AD-4412-CW
AD-4413-CW

Weighing Indicator

[Software Ver. 02.00.00]

INSTRUCTION MANUAL

A&D

A&D Company, Ltd.

WARNING DEFINITIONS

The warnings described in this manual have the following meanings:

⚠DANGER	An imminently hazardous situation which, if not avoided, will result in death or serious injury.
⚠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.

ABOUT THIS MANUAL

(1) No part of this manual may be reprinted, copied, modified, or translated to another language without the prior written consent of A&D Company, Limited (A&D).

(2) The contents of this manual are subject to change without notice.

(3) Please contact A&D if you notice any uncertainty, errors, omissions, etc. in this manual.

(4) A&D bears no liability for any loss or lost profits due to the operation of this product, and for direct, indirect, special, or consequential damages resulting from any defect in this product or this manual, even if advised of the possibility of such damage. Furthermore, A&D assumes no liability for claims of rights from third parties. Concurrently, A&D assumes no liability whatsoever for software or data losses.

© 2024 A&D Company, Limited

Contents

1.   Introduction

1.1.   Features

Note

- ❑ This instruction manual describes both the AD−4412−CW and AD−4413−CW. The AD-4412-CW is used for the description of common parts for convenience. Therefore, if you use the AD−4413−CW, replace the product name appropriately when reading.
- ❑ The AD−4412−CW and AD−4413−CW are weighing indicators designed for classifying and weighing products on a conveyor.
- ❑ Stainless steel is used for the front panel of the AD−4413−CW.

Display

- ❑ 7−inch touchscreen employed with operability in mind.
- ❑ Ease of use achieved by touchscreen.

Dustproof/waterproof construction

- ❑ Waterproof construction conforms to IP65 requirements with the panel mounted.

Functions

- ❑ Up to 1000 products (10 groups, 100 items in each group) can be registered.
- ❑ Images of products can be imported and displayed from a USB flash drive.
- ❑ With the user registration function, the system can be operated safely by appropriately assigning a user level to each user.
- ❑ The system can communicate with Modbus compatible devices via serial communication or TCP/IP communication without any program.

External output/input

- ❑ General purpose input, rejector output, alarm output, RS−232C/RS−485 input/output TCP/IP are provided as standard.

1.2.   Safety Precautions

To use the AD-4412-CW／AD-4413-CW indicator safely, read and comply with the following precautions before use.

⚠CAUTION

Rotating object hazard

- ❑ Keep hands and fingers away from the rotating parts while the indicator is running.
- ❑ If products accumulate, fall over, or spill their contents on the indicator, stop the indicator immediately, turn the power off and take necessary actions.

Electrical shock hazard

- ❑ Be sure to turn the power off before removing the display cover for inspection.
- ❑ Keep the power turned off during inspection.
- ❑ Turn the power on only after the installation is 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 air flow from any windows, electric fans, or air conditioners.

Grounding

- ❑ Be sure to ground the indicator to prevent the occurrence electrical shocks, fire hazards, or malfunctions.

Precautions for use

- ❑ Do not apply impacts or excessive external force to the weighing conveyor.
- ❑ Do not apply a load exceeding the weighing capacity of the weighing conveyor.
- ❑ Do not modify or disassemble the indicator. Do not change any parts.
- ❑ Make sure that the indicator is level.
- ❑ Feed the product to be weighed into the indicator at a constant interval.

Cooling the indicator

- ❑ To avoid overheating the indicator, allow enough clearance from other devices.
  If the temperature around the indicator exceeds the specified operating temperature range, implement measures such as cooling the indicator using a fan, to control the temperature while taking care not to affect the weighing.

1.3.   Compliance

Compliance with local laws

This device has been tested and complies with Part 15, subpart C of the FCC rules. (FCC = Federal Communications Commission in the U.S.A.) This device is equipped with a licensed wireless communication unit that uses a 2.4 GHz band that specifies 2AC7Z-ESPWROOM02 as the FCC ID.

This device has been tested and complies with Industry Canada rules as a wireless communication device modular approval spread / spectrum / digital device ID 21098-ESPWROOM02.

The licenses are valid only for the United States, Canada, People's Republic of China, Taiwan. If this device is to be used in other countries, then please contact local authorities on obtaining a new license.

Wireless LAN precautions

If the communication function of this device is used near a wireless device that communicates in the 2.4 GHz frequency

band, the processing speed of both devices may decrease. The frequency band used by this device is also used by microwave ovens, industrial / scientific / medical equipment, mobile identifiers in factories and licensed / unlicensed radio stations.

❑ Before using this device, check to make sure that there are no radio stations for mobile identifiers, specified low-power radio stations, or amateur radio stations in operation in the vicinity.

❑ In the unlikely event that this device emits radio waves that are harmful to a nearby mobile identifier station, immediately change the frequency used or stop emitting radio waves and implement measures to avoid causing radio interference (e.g. install partitions, change installation location, etc.).

2.4 DS 4

2.4   : Wireless equipment using 2.4 GHz band.

DS   : Modulation method is direct-sequence spread spectrum (DS-SS).

4   : Distance to which radio interference can occur is 40 m or shorter.

━━ ━ ━ : Whole range is used and cannot avoid overlap with mobile identifier band.

1.4.   Required Tools

Table 1 List of required tools

Name	Specification	Use
Phillips screwdriver	#2	• Connecting the power cable • Connecting the load cell • Attaching the panel mount kit (AD–4412–10) • Attaching the attachment kit (AD–4412–11) for the indicator stand • Replacing the backup battery
Flat-blade screwdriver	Blade width 3.5 mm or less	• Connecting the photo eye sensor • Connecting the RS-485

2.　　Description of Individual Parts

This section describes each part of the system.

2.1.　　Front Panel
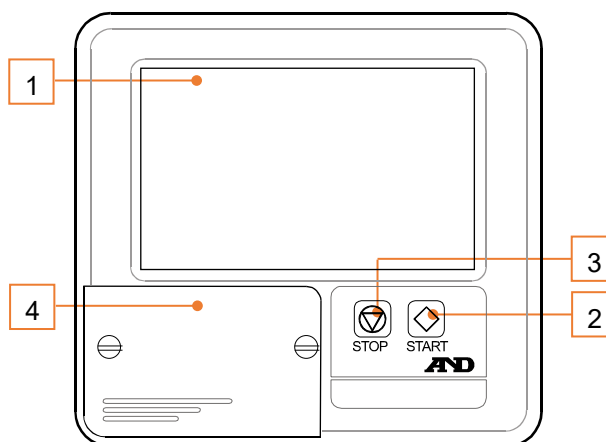
Fig. 1 Front panel of the AD-4412-CW
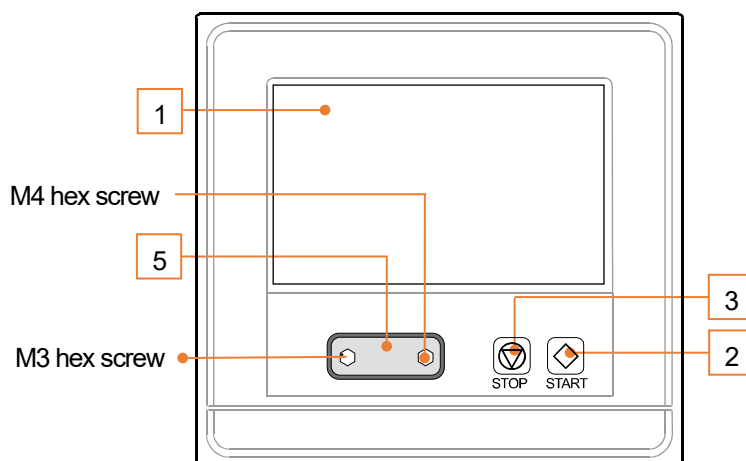
Fig. 2 Front panel of the AD-4413-CW

Table 2 Front panel: part names and functions

No.	Name	Function
1	Touch screen	Displays the weighing screen and other screens. Used to change settings and operate the indicator.
2	START button	Starts weighing; the conveyor starts running.
3	STOP button	Stops weighing; the conveyor stops running.
4	USB port cover	Waterproof cover for a USB port inside on the AD‑4412‑CW.
5	CAL cover	Prevents unnecessary operation of the calibration switch on the AD‑4413‑CW.

2.2.   Rear Panel
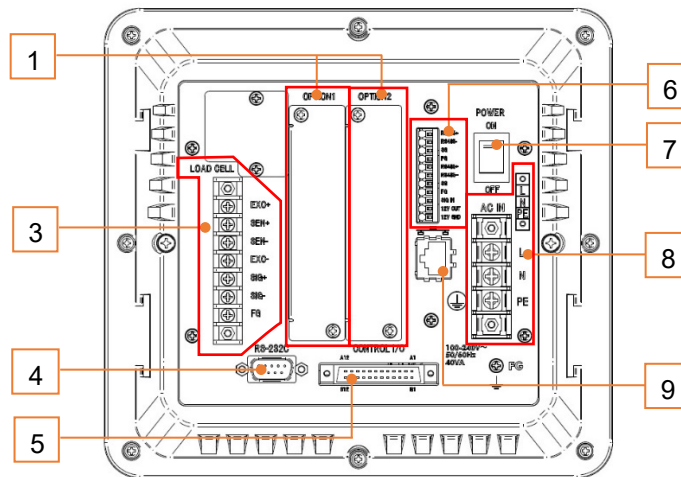
Fig. 3 Rear panel of the AD-4412-CW
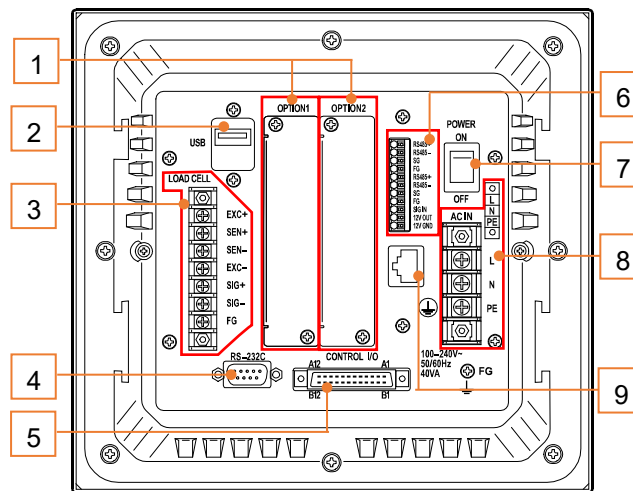
Fig. 4 Rear panel of the AD-4413-CW

Table 3 Rear panel: part names and functions

No.	Name	Function
1	Optional ports	Up to two optional boards, sold separately, can be installed.
2	USB terminal	Used to connect a USB device to the AD–4413–CW.
3	Input terminal of load cells	Up to four 350 Ω load cells can be connected.
4	RS–232C	Used for communication with a printer, a barcode reader, or a computer.
5	Control I/O	Used to connect to external control devices. Input: 11 points Output: 11 points
6	I/F terminals RS–485/photo eye sensor	Used for communication with a PLC using Modbus RTU or with a computer in stream mode. Used as the power source of the photo eye sensor.
7	Power switch	The main power supply switch for the indicator.
8	Power cord terminals	Power supply range: AC 100 to 240 V
9	LAN connector	Used for communication using Modbus/TCP communication and outputting in PDF to laser printers.

3. Installing the Weighing Indicator

This chaper describes the procedures of installing the indicator and connection of the power source.

3.1. USB Flash Drive
3.1.1. Connecting a USB Flash Drive to the Indicator

A USB flash drive can be used to import product images and store weighing data.
To use a USB flash drive, insert a USB flash drive into the USB port (with the the AD-4412-CW, remove the USB port cover beforehand).

AD-4412-CW   AD-4413-CW

USB flash drive   USB port cover   USB flash drive
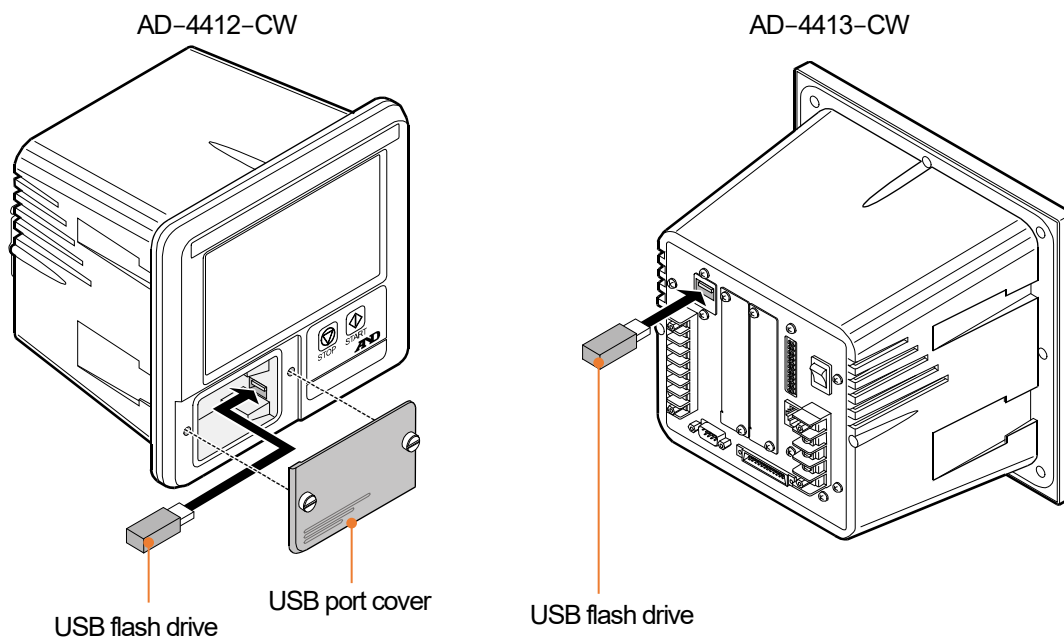
Fig. 5 Connecting a USB flash drive

When the USB flash drive is recognized, the USB button appears on the top right corner of the screen.

/01 12:00:00   No. 01-001   User:Admin   ● USB

Fig. 6 USB button

Caution
❑   The indicator supports FAT32 format USB flash drives only. To use a USB flash drive that is not FAT32 formatted, the USB flash drive needs to be formatted using the indicator before use.
❑   If the connection has been checked but the USB button is not shown, format the USB flash drive while referring to "9.1. How to Format a USB Flash Drive" as there may be a problem with file system incompatibility.

3.1.2.   Removing a USB Flash Drive from the Indicator

Follow the steps below to safely remove the USB flash drive.

Caution

Removing a USB flash drive without following the method below may result in a file data storage error.

1. To remove the USB flash drive, keep pressing the USB button on the top right of the screen.

Fig. 7 Keep pressing the USB button

2. Check that the USB button disappears and then remove the USB flash drive from the indicator.

Fig. 8 USB button disappears

3.2. Installing the Optional Boards

Caution

❑ Install the optional boards before performing work them.

❑ An option board can be installed in either of the two slots.

⚠DANGER

Make sure to turn off the power switch and remove the power cables when removing the cover of the optional board.

⚠WARNING

Do not touch the inside of the indicator immediately after turning off the power. Doing so may cause electrical shock.

Wait for 10 seconds before touching inside the indicator.

⚠CAUTION

Fasten the screws firmly, and do not leave them loosened. Loosened screws may come off and cause short circuit during use. Loose screws may also cause malfunction due to noise.
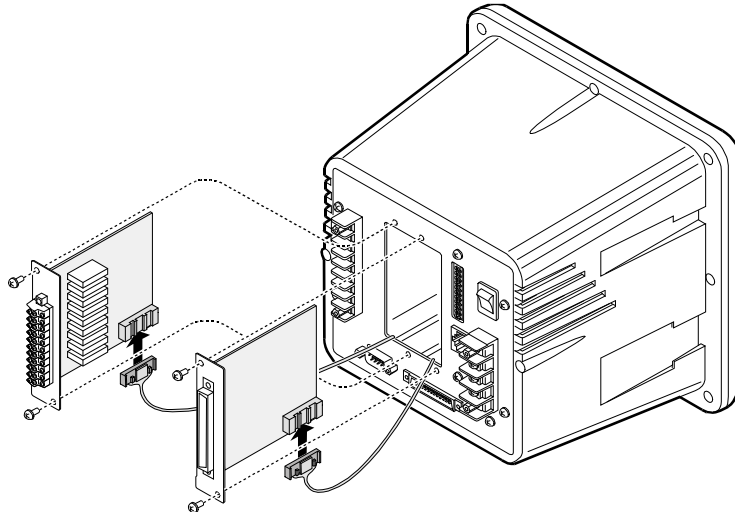
Fig. 9 Installing the optional boards

3.3. Mounting the Weighing Indicator on the Panel

Installation of the indicator is by panel mounting using slide rails. With the sealing gasket used for the panel mounting, the front panel gains a waterproof structure compliant with IP-65.
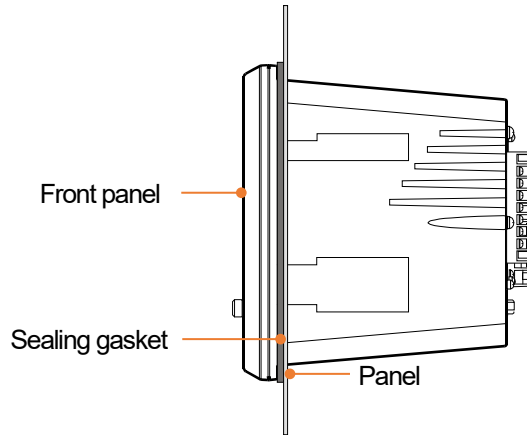
Fig. 10 Mounting the weighing indicator on the panel

3.3.1. Panel Mount Kit (AD−4412−10)

1. Attach the sealing gasket to the indicator in the correct direction.
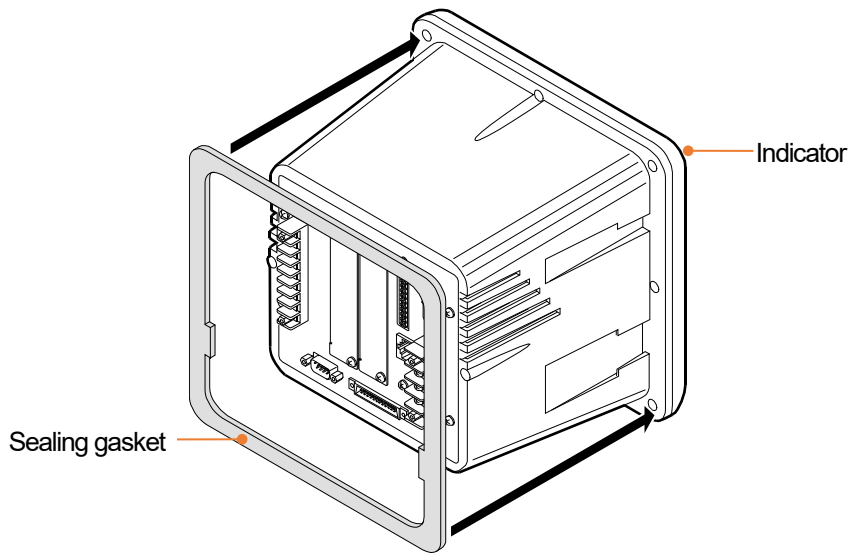
Fig. 11 Attaching the sealing gasket

2.   Mount the indicator on the panel while taking care not to kink the sealing gasket.
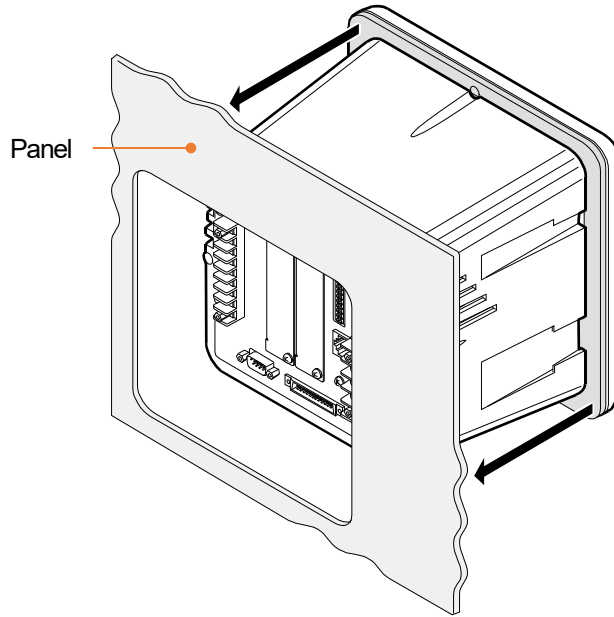
Panel

Fig. 12 Attaching the panel

3.   Slide each attachment part into the groove of each side. Secure the indicator using the attachment parts and screws (two M4 x 12) to mount on the panel. Check the installation.

Attachment part
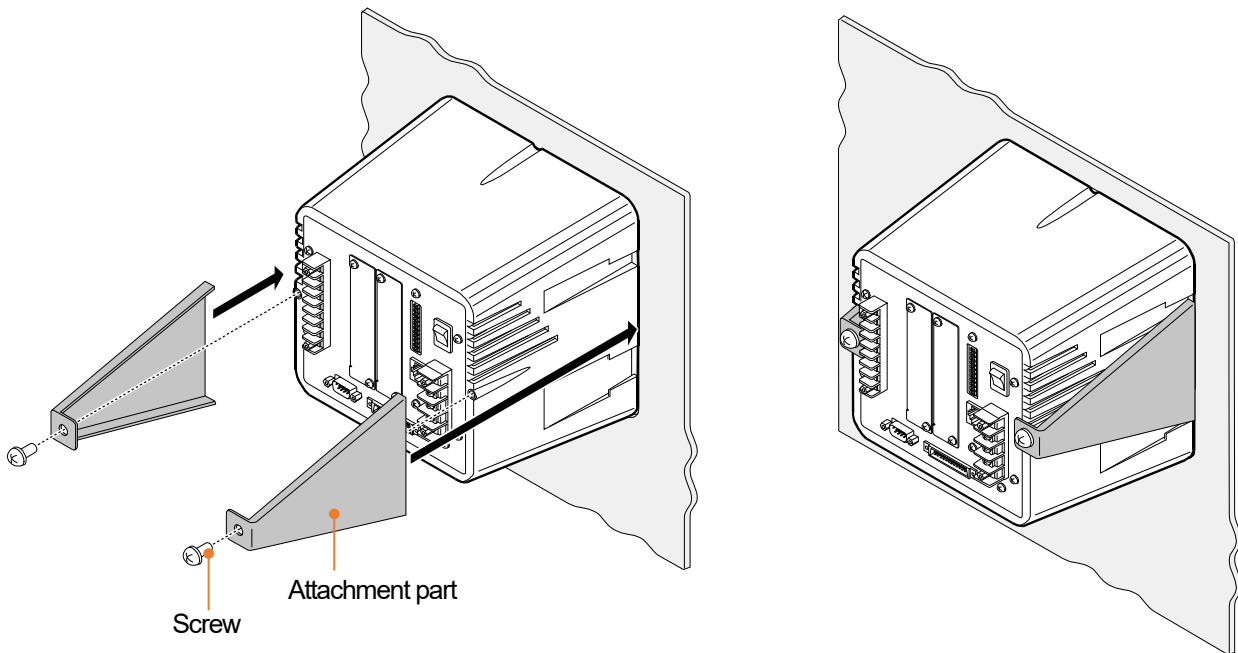
Screw

Fig. 13 Attaching the attachment parts

$182 \ ^{+0.3}_{0}$

$190 \ ^{+0.3}_{0}$

4−R15
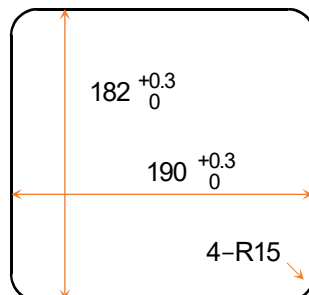
Fig. 14 Dimensions of the panel cut-out

3.3.2.　　Attachment Kit (AD‒4412‒11) for the Indicator Stand (AD‒4402‒25)

1.　Remove the two M3 x 8 screws and two M4 x 15 screws on the rear panel on the indicator.
2.　Insert the guide plates between the rear panel and screws of step 1. Secure the guide plates with the screws.
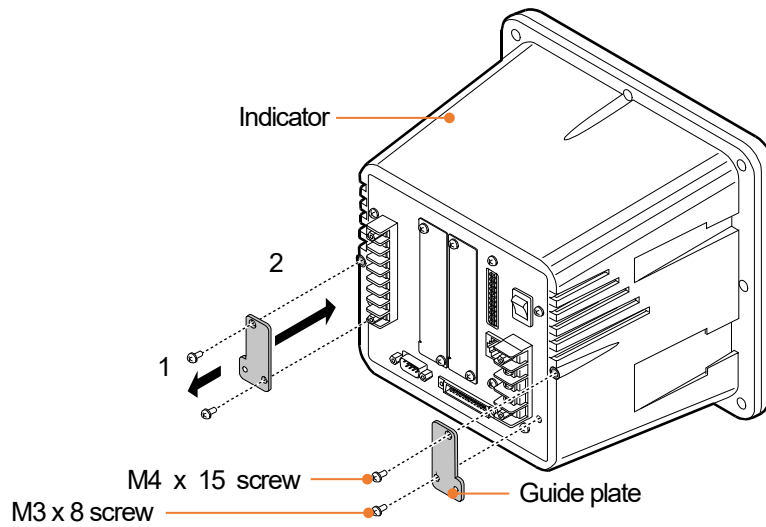
Fig. 15 Inserting the guide plates

3.　Slide the indicator along the slide rails on the indicator stand.
4.　Secure the indicator using the two M4 x 8 screws included in the accessories of the attachment kit.
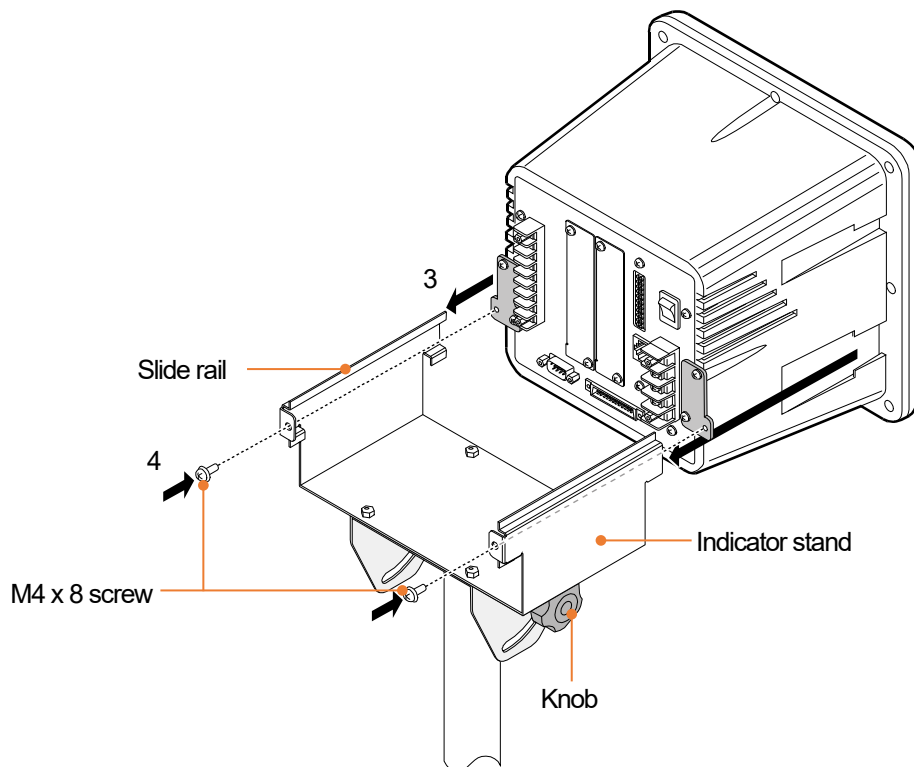
Fig. 16 Attaching the indicator stand

5.   The angle of the indicator can be adjusted using two knobs.

Knob
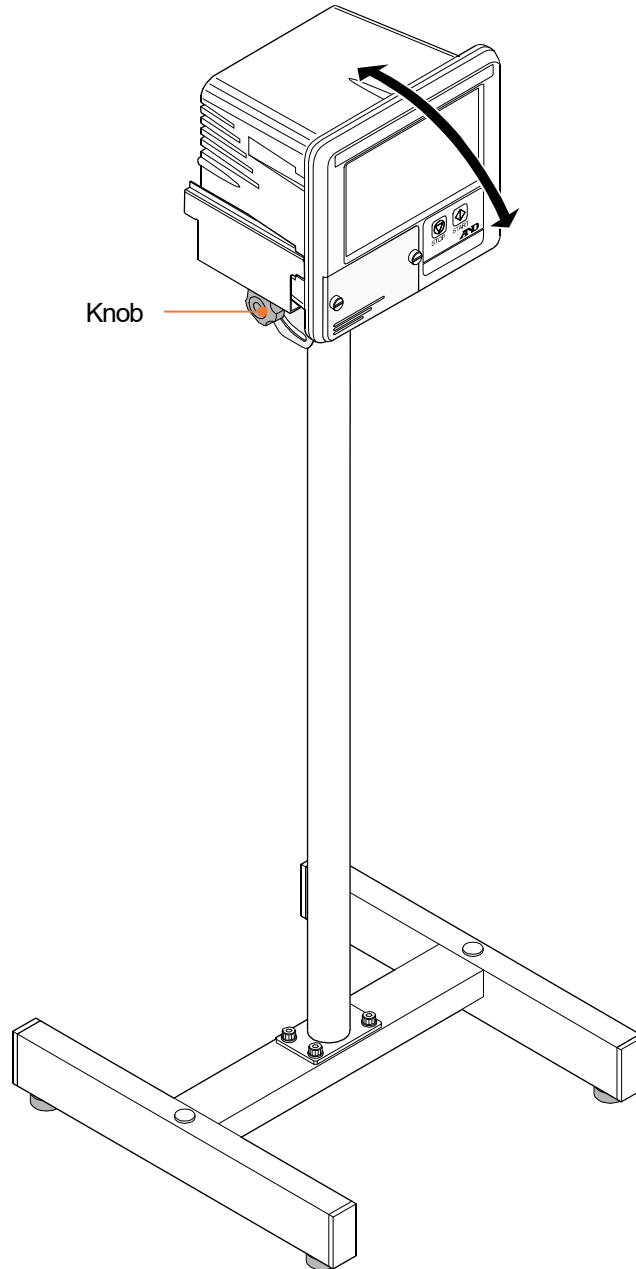
Fig. 17 Adjusting the angle

3.4. Connecting Load Cell Cables

We recommend that you use a 6-wire shielded cable to prevent loss of weighing precision. If using long load cell cables or a summing box, use 6-wire shielded cable to prevent drift of weighing values due to temperature change. Although a 4-wire shielded cable (shorted EXC+ and SEN+, and shorted EXC− and SEN−) is usable, it may cause increased weighing error when a summing box is used for multiple load cells or a long cable is used.
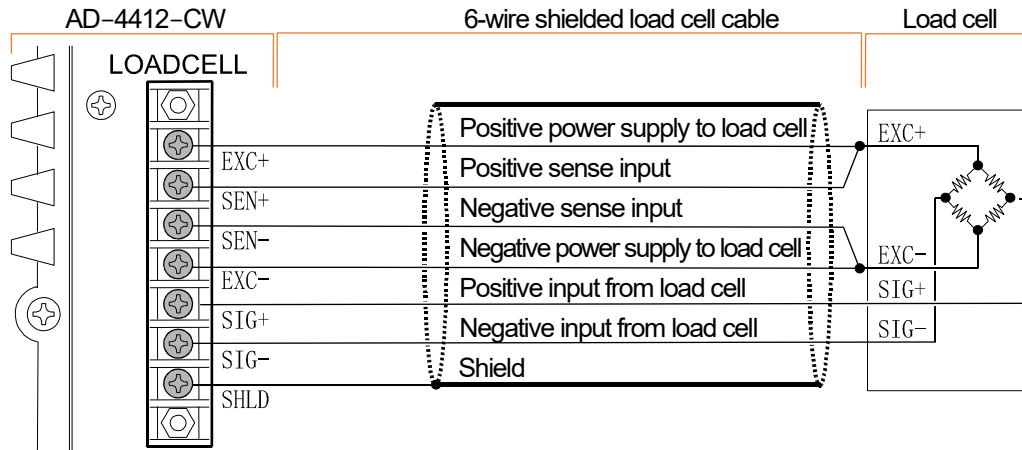
Fig. 18 Connecting load cell cable (6-wire)

Adjusting voltage output at zero point

When zero calibration is performed, if the output voltage of the load cell at the zero point (no load) is too large or too small (a zero point range error is displayed in both cases), the output voltage can be adjusted by adding a correction resistor as shown in Fig. 19. Use a correction resistor with low temperature coefficient.
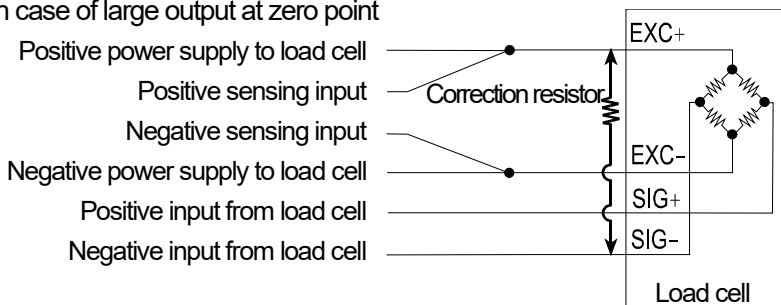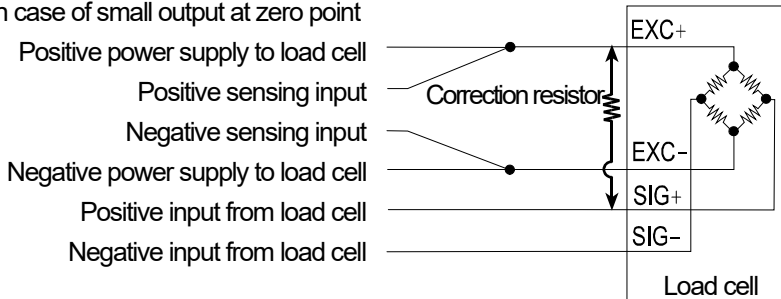
Fig. 19 Adjusting voltage output at zero point

Adaptable compression terminal parts (M3)
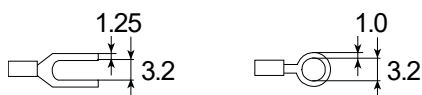
3.5.   Connecting Power Lines

The AD–4412–CW operates with single phase AC100 to 240 V power. Do not share the power cord with other electric powered devices to avoid operation errors due to noise. Make sure to ground the indicator. Do not share the ground wire with other electric powered devices.

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

ON
OFF
AC IN

Live terminal
Neutral terminal
PE terminal

100-240C~
50/60Hz
40VA
FG

AC100 to 240 V, 50Hz or 60Hz
Noiseless stable single phase power source

Ground
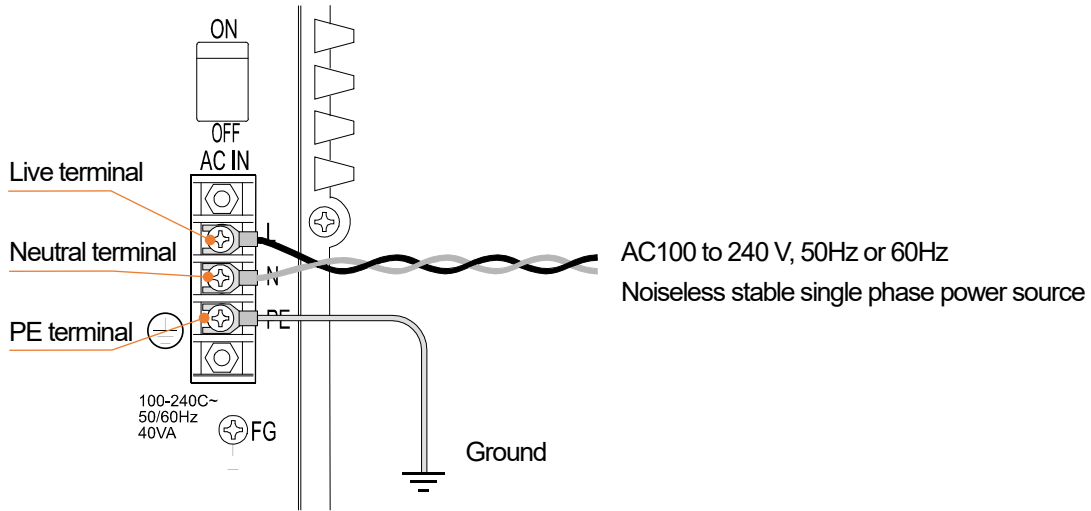
Fig. 20 Connecting the power lines

Adaptable compression terminal parts (M4)

1.0
4.3
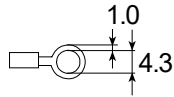
4. Touchscreen Opration

The indicator's operation panel uses a touchscreen. This chapter describes the basic operations of the touchscreen.

4.1. Icons

This section describes the functions of common icons. The other operation icons are explained separately in their respective sections.

Table 4 Common icons: names and functions

Icon	Name	Description
	HOME icon	Returns to the Weighing screen.
	RETURN icon	Returns to the previous screen. Returns to the Weighing screen when touched repeatedly.
	Left Arrow icon	Moves between screens when there is more than one screen for displaying product selections, histories, etc.
	Right Arrow icon	

4.2. Inputting Numerical Values / Passwords

When inputting numbers, the indicator displays the "Number Entry" dialog box. When inputting passwords, the indicator displays the "Password Entry" dialog box. On the "Password Entry" dialog box, the entered values are hidden by asterisks (*).

Fig. 21 Number Entry dialog box
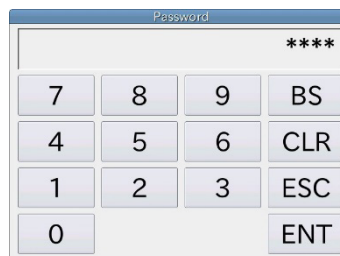
Fig. 22 Password Entry dialog box

Table 5 Numerical Value Entry / Password Entry dialog boxes: part names and descriptions

No.	Name	Description
1	BS button	Deletes the number / character to the left of the cursor.
2	CLR button	Removes all numbers / characters in the input field.
3	ESC button	Cancels input in the input field and closes the dialog box.
4	ENT button	Applies / confirms entry of the input numbers / characters. If the entered value is out of range, the value will not be applied.

4.3.   Selecting From a Drop-Down List

When selecting an item, the indicator shows a "Drop-down List" dialog box.
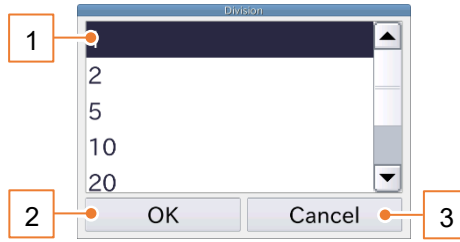
Fig. 23 Drop-down List dialog box

Table 6 Drop-down List dialog box: part names and descriptions

No.	Name	Description
1	List of options	Shows a list of options.
2	OK button	Applies the item highlighted in the list.
3	Cancel button	Cancels selection and closes the dialog box.

4.4.   Inputting IP Addresses

When entering IP address settings for the indicator or dedicated printers on the network, the indicator displays the "IP Address Input" dialog box. Select the IP address input field, then enter the numbers.
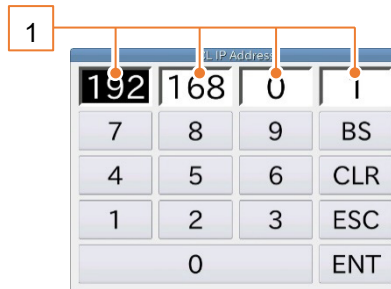
Fig. 24 IP Address Entry dialog box

Table 7 IP Address Entry dialog box: part name and description

No.	Name	Description
1	IP address input fields	Activate an individual input field to enable entry of numbers.

4.5. Inputting Characters

When setting product names or registering user names, the indicator shows the "Character Entry" dialog box. The indicator offers a choice of "Numeric Keypad," "QWERTY" or "Alphabetical" layouts for character input key layout settings. Use the Character Entry dialog box to enter alphabet characters and numbers.

Caution

The characters that can be entered differ depending on the input location.

Note

On how to change the Display Keyboard settings, refer to "10.16.4. Display Keyboard".

4.5.1. Numeric Keypad Layouts
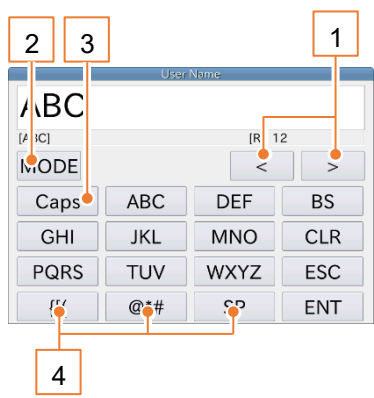
Fig. 25 Alphabetic layout   Fig. 26 Numeric layout

Table 8 Numeric Keypad layout: part names and descriptions

No.	Name	Description
1	Cursor buttons	Moves the input cursor.
2	MODE button	Switches between alphabetic/numeric layouts.
3	Caps button	Toggles between lowercase and uppercase.
4	Symbol buttons	Enter a space and various symbols. Refer to Table 9 for the symbols that can be entered.

Table 9 Numeric Keypad layout: symbols

Keypad	Key	Number of key touches											
		1	2	3	4	5	6	7	8	9	10	11	12	13
Alphabetic layout	SP	␣	"	'	^	~	`	,	.	:	;	_	␣	
	{[(	{	}	[	]	(	)	<	>	|	/	{		
	@*#	@	*	#	¥	%	$	&	+	-	!	?	=	@
Numeric Layout	SP	␣	"	'	^	~	`	,	.	:	;	_	␣	
	{[(	{	}	[	]	(	)	<	>	|	/	{		

"␣" represents a space.

4.5.2.   QWERTY Layouts

Fig. 27 Alphanumeric layout

Fig. 28 Symbol layout

Table 10 QWERTY Keyboard: part names and descriptions

No.	Name	Description
1	Space button	Enters a space.
2	Layout button	Toggles between alphanumeric and symbol layouts.

4.5.3.   Alphabetical Layouts

Fig. 29 Alphanumeric layout
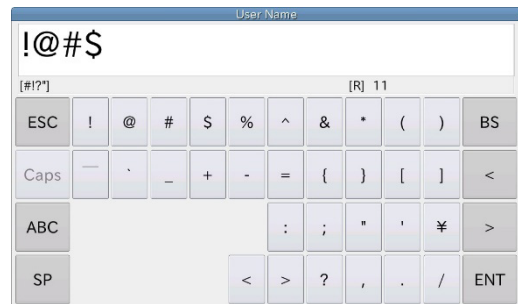
Fig. 30 Symbol layout

Table 11 Alphabetical Keyboard: part names and descriptions

No.	Name	Description
1	Layout button	Toggles between alphanumeric and symbol layouts.
2	Space button	Enters a space.

5.   Basic Operations

This chapter describes the basic operations of the indicator.

5.1.   Overview

This section gives an overview of weighing operations. A flowchart of daily weighing operations is given below. For details of each step in the flowchart, refer to "5.2. Turning on the Indicator" and subsequent sections as explained in the flow chart.

```
                    ┌─────────────────────────────┐
                    │ Start the indicator. Refer   │
                    │ to "5.2. Turning on the      │
                    │ Indicator".                  │
                    └─────────────────────────────┘

When weighing registered products        When registering and weighing new products

                                          ┌─────────────────────────────┐
                                          │ Change the User Level.       │
                                          │ * Refer to "5.5.2. Changing  │
                                          │ the User".                   │
                                          └─────────────────────────────┘

    ┌─────────────────────────────┐       ┌─────────────────────────────┐
    │ Select the product.          │       │ Register the product.        │
    │ Refer to "5.6.8. Changing    │       │ Refer to "5.6.1. Product     │
    │ the Product to Be Weighed".  │       │ Registration".               │
    └─────────────────────────────┘       └─────────────────────────────┘

                    ┌─────────────────────────────┐
                    │ Perform weighing.            │
                    │ Refer to "5.4.4. How to      │
                    │ Start／Finish Weighing".      │
                    └─────────────────────────────┘

                    ┌─────────────────────────────┐
                    │ Check the weighing results.  │
                    │ Refer to "5.7. Weighing      │
                    │ Result & Summary".           │
                    └─────────────────────────────┘
When changing products

                    ┌─────────────────────────────┐
                    │ Stop the indicator.          │
                    │ Refer to "5.3. Turning off   │
                    │ the Indicator".              │
                    └─────────────────────────────┘
```

   * To register new products, a user at the "Supervisor" level or higher is required.

   To register a user, refer to "5.5. User Level／User Editing and Login Method".

   In the factory settings, the user "Admin" at the "Administrator" user level has already been registered.

Fig. 31 Daily weighing operation workflow

5.2. Turning on the Indicator

1. To turn on the indicator, turn the power switch to the "ON" position.

2. The indicator starts up, then the Standard Screen appears.
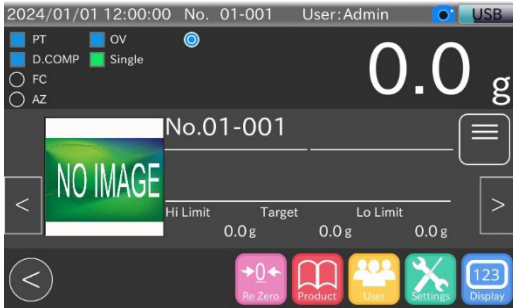
Fig. 32 Weighing screen (initial screen)
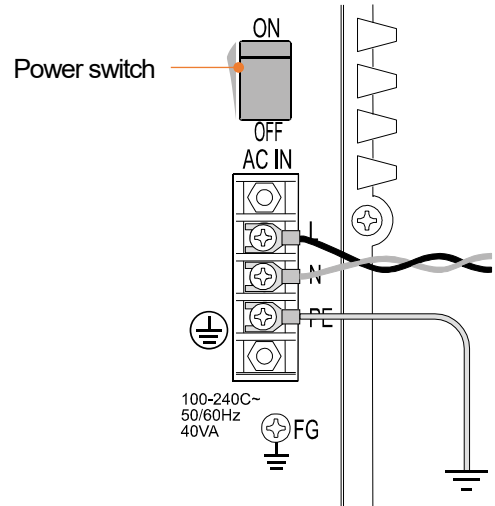
5.3. Turning off the Indicator

1. To turn off and stop the indicator, turn the power switch to the "OFF" position.

Caution

> Perform the same procedure for emergency stops.
>
> After making an emergency stop, eliminate the cause of the
>
> stop and then turn on the power again.
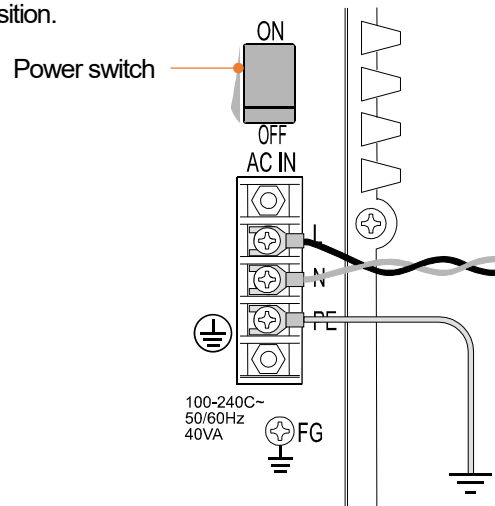
5.4. Weighing Operation

This section describes the weighing operation.

Note

❏ The description in this section assumes that product registration and settings have been completed.

❏ For product registration and settings, refer to "5.6. Product Selection and Change to the Cetection Settings".

5.4.1. Weighing Screen

The Weighing screen consists of the following display and confirmation functions: weighing result, operating status of each function, judgement result, stability, product information, History／Summary／Statistical data, external input／output status and more.
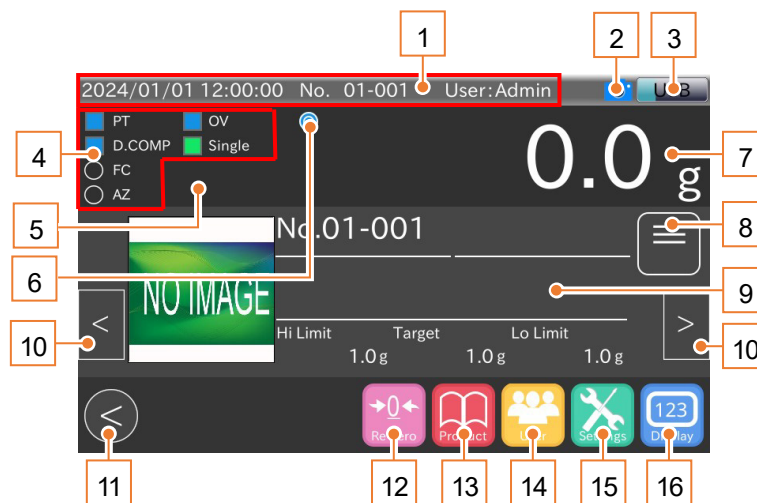
Fig. 33 Weiging screen

Table 12 Weighing screen: part names and descriptions

No.	Name	Description
1	General Information bar	Displays the current date and time, number of the currently read product, and current logged in user. This general information bar is shown on every screen.
2	Save screen button	Saves the current screen to a USB flash drive. This button appears on every screen. When no USB flash drive is connected, this button is hidden.
3	USB button	When a USB flash drive is connected, the remaining capacity of the USB flash drive is displayed in 3 stages. Keep pressing this button to safely remove the USB flash drive. This button appears on every screen.

No.	Name		Description
4	Function Status indicators		Displays the operational status of each function.
		☐ PT ☐ D.COMP ☐ OV	The color of each square indicator shows the operational status of PT (Preset Tare), Dynamic Compensation (D.COMP), and Overweight Exception (OV) functions. When a function is operating, the corresponding indicator is lit in blue.
		☐ Single	The color of the square indicator shows the operating status of the Single/Interlock function. When a Single/Interlock DI (digital Input) is enabled, the square indicator is lit as follows: ● Green when Single is enabled. ● Orange when Interlock is enabled.
		○ FC (Feedback Control)	The color of the text indicates whether the Feedback Control function is enabled or not. This indicator is lit as follows: ● White when enabled. ● Dark gray when disabled. The color of the circle indicates the output direction during the correction operation, as follows: ● Green when output is in the positive direction. ● Orange when output is in the negative direction. The text is lit in white at this time.
		○ AZ (Auto Zero)	The color of the text indicates whether the Auto-Zero function is enabled or not. This indicator is lit as follows: ● White when enabled. ● Dark gray when disabled. The circle is lit in green during a correction operation. The text is shown in white at this time.
5	Judgement indicator		Shows the judgement result of dynamic weighing. This indicator is not displayed during static weighing.
6	Stability indicator		Shows the stability of the weighing value during static weighing. This indicator is not shown during dynamic weighing.
7	Weight display		Displays either of the following: ● Current weight during static weighing. ● Weighing results during dynamic weighing. The error display and display conditions are as follows. ● +E when the weight is "Capacity + (9 x resolution)" or more ● -E when the weight is "-19 x resolution" or less
8	Menu button		Shows the menu panel according to the contents of the Information Display area.
9	Information Display area		Displays currently read product information, weighing history, summary / statistical data, histogram, control chart, and external input/output monitor.
10	Screen Switching button		Use `<` / `>` to switch the contents of the Information Display area.
11	Show/Hide button		Shows/hides the icons. While the icons are hidden, the Weighing History and Histogram displays are expanded.

No.	Name	Description
12	Re-Zero icon	Performs a zero adjustment.
13	Product icon	Shows the Product Selection panel.
14	User icon	Shows the User Login dialog box. User information can be registered, changed, or deleted by touching the Edit icon 🖉 in the dialog box.
15	Settings icon	Shows the Common Settings screen.
16	Display icon	Shows the panel for switching the contents of the Information Display area. The contents for the selected button will be displayed in the Information Display area.

Note

❑ For details on the Information Display area, refer to the following sections.

❑ To switch the contents of the Information Display area or display the Standard Screen, refer to "5.4.3. Switching the Contents of the Information Display Area".

❑ To display the Weighing History screen, Summary, Histogram, or Control Chart, refer to "5.7. Weighing Result & Summary".

❑ To display Monitor, refer to "9.9. AD-4412-CW and External Device Signal Monitoring".

5.4.2.   Adjusting Zero

If the weighing value is not zero (0) when the conveyor is stopped, touch the "Re-Zero" icon 　　 to perform zero adjustment, which sets the weighed value to zero.

Zero adjustment is not possible when the conveyor is stopped and the weighed value is large or unstable.

The following are possible reasons for large weighing values.

❑ There is foreign matter on the conveyor.

❑ Each time foreign matter accumulates on a conveyor, a zero adjustment is needed. If an excessive amount of foreign matter accumulates, then it may exceed the zero adjustment range.

❑ Conveyor is in contact with upstream/downstream conveyors.

❑ Load cell is deformed due to the conveyor being overloaded.

❑ Load cell is deformed due to an excessive upward load being applied to the load cell. Commonly caused by lifting the indicator while holding the conveyor.

If the static weight (weight measured when the conveyor is stopped) does not reach 0.0 g even after removing the foreign matter on the conveyor and making a zero adjustment, then an adjustment using the calibration weight needs to be performed.

If a load cell deformation is within the permissible range, performing adjustment with the calibration weight will adjust the static weight to 0.0 g.

If the weighing value cannot be set to 0.0 g even after performing adjustment with the calibration weight, the weighing unit of the device needs to be replaced.

Note

For the method of adjustment using the calibration weight, refer to "6.1. Adjustment".

5.4.3. Switching the Contents of the Information Display Area

The contents of the Information Display area can be switched by operating the Screen Switching buttons < > and the Display icon on the Weighing screen 123.

This section describes how to switch the contents shown in the Information Display area using the Display icon 123, and also describes the contents of the Information Display area on the Standard Screen display.

The procedure for switching the display contents is as follows.

1. Touch the Display icon 123 on the Weighing screen to display the selection panel for the Information Display area.
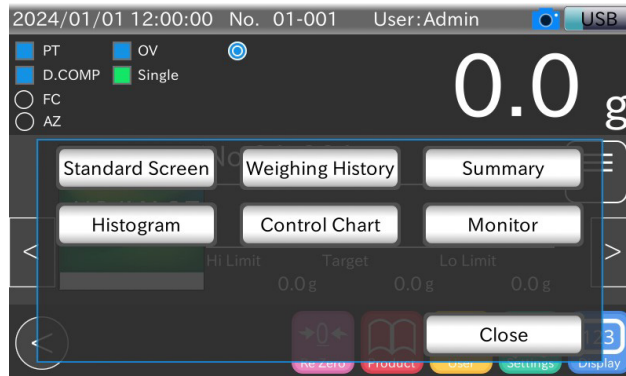
Fig. 34 Switching the Information Display area (step 1)

2. Touch the button for the desired contents to switch the display in the Information Display area.
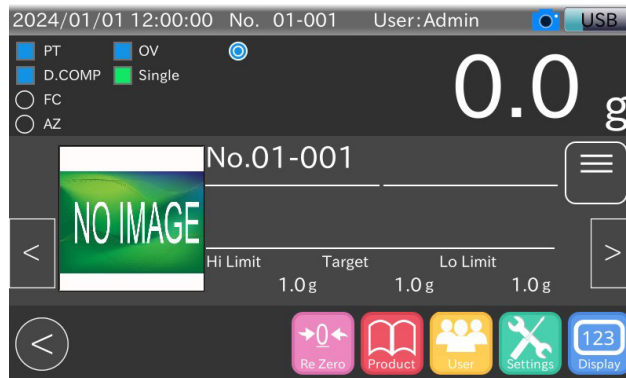
Fig. 35 Switching the Information Display area (step 2)

Note

❑ Operating the Screen Switching button switches the display of the Information Display area in the order shown below.
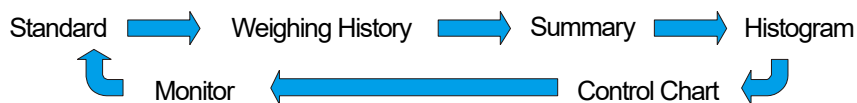
Fig. 36 Order of screens shown when switching the contents of the Information Display area

❑ For details on the Weighing History, Summary, Histogram, and Control Chart displays, refer to "5.7. Weighing Result & Summary".

❑ For details on the Monitor display, refer to "9.9. AD-4412-CW and External Device Signal Monitoring".

Standard Screen

When the Standard Screen is selected for the Information Display area, the basic information of the currently read product is displayed.

The settings can also be changed to display the deviation from the target value and the real-time throughput (current throughput).
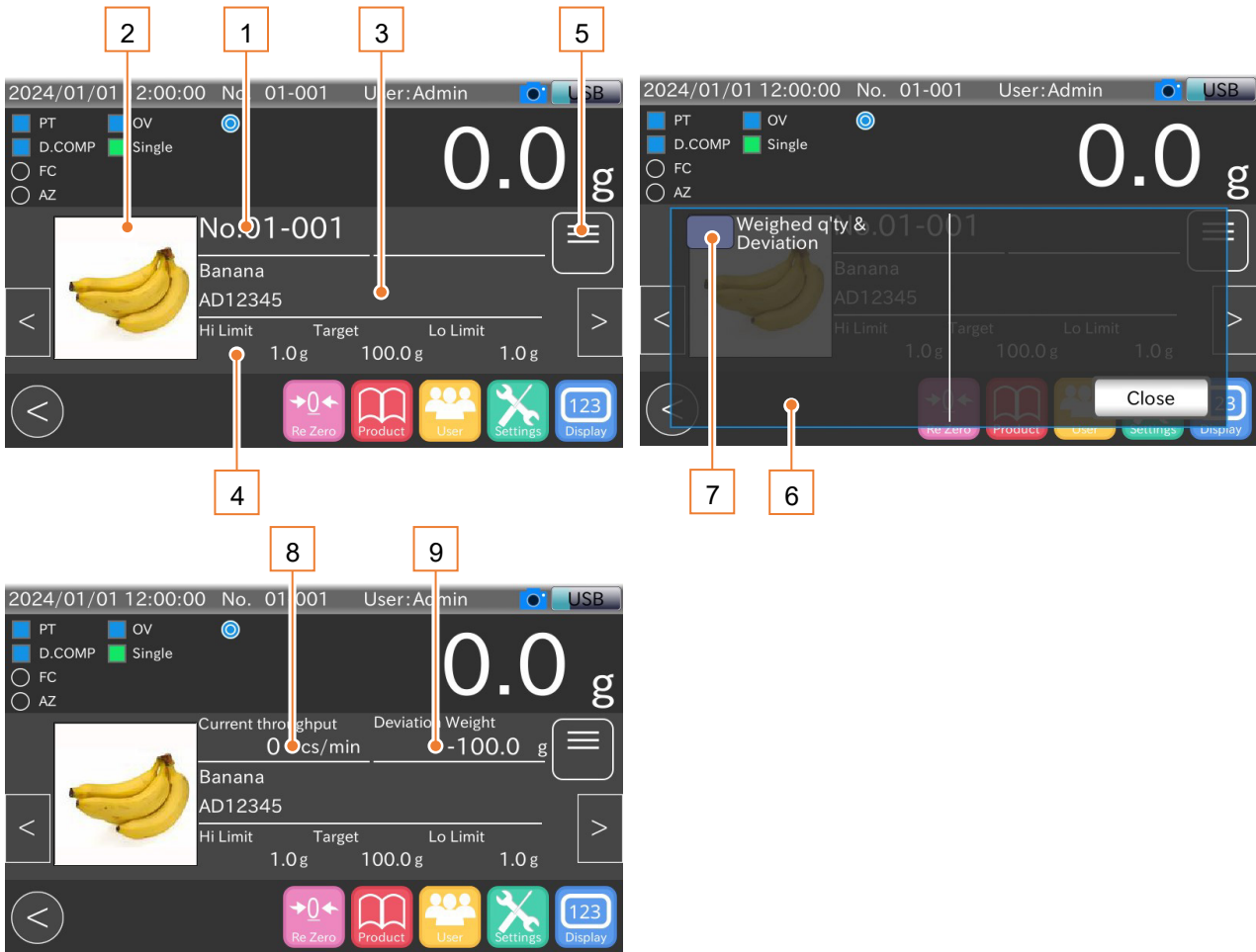
Fig. 37 Standard Screen of the Information Display area

Table 13 Standard Screen of the Information Display area: part names and descriptions

No.	Name	Description
1	Product number	Shows the product number of the currently read product.
2	Product image	Shows the image of the currently read product.
3	Product name and code	Shows the name and code of the currently read product.
4	Target, upper limit, and lower limit values	Shows the target, upper limit, and lower limit values of the currently read product.
5	Menu button	Shows the menu panel when the Standard Screen is selected for the Information Display area.
6	Standard Screen menu	Touching the Menu button when the Standard Screen is selected for the Information Display area shows this menu panel.
7	Weighed q'ty & Deviation display selection	Shows/hides current throughput and deviation information. When current throughput and deviation are shown, the product number of the currently read product is hidden.

No.	Name	Description
8	Current throughput display	Shows the throughput in the last minute.
9	Deviation display	Shows the difference between the weighing value and target value.

5.4.4. How to Start/Finish Weighing

Press the START button of the Display Unit to activate the conveyor and start weighing.

Press the STOP button of the Display Unit to stop the conveyor and finish weighing.

5.4.5. Judgement Result

A dynamic weighing judgement is made comprehensively from the weighing value, the input of the photo eye sensor, and the state of the external input.

The judgement result is shown by the Judgement indicator on the Weighing screen.

Table 14 List of judgement results

Name	Judgement conditions
OK	Product judged as OK.
Hi Hi	Weighing result is more than "Target + Extra Upper Limit".
Hi	Weighing result is more than "Target + Upper Limit".
Lo	Weighing result is less than "Target – Lower limit".
Lo Lo	Weighing result is less than "Target – Extra Lower limit".
Detect Two	Entry of next product onto conveyor is detected during weighing.
Unsplit	After detecting entry of a product, a certain period of time has elapsed with the light from the photo eye sensor blocked.
Weighing Error	Weighing result is "Capacity + (9 x resolution)" or more, or "-19 x resolution" or less.
Metal	When the Metal Fail signal is used, the Metal Fail signal is input. When the Metal OK input signal is used, the Metal OK signal is not input. Weighing result is judged as 0.0 g.
X-ray	When the X-ray Fail input signal is used, the X-ray Fail signal is input. When the X-ray OK input signal is used, the X-ray OK signal is not input. Weighing result is judged as 0.0 g.
Ext 1	When the Ext1 Fail input signal is used, Ext1 Fail signal is input. When the Ext1 OK input signal is used, the Ext1 OK signal is not input. Weighing result is judged as 0.0 g.
Ext 2	When the Ext2 Fail input signal is used, the Ext2 Fail signal is input. When the Ext2 OK input signal is used, the Ext2 OK signal is input. Weighing result is judged as 0.0 g.

The priority of judgement is as follows.

