



It's manufactured in Korea



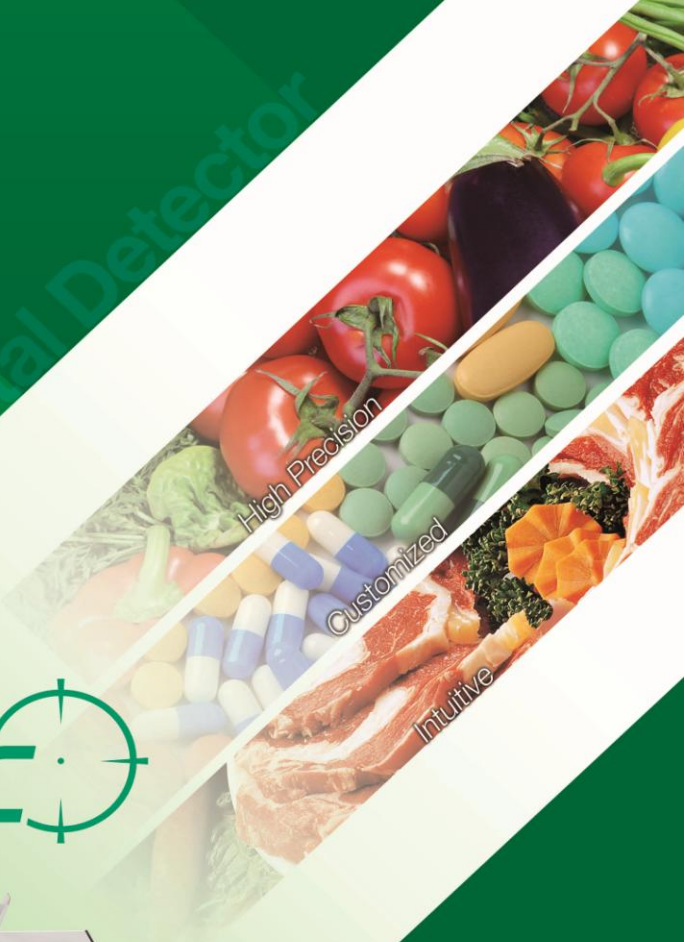
ISO 9001 : 2008



INNOBIZ
기술혁신영종소기업



Smart Metal Detector



High Precision

Customized

Intuitive

MEDIC[®]



NOW SYSTEMS Total Inspection Systems & solution
NOW SYSTEMS CO., LTD.
www.nowsystems.co.kr

The advantages are as follows

◆ Supports the automatic setting function

It is easy to use since setting sensitivity and phase to effectively remove the impact of the product for inspection can be made by auto setup process.

◆ Convenient wide touch screen operation

A variety of device operating information including help is displayed on the 7-inch screen, so even a beginner has easy access to operate the equipment.

◆ With excellent durability, it can be used for a long time

With a durable structure without deformation under vibration, shock & heat shock, it maintains stable detection performance for the prolonged use.

◆ Support a wide variety of additional functions

Various features such as self-diagnosis, detection history storing, using optional printer, ethernet connection, USB Disk accessibility, various rejecting systems, others and etc.,

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It is the precautions to prevent accident or risk by using a product safely and properly.



Warning

In case any violation of instruction might result in serious injury or death

- Please make sure to plug the power cord to an outlet with waterproof.
 - There is a risk of fire and injury caused by an electric short circuit.
- Please do not disassemble the machine discretionally while power is on.
 - There is a risk of injury by electric shock and fire by electrical short circuit.
- Please do not clean the machine with flammable substance.
 - There is a risk of injury due to fire
- Please do not damage the power cord, and when the outlet is loose, please stop using the machine.
 - If the electrical connection is unstable, there is a risk of heat and ignition.



Cautions

In case any violation of instructions might result in minor injury or failure of the machine

- Please do not press the touch screen with sharp tools or nails.
 - Any failure of waterproof is might result in malfunction of the machine.
- Please prevent any excessive changes in temperature.
 - Sudden changes in temperature might result in a fatal failure of the machine.
- Please install the machine by avoiding a heating element and direct sunlight.
 - Excessive temperature change inside the machine might result in a fatal failure of the machine.
- Please avoid installation in a place with strong vibrations
 - It may cause a malfunction.
- Please avoid installation around the high-frequency generator
 - Electrical conduction and radiating noise might result in malfunction of the machine.
- Please be sure to connect the ground wire.
 - It may result in electric shock due to electric leakage.

