NMD-500 Series

Metal Detector

User Manual

The First Edition

Total Inspection Systems & solution

NOW SYSTEMS (주)나우시스템즈

REVISION HISTORY

REVISION	VERSION	DATE	AUTHORS	DESCRIPTION
1	1.0	2018-01-18		FIRST EDITION

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- This is a operation manual for NowSystems NWD-500 metal detector.
- Please follow the stated instructions, as false installation or operation may lead to performance degradation and higher chance of accidents.
- Please read the instructions before using the device.
- Leave the manual with the device at all times.

Safety Signs

These are precautions to keep users away from accidents and harms by operating the device safely.

Signs used in the manual

Warning	**Used when violation of instruction may lead to serious injury or death.**
Caution	**Used when violation of instruction may lead to minor injury or malfunction of the device.**
Information	**Describes the necessary information for operating the device.**

Safety Precautions

Please be informed of the following precautions for safe operation of the device.

Warning

- **Power cords should be plugged into water-proof sockets at all times.**
  - **Fire and injury may occur due to electrical shorts.**
- **Do not separate the device when power is permitted.**
  - **Injury due to electrocution and fire due to electrical shorts may occur.**
- **Do not wash the device with flammable substances.**
  - **Injury due to fire may occur.**
- **Do not put hands in the rotating part of the device when it is operating.**
  - **Injury due to stuck hands may occur.**
- **Do not damage the power cord, and stop the device when it is loosely plugged in.**
  - **Overheating and ignition may occur when electrical connection is unstable.**

Caution

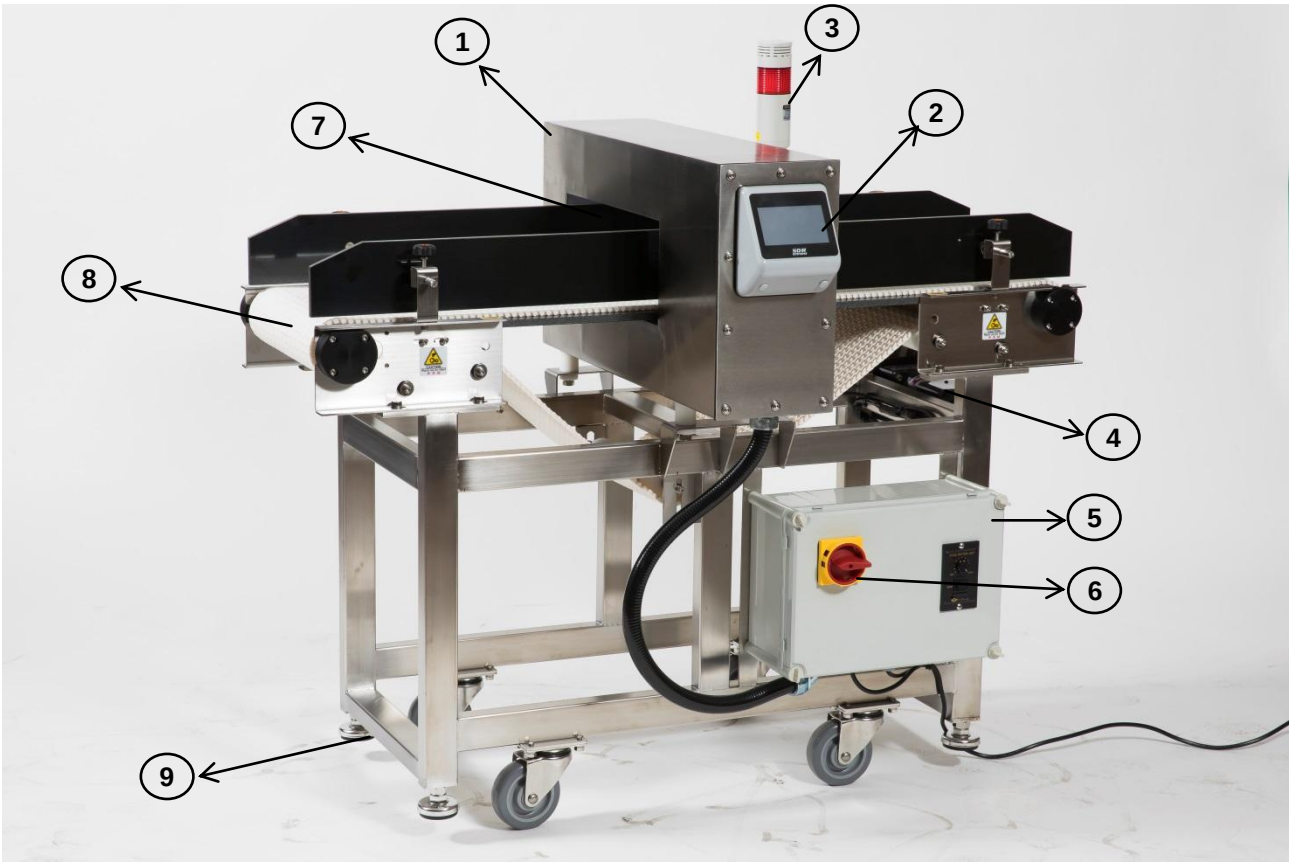
- **Do not press the touch-screen with sharp tools or nails.**
  - **Malfunction of the device may occur due to destruction of its water-proof function.**
- **Do not change the temperature abruptly.**
  - **Critical malfunction of the device may occur due to abrupt change in temperature.**
- **Install the device away from heating elements and direct sunlight.**
  - **Critical malfunction may occur when the internal temperature of the device changes abruptly.**
- **Install the device on a hard and vibration-free surface.**
  - **It may be a cause of breakdown and malfunction.**
- **Install the device away from high-frequency generating devices.**
  - **Malfunction may occur due to electrical conduction and radiation noise.**
- **Make sure to ground the device.**
  - **Electrocution or malfunction may occur due to electric leakage.**

■ Do not attempt to break down, repair, or alter the device other than the repair technician designated by NowSystems. (Repair costs may be incurred even when critical injuries and customer services occur during the warranty period.)

Contents

1 PARTS NAME AND FUNCTIONS

1.1 OVERALL CONFIGURATION



Distinction	Details
① Detector Head	It comprises of internal coils and circuits processing electrical signals.
② Touch-screen	Metal detecting menu, detection condition, and other display and start/stop settings are displayed through 4.3 inch touch-screen.
③ Warning Light	When metal is detected, a red lamp lights on and a buzzer sounds.

④ Motor	This powers the conveyor.
⑤ Power Box	This provides power to the metal detector head and the motor powers.
⑥ Power Switch	This turns the metal detector On/Off.
⑦ Tunnel	The product to be tested passes the tunnel.
⑧ Belt	This should be maintained clean at all times when transferring the products to maximize the device's performance.
⑨ Adjusting Unit	This adjusts the height of the conveyor. Please fasten it after adjusting. **(Caution) Malfunction may occur if the metal detector is not fastened properly with the adjusting unit.**

Warning

Do not put hands in the rotating part when operating the device.

2 INSTALLATIONAND MANAGEMENT

This explains how to install, move, and perform a trial run for the device.

2.1 INSTALLATION AND MOVING

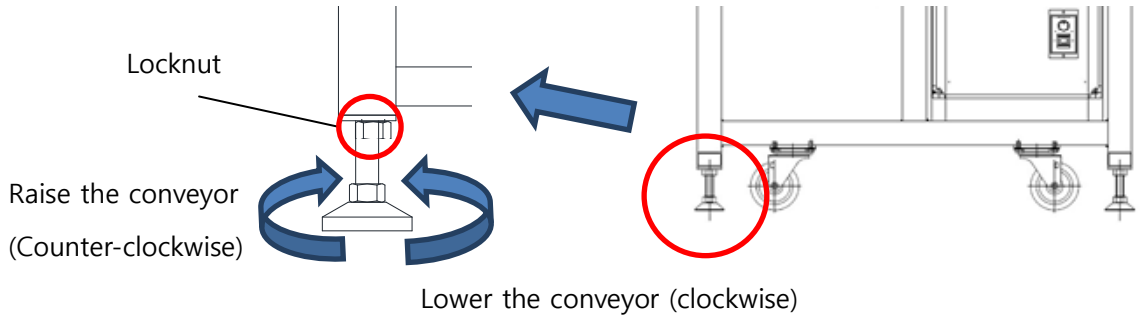
The metal detector is susceptible to shock and external electromagnetic waves, which may cause malfunction. Therefore, it is crucial to follow these conditions when installing to maximize its full function.

2.1.1 INSTALLATION LOCATION

1) Install the device with small temperature fluctuations. (Suitable Temperature:0 - 50℃)
2) Install the device on a hard and vibration-free surface.
3) Install the device away from elements that cause strong static electricity.
4) Install the device far from motors or sub-motors.
5) Keep the device away from devices which use strong electricity.
6) Install the device in a dry area. (Malfunction may occur due to surface condensation from humidity)
7) Install the device away from devices which exposes excess amount of electromagnetic waves and magnetic fields.
8) Keep it especially away from areas with inverter motors.
9) After installation, **fasten it with the adjusting unit.**

Fastening Adjusting Unit.

1) Ease the locknut of the adjusting unit with a spanner.



2) Adjust the leg of the adjusting unit to level it with the front and back conveyors. Here, make sure it does not make contact with the front and back conveyors.

2.1.2 MOVING THE DEVICE

1) Be careful not to knock the device over or apply shock to the head.

2) Be careful not to apply damage to the wheels or electric wires when moving the device with a forklift.

3) Do not put hands or other tools inside the tunnel when moving the device.

