure but with different function. The different function will be introduced later.

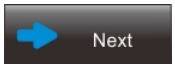


1. Name of sub-interface
2. Information and functional key area of sub-interface

In addition to the keys present in main interface, there are some other keys in sub interface:

<Exit> Return to main interface.

<Previous> Back to previous page



<Next> Go to next page.

5 Instruction of operation

After correct installation, the device can be operated by touch screen, operation procedure as follows:

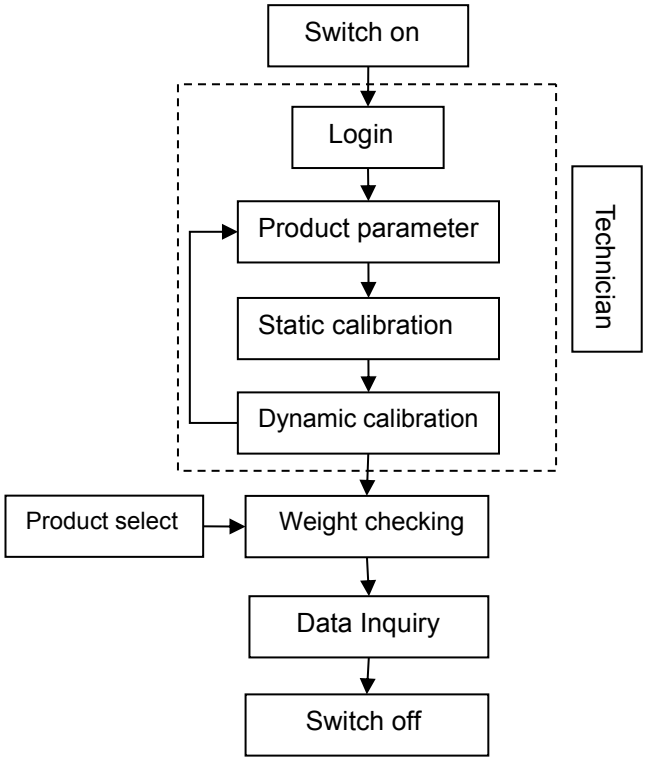


Fig 6- 1 Operation procedure of Checkweigher

In above operation procedure flow chart, the procedure in dashed box can only be operated by technician account. “Product parameter” should be added before any new products need to be checked. “Static calibration” should be carried out when the device is installed the first time. “Dynamic calibration” should be carried out when a new product is added.

5.1 Daily operation

5.1.1 Switch on device

Prerequisites:
- The device has been installed properly and all wires have been connected correctly.
- The operating conditions listed in 2.4 have been fulfilled.
- The operator has been trained and operation procedure must comply with the safety instructions listed in chapter 3.
- The weighing belt is empty.

Switch on the device at least 20 minutes before start to weight checking

The pre-run aims to ensure the system reach the correct operating temperature. Ignore the pre-run may cause negative effect on the precision of the weighing process.

⇨ Turn the main switch in a clockwise direction.

The main interface appears after a few seconds.

The default user level is operator.

⇨ Wait 20 minutes before weight checking.

Aims to ensure system reach the correct operating temperature.

⇨ Press <**Start** >.

5.1.2 Switch off device

Frequent breaks where the device is switched off can affect the precision of the weighing process. Leave the device switched on during short breaks in production. Do not switch off the device until production is over.

⇨ Press <**Stop** >.

⇨ Turn the main switch in an anti-clockwise direction.

5.1.3 Logon and logoff

The device has three different authorization levels:

Operator: having the access to daily work;

Technician: having the access to calibration and production parameter configuration;

General Measure: manufacture level, having full access to all parameters.

⇨ In main interface : Press <User >

Then enter main interface. Please refer following Fig 5-2:

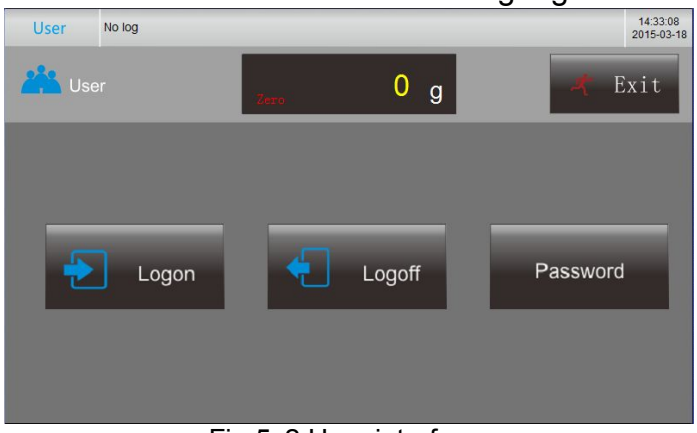


Fig 5-2 User interface

⇨Press <logon >

Then input user name and password. Please refer following Fig 5-3

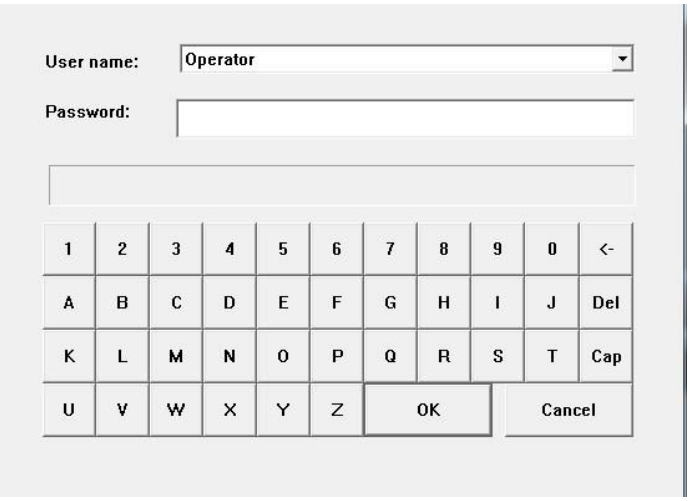


Fig 5-3

Note: The default password of operator and technician are 000000. Please login on and change password.

⇨Press OK button.

Then enter main interface successfully.

⇨In user interface press <logoff >

After finished, press <logoff > to protect parameters.

5.1.4 **Start and stop weight checking**

Prerequisites:
- Product to be checked has been selected.
- Product parameter has been set correctly.
- Weight calibration has been carried out.
- The device has been switched on for at least 20 minutes.

⇨Start weight checking: Press <**Start**>.

Start weight checking process.

⇨Stop weight checking: Press <**Stop**>.

Stop weight checking process.

5.1.5 **Enter/modify data**

A numerical keyboard which can be operated as a normal PC keyboard will pop up when data input box is triggered.

Prerequisite:
- A data input 1 box exists and it can be triggered to input data

⇨Click the input box.

A numerical keyboard with data description appears, as Fig 6-2.

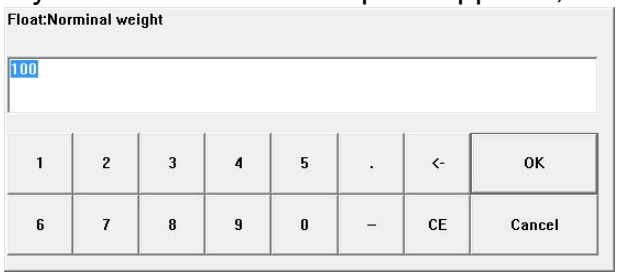


Fig 5-4 Input box

⇨ Input data according to the data description.

⇨ Press <**OK**> to confirm entered data or press <**Cancel**> to cancel and exit

5.1.6 **Product select**

For the operator level user, it has no right to change product parameter, this avoids incorrect parameter modification. The operator level user can only choose the product parameter pre-defined by technician level user.

⇨Press <**PD slect**> in main interface.

Enter product select interface, as Fig 5-5.

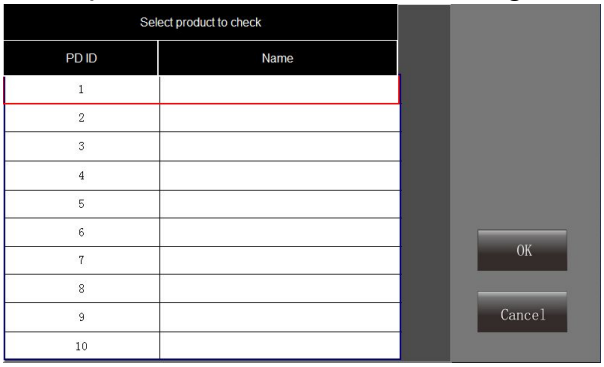


Fig 5-5 Product select interface

⇨By changing “PD ID” to select the product to be checked.