■ Any person other than designated technicians and the personnel authorized by NOWSYSTEMS is not allowed to disassemble or repair / modify the product.

(There is a risk of fatal injury and if after sales service is required, repairs will be made at cost even within the warranty period.)

A metal detector is an inspection equipment to detect metal contaminants such as ferrous, stainless steel and etc. non-normally incorporated in the products.

The metal detector is applied to the following areas:

Food Processing

To screen the presence of metal contaminants that a human or an animal should not consume mainly in food.



Instant foods



Pharmaceuticals



Meat products



Agricultural and fishery products



Confectionery and Bakery sector



Feedstuff

Clothing / Shoes / Sewing sector

To screen mainly a piece of metal that causes the trauma of the human body.



Clothing



Stuffed toys



Shoes

Industrial Area

To screen metallic impurities in the raw materials and finished goods for protection of production machinery



Rubber

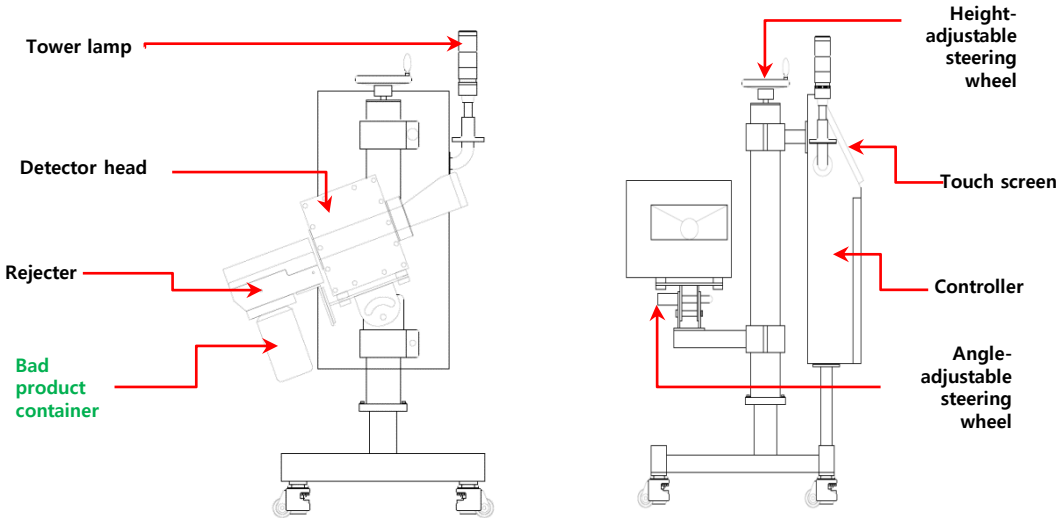


Chemical



Recycling products

Structure and name of each parts for pharmaceutical type



Category	Description	Category	Description
Detector head	Consists of inner coil and circuit, etc that processes electronic signal	Height-adjustable steering wheel	The handle to adjust the height of the top and bottom of the head
Touch screen	Displays manipulation of the menu and detection status in the metal detector through the 7-inch touch screen.	Controller	Metal detection circuitry, power supply, input and output on-board housing
Tower lamp	Displays the state of metal detector by lighting of the lamp is lit. Green / Red	Angle-adjustable steering wheel	The handle to adjust the angle of the head
Rejecter	Good/Bad product switch solenoid driving unit	Bad product container	The bad products fall to the container when a metal is detected

1. Installation of the metal detector

Metal detector malfunctions by being sensitive to impact, external electromagnetic wave and magnetic field. Thus, only if a metal detector is installed in the following ways, the performance of a device can be achieved to the maximum.

- 1) All the bolts that fix a metal detector to the frame must be insulated with a plastic cup washer.
- 2) The wires or metallic attachments around the metal detector should be kept away from the metal detector.
- 3) In particular, signal lines for inverter should be isolated by a separate pipe duct.