Caution

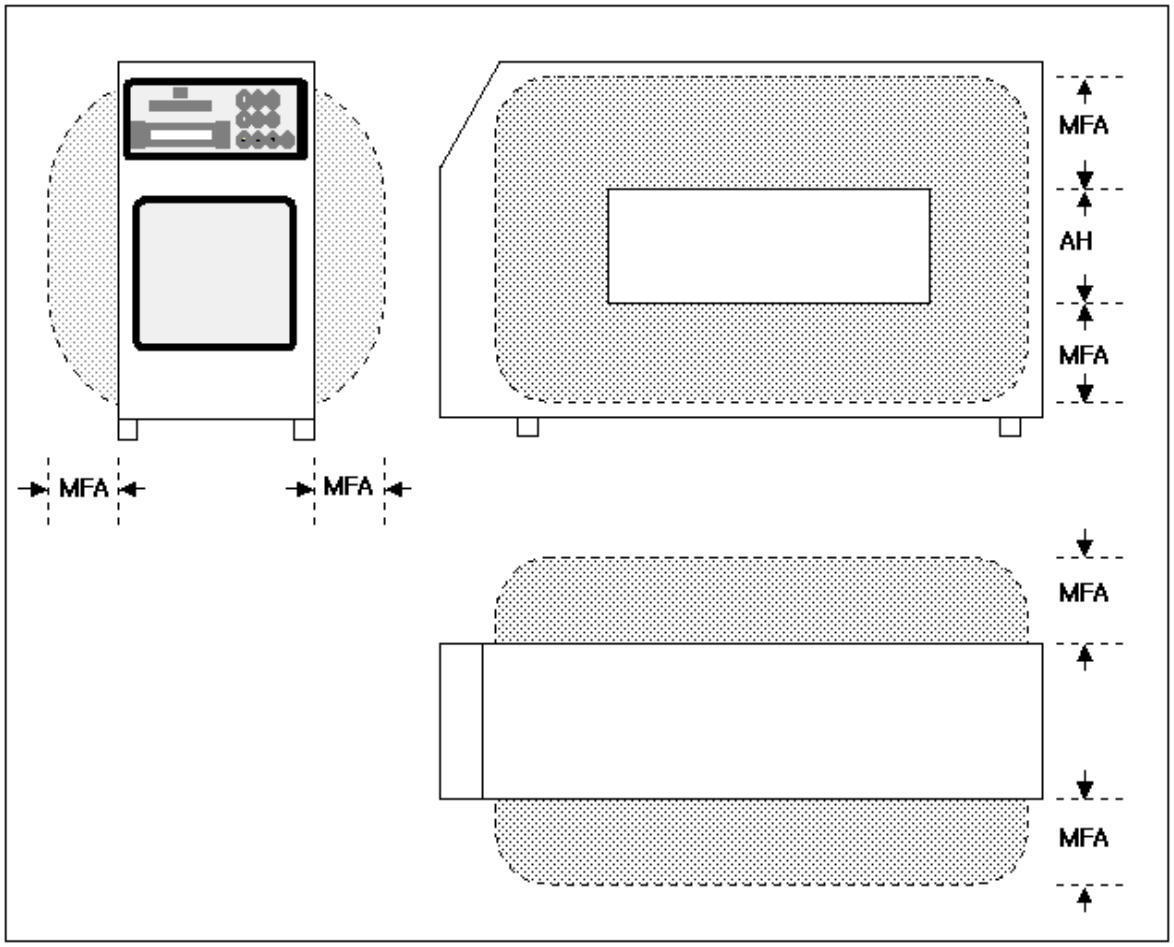
Malfunction may occur if the interior of the tunnel is damaged.

2.1.3 MFA COMPLIANCE

[What is Metal Free Area?]

Due to the nature of a metal detector that senses even a minute change in status of the electromagnetic field, detection occurs when there is metal near the tunnel which forms the magnetic field.

Metal Free Area refers to the place near the tunnel where metal should not be placed



MFA :Metal Free Area, AH :Aperture Height

Low - Middle Frequency :MFA = AH
High Frequency :MFA = AH x 1.8

Do not place metal objects inside the M.F.A

2.1.4 CONVEYOR INSULATION

[Why is Insulation Necessary]

Because a metal detector measures a minute change in a signal, an instant grounding status change which occurs during a rotation of a roller or a bearing affects the circuit of the detector.

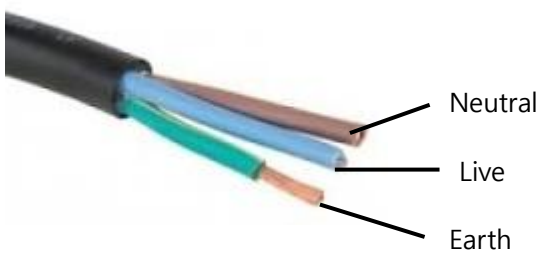
In order to block out the grounding status change, one side of the conveyor is insulated.

Caution

Do not alter the metal detector roller, since it is insulated and specially designed.
Please contact the manufacturer if alteration is necessary.

2.1.5 POWER-GROUNDING

Power grounding terminal must be grounded.



Warning

Electrocution may occur if the grounding is not connected.
If the input power grounding is unstable, it may cause malfunction.

2.2 TRIAL RUN

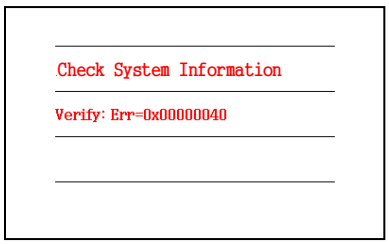
2.2.1 BEFORE CONDUCTING A TRIAL RUN

PLEASE CHECK THE FOLLOWING ITEMS BEFORE TURNING THE POWER ON,

- The metal detector should be stably installed.
- Wiring and grounding of the motor should be conducted appropriately.
- There should be no foreign substances inside the tunnel.
- There should be no foreign substances between the conveyor belt.

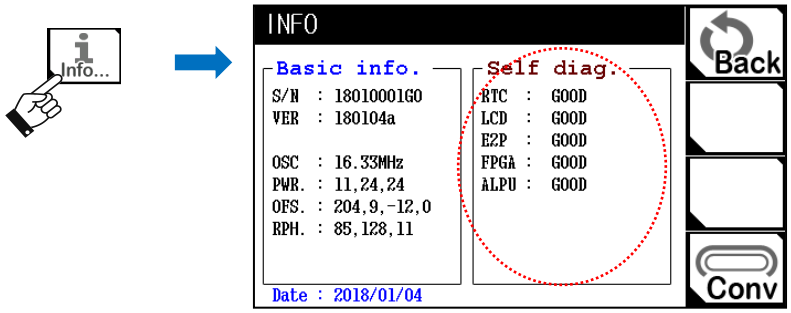
2.2.2 OPERATION CHECK

1) Turn the power switch clockwise to check if the booting works normally.
2) When the booting is complete, check for error signs on the screen.
   If there is an error in the self-diagnosis, a message should appear on the right-hand side of the screen. Details of the error are displayed on the [Information] menu.
3) Turn the conveyor ON/OFF to check the operation speed and direction of the conveyor.
4) Check for any abnormal noise in the device.



Check Error Details

1) Click on the [Information] button on the main screen to move to the [Information] menu.

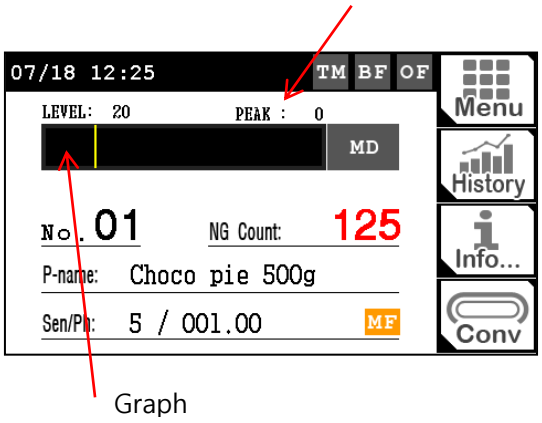


2) If the "**ERROR**" sign continues to show, contact the customer service of the place of purchase or the manufacturer

Distinction	Conditions for Error Occurrence
RTC	System Time Error The time is incorrect or resets after the boot.
LCD	The screen is broken or does not show.
E2P	System, product settings, and detection history errors. The settings returns to default or cannot be saved.
FPGA	All activities including detection are non-functional.
ALPU	Security chip error. Abnormal behavior of the detection wave.

2.2.3 CONTINUOUS OPERATION

1) Check for any changes in the graph and PEAK value on the screen. (At least over 20 minutes)
If only the conveyor has been operated, the graph should show no changes and the PEAK value should be 0.



Only if the external environment is unfavorable should the graph and PEAK value show changes, and if the change is less than the effect of the inspected product, there is no problem..

2) Pass a specimen to check for metal detection status, warning light, buzzer status, and belt stop status.
(In test mode, only the metal detection status is displayed. Other activities does not show.)

3) If a is installed, check for its signal output status.
(In test mode, the reject signal does not show.)

3 BASIC OPERATIONS

This explains the basic operations.

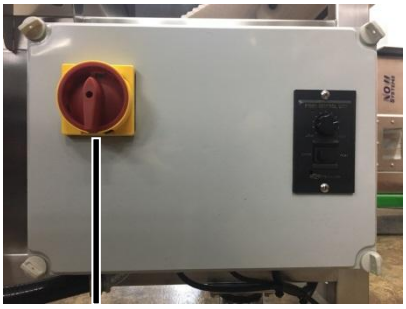
3.1 TURN THE POWER ON/OFF

Power On

Turning the switch clockwise turns the power on.

Power Off

Turning the switch counter-clockwise turns the power off.



Power Switch

For more stable production, Turn the power on 30 minutes before starting production.

3.2 OPERATE / STOP

Operate

Pressing on the conveyor button on the screen for more than 1 second runs the conveyor to be operational.

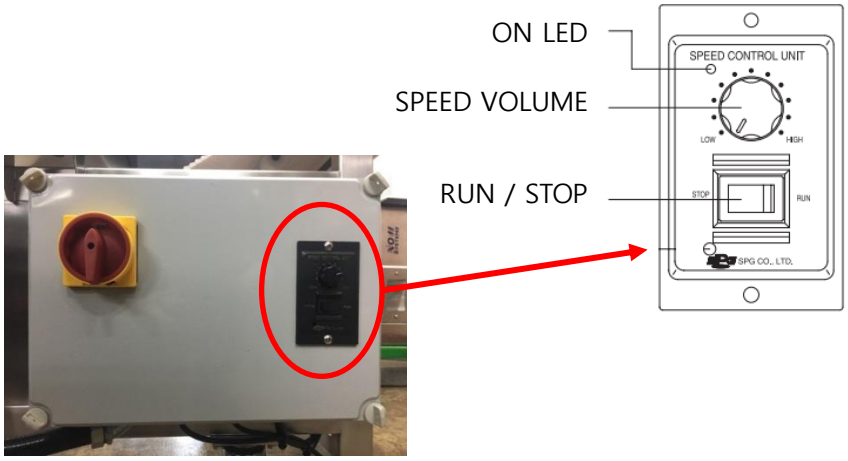
Stop

Pressing the conveyor button again stops the conveyor.

