

CYD-W

Check Weigher

Operation Manual



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1. Instructions

1.1 Login interface

This check weigher system has two language interfaces: English and Chinese.



Fig.1-1 Login interface

During the boot process, please do not touch the screen panel, or it will enter the screen calibration interface. When the boot process is finished, the login interface will pop up as shown in Fig.1-1. Click “English” or “Chinese” button to enter the corresponding language interfaces. Now we take English interfaces for example.

1.2 System running interfaces

1.2.1 Main running interface

Notice:

Before running the whole system, please click “Main Menu” button to enter this menu and set the parameters. If the parameters are not modified properly, the weighing result will display 0.0g. Please refer to Chapter 3 for parameter setting rules.

System running interface includes four parts:

- 1) The top shows current time and date.
- 2) The left side displays the product information and some statistic information. The product **ID** can only be changed in Product Selection (the submenu of Main Menu), and the product

Name can only be changed in Basic Settings (Main Menu -> Product Settings -> Basic Settings). In other menus, these two items can only be checked. **Packages** is the number of product packages having passed the check weigher. **Qualified** means the qualified rate, which is the percentage of the qualified products over all the products. **Speed** is the weighing capacity, its unit is packages per minute, and it's a real time number.

- 3) The right side displays the check weighing result. Indicator lights show different weighing states, and the indicator bar shows whether the product is qualified or not. Please refer to the corresponding settings in later chapters.
- 4) The bottom part is the button operating area. Click “**MENU**” to enter Main Menu. “**ZERO**” button is zero clear button. If you click “**W-W**” button, the interface will switched between “Statistic running interface”, “Curve running interface” and “Main running interface”. Click “**CE**” button to clear all statistics. Click “**START**” button to start check weighing and click “**STOP**” to stop running.

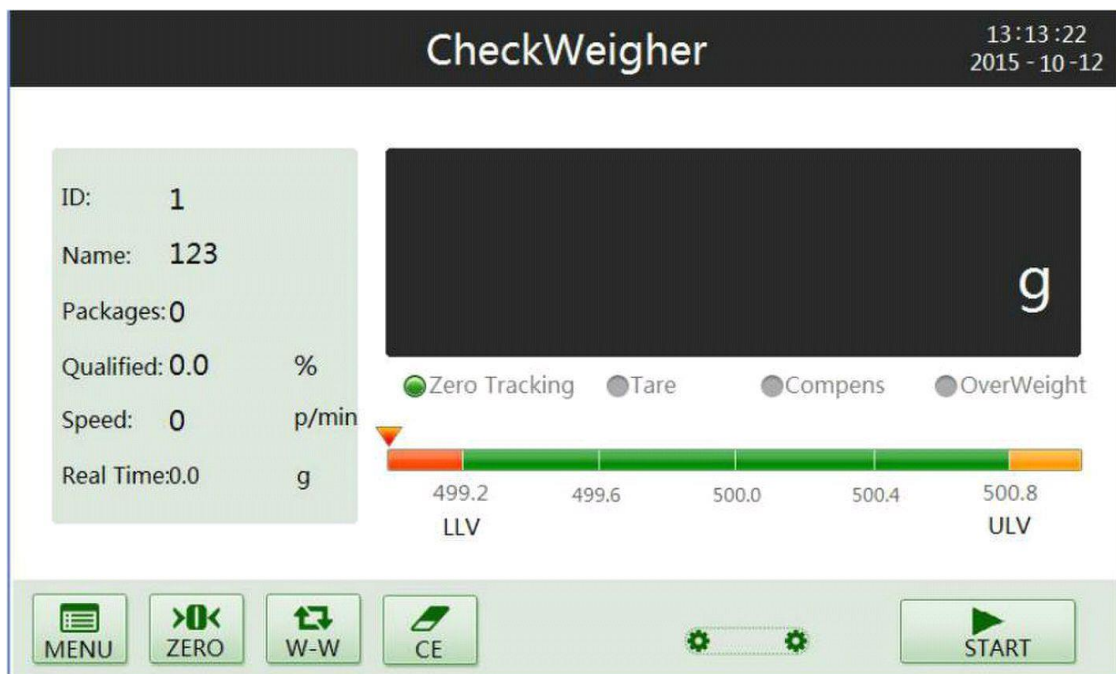


Fig.1-2 Main running interface

If the communication has no problem, a real time value will display in the main running interface. Put an object on the load receptor and then take it, the real time value is expected to change.

Click “**START**” button, the belts will be running at the specified speed and the whole system begins to run. When an object is passing the load receptor, its weight is supposed to display on the right side of the screen.

Note:

When the system is running, “**MENU**” button is disabled. Only when the system stops, this button will be enabled again.

If “**ZERO**” button is invalid, please check Manually zero clear in chapter 3.4.3.

1.2.2 Histogram and statistic interface

Path of statistic parameters: Main Menu -> System Settings -> Storage & Statistic Settings.

Storage & Statistic Settings include Statistics Display Mode, Number of packages of a batch, etc.

There are two Statistics Display Modes: Continuous updates and Batch updates. Number of packages of a batch means how many packages in a batch.

Now we'll discuss more details about the two display modes. When the package number is less than the Number of packages of a batch, the real time statistic STDEV and Mean (value) have nothing to display. When the package number just reaches the Number of packages of a batch, statistic information will be displayed right now. If the display mode is Continuous updates, STDEV and Mean (values) are always recalculated with each new arrival of products (based on recent Number of packages of a batch packages). But in Batch updates, only when the reaching package number is just the integral multiple times of the Number of packages of a batch can the STDEV and Mean be recalculated. Moreover, the display mode also affects histogram display. In Continuous update mode, when a new datum comes, it will display at the corresponding place, whereas in Batch updates, only when the reaching package number is just the integral multiple times of the Number of packages of a batch, the whole histogram will change at once.

This Statistic running interface includes 5 parts:

- 1) The top shows current time and date.
- 2) The left side displays the weight of recent 20 packages. The data is changing from the top to bottom (latest on the top and green).
- 3) The meaning of parameters in upper middle area is the same as those in main interface. Please refer to Chapter 1.2.1 for more details. Take Fig. 1-3 for instance, the part of middle 8 bars is the package distribution according to weight, the far left bar is the package numbers whose weight is less than 500.8g, and the far right bar is the package numbers whose weight is greater than 501.8g. **Total** is the total number of packages having passed through the check weigher. If you click "CE" button, it will be cleared. The lower part is the histogram display area. When the package number is less than the Number of packages of a batch, the histogram displays the weight distribution map of all the packages within the specified ranges according to their weight. When the packages is greater than the Number of packages of a batch, in Continuous update mode, the histogram displays the distribution map of the recent Number of packages of a batch packages. For instance, if Number of packages of a batch is 20, when the 78th package passes, the histogram is based on the 59th to 78th package (altogether 20 packages). In Batch update mode, the histogram still displays the 41th to 60th package weight distribution map (also based on 20 packages), and it won't be updated until the 80th package's coming.
- 4) The right side is statistic parameters. The upper part is real time statistic parameters area, and the lower part is historical statistic parameters part. **Batch** is the number of batches, which is the quotient of the total packages and Number of packages of a batch. **Unqualified** is, in the current batch, the number of products whose weights are not within the specified range. **Mean** (value) is the average of all the data in current batch. **STDEV** is the standard deviation of the data in current batch. **Maximum** is the maximum value of the data in current batch, and **Minimum** is the minimum value of the data in current batch. Click "CE" button, then Total, Batch, (real time) Unqualified, Mean, STDEV, Maximum, Minimum, History, (historical) Unqualified, Mean, Maximum, Minimum will be cleared.
- 5) The bottom part is the button operating area. Please refer Chapter 1.2.1 for more details.