Table 15 Priority of judgement

Priority	Prioritizing external input "Disabled"	Prioritizing external input "Enabled"
1	Detect Two	Ext1
2	Unsplit	X-ray
3	Ext1	Metal
4	X-ray	Detect Two
5	Metal	Unsplit
6	Weighing Error	Weighing Error
7	Lo Lo	Lo Lo
8	Lo	Lo
9	Hi Hi	Hi Hi
10	Hi	Hi
11	Ext2	Ext2
12	OK	OK

Caution

Judgement with the highest priority is applied to each weighing.

E.g.: If Metal and Lo occur at the same time, the Metal judgement is prioritized.

Note

❑ On how to set Target, Upper Limit, and Lower Limit, refer to "5.6.2. Target / Hi Hi Limit / Hi Limit / Lo Limit / Lo Lo Limit Value Settings".

❑ The light blocking time of the photo eye sensor for an Unsplit judgement can be adjusted by changing the Unsplit Range settings.
For the setting method, refer to "10.14.4. Unsplit Range".

❑ For the setting method of priority, refer to "10.14.7. External Devices Priority".

❑ DI setting is required to make Metal, X-ray, Ext1 and Ext2 judgements.
For the setting method, refer to "10.22. Digital Input (DI) / Option DI".

5.5. User Level／User Editing and Login Method

The indicator allows users to be registered and operations can be restricted by user level.

This section describes user level and user editing and also how to log in.

Fig. 38 User login and editing screens

Table 16 User login / editing screens: part names and descriptions

No.	Name	Description
1	Login User Name	Displays the currently logged in user name.
2	User Level	Displays the currently logged in user level.
3	Logout button	Logs out the currently logged in user.
4	User Name input field	Enter the user name to log in.
5	Password input field	Enter the password of the user to log in.
6	Login button	Performs login authentication with the entered user name and password.
7	Edit icon	Display the User Edit screen.
8	User List	Displays the list of registered users.
9	Register icon	Displays the User Registration screen.
10	Change icon	Displays the User Change screen.
11	Delete icon	Displays the User Deletion screen.

Caution

❑ User name "Admin", password "0000", and user level "Administrator" are registered in the indicator as an initial user.

❑ Login at the "Administrator" user level is required to edit users.

To edit a user when there is no registered user, log in as the initial user "Admin".

Note

❑ User editing enables the registration, change, and deletion of users.

❑ The user level logged in automatically when the indicator is turned on can be changed.

For the setting method, refer to "10.14.2. Startup User Level".

❑ Characters on each screen can be entered with the Character Entry dialog box.

For details on the Character Entry dialog box, refer to "4.5. Inputting Characters".

5.5.1. User Level

The operation permissions of the indicator is divided into four bands according to the user levels, which are "Administrator", "Quality Manager", "Supervisor", and "Operator". Table 17 shows the operation permissions by user level. By assigning an appropriate user level to each user, inadvertent operations can be avoided, and the indicator can be operated safely.

Caution
- ❑ The user level when not logged in as "Supervisor" or higher is "Operator".
- ❑ Users whose user level is "Operator" cannot be registered, changed, or deleted.

Table 17 Authorized operations by user level

User level	Operation permissions						
	Weighing start/stop	Summary screen display	Product selection	Product settings registration	Clear summary	System settings change	User information edit
Administrator	✓	✓	✓	✓	✓	✓	✓
Quality manager	✓	✓	✓	✓	✓	✓	
Supervisor	✓	✓	✓	✓	✓		
Operator	✓	✓	✓				

5.5.2. Changing the User

When changing the logged-in user, a login authentication is required.
The procedure for login authentication is as follows.
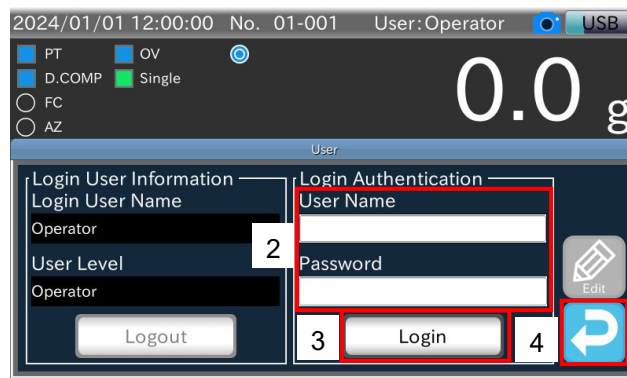
Fig. 39 Changing the user

1. Touch the User icon 👥 on the Weighing screen to display the User Login dialog box.

2. Touch the User Name and Password input fields respectively and enter the registered user name and password.

3. Touch the Login button to log in.

4. Touch the Return icon ↩ to return to the Weighing screen.

5.5.3.   User Registration

The user registration procedure is as follows.

Caution

Login at the "Administrator" user level is required to register users.

To register a user when there is no registered user, log in as the initial user "Admin".
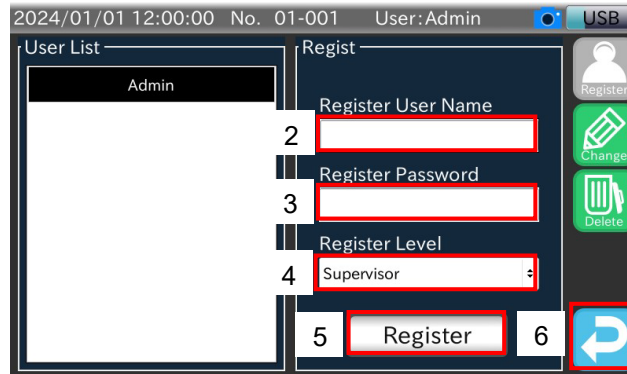
Fig. 40 User registration

1.   Touch the Edit icon [icon] in the User Login dialog box to display the User Edit screen.

2.   Touch the Register User Name input filed and enter a user name to register.

3.   Touch the Register Password input field and enter a 4–digit password.

4.   Touch the Register Level field and select a user level to register from "Administrator", "Quality Manager", and "Supervisor".

5.   Touching the Register button puts the registered user in the user list.

6.   Touch the Return icon [icon] to return to the Weighing screen.

5.5.4.   Changing User Settings

The settings of registered users can be changed.
The procedure for changing user settings is as follows.

Caution

Login at the "Administrator" user level is required to change the user settings.
To change user settings when there is no user registered at the "Administrator" user level, log in as the initial user "Admin".
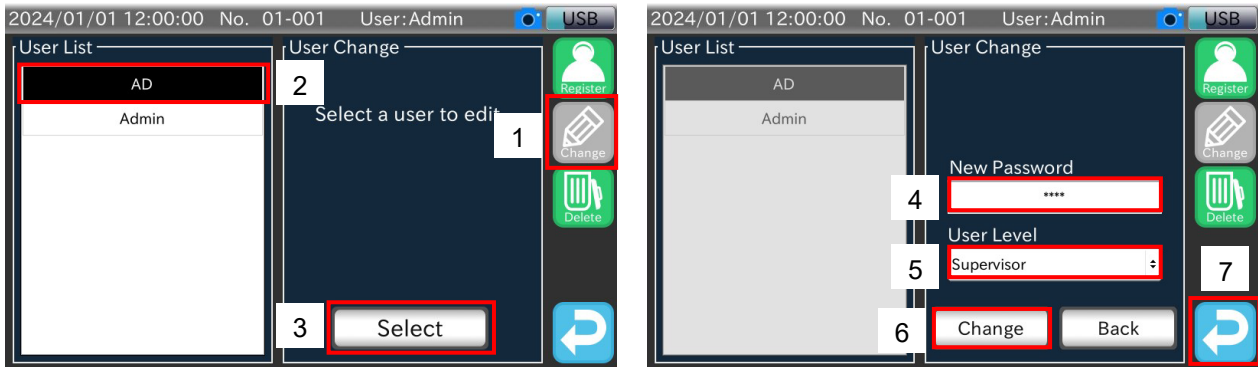
Fig. 41 Changing user settings

1. Touch the Change icon on the User Edit screen to display the Change User Selection screen.

2. Touch the user to be changed on the User List.

3. Touch the Select button to display the user's settings to be changed.

4. Touch the New Password input field and enter a new 4–digit password.

5. Touch the User Level input field and select a desired user level from "Administrator", "Quality Manager", and "Supervisor".

6. Touch the Change button to apply the user settings.

7. Touch the Return icon to return to the Weighing screen.

5.5.5.   Deleting a User/Users

Registered users can be deleted.
There are two ways to delete users, one is to delete a specific user, and the other is to delete all registered users (Delete All).
The procedure for deleting users is as follows.

Caution

❑   The initial user "Admin" and the logged-in user (when deleting a specific user) cannot be deleted.
❑   If the "Delete All" command is executed while logged in as a user other than the initial user "Admin", any subsequent users will automatically become Operators.

Touch the Delete icon on the User Edit screen to display the User Delete screen.
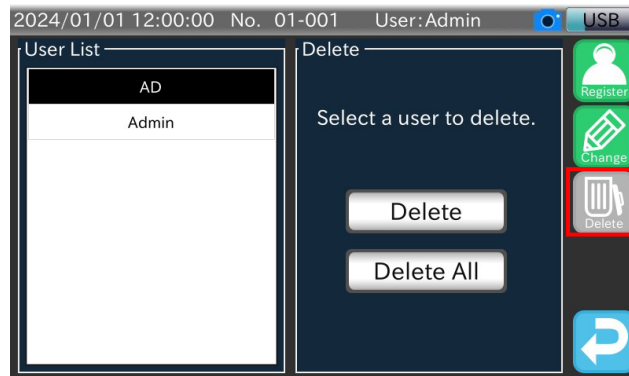
Fig. 42 Deleting users

Subsequent steps differ depending on whether a single specific user will be deleted or all user will be deleted.

Deleting a specific user only
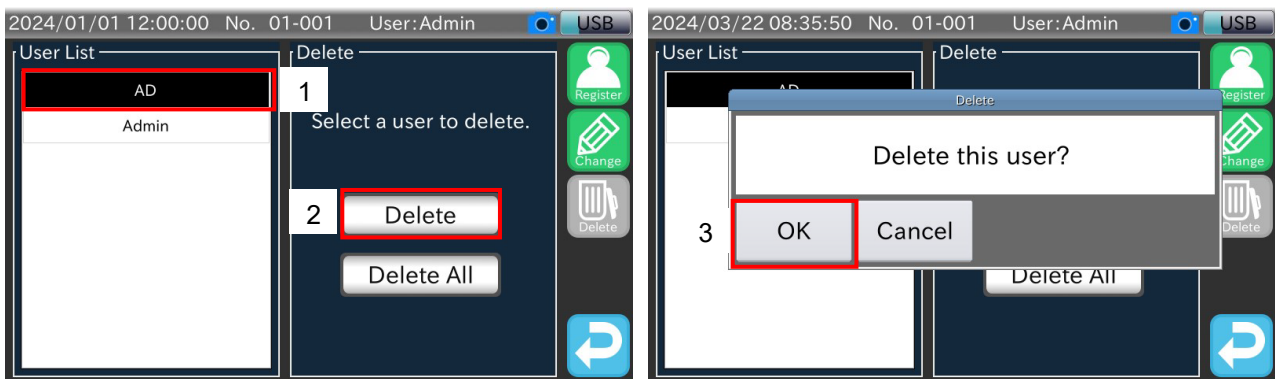
Fig. 43 Deleting a specific user

1. Touch the user to be removed from the User List on the User Deletion screen.

2. Touch the Delete button.

3. Touch the OK button in the dialog box for confirming deletion.
   The specified user is removed from the User List.

Deleting all registered users (Delete All)
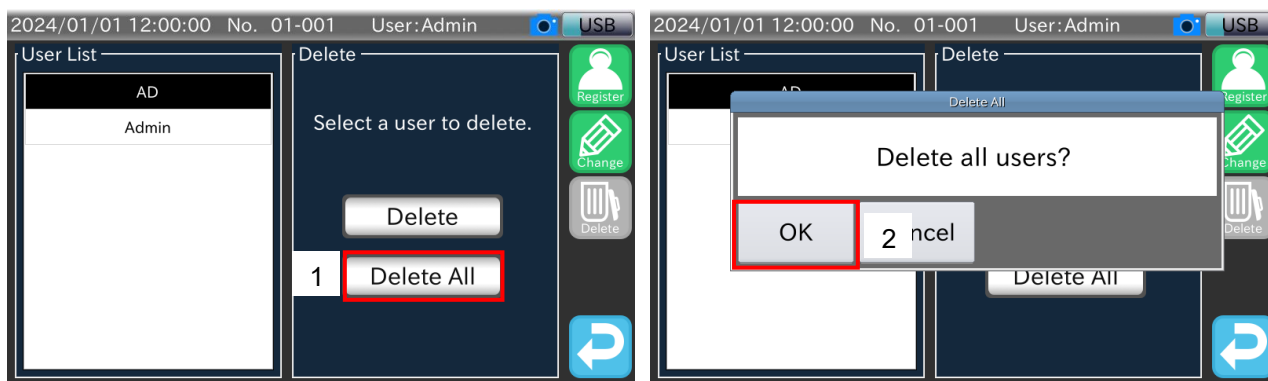
Fig. 44 Deleting all registered users

1. Touch the Delete All button on the User Delete screen.

2. Touch the OK button on the Delete All dialog box.
   All users except "Admin" will be deleted.

5.6.　　Product Selection and Change to the Detection Settings

This section describes product registration, product selection, and changing the detection settings.

To register products, a user at the "Supervisor" level or higher is required.

The description in this section assumes that the user has logged in to the indicator with a user level of "Supervisor" or higher.

Fig. 45 Product Selection panel and Product Settings screen

Table 18 Product Selection panel and Product Settings screen: part names and descriptions

No.	Name	Description
1	Product Selection panel	A product can be selected from the panel. The selected product is highlighted in orange.
2	Product name	Shows the product name.
3	Product code	Shows the product code.
4	Target	Shows the target value.
5	Reference DO	Shows the number of the referenced common digital output (DO) settings. If DO Reference is disabled, 0 is shown.
6	Product image	Shows the registered product image.
7	Group input field	Enter a group number to move to the group. Input range: 1 to 10
8	No. input field	Enter a product number to select the product: Input range: 1 to 100

No.	Name	Description
9	Read icon	Loads the settings for the selected product.
10	Edit icon	Shows the Product Settings screen for the selected product.
11	Copy Setting button	Copies the setting from a specified product.
12	Delete button	Deletes the current settings and returns to the unregistered state.
13	Product Image button	Selects an image from the USB flash drive.
14	Image Delete button	Replaces the current image with "NO IMAGE".
15	Read Product Code button	Sets the product code from the serial.
16	Product number being edited	Product number of the product being edited blinks in red.
17	Product Name input field	Enables entry of a product name for registration. Input range: 0 to 40 characters
18	Product Code input field	Enables entry of a product code for registration. Input range: 0 to 40 characters
19	Tab Selection	Changes the content shown on the screen when switching tabs.
20	Detection Settings tab	Shows the buttons related to detection settings. Touching a button displays the corresponding screen.
21	Control Revision tab	Shows the buttons related to control revision. Touching a button shows the corresponding screen.

Note

❑ Copy Setting function enables the settings of a registered product to be copied to the product being edited. For details, refer to "5.6.12. Copying the Settings from a Registered Product".

❑ Delete function enables the deletion of registered product settings. For details, refer to "5.6.13. Deleting the Registered Product Settings".

❑ Product Image function enables the registration of product images. For details, refer to "5.6.10. Registration of Product Images".

❑ Image Delete function enables the deletion of registered product images. For details, refer to "5.6.11. Deletion of Product Images".

❑ For the details of reading the product codes, refer to "9.7. Reading Product Code by Serial Communication".

❑ For setting items other than those explained in this section, refer to "10. Setting Details".

❑ During operation, the setting value is saved every time the setting is changed.

❑ Touch the Return icon during operation to return to the previous screen.

5.6.1. Product Registration

The product registration procedure is as follows.
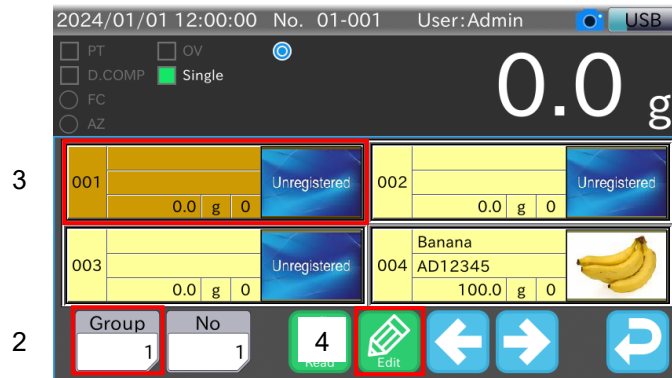
Fig. 46 Product registration

1. Touch the Product icon 📕 on the Weighing screen to display the Product Selection panel.

2. Enter a group number (selection range: 1-10).

Note
- ❑ Use the Left Arrow icon ⬅ / Right Arrow icon ➡ to switch pages.
- ❑ The product number can be entered directly in the No. input field.

3. Touch the product number to be registered.

4. Touch the Edit icon ✎ to register a product and show the Product Settings screen.
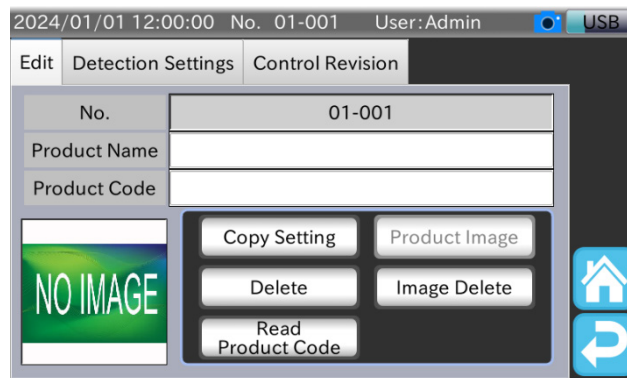
Fig. 47 Product Settings screen (Edit tab)

5.6.2.   Target/Hi Hi Limit/Hi Limit/Lo Limit/Lo Lo Limit Value Settings

The procedure for setting Detect Basis for detection is as follows.
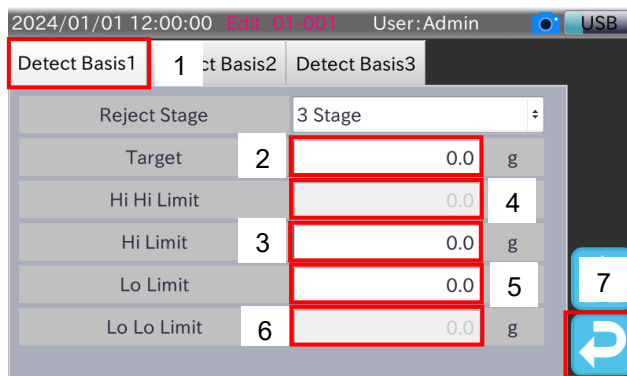
Fig. 48 Detect Basis settings

1. Touch the Detect Basis button on the Detection Settings tab of the Product Settings screen to show the Detect Basis Settings screen.

2. Touch Target and enter the weight of the product.

3. Touch Hi Limit and enter the upper limit value for the product. Enter the upper limit value as the deviation from the target value.

    E.g. If the target is 100 g and the upper limit of the allowable weight is 150 g, then 150 g – 100 g = 50 g, so 50 g is the upper limit value.
    (only when the number of reject stages is 5)

4. Touch Hi Hi Limit and enter the upper-upper limit value for the product. Enter the upper-upper limit value as the deviation from the target value.

5. Touch Lo Limit and enter the lower limit value for the product. Enter the lower limit value as the deviation from the target value.

    E.g. If the Target is 100 g and the lower limit of the allowable mass is 50 g, then 100 g – 50 g = 50 g, so 50 g is the lower limit value.
    (only when the number of reject stages is 5)

6. Touch Lo Lo Limit and enter the lower-lower limit value for the product. Enter the lower-lower limit value as the deviation from the target value.

7. Touch the Return icon ⮐ to return to the Product Settings screen.

5.6.3. Product Length and Speed Settings

The procedure for setting the detection capacity (throughput) is as follows.

2024/01/01 12:00:00	No. 01-001	User:Admin
Detect Paramater1	Detect Paramater2	Detect Paramater3

Product Length	2	100 mm
Speed	3	10.0 m/min
Weighing Mode		Auto Mode
Conveyor Stop Timer		0.00 sec
Product Detection		Photo Eye
Detection method of Photo Eye sensor		Rising Edge

Fig. 49 Detect Parameter settings

1. Touch the Detect Parameter button on the Detection Settings tab of the Product Settings screen to show the Detect Parameter Settings screen.

2. Touch the Product Length input field and enter the product length.

3. Touch the Speed input field and enter the conveyor speed.

4. Touch the Return icon 🔄 to return to the Product Settings screen.

5.6.4. Digital Output (DO) Settings

This section describes how to set the conveyor stop and DO setting for each detection item.

The description in this section assumes that the DO behavior is set to "Timer".
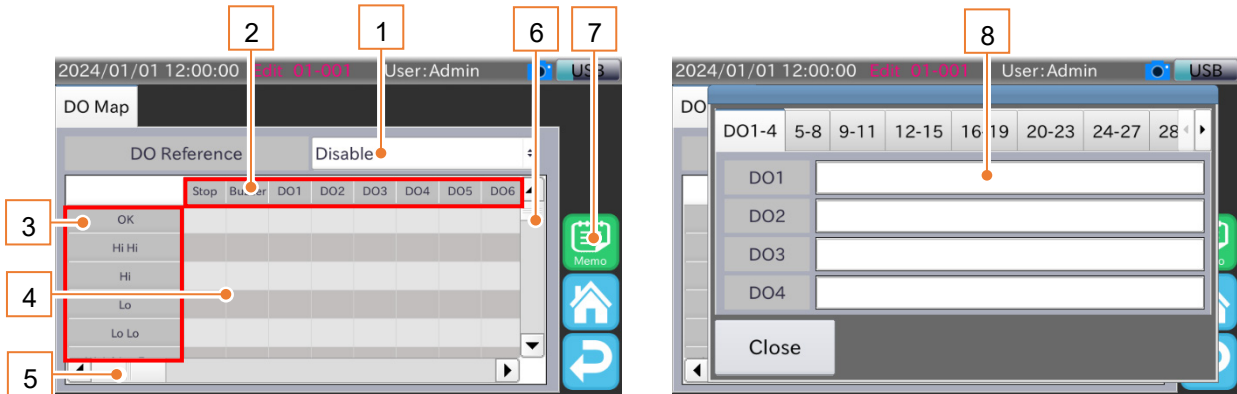
Fig. 50 DO Map Settings screen

Table 19 DO Map Settings screen: part names and descriptions

No.	Name	Description
1	DO Reference	Selects the common DO setting for reference. For details on the DO reference, refer to "10.4.1. DO Reference".
2	Stop / DO numbers	Shows Conveyor Stop and DO numbers. Touching a DO number performs the DO's test output. For DO test output, refer to "5.6.6. Digital Output (DO) Behavior Test Function".
3	Stop / DO output definitions	Shows a list of definitions for activating a DO and/or stopping the conveyor.
4	Checkboxes	Selects a DO number / numbers to operate with a DO output definitions. If a checkbox is "○", the corresponding DO lights up, and if the corresponding DO is "◎", it blinks.
5	Horizontal scroll bar	Moves the viewing area of the Stop / DO numbers screen.
6	Vertical scroll bar	Moves the viewing area of the DO output definitions screen.
7	DO name memo button	Shows DO name memo screen.
8	DO name	Enables entry of DO name.

Note
❑ For details on DO Map, refer to "10.4. DO Map".
❑ For the DO behavior settings other than "Timer", refer to "10.5.1. DO Behavior".
❑ Blinking action cannot be set for the DO set for stop conditions.

The procedure for setting the DO Map is as follows.
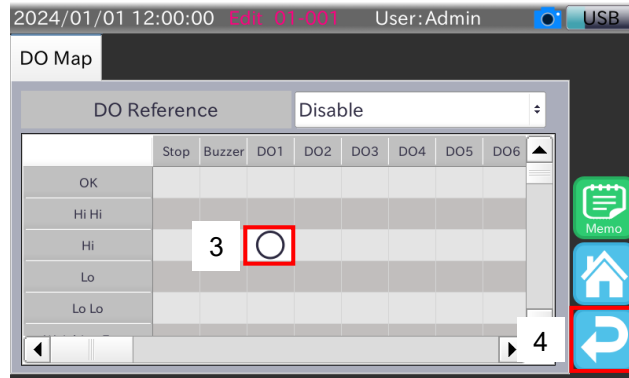
Fig. 51 DO Map settings (e.g. DO map check)

1. Touch the Digital Output button on the Detection Settings tab of the Product Settings screen to show the DO Settings screen.

2. Touch the DO Map button to show the DO Map Settings screen.

3. Touch the checkbox of the DO number to be output for each judgement item.

   E.g. If you want to output a signal from DO1 when an Hi judgment is made, touch the square mark in Fig. 51. Touch the check box until "○" is displayed for lighting output, and "◎" is displayed for blinking output.

4. When the judgement result of a checked item is obtained after weighing, the signal is output from the corresponding DO according to the settings of detection delay time and detection hold time.
   If the Stop item is checked, the conveyor will stop when the corresponding judgement result is obtained.

Note

   For details on detection delay time and detection hold time, refer to "5.6.5. Delay／Hold Time Settings".

5. Touch the Return icon to return to the DO Settings screen.

5.6.5. Delay/Hold Time Settings

This section describes how to set the digital output (DO) behavior after judgement.

The description in this section assumes that the DO map setting is lighting operation and the DO operation setting is "Timer".

The delay time is the time until the signal is output from the DO after the judgement.

The hold time is the time the signal is being output from the DO.
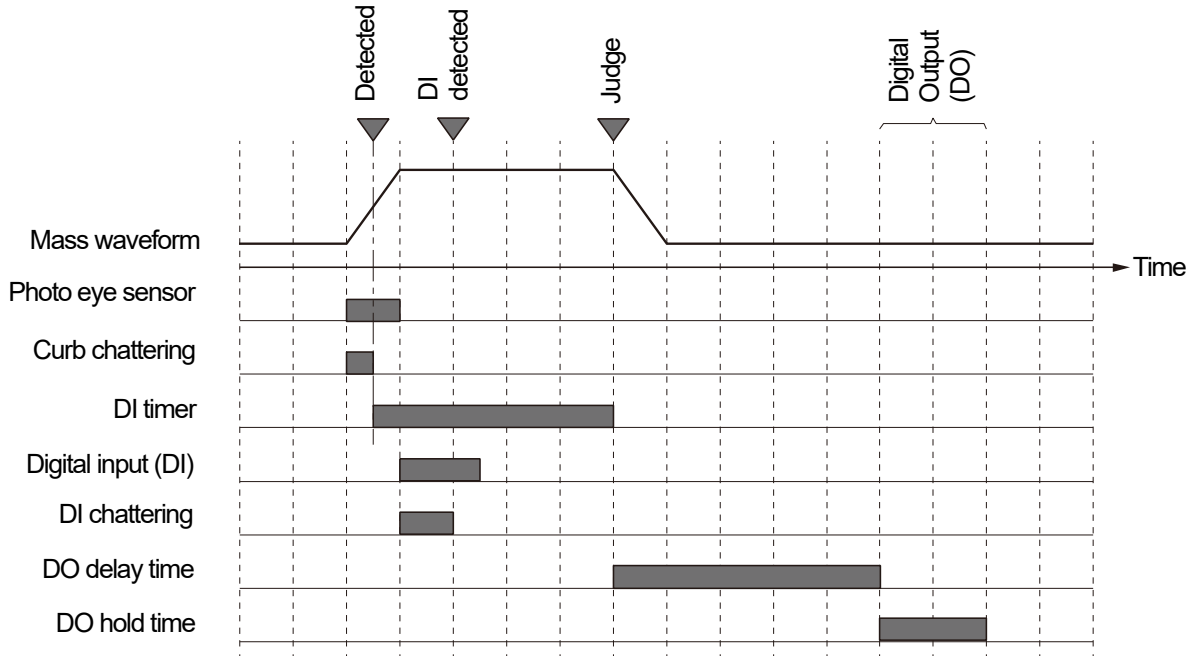
Fig. 52 DI / DO timing chart

Note

❑ For details on the delay time and hold time settings, refer to "10.5. Standard DO/DO Option".

❑ For the DO behavior settings other than "Timer", refer to "10.5.1. DO Behavior".

The procedure for setting the delay time and hold time is as follows.
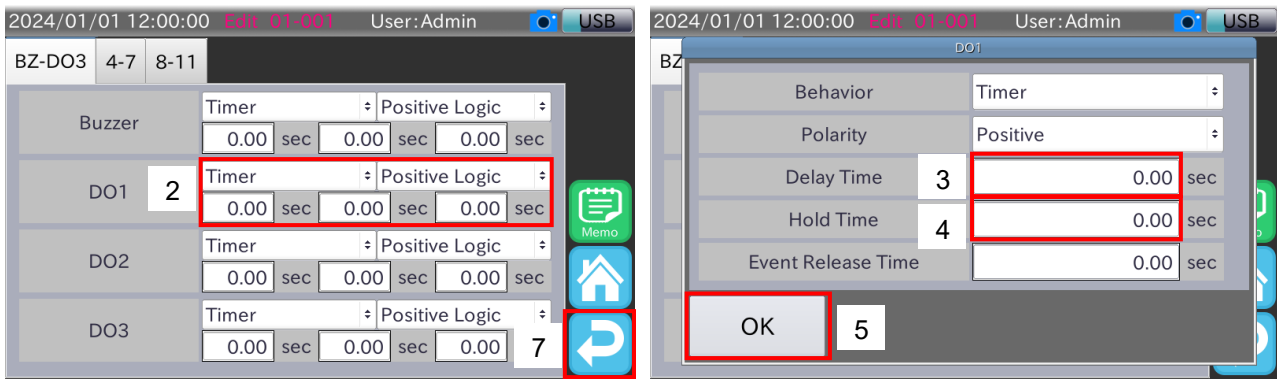
Fig. 53 Changing the delay/hold time settings

1. Touch the Standard DO button on the DO Settings screen to show the Standard DO Settings screen.

2. Touch the DO settings display area to display the dialog box for changing the settings.

3. Touch the Delay Time input field and enter a delay time value.

    E.g.: Connecting DO1 to a flipper type rejector.

        For the delay time, set a time that matches the travel time for the product to be carried to the rejector after the weighing value is confirmed/judged at the end of the weighing conveyor. Also take into account the time it takes for the rejector flipper to swing.
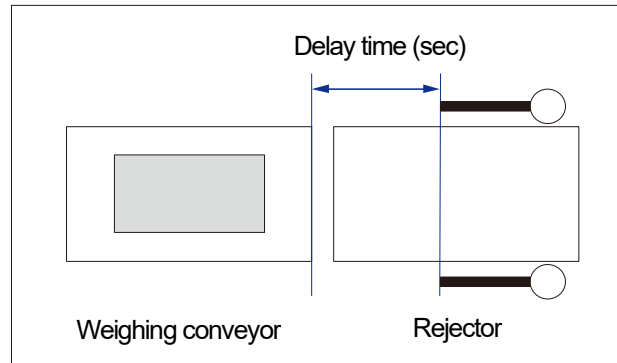
Fig. 54 Delay time setting example

    If the distance from the weighing conveyor to the rejector is 0.2 m, the conveyor speed is 30 m / min, and the flipper swing time is 0.3 seconds, the delay time for DO1 is 0.2 m ÷ 30 m / min x 60 seconds - 0.3 seconds = 0.1 seconds. Note that the time that the flipper of the rejector swings depends on the setting of the air cylinder's cushion needle, which will require further fine adjustment.

    When connecting a comparator light, it is advisable to shorten the delay time and increase the hold time for visual recognition.

4. Touch the Hold Time input field and enter a hold time value.

5. Touch the OK button to return to the DO Settings screen.

6. Set other DOs in the same way.

7. Touch the Return icon [icon] to return to the DO Settings screen.

5.6.6.   Digital Output (DO) Behavior Test Function

DO tests can be performed with the DO behavior test function, which is performed by touching a DO number on the DO Map Settings screen.

E.g.: To test the DO1 output, touch the area shown with a square in Fig. 55.
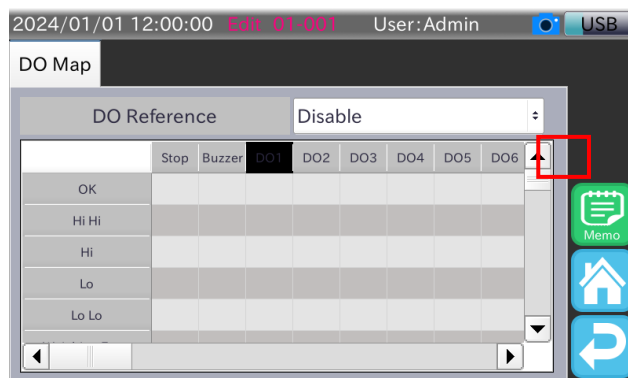
Fig. 55 DO behavior test screen (DO1 test output example)

        AD-4412-CW   AD-4413-CW

5.6.7. Preset Tare Value Setting

The procedure for setting the preset tare for detection is as follows.

Fig. 56 Preset tare setting

1. Touch the Preset Tare button on the Control Revision tab to show the Preset Tare Settings screen.

2. Touch the Preset Tare input field and enter the tare value. To clear the preset tare value, enter "0.0".
   When the preset tare value is set, the PT (Preset Tare) indicator in the Function Status display of the Weighing screen is lit.

3. Touch the Return icon [icon] to return to the Product Settings screen.

5.6.8. Changing the Product to Be Weighed

The procedure for changing the product to be weighed is as follows.
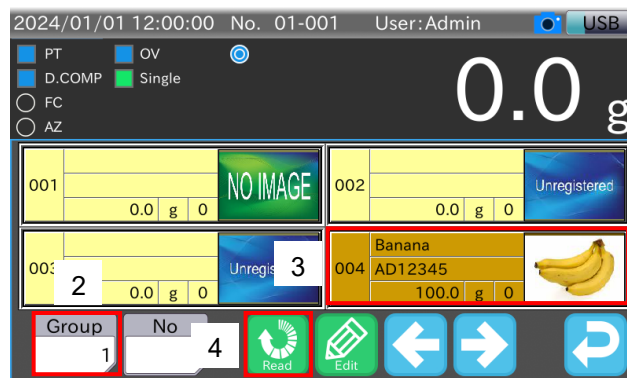
Fig. 57 Changing the product to be weighed

1. Touch the Product icon [icon] on the Weighing screen to show the Product Selection panel.

2. Enter a group number (selection range: 1-10).

Note
- ❏ Use the Left Arrow icon [icon] / Right Arrow icon [icon] to switch pages.
- ❏ The product number can be entered directly in the No. input field.

3. Touch the product you want to weigh.

4. Touch the Read icon [icon] in the Product Selection panel to load the settings for the selected product.

5. After loading is complete, the Product Selection panel disappears automatically.

5.6.9.   Dynamic Compensation Value Measurement

This chapter describes how to measure the dynamic compensation value for the indicator.
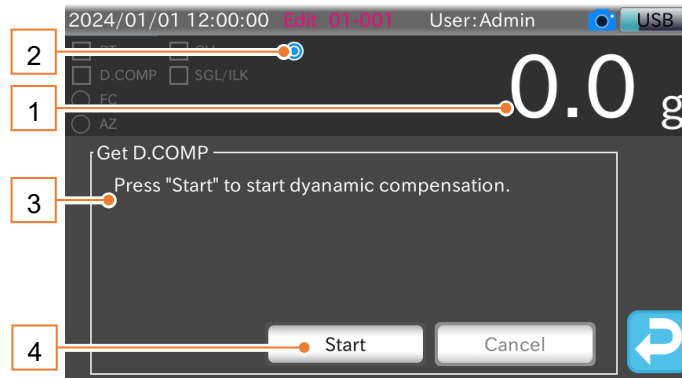
Fig. 58 Get D.COMP screen

Table 20 Get D.COMP screen: part names and descriptions

No.	Name	Description
1	Weight display	Displays the current weight or weighing result. The error display and display conditions are as follows. ● + E when the weight is "Capacity + (9 × resolution)" or more ● - E when the weight is "-19 x resolution" or less
2	Stability indicator	Displays the stability of the weight.
3	Get D.COMP Message Display area	Displays a message for dynamic compensation. Follow the message when performing dynamic compensation.
4	Start button	Performs dynamic compensation.

The procedure for setting dynamic compensation is as follows.

Note

> The dynamic compensation value can also be entered directly. For the setting method, refer to "10.9. Dynamic Compensation".
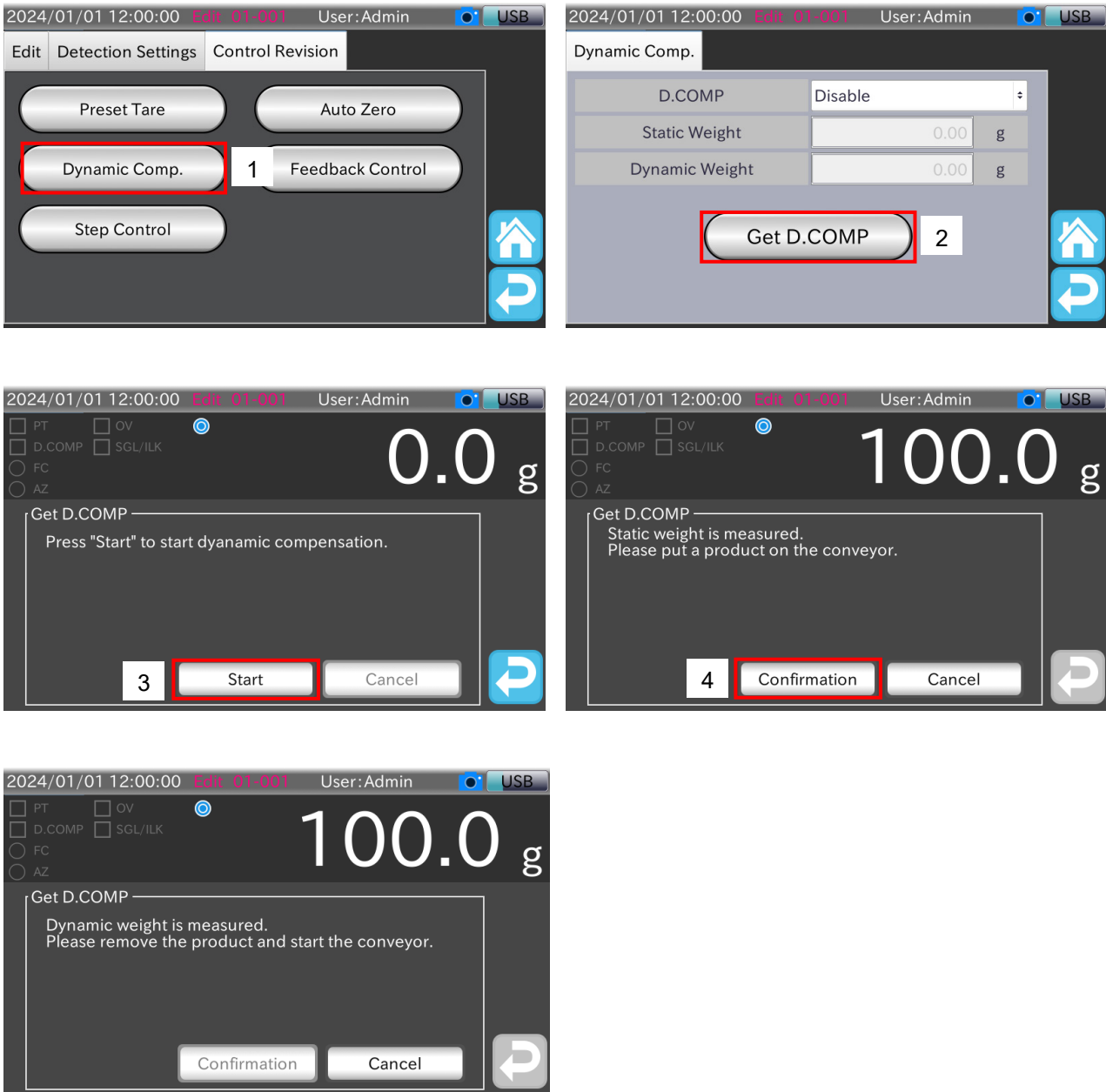
Fig. 59 Setting dynamic compensation

1. Touch the Dynamic Comp. button on the Control Revision tab of the Product Settings screen to show the Dynamic Comp. screen.

2. Touch the Get D.COMP button to display the Get D.COMP screen.

Caution

❑ To perform dynamic compensation, the settings of the product to be measured need to be loaded. Load the settings with the Reading Confirmation dialog box, which appears when the "Get D. COMP" button is touched in step 2, or load them before dynamic compensation by following the procedure in "5.6.8. Changing the Product to Be Weighed".

3. Touch the Start button to display the message for static weight measurement.

4. Place the product on the weighing conveyor and touch the Confirmation button when the stability indicator appears. The message for dynamic weight measurement is shown.

5. Remove the product from the weighing conveyor and activate the conveyor.

6. Continue weighing until the conveyor stops automatically.
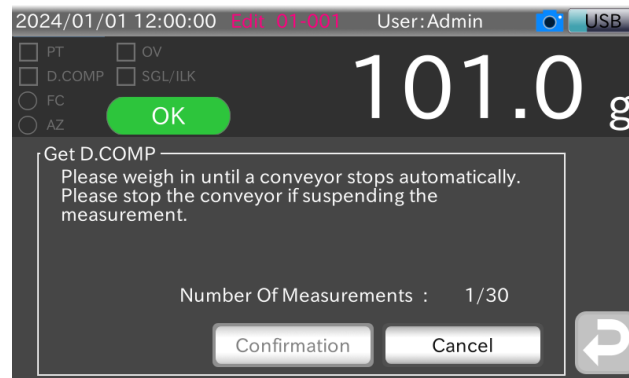
Fig. 60 Dynamic Weighing screen

Caution

The judgement result must be OK for a dynamic weight measurement.

7. After the measurement is completed, each measured value is set and the screen automatically returns to the previous screen.

5.6.10. Registration of Product Images

This section describes how to register product images.
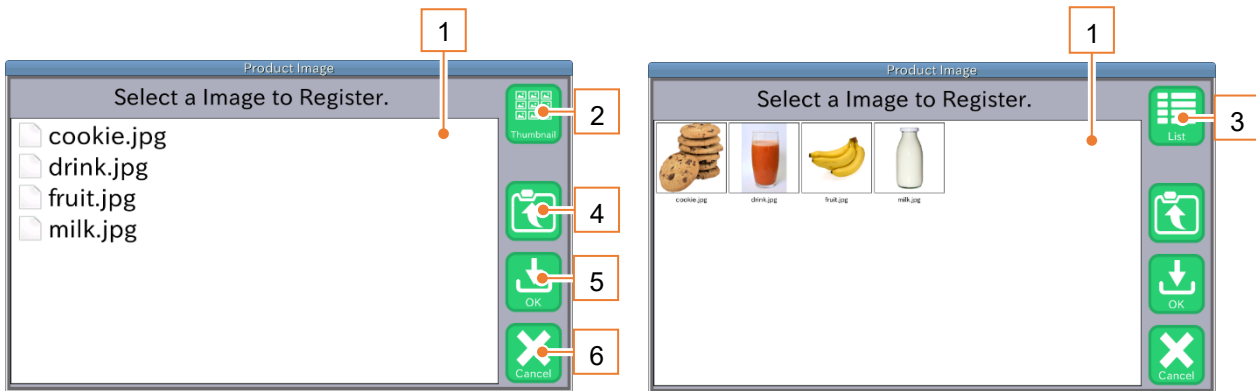
Fig. 61 Product Image screen

Table 21 Product Image screen: part names and descriptions

No.	Name	Description
1	Image Selection area	Shows JPEG images stored on the USB flash drive. Selects an image to register from the Image Selection area. Selecting the Thumbnail icon or List icon toggles the view between list view and thumbnail view.
2	Thumbnail icon	Switches the Image Selection area to thumbnail view.
3	List icon	Switches the Image Selection area to list view.
4	Back icon	Returns to an upper–hierarchy folder view.
5	OK icon	Registers the selected image.
6	Cancel icon	Closes the Dialog box without registering the image.

Caution

❑ Save the required images onto the USB flash drive in advance.

❑ If an image file name contains a space, the image cannot be registered.

❑ Folder/file names that contain characters other than the English alphabet will not be shown correctly on the Product Image screen.

❑ Only JPEG format image files can be registered.

Note

❑ The registered images are compressed by the internal software (ImageMagick) and shown on the screen. ImageMagick is a copyrighted software owned by ImageMagick Studio LLC.

❑ On how to connect a USB flash drive, refer to "3.1.1. Connecting a USB Flash Drive to the Indicator".

❑ On how to format the USB flash drive, refer to "9.1. How to Format a USB Flash Drive".

❑ On how to remove the USB flash drive, refer to "3.1.2. Removing a USB Flash Drive from the Indicator".

The procedure for image registration is as follows.
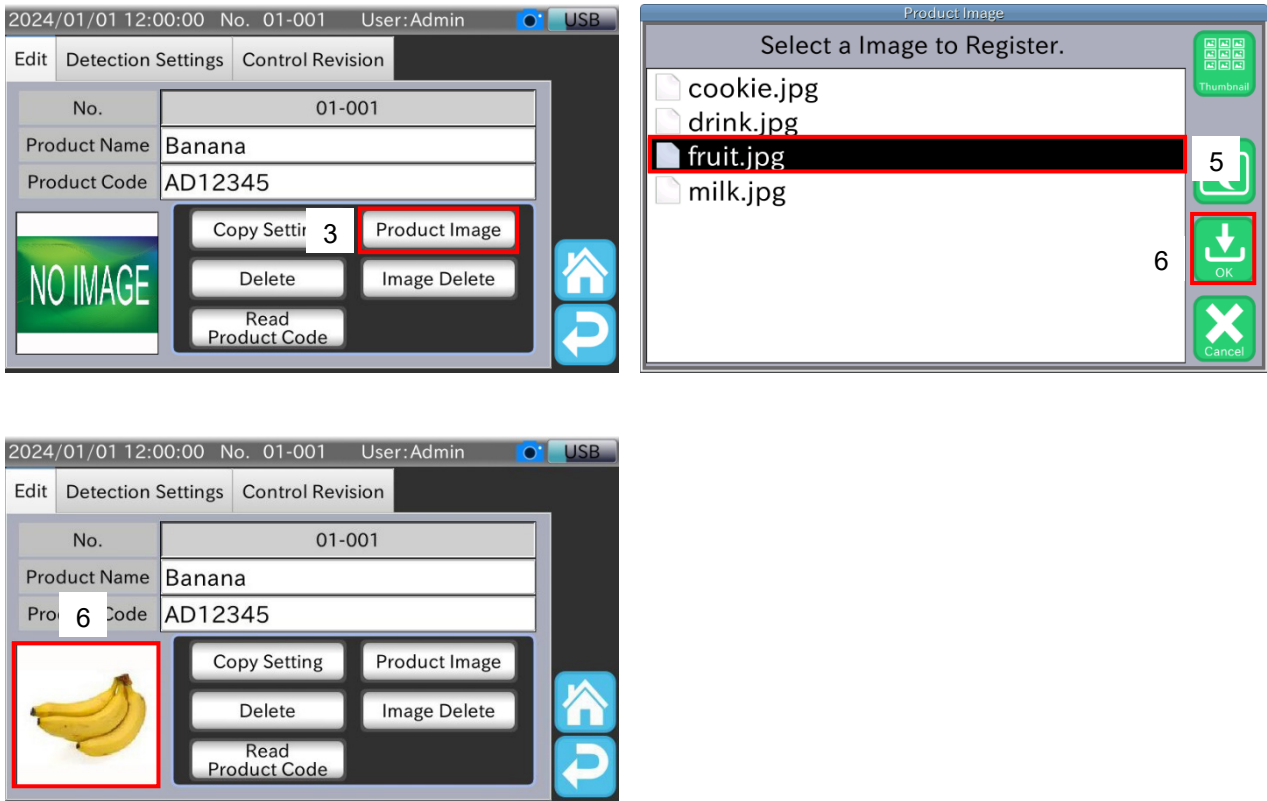
Fig. 62 Image Selection

1. From the Product Settings screen, display the Edit tab.

2. Connect a USB flash drive to the indicator.

3. Touch the Product Image button to display the Product Image screen.
   The folders and files on the USB flash drive are shown on the screen.

4. Touch a folder name to explore the folder. Touch the Back icon 🔼 to return to the folder in the upper hierarchy.

5. Touch a file name to select the image.

6. Touch the OK icon ⬇ to register the highlighted image file and show it on the Edit tab display of the Product Settings screen.

5.6.11. Deletion of Product Images

This section describes how to delete a registered product image. The procedure for deleting an image is as follows.

Fig. 63 Deleting an image

1. From the Product Settings screen, display the Edit tab.

2. Touch the Image Delete button to display the dialog box for confirming image deletion.

3. To delete the image, touch the OK button.
   Then the product image is removed and "NO IMAGE" is displayed.

5.6.12. Copying the Settings from a Registered Product

This chapter describes how to copy the settings of a registered product. This function enables the use of settings copied from an existing product registration to another product registration with a different product number.
The procedure for copying product settings is as follows.
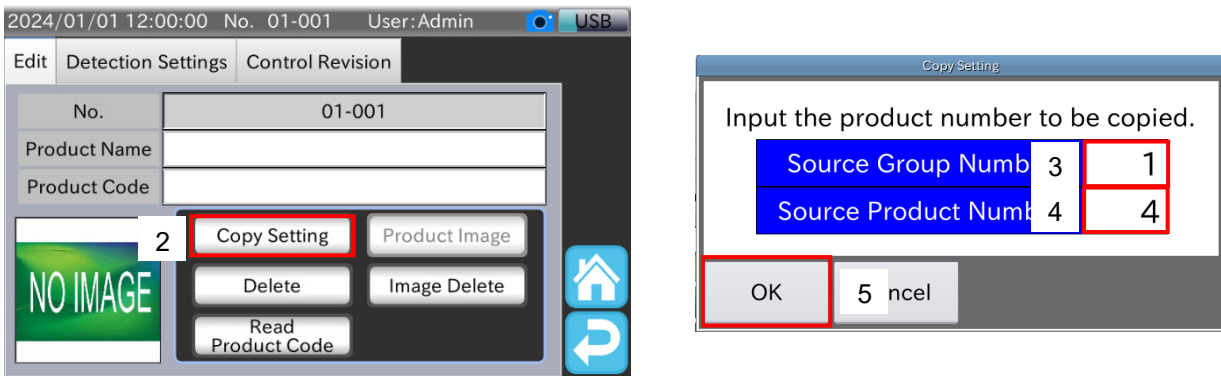
Fig. 64 Copying product settings

1. From the Product Settings screen, display the Edit tab.

2. Touch the Copy Setting button to show the dialog box for copying settings.

3. Touch the Source Group Number input field and enter the group number of the copy source.

4. Touch the Source Product Number input field and enter the product number of the copy source.

5. Touch the OK button to copy the settings from the specified product to the product you are editing.

5.6.13. Deleting the Registered Product Settings

This section explains how to delete registered product settings. The procedure for deleting product settings is as follows.
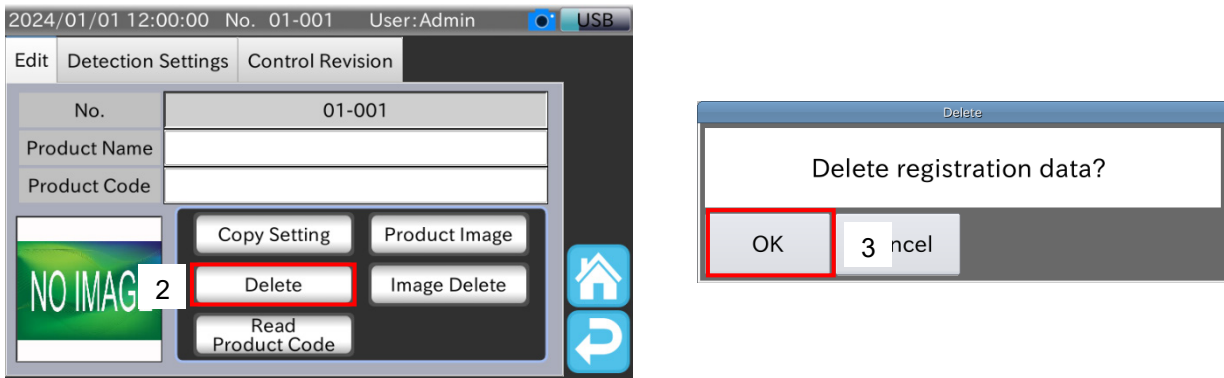
Fig. 65 Deleting registered product settings

1. From the Product Settings screen, display the Edit tab.

2. Touch the Delete button to display the dialog box for deleting registration settings.

3. To delete the settings, touch the OK button.
   Then the product is removed from the registered products.

AD-4412-CW   AD-4413-CW

5.7. Weighing Result & Summary

This chapter describes Weighing Result & Summary.

The summary is displayed in the Information Display area of the Weighing screen.

Note

❑ On how to change the display of the Information Display area, refer to "5.4.3. Switching the Contents of the Information Display Area".

❑ Individual data can be output to the USB flash drive or printer.
  For the output method, refer to "7. Output of Weighing Results／Summary".

❑ The indicator only supports FAT32 formatted USB flash drives.
    On how to format a USB flash drive, refer to "9.1. How to Format a USB Flash Drive".

5.7.1. Weighing History

The Weighing History screen can display the existing weighing data up to 1000 results.

Weighing History data can be output as a CSV / PDF file to a USB flash drive connected to the indicator.
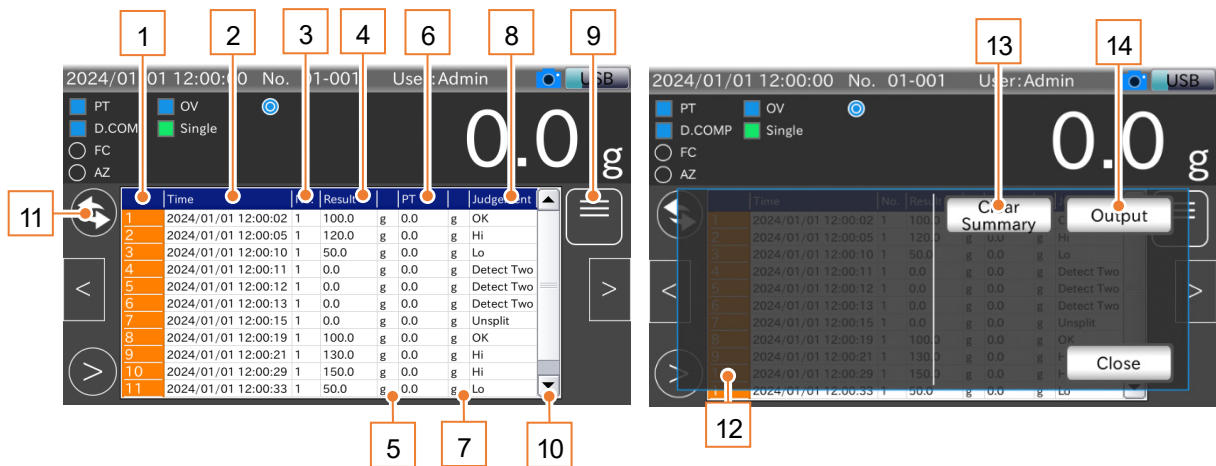
Fig. 66 Weighing History screen

Table 22 Weighing History screen: part names and descriptions

No.	Name	Description
1	Weighing History	Shows the history of weighing data. Up to 1,000 weighing data can be shown.
2	Time	Shows the time of a weighing. Shows the time (year, month, day, hour, minute, and second) of a weighing.
3	No.	Products are numbered at the same time as they are weighed.
4	Result	Shows the weighing value of the product. A product judged to be Detect Two／Unsplit／Metal／X-ray／Ext1／Ext2 is displayed as 0.0.
5	Weighing value unit	Shows the unit of weighing value.
6	PT	Shows preset tare value of the weighing.

No.	Name	Description
7	PT unit	Shows the unit of preset tare value.
8	Judgement	Shows judgement result.
9	Menu button	Shows the Weighing History menu panel.
10	Scroll bar	Moves the viewing area of the Weighing History screen. The scroll bar appears when the number of weighing history results reaches a certain number.
11	Update button	Updates the weighing history.
12	Weighing History menu	Shows the Weighing History menu panel when the Menu button is touched.
13	Clear Summary button	Clears the Summary. Shows the Confirmation dialog box when this button is touched. Clears Summary data (including All Summary, OK Summary, Sample Summary, OK Sample Summary, Histogram, and Control Chart). To clear Summary data, login at the "Supervisor" or higher user level is required.
14	Output button	Outputs Weighing History. Shows the Select Output Format dialog box when this button is touched. ● To output Weighing History as a PDF file, touch the PDF button when a USB flash drive is connected to the indicator. ● To output Weighing History as a CSV file, touch the CSV button when a USB flash drive is connected to the indicator. ● To output Weighing History to a printer, touch the Print button when a PostScript printer is connected to the indicator.

Caution

The indicator can save up to 1000 results in the Weighing History. When the number of the weighing results exceeds 1000, existing results data is deleted in order from the oldest.

5.7.2.　Summary

The Summary screen displays statistical data such as Summary data and average weight of weighed products. There are four types of summary: "All Summary", "OK Summary", "Sample Summary", and "OK Sample Summary".
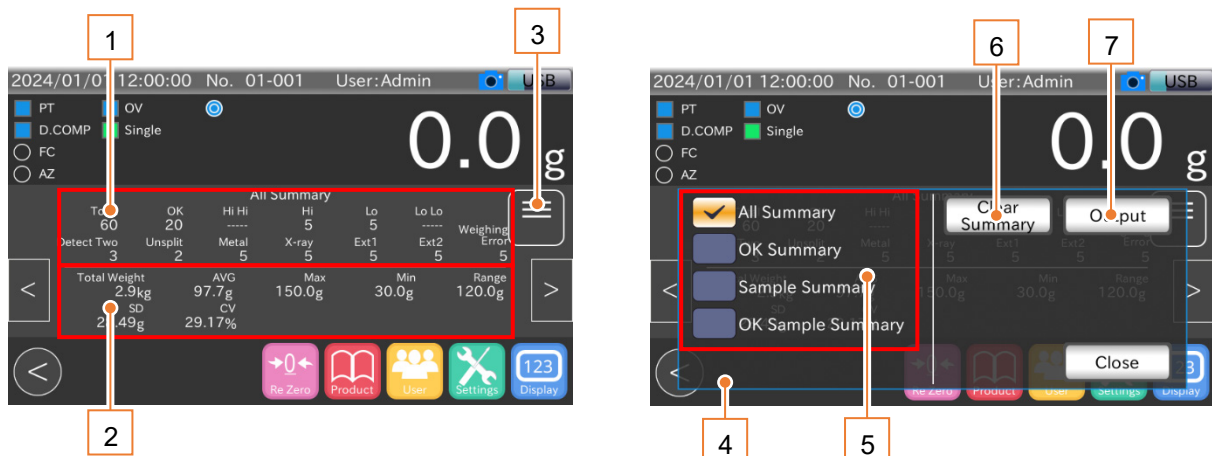
Fig. 67 Summary screen

Table 23 Summary screen: part names and descriptions

No.	Name	Description
1	Summary data	Shows the number of times each judgement has occurred on the weighed products.
2	Statistical data	Shows Statistical data for weighed products. Statistical data of All Summary or Sample Summary does not include weighing results of Weighing Error, Detect Two, Unsplit, Metal, X-ray, Ext1, and Ext2 judgements. ● "Total Weight" shows the total weight of the weighing results. ● "AVG" shows the average value obtained by dividing the total weight by the number of results contained in the Statistical data. ● "Max" shows the maximum weighing value contained in the Statistical data. ● "Min" shows the minimum weighing value contained in the Statistical data. ● "Range" shows the "maximum value minus minimum value" value. ● "SD" shows the standard deviation. ● "CV" shows the coefficient of variation.
3	Menu button	Shows the Summary menu panel.
4	Summary menu	Shows this Menu panel when the Menu button is touched on the Summary screen.
5	Summary display selection	Selects Summary data to be shown on the Summary screen.
6	Clear Summary button	Clears Summary. Shows the Confirmation dialog box when this button is touched. Clears all Summary data (including Weighing History, Histogram, and Control Chart). To clear Summary data, login at the "Supervisor" or higher user level is required.
7	Output button	Outputs Summary data and Statistical data. Shows Output Format Selection dialog box when this button is touched. ● To output Summary as a PDF file, touch the PDF button when a USB flash drive is connected to the indicator. ● To output Summary to a printer, touch the Print button when a PostScript printer is connected to the indicator. ● To output Summary to a dump printer, touch the Printing button when a dump printer is connected to the indicator.

Note

The summary result of the "Print" or "PDF" output format includes All Summary, OK Summary, Sample Summary, and OK Sample Summary.

All Summary

All Summary is the summary including failed products for the currently configured product.
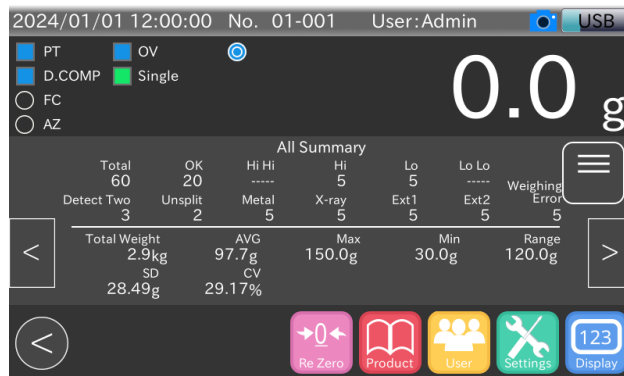
Fig. 68 All Summary screen

OK Summary

OK Summary is the summary of passed products for the currently configured product.
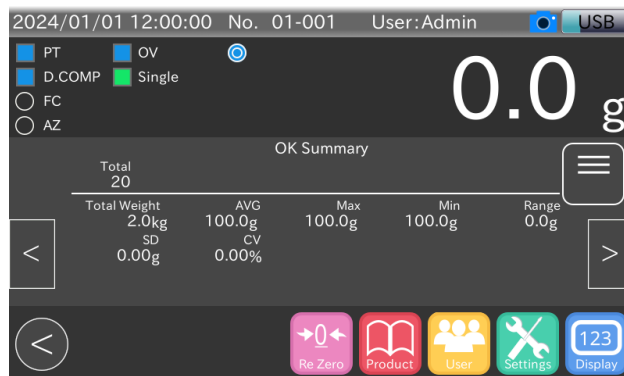
Fig. 69 OK Summary screen

Sample Summary

Sample Summary is an aggregate of a specified number (number of samples - total) of the currently configured products.
The summary is reset when the weighing for the set number of "number of samples - total", excluding judgements of Detect Two, Unsplit, Metal, X-ray, Ext1, and Ext2, is performed.
Failed products are included in the summary.