2. Place of Installation

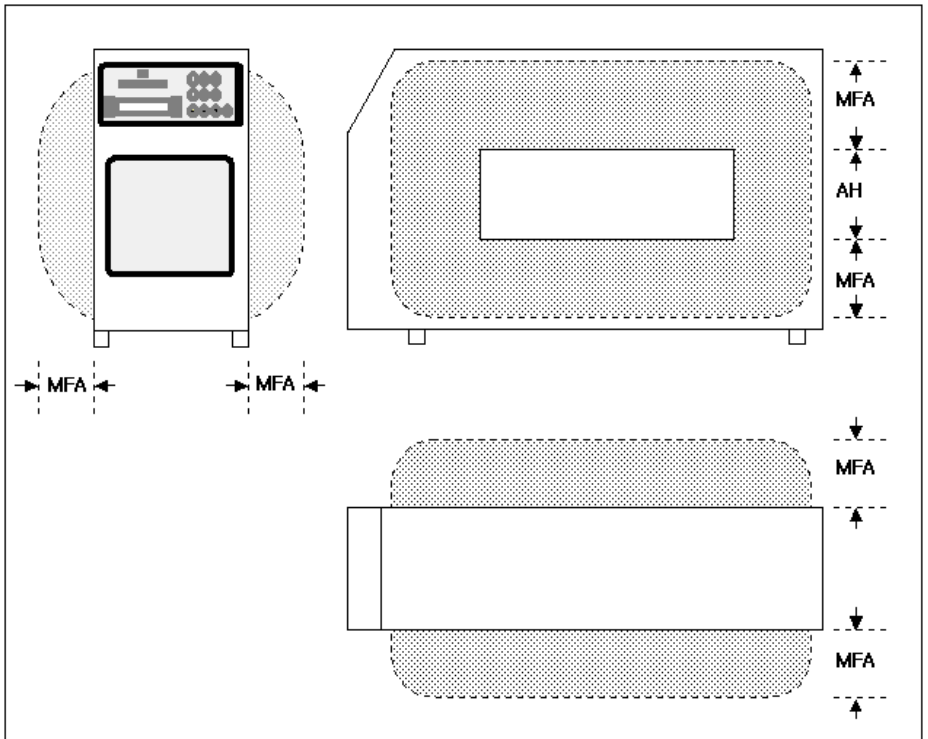
- 1) Do not place large metal objects around this product.
- 2) Connect the power to where voltage fluctuation is low.
(Power ground should be used)
- 3) Avoid equipment with excessive external vibration and vibration.
- 4) Avoid equipment that generates strong electrostatic.
- 5) Install it far away from the motor or servo motor..
- 6) Do not place it near devices that use powerful electricity.
- 7) Install it in a place with a constant ambient temperature and no humidity.
- 8) Install it away from the devices that leak electromagnetic wave and magnetic field excessively.
- 9) In particular, install it away from where the inverter motor is used.

4. KEEP METAL FREE AREA (MFA)

[What is Metal Free Area?]

If a metal exists in the vicinity of the tunnel where the electromagnetic field is formed due to the electromagnetic nature of the metal detector to measure the change of the microscopic state of the electromagnetic field, the metal detection reactions appear.

In order to prevent malfunction of the metal detector, a metal should not be positioned in the vicinity of the tunnel area of the metal detector, which is called Metal Free Area.



MFA : Metal Free Area, AH : Aperture Height

High Frequency 400 KHz

: MFA = AH x 1.8

*** Do not place any metal objects in M.F.A.

Precautions for Installation

Considerations during the initial
installation

- Avoid installing it around the inverter for motor control.
 - The radiation noise generated during the operation of the inverter will result in the malfunction of the metal detector. If unavoidable, separate the output line of an inverter by a metal duct and ground the duct.
- Avoid installing where severe vibration is expected.
 - Severe vibration and shock can cause the destruction of the magnetic insulation or malfunction.
- Do not connect the power supply in severe voltage fluctuating.
 - Severe voltage fluctuations can cause the noise of the input power.
 - If unavoidable, install a noise filter.
- Avoid where sudden temperature changes are expected or other places with direct sunlight.
 - The rapid changes in temperature do a devastating effect on the molding inside the metal detector.
- No wires or metallic attachments should be placed around the metal detector head.
 - A certain range of MFA exists around the metal detector head. Any metal structures and metal attachments in the MFA can be the cause of the malfunction.