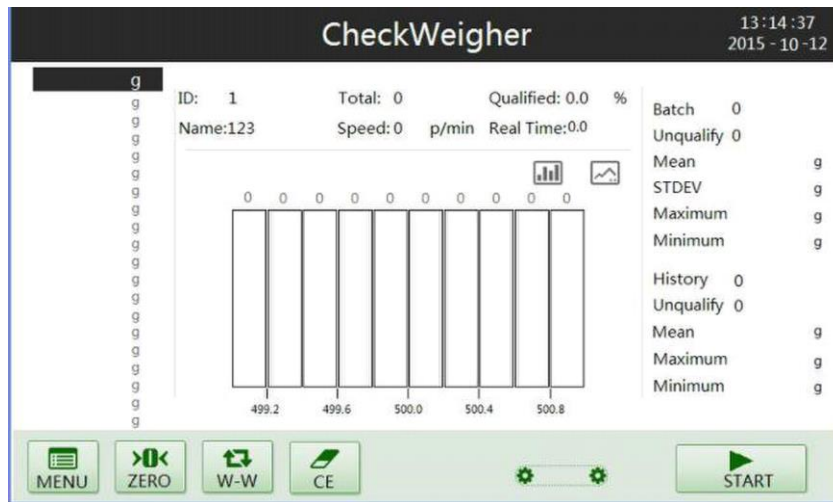




Fig.1-3 Histogram and statistic interface

1.2.3 Curve and statistic interface

Click picture  to enter curve running interface. The curve is drawn according to the weights of recent 20 packages. Click  to return to histogram.

The calculation method of curvilinear ordinates (The bottom coordinate is coordinate 1):

$$\text{interval} = (\text{upper limit} - \text{lower limit}) / 8$$

$$\text{coordinate 1} = \text{lower limit} - \text{interval}$$

$$\text{coordinate 2} = \text{lower limit} + 3 * \text{interval}$$

$$\text{coordinate 5} = \text{upper limit} - \text{interval}$$

$$\text{coordinate 2} = \text{lower limit} + \text{interval}$$

$$\text{coordinate 4} = \text{lower limit} + 5 * \text{interval}$$

$$\text{coordinate 6} = \text{upper limit} + \text{interval}$$

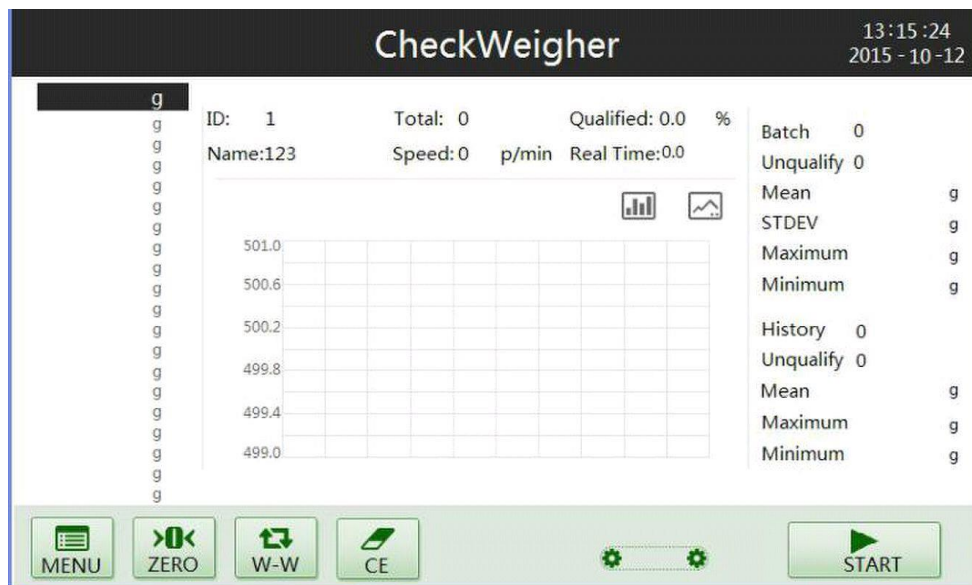


Fig. 1-4 Curve and statistic interface

Note that there are 20 points in the curve, and this number is fixed and has nothing to do with Number of packages of a batch. Please refer to Chapter 1.2.2 for more details.

2. Permission Settings

When you want to change parameters in Main Menu, you need to enter the password. The permission has two classes, Operator and Administrator. Operator can only select products, while administrator can access all settings.

2.1 Password verification

Click “MENU” button, an interface will pop up.

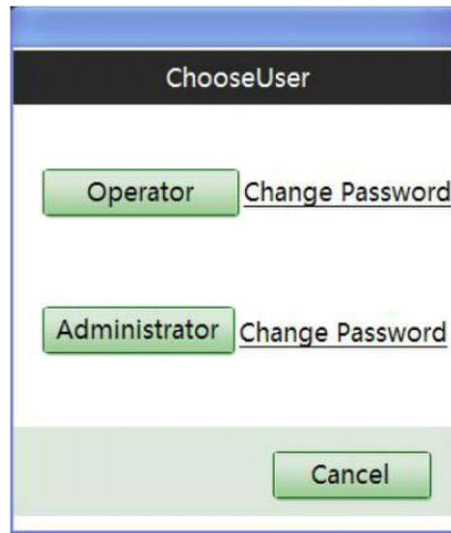


Fig.2-1 Choose User interface

Click “Operator” button and input the password, now you have the right of operator. Click “Administrator” button and input the password, now you have the right of administrator. The two passwords are not interfered with each other. The default password of Operator is 222, and that of Administrator is 111.

2.2 Changing Password

Click “Change Password” at the right of user identity, a small window, as shown in Fig. 2-2, will pop up: The new password can be set successfully only if the correct old password has been entered. The password range is 0~4294967295 and digits only.



Fig.2-2 Changing password window

3. Parameter Settings

In Main Menu window, gray buttons are not available and green buttons are available now. When the color of a text box is gray, this means unavailable or read only.

Click “MENU” button in main running interface and open the Main Menu as shown in Fig3.1.

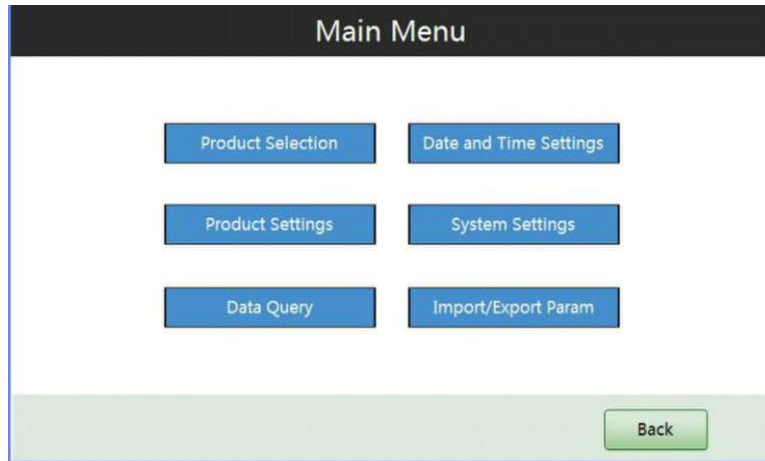


Fig. 3-1 Main Menu

Note that the “Import/Export Param” menu appears only when a U disk is connected to the check weigher.