Before operating the conveyor, check if there is nothing on top of the conveyor. Foreign substances on top of the conveyor may influence the detection and cause malfunction.

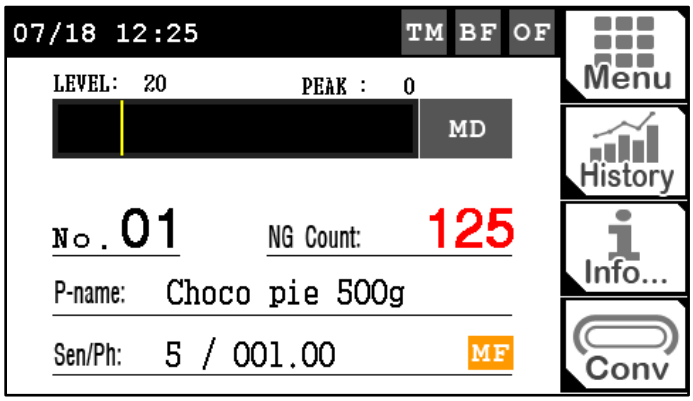
3.3 OPERATION SPEED ADJUSTMENT

Adjust the speed using the speed volume.
If a rejector is installed, make sure to readjust the selection time after adjusting the speed.
(Refer to 6.5 detection criteria)



4 MAIN SCREEN CONFIGURATION

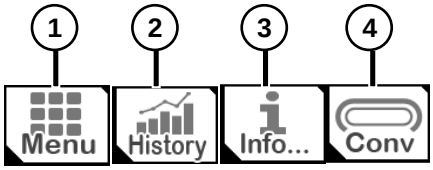
When the power turns on and the system initializes, the main screen appears.



Caution

Do not press the touch-screen with sharp tools or nails.
Malfunction of the device may occur due to destruction of its water-proof function.

4.1 MENU AREA



① [Menu] Button

This moves to the detail menu to change the necessary values for the operation of the device such as product settings, detection history, and configuration. Password input is necessary to access the menu, and some functions are restricted depending on the password security level. (Refer to 5.1 Log-in)

② [Detection History] Button

This is used for searching statistical data for detection history. History for the recent 1000 units can be searched.

③ [Information] Button

Device number and version information can be checked.

④ [Conveyor] Button

This operates or stops the conveyor. To operate, it should be pressed and held until the conveyor starts to run.

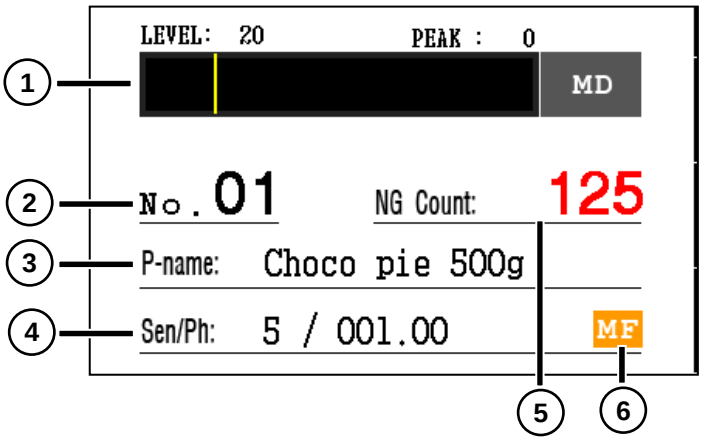
4.2 STATUS DISPLAY AREA

① [Date/Time] Area
This shows the current date and time. This is the standard time used for saving and printing out the detection history.

② [Status Display] Area
This shows information related to test mode and errors.

Icon	Details
TM TM	**Test Mode** This activates in test mode. In this mode, selective operations such as stopping conveyor or screening are not conducted. **(Caution) Do not set as test mode in without a specific reason. In test mode, selective operations are not conducted even if metal is detected.**
BF BF	**Balance Error** This shows the balance status inside the tunnel. A red icon is displayed when error occurs. Malfunction may occur during a balance error, which hinders optimal operation of the device. Please contact the customer service if this error continues.
OF OF	**Printing Error** If the printing of the detection signal has an issue, a red icon is displayed. Please contact the customer service if this error continues.

4.3 MAIN AREA



① [Graph & Detection Display] Area

This shows the size of the detected signal when products pass through in graphs and figures. (Refer to 4.4 Detection Display)

If the product signal exceeds the detection level (yellow bar), it is detected, and the( ) MD he right-hand side of the graph is displayed as red () MD

② [No.] Area

This shows the product number in production.

③ [Product Name] Area

This shows the product name in production.

④ [Sensitivity/Attribute] Area

This shows the current sensitivity and attribute settings.

⑤ [Detection Quantity] Area

This shows the detection quantity of the metal detected. The quantity does not rise during test mode.

Detection quantity counts up until 50000 and does not rise above this level. In this case, initialize the detection quantity. (refer to 7.5 security-shortcut key)

⑥ [Frequency] Area

This shows the frequency of the set detection signal.

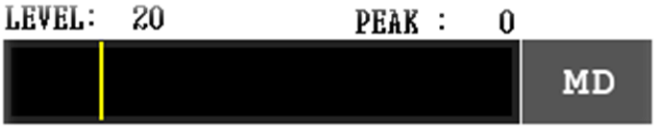
There are 3 operational frequencies available. (Low/Middle/High Frequency)

(Refer to 6.4 Manual Settings - Detection Mode)

Operational Frequency	Low Frequency	Middle Frequency	High Frequency
Icon	LF	MF	HF

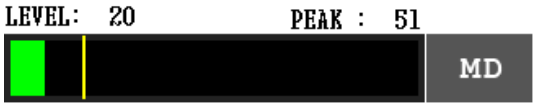
4.4 DETECTION DISPLAY

The detected signal when the product passes is expressed in graphs and PEAK figures.

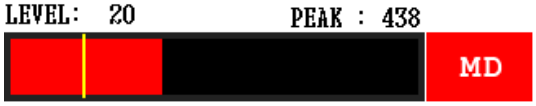


Graph

- If the detection signal does not go over the yellow level, it is expressed in a green graph, which represents non-detection.



- If the detection signal go over the yellow level, the graph turns red, which represents detection of metal.



Detection Mark

Mark	Details
MD	This shows the status of non-detection.
MD	This shows the status of detection. When detected, the detection history is saved, and selective operation is conducted.
MD	This shows the status of detection. (In test mode) In this case, the detection history is not saved, and selective operation is not conducted.

5 OPERATION METHOD

5.1 LOG-IN

The user must type in the password to log-in in order to change the settings of the metal detector.
Depending on the password, there are administrator rights and engineer rights. Unlike the administrator rights, the engineer rights have some limitations on change of settings.
Conveyor running/stopping, searching detection history, and checking information window do not require log-in to access.

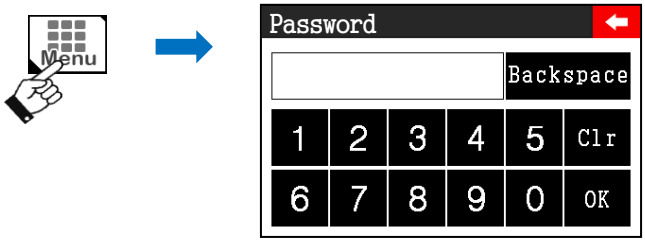
- **Administrator**: can conduct settings by product, search/initialize/print, etc.
  The default password is "20000".
- **Engineer**:Within the administrator rights, can additionally conduct overall system settings.
  The default password is "30119".

Caution

It is advisable to change the password before using.
Please contact the manufacturer if password is lost.

(Refer to 7.5 security - administrator/password change)

3) [Password] input window appears by pressing the [menu] button on the main screen.

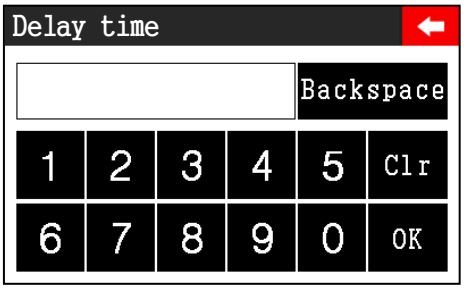


4) Input 5-character password for administrator or engineer rights. The input numbers are shown as *.

5) If the input number is correct, it will move to the main screen.

5.2 NUMBER INPUT WINDOW

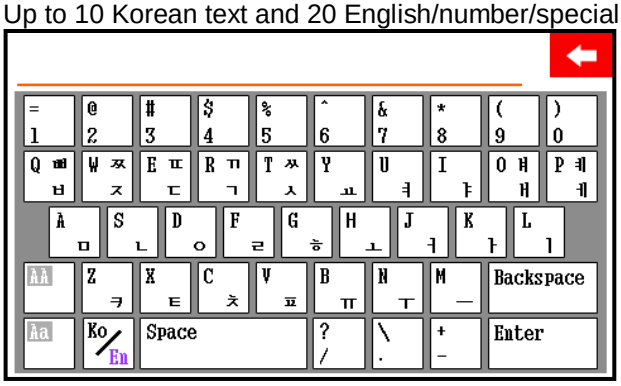
For settings that requires figure inputs, the number input window appears.



1) By pressing the [Backspace] button, the number right before are deleted.
2) By pressing the [Clr] button, all the input values are deleted.
3) By pressing the [OK] button, the input values are saved and it returns to the previous menu.