⇨Press <**Back**> or <**Exit**>.

Go back to main interface.

5.1.7 **Alarm clear**

The system will display alarm message if operation error occurs, the common alarm list in Table 8-1. To continue operation, you need to clear the alarm message.

⇨Press <**Alarm clear**> in main interface.

5.1.8 Data inquiry

The device has data storage and inquiry function.

⇨ Press <**Data**> in main interface.

Enter data inquiry interface, Fig 5-6.

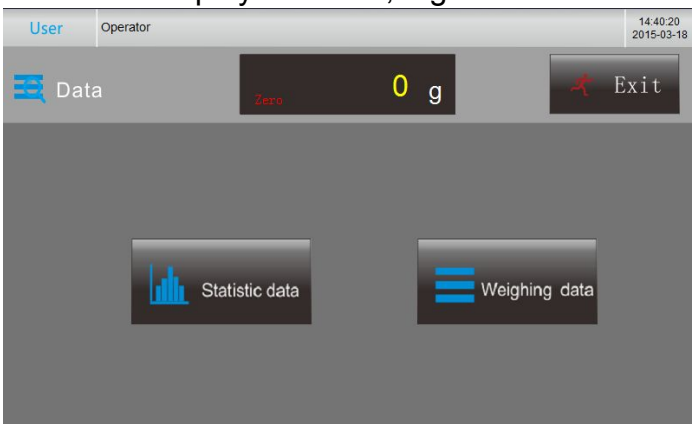


Fig 5-6 Data inquiry interface

⇨ Press <**Statistic data**>.

Statistic information of batch can be inquired in 'statistic data interface', Fig 5-7. This information of each product is recorded separately and it will be reset if related product parameter is modified. If starting a new batch checking procedure without changing product parameter, user needs to clear previous statistic information of batch manually in 'statistic data interface'; otherwise the new batch statistic information will be added to previous information.

⇨ Press <**Print**>.

When the RS232/RS485 is set to Print1 or Print2 and the printer connect correctly, the statistic data will be printed.

⇨ Press <**Delete**> in statistic data.

The batch information will be reset.

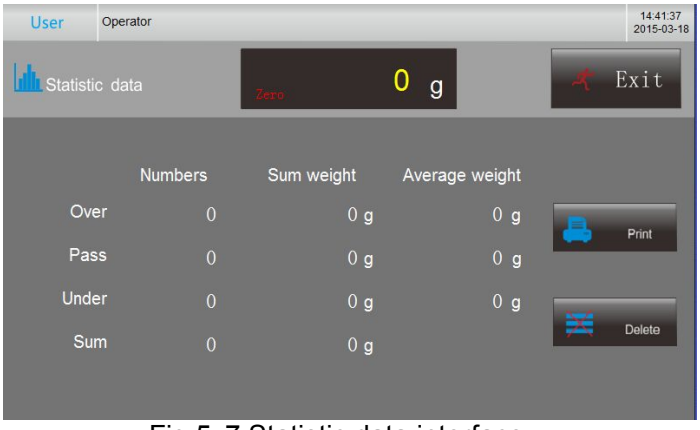


Fig 5-7 Statistic data interface

Besides the statistic information, the device records every check result. The weighing result can be viewed conveniently in weighing data interface.

⇨Press <**Weighing data**> in data inquiry interface.

Enter weighing data interface, Fig 5-8. All the checking results are recorded and viewed by <**Home**>, <**PageUp**>, <**PageDown**> and <**End**> .