E.g.: When the number of samples is set to 10.
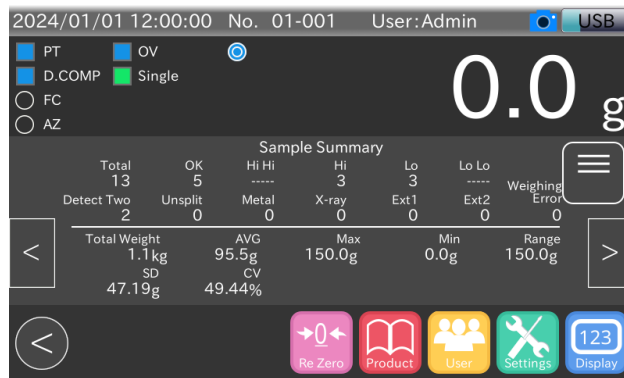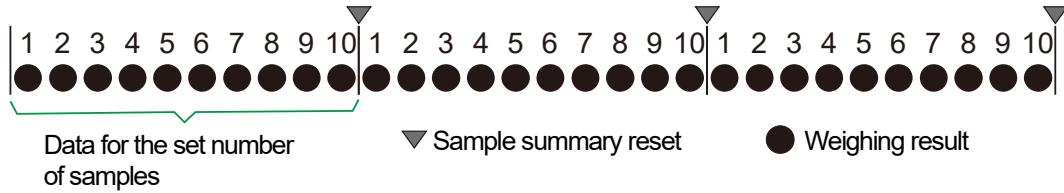
Fig. 70 Sample Summary reset timing and Sample Summary screen

Note

If the digital output definition "Total Num Count" is used, output operation is performed for each total of the set number of samples.
For details on digital output definitions, refer to "10.4.2. DO Output Definition".

OK Sample Summary

OK Sample Summary is an aggregate of a specified number (number of samples – number of passed samples) of the currently configured products. The summary is reset when the weighing for the set number of "number of samples - number of passed samples" is performed.

E.g.: When the number of samples is set to 10.
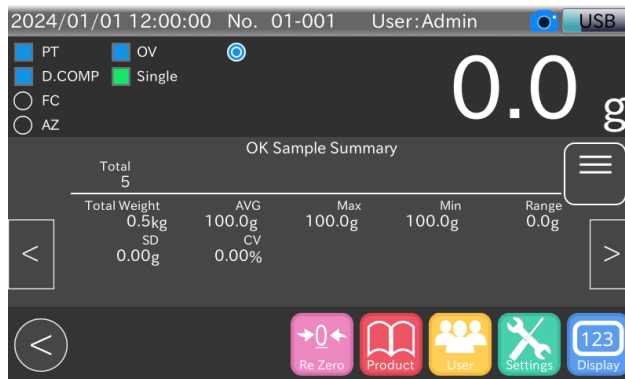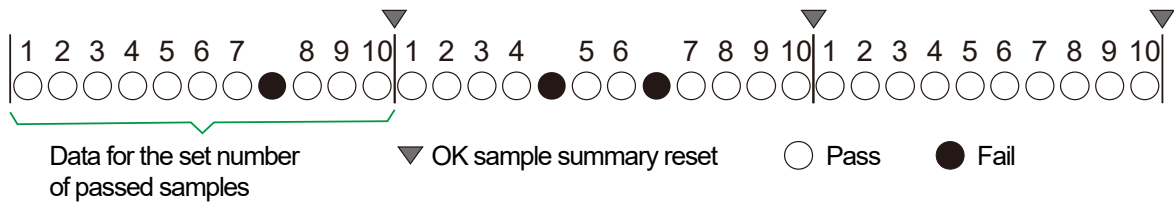
Fig. 71 OK sample summary reset timing and OK Sample Summary screen

Note

If the digital output definition "OK Num Count" is used, output operation is performed for each set number of passed samples.

For details on digital output definitions, refer to "10.4.2. DO Output Definition".

5.7.3. Histogram

A histogram showing the frequency distribution of the overall summary for the currently read product is displayed. To display and print the histogram, set the target and section width in advance.
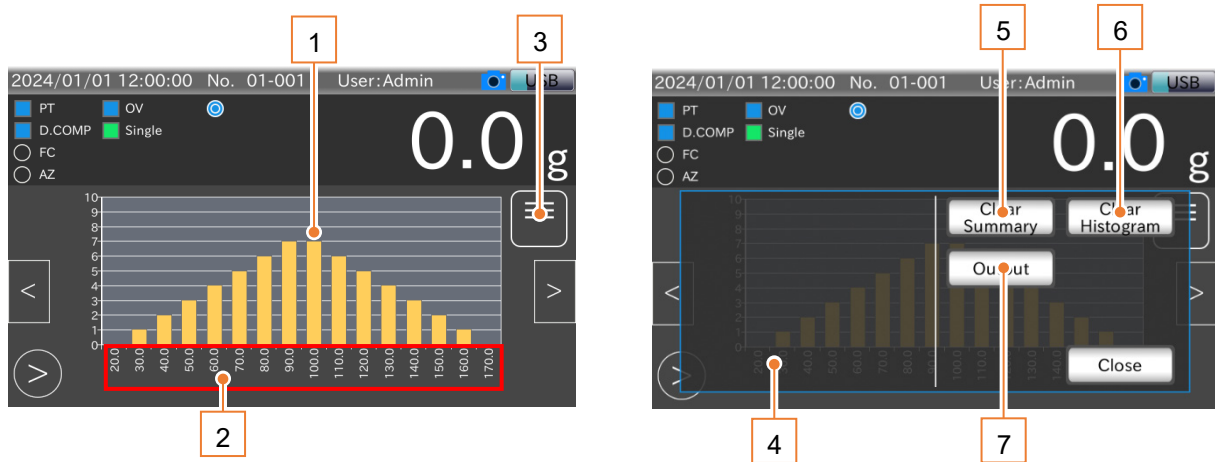
Fig. 72 Histogram screen

Table 24 Histogram screen: part names and descriptions

No.	Name	Description
1	Histogram	A histogram showing data divided into 16 sections.
2	Border values	Displays the weighing values that are the boundaries for the sections.
3	Menu button	Displays the Histogram menu panel.
4	Histogram menu	Touching the Menu button on the Histogram screen displays this menu panel.
5	Clear Summary button	Clears the summary. Shows the confirmation dialog box when this button is touched. Clears Summary data (including Weighing History, All Summary, OK Summary, Sample Summary, OK Sample Summary, and Control Chart). To clear Summary data, login at the "Supervisor" or higher user level is required.
6	Clear Histogram button	Clears the histogram. Shows the confirmation dialog box when this button is touched. Summary (Weighing History, All Summary, OK Summary, Sample Summary, OK Sample Summary, and Control Chart) other than Histogram are not cleared.
7	Output button	Outputs the histogram data. Shows the dialog box for selecting the output format when this button is touched. ● To output Histogram as a PDF file, touch the PDF button when a USB flash drive is connected to the indicator. ● To output Histogram to a printer, touch the Print button when a PostScript printer is connected to the indicator.

The relationship between the border value and section width is shown in Table 25. The target is placed in section No. 9 and the frequency of each step is counted in 16 sections according to the section width setting.

Caution

❑ Even if the target is changed in the middle of summary, the summary is performed with the section width using the target before the change. The section width is changed to a new target if you clear the summary using the "Clear Summary" or "Clear Histogram" buttons.

❑ If the section width is changed, the graph data is automatically deleted, and the section width is updated. The target is not updated.

❑ Weighing Error, Detect Two, Unsplit, Metal, X-ray, Ext1, and Ext2 judgements are not included in the histogram distribution.

Note

For the target and section width setting, refer to "10.2.2. Target" and "10.6.3. Width of Section".

Table 25 Relationship between the border value and section width

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

w: Weighing value

W: Border value for each section

S: Target

k: Section width

AD-4412-CW   AD-4413-CW

5.7.4. Control Chart

The control chart is displayed based on the settings of Number of Samples - CC, Sample Size, $\bar{X}$ and $\bar{R}$.

The control chart consists of an X-bar control chart and an R control chart.

The control chart uses the weighing result data, excluding the judgements of Detect Two, Unsplit, Metal, X-ray, Ext1, and Ext2, as a single data unit.

From each Number of Samples – CC data, a control chart is created using the Sample Size data as the control chart data.

Note

> For the settings of Number of Samples – CC, Sample Size, $\bar{X}$, and $\bar{R}$, refer to "10.6.4. Number of Samples-CC", "10.6.5. Sample Size", "10.6.6. X-Bar Control Chart", "10.6.7. R Control Chart".

E.g.: When the Number of Samples - CC is set to 10 and Sample Size is set to 5. Of the data for ten pieces set as the number of samples, the first five pieces (Sample Size) are used for the control chart data.
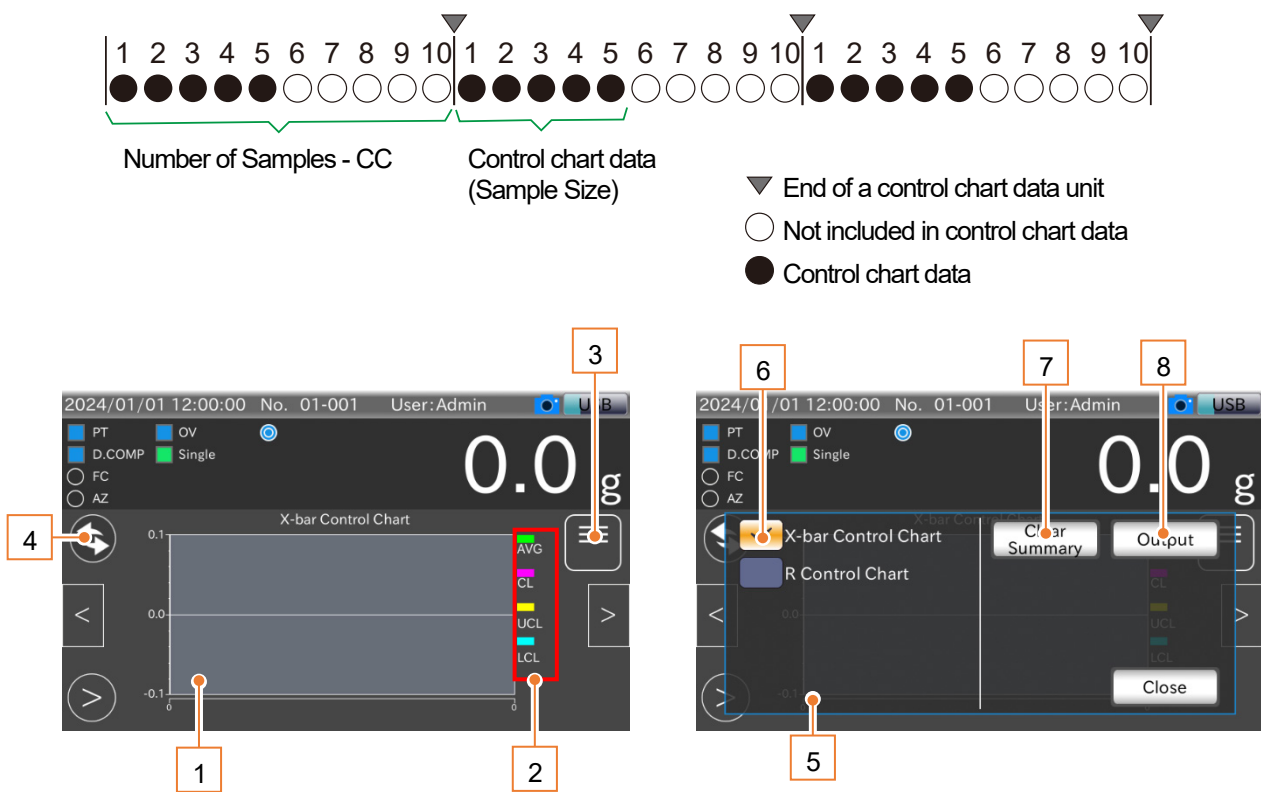
Fig. 73 Number of Samples – CC Summary reset timing and Control Chart screen

Table 26 Control Chart screen: part names and descriptions

No.	Name	Description
1	Control Chart	Shows a control chart graph.
2	Legend	Shows the legend of the control chart.
3	Menu button	Shows the Control Chart menu panel when this button is touched.
4	Update button	Updates the control chart graph.
5	Control Chart menu	Shows the menu panel when the Menu button is touched on the Control Chart screen.
6	Control Chart display selection	Selects a control chart to be shown on the screen.

No.	Name	Description
7	Clear Summary button	Clears the summary. Shows the confirmation dialog box when this button is touched. Clears all Summary (including Weighing History, All Summary, OK Summary, Sample Summary, OK Sample Summary, and Histogram). To clear Summary data, login at the "Supervisor" or higher user level is required.
8	Output button	Outputs Control Chart data. Shows the dialog box for selecting the output format when this button is touched. ● To output Control Chart as a PDF file, touch the PDF button when a USB flash drive is connected to the indicator. ● To output Control Chart to a printer, touch the Print button when a PostScript printer is connected to the indicator.

X-bar control chart

If $\overline{X}$ is set, a graph with the $\overline{X}$ as the center line value is displayed on the X-Bar Control Chart screen.
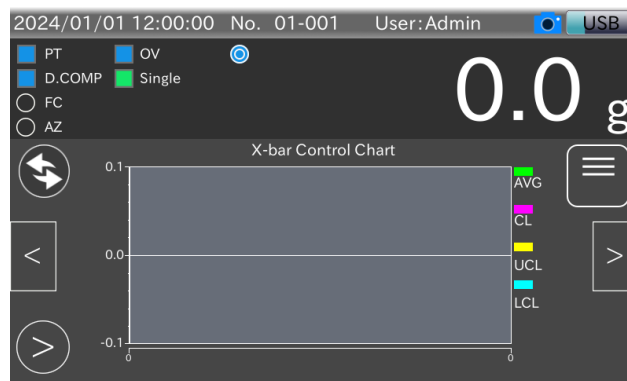
Fig. 74 X-Bar Control Chart screen

R control chart

If $\overline{R}$ is set, a graph with the $\overline{R}$ as the center line is displayed on the R Control Chart screen.
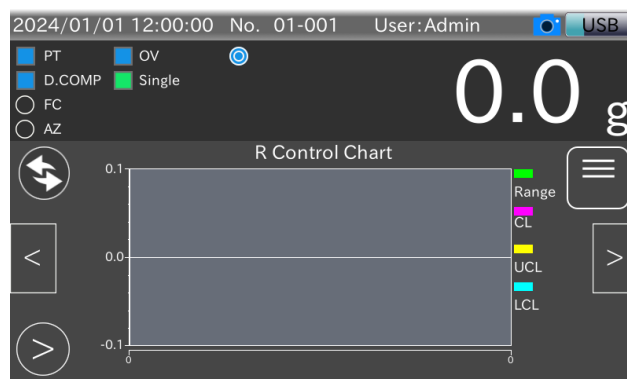
Fig. 75 R Control Chart screen

AD-4412-CW   AD-4413-CW

6.   Adjustment of the Main Unit

This chapter describes how to perform operations related to adjustment of the main unit.

To perform the main unit adjustment, a user at the "Quality Manager" level or higher is required.

This chapter assumes that the user has logged in at the "Quality Manager" or higher user level.

6.1.   Adjustment

This section describes how to adjust the weighing values of the indicator.
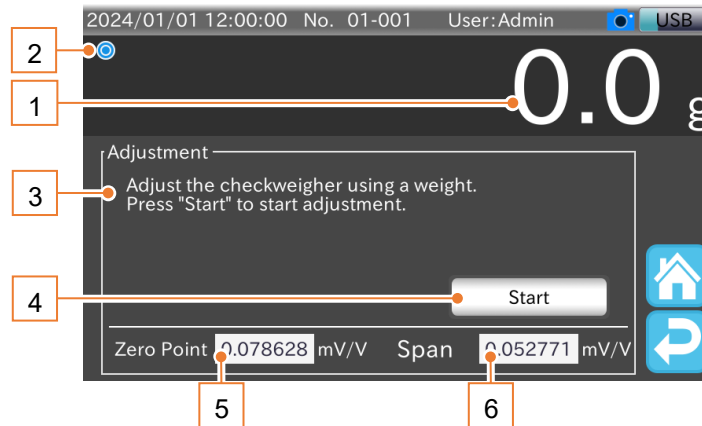
Fig. 76 Adjustment screen

Table 27 Adjustment screen: part names and descriptions

No.	Name	Description
1	Weight display	Displays the current weight. Or, the error display and display conditions are as follows. ● +E when the weighing value is "Capacity + (9 x resolution)" or more ● −E when the weighing value is "-19 x resolution" or less
2	Stability indicator	Shows the stability of the weighing value.
3	Adjustment Message Display area	Displays a message for adjustment. Follow the message when performing adjustment.
4	Start button	Shows the buttons for adjustment.
5	Zero Point	Shows the currently set zero point. Shows the load cell signal voltage ratio [mV / V] when adjusting the zero point.
6	Span	Shows the currently set span. Shows the load cell signal voltage ratio [mV / V] -zero point when adjusting the span.

The procedure for adjustment is as follows.
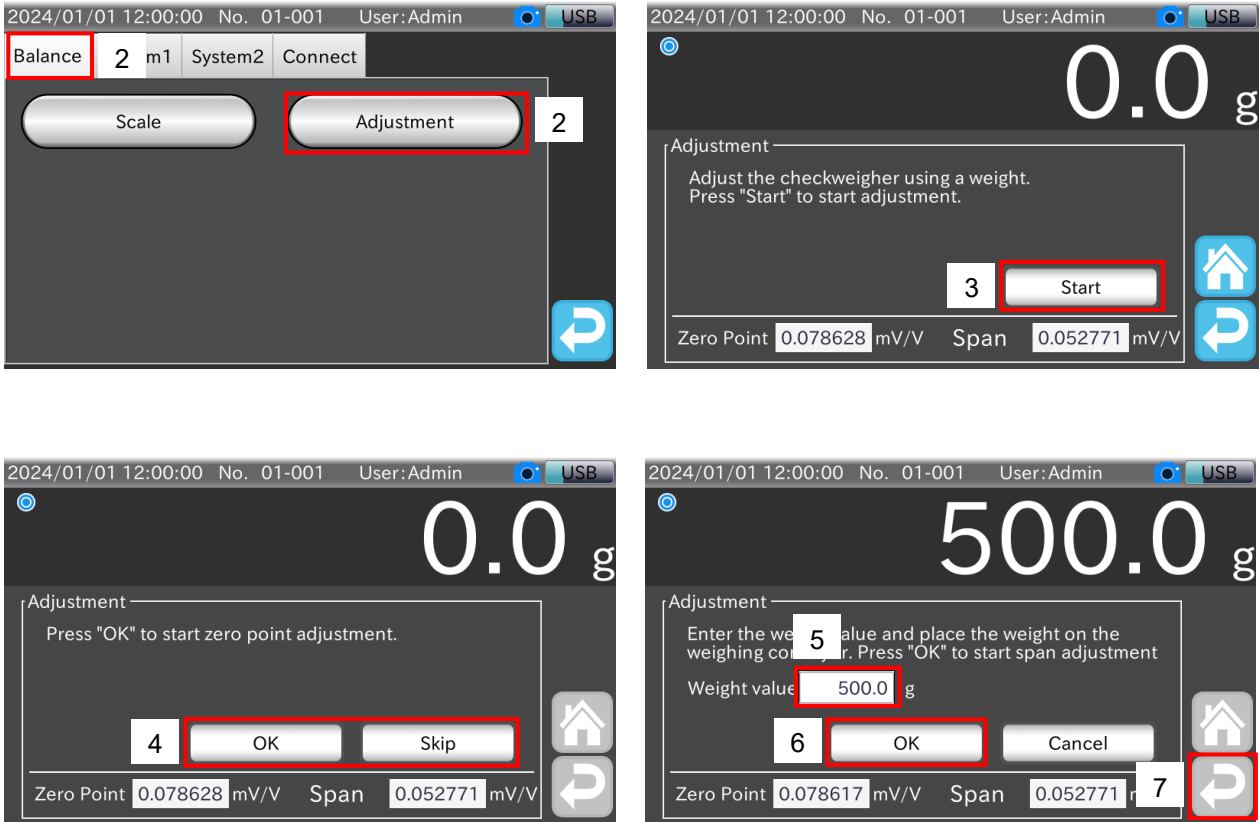
Fig. 77 Adjustment

1. Touch the Settings icon ![icon] on the Weighing screen to display the Common Settings screen.

2. Touch the Adjustment button on the Balance tab to display the Adjustment screen.

3. Touch the Start button to display the confirmation message for zero-point adjustment.

4. Unload the weighing conveyor.
   To set the zero point, touch the OK button.
   To move to span adjustment without adjusting zero point, touch the Skip button.
   When the zero adjustment is complete, the message for entering the weight value used for span adjustment is displayed.

5. Enter the weight value to be used. Place the weight on the weighing conveyor.

6. Touch the OK button to set the span.

7. Touch the Return icon ![icon] to return to the Common Settings screen.

6.2. Date and Time Settings

This section describes the date and time settings of the indicator.
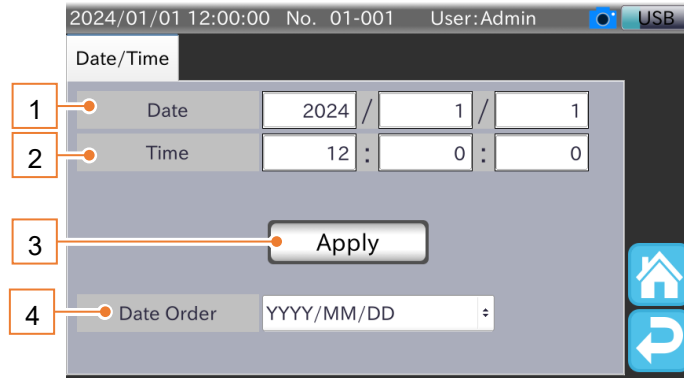
Fig. 78 Date / Time Settings screen

Table 28 Date / Time Settings screen: part names and descriptions

No.	Name	Description
1	Date	Enter the date to set for the indicator.
2	Time	Enter the time to set for the indicator.
3	Apply button	Applies the date and time settings.
4	Date Order	Changes the order of year, month, and day.

The procedure for setting the date and time is as follows.
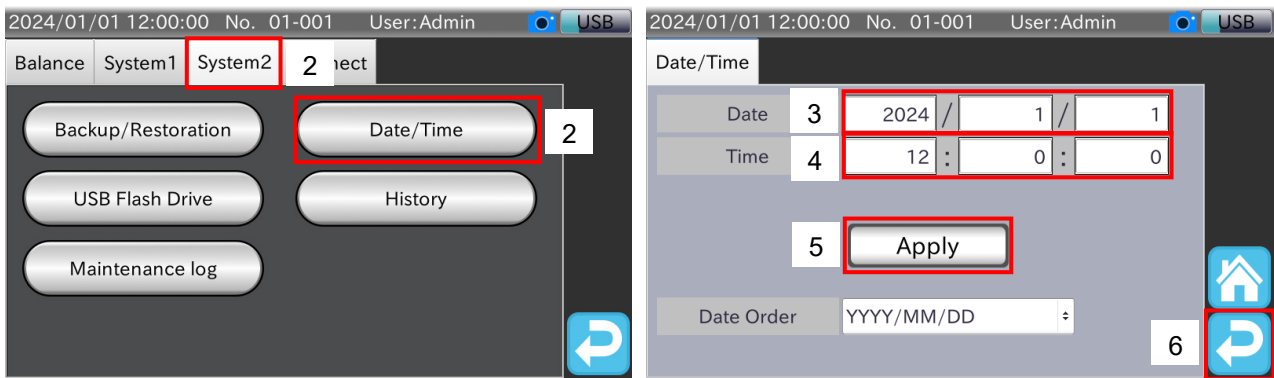
Fig. 79 Displaying Date / Time Settings screen

1. Touch the Settings icon ⚒ on the Weighing screen to display the Common Settings screen.

2. Touch the System 2 tab of the Common Settings screen and touch the Date∕Time button to display the Time∕Date Settings screen.

3. Touch and enter the year, month, and day of the Date input fields.

4. Touch and enter the hour, minute, and second of the Time input fields.

5. Touch the Apply button.
   The Date and Time settings are applied.

6. Touch the Return icon ⏎ to return to the Common Settings screen.

6.3.　　　LAN Settings

This section describes how to set up the LAN.

The indicator supports two types of networks, wired LAN and wireless LAN.
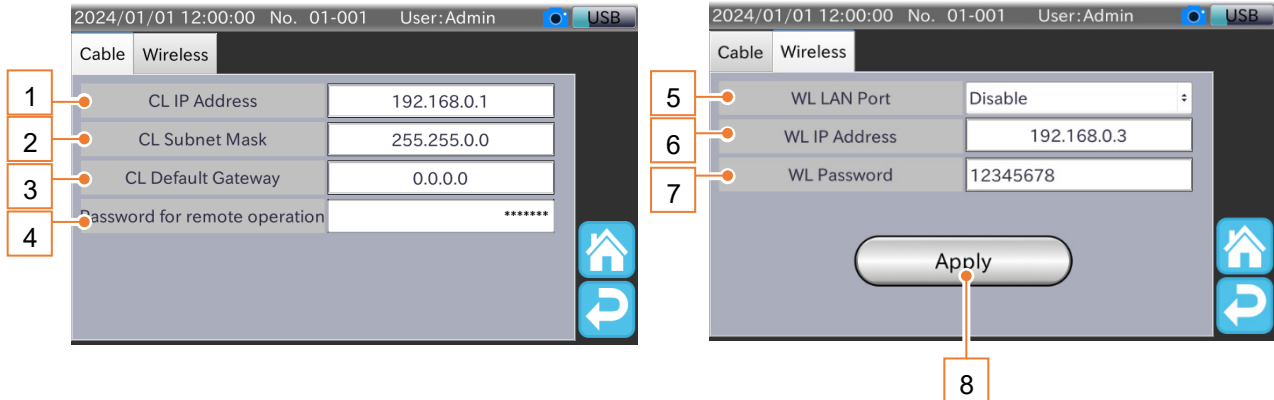
Fig. 80 LAN Settings screen

Table 29 LAN Settings screen: names and descriptions

No.	Name	Description
1	CL IP Address	Enter the IP address of the wired LAN.
2	CL Subnet Mask	Enter the subnet mask of the wired LAN.
3	CL Default Gateway	Enter the default gateway for the wired LAN.
4	Password for remote operation	Enter the password for remote operation.
5	WL LAN Port	Select "Enable" or "Disable" of the wireless LAN.
6	WL IP Address	Enter the IP address of the wireless LAN.
7	WL Password	Enter the password for the wireless LAN.
8	Apply button	Applies the settings of the wireless LAN port, wireless LAN IP address, and wireless LAN password.

The setting procedure for each network is as follows.

Caution

❑　For remote operation, refer to "9.5. Remote Connection".

❑　The default wireless LAN password is "12345678". Please change the default password when using it for the first time.

❑　The wireless LAN password is eight characters.

❑　Up to 4 devices can be connected to the wireless LAN.
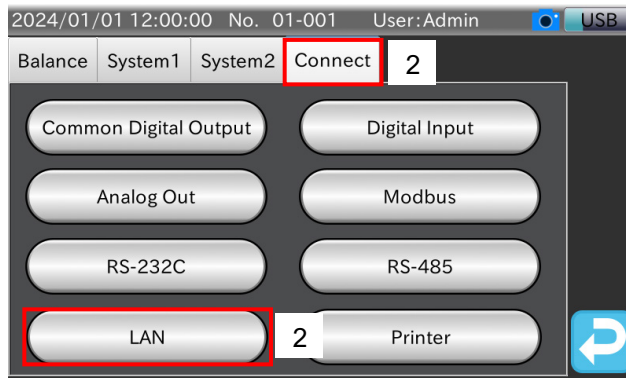
Fig. 81 Displaying LAN Settings screen

1. Touch the Settings icon [icon] on the Weighing screen to display the Common Settings screen.

2. Touch the Connect tab of the Common Settings screen, then touch the LAN button to display the LAN Settings screen.

Note that the subsequent steps vary between wired LAN and wireless LAN.

For wired LAN
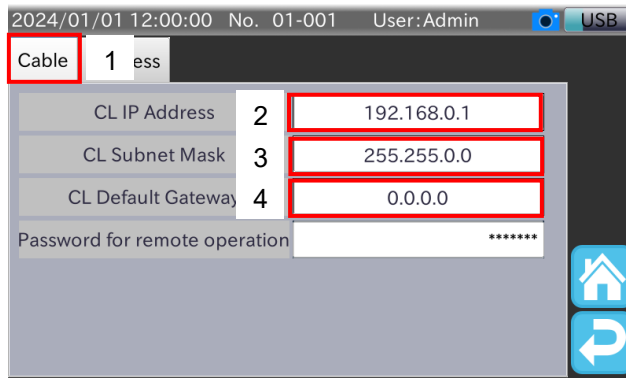
Fig. 82 Wired LAN settings

1. Select the Cable tab of the LAN Settings screen.

2. Touch the CL IP Address input field and enter the IP address of the indicator's wired LAN.

3. Touch the CL Subnet Mask input field and enter the subnet mask of the indicator's wired LAN.

4. Touch the CL Default Gateway input field and enter the default gateway for the indicator.

5. To apply the wired LAN settings, turn off the power switch and then turn it on again.

For wireless LAN

Fig. 83 Wireless LAN settings

1. Touch the Wireless tab of the LAN Settings screen.

2. Touch the WL LAN Port input field to enter the indicator's wireless LAN operation.

3. Touch the WL IP Address input field and enter the IP address of the indicator's wireless LAN.

4. Touch the WL Password input field and enter the 8-character password for the indicator's wireless LAN.

5. Touch the Apply button.

6. Touch the OK button in the dialog box for change confirmation.

7. The wireless LAN settings are applied.

8. Touch the Return icon to return to the Common Settings screen.

7.   Output of Weighing Results／Summary

The indicator can output data such as summary to a USB flash drive or printer.

This chapter describes how to output each data.

7.1.   Outputting to USB Flash Drive

Weighing History, Histogram, Control Chart and Summary data can be output to a USB flash drive.

Caution

❑   The indicator only supports FAT32 formatted USB flash drives.

❑   Never remove the USB flash drive while accessing it as the data may become corrupted.

❑   Back up the data output to the USB flash drive to a PC or similar medium within at least one month, and then empty the USB flash drive. If you store too much data on the USB flash drive, the files may become corrupted.

❑   A warning message appears when the remaining USB flash drive capacity is less than 2 MB.

Note

❑   For how to connect the USB flash drive, refer to "3.1.1. Connecting a USB Flash Drive to the Indicator".

❑   For how to format the USB flash drive, refer to "9.1. How to Format a USB Flash Drive".

7.1.1.   CSV File Output of Weighing History

This section describes how to output the Weighing History data to the USB flash drive.

The Weighing History data is saved to a USB flash drive as a CSV file.

There are two ways to output data.

●   Output data to a USB flash drive after performing judgement of a product.

●   Output data that is stored on the indicator.

Outputting weighing result after judgement

The procedure to output the weighing result to a USB flash drive after performing judgement of a product is as follows.

1. While referring to the procedure in "3.1.1. Connecting a USB Flash Drive to the Indicator", connect a USB flash drive to the USB port located on the Display Unit.

2. Make sure that the USB flash drive is connected, and then start weighing.

3. During weighing, the weighing result is output to the USB flash drive.

4. To remove the USB flash drive from the Display Unit after weighing, follow the procedure in "3.1.2. Removing a USB Flash Drive from the Indicator".

The save location and names of the output files are as follows.

●   Save location   :   ¥USB flash drive root directory¥Model name_Folder creation date

●   File names   :   File creation date_File creation time_Weiging_Result.csv

                         File creation date_File creation time_Backup_Weighing_Result.csv (for backup)

●   "Model name" is "AD4412CW" or "AD4413CW".

Caution

To output the weighing result to a USB flash drive after judgement, the USB Weighing History setting must be enabled.

On how to set USB Weighing History, refer to "10.19.1. USB Operation History".

Folders and files are created when one of the following conditions is met:

- Conditions for new folder creation

  Under any of the conditions, a folder is created when weighing is started with no existing "AD4961A_folder creation date" folder in the root directory of the USB flash drive.

- ❑ When the power is turned on.
- ❑ After connecting a USB flash drive.
- ❑ After updating the date and time.

- Conditions for new file creation

- ❑ When any of the new folder creation conditions are met.
- ❑ When the number of the Weighing History results exceed 65,000.
- ❑ When history writing fails.

The following is a file example for the Weighing History data output to the USB flash drive.

"Date (year / month / day), time (hours:minutes:seconds), number, product number, weighing result, preset tare value, judgement result"

Fig. 84 shows an example of the Weighing History file output to the USB flash drive.

Table 30 is the correspondence table for judgement results output to the file.

```
2024/01/01,10:00:00,1,01-001,99.9, g,0.0, g,OK
2024/01/01,10:00:10,1,01-001,120.1, g,0.0, g,Hi
2024/01/01,10:00:10,2,01-001,142.8, g,0.0, g,HiHi
2024/01/01,10:00:20,1,01-001,80.0, g,0.0, g,Lo
2024/01/01,10:00:30,1,01-001,75.8, g,0.0, g,LoLo
2024/01/01,10:00:40,1,01-001,Error,,0.0, g,Weighing Error
2024/01/01,10:01:00,1,01-001,0.0, g,0.0, g,Metal
2024/01/01,10:01:10,1,01-001,0.0, g,0.0, g,X-ray
2024/01/01,10:01:20,1,01-001,0.0, g,0.0, g,Ext1
2024/01/01,10:01:30,1,01-001,0.0, g,0.0, g,Ext2
```

Judgement Date & time   No.   Product No.   Weighing result   Preset tare value   Judgement result

Fig. 84 Weighing History output example

Table 30 Correspondence table for judgement results

Judgement in the file	Description	Judgement in the file	Description
OK	Pass	Detect Two	Detect Two
HiHi	Very overweight	Unsplit	Unsplit
Hi	Overweight	Metal	Metal
Lo	Underweight	Xray	X-ray
LoLo	Very underweight	Ext1	Ext1
Weighing Error	Weighing Error	Ext2	Ext2

Outputting Weighing History data stored on the device

The procedure to output Weighing History data stored on the indicator to the USB flash drive is as follows.
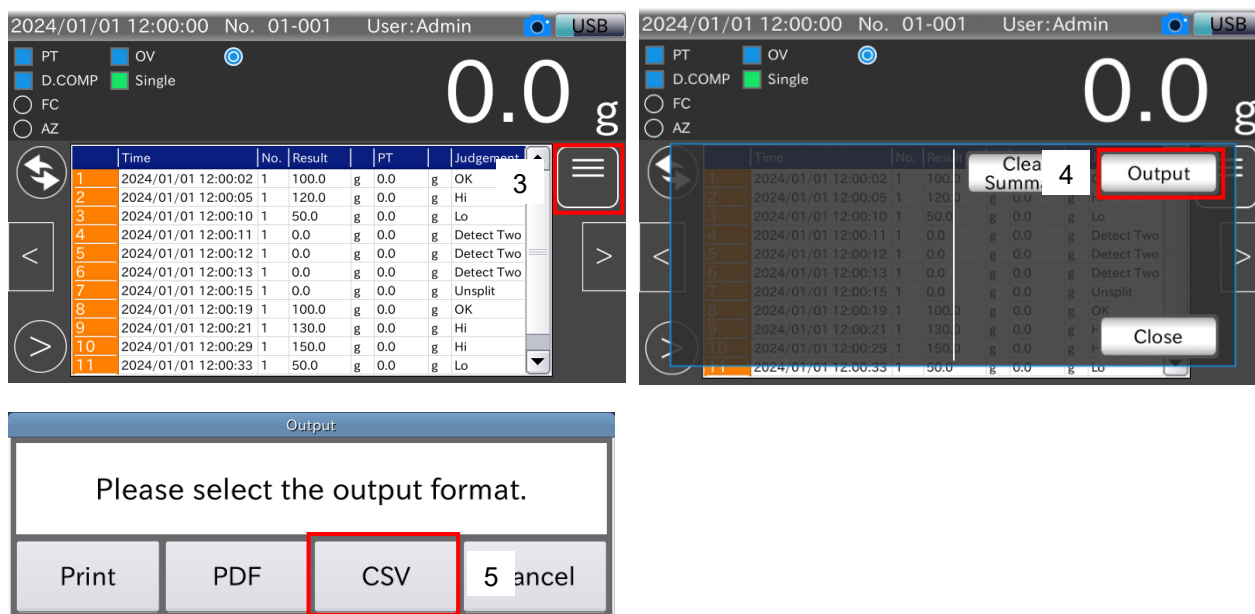
Fig. 85 Weighing History data output

1. While referring to the procedure in "3.1.1. Connecting a USB Flash Drive to the Indicator", connect a USB flash drive to the USB port located in the Display Unit.

2. Make sure that the USB flash drive is connected, and then display Weighing History in the Information Display area of the Weighing screen.

3. Touch the Menu button to display the Weighing History Menu panel.

4. Touch the Output button.

5. Touch the CSV button in the dialog box for selecting the output format.
   A CSV file for the Weighing History data stored on the indicator is created on the USB flash drive.

The save location and name of the output file are as follows.
- Save location : USB flash drive root directory¥Model name_WeighingResult
- File name : File creation date_File creation time_Weighing_Results.csv
- "Model name" is "AD4412CW" or "AD4413CW".

Caution
❑ The product number is not included in the Weighing History data stored on the indicator.
❑ The product number is not output to the CSV file.

Note
A file is created for each output.

The following is a file example for the Weighing History data output to the USB flash drive:

"Date (year / month / day), time (hours:minutes:seconds), No., weighing result, preset tare value, judgement result"

Fig. 86 shows an example of the Weighing History file output to a USB flash drive.

Refer to Table 30, the correspondence table for judgement results output to the file.

Fig. 86 Weighing History output example

7.1.2. PDF File Output of Weighing History/Histogram/Control Chart/Summary

This section describes how to output a PDF file of the Weighing History / Histogram / Control Chart / Summary data to a USB flash drive.

Note

For the contents of Weighing History, Histogram, Control Chart, and Summary data output to a USB flash drive, refer to "7.2.2. PDF Output Example of Weighing History" through "7.2.5. PDF/Print Output Example of Summary".

Outputting a Weighing History PDF file

The procedure to output a PDF of the Weighing History that is stored on the checkweigher to a USB flash drive is as follows.
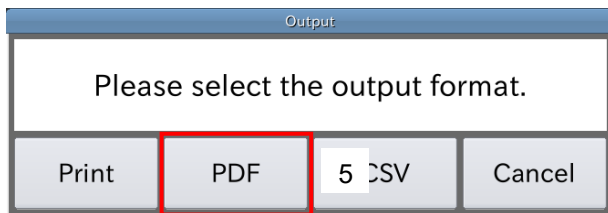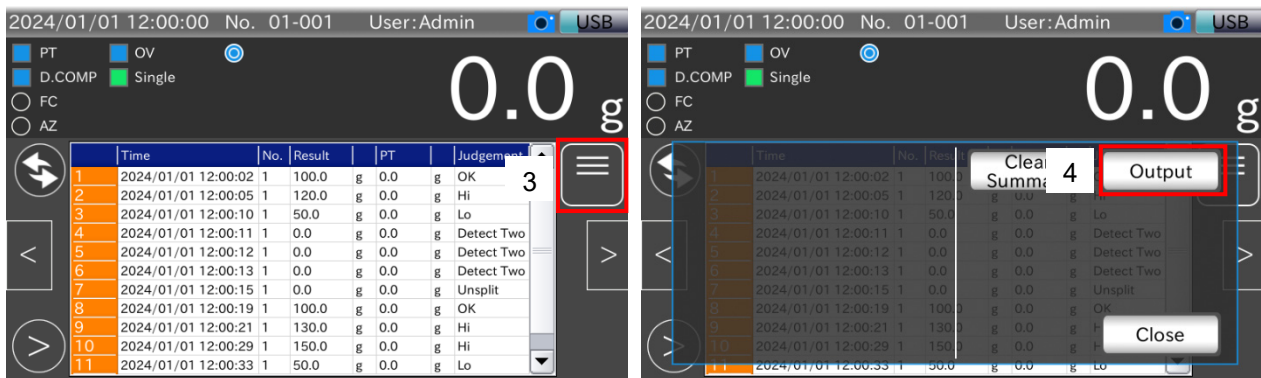
Fig. 87 Weighing History PDF file output

1. While referring to the procedure in "3.1.1. Connecting a USB Flash Drive to the Indicator", connect a USB flash drive to the USB port located on the Display Unit.

2. Make sure that the USB flash drive is connected, and then display Weighing History in the Information Display area of the Weighing screen.

3. Touch the Menu button to display the Weighing History Menu panel.

4. Touch the Output button.

5. Touch the PDF button in the dialog box for selecting the output format.
   A PDF file for the Weighing History data stored on the indicator is created on the USB flash drive.

The save location and name of the output file are as follows.
- Save location : USB flash drive root directory¥Model name_WeighingResults
- File name : File creation date_File creation time_Weighing_Results.pdf
- "Model name" is "AD4412CW" or "AD4413CW".

Caution
- ❏ The product number is not included in the Weighing History data stored on the indicator.
- ❏ The product number is not output to the PDF file.

Outputting a Histogram/Control Chart/Summary PDF file

The procedure to output a PDF file of the Histogram/Control Chart/Summary data to a USB flash drive is as follows.

Note

This section describes the PDF output procedure using Summary data as an example.
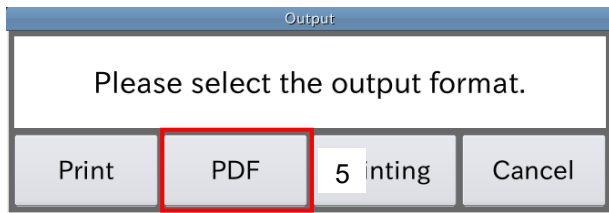
Fig. 88 Histogram / Control Chart / Summary PDF file output

1. While referring to the procedure in "3.1.1. Connecting a USB Flash Drive to the Indicator", connect a USB flash drive to the USB port located on the Display Unit.

2. Make sure that the USB flash drive is connected, and then display the data to output in the Information Display area of the Weighing screen.

3. Touch the Menu button to display the Menu panel.

4. Touch the Output button.

5. Touch the PDF button in the dialog box for selecting the output format.
   A PDF file is created on the USB flash drive.

The save location and name of the output file are as follows.
- Save location : USB flash drive root directory¥Model name_PDF_folder creation date
- File name : Output data name_read product number_file creation date_file creation time.pdf
- "Model name" is "AD4412CW" or "AD4413CW".

Note

The output data name of the output file name contains "StatisticalResult" (Summary), "Histogram" (Histogram), or "ControlChart" (Control Chart).

7.2.   Printing to PostScript Printer

The indicator can print Histogram, Control Chart, and Summary data to a PostScript compatible printer.

Caution

> A PostScript compatible printer is required for printing.

Note

> For connection to a printer, refer to "9.3. Connecting a PostScript Printer".

7.2.1.   How to Print to a PostScript Printer

The procedure for printing Histogram, Control Chart, and Summary data to a printer is as follows.

Note

> This section describes the printing procedure to a printer using a Summary result as an example.
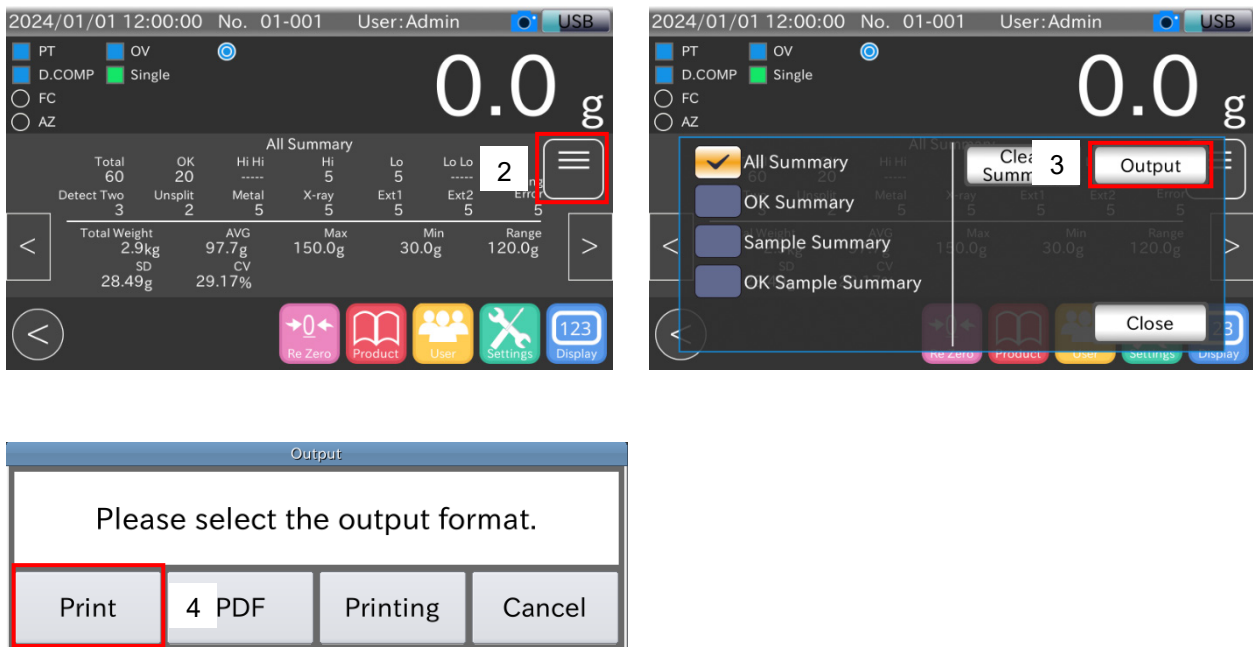
Fig. 89 PostScript printer output

1.   Display the data to output on the Information Display area of the Weighing screen.

2.   Touch the Menu button to display the Menu panel.

3.   Touch the Output button.

4.   Touch the Print button to print the data.

7.2.2.　PDF Output Example of Weighing History

See the example below for Weighing History PDF output.

Fig. 90 Weighing History PDF output

Table 31 Weighing History PDF output example: part names and descriptions

No.	Name	Description
1	Output date and time	The date and time when the PDF was output is recorded.
2	Model Name / Serial No. / Identification Name	Model name, serial number, and identification name are specified.
3	Weighing History	Judgement time, weighing results, preset tare values, and judgement results are listed.
4	Page number	The page number / total number of pages is shown.

7.2.3.　PDF／Print Output Example of Histogram

See the example below for Histogram PDF / print output.

The number of reject stages is 3   The number of reject stages is 5
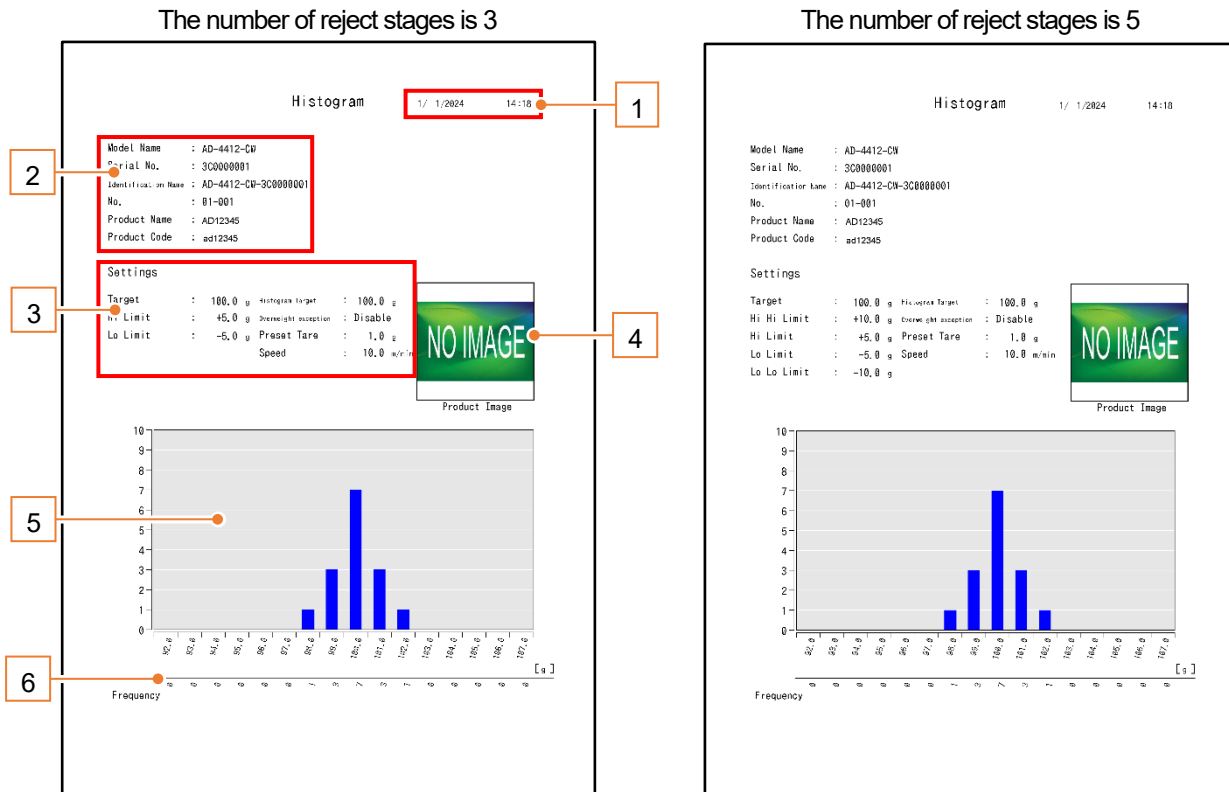
Fig. 91 Histogram PDF / print output

Table 32 Histogram PDF / print output example: part names and descriptions

No.	Name	Description
1	Output date and time	The date and time when the PDF / print was output is recorded.
2	Model Name / Serial No. / Identification Name / No. / Product Name / Product Code	The model name, serial number, identification name, product number, product name, and product code are specified.
3	Contents	The target, Hi Hi limit, Hi limit, Lo limit, Lo Lo limit, histogram target, overweight exception, preset tare value, throughput, and processing speed are specified.
4	Product image	The registered product image is shown.
5	Frequency distribution	A graph of frequencies by section width is shown.
6	Frequency	Frequencies by section width are shown.

7.2.4.   PDF／Print Output Example of Control Chart

See the example below for Control Chart PDF／print output.

The number of reject stages is 3   The number of reject stages is 5
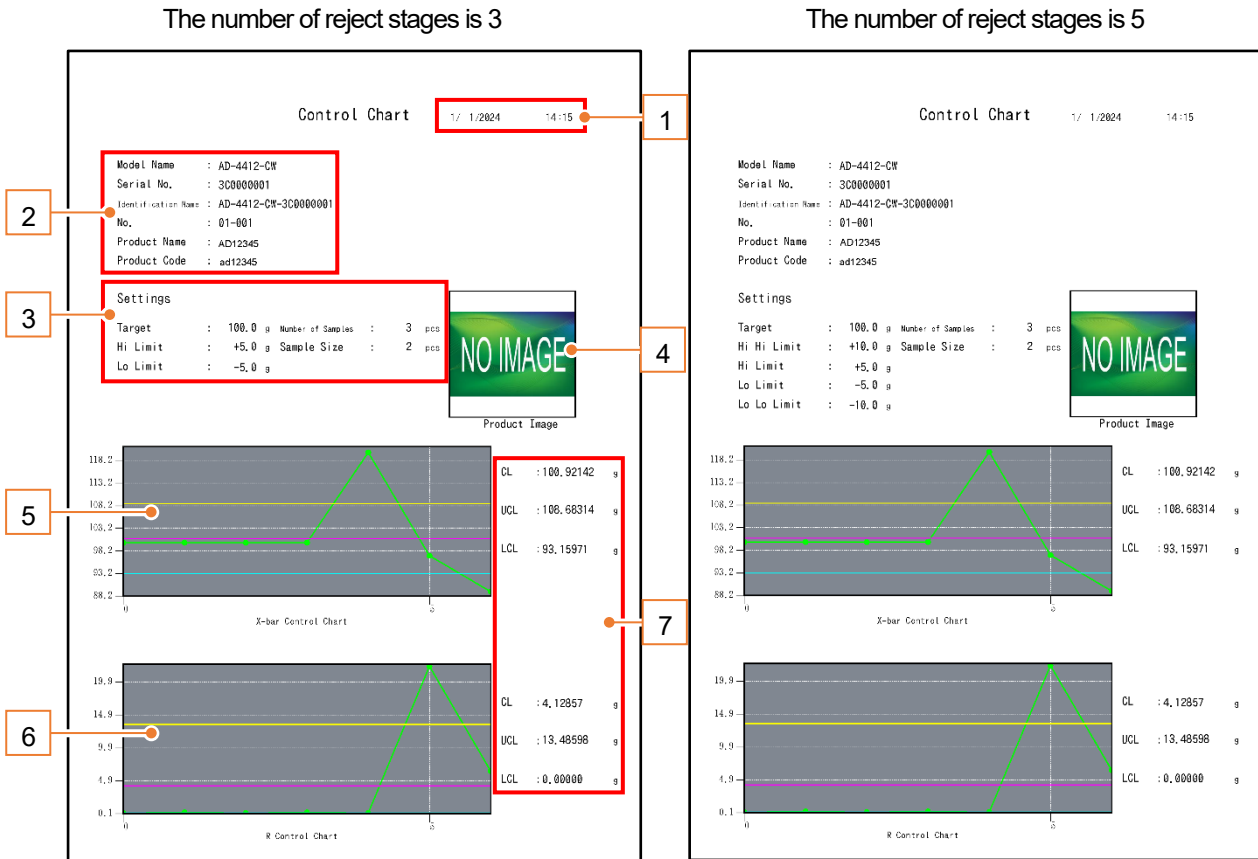
Fig. 92 Control Chart PDF / print output

Table 33 Control Chart PDF / print output example: part names and descriptions

No.	Name	Description
1	Output date and time	The date and time when the PDF / print was output is recorded.
2	Model Name / Serial No. / Identification Name / Product Number / Product Name / Product Code	The model name, serial number, identification name, product number, product name, and product code are specified.
3	Contents	The target, Hi Hi limit, Hi limit, Lo limit, Lo Lo limit, Number of Samples-CC, and Sample Size are specified.
4	Product image	The registered product image is shown.
5	$\bar{X}$ Control Chart	The X-bar control chart is shown.
6	R Control Chart	The R control chart is shown.
7	Control Chart data	The center line, UCL, and LCL values of the X-bar and R control charts are shown.

7.2.5. PDF / Print Output Example of Summary

See the example below for Summary PDF / print output.

The number of reject stages is 3

The number of reject stages is 5

Fig. 93 Summary PDF / print output

Table 34 Summary PDF / print output example: part names and descriptions

No.	Name	Description
1	Output date and time	The date and time when the PDF / print was output is recorded.
2	Model Name / Serial No. / Identification Name / No. / Product Name / Product Code	The model name, serial number, identification name, product number, product name, and product code are specified.
3	Contents	The target, Hi Hi limit, Hi limit, Lo limit, Lo Lo limit, weight tracking target value, weight tracking Hi limit, weight tracking Lo limit, overweight exception, preset tare value, and processing speed are specified.
4	Product image	The registered product image is shown.
5	Summary data	The table of summary data is shown.
6	Statistical data	The table of statistical data is shown.

7.3. Printing to Dump Printer

The indicator can print the weighing result, summary, and statistical data to a dump printer, such as the AD-8127 (set to dump printing mode).

To connect the indicator with a dump printer, use the RS-232C/RS-485 interface.

The RS-232C interface settings can be configured on the RS-232C Settings screen.

The RS-485 interface settings can be configured on the RS-485 Settings screen.

The description in this section assumes that the RS-232C interface is used.

Caution

❑ A single line in print format has 24 characters.
Use a printer supporting at least 24 characters per line.

❑ The Weighing Result, All Summary, OK Summary, Sample Summary, and OK Sample Summary data can be printed.
The Histogram and Control Chart data cannot be printed.

❑ The Weighing Result data with small throughput (not exceeding about 100 pcs/min) can be printed.

❑ The line terminator is <CR> <LF> fixed.

Note

❑ For the location of the serial interface terminal block, refer to "2.2. Rear Panel".

❑ The indicator can transmit data also to devices such as PCs via serial connection.
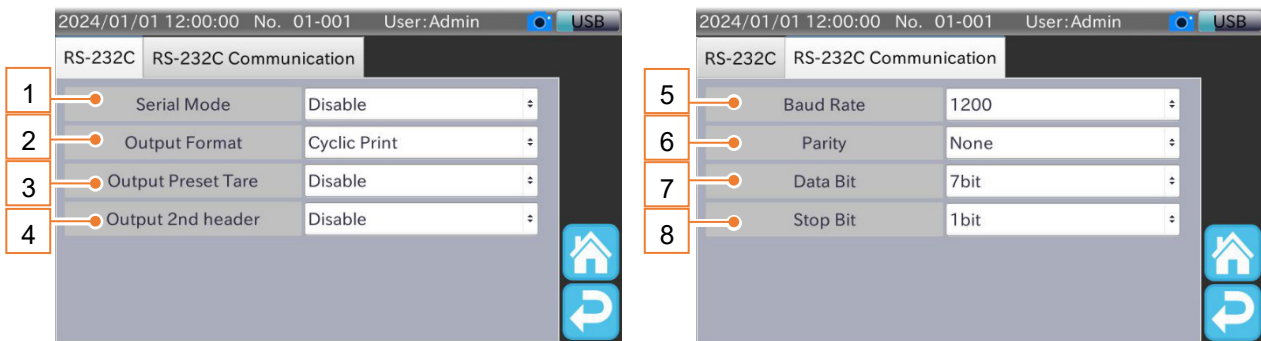
Fig. 94 RS-232C Settings screen

Table 35 RS-232C Settings screen: part names and descriptions

No.	Name	Description
1	Serial Mode	Select RS-232C Communication Mode.
2	Output Format	Select the data output format when Serial Mode is set to Weighing Result.
3	Output Preset Tare	Select additional output of the preset tare value when data is output while the serial mode is stream or weighing result is given.
4	Output 2nd header	Select additional output of the 2nd header to the data when the output format is Cyclic Print or A&D Standard Format.
5	Baud rate	Select the baud rate for RS-232C communication.
6	Parity	Select the parity for RS-232C communication.
7	Data Bit	Select the data bit for RS-232C communication.
8	Stop Bit	Select the stop bit for RS-232C communication.

The procedure for setting the RS-232C interface is as follows.

Fig. 95 RS-232C settings

1. Touch the Settings icon ⚒ on the Weighing screen to display the Common Settings screen.

2. Touch the Connect tab of the Common Settings screen and touch the RS-232C button. RS-232C Settings screen is displayed.

3. Set the baud rate, parity, data bit, and stop bit according to the settings of the dump printer.

7.3.1. How to Print the Weighing Result

The procedure for printing the weighing result to a dump printer is as follows.
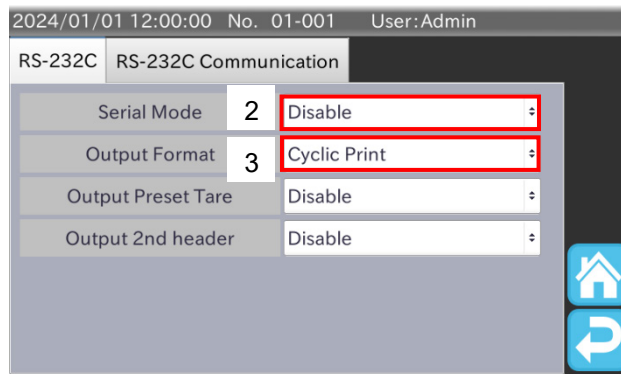
Fig. 96 Serial Mode and Output Format settings

1. Display the RS-232C Settings screen.

2. Set Serial Mode to "Weighing Result & Summary".

3. Set Output Format to "Cyclic Print", "A&D Standard Format" or "Weight Value Format".

4. Start weighing.
   During weighing, the weighing result is output to the dump printer and printed.

Note

For details on the output format, refer to "10.27.2. Output Format".

Print examples:

```
          PT,+0001234.5  g
00001,OK,ST,NT,+1234.5  g
          PT,+0001234.5  g
00002,HI,ST,NT,+1234.5  g
00003,LO,ST,GS,+1234.5  g
00004,DT,**,**********
00005,DT,**,**********
00006,US,**,**********
```

Cyclic Print

```
          PT,+0001234.5g
 ST,NT,+0001234.5g
 ST,GS,+0001234.5g
 ST,GS,+0001234.5g
          PT,+0001234.5g
 ST,NT,+0001234.5g
```

A&D Standard Format

```
 PT,+0001234.5  g
    +0001234.5  g
    +0001234.5  g
    +0001234.5  g
 PT,+0001234.5  g
    +0001234.5  g
```

Weight Value Format

Fig. 97 Weighing result print examples

7.3.2. How to Print the Summary Data

The procedure for printing the Summary to the dump printer is as follows.

Note

   This section describes the procedure for printing to a dump printer using the Summary data as an example.
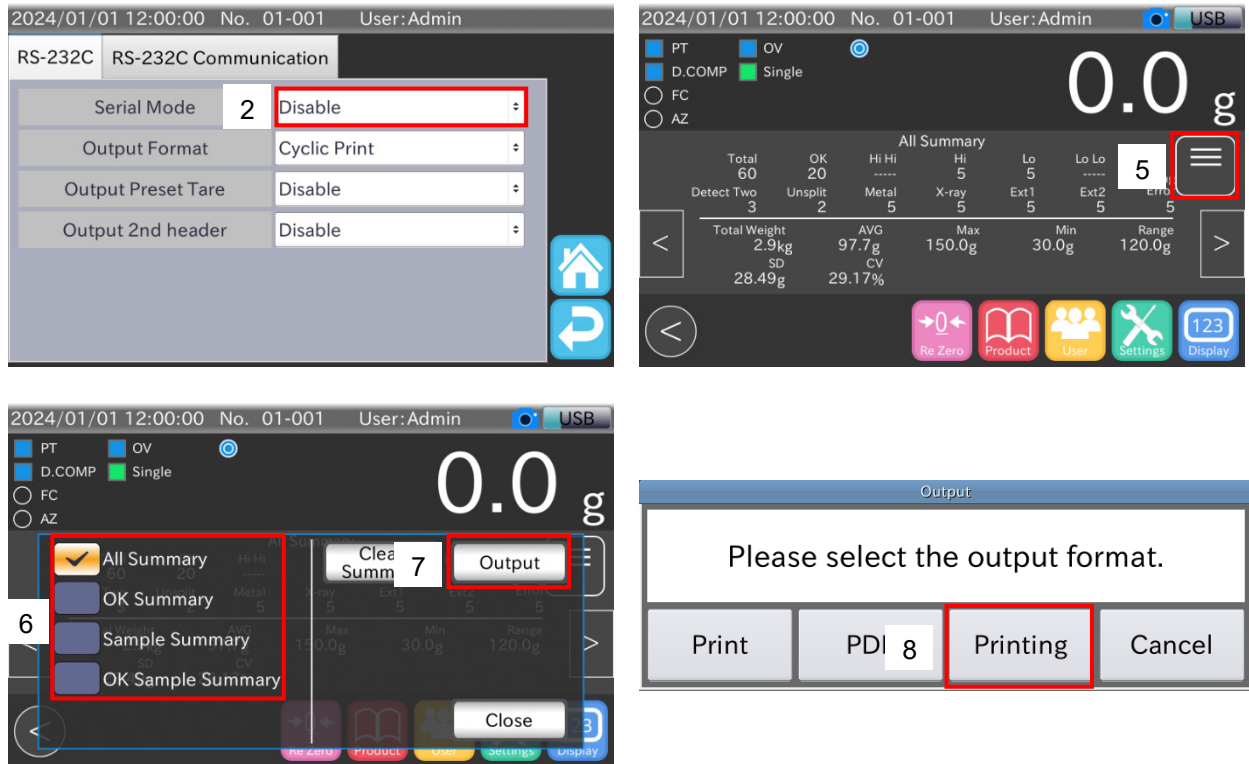
Fig. 98 Summary printing

1. Display the RS-232C Settings screen.

2. Set Serial Mode to "Summary" or "Weighing Result & Summary".

3. Touch the Home icon   to return to the Weighing screen.

4. Display the Summary data in the Information Display area of the Weighing screen.

5. Touch the Menu button to display the Menu panel.

6. Touch the Summary result to select for printing.

7. Touch the Output button.

8. Touch the Printing button in the dialog box for selecting the output format.
The selected Summary result is printed by the dump printer.