5.3 TEXT INPUT WINDOW

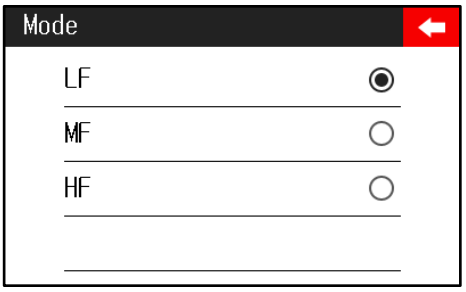
[Keyboard] window appears when setting the product name.
Up to 10 Korean text and 20 English/number/special characters can be inputted.



1) By pressing the [AA] button, English characters change to upper cases.
2) By holding the [Aa] button, the typed characters are input as upper cases.
3) By holding the [Aa] button, special characters in the keyboard can be inputted.
4) By pressing the [Ko/En] button, it alternates between Korean or English keyboard.
5) By pressing the [Backspace] button, the text typed in right before is deleted.
6) By pressing the [Space] button, one character space is added.
7) By pressing the [Enter] button, the input values are saved, and it returns to the previous menu.

5.4 SINGLE SELECTION WINDOW

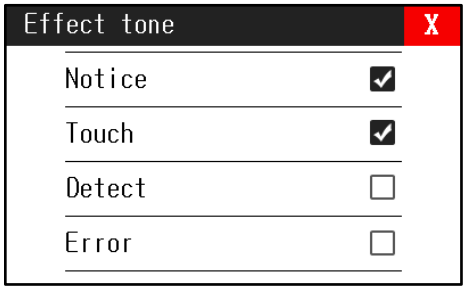
When setting the detection mode, language, and IO, the single selection(radio button) window appears.



1) By pressing the desired item, the selected values are saved and it returns to the previous menu.
2) By pressing the button, it returns to the previous menu.

5.5 MULTI SELECTION WINDOW

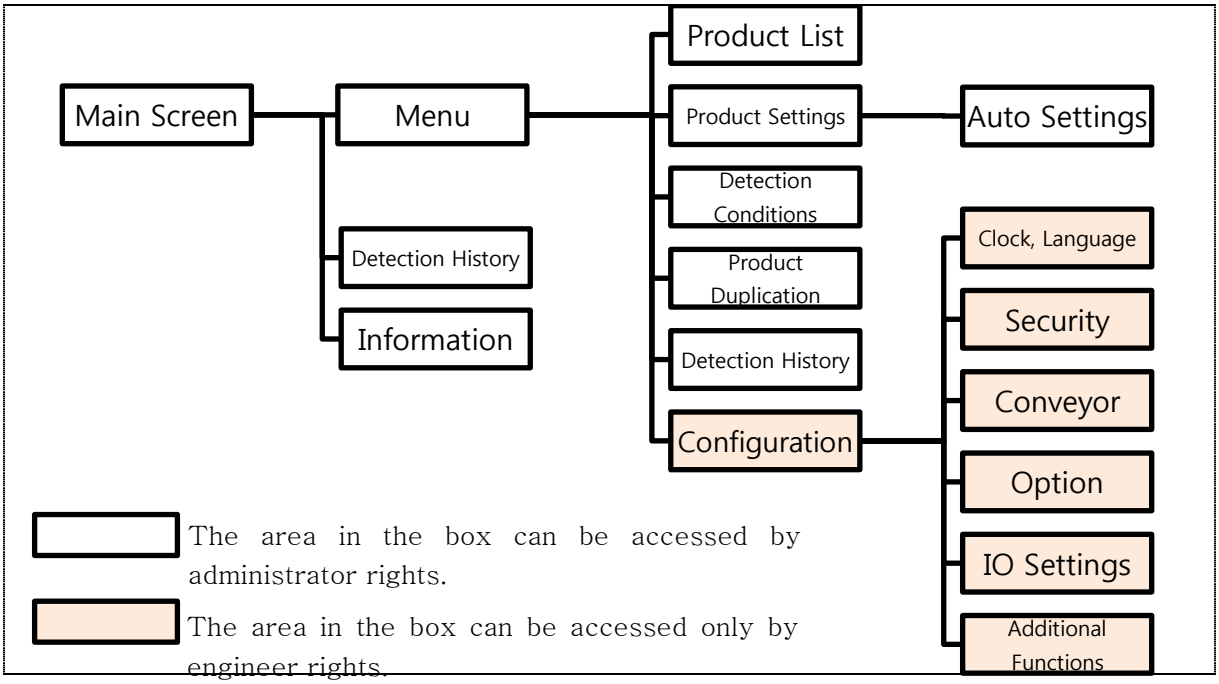
The multi selection window appears when setting shortcut keys and sound effects.



1) Clicking each item selects/cancels the items.
2) Clicking X returns to the previous menu.

5.6 MENU STRUCTURE

This comprises of various menu including detection performance settings, detection history management, and settings. The overall menu structure is as follows.



Menu	Details
Product List	Product list can be displayed and inspected product names can be registered up to 50.
Product Settings	Manual setting of product attributes/sensitivity
Auto Settings	Auto setting of product attributes/sensitivity
Detection Conditions	Detection condition setting such as detection mode and time intervals.
Product Duplication	Duplicate the product setting to another number
Detection History	Detection history screen print out, delete, and output support
Clock, Language	Current date, time, displayed language(Korean,English) settings
Security	Password change, main screen shortcut keys settings
Conveyor	Conveyor stop mode and auto start status settings
Option	Test mode, sound effects, detection history save status settings
IO Settings	3 output port settings
Additional Functions	Printer usage status settings

6 PRODUCT SETTINGS

This is to set the metal detector operation status on inspected products. Generally, the sequence is as follows.

Metal Detector by Product Setting Sequence

1) Select Product
:Select the product number to be set from the product list. Number 1 - 50 can be selected.

2) **Register Product Name**:
:Register the product name. If the product name does not need to be registered, this process can be skipped.

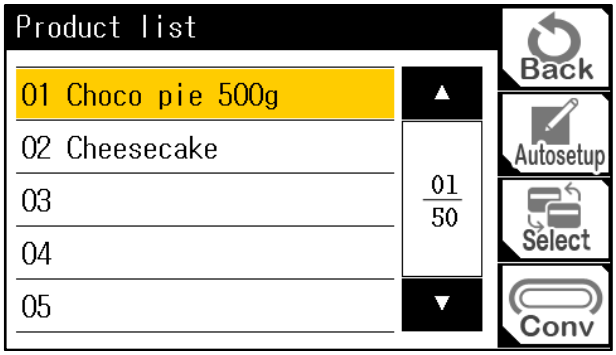
3) Auto Settings
: This sets the inspection mode, attributes, and sensitivity of the product automatically. If the attribute/sensitivity setting value of the product is already known, this stage can be skipped and proceed to the manual settings.

4) Manual Settings
:This sets the inspection mode, attributes, and sensitivity of the product manually. If the set values have sufficient detection sensitivity, this step can be skipped. This is used when fine tuning the attributes and sensitivity after the auto setting.

5) Detection Condition Settings
:This sets the values related to the product's passing speed and passing interval.

6.1 SELECT PRODUCT

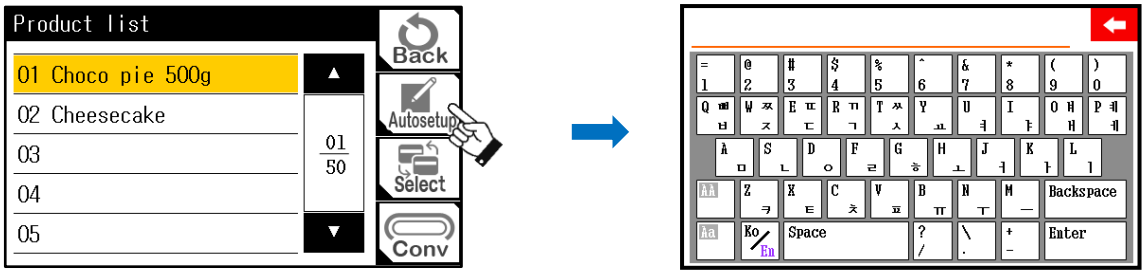
(Menu - Product List)



1) After selecting the product number from the product list, press the [select] button to change the product.
2) Select an empty number when registering a new product.

> The same applies when changing the inspected product to an already registered product.

6.2 PRODUCT NAME REGISTRATION



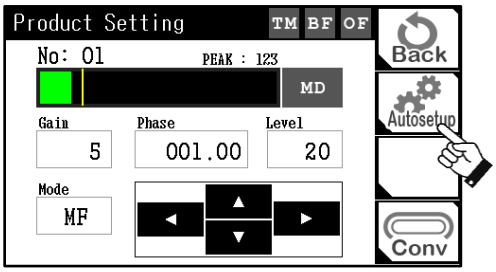
1) Select [Product Name] from the product list screen.
2) Enter the product name and press [Enter] to save and return to the previous screen.

> Up to 10 Korean text and 20 English/number/special characters can be inputted. (Refer to 5.3 character input window)

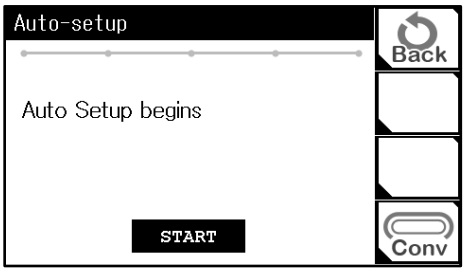
6.3 AUTO SETTINGS

This sets the inspection frequency, attributes, sensitivity of the product automatically.

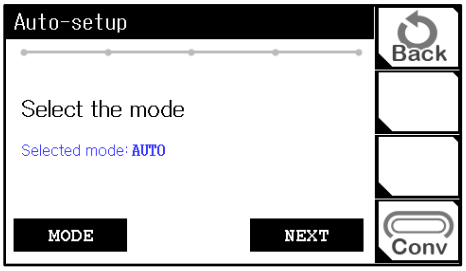
1) Select [automatic setting] from the product setting screen.