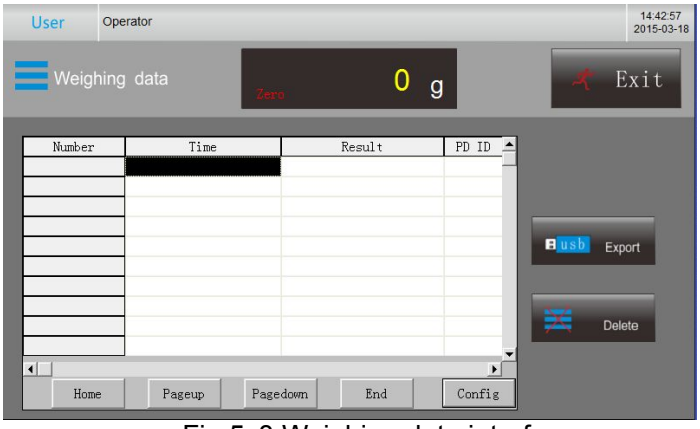


Fig 5-8 Weighing data interface

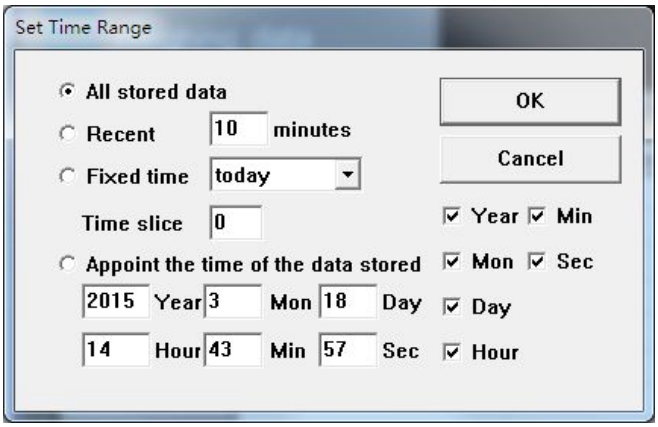


Fig 5-9 Configuration window

⇨Press <**config**>.

Configuration window appear, you can choose special time range to show check result.

The weighing data information can be deleted

Prerequisites: - The device has been Logon with technician account.

⇨Press <**Delete**>.

Delete all the weighing data.

5.2 Basic setup

5.2.1 Product parameter

Prerequisite: - Logon with the technician account.

⇨Press <**Setup**> in main interface.

Enter setup interface, as shown in Fig 5-10.

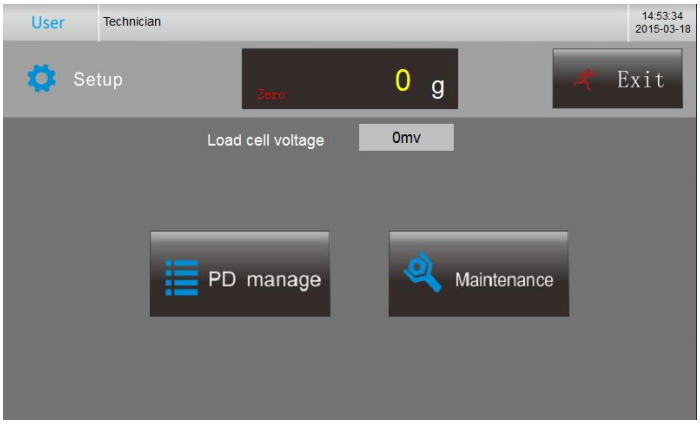


Fig 5- 10 setup interface

CAUTION	Weight checking process will be interrupt even the belt still runs when entering setup interface. Stop feeding item at this stage, otherwise the item will pass weighing platform without weight checking.

⇨Press <**PD manage**>.

Enter first page of product parameter interface, Fig 5- 11.

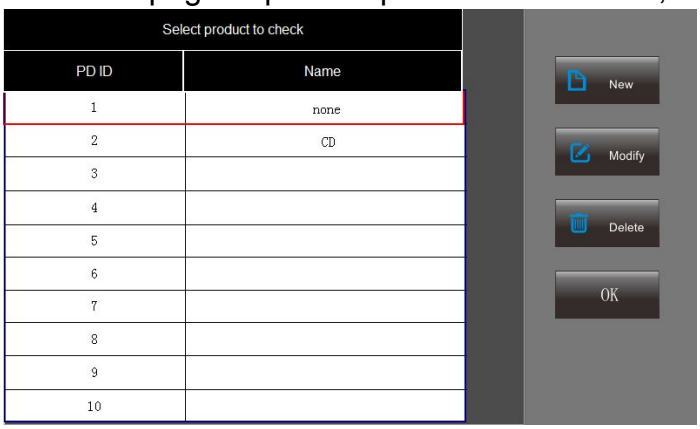


Fig 5- 11 Product parameter

The technician can set, modify and delete products

⇨Press <**New**>.

Set up new product parameters as follows,Fig 5- 12 to 5-16.