Printing examples:

All Summary

<div style="display:flex">
<div>

The number of reject stages is 3

```
******** TOTAL *********
Date:          2024/01/01
Time:            12:00:01

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

SETTINGS

No.                  01-001
Name
0123456789abcde

Code
0123456789abcdefghij

Target:        +012.3456  g
Hi Limit:      +012.3456  g
Lo Limit:      +012.3456  g
Reject Over:      Disable
PT:            +01.2345  g
Belt Speed:    30.0m/min

SUMMARY DATA

Total:            12345  pcs
OK:               12345  pcs
Hi:               12345  pcs
Lo:               12345  pcs
Detect Two:       12345  pcs
Unsplit:          12345  pcs
Metal:            12345  pcs
X-ray:            12345  pcs
Ext 1:            12345  pcs
Ext 2:            12345  pcs
Weighing Error: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  %
```

</div>
<div>

The number of reject stages is 5

```
******** TOTAL *********
Date:          2024/01/01
Time:            12:00:01

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

SETTINGS

No.                  01-001
Name
0123456789abcde

Code
0123456789abcdefghij

Target:        +012.3456  g
Hi Limit:      +012.3456  g
Lo Limit:      +012.3456  g
Reject Over:      Disable
PT:            +01.2345  g
Belt Speed:    30.0m/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
Metal:            12345  pcs
X-ray:            12345  pcs
Ext 1:            12345  pcs
Ext 2:            12345  pcs
Weighing Error: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  %
```

</div>
</div>

OK Summary

The number of reject stages is 3

```
******** OK *********
Date:          2024/01/01
Time:            12:00:01

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

SETTINGS

No.                  01-001
Name
0123456789abcde

Code
0123456789abcdefghij

Target:       +012.3456  g
Hi Limit:     +012.3456  g
Lo Limit:     +012.3456  g
Reject Over:      Disable
PT:           +01.2345  g
Belt Speed:     30.0m/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 number of reject stages is 5

```
******** OK *********
Date:          2024/01/01
Time:            12:00:01

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

SETTINGS

No.                  01-001
Name
0123456789abcde

Code
0123456789abcdefghij

Target:       +012.3456  g
Hi Hi Limit:  +012.3456  g
Hi Limit:     +012.3456  g
Lo Limit:     +012.3456  g
Lo Lo Limit:  +012.3456  g
Reject Over:      Disable
PT:           +01.2345  g
Belt Speed:     30.0m/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

The number of reject stages is 3

```
*** Number of Samples **
Date:          2024/01/01
Time:            12:00:01

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

SETTINGS

No.                   01-001
Name
0123456789abcde

Code
0123456789abcdefghij

Target:        +012.3456  g
Hi Limit:      +012.3456  g
Lo Limit:      +012.3456  g
Reject Over:       Disable
PT:            +01.2345  g
Belt Speed:     30.0m/min

SUMMARY DATA

Total:            12345  pcs
OK:               12345  pcs
Hi:               12345  pcs
Lo:               12345  pcs
Detect Two:       12345  pcs
Unsplit:          12345  pcs
Metal:            12345  pcs
X-ray:            12345  pcs
Ext 1:            12345  pcs
Ext 2:            12345  pcs
Weighing Error: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 number of reject stages is 5

```
*** Number of Samples **
Date:          2024/01/01
Time:            12:00:01

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

SETTINGS

No.                   01-001
Name
0123456789abcde

Code
0123456789abcdefghij

Target:        +012.3456  g
Hi Hi Limit:   +012.3456  g
Hi Limit:      +012.3456  g
Lo Limit:      +012.3456  g
Lo Lo Limit:   +012.3456  g
Reject Over:       Disable
PT:            +01.2345  g
Belt Speed:     30.0m/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
Metal:            12345  pcs
X-ray:            12345  pcs
Ext 1:            12345  pcs
Ext 2:            12345  pcs
Weighing Error: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  %
```

OK Sample Summary

The number of reject stages is 3

```
＊ OK(Number of Samples)＊
Date:              2024/01/01
Time:                12:00:01