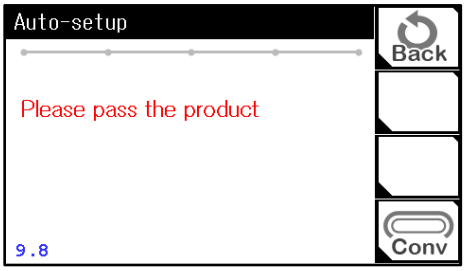
2) Press the [START] button the start the auto setting.



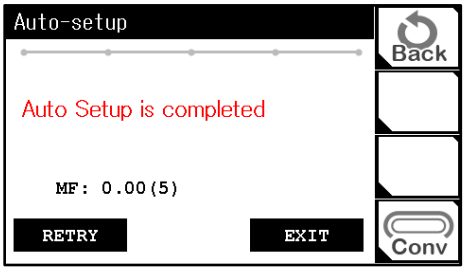
3) Press the [MODE} button to select an detection mode. If the product attribute is already known, the detection mode can be set manually. For information on manual settings, please refer to **Detection Mode Manual Settings** in the next page.
Press the [NEXT] button to automatically distinguish the detection mode.



4) From this step, follow the screen guide. depending on the property of the product, number of passing range from 3 to 10. The larger the property(more salt/water) of the product, the number of passing for auto setting increases.



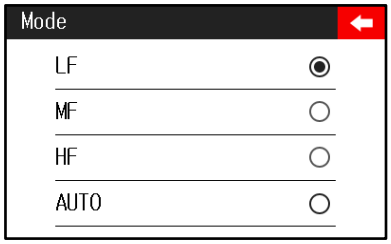
5) When the auto setting is complete, press the [EXIT] button to close the auto setting. Press the [RETRY] button to restart the auto setting.



Detection Mode Manual Settings

Set the inspection mode to manual to quickly proceed with the auto setting stage.

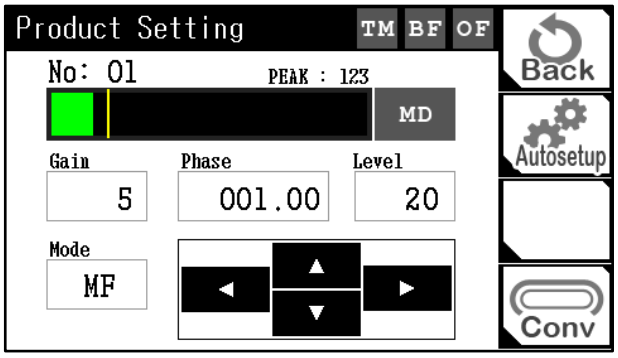
Select the desired mode to move to the next step. The changed frequency is applied from this point.



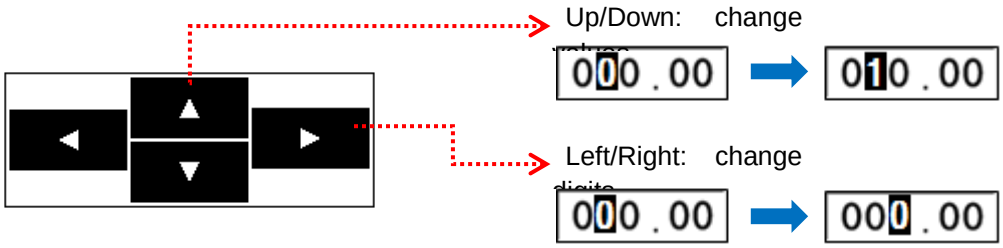
Detection Mode	Details
LF	Use low frequency. Suitable for products with ample amount of moisture/salinity.
MF	Use middle frequency. Suitable for products with small amount of moisture/salinity.
HF	High frequency. Suitable for products with no moisture/salinity.
AUTO	This distinguishes the detection mode automatically. This is the default value when starting the auto setting.

6.4 MANUAL SETTINGS

Manual settings are used when conducting fine tuning after the auto setting or the attributes and sensitivity value of the product is already known. Manual settings are also used for special products that cannot conduct auto setting.



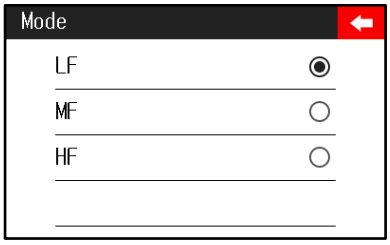
Using Arrow Keys



Detection Mode

This sets the frequency of the detection signal. detection signal frequency can be selected depending on the inspected product's property (moisture/salinity level, frozen condition, and temperature etc.) Lower the frequency when the graph moves over half of the screen during product passing after auto setting.

1) Press the detection mode area to display single selection window.
2) if the mode is selected, it returns to the previous menu.



Select Detection Mode

There are 3 frequencies: HF, MF, LF; and the strength of the frequency is HF > MF > LF.
Change the frequency to HF for dry products with no property and MF, LF for those of more properties. If the auto setting is conducted, the most suitable inspection mode is selected automatically. However, depending on the inspected product's condition, the sensitivity may be higher than the automatically selected mode, and this can be modified through manual setting.

Attributes

1) Select the attributes area.
2) When the cursor appears on the input screen, use the arrow keys to change the values. (Modification range: 0.00 - 180.00)
3) Examine the graph while the product passes and set the smallest attribute value of the graph.

> **What are product attributes?**
> A setting value that deletes the influence of the inspected product. The more accurate this value is, the smaller metal the device can detect. The value is set from 0 to 180.00 In an ideal condition where a product's influence is completely erased, the graph does not pick up any signal when the product passes.

4) If the graph goes over more than half when the product passes after modifying the attribute value, the sensitivity should be modified.

Sensitivity

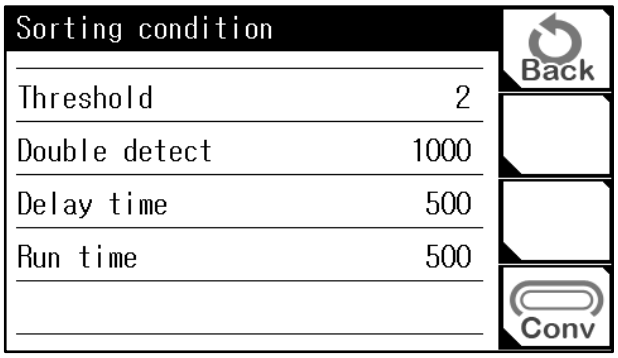
1) Select the sensitivity area.
2) When the cursor appears on the input screen, use the up/down arrow keys to change the value. (Modification range: 1 - 5, higher number represents higher sensitivity)
3) Examine the detection graph when the product passesand modify the sensitivity by lowering it so that the maximum value of the graph does not go over 50%.

Detection Level

1) Select detection level area.
2) When the cursor appears on the input screen, use the arrow keys to change the values. (Modification range: 1 - 99)
3) Modify the yellow detection level displayed vertically on the graph.

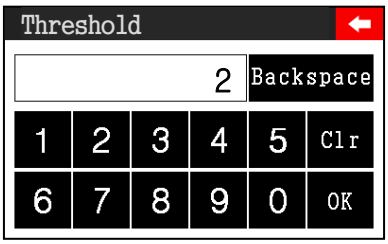
> **What is the appropriate detection level setting value?**
> Set the detection level higher than the graph while passing the inspected products. Set the value to 2 - 3 times the graph If the height of the graph is not consistent due to the variation of the product, 1.5 times if consistent. The sensitivity increases as the detection level reaches the highest point of the graph, but malfunction occurrence increases if the product variation is severe.

6.5 DETECTION CONDITION SETTINGS



Threshold/double detection/delay time/operation time

1) Select this setting to display a number input window.
2) After input, select [OK] to complete the setting.



Threshold

This is the time setting which determines how long the overtime should be to accept the detection when the detection signal exceeds the detection level, and the unit is msec (1/1000 second). For example, if the threshold setting was 100 and the detection signal exceeded the detection level for 99msec, this detection would not be accepted. This setting is used in an environment with a lot of pulse noise and maintained below 20. (Maintain factory default value)

Double Detection

This is the time setting which determines how long the time should be to ignore the detection until the next one. This function is used only when the selective device's operation time is long or there are restraints in returning to the starting position.
(Double detection is not used for general belt-stop type devices, and the belt stops after the set delay time during metal detection. When restarting, the conveyor button should be pressed manually.)

Delay Time

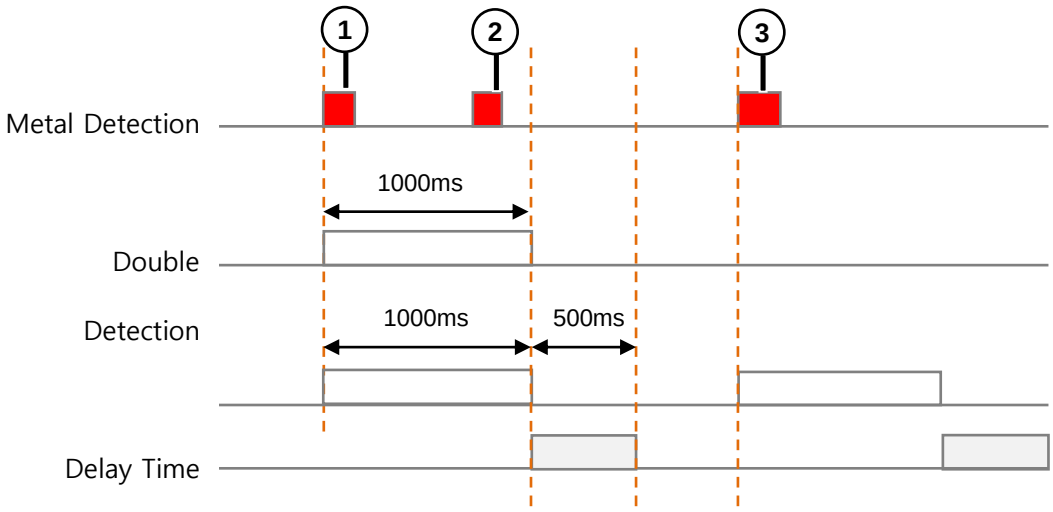
This is the time setting which determines when the next detection and belt stopping function should be conducted after the detection of the metal. The shorter the delay time, the nearer the belt stops to the head for belt type devices, and for screener type devices, the time for the screener to start operating becomes shorter.