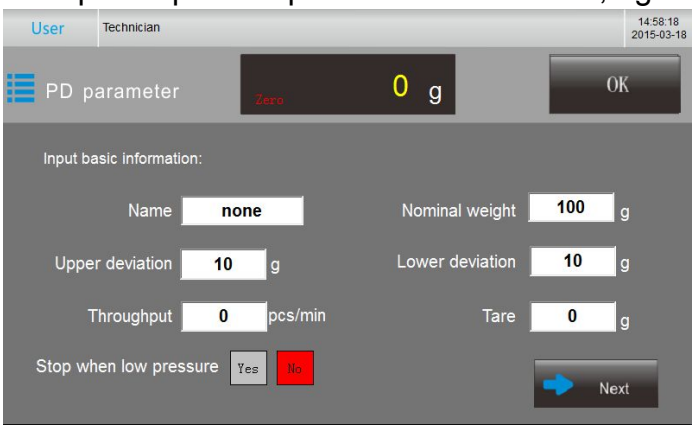


Fig 5- 12 Basic product parameter

"**Name**"

Checked product name.

"**Nominal weight**"

Product nominal target weight value

"**Upper deviation**"

When the weighing result > nominal weight + upper deviation, the checking result is over.

"**Lower deviation**"

When the weighing result < nominal weight – lower deviation, the checking result is under.

"**Throughput**"

Quantity of product checked per minute.

"**Tare**"

Weight of the product package, display result = weighing result – tare.

"**Stop when low pressure**"

If setting is yes than you need to stop machine as air pressure is low; if set value is No than even if air pressure is low machine will not stop and run even low pressure.

⇨Press <**Next**>.

"**Length**"

Length of the product along the throughput direction, this parameter has great influence on the precision of the checkweigher, make sure to measure it correctly.

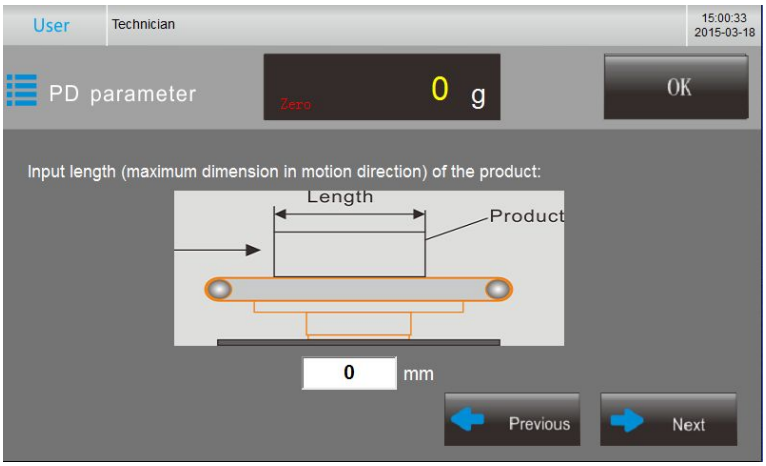


Fig 5- 13 Length interface

“**Input reject parameter**”

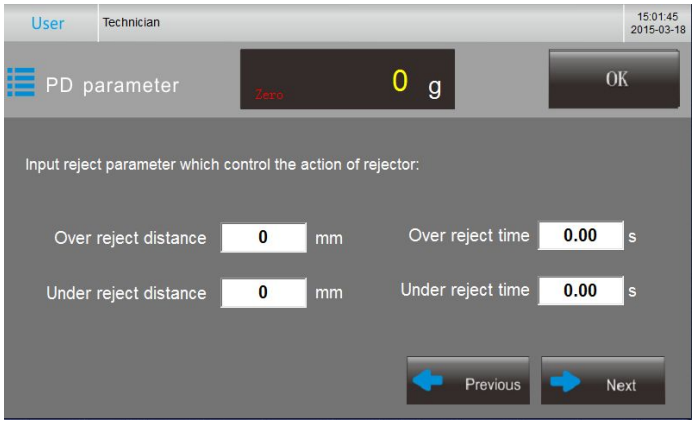


Fig 5- 14 reject parameters

“**Over reject distance**”

Over reject distance is the distance between the end of weighing platform and the centre of over rejector.

“**Over reject time**”

Over reject time is the lasting time of over reject signal.

“**Under reject distance**”

Under reject distance is the distance between the end of weighing platform and the centre of under rejector.

“**Under reject time**”

Under reject time is the lasting time of under reject signal.