Precautions for Management

Precautions after installation

- Protects against strong acid or salt.
 - Strong acid or salt affects the durability of enclosures.
- During the operation of LCD screen, do not use sharp tools (nail, knife).
 - The protective film is damaged to affect the performance of the waterproof.
- Do not pull the power cord excessively.
 - Internal connection may be cut.

It is the main screen where Detection, Screening & etc. are executed.

- ▶ Please press the power switch on the side of the display box.



Menu Area



1. "Menu" button

You can go to sub menus that can change the values necessary for the operation of the metal detector, including product setting, screening, detection history, preferences and etc., You need to input the password to enter the menu, and some functions are limited to functions depending on the security level of the password.

2. "History" button

You can view various kinds of detecting history.

3. "About" button

You can check the device number, version information, frequency setting and etc.,

4. "Return" button

You can stop the operation of warning lamp and buzzer when metal is detected. But, the operation of warning lamp and buzzer may automatically stop after a certain period of time even without need to press return button depending on set parameters of the metal detector.















5. "Hold Display" button

When you push "Hold Display" button, you can lock screen in all functions.

Status Display Area



ICONS

ICONS	IMAGES
Balance Fault	 
Output Fault	 
Sensor	 
Conveyor	 
LAN	 
Test Mode	 
Frequency	
Help	

1. Product Number

It means the number of product in production. You can directly access the menu to change the product by touching the area of product number.

2. (BF) "Balance Fault" Icon

It shows the status of the balance inside the tunnel. If it is in error, its icon becomes red. If this error persists, please put in for a A/S.

3. (OF) "Output Fault" Icon

It shows the status of the output of the signal for the detection. If it is in error, its icon becomes red. If this error persists, please put in for a A/S.

4. "Sensor" Icon

This icon is activated when the product in production is detected through the sensor. And, if the product is detected by sensor, the Quantity for production will increase.

(If you choose "Bulk" in Product/Set Parameter, production quantity will not be digitized.)

5. "Conveyor" Icon

This icon is not working on the pharmaceutical type.

6. "LAN Connection" Icon

When the machine is connected to management program through the network, its icon is activated.

7. "Test Mode" Icon

Under the test mode, even if the metal is detected, rejecting operation such as other types of rejecters will not work. Switching between normal and test mode will be made if you touch and hold the test mode icon for more than a second.

(Unless otherwise you have a specific reason, please do not set it to the test mode because rejecting operation will not be made even if the metal is detected.)

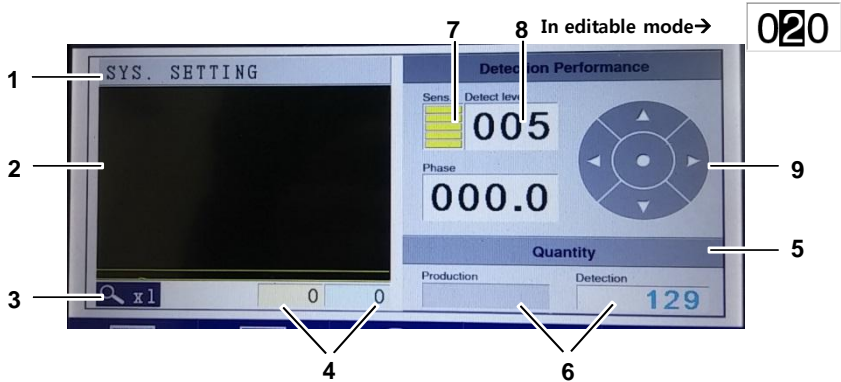
8. "Frequency" Icon

It shows mode and frequency of detecting signal for the current product in production.

9. "Help" Icon

If you touch this icon, you can view Help message in the current screen.

Main Area

**1. Product Name**

It shows the name of the product in production.

2. Waveform Graph Screen

You can see detection signal in waveform graph on this screen.

3. Magnify Icon

You can adjust magnification of the detection signal in waveform graph screen at the rate of (x1, x2, x4).

4. Display the peak values of the detection signal in integer value

Simultaneously, it shows the peak values of the detection signal on H (High) channels in integer value.

