AD-4412-CW

INSTRUCTION MANUAL

Weighing Indicator

1WMPD4003953

A&D Company, Ltd.

WARNING DEFINITIONS

The warnings described in this manual have the following meanings:

⚠WARNING	A potentially hazardous situation which, if not avoided, could result in death or serious injury.
⚠CAUTION	A potentially hazardous situation which, if not avoided, may result in minor or moderate injury or damage to the instrument.
	This symbol indicates caution against electrical shock. Do not touch the part where the symbol is placed.
	This symbol indicates the ground terminal.
	This symbol indicates that an operation is prohibited.
Note	Information or cautions to use the device correctly.

The contents of this manual and the specifications of the instrument covered by this manual are subject to change for improvement without notice.

Contents

1. Introduction

1.1. Features

The AD-4412-CW is the indicator designed for classifying the weighing product on conveyor.

Display Unit

- The indicator equips 7-inch sensitive touch screen considered with operability.
- The indicator realizes easy readability and operability using the touch screen.

Dustproof & waterproof structure

- The indicator equips waterproof construction complying with IP65 when mounting on panel.

Functions

- The indicator can store 1000 products (100 products for each 10 group) in maximum.
- The indicator can read picture from USB memory and display it on touch screen.
- User data can be stored, classified and managed properly using management level. Therefore safety weighing operation can be performed.
- The indicator can perform serial communication and communicate with peripherals to support modbus using TCP/IP communication and no program.

Output & input Interface

- General input, rejecter output, alarm output, RS-232C / RS-485 input / output and TCP/IP are equipped as standard model.

1.2. Safety Precautions

Read the following precautions to use the indicator safely before use surely.

⚠ Caution

Hazard of rotating object

- ❑ Keep hands and fingers away from the rotating part while the indicator is running.
- ❑ If product on conveyor stays, falls over or spills, stop the indicator immediately, turn the power off and take necessary actions.

Hazard of electrical shock

- ❑ Be sure to turn the power off before removing the display cover or control box cover for inspection.
- ❑ Keep the power turned off during the inspection.
- ❑ Turn the power on after the installation has been complete.

Precautions for installation

- ❑ Install the indicator on a solid surface away from sources of vibration.
- ❑ Install the indicator in an area where it is not exposed to direct sunlight.
- ❑ Install the indicator in an area where it is not subject to direct flow from the window, electric fan or air conditioner.

Grounding

- ❑ Be sure to ground the indicator to avoid electrical shock, fire or malfunction.

Precautions for use

- ❑ Do not apply shock or excessive external force to the weighing conveyors.
- ❑ Do not apply a load exceeding the weighing capacity to the weighing conveyor.
- ❑ Do not modify or disassemble the indicator and conveyor. Do not change the parts.
- ❑ Install the weighing conveyor to horizontal level.
- ❑ Keep feeding of product with a constant interval.

Cooling the Indicator

- ❑ To avoid overheat of the indicator, make enough clearance from other devices. If the temperature surrounding the indicator exceeds the operating temperature range, use fan for forced cooling to the indicator so as not to effect to weighing.

1.3. Compliance

Adaptation for local laws

The indicator has been tested and complies with Subpart J of Part 15 of FCC rules.
(FCC = Federal Communications Commission in the U.S.A.)
The indicator equips a licensed wireless communication unit used 2.4 GHz band which specifies 2AC7Z-ESPWROOM02 to FCC ID. This license area is Japan and U.S.A. If you use other area, ask concerning of approval to local authority.

Cautions of wireless LAN (WiFi)

If the communication function of this scale is used near a wireless device that communicates in the 2.4 GHz range, the processing speed of both devices may decrease.
The wireless band using the scale is used by microwave oven, industry, science, medical device, mobile identifier in factory and licensed radio station and radio station of no license.

- ❑ Confirm that there is no these radio stations and mobile identifier around the weighing indicator.
- ❑ If radio interference by the indicator is occurred to radio station of mobile identifier, change the frequency or stop transmission of radio wave. (Example: Use of partition. Installation to other place etc.)

2.4 DS 4

2.4 : Wireless equipment of 2.4 GHz band.
DS : Modulation method is direct-sequence spread spectrum (DS-SS).
4 : The distance to occur radio interference is 4 m or shorter.
▬▬▬ : The whole range is used and it cannot avoid band of mobile identifier.

2. Parts Names

Names of each part are described in this chapter.

2.1. Front Panel

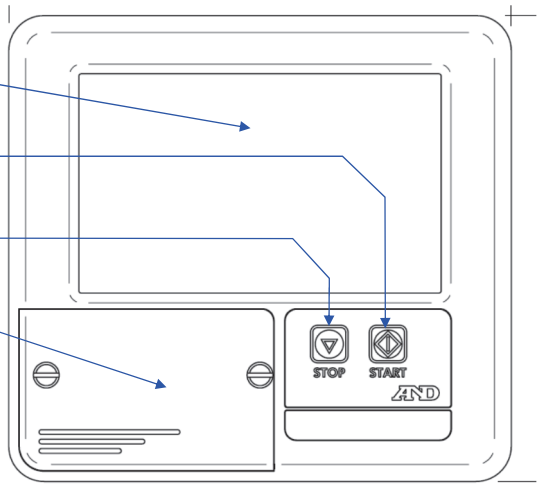
2.1.1. Names of Front Panel

1. Touch screen for indication and operation

2. Start button

3. Stop button

4. USB terminal cover



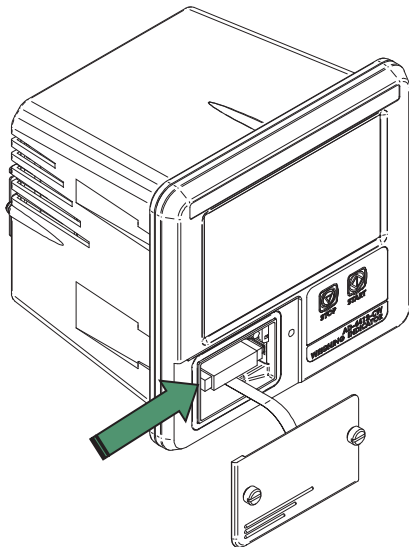
Drawing 1 Front panel

Table 1 **Names and functions of front panel**

No.	Name	Description and Function
1.	Touch screen	The indication and settings of weighing can be displayed and operated.
2.	Start button	Weighing can be started and conveyor can be moved.
3.	Stop button	Weighing can be stopped and conveyor can be stopped.
4.	USB terminal cover	Waterproof cover for the USB terminal. A USB terminal is equipped.

2.1.2. Connecting USB Memory

The terminal are used when product image data is registered and output data is stored into USB memory. If you use USB memory, open the cover and connect USB memory to the USB terminal. When USB memory is identified by the indicator, USB mark is displayed at right-upper side of the screen.



Caution

Use USB memory formatted in FAT32.
If USB memory of other format is used, format it in FAT32 before use.
If USB mark is not displayed after connecting USB memory, it may be incompatible to file system of operation system.
Refer to "**8.1 Format of USB Memory**" and format USB memory.

2.1.3. Removing USB Memory

Caution

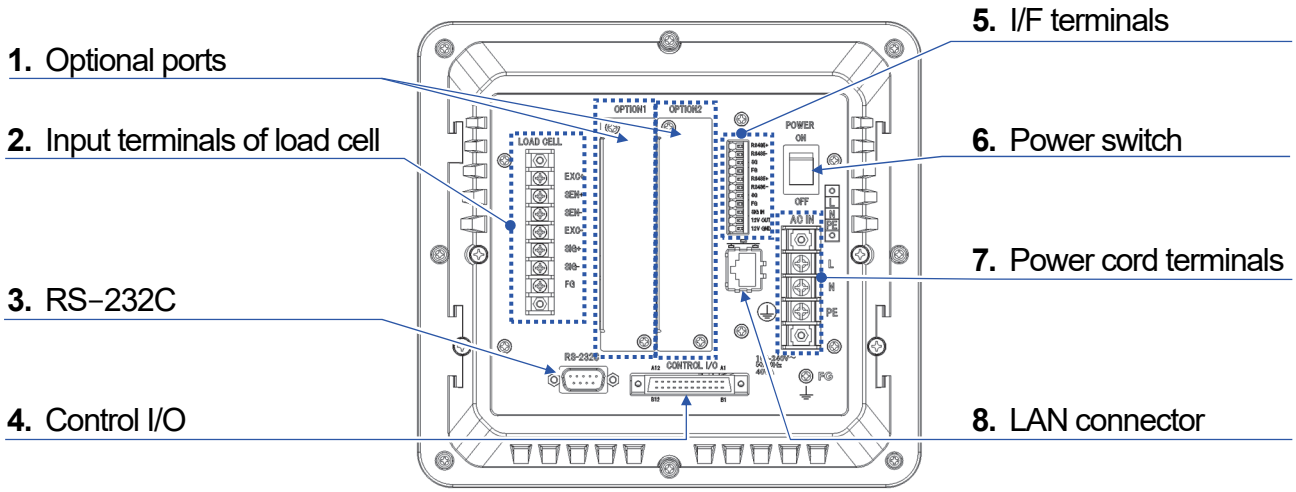
If USB memory is removed using method without the following procedure, it may cause a failure concerning storing data file.

1. Press and hold the USB mark at right-upper side of the screen when removing USB memory.

2. After the USB mark hides, remove the USB memory.

2.2. Rear panel

2.2.1. Names of Rear Panel



Drawing 2 Rear panel

Table 2 **Names and functions of rear panel**

No.	Name	Description and Function
1.	Optional ports	Two optional boards can be installed in maximum.
2.	Input terminals of load cells	Four 350 Ω load cells can be connected in maximum.
3.	RS-232C	It is used to communicate printer, barcode reader and computer.
4.	Control I/O	It is used to control peripherals. Input **:** 11 points. Output **:** 11 points.
5.	I/F terminals	It is used for stream mode and communication with PLC using Modbus RTU. It uses as power source of photoelectric sensor.
6.	Power switch	It is the main power supply switch for the indicator.
7.	Power cord terminals	Power supply range **:** 100-240 V～
8.	LAN connector	It is used communication using Modbus TCP and a PDF output to the printer on network.

3. Installing the Weighing Indicator

Procedures of installing the indicator and connecting power line are described in this chapter.

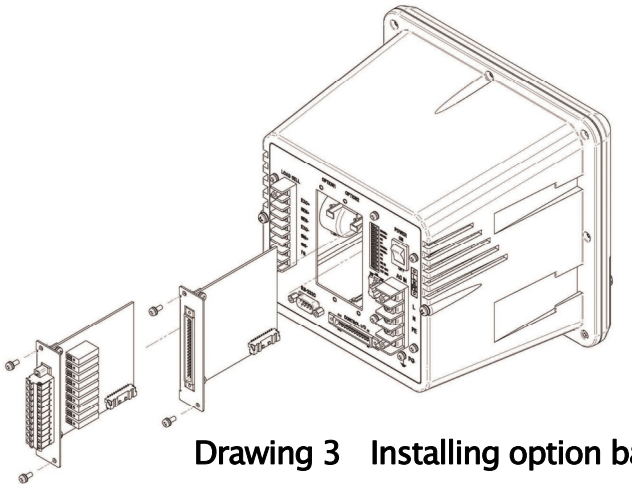
3.1. Installing Option board

- In first, install the option board. Next, operate them.
- An option board can install to an arbitrary slot of either two slots.

⚠ Danger
Turn off power switch and remove power lines when removing cover of option board.

⚠ Warning
Do not touch the inside of the indicator immediately after turning off the power. It may cause catch electrical shock. Wait for 10 seconds and operate them.

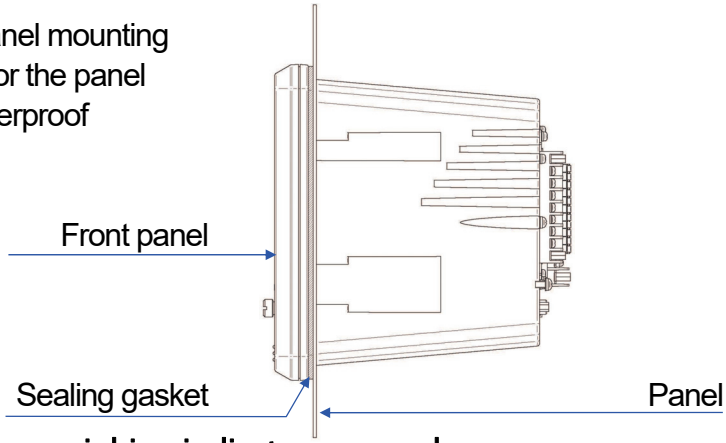
⚠ Caution
Fix screws securely and do not leave loosen screw. If a loosen screw is left, electrical circuit may short during use. And it may cause malfunction due to noise.



Drawing 3 Installing option bard

3.2. Mounting the Weighing Indicator on Panel

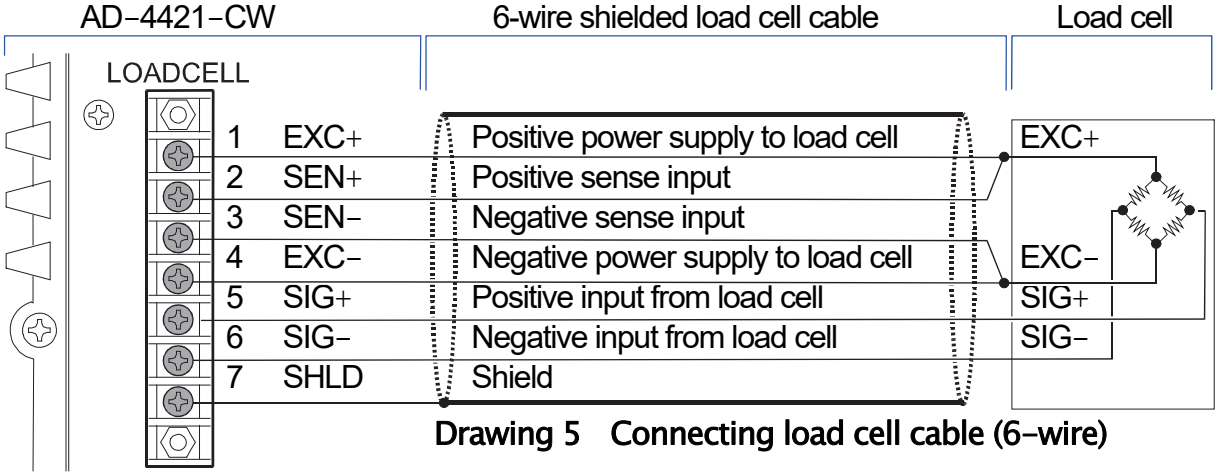
- The installation of the indicator is the panel mounting using slide rails. When sealing gasket for the panel mounting is used, the front panel is waterproof structure complied with IP-65.



Drawing 4 Mounting weighing indicator on panel

3.3. Connecting Load Cell Cables

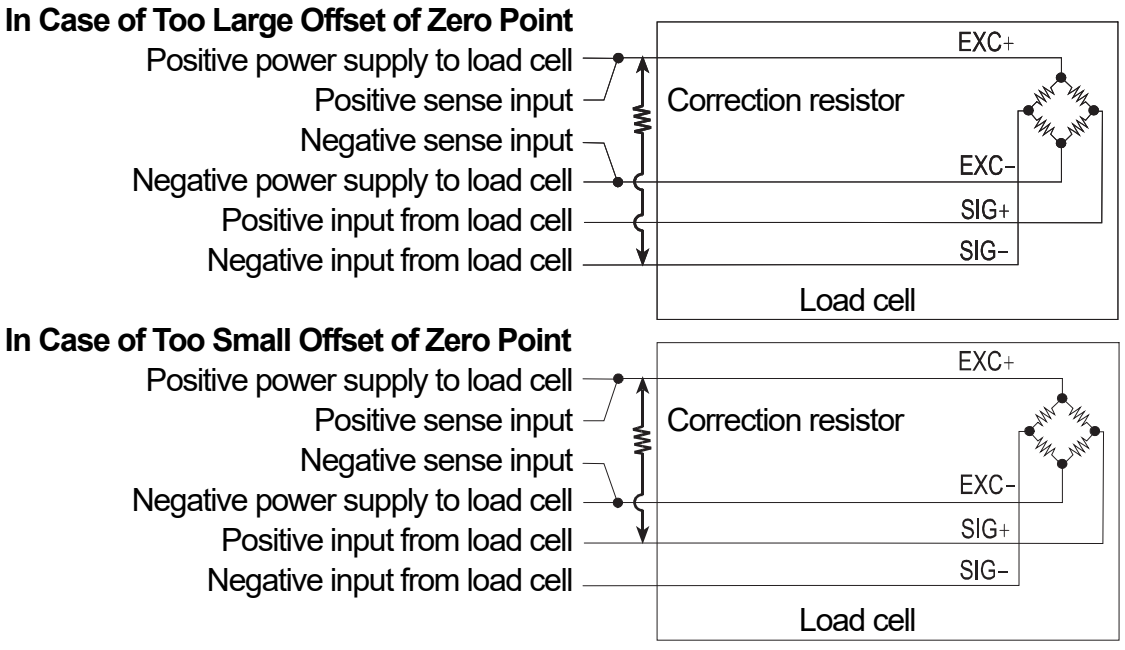
- We recommend that you use the 6-wire shielded cable to prevent loss of weighing precision. If long load cell cables or summing box is used, use 6-wire shielded cable to prevent drift of weighing value due to temperature change. The 4-wire shielded cable (that is shorted EXC+ & SEN+ and shorted EXC− & SEN−) is able to use, but it may cause weighing error when the summing box is used for plural load cells or long cable is used.



Drawing 5 Connecting load cell cable (6−wire)

Compensating Voltage Output at Zero Point

- When the zero calibration is performed, if the output voltage of the load cell at the zero point is too large (the message "CERR2" is displayed) and it is too small (the message "CERR3" is displayed), the output voltage can be adjusted by adding a correction resistor as Drawing 6. Use the correction resistor of low (good) temperature coefficient.



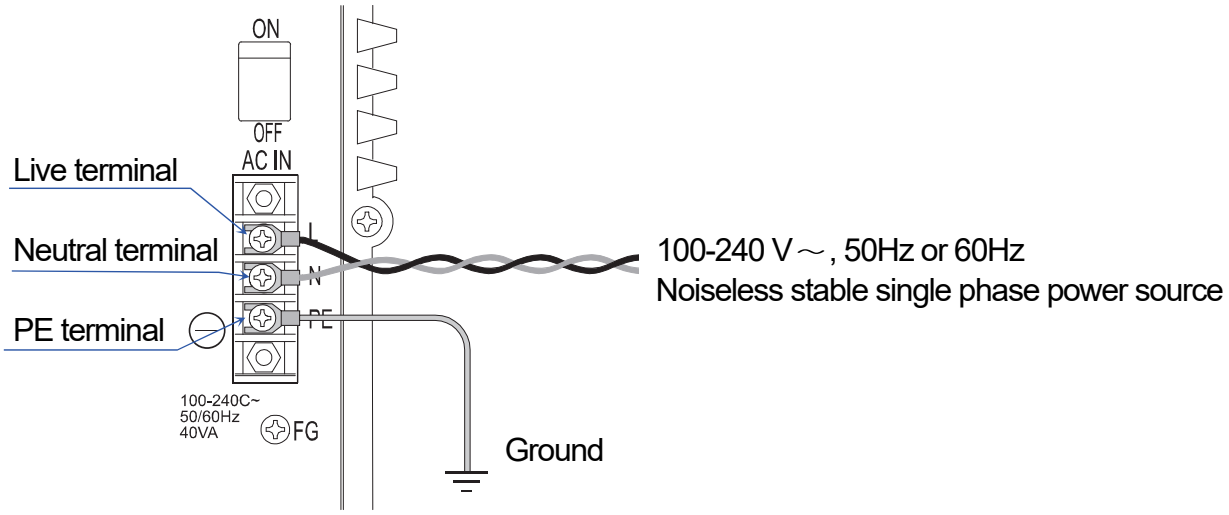
Drawing 6 Adjusting voltage output at zero point

Adaptable Compression Terminal Parts (M3)

3.4. Connecting Power Lines

The Indicator can connect to power line of 100-240 V～.
Do not share the power cord with an electric power device to avoid operation errors.
Ground the indicator certainly.
Do not use an unstable power source.
Do not share the ground wire with an electrical device that generates noise.

⚠Warning
Ground the indicator to avoid an electric shock or operation error. If the indicator is not grounded, it may cause an electric shock or malfunction due to discharge of static electricity.



Drawing 7 Connecting Power Lines

Adaptable Compression Terminal Parts (M4)

4. Operation Window

Basic operations of the touch screen equipped in the indicator is described in this chapter.

4.1. Icon

This section describes the function of the common icon.
Other icons describes at each operation.

Icon	Name	Description and Function
	Home key	The key to return to weighing display.
	Return key	The key to back to last window. If you touch the key plural times, the indicator backs to weighing display.
	Left arrow key	The key to move the cursor position of product selection, setting menu and plural pages on the display.
	Right arrow key	
	Up arrow key	
	Down arrow key	

4.2. Numerical Input

When numerical input is performs, the numerical dialog box is displayed.

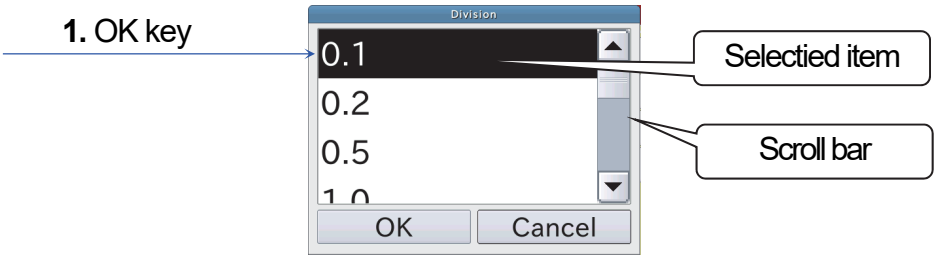
1. The BS key to delete a numeric character input last. The cursor proceeds back one character.
2. The CLR key to delete all numeric characters.
3. When the ESC key is touched, the current input value is canceled and the dialog box is closed.
4. When the ENT key is touched, the current input value is stored and the dialog box is closed.
   If an input value is out of range, it does not stored.

Drawing 8 The numerical dialog box

4.3. Pull Down Menu

When an item selection is required, the pulldown selection dialog box appears.

1. Select an item and touch the OK key. The selected item is confirmed.



Drawing 9 Pulldown selection dialog box

4.4. IP Address

The IP address dialog box is displayed when it is necessary to specify the IP address of the indicator and network printer. Input numeric value after opening the IP address dialog box.

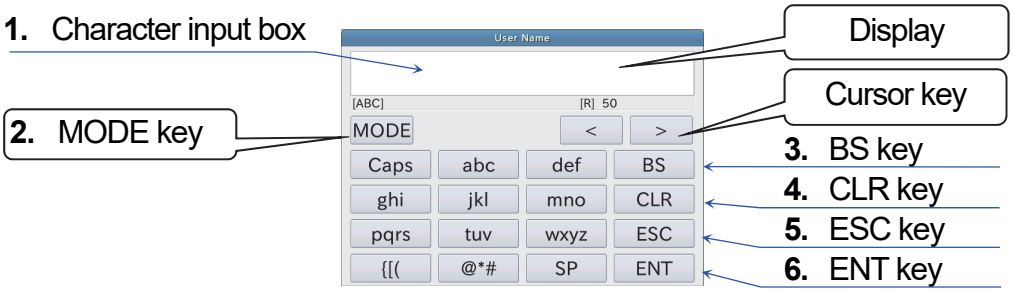
1. The BS key to delete a numeric character input last. The cursor proceeds back one character.
2. The CLR key to delete all numeric characters.
3. When the ESC key is touched, the current input value is canceled and the dialog box is closed.
4. When the ENT key is touched after inputting IP address, the current input value is stored and the dialog box is closed.

Drawing 10 IP Address dialog box

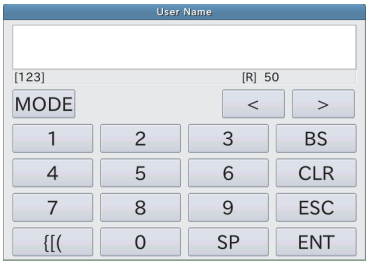
4.5. Alphanumeric Input

The alphanumeric dialog box is displayed when it is necessary to input characters.

1. The alphanumeric dialog box can input alphabet of small caps and numeric characters.
2. The MODE key to exchange dialog box of alphabet and numeric characters.
3. The BS key to delete a numeric character input last. The cursor proceeds back one character.
4. The CLR key to delete all numeric characters.
5. When the ESC key is touched, the current input value is canceled and the dialog box is closed.
6. When the ENT key is touched, the current input value is stored and the dialog box is closed.



Drawing 11 Uppercase letters

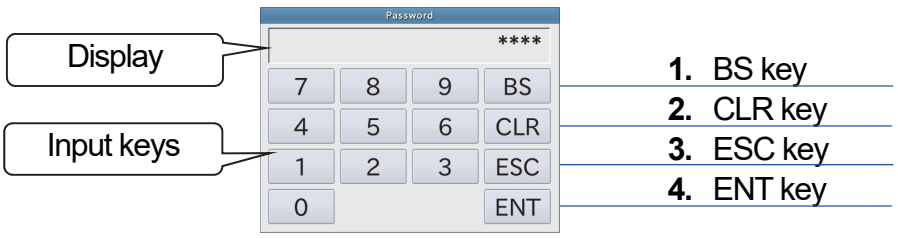


Drawing 12 Numerical letters

4.6. Password Input

The password dialog box is displayed at login window and registration of user password.

1. The BS key to delete a numeric character input last. The cursor proceeds back one character.
2. The CLR key to delete all numeric characters.
3. When the ESC key is touched, the current input value is canceled and the dialog box is closed.
4. When the ENT key is touched, the current input value is stored and the dialog box is closed. The input password is displayed as "∗" characters.



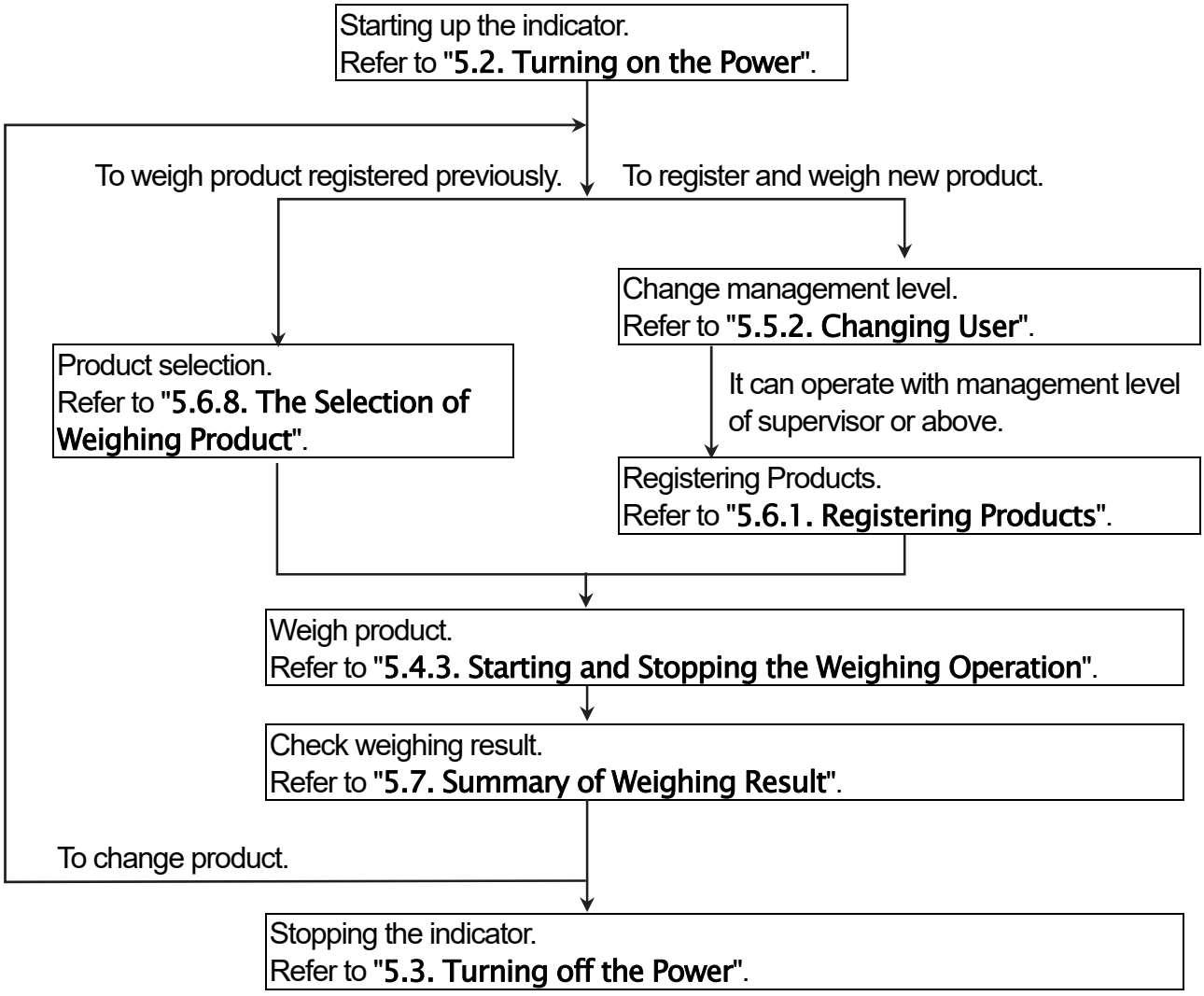
Drawing 13 Password input dialog box

5. Basic Operations

5.1. Operation Outline

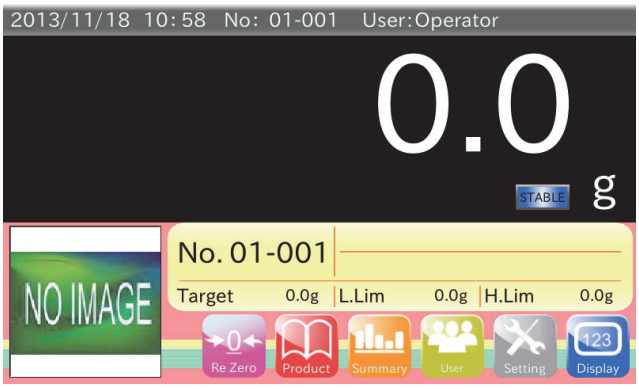
The outline of weighing procedure and operations are described in this chapter.
An ordinary weighing operation is as follows : Refer to chapters after "**5.2. Turning on the Power**" in accordance with the following flowchart.

＊1 Refer to "**5.5. Managing User level for Logging in**" if you need to register a user.
Administrator user "**Admin**" is registered in factory settings.

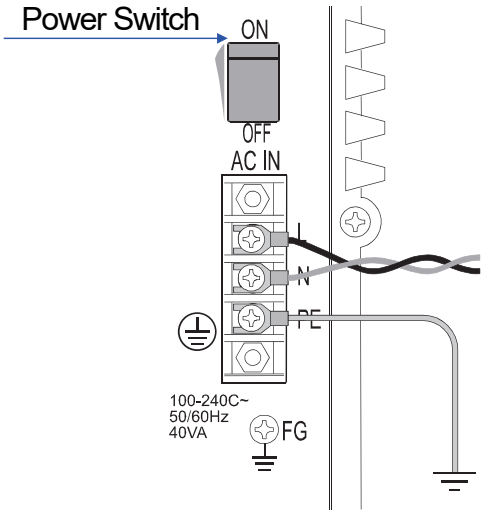


5.2. Turning on the Power

1. Turn on the indicator when power switch turns to "ON".
2. The weighing mode is displayed after turning on.



Drawing 14 Weighing window (Initial setting)

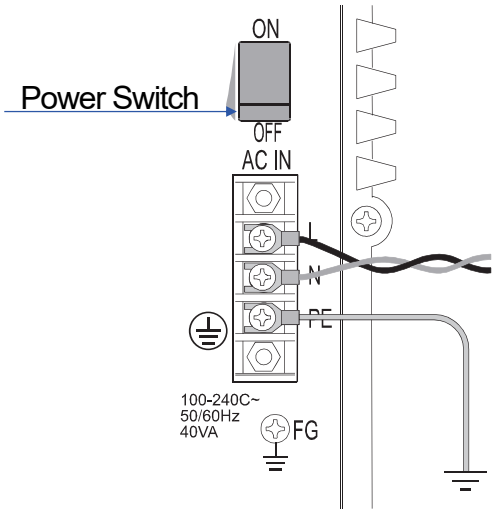


5.3. Turning off the Power

1. When turning off power switch to "OFF", the indicator is stopped.

Caution

- For emergency stop, perform the above operation. In that case, before turning the power ON again, be sure to resolve the cause of the stop.



5.4. Weighing Operations

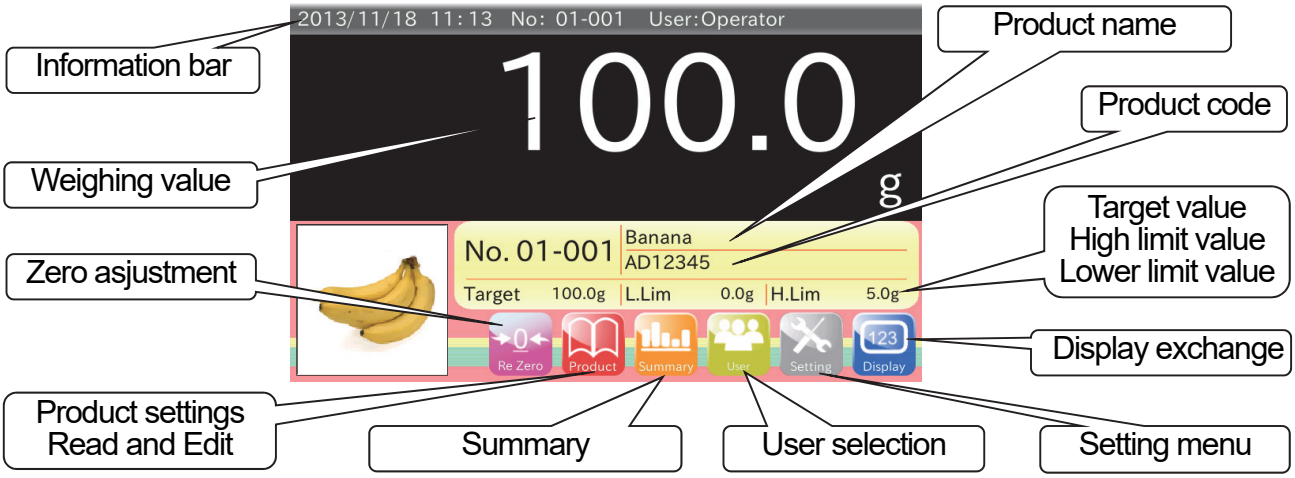
Weighing operations are described in this chapter.

Note

- The description of this section assumes that the product has been registered and set beforehand.
- For details about the product registration and setting, refer to "**5.6. Selection of Products and Detection Function**".

5.4.1. Changing the Indication of weighing Value

Touch the display key on the weighing screen to change the displaying size and contents of the weighing values. The contents are two types : Regular display and display with deviation. Both display can be enlarged and reduced.



Drawing 15 Example of magnifying display

Drawing 16 Example of shrinking display

The "regular display" shows the current weighing value. If a tare value is set, net value is displayed. The "display with deviation" shows a standard value and deviation of weighing value of product. The mark DEV is displayed in "display with deviation".
The display sequence of the display key is as follows :

Regular display (Enlarged) → Regular display (Reduced) → Display with deviation (Enlarged) → Display with deviation (Reduced) → (back to Regular display (Enlarged))

5.4.2. Adjusting Zero point (to Display Zero)

If the weighing value is not zero (0) when the conveyor is stopped, touch the Re-Zero key to perform zero adjustment to set the weighing value to zero.
When the weighing value exceeds the zero adjustment range when the conveyor is stopped, zero adjustment cannot be performed.
Causes of the above situation are :

- There may be foreign substances on the conveyor.
- Foreign substances are collected on the conveyor little by little. And zero adjustment is performed each time. Now the mass value of the collected foreign substances may exceed the zero adjustment range.
- The weighing conveyor may be contacted with the infeed conveyor or reject conveyor.
- An excessive load is applied to the conveyor and the load cell is deformed.
- An upward excessive load is applied to the load cell and the load cell is deformed.
  For example : To hold and rise up the conveyor.

If the weighing value is not zero even if the foreign substances are removed and zero adjustment is performed, calibrate the indicator using a weight.
When the load cell is deformed within the usable range, the calibration using a weight will set the weighing value to zero.
If the weighing value is not zero even if the calibration using a weight, replace the weighing conveyor unit.

Note

- Refer to "**6.1. Calibration the Indicator using a Weight**" for the details about the calibration using a weight".

5.4.3. Starting and Stopping the Weighing Operation

Press the START button on the front panel to move the conveyor to start a weighing operation.
Press the STOP button on the front panel to stop the conveyor to finish a weighing operation.

5.5. Managing User level for Logging in

This indicator can register user and limit available operations in accordance with user level for management. In this chapter, the way of editing user data, managing user level and entering in the mode are described.

Cautions

- ❑ User name "**Admin**", Password "**0000**" and management level "Administrator" are registered as default user.
- ❑ "Administrator" is required to edit user data.
  Log in as "Administrator" to edit new user unregistered.

Note

- ❑ This management mode can perform "registration", "change" and "deletion" of user.
- ❑ This management mode can change user level to arbitrary level for management.
  Refer to "**9.10.2. Type of User at Turning on the Indicator**".

5.5.1. Management level of User

The indicator has four levels for management : "Administrator", "Supervisor", "Quality Manager" and "Operator". Refer to "**Table 3 Difference between management levels**" for details. Assign an appropriate user level for each user so as to avoid unintentional operations and be able to use the indicator safely. Management level is set "Operator" when turning on the indicator.

Cautions

- ❑ "Operator" of management level means that is not more than "Quality Manager".
  "Operator" cannot perform "registration", "change" and "deletion" of user.

Table 3 **Difference between management levels**

Management level	Description
Operator	Starting weighing or stopping operation, display of summary and operation of selecting weighing product.
Supervisor	In addition to operations of "Operator", product settings and deletion of summary data.
Quality Manager	In addition to operations of "Supervisor", the whole system operations.
Administrator	In addition to operations of "Quality Manager", operations of user management.

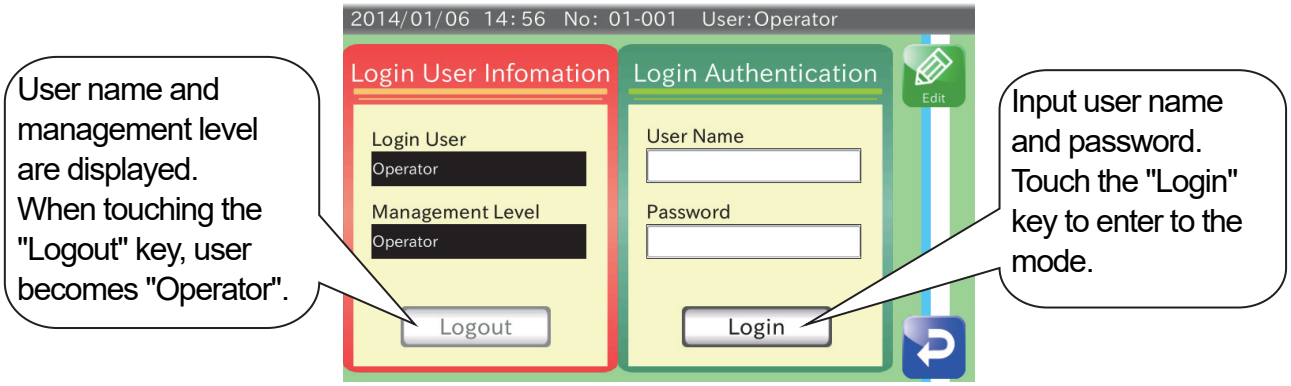
5.5.2. Changing User

Management level is set "Operator" when turning on the indicator. It is required to log in with authorized management user when changing user.
The way to logging in with authorized management user shown below.