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

SETTINGS

No.                     01-001
Name
0123456789abcde

Code
0123456789abcdefghij

Target:        +012.3456  g
Hi Limit:      +012.3456  g
Lo Limit:      +012.3456  g
Reject Over:        Disable
Tare Value:      +01.2345  g
Belt Speed:       30.0m/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 number of reject stages is 5

```
＊ OK(Number of Samples)＊
Date:              2024/01/01
Time:                12:00:01

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

SETTINGS

No.                     01-001
Name
0123456789abcde

Code
0123456789abcdefghij

Target:        +012.3456  g
Hi Hi Limit:   +012.3456  g
Hi Limit:      +012.3456  g
Lo Limit:      +012.3456  g
Lo Lo Limit:   +012.3456  g
Reject Over:        Disable
Tare Value:      +01.2345  g
Belt Speed:       30.0m/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. Various Histories Check

This chapter describes how to check the various histories stored on the indicator.

To check the histories, a user at the "Quality Manager" level or higher is required.

This chapter assumes that the user has logged in at the "Quality Manager" or higher user level.

8.1. How to Check the Various Histories

This section describes how to check various histories.
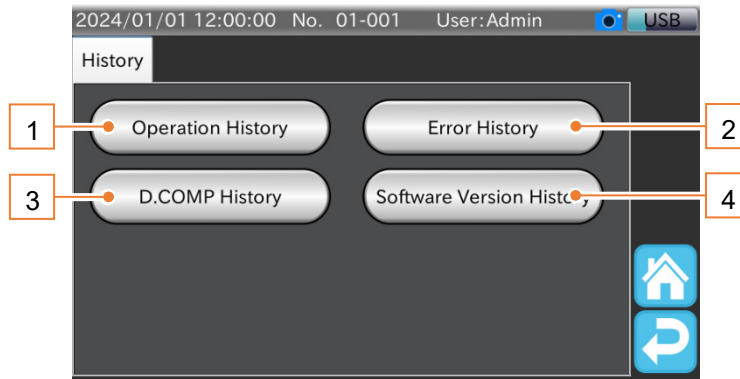
Fig. 99 History screen

Table 36 History screen: part names and descriptions

No.	Name	Description
1	Operation History button	Displays the Operation History screen.
2	Error History button	Displays the Error History screen.
3	D.COMP History button	Displays the D.COMP History screen.
4	Software Version History button	Displays the Software Version History screen.

The procedure for checking the histories is as follows.

Fig. 100 Displaying the History screen

1. Touch the Settings icon 🛠 on the Weighing screen to display the Common Settings screen.

2. Touch the System2 tab of the Common Settings screen and touch the History button. The History screen is displayed.

3. Touch the desired button on the History screen to check the history.

8.2. Operation History

On the Operation History screen, the indicator's operation history, such as turning on the power, logging in to the user, and changing the setting values, can be checked.
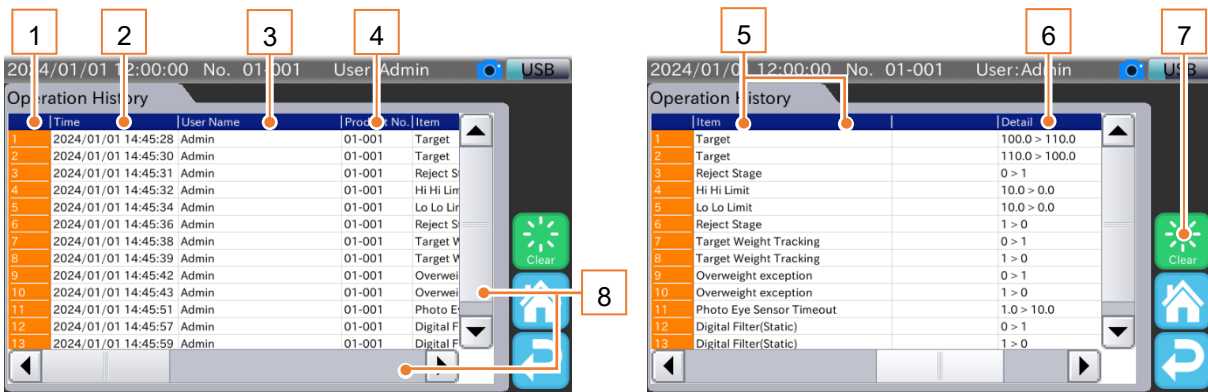
Fig. 101 Operation History screen

Table 37 Operation History screen: part names and descriptions

No.	Name	Description
1	Operation History	The history of the indicator's operations is displayed. Up to 100 operation instances in the past can be displayed.
2	Time	Displays the date and time at the time of operation.
3	User Name	Displays the login user name at the time of operation.
4	Product No.	When the product settings were changed, the number of the changed product is displayed. For other operations, the number of product read at the time of operation is displayed.
5	Item	Displays the details of the operation.
6	Detail	When the setting value was changed, the setting values before and after the change is displayed.
7	Clear icon	Deletes the Operation History data.
8	Scroll bar	Moves the viewing area of the Operation History screen. The vertical scroll bar appears when the number of history instances reaches a certain number.

Caution

Settings related to dynamic compensation are stored in D.COMP History.

8.3. Error History

On the Error History screen, the time and contents of errors and warnings that occurred on the indicator can be checked.
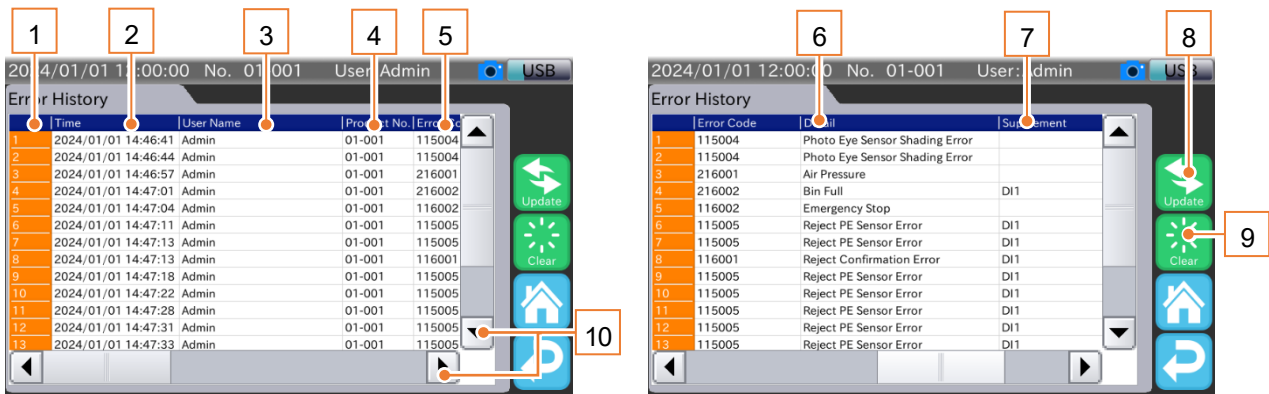
Fig. 102 Error History screen

Table 38 Error History screen: part names and descriptions

No.	Name	Description
1	Error History	The history of the indicator's errors is displayed. Up to 100 error instances in the past can be displayed.
2	Time	Displays the date and time when the error occurred.
3	User Name	Displays the login user name when the error occurred.
4	Product No.	Displays the number of the product being read when the error occurred.
5	Error Code	Displays the error code of the error that occurred.
6	Detail	Displays the content of the error that occurred.
7	Supplement	Displays supplementary information about the error.
8	Update icon	Updates the Error History data.
9	Clear icon	Deletes the Error History data.
10	Scroll bar	Moves the viewing area of the Error History screen. The vertical scroll bar appears when the number of history instances reaches a certain number.

Note

For the details of the errors and warnings, refer to "13.2. Indicator Error".

8.4. D.COMP History

On the D.COMP History screen, the change history of settings related to Dynamic compensation for all registered products can be checked.
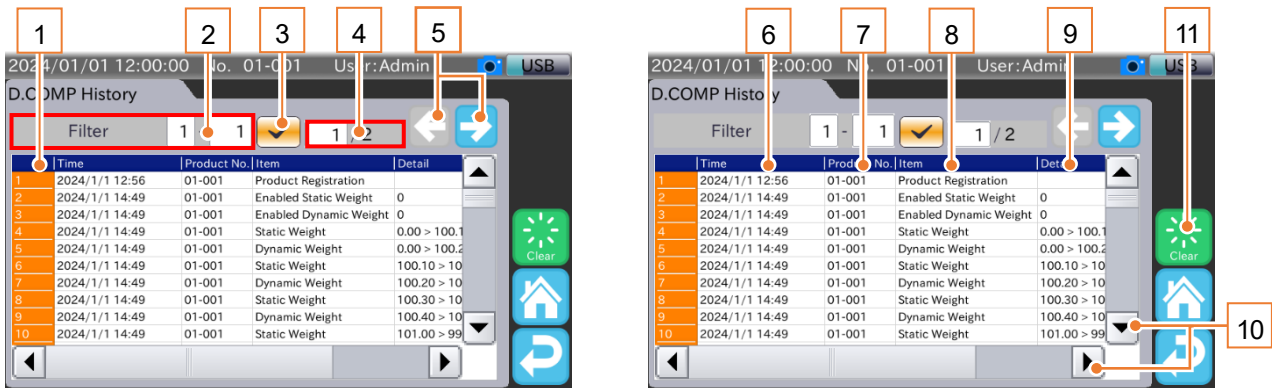
Fig. 103 D.COMP History screen

Table 39 D.COMP History screen: part names and descriptions

No.	Name	Description
1	D.COMP History	The history related to dynamic compensation is displayed. Up to 100 instances can be displayed on one page.
2	Filter	Enter the product number to search for its history. Displays the history of the product number entered when Filter is enabled.
3	Checkbox	Enables Filter when the checkbox is turned on ✓.
4	Page number input field	Enter the number of the page to display. The number to the right of the field is the number of existing pages.
5	Right Arrow / Left Arrow icon	Use the Right Arrow / Left Arrow icon to switch pages.
6	Time	Displays the date and time when the settings were changed.
7	Product No.	Displays the number of the product whose settings were changed.
8	Item	Displays the details of a change.
9	Detail	Displays the setting values before and after the change.
10	Scroll bar	Moves the viewing area of the D.COMP History display. The scroll bar appears when the number of history instances reaches a certain number.
11	Clear	Deletes the D.COMP History data.

Note

D.COMP History also stores the following operations:

❑ Product registration
❑ Product deletion
❑ Restoration
❑ Factory settings restoration
❑ Initialization

8.5.   Software Version History

On the Software Version History screen, the software update history of the indicator can be checked.
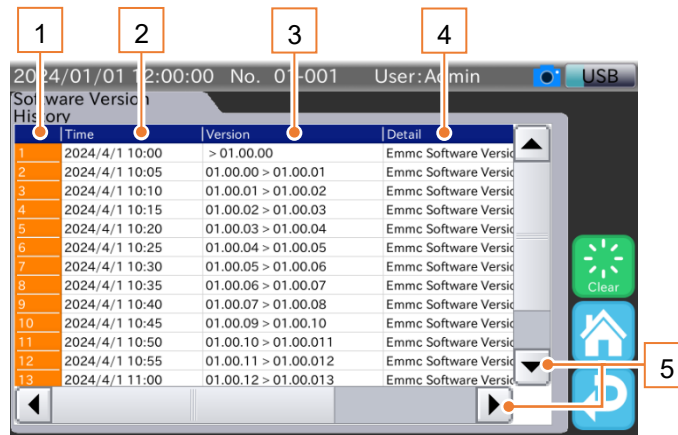
Fig. 104 Software Version History screen

Table 40 Software Version History screen: part names and descriptions

No.	Name	Description
1	Software Version History	The software update history is displayed.
2	Time	Displays the software update date and time.
3	Version	Displays the software version before and after the update.
4	Detail	Displays the details of the updated software.
5	Scroll bar	Moves the viewing area of the Software Version History display. The vertical scroll bar appears when the number of history instances reaches a certain number.

9. External Devices

This chapter describes each external device's operation and connection, and signal monitoring with the indicator.

9.1. How to Format a USB Flash Drive

This section describes how to format a USB flash drive.

To format a USB flash drive, a user at the "Quality Manager" level or higher is required.

This section assumes that the user has logged in at the "Quality Manager" or higher user level.
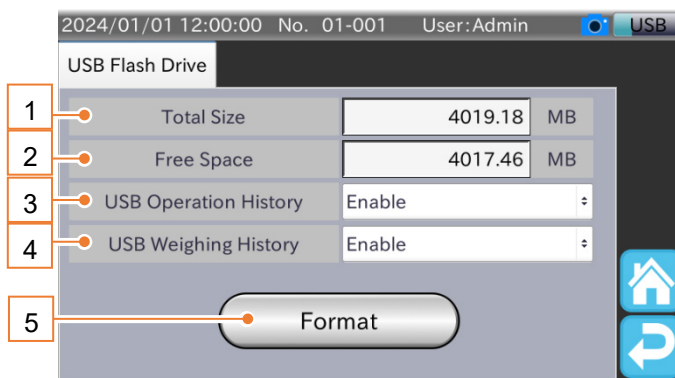
Fig. 105 USB Flash Drive screen

Table 41 USB Flash Drive screen: part names and descriptions

No.	Name	Description
1	Total Size	Displays the maximum capacity of the USB flash drive.
2	Free Space	Displays the free space on the USB flash drive.
3	USB Operation History	Selects the output behavior of Operation History.
4	USB Weighing History	Selects the output behavior of Weighing History.
5	Format button	Formats the USB flash drive.

Caution

❑ Formatting the USB flash drive deletes all the data stored in the USB flash drive.

❑ Deleted data cannot be restored. When formatting the USB flash drive, back up the necessary data to a PC and the like beforehand.

❑ If the USB flash drive cannot be connected correctly, format the flash drive on the indicator.

Note

On how to remove the USB flash drive, refer to "3.1.2. Removing a USB Flash Drive from the Indicator".

The procedure for formatting a USB flash drive is as follows.
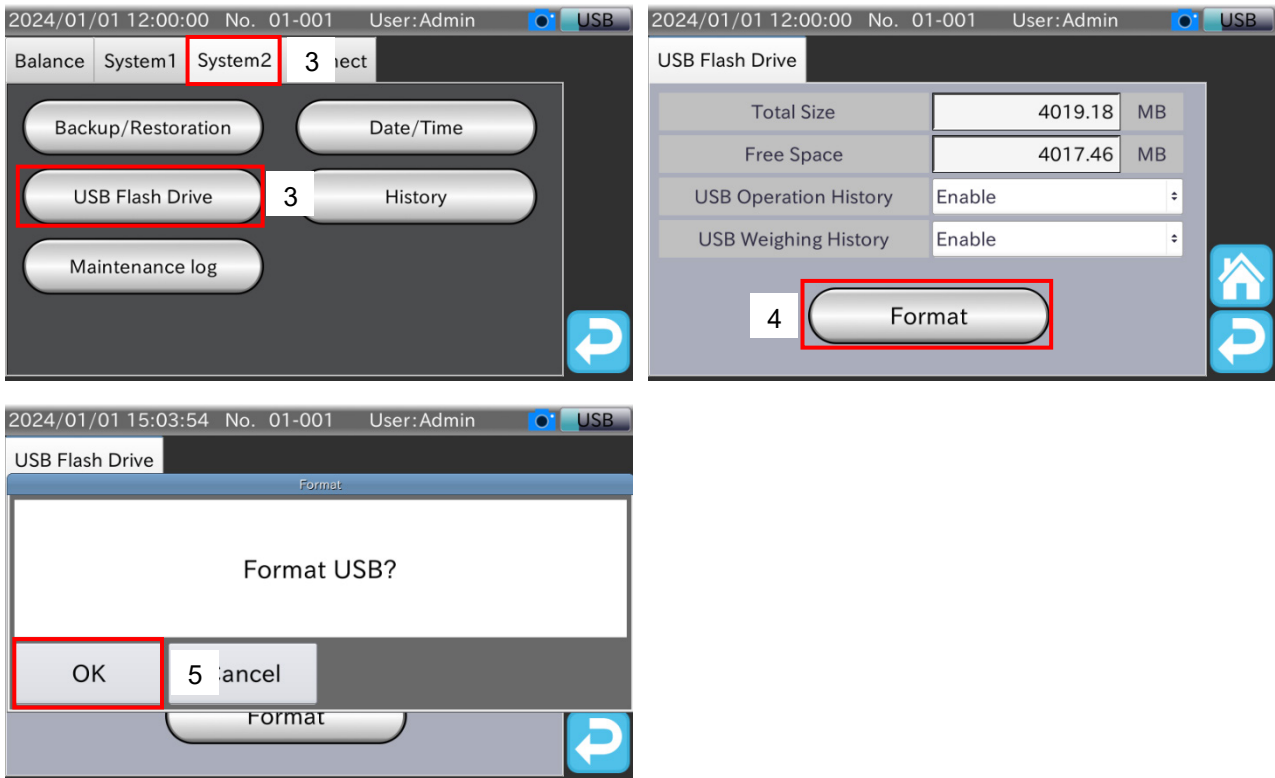
Fig. 106 Formatting a USB flash drive

1. Connect the USB flash drive to the USB port located on the Display Unit according to the procedure in "3.1.1. Connecting a USB Flash Drive to the Indicator".

2. Touch the Settings icon ![icon] on the Weighing screen to display the Common Settings screen.

3. Touch the System2 tab of the Common Settings screen, and then touch the USB Flash Drive button.
   The USB Flash Drive screen is displayed.

4. Touch the Format button to display the dialog box for confirmation of USB flash drive formatting.

5. To perform formatting, touch the OK button.
   Formatting is in progress while the dialog box is displayed, and the dialog box disappears when formatting is complete.

6. Touch the Return ![icon] icon to return to the Common Settings screen.

9.2.   How to Connect to the Network (LAN)

The indicator is equipped with both a wired LAN interface and a wireless LAN interface.
The procedure for each connection is as follows.

9.2.1.   Wired LAN Connection

A wired LAN connection is used for Modbus communication with Modbus/TCP.
Connect a commercially available LAN cable to the LAN connector of the control box and the LAN connector of the Modbus master or the Ethernet hub connected to the master.

Note

❑ To perform Modbus communication with Modbus/TCP, the wired LAN settings of the indicator must be configured.

❑ For the wired LAN settings of the indicator, refer to "6.3. LAN Settings".

9.2.2. Wireless LAN Connection

A wireless LAN connection is used for remote monitoring.

Prepare a device equipped with wireless LAN, such as a PC, tablet, or smartphone, select the SSID displayed as "model name-xxxxxxxxx" from the network list, and then enter the password.

- "Model name" is "AD4412CW" or "AD4413CW".
- "xxxxxxxxx" is the serial number of the indicator.

Caution

The default password is "12345678". Please change the default password when using it for the first time.

Note

- ❑ To perform remote monitoring, the wireless LAN settings of the indicator must be configured.
- ❑ For the details on the wireless LAN settings of the indicator, including changing the password, refer to "6.3. LAN Settings".
- ❑ The serial number is on the side of the control box.
- ❑ For details on the remote monitor, refer to "9.4. Remote Monitoring".

9.3. Connecting a PostScript Printer

PostScript-compatible printers are used to print graphs and summary data.

Connect the indicator with a PostScript printer via a wired LAN.

Caution

- ❑ Please consult your network administrator when connecting the indicator to a network (LAN).
- ❑ For the IP address setting of the printer to be used, refer to the printer's instruction manual.
- ❑ When using the printer on a wired LAN, configure the indicator's wired LAN settings and the printer IP address.

Note

- ❑ For the wired LAN settings of the indicator, refer to "6.3. LAN Settings".
- ❑ For the printer connection and IP address, refer to "10.30.1. Printer IP Address".

Connect a commercially available LAN cable to the LAN connector of the control box and the LAN connector of the printer or the Ethernet hub connected to the printer.

9.4. Remote Monitoring

The function of remote monitoring via wireless LAN allows you to view the indicator's product information and statistical data in real-time on an external device equipped with wireless LAN.

Connect the indicator with your device, and then enter the indicator's set wireless LAN IP address in the address bar of a browser on the device to display the monitoring screen.

Input example: http://xxx.xxx.xxx.xxx (set wireless LAN IP address)
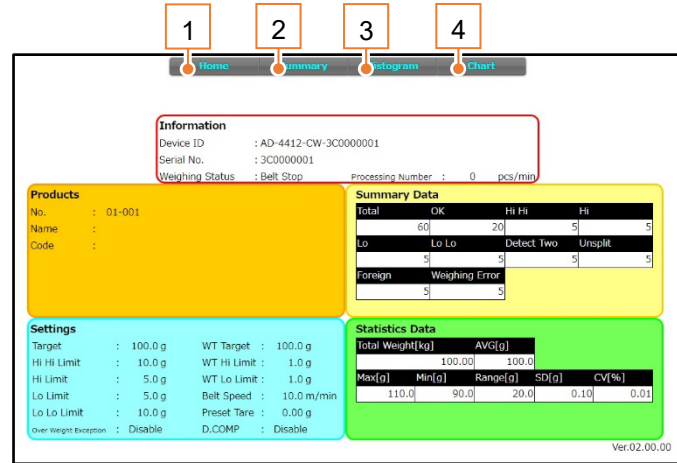
Fig. 107 Remote monitoring (the Home screen)

Table 42 Remote monitoring (the Home screen): part names and descriptions

No.	Name	Description
1	Home button	Displays the Home screen. On the Home screen, product information, product settings, summary data, and statistical data are displayed.
2	Summary button	Displays the Summary data screen.
3	Histogram button	Displays the Histogram screen.
4	Control Chart button	Displays the Control Chart screen.

Caution

❑ It is not advisable to use wireless LAN for continuous connection and monitoring because communication may become unstable depending on the installation environment.

❑ The function has been confirmed to run in the following browsers: Microsoft Edge, Google Chrome, Mozilla Firefox, and Safari. (It cannot run properly in Internet Explorer.)

❑ For the wireless LAN settings of the device to be used, refer to the device's instruction manual.

Note

❑ By using the browser's print function, you can output the Summary, Histogram, and Control Chart data to a PDF file or a printer (the output format is different from the indicator's output format).

❑ For the wireless LAN settings, refer to "6.3. LAN Settings".

❑ For the wireless LAN connection method, refer to "9.2.2. Wireless LAN Connection".

9.5.   Remote Connection

9.5.1.   Connection to a PC

Connect to the LAN connector for the indicator and the one for your PC.
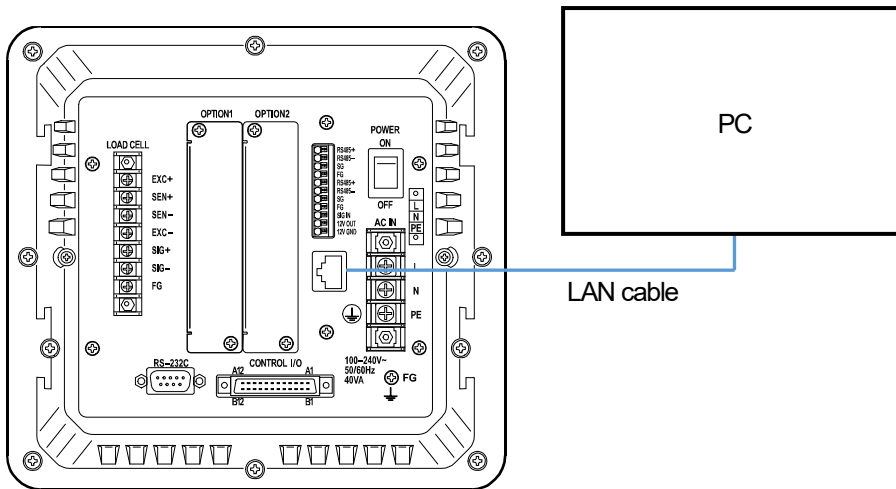
The procedure for remote connection is as follows.
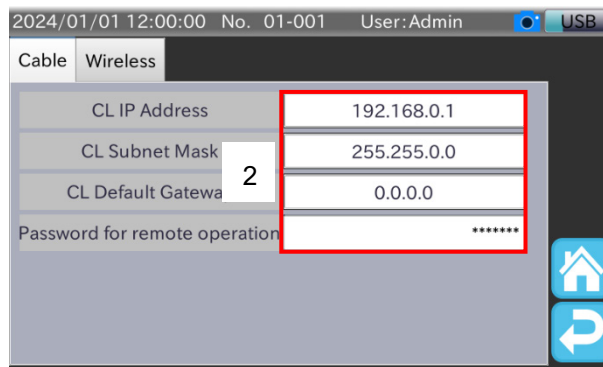
Fig. 108 LAN screen

1. Display the Cable settings screen.
2. Set the CL IP Address, CL Subnet Mask, CL Default Gateway, and Password for remote operation.

Caution

❑ Make sure to reboot the indicator after changing the LAN screen.
❑ The default password for remote operation is "AND_IS".
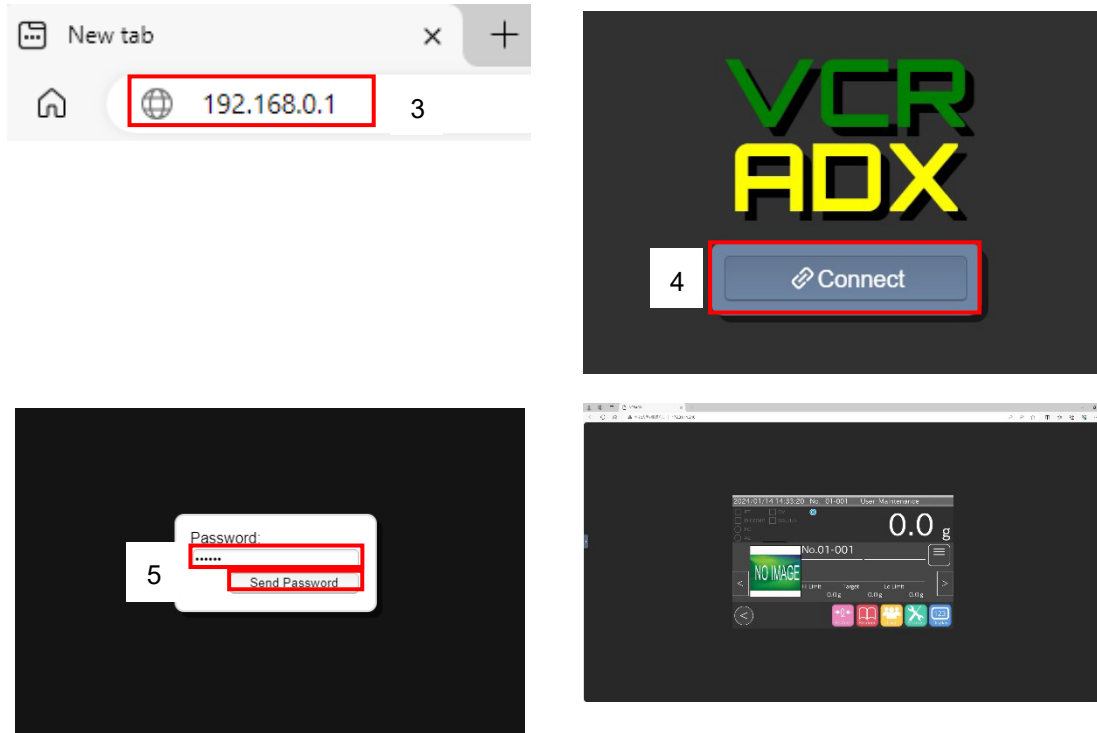
Fig. 109 Connect

3. Enter the IP address set in step 2 in the address bar on the browser.
4. Check that the password entry screen appears, and then press the Connect button.
5. Enter the password for remote operation in the Password field, and then press the Send Password button.

Note

- ❑ The browsers with which operation has been verified are "Google Chrome Ver.121.0.6167.140" and "Microsoft Edge Ver.121.0.2277.98".
- ❑ Google Chrome is a trademark of Google LLC. Microsoft Edge is a trademark of Microsoft Corporation in the United States.

9.6. Switching Products by Serial Communication

The product read on the indicator can be switched by using serial communication via RS-232C/RS-485 interface.

The product code received from an external device such as a barcode reader or PLC is searched from the group selected on the product selection panel to switch weighing products.

The description in this section assumes that the RS-232C interface is used.

The procedure for switching products by serial communication is as follows.

Caution

- ❏ You must have registered the products to be switched.
- ❏ You must have selected the group to be switched in the product selection panel.
- ❏ To the data from external devices, <CR> (carriage return, 0x0D) must be added after the product code.
- ❏ It is not possible to switch to the other groups.
- ❏ If the product code has no match, product switching is not performed.
- ❏ Data of the Read Product Code during product switching is ignored.
- ❏ The product code must be set with single-byte alphanumerical characters and single-byte symbols.

Note

- ❏ To display the RS-232C/RS-485 Settings screen, refer to "7.3. Printing to Dump Printer".
- ❏ To display the Product Settings screen, refer to "5.6. Product Selection and Change to the Cetection Settings".
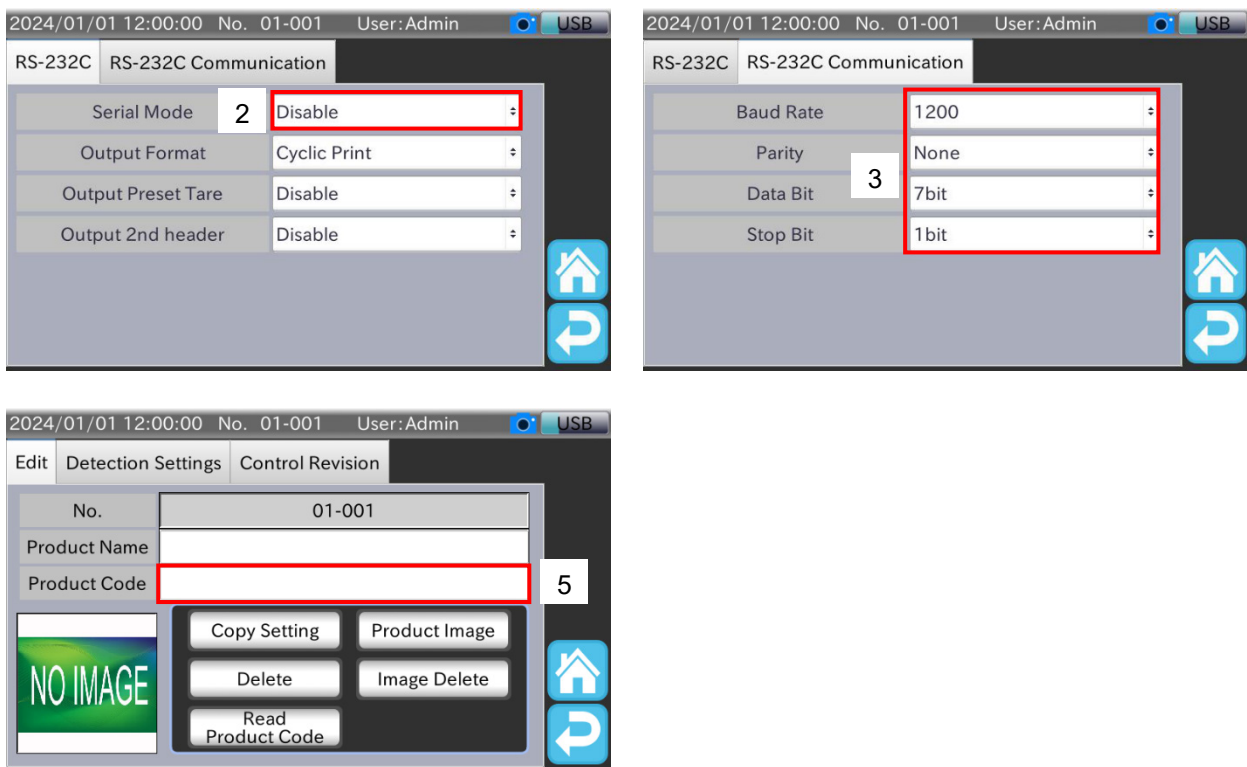
Fig. 110 Product Change settings

1. Display the RS-232C Settings screen.

2. Set the Serial Mode to "Product Change".

3. Set the baud rate, parity, data bit, and stop bit according to the external device to be connected.

4. Display the Product Settings screen for the product to be switched.

5. Enter the data to receive from the external device in the Product Code input field.

6. In the same group, perform Step 5 for all products necessary for product switching.

7. The product will be switched when the product code + <CR> is received from the external device while the group to be switched is selected in the product selection panel.

9.7.   Reading Product Code by Serial Communication

The product code can be set on the indicator by using serial communication via RS−232C / RS−485 interface. A product code received from an external device such as a barcode reader or PLC can be set.
The description in this section assumes that the RS−232C interface is used.
The procedure for reading the product code by serial communication is as follows.

Caution
❑   You must have set RS-232C or RS-485 serial mode for product switching.
❑   <CR> (carriage return, 0x0D) must be added to data from external devices after the product code.
❑   The product code must be set with single−byte alphanumerical characters and single−byte symbols.

Note
❑   For the settings of RS−232C, refer to "10.27. RS−232C".
❑   For the settings of RS−485, refer to "10.28. RS−485".
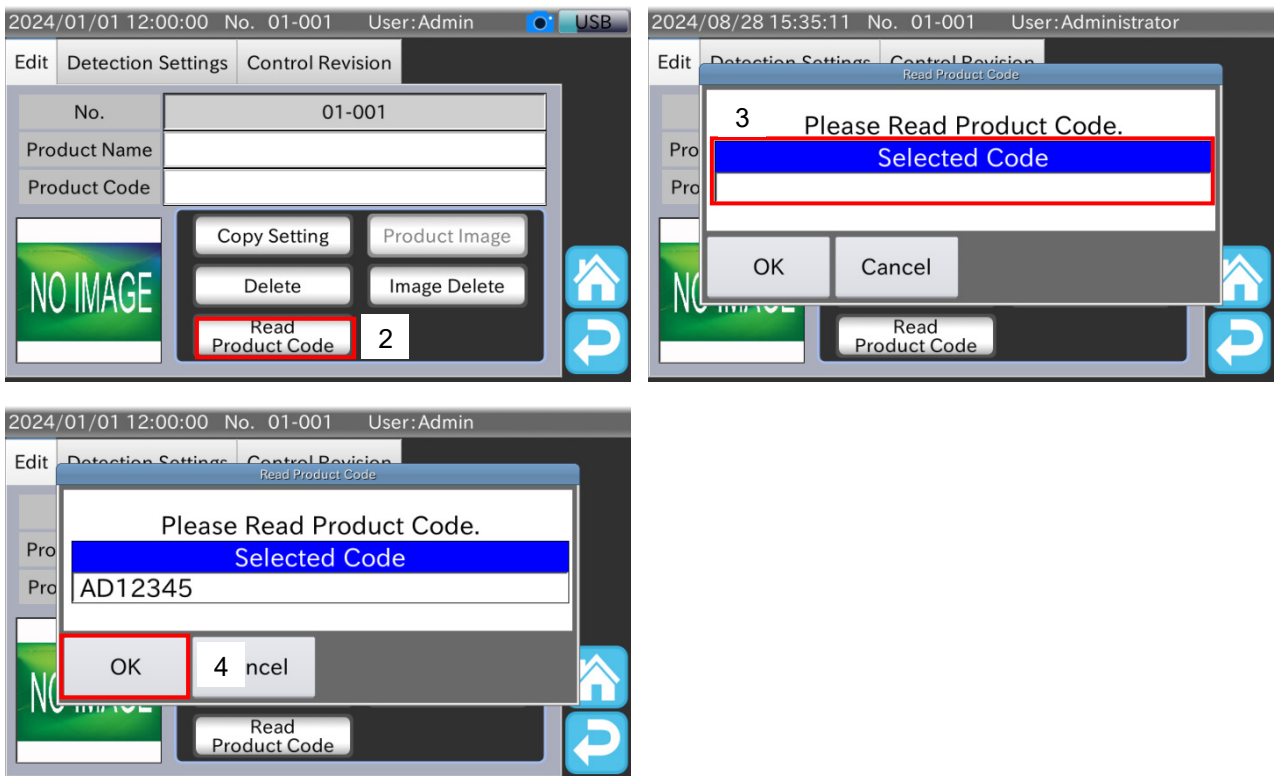
Fig. 111 Reading Product Code

1. Display the Edit tab in the Product Settings screen.

2. Touch the Read Product Code button to display Read Product Code.

3. Read the product code + <CR> you want to set from the external devices.

4. Touch the OK button to set the product code that was read.

9.8. Product No. Interlocking

The indicator can communicate serially with an A&D metal detector AD–4976 by Product No. Interlocking.
Product No. Interlocking is a function that links the product read by the indicator and the product read by the AD–4976 using the RS–232C interface or the RS–485 interface for connecting the inspection machine.
Product No. Interlocking works when the device is started and when the read product is switched.

Caution

❑ It is necessary to register the products to be switched in advance.
❑ The switching of the read product must be done on the indicator.

Note

❑ For details on the RS–232C interface, refer to "12.2. RS-232C".
❑ For details on the RS–485 interface, refer to "12.3. RS-485".
❑ On how to set the AD–4976, refer to the instruction manual for the AD-4976.

9.8.1. Connection with AD-4976

Connecting the RS–232C interface
Connect the RS–232 interface for connecting the inspection machine of the indicator and the RS–232C/RS–485 interface of the AD–4976 I/O board as shown in Fig. 112.

AD–4412-CW/AD–4413-CW		AD–4976
RS–232C interface		RS–232C/485 interface
TxD	—————	RxD
RxD	—————	TxD
SG	—————	GND
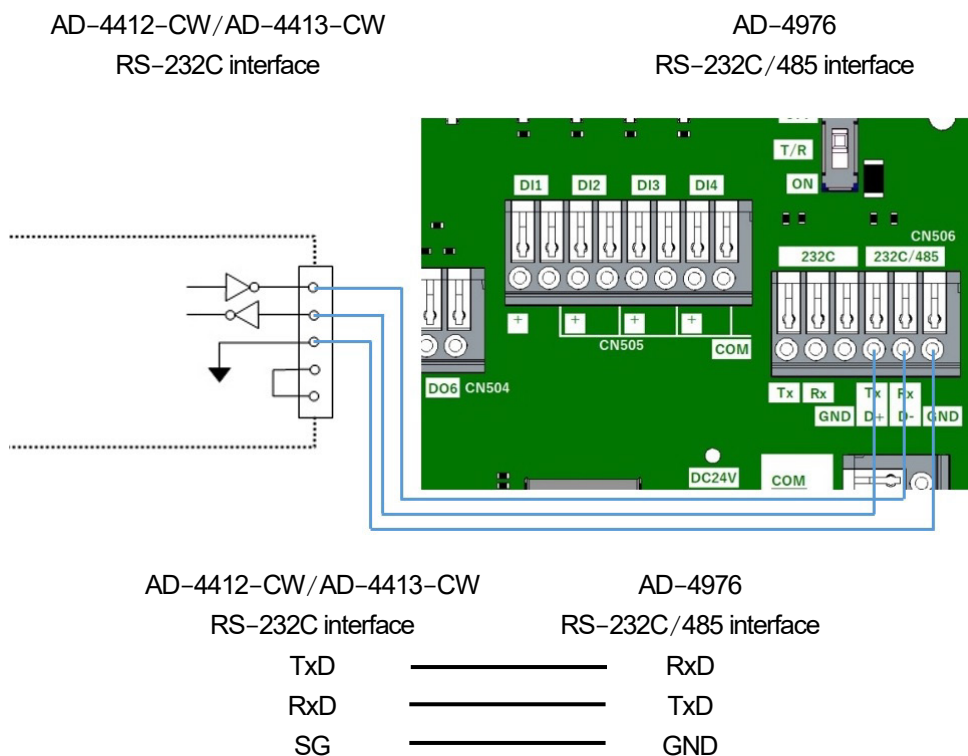
Fig. 112 RS–232 Product No. Interlocking wiring diagram

Connecting the RS-485

Connect the RS-485 interface for connecting the inspection machine of the indicator and the RS-232C/RS-485 interface of the AD-4976 I/O board as shown in Fig. 113.

AD-4412-CW/AD-4413-CW
RS-485 interface

AD-4976
RS-232C/485 interface

AD-4412-CW/AD-4413-CW RS-485 interface		AD-4976 RS-232C/485 interface
RS-485+	————————	D+
RS-485-	————————	D-
SG	————————	GND
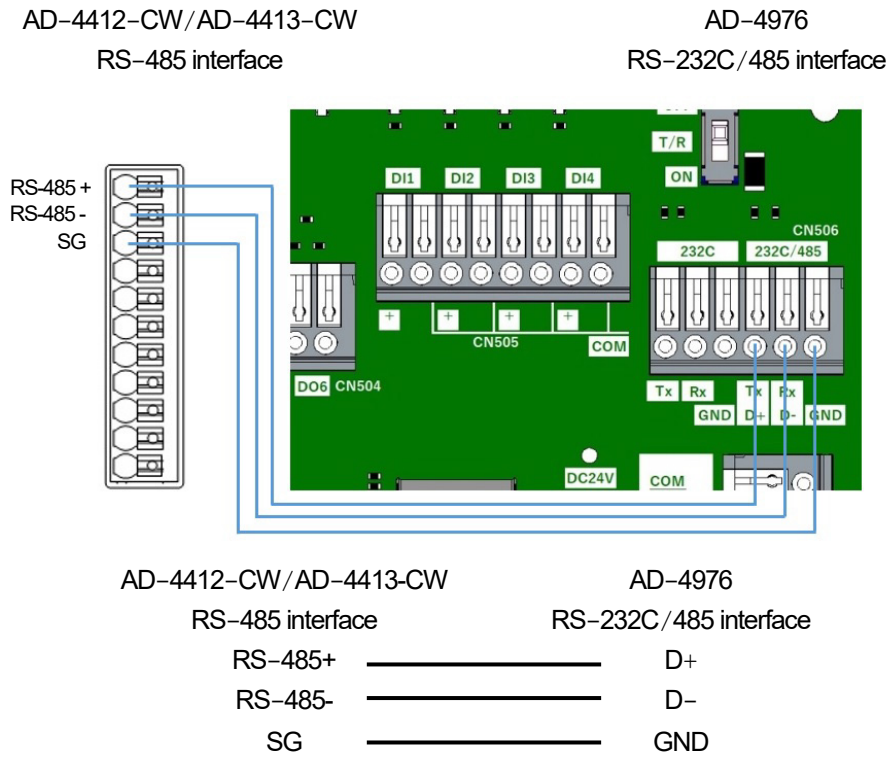
Fig. 113 RS-485 Product No. Interlocking wiring diagram

AD-4412-CW AD-4413-CW

9.8.2. Product No. Interlocking Setting

The setting procedure for Product No. Interlocking using the RS-232C is as follows.
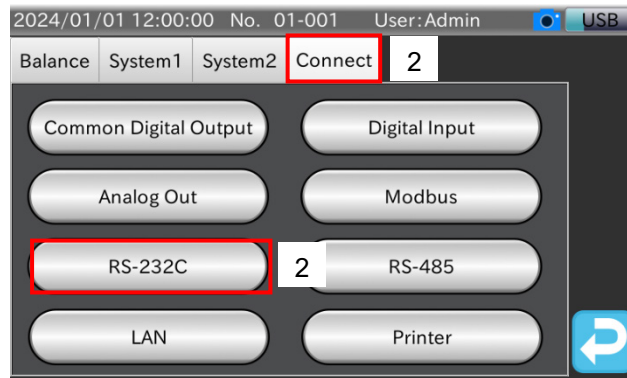
Fig. 114 RS-232 setting screen display procedure

1. Touch the "Settings" icon on the "Weighing screen" to display the "Common screen".

2. Touch the "Connect" tab on the "Common setting screen" and touch the "RS-232C" button to display the "RS-232C setting screen".

Fig. 115 Product No. Interlocking setting procedure

3. Set the serial mode to "Product No. Interlocking".
4. Set the baud rate, parity, data bits and stop bits to match those of the AD-4976.
5. Switching the product read by the indicator will switch the product read by the AD-4976.

The setting procedure for Product No. Interlocking using the RS-232C is as follows.
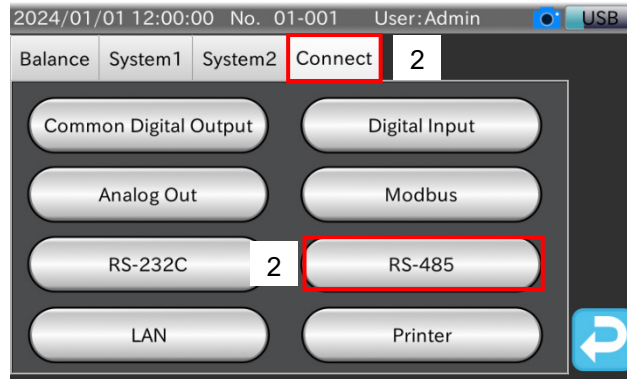
Fig. 116 RS-485 setting screen display procedure

1. Touch the "Settings" icon on the "Weighing screen" to display the "Common screen".

2. Touch the "Connect" tab on the "Common setting screen" and touch the "RS-485" button to display the "RS-485 setting screen".

Fig. 117 Product No. Interlocking setting procedure

3. Set the serial mode to "Product No. Interlocking".
4. Set the baud rate, parity, data bits and stop bits to match those of the AD-4976.
5. Switching the product read by the indicator will switch the product read by the AD-4976.

AD-4412-CW   AD-4413-CW

9.9. AD-4412-CW and External Device Signal Monitoring

This section describes how to monitor the indicator and external device signals.

The monitoring data is displayed in the Information Display area of the Weighing screen.

In the Information Display area, the following signals can be monitored:

- Digital input signal status check (DI Indicator)
- State of the indicator output signals (DO Monitor)
- RS-232C / RS-485 communication data (Serial Monitor)
- Reject Confirmation signal status check (Reject Confirmation Indicator)
- Analog board output status check (Analog Board Monitor)

Caution

- ❑ If the digital input / output is shorter than the screen update frequency, it may not be displayed correctly.
- ❑ Digital inputs are displayed in real-time, unaffected by delays and chattering.

Note

To change the display of the Information Display area, refer to "5.4.3. Switching the Contents of the Information Display Area".
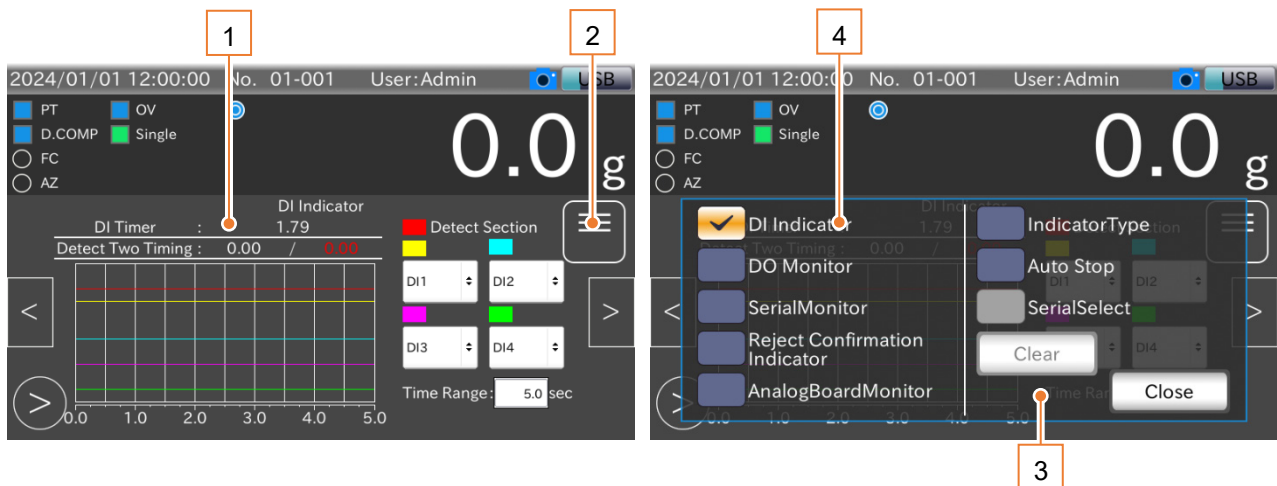
Fig. 118 Monitoring screen

Table 43 Monitoring screen: part names and descriptions

No.	Name	Description
1	Monitoring area	Displays the monitoring status. The display switches according to the mode selected in Monitoring Mode Selection.
2	Menu button	Displays the Monitoring Menu panel.
3	Monitor Menu panel	Touching the Menu button on the Monitoring screen displays this panel.
4	Monitoring Mode Selection	Selects a monitoring mode. Selects a mode according to the interface to monitor.

To display the monitoring screen you want to view, touch it to select from Monitoring Mode Selection.

9.9.1. DI Indicator

The DI Indicator function checks the signal input from external devices to the indicator.
It allows you to check the input status and adjust the weighing status and signal timing of the indicator.
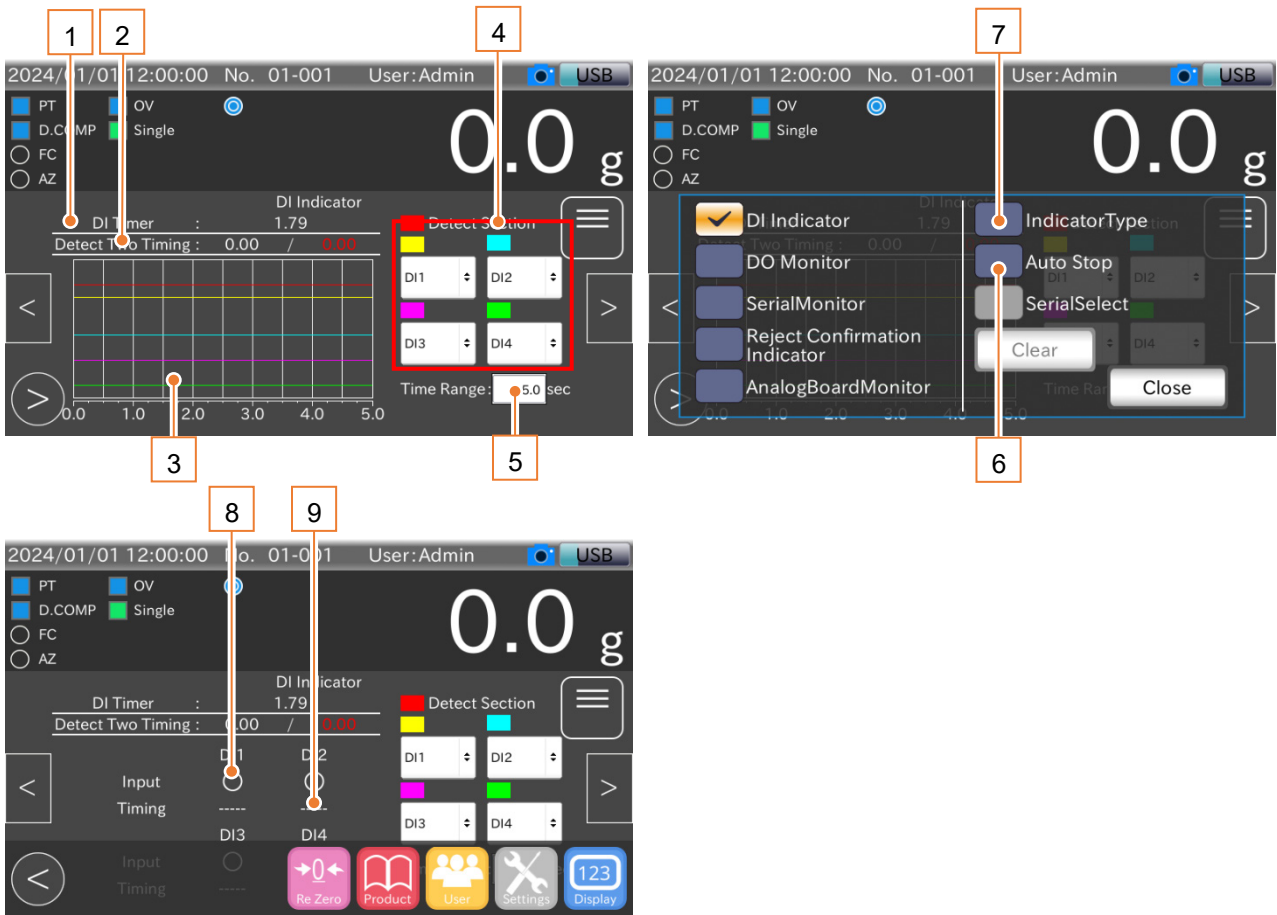
Fig. 119 DI Indicator screen

Table 44 DI Indicator screen: part names and descriptions

No.	Name	Description
1	DI Timer	Displays the time when input from the digital input can be accepted.
2	Detect Two Timing	Displays the time from the photo eye sensor light blocking timing of the previous weighing to the light blocking timing of the next weighing. For judgements other than Detect Two, the time (white text) in the left column of Detect Two Timing is updated. For Detect Two judgement, the time (in red) in the right column of Detect Two Timing is updated.
3	Indicator Graph	Graphs the input status of the selected digital input.
4	DI Selection	Selects the digital input to display in Indicator Graph.
5	Time Range	Sets the display range for Indicator Graph.
6	Auto Stop	Stops displaying Indicator Graph automatically.
7	Indicator type	Changes the indicator type.

No.	Name	Description
8	Digital input status	Displays the status of digital input in real time without being affected by delay time. ● ○ (Circle with white outline and filling): Input is on. ● ● (Circle with white outline and black filling): Input is off.
9	Digital input timing	Display the time from digital input reception starts till the signal to digital input is input. The input timing is reflected being affected by delay time. The input timing is shown in black letters when the signal is input in the digital input reception time. The input timing is shown in red letters when the signal is input other than in the digital input reception time.

9.9.2.　DO Monitor

The DO Monitor is a function for checking the digital output status.
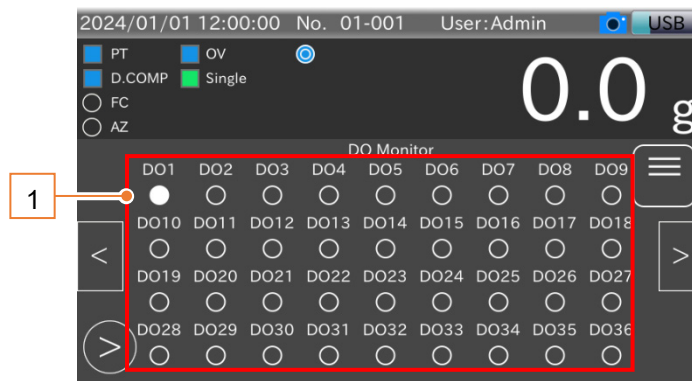
Fig. 120 DO Monitor screen

Table 45 DO Monitor screen: part names and descriptions

No.	Name	Description
1	DO Output Status	Displays the status of digital outputs. ● ○ (Circle with white outline and filling): Output is on. ● ● (Circle with white outline and black filling): Output is off.

9.9.3.   Serial Monitor

The serial monitor is a function for checking the transmission data and reception data of RS-232C / RS-485.
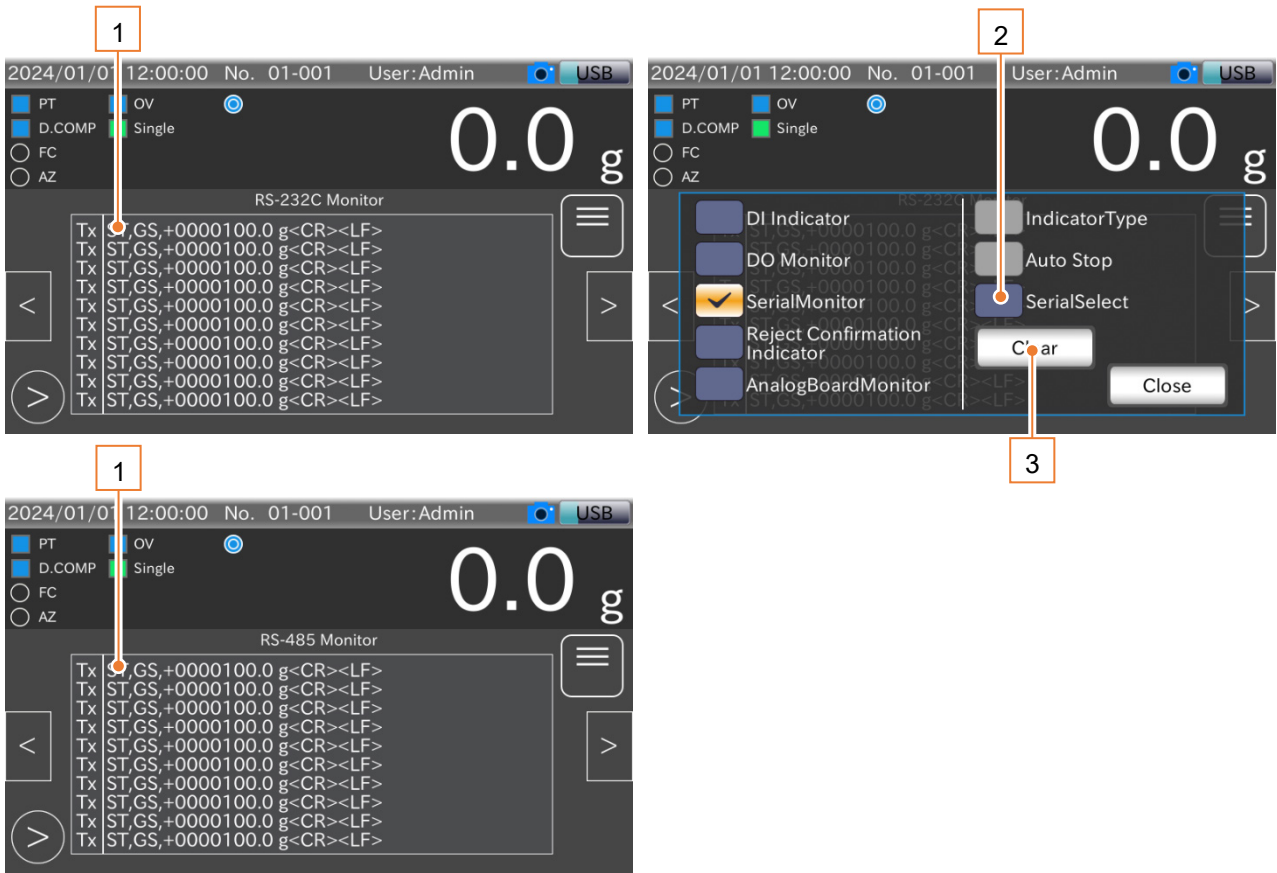
Fig. 121 Dedicated Serial Port Monitor screen

Table 46 RS-232C / RS-485 Monitor screen: part name and descriptions

No.	Name	Description
1	Send / Receive Data Display area	Displays send and receive data in chronological order. The data identification characters are displayed to the left of the display area. ● Identification characters for received data: Rx ● Identification characters for transmitted data: Tx
2	SerialSelect	Selects the RS-232C / RS-485 monitor.
3	Clear button	Clears the contents in the Send / Receive Data Display area.

Caution

> If Modbus / RTU is specified, the RS-485 monitor is disabled.

Note

❑ When <CR> (carriage return, 0x0D) is received and the next data is other than <LF> (line feed, 0x0A), a line feed occurs.

❑ When <LF> is received, a line break occurs.

❑ When data is sent while receiving data, a line break occurs.

❑ Control codes other than <CR> and <LF> are displayed as <.> (period, 0x2E).

9.9.4.　　Reject Confirmation Indicator

Reject Confirmation Indicator is a function to check the weighing status of the indicator and the digital input signal to which Reject Confirmation is assigned.
It allows you to adjust the timing of the Detect Section that performs Reject Confirmation and the digital input signal.
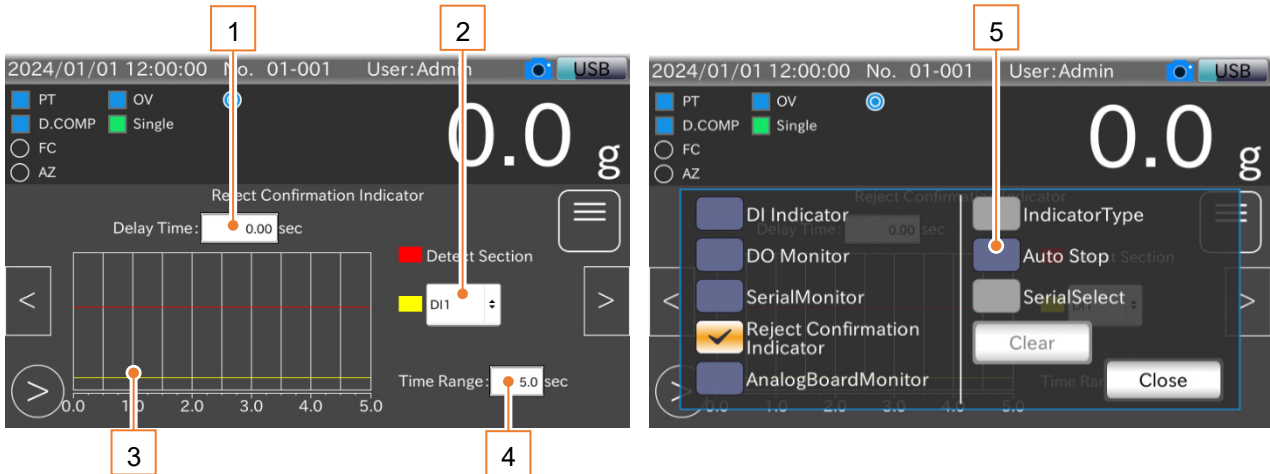
Fig. 122 Reject Confirmation screen

Table 47 Reject Confirmation screen: part names and descriptions

No.	Name	Description
1	Delay Time	Sets the Delay Time for the selected digital input.
2	Digital Input Selection	Selects the digital input to display in the Reject Confirmation Graph.
3	Reject Confirmation Graph	Graphs the Detect Section of Reject Confirmation and the input status of the selected digital input.
4	Time Range	Sets the display range for Reject Confirmation Graph.
5	Auto Stop	Stops displaying Reject Confirmation Graph automatically.

9.9.5. Analog Board Monitor

Analog board monitor is a function to check the output value of the OP-07 analog output.

The value displayed may be slightly different from the value actually output.

When the OP-07 analog output or the OP-17 analog output expansion module is not connected, this status message is displayed.
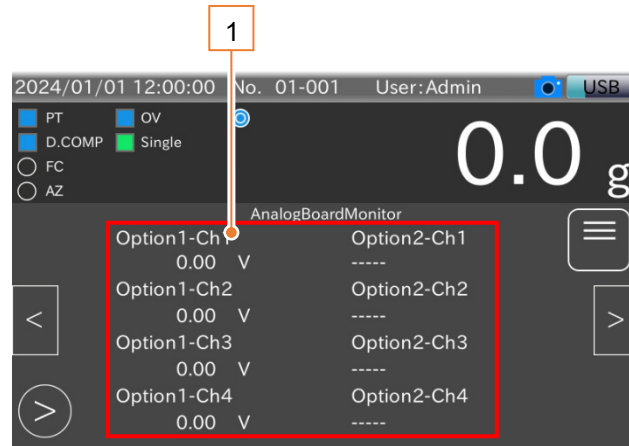
Fig. 123 Analog board monitor screen

Table 48 Analog board monitor screen: part names and descriptions

No.	Name	Description
1	Analog input status	Displays the analog output status. Depending on the setting of the analog board output, the unit is selected from "V" and "mA". Displays "-----" when not connected.

10.　Setting Details

This chapter describes the details of the indicator's settings. For the indicator's screen configurations and settings, refer to "Table 49 List of setting values by product" and "Table 50 List of common setting values".

Table 49 List of setting values by product

Edit screen	Edit tab	Product Name		
		Product Code		
	Detection Settings tab	Detect Basis	Reject Stage	
			Target	
			Hi Hi Limit	
			Hi Limit	
			Lo Limit	
			Lo Lo Limit	
			Target Weight Tracking	
			Weight Tracking Target Value	
			Weight Tracking Hi Limit	
			Weight Tracking Lo Limit	
			Weight Tracking Sample Size	
			Overweight Exception	
			No. of Consecutive Fail	
			Consecutive Fail Map	
		Detect Parameter	Product Length	
			Speed	
			Weighing Mode	
			Conveyor Stop Timer	
			Product Detection	
			Detection Method of Photo Eye Sensor	
			Zero Band	
			Stop Time After Judgment	
			Stop Map	
			Auto Mode	
			Filter	
			Judgement Timer	
			Number of Samples	
		DO	DO Memo	
			DO Map	DO Reference
				OK
				Hi Hi
				Hi
				Lo
				Lo Lo
				Weighing Error
				Detect Two
				Unsplit
				Metal
				X-ray

Table 49 List of setting values by product (continued)

Edit screen	Detection Settings tab	Digital output	DO Map	Ext1
				Ext2
				Inspecting
				Belt Running
				Belt Stop
				Consecutive Fail
				Not Busy
				Emergency Stop On
				Photo Eye Sensor Shading Error
				Bin Full
				Air Pressure
				Total Num Count
				OK Num Count
				Reject / Pass Error
				Reject Check Photo Eye Shading Timeout
				FC+
				FC−
				+Step 1
				+Step 2
				+Step 3
				+Step 4
				+Step 5
				−Step 1
				−Step 2
				−Step 3
				−Step 4
				−Step 5
				Thermal Error
				(Free Name) Error 1
				(Free Name) Error 2
				(Free Name) Error 3
				Rejector Processing Error
				Live Signal
			DO	Behavior
				Delay Time
				Hold Time
				Event Release Time
				Polarity
			DO Option	Behavior
				Delay Time
				Hold Time
				Event Release Time
				Polarity
		Statistics	Number of samples-Total	

Table 49 List of setting values by product (continued)

AD-4412-CW			
Edit screen	Detection Settings tab	Statistics	Number of samples-OK
			Width of Section
			Number of samples-CC
			Sample Size
			X-Bar Control Chart
			R Control Chart
	Control Revision tab	Preset Tare	Preset Tare value
		Auto Zero	Auto Zero behavior
			Auto Zero Averaging Time
			Dead Zone Timer
			Auto Zero Samples
		D.COMP	Dynamic compensation
			Static Weight
			Dynamic Weight
		Feedback Control	Feedback Control behavior
			Feedback Control Target
			Feedback Control Range
			Feedback Control Step [g / sec]
			Feedback Control Step [sec / g]
			Feedback Control Sample
			Feedback Control Wait Time
		Step Control	Step Control behavior
			Control Target
			10C Sample
			10C Wait Time
			+Zone 1
			+Zone 2
			+Zone 3
			+Zone 4
			−Zone 1
			−Zone 2
			−Zone 3
			−Zone 4

Table 50 List of common setting values

Common Settings screen	Balance tab	Scale	Unit
			Decimal Point
			Division
			Capacity
			Digital Filter (Static)
			Zero Range
			Power On Zero Auto Zero Range
			Stability Time
			Stability Weight
			Zero Tracking Time
			Zero Tracking Weight
		Adjustment	Weight Value
			Zero Point
			Span
	System1 tab	Main unit	Identification Name
			Startup User Level
			Login Timeout
			Unsplit Range
			Conveyor Mode
			Weighing Conveyor Length
			Connect Device Priority
			Curb Chattering
			Photo Eye Sensor Timeout
			Photo Eye Sensor Polarity
			Initial Value Of Speed
		Device	Model Name
			Serial No.
			Option 1
			Option 2
			Software version
			Firmware Version
			Weighing software version
			Wireless Version
		Display	Display Mode
			Negative Weight
			Display Data
			Display Keyboard
			Standby Mode
			Brightness
		Language	Language
	System2 tab	Date / Time	Date
			Time
			Date Order
		Backup / Restoration	

AD-4412-CW   AD-4413-CW

Table 50 List of common setting values (continued)

			History	
	System2 tab	USB Flash Drive	USB Operation History	
			USB Weighing History	
			DO Memo	
				OK
				Hi Hi
				Hi
				Lo
				Lo Lo
				Weighing Error
				Detect Two
				Unsplit
				Metal
				X-ray
				Ext1
				Ext2
				Inspecting
				Belt Running
				Belt Stop
				Consecutive Fail
				Not Busy
Common Settings screen	Connect	Common Digital Output	Common DO Map	Emergency Stop On
				Photo Eye Sensor Shading Error
				Bin Full
				Air Pressure
				Total Num Count
				OK Num Count
				Reject / Pass Error
				Reject Confirmation Photo Eye Shading Timeout
				FC+
				FC−
				+Step 1
				+Step 2
				+Step 3
				+Step 4
				+Step 5
				−Step 1
				−Step 2
				−Step 3
				−Step 4
				−Step 5
				Thermal Error
				(Free Name) Error 1
				(Free Name) Error 2

Table 50 List of common setting values (continued)

Common Settings screen	Connect	Common DO Map	Common DO Map	(Free Name) Error 3	
				Rejector Processing Error	
				Live Signal	
			Common DO	Behavior	
				Delay Time	
				Hold Time	
				Event Release Time	
				Polarity	
			Common DO Option	Behavior	
				Delay Time	
				Hold Time	
				Event Release Time	
				Polarity	
		Digital Input	DI Memo		
			Reject Check	Reject Check Map tab	OK
					Hi Hi
					Hi
					Lo
					Lo Lo
					Weighing Error
					Detect Two
					Unsplit
					Metal
					X-ray
					Ext1
					Ext2
				Reject Check tab	Delay Distance
					Extension Time
					Check Non-Reject Section
			DI	Input Trigger	
				Item	
				Delay Time	
				Curb Chattering	
				Polarity	
			DI Option	Input Trigger	
				Item	
				Delay Time	
				Curb Chattering	
				Polarity	
			Free Name Error		
			Bin Full Behavior		
		Analog Board	Analog Board 1	Data Types	
				Output Format	
				Low Voltage Standard	
				High Voltage Standard	

Table 50 List of common setting values (continued)

Common Settings screen	Connect	Analog Board	Analog Board 1	Low Voltage Output
				High Voltage Output
				Low Current Standard
				High Current Standard
				Low Current Output
				High Current Output
			Analog Board 2	Data Types
				Output Format
				Low Voltage Standard
				High Voltage Standard
				Low Voltage Output
				High Voltage Output
				Low Current Standard
				High Current Standard
		Modbus	Modbus Mode	
			Slave Address	
		RS-232C	Serial Mode	
			Output Format	
			Output Preset Tare	
			Output 2nd Header	
			Baud Rate	
			Parity	
			Data Bit	
			Stop Bit	
		RS-485	Serial Mode	
			Output Format	
			Output Preset Tare	
			Output 2nd Header	
			Baud Rate	
			Parity	
			Data Bit	
			Stop Bit	
		LAN	CL IP Address	
			CL Subnet Mask	
			CL Default Gateway	
			Password for Remote Operation	
			WL LAN Port	
			WL IP Address	
			WL Password	
		Printer	Printer IP Address	

10.1. Product Name and Product Code

10.1.1. Product Name

For Product Name, enter the name of the product to be displayed on the Weighing screen and Product Selection panel.
Up to 40 characters can be entered for Product Name.

10.1.2. Product Code

For Product Code, enter the code of the product to be displayed on the Weighing screen and Product Selection panel.
The Product Code is also used for product switching using serial communication.
For product switching with serial communication, refer to "9.6. Switching Products by Serial Communication".
Up to 40 characters can be entered for Product Code.

10.2. Judgement Criteria

10.2.1. Reject Stage

Reject Stage is the setting for the number of reject stages of the product. Select either 3 stages or 5 stages.

10.2.2. Target

For Target, enter the weight value of the product.
For the Target settings, refer to "5.6.2. Target／Hi Hi Limit／Hi Limit／Lo Limit／Lo Lo Limit Value Settings".
    Setting range: 0 to weighing capacity

10.2.3. Hi Hi Limit

For Hi Hi limit, enter the Hi Hi limit value of the product.
For the Hi Hi limit settings, refer to "5.6.2. Target／Hi Hi Limit／Hi Limit／Lo Limit／Lo Lo Limit Value Settings".
    Setting range: 0 to weighing capacity

10.2.4. Hi Limit

For Hi limit, enter the Hi limit value of the product.
For the Hi limit settings, refer to "5.6.2. Target／Hi Hi Limit／Hi Limit／Lo Limit／Lo Lo Limit Value Settings".
    Setting range: 0 to weighing capacity

10.2.5. Lo Limit

For Lo limit, enter the Lo limit value of the product.
For the Lo limit settings, refer to "5.6.2. Target／Hi Hi Limit／Hi Limit／Lo Limit／Lo Lo Limit Value Settings".
    Setting range: 0 to weighing capacity

10.2.6. Lo Lo Limit

For Lo Lo limit, enter the Lo Lo limit value of the product.
For the Lo Lo limit settings, refer to "5.6.2. Target／Hi Hi Limit／Hi Limit／Lo Limit／Lo Lo Limit Value Settings".
    Setting range: 0 to weighing capacity

10.2.7.   Target Weight Tracking

Sets whether the Target Weight Tracking function is enabled/disabled.

1.   "Disable"

   The Target Weight Tracking function is disabled.

2.   "Enable"

   The Target Weight Tracking function is enabled.

Target Weight Tracking function

The Target Weight Tracking function calculates a moving average of weighing values based on the target, upper / lower limit, and the settings for the Target Weight Tracking function and sets a new target value.
Updating the target value enables checkweighing corresponding to weight fluctuations of the products.

The Target Weight Tracking function is operated in the following procedure.

1.   After the products have been judged, the weighing values that satisfy the following conditions are collected as data for calculating the target value.

   Condition 1:   Weighing values of passed products
   Condition 2:   (Weight Tracking Target Value – Weight Tracking Lo Limit) ≤ Weighing value ≤ (Weight Tracking Target Value + Weight Tracking Lo Limit)

Note

   Condition 2 is a condition to limit the calculated target value so that it does not fall outside the setting range for the Target Weight Tracking function.

2.   When the weight tracking sample size data is collected, the average value is calculated and set as a new target.
   After that, the data collected from each weighing is processed for a moving average, and the target value is updated.
   The calculated target value / the data collected for the moving average is reset to the input values at the following timing:

❑   When the power of the indicator is turned on / off.
❑   When the product to be read is changed.
❑   When the target value is changed directly.

Fig.124 Target weight tracking function

10.2.8. Weight Tracking Target Value

Enter the target weight for the target weight tracking function.

The value is used for weighing value collecting judgement. It is set separately from the target value for checkweighing.

   Setting range: 0 to weighing capacity

10.2.9. Weight Tracking Lo Limit

Enter the upper limit value for the target weight tracking function.

The value is used for weighing value collecting judgement.

   Setting range: 0 to weighing capacity

10.2.10. Weight Tracking Lo Limit

Enter the lower limit value for the Target Weight Tracking function.

The value is used for weighing value collecting judgement.

   Setting range: 0 to weighing capacity

10.2.11. Weight Tracking Sample Size

With the Target Weight Tracking function, enter the number of data samples for calculating the checkweighing target value.

   Setting range: 1 to 9999

10.2.12. Overweight Exception

Overweight Exception is the setting for judging overweight products as acceptable.

When Overweight Exception is activated, the "OV" indicator on the Weighing screen is lit in blue.

For the display position of the "OV" indicator, refer to "5.4.1. Weighing Screen".

1. "Disable"

   The Overweight Exception setting is disabled.

2. "Enable"

   The Overweight Exception setting to judge overweight as OK is enabled.

10.2.13. Number of Consecutive Fail

This setting detects that consecutive fail judgements have occurred.

To detect consecutive fails, specify the number of failed products.

For the stop / output behavior when consecutive fails are detected, refer to "10.4.2. DO Output Definition".

   Setting range: 2 to 9999

10.2.14. Consecutive Fail Map

Sets which judgements are to be detected as consecutive fails.

Each judgement with a circle " ○ " in its checkbox will be detected.

For the stop / output behavior when consecutive fails are detected, refer to "10.4.2. DO Output Definition".
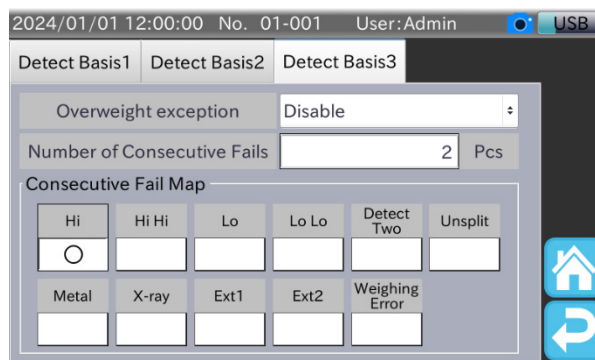
Fig. 125 Consecutive Fail Map (Detect Basis3 tab)

10.3.　　Detect Parameter

10.3.1.　　Product Length

For Product Length, enter the length of the product to be weighed. The parameter is used to calculate the unsplit judgement, filter selection, judgement timer, and number of samples when auto mode is enabled.

　　　Setting range: 1 to 300

10.3.2.　　Speed

For Speed, enter the operating belt speed.

　　　Setting range: 1 to 100

10.3.3.　　Weighing Mode

For Weighing Mode, select from "Auto Mode" or "Conveyor Stop Mode".

1.　Auto Mode

　　Weight value is dynamically judged by Judgement Timer and Number of Samples while the product is passing.

2.　Conveyor Stop Mode

　　After the product on the conveyor is detected, weight value is judged by Judgement Timer and Number of Samples when the conveyor is stopped by the conveyor stop timer. Detect Two and Unsplit are also detected.

10.3.4.　　Conveyor Stop Timer

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

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

10.3.5.　　Product Detection

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

1.　Photo eye sensor

　　Entry of the product is detected by shading of the photo eye sensor.

2.　Near zero

　　Entry of the product is detected by the weighing value rising above threshold value.

Caution

❑　Unsplit judgment is not possible because the product length cannot be identified.

❑　After the product entering on the conveyor is detected, the weighing value must drop below near zero once in order to detect the next product entering on the conveyor.

❑　Detect Two may not be judged correctly. (Some of the possible reasons: The next product cannot be detected until the previous one leaves the conveyor. When the weighing value is determined and detection is possible, if the vibration of releasing the product from the conveyor is above the threshold value, detection error occurs.)

❑　The processing rate of Near Zero is smaller than that of Photo Eye Sensor.

10.3.6.　Detection Method of Photo Eye Sensor

To detect with the photo eye sensor, when the product detection is set to "photo eye sensor", select "Rising Edge" or "Falling Edge".

1. "Rising Edge"
   Detects entry of a product after the leading edge of weighing product reaches the photo eye sensor and the edge is turned off and on.

2. "Falling Edge"
   Detects entry of a product when the trail edge of weighing product passes the photo eye sensor. Even if the speed of the infeed conveyor and weighing conveyor changes, weighing starts after a product enters on the weighing conveyor.

Caution

As the product length is not recognizable, Unsplit cannot be judged.

10.3.7.　Zero Band

Zero Band sets a threshold value that weighing value regards as near zero. When the weighing value becomes above the threshold value, it means "The start time for the weighing product entering on the conveyor". When the weighing value becomes under the threshold value, it means "The end time for the weighing product leaving the conveyor".

10.3.8.　Stop Time after Judgement

Stop Time after Judgement sets time after a weighing product being judged until the conveyor is restarted when the weighing mode is "Conveyor Stop Mode".

10.3.9.　Stop Map

Stop Map enables Stop Time after Judgement according to the judgement of the weighing product when the weighing mode is "Conveyor Stop Mode".
Example:
When Stop Time after Judgement is 1.00 second and the overweight checkbox in Stop Map is marked, if the judgement result shows Pass, the conveyor is restarted without waiting for Stop Time after Judgement. When the judgement result shows overweight, the conveyor is restarted after Stop Time after Judgement passes.

10.3.10.　Auto Mode

Auto Mode sets the calculation method of Filter, Judgement Timer, and Number of Samples when it is enabled.

Caution

This item must not be changed by anyone other than an A&D service engineer.

10.3.11.　Filter

The filter setting used for dynamic weighing is displayed.

Caution

This item must not be changed by anyone other than an A&D service engineer.

10.3.12.　Judgement Timer

The Judgement Timer setting used for dynamic weighing is displayed.

Caution

This item must not be changed by anyone other than an A&D service engineer.

10.3.13.　Number of Samples

The Number of Samples setting used for dynamic weighing is displayed.

Caution

This item must not be changed by anyone other than an A&D service engineer.

10.4.　DO Map

DO Map sets the conveyor stop and digital output behaviors for each output definition.

If the checkbox on the DO map is "○", the corresponding DO will light up, and if it is "◎", the corresponding DO will blink.

Caution

> The output does not work with the DO Map alone. The settings in "10.5. Standard DO／DO Option" are required.

Note

❑　For the DO Map setting method, refer to "5.6.4. Digital Output (DO) Settings".

❑　Blinking action cannot be set for the DO set for stop conditions or rejectors.

10.4.1.　DO Reference

The digital output settings common to the system are referred to.

Select the desired Common DO setting to reference. When set to "Disable", operation is performed with the digital output settings for each product.

Note

❑　It is necessary to set the DO settings common to the system beforehand.

❑　For the DO setting method common to the system, refer to "10.20. Common DO Map／Common DO／Common Option DO".

10.4.2.　DO Output Definition

The digital output definitions are as follows:

Table 51 DO output definitions

Item	Output definition
OK	When the latest weighing result is judged as acceptable.
Hi Hi	When the latest weighing result is judged as extra overweight.
Hi	When the latest weighing result is judged as overweight.
Lo	When the latest weighing result is judged as underweight.
Lo Lo	When the latest weighing result is judged as extra underweight.
Weighing Error	When the latest weighing result is judged as an error.
Detect Two	When the latest weighing result is judged as a detect two.
Unsplit	When the latest weighing result is judged as an unsplit.
Metal	When the latest weighing result is judged as a metal.
X-ray	When the latest weighing result is judged as an X-ray.
Ext1	When the latest weighing result is judged as an Ext1.
Ext2	When the latest weighing result is judged as an Ext2.
Inspecting	During inspection (between the start and stop of conveyor operation). Also when the conveyor is stopped during "Conveyor Stop Mode." No output when the conveyor mode is set to "Enable".
Belt Running	When the conveyor is in operation. Also when the conveyor mode is set to "Enable".
Belt Stop	When the conveyor is stopped. Also when the conveyor is stopped during "Conveyor Stop Mode."

Item	Output definition
Consecutive Fail	When consecutive fail has occurred.
Not Busy	When no product is judged during inspection.
Emergency Stop On	When inputting the Emergency Stop signal.
Photo Eye Sensor Shading Error	When Photo Eye Sensor Shading Error has occurred.
Bin Full	When the input to the digital input assigned to Bin Full is confirmed.
Air Pressure	When the input to the digital input assigned to Air Pressure is confirmed.
Total Num Count	When the total of Sample Summary matches the set Number of samples-Total.
OK Num Count	When the total of the OK Sample Summary matches the set Number of samples-OK.
Reject / Pass Error	When a discharge abnormality has occurred due to Reject Check.
Reject Confirmation Photo Eye Shading Timeout	When Photo Eye Sensor Shading Error for Reject Check has occurred.
FC+	When the pulse width of the feedback pulse by Feedback Control is positive.
FC-	When the pulse width of the feedback pulse by Feedback Control is negative.
+Step 1	When the average weighing value calculated by the Step Control function corresponds to + Step 1.
+Step 2	When the average weighing value calculated by the Step Control function corresponds to + Step 2.
+Step 3	When the average weighing value calculated by the Step Control function corresponds to + Step 3.
+Step 4	When the average weighing value calculated by the Step Control function corresponds to + Step 4.
+Step 5	When the average weighing value calculated by the Step Control function corresponds to + Step 5.
-Step 1	When the average weighing value calculated by the Step Control function corresponds to - Step 1.
-Step 2	When the average weighing value calculated by the Step Control function corresponds to - Step 2.
-Step 3	When the average weighing value calculated by the Step Control function corresponds to - Step 3.
-Step 4	When the average weighing value calculated by the Step Control function corresponds to - Step 4.
-Step 5	When the average weighing value calculated by the Step Control function corresponds to - Step 5.
Thermal Error	When the input to the digital input assigned to Termal Error is confirmed.
(Free Name) Error 1	When the input to the digital input assigned to (Free Name) Error 1 is confirmed.