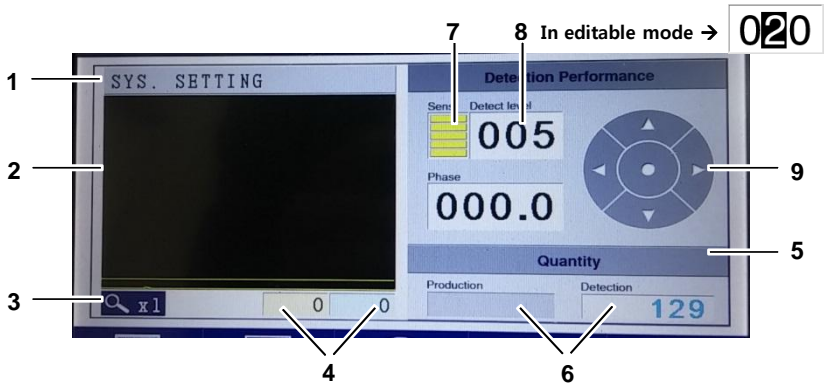
5. Quantity Deletion Icon

If you touch this icon, you can turn the quantity of production and detection each to 0.

(Even if you clear both the quantities to 0, detection history will not be initialized.)

6. Display Quantity of Production & Detection

It shows quantity of products that are checked through the sensor and number of detection.

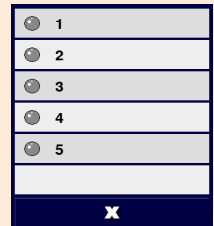


7. Sensitivity Display / How to set

It shows the level of sensitivity set to the current product as a bar graph. Its setting ranges from 1 (minimum) to 5 (maximum).

[How to set sensitivity]

- 1) Please touch the area of sensitivity to change on the pop-up screen.
- 2) Then, it will return to the main screen after saving its change.
If you want to close the window without changing it, please touch X under the pop-up screen.



8. Detection Level Display / How to set

It shows detection level set to the current product. If the measured detecting value exceeds the detection level, the metal detection is made.

If you want to modify the detection level of the corresponding channel, please touch the area on which the value is displayed. Its setting ranges from 0 (most sensitive) to 100 (most insensitive). If you touch it, the corresponding area will be switched to the editable mode.

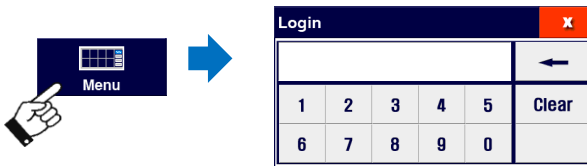
9. Sensitivity Adjustment Icon.

- 1) Left / Right Icon: You can move the number of digits in the channel to change.
- 2) Up / Down Icon: You can increase or decrease the value of the corresponding digits by 1.
- 3) Central (Deactivation) Icon: You can deactivate the editable mode of the channel that is currently selected. (If you touch the activated area again, it will be the same.)

Log-in

You need to go through log-in process to input password in order to change the setting state of the metal detector. There are both administrator and engineer authority depending on the password to enter. Unlike the log-in of engineer authority, there are restrictions on some of the settings to change in the log-in of administrator authority.

► Please touch "Menu" icon on the main screen.



1) Please enter the 5-digit password.

- **Administrator Authority**

: The password is "20000".

Some of the sub-menus can only be modified with the engineer authority.

- **Engineer Authority**

: The password is "30119".