3.1 Product Selection

The screenshot shows a 'Product Selection' interface with a dark header. Below the header, there are several input fields and buttons. The 'Product number' field is highlighted with a yellow background and contains the value '1'. Other fields include 'Product name' (123), 'Upper limit value' (500.8), 'Lower limit value' (499.2), 'Checkweighing limit' (200.0), 'UnderW. output On Time(ms)' (300), 'UnderW. Output delay(ms)' (300), 'OverW. output On Time(ms)' (300), 'OverW. output delay(ms)' (300), 'Feeding Belt Speed' (25.0 m/min), 'Weighing Belt Speed' (25.0 m/min), and 'Sorting Belt Speed' (25.0 m/min). There is also a radio button for 'Overweight products allowed' which is currently unselected. At the bottom right, there are two buttons: 'WriteToPLC' and 'Back'.

Parameter	Value
Product number	1
Product name	123
Upper limit value	500.8
Lower limit value	499.2
Checkweighing limit	200.0
UnderW. output On Time(ms)	300
UnderW. Output delay(ms)	300
OverW. output On Time(ms)	300
OverW. output delay(ms)	300
Feeding Belt Speed	25.0 m/min
Weighing Belt Speed	25.0 m/min
Sorting Belt Speed	25.0 m/min
Overweight products allowed	<input type="radio"/>

Fig.3-2 Product Selection interface

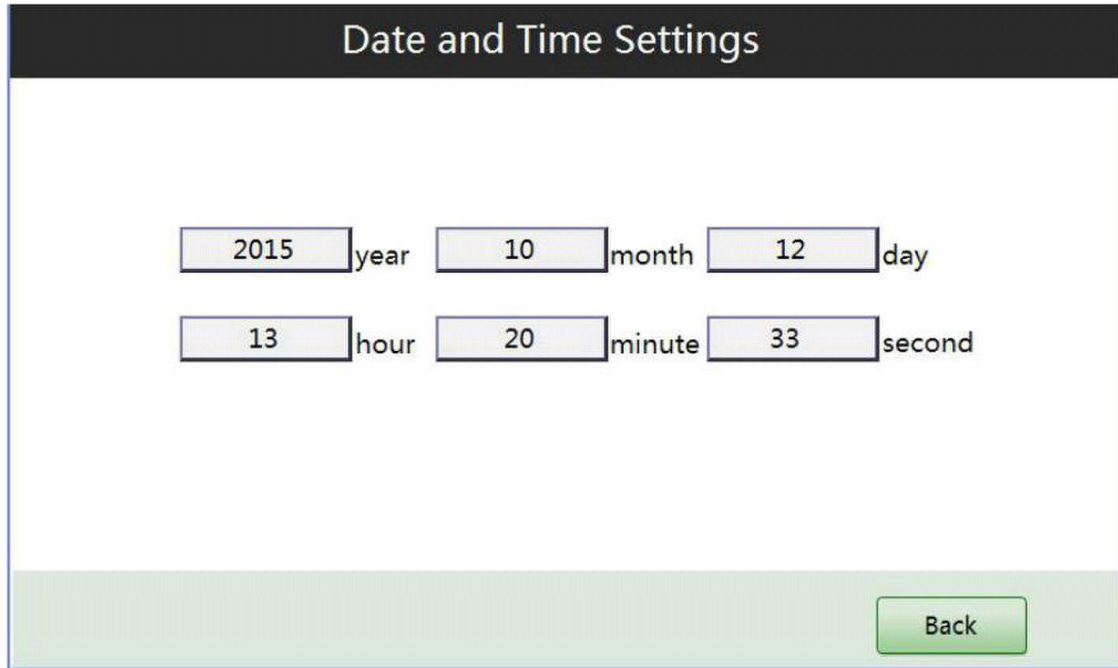
Product number: In this menu, only this parameter can be changed. By changing the product number, we can call out the different parameters or create a new formula. Its range is from 1 to 100. When a product number is written into PLC, all the parameters will be replaced with its corresponding new parameters.

Other parameters are read only parameters. Please refer to the corresponding settings interface for their description.

Notice:

- ① Click “Write To PLC” button, then a green indicator light is blinking at the lower left corner, which means the communication is busy. We must wait for its disappearance and have other operations.
- ② Please refer to Chapter 3.3.1 for more details about Upper limit value and Lower limit value.
- ③ Please refer to Chapter 3.3.4 for the explanation of Overweight output delay, Overweight output On Time, Underweight output delay, Underweight output On Time.
- ③ Please refer to Chapter 3.3.2 for the explanation of check weighing limit.

3.2 Date and Time Settings



The image shows a user interface for setting the date and time. At the top, there is a black header bar with the text "Date and Time Settings" in white. Below the header, the interface is divided into two rows of input fields. The first row contains three input boxes: the first contains "2015" followed by the label "year", the second contains "10" followed by "month", and the third contains "12" followed by "day". The second row contains three input boxes: the first contains "13" followed by "hour", the second contains "20" followed by "minute", and the third contains "33" followed by "second". At the bottom right of the interface, there is a green button with the text "Back".

Fig.3-3 Date and Time Settings interface

You can type the current date and time in this interface.

3.3 Product Settings

Click “Product Settings” button in Fig.3-1. Open the Product Settings interface as shown in Fig. 3-4.

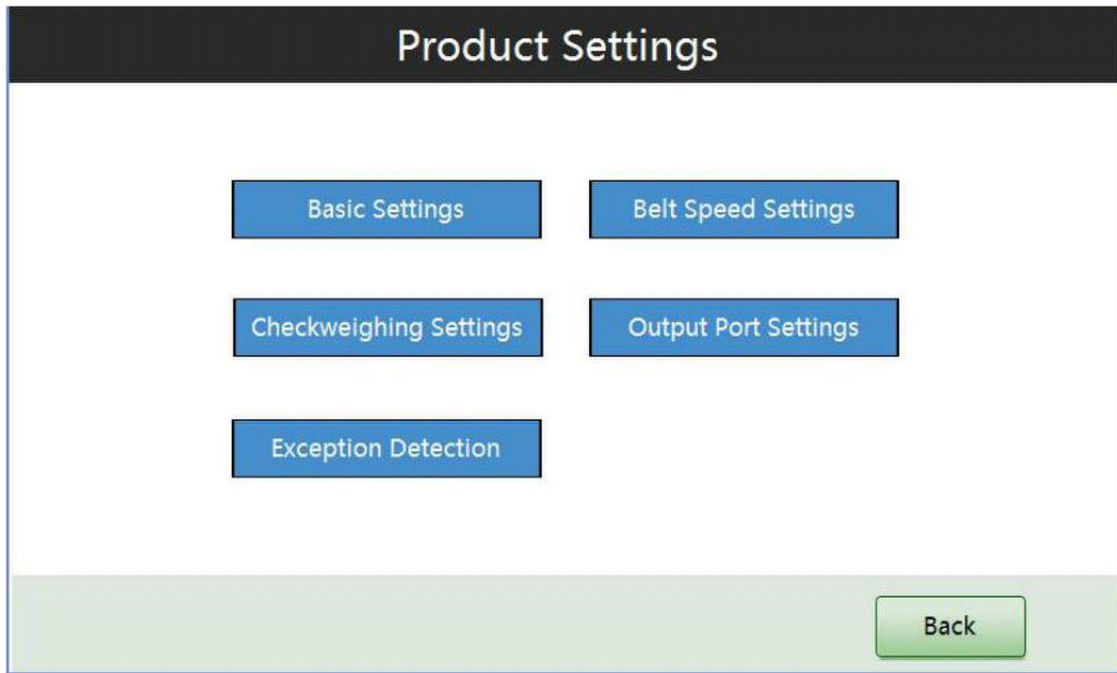


Fig.3-4 Product Settings interface

3.3.1 Basic Settings

The screenshot shows a 'Basic Settings' window with a grid of input fields and buttons. The parameters and their values are as follows:

Parameter	Value
Product number	1
Product name	123
Product length(mm)	0
Product width(mm)	0
Min. space between Products(mm)	0
Load Receptor length(mm)	0
Load Receptor width(mm)	0
Upper limit value	500.8
Reference weight	500.0
Lower limit value	499.2
Max check capacity(p/min)	0
Overweight products allowed	NO
Dynamic compensation value	0.0
Dynamic compensation Coefficient	1.0000
Tare value	0

At the bottom right, there are two buttons: 'WriteToPLC' and 'Back'.