(Free Name) Error 2	When the input to the digital input assigned to (Free Name) Error 2 is confirmed.
(Free Name) Error 3	When the input to the digital input assigned to (Free Name) Error 3 is confirmed.
Rejector Processing Error	Output when the rejector processing error occurs.
Live Signal	DO output on 1Hz cycle

Note

❑ The DO output definitions Inspecting, Belt Running, Belt Stop, Not Busy, Emergency Stop On, FC +, and FC- work regardless of the DO Behavior, Delay Time, and Hold Time settings.

❑ For the conditions of each judgement, refer to "5.4.5. Judgement Result".

In the case of the Modbus settings, 2 bytes make one word, and eight DO output definitions are assigned to each word. When setting the DO map with Modbus, set the value obtained by adding the product of the output definitions and the lighting/blinking operation (disable = 0, lighting = 1, blinking = 2).

Table 52 Bit allocation

No.	Content	Word No.		No.	Content	Word No.
0	OK	1		32	-Step 1	5
1	Hi Hi			33	-Step 2	
2	Hi			34	-Step 3	
3	Lo			35	-Step 4	
4	Lo Lo			36	-Step 5	
5	Weighing Error			37	Thermal Error	
6	Detect Two			38	(Free Name) Error 1	
7	Unsplit			39	(Free Name) Error 1	
8	Metal	2		40	(Free Name) Error 1	6
9	X-ray			41	Rejector Processing Error	
10	Ext1			42	Live Signal	
11	Ext2					
12	Inspecting					
13	Belt Running					
14	Belt Stop					
15	Consecutive Fail					
16	Not Busy	3				
17	Emergency Stop On					
18	Photo Eye Sensor Shading Error					
19	Bin Full					
20	Air Pressure					
21	Total Num Count					
22	OK Num Count					
23	Reject / Pass Error					
24	Reject Confirmation Photo Eye Shading Timeout	4				
25	FC+					
26	FC-					
27	+Step 1					
28	+Step 2					
29	+Step 3					
30	+Step 4					
31	+Step 5					

E.g.: When assigning "Consecutive Fail (lit)", " Metal (blinking)", "Unsplit (blinking)", and "Detect Two (lit)" to DO1, the first word of address 40675 (address 40185 for common DO), is $3^7 \times 2 + 3^6 \times 1 = 5103$ (Unsplit, Detect Two), the second word is $3^{(15-8)} \times 1 + 3^{(8-8)} \times 2 = 2189$ (Consecutive Fail, Ext1).

10.5.　　Standard DO/DO Option

10.5.1.　　DO Behavior

Sets the digital output behaviors.

1.　Time

The Hold Time setting controls the ON / OFF of the digital output.

After the Delay Time has elapsed, the ON state of the digital output is maintained for the Hold Time setting.

If the DO output definition occurs again during output, the timer is reset, and the output is retained.

See the timing chart below for the case of digital output at the time of judgement.
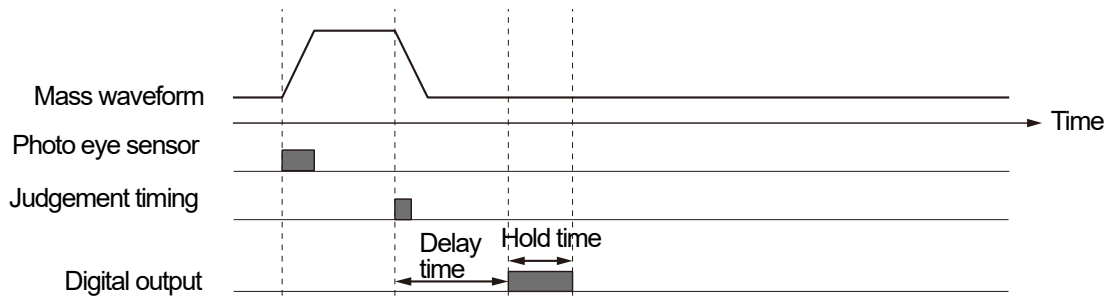
Fig. 126 DO Behavior (Time) timing chart

2.　Event

When the assigned output definition occurs, the digital output is turned on after the Delay Time has elapsed.

When the digital output is turned on, it stays on from the timing when it is turned on until the next judgement is completed.

No delay processing is performed for the trigger of judgement completion.

See the timing chart below for the case of digital output at the time of judgement.
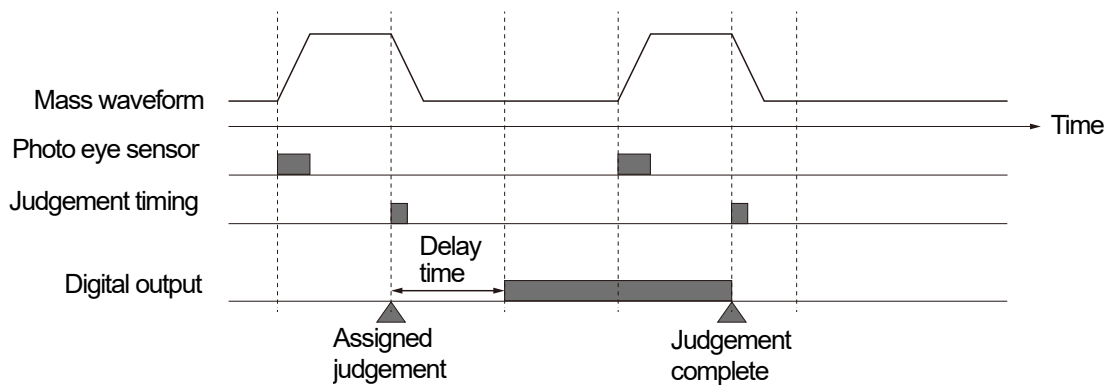
Fig. 127 DO Behavior (Event) timing chart

3. Next Weighing

When the assigned output definition occurs, the digital output is turned on after the Delay Time has elapsed.

When the digital output is turned on, it stays on from the timing when it is turned on until the next weighing starts.

No delay processing is performed for the trigger of weighing start.

Note

The timing to start weighing changes depending on the settings.

See the timing chart below for the case of digital output at the time of judgement.
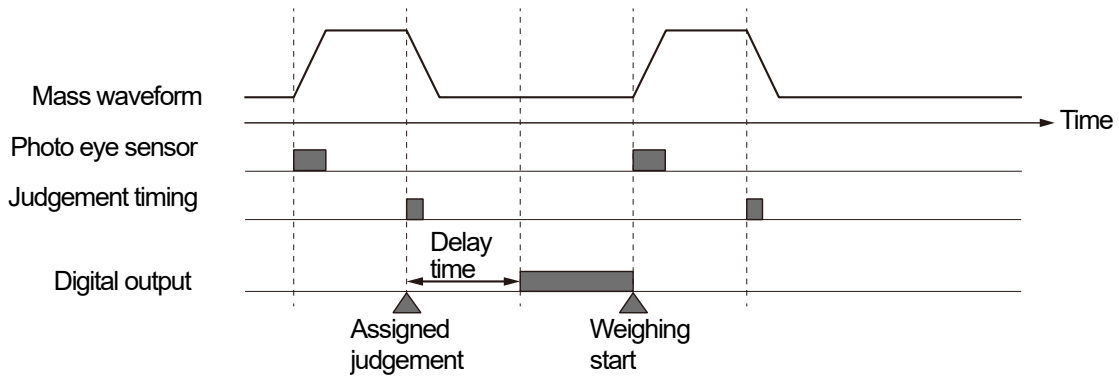
Fig. 128 DO Behavior (Next Weighing) timing chart

4. Dialog

A dialog box appears when the assigned output definition occurs, and the digital output is turned on.

When the digital output is turned on, it stays on until the dialog box is closed.

Even when weighing is stopped, the output is retained until the dialog box is cleared.

See the timing chart below for the case of digital output at the time of judgement.
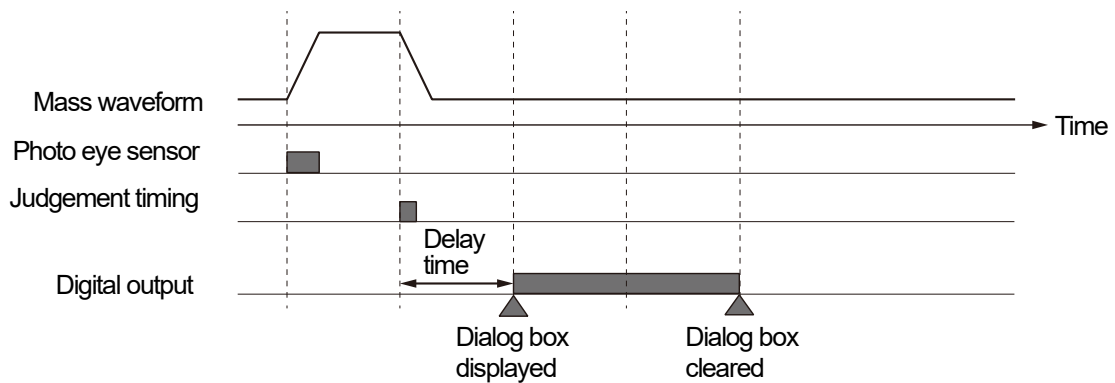
Fig. 129 DO Behavior (Dialog) timing chart

10.5.2. Delay Time

For Delay Time, enter the time from when the DO Behavior flag is generated until the digital output operates.

For the Delay Time setting method, refer to "5.6.5. Delay / Hold Time Settings".

Setting range: 0.00 to 100.00 [seconds]

10.5.3. Hold Time

For Hold Time, enter the time to hold the digital output behavior.

For the Hold Time setting method, refer to "5.6.5. Delay／Hold Time Settings".

    Setting range: 0.00 to 300.00 [seconds]

10.5.4. Event Release Time

For the event release time, enter the time to release the output after a certain period of time when the DO action is set to "Event". After DO is turned on due to the occurrence of an output definition, DO is turned off after the event release time has elapsed.

If the output definition occurs again before the event release time elapses, the release timer is reset.

If the event release time is 0.00 seconds, the event release time will not work.

    Setting range: 0.00 to 300.00 [seconds]
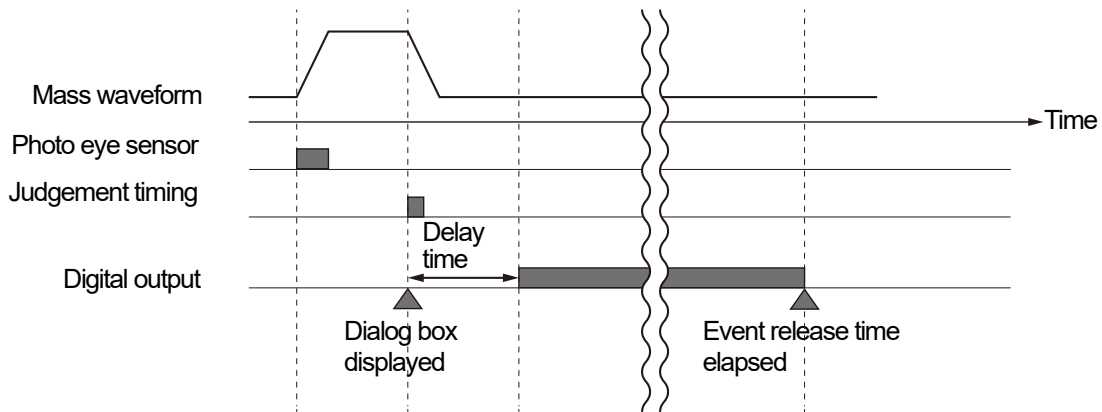
Fig. 130 Event release time timing chart

10.5.5. Polarity

Polarity sets the Polarity of the signal from the digital output.

1. Positive Logic

   The a-contact device turns on when a signal is output from the digital output.

2. Negative Logic

   The b-contact device turns on when a signal is output from the digital output.

    AD-4412-CW AD-4413-CW

10.6. Statistics

10.6.1. Number of Samples-Total

For Number of Samples-Total, enter the number of weighing measurements to reset Sample Summary.

For Sample Summary, refer to "5.7.2. Summary".

Setting range: 2 to 9999

10.6.2. Number of Samples-OK

For Number of Samples-OK, enter the number of OK judgements to reset OK Sample Summary.

For OK Sample Summary, refer to "5.7.2. Summary".

Setting range: 2 to 9999

10.6.3. Width of Section

Enter the range of each bar of the histogram.

If the section width is changed, the histogram data is reset.

For Histogram, refer to "5.7.3. Histogram".

Setting range: 0.1 to weighing capacity

10.6.4. Number of Samples-CC

For Number of Samples–CC, enter the number of weighing result data samples for creating the control chart data.

For Control Chart, refer to "5.7.4. Control Chart".

Setting range: 2 to 9999 (The value must be greater than or equal to the value set in Sample Size.)

10.6.5. Sample Size

Enter the number of weighing result data samples for calculating the average value when creating a control chart.

For Control Chart, refer to "5.7.4. Control Chart".

Setting range: 2 to 25

10.6.6. X-Bar Control Chart

Enter the center line (CL) value for creating an X-bar control chart.

When $\bar{\bar{X}}$ is non-zero, the X-bar control chart based on this setting is displayed.

For Control Chart, refer to "5.7.4. Control Chart".

Setting range: 0 to weighing capacity

10.6.7. R Control Chart

Enter the center line (CL) value for creating an R control chart.

When $\bar{R}$ is non-zero, the X-bar control chart and R control chart based on this setting is displayed.

For Control Chart, refer to "5.7.4. Control Chart".

Setting range: 0 to weighing capacity

10.7.   Preset Tare

10.7.1.   Preset Tare Value

Enter the preset tare value if you want to weigh products in net weight.

For the Preset Tare settings, refer to "5.6.7. Preset Tare Value Setting".

When the preset tare value is entered, the PT indicator on the weighing screen is lit in blue.

When the preset tare value is entered, the value is also output when the weighing result is output via serial communication.

For the display position of the PT indicator, refer to "5.4.1. Weighing Screen".

For the output format of serial communication, refer to "10.27.2. Output Format".

 Setting range: 0 and greater (weighing capacity − one resolution)

10.8.   Auto Zero

The Auto Zero function performs zero adjustment during dynamic weighing.

When there is nothing on the weighing conveyor during dynamic weighing, the weight values for the averaging time are averaged, and zero adjustment is automatically performed.

In addition, by using the Auto Zero Samples settings to accumulate average values, zero adjustment can be performed based on the average of the accumulated results.

Auto Zero does not work while the Dead Zone Timer is running.

When zero adjustment is performed with Auto Zero, the AZ indicator on the weighing screen is lit in green.

For the display position of the AZ indicator, refer to "5.4.1. Weighing Screen".

If the averaged weight is outside the adjustable range, zero adjustment is not performed.

For the range where zero adjustment is possible, refer to "10.12.7. Zero Range".
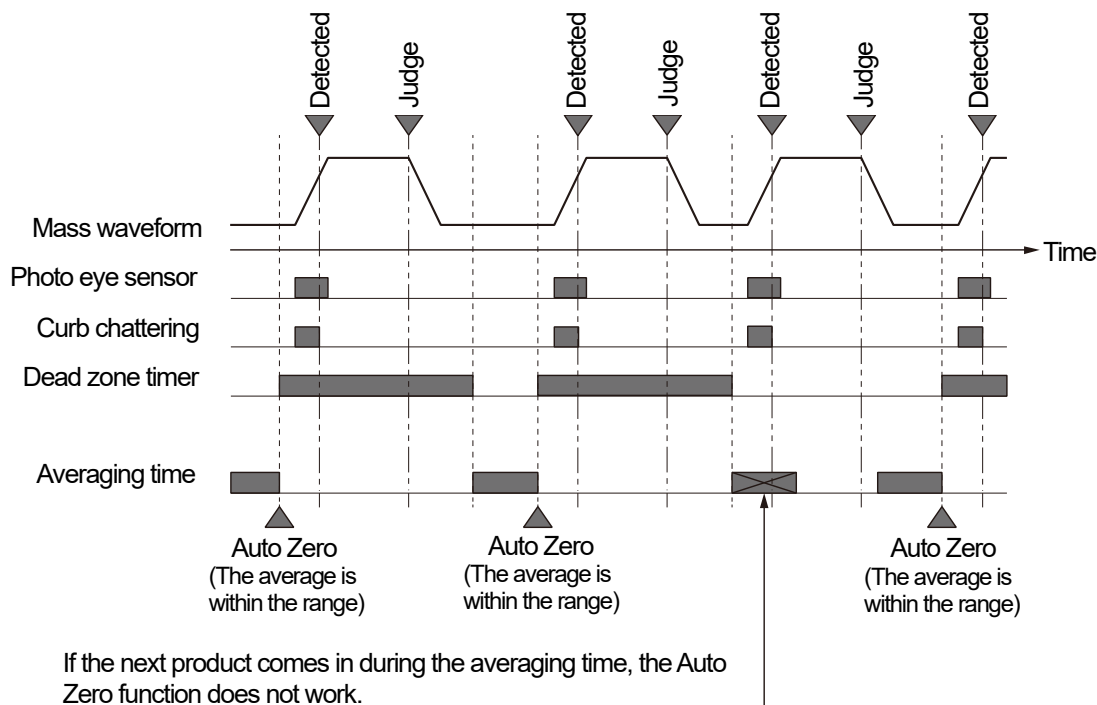
Fig. 131 Auto Zero timing chart

AD-4412-CW AD-4413-CW

10.8.1. Auto Zero Operation

Sets the Auto Zero operation.

1. "Disable"

   The Auto Zero operation is disabled.

2. "Enable"

   The Auto Zero operation is enabled.

10.8.2. Auto Zero Averaging Time

This setting sets the time to average the weight values with Auto Zero.

Setting range: 0.01 to 9.99 [sec]

10.8.3. Dead Zone Timer

The Dead Zone Timer setting prohibits the Auto Zero operation for the set time after zero adjustment is performed by Auto Zero.

E.g.:   When set to 5 seconds, no zero adjustment is operated by Auto Zero for the next five seconds once the zero adjustment is performed.

Setting range: 0.0 to 999.9 [seconds]

10.8.4. Auto Zero Samples

The Auto Zero Samples sets the number of times to cumulate the average value of the Auto Zero averaging time. After the cumulation, the Auto Zero operation performs zero adjustment with the average value.

E.g.:   When the Auto Zero averaging time is set to 0.1 seconds and the number of times to cumulate Auto Zero is set to 3 times, and when each average value is 1.0 g, 2.0 g, and 3.0 g, (1.0 g + 2.0 g + 3.0 g) / 3 = 2.0 g is the amount of dynamic compensation of Auto Zero.

Setting range: 1 to 999 [times]

See the timing chart below for the case of the number of times to cumulate Auto Zero being set to 3 times.
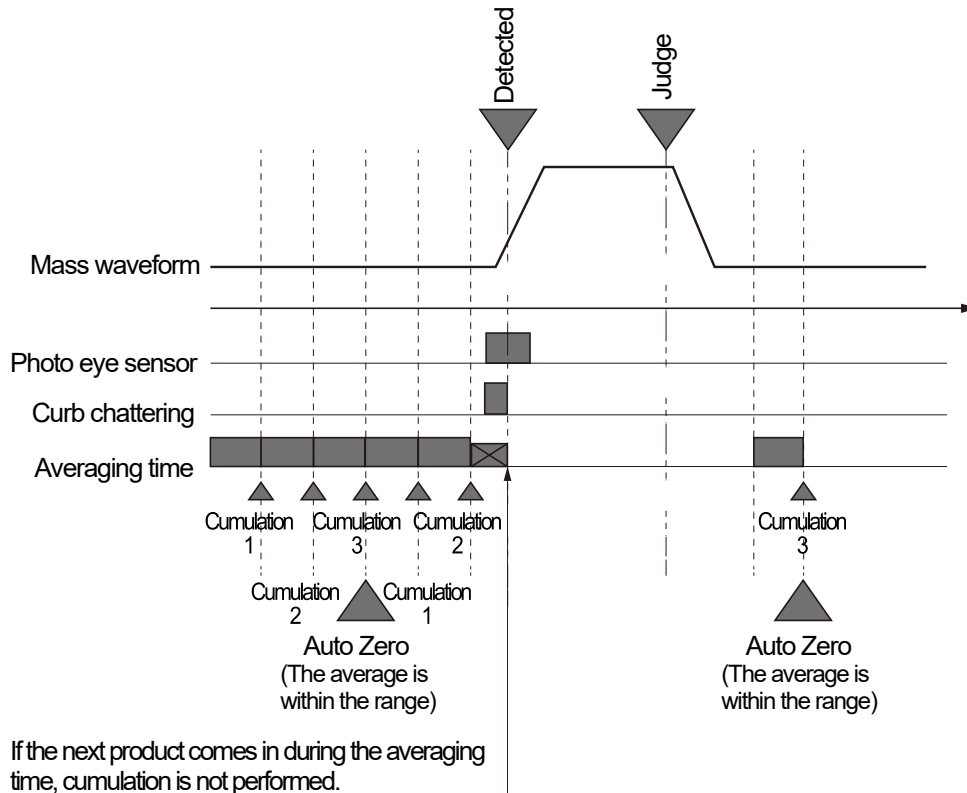
Fig. 132 Auto Zero timing charg when the number of cumulative times is used

10.9.   Dynamic Compensation

10.9.1.   D.COMP

Set the dynamic compensation operation.

When dynamic compensation is performed, the D.COMP indicator on the Weighing screen is lit in blue.

For the display position of D.COMP indicator, refer to "5.4.1. Weighing Screen".

1. "Disable"

    The dynamic compensation operation by D.COMP is disabled.

2. "Enable"

    The dynamic compensation operation by D.COMP is enabled.

10.9.2.   Static Weight

Enter the static weight value.

This setting calculates the amount of dynamic compensation.

The static weight can also be measured by dynamic correction measurement.

For dynamic compensation, refer to "5.6.9. Dynamic Compensation Value Measurement".

   Setting range: 0 to weighing capacity

10.9.3.   Dynamic Weight

Enter the dynamic weight value.

This setting calculates the amount of dynamic compensation.

The dynamic weight can also be measured by dynamic correction measurement.

For dynamic compensation, refer to "5.6.9. Dynamic Compensation Value Measurement".

   Setting range: 0 to weighing capacity

10.10. Feedback Control (FC)

The Feedback Control function outputs the difference between the feedback control target weight and the weighing value as the digital output pulse width and gives feedback to the upstream device of the indicator.

The operating status of Feedback Control can be checked with the FC indicator on the Weighing screen. For the display position of the FC indicator, refer to "5.4.1. Weighing Screen".

Note

❑ For details on digital output, refer to "10.4. DO Map".

❑ If the feedback pulse width is 0.1 seconds or less, no pulse is output. In that case, the average value calculation is started again without waiting for the wait time.

❑ Judgements other than Weighing Error, Detect Two, Unsplit, Metal, X-ray, Ext1, and Ext2 are used to calculate the average value.

The Feedback Control function is operated in the following procedure.

1. When the first product is judged after weighing is started, the feedback control function waits for the time set as Feedback Control Wait Time.

2. The weighing values for the number of times set as Feedback Control Sample, starting from the first weighing after the wait time, are averaged.

3. The difference between the average weight [g] obtained in step 2 and the Feedback Control Target value is calculated with the following formula.

Feedback Control Step [sec / g] × (Average Weight [g] - Feedback Control Target [g]) = Pulse Width [sec]

4. The obtained pulse width is output from FC+ when the pulse width is positive and from FC- when the pulse width is negative.

5. The procedure is repeated from step 1.
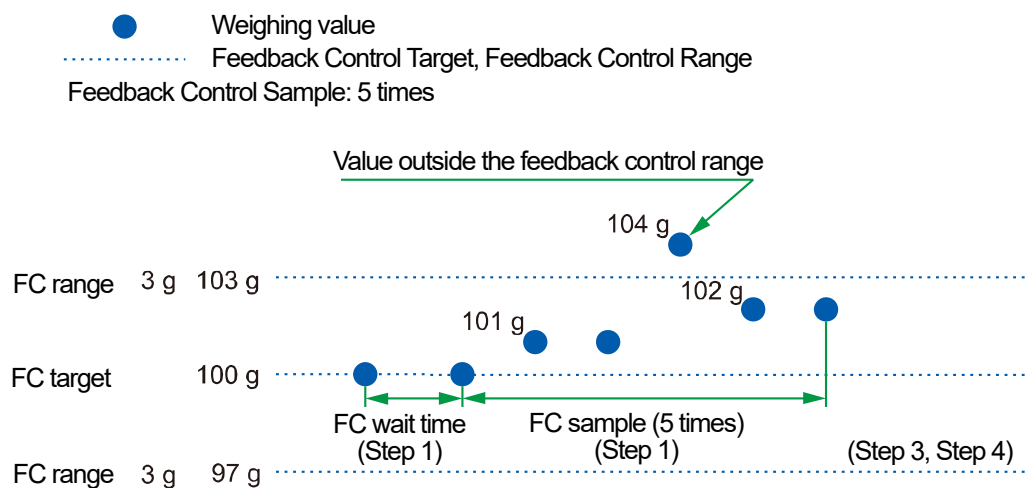
Fig. 133 Feedback Control function

10.10.1.   Feedback Control Operation

Set the Feedback Control operation.

When the Feedback Control operation is set to "Enable", the FC indicator is displayed in white.

For the display position of the FC indicator, refer to "5.4.1. Weighing Screen".

1.   "Disable"

   The Feedback Control operation is disabled.

2.   "Enable"

   The Feedback Control operation is enabled.

10.10.2.   Feedback Control Target

Enter the target weight for Feedback Control.
   Setting range: 0.0 to weighing capacity

10.10.3.   Feedback Control Range

Enter the weight range used to calculate the average for Feedback Control.

The setting range is ± around the Feedback Control Target value.
   Setting range: 0.0 to weighing capacity

10.10.4.   Feedback Control Step [g / sec], [sec / g]

This is the parameter to set the pulse width. Enter the value in [g / sec] or [sec / g].

When one of the settings is changed, the other is calculated and corrected automatically.
   Setting range: 0.01 to 100 [sec / g] (0.01 to 100 [g / sec])

10.10.5.   Feedback Control Sample

Enter the number of weighing value data samples to be averaged to evaluate the difference.
   Setting range: 1 to 9999 [times]

10.10.6.   Feedback Control Wait Time

After sending the feedback pulse, enter the wait time until averaging is performed again.
   Setting range: 0 to 999 [sec]

10.11. Step Control

The Step Control function checks the weighing value based on the feedback settings and performs digital output. This function is only for digital output and does not affect the summary function and others.

Note

❑ For details on digital output, refer to "10.4. DO Map".

❑ For details on the digital output operation, Delay Time, and Hold Time settings, refer to "10.5. Standard DO/DO Option".

❑ Judgements other than Weighing Error, Detect Two, Unsplit, Metal, X-ray, Ext1, and Ext2 are used to calculate the average.

The procedure for outputting with Step Control is as follows.

1. When the first product is judged after weighing is started, the Step Control function waits for the time set as 10C Wait Time.

2. The weighing values for the number of times set as 10C Sample, starting from the first weighing after the wait time, are averaged.

3. After weighing for 10C Sample is performed, the average value is calculated, and step judgement is made as shown in the figure below according to the Control Target and ± zones 1 to 4 settings.

4. Output is performed according to the DO Map and DO Behavior settings.

5. The procedure is repeated from the beginning.

Zone	Step	Condition
	+Step 5	Control target + (Sum of +Zones 1 to 4) ≤ Average
+Zone 4 [g]	+Step 4	Control target + (Sum of +Zones 1 to 3) < Average ≤ Control target + (Sum of +Zones 1 to 4)
+Zone 3 [g]	+Step 3	Control target + (Sum of +Zones 1 to 2) < Average ≤ Control target + (Sum of +Zones 1 to 3)
+Zone 2 [g]	+Step 2	Control target + (+Zone 1) < Average ≤ Control target + (Sum of +Zones 1 to 2)
+Zone 1 [g]	+Step 1	Control target < Average ≤ Control target + (+Zone 1)
-Zone 1 [g]	-Step 1	Control target - (-Zone 1) < Average ≤ Control target
-Zone 2 [g]	-Step 2	Control target - (Sum of -Zones 1 to 2) < Average ≤ Control target - (-Zone 1)
-Zone 3 [g]	-Step 3	Control target - (Sum of -Zones 1 to 3) < Average ≤ Control target - (Sum of -Zones 1 to 2)
-Zone 4 [g]	-Step 4	Control target - (Sum of -Zones 1 to 4) < Average ≤ Control target - (Sum of -Zones 1 to 3)
	-Step 5	Average ≤ Control target – (Sum of -Zones 1 to 4)

Control target

Fig. 134 Step Control function

The conditions of step judgement can also be checked on the screen.
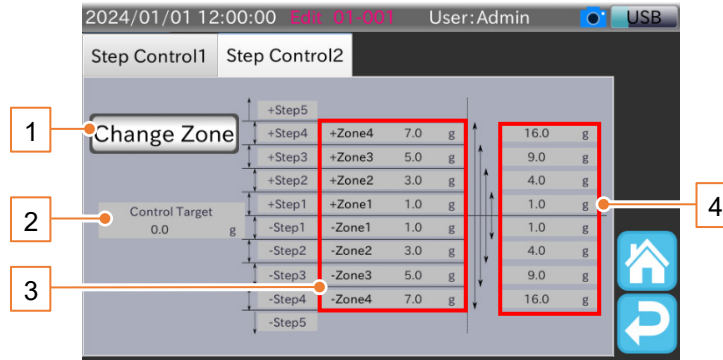
Fig. 135 Step Control judgement (Step Control2 tab)

Table 53 Step Control2 tab: part names and descriptions

No.	Name	Description
1	Change Zone button	Changes zone between the ±zones 1 to 4.
2	Control Target	Displays the set Control Target value.
3	Zone settings	Displays the set ± zones 1 to 4.
4	Sum of zone settings	Displays each zone's sum used for step judgement.

10.11.1. Step Control Operation

Sets the step control operation.

1. "Disable"

   The step control operation is disabled.

2. "Enable"

   The step control operation is enabled.

10.11.2. Control Target

For Control Target, enter the target value of Step Control.

   Setting range: 0.0 to weighing capacity

AD-4412-CW   AD-4413-CW

10.11.3. ±Zone 1 to 4

Enter the zone to perform weight check in Step Control.

Setting range: 0.0 to weighing capacity

How to change the settings

The procedure for changing the settings of each zone is as follows.
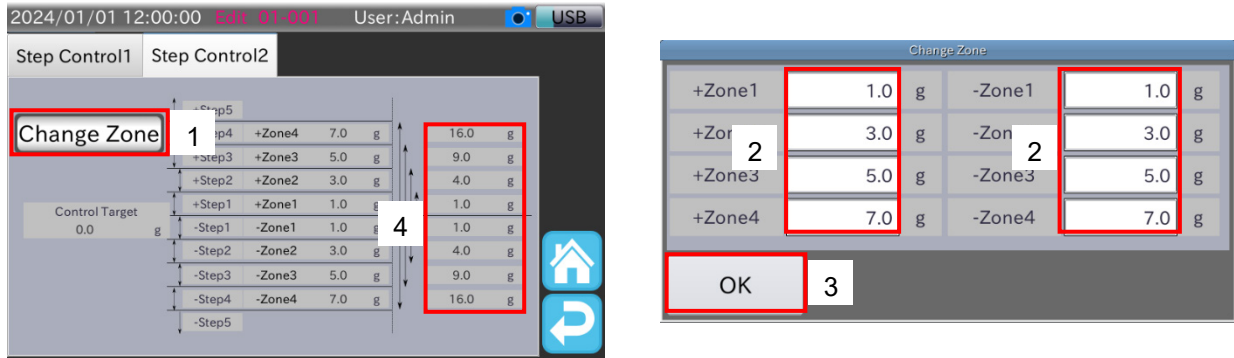
Fig. 136 Step Control Feedback Function Zone settings screen

1.   To change the zone settings, touch the Change Zone button on the Step Control2 tab to display the dialog box for zone settings.

2.   Touch the input field of each zone to change the setting.

3.   After changing the settings, touch the OK button.

4.   Each zone's setting value and sum used for step judgement can be checked on the Step Control2 tab.

E.g.: The cumulative total of +Zone 2 is 1.0 g + 3.0 g = 4.0 g when the + Zone 1 setting value is 1.0 g and the +Zone 2 setting value is 3.0 g.

10.11.4. 10C Sample

Enter the average number of times to calculate the weight used to Step Control judgement.

Setting range: 1 to 9999 [times]

10.11.5. 10C Wait Time

Enter the wait time until the averaging of the weighing values is performed after the start of weighing or after the output operation by Step Control.

Setting range: 1 to 999 [sec]

10.12.   Scale

10.12.1.   Unit

Sets the unit of weight.

Caution

> If the unit is changed, the summary is cleared.

10.12.2.   Decimal Point

Sets the decimal point position of the weight.
0／0.0／0.00／0.000／0.0000 can be selected.

10.12.3.   Division

Sets the minimum weight division.
1／2／5／10／20／50 can be selected.

10.12.4.   Capacity

Sets the weighing capacity.

10.12.5.   Digital Filter (Static)

Digital Filter (Static) 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.
0.33Hz/0.5Hz/0.7Hz/1.0Hz/1.4Hz/2.0Hz/2.8Hz/4.0Hz/5.6Hz/8.0Hz/11.0Hz/None can be selected.

10.12.6.   Power On Zero Auto Zero Range

Sets the range where auto zero adjustment is possible when the indicator starts up as a ratio to the weighing capacity.
E.g.:   When the weighing capacity is 600 g and Power On Zero Auto Zero Range is 10%, ±60 g is the range where zero adjustment is possible when the indicator is started.
> Setting range: 0 to 50 [%]

10.12.7.   Zero Range

Sets the range that can be adjusted by zero tracking, auto zero, and zero adjustment by the Re Zero icon on the Weighing screen as a ratio to the weighing capacity.

E.g.:   When the weighing capacity is 600 g and Zero Range is 2%, ±12 g is the range where zero adjustment is possible.
> Setting range: 0 to 50 [%]

10.12.8.   Stability Time

This stability weighing setting detects the stability of weight during static weighing. Enter the time width for stability detection. When the weight is within a certain weight width (Stability Weight) during the stability time, it is detected as stable.
> Setting range: 0.0 to 9.9 [sec]

10.12.9. Stability Weight

This stability weighing setting detects the stability of weight during static weighing. Enter the weight width for stability detection.

It is detected as stable when the weight is within the stability weight during a certain time width (Stability Time).

When stable, the Stability indicator is displayed on the Weighing screen.

For the display position of the Stability indicator, refer to "5.4.1. Weighing Screen".

None/0.5/1/2/3/4/5/6/7/8/9 [digit] can be selected.

E.g.: When the stability weight is one digit and the stability time is 2 seconds, stability is detected within the range of ±1 digit for 2 seconds.

10.12.10. Zero Tracking Time

The zero tracking function automatically performs zero adjustment during static weighing.

For Zero Tracking Time, enter the time width for zero tracking. During static weighing, zero tracking operates when the total weight is within a certain weight width (Zero Tracking Weight) for the set time of Zero Tracking Time in a stable state.

Setting range: 0.0 to 9.9 [sec]

10.12.11. Zero Tracking Weight

For Zero Tracking Weight, enter the weight width for zero tracking. During static weighing, zero tracking operates when the total weight is within the zero tracking weight for a certain time (Zero Tracking Time) in a stable state.

Zero tracking does not work when Zero Tracking Weight is set to "None".

None/0.5/1.0/1.5/2.0/2.5/3.0/3.5/4.0/4.5 [digit] can be selected.

E.g.: When Zero Tracking Weight is 1.0 digit and Zero Tracking Time is 3 seconds, zero tracking will operate when the total weight is within the range of 0 ± 1.0 digit for 3 seconds in a stable state.

10.13. Adjustment

Note

For the operation procedure of adjustment, refer to "6.1. Adjustment".

10.13.1. Weight Value

Enter the mass value of the weight to be used for adjustment.

10.13.2. Zero Point

The zero point (reference point for weighing) is displayed. The unit is mV/V.

10.13.3. Span

The weighing capacity span is displayed. The unit is mV/V.

10.14.   Main Unit

10.14.1.   Identification Name

Enter a name to identify the device.

It is used to identify each device when using multiple devices.

Up to 40 characters can be entered for the name.

10.14.2.   Startup User Level

Sets the user level to log in automatically when the indicator starts.

Select from "Operator", "Supervisor", "Quality Manager", and "Administrator".

Caution

❑   To change the Startup User Level setting, a user at the "Administrator" level or higher is required.

❑   This setting is not for an individual registered user level.

10.14.3.   Login Timeout

Sets the time to log out automatically.

When the setting value is 0, this function is disabled.

> Setting range: 0 to 60 [minutes]

10.14.4.   Unsplit Range

Sets the limit for allowing Unsplit as a percentage to the product length.

E.g.:   When Unsplit Range is set to 20%, an Unsplit judgement is made if the photo eye sensor light is blocked 120% of the product length.

> Setting range: 0 to 200 [%]

10.14.5.   Conveyor Mode

The Conveyor Mode function operates the conveyor without weighing.

This function cannot be applied if it is changed while the conveyor is running. The change is applied to the next operation after the conveyor is stopped.

1.   "Disable"

   The Conveyor Mode function is disabled.

2.   "Enable"

   The Conveyor Mode function is enabled.

10.14.6.   Weighing Conveyor Length

Enter the length of the weighing conveyor.

> Setting range: 10 to 2000 [mm]

10.14.7. External Devices Priority

The external devices priority sets the external signal input to the DI to the top priority.

Note

　　　For the priorities of judgement, refer to "5.4.5. Judgement Result".

10.14.8. Curb Chattering

Enter the time to curb chattering for the photo eye sensor.

　　Setting range: 0.00 to 9.99 [sec]
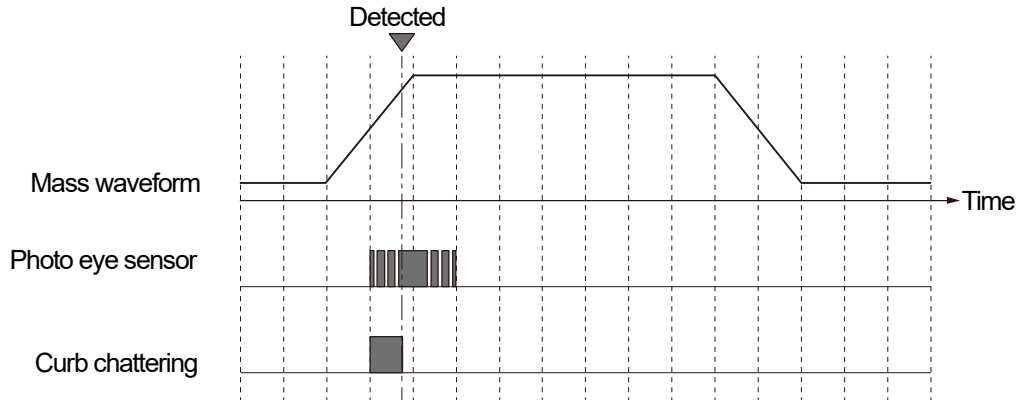
Fig. 137 Chattering timing chart

10.14.9. Photo Eye Sensor Timeout

Enter the time until the light blocking abnormality of the photo eye sensor is detected.

If the photo eye sensor light is continuously blocked for a set time or longer during dynamic weighing, it is detected as a light blocking abnormality of the photo eye sensor.

　　Setting range: 0.1 to 99.9 [sec]

10.14.10. Photo Eye Sensor Polarity

Sets the polarity of photo eye sensor.

10.14.11. Initial Value Of Speed

Sets the speed when a product is registered.

10.15.   Device

10.15.1.   Model Name

The model name of the indicator is displayed.

10.15.2.   Serial No.

The serial number of the indicator is displayed.

10.15.3.   Option Port 1 and 2

The information of option board installed in the indicator.

10.15.4.   GUI Software Version

The version of software installed in the display panel is displayed.

10.15.5.   Firmware Version

The firmware version of the indicator is displayed.

10.15.6.   Weighing Software Version

The version of weighting software installed in the indicator is displayed.

10.15.7.   Wireless Version

The Wireless Version of the indicator is displayed.

10.16. Display

10.16.1. Display Mode

Sets the display content of the weight display during dynamic weighing.

1. "Weighing Result"

   The weighing result of dynamic weighing is displayed.

2. "Current Weight"

   The current weighing value of the weighing conveyor is displayed.

10.16.2. Negative Weight

Set to show／hide the negative weight.

1. "Display"
   The negative weight is displayed.

2. "Hide"
   In static weighing or when Display Mode is set to "Current Weight", the weight display becomes blank for negative weight.

10.16.3. Display Data

Set the data to be displayed on the weight display.

1. "Weight"

   The weight is displayed.

2. "AD Count"

   The input from the load cell is displayed.

10.16.4. Display Keyboard

Set the keyboard layout displayed when entering characters.

1. "Numeric"

   The numeric keypad layout is displayed.

2. "QWERTY"

   The QWERTY layout is displayed.

3. "Alphabetical"

   The alphabetical layout is displayed.

Note

For the keyboard displayed for each setting, refer to "4.5. Inputting Characters".

10.16.5. Standby Mode

Enter the time until the screen display is turned off when the indicator is not operating.

Once in Standby Mode, touching the display or starting weighing cancels the mode.

When Standby Mode is set to 0 minutes, the mode does not work.

The Standby Mode does not work during dynamic weighing.

> Setting range: 0 to 99 [min]

10.16.6. Brightness

Sets the brightness of the display.

● Touch the "▲" button to increase the brightness by one level.
● Touch the "▼" button to reduce the brightness by one level.

10.17. Language

10.17.1. Language

Sets the display language.

1. Japanese

    The display language is set to Japanese.

2. English

    The display language is set to English.

3. Korean

    The display language is set to Korean.

4. Traditional Chinese

    The display language is set to Traditional Chinese.

10.18.　Date/Time

10.18.1.　Date

Sets the clock date (year, month, day).

For details on the settings, refer to "6.2. Date and Time Settings".

10.18.2.　Time

Sets the clock time (hours, minutes, seconds).

For details on the settings, refer to "6.2. Date and Time Settings".

10.18.3.　Date Order

Sets the display order of dates (year, month, day).

For details on the settings, refer to "6.2. Date and Time Settings".

1.　YYYY/MM/DD

   The date is displayed in the order of year, month, and day.

2.　MM/DD/YYYY

   The date is displayed in the order of month, day, and year.

3.　DD/MM/YYYY

   The date is displayed in the order of day, month, and year.

10.19.　USB Flash Drive

10.19.1.　USB Operation History

Sets the output operation of the operation history to the connected USB flash drive.

1.　"Disable"

   The operation history output to the connected USB flash drive is disabled.

2.　"Enable"

   The operation history output to the connected USB flash drive is enabled.

10.19.2.　USB Weighing History

Sets the output operation of the weighing history to the connected USB flash drive.

1.　"Disable"

   The weighing history output to the connected USB flash drive is disabled.

2.　"Enable"

   The weighing history output to the connected USB flash drive is enabled.

10.20.　Common DO Map／Common DO／Common Option DO

In the Common DO Map, Common DO, and Common Option DO settings, the digital output settings common to the system ("Common DO settings") can be set. The indicator can have 10 sets of the Common DO settings.

By changing the DO Reference settings of the registered product, digital outputs can be operated according to the Common DO settings.

For the DO Reference setting method, refer to "10.4.1. DO Reference".

How to change the settings

The procedure for changing the common DO to edit is as follows.
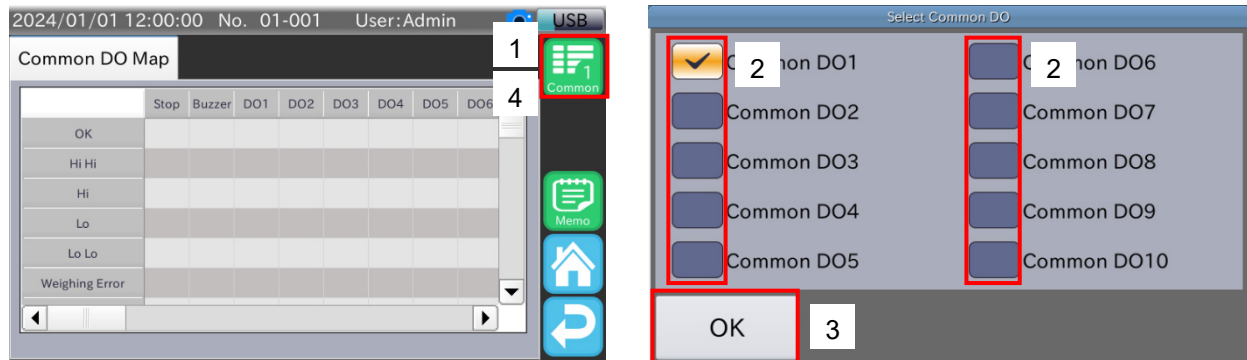
Fig. 138 Changing the common DO settings

1. Touch the Common icon ![icon] on the Common DO Map screen, Common DO screen, or Common Option DO screen to display the Select Common DO dialog box.

2. Touch the checkbox of the Common DO you want to edit.

3. Touch the OK button.

4. The number of the selected common DO is displayed over the Common icon ![icon].

10.20.1.　DO Output Definition

Sets the conveyor stop operation and digital output operation for each output definition of the Common DO settings.

For the DO Map setting method, refer to "5.6.4. Digital Output (DO) Settings".

For details on each requirement, refer to "10.4.2. DO Output Definition".

10.20.2.　DO Behavior

Sets the output behaviors for the Common DO settings.

For details on DO Behavior, refer to "10.5.1. DO Behavior".

10.20.3.　Delay Time

Enter the delay time for the Common DO settings.

For the Delay Time setting method, refer to "5.6.5. Delay／Hold Time Settings".

For details on Delay Time, refer to "10.5.2. Delay Time".

10.20.4. Hold Time

Enter the hold time for the Common DO settings.

For the Hold Time setting method, refer to "5.6.5. Delay／Hold Time Settings".

For details on Hold Time, refer to "10.5.3. Hold Time".

10.20.5. Event Release Time

Enter the event release time for common DO settings.

For details on the event release time, please refer to "10.5.4. Event Release Time".

10.20.6. Polarity

Sets the polarity for the Common DO settings.

For details on Polarity, refer to "10.5.5. Polarity".

10.21. Reject Confirmation

The Reject Confirmation function monitors whether each product has been rejected or passed using the photo eye sensor attached to the device downstream of the indicator. There are two types of checks available in the Reject Confirmation function:

- Reject check type
- Pass check type

Caution

DI1 to DI11 are to be used for the Reject Confirmation settings.

Reject Check

The reject check type uses a photo eye sensor attached downstream (in the pass direction / reject direction of the indicator) to monitor if there is any unwanted product passed incorrectly.

See below for the timing chart of the reject check operation.
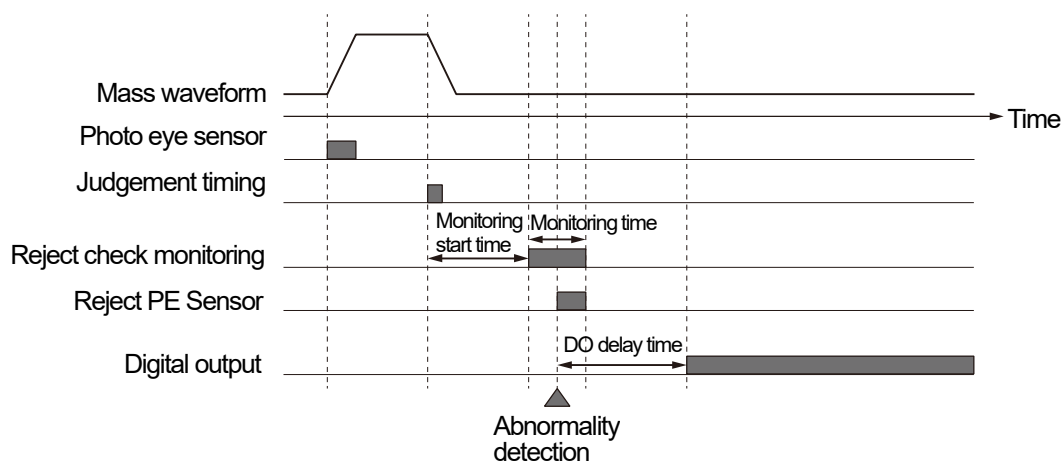
Fig. 139 Reject Check timing chart

The timing chart shows an example of when a product to be rejected is detected by the Reject PE Sensor.

After the judgement, monitoring of products starts when the monitoring start time has elapsed.

If the Reject PE Sensor is turned on from its off state during this monitoring operation (Detect Section), the function judges the product as a reject abnormality.

If the Reject / Pass Error requirement is assigned to the digital output, the digital output operates when the DO Delay Time has elapsed after the reject abnormality judgement.

When the monitoring start time is T1, monitoring delay distance is Ld, and conveyor speed is V:

$T1 = Ld / V$

Set the above as a guide, and make fine adjustments on the actual device.

When the monitoring operation time is t1, weighing conveyor length is Lv, conveyor speed is V, and extension time is T2:

$t1 = (Lv × 0.8) / V + T2$

In the case of Detect Two judgement, the monitoring time t1 is calculated from the above formula, considering the entire products included in the Detect Two judgement as a single product length. If the Reject PE Sensor continues turning on for more than the set value while the conveyor is in operation, it is treated as a Reject PE Sensor Error.

Pass Check

The pass check type uses the photo eye sensor attached to the downstream (in the pass direction of the indicator) to monitor if each product has passed correctly.

It is mainly used to monitor OK products if each has passed correctly.

See below for the timing chart of the Pass Check operation.
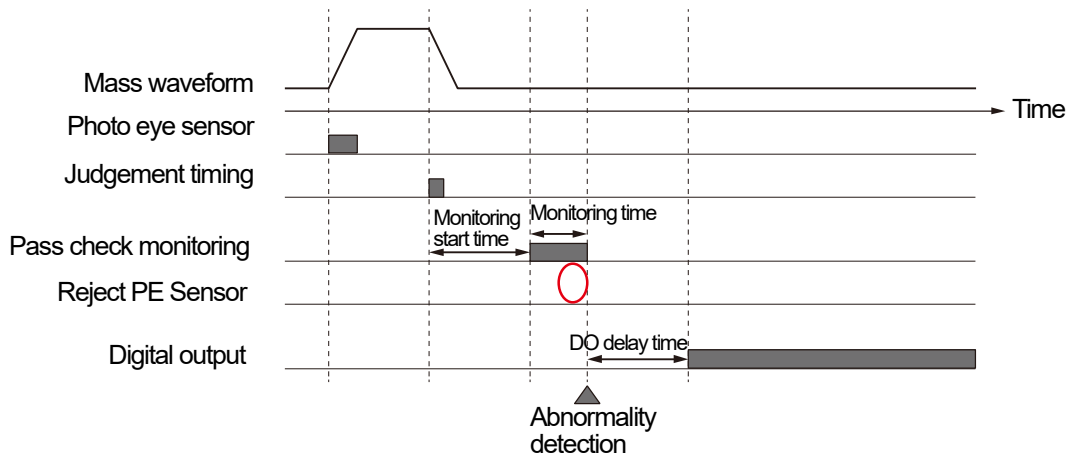
Fig. 140 Pass Check timing chart (when the product has not passed)

The timing chart shown in Fig. 140 is an example of when the product has not passed correctly.

After the judgement, monitoring of products starts when the monitoring start time has elapsed.

If the Reject PE Sensor is not turned on during this monitoring operation, the function judges it as a pass abnormality.

If the Reject / Pass Error requirement is assigned to the digital output, the digital output operates after the DO Delay Time has elapsed from the pass abnormality judgement.

Note

❏ The calculation method of the monitoring start time and monitoring time is the same as for the Reject Check function type.

❏ The operation for Detect Two judgement is the same as for the Reject Check function type.

Caution

Since the Detect Two judgement is processed as a single detect section from the start to the end, each product included in the judgement cannot be checked for pass individually.

10.21.1. DI Map (Reject Confirmation)

The DI Map is set when one of "Reject Check", "Pass Check", and "Reject + Pass" is assigned to the digital input item.
The setting method of DI Map varies depending on the set digital input items.

When "Reject Check"/"Pass Check" is assigned
Put a circle mark in the checkbox of the judgement to perform the reject / pass check.

When "Reject + Pass" is assigned
Put a circle mark in the checkbox of the judgement to perform the pass check.
For unmarked judgements, the reject check is performed.
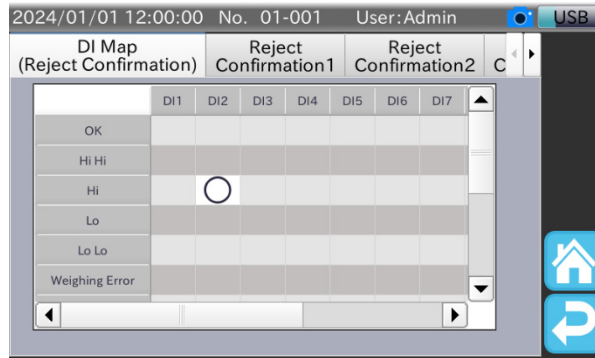
Fig. 141 DI Map (Reject Confirmation)

10.21.2. Delay Distance

Set the delay from the judgement timing of weighing to the start of monitoring by the distance.
　　Setting range: 0 to 1999 [mm]

10.21.3. Extension Time

Set the time to extend the reject check / pass check monitoring time.
This setting adjusts the monitoring time.
　　Setting range: 0.00 to 9.99 [seconds]

10.21.4. Out of Section Check

Monitors the input of the photo eye sensor even outside of the monitoring time for reject check.

10.22.   Digital Input (DI)／Option DI

For digital input (DI) reception for Metal／X-ray／Ext1／Ext2 judgement, a pulse of Curb Chattering + 50 msec or more is input in the DI Timer duration shown in the DI timing chart below. Judgement is made when the product begins to leave the weighing conveyor.
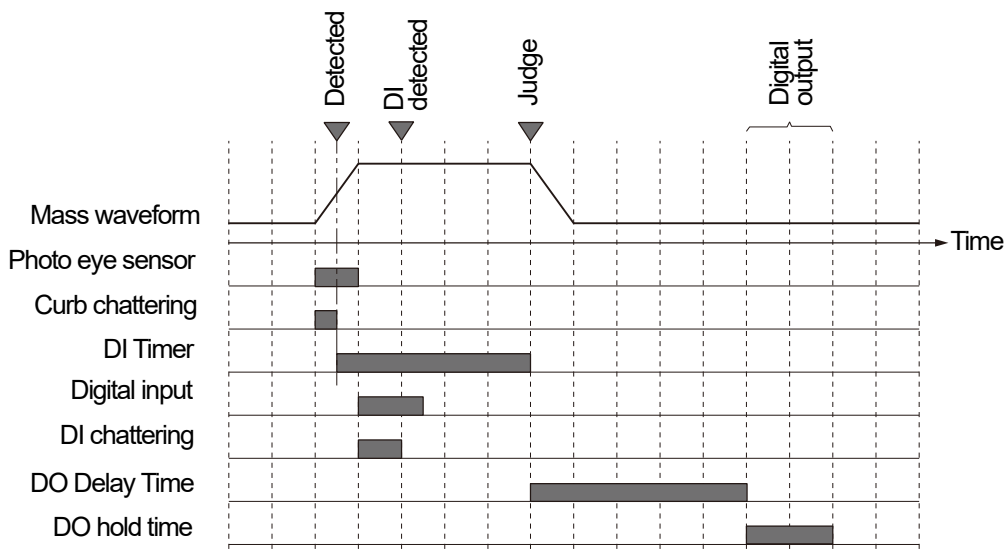
Fig. 142 DI / DO timing chart

How to change the settings

The procedure for changing the digital input settings is as follows.
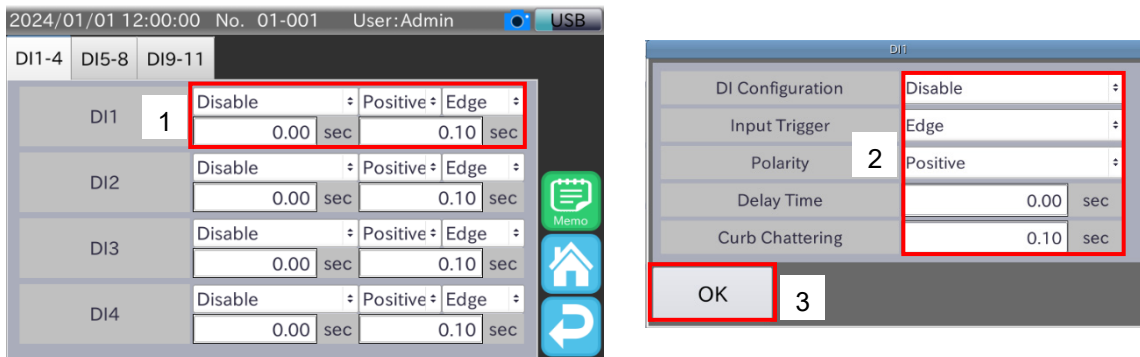
Fig. 143 Changing the DI settings

1. To change the digital input settings, touch the desired digital input settings on the screen to display the dialog box for changing the settings.

2. Change each setting.

3. After changing each setting, touch the OK button.

10.22.1. Input Trigger

Sets the signal reception method for digital inputs.

After chattering processing, the input signal processed with the input trigger is accepted.

1. "Edges"

    When the polarity is positive, the input trigger is generated when a rise (0 → 1) in input is detected.

    The next input trigger does not occur until the input becomes 0 after a rise.

    When the polarity is negative, the input trigger is generated when a fall (1 → 0) in input is detected.

    The next input trigger does not occur until the input becomes 1 after a fall.

When the polarity is positive	When the polarity is negative
Input (after chattering processing)	Input (after chattering processing)
Input trigger	Input trigger
Trigger signal is high only when a rise is detected.	Trigger signal is high only when a fall is detected.
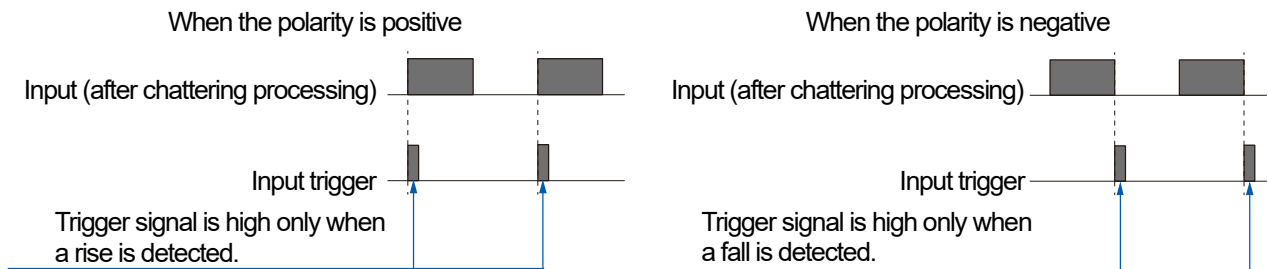
Fig. 144 Input trigger, rising / falling edges

2. "Levels"

    When the polarity is positive, this method uses the interval from rise (0 → 1) of the input to fall (1 → 0) as the input trigger.

    When the polarity is negative, this method uses the interval from fall (1 → 0) of the input to rise (0 → 1) as the input trigger.

When the polarity is positive	When the polarity is negative
Input (after chattering processing)	Input (after chattering process)
Input trigger	Input trigger
Trigger signal is set as High for the interval from the rising edge to the falling edge.	Trigger signal is set as High for the interval from the falling edge to the rising edge.
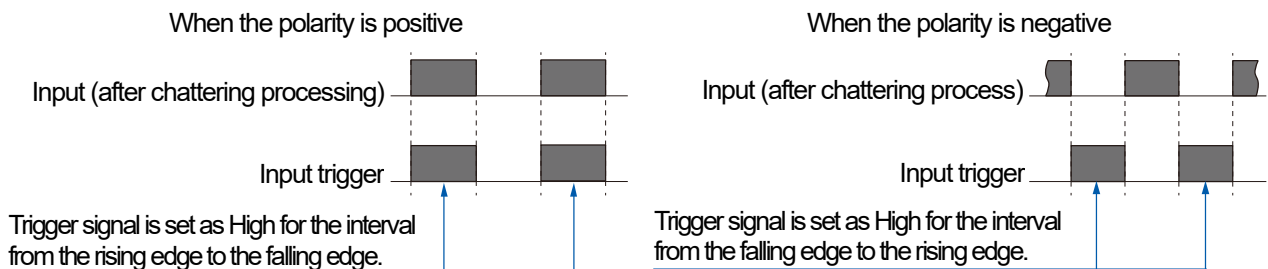
Fig. 145 Input trigger, on / off levels

10.22.2.   Polarity

Sets the polarity for the input signal.

10.22.3.   Item

Sets the function to be assigned to a digital input.

1.   "Disable"

    No function is assigned to the digital input. The setting value on the Modbus is 0.

2.   "Weighing Start"

    A Weighing Start signal is assigned.
    Input trigger is fixed as edges. Setting value on the Modbus is 1.

3.   "Weighing Stop"

    A Weighing Stop signal is assigned.
    Input trigger is fixed as edges. Setting value on the Modbus is 2.

4.   "Start∕Stop"

    A weighing Start∕Stop signal is assigned. Input trigger is fixed as levels. Weighing starts at the rising edge of the input
    (0 → 1) and stops at the falling edge (1 → 0). Setting value on the Modbus is 3.

5.   "Weighing Start∕Stop (Momentary)"

    A momentary weighing Start∕Stop signal is assigned.
    Input trigger is fixed as edges.
    Weighing state changes according to the input.
    Setting value on the Modbus is 4.
    E.g.: If an input is made during dynamic weighing (when the conveyor is in operation), weighing stops.

6.   "Dialog Release"

    This function allows an input from an external device to cancel the dialog that is displayed when a
    judgement∕abnormality is detected.
    Setting value on the Modbus is 5.

7.   "Clear Summary"

    Clear Summary is assigned. When Clear Summary is performed, all Summary data (Weighing History∕All
    Summary∕OK Summary∕Sample Summary∕OK Sample Summary∕Histogram∕Control Chart) is cleared. Setting
    value on the Modbus is 6.

8.   "Single∕Interlock"

    Single∕Interlock is assigned. Setting value on the Modbus is 7.
    Each operation is as follows.
    ❑   Single: Operation instructions using the START button and STOP button of the Display Unit are enabled.
                    Operation instructions using the Digital Input Weighing Start/Stop signal are disabled.

❑ Interlock: Operation instructions using the Digital Input Weighing Start/Stop signal are enabled. Operation instructions using the START button of the Display Unit are disabled.

9. "Metal Inspection"

This is a setting for a specific device.

Caution

This item must not be changed by anyone other than an A&D Service Engineer.

10. "Ext1 Fail"

Ext1 Fail signal is assigned. Set when a device connected to a digital input outputs a Fail signal.
Setting value on the Modbus is 9.

11. "Ext1 OK"

Ext1 OK signal is assigned. Set when a device connected to a digital input outputs an OK signal.
Setting value on the Modbus is 10.

12. "Ext2 Fail"

Ext2 Fail signal is assigned. Set when a device connected to a digital input outputs a Fail signal.
Setting value on the Modbus is 11.

13. "Ext2 OK"

Ext2 OK signal is assigned. Set when a device connected to a digital input outputs an OK signal.
Setting value on the Modbus is 12.

14. "Metal Fail"

Metal Fail signal is assigned. Set when a metal detector connected to a digital input outputs a Fail signal.
Setting value on the Modbus is 13.

15. "Metal OK"

Metal OK signal is assigned. Set when a metal detector connected to a digital input outputs an OK signal.
Setting value on the Modbus is 14.

16. "X-ray Fail"

X-ray Fail signal is assigned. Set when an X-ray inspection system connected to a digital input outputs a Fail signal.
Setting value on the Modbus is 15.

17. "X-ray OK"

X-ray OK signal is assigned. Set when an X-ray inspection system connected to a digital input outputs an OK signal.
Setting value on the Modbus is 16.

18. "Air Pressure"

Air Pressure is assigned. Setting value on the Modbus is 17.

19. "Bin Full"

Bin Full is assigned. Used to signal that the reject bin is full.
Setting value on the Modbus is 18.

20. "Emergency Stop"

Emergency Stop is assigned. Setting value on the Modbus is 19.

21. "Reject Check"

Reject Check is assigned. Setting value on the Modbus is 20. Reject Check must be set to DI1 to DI8.
For Reject Check, refer to "10.21. Reject Confirmation".

22. "Pass Check"

Pass Check is assigned. Setting value on the Modbus is 21. Pass Check must be set to DI1 to DI8.
For Pass Check, refer to "10.21. Reject Confirmation".

23. "Reject + Pass"

Function to perform Reject Check and Pass Check with a single photo eye sensor is assigned. The photo eye sensor should be attached downstream of the pass direction of OK products on the conveyor line. Setting value on the Modbus is 22. Reject + Pass must be set to DI1 to DI8.

24. "Thermal Error"

Thermal Error is assigned. Setting value on the Modbus is 23.

25. "Photo Eye Sensor"

Photo Eye Sensor is assigned. Setting value on the Modbus is 24.

26. "DO1 to DO8 Forced Operation"

Forces digital outputs to operate. Setting values on the Modbus are 23 to 35, assigned in order starting from DO1.

27. "Free Name Error 1 to 3"

Free Name Error is assigned. Setting values on the Modbus are 36 to 38 assigned in order starting from Free Name Error 1.

10.22.4. Delay Time

Enter a delay time of the digital input signal.

Use this when a device connected to a digital input does not have a function to delay a signal output.

When inputting the Fail signal or OK signal of Metal / X-ray / Ext1 / Ext2, set the time so that the signal of the external device is input within the DI Timer shown in Fig. 142.

Setting range: 0.00 to 100.00 [sec]

10.22.5. Curb Chattering

Enter the time to prevent chattering for a digital input signal.

Setting range: 0.00 to 9.99 [seconds]

10.23.   Free Name Error

Sets the names of Free Name Error 1 to 3 assigned to a digital input.

How to change the settings

The procedure for changing the Free Name Error settings is as follows.
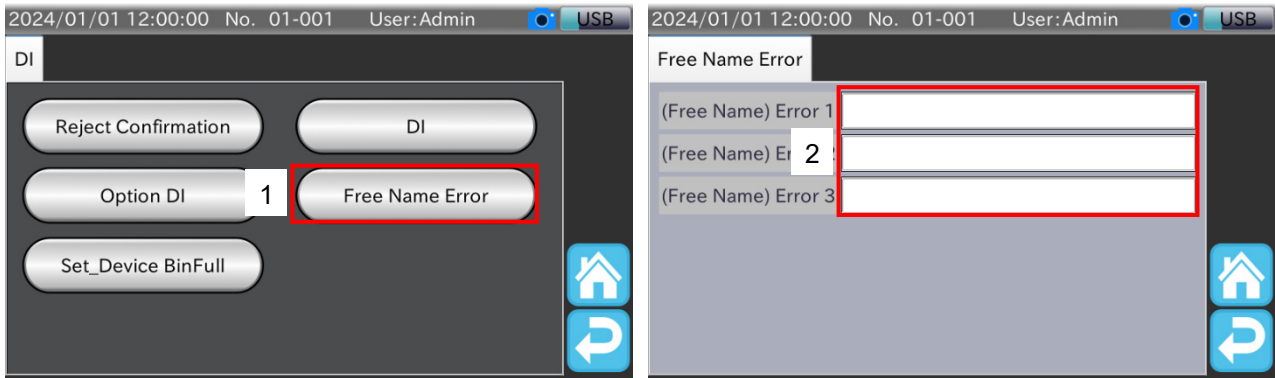
Fig. 146 Free Name Error

1. To change the Free Name Error settings, touch the Free Name Error button on the screen to display the dialog box for changing the settings.

2. Change each setting.

10.24.   Bin Full Behavior

10.24.1. Bin Full Behavior

Sets the stop behavior when Bin Full is detected.

1. Immediate stop

   Immediately stops when Bin Full is detected.

2. Stop except when "OK"

   While Bin Full is detected, stops when the judgement is other than "OK".

10.25. Analog Out

The analog output OP-07 can be installed in the option slot by which the analog board can output the weighing value and speed, etc. using electric current and voltage. On how to set the analog output, refer to the "12.7.1. How to Set the Output Current Values".

10.25.1. Output Data Type

Sets the output data type for analog output. The output data type can be selected from the weighing value or speed.

10.25.2. Output Format

Sets the output format for analog output. The output format can be selected from the voltage output or current output.

10.25.3. Low Voltage Standard

Sets the low voltage standard for analog output. The low voltage standard can be selected from 0 V, 1 V, or 2 V.

10.25.4. High Voltage Standard

Sets the high voltage standard for analog output. The high voltage standard can be selected from 3 V, 4 V, 5 V, 6 V, 7 V, 8 V, 9 V, or 10 V.

10.25.5. Low Voltage Output

Sets the low voltage output for analog output. When the output data is set with the low voltage output, the voltage set with the low voltage standard is output.

10.25.6. High Voltage Output

Sets the high voltage output for analog output. When the output data is set with the high voltage output, the voltage set with the high voltage standard is output.

10.25.7. Low Current Standard

Sets the low current standard for analog output. The low current standard can be selected from 4 mA, 5 mA, or 6 mA.

10.25.8. High Current Standard

Sets the high current standard for analog output. The high current standard can be selected from 18 mA, 19 mA, or 20 mA.

10.25.9. Low Current Output

Sets the low current output for analog output. When the output data is set with the low current output, the current value set with the low current standard is output.

10.25.10. High Current Output

Sets the high current output for analog output. When the output data is set with the high current output, the current value set with the high current standard is output.

10.26. Modbus

10.26.1. Modbus Mode

Sets the Modbus Communication Mode. When the settings are changed, the device needs to be restarted.

1. Disable

    Modbus communication is disabled.
    This setting is used when Modbus communication is not used.

2. Modbus／RTU

    Modbus communication is performed via serial communication.

3. Modbus／TCP

    Modbus communication is performed via TCP connection.

10.26.2. Slave Address

Enter the slave address of the indicator when using Modbus communication.

   Setting range: 1 to 247

10.27. RS-232C

10.27.1. Serial Mode

Sets the serial communication function assigned to RS-232C.

1. "Disable"

   RS-232C communication is disabled.
   Set when RS-232C is not used.

2. "Summary"

   This is the setting for outputting Summary data.
   To print Summary data with a dump printer, refer to "7.3. Printing to Dump Printer".

3. "Stream"

   The current weight is output.
   The output interval is 200 ms.

4. "Weighing Result and Summary"

   This is the setting for outputting weighing result when a product is judged.
   According to the settings of output format, weighing result is output.
   Summary data can also be output.
   To print weighing result and Summary data with a dump printer, refer to "7.3. Printing to Dump Printer".

5. "Product Change"

   The product is changed according to the product code received from an external device.
   This is a setting for changing the product loaded from an external device such as a barcode reader or PLC.
   For details on product change, refer to "9.6. Switching Products by Serial Communication".

6. "CS Metal Detect"

   This is the setting for interlocking the product number with A&D CS-type metal detector.

7. "Product No. Interlocking"

   This is the setting for interlocking the product number with A&D AD-4976 or AD-4972A.
   For details on product number interlocking, refer to "9.8. Product No. Interlocking".

Caution

   When the Serial Mode setting is "Stream", the output format needs be set to "A&D Standard Format" or "Weight Value Only".

10.27.2.　Output Format

Sets the data output format.

When a preset tare value is set, the preset tare value is also output.

When the second header is set, the second header is also output.

1. "Cyclic Print"

   The weighing result is output in A&D Standard Format including the total number and judgement result.

2. "A&D Standard Format"

   The weighing result is output in A&D Standard Format.

3. "Weight Value Only"

   The weighing result is output in weight value only or unit only.

The format is as follows.

Caution

- ❑ All outputs are ASCII codes. The line terminator <CR><LF> is added to the end of output data.
- ❑ <CR>: Carriage returns are hexadecimal codes, 0x0D.