Caution

- ❑ User name "**Admin**", Password "**0000**" and management level "Administrator" are registered as default user.

1. Touch the key on the weighing screen to display "**Login window**".



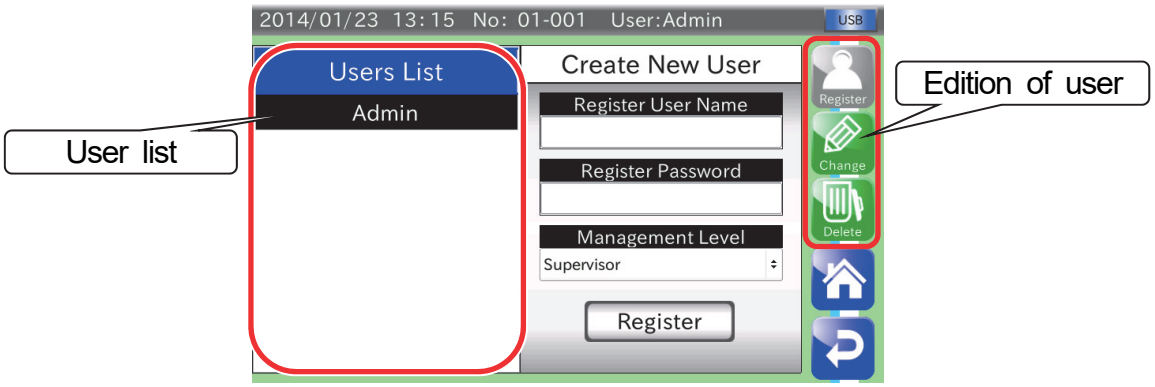
Drawing 17. Login window

2. Input user name and password registered previously.
3. Touch the "Login" key after inputting them.
4. Touch the key to proceed to the weighing mode.

5.5.3. Registering User

The procedure to register user is shown below.

1. Touch the key to display "**User edition window**".



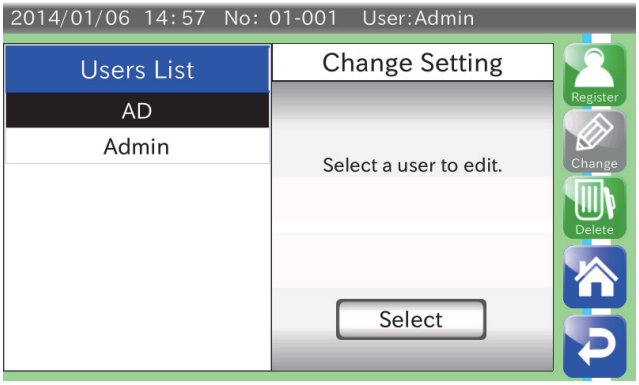
Drawing 18 User edition window

2. Select a user name from user list and input user name.
3. Input password. Password is four characters.
4. Select a management level.
   Management level is "Administrator", "Supervisor", "Quality Manager" and "Operator".
5. Touch the registration key to display it in user list.
6. Touch the key to return the "**Login window**".

5.5.4. Changing User Information

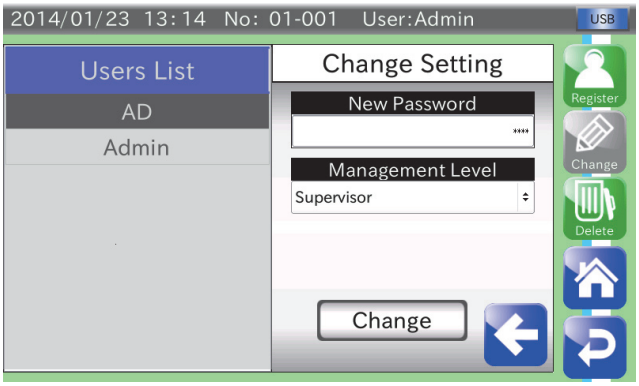
The content of registered user can be changed using this user management mode.
The procedure of changing user data is shown below.

1. Display the "**User edition window**".
2. Touch the Edit key to display "**User information window**".



Drawing 19 User information window

3. Select a user to change the data from user list.
   Touch the "Select" key to display "**Window to change user information**".
   Touch the "right-arrow" key to return "**User information window**".



Drawing 20 Window to change user information

4. Select password. Input new password of four characters.
5. Select management level.
6. Touch the "Change" key to store them.

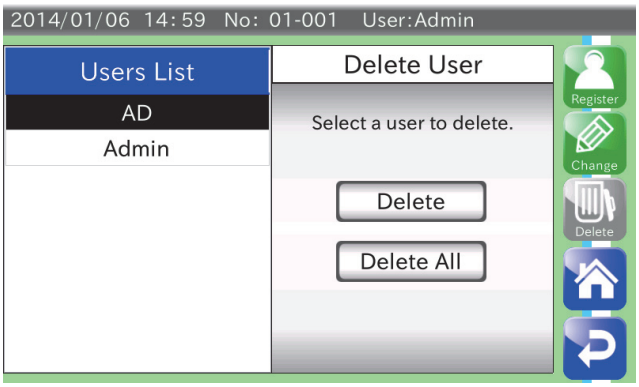
5.5.5. Deleting User

The user can be deleted using the user management mode.
There are two types for deletion : The way to delete a specified user and all registered users.
The procedure to delete user is shown below.

Caution

- ❑ Default user "**Admin**" cannot be deleted.
- ❑ The current user logged in cannot be deleted.
- ❑ If user except default user "**Admin**" is logged in and all user are deleted, user is set to "Operator" automatically.

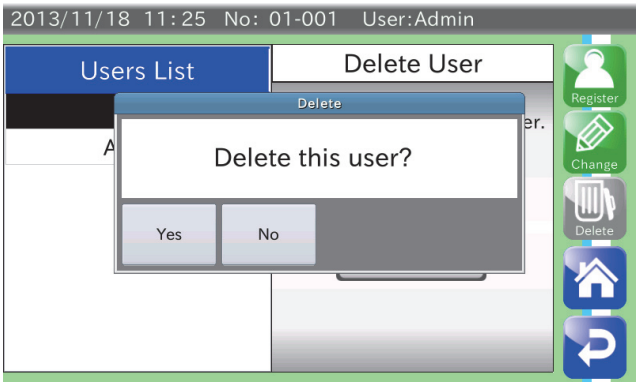
1. Display the "**User edition window**".
2. Touch the  key to display the "**Window to delete user**".



Drawing 21 Window to delete user

Deleting Specified User

1. If specified user is deleted, select a name from user list of the "**Window to delete user**".
2. Touch the "Delete" key to display the following "**Dialog box to confirm deletion**".
   Touch the "YES" key to delete user.

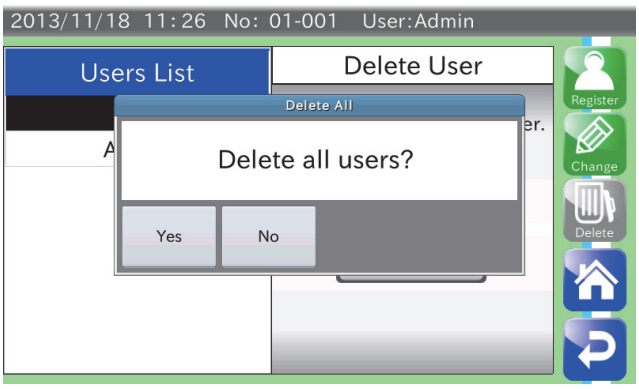


Drawing 22 Dialog box to confirm deletion

3. A specified user is disappeared from user list.

Deleting all user

1. Touch the "All delete" key to display the "**Dialog box to confirm deletion**".



Drawing 23 Dialog box to confirm deletion

2. Touch the "YES" key to delete all user except "**Admin**".

5.6. Selection of Products and Detection Function

This chapter describes for the changing procedure of product selection and detection function required for weighing. If it is necessary to register product, log in "Quality Manager" or greater user in advance.
This chapter assumes that user is "Quality Manager" or greater user.

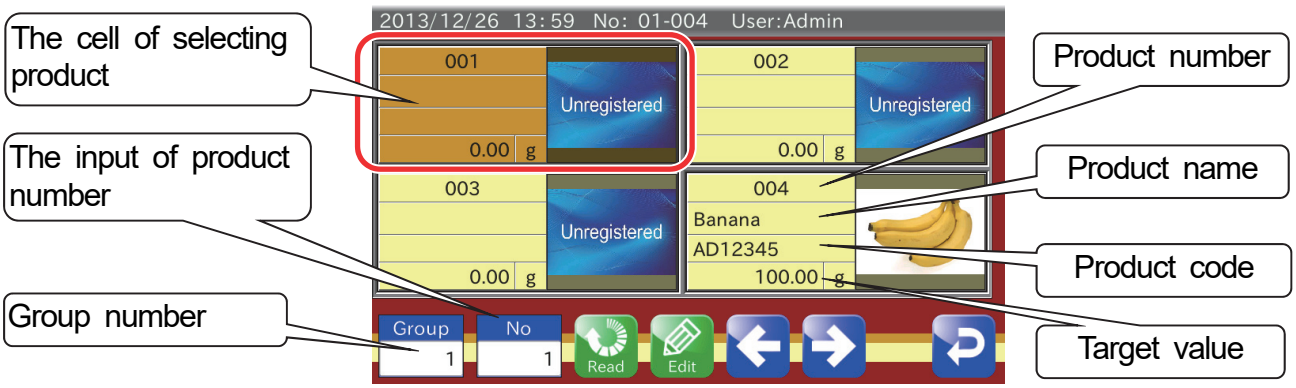
Note

Refer to "**9. The Details of Settings**" concerning of other settings except settings of this chapter. The settings are stored for each changing it during the procedure. If the key is touched during the procedure, previous window is displayed.

5.6.1. Registering Products

The procedure to register product is shown below.

1. Touch the key (product key)" on the "**Weighing window**" to display the "**Window to select product**.
2. Input group number (Selection range : 1 to 10).
   The registration page can switch using the "Left" key and "Right" key.
   Touch the product number to register. When product number is touched, the cell changes orange and product can be edited. Product number can be edited directly, too.

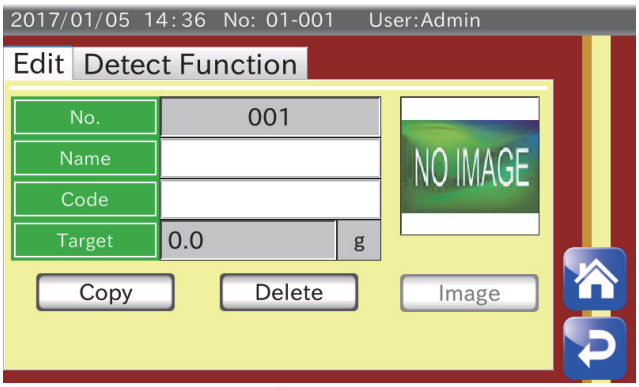


Drawing 24 Window to select product

3. Touch the key to register the product. "**Product profile window**" is displayed.
   In the window, product name, code, image can be edited and the settings can be copied or deleted.

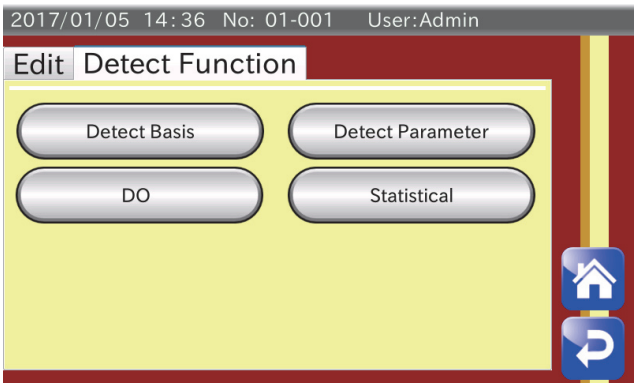
Note

- ❑ The "Image" key can register product image stored in USB memory.
  Refer to "**5.6.9. The Registration of Product Image**".
- ❑ The "Copy" key can copy registered product settings previously to the current product number.
  Refer to "**5.6.10. Creating a Copy of Product Settings**".
- ❑ The "Delete" key can delete a registered product settings.
  Refer to "**5.6.11. Deleting Product Settings**".



Drawing 25 Product profile window (Product edition tab)

4. Touch the "Detect function" tab to display the product profile window.
   The settings of each product can edit in the product profile window.
   Refer to "**5.6.2. Settings of Threshold Values (Target value, Upper-Upper Limit, Upper Limit, Lower Limit, Lower-Lower Limit)"** and below.

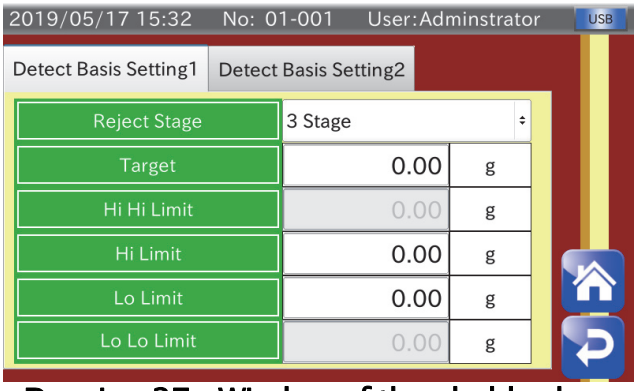


Drawing 26 Product profile window (Detection function tab)

5.6.2. Settings of Threshold Values
(Target value, Upper-Upper Limit, Upper Limit, Lower Limit, Lower-Lower Limit)

Standard values for detection can be specified in the "**Window of threshold values**".

1. Touch the "Detect basis" key in the "**Product profile window (Detection function tab)**" tab to display the "**Window of threshold values**".



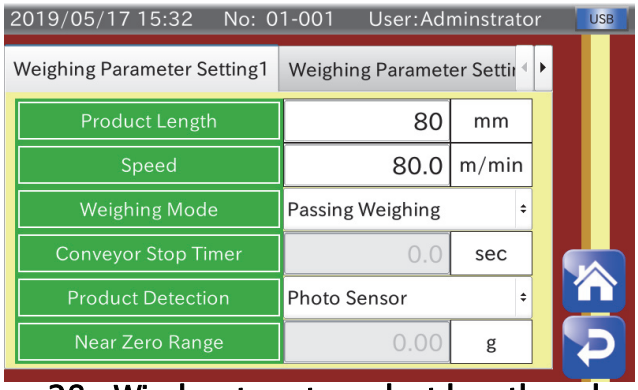
Drawing 27 Window of threshold values

2. Select separation number either the three stages or the fifth stages.
3. Touch the "Target" item and input mass value of target product.
4. Touch the "Upper limit" item and input upper limit mass value of product.
   It is deviation value from target value. Input it smaller than upper-upper limit value.
   Example : If target value is 100 g and tolerance value of upper side is 150 g, upper limit value is 50 g. 50 g = 150 g − 100 g
5. When the fifth stage separation is used, touch the "Upper-upper" item and input upper-upper limit value. It is deviation value from target value. Input it bigger than upper limit value.
6. Touch the "Lower limit" item and input lower limit mass value of product.
   It is deviation value from target value. Input it bigger than lower-lower limit value.
   Example : If target value is 100 g and tolerance value of lower side is 50 g, lower limit value is 50 g.
   50 g = 100 g − 50 g
7. When the fifth stage separation is used, touch the "Lower-lower" item and input lower-lower limit value. It is deviation value from target value. Input it smaller than lower limit value.
8. Touch the key to display the "**Product profile window**".

5.6.3. Setting Product Length and Velocity

The procedure to specify the processing performance is shown below.

1. Touch the "**Processing performance**" tab in the "**Window to set product length and velocity**".
2. Touch the "Product length" item and input product length.
3. Touch the "Speed" item and input velocity of the conveyer.
4. Touch the key to display the "**Product profile window**".



Drawing 28 Window to set product length and velocity

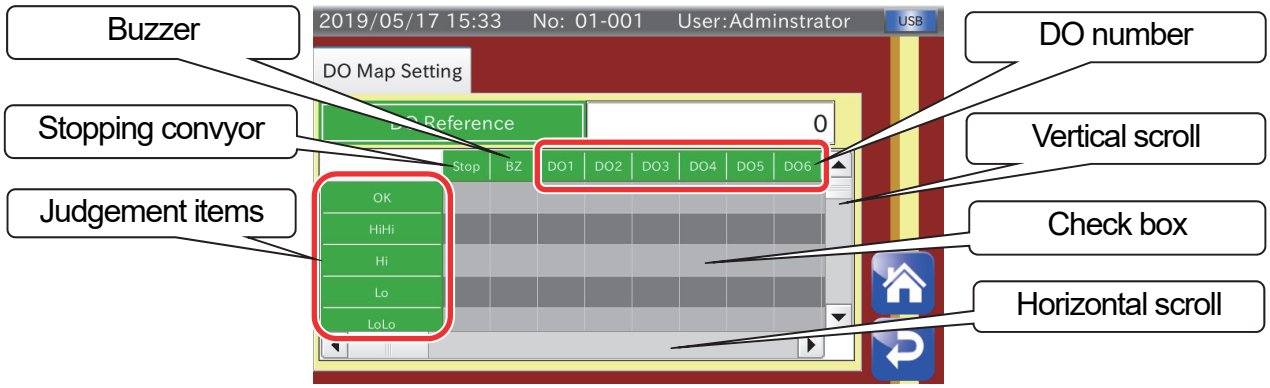
5.6.4. Setting the Digital Output (DO)

The procedure to specify the settings for each product concerning of stopping conveyor and DO (Digital Output) is shown below.

Note

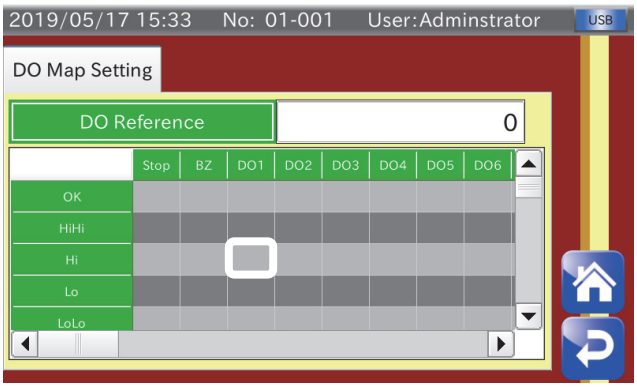
❑ Refer to "**9.4. DO Map**" for details of DO.

1. Touch the "DO" key of "**Product profile window (Detection function tab)**" to display "**DO setting window**". Touch the "DO" key to display "**Setting window of DO map**".



Drawing 29 Setting window of DO map

2. Touch each check box to make check sa that outputs each judgement. Items of judgement can be changes using vertical scroll bar. DO number can be changed using horizontal scroll bar.
   Example : If judgement is "over" and you want to output a signal from DO1, touch to check box with white line. Then, check mark ○ is appeared.



Drawing 30 Check window of DO map

3. When product is weighed and is output judgement, DO outputs in accordance with settings of delay time and signal holding time of separator.

Note

❑ Refer to "**5.6.5. Setting the Delay Time and Holding Time**" for delay time and signal holding time.

4. If check mark exists in "Stop" item and applicable judgement is output, the conveyor stops.
5. If check mark exists in "BZ" item and applicable judgement is output, buzzer sounds.
6. Touch the key to display the "**DO setting window**".

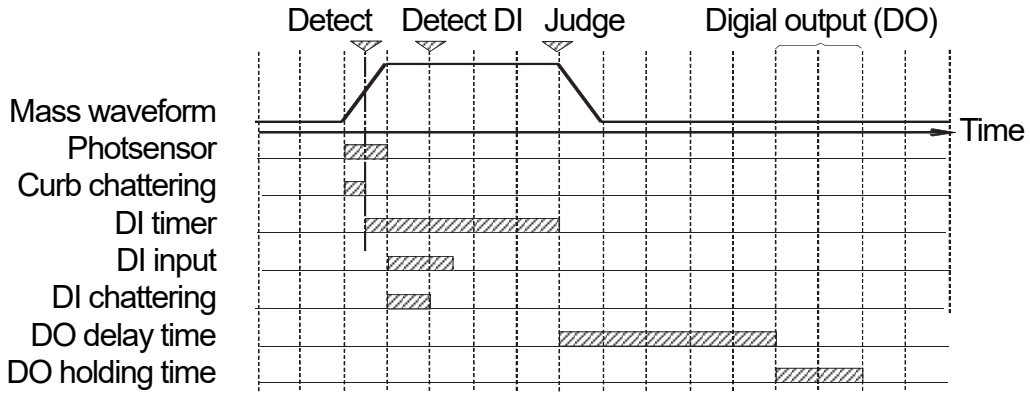
5.6.5. Setting the Delay Time and Holding Time

Note

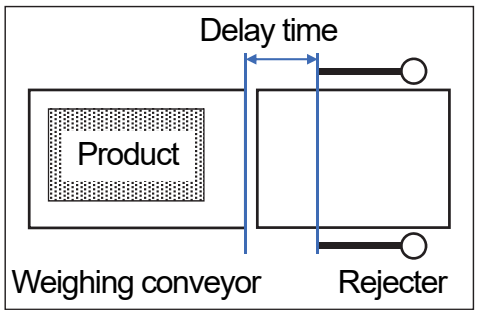
❑ Refer to "9.5. DO Action" for delay time and signal holding time.

The procedure of settings for DO behavior after judgement is shown below.
Delay time means time from judgement to output.
Signal holding time means time to maintain DO output signal.

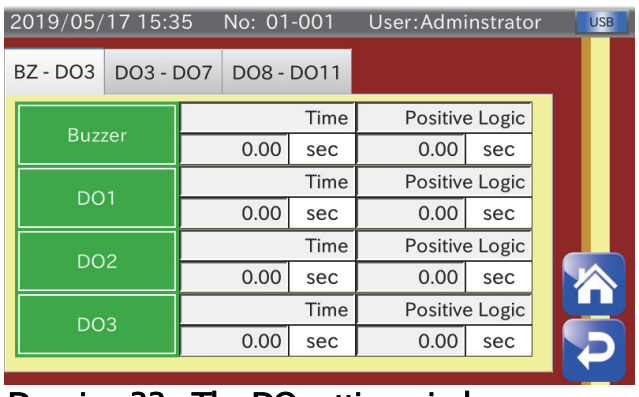
1. Touch the "AD-4421-CW" key on "**DO setting**" tab to display "**The DO setting window**".
   Judgement item can be changed using "Tab".
2. Touch DO and input delay time for each DO.
   Example : In case that rejecter of flipper type is used.
   Set the delay time that is transportation time from judgement at the end of the weighing conveyor to be fed to the rejecter. At this time, consider swing time of rejection flipper.
   If distance between weighing conveyor to rejecter is 0.2 m,
   conveyor velocity is 30 m/min. and swing time of rejecter is 0.3 sec.,
   delay time is 0.1 sec = 0.2 m ÷ 30 m/min x 60 sec. − 0.3 sec.
   In additionally, swing time of the rejecter depends on the air cylinder cushion needle setting. Therefore, so further fine adjustment is required.
   If a comparator light is connected, we recommend to shorten delay time and increase hold time for visual confirmation.
3. Touch the holding time and input it for each DO.



Drawing 31 Timing chart of DI/DO (Digital input / Digital output)



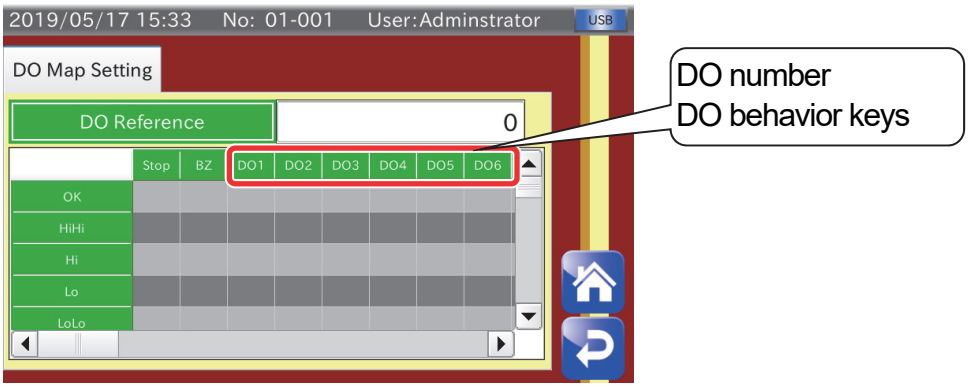
Drawing 32 Example of delay time



Drawing 33 The DO setting window

5.6.6. DO Test Function

The DO behavior function can use to DO test output.
Touch DO number in "**DO test function window**" to test it.

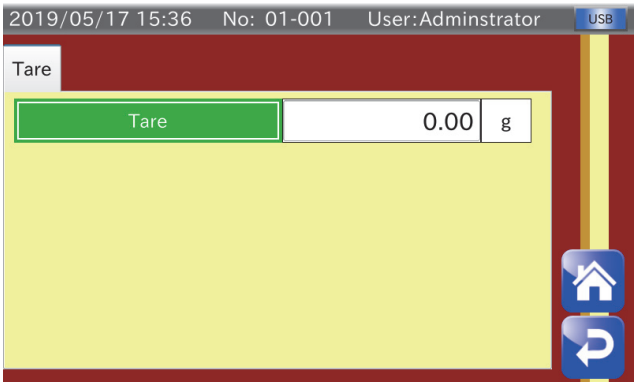


Drawing 34 DO test function winodow (Example : DO1, DO2)

5.6.7. Setting a Tare Value

Tare value can be set the following window.

1. Touch the "TARE" key on "Compensation Setting" Tab to display the window of Drawing 35.
2. Input a tare value. If it is necessary to cancel tare value, input "0.00" to tare value.
   When tare value stored in the indicator is deleted, tare value is set to "0.00".
   Tare mark Tare is displayed while tare value is used.
3. Touch the return key to display "**Product profile window**".



Drawing 35 The setting window of tare value

5.6.8. The Selection of Weighing Product

The procedure to select a weighing product.

1. Touch the product key on the "**Window to select product**" to display the "**Window to select product**".
2. Input a group number (Range: 1 to 10).
   The registration page can change using the "Left arrow" key and "Right arrow" key.
   Touch the product number to select it. Then, the area of selected product becomes orange.
   And a product number can be input directly.
3. If the "Read" key on the "**Window to select product**" is touched, the settings of the selected product is input.
   Otherwise, if the "START" button is pressed while displaying the "**Window to select product**", the "**Window profile product**" and each function windows, the product data can be read.

Caution

If a selected product is same as the weighing product, the change of the product using the "START" button can not use.

4. Touch the return key to display "**Product profile window**".

5.6.9. The Registoration of Product Image

The procedure to store the product image.

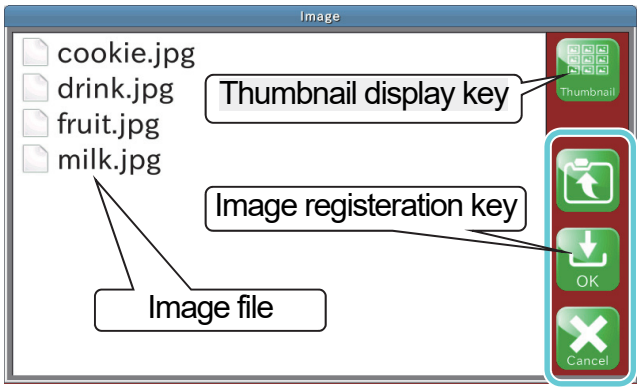
Caution

- Store product image in USB memory beforehand.
- The file name including space character can not register.
- The file extension of registrable image file is ".jpg" JEPG file.

Note

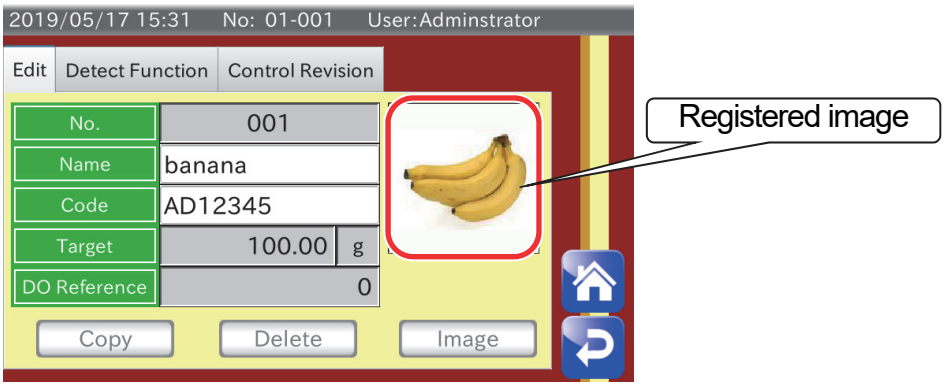
- Refer to the "**2.1.2. Connecting USB Memory**" to connect the USB memory.
- Refer to the "**8.1. Format of USB Memory**" to format the USB memory.
- Refer to the "**8.12.1.3. Removing USB Memory**" to remove the USB memory.

1. Display the "**Product edit**" tab on the "**Product profile window**".
2. Connect the USB memory to the indicator.
3. Touch the "**Image selection**" key to display the "**Image selection window**".



Drawing 36 The windows to select a product image file

4. Touch the holder name to open it. If you want to move to parent directory, touch the return key  If you want to finish image selection, touch the cancel key  . If you want to display thumbnail, touch the "Thumbnail display" key  .
5. Touch the image file name to select it.
6. Touch the "OK" key. Then, the image is registered and display to "**Product edit**" tab on the "**Product profile window**".

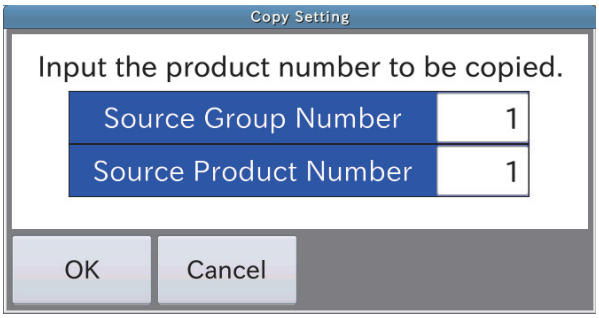


Drawing 37 Example to store product image

5.6.10. Creating a Copy of Product Settings

The procedure to copy the product settings.
If you want to use the product settings to another product, you can create a copy of the product settings with this procedure. This procedure is shown below.

1. Display the "**Product edit**" tab on the "**Product profile window**".
2. Touch the "Copy" key.
3. The dialog box to copy the product settings is displayed.



Drawing 38 Dialog box to create a copy of product settings

4. Select a source group number and input it.
5. Select a source product number and input it.
6. Touch the "OK" key.
7. Then, the specified product settings is copied.

Caution

- Do not copy the product settings that is specified as source DO reference.

5.6.11. Deleting Product Settings

The procedure to delete the product settings.
The procedure is shown below.

1. Display the "**Product edit**" tab on the "**Product profile window**".
2. Touch the "Delete" key.
3. The dialog box to delete the product settings is displayed.
   If you want to delete it, touch the "OK" key.

Drawing 39 Dialog box to delete product settings

4. The product settings is deleted and becomes unregistered.

Caution

- Do not copy the product settings that is specified as source DO reference.

5.7. Summary of Weighing Result

This section describes summary of data totalization of weighing result.
Touch the "Summary" key in the "**Wieghing window**" to display the "**Weighing history window**". The following windows can be changed using the "Summary" key .

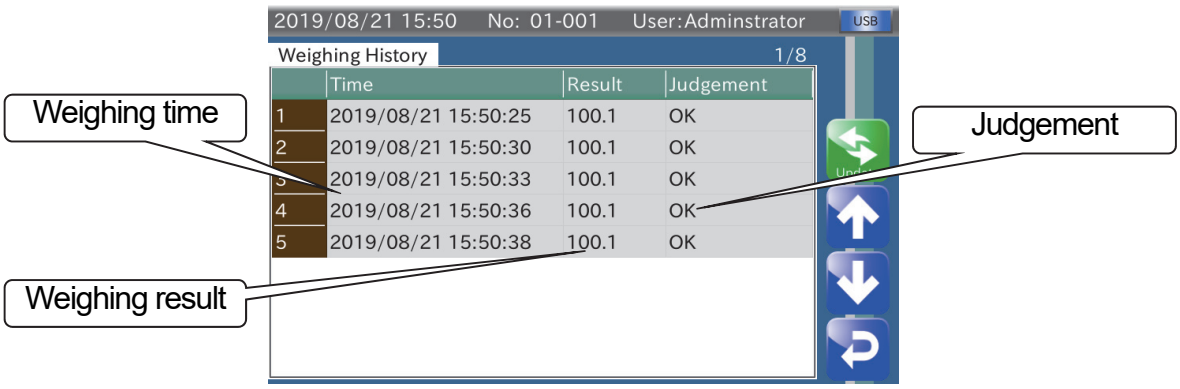
"**Weighing history**"↔"**All summary**"↔"**OK summary**"↔
"**Number of samples summary**"↔"**Number of OK samples summary**"↔
"**Histogram**"↔"$\overline{X}$ **control chart**"↔"***R*** **control chart**"↔"**Weighing history**"

Note

- Histogram, control cahrt and summary results can output to USB memory and printer.
  Refer to the "**7. Output of Weighing Results and Summary**" concerning of how to output it.
- USB memory of FAT32 format can use only.
  Refer to the "**8.1. Format of USB Memory**" concerning of how to format it.

5.7.1. Weighing History

The weighing result can display last 100 data in the weighing history window in maximum.
Touch the "Update" key to update the display to latest history.
Touch the "Up arrow" key to move to "***R*** **control chart window**".
Rouch the "Down arrow key" key to move to "**All summary window**".
Touch the "Return" key to return to "**Weighing window**".



Drawing 40 Weighing history window

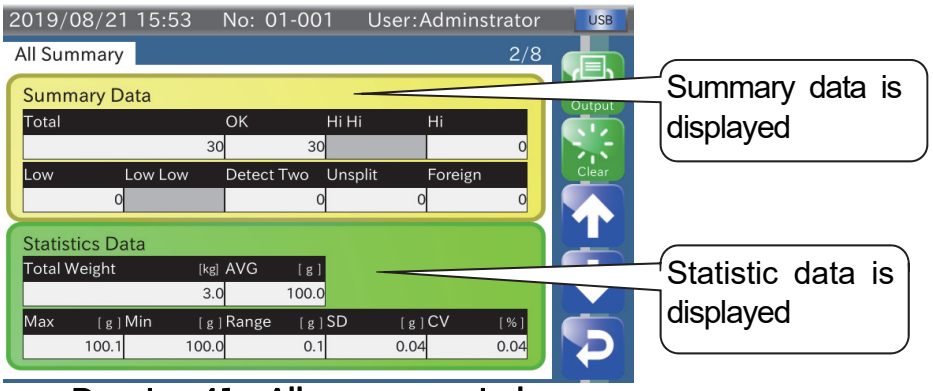
5.7.2. All Summary

The "All summary" means totalization of all weighing products that failed products is included.
Touch the "Clear" key to delete "all summary" of all weighing results.
Touch the "Output" key to display dialog box with output format of "all summary".
Summary result can be outputted, when USB memory is connected to USB port and the "PDF" key is touched.
Summary result can be printed, when PostScript printer is connected to USB port and the "Print" key is touched.
Summary result can be printed, when dump printer is connected to USB port and the "Print" key is touched.

Touch the "Up arrow" key to move to the "**Weighing history window**".
Touch the "Down arrow" key to move to the "**OK summary window**".
Touch the "Return" key to return to "**Weighing window**".

Note

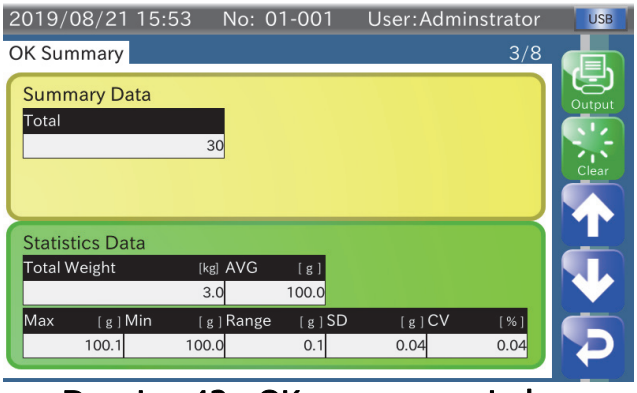
❑ The summary result includes all summary, OK summary, number of samples summary and number of OK samples summary.



Drawing 41 All summary window

5.7.3. OK Summary

The "OK summary" means totalization of weighing products that is passed.
Touch the "Up arrow" key to move to the "**All summary window**".
Touch the "Down arrow" key to move to the "**Number of samples summary window**".
Touch the "Return" key to return to "**Weighing window**".

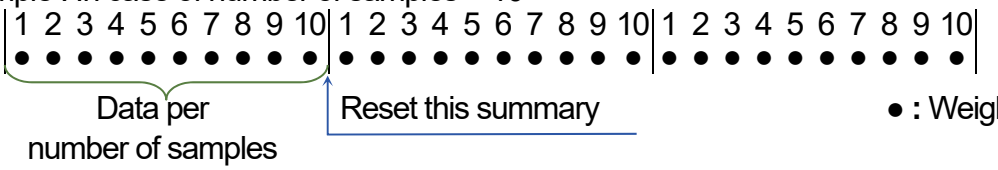


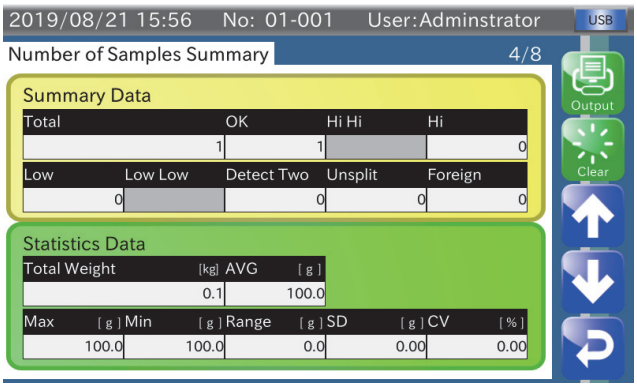
Drawing 42 OK surmmary window

5.7.4. Number of Samples Summary

The "Number of samples summary" means totalization of weighing products per the specified number of samples concerning of the current product selected.
When the weighing in unit of specified number of samples is complete, the "Number of samples summary" will be reset.
The "Number of samples summary" includes failed product.
Touch the "Up arrow" key to move to the "**OK summary window**".
Touch the "Down arrow" key to move to the "**Number of OK samples summary window**".
Touch the "Return" key to return to "**Weighing window**".

Example : In case of number of samples = 10





Drawing 43 Number for samples summary window

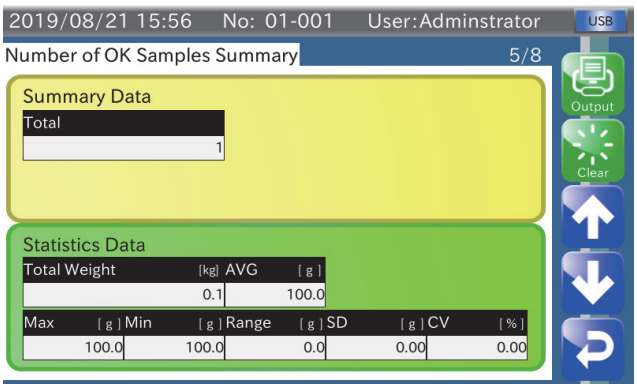
5.7.5. Number for OK Samples Summary

The "Number of OK samples summary" means totalization of passed weighing products per the specified number of samples concerning of the current product selected.
When the weighing of passed products in unit of specified number of samples is complete, the "Number of OK samples summary" will be reset.
Touch the "Up arrow" key to move to the "**Number of samples window**".
Touch the "Down arrow" key to move to the "**Histogram window**".
Touch the "Return" key to return to "**Weighing window**".