Operation Time

This is the time setting which determines when the screener should be operational after the delay time. (Generally for belt-stop type devices, the operation time is not used, and the conveyor belt stops when metal is detected. When restarting, the conveyor button should be pressed manually.)

6.5.1 SCREENING TIMING BY DELAY/OPERATION TIME (FOR SCREENER TYPE MODELS)

ex) delay time=1000ms, operation time=500ms
Double detection = 1000ms



In the above picture, in the point where the metal ① is detected, if the metal ② passes during the double detection time 1000ms, the metal is not detected. Within the double detection time, the two would be detected as one.

The delay time is set as 1000ms (1second), so after 1 second from detecting the metal ①, the warning light, belt stop function, and screener operation starts to run. At this point, screener type models operate for as long as their operation time 500ms.

7 ADDITIONAL FUNCTION

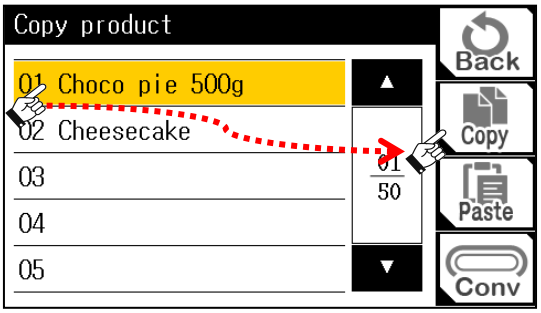
This explains how to use each functions.

7.1 PRODUCT DUPLICATION

(Menu →Copy product)

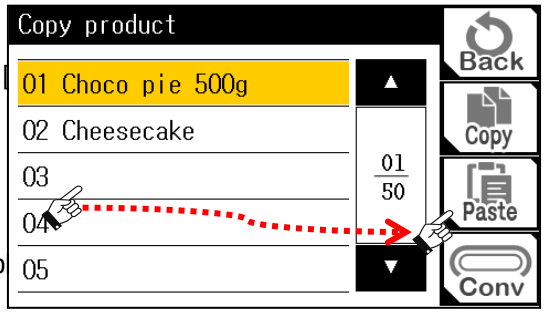
The setting values of the original product can be duplicated.
This function is used when the newly added product has the same setting values as the original product with a different name and requires changing only partial settings.

1) After selecting a product number from the product list, press [**Copy**].



The detection quantity is not duplicated.

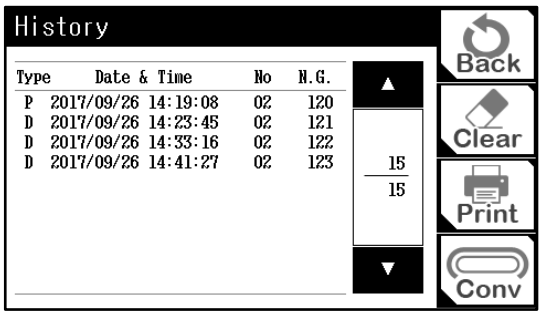
2) Select the product number to be duplicated, and press [



3) The product list is updated after the duplication is comp

7.2 DETECTION HISTORY

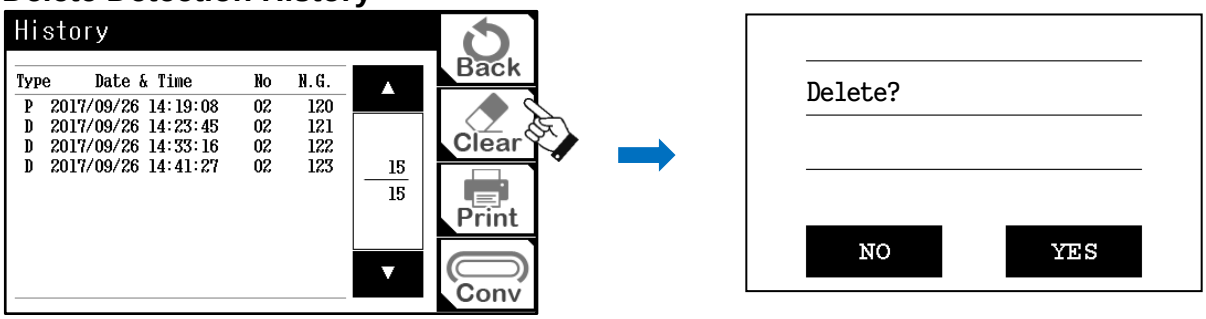
(Menu →History)
This displays the metal detection saved history. It saves up to 1000.



Only if the history save setting is clicked, is the detection history saved. (Refer to 8.4 option)

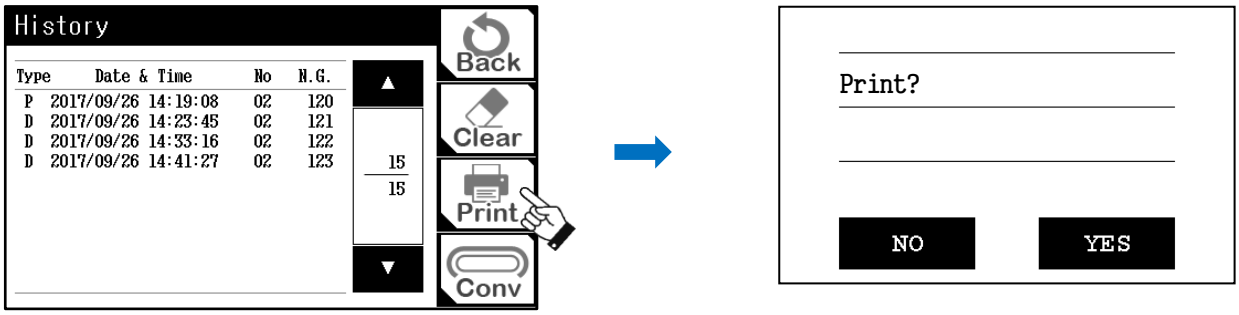
Items	Details
Type	P(power) - if the metal detection is turned on, the history is saved. D(detect) - the history is saved when metal is detected.
Date & Time	This displays the power on and the time the detection history is saved.
No	This displays the selected product number.
N.G	This displays the accumulated detection quantity.

Delete Detection History



By pressing the [Delete] button, a pop-up window appears asking whether to delete it. Press [Yes] to delete all existing detection history. The detection quantity of all the products also initializes.

Print-out (For printer installed model only)



By pressing the [Print] button,the installed printerprints out the content of the detection history.

Type	Date& Time	No	N.G.
P	17-12-01 09:12:30	1	20
D	17-12-01 13:12:30	1	21
D	17-12-01 14:18:33	1	22
D	17-12-01 14:46:10	1	23

1) Type

P: Power ON

D: Metal Detected

2) Date & Time: Detected Time

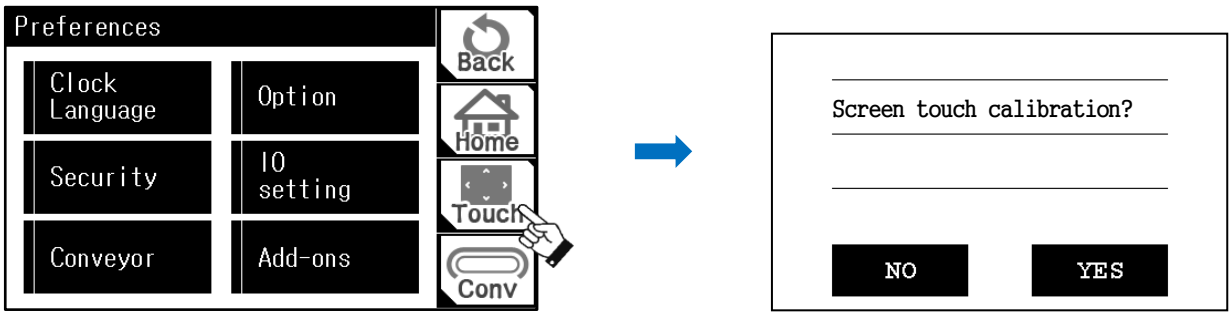
3) No: Product Number

4) N.G: Accumulated Detection Quantity

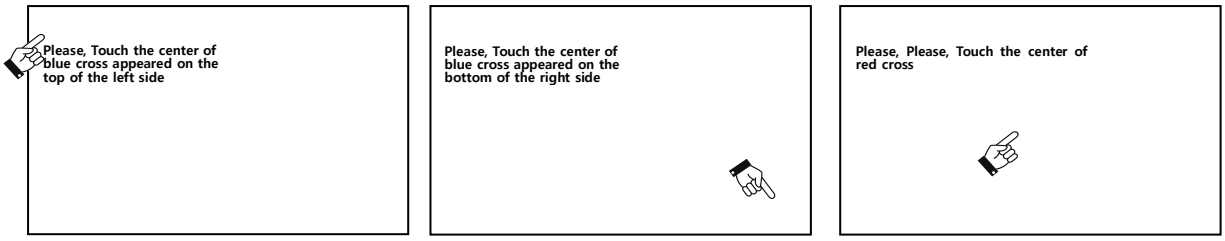
7.3 ADJUSTING TOUCH

This resets the touch coordinates of the LCD screen.

(Menu →Preferences)



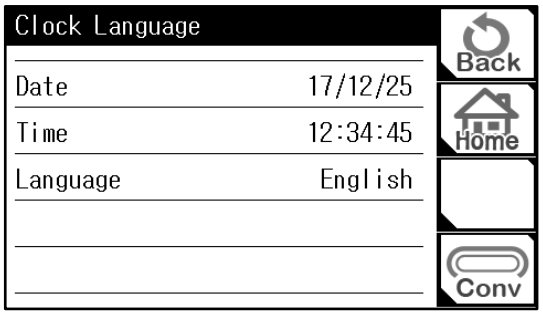
1) Press the [Adjust Screen] button.
2) Press [Yes] when the pop-up window on the right-hand side appears.
3) Follow the instruction on the screenand press the **+** shape using a sharp-tipped tool (ballpoint pen).
4) The order is the top left, the bottom right, and the middle.
5) When it is done, save the adjust value and return to the main screen.