- ❑ <LF>: Line feeds are hexadecimal codes, 0x0A.
- ❑ ⎵ represents a space. Spaces are hexadecimal codes, 0x20.

1. Cyclic Print

   The total number, judgement result, and A&D Standard Format are output for each weighing.
   Five characters for the total number, two characters for the judgement result, and 15 to 18 characters for the A&D Standard Format are output in this order.
   Transmission data is output in 24 to 27 characters (not including line terminators <CR><LF>).
   When a preset tare value is set, the following data is output before weighing result data.

Preset Tare value output

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

Space (1–9), Preset tare (10–24)

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	,	N	T	,	+	1	2	3	4	.	5	⎵	g

Total (1–5), Judgment result (7–8), A&D Standard Format (10–24)

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	,	N	T	,	+	1	2	3	4	.	5	⎵	g

Hi Hi

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	2	,	H	H	,	S	T	,	N	T	,	+	1	2	3	4	.	5	␣	g

Hi

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	3	,	H	I	,	S	T	,	N	T	,	+	1	2	3	4	.	5	␣	g

Lo

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	,	L	O	,	S	T	,	N	T	,	+	1	2	3	4	.	5	␣	g

Lo Lo

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	5	,	L	L	,	S	T	,	N	T	,	+	1	2	3	4	.	5	␣	g

Weighing Error

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	,	O	L	,	S	T	,	N	T	,	+	1	2	3	4	.	5	␣	g

Detect Two

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	7	,	D	T	,	S	T	,	N	T	,	+	1	2	3	4	.	5	␣	g

Unsplit

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	8	,	U	S	,	S	T	,	N	T	,	+	1	2	3	4	.	5	␣	g

Metal

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	9	,	M	D	,	S	T	,	N	T	,	+	1	2	3	4	.	5	␣	g

X-ray

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	1	0	,	X	R	,	S	T	,	N	T	,	+	1	2	3	4	.	5	␣	g

Ext1

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	1	1	,	E	1	,	S	T	,	N	T	,	+	1	2	3	4	.	5	␣	g

Ext2

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	1	2	,	E	2	,	S	T	,	N	T	,	+	1	2	3	4	.	5	␣	g

2. A&D Standard Format

This format outputs header and weight data.
Output data is in 15 to 18 characters (not including line terminators <CR><LF>).
The first header, second header (when the second header output is set), data (weight value), and the unit are output in this order.
The first header shows the state of the weighing value.
The second header is "NT" for net weight and "GS" for total weight.
The data is signed. When the data is zero, the polarity is positive.
If the preset tare value is set, the following data will be output before the weighing result data.

Preset Tare value output example

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
␣	␣	␣	P	T	,	+	1	2	3	4	.	5	6	7	8	␣	g

Space (1–3) Preset tare (4–18)

Output example (Enabled 2nd header output)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
S	T	,	N	T	,	+	1	2	3	4	.	5	6	7	8	␣	g

1st header (1–2) 2nd header (4–5) Data (7–16) Unit (17–18)

Output example (Disabled 2nd header output)

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

1st header (1–2) Data (4–13) Unit (14–15)

The following output example shows the case when the second header output is set.

When stable

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
S	T	,	N	T	,	+	1	2	3	4	.	5	6	7	8	␣	g

When unstable

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
U	S	,	N	T	,	+	1	2	3	4	.	5	6	7	8	␣	g

(Positive) Overload

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

AD-4412-CW   AD-4413-CW

(Negative) Overload

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

3. Weight Value Only

This format outputs weight value only.

Output data is in 12 characters (not including line terminators <CR><LF>).

If the preset tare value is set, the following data will be output before the weighing result data.

Preset Tare value output

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

Preset Tare

Output example

1	2	3	4	5	6	7	8	9	10	11	12
+	1	2	3	4	.	5	6	7	8	␣	g

Data — Unit

(Positive) Overload

1	2	3	4	5	6	7	8	9	10	11	12
+	9	9	9	9	9	9	9	9	9	9	9

(Negative) Overload

1	2	3	4	5	6	7	8	9	10	11	12
−	9	9	9	9	9	9	9	9	9	9	9

10.27.3. Outputting Preset Tare Value

Set the output of preset tare value.

When the serial mode is set to "Stream" or "Weighing Result", the preset tare value is output.

10.27.4. Outputting the Second Header

Set the output of the second header.

When the serial mode is set to "Stream" or "Weighing Result", the second header is output.

10.27.5. Baud Rate

Set the baud rate for RS-232C communication.

1200, 2400, 4800, 9600, 19200, 38400, 57600, or 115200 bps can be selected.

10.27.6. Parity

Set the parity for RS-232C. None, Even, or Odd can be selected.

10.27.7. Data Bit

Set the data bit for RS-232C. 7 bits or 8 bits can be selected.

10.27.8. Stop Bit

Set the stop bit for RS-232C. 1 bit or 2 bits can be selected.

AD-4412-CW   AD-4413-CW

10.28. RS-485

10.28.1. Serial Mode

Set the serial communication function assigned to RS-485.

1. "Disable"

    RS-485 communication is disabled.
    Set when RS-485 is not used.

2. "Summary"

    This is the setting for outputting Summary data.
    To print Summary data with a dump printer, refer to "7.3. Printing to Dump Printer".

3. "Stream"

    The current weight is output.
    The output interval is 200 ms.

4. "Weighing Result and Summary"

    This is the setting for outputting weighing result when a product is judged.
    According to the settings of output format, weighing result is output.
    Summary data can also be output.
    To print weighing result and Summary data with a dump printer, refer to "7.3. Printing to Dump Printer".

5. "Product Change"

    The product is changed according to the product code received from an external device.
    This is a setting for changing the product loaded from an external device such as a barcode reader or PLC.
    For details on product change, refer to "9.6. Switching Products by Serial Communication".

6. "CS Metal Detect"

    This is the setting for interlocking the product number with A&D CS-type metal detector.

7. "Product No. Interlocking"

    This is the setting for interlocking the product number with A&D AD-4976 or AD-4972A.
    For details on product number interlocking, refer to "9.8. Product No. Interlocking".

Caution

When the Serial Mode setting is "Stream", the output format needs be set to "A&D Standard Format" or "Weight Value Only".

10.28.2. Output Format

Sets the data output format.

When a preset tare value is set, the preset tare value is also output.

When the second header is set, the second header is also output.

1. "Cyclic Print"

    The weighing result is output in A&D Standard Format including the total number and judgement result.

2. "A&D Standard Format"

    The weighing result is output in A&D Standard Format.

3. "Weight Value Only"

    The weighing result is output in weight value only or unit only.

For details on the output format, refer to "10.27.2. Output Format".

10.28.3. Outputting Preset Tare Value

Set the output of preset tare value.

When the serial mode is set to "Stream" or "Weighing Result", the preset tare value is output.

10.28.4. Outputting the Second Header

Set the output of the second header.

When the serial mode is set to "Stream" or "Weighing Result", the second header is output.

10.28.5. Baud Rate

Set the baud rate for RS-485 communication.

1200, 2400, 4800, 9600, 19200, 38400, 57600, or 115200 bps can be selected.

10.28.6. Parity

Set the parity for RS-485. None, Even, or Odd can be selected.

10.28.7. Data Bit

Set the data bit for RS-485. 7 bits or 8 bits can be selected.

10.28.8. Stop Bit

Set the stop bit for RS-485. 1 bit or 2 bits can be selected.

10.29. LAN

10.29.1. CL IP Address

Set the wired LAN IP address of the indicator.

10.29.2. CL Subnet Mask

Set the wired LAN subnet mask of the indicator.

10.29.3. CL Default Gateway

Set the wired LAN default gateway of the indicator.

10.29.4. Password for Remote Operation

Set the password necessary for remote operation.
Password is set in 1 to 8 characters (alphanumeric, symbols).

10.29.5. WL LAN Port

Sets the wireless LAN operation of the indicator.

1. "Disable"

    Wireless LAN operation of the indicator is disabled.

2. "Enable"

    Wireless LAN operation of the indicator is enabled.

10.29.6. WL IP Address

Sets the wireless LAN IP address of the indicator.

10.29.7. WL Password

Enter the password for the wireless LAN of the indicator.
An 8-character password is required.

10.30. Printer

10.30.1. Printer IP Address

Sets the IP address of the PostScript compatible printer connected to the indicator.

11. Modbus Communication

Modbus is a communication protocol developed by Modicon Inc. of the United States.

Communications with Modbus supported devices is possible without using any programs.

The indicator supports Modbus RTU (serial transmission using RS-232 or RS-485) and Modbus TCP (which is an extension of serial transmission to TCP / IP).

With Modbus communications, setting value change, Summary data reading, digital input writing, digital output status reading, and more can be performed. For the communication setting method, refer to "11.1.2. Modbus TCP Communication Settings".

Caution

❑ With Modbus communications, you can only change the product settings for the product read for weighing.

❑ When the group number or product number is changed via Modbus communication, the target product settings are read. If the target product number has not been registered, a new registration is made and then the settings are read.

❑ When the settings such as the product number are changed via Modbus communication, it takes a few seconds until the settings are changed.

❑ With Modbus communications, data simultaneity and real-time synchronization are not guaranteed.
For example, even if all the data in an address map is read, not all the data may be from the same instance, depending on the system and commands used. Also, it is not always possible to read the data for each weighing.

❑ When specifying the register address for Modbus communications, remove the reference number from the address value described in "11.5. Address" and specify a value that is one less.

Note

❑ When data is written to the holding register via Modbus, the information bar at the top of the screen flashes green.

❑ For the connection methods to use Modbus TCP and Modbus RTU, refer to "9.2.1. Wired LAN Connection" and "12.3. RS-485", respectively.

❑ Modbus TCP requires the LAN settings for the indicator. For the LAN setting procedure, refer to "6.3. LAN Settings".

11.1. Setting Up the Modbus Communication

This section describes how to configure the Modbus communication.
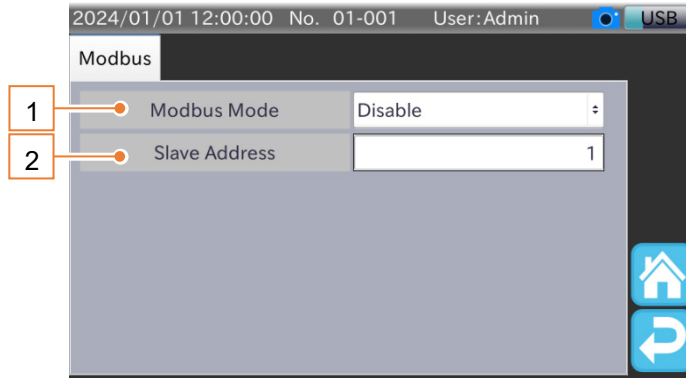
Fig. 147 Modbus settings screen

Table 54 Modbus Settings screen: part names and descriptions

No.	Name	Description
1	Modbus Mode	Select the Modbus Communication Mode.
2	Slave Address	Set the slave address for the Modbus communication.

With the indicator, you can select from two communication modes: Modbus RTU or Modbus TCP.

The setting procedure for each mode is as follows.
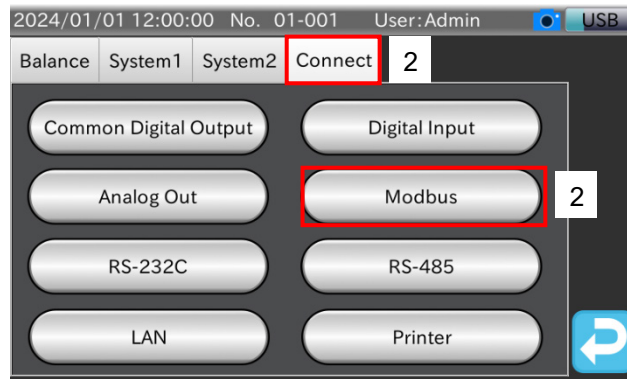
Fig. 148 Modbus setting screen display

1. Touch the Settings icon 🛠 on the Weighing screen to display the Common Settings screen.

2. Select the Connect tab of the Common Settings screen and touch the Modbus button.

   The Modbus Settings screen is displayed.

11.1.1.   Modbus RTU Communication Settings

The procedure for setting up the Modbus RTU communication is as follows.

Fig. 149 Modbus RTU communication settings

1.   Set the Modbus mode to Modbus∕RTU.

2.   Enter the slave address.

3.   Set the baud rate, parity, and stop bit in RS-485 Settings screen on the Connect tab of the Common Settings screen.

4.   Communication can be performed by connecting the serial interface of the indicator with an external device.

Caution

> When Modbus mode is set to Modbus RTU, the serial mode, output format, and data bit settings of the RS-485 Settings screen are ignored (the data bit is 8 bits fixed).

11.1.2.   Modbus TCP Communication Settings

The procedure for setting up the Modbus TCP communication is as follows.

1.   Set the Modbus mode to "Modbus∕TCP" using the same procedure as for Modbus RTU.

2.   Enter the slave address.

3.   Connect the indicator's LAN connector to an external device with a LAN cable to perform communication.

11.2.　Modbus RTU Communication Command

This section shows the Modbus RTU communication command examples. See the examples below for reading input registers and writing holding registers.

11.2.1.　Example of Reading an Input Register

Command that reads input registers. The following is an example where All Summary Total (address: 30216) is read.

Transmission command

The transmission command specifies which input register to start at and how many input registers to read.
To read All Summary Total, specify the starting address as 215, which is the value one less than the address value (see "11.5. Address") after removing the reference number. Specify the number of input registers to read as 2 because the number of bytes of All Summary Total is 4 bytes.Table 55 shows an example of a transmission command.

Table 55 Example of a transmission command (Read input registers)

Command field	Transmission data
Slave Address	0x01
Function Code	0x04
Starting Address (High)	0x00
Starting Address (Low)	0xD7
Number of Registers (High)	0x00
Number of Registers (Low)	0x02
Error Check	CRC (16 bits)

Response

Table 56 shows an example of the response when the command is processed normally.

Table 56 Example of a response (Read input registers)

Command field	Response data
Slave Address	0x01
Function Code	0x04
Number of data bytes	0x04
Data 1 (High)	0x03
Data 1 (Low)	0xE8
Data 2 (High)	0x00
Data 2 (Low)	0x00
Error Check	CRC (16 bits)

11.2.2.　Writing Example of Holding Register

Command that writes holding registers. The following is an example of the request for Product Number (address 40001).

Transmission command

The transmission command specifies which holding register to start at and the data to change. To write to a Product Number, specify 0, which is the value one less than the address value (see "11.5. Address") after removing the reference number. In this example, the data to be changed is 2. Table 57 shows an example of a transmission command.

Table 57 Example of a transmission command (Write holding registers)

Command field	Transmission data
Slave Address	0x01
Function Code	0x06
Starting Address (High)	0x00
Starting Address (Low)	0x00
Changing Data (High)	0x00
Changing Data (Low)	0x02
Error Check	CRC (16 bits)

Response

The normal response is the same as the transmission command.

Table 58 shows a response example.

Table 58 Example of a response (Write holding registers)

Command field	Response data
Slave Address	0x01
Function Code	0x06
Starting Address (High)	0x00
Starting Address (Low)	0x00
Changing Data (High)	0x00
Changing Data (Low)	0x02
Error Check	CRC (16 bits)

11.2.3.   Example of Exception Reponse

When a command that cannot be processed in Modbus communication is received, an exception response is returned.
The following is an example where a request to read input registers specifies an absent address (address 30550).

Transmission command

Table 59 shows a response example of the transmission command to address 30550.

Table 59 Example of a transmission command (Exception response example)

Command field	Transmission data
Slave Address	0x01
Function Code	0x04
Starting Address (High)	0x02
Starting Address (Low)	0x25
Number of Registers (High)	0x00
Number of Registers (Low)	0x01
Error Check	CRC (16 bits)

Response

An exception response is returned because input register 30550 does not exist.
Table 60 shows the example of an exception response. The function code for the exception response is the transmission command's function code value to which 0x80 is added.

Table 60 Example of an exception response (Read input registers specifying an absent address)

Command field	Response data
Slave Address	0x01
Function Code	0x84
Exception Code	0x02
Error Check	CRC (16 bits)

Table 61 shows the exception codes and descriptions.

Table 61 Exception codes

Exception code	Name	Meaning
01	Illegal Function	The function is not supported.
02	Illegal Data Address	The specified data address does not exist.
03	Illegal Data Value	The specified data is not allowed.

11.3. Modbus TCP Communication Commands

11.3.1. Protocol Layout

This section describes the format when a Modbus request/response is communicated via a Modbus TCP network.

The transaction identifier is used for message transaction management on the master side, and the slave side only returns a copy.

A dedicated 6-byte long header is added at the head of a Modbus request/response message.

Byte 0 : Transaction identifier (copied by the slave; typically, 0)

Byte 1 : Transaction identifier (copied by the slave; typically, 0)

Byte 2 : Protocol identifier (= 0)

Byte 3 : Protocol identifier (= 0)

Byte 4 : Field length (upper byte) = 0 (as the maximum message length is 256.

Byte 5 : Field length (lower byte) = number of following bytes

Byte 6 : Slave Address

Byte 7 : Modbus Function

Byte 8 and following bytes : Necessary data field

A Modbus TCP message frame and a general Modbus message frame are shown in the figure below.

Modbus	Start	Address	Function	Data	CRC LRC	End

Modbus TCP	Transaction identifier	Protocol identifier	Length	Unit identifier	Function	Data
	byte 0, 1	byte 2, 3	byte 4, 5	byte 6	byte 7	byte 8
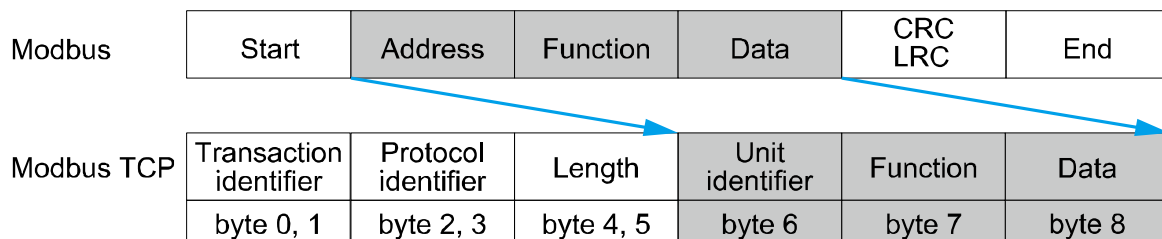
Fig. 150 Relationship between Modbus TCP and general Modbus message frames

11.3.2. Example of Reading an Input Register

This is an example of a communication command with Modbus TCP.

An input register is read under the same conditions as given in "11.2.1. Example of Reading an Input Register" is performed.

The table shows an example of a transmission command and response when the command is processed normally.

Caution

No error check is required with Modbus TCP.

Transmission command

Table 62 Example of a transmission command (Read input registers)

Command field	Transmission data
Transaction Identifier	0x00
Transaction Identifier	0x00
Protocol Identifier	0x00
Protocol Identifier	0x00
Length (High)	0x00
Length (Low)	0x06
Slave Address	0x01
Function Code	0x04
Starting Address (High)	0x00
Starting Address (Low)	0xD7
Number of Registers (High)	0x00
Number of Registers (Low)	0x02

Response

Table 63 Example of a response (Read input registers)

Command field	Transmission data
Transaction Identifier	0x00
Transaction Identifier	0x00
Protocol Identifier	0x00
Protocol Identifier	0x00
Length (High)	0x00
Length (Low)	0x07
Slave Address	0x01
Function Code	0x04
Number of data bytes	0x04
Data 1 (High)	0x03
Data 1 (Low)	0xE8
Data 2 (High)	0x00
Data 2 (Low)	0x00

11.4.   Reference Number

With Modbus, "reference number" and "address" are used to send instructions to the device and data reading. The data types and reference numbers are shown in Table 64.

Table 64 Reference Number

Data type	Reference number	Description
Output Coil	0	Write-only bit data. For controlling DI1 to DI27.
Input Status	1	Read-only bit data. For monitoring DI/DO.
Input Register	3	Read-only word data. For reading setting value, weighing value, and summary data.
Holding Register	4	Reading/writing of word data. For changing setting values and reading product settings.

11.5.　Address

The Modbus communication addresses are shown in Table 65 to Table 68.

Table 65 Output Coil Address List

Address	Name
00001	DI1
00002	DI2
00003	DI3
00004	DI4
00005	DI5
00006	DI6
00007	DI7
00008	DI8
00009	DI9
00010	DI10
00011	DI11
00012	DI12
00013	DI13
00014	DI14
00015	DI15
00016	DI16
00017	DI17
00018	DI18
00019	DI19
00020	DI20
00021	DI21
00022	DI22
00023	DI23
00024	DI24
00025	DI25
00026	DI26
00027	DI27

Table 66 Input Status Address List

Address	Name
10001	DI 1 (Indicates the status of DI 1)
10002	DI 2 (Indicates the status of DI 2)
10003	DI 3 (Indicates the status of DI 3)
10004	DI 4 (Indicates the status of DI 4)
10005	DI 5 (Indicates the status of DI 5)
10006	DI 6 (Indicates the status of DI 6)
10007	DI 7 (Indicates the status of DI 7)
10008	DI 8 (Indicates the status of DI 8)
10009	DI 9 (Indicates the status of DI 9)
10010	DI 10 (Indicates the status of DI 10)
10011	DI 11 (Indicates the status of DI 11)
10012	DI 12 (Indicates the status of DI 12)
10013	DI 13 (Indicates the status of DI 13)
10014	DI 14 (Indicates the status of DI 14)
10015	DI 15 (Indicates the status of DI 15)
10016	DI 16 (Indicates the status of DI 16)
10017	DI 17 (Indicates the status of DI 17)
10018	DI 18 (Indicates the status of DI 18)
10019	DI 19 (Indicates the status of DI 19)
10020	DI 20 (Indicates the status of DI 20)
10021	DI 21 (Indicates the status of DI 21)
10022	DI 22 (Indicates the status of DI 22)
10023	DI 23 (Indicates the status of DI 23)
10024	DI 24 (Indicates the status of DI 24)
10025	DI 25 (Indicates the status of DI 25)
10026	DI 26 (Indicates the status of DI 26)
10027	DI 27 (Indicates the status of DI 27)
10028 to 10032	Reserved for expansion. Do not use.
10033	DI Status 1 (Indicates the status of the function assigned to DI 1) *
10034	DI Status 2 (Indicates the status of the function assigned to DI 2) *
10035	DI Status 3 (Indicates the status of the function assigned to DI 3) *
10036	DI Status 4 (Indicates the status of the function assigned to DI 4) *
10037	DI Status 5 (Indicates the status of the function assigned to DI 5) *
10038	DI Status 6 (Indicates the status of the function assigned to DI 6) *
10039	DI Status 7 (Indicates the status of the function assigned to DI 7) *
10040	DI Status 8 (Indicates the status of the function assigned to DI 8) *
10041	DI Status 9 (Indicates the status of the function assigned to DI 9) *
10042	DI Status 10 (Indicates the status of the function assigned to DI 10) *
10043	DI Status 11 (Indicates the status of the function assigned to DI 11) *

*   DI status 1 to 27

Indicates the operation status of DI1 to DI27. Each DI is assigned together to the hardware and the Modbus output coil, and the DI status indicates the operation status for both put together.

Table 66 Input Status Address List (continued)

Address	Name
10044	DI Status 12　(Indicates the status of the function assigned to DI 12) *
10045	DI Status 13　(Indicates the status of the function assigned to DI 13) *
10046	DI Status 14　(Indicates the status of the function assigned to DI 14) *
10047	DI Status 15　(Indicates the status of the function assigned to DI 15) *
10048	DI Status 16　(Indicates the status of the function assigned to DI 16) *
10049	DI Status 17　(Indicates the status of the function assigned to DI 17) *
10050	DI Status 18　(Indicates the status of the function assigned to DI 18) *
10051	DI Status 19　(Indicates the status of the function assigned to DI 19) *
10052	DI Status 20　(Indicates the status of the function assigned to DI 20) *
10053	DI Status 21　(Indicates the status of the function assigned to DI 21) *
10054	DI Status 22　(Indicates the status of the function assigned to DI 22) *
10055	DI Status 23　(Indicates the status of the function assigned to DI 23) *
10056	DI Status 24　(Indicates the status of the function assigned to DI 24) *
10057	DI Status 25　(Indicates the status of the function assigned to DI 25) *
10058	DI Status 26　(Indicates the status of the function assigned to DI 26) *
10059	DI Status 27　(Indicates the status of the function assigned to DI 27) *
10060 to 10064	Reserved for expansion. Do not use.
10065	DO Stop
10066	DO Buzzer
10067	DO1
10068	DO2
10069	DO3
10070	DO4
10071	DO5
10072	DO6
10073	DO7
10074	DO8
10075	DO9
10076	DO10
10077	DO11
10078	DO12
10079	DO13
10080	DO14
10081	DO15
10082	DO16
10083	DO17
10084	DO18
10085	DO19
10086	DO20

*　DI status 1 to 27

Indicates the operation status of DI1 to DI27. Each DI is assigned together to the hardware and the Modbus output coil, and the DI status indicates the operation status for both put together.

Table 66 Input Status Address List (continued)

Address	Name
10087	DO21
10088	DO22
10089	DO23
10090	DO24
10091	DO25
10092	DO26
10093	DO27
10094	DO28
10095	DO29
10096	DO30
10097	DO31
10098	DO32
10099	DO33
10100	DO34
10101	DO35
10102	DO36

Table 67 Input Register Address List

Address	Setting name		Size	Output range
30001	Main Unit IP Address 1	(High)	2 bytes	0 – 255
30002	Main Unit IP Address 2		2 bytes	0 – 255
30003	Main Unit IP Address 3		2 bytes	0 – 255
30004	Main Unit IP Address 4	(Low)	2 bytes	0 – 255
30005	Main Unit Subnet Mask 1	(High)	2 bytes	0 – 255
30006	Main Unit Subnet Mask 2		2 bytes	0 – 255
30007	Main Unit Subnet Mask 3		2 bytes	0 – 255
30008	Main Unit Subnet Mask 4	(Low)	2 bytes	0 – 255
30009	Main Unit Default Gateway1	(High)	2 bytes	0 – 255
30010	Main Unit Default Gateway2		2 bytes	0 – 255
30011	Main Unit Default Gateway3		2 bytes	0 – 255
30012	Main Unit Default Gateway4	(Low)	2 bytes	0 – 255
30013	WL LAN Port		2 bytes	0 – 1
30014	WL IP Address 1	(High)	2 bytes	0 – 255
30015	WL IP Address 2		2 bytes	0 – 255
30016	WL IP Address 3		2 bytes	0 – 255
30017	WL IP Address 4	(Low)	2 bytes	0 – 255
30018	Reserved for expansion. Do not use.			
30019	Printer IP Address 1	(High)	2 bytes	0 – 255
30020	Printer IP Address 2		2 bytes	0 – 255
30021	Printer IP Address 3		2 bytes	0 – 255
30022	Printer IP Address 4	(Low)	2 bytes	0 – 255
30023	RS-232C Port		2 bytes	0 – 6
30024	RS-232C Output Format		2 bytes	0 – 2
30025	RS-232C Output Preset Tare		2 bytes	0 – 1
30026	RS-232C Output 2nd Header		2 bytes	0 – 1
30027	RS-232C Baud Rate		2 bytes	0 – 7
30028	RS-232C Parity		2 bytes	0 – 2
30029	RS-232C Stop Bit		2 bytes	0 – 1
30030	RS-232C Data Bit		2 bytes	0 – 1
30031	RS-485 Port		2 bytes	0 – 6
30032	RS-485 Output Format		2 bytes	0 – 2
30033	RS-485 Output Preset Tare		2 bytes	0 – 1
30034	RS-485 Output 2nd Header		2 bytes	0 – 1
30035	RS-485 Baud Rate		2 bytes	0 – 7
30036	RS-485 Parity		2 bytes	0 – 2
30037	RS-485 Stop Bit		2 bytes	0 – 1
30038	RS-485 Data Bit		2 bytes	0 – 1
30039	Modbus Mode		2 bytes	0 – 2
30040	Slave Address		2 bytes	1 – 247
30041	Unit		2 bytes	0 – 1
30042	Conveyor Mode		2 bytes	0 – 1
30043	Data Type	1 – 1ch	2 bytes	0 – 1

Table 67 Input Register Address List (continued)

Address	Setting name		Size	Output range
30044	Data Type	1 – 2ch	2 bytes	0 – 1
30045	Data Type	1 – 3ch	2 bytes	0 – 1
30046	Data Type	1 – 4ch	2 bytes	0 – 1
30047	Data Type	2 – 1ch	2 bytes	0 – 1
30048	Data Type	2 – 2ch	2 bytes	0 – 1
30049	Data Type	2 – 3ch	2 bytes	0 – 1
30050	Data Type	2 – 4ch	2 bytes	0 – 1
30051	Output Format	1 – 1ch	2 bytes	0 – 1
30052	Output Format	1 – 2ch	2 bytes	0 – 1
30053	Output Format	1 – 3ch	2 bytes	0 – 1
30054	Output Format	1 – 4ch	2 bytes	0 – 1
30055	Output Format	2 – 1ch	2 bytes	0 – 1
30056	Output Format	2 – 2ch	2 bytes	0 – 1
30057	Output Format	2 – 3ch	2 bytes	0 – 1
30058	Output Format	2 – 4ch	2 bytes	0 – 1
30059	Low Current Standard	1 – 1ch	2 bytes	0 – 2
30060	Low Current Standard	1 – 2ch	2 bytes	0 – 2
30061	Low Current Standard	1 – 3ch	2 bytes	0 – 2
30062	Low Current Standard	1 – 4ch	2 bytes	0 – 2
30063	Low Current Standard	2 – 1ch	2 bytes	0 – 2
30064	Low Current Standard	2 – 2ch	2 bytes	0 – 2
30065	Low Current Standard	2 – 3ch	2 bytes	0 – 2
30066	Low Current Standard	2 – 4ch	2 bytes	0 – 2
30067	High Current Standard	1 – 1ch	2 bytes	0 – 2
30068	High Current Standard	1 – 2ch	2 bytes	0 – 2
30069	High Current Standard	1 – 3ch	2 bytes	0 – 2
30070	High Current Standard	1 – 4ch	2 bytes	0 – 2
30071	High Current Standard	2 – 1ch	2 bytes	0 – 2
30072	High Current Standard	2 – 2ch	2 bytes	0 – 2
30073	High Current Standard	2 – 3ch	2 bytes	0 – 2
30074	High Current Standard	2 – 4ch	2 bytes	0 – 2
30075	Low Current Output Weight	1 – 1ch	4 bytes	-99999.0000 – 99999.9999
30077	Low Current Output Weight	1 – 2ch	4 bytes	-99999.0000 – 99999.9999
30079	Low Current Output Weight	1 – 3ch	4 bytes	-99999.0000 – 99999.9999
30081	Low Current Output Weight	1 – 4ch	4 bytes	-99999.0000 – 99999.9999
30083	Low Current Output Weight	2 – 1ch	4 bytes	-99999.0000 – 99999.9999
30085	Low Current Output Weight	2 – 2ch	4 bytes	-99999.0000 – 99999.9999
30087	Low Current Output Weight	2 – 3ch	4 bytes	-99999.0000 – 99999.9999
30089	Low Current Output Weight	2 – 4ch	4 bytes	-99999.0000 – 99999.9999
30091	High Current Output Weight	1 – 1ch	4 bytes	-99999.0000 – 99999.9999
30093	High Current Output Weight	1 – 2ch	4 bytes	-99999.0000 – 99999.9999
30095	High Current Output Weight	1 – 3ch	4 bytes	-99999.0000 – 99999.9999
30097	High Current Output Weight	1 – 4ch	4 bytes	-99999.0000 – 99999.9999
30099	High Current Output Weight	2 – 1ch	4 bytes	-99999.0000 – 99999.9999

AD-4412-CW   AD-4413-CW

Table 67 Input Register Address List (continued)

Address	Setting name		Size	Output range
30101	High Current Output Weight	2 – 2ch	4 bytes	-99999.0000 – 99999.9999
30103	High Current Output Weight	2 – 3ch	4 bytes	-99999.0000 – 99999.9999
30105	High Current Output Weight	2 – 4ch	4 bytes	-99999.0000 – 99999.9999
30107	Low Current Output Speed	1 – 1ch	2 bytes	1.0 – 3000.0
30108	Low Current Output Speed	1 – 2ch	2 bytes	1.0 – 3000.0
30109	Low Current Output Speed	1 – 3ch	2 bytes	1.0 – 3000.0
30110	Low Current Output Speed	1 – 4ch	2 bytes	1.0 – 3000.0
30111	Low Current Output Speed	2 – 1ch	2 bytes	1.0 – 3000.0
30112	Low Current Output Speed	2 – 2ch	2 bytes	1.0 – 3000.0
30113	Low Current Output Speed	2 – 3ch	2 bytes	1.0 – 3000.0
30114	Low Current Output Speed	2 – 4ch	2 bytes	1.0 – 3000.0
30115	High Current Output Speed	1 – 1ch	2 bytes	1.0 – 3000.0
30116	High Current Output Speed	1 – 2ch	2 bytes	1.0 – 3000.0
30117	High Current Output Speed	1 – 3ch	2 bytes	1.0 – 3000.0
30118	High Current Output Speed	1 – 4ch	2 bytes	1.0 – 3000.0
30119	High Current Output Speed	2 – 1ch	2 bytes	1.0 – 3000.0
30120	High Current Output Speed	2 – 2ch	2 bytes	1.0 – 3000.0
30121	High Current Output Speed	2 – 3ch	2 bytes	1.0 – 3000.0
30122	High Current Output Speed	2 – 4ch	2 bytes	1.0 – 3000.0
30123	Low Voltage Standard	1 – 1ch	2 bytes	0 – 2
30124	Low Voltage Standard	1 – 2ch	2 bytes	0 – 2
30125	Low Voltage Standard	1 – 3ch	2 bytes	0 – 2
30126	Low Voltage Standard	1 – 4ch	2 bytes	0 – 2
30127	Low Voltage Standard	2 – 1ch	2 bytes	0 – 2
30128	Low Voltage Standard	2 – 2ch	2 bytes	0 – 2
30129	Low Voltage Standard	2 – 3ch	2 bytes	0 – 2
30130	Low Voltage Standard	2 – 4ch	2 bytes	0 – 2
30131	High Voltage Standard	1 – 1ch	2 bytes	0 – 7
30132	High Voltage Standard	1 – 2ch	2 bytes	0 – 7
30133	High Voltage Standard	1 – 3ch	2 bytes	0 – 7
30134	High Voltage Standard	1 – 4ch	2 bytes	0 – 7
30135	High Voltage Standard	2 – 1ch	2 bytes	0 – 7
30136	High Voltage Standard	2 – 2ch	2 bytes	0 – 7
30137	High Voltage Standard	2 – 3ch	2 bytes	0 – 7
30138	High Voltage Standard	2 – 4ch	2 bytes	0 – 7
30139	Low Voltage Output Weight	1 – 1ch	4 bytes	-99999.0000 – 99999.9999
30141	Low Voltage Output Weight	1 – 2ch	4 bytes	-99999.0000 – 99999.9999
30143	Low Voltage Output Weight	1 – 3ch	4 bytes	-99999.0000 – 99999.9999
30145	Low Voltage Output Weight	1 – 4ch	4 bytes	-99999.0000 – 99999.9999
30147	Low Voltage Output Weight	2 – 1ch	4 bytes	-99999.0000 – 99999.9999
30149	Low Voltage Output Weight	2 – 2ch	4 bytes	-99999.0000 – 99999.9999
30151	Low Voltage Output Weight	2 – 3ch	4 bytes	-99999.0000 – 99999.9999
30153	Low Voltage Output Weight	2 – 4ch	4 bytes	-99999.0000 – 99999.9999
30155	High Voltage Output Weight	1 – 1ch	4 bytes	-99999.0000 – 99999.9999

Table 67 Input Register Address List (continued)

Address	Setting name		Size	Output range
30157	High Voltage Output Weight	1 – 2ch	4 bytes	-99999.0000 – 99999.9999
30159	High Voltage Output Weight	1 – 3ch	4 bytes	-99999.0000 – 99999.9999
30161	High Voltage Output Weight	1 – 4ch	4 bytes	-99999.0000 – 99999.9999
30163	High Voltage Output Weight	2 – 1ch	4 bytes	-99999.0000 – 99999.9999
30165	High Voltage Output Weight	2 – 2ch	4 bytes	-99999.0000 – 99999.9999
30167	High Voltage Output Weight	2 – 3ch	4 bytes	-99999.0000 – 99999.9999
30169	High Voltage Output Weight	2 – 4ch	4 bytes	-99999.0000 – 99999.9999
30171	Low Voltage Output Speed	1 – 1ch	2 bytes	1.0 – 9999.0
30172	Low Voltage Output Speed	1 – 2ch	2 bytes	1.0 – 9999.0
30173	Low Voltage Output Speed	1 – 3ch	2 bytes	1.0 – 9999.0
30174	Low Voltage Output Speed	1 – 4ch	2 bytes	1.0 – 9999.0
30175	Low Voltage Output Speed	2 – 1ch	2 bytes	1.0 – 9999.0
30176	Low Voltage Output Speed	2 – 2ch	2 bytes	1.0 – 9999.0
30177	Low Voltage Output Speed	2 – 3ch	2 bytes	1.0 – 9999.0
30178	Low Voltage Output Speed	2 – 4ch	2 bytes	1.0 – 9999.0
30179	High Voltage Output Speed	1 – 1ch	2 bytes	1.0 – 9999.0
30180	High Voltage Output Speed	1 – 2ch	2 bytes	1.0 – 9999.0
30181	High Voltage Output Speed	1 – 3ch	2 bytes	1.0 – 9999.0
30182	High Voltage Output Speed	1 – 4ch	2 bytes	1.0 – 9999.0
30183	High Voltage Output Speed	2 – 1ch	2 bytes	1.0 – 9999.0
30185	High Voltage Output Speed	2 – 2ch	2 bytes	1.0 – 9999.0
30186	High Voltage Output Speed	2 – 3ch	2 bytes	1.0 – 9999.0
30187	High Voltage Output Speed	2 – 4ch	2 bytes	1.0 – 9999.0
30188	Re Zero		4 bytes	0.000000 – 9.999999
30190	Span		4 bytes	0.000000 – 9.999999
30192	Conveyor Length		2 bytes	1 – 9999
30193	Initial Speed		2 bytes	1 – 100
30194 to 30213	Reserved for expansion. Do not use.			
30214	Weighing Result		4 bytes	0 – 9999.9999
30216	All Summary Total		4 bytes	0 – 9999999
30218	All Summary OK		4 bytes	0 – 9999999
30220	All Summary Hi Hi		4 bytes	0 – 9999999
30222	All Summary Hi		4 bytes	0 – 9999999
30224	All Summary Lo		4 bytes	0 – 9999999
30226	All Summary Lo Lo		4 bytes	0 – 9999999
30228	All Summary Detect Two		4 bytes	0 – 9999999
30230	All Summary Unsplit		4 bytes	0 – 9999999
30232	All Summary Metal		4 bytes	0 – 9999999
30234	All Summary X-ray		4 bytes	0 – 9999999
30236	All Summary Ext1		4 bytes	0 – 9999999
30238	All Summary Ext2		4 bytes	0 – 9999999

Table 67 Input Register Address List (continued)

Address	Setting name	Size	Output range
30240	All Summary Weighing Error	4 bytes	0 – 9999999
30242	All Summary Total Weight	4 bytes	0 – 9999.9999
30244	All Summary Average Weight	4 bytes	0 – 9999.9999
30246	All Summary Maximum	4 bytes	0 – 9999.9999
30248	All Summary Minimum	4 bytes	0 – 9999.9999
30250	All Summary Range	4 bytes	0 – 9999.9999
30252	All Summary SD	4 bytes	0 – 1.00000
30254	All Summary CV	2 bytes	0 – 99.99
30255	OK Summary Total	4 bytes	0 – 9999999
30257	OK Summary Total Weight	4 bytes	0 – 9999.9999
30259	OK Summary Average Weight	4 bytes	0 – 9999.9999
30261	OK Summary Maximum	4 bytes	0 – 9999.9999
30263	OK Summary Minimum	4 bytes	0 – 9999.9999
30265	OK Summary Range	4 bytes	0 – 9999.9999
30267	OK Summary SD	4 bytes	0 – 1.00000
30269	OK Summary CV	2 bytes	0 – 99.99
30270	Sample Summary Total	4 bytes	0 – 9999999
30272	Sample Summary OK	4 bytes	0 – 9999999
30274	Sample Summary Hi Hi	4 bytes	0 – 9999999
30276	Sample Summary Hi	4 bytes	0 – 9999999
30278	Sample Summary Lo	4 bytes	0 – 9999999
30280	Sample Summary Lo Lo	4 bytes	0 – 9999999
30282	Sample Summary Detect Two	4 bytes	0 – 9999999
30284	Sample Summary Unsplit	4 bytes	0 – 9999999
30286	Sample Summary Metal	4 bytes	0 – 9999999
30288	Sample Summary X-ray	4 bytes	0 – 9999999
30290	Sample Summary Ext1	4 bytes	0 – 9999999
30292	Sample Summary Ext2	4 bytes	0 – 9999999
30294	Sample Summary Weighing Error	4 bytes	0 – 9999999
30296	Sample Summary Total Weight	4 bytes	0 – 9999.9999
30298	Sample Summary Average Weight	4 bytes	0 – 9999.9999
30300	Sample Summary Maximum	4 bytes	0 – 9999.9999
30302	Sample Summary Minimum	4 bytes	0 – 9999.9999
30304	Sample Summary Range	4 bytes	0 – 9999.9999
30306	Sample Summary SD	4 bytes	0 – 1.00000
30308	Sample Summary CV	2 bytes	0 – 99.99
30309	OK Sample Summary Total	4 bytes	0 – 9999999
30311	OK Sample Summary Total Weight	4 bytes	0 – 9999.9999
30313	OK Sample Summary Average Weight	4 bytes	0 – 9999.9999
30315	OK Sample Summary Maximum	4 bytes	0 – 9999.9999
30317	OK Sample Summary Minimum	4 bytes	0 – 9999.9999
30319	OK Sample Summary Range	4 bytes	0 – 9999.9999
30321	OK Sample Summary SD	4 bytes	0 – 1.00000
30323	OK Sample Summary CV	2 bytes	0 – 99.99

Table 67 Input Register Address List (continued)

Address	Setting name	Size	Output range
30324 to 30539	Reserved for expansion.		

Table 68 Holding Register Address List

Address	Setting name	Size	Output range
40001	Product No.	2 bytes	1 – 100
40002	Group Number	2 bytes	1 – 10
40003	Language	2 bytes	0 – 3
40004	Standby Mode	2 bytes	0 – 99
40005	DI1 Setting (Map)	4 bytes	0 – 4095
40007	DI2 Setting (Map)	4 bytes	0 – 4095
40009	DI3 Setting (Map)	4 bytes	0 – 4095
40011	DI4 Setting (Map)	4 bytes	0 – 4095
40013	DI5 Setting (Map)	4 bytes	0 – 4095
40015	DI6 Setting (Map)	4 bytes	0 – 4095
40017	DI7 Setting (Map)	4 bytes	0 – 4095
40019	DI8 Setting (Map)	4 bytes	0 – 4095
40021	DI9 Setting (Map)	4 bytes	0 – 4095
40023	DI10 Setting (Map)	4 bytes	0 – 4095
40025	DI11 Setting (Map)	4 bytes	0 – 4095
40027	DI1 Reject Check Delay Distance	2 bytes	0 – 1999
40028	DI2 Reject Check Delay Distance	2 bytes	0 – 1999
40029	DI3 Reject Check Delay Distance	2 bytes	0 – 1999
40030	DI4 Reject Check Delay Distance	2 bytes	0 – 1999
40031	DI5 Reject Check Delay Distance	2 bytes	0 – 1999
40032	DI6 Reject Check Delay Distance	2 bytes	0 – 1999
40033	DI7 Reject Check Delay Distance	2 bytes	0 – 1999
40034	DI8 Reject Check Delay Distance	2 bytes	0 – 1999
40035	DI9 Reject Check Delay Distance	2 bytes	0 – 1999
40036	DI10 Reject Check Delay Distance	2 bytes	0 – 1999
40037	DI11 Reject Check Delay Distance	2 bytes	0 – 1999
40038	DI1 Reject Check Extension Time	2 bytes	0 – 9.99
40039	DI2 Reject Check Extension Time	2 bytes	0 – 9.99
40040	DI3 Reject Check Extension Time	2 bytes	0 – 9.99
40041	DI4 Reject Check Extension Time	2 bytes	0 – 9.99
40042	DI5 Reject Check Extension Time	2 bytes	0 – 9.99
40043	DI6 Reject Check Extension Time	2 bytes	0 – 9.99
40044	DI7 Reject Check Extension Time	2 bytes	0 – 9.99
40045	DI8 Reject Check Extension Time	2 bytes	0 – 9.99
40046	DI9 Reject Check Extension Time	2 bytes	0 – 9.99
40047	DI10 Reject Check Extension Time	2 bytes	0 – 9.99
40048	DI11 Reject Check Extension Time	2 bytes	0 – 9.99
40049	DI1 Reject Check Non-Reject Section	2 bytes	0 – 1

Table 68 Holding Register Address List (continued)

Address	Setting name	Size	Output range
40050	DI2 Reject Check Non-Reject Section	2 bytes	0 – 1
40051	DI3 Reject Check Non-Reject Section	2 bytes	0 – 1
40052	DI4 Reject Check Non-Reject Section	2 bytes	0 – 1
40053	DI5 Reject Check Non-Reject Section	2 bytes	0 – 1
40054	DI6 Reject Check Non-Reject Section	2 bytes	0 – 1
40055	DI7 Reject Check Non-Reject Section	2 bytes	0 – 1
40056	DI8 Reject Check Non-Reject Section	2 bytes	0 – 1
40057	DI9 Reject Check Non-Reject Section	2 bytes	0 – 1
40058	DI10 Reject Check Non-Reject Section	2 bytes	0 – 1
40059	DI11 Reject Check Non-Reject Section	2 bytes	0 – 1
40060	DI1 Input Trigger	2 bytes	0 – 1
40061	DI2 Input Trigger	2 bytes	0 – 1
40062	DI3 Input Trigger	2 bytes	0 – 1
40063	DI4 Input Trigger	2 bytes	0 – 1
40064	DI5 Input Trigger	2 bytes	0 – 1
40065	DI6 Input Trigger	2 bytes	0 – 1
40066	DI7 Input Trigger	2 bytes	0 – 1
40067	DI8 Input Trigger	2 bytes	0 – 1
40068	DI9 Input Trigger	2 bytes	0 – 1
40069	DI10 Input Trigger	2 bytes	0 – 1
40070	DI11 Input Trigger	2 bytes	0 – 1
40071	DI12 Input Trigger	2 bytes	0 – 1
40072	DI13 Input Trigger	2 bytes	0 – 1
40073	DI14 Input Trigger	2 bytes	0 – 1
40074	DI15 Input Trigger	2 bytes	0 – 1
40075	DI16 Input Trigger	2 bytes	0 – 1
40076	DI17 Input Trigger	2 bytes	0 – 1
40077	DI18 Input Trigger	2 bytes	0 – 1
40078	DI19 Input Trigger	2 bytes	0 – 1
40079	DI20 Input Trigger	2 bytes	0 – 1
40080	DI21 Input Trigger	2 bytes	0 – 1
40081	DI22 Input Trigger	2 bytes	0 – 1
40082	DI23 Input Trigger	2 bytes	0 – 1
40083	DI24 Input Trigger	2 bytes	0 – 1
40084	DI25 Input Trigger	2 bytes	0 – 1
40085	DI26 Input Trigger	2 bytes	0 – 1
40086	DI27 Input Trigger	2 bytes	0 – 1
40087	DI1 Item	2 bytes	0 – 38
40088	DI2 Item	2 bytes	0 – 38
40089	DI3 Item	2 bytes	0 – 38
40090	DI4 Item	2 bytes	0 – 38
40091	DI5 Item	2 bytes	0 – 38
40092	DI6 Item	2 bytes	0 – 38
40093	DI7 Item	2 bytes	0 – 38

Table 68 Holding Register Address List (continued)

Address	Setting name	Size	Output range
40094	DI8 Item	2 bytes	0 – 38
40095	DI9 Item	2 bytes	0 – 38
40096	DI10 Item	2 bytes	0 – 38
40097	DI11 Item	2 bytes	0 – 38
40098	DI12 Item	2 bytes	0 – 38
40099	DI13 Item	2 bytes	0 – 38
40100	DI14 Item	2 bytes	0 – 38
40101	DI15 Item	2 bytes	0 – 38
40102	DI16 Item	2 bytes	0 – 38
40103	DI17 Item	2 bytes	0 – 38
40104	DI18 Item	2 bytes	0 – 38
40105	DI19 Item	2 bytes	0 – 38
40106	DI20 Item	2 bytes	0 – 38
40107	DI21 Item	2 bytes	0 – 38
40108	DI22 Item	2 bytes	0 – 38
40109	DI23 Item	2 bytes	0 – 38
40110	DI24 Item	2 bytes	0 – 38
40111	DI25 Item	2 bytes	0 – 38
40112	DI26 Item	2 bytes	0 – 38
40113	DI27 Item	2 bytes	0 – 38
40114	DI1 Curb Chattering	2 bytes	0.00 – 9.99
40115	DI2 Curb Chattering	2 bytes	0.00 – 9.99
40116	DI3 Curb Chattering	2 bytes	0.00 – 9.99
40117	DI4 Curb Chattering	2 bytes	0.00 – 9.99
40118	DI5 Curb Chattering	2 bytes	0.00 – 9.99
40119	DI6 Curb Chattering	2 bytes	0.00 – 9.99
40120	DI7 Curb Chattering	2 bytes	0.00 – 9.99
40121	DI8 Curb Chattering	2 bytes	0.00 – 9.99
40122	DI9 Curb Chattering	2 bytes	0.00 – 9.99
40123	DI10 Curb Chattering	2 bytes	0.00 – 9.99
40124	DI11 Curb Chattering	2 bytes	0.00 – 9.99
40125	DI12 Curb Chattering	2 bytes	0.00 – 9.99
40126	DI13 Curb Chattering	2 bytes	0.00 – 9.99
40127	DI14 Curb Chattering	2 bytes	0.00 – 9.99
40128	DI15 Curb Chattering	2 bytes	0.00 – 9.99
40129	DI16 Curb Chattering	2 bytes	0.00 – 9.99
40130	DI17 Curb Chattering	2 bytes	0.00 – 9.99
40131	DI18 Curb Chattering	2 bytes	0.00 – 9.99
40132	DI19 Curb Chattering	2 bytes	0.00 – 9.99
40133	DI20 Curb Chattering	2 bytes	0.00 – 9.99
40134	DI21 Curb Chattering	2 bytes	0.00 – 9.99
40135	DI22 Curb Chattering	2 bytes	0.00 – 9.99
40136	DI23 Curb Chattering	2 bytes	0.00 – 9.99
40137	DI24 Curb Chattering	2 bytes	0.00 – 9.99

AD-4412-CW   AD-4413-CW

Table 68 Holding Register Address List (continued)

Address	Setting name	Size	Output range
40138	DI25 Curb Chattering	2 bytes	0.00 – 9.99
40139	DI26 Curb Chattering	2 bytes	0.00 – 9.99
40140	DI27 Curb Chattering	2 bytes	0.00 – 9.99
40141	DI1 Delay Time	2 bytes	0.00 – 100.00
40142	DI2 Delay Time	2 bytes	0.00 – 100.00
40143	DI3 Delay Time	2 bytes	0.00 – 100.00
40144	DI4 Delay Time	2 bytes	0.00 – 100.00
40145	DI5 Delay Time	2 bytes	0.00 – 100.00
40146	DI6 Delay Time	2 bytes	0.00 – 100.00
40147	DI7 Delay Time	2 bytes	0.00 – 100.00
40148	DI8 Delay Time	2 bytes	0.00 – 100.00
40149	DI9 Delay Time	2 bytes	0.00 – 100.00
40150	DI10 Delay Time	2 bytes	0.00 – 100.00
40151	DI11 Delay Time	2 bytes	0.00 – 100.00
40152	DI12 Delay Time	2 bytes	0.00 – 100.00
40153	DI13 Delay Time	2 bytes	0.00 – 100.00
40154	DI14 Delay Time	2 bytes	0.00 – 100.00
40155	DI15 Delay Time	2 bytes	0.00 – 100.00
40156	DI16 Delay Time	2 bytes	0.00 – 100.00
40157	DI17 Delay Time	2 bytes	0.00 – 100.00
40158	DI18 Delay Time	2 bytes	0.00 – 100.00
40159	DI19 Delay Time	2 bytes	0.00 – 100.00
40160	DI20 Delay Time	2 bytes	0.00 – 100.00
40161	DI21 Delay Time	2 bytes	0.00 – 100.00
40162	DI22 Delay Time	2 bytes	0.00 – 100.00
40163	DI23 Delay Time	2 bytes	0.00 – 100.00
40164	DI24 Delay Time	2 bytes	0.00 – 100.00
40165	DI25 Delay Time	2 bytes	0.00 – 100.00
40166	DI26 Delay Time	2 bytes	0.00 – 100.00
40167	DI27 Delay Time	2 bytes	0.00 – 100.00
40168	Common DO Number	2 bytes	1 – 10
40169	Common DO – Stop Settings	16 bytes	Refer to "10.4.2. DO Output Definition"
40177	Common DO – Buzzer Settings	16 bytes	Refer to "10.4.2. DO Output Definition"
40185	Common DO – DO1 Settings	16 bytes	Refer to "10.4.2. DO Output Definition"
40193	Common DO – DO2 Settings	16 bytes	Refer to "10.4.2. DO Output Definition"
40201	Common DO – DO3 Settings	16 bytes	Refer to "10.4.2. DO Output Definition"
40209	Common DO – DO4 Settings	16 bytes	Refer to "10.4.2. DO Output Definition"
40217	Common DO – DO5 Settings	16 bytes	Refer to "10.4.2. DO Output Definition"
40225	Common DO – DO6 Settings	16 bytes	Refer to "10.4.2. DO Output Definition"
40233	Common DO – DO7 Settings	16 bytes	Refer to "10.4.2. DO Output Definition"
40241	Common DO – DO8 Settings	16 bytes	Refer to "10.4.2. DO Output Definition"
40249	Common DO – DO9 Settings	16 bytes	Refer to "10.4.2. DO Output Definition"
40257	Common DO – DO10 Settings	16 bytes	Refer to "10.4.2. DO Output Definition"
40265	Common DO – DO11 Settings	16 bytes	Refer to "10.4.2. DO Output Definition"

Table 68 Holding Register Address List (continued)

Address	Setting name	Size	Output range
40273	Common DO – DO12 Settings	16 bytes	Refer to "10.4.2. DO Output Definition"
40281	Common DO – DO13 Settings	16 bytes	Refer to "10.4.2. DO Output Definition"
40289	Common DO – DO14 Settings	16 bytes	Refer to "10.4.2. DO Output Definition"
40297	Common DO – DO15 Settings	16 bytes	Refer to "10.4.2. DO Output Definition"
40305	Common DO – DO16 Settings	16 bytes	Refer to "10.4.2. DO Output Definition"
40313	Common DO – DO17 Settings	16 bytes	Refer to "10.4.2. DO Output Definition"
40321	Common DO – DO18 Settings	16 bytes	Refer to "10.4.2. DO Output Definition"
40329	Common DO – DO19 Settings	16 bytes	Refer to "10.4.2. DO Output Definition"
40337	Common DO – DO20 Settings	16 bytes	Refer to "10.4.2. DO Output Definition"
40345	Common DO – DO21 Settings	16 bytes	Refer to "10.4.2. DO Output Definition"
40353	Common DO – DO22 Settings	16 bytes	Refer to "10.4.2. DO Output Definition"
40361	Common DO – DO23 Settings	16 bytes	Refer to "10.4.2. DO Output Definition"
40369	Common DO – DO24 Settings	16 bytes	Refer to "10.4.2. DO Output Definition"
40377	Common DO – DO25 Settings	16 bytes	Refer to "10.4.2. DO Output Definition"
40385	Common DO – DO26 Settings	16 bytes	Refer to "10.4.2. DO Output Definition"
40393	Common DO – DO27 Settings	16 bytes	Refer to "10.4.2. DO Output Definition"
40401	Common DO – DO28 Settings	16 bytes	Refer to "10.4.2. DO Output Definition"
40409	Common DO – DO29 Settings	16 bytes	Refer to "10.4.2. DO Output Definition"
40417	Common DO – DO30 Settings	16 bytes	Refer to "10.4.2. DO Output Definition"
40425	Common DO – DO31 Settings	16 bytes	Refer to "10.4.2. DO Output Definition"
40433	Common DO – DO32 Settings	16 bytes	Refer to "10.4.2. DO Output Definition"
40441	Common DO – DO33 Settings	16 bytes	Refer to "10.4.2. DO Output Definition"
40449	Common DO – DO34 Settings	16 bytes	Refer to "10.4.2. DO Output Definition"
40457	Common DO – DO35 Settings	16 bytes	Refer to "10.4.2. DO Output Definition"
40465	Common DO – DO36 Settings	16 bytes	Refer to "10.4.2. DO Output Definition"
40473	Common DO – Buzzer Behavior	2 bytes	0 – 3
40474	Common DO – DO1 Behavior	2 bytes	0 – 3
40475	Common DO – DO2 Behavior	2 bytes	0 – 3
40476	Common DO – DO3 Behavior	2 bytes	0 – 3
40477	Common DO – DO4 Behavior	2 bytes	0 – 3
40478	Common DO – DO5 Behavior	2 bytes	0 – 3
40479	Common DO – DO6 Behavior	2 bytes	0 – 3
40480	Common DO – DO7 Behavior	2 bytes	0 – 3
40481	Common DO – DO8 Behavior	2 bytes	0 – 3
40482	Common DO – DO9 Behavior	2 bytes	0 – 3
40483	Common DO – DO10 Behavior	2 bytes	0 – 3
40484	Common DO – DO11 Behavior	2 bytes	0 – 3
40485	Common DO – DO12 Behavior	2 bytes	0 – 3
40486	Common DO – DO13 Behavior	2 bytes	0 – 3
40487	Common DO – DO14 Behavior	2 bytes	0 – 3
40488	Common DO – DO15 Behavior	2 bytes	0 – 3
40489	Common DO – DO16 Behavior	2 bytes	0 – 3
40490	Common DO – DO17 Behavior	2 bytes	0 – 3
40491	Common DO – DO18 Behavior	2 bytes	0 – 3

AD-4412-CW   AD-4413-CW

Table 68 Holding Register Address List (continued)

Address	Setting name	Size	Output range
40492	Common DO – DO19 Behavior	2 bytes	0 – 3
40493	Common DO – DO20 Behavior	2 bytes	0 – 3
40494	Common DO – DO21 Behavior	2 bytes	0 – 3
40495	Common DO – DO22 Behavior	2 bytes	0 – 3
40496	Common DO – DO23 Behavior	2 bytes	0 – 3
40497	Common DO – DO24 Behavior	2 bytes	0 – 3
40498	Common DO – DO25 Behavior	2 bytes	0 – 3
40499	Common DO – DO26 Behavior	2 bytes	0 – 3
40500	Common DO – DO27 Behavior	2 bytes	0 – 3
40501	Common DO – DO28 Behavior	2 bytes	0 – 3
40502	Common DO – DO29 Behavior	2 bytes	0 – 3