Example : In case of number of samples = 10

1 2 3 4 5 6 7 8 9 10	1 2 3 4 5 6 7 8 9 10	1 2 3 4 5 6 7 8 9 10
○ ○ ○ ○ ○ ○ ○ ● ○ ○ ○	○ ○ ○ ○ ● ○ ○ ● ○ ○ ○ ○	○ ○ ○ ○ ○ ○ ○ ○ ○ ○

Data per number of OK samples | Reset this summary | ○ : OK product | ● : Failed product



Drawing 44 Number for OK samples summary window

5.7.6. Histogram

A Histogram can display the frequency distribution of all summary (that includes failed products) concerning of the current product selected. Store the center value and section width of histogram for displaying and printing out in advance. The relation between the center value and section width of histogram is shown in Table 4 below. The center value is placed in section No.9 and frequency is counted for each section. The management level so as to clear a graph is required supervisor or greater user.

Cautions

- Last center value and section width is used even if they are changed during summary processing. If the "Clear" key is touched, the center value and section width are updated.
- When section width is changed, data of graph is deleted and section width is updated.

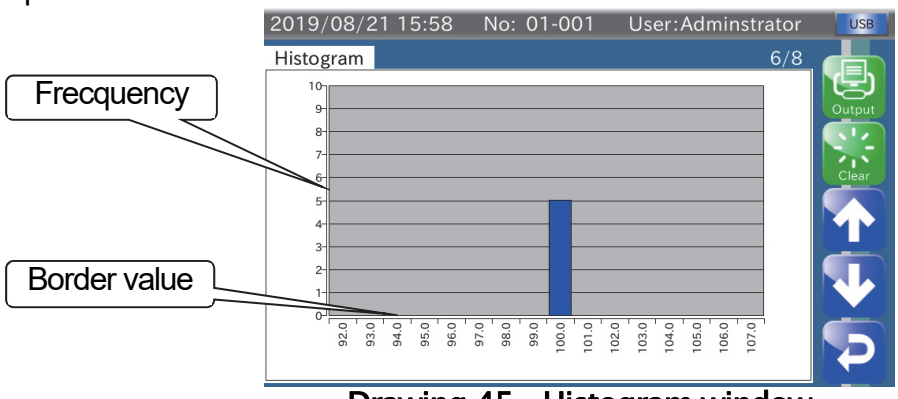
Note

- Refer to "**9.2.2. Target Value**" and "**9.6.5. Section Width of Histogram**" for settings of the center value and section width of histogram. Center value : S, Section width : k

Section No.	Border value	Range
1	–	w < W2
2	W2 = S − 7k	W2 ≤ w < W3
3	W3 = S − 6k	W3 ≤ w < W4
4	W4 = S − 5k	W4 ≤ w < W5
5	W5 = S − 4k	W5 ≤ w < W6
6	W6 = S − 3k	W6 ≤ w < W7
7	W7 = S − 2k	W7 ≤ w < W8
8	W8 = S − k	W8 ≤ w < W9
9	W9 = S	W9 ≤ w < W10
10	W10 = S + k	W10 ≤ w < W11
11	W11 = S + 2k	W11 ≤ w < W12
12	W12 = S + 3k	W12 ≤ w < W13
13	W13 = S + 4k	W13 ≤ w < W14
14	W14 = S + 5k	W14 ≤ w < W15
15	W15 = S + 6k	W15 ≤ w < W16
16	W16 = S + 7k	W16 ≤ w

Table 4 **Relation bewteen ranges and border values**

If the "OUTPUT" key is touched, the dialog box of graph with output format is displayed. When USB memory is connected to USB port and the "PDF" key is touched, graph can be outputted. When PostScript printer is connected to USB port and the "PRINT" key is touched, It is printed.



Drawing 45 Histogram window

Touch the "Up arrow" key to move to the "**Number of OK samples window**".
Touch the "Down arrow" key to move to the "$\bar{X}$ **Control Chart window**".
Touch the "Return" key to return to "**Weighing window**".

5.7.7. $\overline{X}$ Control Chart

The $\overline{X}$ control chart is displayed based on number of samples, size of sample and data of $\overline{\overline{X}}$.
If $\overline{\overline{X}}$ is used, graph is displayed based on $\overline{\overline{X}}$.
If $\overline{\overline{X}}$ is 0, $\overline{\overline{X}}$ is calculated using weighing data inputted for control chart and graph is displayed.
Control chart is made using data that corresponds to size of sample per number of samples

Note

- Refer to "**9.2.29.6.1. Amount of Sample**" and "**9.6.59.6.2. Size of Sample**" for number of sampled, size of sample.

Example : In case of number of samples = 10, size of samples = 5

First 5 samples (size of samples) from 10 samples are assumed as control chart data.

1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10
●	●	●	●	●	○	○	○	○	○	●	●	●	●	●	○	○	○	○	○	●	●	●	●	●	○	○	○	○	○

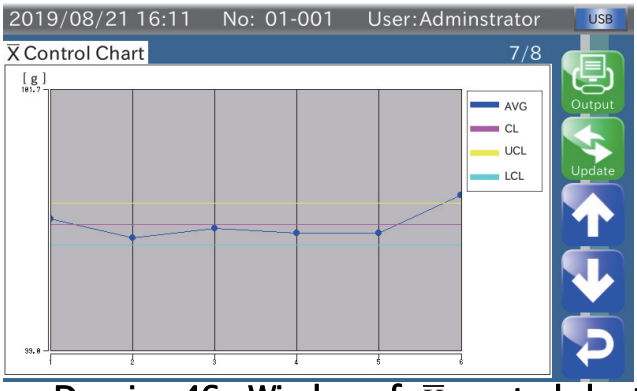
Size of samples　　Data of control chart

○ : Not for control cart data
● : Control chart data

This data can be plotted like Drawing 46.
Touch the "Update" key to update it.

Note

- $\overline{X}$ control chart and R control chart can be converted to PDF files.



Drawing 46　Window of $\overline{X}$ control chart

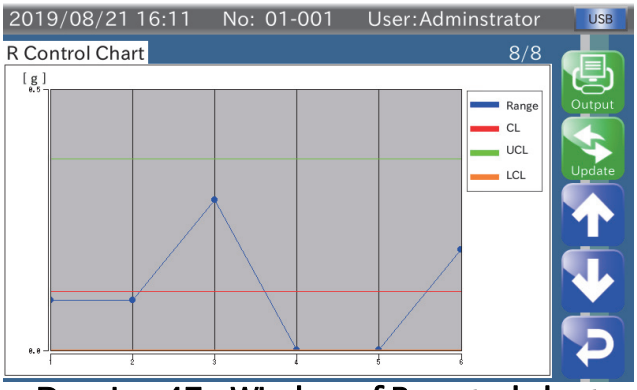
Touch the "Output" key to output control chart.
The PDF file of control chart can be outputted, when USB memory is connected to USB port and the "PDF" key is touched.
Touch the "Up arrow" key to move to the "**Histogram window**".
Touch the "Down arrow" key to move to the "$\overline{R}$ **Contol Chart window**".
Touch the "Return" key to return to "**Weighing window**".

5.7.8. $\overline{R}$ Control Cahrt

The $\overline{R}$ control chart is displayed based on number of samples, size of sample and data of $\overline{R}$.
If $\overline{R}$ is used, graph is displayed based on $\overline{R}$.
If $\overline{R}$ is 0, $\overline{R}$ is calculated using weighing data inputted for control chart and graph is displayed.
This data can be plotted like Drawing 47.
Touch the "Update" key to update it.

Note

- Refer to "**9.6.4.** R" for R control chart.



Drawing 47 Window of R control chart

Touch the "Up arrow" key to move to the "**Control chart window**".
Touch the "Down arrow" key to move to the "**All summary window**".
Touch the "Return" key to return to "**Weighing window**".

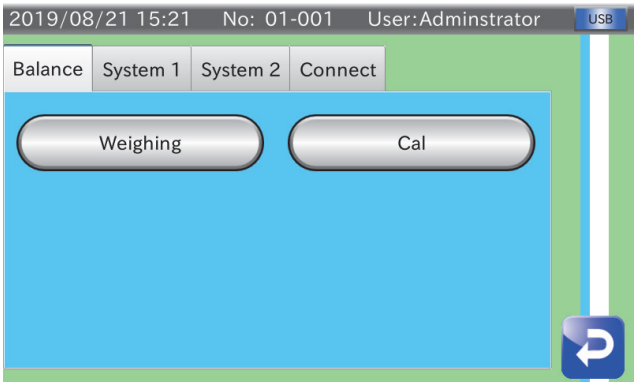
6. Ajdustment Operations for the Indicator

This chapter describes operations concerning of adjusting the indicator.
If user management function is used, user level to log on the indicator is required "Quality Manager" or greater.

6.1. Calibrating the Indicator using a Weight

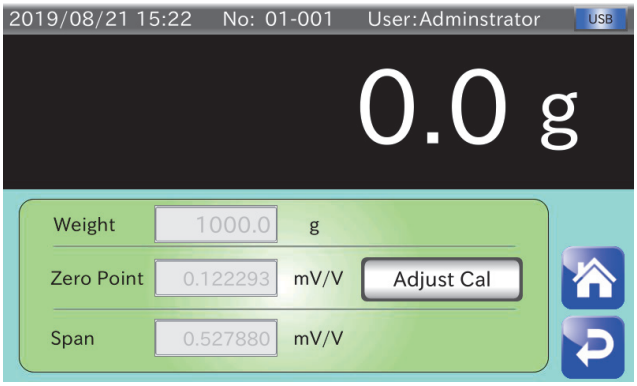
This section describes the adjustment procedure to display weighing value correctly.
The procedure using calibration weight is shown below.

1. Login with "Quality Manager" or greater.
2. Touch the "Setting" key on the "**weighing window**" to display the "**common settings window**".



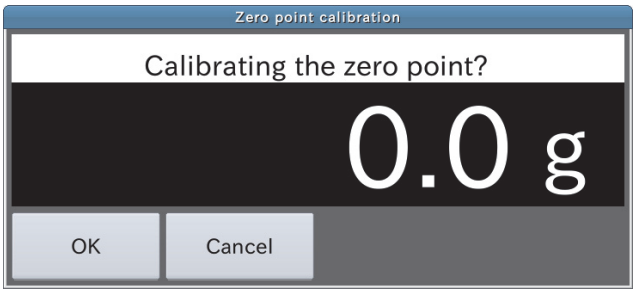
Drawing 48 Common settings window (Weighing tab)

3. Touch the "Cal" key on the "**Balance**" tab to display the "**Cal window**".



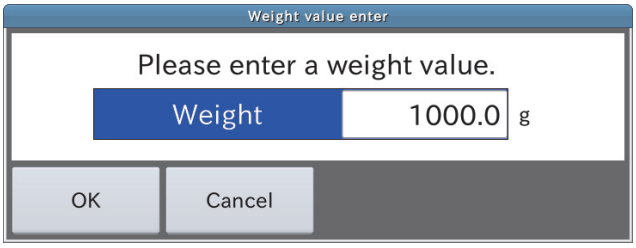
Drawing 49 Cal window

4. Touch the "Adjust Zero" key to display the "**zero point calibration**" dialog box.
   Place nothing on the weighing conveyer and touch the "OK" key to store the zero point.
   If you want to cancel the current zero point calibration and to proceed to sapn calibration, touch the "Cancel" key.



Drawing 50 Zero point calibration dialog box

5. The "**span calibration**" dialog box is displayed after zero point calibration.
   Touch the "OK" key to display the "**weight value input window**".
   Input the weight value and touch the "OK" key to store it.



Drawing 51 Weight value input dialog box

6. Touch the "OK" key to specify the calibration weight on the "**span calibration**" dialog box.

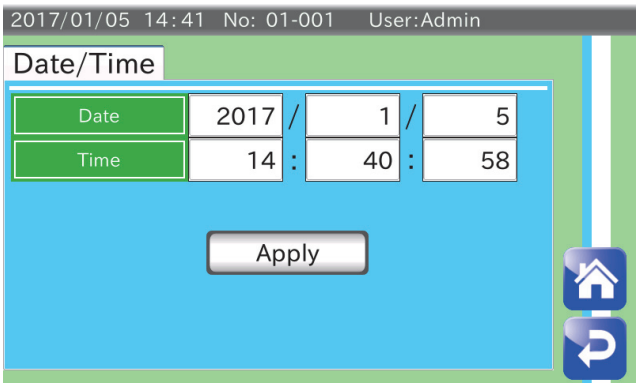
Drawing 52 Span calibration dialog box

7. Touch the "Return" key to return to the "**Common settings window**".

6.2. Settings for Time and Date

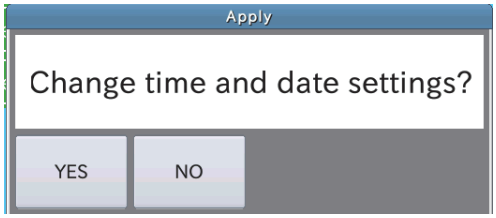
This chapter describes how to set a built-in clock. The setting procedure is shown below.

1. Login with "Quality Manager" or greater.
2. Touch the "Setting" key on the "**weighing window**" to display the "**common settings window**".
3. Select the "**System setting 2**" tab.
   Touch the "**Time & date setting**" key to display to the "**Time & date window**".



Drawing 53 Time & date window

4. Select and input each data of year, month and date.
5. Select and input each data of hour, minute and second.
6. Touch the "Yes" key on the "**New time and date**" dialog box to store them.
   The clock is updated.



Drawing 54 New time and date dialog box

7. Touch the "Return" key to return to the "**Common settings window**".

6.3. Setting up LAN interface

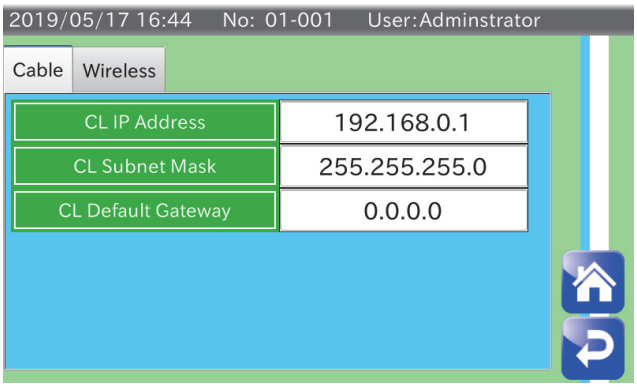
This chapter describes the settings of LAN. The setting procedure is shown below.

Cautions

- ❑ The password of factory setting is "123456789". Change the password at first use.
- ❑ Use 8 characters for the password.
- ❑ Number of connection to the indicator using LAN is 4 in maximum.

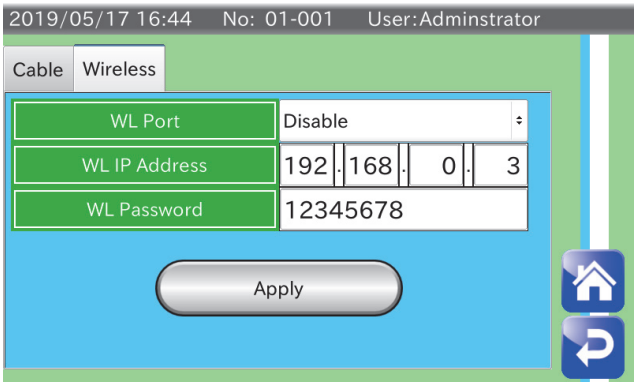
1. Login with "Quality Manager" or greater.
2. Touch the "Setting" key on the "**Weighing window**" to display the "**Common settings window**".
3. Select the "**Connection**" tab on the "**Common settings window**"
   Touch the "LAN" key to display the "**LAN interface window**".
4. The indicator can use wired LAN and wireless LAN.
   These setting procedure are as follows **:**

   Wired LAN
   Select and input each settings of IP address, subnet mask and default gateway.



Drawing 55 Wired LAN interface window

   Wireless LAN
   Choose use or invalid of the wireless port. Specify wireless IP address and password.



Drawing 56 Wireless LAN interface window

5. Turn the power off once and on again using the power switch.
   Then the settings of LAN has effective.

7. Output of Weighing Results and Summary

This indicator can output weighing data and summary of data totalization to the USB memory or printer. This chapter describes procedures of outputting data.

7.1. Output to USB Memory

Weighing history, histogram, control chart and summary can be outputted.

Cautions

- ❑ The USB memory formatted in FAT32 can use.
- ❑ Do not remove the USB memory in accessing.

Note

- ❑ Refer to "**2.1.2. Connecting USB Memory**" for the procedure to connect it.
- ❑ Refer to "**8.1. Format of USB Memory**" for the procedure to format it.

7.1.1. Output of Weighing History

This section describes the procedure to output weighing history. If weighing history is stored in the USB memory, file of weighing history is created with either condition below.

Condition to create new folder

New folder can be created in the condition that the following conditions is effective and a folder of folder name "AD4412CW_date of folder creation" is not in root directory of the USB memory.

- ❑ At turning on the power.
- ❑ After connecting USB memory.
- ❑ After clock data is updated.

Condition to create new file

- ❑ When the condition of new folder is met.
- ❑ When data counts of weighing history becomes 65000 or above.
- ❑ When weighing history is stored, an error occurred.

The weighing history outputted to the USB memory is sotered in folder that is created in root of the USB memory.
File name stored in folder is "Date of file creation_Time of file creation_Weight_Result.csv".
The procedure to output weighing history is shown below.

1. Insert the USB memory to USB port of the indicator.
2. When USB memory is connected, USB indicator is displayed at upper-right area of the display.

Confirm the connection of the USB memory and start weighing.

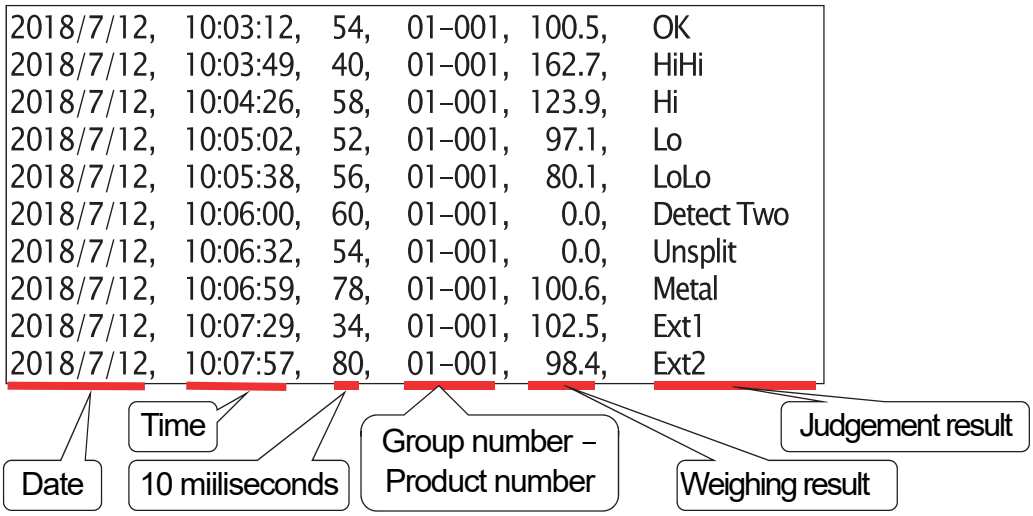
3. When weighing is performed, weighing history is stored in the USB memory.
4. When you want to remove the USB memory, remove it after touch and hold the USB indicator until it is hidden.

7.1.2. Example: Output File of Weighing History

The format outputted to the USB memory is shown below.

"Date (year / month / day), time (hour : minute : second, 10 milliseconds.),
group number – product number, weighing result, judgement result"

Example of this format is shown to Drawing 57.
Judgement result outputted to the USB memory is shown to Table 5.



Drawing 57 Output sample of weihging history

Judgemwnt results in file	Description
OK	Passed (within target weighing value)
HiHi	HiHi
Hi	Hi
Lo	Lo
LoLo	LoLo
Detect Two	The next product is conveyed to the weighing conveyor before the weighing value of the previous product is confirmed.
Unsplit	The product length is longer than the specified product length.
Metal	Metal detected
Ext 1	External 1
Ext 2	External 2

Table 5 Relation between results and meanings

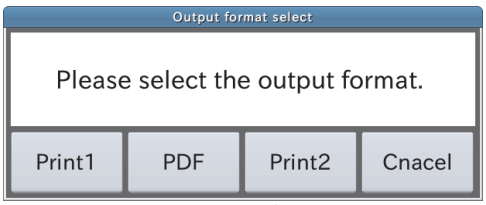
7.1.3. PDF output of Histogram, Control Chart and Summary

This section describes the procedure to output PDFs of histogram, control chart and summary of totalization result to the USB memory.
The procedure of outputting each PDF file is shown below.

Note

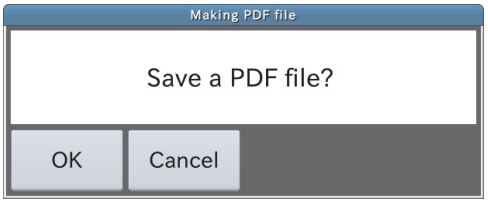
- ❑ Refer to the "**7.2.2. Print sample of Histogram to 7.2.4.**" concerning of histogram, control chart and summary of totalization result outputted to the USB memory.
- ❑ The file name of PDF outputted to the USB memory is "AD4412CE_PDF_date of folder creation".

1. Insert the USB memory to USB port of the indicator.
2. Confirm the connection of the USB memory. Start weighing.
3. Display summary of data that must store after weighing.
4. Touch the "Output" key  of the "**Summary window**" to display the "**Output format**" dialog box.



Drawing 58 Output format dialog box

5. Touch the "PDF" key to display the "**PDF output**" dialog box.



Drawing 59 PDF output dialog box

6. Touch the "OK" key to output PDF file to the USB memory.

7.2. Output to the Postscript Printer

Histogram, control chart and summary of totalization data can be output to PostScript printer and PDF file.

Cautions

❑ PostScript printer is required for printer output.

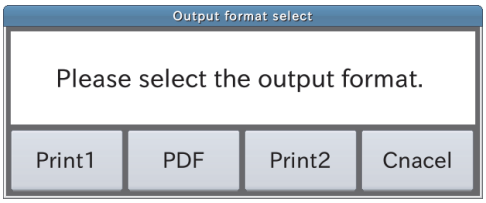
Note

❑ Refer to "**9.2.28.3. Connecting the PostScript Printer**" for connecting printer.

7.2.1. Output to Postscript Printer

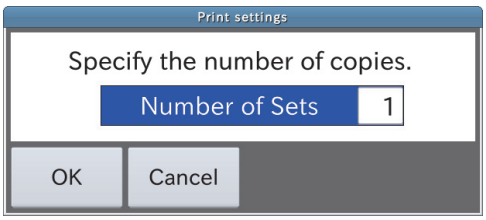
The procedure of printing data is shown below.

1. Display the summary window to be printed after weighing.
2. Touch the "Output" key to display the "**Output format**" dialog box.



Drawing 60 Output format dialog box

3. Touch the "Print" key to display the "**Print setting**" dialog box.



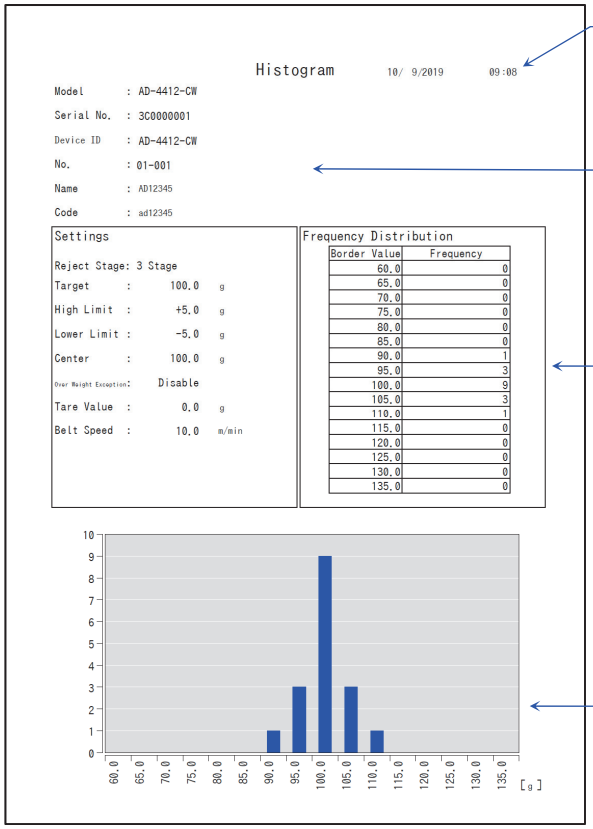
Drawing 61 Print setting dialog box

4. Select and input number of printing.
5. Touch the "OK" key to print them.

7.2.2. Printing sample of Histogram

Printing sample of histogram is shown below.
The PDF file outputted to the USB memory is the same as this printing sample.

The three stage separation



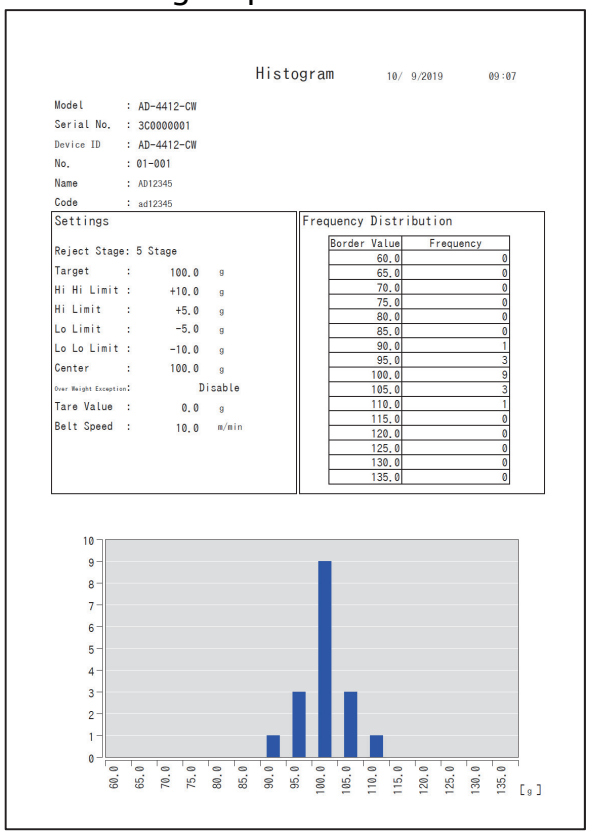
Printed date

Contents :
Product number, product name, product code, target value, high limit value, lower limit value, center value of histogram, over weight exception, tare value, processing number, belt speed.

Frequency distribution
The display of frequency for each section.

Frequency distribution
The display of frequency for each section.

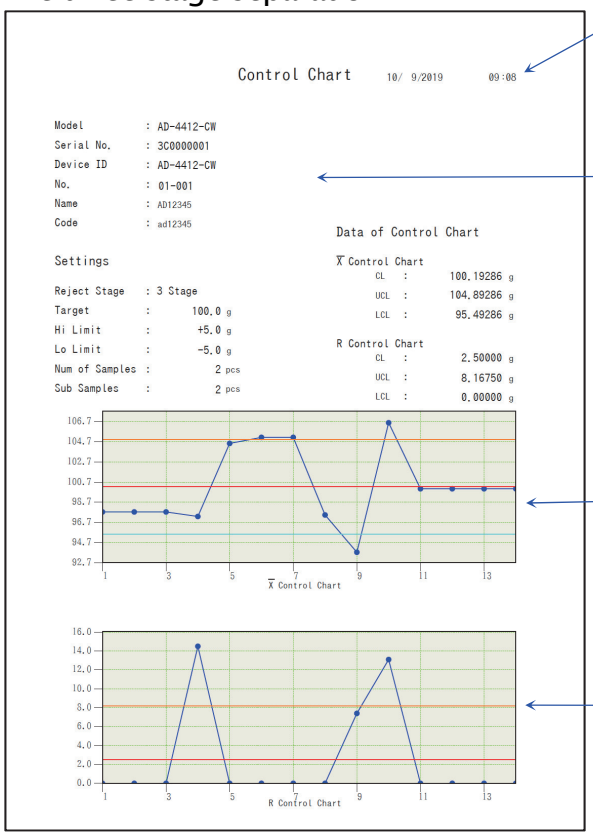
The fifth stage separation



7.2.3. Print Sample of Control Chart

Printing sample of control chart is shown below.
The PDF file outputted to the USB memory is the same as this printing sample.

The three stage separation



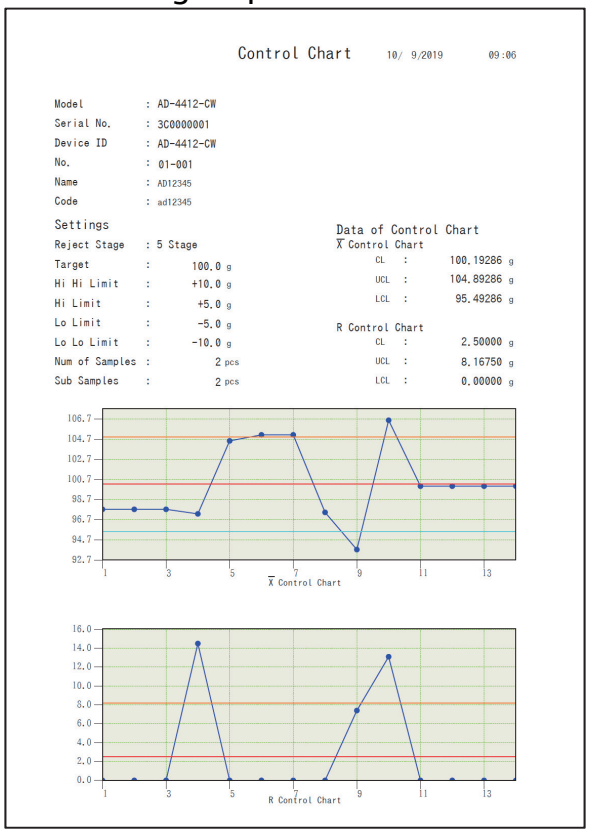
Printed date

Contents :
Product number, product name, product code, target value, high limit value, lower limit value, number of samples, size of sample

$\overline{X}$ control chart

R control chart

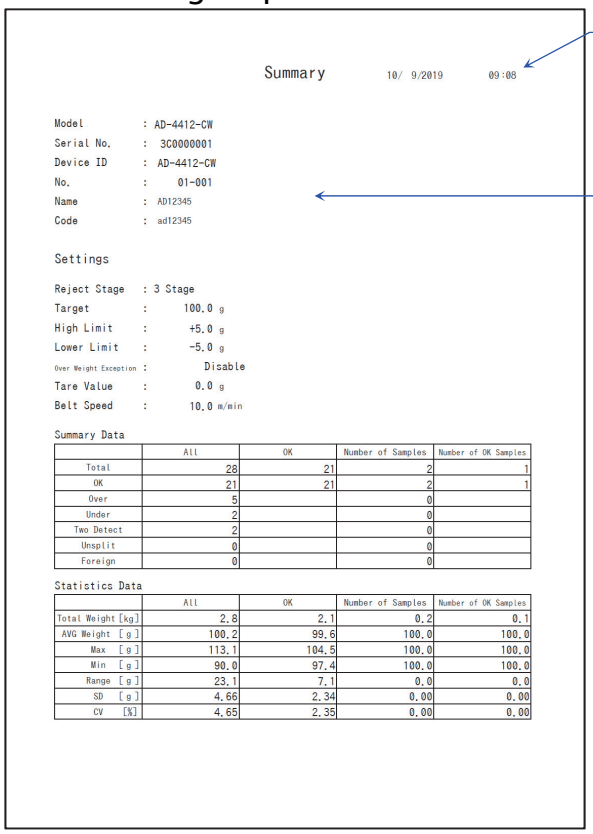
The fifth stage separation



7.2.4. Print Sample of Summary

Printing sample of summary is shown below.
The PDF file outputted to the USB memory is the same as this printing sample.

The three stage separation



Summary 10/ 9/2019 09:08

Model : AD-4412-CW
Serial No. : 3C0000001
Device ID : AD-4412-CW
No. : 01-001
Name : AD12345
Code : ad12345

Settings

Reject Stage : 3 Stage
Target : 100.0 g
High Limit : +5.0 g
Lower Limit : -5.0 g
Over Weight Exception : Disable
Tare Value : 0.0 g
Belt Speed : 10.0 m/min

Summary Data

	All	OK	Number of Samples	Number of OK Samples
Total	28	21	2	1
OK	21	21	2	1
Over	5		0	
Under	2		0	
Two Detect	2		0	
Unsplit	0		0	
Foreign	0		0	

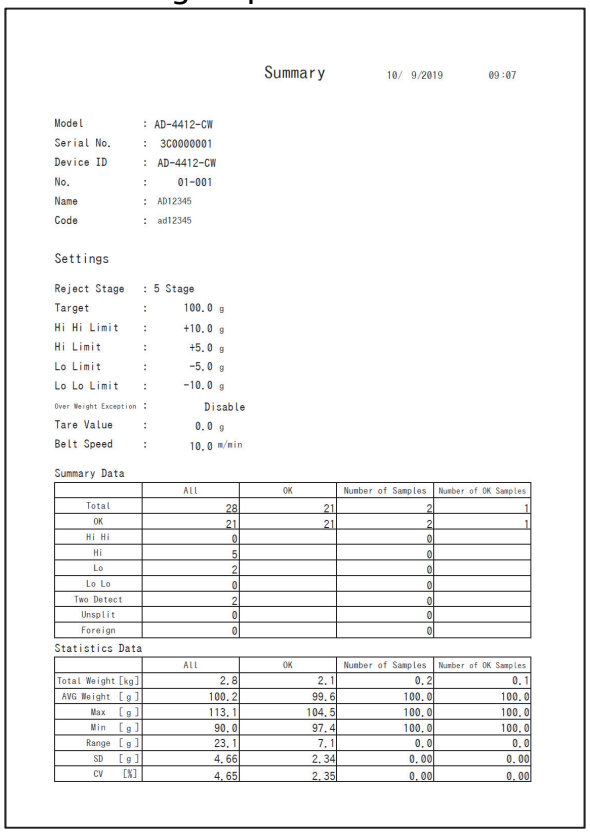
Statistics Data

	All	OK	Number of Samples	Number of OK Samples
Total Weight [kg]	2.8	2.1	0.2	0.1
AVG Weight [g]	100.2	99.6	100.0	100.0
Max [g]	113.1	104.5	100.0	100.0
Min [g]	90.0	97.4	100.0	100.0
Range [g]	23.1	7.1	0.0	0.0
SD [g]	4.66	2.34	0.00	0.00
CV [%]	4.65	2.35	0.00	0.00

Printed date

Contents :
Product number, product name, product code, target value, high limit value, lower limit value, over weight exception, tare value, processing number, belt speed.

The fifth stage separation



Summary 10/ 9/2019 09:07

Model : AD-4412-CW
Serial No. : 3C0000001
Device ID : AD-4412-CW
No. : 01-001
Name : AD12345
Code : ad12345

Settings

Reject Stage : 5 Stage
Target : 100.0 g
Hi Hi Limit : +10.0 g
Hi Limit : +5.0 g
Lo Limit : -5.0 g
Lo Lo Limit : -10.0 g
Over Weight Exception : Disable
Tare Value : 0.0 g
Belt Speed : 10.0 m/min

Summary Data

	All	OK	Number of Samples	Number of OK Samples
Total	28	21	2	1
OK	21	21	2	1
Hi Hi	0		0	
Hi	5		0	
Lo	2		0	
Lo Lo	0		0	
Two Detect	2		0	
Unsplit	0		0	
Foreign	0		0	

Statistics Data

	All	OK	Number of Samples	Number of OK Samples
Total Weight [kg]	2.8	2.1	0.2	0.1
AVG Weight [g]	100.2	99.6	100.0	100.0
Max [g]	113.1	104.5	100.0	100.0
Min [g]	90.0	97.4	100.0	100.0
Range [g]	23.1	7.1	0.0	0.0
SD [g]	4.66	2.34	0.00	0.00
CV [%]	4.65	2.35	0.00	0.00

7.3. Output to the Dump Printer

Summary data ans statistic data can be output to the dump printer such as AD-8126 that can connect to the RS-232C interface.
Dump printer can be used for printing of a summary or weighing result that is smaller than approximately 100 piece per minute or less.
RS-232C is used to the connection between this indicator and dump printer. 。

Cautions

- ❑ The format of dump printer is 24 characters per line.
  Use the printer that can print 24 characters or more per line.
- ❑ Printing data are all summary, OK summary, number of samples summary and number of OK samples summary. Histogram can not print.
- ❑ Terminetor is fixed to <CR> <LF>. <CR> is carriage return, 0x0D. <LF> is line feed, 0x0A.

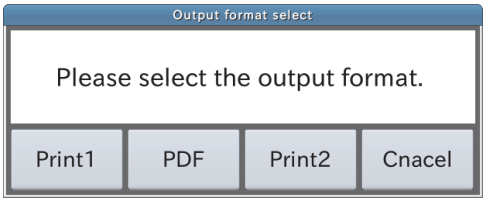
Note

- ❑ Refer to "9.20. **Output Format**" for data output of each weighing.
- ❑ Data can be received at the computer connected to serial interface.

7.3.1. Output to the Dump Printer

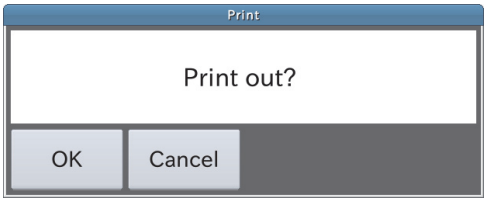
The procedure to print each data using the printer is shown below.

1. Display the window (of all summary, OK summary, number of samples summary and number of OK samples summary) to print data after weighing.
2. Touch the "Output" key to display the "**Output format**" dialog box.