“**Start study**”

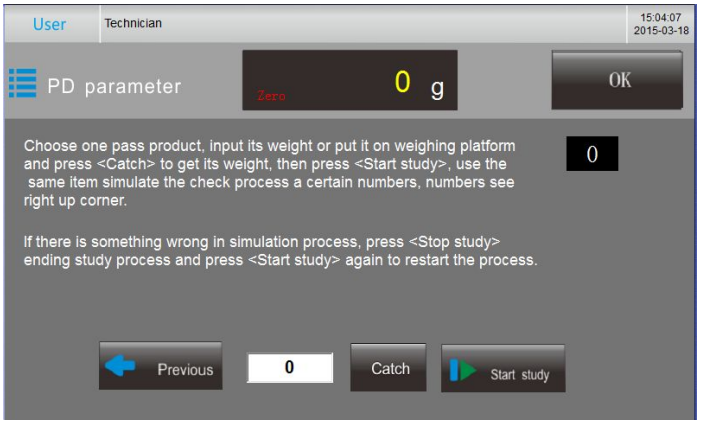


Fig 5- 15 Start study

After finished, enter product information and check result:

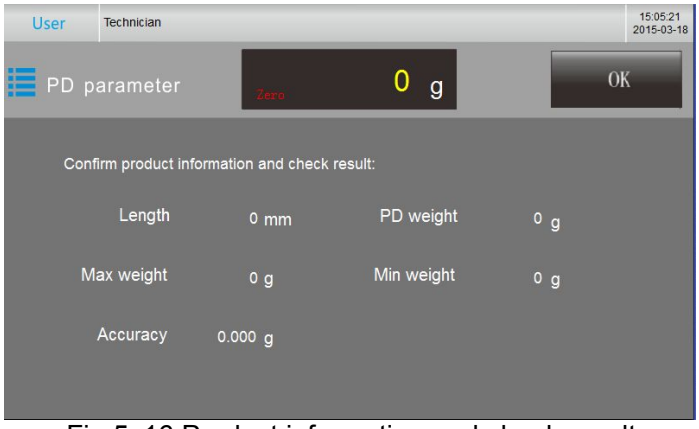


Fig 5- 16 Product information and check result

⇨Press <**OK**> to save products parameters.

5.2.2 **Maintenance**

⇨Press <**maintenance**>. Fig 5- 17.

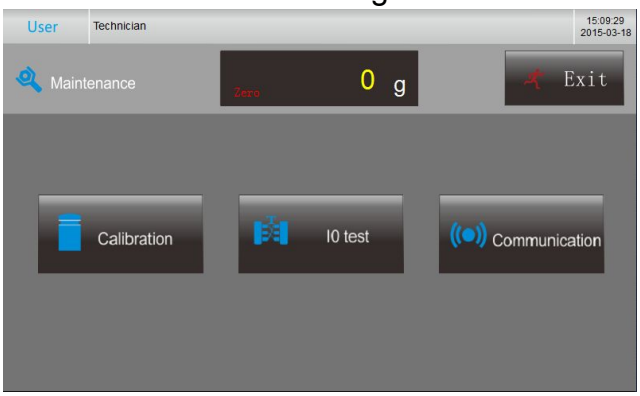


Fig 5- 17 Maintenance interface

5.2.2.1 Weight calibration

Prerequisite:
- Logon with the technician account.
- The device has been switched on for at least 20 minutes.

Calibration is essential for weighing system.

⇨Press <**calibration**> .Fig 5- 18.

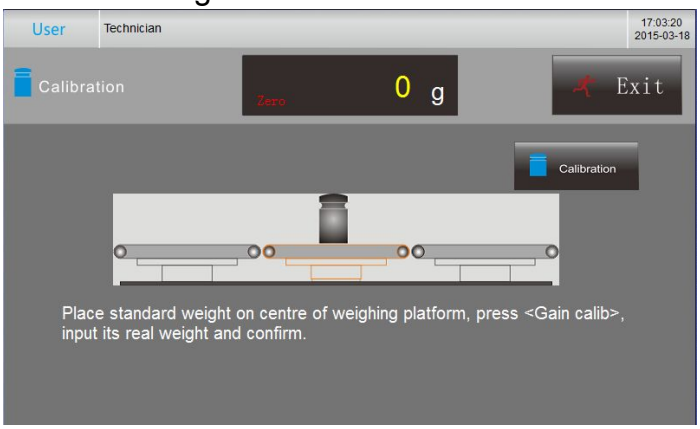


Fig 5- 18 Calibration interface

5.2.2.2 I/O test

I/O test to check if the controller input and output are ok.