Fig.3-5 Basic Settings interface

Here we can set a product's "Reference weight", "Upper limit value" and "Lower limit value", etc.

Upper limit value: the maximum value of the check weighing range. If the weight of current object is heavier than this value, the object is considered as overweight.

Reference weight: the standard reference weight of this product. The range between Upper limit value and Reference weight, as well as the range between Reference weight and Lower limit value, constitute the qualified products range.

Lower limit value: the minimum value of the check weighing range. If the weight of current object is less than this value, the object is considered as underweight.

Overweight products allowed: If you choose Yes, when the check weighing result exceeds the Upper limit value, the rejectors make no response, and this value won't affect the unqualified statistics, and the corresponding indicator in the main running interface will be illuminated.

Dynamic compensation value: The default value is 0.

Dynamic compensation coefficient: The default value is 1. If either of the two parameters is changed, the corresponding indicator in the main running interface will be illuminated.

Weight displayed = weight measured * Dynamic compensation coefficient + Dynamic compensation value

3.3.2 Check weighing Settings

The screenshot shows the 'Checkweighing Settings' interface. It features a title bar at the top. Below the title, there are several sections for configuration. The 'Check type' section has a dropdown menu currently showing '0' and a list of options: '0:Limit in,limit out', '1:Switch1 On in, switch2 On out', '2:Switch1 On in, limit out', '3:Limit in, switch2 On out', '4:Switch1 On in, switch1 Off out', and '5:Switch1 Off in, switch1 On out'. The 'Data process mode' section has a dropdown menu showing '0' and a list of options: '0:Digital filter mean value process', '1:Digital filter maximum value process', and '2:Digital filter latest value process'. To the right of these dropdowns are input fields for 'Checkweighing limit' (200.0), 'Check time(ms)' (4000), 'Data process effective percent' (30), 'Digital filter intensity' (3), and 'Digital filter coefficient' (3.0). At the bottom left, there is a 'Product number' field with the value '1'. At the bottom right, there are two buttons: 'WriteToPLC' and 'Back'.

Fig.3-6 Check weighing Settings interface

Check type: Determines when the product/object is in or out of the load receptor. Here Switch 1 and 2 are photo couplers. Default is 0. (Whether an object is in or out of the weighing belt is up to the check weighing limit.)

0: digital filter mean value processing, suitable for objects with regular shape, e.g. cartons (used along withALP)

1: digital filter maximum value processing, suitable for objects with regular shape, e.g. cartons

2: digital filter latest value processing, suitable for objects with regular shape, e.g. cartons, or irregular shape, e.g. plastic bags.

Data process mode: the check weighing data processing methods.

Check weighing limit: In the process of self-learning, only the weight of the object greater than this limit is valid, and successful self-learning time is increased by 1. In the process of WIM testing, only the weight greater than this limit will be outputted.

Check time (ms): If the time when the object is on the load receptor is longer than the value specified here and the weight of the object is heavier than Check weighing limit, the check weigher will generate the check weighing result after this time automatically and will not generate it again when the object is out of the load receptor.

Data process effective percent: If you're using mean value processing, this parameter means only the middle percentage data will be calculated. For example, 20 means only the 20% of the whole sampled data will be processed. The higher the speed is, the smaller the percent should be.

Digital filter operator : The digital filtering strength for the check weighing data. The greater the number is, the better the digital filtering effect is, but the longer the weight becomes stable. It is recommended to choose a relatively small value to let the check weighing result become stable soon. Before self-learning, please change it to 3.

Digital filter intensity : Usually, the higher the speed is, the greater this parameter should be. However, a large one may result in several results returns after a sampling, which may be solved by raising the Check weighing limit. Default value is 6.4. Before self-learning, please change it to 8.0.

3.3.3 Belt Speed Settings

Belt Speed Settings

Feeding Belt Speed
25.0 m/min

Weighing Belt Speed
25.0 m/min

Sorting Belt Speed
25.0 m/min

Product number
1

Back

Fig.3-7 Belt Speed Settings

This settings window include 3 settings: Feeding belt speed, Weighing belt speed and Sorting belt speed. You can set different speeds in these text boxes.

3.3.4 Output Port Settings

Output Options	output On Time(ms)	Output delay(ms)
Normal weight output options < 0:Close >	300	300
Overweight output options < 2:PortOutput >	300	300
Underweight output options < 2:PortOutput >	300	300

Product number: 1

Buttons: WriteToPLC, Back

Fig.3-8 Output Port Settings interface

Normal weight output options: chooses an output option when the weighing result is normal, including 0: Close 1: Halt 2: Port Output.

Overweight output options: setting method is the same as above.

Underweight output options: setting method is the same as above.

Normal weight output On Time (ms): If the weighing result is normal, this is duration of rejection time when the output signal is On. The unit is ms.

Normal weight output delay (ms): If the weighing result is normal, this is the time that it will be delayed to begin rejecting. The unit is ms.

Overweight output On Time (ms): If overweight, this is the duration of rejection time when the output signal is On.

Overweight output delay (ms): If overweight, this is the time to be delayed before rejection. The unit is ms.

Underweight output On Time (ms): If underweight, this is the duration of rejection time when the output signal is On.

Underweight output delay (ms): If underweight, this is the time to be delayed before rejection.

3.3.5 Exception detection

Exception Detection

Continuous unqualified check enabled
NO

Continuous unqualified output
0:Close

Continuous unqualified sampled number
10

Empty bag detect enabled
NO

Empty bag detect delay(ms)
10

Product number
1

WriteToPLC Back

Fig.3-9 Exception detection

Exception detection includes continuous unqualified check and empty bag detection.

In continuous unqualified check settings, firstly enable or disable the first option. If you enable it, then you can set the following two options. If the continuous unqualified sampled number is 10 and continuous unqualified output is 2, then after 10 continuous unqualified samples pass, the IO port will output a signal.

In empty bag detection, you need to set the empty bag detection enabled option and empty bag detection delay which is the delay between detection of an empty bag and rejection. The unit of the latter is ms.