Drawing 62 Output format dialog box

3. Touch the "Print" key to display the "**Print output**" dialog box.



Drawing 63 Printing output dialog box

4. Touch the "OK" key to print them.

7.3.2. Print Samples

All Summary by Data Totalization

The three stage separation

```
******* TOTAL *******
Date:          2019/05/17
Time:            13:11:02

Model:         AD-4412-CW
Serial No:     1R0000001
Identification Name:
0123456789abcdefghij


SETTINGS

NO.                  01-001
Name
0123456789abcde

Code
0123456789abcdefghij

Reject Stage:      3 Stage
Target:       +01234.56 g
Hi Limit:     +01234.56 g
Lo Limit:     +01234.56 g
Reject Over:       Disable
Tare Value:   +01234.56 g
Belt Speed:     80.0m/min

SUMMARY DATA

Total:            12345 pcs
OK:               12345 pcs
Hi:               12345 pcs
Lo:               12345 pcs
Detect Two:       12345 pcs
Unsplit:          12345 pcs
Foreign:          12345 pcs

STATISTICS DATA

Total Weight:
                +012345.6kg
Average:      +01234.56 g
Max Weight:   +01234.56 g
Min Weight:   +01234.56 g
Range:        +01234.56 g
SD:           +0123.456 g
CV:           +0123.456 %
```

The fifth stage separation

```
******* TOTAL *******
Date:          2019/05/17
Time:            13:11:02

Model:         AD-4412-CW
Serial No:     1R0000001
Identification Name:
0123456789abcdefghij


SETTINGS

NO.                  01-001
Name
0123456789abcde

Code
0123456789abcdefghij

Reject Stage:      5 Stage
Target:       +01234.56 g
Hi Hi Limit:  +01234.56 g
Hi Limit:     +01234.56 g
Lo Limit:     +01234.56 g
Lo Lo Limit:  +01234.56 g
Reject Over:       Disable
Tare Value:   +01234.56 g
Belt Speed:     80.0m/min

SUMMARY DATA

Total:            12345 pcs
OK:               12345 pcs
Hi Hi:            12345 pcs
Hi:               12345 pcs
Lo:               12345 pcs
Lo Lo:            12345 pcs
Detect Two:       12345 pcs
Unsplit:          12345 pcs
Foreign:          12345 pcs

STATISTICS DATA

Total Weight:
                +012345.6kg
Average:      +01234.56 g
Max Weight:   +01234.56 g
Min Weight:   +01234.56 g
Range:        +01234.56 g
SD:           +0123.456 g
CV:           +0123.456 %
```

Net Summary by Data Totalization

The three stage separation

```
********** OK **********
Date:           2019/05/17
Time:             13:11:02

Model:          AD-4412-CW
Serial No:     1R0000001
Identification Name:
0123456789abcdef9hij


SETTINGS

NO.                   01-001
Name
0123456789abcde

Code
0123456789abcdef9hij

Reject Stage:      3 Stage
Target:        +01234.56 g
Hi Limit:      +01234.56 g
Lo Limit:      +01234.56 g
Reject Over:       Disable
Tare Value:    +01234.56 g
Belt Speed:      80.0m/min

SUMMARY DATA

Total:            12345 pcs
OK:               12345 pcs


STATISTICS DATA

Total Weight:
                +012345.6kg
Average:        +01234.56 g
Max Weight:     +01234.56 g
Min Weight:     +01234.56 g
Range:          +01234.56 g
SD:             +0123.456 g
CV:             +0123.456 %
```

The fifth stage separation

```
********** OK **********
Date:           2019/05/17
Time:             13:11:02

Model:          AD-4412-CW
Serial No:     1R0000001
Identification Name:
0123456789abcdef9hij


SETTINGS

NO.                   01-001
Name
0123456789abcde

Code
0123456789abcdef9hij

Reject Stage:      5 Stage
Target:        +01234.56 g
Hi Hi Limit:   +01234.56 g
Hi Limit:      +01234.56 g
Lo Limit:      +01234.56 g
Lo Lo Limit:   +01234.56 g
Reject Over:       Disable
Tare Value:    +01234.56 g
Belt Speed:      80.0m/min

SUMMARY DATA

Total:            12345 pcs
OK:               12345 pcs


STATISTICS DATA

Total Weight:
                +012345.6kg
Average:        +01234.56 g
Max Weight:     +01234.56 g
Min Weight:     +01234.56 g
Range:          +01234.56 g
SD:             +0123.456 g
CV:             +0123.456 %
```

Sample Summary by Data Totalization

The three stage separation

```
*** Number of Samples **
Date:           2019/05/17
Time:             13:11:02

Model:          AD-4412-CW
Serial No:     1R0000001
Identification Name:
0123456789abcdef9hij


SETTINGS

NO.                  01-001
Name
0123456789abcde

Code
0123456789abcdef9hij

Reject Stage:      3 Stage
Target:       +01234.56 g
Hi Limit:     +01234.56 g
Lo Limit:     +01234.56 g
Reject Over:       Disable
Tare Value:   +01234.56 g
Belt Speed:     80.0m/min

SUMMARY DATA

Total:            12345 pcs
OK:               12345 pcs
Hi:               12345 pcs
Lo:               12345 pcs
Detect Two:       12345 pcs
Unsplit:          12345 pcs
Foreign:          12345 pcs

STATISTICS DATA

Total Weight:
                +012345.6kg
Average:      +01234.56 g
Max Weight:   +01234.56 g
Min Weight:   +01234.56 g
Range:        +01234.56 g
SD:           +0123.456 g
CV:           +0123.456 %
```

The fifth stage separation

```
*** Number of Samples **
Date:           2019/05/17
Time:             13:11:02

Model:          AD-4412-CW
Serial No:     1R0000001
Identification Name:
0123456789abcdef9hij


SETTINGS

NO.                  01-001
Name
0123456789abcde

Code
0123456789abcdef9hij

Reject Stage:      5 Stage
Target:       +01234.56 g
Hi Hi Limit:  +01234.56 g
Hi Limit:     +01234.56 g
Lo Limit:     +01234.56 g
Lo Lo Limit:  +01234.56 g
Reject Over:       Disable
Tare Value:   +01234.56 g
Belt Speed:     80.0m/min

SUMMARY DATA

Total:            12345 pcs
OK:               12345 pcs
Hi Hi:            12345 pcs
Hi:               12345 pcs
Lo:               12345 pcs
Lo Lo:            12345 pcs
Detect Two:       12345 pcs
Unsplit:          12345 pcs
Foreign:          12345 pcs

STATISTICS DATA

Total Weight:
                +012345.6kg
Average:      +01234.56 g
Max Weight:   +01234.56 g
Min Weight:   +01234.56 g
Range:        +01234.56 g
SD:           +0123.456 g
CV:           +0123.456 %
```

Net Sample Summary by Data Totalization

The three stage separation

```
* OK(Number of Samples)*
Date:          2019/05/17
Time:            13:11:02

Model:         AD-4412-CW
Serial No:     1R0000001
Identification Name:
0123456789abcdef9hij


SETTINGS

NO.                01-001
Name
0123456789abcde

Code
0123456789abcdef9hij

Reject Stage:      3 Stage
Target:       +01234.56 g
Hi Limit:     +01234.56 g
Lo Limit:     +01234.56 g
Reject Over:       Disable
Tare Value:   +01234.56 g
Belt Speed:     80.0m/min

SUMMARY DATA

Total:           12345 pcs
OK:              12345 pcs


STATISTICS DATA

Total Weight:
              +012345.6kg
Average:      +01234.56 g
Max Weight:   +01234.56 g
Min Weight:   +01234.56 g
Range:        +01234.56 g
SD:           +0123.456 g
CV:           +0123.456 %
```

The fifth stage separation

```
* OK(Number of Samples)*
Date:          2019/05/17
Time:            13:11:02

Model:         AD-4412-CW
Serial No:     1R0000001
Identification Name:
0123456789abcdef9hij


SETTINGS

NO.                01-001
Name
0123456789abcde

Code
0123456789abcdef9hij

Reject Stage:      5 Stage
Target:       +01234.56 g
Hi Hi Limit:  +01234.56 g
Hi Limit:     +01234.56 g
Lo Limit:     +01234.56 g
Lo Lo Limit:  +01234.56 g
Reject Over:       Disable
Tare Value:   +01234.56 g
Belt Speed:     80.0m/min

SUMMARY DATA

Total:           12345 pcs
OK:              12345 pcs


STATISTICS DATA

Total Weight:
              +012345.6kg
Average:      +01234.56 g
Max Weight:   +01234.56 g
Min Weight:   +01234.56 g
Range:        +01234.56 g
SD:           +0123.456 g
CV:           +0123.456 %
```

8. Peripherals

This chapter describes operation of peripherals and how to connect them.

8.1. Format of USB Memory

This section describes the procedure of formatting the USB memory.
The procedure of formatting the USB memory is shown below.

Cautions

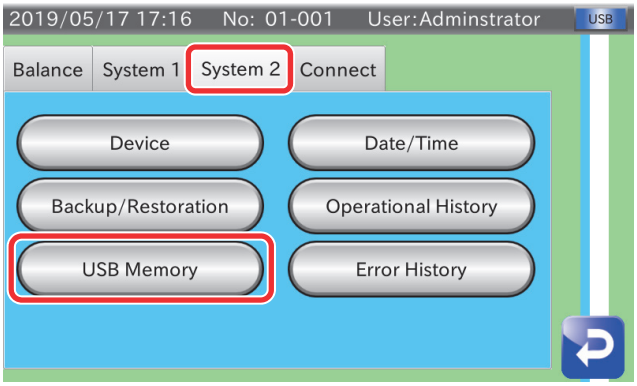
- ❑ When the USB memory is formatted, the whole of data stored in it is deleted.
- ❑ Make backup data in advance before formatting the USB memory because the deleted data cannot restore.

Note

- ❑ Refer to the "**2.1.3. Removing USB Memory**" for how to remove the USB memeory.

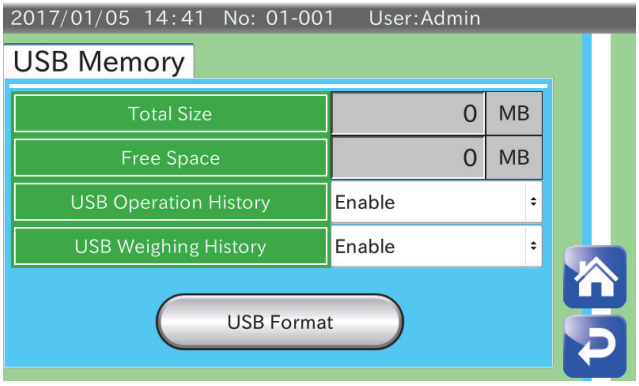
1. Login with "Quality Manager" or greater.
2. Connect the USB memory to the USB port on the indicator.
3. When USB memory is connected, USB indicator is displayed at upper-right area of the display.

4. Touch the "Setting" key on the "**Weighing window**" to display the "**Common settings window**".
5. Select the the "**system 2**" tab of the "**Common settings window**".
   Touch the "USB memory" key.



Drawing 64 Common settings window (System tab 2)

6. Confirm the USB indicator on the "**USB memory window**". The USB indicator is displayed when connecting the USB memory.



Drawing 65 USB Memory window

7. Touch the "USB format" key to display the confirmation dialog box. Touch the "OK" key to format it.
8. Wait that the formatting finishes.
9. Touch the "return" key  to return to the "**Common settings window**".

8.2. Connecting the LAN interface

This section describes the connection of wired LAN and wireless LAN that is built in the indicator. The procedure of connecting them is shown below.

8.2.1. How to Connect to Network Using Wired LAN

The wired LAN is used when Modbus communication using "Modbus TCP" is performed. Connect the connector of LAN cable in the market to the LAN terminal on the rear panel, connect the other to LAN terminal of master device or Ethernet hub.

Note

- ❑ Store the settings of wired LAN in advance if Modbus communication using "Modbus TCP" is performed.
- ❑ Refer to the "**6.3. Setting up LAN interface**" concerning the settings of wired LAN.

8.2.2. How to Connect to Network Using Wirless LAN

The wireless LAN is used when remote network monitoring is performed.
Prepare a communication device such as personal computer, tablet or smartphone that wireless LAN is built-in.
Select this indicator form wireless network list of the communication device.
Enter SSID "`AD-4412CW-xxxxxxxxx`" and password.
"`xxxxxxxxx`" is serial number of the indicator.

Cautions

- ❑ The password of factory setting is "`123456789`". Change the password at first use.

Note

- ❑ Store the settings of wireless LAN in advance if remote network monitoring is performed.
- ❑ Refer to the "**6.3. Setting up LAN interface**" concerning the settings of wireless LAN including password.

8.3. Connecting the PostScript Printer

PostScript printer is used printing of graph and summary result.
The connection between the indicator and printer is used wired LAN.

Cautions

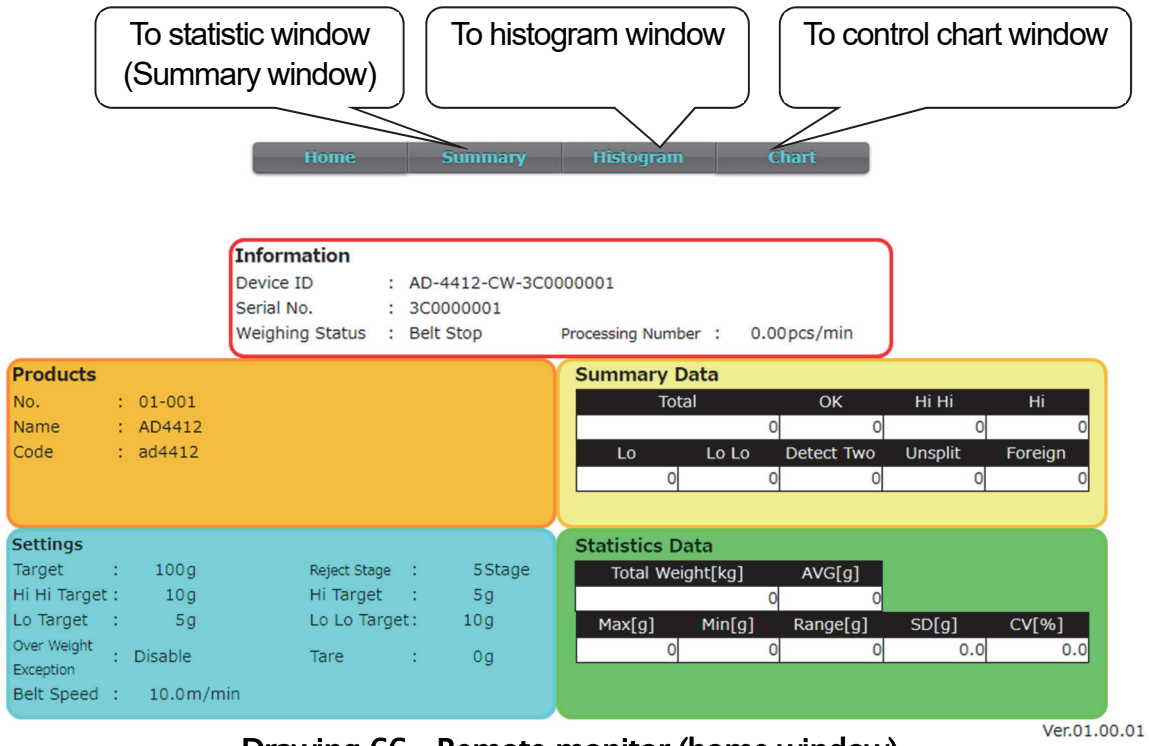
- ❑ Consult to network manager concerning connection between the indicator and printer.
- ❑ Refer to the accessory manual concerning IP address for the printer.
- ❑ Store IP address for the printer in advance if printer is connected to wired LAN.

Note

- ❑ Refer to the "**6.3. Setting up LAN interface**" concerning the settings of wired LAN.
- ❑ Refer to the "**6.39.12.1. IP Address for Printer**" concerning IP address for the printer.

8.4. Remote Monitor

Remote network monitoring using wireless is the function that can monitor information of the indicator and statistical data etc. by external network devices in real time.
After the indicator and external device are connected to network, if you access to IP address of the indicator using web browser, monitoring window is displayed.
Example **:** http:// xxx.xxx.xxx.xxx (is preset IP address of wireless LAN)



Drawing 66 Remote monitor (home window)

Information that can monitor from remote network monitor is as follows **:**

- ❑ Product information
- ❑ Content of product settings
- ❑ Summary of totarization data
- ❑ Statistic data
- ❑ Histogram
- ❑ Control chart

Cautions

- We cannot recommend use such as continuous monitoring because wireless LAN may become unstable depened on placed environment.
- Browsers that has checked operations are Microsoft Edge, Google Chrome, Mozilla Firefox and Safari. Internet Explorer doesn't work properly.
- Refer to accessory manual of wireless LAN for settings of wireless LAN.

Note

- Browsable information of statistical data, histogram and control chart are the same as contents of PDF and printer etc.

8.5. Replacing Product Using Serial Communication

The indicator can replace product using serial communication of RS-232C interface.
The replacement of product receives product code form peripherals of bar code reader or PLC etc., search product code from product group and is performed.

Cautions

- Product code received during replacement is ignored.

Note

- The settings of RS-232C needs if the replacement using serial communication is performed.
- Refer to the "6.39.21. RS-232C" for the settings of RS-232C.

9. The Details of Settings

Detalis of settings for the weihging indicator are described in this chapter. Refer to "**Table 7 of setting list according to product**" and "**Table 10 of common settings**" for windows and settings of the indicator.

Part 1／2 of Table 6 **Table 7 of setting list according to product**

Product setting window	Edit tab	Product name		
		Product code		
	Detect function tab	Detect basis	Reject stage	
			Target value	
			Hi Hi limit	
			Hi limit	
			Lo limit	
			Lo Lo limit	
			Over weight exception	
			Consecutive fail	
			Consecuitve fail num	
		Processing performance	Product length	
			Speed	
			Weighing mode	
			Conveyor stop timer	
			Prodcut detection	
			Near zero range	
			Auto mode	
			Filter	
			Judge timer	
			Average timer	
		DO	DO map	Reference
				OK
				HiHi
				Hi
				Lo
				LoLo
				Detect two
				Unsplit
				Material
				Ext 1
				Ext 2
				Belt running
				Belt stop
				Consecutive fail
				Emergency stop on
				Weighing error
				PES error
				Bin full
				Air pressure error
				Total num count
				OK item count
				Reject confirmation
				Reject photo eye sensor

Part 2／2 of Table 8

Product setting window	Detect function tab	DO	DO map	FC+
				FC−
				+Zone 1
				+Zone 2
				+Zone 3
				+Zone 4
				+Zone 5
				−Zone 1
				−Zone 2
				−Zone 3
				−Zone 4
				−Zone 5
			Main unit DO behavior	Behavior
				Delay time
				Hold time
				Polarity
			Option port 1 DO behavior	Behavior
				Delay time
				Hold time
				Polarity
			Option port 2 DO behavior	Behavior
				Delay time
				Hold time
				Polarity
		Statistical	Num of samples	
			Samples size	
			$\overline{\overline{X}}$	
			$\overline{X}$	
			Width of section	
	Control revision tab	Tare	Tare	
		Auto zero	Auto zero range	
			Dead zone timer	
			Observation timer	
			Averaging time	
			Number of averaging for automatic zero	
			Number of totarization for automatic zero	
			Coe	
		Dynamic compensation	Dynamic compensation value	
		Feedback control	FC target	
			FC range	
			Feedback control step [g/sec]	
			Feedback control step [sec/g]	
			Feedback control sample	
			Feedback control wait time	
		Step control	Control target	
			Zone 1	
			Zone 2	
			Zone 3	
			Zone 4	
			10C sample	
			10C wait time	

Part 1／2 of Table 9 Table 10 of common settings

Common setting window	Balance tab	Weighing	Unit	g
			Decimal point	0
			Readability	1
			Capacity	30000 g
			Zero point range	0 %
			Stop digital filter	
			Power on zero auto zero range	0 %
			Zero tracking time	20.0 sec.
			Zero tracking weight	4 digit
			Stability time	1.0 sec.
			Stability weight	4 digit
		Cal	Cal weight	
			Zero point	
			Span	
	System 1 tab	Main unit	Identification name	
			Startup user level	operator
			Conveyer length	
			Unsplit range	10 %
			Connect device priority	Invalid
			Conveyor mode	Invalid
			Curb chattering	0.2 sec.
			Photo eye sensor polarity	True
			Photo eye sensor timeout	30 sec.
			Random check	Invalid
		Display	Language	English
			Weighing display mode	Weighing result
			Negative value	Display
			Display data	Disp data weight
			Standby mode	0 sec.
			Brightness	
		Connection	Printer IP address	
		DI indicator		
		DI	DI map	OK
				HiHi
				Hi
				Lo
				LoLo
				Detect two
				Unsplit
				Material
				Ext 1
				Ext 2
			Main unit DI behavior	Input trigger
				Configuration
				Delay time
				Chattering
			Option port 1 DI behavior	Input trigger
				Configuration
				Delay time
				Chattering
			Option port 2 DI behavior	Input trigger
				Configuration
				Delay time
				Chattering

Part 2／2 of Table 11

Common setting window	System 1 tab	Analog out	Analog out 1	Data types
				Output format
				Low voltage standard
				High voltage standard
				Low voltage output
				High voltage output
				Low current standard
				High current standard
				Low current output
				High current output
			Analog out 2	Data types
				Output format
				Low voltage standard
				High voltage standard
				Low voltage output
				High voltage output
				Low current standard
				High current standard
				Low current output
				High current output
	System 2 tab	Device	Model name	
			Serial number	
			Disp soft version	
			Weighing soft version	
			Option port 1	
			Option port 2	
		Date / time	Date set	
			Time set	
		Backup / restoration		
		Operational history		
		Error history		
		USB memory	USB operation history	
			USB weighing history	
	Connect tab	Modbus	Modbus	Invalid
			Slave Address	1
		RS232C	RS−232C port	Invalid
			RS−232C output format	Cyclic print
			RS−232C baudrate	2400
			RS−232C parity	Non
			RS−232C stop bit	1 bit
			RS−232C data bit	7 bit
		RS485	RS−485 port	Invalid
			RS−485 output format	Cyclic print
			RS−485 baudrate	2400
			RS−485 parity	Non
			RS−485 stop bit	1 bit
			RS−485 data bit	7 bit
		LAN	CL IP address	
			CL subnet mask	
			CL default gateway	
			WL port	Invalid
			WL IP address	
			WL password	

9.1. Product Name and Product Code

9.1.1. Product Name

Input the product name displayed at the "**Weighing window**" and "**Window to select product**". The product name can input 40 characters in maximum.

9.1.2. Product Code

Input the product code displayed at the "**Weighing window**" and "**Window to select product**". The product code can input 40 characters in maximum.

9.2. Detection Criteria

9.2.1. Reject Stage (Count of Sparation)

Select 3 stage or 5 stage to the reject stage to classify product.

9.2.2. Target Value

Input weight value to the "target value" as standard value of the product.
Refer to the "**5.6.2. Settings of Threshold Values** (Target value, Upper-Upper Limit, Upper Limit, Lower Limit, Lower-Lower Limit)" for the settings.

9.2.3. Upper-Upper Limit Value

Input the "upper-upper limit value" of the product.
Refer to the "**5.6.2. Settings of Threshold Values** (Target value, Upper-Upper Limit, Upper Limit, Lower Limit, Lower-Lower Limit)" for the settings.

9.2.4. Upper Limit Value

Input the "upper limit value" of the product.
Refer to the "**5.6.2. Settings of Threshold Values** (Target value, Upper-Upper Limit, Upper Limit, Lower Limit, Lower-Lower Limit)" for the settings.

9.2.5. Lower Limit Value

Input the "lower limit value" of the product.
Refer to the "**5.6.2. Settings of Threshold Values** (Target value, Upper-Upper Limit, Upper Limit, Lower Limit, Lower-Lower Limit)" for the settings.

9.2.6. Lower-Lower Limit Value

Input the "lower-lower limit value" of the product.
Refer to the "**5.6.2. Settings of Threshold Values** (Target value, Upper-Upper Limit, Upper Limit, Lower Limit, Lower-Lower Limit)" for the settings.

9.2.7. Reject Over

Input value that assumes the product of the "over weight exception" as OK product.
If the "over weight exception" is "effectiveness" and this applicable product is detected, the "over weight exception" indicator 

is displayed in the "**Weighing window**".

9.2.8. Consecutive Fail

The "consecutive fail" is the settings to detect that consecutive defective products occurs more than preset count of failed product (of Lo, LoLo, Hi and HiHi).
If this settings of consecutive fail is "effectiveness", it can detect.
Refer to the "**9.2.9. Count of Continued Failed Products**" for count of consecutive defective products.

9.2.9. Count of Continued Failed Products

The "count of consecutive fail" is the settings to input the count of consecutive failed product (of Lo, LoLo, Hi and HiHi) that is used to detect consecutive defective products.

9.3. Detection Parameters

9.3.1. Product Length

The "product length" of length of the weighing product is used for detection of "unsplit judge".

9.3.2. Velocity of Conveyor

Input a velocity of the conveyor to the "speed".

9.3.3. Weighing Mode

The weighing mode can be selected from "passing weighing", "stop weighing" and "static weighing".

1. **Passing weighing**
   The judgement is performed using the "Judge timer" and "Average timer" during a weighing product is passing on the conveyor.
2. **Stop weighing**
   The judgement is performed using the "Judge timer" and "Average timer" after the conveyor is stopped using the "Conveyor stop timer" when the indicator detects that a weighing product is entered on the conveyor. This mode performs judgement of "Two put" and "Unsplit", too.
3. **Static weighing**
   The conveyor is stopped using the "Conveyor stop timer" when the indicator detects that a weighing product is entered on the conveyor. The judgement is performed after the indicator detects stability of a weighing product. This mode performs judgement of "Two put" and "Unsplit", too.

9.3.4. Conveyor Stop Timer

The "Conveyor stop timer" for the weighing product stores a time from entering on the conveyor to stopping when the "Stop weighing" or "Static weighing" is used.

$$0 < \text{Conveyor stop timer (sec.)} < \frac{\text{Length of conveyor (mm)} - \text{Length of weighing product (mm)}}{\text{Velocity of conveyor (m/min)}}$$

9.3.5. Product Detection

The "Product detection" specifies a method of the detection.
Choose a method from "Photo eye" and "Near zero".

1. **Photo eye**
   When the weighing product enters on the conveyor and the light of the photoelectric sensor is shaded, it regards as a weighing product is detected.

2. **Near zero**
   When the weighing product enters on the conveyor and the weighing value rises above threshold value of zero point range, it regards as a weighing product is detected.

Cautions

- The "Unsplit" cannot judge because the product length cannot identify.
- It is necessary that displays once the weighing value within "near zero range" so as to detect next weighing product after last weighing product enters on the conveyor.
- "Two put" may judge correctly. (Next weighing product cannot detect during last weighing product leaves on the conveyor. When the weighing value is decided and the detection can be effectiveness, if the vibration of releasing the product from the conveyor is above the threshold value, detection error occurs. etc.)
- Processing rate of the "Near zero" is smaller than "Photo eye".

9.3.6. Near Zero Range

The "Near zero range" stores a threshold value that weighing value regards as nearly-zero.
When the weighing value becomes above the threshold value, it means "The start time that weighing product enters on the conveyor".
When the weighing value becomes under the threshold value, it means "The end time that weighing product releases from the conveyor".

9.3.7. Automatic Mode (to Set Parameters)

The "Auto mode" stores parameters that is automatically calculated when "Filter", "Judge timer" and "Average timer" are effectiveness.
Do not change these parameters except authorized persons.

9.4. DO Map (Digital Output Map)

DO map specifies whether stops the conveyor or not in each judgement result. And DO map stores the settings concerning DO output.
Refer to the "**5.6.4. Setting the Digital Output (DO)**" to how to store the settings of DO map.
The output circuit cannot use by the settings of DO map only. Store the settings of the "**9.5. DO Behavior**".

9.4.1. DO Map Reference

The product number of the same group can be referred concerning the content of DO map and DO behaviour. Input a product number of the same group as target of reference. If "0" is inputted, specified reference becomes invalid.

Cautions

- Just product number 1 of each group cannot use the function of DO map reference. And it cannot delete and copy product settings.
- This function is can specify just invalid reference as target of reference. If target product is referring other product or isn't registered, it cannot refer.

9.4.2. Output Definition of DO Map

OK :	It is outputted when last weighing result is within target value.
HiHi :	It is outputted when last weighing result is within upper-upper limit.
Hi :	It is outputted when last weighing result is within upper limit.
Lo :	It is outputted when last weighing result is within lower limit.
LoLo :	It is outputted when last weighing result is within lower-lower limit.
Detect Two :	It is outputted when next product is entered on the conveyor before last product released from the conveyor.
Unsplit :	It is outputted when product length is longer than preset product length.
Matel :	It is outputted when DI assingned to metal detection is active.
Ext 1 :	It is outputted when DI assingned to external 1 is active.
Ext 2 :	It is outputted when DI assingned to external 2 is active.
Belt Running :	It is outputted when the conveyor is moving.
Belt Stop :	It is outputted when the conveyor is stopped.
Consecutive Fail :	It is outputted when an error of consecutive defective products occurs.
Emergency Stop On :	It is outputted when DI assingned to emergency stop is active.
Weighing Error :	It is outputted when last weighing result is value above capacity (+over) or negative value (-over).
PES Error :	It is outputted when an error occurs to photoelectric sensor.
Bin Full :	It is outputted when full capacity is detected.
Air Pressure :	It is outputted when DI assingned to air pressure error is active.
Total Num Count :	Total number count is outputted when total number in the number of samples summary reaches to preset number.
OK Item Count :	Confirmation item count is outputted when total number in the number of OK samples summary reaches to preset number.
Reject Confirmation :	It is outputted when an error occurs at confirmation to release product from the conveyor.

Reject Photo Eye Sensor : It is outputted when an error occurs to photoelectric sensor used for confirmation to release product from the conveyor.

FC+ : It is outputted when pulse width of feedback control (FC) is positive.

FC− : It is outputted when pulse width of feedback control (FC) is negative.

+zone 1 : It is outputted when the average weighing value calculated with the 10-stage feedback function is within +zone 1.

+zone 2 : It is outputted when the average weighing value calculated with the 10-stage feedback function is within +zone 2.

+zone 3 : It is outputted when the average weighing value calculated with the 10-stage feedback function is within +zone 3.

+zone 4 : It is outputted when the average weighing value calculated with the 10-stage feedback function is within +zone 4.

+zone 5 : It is outputted when the average weighing value calculated with the 10-stage feedback function is within +zone 5.

−zone 1 : It is outputted when the average weighing value calculated with the 10-stage feedback function is within −zone 1.

−zone 2 : It is outputted when the average weighing value calculated with the 10-stage feedback function is within −zone 2.

−zone 3 : It is outputted when the average weighing value calculated with the 10-stage feedback function is within −zone 3.

−zone 4 : It is outputted when the average weighing value calculated with the 10-stage feedback function is within −zone 4.

−zone 5 : It is outputted when the average weighing value calculated with the 10-stage feedback function is within −zone 5.

Cautions

- The judgement of highest priority is applied for each weighing.

  Example : When "Detect two", "Metal" and "Lo" is occurred at the same time, judgement is applicable as "Detect two" if the priority of the extrnal input is invalid or as "Metal" if the priority is effectiveness, either judgement is outputted. And the output of "Metal" is continued until "Detect tow" is cleared if the external input is effectiveness.

Note

- The priority list of judgement are the following 2 types.
- Rank "1" is highest priority.
- Refer to "**9.10.10. To Set Priority Input to Peripheral Input**" to how to change priority.

Priority	The priority of the extrnal input is "invalid".	The priority of the extrnal input is "effectiveness"
1	Detect tow	Ext 1
2	Unsplit	Metal
3	Ext 1	Ext 2
4	Metal	Detect tow
5	Ext 2	Unsplit
6	LoLo	LoLo
7	Lo	Lo
8	HiHi	HiHi
9	Hi	Hi
10	OK	OK

- The settings of Modbus can be assigned each 8 byte (4 byte upper figures, 4 byte lower figures) as the followings. Set to "1" against to assigned bit.

Upper 4 byte	
Bit	Description
MSB 31	0
30	−zone 2
29	−zone 1
28	+zone 5
27	+zone 4
26	+zone 3
25	+zone 2
24	+zone 1
23	FC−
22	FC+
21	Reject photo eye sensor
20	Reject confirmation
19	Ok item count
18	Total num count
17	Air pressure error
16	Bin full
15	PES error
14	Weighing error
13	Emergency stop
12	Consecutive fail
11	Belt stop
10	Belt running
9	Ext 2
8	Ext 1
7	Metal
6	Unsplit
5	Detect teo
4	LoLo
3	Lo
2	Hi
1	HiHi
LSB 0	OK

Lower 4 byte	
Bit	Description
MSB 31	0
30	0
29	0
28	0
27	0
26	0
25	0
24	0
23	0
22	0
21	0
20	0
19	0
18	0
17	0
16	0
15	0
14	0
13	0
12	0
11	0
10	0
9	0
8	0
7	0
6	0
5	0
4	0
3	0
2	−zone 5
1	−zone 4
LSB 0	−zone 3

MSB **:** Most significant bit, High-order bit. LSB **:** Least significant bit, Low-order bit.

Example : When you assign "Bet running", "Unsplit", "Detect two", "−zone 5" and "−zone 3" to DO1, the settings is shown below.
Specify $2^{10} + 2^6 + 2^5 = 1120$ to upper 4 byte.
Specify $2^2 + 2^0 = 5$ to lower 4 byte.
Therefore, input 1120 into address 40271 and 5 into address 40273 using each 4 byte access.

9.5. DO Behavior

9.5.1. DO Behavior

This section describes the settings of DO behavior.

1. **Hold Time**
   The "**Hold time**" to maintain ON or OFF state of DO can be controlled.
   ON state of DO can be maintained for "**Hold time**" after delay time.
   When "DO start flag" is turned on during last output, timer is reset and output is maintained.
   When the flag is turned on during changing product and the settings of product, the output is turned OFF forcibly.
2. **Next Weighing**
   ON state of DO is maintained from turning on it to the start time of next weighing (detection of rising edge of PES). Do not overlap the "start trigger of next weighing" with delay processing.
3. **Next Judgement**
   When DO turns to ON state, it is maintained until the end of judgement.
4. **Dialog Box**
   When DO turns to ON state, it is maintained until the indicator receives a command to turn off it.
   When weighing is stopped, DO is maintained until dialog box is hidden. The output is maintained during changing product and the settings of product.

9.5.2. Deleay Time of Output

"**Delay time**" is time length from judgement to signal output of DO.
Refer to the "**5.6.5. Setting the Delay Time and Holding Time**" for the settings.

Cautions

- "**Delay time**" may include jitter of approximately 50 ms. Make enough time length.

9.5.3. Hold Time of Output

"**Hold time**" is time length of outputting DO signal.
Refer to the "**5.6.5. Setting the Delay Time and Holding Time**" for the settings.

Cautions

- "**Hold time**" may include jitter of approximately 50 ms. Make enough time length.

9.5.4. Output Logic

"Output logic" can specify either positive logic or negative logic.

Positive logic : When a signal is outputted from DO, "A-contact (arbeit contact)" of the relay makes a contact. The settings of Modbus is set to "0".

Negative logic : When a signal is outputted from DO, "B-contact (break contact)" of the relay makes a contact. The settings of Modbus is set to "1".

9.6. Summary of Data Totalization

9.6.1. Number of Samples

Number of samples is used to totarization of control chart, number of OK samples.
Input range : 2 to 9999 (it is amount of samples or more)

9.6.2. Size of Sample

Number of averaging when control chart is created.
Input range : 2 to 10

9.6.3. $\overline{\overline{X}}$

Center line (CL) for creating $\overline{X}$ control chart.
$\overline{X}$ control chart is displayed using this value when $\overline{X}$ is not 0.

9.6.4. $\overline{R}$

Center line (CL) for creating $\overline{R}$ control chart.
$\overline{R}$ control chart is displayed using this value when $\overline{R}$ is not 0.

9.6.5. Section Width of Histogram

The range of histogram.
It is reset when width of section is changed.

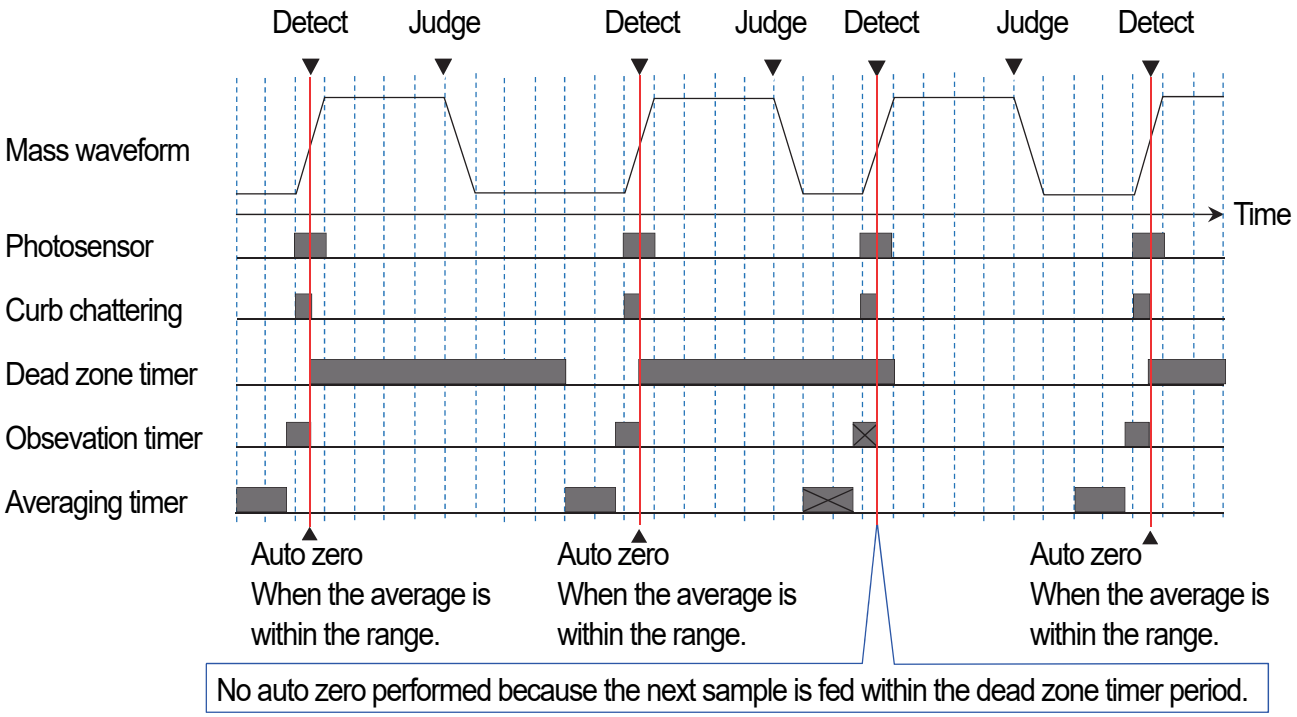
9.7. Compensation Settings

9.7.1. Tare Value

Tare value is used to display net value of product.
Refer to the "**5.6.7. Setting a Tare Value**" to set tare value.

9.7.2. Automatice Zero Adjustment

The automatic zero adjustment is the function to assign averaging value of weiging value for a averaging time to zero value if adapting to all conditions of "auto zero range", "dead zone timer" and "observation timer" during conveyor is moving.
When the "auto zero" function is "enable", this function is performed.



Drawing 67 **Automatic zero timing chart**

9.7.3. Range of Automatice Zero Adjustment

The range to perform the function of automatic zero adjustment.
When the range is "0.01" or lager, the function is effective. If weighing values are within this range for averaging time, averaging value of weighing values is assigned to zero.

9.7.4. Timer of Next Automatic Zero Adjustment

Dead zone timer store time width to inhibit automatice zero adjustment after automatice zero adjustment.

Example :

If 5 seconds is specified, automatic zero adjustment doesn't work for 5 second.

9.7.5. Timer of Automatic Zero Adjustment After Loading

The settings to inhibit automatic zero adjustment before loading product so that can perform automatic zero adjustment with stable weighing value.

Example :

If a timing to load on the conveyor like package is not unkown clearly (like product loads on the conveyor befor detection of photosensor), it specifies so as not to perform automatic zero adjustmant with unstable weighing value.

9.7.6. Averaging Time of Automatic Zero Adjustment

The averaging time of weighing value using automatic zero adjustment.

9.7.7. Accumulation Count of Automatic Zero Adjustment

The count to calculate average of automatic zero adjustment.
When number of automatic zero adjustment reaches this count, zero compensation value is replaced to these averaging value.

Example :

If count is set to 3, when each zero adjustment are 1 g, 2 g, 3 g, compensation value of zero point is (1 + 2 + 3)/3 = 2 g.

9.7.8. Correction Coefficient of Automatic Zero Adjustment

The coefficient against to compensation value at automatic zero adjustment.
Range **:** 1.0 to 100.0

Example :

If coefficient is 50 % and compensation value is 5 g, corrected compensation value is 2.5 g.

9.7.9. Dynamic Conpensation Value of Automatic Zero Adjustment

The dynamic copensation value of automatic zero adjustment.
Range **:** 0.5 to 2.0

9.7.10. Output of Feedback Control (FC)

Feedback control is the function to output pulse from DO. This pulse width adapts to the difference between target value and current weighing value. This pulse is used for feedback control of packing machine.
When target value of FC is "0.01" or more, this function is effective and FC mark FC is displayed on the window.
When pulse of feedback control is outputted, FC mark FC changes to "Feedback control +" FC+ or "Feedback control − " FC− for 3 seconds.