40503	Common DO – DO30 Behavior	2 bytes	0 – 3
40504	Common DO – DO31 Behavior	2 bytes	0 – 3
40505	Common DO – DO32 Behavior	2 bytes	0 – 3
40506	Common DO – DO33 Behavior	2 bytes	0 – 3
40507	Common DO – DO34 Behavior	2 bytes	0 – 3
40508	Common DO – DO35 Behavior	2 bytes	0 – 3
40509	Common DO – DO36 Behavior	2 bytes	0 – 3
40510	Common DO – Buzzer Delay Time	2 bytes	0.00 – 100.00
40511	Common DO – DO1 Delay Time	2 bytes	0.00 – 100.00
40512	Common DO – DO2 Delay Time	2 bytes	0.00 – 100.00
40513	Common DO – DO3 Delay Time	2 bytes	0.00 – 100.00
40514	Common DO – DO4 Delay Time	2 bytes	0.00 – 100.00
40515	Common DO – DO5 Delay Time	2 bytes	0.00 – 100.00
40516	Common DO – DO6 Delay Time	2 bytes	0.00 – 100.00
40517	Common DO – DO7 Delay Time	2 bytes	0.00 – 100.00
40518	Common DO – DO8 Delay Time	2 bytes	0.00 – 100.00
40519	Common DO – DO9 Delay Time	2 bytes	0.00 – 100.00
40520	Common DO – DO10 Delay Time	2 bytes	0.00 – 100.00
40521	Common DO – DO11 Delay Time	2 bytes	0.00 – 100.00
40522	Common DO – DO12 Delay Time	2 bytes	0.00 – 100.00
40523	Common DO – DO13 Delay Time	2 bytes	0.00 – 100.00
40524	Common DO – DO14 Delay Time	2 bytes	0.00 – 100.00
40525	Common DO – DO15 Delay Time	2 bytes	0.00 – 100.00
40526	Common DO – DO16 Delay Time	2 bytes	0.00 – 100.00
40527	Common DO – DO17 Delay Time	2 bytes	0.00 – 100.00
40528	Common DO – DO18 Delay Time	2 bytes	0.00 – 100.00
40529	Common DO – DO19 Delay Time	2 bytes	0.00 – 100.00
40530	Common DO – DO20 Delay Time	2 bytes	0.00 – 100.00
40531	Common DO – DO21 Delay Time	2 bytes	0.00 – 100.00
40532	Common DO – DO22 Delay Time	2 bytes	0.00 – 100.00
40533	Common DO – DO23 Delay Time	2 bytes	0.00 – 100.00
40534	Common DO – DO24 Delay Time	2 bytes	0.00 – 100.00
40535	Common DO – DO25 Delay Time	2 bytes	0.00 – 100.00

Table 68 Holding Register Address List (continued)

Address	Setting name	Size	Output range
40536	Common DO – DO26 Delay Time	2 bytes	0.00 – 100.00
40537	Common DO – DO27 Delay Time	2 bytes	0.00 – 100.00
40538	Common DO – DO28 Delay Time	2 bytes	0.00 – 100.00
40539	Common DO – DO29 Delay Time	2 bytes	0.00 – 100.00
40540	Common DO – DO30 Delay Time	2 bytes	0.00 – 100.00
40541	Common DO – DO31 Delay Time	2 bytes	0.00 – 100.00
40542	Common DO – DO32 Delay Time	2 bytes	0.00 – 100.00
40543	Common DO – DO33 Delay Time	2 bytes	0.00 – 100.00
40544	Common DO – DO34 Delay Time	2 bytes	0.00 – 100.00
40545	Common DO – DO35 Delay Time	2 bytes	0.00 – 100.00
40546	Common DO – DO36 Delay Time	2 bytes	0.00 – 100.00
40547	Common DO – Buzzer Hold Time	2 bytes	0.00 – 300.00
40548	Common DO – DO1 Hold Time	2 bytes	0.00 – 300.00
40549	Common DO – DO2 Hold Time	2 bytes	0.00 – 300.00
40550	Common DO – DO3 Hold Time	2 bytes	0.00 – 300.00
40551	Common DO – DO4 Hold Time	2 bytes	0.00 – 300.00
40552	Common DO – DO5 Hold Time	2 bytes	0.00 – 300.00
40553	Common DO – DO6 Hold Time	2 bytes	0.00 – 300.00
40554	Common DO – DO7 Hold Time	2 bytes	0.00 – 300.00
40555	Common DO – DO8 Hold Time	2 bytes	0.00 – 300.00
40556	Common DO – DO9 Hold Time	2 bytes	0.00 – 300.00
40557	Common DO – DO10 Hold Time	2 bytes	0.00 – 300.00
40558	Common DO – DO11 Hold Time	2 bytes	0.00 – 300.00
40559	Common DO – DO12 Hold Time	2 bytes	0.00 – 300.00
40560	Common DO – DO13 Hold Time	2 bytes	0.00 – 300.00
40561	Common DO – DO14 Hold Time	2 bytes	0.00 – 300.00
40562	Common DO – DO15 Hold Time	2 bytes	0.00 – 300.00
40563	Common DO – DO16 Hold Time	2 bytes	0.00 – 300.00
40564	Common DO – DO17 Hold Time	2 bytes	0.00 – 300.00
40565	Common DO – DO18 Hold Time	2 bytes	0.00 – 300.00
40566	Common DO – DO19 Hold Time	2 bytes	0.00 – 300.00
40567	Common DO – DO20 Hold Time	2 bytes	0.00 – 300.00
40568	Common DO – DO21 Hold Time	2 bytes	0.00 – 300.00
40569	Common DO – DO22 Hold Time	2 bytes	0.00 – 300.00
40570	Common DO – DO23 Hold Time	2 bytes	0.00 – 300.00
40571	Common DO – DO24 Hold Time	2 bytes	0.00 – 300.00
40572	Common DO – DO25 Hold Time	2 bytes	0.00 – 300.00
40573	Common DO – DO26 Hold Time	2 bytes	0.00 – 300.00
40574	Common DO – DO27 Hold Time	2 bytes	0.00 – 300.00
40575	Common DO – DO28 Hold Time	2 bytes	0.00 – 300.00
40576	Common DO – DO29 Hold Time	2 bytes	0.00 – 300.00
40577	Common DO – DO30 Hold Time	2 bytes	0.00 – 300.00
40578	Common DO – DO31 Hold Time	2 bytes	0.00 – 300.00
40579	Common DO – DO32 Hold Time	2 bytes	0.00 – 300.00

AD-4412-CW   AD-4413-CW

Table 68 Holding Register Address List (continued)

Address	Setting name	Size	Output range
40580	Common DO – DO33 Hold Time	2 bytes	0.00 – 300.00
40581	Common DO – DO34 Hold Time	2 bytes	0.00 – 300.00
40582	Common DO – DO35 Hold Time	2 bytes	0.00 – 300.00
40583	Common DO – DO36 Hold Time	2 bytes	0.00 – 300.00
40584	Common DO – Buzzer Polarity	2 bytes	0 – 1
40585	Common DO – DO1 Polarity	2 bytes	0 – 1
40586	Common DO – DO2 Polarity	2 bytes	0 – 1
40587	Common DO – DO3 Polarity	2 bytes	0 – 1
40588	Common DO – DO4 Polarity	2 bytes	0 – 1
40589	Common DO – DO5 Polarity	2 bytes	0 – 1
40590	Common DO – DO6 Polarity	2 bytes	0 – 1
40591	Common DO – DO7 Polarity	2 bytes	0 – 1
40592	Common DO – DO8 Polarity	2 bytes	0 – 1
40593	Common DO – DO9 Polarity	2 bytes	0 – 1
40594	Common DO – DO10 Polarity	2 bytes	0 – 1
40595	Common DO – DO11 Polarity	2 bytes	0 – 1
40596	Common DO – DO12 Polarity	2 bytes	0 – 1
40597	Common DO – DO13 Polarity	2 bytes	0 – 1
40598	Common DO – DO14 Polarity	2 bytes	0 – 1
40599	Common DO – DO15 Polarity	2 bytes	0 – 1
40600	Common DO – DO16 Polarity	2 bytes	0 – 1
40601	Common DO – DO17 Polarity	2 bytes	0 – 1
40602	Common DO – DO18 Polarity	2 bytes	0 – 1
40603	Common DO – DO19 Polarity	2 bytes	0 – 1
40604	Common DO – DO20 Polarity	2 bytes	0 – 1
40605	Common DO – DO21 Polarity	2 bytes	0 – 1
40606	Common DO – DO22 Polarity	2 bytes	0 – 1
40607	Common DO – DO23 Polarity	2 bytes	0 – 1
40608	Common DO – DO24 Polarity	2 bytes	0 – 1
40609	Common DO – DO25 Polarity	2 bytes	0 – 1
40610	Common DO – DO26 Polarity	2 bytes	0 – 1
40611	Common DO – DO27 Polarity	2 bytes	0 – 1
40612	Common DO – DO28 Polarity	2 bytes	0 – 1
40613	Common DO – DO29 Polarity	2 bytes	0 – 1
40614	Common DO – DO30 Polarity	2 bytes	0 – 1
40615	Common DO – DO31 Polarity	2 bytes	0 – 1
40616	Common DO – DO32 Polarity	2 bytes	0 – 1
40617	Common DO – DO33 Polarity	2 bytes	0 – 1
40618	Common DO – DO34 Polarity	2 bytes	0 – 1
40619	Common DO – DO35 Polarity	2 bytes	0 – 1
40620	Common DO – DO36 Polarity	2 bytes	0 – 1
40621	Common DO – Buzzer Event Release Time	2 bytes	0.00 – 300.00
40622	Common DO – DO1 Event Release Time	2 bytes	0.00 – 300.00
40623	Common DO – DO2 Event Release Time	2 bytes	0.00 – 300.00

Table 68 Holding Register Address List (continued)

Address	Setting name	Size	Output range
40624	Common DO – DO3 Event Release Time	2 bytes	0.00 – 300.00
40625	Common DO – DO4 Event Release Time	2 bytes	0.00 – 300.00
40626	Common DO – DO5 Event Release Time	2 bytes	0.00 – 300.00
40627	Common DO – DO6 Event Release Time	2 bytes	0.00 – 300.00
40628	Common DO – DO7 Event Release Time	2 bytes	0.00 – 300.00
40629	Common DO – DO8 Event Release Time	2 bytes	0.00 – 300.00
40630	Common DO – DO9 Event Release Time	2 bytes	0.00 – 300.00
40631	Common DO – DO10 Event Release Time	2 bytes	0.00 – 300.00
40632	Common DO – DO11 Event Release Time	2 bytes	0.00 – 300.00
40633	Common DO – DO12 Event Release Time	2 bytes	0.00 – 300.00
40634	Common DO – DO13 Event Release Time	2 bytes	0.00 – 300.00
40635	Common DO – DO14 Event Release Time	2 bytes	0.00 – 300.00
40636	Common DO – DO15 Event Release Time	2 bytes	0.00 – 300.00
40637	Common DO – DO16 Event Release Time	2 bytes	0.00 – 300.00
40638	Common DO – DO17 Event Release Time	2 bytes	0.00 – 300.00
40639	Common DO – DO18 Event Release Time	2 bytes	0.00 – 300.00
40640	Common DO – DO19 Event Release Time	2 bytes	0.00 – 300.00
40641	Common DO – DO20 Event Release Time	2 bytes	0.00 – 300.00
40642	Common DO – DO21 Event Release Time	2 bytes	0.00 – 300.00
40643	Common DO – DO22 Event Release Time	2 bytes	0.00 – 300.00
40644	Common DO – DO23 Event Release Time	2 bytes	0.00 – 300.00
40645	Common DO – DO24 Event Release Time	2 bytes	0.00 – 300.00
40646	Common DO – DO25 Event Release Time	2 bytes	0.00 – 300.00
40647	Common DO – DO26 Event Release Time	2 bytes	0.00 – 300.00
40648	Common DO – DO27 Event Release Time	2 bytes	0.00 – 300.00
40649	Common DO – DO28 Event Release Time	2 bytes	0.00 – 300.00
40650	Common DO – DO29 Event Release Time	2 bytes	0.00 – 300.00
40651	Common DO – DO30 Event Release Time	2 bytes	0.00 – 300.00
40652	Common DO – DO31 Event Release Time	2 bytes	0.00 – 300.00
40653	Common DO – DO32 Event Release Time	2 bytes	0.00 – 300.00
40654	Common DO – DO33 Event Release Time	2 bytes	0.00 – 300.00
40655	Common DO – DO34 Event Release Time	2 bytes	0.00 – 300.00
40656	Common DO – DO35 Event Release Time	2 bytes	0.00 – 300.00
40657	Common DO – DO36 Event Release Time	2 bytes	0.00 – 300.00
40658	DO Reference	2 bytes	0 – 10
40659	Stop Setting	16 bytes	Refer to "10.4.2. DO Output Definition"
40667	Buzzer Setting	16 bytes	Refer to "10.4.2. DO Output Definition"
40675	DO1 Setting	16 bytes	Refer to "10.4.2. DO Output Definition"
40683	DO2 Setting	16 bytes	Refer to "10.4.2. DO Output Definition"
40691	DO3 Setting	16 bytes	Refer to "10.4.2. DO Output Definition"
40699	DO4 Setting	16 bytes	Refer to "10.4.2. DO Output Definition"
40707	DO5 Setting	16 bytes	Refer to "10.4.2. DO Output Definition"
40715	DO6 Setting	16 bytes	Refer to "10.4.2. DO Output Definition"
40723	DO7 Setting	16 bytes	Refer to "10.4.2. DO Output Definition"

Table 68 Holding Register Address List (continued)

Address	Setting name	Size	Output range
40731	DO8 Setting	16 bytes	Refer to "10.4.2. DO Output Definition"
40739	DO9 Setting	16 bytes	Refer to "10.4.2. DO Output Definition"
40747	DO10 Setting	16 bytes	Refer to "10.4.2. DO Output Definition"
40755	DO11 Setting	16 bytes	Refer to "10.4.2. DO Output Definition"
40763	DO12 Setting	16 bytes	Refer to "10.4.2. DO Output Definition"
40771	DO13 Setting	16 bytes	Refer to "10.4.2. DO Output Definition"
40779	DO14 Setting	16 bytes	Refer to "10.4.2. DO Output Definition"
40787	DO15 Setting	16 bytes	Refer to "10.4.2. DO Output Definition"
40795	DO16 Setting	16 bytes	Refer to "10.4.2. DO Output Definition"
40803	DO17 Setting	16 bytes	Refer to "10.4.2. DO Output Definition"
40811	DO18 Setting	16 bytes	Refer to "10.4.2. DO Output Definition"
40819	DO19 Setting	16 bytes	Refer to "10.4.2. DO Output Definition"
40827	DO20 Setting	16 bytes	Refer to "10.4.2. DO Output Definition"
40835	DO21 Setting	16 bytes	Refer to "10.4.2. DO Output Definition"
40843	DO22 Setting	16 bytes	Refer to "10.4.2. DO Output Definition"
40851	DO23 Setting	16 bytes	Refer to "10.4.2. DO Output Definition"
40859	DO24 Setting	16 bytes	Refer to "10.4.2. DO Output Definition"
40867	DO25 Setting	16 bytes	Refer to "10.4.2. DO Output Definition"
40875	DO26 Setting	16 bytes	Refer to "10.4.2. DO Output Definition"
40883	DO27 Setting	16 bytes	Refer to "10.4.2. DO Output Definition"
40891	DO28 Setting	16 bytes	Refer to "10.4.2. DO Output Definition"
40899	DO29 Setting	16 bytes	Refer to "10.4.2. DO Output Definition"
40907	DO30 Setting	16 bytes	Refer to "10.4.2. DO Output Definition"
40915	DO31 Setting	16 bytes	Refer to "10.4.2. DO Output Definition"
40923	DO32 Setting	16 bytes	Refer to "10.4.2. DO Output Definition"
40931	DO33 Setting	16 bytes	Refer to "10.4.2. DO Output Definition"
40939	DO34 Setting	16 bytes	Refer to "10.4.2. DO Output Definition"
40947	DO35 Setting	16 bytes	Refer to "10.4.2. DO Output Definition"
40955	DO36 Setting	16 bytes	Refer to "10.4.2. DO Output Definition"
40963	Buzzer Behavior	2 bytes	0 – 3
40964	DO1 Behavior	2 bytes	0 – 3
40965	DO2 Behavior	2 bytes	0 – 3
40966	DO3 Behavior	2 bytes	0 – 3
40967	DO4 Behavior	2 bytes	0 – 3
40968	DO5 Behavior	2 bytes	0 – 3
40969	DO6 Behavior	2 bytes	0 – 3
40970	DO7 Behavior	2 bytes	0 – 3
40971	DO8 Behavior	2 bytes	0 – 3
40972	DO9 Behavior	2 bytes	0 – 3
40973	DO10 Behavior	2 bytes	0 – 3
40974	DO11 Behavior	2 bytes	0 – 3
40975	DO12 Behavior	2 bytes	0 – 3
40976	DO13 Behavior	2 bytes	0 – 3
40977	DO14 Behavior	2 bytes	0 – 3

Table 68 Holding Register Address List (continued)

Address	Setting name	Size	Output range
40978	DO15 Behavior	2 bytes	0 – 3
40979	DO16 Behavior	2 bytes	0 – 3
40980	DO17 Behavior	2 bytes	0 – 3
40981	DO18 Behavior	2 bytes	0 – 3
40982	DO19 Behavior	2 bytes	0 – 3
40983	DO20 Behavior	2 bytes	0 – 3
40984	DO21 Behavior	2 bytes	0 – 3
40985	DO22 Behavior	2 bytes	0 – 3
40986	DO23 Behavior	2 bytes	0 – 3
40987	DO24 Behavior	2 bytes	0 – 3
40988	DO25 Behavior	2 bytes	0 – 3
40989	DO26 Behavior	2 bytes	0 – 3
40990	DO27 Behavior	2 bytes	0 – 3
40991	DO28 Behavior	2 bytes	0 – 3
40992	DO29 Behavior	2 bytes	0 – 3
40993	DO30 Behavior	2 bytes	0 – 3
40994	DO31 Behavior	2 bytes	0 – 3
40995	DO32 Behavior	2 bytes	0 – 3
40996	DO33 Behavior	2 bytes	0 – 3
40997	DO34 Behavior	2 bytes	0 – 3
40998	DO35 Behavior	2 bytes	0 – 3
40999	DO36 Behavior	2 bytes	0 – 3
41000	Buzzer Delay Time	2 bytes	0.00 – 100.00
41001	DO1 Delay Time	2 bytes	0.00 – 100.00
41002	DO2 Delay Time	2 bytes	0.00 – 100.00
41003	DO3 Delay Time	2 bytes	0.00 – 100.00
41004	DO4 Delay Time	2 bytes	0.00 – 100.00
41005	DO5 Delay Time	2 bytes	0.00 – 100.00
41006	DO6 Delay Time	2 bytes	0.00 – 100.00
41007	DO7 Delay Time	2 bytes	0.00 – 100.00
41008	DO8 Delay Time	2 bytes	0.00 – 100.00
41009	DO9 Delay Time	2 bytes	0.00 – 100.00
41010	DO10 Delay Time	2 bytes	0.00 – 100.00
41011	DO11 Delay Time	2 bytes	0.00 – 100.00
41012	DO12 Delay Time	2 bytes	0.00 – 100.00
41013	DO13 Delay Time	2 bytes	0.00 – 100.00
41014	DO14 Delay Time	2 bytes	0.00 – 100.00
41015	DO15 Delay Time	2 bytes	0.00 – 100.00
41016	DO16 Delay Time	2 bytes	0.00 – 100.00
41017	DO17 Delay Time	2 bytes	0.00 – 100.00
41018	DO18 Delay Time	2 bytes	0.00 – 100.00
41019	DO19 Delay Time	2 bytes	0.00 – 100.00
41020	DO20 Delay Time	2 bytes	0.00 – 100.00
41021	DO21 Delay Time	2 bytes	0.00 – 100.00

AD-4412-CW AD-4413-CW

Table 68 Holding Register Address List (continued)

Address	Setting name	Size	Output range
41022	DO22 Delay Time	2 bytes	0.00 – 100.00
41023	DO23 Delay Time	2 bytes	0.00 – 100.00
41024	DO24 Delay Time	2 bytes	0.00 – 100.00
41025	DO25 Delay Time	2 bytes	0.00 – 100.00
41026	DO26 Delay Time	2 bytes	0.00 – 100.00
41027	DO27 Delay Time	2 bytes	0.00 – 100.00
41028	DO28 Delay Time	2 bytes	0.00 – 100.00
41029	DO29 Delay Time	2 bytes	0.00 – 100.00
41030	DO30 Delay Time	2 bytes	0.00 – 100.00
41031	DO31 Delay Time	2 bytes	0.00 – 100.00
41032	DO32 Delay Time	2 bytes	0.00 – 100.00
41033	DO33 Delay Time	2 bytes	0.00 – 100.00
41034	DO34 Delay Time	2 bytes	0.00 – 100.00
41035	DO35 Delay Time	2 bytes	0.00 – 100.00
41036	DO36 Delay Time	2 bytes	0.00 – 100.00
41037	Buzzer Hold Time	2 bytes	0.00 – 300.00
41038	DO1 Hold Time	2 bytes	0.00 – 300.00
41039	DO2 Hold Time	2 bytes	0.00 – 300.00
41040	DO3 Hold Time	2 bytes	0.00 – 300.00
41041	DO4 Hold Time	2 bytes	0.00 – 300.00
41042	DO5 Hold Time	2 bytes	0.00 – 300.00
41043	DO6 Hold Time	2 bytes	0.00 – 300.00
41044	DO7 Hold Time	2 bytes	0.00 – 300.00
41045	DO8 Hold Time	2 bytes	0.00 – 300.00
41046	DO9 Hold Time	2 bytes	0.00 – 300.00
41047	DO10 Hold Time	2 bytes	0.00 – 300.00
41048	DO11 Hold Time	2 bytes	0.00 – 300.00
41049	DO12 Hold Time	2 bytes	0.00 – 300.00
41050	DO13 Hold Time	2 bytes	0.00 – 300.00
41051	DO14 Hold Time	2 bytes	0.00 – 300.00
41052	DO15 Hold Time	2 bytes	0.00 – 300.00
41053	DO16 Hold Time	2 bytes	0.00 – 300.00
41054	DO17 Hold Time	2 bytes	0.00 – 300.00
41055	DO18 Hold Time	2 bytes	0.00 – 300.00
41056	DO19 Hold Time	2 bytes	0.00 – 300.00
41057	DO20 Hold Time	2 bytes	0.00 – 300.00
41058	DO21 Hold Time	2 bytes	0.00 – 300.00
41059	DO22 Hold Time	2 bytes	0.00 – 300.00
41060	DO23 Hold Time	2 bytes	0.00 – 300.00
41061	DO24 Hold Time	2 bytes	0.00 – 300.00
41062	DO25 Hold Time	2 bytes	0.00 – 300.00
41063	DO26 Hold Time	2 bytes	0.00 – 300.00
41064	DO27 Hold Time	2 bytes	0.00 – 300.00
41065	DO28 Hold Time	2 bytes	0.00 – 300.00

Table 68 Holding Register Address List (continued)

Address	Setting name	Size	Output range
41066	DO29 Hold Time	2 bytes	0.00 – 300.00
41067	DO30 Hold Time	2 bytes	0.00 – 300.00
41068	DO31 Hold Time	2 bytes	0.00 – 300.00
41069	DO32 Hold Time	2 bytes	0.00 – 300.00
41070	DO33 Hold Time	2 bytes	0.00 – 300.00
41071	DO34 Hold Time	2 bytes	0.00 – 300.00
41072	DO35 Hold Time	2 bytes	0.00 – 300.00
41073	DO36 Hold Time	2 bytes	0.00 – 300.00
41074	Buzzer Polarity	2 bytes	0 – 1
41075	DO1 Polarity	2 bytes	0 – 1
41076	DO2 Polarity	2 bytes	0 – 1
41077	DO3 Polarity	2 bytes	0 – 1
41078	DO4 Polarity	2 bytes	0 – 1
41079	DO5 Polarity	2 bytes	0 – 1
41080	DO6 Polarity	2 bytes	0 – 1
41081	DO7 Polarity	2 bytes	0 – 1
41082	DO8 Polarity	2 bytes	0 – 1
41083	DO9 Polarity	2 bytes	0 – 1
41084	DO10 Polarity	2 bytes	0 – 1
41085	DO11 Polarity	2 bytes	0 – 1
41086	DO12 Polarity	2 bytes	0 – 1
41087	DO13 Polarity	2 bytes	0 – 1
41088	DO14 Polarity	2 bytes	0 – 1
41089	DO15 Polarity	2 bytes	0 – 1
41090	DO16 Polarity	2 bytes	0 – 1
41091	DO17 Polarity	2 bytes	0 – 1
41092	DO18 Polarity	2 bytes	0 – 1
41093	DO19 Polarity	2 bytes	0 – 1
41094	DO20 Polarity	2 bytes	0 – 1
41095	DO21 Polarity	2 bytes	0 – 1
41096	DO22 Polarity	2 bytes	0 – 1
41097	DO23 Polarity	2 bytes	0 – 1
41098	DO24 Polarity	2 bytes	0 – 1
41099	DO25 Polarity	2 bytes	0 – 1
41100	DO26 Polarity	2 bytes	0 – 1
41101	DO27 Polarity	2 bytes	0 – 1
41102	DO28 Polarity	2 bytes	0 – 1
41103	DO29 Polarity	2 bytes	0 – 1
41104	DO30 Polarity	2 bytes	0 – 1
41105	DO31 Polarity	2 bytes	0 – 1
41106	DO32 Polarity	2 bytes	0 – 1
41107	DO33 Polarity	2 bytes	0 – 1
41108	DO34 Polarity	2 bytes	0 – 1
41109	DO35 Polarity	2 bytes	0 – 1

AD-4412-CW   AD-4413-CW

Table 68 Holding Register Address List (continued)

Address	Setting name	Size	Output range
41110	DO36 Polarity	2 bytes	0 – 1
41111	Buzzer Event Release Time	2 bytes	0.00 – 300.00
41112	DO1 Event Release Time	2 bytes	0.00 – 300.00
41113	DO2 Event Release Time	2 bytes	0.00 – 300.00
41114	DO3 Event Release Time	2 bytes	0.00 – 300.00
41115	DO4 Event Release Time	2 bytes	0.00 – 300.00
41116	DO5 Event Release Time	2 bytes	0.00 – 300.00
41117	DO6 Event Release Time	2 bytes	0.00 – 300.00
41118	DO7 Event Release Time	2 bytes	0.00 – 300.00
41119	DO8 Event Release Time	2 bytes	0.00 – 300.00
41120	DO9 Event Release Time	2 bytes	0.00 – 300.00
41121	DO10 Event Release Time	2 bytes	0.00 – 300.00
41122	DO11 Event Release Time	2 bytes	0.00 – 300.00
41123	DO12 Event Release Time	2 bytes	0.00 – 300.00
41124	DO13 Event Release Time	2 bytes	0.00 – 300.00
41125	DO14 Event Release Time	2 bytes	0.00 – 300.00
41126	DO15 Event Release Time	2 bytes	0.00 – 300.00
41127	DO16 Event Release Time	2 bytes	0.00 – 300.00
41128	DO17 Event Release Time	2 bytes	0.00 – 300.00
41129	DO18 Event Release Time	2 bytes	0.00 – 300.00
41130	DO19 Event Release Time	2 bytes	0.00 – 300.00
41131	DO20 Event Release Time	2 bytes	0.00 – 300.00
41132	DO21 Event Release Time	2 bytes	0.00 – 300.00
41133	DO22 Event Release Time	2 bytes	0.00 – 300.00
41134	DO23 Event Release Time	2 bytes	0.00 – 300.00
41135	DO24 Event Release Time	2 bytes	0.00 – 300.00
41136	DO25 Event Release Time	2 bytes	0.00 – 300.00
41137	DO26 Event Release Time	2 bytes	0.00 – 300.00
41138	DO27 Event Release Time	2 bytes	0.00 – 300.00
41139	DO28 Event Release Time	2 bytes	0.00 – 300.00
41140	DO29 Event Release Time	2 bytes	0.00 – 300.00
41141	DO30 Event Release Time	2 bytes	0.00 – 300.00
41142	DO31 Event Release Time	2 bytes	0.00 – 300.00
41143	DO32 Event Release Time	2 bytes	0.00 – 300.00
41144	DO33 Event Release Time	2 bytes	0.00 – 300.00
41145	DO34 Event Release Time	2 bytes	0.00 – 300.00
41146	DO35 Event Release Time	2 bytes	0.00 – 300.00
41147	DO36 Event Release Time	2 bytes	0.00 – 300.00
41148	Startup User Level	2 bytes	0 – 3
41149	Login Timeout	2 bytes	0 – 60
41150	Curb Chattering	2 bytes	0.00 – 9.99
41151	Photo Eye Sensor Timeout	2 bytes	0.1 – 99.9
41152	Photo Eye Sensor Polarity	2 bytes	0 – 1
41153	USB Operation History	2 bytes	0 – 1

Table 68 Holding Register Address List (continued)

Address	Setting name	Size	Output range
41154	USB Weighing History	2 bytes	0 – 1
41155	Division	2 bytes	0 – 5
41156	Decimal Point	2 bytes	0 – 4
41157	Capacity	4 bytes	0.0000 – 99999.9999
41159	Digital Filter (Static)	2 bytes	0 – 9
41160	Zero Range	2 bytes	0 –30
41161	Power On Zero Auto Zero Range	2 bytes	0 – 100
41162	Stability Detection Time	2 bytes	0.0 – 9.9
41163	Stability Detection Weight	2 bytes	0 – 9
41164	Zero Tracking Time	2 bytes	0.0 – 9.9
41165	Zero Tracking Weight	2 bytes	0 – 9
41166	Weight Value	4 bytes	0.0000 – Capacity
41168	Display Keyboard	2 bytes	0 – 2
41169	Display Mode	2 bytes	0 – 1
41170	Negative Weight Value	2 bytes	0 – 1
41171	Display Data	2 bytes	0 – 1
41172	Connect Device Priority	2 bytes	0 – 1
41173	Unsplit Range	2 bytes	1 – 100
41174	Bin Full Behavior	2 bytes	0 – 1
41175	Date Order	2 bytes	0 – 2
41176 to 41195	Reserved for expansion. Do not use.		
41196	Reject Stage	2 bytes	0 – 1
41197	Target	4 bytes	0.0000 – Capacity
41199	Hi Hi Limit	4 bytes	0.0000 – Capacity
41201	Hi Limit	4 bytes	0.0000 – Capacity
41203	Lo Limit	4 bytes	0.0000 – Capacity
41205	Lo Lo Limit	4 bytes	0.0000 – Capacity
41207	Target Weight Tracking	2 bytes	0 – 1
41208	Weight Tracking Target Value	4 bytes	0.0000 – Capacity
41210	Weight Tracking Hi Limit	4 bytes	0.0000 – Capacity
41212	Weight Tracking Lo Limit	4 bytes	0.0000 – Capacity
41214	Weight Tracking Sample Size	2 bytes	1 – 9999
41215	Overweight Exception	2 bytes	0 – 1
41216	Number of Consecutive Fails	2 bytes	2 – 9999
41217	Consecutive Fail Map	4 bytes	0 – 2047
41219	Product Length	2 bytes	1 – 300
41220	Speed	2 bytes	1 – 100
41221 to 41227	Reserved for expansion. Do not use.		
41228	Stop Time After Judgement	2 bytes	0.00 – 99.99
41229	Stop Map	4 bytes	0 – 4095

Table 68 Holding Register Address List (continued)

Address	Setting name	Size	Output range
41231 to 41234	Reserved for expansion. Do not use.		
41235	Number of Samples - Total	41235	Number of Samples – Total
41236	Number of Samples - OK	41236	Number of Samples – OK
41237	Width of Section	4 bytes	0.1 – Capacity
41239	Number of Samples - CC	2 bytes	2 - 9999
41240	Sample Size	2 bytes	2 - 25
41241	X-Bar Control Chart	4 bytes	0.0000 – Capacity
41243	R Control Chart	4 bytes	0.0000 – Capacity
41245	Preset Tares	4 bytes	0.0000 – (Capacity – 1 resolution)
41247	Auto Zero	2 bytes	0 – 1
41248	Auto Zero Averaging Time	2 bytes	0.01 – 9.99
41249	Dead Zone Timer	2 bytes	0 – 999.9
41250	Auto Zero Samples	2 bytes	1 – 999
41251	D.COMP	2 bytes	0 – 1
41252	Static Weight	4 bytes	0.0000 – Capacity
41254	Dynamic Weight	4 bytes	0.0000 – Capacity
41256	Feedback Control	2 bytes	0 – 1
41257	Feedback Control Target	4 bytes	0.0000 – Capacity
41259	Feedback Control Range	4 bytes	0.0000 – Capacity
41261	Feedback Control Step [g / sec]	4 bytes	1.0000 – 100.0000
41263	Feedback Control Step [sec / g]	4 bytes	0.0001 – 1.0000
41265	Feedback Control Sample	2 bytes	1 – 999
41266	Feedback Control Wait Time	2 bytes	0 – 999
41267	Step Control	2 bytes	0 – 1
41268	Control Target	4 bytes	0.0000 – Capacity
41270	+ Zone 1	4 bytes	0.0000 – Capacity
41272	+ Zone 2	4 bytes	0.0000 – Capacity
41274	+ Zone 3	4 bytes	0.0000 – Capacity
41276	+ Zone 4	4 bytes	0.0000 – Capacity
41278	- Zone 1	4 bytes	0.0000 – Capacity
41280	- Zone 2	4 bytes	0.0000 – Capacity
41282	- Zone 3	4 bytes	0.0000 – Capacity
41284	- Zone 4	4 bytes	0.0000 – Capacity
41286	10C Sample	2 bytes	1 – 999
41287	10C Wait Time	2 bytes	0 – 999

12.　　Interface

12.1.　　Control I/O

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

Table 69 Specifications of the Control I/O Interface

Item	Specifications
Input Circuit	Non-voltage input／open collector driving
Input open voltage	7 to 11 V
Current of input terminal	5 mA (Maximum)
Tolerance saturation voltage	2 V (Maximum)
Output Circuit	Open collector
Maximum output voltage	DC 40 V
Maximum output current	50 mA
Tolerance saturation voltage	1.5 V (at 50 mA drive current)

Table 70 Control I/O Accessories

Product name	Qty	Product No., etc.	
Control I/O connector	1	1JI360C024-B	OHTAX
Control I/O connector cover	1	1JI361J024-AG	OHTAX

12.1.1.　　Connection of Control I/O

Fig. 151 Input/output circuit of control I/O

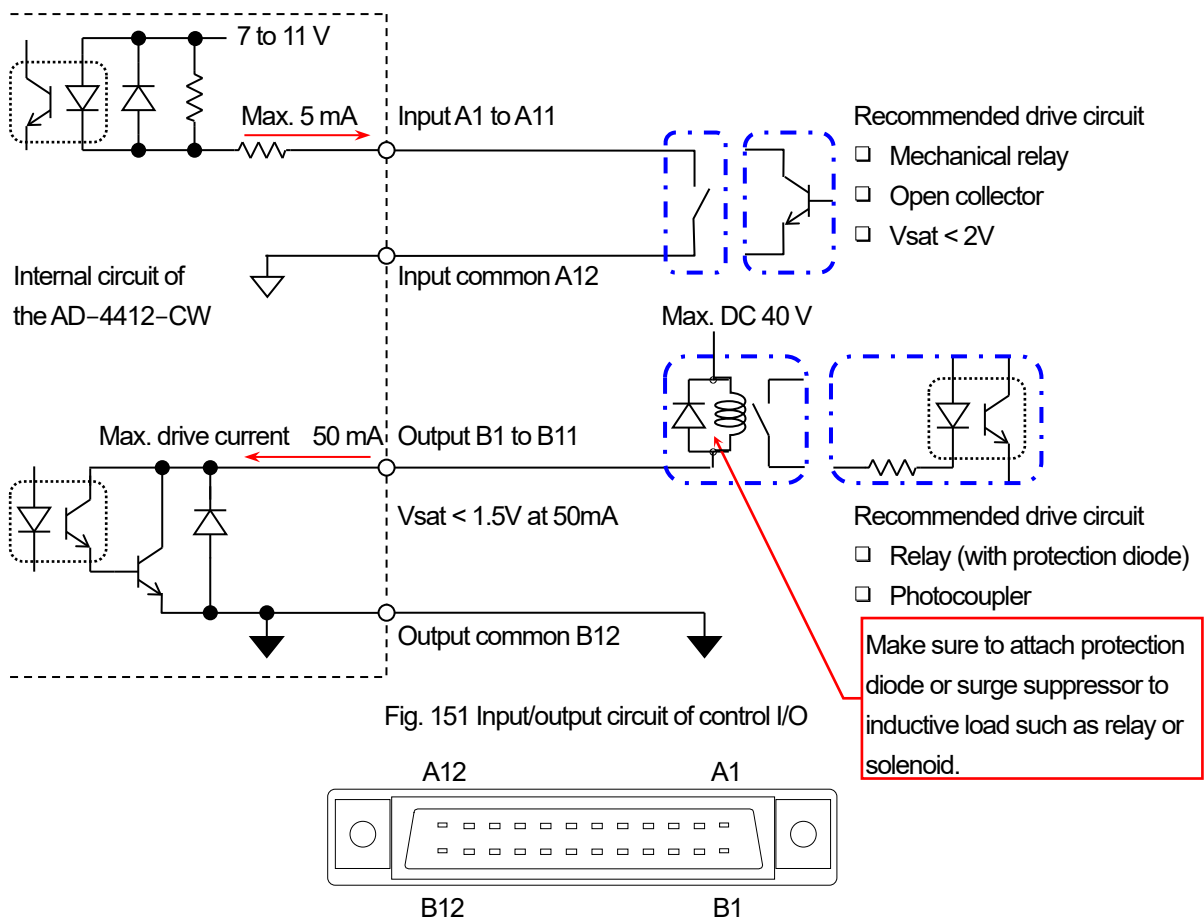
Fig. 152 Terminal numbers of the control I/O connector

Table 71 DI and DO terminals on the control I/O

Input Terminal	DI No.		Output Terminal	DO No.	
A1	DI	1	B1	DO	1
A2	DI	2	B2	DO	2
A3	DI	3	B3	DO	3
A4	DI	4	B4	DO	4
A5	DI	5	B5	DO	5
A6	DI	6	B6	DO	6
A7	DI	7	B7	DO	7
A8	DI	8	B8	DO	8
A9	DI	9	B9	DO	9
A10	DI	10	B10	DO	10
A11	DI	11	B11	DO	11
A12	Input common terminal		B12	Output common terminal	

12.2. RS‑232C

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

Table 72 RS‑232C Interface Specifications

Item	RS-232C
Connector	D‑Sub9 pin (male)
Signal system	EIA RS‑232C compliant
Data bit length	7 bits, 8 bits
Start bit	1 bit
Parity bit	1 bit Even, 1 bit Odd, None
Stop bit	1 bit, 2 bits
Baud rate	1200／2400／4800／9600／19200／38400／57600／115200
Character code	ASCII

12.2.1. Connection of RS‑232C

Internal circuit of the AD‑4412‑CW

	EIA notation	JIS notation
2	TxD	SD
3	RxD	RD
5	SG	SG
7	RTS	RS
8	CTS	CS

The AD‑4412‑CW is DEC (modem connection).

Fig. 153 Internal circuit of RS‑232C

Inch screw #4-40UNC
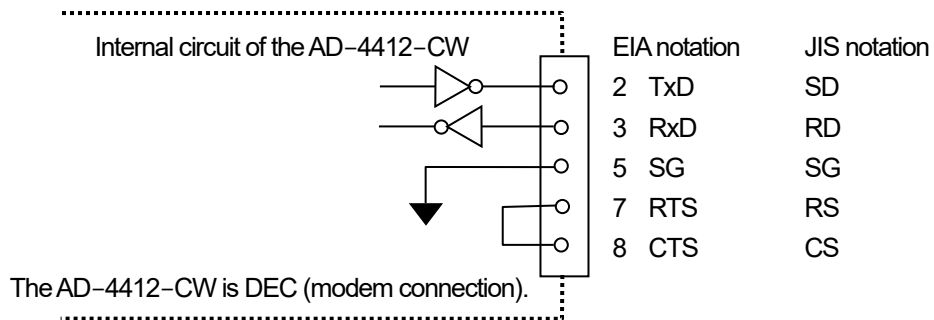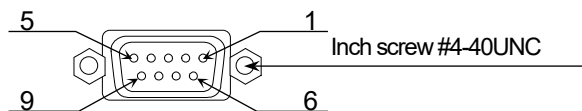
Fig. 154 RS‑232C connector

12.3.   RS-485

The RS-485 interface is used for communication with a PLC using Modbus RTU and with computer in stream mode.

Note
- ❑ A terminal resistor is required for connecting with RS-485. Install a terminal resistor between the + terminal and – terminal.
- ❑ The polarity of terminals on some host devices may be reversed.
- ❑ If the host device is not equipped with a signal ground terminal, a SG terminal is not required.
- ❑ Connect the shield wire to the FG terminal if you use shielded cable.

Table 73 RS-485 Interface Specifications

Item	RS-485
Signal system	EIA RS-485 compliant
Data bit length	7 bits, 8 bits
Start bit	1 bit
Parity bit	1 bit Even, 1 bit Odd, None
Stop bit	1 bit, 2 bits
Baud rate	1200/2400/4800/9600/19200/38400/57600/115200
Signal line	2-wire type x 2
Character code	ASCII

Table 74 RS-485 Accessories

Product name	Qty	Product No., etc.
Terminal resistor for RS-485 (100 Ω)	1	1RC1/2100R KOA

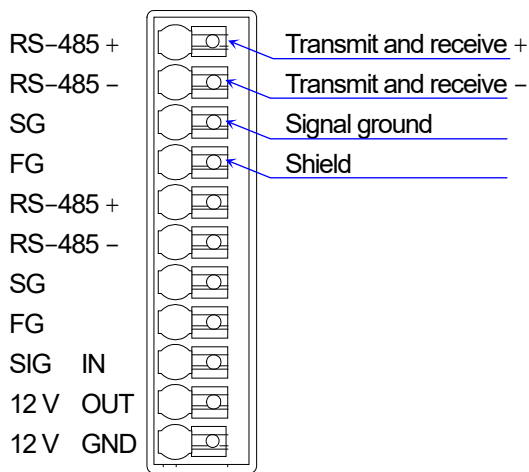## 12.3.1.   Connection of RS-485
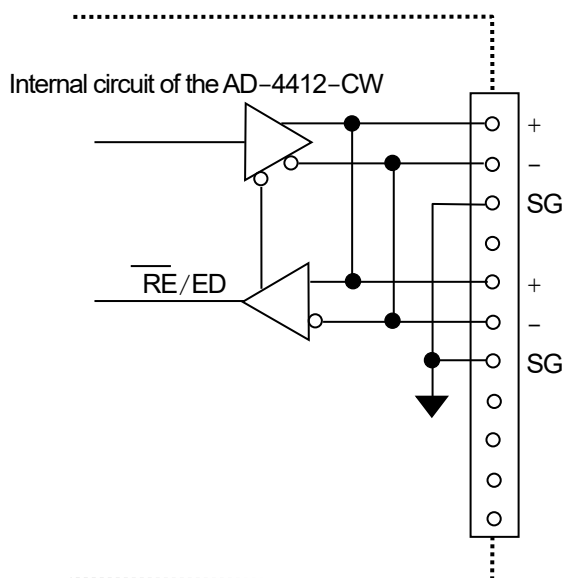

Fig. 155 Terminal connection of RS-485

Fig. 156 Internal circuit of RS-485

12.4.   Photo Eye Sensor

This interface is used for the photo eye sensor. Ordinarily, it can be used with the photo eye sensor signal being input to the terminal box shown below. It also can be used with the signal being input to the digital input of the Control I/O.

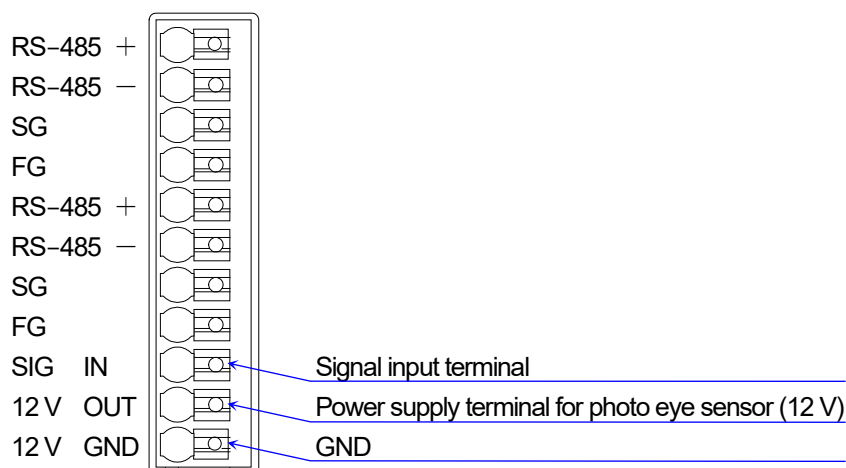### 12.4.1.   Connection of Photo Eye Sensor

Fig. 157 The terminal connection of photo eye sensor

12.5.   OP-02 Relay Output

OP-02 relay output is an output option with 9 DO points that performs the same terminal function as the control I/O with a mechanical contact.

Table 75 The interface specifications of OP-02 relay output

Item	Specifications		
Output Circuit	Mechanical contact relay		
Current at common terminal	AC250 V	3 A	(at rated load)
	DC 30 V	3 A	(at rated load)
	Maximum common current	10 A	(per each COM terminal)
Minimum load	DC 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)	

Caution

- ▥ OP-02 relay output and OP-05 parallel input/output can be installed to the indicator up to a total of two. The address number of DI and DO changes according the slot to which it is 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.
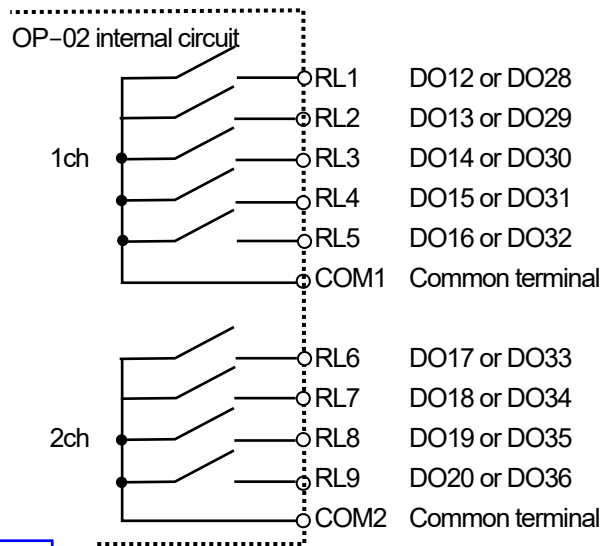
Table 76 Accessory of OP-02 relay output

Product name	Qty	Product No., etc.	
Relay output connector	1	1TMFKC2.5/11STF	Phoenix contact
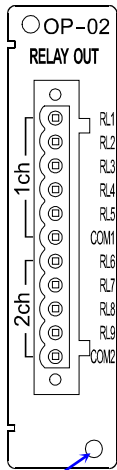
Screw hole
When installing the option, check that the screws are firmly fastened.

Fig. 158 Terminal numbers of the OP-02 connector

If the device to connect has an inductive load such as a mechanical relay or solenoid valve, make sure to attach an appropriate protection device such as a protection diode or surge suppressor.

Fig. 159 OP-02 output circuit

Table 77 DO terminals on the OP-02 relay output

Output terminal		DO No. on option slot 1	DO No. on option slot 2
1ch	RL1	DO 12	DO 28
	RL2	DO 13	DO 29
	RL3	DO 14	DO 30
	RL4	DO 15	DO 31
	RL5	DO 16	DO 32
	COM1	Common terminal	
2ch	RL6	DO 17	DO 33
	RL7	DO 18	DO 34
	RL8	DO 19	DO 35
	RL9	DO 20	DO 36
	COM2	Common terminal	

12.6.   OP-05 Parallel Input/Output

OP-05 parallel input/output is the option to expand the number of input/output terminals of the control I/O. The functions of each terminal can be set as desired in the same way as the control I/O. The operation timing of input and output is also the same as that of the control I/O.

Table 78 OP-05 Pararell Input / Output Interface Specifications

Item	Specifications
Input circuit	None voltage input / open collector drive
Open voltage of input terminal	7 to 11 V
Current of input terminal	5 mA (Maximum)
Tolerance saturation voltage	2 V (Maximum)
Output circuit	Open collector
Maximum output voltage	DC 40 V
Maximum output current	50 mA
Tolerance saturation voltage	1.5 V (at 50 mA drive current)

Caution

❑ The OP-02 relay output and the OP-05 parallel input/output can be installed in the indicator up to a total of two. The address number of DI and DO changes according the slot to which it is installed.

❑ However, the OP-05 parallel input/output can be installed in option slot 1 only.

❑ When the OP-05 parallel input/output is installed in slot 1, DI 12 to DI 27 and DO 12 to DO 27 are assigned as address numbers.

Table 79 OP-05 Pararell Input / Output Interface Accessories

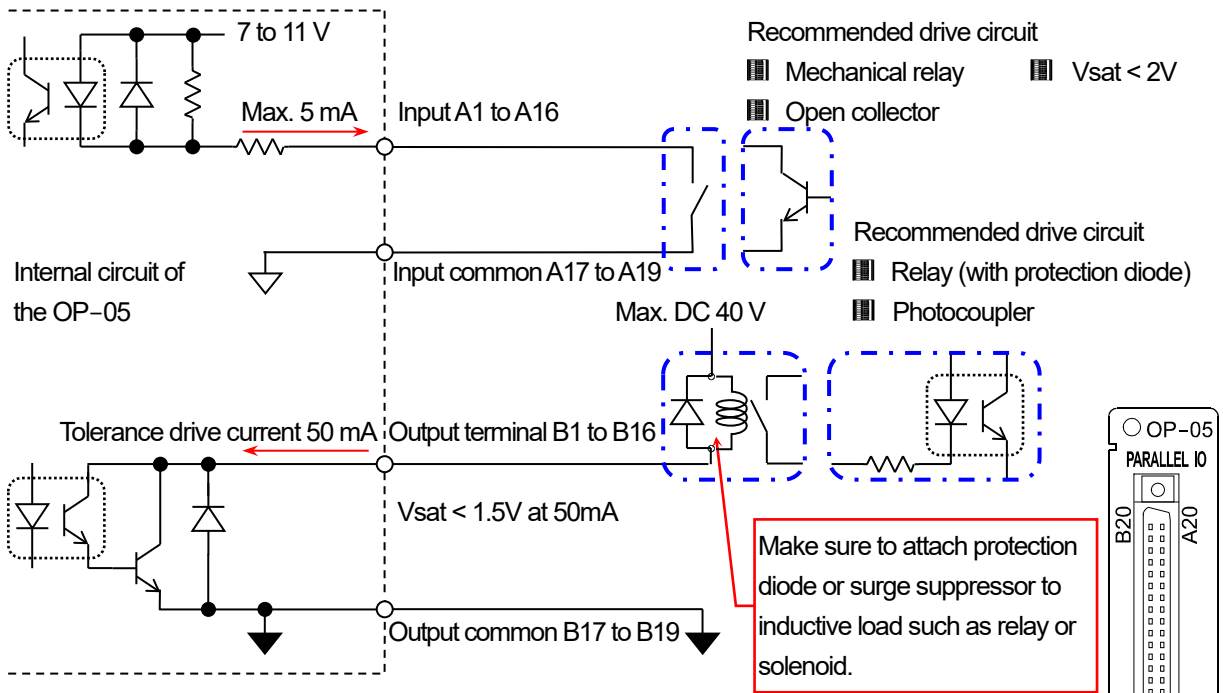| Product name	Qty	Product No., etc.	
Control I/O connector	1	1JI361J040-AG	OHTAX
Control I/O connector cover	1	1JI360C040-B	OHTAX

Fig. 160 Input/output circuit of OP-05

Screw hole
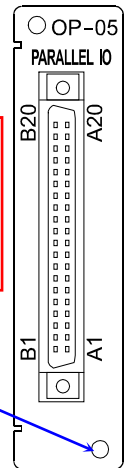When installing the option, check that the screws are firmly fastened.

Fig. 161 Terminal numbers of the OP-05 connector

Table 80 DI / DO terminals on the OP-05 parallel I/O

| Input terminal	DI No.	Output terminal	DO No.
A1	DI 12	B1	DO 12
A2	DI 13	B2	DO 13
A3	DI 14	B3	DO 14
A4	DI 15	B4	DO 15
A5	DI 16	B5	DO 16
A6	DI 17	B6	DO 17
A7	DI 18	B7	DO 18
A8	DI 19	B8	DO 19
A9	DI 20	B9	DO 20
A10	DI 21	B10	DO 21
A11	DI 22	B11	DO 22
A12	DI 23	B12	DO 23
A13	DI 24	B13	DO 24
A14	DI 25	B14	DO 25
A15	DI 26	B15	DO 26
A16	DI 27	B16	DO 27
A17	DI common terminal	B17	DO common terminal
A18		B18	
A19		B19	
A20	FG	B20	FG

12.7. OP–07 Analog Output

OP-07 analog output is the option to output data such as weighing value with 4 - 20 mA current value or 0 -10 V voltage value.

Table 81 Interface specifications of the OP-07 analog output

Item	Specifications
Output form	4－20 mA current output (Range: 2 to 22 mA)／0－10 V voltage output
Maximum output voltage	11 V min. (at current output)／10 V (at voltage output)
Adaption load resistor	0 to 500 Ω (at current output)／560 Ω or more (at voltage output)
Output rate	200 times／s
Zero temperature coefficient	±150 ppm／°C (Max.)
Span temperature coefficient	±150 ppm／°C (Max.)
Non-linearity	0.1 % (Max.)
Resolution	Smaller value between 40000 and resolution displayed

Table 82 Accessory of the OP–07 analog output

Product name	Qty	Product No., etc.	
Analog output connector	1	1TMFKC2.5/12STF	Phoenix contact
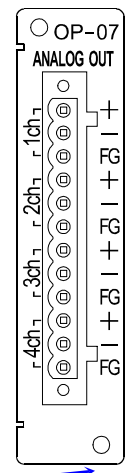
Screw hole
When installing the option, check that the screws are firmly fastened.

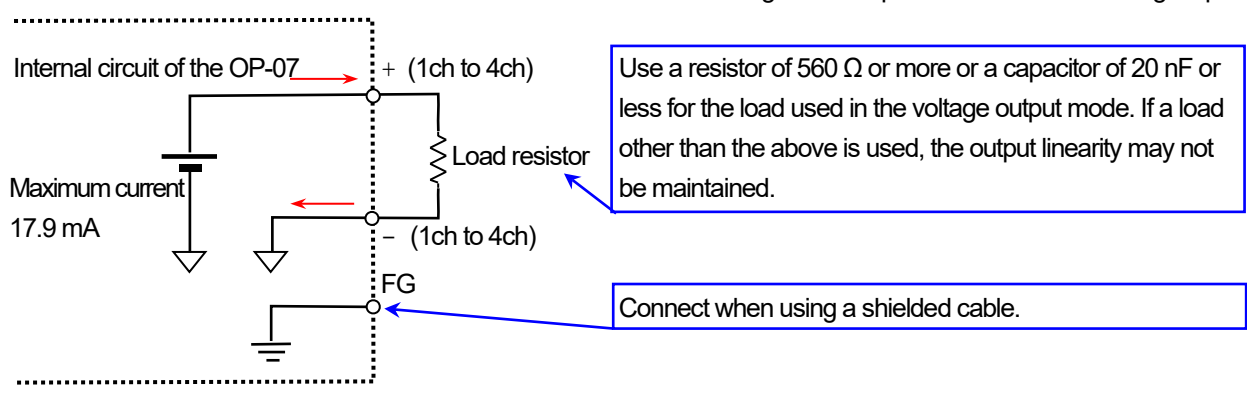Fig. 162 The panel of the OP–07 analog output

Internal circuit of the OP-07

Maximum current 17.9 mA

+ (1ch to 4ch)

Load resistor

− (1ch to 4ch)

FG

Use a resistor of 560 Ω or more or a capacitor of 20 nF or less for the load used in the voltage output mode. If a load other than the above is used, the output linearity may not be maintained.

Connect when using a shielded cable.

Fig. 163 OP–07 output circuit (voltage output)

Internal circuit of the OP-07

Maximum voltage 11 V min

+ (1ch to 4ch)

Load resistor

− (1ch to 4ch)

FG

The output voltage changes depending on the load resistor. Use a resistor of 500 Ω or less in the voltage output mode. When a 250 Ω resistor is connected, output range becomes 1 - 5 V.
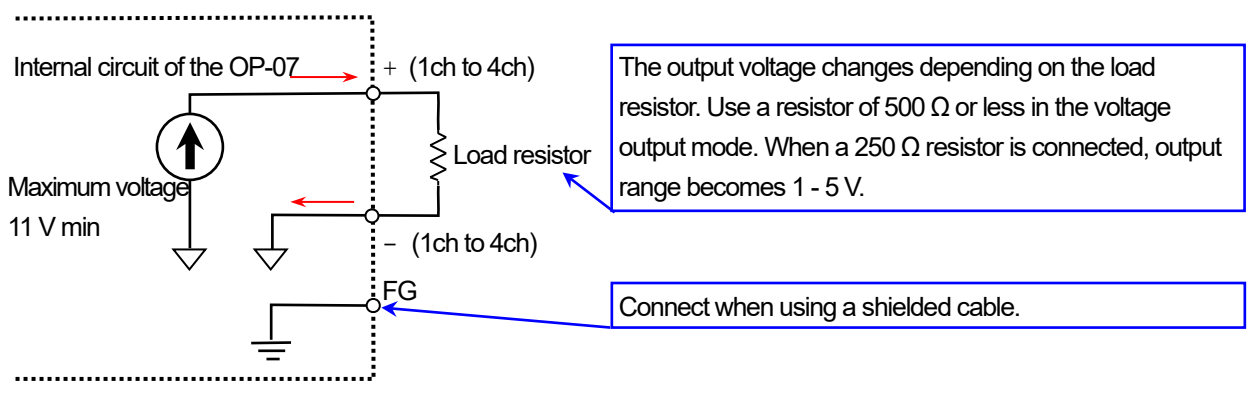
Connect when using a shielded cable.

Fig. 164 OP-07 output circuit (current output)

12.7.1.   How to Set the Output Current Values

The slope of analog output is determined by the settings of low output value and high output value. For the output value, weighing value and speed can be selected.
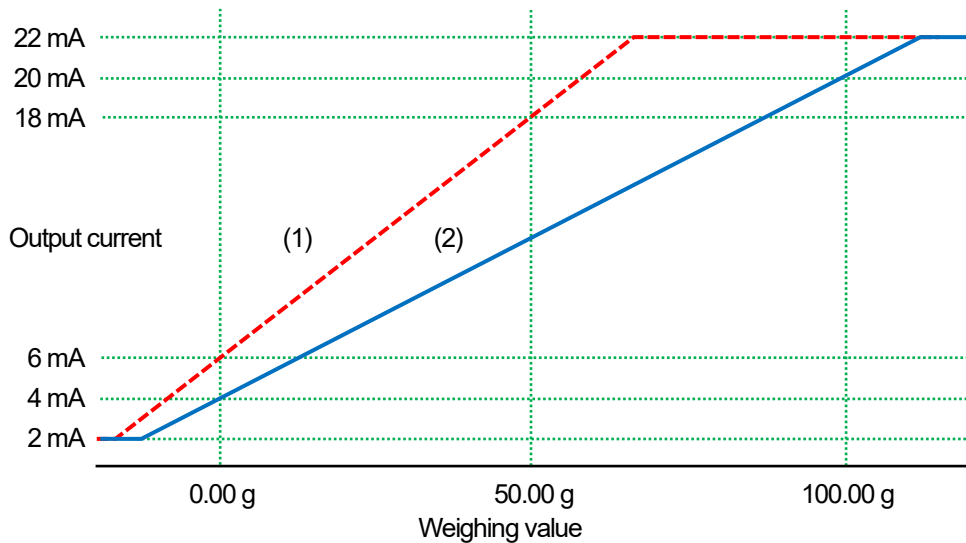

Fig. 165 Example of the setting of OP-07 analog output (when the weight value is output with current)

Example   Line 1   Low current standard   =   6 mA
                    High current standard   =   18 mA
                    Low current output   =   0.00 g
                    High current output   =   50.00 g   are specified.

           Line 2   Low current standard   =   4 mA
                    High current standard   =   20 mA
                    Low current output   =   0.00 g
                    High current output   =   100.00 g   are specified.

Note

▥   In addition to the example above, speed can be output with the current value, or weighing value can be output with the voltage value.

12.8.   OP-17 Analog Output Expansion Module

The OP-17 analog output expansion module is an option for outputting with the current value of 4-20 mA or the voltage value of 0-10 V. It is the module to expand the channels of the OP-07 analog output up to three channels (up to four channels in total together with the existing channels).

AD-4412-CW   AD-4413-CW

13. Maintenance

This chapter describes the maintenance of the indicator.

13.1. Maintenance Log

Displays the usage status of the indicator.

When replacing components, reset each value by marking an appropriate checkbox and pressing the Clear button.
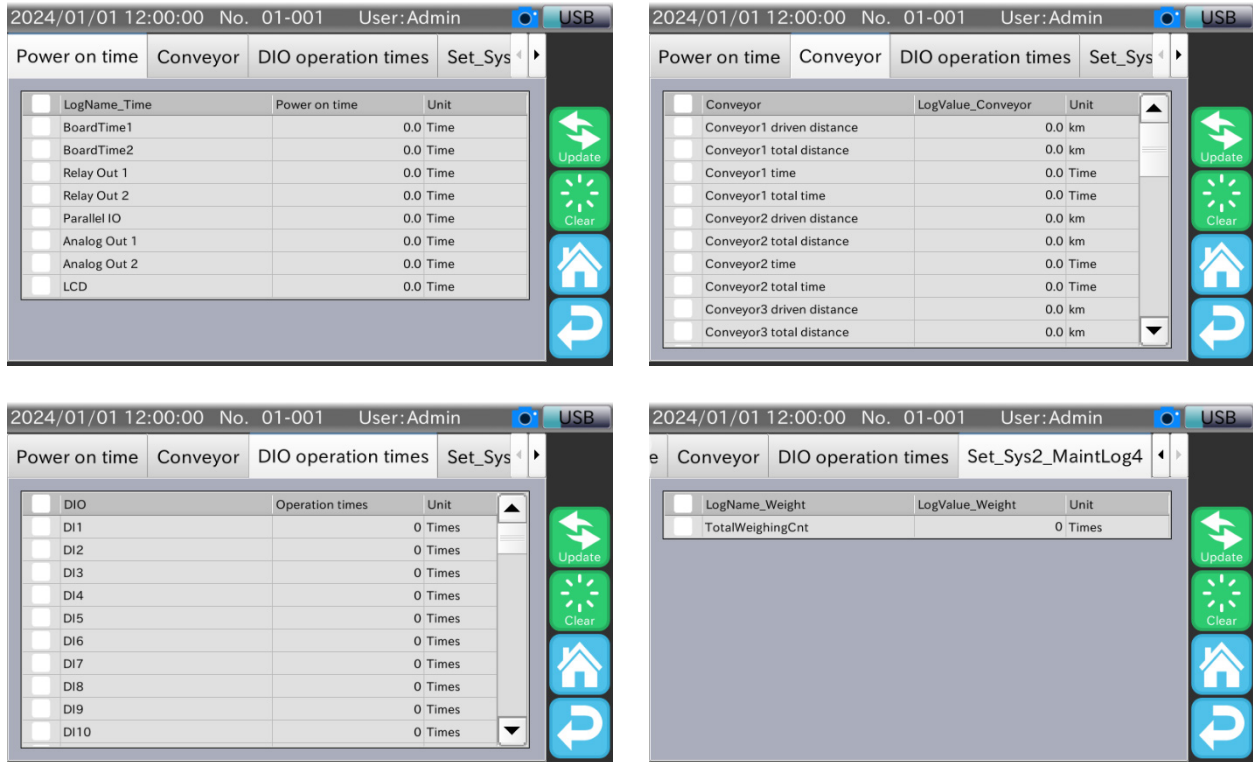

Fig. 166 Maintenance log screen

13.2. Indicator Error

The indicator displays an error/warning message on the screen when an error occurs.

If an error / warning message is displayed, take action according to the contents of the following lists.

13.2.1. Error Messages

Table 83 List of Error Messages

Error Code	Name	Description	Troubleshooting Measures
111001	System Initialize Fail	There are setting files that cannot be read at startup.	Log in at the "Quality Manager" or higher user level, and restore the setting files according to the procedure in "13.3.2. Restoring Configuration Files".
115004	Photo Eye Sensor Shading Error	Photo eye sensor light is continuously blocked by an obstacle for a certain period of time.	Remove the obstacles. Adjust sensitivity of the photo eye sensor.
		Abnormality that blocks light due to misalignment of optical axis.	Adjust the mounting position of the photo eye sensor. Adjust sensitivity of the photo eye sensor.

Error Code	Name	Description	Troubleshooting Measures
115005	Reject PE Sensor Error	Photo eye sensor light is continuously blocked by an obstacle for a certain period of time.	Remove the obstacles. Adjust sensitivity of the photo eye sensor.
		Abnormality that blocks light due to misalignment of optical axis.	Adjust the mounting position of the photo eye sensor. Adjust sensitivity of the photo eye sensor.
115007 to 115009	Rejector Processing Error	Throughput limit of the rejector exceeded.	Adjust throughput speed. Check setting value.
115010	Weighing Board Communication Error	Communication with the weighing board failed.	Check connection of the display board and the weighing board.
115011	(Free Name) Error 1	The DI signal set to (Free Name) Error 1 is input.	Check the device connected.
115012	(Free Name) Error 2	The DI signal set to (Free Name) Error 2 is input.	Check the device connected.
115013	(Free Name) Error 3	The DI signal set to (Free Name) Error 3 is input.	Check the device connected.
116001	Reject Confirmation Error	Reject/Pass Check abnormality detected.	Adjust transport interval. Check setting value.
116002	Emergency Stop	Input of emergency stop signal.	Remove the cause of emergency stop and cancel input.
116003	Weight Adjustment Error	Span adjustment weight is different from the set calibration weight value.	Adjust the span again using the weight of the set weight value.
		Span adjustment weight is not properly placed on the conveyor.	Place the span adjustment weight in the center of the conveyor and readjust the span.
		There is an object on the weighing conveyor or in contact with the conveyor.	Remove the cause and readjust the span.

13.2.2. Warning

Table 84 List of warning messages

Error Code	Name	Description	Troubleshooting Measures
212001	USB Flash Drive Memory Full	Free space on the USB flash drive is less than 2 MB.	Organize the USB flash drive to free up memory capacity.
213001	Printer Communication Error	Connection failure with a printer	Check the connection between the printer and the indicator.
216001	Air Pressure	Input of air pressure abnormality signal.	Adjust air pressure. Check air tube connection.
216002	Bin Full	Input of Bin Full signal.	Empty rejected items bin. Adjust the mounting position of the photo eye sensor. Adjust sensitivity of the photo eye sensor.
216003	Count Overflow	Count number of the summary reaches 9,999,999.	Reset Summary.

13.3. Backup/Restoration

This section describes the maintenance of the indicator. To perform maintenance operations, a user at the "Quality Manager" level or higher is required. This chapter assumes that the user has logged in at the "Quality Manager" or higher user level.

13.3.1. Backing Up Configuration Files

Configuration files (product settings, user settings, various settings, etc.) of the indicator can be saved onto the USB flash drive. If a user inadvertently deletes necessary data or data corruption is found, the data can be restored to the state when it was saved. We recommend that you back up configuration files on a regular basis.

Caution

❑ Never remove the USB flash drive while accessing it. The files may become corrupted.
❑ Do not make any changes to a saved directory or the setting files as this will prevent the data from being restored properly.

The procedure for backing up configuration files is as follows.
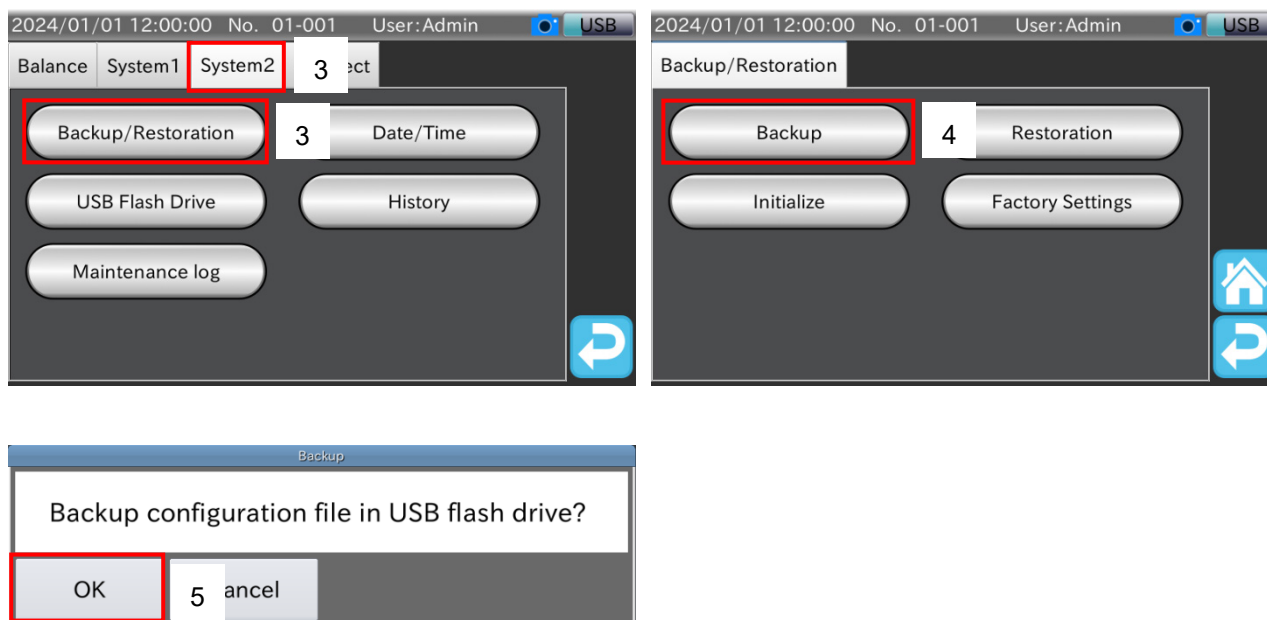
Fig. 167 Backup of Configuration Files

1. Connect the USB flash drive to the USB terminal on the Display Unit following the procedure given in "3.1.1. Connecting a USB Flash Drive to the Indicator".

2. Touch the Settings icon on the Weighing screen to display the Common Settings screen.

3. Touch the System 2 tab on the Common Settings screen, and then touch the Backup/Restoration button. The Backup/Restoration screen is displayed.

4. Touch the Backup button to display the dialog box for backup confirmation.

5. Touch the OK button. The dialog box remains on the screen while the backup is in progress and disappears when completed.

6. Touch the HOME icon to return to the Common Settings screen.

The storage location of configuration files is as follows.

Storage location : USB flash drive root directory¥model name_backup¥storage date and time_model name

"Model name" is "AD4412CW" or "AD4413CW".

13.3.2.   Restoring Configuration Files

The indicator can be restored to the state when the configuration files were saved as described in "13.3.1. Backing Up Configuration Files".

Restoration of configuration files can either be Partial or All Settings.
- Partial: Settings other than adjustment settings (zero-point／span) and LAN settings are restored.
  - ❑ Select this when copying settings to other devices.
- All Settings: All settings including the adjustment settings (zero-point/span) and LAN settings are restored.
  - ❑ Select this to restore the device to the state when the settings were saved.

Caution
- ❑   When restoration is performed, all the current configuration files since the last backup are lost.
- ❑   If there are a large number of registered products, it may take 10 minutes or more to restore.

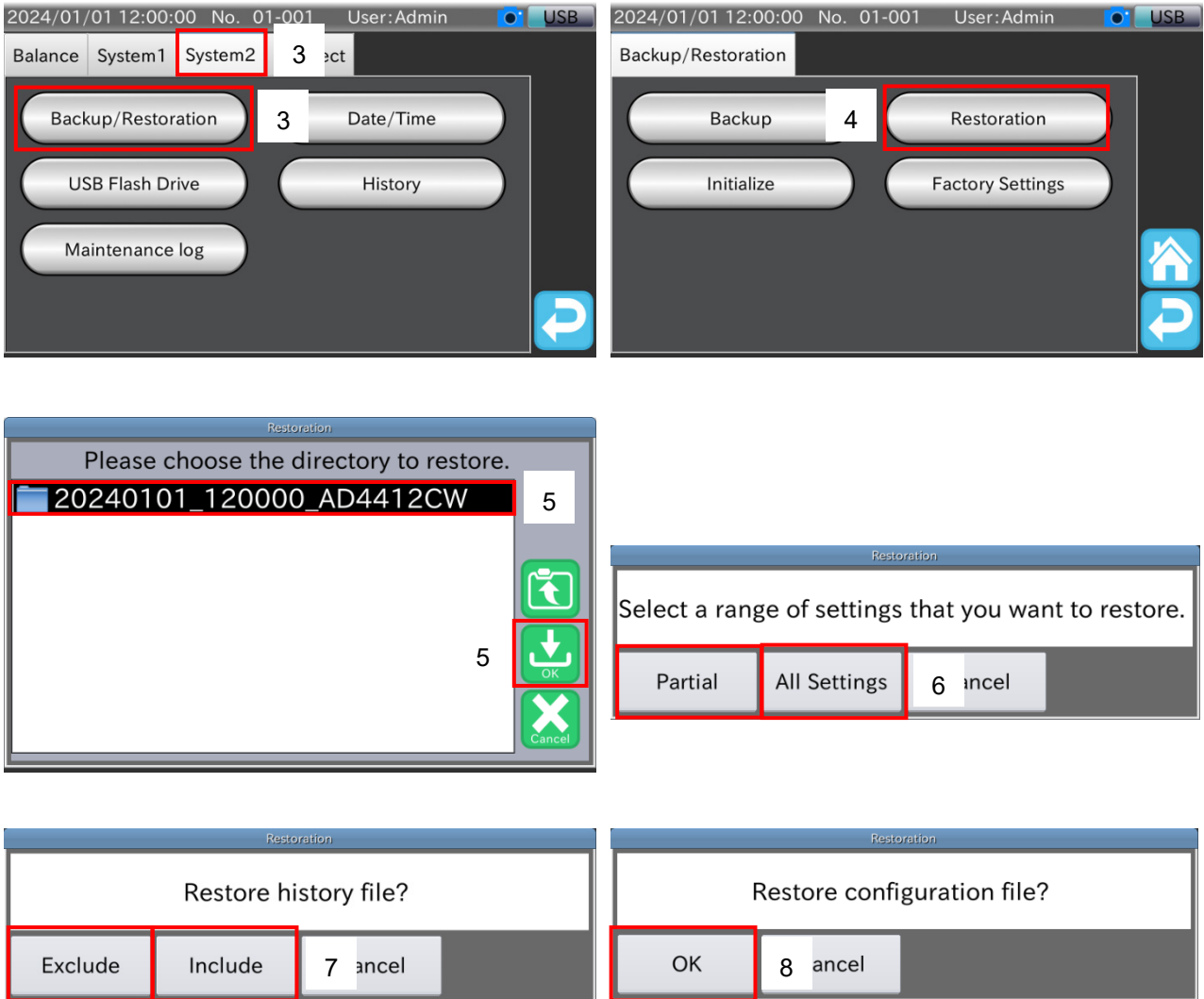The procedure for restoring the configuration files is as follows.

Fig. 168 Restoration Procedure

1. Connect the USB flash drive to the USB terminal on the Display Unit according to the procedure described in "3.1.1. Connecting a USB Flash Drive to the Indicator".

2. Touch the Settings icon [icon] on the Weighing screen to display the Common Settings screen.

3. Touch the System2 tab on the Common Settings screen, and then touch the Backup/Restoration button.
   The Backup / Restoration screen is displayed.

4. Touch the Restoration button to display the dialog box for selecting configuration data to be restored.

5. Touch the folder of the configuration files you want to restore, then touch the OK icon [icon].

Note

   Touch the directory name to select the directory. Touch it again to move to the directory.

6. Touch the Partial button or All Settings button in the dialog box for restoration range selection.

7. Touch the "Exclude" or "Include" button in the dialog box for restoring history files.

❑ Exclude: Operation history, D.COMP history, and error history files are not included in restoration.
❑ Include: Operation history, D.COMP history, and error history files are included in restoration.

Caution

Software version history is not restored.

8. Touch the OK button in the dialog box for final confirmation.
When restoration is complete, a message prompting a reboot appears.

9. Turn off the power of the indicator and then turn it on again (to restart the indicator).
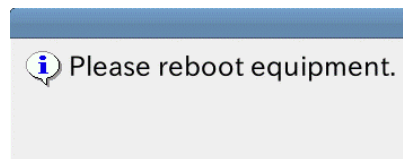

Fig. 169 Reboot message

13.3.3. Initialization

The procedure for initializing the indicator settings is as follows.

Caution

When the settings are initialized, all settings such as the product information, weighing history saved in the indicator, balance settings and the system settings are initialized.
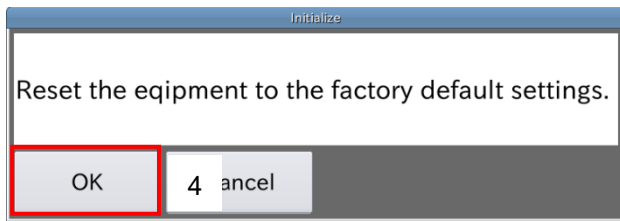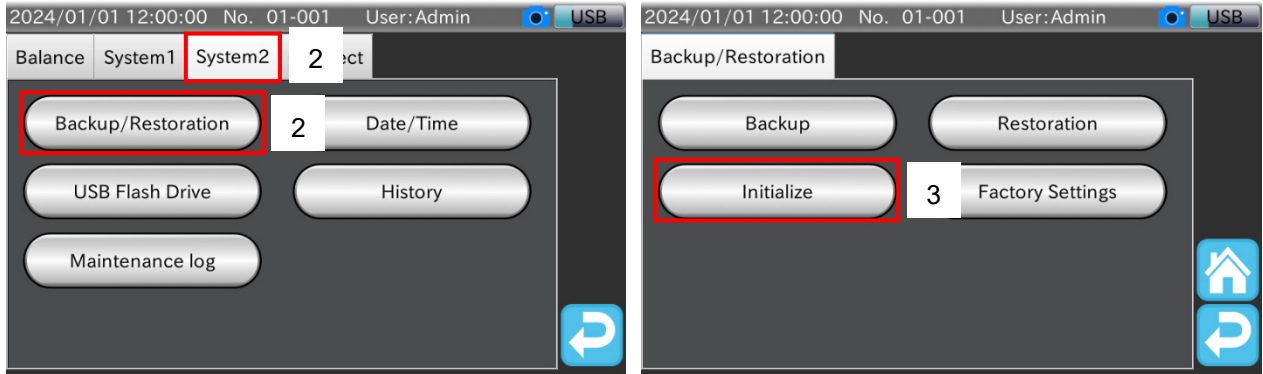

Fig. 170 Factory settings restoration

1. Touch the Settings icon ⚒ on the Weighing screen to display the Common Settings screen.

2. Touch the System2 tab on the Common Settings screen, and then touch the Backup/Restoration button. The Backup/Restoration screen is displayed.

3. Touch the Initialize button to display the Initialize dialog box for initialization confirmation.

4. Touch the OK button. When the initialization is complete, the message for prompting a reboot appears.

5. Follow the message to turn off the power of the indicator and then turn it on again (restart the indicator).
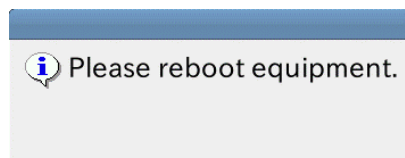

Fig. 171 Reboot message

13.3.4. Restoring Factory Settings

The procedure for restoring the factory settings is as follows.

Caution

When factory settings are restored, the configuration data (product settings, user settings, adjustment settings, various settings, etc.) of the indicator returns to the factory default settings.
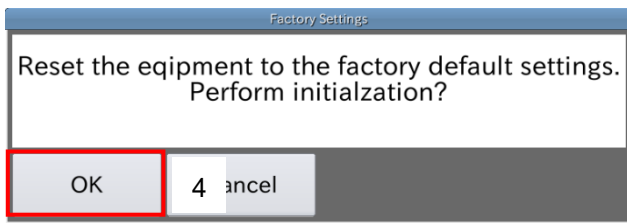

Fig. 172 Factory settings restoration

1. Touch the Settings icon [icon] on the Weighing screen to display the Common Settings screen.

2. Touch the System2 tab on the Common Settings screen, and then touch the Backup / Restoration button. The Backup / Restoration screen is displayed.

3. Touch the Factory Settings button to display the Factory Settings dialog box for restoration confirmation.

4. Touch the OK button. When the factory settings restoration is complete, the message for prompting a reboot appears.

5. Follow the message to turn off the power of the indicator and then turn it on again (restart the indicator).
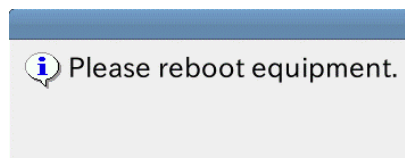

Fig. 173 Reboot message
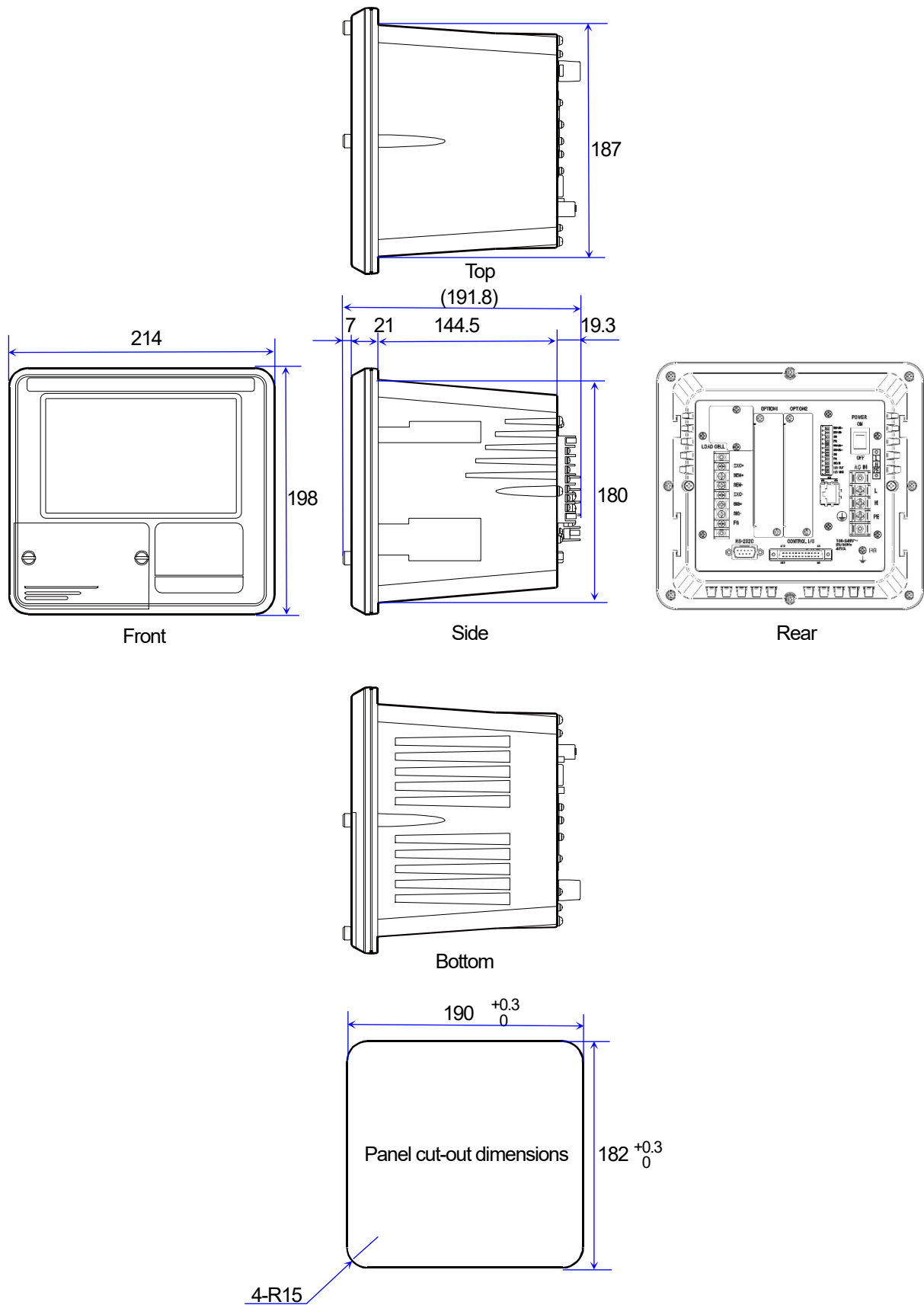
14.   Specifications

Table 85 AD-4412-CW, AD-4413-CW specifications

	AD-4412-CW	AD-4413-CW
Load cell applied voltage	DC 5 V, 60 mA/with remote sense/up to 4 350-Ω cells	
Input sensitivity	0.15 μV/d or more *	
Maximum display resolution	999999 d *	
Zero adjustment range	±7 mV/V (±35 mV)	
Zero point 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 measurement range	±7 mV/V (±35 mV)	
Display	LCD display with 7 inch touch screen	
Method of operation	Touch screen	
Number of registered varieties	1000 varieties (10 groups x 100 varieties)	
Communication	RS-232C PC/dot impact printer, etc. RS-485 Modbus RTU LAN Modbus TCP/printer USB USB flash drive, for saving data and capturing images	
General-Purpose Input	11 points (Non-voltage input/open collector driving)	
General-Purpose Output	11 points (Open collector output)	
Expansion port	OP-02 Relay output 9 points OP-05 Pararell I/O, DI 16 points, DO 16 points (Expansion port 1 only) OP-07 Up to 4ch analog output	
Photo eye sensor power I/F	12 V 250 mA 1 point	
Power supply	Single phase AC100 to 240 V (+10 %, −15 %), 50/60 Hz, approx. 30 VA	
Operating temperature range	-10 to 50 °C	
Operating humidity range	20 to 85 %RH (no condensation)	
Dustproof and waterproof performance	With the panel mount attached, IP65 compliant	
Material	Front panel : PC and ABS plastic Rear panel : PC and ABS plastic	Front panel : stainless steel Rear panel : PC and ABS plastic

*   d: digit

14.1. External Dimensions

14.1.1. AD-4412-CW

Top

(191.8)

187

7 21 144.5 19.3

214

198

Side

180

Front

Rear

Bottom

190 $^{+0.3}_{0}$

Panel cut-out dimensions

182 $^{+0.3}_{0}$

4-R15

14.1.2.　AD−4413−CW

187

9　13　　144.5　　19.3

208

224

Front

180

185

Side

Top

Rear

Bottom

190 $^{+0.3}_{0}$

Panel cut-out dimension

182 $^{+0.3}_{0}$

4-R15
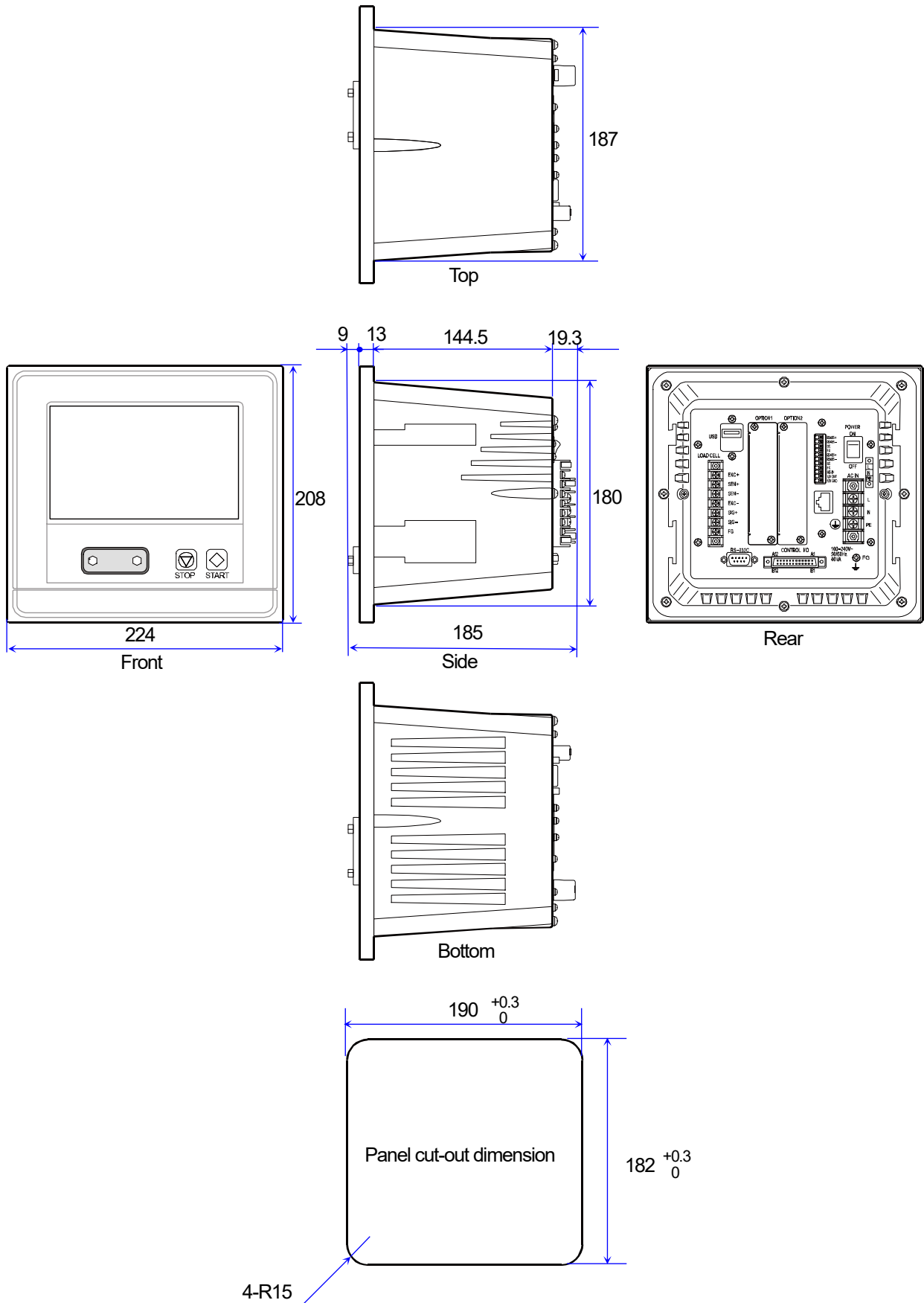
15. Consumables List

The models listed are subject to change without notice. For details, please contact A&D.

Table 86 AD-4412-CW, AD-4413-CW consumables list

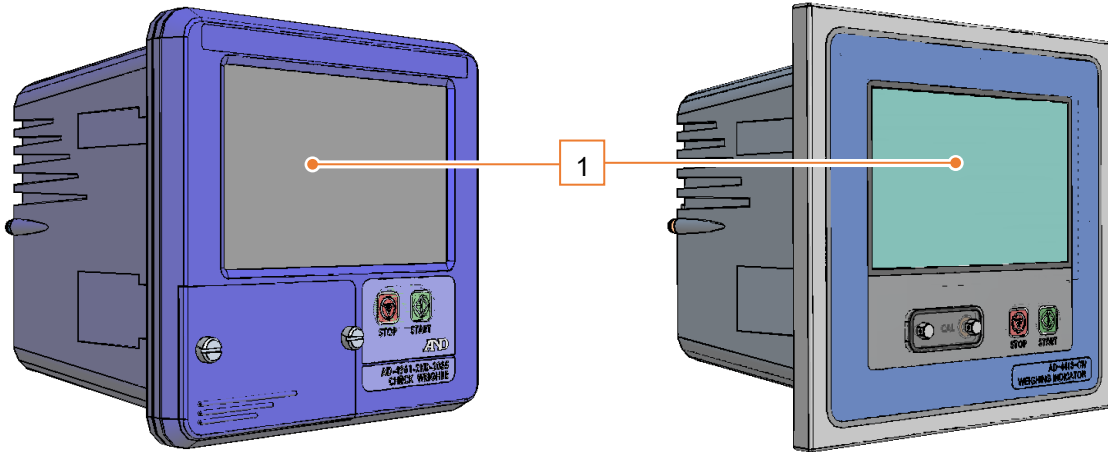| No.	Product name	Model	Qty
1	Backup battery	1EBCR2450	1

Fig. 174 Consumables layout (AD-4412-CW, AD-4413-CW)

16. Revision History

Table 87 Revision History

Date	Control number	Revision details
2024/04/01	1WMPD4005267	First edition (compatible with software version 02.00.00)

MEMO

AD-4412-CW   AD-4413-CW

THIS PAGE INTENTIONALLY LEFT BLANK

A&D Company, Limited
3-23-14 Higashi-Ikebukuro, Toshima-ku, Tokyo   170-0013,   JAPAN
Telephone: [81] (3) 5391-6132   Fax: [81] (3) 5391-1566

A&D ENGINEERING, INC.
47747 Warm Springs Blvd, Fremont, California   94539,   U.S.A.
Tel: [1] (800) 726-3364   Weighing Support:[1] (888) 726-5931   Inspection Support:[1] (855) 332-8815

A&D INSTRUMENTS LIMITED
Unit 24/26 Blacklands Way, Abingdon Business Park, Abingdon, Oxfordshire   OX14 1DY   United Kingdom
Telephone: [44] (1235) 550420   Fax: [44] (1235) 550485

A&D AUSTRALASIA PTY LTD
32 Dew Street, Thebarton, South Australia   5031,   AUSTRALIA
Telephone: [61] (8) 8301-8100   Fax: [61] (8) 8352-7409

A&D KOREA Limited   한국에이.엔.디(주)
서울특별시 영등포구 국제금융로6길33 (여의도동) 맨하탄빌딩 817   우편 번호 07331
(817, Manhattan Bldg., 33. Gukjegeumyung-ro 6-gil, Yeongdeungpo-gu, Seoul,   07331   Korea)
전화: [82] (2) 780-4101   팩스: [82] (2) 782-4264

OOO A&D RUS   ООО "ЭЙ энд ДИ РУС"
Почтовый адрес:121357, Российская Федерация, г.Москва, ул. Верейская, дом 17
Юридический адрес: 117545, Российская Федерация, г. Москва, ул. Дорожная, д.3, корп.6, комн. 8б
(121357, Russian Federation, Moscow, Vereyskaya Street 17)
тел.: [7] (495) 937-33-44   факс: [7] (495) 937-55-66

A&D Instruments India Private Limited   ऐ&डी इन्स्ट्रयूमेन्ट्स इण्डिया प्रा0 लिमिटेड
D-48, उद्योग विहार , फेस –5, गुड़गांव – 122016, हरियाणा , भारत
(D-48, Udyog Vihar, Phase-Ⅴ, Gurgaon – 122016, Haryana, India)
फोन : [91] (124) 4715555   फैक्स : [91] (124) 4715599

A&D SCIENTECH TAIWAN LIMITED.   A&D台灣分公司 艾安得股份有限公司
台灣台北市中山區南京東路2段206號11樓之2
(11F-2, No.206, Sec.2, Nanjing E.Rd., Zhongshan Dist., Taipei City 10489, Taiwan, R.O.C.)
Tel : [886](02) 2322-4722   Fax : [886](02) 2392-1794

A&D INSTRUMENTS (THAILAND) LIMITED   บริษัท เอ แอนด์ ดี อินสทรูเม้นท์ (ไทยแลนด์) จำกัด
168/16 หมู่ที่ 1 ตำบลรังสิต อำเภอธัญบุรี จังหวัดปทุมธานี 12110 ประเทศไทย
(168/16 Moo 1, Rangsit, Thanyaburi, Pathumthani 12110 Thailand)
Tel : [66] 20038911