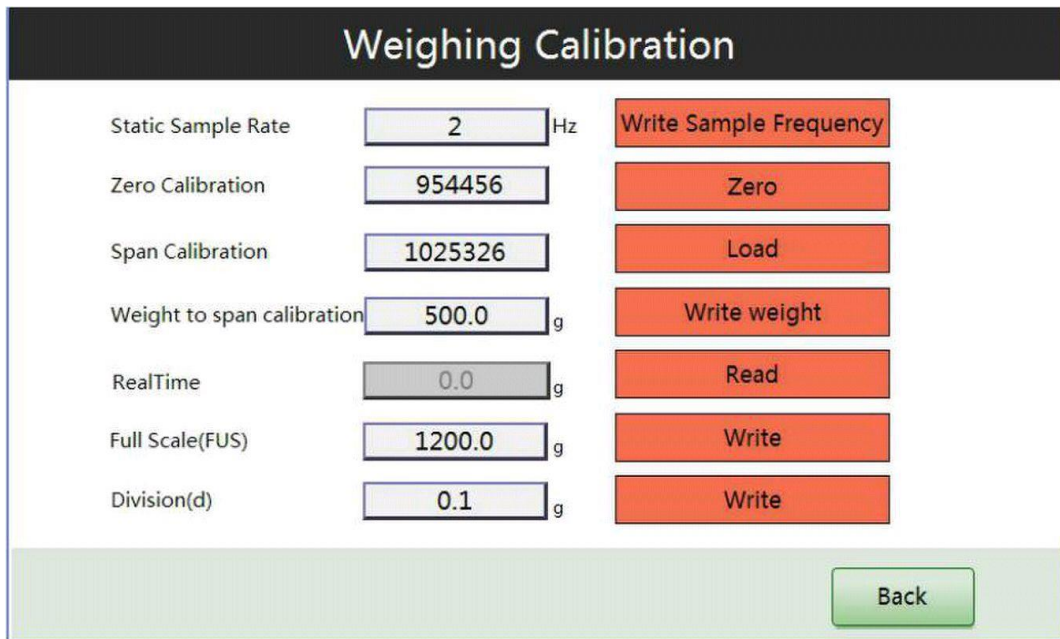
3.4 System Settings

Click “System Settings” button in Main Menu, the following window will pop up.



Fig.3-10 System Setting interface

3.4.1 Weighing Calibration



The screenshot shows a 'Weighing Calibration' interface with the following fields and buttons:

Parameter	Value	Unit	Action Button
Static Sample Rate	2	Hz	Write Sample Frequency
Zero Calibration	954456		Zero
Span Calibration	1025326		Load
Weight to span calibration	500.0	g	Write weight
RealTime	0.0	g	Read
Full Scale(FUS)	1200.0	g	Write
Division(d)	0.1	g	Write

A 'Back' button is located at the bottom right of the interface.

Fig.3-11 Weighing Calibration interface

Calibration steps:

1. **Zero Calibration:** Click “Zero” button with now load on the load receptor, then the corresponding original count will display in the left text box.
2. **Span Calibration:** Place a standard weight on the load receptor and wait for a while, then click “Load” button. Then the corresponding original count will display in the left text box.
3. **Weight to span calibration:** Enter the weight of the load in the left text box, then click “Write weight” button. For instance, if you’re using a 500g weight, you should enter 500.0 in the text box.
4. Click “Read” button to check and display the real time weight.
5. **Full Scale (FUS):** the full scale (capacity) of the check weigher, e.g. 1200.0g
6. **Division (d):** the division of the check weigher. The default value is 0.1g..

3.4.2 Self-learning Settings

The screenshot shows a software interface for configuring self-learning settings. The title is 'Self-Learning Settings'. The settings are arranged in two columns. The left column contains: 'Self-learning Times' with a value of 5; 'Standard Weight' with a value of 500.0 g; and 'Place the package for the' with a value of 0 time. The right column contains: 'Digital filter intensity' with a value of 3; and 'Digital filter coefficient' with a value of 3.0. At the bottom of the interface are three green buttons labeled 'Start', 'Stop', and 'Back'.

Fig.3-12 Self-learning Settings

Self-learning Times:

Presets self-learning times (usually 5 or 6 times), namely, the times we will let a standard sample pass the check weigher.

Standard Weight: standard static weight of the sample.

Place the package for the Nth time: When the self-learning begins, please place the package to the feeding belt several times according to this tip.

Please refer to Chapter 3.3.2 for the explanation of **Digital filter operator** and **Digital filter intensity**.

Having set the first two parameters, click “**Start**” button. Each time the sample passed through the check weigher, N is increased by 1. When it equals self-learning times, the self-learning is finished. The result may be successful or failed. If it is successful, digital filter operator, intensity and compensation value will be updated.

Please check the following directory for Digital filter parameters:

Main Menu -> Product Settings -> Check weighing Settings

If the self-learning is completed, the belts will be stopped automatically. You can also click “stop” button during the self-learning process to force the process to stop.