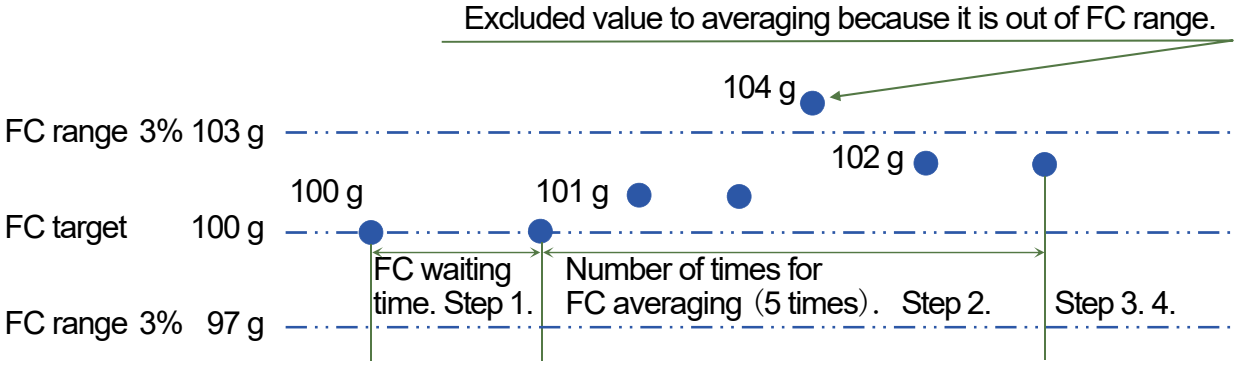
Note

- When pulse width is shorter than 0.1 seconds, pulse is not outputted and averaging starts again immediately.
- Data except judgement of "Detect two", "Unsplit", "Ext 1" and "Ext 2" are used to calculation of averaging.

The response and action of feedback control are shown below.

1. When the first product is detected after weighing is started, the indicator waits for preset FC waiting time.
2. After waiting time, averaging of the weighing value performs for the number of times for FC averaging.
3. The difference between average value of step 2 and FC target value is calculated.
   FC step [sec. / g] x (average value [g] − FC target value [g]) = pulse width [sec.]
4. Calculated pulse width is outputted from FC+ if pulse width is positive or from FC− if pulse width is negative.
5. Return to step 1 and repeat these steps.

● : Weighing value
—·—·— : FC target value, FC range
Averaging FC of 5 times : Target value, Upper limit and lower limit



Drawing 68 **Tendecy control function**

9.7.11. Target Value of Feedback Control (FC)

The mass value as target value of feedback control.
When target value of FC is "0.01" or more, this function is effective.

9.7.12. Range of Feedback Control (FC)

The range used averaging calculation of feedback control.
The center value of the range is FC target value.

9.7.13. Unit of Feedback Control (FC) : [g/sec.] or [sec./g]

The parameter to specify pulse width in unit of [g / sec.] or [sec. / g]. If one is decided, the other is also calculated automatically.
Range : 0.01 to 1 [sec. / g] (1 to 100 [g / sec.])

9.7.14. Count of Averaging for Feedback Control (FC)

The number of times that is used to averaging of weighing value for the judgement of this difference.
Range : 1 to 9999 [times]

9.7.15. Wating Time of Feedback Control (FC)

Wating time until averaging is start after feedback control is outputted.
Range : 0 to 999 [seconds]

9.7.16. Threshold Values of Output for 10 Stage Feedback Control

The threshold values to be used to judgement of 10 stage feedback control.
The function of 10 stage feedback control judges weighing value based on the settings and outputs to DO. This function is used for DO and does not affect to summary.

Note

- Refer to "**9.4. DO Map**" for details of DO.
- Refer to "**9.49.5. DO Behavior**" for delay time and Hold time of DO.

The procedure to use 10 stage feedback control is as follows **:**

1. Specify waiting time after detecting first product on the conveyor when weighing is started.
2. Weighing value are averaged using number of times for the averaging after this detection.
3. Average weighing value is judged using threshold values, zones after averaging.
4. DO is outputted using DO delay time and hold time based on DO map.
5. Return to step 1 and repeat procedure.

Target weight [g]		
	+zone 5	Target value + sum of zone 1 to 4 ≤ average
+zone 4 [g]	+zone 4	Target value + sum of zone 1 to 3 < average ≤ Target value + sum of zone 1 to 4
+zone 3 [g]	+zone 3	Target value + sum of zone 1 to 2 < average ≤ Target value + sum of zone 1 to 3
+zone 2 [g]	+zone 2	Target value + zone 1 < average ≤ Target value + sum of zone 1 to 2
+zone [g]	+zone 1	Target value < average ≤ Target value + zone 1
−zone 1 [g]	−zone 1	Target value − zone 1 < average ≤ Target value
−zone 2 [g]	−zone 2	Target value − sum of zone 1 to 2 < average ≤ Target value − zone 1
−zone 3 [g]	−zone 3	Target value − sum of zone 1 to 3 < average ≤ Target value − sum of zone 1 to 2
−zone 4 [g]	−zone 4	Target value − sum of zone 1 to 4 < average ≤ Target value − sum of zone 1 to 3
	−zone 5	average ≤ Target value − sum of zone 1 to 4

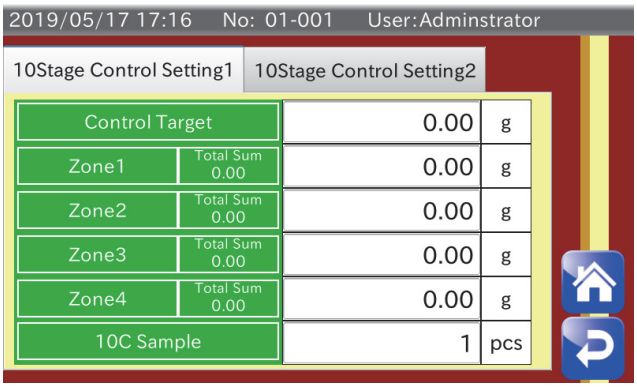
Drawing 69 **10 stages feedback control function**

9.7.17. Zone 1 to 4 of 10 Stage Feedback Control

The settings of zone is used to judge weighing value on 10 stage feedback control.
The initial values of zone are 0 g at factory settings.
Each total value of zone is total value from zone 1 to applicable zone.

Example :

If the setting vlaue of zone 1 is 10.0 g and the setting vlaue of zone 2 is 20.0 g, total value of zone 2 is 10.0 g + 20.0 = 30.0 g.



Drawing 70 **10 stages beadbock control function window**

9.7.18. Count of Averaging for 10 Stage Feedback Control

The number of times to average weighing value that is used to judgement of 10 stage feedback control.
Range : 1 to 9999［times］

9.7.19. Wating Time of 10 Stage Feedback Control

Waiting time from DO of 10 stage feedback control to start time of next averaging.
Range : 1 to 999［seconds］

9.8. Weighing Parameters

9.8.1. Weighing Unit

A weihging unit can select from kg, g, lb and oz.
If the law in your area permits, you may use all of the units. lb and oz can be used in U.S.A. version.

Cautions

- ❑ If the current unit is changed, summary of totalization is reset.

9.8.2. Position of Decimal Point

The position of decimal point is 0, 0.0, 0.00, 0.000 and 0.0000.
This indicator uses point (Dot) for format of decimal point.

9.8.3. Readability

The readability of weighing value uses 1, 2, 5, 10, 20, and 50.

9.8.4. Weighing Capacity

The weighing capacity is maximum value that this indiactor can display.

9.8.5. Digital Filter at Stopping

Digital filter at stopping the conveyor uses a cutoff frequency to suppress drift of weighing value. When low frequency is used, drift decreases and response becomes slow.
Cutoff frequency **:** None, 7, 10, 14, 20, 28, 40, 56, 80, 110［Hz］

9.8.6. Range of Zero Point

Touch the "Zero" key  on the "**weighing window**" to input a adjustable range of zero point using ratio against to capacity.

Example :

If capacity is 10000 g and range of zero point is 2 %, ±200 g is adjustable range of zero point.

9.8.7. Range of Power on Zero

When indicator turns on, specify a range of automatic zero adjustment using ratio against to the capacity.

Example :

If capacity is 10000 g and range of zero point is 10 %, ±1000 g is adjustable range of zero point when turning on.

9.8.8. Zero Tracking Time

The zero tracking is a function to display automatically zero while the conveyor stops. Zero tracking time is time range to perform this function. If gross weighing values are within a weighing range (zero tracking weight) during time range (zero tracking time), the zero tracking function is performed and 0 is displayed.

9.8.9. Zero Tracking Weight

The zero tracking weight specifies weighing range to perform zero tracking function.
When zero tracking weight is set to "None", the function doesn't perform.
If weighing value is within zero tacking weight for zero tracking time when the conveyor stops, the function is performed and 0 is displayed.
Zero tracking weight : None, 0.5, 1.0, 1.5, 2.0, 2.5, 3.0, 3.5, 4.0, 4.5 [digit]

Example :

If zero tracking weight is 1.0 digit and zero tracking time is 3 seconds,
when gross weighing value is within 0 ± 1.0 digit for 3 second, the zero tracking function is performed and 0 is displayed.

9.8.10. Stability Time for Weighing Value

Time range to be used on the stability detection function.

9.8.11. Stability Range for Weighing Value

Range of weighing value to be used on the stability detection function.
Zero tracking weight : None, 1, 2, 3, 4, 5, 6, 7, 8, 9 [digit]

9.9. Weight Adjustment

Refer to the "**6.1. Calibrating the Indicator using a Weight**" for adjustment procedure.

9.9.1. Value of Weight

A value of weight used for adjustment can input value between 0 g and capacity of load cell in unit of gram.

9.9.2. Zero Point Value

Zero point value is a base point of weighing. Unit is mV / V.

9.9.3. Span Value of Weight

Value of the adjustment weight in unit of mV / V.

9.10. Indicator

9.10.1. Identification Name

Identification name uses to find this indicator from multiple devices.
Identification name can use upto 40 characters.

9.10.2. Management User at Turning on the Indicator

Management user can specify a management level of automatic login user at turning on the indicator.
Management level of user : "Operator", "Supervisor", "Quality manager" and "Administrator"

Cautions

- ❑ Management level of management user needs "Administrator".
- ❑ Management user can only change management level. The settings of user cannot change.

9.10.3. Length of Conveyor

This length means length of weighing conveyor.

Cautions

- ❑ If the length is changed, this update needs time because the whole parameters of judgement are calculated.
- ❑ When update has finished, restart of the indicator needs.

9.10.4. Margin of Length for Double Products (Detect Two)

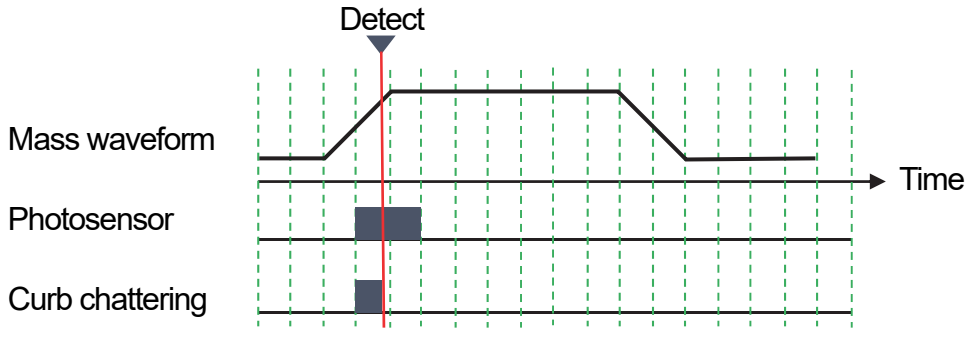
Tolerance value of unsplit can specify in ratio (%) against to product length.

9.10.5. Conveyor Mode

The conveyor mode moves only the conveyor without weighing.
If conveyor mode is "enable", it is performed and cannot change the settings.

9.10.6. Chattering Elimination Time

Duration time to prevent the photosensor chattering can be specified.



Drawing 71 **Chattring elimination timing chart**

9.10.7. Logic for Photoelectric Sensor

Output of photosensor can be selected either positive logic or negative logic.

9.10.8. Timer for Photoelectric Sensor Error

Timer to detect shading error of photosensor.
If light of photosensor is shaded longer than this preset time, it regards as photosensor error.
Range : 0.1 to 99.0［seconds］

9.10.9. Random Check (To input data previously)

Random check is the function that can shorten reading time by inputting product settings of the same group at turning on the indicator.

Cautions

- ❑ If the random check function is changed to effective, restart the indicator to use it.

9.10.10. To Set Priority Input to Peripheral Input

If an external input is specified to priority input, external signal inputted to DI has priority.

9.11. Monitoring ／ User Management

9.11.1. Language

Language can specify either Japanese or English.

9.11.2. Type of Weighing Monitor

The display method of weighing mode is shown below.

1. **Weighing Result**
   Weighing result is only displayed.
2. **The Current Weighing Value**
   The current weighing value of the conveyor is displayed.

9.11.3. Negative Weighing Value

The selection either displaying negative weighing value or not.
If display mode of weighing value is "Current value" and "Not displayed", the display of the indicator is blank when weighing value is negative.

9.11.4. Monitoring Selection for Stopped Conveyor

Data displayed on weighing monitor in the indicator can be specified. When the conveyor is moving, it cannot change.

9.11.5. Transition Time to Waiting Mode

The waiting mode is the function to hide the display of the indicator if operation is not during preset time of standby mode.
Store time until standby mode is started.

9.11.6. Brightness of Display

Specify brightness of display on the indicator.

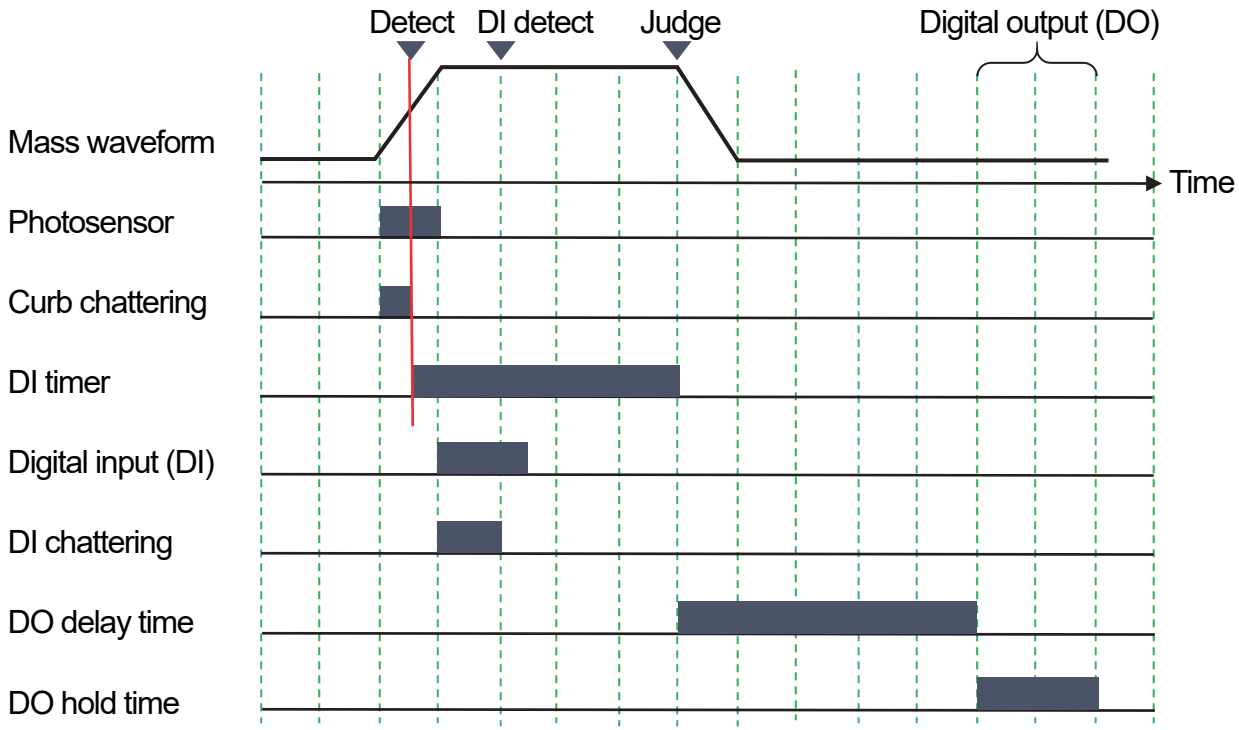
9.12. Peripherals

9.12.1. IP Address for Printer

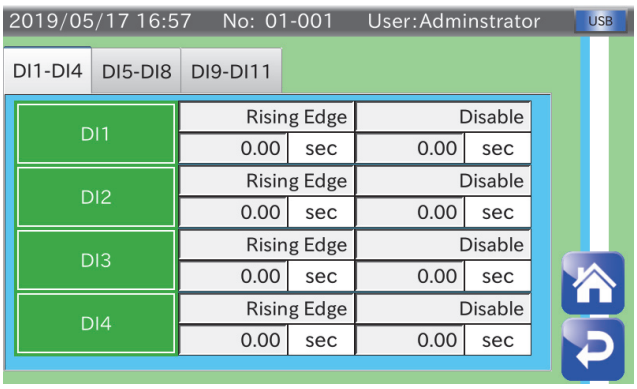
Specify a IP address for the printer connecting to the indicator.

9.13. DI (Digital Input)

The timing chart of DI (Digital input) is shown below.
The pulse width of DI needs "duration time to prevent chattering" + 50 ms or more.
Processing of judgement is performed when sample is released from the conveyor.



Drawing 72 DI/DO timing chart



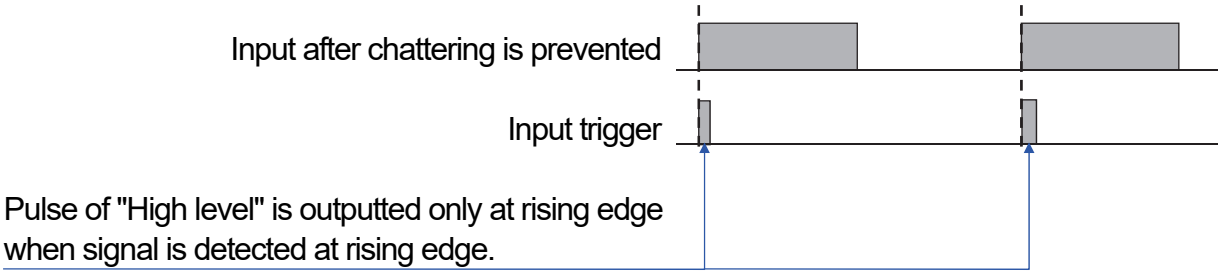
Drawing 73 DI window

9.13.1. Input Trigger

The input trigger can be select from "Rising edge", "Falling edge", "Both edge", "High level" and "Low level" at pull-down menu. These action are shown below.

1. Trigger Input by Rising Edge

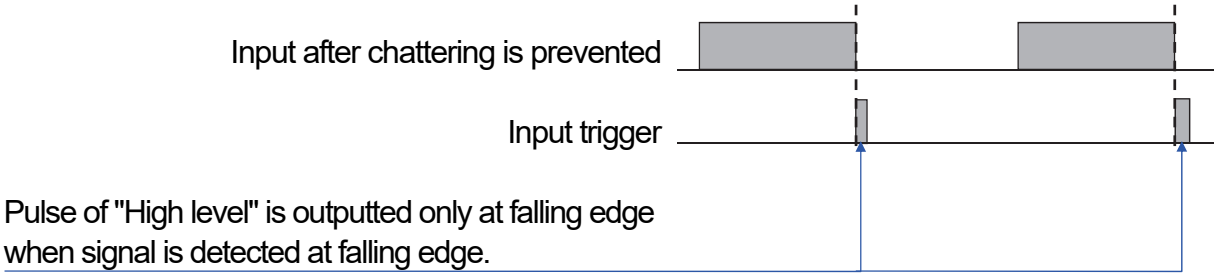
The method to regard as input trigger when rising edge (0 → 1) of the input is detected.
Next trigger can detect after the input becomes 0 once.



Drawing 74 Input trigger by rising edge

2. Trigger Input by Falling Edge

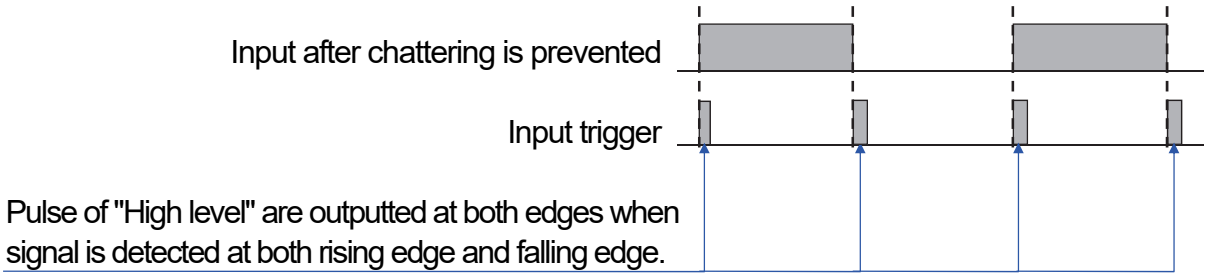
The method to regard as input trigger when falling edge (1 → 0) of the input is detected.
Next trigger can detect after the input becomes 1 once.



Drawing 75 Trigger input by falling edge

3. Trigger Input by Both Edge (Rising Edge and Falling Edge)

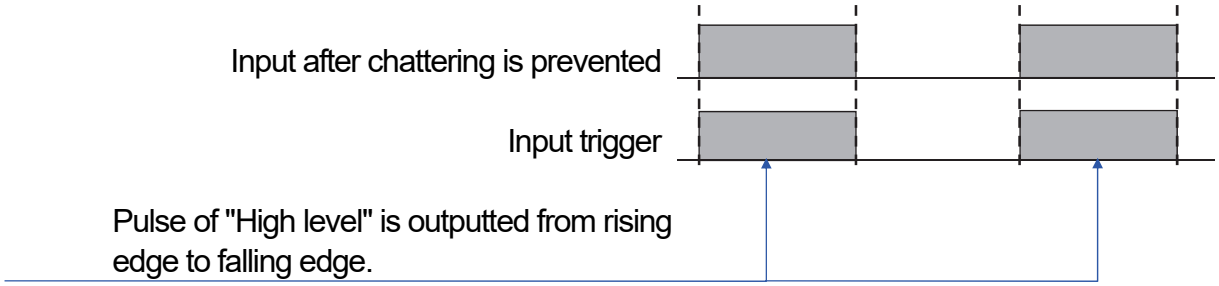
The method to regard as input trigger when both rising edge (0 → 1) and falling edge (1 → 0) of the input are detected.



Drawing 76 Trigger input by both edge (rising edge and falling edge)

4. Trigger Input by High Level

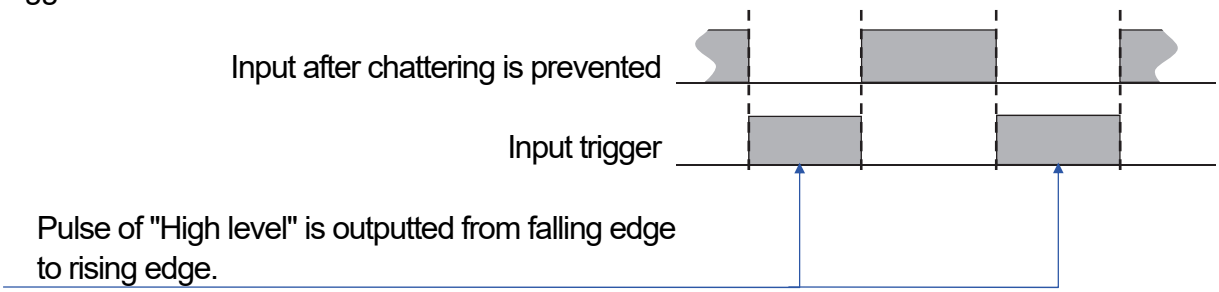
The method to regard the input level from rising edge (0 → 1) to falling edge (1 → 0) as input trigger.



Drawing 77 Trigger input by active high level

5. Trigger Input by Low Level

The method to regard the input level from falling edge (1 → 0) to rising edge (0 → 1) as input trigger.



Drawing 78 Trigger input by active low level

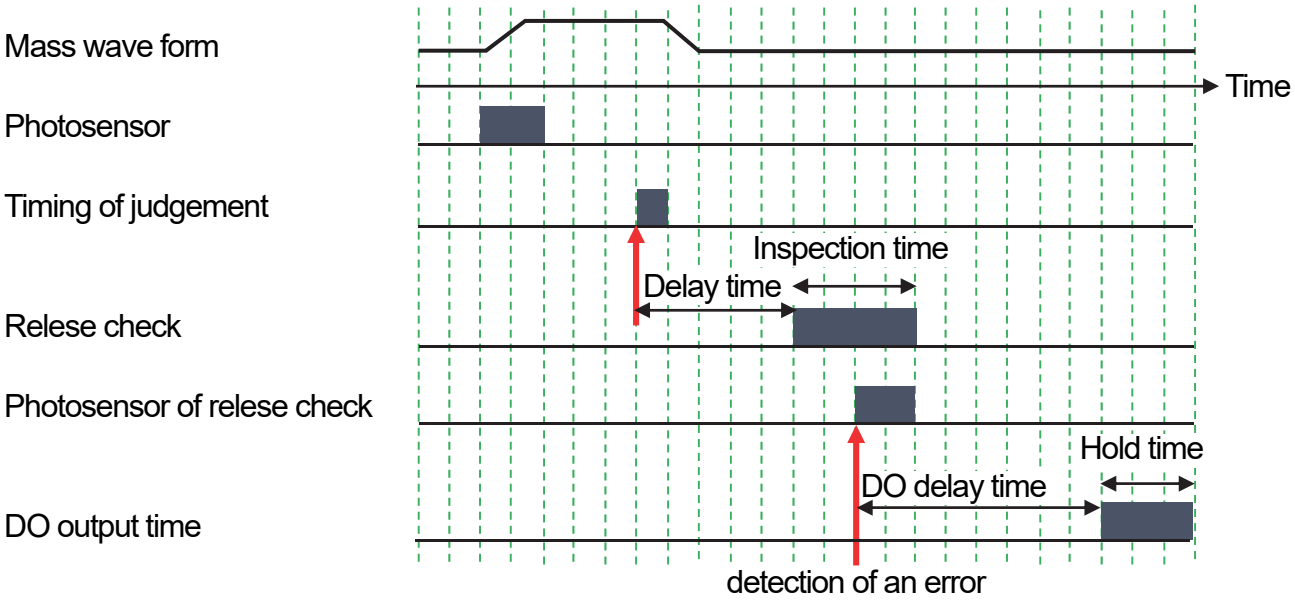
9.13.2. DI1 to DI43

The function of each DI can specify using pull-down menu.
Available functions are shown below.

1. **Invalid**
   The content means "no function". The setting value of Modbus is 0.
2. **Weighing Start**
   To assign a signal of weighing start. The setting value of Modbus is 1.
3. **Weighing Stop**
   To assign a signal of weighing stop. The setting value of Modbus is 2.
4. **Weighing Start/Stop**
   To assign a signal of weighing start and weighing stop. When this signal is high level (low level), weighing is started. When this signal is low level (high level), weighing is stopped. input trigger uses both edges always. The setting value of Modbus is 3.
5. **To Hide Dialog Box**
   To assign a signal to hide dialog box from peripherals if dialog box is displayed when judgement and error is detected. The setting value of Modbus is 4.
6. **To Delete Summary (Totalization)**
   To assign a signal to delete summary. The setting value of Modbus is 5.
7. **Ext 1**
   To assign a signal of Ext 1. The setting value of Modbus is 6. Ext 1 : External 1.
8. **Ext 2**
   To assign a signal of Ext 2. The setting value of Modbus is 7. Ext 2 : External 2.
9. **Metal**
   To assign a signal of Metal detection. The setting value of Modbus is 8.
10. **Air Pressure Error**
    To assign a signal of Air pressure error. The setting value of Modbus is 9.
11. **Bin Full**
    To assign a signal of Bin full. Bin full is the function to inform that discharge box (like hopper) is full capacity. The setting value of Modbus is 10.
12. **Emergency Stop**
    To assign a signal of Emergency stop. When a signal of emergency stop is inputted, the conveyor is stop immediately. While a signal of emergency stop is inputted, the conveyor stops. The setting value of Modbus is 11.

13. Reject Check

To assign a signal of "Reject check". The setting value of Modbus is 12.
"Reject check" is the function to inspect an error that weighing matter except target product passes using photosensor that is placed at releasing side of the rejector on conveyor line.
Timing chart of "Reject check" is shown below.



Drawing 79 Timing chart to confirm releasing

Example of timing chart is detected product to be judged as "over weight" using photosensor of release side.
After weighing judgement, Hold time of length of product can be specified after delay time.
If photosensor of release side is from OFF to ON during inspection time, it is judged as releasing error.
In example, photosensor of release check is held to ON because the conveyor stops.
if "Reject confirmation" is assigned to DO and it is judged, DO is outputted during DO hold time after DO delay time.

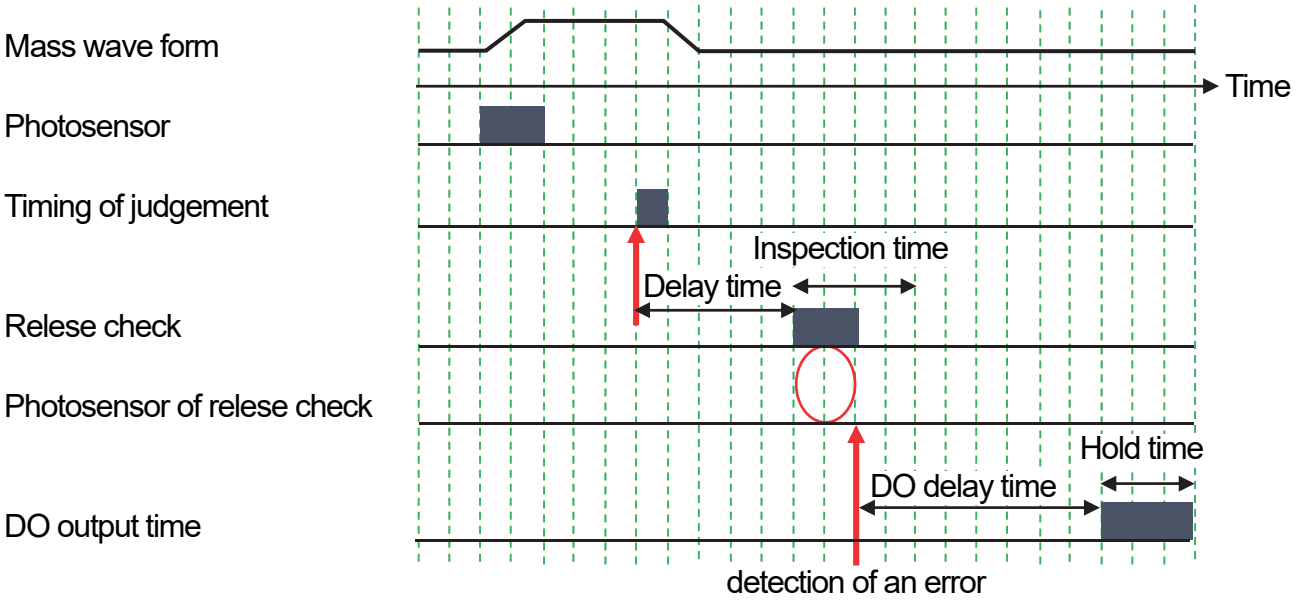
Delay time T can be calculated using distance Ld from the end of conveyor to detection position of photosensor and the conveyor velocity V.
$T = Ld / V$
Use as approximate value and adjust value using measurement.

Release check time t_1 is calculated using length of weighing belt Lv and conveyor velocity V.
$t_1 = (Lv \times 0.8) / V$

In judgement of "Detect two", the inspection time t is calculated regard plural products as product length. If photosensor of release check is ON longer than preset value during operation, it is judged as error of photosensor, the conveyor stops and error is displayed.

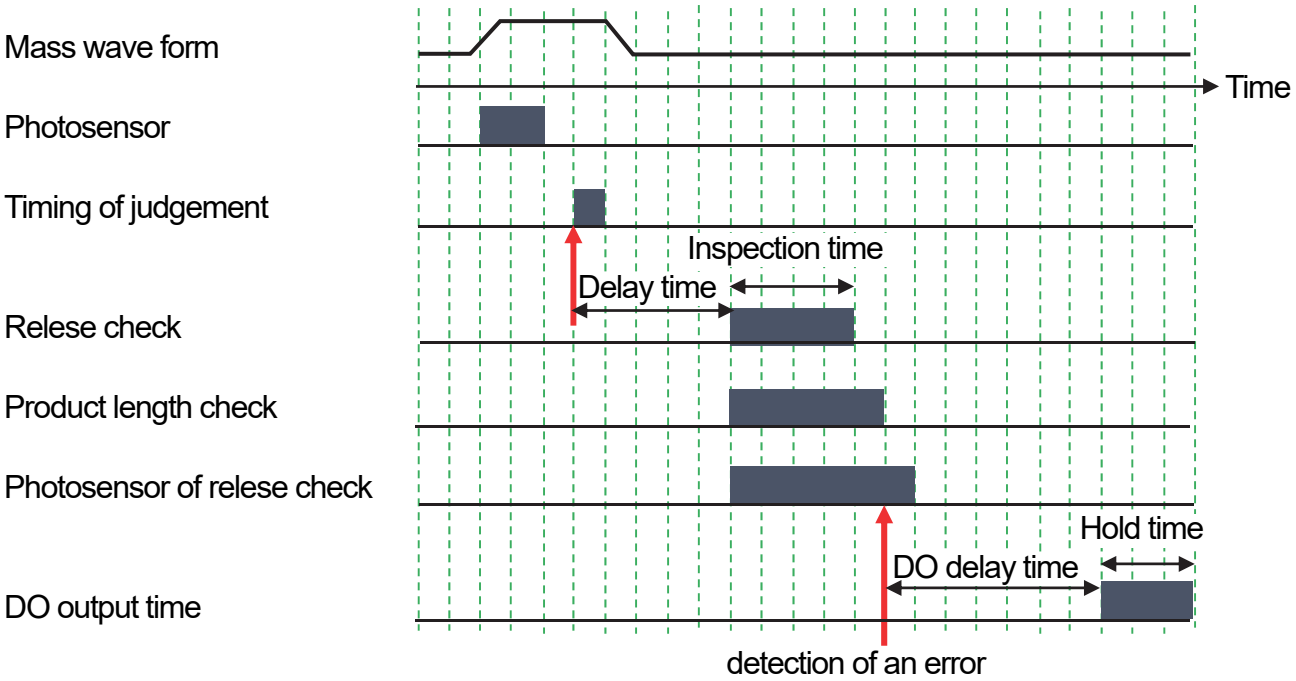
14. Approve Check

To assign a signal of "Approve check". The setting value of Modbus is 13.
"Approve check" is the function to confirm that product passes correctly using photosensor that is placed at release side in the regular direction on conveyor line.
Timing chart of "Approve check" is shown below.



Drawing 80 Timing chart when (correct product) is passing

First timing chart is a sample that OK product doesn't pass correctly.
After weighing judgement, Hold time of length of product can be specified after delay time.
If photosensor of relese check is not ON during inspection time, it is judged as passing error.



Drawing 81 Timing chart when (long product) is passing

Second timing chart is a sample that OK product shades light of photosensor longer than time of product length check. After weighing judgement, Hold time of length of product can be specified after delay time. If light of photosensor is shaded longer than check time of product length, it is judged as passing error.

Check time of product length t_2 is calculated using length of product Lp and conveyor velocity V.
$t_2 = (Lp \times 1.5) / V$

If "Reject confirmation" is assigned to DO and it is judged, DO is outputted during hold time after delay time. Judgement of "Delay time" and "detect two" are the same as "Release check".

Cautions

- "Detect two" cannot judge each product because judgement is one section.
- In stopped weighing and stable weighing, If first product is OK weighing product and second product is judged to "detect two", release of first product cannot confirm because both product is near place on conveyor during second product is weighed.

15. Reject Check + Approve Check

It is used when "Reject check" and "Approve check" are performed using one photosensor.
Place the photosensor at release side in regular direction on conveyor line.
The setting value of Modbus is 14.

16. Photoelectric Sensor

To assign photosensor. Chattering time is the same as time to prevent chattering.
The setting value of Modbus is 15.

17. Forced Operation, DO1 to DO11

DO can use forced. The setting value on Modbus is 16 to 26 of DO1 in order.

9.13.3. Delay Time of DI

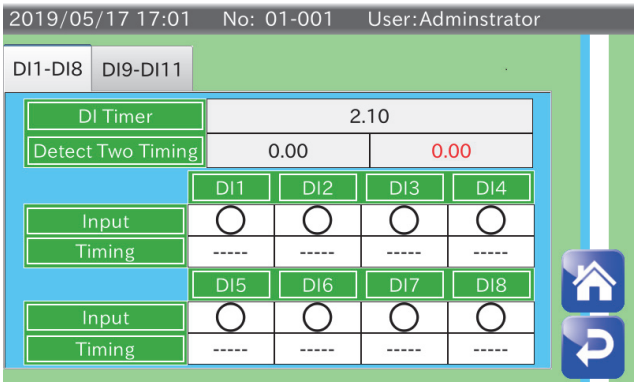
Delay time of DI1 to DI11 are specifies.
This function uses when connected peripherals needs delay time.
Tune delay time so as to receive signal of peripherals within receiving time in DI timing chart.
DI assigned to "Reject check" is time from weighing judgement to "Reject check".

9.13.4. Chattering Elimination Time

Time to prevent chattering to DI1 to DI11 can be input.

9.13.5. DI Indicator Function

The DI indicator is the function to monitor input signals form peripherals.



Drawing 82 DI indicator window

1 DI Timer

The receiving time of DI can be specified.

2 Timing of "Detect two"

Time from shading of photosensor of last weighing to shading of photosensor of next weighing.
If judgement is except "Detect two", time (black) in left side of "Detect two" is updated.
If judgement is "Detect two", time (red) in right side of "Detect two" is updated.
If many "Detect two" occurs, check these timing and arrange the velocity etc.

3 Status Monitor of DI

Status of DI are displayed. ON is ●. OFF is ○.

4 Input Timing of DI

It displays time from the starting of receiving to input signal.
If it is within receiving time, input timing is display with black characters.
If it is not within receiving time, input timing is display with red characters. Arrange input timing using delay time.

The Adjustment of Input Timing

The procedure to adjust input timing is shown below.

1. Operate the indicator and conveyor.
2. If metal detection device is connected, put test piece on sample. Feed the sample (weighing product) on the conveyor.
3. After sample enters on the infeed conveyor, an input timing is displayed.
   When the input timing is black characters, it is correct input.
   When the input timing is red characters, arrange it using delay time, adjust once again.

9.14. Release Confirmation Map

DI map is used when "Reject check", "Approve check" and "Reject + Approve" are assigned.
The checked item of "Reject check" and "Approve check" can be confirmed.
In "Reject + Approve", item of "Approve check" can be confirmed when item is checked, item of "Reject check" can be confirmed when item is not checked.
Refer to the "**9.13. DI (Digital Input)**" concerning of "Reject check", "Approve check" and "Reject + Approve".

9.15. Analog Board

The analog output OP-07 can install to option slot which is analog board to output weighing value and velocity data etc. using electric current and voltage. Refer to the "**11.8. OP-07 Additional Analog Output Module**".

9.15.1. Output Format of Analog Output

Data type for analog output can be specified either weight or velocity.