⇨Press <**IO test**>

in setup interface to enter I/O test as Fig 5-19.

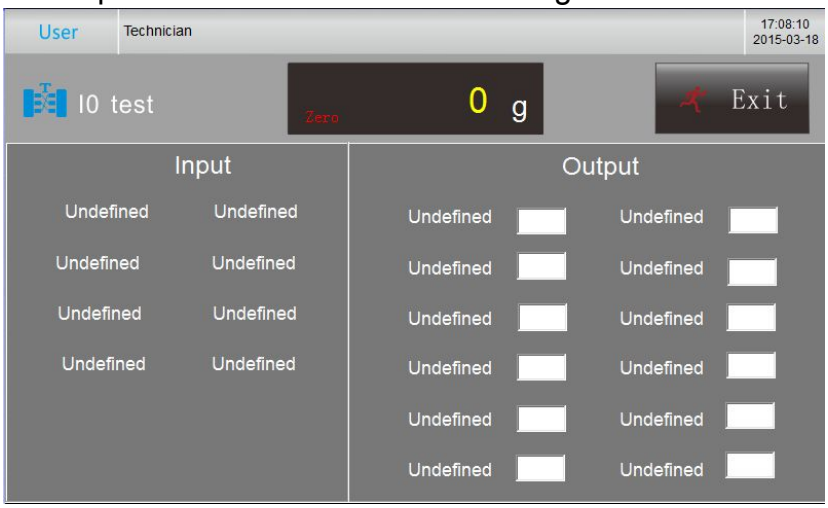


Fig 5-19 IO test interface

I/O test interface have two parts of input and output test. When input effectively, the lights will be bright. When test output, please select first, then output effectively.

5.2.3 **Communication parameter**

Set the controller RS232/RS485 serial port by communication parameter.

⇨ Press <**Communication**> in maintenance interface.

Enter communication parameter interface, as Fig 5-20

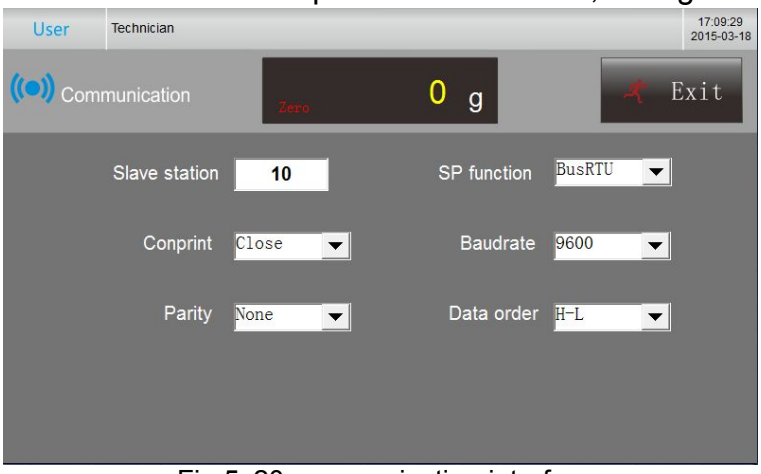


Fig 5-20 communication interface

"**Stave station**"

The checkweigher on the address of communication system.

"**SP function**"

Function of the RS232/RS485 selectable serial port.

Serial port function can set:

Modbus communication by BusRTU as following default parameters:

Baud rate: 9600

Data bits: 8

Parity: none

Stop bits: 1

Data order: H-L

Press "Send weight"，the device send result after each test.

Press "Print1"， print each test result if "**Conprint**" is open, and will print accumulation test result if "**Conprint**" is close.

"**Conprint**"

Open to print each test result, but **Close** to print accumulation test result.

"**Baudrate**"

Serial port communication baud rate.

"**Parity**"

Set none, odd or even.

"**Data order**"

Set H-L which means high byte in the front and low byte at back, or L-H H-L which means low byte in the front and high byte at back.