3.4.3 Zero Point Settings

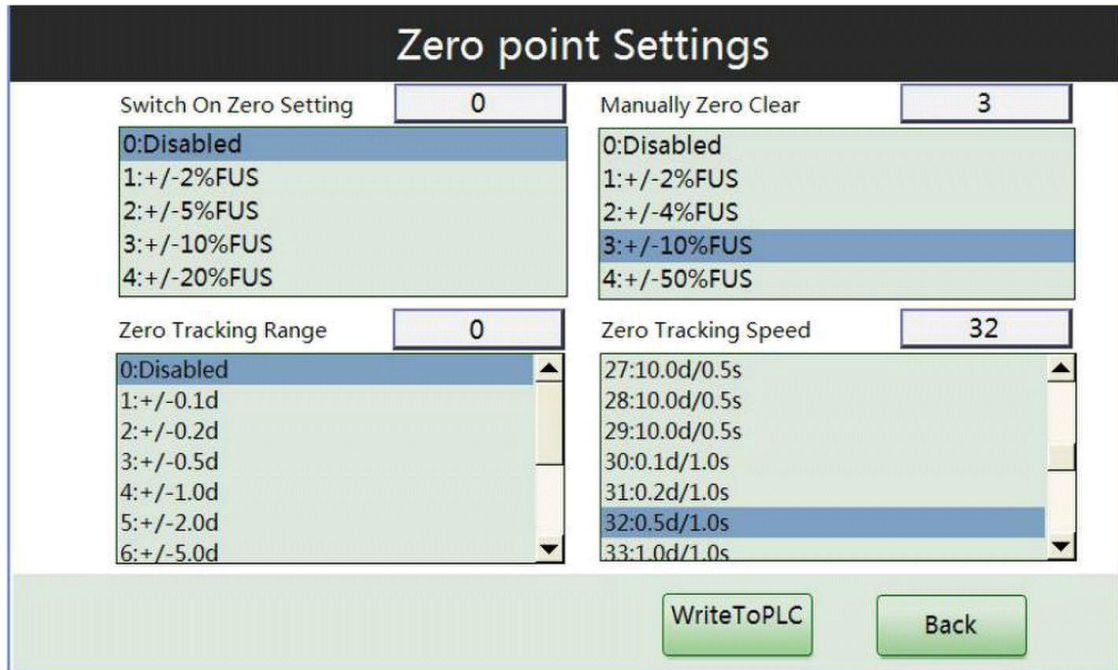


Fig.3-13 Zero Point Settings

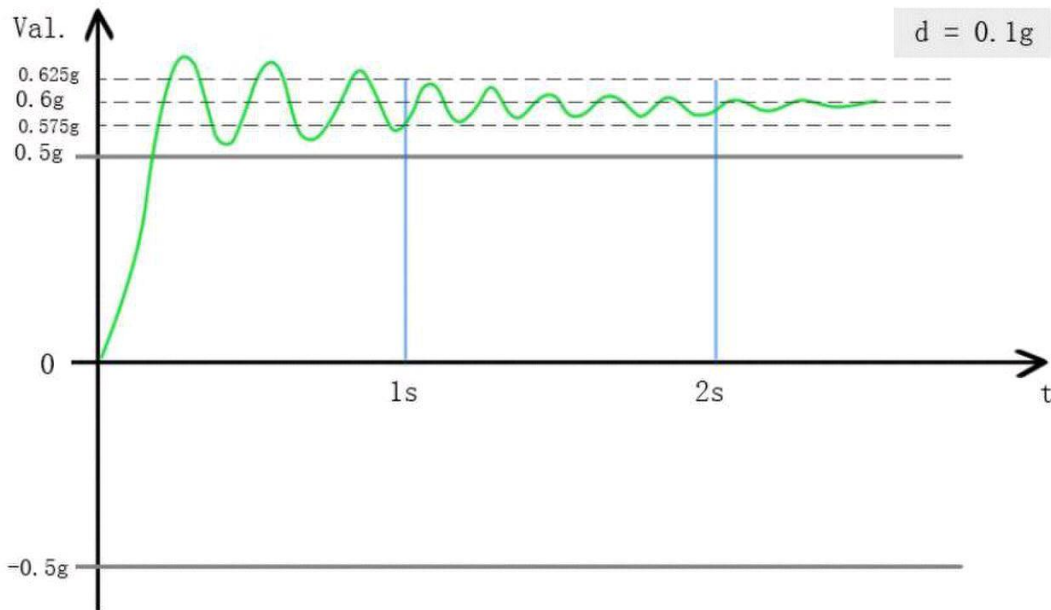
Switch-On Zero Setting: When the check weiger is switched on or rebooted, in the following 2.5 seconds, if the weight value is within this range, the check weiger is zero cleared automatically. If the weight value exceeds the range, zero clear will fail.

Manually Zero Clear: Manually zero clear range.

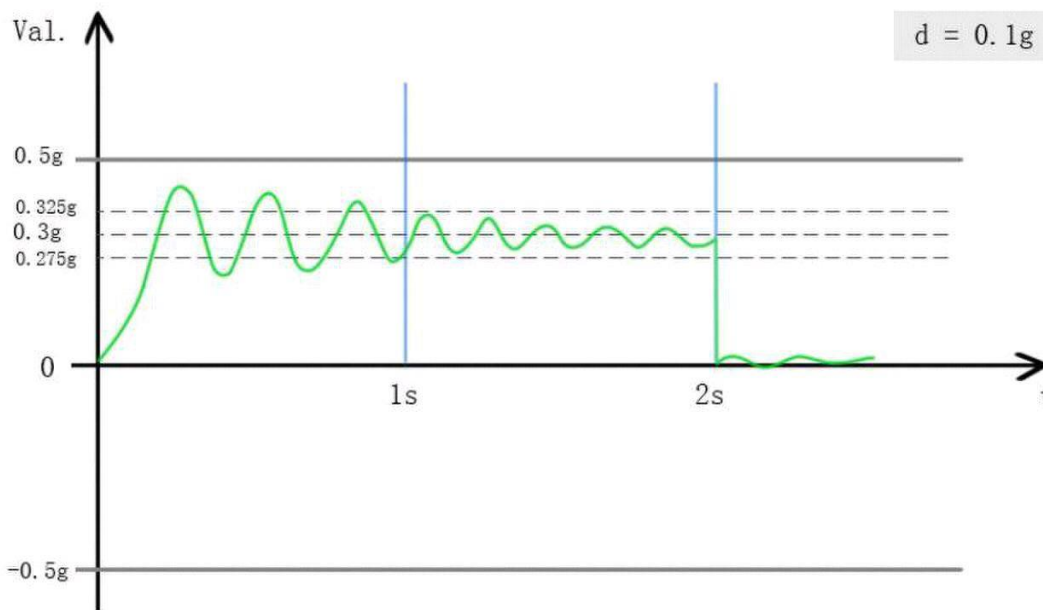
Zero Tracking Range: If the measured weight value is within the zero tracking range specified here, the check weiger will begin zero tracking. Otherwise, the check weiger will stop zero tracking.

Zero Tracking Speed: It is related to the capability of zero tracking. Usually the greater the speed is, the more powerful the zero tracking capability is, and the more stable the zero point is.

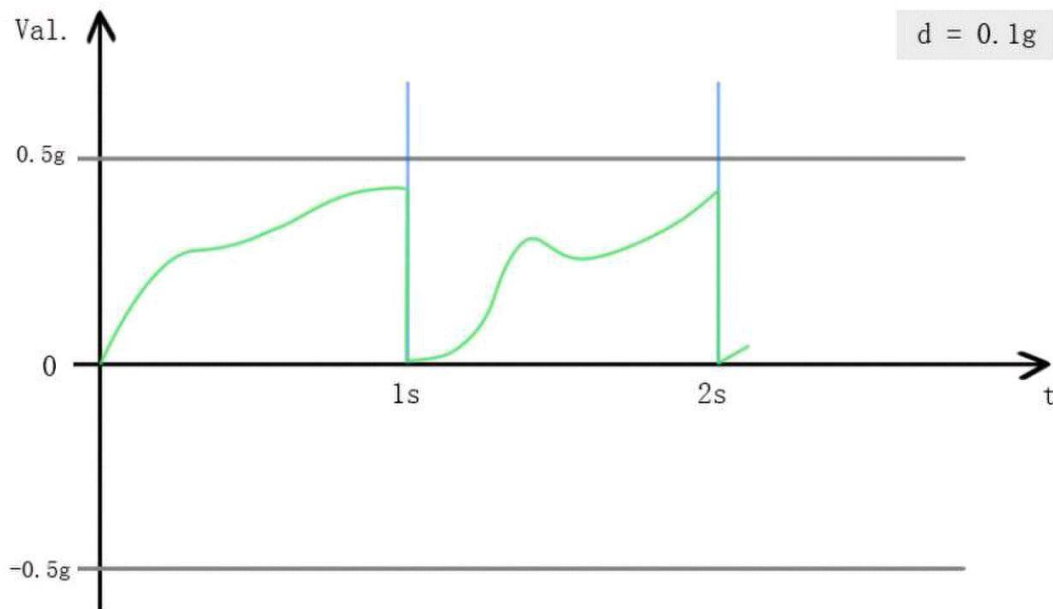
For example, if the division (interval) is 0.1g and the Zero Tracking Range is $\pm 5.0d$ (namely, $\pm 0.5g$), when the weight value is greater than 0.5g or less than -0.5g, the check weigher will not track zero. (see chart below)



If weight value fluctuation is within $\pm 0.5g$, then we must check Zero Tracking Speed. For instance, ZTS is set to $0.5d/s$, which means if the fluctuation in a second is within $\pm 0.25g$, the checkweigher will track zero. (see chart below)



Note: The Zero Tracking function of our checkweighers is implemented each time (not accumulated). For example, $d=0.1g$, $ZTR=\pm 5.0d(\pm 0.5g)$, $ZTS=10d/s (\pm 5.0d/s = \pm 0.5g/s)$. Because the ZTS and ZTR are all within 0.5g, after 1 second, the checkweigher will track zero. And the value cleared will not affect the next second implementation.



3.4.4 Storage&Statistic Settings

Storage&Statistic Settings

<h3>Storage Settings</h3> <p>Error Report Storage Capacity <input style="width: 100px;" type="text" value="0"/></p> <p>Checking Weight Storage Capacity <input style="width: 100px;" type="text" value="21500"/></p>	<h3>Statistics Settings</h3> <p>Statistics Object <input style="width: 100px;" type="text" value="0"/></p> <p>0:All products 1:Qualified products</p> <p>Statistics Display Mode <input style="width: 100px;" type="text" value="0"/></p> <p>0:Continuous update 1:Batch update</p> <p>Number of packages of a batch <input style="width: 100px;" type="text" value="20"/></p>
--	--

Fig.3-14 Storage &Statistic Settings

Note that Number of packages of a batch must be an integer and no less than 13.