9.15.2. Output Data Type

Output format for analog output can be specified either current output or voltage output.

9.15.3. Standard Value at Low Voltage

Low voltage standard of analog output can be specified from 0 V, 1 V, 2 V.

9.15.4. Standard Value at High Voltage

High voltage standard of analog output can be specified from 8 V, 9 V, 10 V.

9.15.5. Data at Low Voltage

Low voltage output of analog output can be set. When output data is value of low voltage, voltage of low voltage standard is outputted.

9.15.6. Data at High Voltage

High voltage output of analog output can be set. When output data is value of high voltage, voltage of high voltage standard is outputted.

9.15.7. Standard Value at Low Current

Low current standard of analog output can be specified from 4 mA, 5 mA, 6 mA.

9.15.8. Standard Value at High Current

High current standard of analog output can be specified from 18 mA, 19 mA, 20 mA.

9.15.9. Data at Low Current

Low current output of analog output can be set. When output data is value of low current, current of low current standard is outputted.

9.15.10. Data at High Current

High current output of analog output can be set. When output data is value of high current, current of high current standard is outputted.

9.16. Information Concerning the Indicator

Information of the indicator is displayed.

9.16.1. Product Name

Name of the indicator is displayed.

9.16.2. Serial Number

Serial number of the indicator is displayed.

9.16.3. Software Version of Display Unit

Version of software installed in the display panel is displayed.

9.16.4. Software Version of Weighing Unit

Version of software installed in the weighing unit is displayed.

9.16.5. Option Port 1 and 2

The information of option board installed in the indicator.

9.17. Date and Time Settings

9.17.1. Date Settings

Date (year, month, day) of the built-in clock can be adjusted.
Refer to the "**6.2. Settings for Time and Date**" for adjustment.

9.17.2. Time Settings

Time (hour, minute, second) of the built-in clock can be adjusted.
Refer to the "**6.2. Settings for Time and Date**" for adjustment.

9.18. USB Memory

9.18.1. History Output of Operations

Select whether to output operation history when the USB memory is connected.

9.18.2. History Output of Weighing

Select whether to output weighing history when the USB memory is connected.

9.19. Modbus

9.19.1. Modbus Mode

The settings of Modbus communication.
If the settings is changed, restart the system to use new settings.
Refer to the "**10.3. Communication Command of Modbus**" for the details.
The settings is shown below.

1 Invalid

Modbus is not used.

2 Modbus / RTU

Serial communication of Modbus can be used.

3 Modbus / TCP

TCP/IP communication of Modbus can be used.

9.19.2. Slave Address

Specify a slave address of the indicator for Modbus communication.

9.20. Output Format

Note

All characters is used ASCII code. ␣ : Space code, hexadecimal code 0×20.

Terminator <CR><LF> is added to the end of characters. <CR> : caridge return, 0×0D.

<LF> : Line feed, 0×0A.

1. Periodical Print

The periodical print format is consists total number, total judgement, A&D format of data.

The periodical print format is a fixed 24 characters (excluding terminator).

Total number : 5 charactes, total judgement : 2 charactes, data format : 15 characters.

Output example

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
0	0	0	0	1	,	O	K	,	S	T	,	+	0	0	0	1	2	.	3	4	5	␣	g

Total number | Judgement result | A&D format

OK

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
0	0	0	0	1	,	O	K	,	S	T	,	+	0	0	0	1	2	.	3	4	5	␣	g

Upper-Upper

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
0	0	0	0	1	,	H	H	,	S	T	,	+	0	0	0	1	2	.	3	4	5	␣	g

Upper

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
0	0	0	0	1	,	H	I	,	S	T	,	+	0	0	0	1	2	.	3	4	5	␣	g

Low

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
0	0	0	0	1	,	L	O	,	S	T	,	+	0	0	0	1	2	.	3	4	5	␣	g

Low-Low

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
0	0	0	0	1	,	L	L	,	S	T	,	+	0	0	0	1	2	.	3	4	5	␣	g

2 packages

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
*	*	*	*	*	,	T	D	,	*	*	,	*	*	*	*	*	*	*	*	*	*	␣	

double product

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
*	*	*	*	*	,	U	S	,	*	*	,	*	*	*	*	*	*	*	*	*	*	␣	

External NG1

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
0	0	0	0	4	,	E	1	,	S	T	,	+	0	0	0	1	2	.	3	4	5	␣	g

External NG2

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
0	0	0	0	4	,	E	2	,	S	T	,	+	0	0	0	1	2	.	3	4	5	␣	g

Material

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
0	0	0	0	6	,	M	D	,	S	T	,	+	0	0	0	1	2	.	3	4	5	␣	g

2. A&D Format

Output format to be outputted only weighing value. This format is shown below.
Timning of output can be specified at output mode.
Weighing data is 15 characters (excluding terminator <CR><LF>), fixed length.
There are two header to monitor status of weighing value in first.
Weighing data has polarity. when data is 0, polarity is positive.

Exmaple

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
S	T	,	+	0	0	0	1	2	.	3	4	5	␣	g
Header			Data										Unit	

Stable

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
S	T	,	+	0	0	0	1	2	.	3	4	5	␣	g

Unstable

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
U	S	,	+	0	0	0	0	5	.	4	3	2	␣	g

Positive over

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
O	L	,	+	9	9	9	9	9	9	9	E	+	1	9

Negative over

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
O	L	,	-	9	9	9	9	9	9	9	E	+	1	9

9.21. RS-232C

9.21.1. RS-232C Port

The settings of RS-232C communication is shown below.

1. Invalid

It is the settings when RS-232C communication is not used.

2. Dump printing mode

It is the settings to use the dump printer.

3. Stream mode

It is the settings to output the current weighing value. The output intervale is 200 ms.

4.Weighing result mode

It is the settings to output weighing result when the weighing values have judged.

5.Changing mode

It is the settings to read the product code using the bar code reader etc. and to change to matched product.

9.21.2. Output Format

The output format of RS-232C communication is the settings below.

1. Periodic printing

This mode is the settings to output using format of periodic printing.

2. A&D format

This mode is the settings to output using A&D format.

9.21.3. Baud Rate

Baud rate of RS-232C communication is the settings below.
Baud rate : 2400, 4800, 9600, 19200, 38400, 57600, 115200［bps］

9.21.4. Parity Bit

Parity of RS-232C communication is the settings below.
Parity : None, Even or Odd

9.21.5. Stop Bit

Stop bit of RS-232C communication is the settings below.
Stop bit : 1 bit or 2 bit

9.21.6. Data Bit

Data length of RS-232C communication is the settings below.
Data length : 7 bit or 8 bit

9.22. RS-485

9.22.1. RS-485 Port

The settings of RS-485 communication is shown below.

1. Invalid

It is the settings when RS-485 communication is not used.

2. Dump printing mode

It is the settings to use the dump printer.

3. Stream mode

It is the settings to output the current weighing value. The output intervale is 200 ms.

9.22.2. Output Format

The output format of RS-485 communication is the settings below.

1. Periodic printing

This mode is the settings to output using format of periodic printing.

2. A&D format

This mode is the settings to output using A&D format.

9.22.3. Baud Rate

Baud rate of RS-485 communication is the settings below.
Baud rate : 2400, 4800, 9600, 19200, 38400, 57600, 115200 [bps]

9.22.4. Parity Bit

Parity of RS-485 communication is the settings below.

9.22.5. Stop Bit

Stop bit of RS-485 communication is the settings below.
Stop bit : 1 bit or 2 bit

9.22.6. Data Bit

Data length of RS-485 communication is the settings below.
Data length : 7 bit or 8 bit

9.23. LAN

9.23.1. IP Address of Wired LAN

IP address of wired LAN can be specified.

9.23.2. Subnet Mask Address of Wired LAN

Subnet mask of wired LAN can be specified.

9.23.3. Default Gateway Address of Wired LAN

Default gateway of wired LAN can be specified.

9.23.4. Port Number of Wired LAN

"Invalid"or "Enable" of wireless LAN can be specified.

9.23.5. IP Address of Wired LAN

IP address of wireless LAN can be specified.

9.23.6. Password of Wired LAN

Password of wireless LAN can be specified. Use 8 characters for password.

10. Modbus Communication

Modbus is a communications protocol developed by Modicon.
If this device uses modbus, it can communicate with other devices equipped with modbus without special programs.
This indicator can use Modbus RTU (of serial communication using RS-485) and Modbus TCP (of serial communication expanded to TCP/IP).
Modbus communication can perform to change the settings, to read summary data, to write to DI, to read DO status and etc.
Refer to the "10.1. Using Modbus RTU" and "10.210.610.1. Communication Command of Modbus TCP".

Cautions

1. The product settings selected for weighing can be changed only via Modbus communication.
2. When group numbers or product numbers are changed, applicable product will be read.
   If applicable product is nothing, new registration will be performed and new settings will be read.
3. If the number of the product and etc. are changed via Modbus communication, the changes needs for several seconds.
4. In Modbus communication, the simultaneity and realtime are not guaranteed.
   For example, when the whole data of address map are read, the whole data cannot be read at the same time. It may depend used systems and commands. And the wieghing result may not include all weighing data.
5. When address is specified in Modbus communication, specify an address value subtract 1 from value of the "10.5. Address" , except reference number.

Note

- When data is written to the holding register via Modbus communication, the information bar blinks on the upper side of the window.
- Refer to the "8.2. Connecting the LAN interface" for using Modbus RTU and Modbus TCP.
- When Modbus TCP is used on the indicator, the settings of LAN interface needs.
  Refer to the "6.3. Setting up LAN interface" for the settings procedure.

10.1. Using Modbus RTU

1. Touch the "Connection " tab in the Common setting window.
   Select "Modbus RTU" in the "Modbus".

Cautions

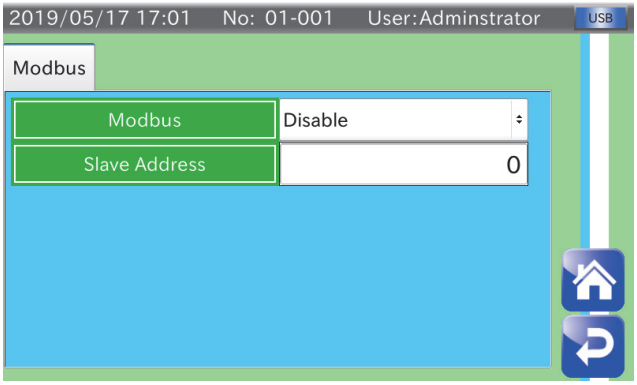
- ❑ Restart the indicator when the settings of the "Modbus" is changed.
  New settings will be effective after restarting system.
- ❑ When the "Modbus RTU" of the "Modbus" is selected, "RS-485" is ignored.

2. Input a slave address.
3. Touch the "Communication" tab in the "Communication setting window".
   "Data length" of the Modbus is 8 bit.

Cautions

- ❑ Refer to the "**9.19. Modbus**" for serial communication settings

4. The indicator can communicate with serial interface connected.



Drawing 83 Communication mode

10.2. Using Modbus TCP

1. Touch the "Connection " tab in the Common setting window.
   Select "Modbus TCP" in the "Modbus".

Cautions

- ❑ Restart the indicator when the settings of the "Modbus" is changed.
  New settings will be effective after restarting system.

2. Select and input a slave address.
3. The indicator can communicate with LAN cable connected.

10.3. Communication Command of Modbus

This section describes the commands of Modbus communication.
For example, the reading of the input register and the writing to the holding register are described.

Cautions

- Examples uses Modbus RTU.
  Refer to documentations of the Modbus TCP protocol for commands.

10.3.1. Example of Reading Input Register

Example is to read total number (address 20045) of all summary in the input register.

Transmission Command

The transmission command consists of start address of the input register and number of the input register to read data.
When tota number of all summary is read from the input register, specify an address 44 subtract 1 from value of the "10.5. Address" , except reference number.
Specify 2 to number of the input register because tota number of all summary is 4 byte.
Example of transmission command is shown as table below.

Command description		Transmission data
Slave address		0x01
Function code		0x04
Start address	(high-order)	0x00
Start address	(low-order)	0x2C
Number of register	(high-order)	0x00
Number of register	(low-order)	0x02
Error check		CRC (16 bits)

Table 12 **Example of transmission comand (Reading input resister)**

Response

Example of the response when command is processed properly is shown as table below.

Command description		Response data
Slave address		0x01
Function code		0x04
Number of data in bytes		0x04
Data 1	(high-order)	0x03
Data 1	(low-order)	0xE8
Data 2	(high-order)	0x00
Data 2	(low-order)	0x00
Error check		CRC (16 bits)

Table 13 **Example of response (Reading input resister)**

10.3.2. Example of Writing Holding Register

Example is to write product number (address 40001) in the holding register.

Transmission Command

The transmission command consists of start address of the holding register and data overwritten.

When product number is written to the holding register, specify an address 0 subtract 1 from value of the "10.5. Address" , except reference number. Specify product number as 2.

Example of transmission command is shown as table below.

Command description	Transmission data
Slave address	0x01
Function code	0x06
Start address (high-order)	0x00
Start address (low-order)	0x00
Number of register (high-order)	0x00
Number of register (low-order)	0x02
Error check	CRC (16 bits)

Table 14 **Example of transmission comand (Writing to holding resister)**

Response

When command is processed properly, the response is the same as transmission command.

The response is shown as table below.

Command description	Response data
Slave address	0x01
Function code	0x06
Start address (high-order)	0x00
Start address (low-order)	0x00
Number of register (high-order)	0x00
Number of register (low-order)	0x02
Error check	CRC (16 bits)

Table 15 **Example of response (Writing to holding resister)**

10.3.3. Example of Exception Response

When the indicator receives command that cannot processed in Modbus communication, an exception is responded. Address of "out of range (Address 30130)" of the input register is read.

Transmission Command

Example of transmission command to address 30130 is shown as table below.

Command description	Transmission data
Slave address	0x01
Function code	0x04
Start address (high-order)	0x00
Start address (low-order)	0x82
Number of register (high-order)	0x00
Number of register (low-order)	0x01
Error check	CRC (16 bits)

Table 16 **Example of transmission comand (Reading input resister / Out of range)**

Response

Because the address 30130 of the input register doesn't exist, the exception response like an example table below is shown. The function code of exception response is value added 0x80 to code of transmission command.

Command description	Response data
Slave address	0x01
Function code	0x84
Exception code	0x02
Error check	CRC (16 bits)

Table 17 **Example of response (Reading input resister / Out of range)**

Exception code and its contents are shown below.

Exception code	Name	Description
01	Wrong function	The corresponding function is not compatible.
02	Wrong data address	The specified address doesn't exist.
03	Wrong data	The specified data is not allowed.

Table 18 **Exception code**

10.4. Reference Number

The command to the indicator and reading of data use "reference number" and "address" in Modbus communication.
The type of data and reference number are show Table 19.

Data type	Reference number	Data description
Output coil	0	It is dedicated bit to write data. It is used for control of DI1 to DI4.
Input status	1	It is dedicated bit to read data. It is used for monitor of DI and DO.
Input register	3	It is dedicated word data to read . It is used to read weighing value and summary.
Holding register	4	It is word data to able to read and write. It is used to change the settings and to read product settings.

Table 19 **Reference number**

10.5. Address

Address of Modbus is listed from Table 21 to Table 23.

Output coil

Address	Name
1	DI1
2	DI2
3	DI3
4	DI4
5	DI5
6	DI6
7	DI7
8	DI8
9	DI9
10	DI10
11	DI11
12	DI12
13	DI13
14	DI14
15	DI15
16	DI16
17	DI17
18	DI18
19	DI19
20	DI20
21	DI21
22	DI22

Table 20 Outout coil address

Address	Name
23	DI23
24	DI24
25	DI25
26	DI26
27	DI27
28	DI28
29	DI29
30	DI30
31	DI31
32	DI32
33	DI33
34	DI34
35	DI35
36	DI36
37	DI37
38	DI38
39	DI39
40	DI40
41	DI41
42	DI42
43	DI43

Input status 1/5 Table 21 Input status address

Address	Name	
1	DI 1	(The status of DI 1 is indicated.)
2	DI 2	(The status of DI 2 is indicated.)
3	DI 3	(The status of DI 3 is indicated.)
4	DI 4	(The status of DI 4 is indicated.)
5	DI 5	(The status of DI 5 is indicated.)
6	DI 6	(The status of DI 6 is indicated.)
7	DI 7	(The status of DI 7 is indicated.)
8	DI 8	(The status of DI 8 is indicated.)
9	DI 9	(The status of DI 9 is indicated.)
10	DI 10	(The status of DI 10 is indicated.)
11	DI 11	(The status of DI 11 is indicated.)
12	DI 12	(The status of DI 12 is indicated.)
13	DI 13	(The status of DI 13 is indicated.)
14	DI 14	(The status of DI 14 is indicated.)
15	DI 15	(The status of DI 15 is indicated.)
16	DI 16	(The status of DI 16 is indicated.)
17	DI 17	(The status of DI 17 is indicated.)
18	DI 18	(The status of DI 18 is indicated.)
19	DI 19	(The status of DI 19 is indicated.)
20	DI 20	(The status of DI 20 is indicated.)
21	DI 21	(The status of DI 21 is indicated.)
22	DI 22	(The status of DI 22 is indicated.)
23	DI 23	(The status of DI 23 is indicated.)
24	DI 24	(The status of DI 24 is indicated.)
25	DI 25	(The status of DI 25 is indicated.)
26	DI 26	(The status of DI 26 is indicated.)
27	DI 27	(The status of DI 27 is indicated.)
28	DI 28	(The status of DI 28 is indicated.)
29	DI 29	(The status of DI 29 is indicated.)
30	DI 30	(The status of DI 30 is indicated.)
31	DI 31	(The status of DI 31 is indicated.)
32	DI 32	(The status of DI 32 is indicated.)
33	DI 33	(The status of DI 33 is indicated.)
34	DI 34	(The status of DI 34 is indicated.)
35	DI 35	(The status of DI 35 is indicated.)
36	DI 36	(The status of DI 36 is indicated.)
37	DI 37	(The status of DI 37 is indicated.)
38	DI 38	(The status of DI 38 is indicated.)
39	DI 39	(The status of DI 39 is indicated.)
40	DI 40	(The status of DI 40 is indicated.)
41	DI 41	(The status of DI 41 is indicated.)
42	DI 42	(The status of DI 42 is indicated.)
43	DI 43	(The status of DI 43 is indicated.)

Input status 2/5

Address	名称		
44	Do not use address because of reserved expansion number.		
45			
46			
47			
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57			
58			
59			
60			
61			
62			
63			
64			
65	DI Status 1	(The status of function assigned to DI 1 is dindicated.)	※
66	DI Status 2	(The status of function assigned to DI 2 is dindicated.)	※
67	DI Status 3	(The status of function assigned to DI 3 is dindicated.)	※
68	DI Status 4	(The status of function assigned to DI 4 is dindicated.)	※
69	DI Status 5	(The status of function assigned to DI 5 is dindicated.)	※
70	DI Status 6	(The status of function assigned to DI 6 is dindicated.)	※
71	DI Status 7	(The status of function assigned to DI 7 is dindicated.)	※
72	DI Status 8	(The status of function assigned to DI 8 is dindicated.)	※
73	DI Status 9	(The status of function assigned to DI 9 is dindicated.)	※
74	DI Status 10	(The status of function assigned to DI 10 is dindicated.)	※
75	DI Status 11	(The status of function assigned to DI 11 is dindicated.)	※
76	DI Status 12	(The status of function assigned to DI 12 is dindicated.)	※
77	DI Status 13	(The status of function assigned to DI 13 is dindicated.)	※
78	DI Status 14	(The status of function assigned to DI 14 is dindicated.)	※
79	DI Status 15	(The status of function assigned to DI 15 is dindicated.)	※
80	DI Status 16	(The status of function assigned to DI 16 is dindicated.)	※
81	DI Status 17	(The status of function assigned to DI 17 is dindicated.)	※
82	DI Status 18	(The status of function assigned to DI 18 is dindicated.)	※
83	DI Status 19	(The status of function assigned to DI 19 is dindicated.)	※
84	DI Status 20	(The status of function assigned to DI 20 is dindicated.)	※
85	DI Status 21	(The status of function assigned to DI 21 is dindicated.)	※
86	DI Status 22	(The status of function assigned to DI 22 is dindicated.)	※
87	DI Status 23	(The status of function assigned to DI 23 is dindicated.)	※

Input status 3/5

Address	Name		
88	DI Status 24	(The status of function assigned to DI 24 is dindicated.)	※
89	DI Status 25	(The status of function assigned to DI 25 is dindicated.)	※
90	DI Status 26	(The status of function assigned to DI 26 is dindicated.)	※
91	DI Status 27	(The status of function assigned to DI 27 is dindicated.)	※
92	DI Status 28	(The status of function assigned to DI 28 is dindicated.)	※
93	DI Status 29	(The status of function assigned to DI 29 is dindicated.)	※
94	DI Status 30	(The status of function assigned to DI 30 is dindicated.)	※
95	DI Status 31	(The status of function assigned to DI 31 is dindicated.)	※
96	DI Status 32	(The status of function assigned to DI 32 is dindicated.)	※
97	DI Status 33	(The status of function assigned to DI 33 is dindicated.)	※
98	DI Status 34	(The status of function assigned to DI 34 is dindicated.)	※
99	DI Status 35	(The status of function assigned to DI 35 is dindicated.)	※
100	DI Status 36	(The status of function assigned to DI 36 is dindicated.)	※
101	DI Status 37	(The status of function assigned to DI 37 is dindicated.)	※
102	DI Status 38	(The status of function assigned to DI 38 is dindicated.)	※
103	DI Status 39	(The status of function assigned to DI 39 is dindicated.)	※
104	DI Status 40	(The status of function assigned to DI 40 is dindicated.)	※
105	DI Status 41	(The status of function assigned to DI 41 is dindicated.)	※
106	DI Status 42	(The status of function assigned to DI 42 is dindicated.)	※
107	DI Status 43	(The status of function assigned to DI 43 is dindicated.)	※
108	Do not use address because of reserved expansion number.		
109			
110			
111			
112			
113			
114			
115			
116			
117			
118			
119			
120			
121			
122			
123			
124			
125			
126			
127			
128			

Input status 4/5

Address	Name
129	DO STOP
130	DO BZ
131	DO 1
132	DO 2
133	DO 3
134	DO 4
135	DO 5
136	DO 6
137	DO 7
138	DO 8
139	DO 9
140	DO 10
141	DO 11
142	DO 12
143	DO 13
144	DO 14
145	DO 15
146	DO 16
147	DO 17
148	DO 18
149	DO 19
150	DO 20
151	DO 21
152	DO 22
153	DO 23
154	DO 24
155	DO 25
156	DO 26
157	DO 27
158	DO 28
159	DO 29
160	DO 30
161	DO 31
162	DO 32
163	DO 33
164	DO 34
165	DO 35
166	DO 36
167	DO 37
168	DO 38
169	DO 39
170	DO 40
171	DO 41

Input status 5/5

Address	Name
172	DO 42
173	DO 43
174	Do not use address because of reserved expansion number.
175	
176	
177	
178	
179	
180	
181	
182	
183	
184	
185	
186	
187	
188	
189	
190	
191	
192	

※ Status of DI 1 to DI 43
Operation status of DI 1 to DI 43 are indicated. Each DI is assigned to hardware and the output coil of Modbus simultaneously. DI status indicates both operation status.

Input register 1/5 Table 22 Inputregister address

Address	Name		Size	Output range
1	IP address 1 of wired LAN for this indicator	(high-order)	2 bytes	0 – 255
2	IP address 2 of wired LAN for this indicator		2 bytes	0 – 255
3	IP address 3 of wired LAN for this indicator		2 bytes	0 – 255
4	IP address 4 of wired LAN for this indicator	(low-order)	2 bytes	0 – 255
5	Subnet mask 1 of this indicator	(high-order)	2 bytes	0 – 255
6	Subnet mask 2 of this indicator		2 bytes	0 – 255
7	Subnet mask 3 of this indicator		2 bytes	0 – 255
8	Subnet mask 4 of this indicator	(low-order)	2 bytes	0 – 255
9	Default gateway 1 of this indicator	(high-order)	2 bytes	0 – 255
10	Default gateway 2 of this indicator		2 bytes	0 – 255
11	Default gateway 3 of this indicator		2 bytes	0 – 255
12	Default gateway 4 of this indicator	(low-order)	2 bytes	0 – 255
13	Wireless LAN port		2 bytes	0 – 1
14	IP address 1 of wireless LAN for this indicator	(high-order)	2 bytes	0 – 255
15	IP address 2 of wireless LAN for this indicator		2 bytes	0 – 255
16	IP address 3 of wireless LAN for this indicator		2 bytes	0 – 255
17	IP address 4 of wireless LAN for this indicator	(low-order)	2 bytes	0 – 255
18	Printer connection		2 bytes	0 – 1
19	IP address 1 for printer	(high-order)	2 bytes	0 – 255
20	IP address 2 for printer		2 bytes	0 – 255
21	IP address 3 for printer		2 bytes	0 – 255
22	IP address 4 for printer	(low-order)	2 bytes	0 – 255
23	RS-232C Port number		2 bytes	0 – 4
24	RS-232C Output mode		2 bytes	0 – 2
25	RS-232C Baud rate		2 bytes	0 – 5
26	RS-232C Parity		2 bytes	0 – 2
27	RS-232C Data length		2 bytes	0 – 1
28	RS-232C Stop bit		2 bytes	0 – 1
29	RS-485 Port number		2 bytes	0 – 2
30	RS-485 Output mode		2 bytes	0 – 2
31	RS-485 Baud rate		2 bytes	0 – 5
32	RS-485 Parity		2 bytes	0 – 2
33	RS-485 Data length		2 bytes	0 – 1
34	RS-485 Stop bit		2 bytes	0 – 1
35	Modbus Settings		2 bytes	0 – 1
36	Modbus Slave address		2 bytes	1 – 247
37	Random check		2 bytes	0 – 1
38	Unit		2 bytes	0 – 1
39	User management level		2 bytes	0 – 1
40	Conveyor mode		2 bytes	0 – 1
41	Type of Data 1ch		2 bytes	0 – 1
42	Type of Data 2ch		2 bytes	0 – 1
43	Type of Data 3ch		2 bytes	0 – 1
44	Type of Data 4ch		2 bytes	0 – 1

Input register 2/5

Address	Name	Size	Output range
45	Type of Data 5ch	2 bytes	0 – 1
46	Type of Data 6ch	2 bytes	0 – 1
47	Type of Data 7ch	2 bytes	0 – 1
48	Type of Data 8ch	2 bytes	0 – 1
49	Output format 1ch	2 bytes	0 – 1
50	Output format 2ch	2 bytes	0 – 1
51	Output format 3ch	2 bytes	0 – 1
52	Output format 4ch	2 bytes	0 – 1
53	Output format 5ch	2 bytes	0 – 1
54	Output format 6ch	2 bytes	0 – 1
55	Output format 7ch	2 bytes	0 – 2
56	Output format 8ch	2 bytes	0 – 2
57	Low current standard value 1ch	2 bytes	0 – 2
58	Low current standard value 2ch	2 bytes	0 – 2
59	Low current standard value 3ch	2 bytes	0 – 2
60	Low current standard value 4ch	2 bytes	0 – 2
61	Low current standard value 5ch	2 bytes	0 – 2
62	Low current standard value 6ch	2 bytes	0 – 2
63	Low current standard value 7ch	2 bytes	0 – 2
64	Low current standard value 8ch	2 bytes	0 – 2
65	High current standard value 1ch	2 bytes	0 – 2
66	High current standard value 2ch	2 bytes	0 – 2
67	High current standard value 3ch	2 bytes	0 – 2
68	High current standard value 4ch	2 bytes	0 – 2
69	High current standard value 5ch	2 bytes	0 – 2
70	High current standard value 6ch	2 bytes	0 – 2
71	High current standard value 7ch	4 bytes	
72	High current standard value 8ch	4 bytes	
73	Low current output of weight value 1ch	4 bytes	
75	Low current output of weight value 2ch	4 bytes	
77	Low current output of weight value 3ch	4 bytes	
79	Low current output of weight value 4ch	4 bytes	
81	Low current output of weight value 5ch	4 bytes	
83	Low current output of weight value 6ch	4 bytes	
85	Low current output of weight value 7ch	2 bytes	
87	Low current output of weight value 8ch	2 bytes	
89	Low current output of conveyor velocity 1ch	2 bytes	
90	Low current output of conveyor velocity 2ch	2 bytes	
91	Low current output of conveyor velocity 3ch	2 bytes	
92	Low current output of conveyor velocity 4ch	2 bytes	
93	Low current output of conveyor velocity 5ch	2 bytes	
94	Low current output of conveyor velocity 6ch	2 bytes	
95	Low current output of conveyor velocity 7ch	4 bytes	
96	Low current output of conveyor velocity 8ch	4 bytes	

Input register 3/5

Address	Name	Size	Output range
97	High current output of weight value 1ch	4 bytes	
99	High current output of weight value 2ch	4 bytes	
101	High current output of weight value 3ch	4 bytes	
103	High current output of weight value 4ch	4 bytes	
105	High current output of weight value 5ch	4 bytes	
107	High current output of weight value 6ch	4 bytes	
109	High current output of weight value 7ch	4 bytes	
111	High current output of weight value 8ch	4 bytes	
113	High current output of conveyor velocity 1ch	2 bytes	
114	High current output of conveyor velocity 2ch	2 bytes	
115	High current output of conveyor velocity 3ch	2 bytes	
116	High current output of conveyor velocity 4ch	2 bytes	
117	High current output of conveyor velocity 5ch	2 bytes	
118	High current output of conveyor velocity 6ch	2 bytes	
119	High current output of conveyor velocity 7ch	2 bytes	
120	High current output of conveyor velocity 8ch	2 bytes	
121	Low voltage standard value 1ch	2 bytes	0 – 2
122	Low voltage standard value 2ch	2 bytes	0 – 2
123	Low voltage standard value 3ch	2 bytes	0 – 2
124	Low voltage standard value 4ch	2 bytes	0 – 2
125	Low voltage standard value 5ch	2 bytes	0 – 2
126	Low voltage standard value 6ch	2 bytes	0 – 2
127	Low voltage standard value 7ch	2 bytes	0 – 2
128	Low voltage standard value 8ch	2 bytes	0 – 2
129	High voltage standard value 1ch	2 bytes	0 – 2
130	High voltage standard value 2ch	2 bytes	0 – 2
131	High voltage standard value 3ch	2 bytes	0 – 2
132	High voltage standard value 4ch	2 bytes	0 – 2
133	High voltage standard value 5ch	2 bytes	0 – 2
134	High voltage standard value 6ch	2 bytes	0 – 2
135	High voltage standard value 7ch	2 bytes	0 – 2
136	High voltage standard value 8ch	2 bytes	0 – 2
137	Low voltage output of weight value 1ch	4 bytes	
139	Low voltage output of weight value 2ch	4 bytes	
141	Low voltage output of weight value 3ch	4 bytes	
143	Low voltage output of weight value 4ch	4 bytes	
145	Low voltage output of weight value 5ch	4 bytes	
147	Low voltage output of weight value 6ch	4 bytes	
149	Low voltage output of weight value 7ch	4 bytes	
151	Low voltage output of weight value 8ch	4 bytes	
153	Low voltage output of conveyor velocity 1ch	2 bytes	
154	Low voltage output of conveyor velocity 2ch	2 bytes	
155	Low voltage output of conveyor velocity 3ch	2 bytes	
156	Low voltage output of conveyor velocity 4ch	2 bytes	

Input register 4/5

Address	Name		Size	Output range
157	Low voltage output of conveyor velocity 5ch		2 bytes	
158	Low voltage output of conveyor velocity 6ch		2 bytes	
159	Low voltage output of conveyor velocity 7ch		2 bytes	
160	Low voltage output of conveyor velocity 8ch		2 bytes	
161	High voltage output of weight value 1ch		4 bytes	
163	High voltage output of weight value 2ch		4 bytes	
165	High voltage output of weight value 3ch		4 bytes	
167	High voltage output of weight value 4ch		4 bytes	
169	High voltage output of weight value 5ch		4 bytes	
171	High voltage output of weight value 6ch		4 bytes	
173	High voltage output of weight value 7ch		4 bytes	
175	High voltage output of weight value 8ch		4 bytes	
177	High voltage output of conveyor velocity 1ch		2 bytes	
178	High voltage output of conveyor velocity 2ch		2 bytes	
179	High voltage output of conveyor velocity 3ch		2 bytes	
180	High voltage output of conveyor velocity 4ch		2 bytes	
181	High voltage output of conveyor velocity 5ch		2 bytes	
182	High voltage output of conveyor velocity 6ch		2 bytes	
183	High voltage output of conveyor velocity 7ch		2 bytes	
184	High voltage output of conveyor velocity 8ch		2 bytes	
185	Zero point		4 bytes	0.000000 – 9.999999
187	Span		4 bytes	0.000000 – 9.999999
189	Length of the conveyor		2 bytes	1 – 9999
190	All summary	Total number	4 bytes	0 – 9999999
192	All summary	Number of OK items	4 bytes	0 – 9999999
194	All summary	Number of HiHi	4 bytes	0 – 9999999
196	All summary	Number of Hi	4 bytes	0 – 9999999
198	All summary	Number of Lo	4 bytes	0 – 9999999
200	All summary	Number of LoLo	4 bytes	0 – 9999999
202	All summary	Number of detect two	4 bytes	0 – 9999999
204	All summary	Number of unsplit	4 bytes	0 – 9999999
206	All summary	Number of foreign matter	4 bytes	0 – 9999999
208	All summary	Total weight (Gross value)	4 bytes	0 – 9999.9999
210	All summary	Averaged weight value	4 bytes	0 – 9999.9999
212	All summary	Maximum value	4 bytes	0 – 9999.9999
214	All summary	Minimum value	4 bytes	0 – 9999.9999
216	All summary	Range	4 bytes	0 – 9999.9999
218	All summary	SD (Standard deviation)	4 bytes	0 – 1.00000
220	All summary	CV (Coefficient of variation)	2 bytes	0 – 99.99
221	OK summary	Total number	4 bytes	0 – 9999999
223	OK summary	Total weight (Gross value)	4 bytes	0 – 9999.9999
225	OK summary	Averaged weighing value	4 bytes	0 – 9999.9999
227	OK summary	Maximum value	4 bytes	0 – 9999.9999
229	OK summary	Minimum value	4 bytes	0 – 9999.9999

Input register 5/5

Address	Name		Size	Output range
231	OK summary	Range	4 bytes	0 – 9999.9999
233	OK summary	SD (Standard deviation)	4 bytes	0 – 1.00000
235	OK summary	CV (Coefficient of variation)	2 bytes	0 – 99.99
236	Sample summary	Total number	4 bytes	0 – 9999999
238	Sample summary	Number of OK items	4 bytes	0 – 9999999
240	Sample summary	mber of HiHi	4 bytes	0 – 9999999
242	Sample summary	mber of Hi	4 bytes	0 – 9999999
244	Sample summary	Number of LoLo	4 bytes	0 – 9999999
246	Sample summary	Number of Lo	4 bytes	0 – 9999999
248	Sample summary	Number of detect two	4 bytes	0 – 9999999
250	Sample summary	Number of unsplit	4 bytes	0 – 9999999
252	Sample summary	Number of foreign matter	4 bytes	0 – 9999999
254	Sample summary	Total weight (Gross value)	4 bytes	0 – 9999.999
256	Sample summary	Averaged weighing value	4 bytes	0 – 9999.999
258	Sample summary	Maximum value	4 bytes	0 – 9999.999
260	Sample summary	Minimum value	4 bytes	0 – 9999.999
262	Sample summary	Range	4 bytes	0 – 9999.999
264	Sample summary	SD (Standard deviation)	4 bytes	0 – 1.00000
266	Sample summary	CV (Coefficient of variation)	2 bytes	0 – 99.99
267	OK sample summary	Total number	4 bytes	0 – 9999999
269	OK sample summary	Total weight (Gross value)	4 bytes	0 – 9999.9999
271	OK sample summary	Averaged weighing value	4 bytes	0 – 9999.9999
273	OK sample summary	Maximum value	4 bytes	0 – 9999.9999
275	OK sample summary	Minimum value	4 bytes	0 – 9999.9999
277	OK sample summary	Range	4 bytes	0 – 9999.9999
279	OK sample summary	SD (Standard deviation)	4 bytes	0 – 1.00000
281	OK sample summary	CV (Coefficient of variation)	2 bytes	0 – 99.99
282	Weighing result		4 bytes	0 – 9999.9999

Holding register 1/13 Table 23 Holding register address

Address	Name	Size	Output range
1	Product number	2 bytes	1 – 100
2	Group number	2 bytes	1 – 10
3	Language	2 bytes	0 – 3
4	Transition time to standby mode	2 bytes	0.0 – 999.9
5	Settings of DI1 (Map)	4 bytes	0 – 1024
7	Settings of DI2 (Map)	4 bytes	0 – 1024
9	Settings of DI3 (Map)	4 bytes	0 – 1024
11	Settings of DI4 (Map)	4 bytes	0 – 1024
13	Settings of DI5 (Map)	4 bytes	0 – 1024
15	Settings of DI6 (Map)	4 bytes	0 – 1024
17	Settings of DI7 (Map)	4 bytes	0 – 1024
19	Settings of DI8 (Map)	4 bytes	0 – 1024
21	Settings of DI9 (Map)	4 bytes	0 – 1024
23	Settings of DI10 (Map)	4 bytes	0 – 1024
25	Settings of DI11 (Map)	4 bytes	0 – 1024
27	Settings of DI12 (Map)	4 bytes	0 – 1024
29	Settings of DI13 (Map)	4 bytes	0 – 1024
31	Settings of DI14 (Map)	4 bytes	0 – 1024
33	Settings of DI15 (Map)	4 bytes	0 – 1024
35	Settings of DI16 (Map)	4 bytes	0 – 1024
37	Settings of DI17 (Map)	4 bytes	0 – 1024
39	Settings of DI18 (Map)	4 bytes	0 – 1024
41	Settings of DI19 (Map)	4 bytes	0 – 1024
43	Settings of DI20 (Map)	4 bytes	0 – 1024
45	Settings of DI21 (Map)	4 bytes	0 – 1024
47	Settings of DI22 (Map)	4 bytes	0 – 1024
49	Settings of DI23 (Map)	4 bytes	0 – 1024
51	Settings of DI24 (Map)	4 bytes	0 – 1024
53	Settings of DI25 (Map)	4 bytes	0 – 1024
55	Settings of DI26 (Map)	4 bytes	0 – 1024
57	Settings of DI27 (Map)	4 bytes	0 – 1024
59	Settings of DI28 (Map)	4 bytes	0 – 1024
61	Settings of DI29 (Map)	4 bytes	0 – 1024
63	Settings of DI30 (Map)	4 bytes	0 – 1024
65	Settings of DI31 (Map)	4 bytes	0 – 1024
67	Settings of DI32 (Map)	4 bytes	0 – 1024
69	Settings of DI33 (Map)	4 bytes	0 – 1024
71	Settings of DI34 (Map)	4 bytes	0 – 1024
73	Settings of DI35 (Map)	4 bytes	0 – 1024
75	Settings of DI36 (Map)	4 bytes	0 – 1024
77	Settings of DI37 (Map)	4 bytes	0 – 1024
79	Settings of DI38 (Map)	4 bytes	0 – 1024
81	Settings of DI39 (Map)	4 bytes	0 – 1024
83	Settings of DI40 (Map)	4 bytes	0 – 1024