If the touch adjustment is not completed properly, the device may not operate normally.
The product is shipped after full adjustment, so do not adjust other than in special cases.

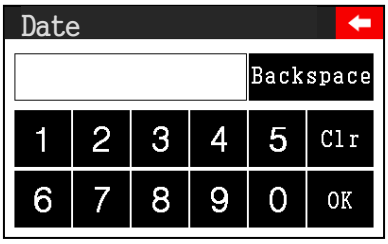
7.4 CLOCK, LANGUAGE

(Menu →Preferences→ Clock, Language)



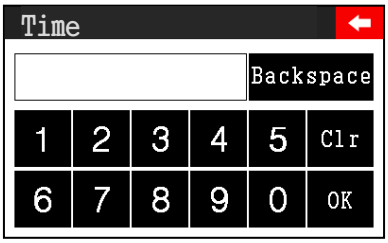
Date

1) Press the date to display the number input window.
2) Input the date in YYMMDD format, and press [OK] to complete the setting.
   ex) January 15th, 2018 is set as 180115



Time

1) Press the time to display the number input window.
2) Input the time in HHMMDD (24hours) format, and press [OK] to complete the setting.
   ex) 2:30:49 PM is set as 143049.

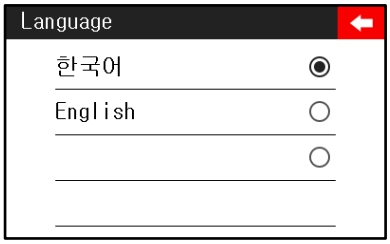


⚠ Caution

When changing the system date/time, delete the detection history.
The system date and time is used as a standard for detection history data management, so altering this would lead to detection history data errors,

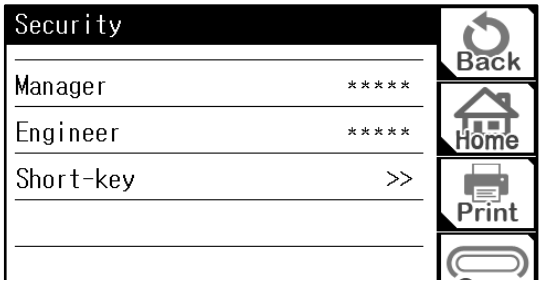
Language

1) Press the language to display single selection window.
2) Select the desired languageand return to the previous menu. From this point, the selected language is displayed.
3) Supported languages are Korean and English.



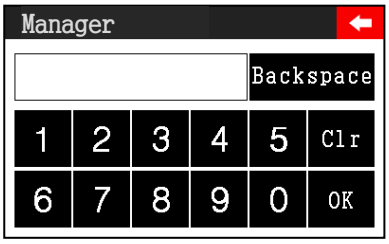
7.5 SECURITY

(Menu, →Preferences→ security)



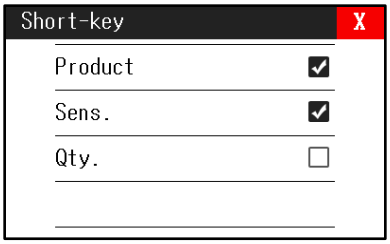
Manager / Engineer Password Change

1) Select the new password. (Manager or Engineer)
2) Enter a 5-character password and press [OK] to complete the setting. The new password is applied from the next menu.

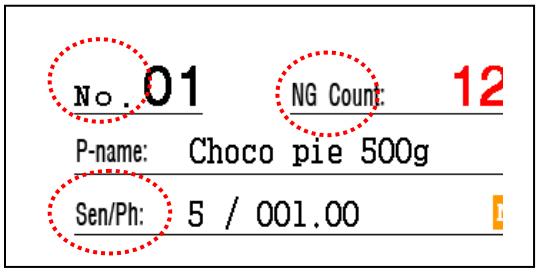


Shortcut Keys

1) Press the [Shortcut Key] to display the multi selection window.
2) Select/cancel the desired items.
3) Clicking X returns to the previous menu.



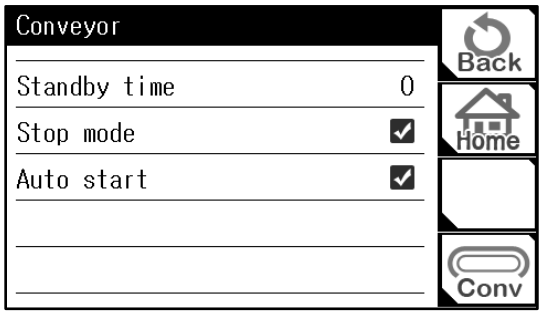
Items	Details
Product	In the main screen **No.** Press the area to use a shortcut to the product list menu.
Sensitivity	Press the **Sensitivity/Attribute** area in the main screen to use a shortcut to the product setting menu.
Quantity	Press the **Detection Quantity** area to delete faulty quantity. Use this function when initializing the detection quantity.



<Part of Main Screen>

7.6 CONVEYOR

(Menu →Preferences→ Conveyor)



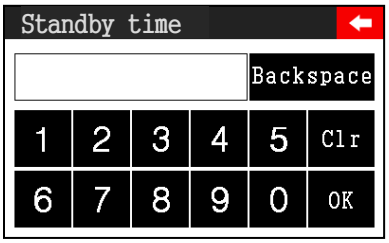
Caution

The following items are shipped by the manufacturer after completing the setting, so do not make alterations without specific reasons. If alteration is required, please contact a designated repair technician or the customer service of the manufacturer.

Standby Time

The detection signal is ignored for the set time during the conveyor's operation. This is used to ignore metal detection for certain amount of time when high-weight and high-vibration products have started to be transferred. (Adjustment range :0 - 30 sec)

1) Press the [Stabilization Time] button to display the number input window.
2) After entering the time, press [OK] to complete the setting.



Stop Mode

Press the line to select/cancel.
This function stops the conveyor when metal is detected.

Auto Start

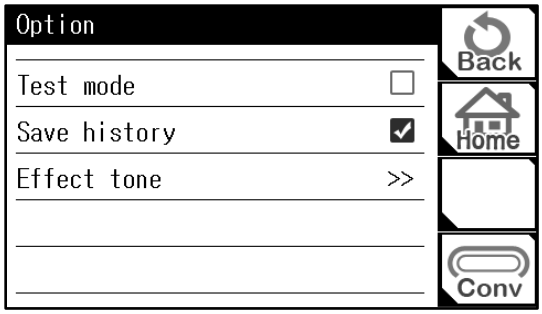
Press the line to select/cancel.
This function automatically starts the conveyor when internal stabilization is complete after the device power is turned on.

Caution

If Auto Start Mode is selected, the conveyor starts automatically. Be careful not to get hands stuck in the device.
Do not change this setting without the administrator's approval.

7.7 OPTION

(Menu →Preferences→ Option)



Caution

Selective operations (belt stop, screener operation) are not conducted during text mode. Do not change this setting without the administrator's approval.

Test mode

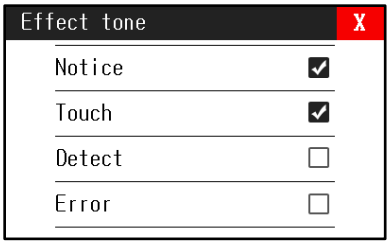
1) Press the line to select/cancel.
2) If this function is selected, it proceeds to the text mode.

Save history

1) Press the line to select/cancel.
2) If this function is select, it activates the detection history save function.

Effect tone

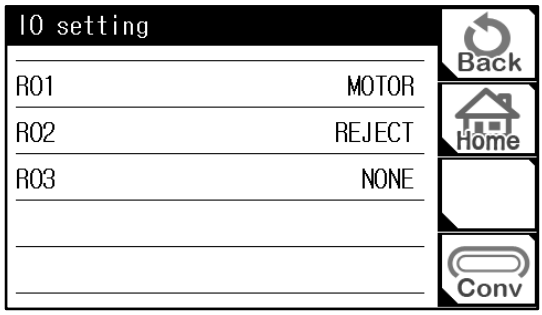
1) Press the [Effect tone] button to display the multi selection window.
2) Select/cancel the desired items.
3) Clicking X returns to the previous menu.



Items	Details
Notice	If the item is checked,the power turns on and the alarm sounds when operation is complete.
Touch	If the item is checked, a sound goes off when touching the LCD screen button.
Detect	If the item is checked, a sound goes off when metal is detected.
Error	If the item is checked,a sound goes off when errors occur.

7.8 IO SETTINGS

(Menu →Preferences→ IO Settings)

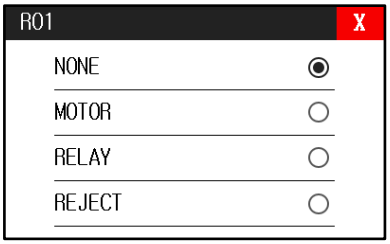


This sets the signal type to be transferred through output port (RO1 - 3).

Items	Details
R01	This is the output setting port for the conveyor. (MOTOR, Factory shipment value applied)
R02	This is the output setting port for the warning light. (REJECT, Factory shipment value applied)
R03	This is a reserve port.