Please refer to Chapter 1.2.2 for the description of Number of packages of a batch, Continuous updates and Batch updates.

3.4.5 Belt Speed Calibration

Please choose the motor type from below according to the motor connected, or enter 0 for DC motor 1 for AC motor in the text box, as shown in Fig.3.13. DC motor's speed calibration is the same as AC motor's. Now we take DC motor for example.

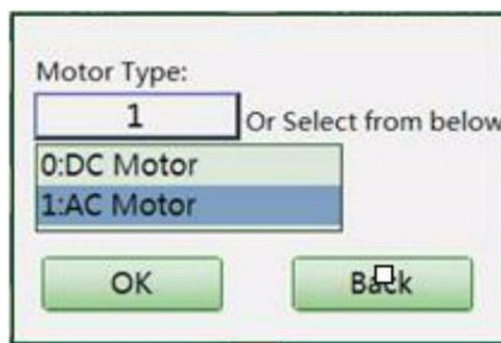


Fig.3-15 Motor Type Selection

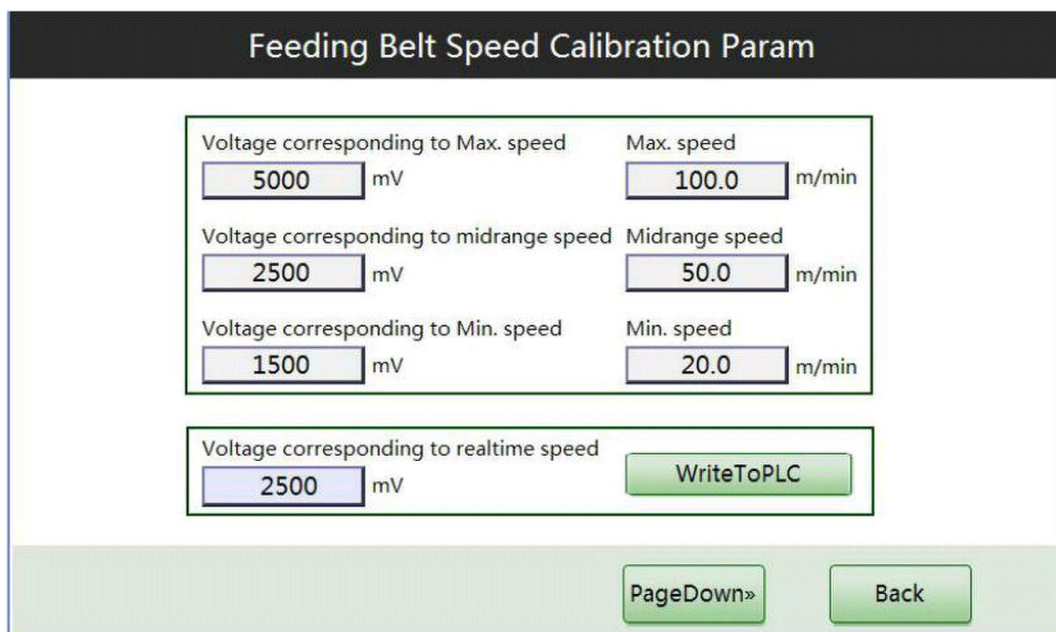


Fig.3-16 Feeding Belt Speed Calibration Param (DC motor)

Belt speed calibration needs relationships between 3 different belt speeds and their corresponding voltages. Of the check weigher belts, the Maximum speed is about 100 m/min and the Minimum speed is about 20 m/min, and their corresponding voltages are about 4500 mV and 1100mV.

Step 1: Having noticed the numbers mentioned above, we try to enter a number in “Voltage corresponding to realtime speed” text box and ensure the feeding belt speed is no less than 20 m/min, and click “WriteToPLC” button. Then the feeding belt starts running.

Step 2: Use a tachometer to measure the speed of the feeding belt. If we entered 1000 (mV) in the previous step, now the speed is 18.5 m/min which doesn’t meet the requirement. So we need to repeat Step 1 again and this time we enter a greater number, say 1120. And we measure the speed of feeding belt again the tachometer shows 22.8 m/min. That’s OK.

Step 3: Enter 1120 to “Voltage corresponding to Min. Speed” text box and enter 22.8 to “Min. speed” text box.

Step 4: Set the midrange speed and Max. speed according to the method above. Note that when we set the voltage corresponding to Maximum speed, we should adopt a relative conservative number to ensure the speed will not exceed 100 m/min

Click “PageDown” button, change the parameters of weighing belt and sorting belt using the similar method.

Weighing Belt Speed Calibration Param	
Voltage corresponding to Max. speed	Max. speed
5000 mV	100.0 m/min
Voltage corresponding to midrange speed	Midrange speed
2500 mV	50.0 m/min
Voltage corresponding to Min. speed	Min. speed
1500 mV	20.0 m/min
Voltage corresponding to realtime speed	WriteToPLC
2500 mV	

<<PageUp PageDown>> Back

Fig.3-17 Weighing Belt Speed Calibration Param (DC motor)

Sort Belt Speed Calibration Param

Voltage corresponding to Max. speed	Max. speed
<input type="text" value="5000"/> mV	<input type="text" value="100.0"/> m/min
Voltage corresponding to midrange speed	Midrange speed
<input type="text" value="2500"/> mV	<input type="text" value="50.0"/> m/min
Voltage corresponding to Min. speed	Min. speed
<input type="text" value="1500"/> mV	<input type="text" value="20.0"/> m/min

Voltage corresponding to realtime speed	WriteToPLC
<input type="text" value="2500"/> mV	

Fig.3-18 Sorting Belt Speed Calibration Param (DC motor)

The belt speed calibration for AC motors is similar to that of DC motors. Note that frequency of inverter corresponding to the Maximum speed and Minimum speed are about 46 Hz and 11 Hz.

Feeding Belt Speed Calibration Param

Frequency corresponding to Max. speed	Max. speed
<input type="text" value="50.00"/> Hz	<input type="text" value="100.0"/> m/min
Frequency corresponding to midrange speed	Midrange speed
<input type="text" value="25.00"/> Hz	<input type="text" value="50.0"/> m/min
Frequency corresponding to Min. speed	Min. speed
<input type="text" value="15.00"/> Hz	<input type="text" value="20.0"/> m/min

Frequency corresponding to realtime speed	WriteToPLC
<input type="text" value="25.00"/> Hz	

Fig.3-19 Feeding Belt Speed Calibration Param (AC motor)

Weighing Belt Speed Calibration Param

Frequency corresponding to Max. speed <input style="width: 80%;" type="text" value="50.00"/> Hz	Max. speed <input style="width: 80%;" type="text" value="100.0"/> m/min
Frequency corresponding to midrange speed <input style="width: 80%;" type="text" value="25.00"/> Hz	Midrange speed <input style="width: 80%;" type="text" value="50.0"/> m/min
Frequency corresponding to Min. speed <input style="width: 80%;" type="text" value="15.00"/> Hz	Min. speed <input style="width: 80%;" type="text" value="20.0"/> m/min

Frequency corresponding to realtime speed <input style="width: 80%;" type="text" value="25.00"/> Hz	<input type="button" value="WriteToPLC"/>
--	---

Fig.3-20 Weighing Belt Speed Calibration Param (AC motor)

Sort Belt Speed Calibration Param

Frequency corresponding to Max. speed <input style="width: 80%;" type="text" value="50.00"/> Hz	Max. speed <input style="width: 80%;" type="text" value="100.0"/> m/min
Frequency corresponding to midrange speed <input style="width: 80%;" type="text" value="25.00"/> Hz	Midrange speed <input style="width: 80%;" type="text" value="50.0"/> m/min
Frequency corresponding to Min. speed <input style="width: 80%;" type="text" value="15.00"/> Hz	Min. speed <input style="width: 80%;" type="text" value="20.0"/> m/min

Frequency corresponding to realtime speed <input style="width: 80%;" type="text" value="25.00"/> Hz	<input type="button" value="WriteToPLC"/>
--	---

Fig.3-21 Sorting Belt Speed Calibration Param (AC motor)

3.4.6 Restart HMI

Click “Restart HMI” button and the HMI will be rebooted.