Holding register 2/13

Address	Name	Size	Output range
85	Settings of DI41 (Map)	4 bytes	0 – 1024
87	Settings of DI42 (Map)	4 bytes	0 – 1024
89	Settings of DI43 (Map)	4 bytes	0 – 1024
91	Input trigger of DI 1	2 bytes	0 – 4
92	Input trigger of DI 2	2 bytes	0 – 4
93	Input trigger of DI 3	2 bytes	0 – 4
94	Input trigger of DI 4	2 bytes	0 – 4
95	Input trigger of DI 5	2 bytes	0 – 4
96	Input trigger of DI 6	2 bytes	0 – 4
97	Input trigger of DI 7	2 bytes	0 – 4
98	Input trigger of DI 8	2 bytes	0 – 4
99	Input trigger of DI 9	2 bytes	0 – 4
100	Input trigger of DI 10	2 bytes	0 – 4
101	Input trigger of DI 11	2 bytes	0 – 4
102	Input trigger of DI 12	2 bytes	0 – 4
103	Input trigger of DI 13	2 bytes	0 – 4
104	Input trigger of DI 14	2 bytes	0 – 4
105	Input trigger of DI 15	2 bytes	0 – 4
106	Input trigger of DI 16	2 bytes	0 – 4
107	Input trigger of DI 17	2 bytes	0 – 4
108	Input trigger of DI 18	2 bytes	0 – 4
109	Input trigger of DI 19	2 bytes	0 – 4
110	Input trigger of DI 20	2 bytes	0 – 4
111	Input trigger of DI 21	2 bytes	0 – 4
112	Input trigger of DI 22	2 bytes	0 – 4
113	Input trigger of DI 23	2 bytes	0 – 4
114	Input trigger of DI 24	2 bytes	0 – 4
115	Input trigger of DI 25	2 bytes	0 – 4
116	Input trigger of DI 26	2 bytes	0 – 4
117	Input trigger of DI 27	2 bytes	0 – 4
118	Input trigger of DI 28	2 bytes	0 – 4
119	Input trigger of DI 29	2 bytes	0 – 4
120	Input trigger of DI 30	2 bytes	0 – 4
121	Input trigger of DI 31	2 bytes	0 – 4
122	Input trigger of DI 32	2 bytes	0 – 4
123	Input trigger of DI 33	2 bytes	0 – 4
124	Input trigger of DI 34	2 bytes	0 – 4
125	Input trigger of DI 35	2 bytes	0 – 4
126	Input trigger of DI 36	2 bytes	0 – 4
127	Input trigger of DI 37	2 bytes	0 – 4
128	Input trigger of DI 38	2 bytes	0 – 4
129	Input trigger of DI 39	2 bytes	0 – 4
130	Input trigger of DI 40	2 bytes	0 – 4
131	Input trigger of DI 41	2 bytes	0 – 4

Holding register 3/13

Address	Name	Size	Output range
132	Input trigger of DI 42	2 bytes	0 – 4
133	Input trigger of DI 43	2 bytes	0 – 4
134	Configuration of DI 1	2 bytes	0 – 25
135	Configuration of DI 2	2 bytes	0 – 25
136	Configuration of DI 3	2 bytes	0 – 25
137	Configuration of DI 4	2 bytes	0 – 25
138	Configuration of DI 5	2 bytes	0 – 25
139	Configuration of DI 6	2 bytes	0 – 25
140	Configuration of DI 7	2 bytes	0 – 25
141	Configuration of DI 8	2 bytes	0 – 25
142	Configuration of DI 9	2 bytes	0 – 25
143	Configuration of DI 10	2 bytes	0 – 25
144	Configuration of DI 11	2 bytes	0 – 25
145	Configuration of DI 12	2 bytes	0 – 25
146	Configuration of DI 13	2 bytes	0 – 25
147	Configuration of DI 14	2 bytes	0 – 25
148	Configuration of DI 15	2 bytes	0 – 25
149	Configuration of DI 16	2 bytes	0 – 25
150	Configuration of DI 17	2 bytes	0 – 25
151	Configuration of DI 18	2 bytes	0 – 25
152	Configuration of DI 19	2 bytes	0 – 25
153	Configuration of DI 20	2 bytes	0 – 25
154	Configuration of DI 21	2 bytes	0 – 25
155	Configuration of DI 22	2 bytes	0 – 25
156	Configuration of DI 23	2 bytes	0 – 25
157	Configuration of DI 24	2 bytes	0 – 25
158	Configuration of DI 25	2 bytes	0 – 25
159	Configuration of DI 26	2 bytes	0 – 25
160	Configuration of DI 27	2 bytes	0 – 25
161	Configuration of DI 28	2 bytes	0 – 25
162	Configuration of DI 29	2 bytes	0 – 25
163	Configuration of DI 30	2 bytes	0 – 25
164	Configuration of DI 31	2 bytes	0 – 25
165	Configuration of DI 32	2 bytes	0 – 25
166	Configuration of DI 33	2 bytes	0 – 25
167	Configuration of DI 34	2 bytes	0 – 25
168	Configuration of DI 35	2 bytes	0 – 25
169	Configuration of DI 36	2 bytes	0 – 25
170	Configuration of DI 37	2 bytes	0 – 25
171	Configuration of DI 38	2 bytes	0 – 25
172	Configuration of DI 39	2 bytes	0 – 25
173	Configuration of DI 40	2 bytes	0 – 25
174	Configuration of DI 41	2 bytes	0 – 25
175	Configuration of DI 42	2 bytes	0 – 25

Holding register 4/13

Address	Name	Size	Output range
176	Configuration of DI 43	2 bytes	0 – 25
177	Chattering of DI 1	2 bytes	0.00 – 99.99
178	Chattering of DI 2	2 bytes	0.00 – 99.99
179	Chattering of DI 3	2 bytes	0.00 – 99.99
180	Chattering of DI 4	2 bytes	0.00 – 99.99
181	Chattering of DI 5	2 bytes	0.00 – 99.99
182	Chattering of DI 6	2 bytes	0.00 – 99.99
183	Chattering of DI 7	2 bytes	0.00 – 99.99
184	Chattering of DI 8	2 bytes	0.00 – 99.99
185	Chattering of DI 9	2 bytes	0.00 – 99.99
186	Chattering of DI 10	2 bytes	0.00 – 99.99
187	Chattering of DI 11	2 bytes	0.00 – 99.99
188	Chattering of DI 12	2 bytes	0.00 – 99.99
189	Chattering of DI 13	2 bytes	0.00 – 99.99
190	Chattering of DI 14	2 bytes	0.00 – 99.99
191	Chattering of DI 15	2 bytes	0.00 – 99.99
192	Chattering of DI 16	2 bytes	0.00 – 99.99
193	Chattering of DI 17	2 bytes	0.00 – 99.99
194	Chattering of DI 18	2 bytes	0.00 – 99.99
195	Chattering of DI 19	2 bytes	0.00 – 99.99
196	Chattering of DI 20	2 bytes	0.00 – 99.99
197	Chattering of DI 21	2 bytes	0.00 – 99.99
198	Chattering of DI 22	2 bytes	0.00 – 99.99
199	Chattering of DI 23	2 bytes	0.00 – 99.99
200	Chattering of DI 24	2 bytes	0.00 – 99.99
201	Chattering of DI 25	2 bytes	0.00 – 99.99
202	Chattering of DI 26	2 bytes	0.00 – 99.99
203	Chattering of DI 27	2 bytes	0.00 – 99.99
204	Chattering of DI 28	2 bytes	0.00 – 99.99
205	Chattering of DI 29	2 bytes	0.00 – 99.99
206	Chattering of DI 30	2 bytes	0.00 – 99.99
207	Chattering of DI 31	2 bytes	0.00 – 99.99
208	Chattering of DI 32	2 bytes	0.00 – 99.99
209	Chattering of DI 33	2 bytes	0.00 – 99.99
210	Chattering of DI 34	2 bytes	0.00 – 99.99
211	Chattering of DI 35	2 bytes	0.00 – 99.99
212	Chattering of DI 36	2 bytes	0.00 – 99.99
213	Chattering of DI 37	2 bytes	0.00 – 99.99
214	Chattering of DI 38	2 bytes	0.00 – 99.99
215	Chattering of DI 39	2 bytes	0.00 – 99.99
216	Chattering of DI 40	2 bytes	0.00 – 99.99
217	Chattering of DI 41	2 bytes	0.00 – 99.99
218	Chattering of DI 42	2 bytes	0.00 – 99.99
219	Chattering of DI 43	2 bytes	0.00 – 99.99

Holding register 5/13

Address	Name	Size	Output range
220	Delay time of DI 1	2 bytes	0.00 – 99.99
221	Delay time of DI 2	2 bytes	0.00 – 99.99
222	Delay time of DI 3	2 bytes	0.00 – 99.99
223	Delay time of DI 4	2 bytes	0.00 – 99.99
224	Delay time of DI 5	2 bytes	0.00 – 99.99
225	Delay time of DI 6	2 bytes	0.00 – 99.99
226	Delay time of DI 7	2 bytes	0.00 – 99.99
227	Delay time of DI 8	2 bytes	0.00 – 99.99
228	Delay time of DI 9	2 bytes	0.00 – 99.99
229	Delay time of DI 10	2 bytes	0.00 – 99.99
230	Delay time of DI 11	2 bytes	0.00 – 99.99
231	Delay time of DI 12	2 bytes	0.00 – 99.99
232	Delay time of DI 13	2 bytes	0.00 – 99.99
233	Delay time of DI 14	2 bytes	0.00 – 99.99
234	Delay time of DI 15	2 bytes	0.00 – 99.99
235	Delay time of DI 16	2 bytes	0.00 – 99.99
236	Delay time of DI 17	2 bytes	0.00 – 99.99
237	Delay time of DI 18	2 bytes	0.00 – 99.99
238	Delay time of DI 19	2 bytes	0.00 – 99.99
239	Delay time of DI 20	2 bytes	0.00 – 99.99
240	Delay time of DI 21	2 bytes	0.00 – 99.99
241	Delay time of DI 22	2 bytes	0.00 – 99.99
242	Delay time of DI 23	2 bytes	0.00 – 99.99
243	Delay time of DI 24	2 bytes	0.00 – 99.99
244	Delay time of DI 25	2 bytes	0.00 – 99.99
245	Delay time of DI 26	2 bytes	0.00 – 99.99
246	Delay time of DI 27	2 bytes	0.00 – 99.99
247	Delay time of DI 28	2 bytes	0.00 – 99.99
248	Delay time of DI 29	2 bytes	0.00 – 99.99
249	Delay time of DI 30	2 bytes	0.00 – 99.99
250	Delay time of DI 31	2 bytes	0.00 – 99.99
251	Delay time of DI 32	2 bytes	0.00 – 99.99
252	Delay time of DI 33	2 bytes	0.00 – 99.99
253	Delay time of DI 34	2 bytes	0.00 – 99.99
254	Delay time of DI 35	2 bytes	0.00 – 99.99
255	Delay time of DI 36	2 bytes	0.00 – 99.99
256	Delay time of DI 37	2 bytes	0.00 – 99.99
257	Delay time of DI 38	2 bytes	0.00 – 99.99
258	Delay time of DI 39	2 bytes	0.00 – 99.99
259	Delay time of DI 40	2 bytes	0.00 – 99.99
260	Delay time of DI 41	2 bytes	0.00 – 99.99
261	Delay time of DI 42	2 bytes	0.00 – 99.99
262	Delay time of DI 43	2 bytes	0.00 – 99.99
263	Setting of stop High order	4 bytes	0 – 4294967296

Holding register 6/13

Address	Name		Size	Output range
265	Setting of stop	Low order	4 bytes	0 – 4294967296
267	Setting of DO BZ	High order	4 bytes	0 – 4294967296
269	Setting of DO BZ	Low order	4 bytes	0 – 4294967296
271	Setting of DO 1	High order	4 bytes	0 – 4294967296
273	Setting of DO 1	Low order	4 bytes	0 – 4294967296
275	Setting of DO 2	High order	4 bytes	0 – 4294967296
277	Setting of DO 2	Low order	4 bytes	0 – 4294967296
279	Setting of DO 3	High order	4 bytes	0 – 4294967296
281	Setting of DO 3	Low order	4 bytes	0 – 4294967296
283	Setting of DO 4	High order	4 bytes	0 – 4294967296
285	Setting of DO 4	Low order	4 bytes	0 – 4294967296
287	Setting of DO 5	High order	4 bytes	0 – 4294967296
289	Setting of DO 5	Low order	4 bytes	0 – 4294967296
291	Setting of DO 6	High order	4 bytes	0 – 4294967296
293	Setting of DO 6	Low order	4 bytes	0 – 4294967296
295	Setting of DO 7	High order	4 bytes	0 – 4294967296
297	Setting of DO 7	Low order	4 bytes	0 – 4294967296
299	Setting of DO 8	High order	4 bytes	0 – 4294967296
301	Setting of DO 8	Low order	4 bytes	0 – 4294967296
303	Setting of DO 9	High order	4 bytes	0 – 4294967296
305	Setting of DO 9	Low order	4 bytes	0 – 4294967296
307	Setting of DO 10	High order	4 bytes	0 – 4294967296
309	Setting of DO 10	Low order	4 bytes	0 – 4294967296
311	Setting of DO 11	High order	4 bytes	0 – 4294967296
313	Setting of DO 11	Low order	4 bytes	0 – 4294967296
315	Setting of DO 12	High order	4 bytes	0 – 4294967296
317	Setting of DO 12	Low order	4 bytes	0 – 4294967296
319	Setting of DO 13	High order	4 bytes	0 – 4294967296
321	Setting of DO 13	Low order	4 bytes	0 – 4294967296
323	Setting of DO 14	High order	4 bytes	0 – 4294967296
325	Setting of DO 14	Low order	4 bytes	0 – 4294967296
327	Setting of DO 15	High order	4 bytes	0 – 4294967296
329	Setting of DO 15	Low order	4 bytes	0 – 4294967296
331	Setting of DO 16	High order	4 bytes	0 – 4294967296
333	Setting of DO 16	Low order	4 bytes	0 – 4294967296
335	Setting of DO 17	High order	4 bytes	0 – 4294967296
337	Setting of DO 17	Low order	4 bytes	0 – 4294967296
339	Setting of DO 18	High order	4 bytes	0 – 4294967296
341	Setting of DO 18	Low order	4 bytes	0 – 4294967296
343	Setting of DO 19	High order	4 bytes	0 – 4294967296
345	Setting of DO 19	Low order	4 bytes	0 – 4294967296
347	Setting of DO 20	High order	4 bytes	0 – 4294967296
349	Setting of DO 20	Low order	4 bytes	0 – 4294967296
351	Setting of DO 21	High order	4 bytes	0 – 4294967296

Holding register 7/13

Address	Name	Size	Output range
353	Setting of DO 21 Low order	4 bytes	0 – 4294967296
355	Setting of DO 22 High order	4 bytes	0 – 4294967296
357	Setting of DO 22 Low order	4 bytes	0 – 4294967296
359	Setting of DO 23 High order	4 bytes	0 – 4294967296
361	Setting of DO 23 Low order	4 bytes	0 – 4294967296
363	Setting of DO 24 High order	4 bytes	0 – 4294967296
365	Setting of DO 24 Low order	4 bytes	0 – 4294967296
367	Setting of DO 25 High order	4 bytes	0 – 4294967296
369	Setting of DO 25 Low order	4 bytes	0 – 4294967296
371	Setting of DO 26 High order	4 bytes	0 – 4294967296
373	Setting of DO 26 Low order	4 bytes	0 – 4294967296
375	Setting of DO 27 High order	4 bytes	0 – 4294967296
377	Setting of DO 27 Low order	4 bytes	0 – 4294967296
379	Setting of DO 28 High order	4 bytes	0 – 4294967296
381	Setting of DO 28 Low order	4 bytes	0 – 4294967296
383	Setting of DO 29 High order	4 bytes	0 – 4294967296
385	Setting of DO 29 Low order	4 bytes	0 – 4294967296
387	Setting of DO 30 High order	4 bytes	0 – 4294967296
389	Setting of DO 30 Low order	4 bytes	0 – 4294967296
391	Setting of DO 31 High order	4 bytes	0 – 4294967296
393	Setting of DO 31 Low order	4 bytes	0 – 4294967296
395	Setting of DO 32 High order	4 bytes	0 – 4294967296
397	Setting of DO 32 Low order	4 bytes	0 – 4294967296
399	Setting of DO 33 High order	4 bytes	0 – 4294967296
401	Setting of DO 33 Low order	4 bytes	0 – 4294967296
403	Setting of DO 34 High order	4 bytes	0 – 4294967296
405	Setting of DO 34 Low order	4 bytes	0 – 4294967296
407	Setting of DO 35 High order	4 bytes	0 – 4294967296
409	Setting of DO 35 Low order	4 bytes	0 – 4294967296
411	Setting of DO 36 High order	4 bytes	0 – 4294967296
413	Setting of DO 36 Low order	4 bytes	0 – 4294967296
415	Setting of DO 37 High order	4 bytes	0 – 4294967296
417	Setting of DO 37 Low order	4 bytes	0 – 4294967296
419	Setting of DO 38 High order	4 bytes	0 – 4294967296
421	Setting of DO 38 Low order	4 bytes	0 – 4294967296
423	Setting of DO 39 High order	4 bytes	0 – 4294967296
425	Setting of DO 39 Low order	4 bytes	0 – 4294967296
427	Setting of DO 40 High order	4 bytes	0 – 4294967296
429	Setting of DO 40 Low order	4 bytes	0 – 4294967296
431	Setting of DO 41 High order	4 bytes	0 – 4294967296
433	Setting of DO 41 Low order	4 bytes	0 – 4294967296
435	Setting of DO 42 High order	4 bytes	0 – 4294967296
437	Setting of DO 42 Low order	4 bytes	0 – 4294967296
439	Setting of DO 43 High order	4 bytes	0 – 4294967296

Holding register 8/13

Address	Name	Size	Output range
441	Setting of DO 43 Low order	4 bytes	0 – 4294967296
443	Behavior of DO BZ	2 bytes	0 – 2
444	Behavior of DO 1	2 bytes	0 – 2
445	Behavior of DO 2	2 bytes	0 – 2
446	Behavior of DO 3	2 bytes	0 – 2
447	Behavior of DO 4	2 bytes	0 – 2
448	Behavior of DO 5	2 bytes	0 – 2
449	Behavior of DO 6	2 bytes	0 – 2
450	Behavior of DO 7	2 bytes	0 – 2
451	Behavior of DO 8	2 bytes	0 – 2
452	Behavior of DO 9	2 bytes	0 – 2
453	Behavior of DO 10	2 bytes	0 – 2
454	Behavior of DO 11	2 bytes	0 – 2
455	Behavior of DO 12	2 bytes	0 – 2
456	Behavior of DO 13	2 bytes	0 – 2
457	Behavior of DO 14	2 bytes	0 – 2
458	Behavior of DO 15	2 bytes	0 – 2
459	Behavior of DO 16	2 bytes	0 – 2
460	Behavior of DO 17	2 bytes	0 – 2
461	Behavior of DO 18	2 bytes	0 – 2
462	Behavior of DO 19	2 bytes	0 – 2
463	Behavior of DO 20	2 bytes	0 – 2
464	Behavior of DO 21	2 bytes	0 – 2
465	Behavior of DO 22	2 bytes	0 – 2
466	Behavior of DO 23	2 bytes	0 – 2
467	Behavior of DO 24	2 bytes	0 – 2
468	Behavior of DO 25	2 bytes	0 – 2
469	Behavior of DO 26	2 bytes	0 – 2
470	Behavior of DO 27	2 bytes	0 – 2
471	Behavior of DO 28	2 bytes	0 – 2
472	Behavior of DO 29	2 bytes	0 – 2
473	Behavior of DO 30	2 bytes	0 – 2
474	Behavior of DO 31	2 bytes	0 – 2
475	Behavior of DO 32	2 bytes	0 – 2
476	Behavior of DO 33	2 bytes	0 – 2
477	Behavior of DO 34	2 bytes	0 – 2
478	Behavior of DO 35	2 bytes	0 – 2
479	Behavior of DO 36	2 bytes	0 – 2
480	Behavior of DO 37	2 bytes	0 – 2
481	Behavior of DO 38	2 bytes	0 – 2
482	Behavior of DO 39	2 bytes	0 – 2
483	Behavior of DO 40	2 bytes	0 – 2
484	Behavior of DO 41	2 bytes	0 – 2
485	Behavior of DO 42	2 bytes	0 – 2

Holding register 9/13

Address	Name	Size	Output range
486	Behavior of DO 43	2 bytes	0 – 2
487	Delay time of DO BZ	2 bytes	0.00 – 99.99
488	Delay time of DO 1	2 bytes	0.00 – 99.99
489	Delay time of DO 2	2 bytes	0.00 – 99.99
490	Delay time of DO 3	2 bytes	0.00 – 99.99
491	Delay time of DO 4	2 bytes	0.00 – 99.99
492	Delay time of DO 5	2 bytes	0.00 – 99.99
493	Delay time of DO 6	2 bytes	0.00 – 99.99
494	Delay time of DO 7	2 bytes	0.00 – 99.99
495	Delay time of DO 8	2 bytes	0.00 – 99.99
496	Delay time of DO 9	2 bytes	0.00 – 99.99
497	Delay time of DO 10	2 bytes	0.00 – 99.99
498	Delay time of DO 11	2 bytes	0.00 – 99.99
499	Delay time of DO 12	2 bytes	0.00 – 99.99
500	Delay time of DO 13	2 bytes	0.00 – 99.99
501	Delay time of DO 14	2 bytes	0.00 – 99.99
502	Delay time of DO 15	2 bytes	0.00 – 99.99
503	Delay time of DO 16	2 bytes	0.00 – 99.99
504	Delay time of DO 17	2 bytes	0.00 – 99.99
505	Delay time of DO 18	2 bytes	0.00 – 99.99
506	Delay time of DO 19	2 bytes	0.00 – 99.99
507	Delay time of DO 20	2 bytes	0.00 – 99.99
508	Delay time of DO 21	2 bytes	0.00 – 99.99
509	Delay time of DO 22	2 bytes	0.00 – 99.99
510	Delay time of DO 23	2 bytes	0.00 – 99.99
511	Delay time of DO 24	2 bytes	0.00 – 99.99
512	Delay time of DO 25	2 bytes	0.00 – 99.99
513	Delay time of DO 26	2 bytes	0.00 – 99.99
514	Delay time of DO 27	2 bytes	0.00 – 99.99
515	Delay time of DO 28	2 bytes	0.00 – 99.99
516	Delay time of DO 29	2 bytes	0.00 – 99.99
517	Delay time of DO 30	2 bytes	0.00 – 99.99
518	Delay time of DO 31	2 bytes	0.00 – 99.99
519	Delay time of DO 32	2 bytes	0.00 – 99.99
520	Delay time of DO 33	2 bytes	0.00 – 99.99
521	Delay time of DO 34	2 bytes	0.00 – 99.99
522	Delay time of DO 35	2 bytes	0.00 – 99.99
523	Delay time of DO 36	2 bytes	0.00 – 99.99
524	Delay time of DO 37	2 bytes	0.00 – 99.99
525	Delay time of DO 38	2 bytes	0.00 – 99.99
526	Delay time of DO 39	2 bytes	0.00 – 99.99
527	Delay time of DO 40	2 bytes	0.00 – 99.99
528	Delay time of DO 41	2 bytes	0.00 – 99.99
529	Delay time of DO 42	2 bytes	0.00 – 99.99

Holding register 10/13

Address	Name	Size	Output range
530	Delay time of DO 43	2 bytes	0.00 – 99.99
531	Hold time of DO BZ	2 bytes	0.00 – 99.99
532	Hold time of DO 1	2 bytes	0.00 – 99.99
533	Hold time of DO 2	2 bytes	0.00 – 99.99
534	Hold time of DO 3	2 bytes	0.00 – 99.99
535	Hold time of DO 4	2 bytes	0.00 – 99.99
536	Hold time of DO 5	2 bytes	0.00 – 99.99
537	Hold time of DO 6	2 bytes	0.00 – 99.99
538	Hold time of DO 7	2 bytes	0.00 – 99.99
539	Hold time of DO 8	2 bytes	0.00 – 99.99
540	Hold time of DO 9	2 bytes	0.00 – 99.99
541	Hold time of DO 10	2 bytes	0.00 – 99.99
542	Hold time of DO 11	2 bytes	0.00 – 99.99
543	Hold time of DO 12	2 bytes	0.00 – 99.99
544	Hold time of DO 13	2 bytes	0.00 – 99.99
545	Hold time of DO 14	2 bytes	0.00 – 99.99
546	Hold time of DO 15	2 bytes	0.00 – 99.99
547	Hold time of DO 16	2 bytes	0.00 – 99.99
548	Hold time of DO 17	2 bytes	0.00 – 99.99
549	Hold time of DO 18	2 bytes	0.00 – 99.99
550	Hold time of DO 19	2 bytes	0.00 – 99.99
551	Hold time of DO 20	2 bytes	0.00 – 99.99
552	Hold time of DO 21	2 bytes	0.00 – 99.99
553	Hold time of DO 22	2 bytes	0.00 – 99.99
554	Hold time of DO 23	2 bytes	0.00 – 99.99
555	Hold time of DO 24	2 bytes	0.00 – 99.99
556	Hold time of DO 25	2 bytes	0.00 – 99.99
557	Hold time of DO 26	2 bytes	0.00 – 99.99
558	Hold time of DO 27	2 bytes	0.00 – 99.99
559	Hold time of DO 28	2 bytes	0.00 – 99.99
560	Hold time of DO 29	2 bytes	0.00 – 99.99
561	Hold time of DO 30	2 bytes	0.00 – 99.99
562	Hold time of DO 31	2 bytes	0.00 – 99.99
563	Hold time of DO 32	2 bytes	0.00 – 99.99
564	Hold time of DO 33	2 bytes	0.00 – 99.99
565	Hold time of DO 34	2 bytes	0.00 – 99.99
566	Hold time of DO 35	2 bytes	0.00 – 99.99
567	Hold time of DO 36	2 bytes	0.00 – 99.99
568	Hold time of DO 37	2 bytes	0.00 – 99.99
569	Hold time of DO 38	2 bytes	0.00 – 99.99
570	Hold time of DO 39	2 bytes	0.00 – 99.99
571	Hold time of DO 40	2 bytes	0.00 – 99.99
572	Hold time of DO 41	2 bytes	0.00 – 99.99
573	Hold time of DO 42	2 bytes	0.00 – 99.99

Holding register 11/13

Address	Name	Size	Output range
574	Hold time of DO 43	2 bytes	0.00 – 99.99
575	Polarity of DO BZ	2 bytes	0.00 – 99.99
576	Polarity of DO 1	2 bytes	0 – 1
577	Polarity of DO 2	2 bytes	0 – 1
578	Polarity of DO 3	2 bytes	0 – 1
579	Polarity of DO 4	2 bytes	0 – 1
580	Polarity of DO 5	2 bytes	0 – 1
581	Polarity of DO 6	2 bytes	0 – 1
582	Polarity of DO 7	2 bytes	0 – 1
583	Polarity of DO 8	2 bytes	0 – 1
584	Polarity of DO 9	2 bytes	0 – 1
585	Polarity of DO 10	2 bytes	0 – 1
586	Polarity of DO 11	2 bytes	0 – 1
587	Polarity of DO 12	2 bytes	0 – 1
588	Polarity of DO 13	2 bytes	0 – 1
589	Polarity of DO 14	2 bytes	0 – 1
590	Polarity of DO 15	2 bytes	0 – 1
591	Polarity of DO 16	2 bytes	0 – 1
592	Polarity of DO 17	2 bytes	0 – 1
593	Polarity of DO 18	2 bytes	0 – 1
594	Polarity of DO 19	2 bytes	0 – 1
595	Polarity of DO 20	2 bytes	0 – 1
596	Polarity of DO 21	2 bytes	0 – 1
597	Polarity of DO 22	2 bytes	0 – 1
598	Polarity of DO 23	2 bytes	0 – 1
599	Polarity of DO 24	2 bytes	0 – 1
600	Polarity of DO 25	2 bytes	0 – 1
601	Polarity of DO 26	2 bytes	0 – 1
602	Polarity of DO 27	2 bytes	0 – 1
603	Polarity of DO 28	2 bytes	0 – 1
604	Polarity of DO 29	2 bytes	0 – 1
605	Polarity of DO 30	2 bytes	0 – 1
606	Polarity of DO 31	2 bytes	0 – 1
607	Polarity of DO 32	2 bytes	0 – 1
608	Polarity of DO 33	2 bytes	0 – 1
609	Polarity of DO 34	2 bytes	0 – 1
610	Polarity of DO 35	2 bytes	0 – 1
611	Polarity of DO 36	2 bytes	0 – 1
612	Polarity of DO 37	2 bytes	0 – 1
613	Polarity of DO 38	2 bytes	0 – 1
614	Polarity of DO 39	2 bytes	0 – 1
615	Polarity of DO 40	2 bytes	0 – 1
616	Polarity of DO 41	2 bytes	0 – 1
617	Polarity of DO 42	2 bytes	0 – 1

Holding register 12/13

Address	Name	Size	Output range
618	Polarity of DO 43	2 bytes	0 – 1
619	Position of decimal point	2 bytes	0 – 4
620	Readability	2 bytes	0 – 5
621	Capacity	4 bytes	0.0000 – 99999.9999
623	Range to be able to adjust zero point	2 bytes	0 – 30
624	Range of power-on zero function	2 bytes	0 – 100
625	Time range of zero tracking function	2 bytes	0.0 – 9.9
626	Weighing value range of zero tracking function	2 bytes	0.0 – 9.9
627	Stability time (to regard as stable weighing value)	2 bytes	0.0 – 9.9
628	Stability range (to regard as stable weighing value)	2 bytes	0.0 – 9.9
629	Weight value	4 bytes	0.0000 – 99999.9999
631	Display mode of weighing value	2 bytes	0 – 2
632	Negative value in weighing	2 bytes	0 – 1
633	Display data	2 bytes	0 – 1
634	Do not use address because of reserved expansion number.	2 bytes	
635		2 bytes	
636	Range of unsplit	2 bytes	0 – 100
637	Time to prevent chattering of photosensor	2 bytes	0.00 – 99.99
638	Output logic of photosensor	2 bytes	0 – 1
639	Error time of photosensor	2 bytes	0.00 – 99.99
640	Priority of peripherals	2 bytes	0 – 1
641	Releasing action of detect two	2 bytes	0 – 1
642	Storing operation history	2 bytes	0 – 1
643	Storing weighing history	2 bytes	0 – 1
644	Number of stage	2 bytes	0 – 1
645	Standard value	4 bytes	0.0000 – 99999.9999
647	Threshold value of HiHi	4 bytes	0.0000 – 99999.9999
649	Threshold value of Hi	4 bytes	0.0000 – 99999.9999
651	Threshold value of Lo	4 bytes	0.0000 – 99999.9999
653	Threshold value of LoLo	4 bytes	0.0000 – 99999.9999
655	Over weight exception	2 bytes	0 – 1
656	Setting to stop due to consecutive fail	2 bytes	0 – 1
657	Number of consecutive fail	2 bytes	0 – 9999
658	Product length	2 bytes	30 – 999
659	Conveyor velocity	2 bytes	10 – 120
660	Do not use address because of reserved expansion number.	2 bytes	
661		2 bytes	
662		2 bytes	
663		2 bytes	
664		2 bytes	
665		2 bytes	
666		2 bytes	
667		4 bytes	
669	Number of samples	2 bytes	2 – 9999

Holding register 13/13

Address	Name	Size	Output range
670	Sample size	2 bytes	2 – 10
671	$\overline{\overline{X}}$	4 bytes	0.0000 – 99999.9999
673	$\overline{X}$	4 bytes	0.0000 – 99999.9999
675	Width of Section	4 bytes	0.0000 – 99999.9999
677	Auto zero range of auto zero	4 bytes	0.0000 – 99999.9999
679	Dead zone timer of auto zero	2 bytes	0.0 – 999.9
680	Observation timer of auto zero	2 bytes	0.00 – 99.99
681	Averaging time of auto zero	2 bytes	0.00 – 99.99
682	Number of averaging of auto zero	2 bytes	1 – 100
683	Compensation value of auto zero	2 bytes	0 – 100
684	Do not use address because of reserved expansion number.	2 bytes	0 – 1
685	Dynamic compensation value	4 bytes	0.50000 – 2.00000
687	Tare value	4 bytes	0.0000 – 99999.9999
689	Target value of feedback control	4 bytes	0.0000 – 99999.9999
691	Range of feedback control	4 bytes	0.0000 – 99999.9999
693	Steps of feedback control [g/sec]	4 bytes	1.0000 – 100.0000
695	Steps of feedback control [sec/g]	4 bytes	0.0001 – 1.0000
697	Number of averaging of feedback control	2 bytes	1 – 999
698	Waiting time of feedback control	2 bytes	0.0 – 999.9
699	Target value of 10 stage feedback control	4 bytes	0.0000 – 99999.9999
701	Zone 1 of 10 stage feedback control	4 bytes	0.0000 – 99999.9999
703	Zone 2 of 10 stage feedback control	4 bytes	0.0000 – 99999.9999
705	Zone 3 of 10 stage feedback control	4 bytes	0.0000 – 99999.9999
707	Zone 4 of 10 stage feedback control	4 bytes	0.0000 – 99999.9999
709	Number of averaging of 10 stage feedback control	2 bytes	1 – 999
710	Waiting time of 10 stage feedback control	2 bytes	0.0 – 999.9

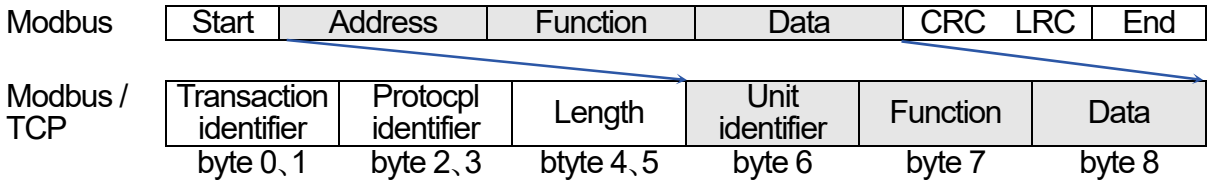
10.6. Communication Command of Modbus TCP

10.6.1. Protocol Layout

When the request or response of Modbus are communicated using Modbus TCP, the format is shown below. Transaction identifier of slave side is used to return a copy only. Transaction identifier of master side is used to transaction management of messages. The following 6 byte information is added at the head of the request and response of Modbus TCP.

byte 0 : Transaction identifier, Slave only copies, usually 0
byte 1 : Transaction identifier, Slave only copies, usually 0
byte 2 : Transaction identifier = 0
byte 3 : Transaction identifier = 0
byte 4 : Length (High-order byte) = 0 (Because all messages are under 256.)
byte 5 : Length (Low-order byte) = Number of following bytes
byte 6 : Slave address
byte 7 : Modbus function
byte 8 or later : Required data sequence

Relationship of data construction of message for Modbus TCP and Modbus is as follows :



10.6.2. Example of Reading Input Register

This example describes concerning communication command in Modbus TCP.
The input register is read the same conditions of the "**10.3.1. Example of Reading Input Register**". Example of transmission command and example of response processed properly are shown below.

Cautions

- Error check is not necessary for Modbus TCP.

Transmission Command

Command description	Transmission data
Transaction identifier	0×00
Transaction identifier	0×00
Protocol identifier	0×00
Protocol identifier	0×00
Field length (high-order)	0×00
Field length (low-order)	0×06
Slave address	0×01
Function code	0×04
Start address (high-order)	0×00
Start address (low-order)	0×2C
Number of register (high-order)	0×00
Number of register (low-order)	0×02

Table 24 Example of the transmission command (Reading of input register)

Response

Command description	Response data
Transaction identifier	0×00
Transaction identifier	0×00
Protocol identifier	0×00
Protocol identifier	0×00
Field length (high-order)	0×00
Field length (low-order)	0×06
Slave address	0×01
Function code	0×04
Start address (high-order)	0×00
Start address (low-order)	0×2C
Number of register (high-order)	0×00
Number of register (low-order)	0×02

Table 25 Example of the response (Reading of input register)

11. Interface

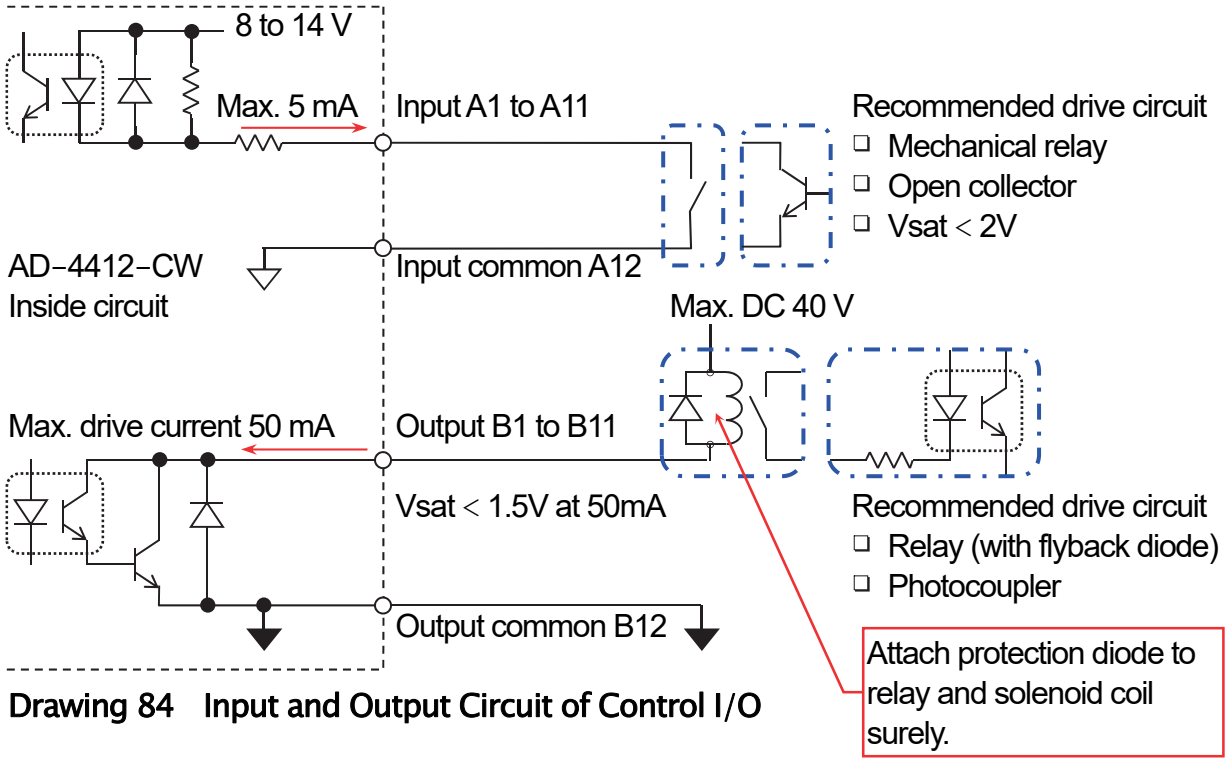
11.1. Control I/O

The control I/O is the interface to input and/or output bit information between this indicator and connected peripherals, and equips 11 points of DO and 11 points of DI.