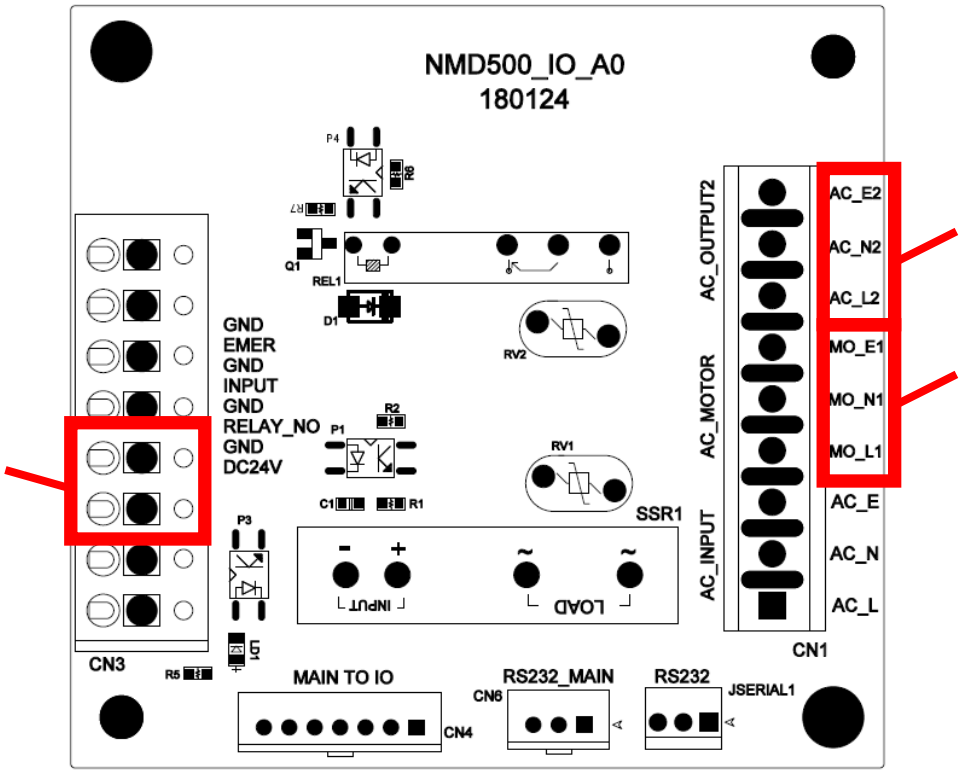
Select Output Signal

1) Press the line to display the single selection window.
2) Clicking X returns to the previous menu.
3) There are 3 output signal types: MOTOR, RELAY, and REJECT.



Items	Details
MOTOR	This is used to control the operation of the conveyor. Pressing the conveyor button transfers the output and stops the metal detection.
RELAY	This is a contact format signal during detection.
REJECT	The output is transferred during the operation time of the detection.

Reference) IO Board Output Port inside the Power Box



① Motor Power Output

Conveyor types are connected to the 220v motor power.

② Warning Light Power Output

This is an output terminal for 220v warning light.

③ Reserve Terminal

This is a reserve terminal for contact signal output.

8 MAINTENANCE & REPAIR

8.1 DAILY INSPECTION

8.1.1 DAILY INSPECTION ITEMS

Inspect the following items before starting operation.

- Check if there are any contacts with the front and back conveyors.
- Check for foreign substances inside the belt.
- Check for noise in the motor and power box.
- Check for specimen detection status.
- Check for rejector operation condition.(Only for rejector installed devices)

8.1.2 WEEKLY/MONTHLY INSPECTION ITEMS

- Detach the transport belt to check for one-sided wear or partial damages.
- Check if there are abnormal sounds generated during conveyor operation.

8.1.3 CLEANSING

Conveyor

- Use a soft piece of cloth soaked in water or neutral detergent to wipe the contaminated surface.
- Using a metal brush may lead to damages in the metal's surface which may cause rust.

Transport Belt

- Transport belt should be washed after detaching it from the conveyor.
- Remove the contaminated water with neutral detergent.
- Dry the surface for a sufficient time after cleansing.

Head

- Use a soft piece of cloth soaked in water or neutral detergent to wipe the contaminated surface.
- Softly wipe the frontal panel with a dry piece of cloth.
- Using a metal brush may lead to damages in the metal's surface which may cause rust.

Warning

Turn the power off at all times before cleansing.
If the head receives shock during cleansing, the device may be damaged and can seriously affect the detection performance.

8.2 PARTS DETACH/ATTACH

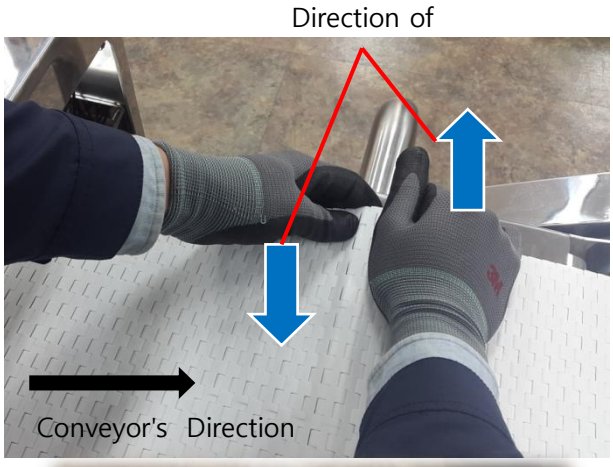
8.2.1 REPLACE TRANSPORT BELT (PLASTIC BELT)

Warning

Turn the power off before operating.

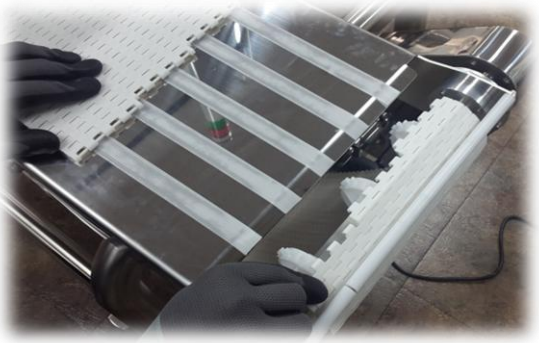
Detach Transport Belt

1) Hold the plastic belt with both handsand pull it toward the opposite directions.



2) When the belt widens, slowly detach it without breaking it.

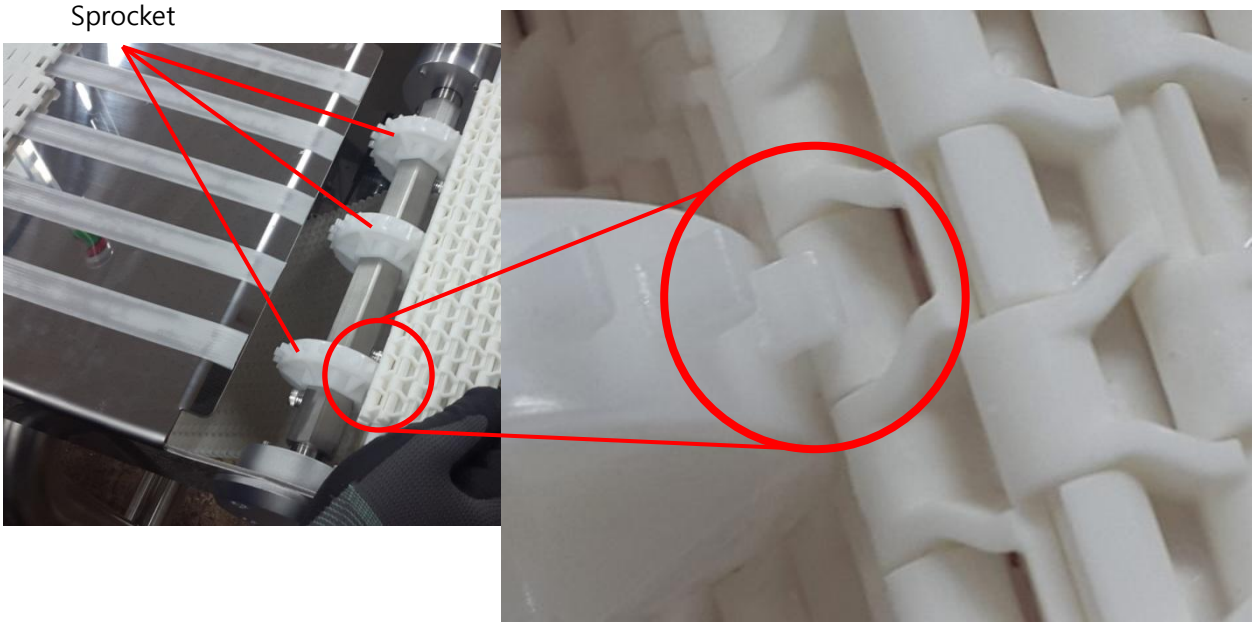
3) After detaching it, remove it without the belt touching the floor.



Assemble Transport Belt

Assemble the belt in the reverse order of detaching.
Make sure to match the sprocket with the groove in the back of the belt.
If the belt operates after being incorrectly assembled, it may lead to damages of the roller or drive shaft.

Sprocket



8.3 CAUSE OF MALFUNCTION AND SOLUTION

If malfunction in the device occurs, check settings using the manual contained with the device.
If the solution stated in the manual does not solve the issue, contact the place of purchase or the manufacturer.

8.3.1 CAUSE AND SOLUTION

1) The screen does not display anything.

Cause	The power is not turned on. The LCD panel of the display board is broken
Solution	Check if the power switch is turned on. Replace the LCD module.

2) The conveyor does not work.

Cause	The voltage is unstable. The output port setting is not properly set. The speed control box power is not turned on.
Solution	Check if the rated voltage is being transferred. Reset the output port. (Refer to 7.8 IO settings) Configure the speed control box switch to RUN.

3) The metal is not detected.

Cause	The sensitivity/level setting is not properly set. The specimen is smaller than the detectable size.
Solution	Readjust the sensitivity and level using the detection wave. Recheck the detection status using the provided specimen.

4) The selective operations after the metal detection are not conducted.

Cause	The output port setting is not properly set. It is in test mode.
Solution	Reset the output port. Cancel the test mode.

5) Metal is detected when the conveyor is operated even if there is nothing in the tunnel.

Cause	A foreign substance is attached to the conveyor belt. The conveyor is in contact with the front and back conveyors.
Solution	Cleanse the conveyor belt and remove the foreign substance. Maintain sufficient space with the front and back conveyors.

6) Metal is detected even when passing a metal-free product.

Cause	The product setting value is not properly set.
Solution	Check if the preside attribute and sensitivity is set. The setting should accurately reflect the product's attributes and sensitivity by using the auto and manual settings for the device to not detect it as a metal substance.

7) Metal is detected even if there are no products inspected.

Cause	The external environment has changed.
Solution	Check for changes in environment compared to the time of installation. Especially, remove any electromagnetic wave sources such as inverters, high-power motors, or high voltage cables, abrupt temperature changes, or large-scale structural changes near the device.