3.5 Data Query

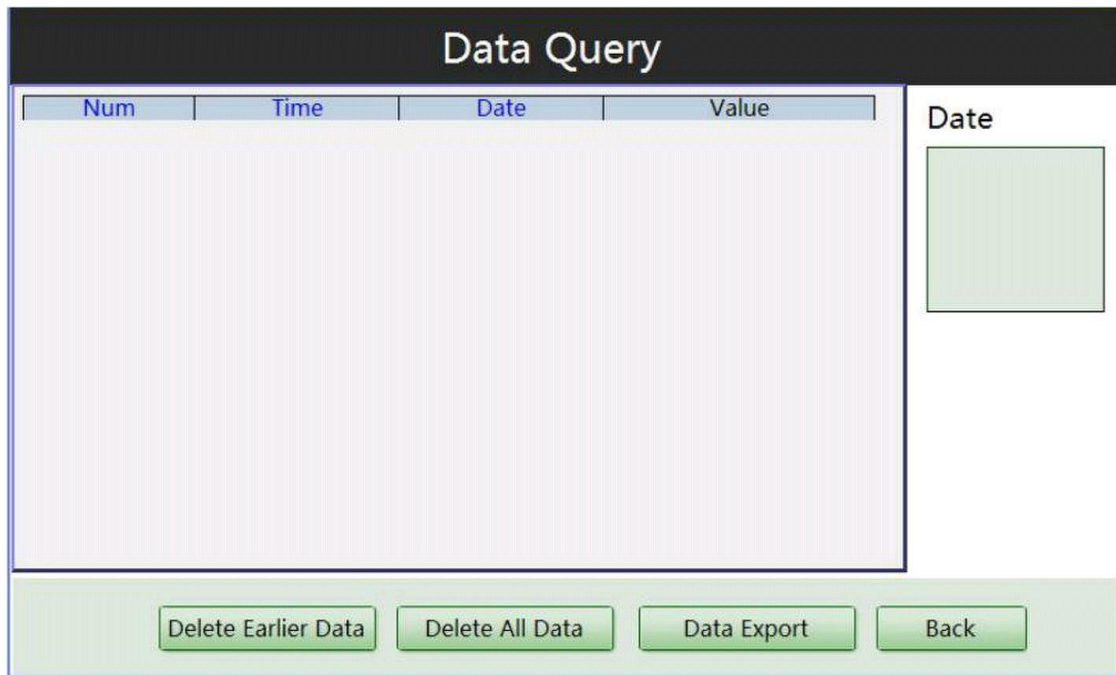


Fig.3-22 Data Query

The historical data can only save the data of recent 3 days.

Delete Earlier Data: deletes earlier data.

DeleteAll data: deletes all the historical records.

Note that if some data have been deleted, the interface may be refreshed only when you enter again.

Data Export : the default directory is a folder named **\datalog\DataRecord** of external storage device. When the data is being exported, there is a blinking icon at the lower left corner.

3.6 Import/Export Param



Fig.3-23 Import / Export interface

When a U disk is connected, click “Export to U Disk” and the data will be exported to a file named **em0.emi** in the U disk. When the export is finished, there will pop up a window.

If you want to import the parameters from a U disk, there must be a file named **em0.emi**. Then click “Import from U disk” button.

4. An operation example

Here we take wheat for example to explain how to operate. The net weight of each package of wheat is 500g, the weight of plastic bag is 10g, and the lower limit range is 1g and the upper limit range is 3g. The check weigher will reject all the overweight or underweight products.

Tip: When entering the Main Menu, you need to choose a user and input the password. The default password of Operator is 222, and that of Administrator is 111.

● If this is the first time to run the check weigher, follow the steps below:

1. Calibration: Main Menu -> System Settings -> Weighing Calibration (3.4.1)
 2. Set proper belt speed, which should be the same as or a little bit faster than the preceding feeding belt speed to prevent the accumulation of products. Main Menu -> Product Settings -> Belt Speed Settings (3.3.3).
 3. Add a formula:
 - 1) In Main running interface, click “MENU” and enter the Main Menu using an administrator ID. Click “Product Selection”, then select “Product number” text box and type the formula number of wheat from 1-100, say 5, which means the formula parameters of wheat will be stored in Product number 5.
 - 2) Product Settings -> Basic Settings. In this menu, enter the Product name “Wheat”, and 513 as Upper limit value, 510 as Reference Weight, 509 as Lower limit value. Select “No” in Overweight products allowed, input 0 as Dynamic compensation value, 1 as Dynamic compensation coefficient.
 - 3) Product Settings -> Check weighing Settings. In this menu, select type0 as Check type (in and out of load receptor based on weight detection), select mean value processing (mode 0) as Data process mode, Check weighing limit 150 (g), Check time 8000 (ms), Data process effective percent 30. The Digital filter operator and Digital filter intensity can either be entered manually, or be automatically determined by the check weigher after self-learning. When you do the self-learning, enter Main Menu -> System Settings -> Self-learning Settings.
 - 4) If we use self-learning, please disable zero tracking parameters in chapter 3.4.3. Then enter Main Menu -> System Settings -> Self-learning Settings. Take a bag of wheat at hand for example, its static weight is 510.6g, then type the 510.6 to textbox of Standard Weight (it won't affect the Reference weight of 510.0g). Then let this bag of wheat pass the check weigher several times and the check weigher will automatically determine the parameters. (Please refer to chapter 3.4.2)
 - 5) If necessary, set other parameters, such as Output Port Settings in chapter 3.3.4.
4. Modify parameters according to measuring results:

Return to Main running interface, click “START” button, and the belts start running. The real time check weighing results will display on the touch screen. Suppose the number of packages of a batch is 20, use the same sample to pass the check weigher 20 times. If the mean value in statistics is 509.7g, we'd better change the dynamic compensation value to 0.9 (510.6-509.7, just leave the dynamic compensation coefficient to 1). If the standard deviation is 0.12g, 3σ is 0.36g (about 0.4g), we can change the upper limit value to 509.4g and upper limit value to 512.6g.

5. Put into service.

● If the parameters of the product have existed, you, as an operator or administrator, can directly select the Product number (formula number) in the Product Selection interface. And click “Write To PLC”, return to Main running interface. Then click “START” to begin running.

5. Additional information

Parameters of inverter:

2-00, source of main frequency: d4, from RS-485 communication interface

2-01, source of running instruction: d4, operating on RS-485 communication interface, keyboard
ATOP is invalid

2-04, reverse rotation prohibited: d2, forward rotation prohibited

9-01, communication rate: d1, Baud rate 9600

9-04, communication file format: d7,8, E,1