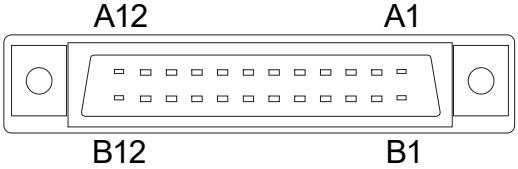
Table 26 Specifications of the control I/O interface

Input Circuit	DC Input (Source)
Open voltage of input terminal	8 - 14 V
Current of input terminal	5 mA (Maximum)
Torelance saturation voltage	2 V (Maximum)
Output Circuit	Open collector
Maximum output voltage	DC 40 V
Maximum output current	50 mA
Tolelance saturation voltage	1.5 V (at 50 mA drive current)

11.1.1. Connection of Control I/O



Drawing 84 Input and Output Circuit of Control I/O



Drawing 85 Terminals of Contorl I/O Connector

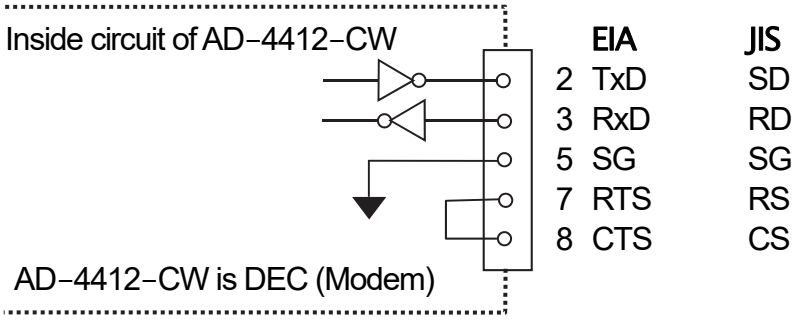
11.2. RS-232C

The RS-232C interface is used to communication with printer, bar code reader and computer.

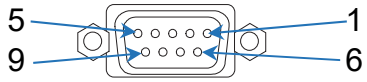
Table 27 Specifications of RS-232C Interface

Transmission form	EIA RS-232C Conformed
Data length	7 bit, 8bit
Start bit	1 bit
Parity	Even 1 bit ,Odd 1bit, None
Stop bit	1 bit, 2 bit
Baud rate	2400, 4800, 9600, 19200, 38400, 57600, 115200
Code	ASCII code

11.2.1. Connection of RS-232C



Drawing 86 RS-232C Internal Circuit



Drawing 87 RS-232C Connector

11.3. RS-485

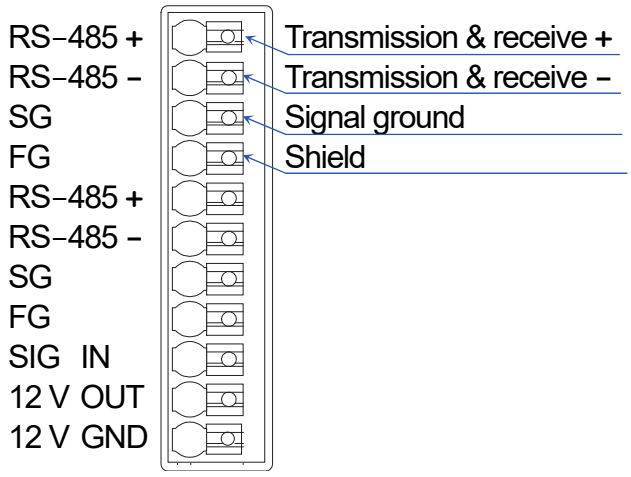
The RS-485 interface is used to communication with PLC on Modbus RTU and to stream mode with computer.

- ❑ Terminal resistor needs surely for RS-485. Install terminal resistor between + terminal and – terminal at the longest position from transmission terminal. (Terminal resistor is not included to accessory.)
- ❑ Polarity of terminals on some host device may be reversed.
- ❑ If signal ground terminal is not equipped, SG terminal is not used.

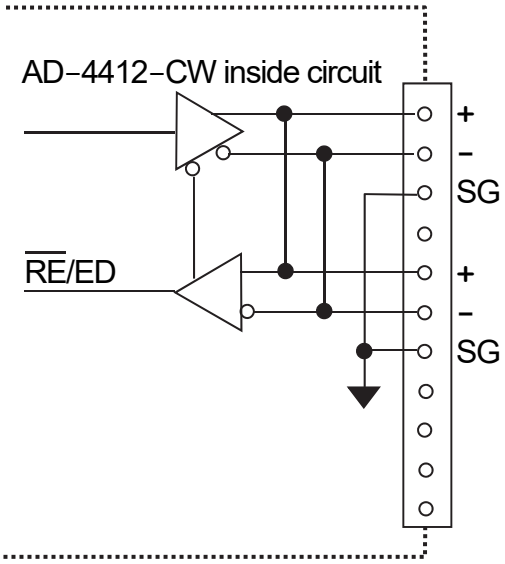
Table 28 Specifications of RS-485 Interface

Transmission form	EIA RS-485 Conformed
Data length	7 bit, 8bit
Start bit	1 bit
Parity	Even 1 bit ,Odd 1bit, None
Stop bit	1 bit, 2 bit
Baud rate	2400, 4800, 9600, 19200, 38400, 57600, 115200
Line type	Differential line × 2
Code	ASCII code

11.3.1. Connection of RS-485



Drawing 88 Treminals of RS-485 Connector

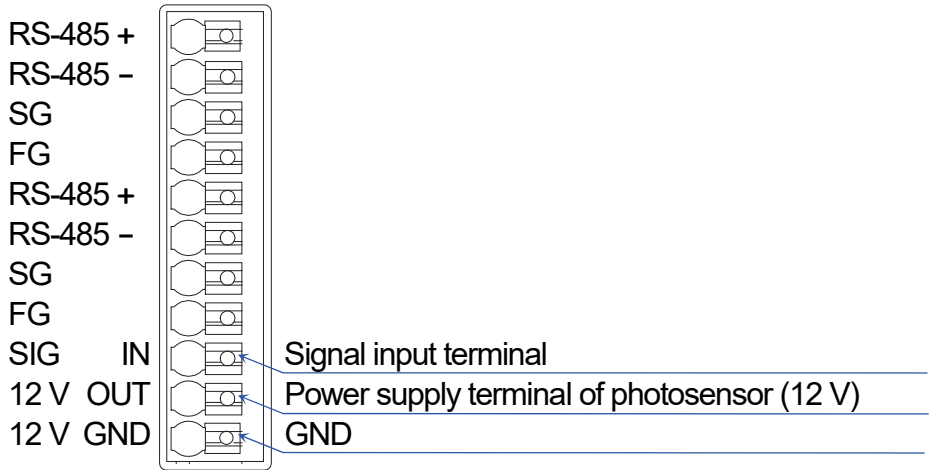


Drawing 89 RS-485 Inside Circuit

11.4. Photoelectric Sensor

The interface is used to photosensor.
The connection of photosensor is used on the terminal of terminal box principally. And it can be used on the terminal of this connector, too.

11.4.1. Connection of Photoelectric Sensor



Drawing 90 Terminal of Photosensor

11.5. OP-02 Relay Output

OP-02 relay output is an option that is equipped mechanical contact of DO 9 which has the same as function to the control I/O.

Table 29 OP-02 Specifications of Relay Output Interface

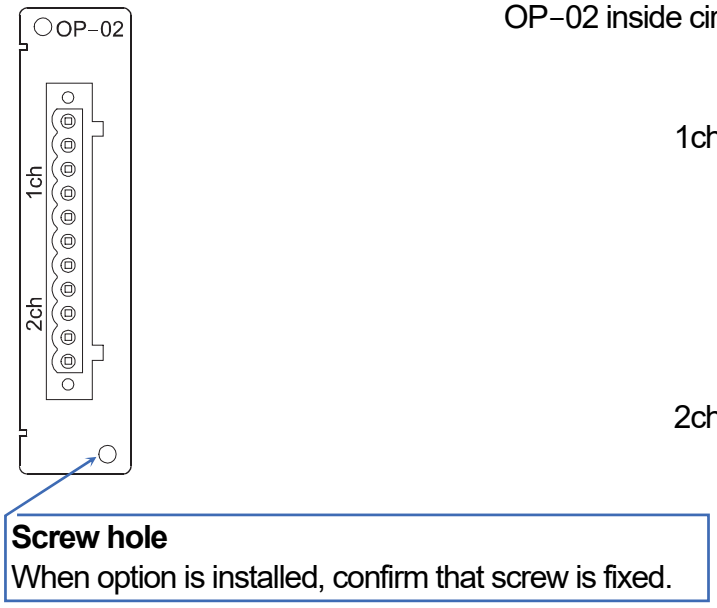
Output circuit	Mechanial contact relay
Rated load	250 VAC 3 A at rated load 30 VDC 3 A at rated load
Current at common terminal	10 A DC at maximum
Minimum load	100 mV 100 μA
Mechanical lifetime	20,000,000 times or more at no load
Electrical lifetime	100,000 times or more at rated load

Cautions

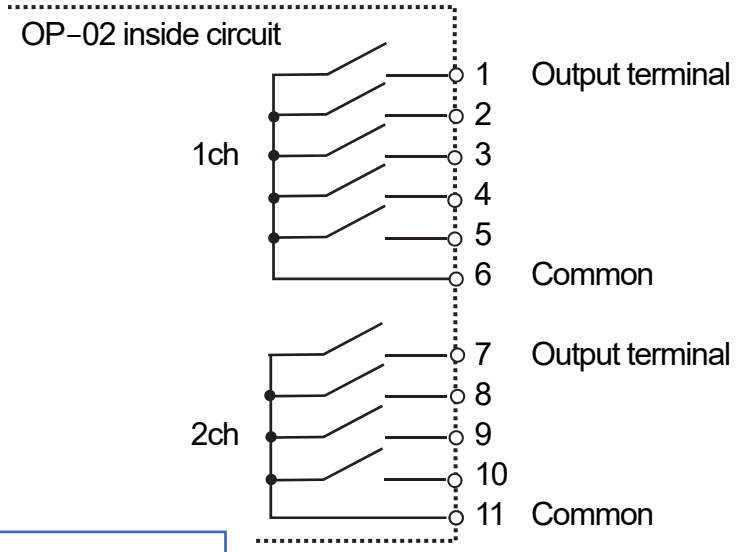
- OP-02 relay output and OP-05 parallel I/O can install into the indicator up to total 2 options. Address number of DI and DO are changed to number adapted to slot installed.
- When OP-02 is installed to slot 1, DO 12 to DO 20 are assigned as address numbers. When OP-02 is installed to slot 2, DO 28 to DO 36 are assigned as address numbers.

Table 30 Accessory of OP-02 Relay Output

Name	Pieces	Descriptions
Relay output connector	1	1TMFKC2.5/11STF Phaenic contact



Drawing 91 Terminal of OP-02 connector



Drawing 92 OP-02 Output Circuit

11.6. OP-05 Parallel Input / Output

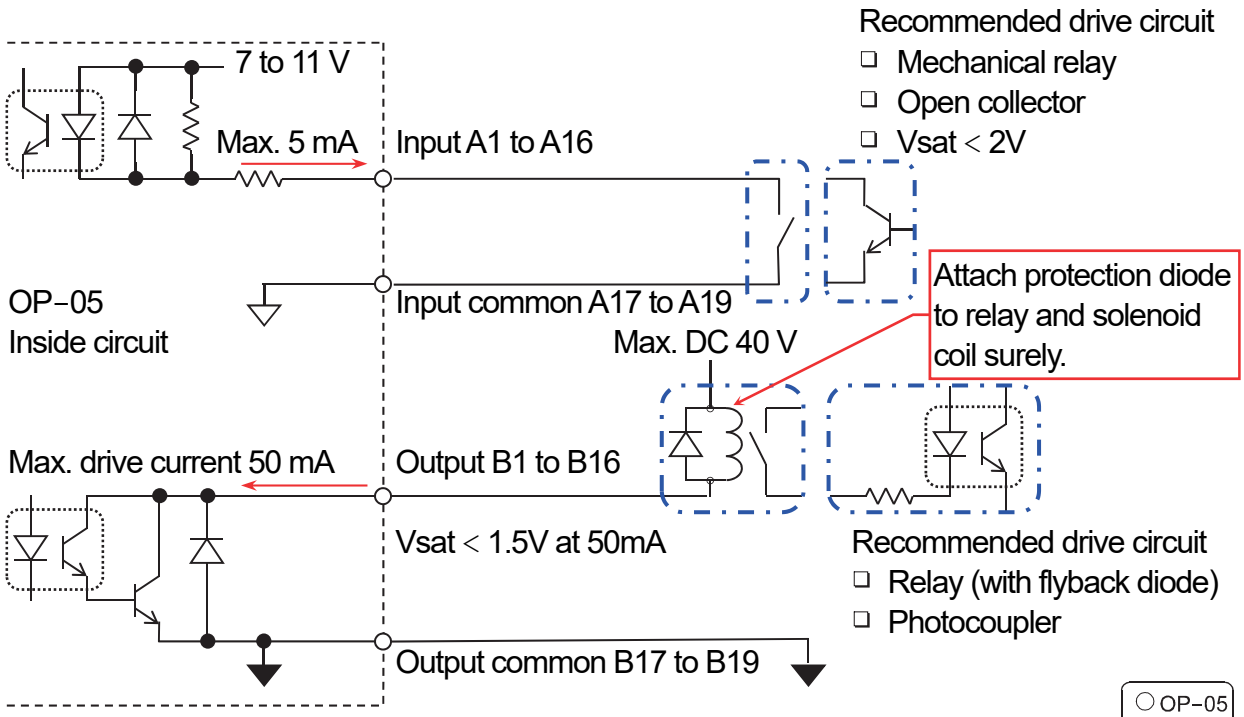
OP-05 parallel input / output is the option to expand the control I/O.
These terminals can use the same as the control I/O.
Timing of input and output is the same as the control I/O, too.

Table 31 Specifications of the OP-05 Parallel Input / Output

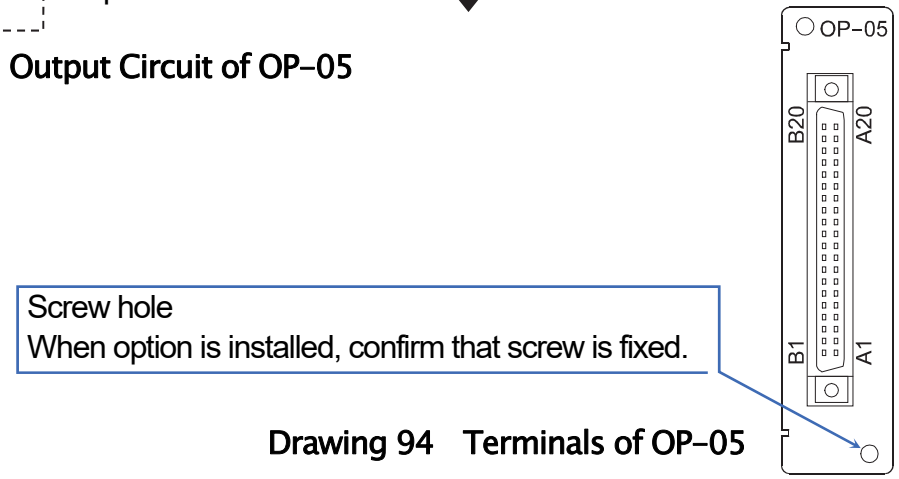
Input Circuit	None voltage input / open collector drive
Open voltage of input terminal	7 – 11 V
Current of input terminal	5 mA (Maximum)
Torelance saturation voltage	2 V (Maximum)
Output Circuit	Open collector
Maximum output voltage	DC 40 V
Maximum output current	50 mA
Tolelance saturation voltage	1.5 V (at 50 mA drive current)

Cautions

- ❑ OP-02 relay output and OP-05 parallel I/O can install into the indicator up to total 2 options. Address number of DI and DO are changed to number adapted to slot installed.
- ❑ When OP-05 is installed to slot 1, DI 12 to DI 27 and DO 12 to DO 27 are assigned. When OP-05 is installed to slot 2, DI 28 to DI 43 and DO 28 to DO 43 are assigned.



Drawing 93 Input and Output Circuit of OP-05



Drawing 94 Terminals of OP-05

11.7. OP-07 Analog Output

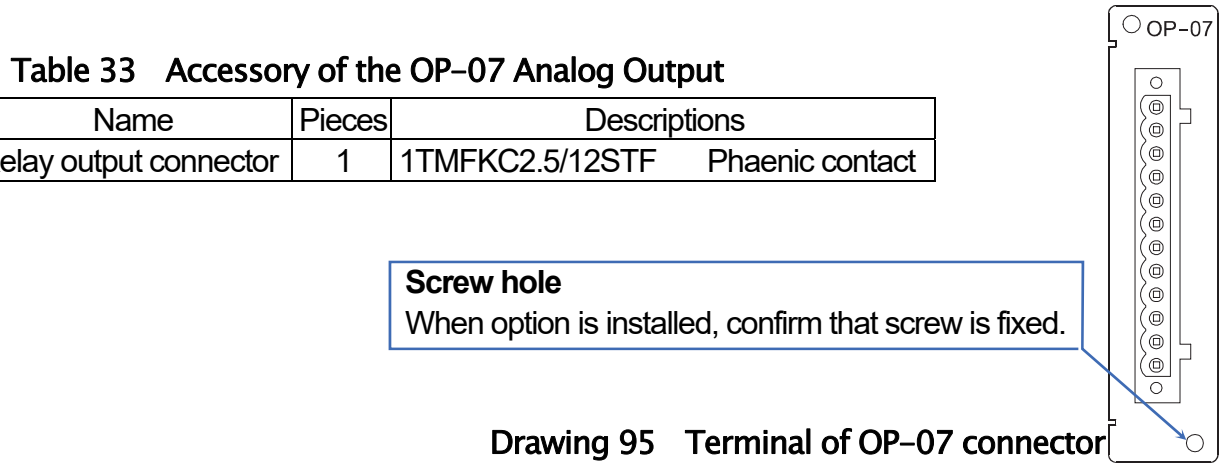
OP-07 analog output is the option to output 4 - 20 mA or 0 -10 V adapted to weighing data etc.

Table 32 Specifications of the OP-07 Analog Output

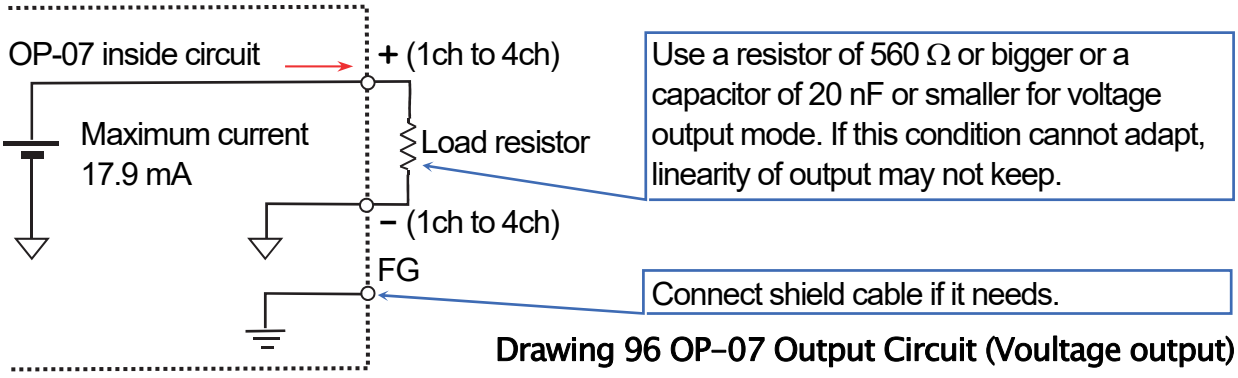
Output form	4 - 20 mA current output (Range : 2 ~ 22 mA) 0 - 10 V voltage output
Maximum output voltage	11 V min. (at current output) / 10 V (at voltage output)
Resistor	0 to 500 Ω (at current output) / 560 Ω or more (at voltage output)
Output rate	200 time / s
Zero temperature coefficient	±150 ppm/°C (max.)
Span temperature coefficient	±150 ppm/°C (max.)
Non-linearity	0.1 % (max.)
Resolution	Smallest value of 40000 or readability

Table 33 Accessory of the OP-07 Analog Output

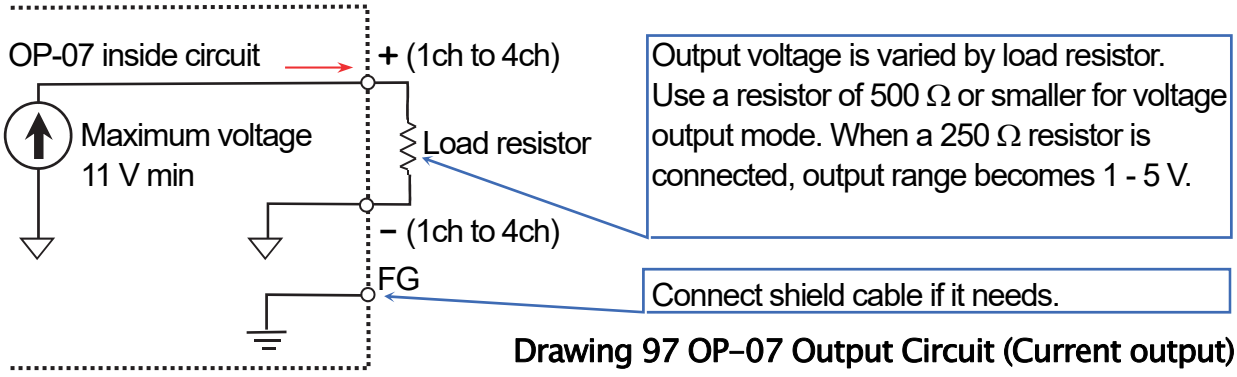
Name	Pieces	Descriptions
Relay output connector	1	1TMFKC2.5/12STF Phaenic contact



Drawing 95 Terminal of OP-07 connector



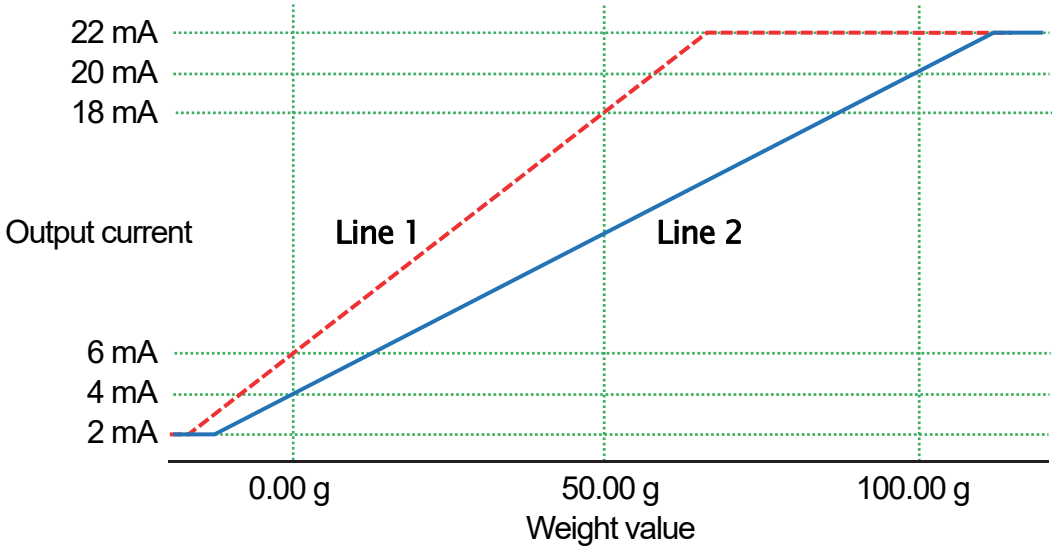
Drawing 96 OP-07 Output Circuit (Voultage output)



Drawing 97 OP-07 Output Circuit (Current output)

11.7.1. The Way to Set Output Current

Rate of analog output can arrange using low output value and high output value.
This value can select weight value or conveyor velocity.



Drawing 98 Example of the Settings of OP-07 (Current output by weight value)

Example	**Line 1**	Standard value of low current	= 6 mA	
		Standard value of high current	= 18 mA	
		Low current output	= 0.00 g	
		High current output	= 50.00 g	are specified.
	Line 2	Standard value of low current	= 4 mA	
		Standard value of high current	= 20 mA	
		Low current output	= 0.00 g	
		High current output	= 100.00 g	are specified.

Note

- ❑ Additionally, it can arrange conveyor velocity to current value and weight value to voltage output.

11.8. OP-17 Additional Analog Output Module

OP-17 analog output is the option to output 4 - 20 mA or 0 -10 V adapted to weighing data etc.

Table 34 Specifications of the OP-17 Addtional Analog Output

Output circuit	Open collector
Maximum output voltage	DC 40 V
Maximum output current	50 mA
Tolelance saturation voltage	1.5 V (at 50 mA drive current)

Table 35 Accessory of the OP-17 Addtional Analog Output

Name	Pieces	Descriptions	
Control I/O connector	1	1JI361J040-AG	Fujistu limited
Control I/O connector cover	1	1JI360C040-B	Fujistu limited

12. Maintenance

Maintenance and management of the indicator is described in this chapter.

12.1. Error Messages of Indicator

When an error occurs in the indicator, error message is displayed in window.
When error message is displayed, treat error using the following table.

12.1.1. Error Message Table

Error message	Probable cause	Remedial action
Calibration weight error. The weight value is not within the span adjustment range.	Calibration weight is different.	Use the correct calibration weight. Perform the calibration again.
	The span weight is not put on the conveyor correctly.	Put the span weight on the center of the conveyor. perform the calibration again.
	Foreign matter is existed or is touched to on the conveyor.	Remove foreign matter and calibrate again.
Photosensor error. Light of photosensor is shaded for preset time or longer.	There is anything between LED light and receiver of photosensor.	Remove anything between LED light and receiver of photosensor
	Axis of LED light and receiver of photosensor have deviation.	Match axis of LED light and axis of receiver of photosensor.
Printer error. Communication to printer failed.	Connection error.	Confirm the connection between indicator and printer.

12.2. Backup of System Data

The system data (all product registration, settings of weighing, settings of system, settings of user data, statistical data of each product, operation history) can store in USB memory.
If necessary data is deleted due to mis-operation or system cannot perform correctly, system at the time stored can be resumed using stored data in USB memory. We recommend to save data of system periodically.

Note

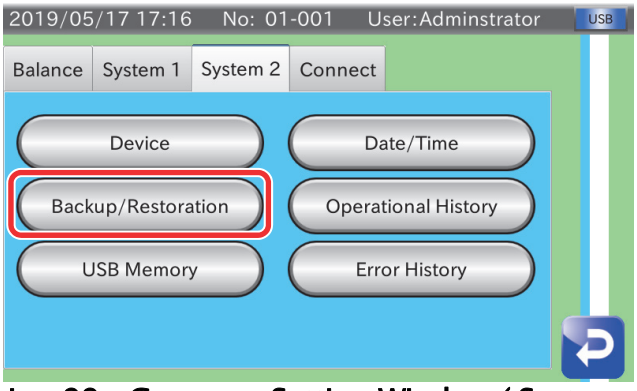
- ❑ Refer to "**6.12.1.3. Removing USB Memory**" for how to remove the USB memory.
- ❑ Backup data has directory construction.
  Directory name is "Year Month Date Hour Minute AD4412".
  Example **:** When it stored at 2019/05/16/ 16:55, directory name is "201905161655AD4412".

Cautions

- ❑ Don't change data and construction of backup data to prevent system error.

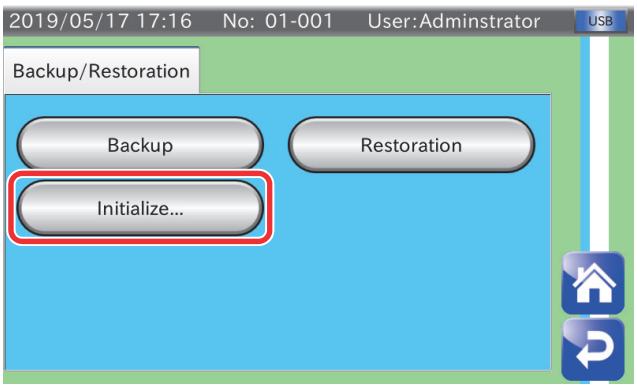
1. Login to the system with user management level of "Quality manager" or greater.
2. Connect the USB memory to the USB port in the indicator.
3. When USB memory is connected, the USB mark is indicated on upper-right side of the window.

4. Touch the "Setting" key to display the common setting window.



Drawing 99 Common Setting Window (System tab2)

5. Select "System 2" tab in the "Common setting window". Touch the "Store/Restore" key.
6. The "Backup/Restoration Window" is displayed. Touch the "Save" key.



Drawing 100 Backup / Restoration Window

7. The "Check dialog box" is displayed. Touch the "YES" key to store system data.
8. After backup has finished, touch the "Home" key to return to the "Weighing window".

12.3. Restoring System Data

The procedure to restore data stored using the "**12.2. Backup of System Data**" is shown below.

Cautions

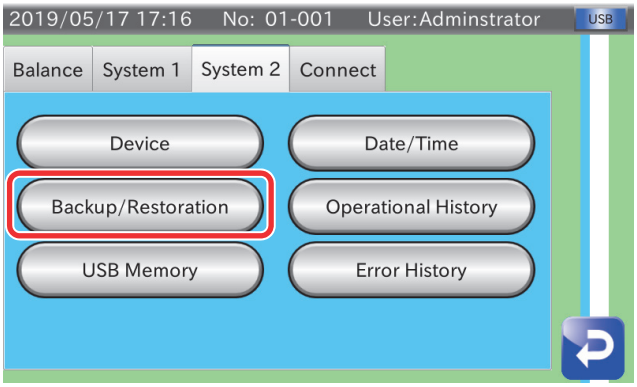
❑ When the restoration of data is performed, updated data from backup to this restoration is lost.

Note

❑ Refer to "**6.12.1.3. Removing USB Memory**" for how to remove the USB memory.

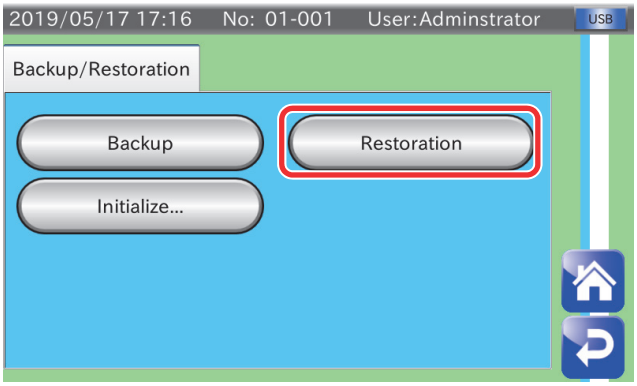
1. Login to the system with user management level of "Quality manager" or greater.
2. Connect the USB memory stored backup data to the USB port in the indicator.
3. When USB memory is connected, the USB mark is indicated on upper-right side of the window.

4. Touch the "Setting" key to display the common setting window.



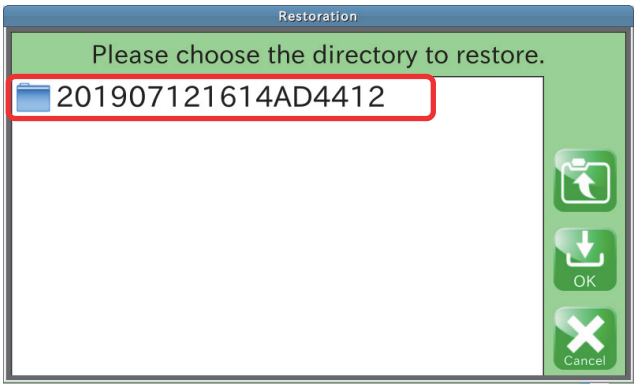
Drawing 101 Common Setting Window (System tab2)

5. Select "System 2" tab in the "Common setting window". Touch the "Store/Restore" key.
6. The "Backup/Restoration Window" is displayed. Touch the "Restore" key.



Drawing 102 Backup / Restoration Window

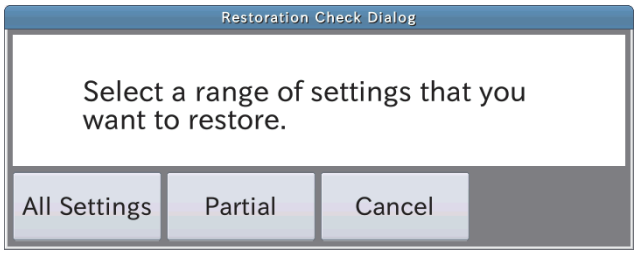
7. The restoration dialog box is displayed. Select a backup file in the directory of system data and touch the "OK" key.



Drawing 103 Restoration dialog box

8. Select type of restoration in the "Restoration check dialog box".

1. All settings
   The settings that includes calibration data (zero point, span), motor calibration data.
   It is used for restoration of the indicator using backup data.
2. Partial settings
   The settings except calibration data (zero point, span", motor calibration data.
   It can use to copy stored settings to other device.



Drawing 104 Restoration check dialog box

9. The check dialog box is displayed. Touch the "YES" key to restore it. If not, touch the "NO".
10. The message is displayed after the restoration. Turn off the indicator and turn on to restart.

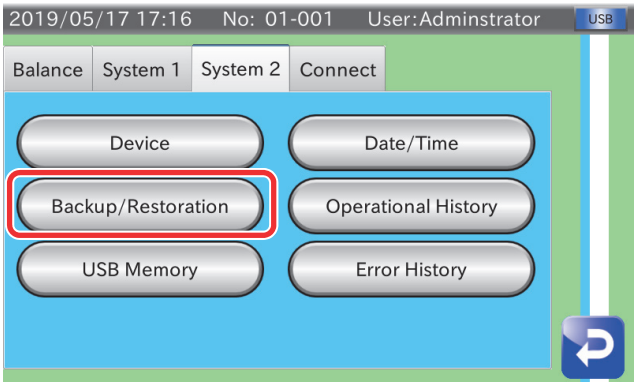
12.4. Initialization to Factory Settings

The procedure to reset to factory settings is shown below.

Cautions

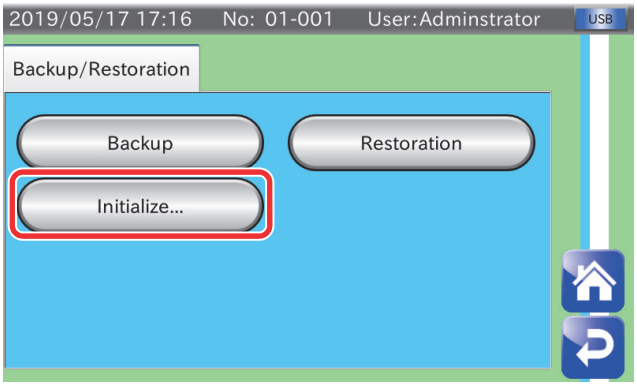
- ❑ When the factory settings is restored into the indicator, product information, weighing history, calibration data and system data stored the indicator are lost.

1. Login to the system with user management level of "Quality manager" or greater.
2. Touch the "Setting" key to display the common setting window.



Drawing 105 Common Setting Window (System tab2)

3. Select "System 2" tab in the "Common setting window". Touch the "Store/Restore" key.
4. The "Backup/Restoration Window" is displayed. Touch the "Factory settings" key.



Drawing 106 Backup / Restoration Window

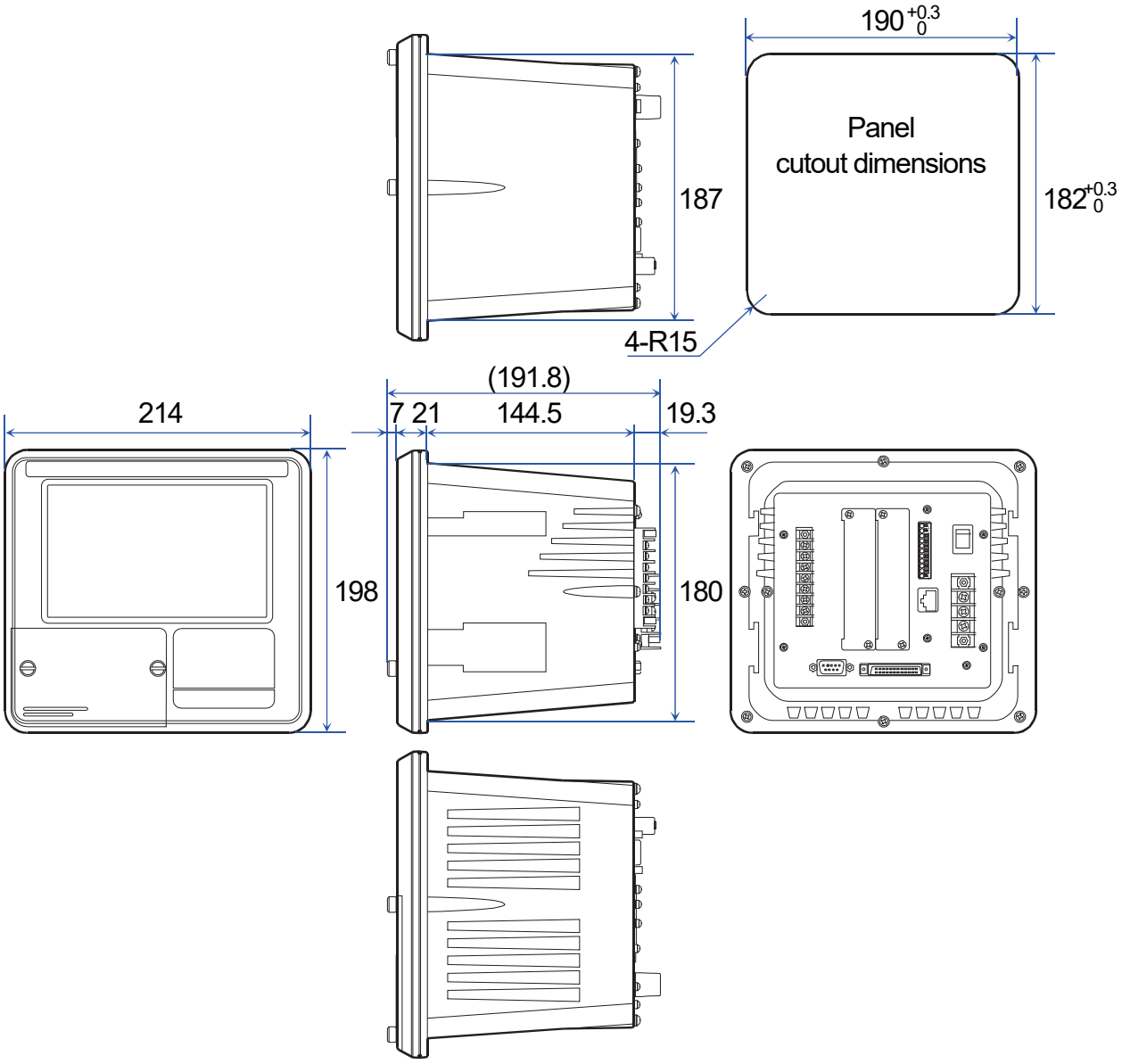
5. The "factory settings dialog box" is displayed. Touch the "YES" key to store them.
6. The message is displayed after factory settings is stored. Turn off the indicator and turn on to restart.

13. Specifications

	AD-4412-CW
Load cell excitation voltage	DC 5 V, 60 mA with remote sense / Maximum 4 x 350 Ω load cells
Input sensitivity	0.15 μV/d or greater
Display resolution	999999 d
Zero range	±7 mV/V (±35 mV)
Zero temperature coefficient	±0.02 μV/C° (typ. , Excluding dead load)
Span temperature coefficient	±3 ppm/C° (typ.)
Non-Linearity	±50 ppm F.S. (typ.)
Maximum input voltage	±7 mV/V (±35 mV)
Display	7 inch LCD with touch panel
Operation	Touch panel
Number of products registration	1000 10 group x 100 kinds
Communication function	RS-232C Computer / Dot inpact printer etc. RS-485 Modbus RTU / LAN (Modbus TCP / Printer) USB USB memory, data registration and image capture
Number of digital input	11 points (None voltage input / open collector drive)
Number of digital output	11 points (Open collector output)
Extention port	OP-02 Relay 9 points OP-05 Palarel I/O DI 16 points, DO16 points OP-07 Maximum 4 analog output
Power supply of photosensor I/F	12 V 250 mA 1 point
Power source	100 – 240 VAC (+10 %, −15 %), 50 / 60Hz approximately 30 VA
Operating temperature	−10 to 50 C°
Operating humidity	20 to 85 %RH, no condensation
Dust/water resistance	IP65 complied on panel

d : digit

13.1. Dimensions



MEMO

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