6 Communication protocol and parameter

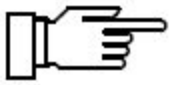
The device can communicate by RS232/RS485 selectable serial port and support Modbus communication protocol. Initial setting is RS232 serial port.Communication protocol address as follows:

Function address	Description
4 bytes read-write, integer	
0100	Current product identity
0114	Product length
0116	Nominal weight
0118	Upper deviation
0120	Lower deviation
0126	Tare
0130	Throughput
0134	Distance between end of weighing platform and centre of over rejector
0136	Distance between end of weighing platform and centre of under rejector
0142	Overweight reject time
0144	Underweight reject time
0158	Total batches
0160	Pass batches
0162	Consecutive reject batches
4 bytes read-write, float	
0116	Nominal weight
0118	Upper deviation
0120	Lower deviation
Read-only register(Function code 0x03), float	
0600	Real-time weight
0602	Current weight (Weight displayed)
0604	Total sum weight
0606	Qualified sum weight
0608	Qualified sum average weight
0612	Over sum weight
0614	Under sum weight

Read-only register(Function code 0x03), integer	
0638	Sampling label
0640	Total sum times
0642	Qualified sum times
0644	Qualified rate
0648	Over sum times
0650	Under sum times
Read-only bit（Function code 0x01，23 bits per time at most）	
0000	Stable-determination (Stable:1, Unstable: 0)
0002	Overflow (overflow: 1, normal: 0)
0004	Alarm (yes: 1, no: 0)
0006	Over (yes: 1, no: 0)
0007	Pass (yes: 1, no: 0)
0008	Under (yes: 1, no: 0)
……	reversed
Read-write bit（read function code 0x01，write function code 0x05）	
0015	Run
0016	Stop
0020	Zero
0021	Alarm clear
0022	Sum clear
0023	Print

7 Maintenance

7.1 Cleaning



Disconnect the power supply before cleaning the checkweigher.
When cleaning the checkweigher working site, the checkweigher must be covered.

The following are not permitted for cleaning:
- Sharp, hard, or pointed objects
- Water or steam jet devices
- Compressed air
- Cleaning agents that are hazardous to health or that contain solvents

Clean Belt and belt unit every day.

Clean touch screen, switch cabinet and light barrier once a week.

7.2 Maintenance

Check the wiring every month to secure that the wiring is reliable.

8 Troubleshooting

8.1 Alarm

If there is something wrong with the operation, the control system will send alarm message and display on touch screen. The common alarm messages, alarm reason and solutions list in table 8-1:

Table 8-1 Alarm message, reason and solution

Alarm message	Alarm reason	Solution
Over zero range	Current weight exceed 50% of the range of checkweigher	Alarm clear, current weight cannot be zeroed.
Overload	Current weight exceed range of checkweigher	Alarm clear, current weight cannot be weighed.
Too close	The distance between two products is too small that causes the checkweigher weigh two products at the same time	Alarm clear, the checkweigher can weigh one product per time, so the next product can only enter the weigh platform after the previous product leave the platform and the control system successfully back to zero. Readjust the distance between two products and check whether the length set in product parameter is right.
Unstable	When zero, the weight is not stable.	Alarm clear, confirm the reason caused the weight unstable, common reasons are disturbance of external air, disturbance of electromagnetic field, some object contact the platform and the foot screw not fix reliably. This solution apply when the stable sign do not appear normally.
Auto zero fail	After each test, the weighing system will carry out zero operation automatically, when this alarm occur, means that the zero operation fail.	Alarm clear, increase the BZSD range. Attention: This operation will affect the accuracy, so carry out this operation cautiously.
Reject error	The rejector receive new reject signal before finishing last reject action	Alarm clear, increase product distance.

8.2 Others

1. If there is loss of accuracy in using process, check as follows:

(1) Make sure that the foot screws touch the floor reliably. If there are foot crews not touch the floor, adjust the nut to make the foot screw touch floor reliably.

(2) Check whether the device is aligned horizontally.

(3) Check whether the motor wire is fixed, avoiding the wire hang in the air.

(4) Check whether there is object contact the platform and remove it if there is.

2. If it doesn't display weigh result when product pass through the weighing platform, check as follows:

(1) Check whether the device has been started, if not, start it.

(2) Check whether the light source and light barrier align, if not, the device cannot start work. Realign the light source and light barrier.

(3) Check whether product parameters are correctly set. If not, the checkweigher cannot work normally.