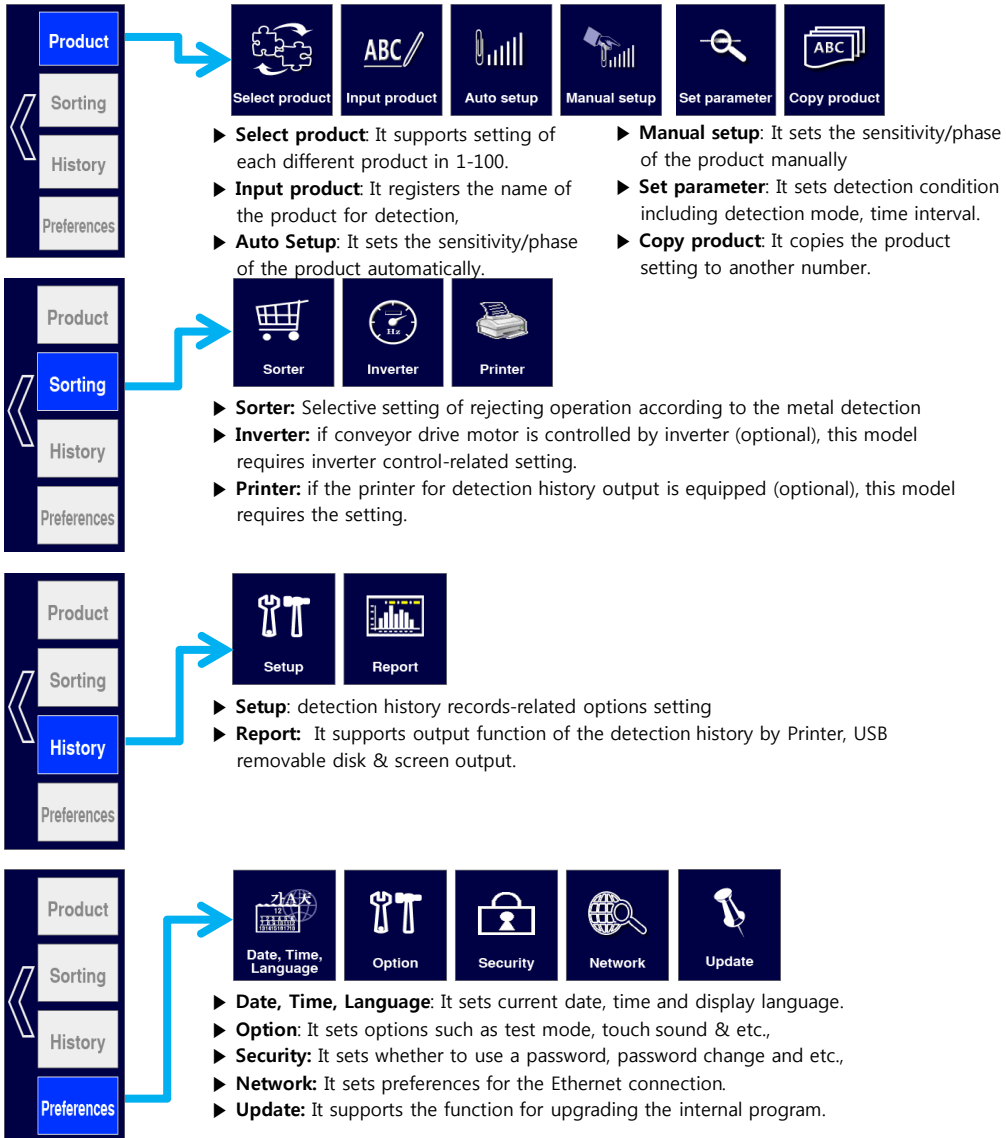
◆ Tip ...

◆ If you forget the password, please contact the manufacturer for how to log in.

Menu Structure

There are various kinds of menus including detection performance-related setting, rejecting function setting, detection history management, preferences and etc.,

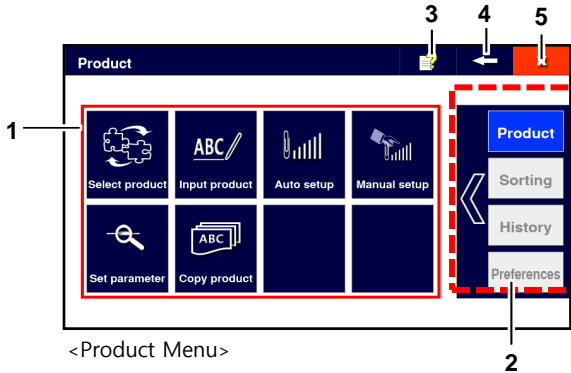
The entire menu structure is as follows:



Configuration of Menu Screen

: There are main menus of "Product", "Sorting", "History" & "Preferences".
Configuration of each menu by screen area is as follows.

► After logging-in, you can choose various main and sub menus on the screen.



<Sorting Menu>



<History Menu>



<Preferences Menu>

1. Sub-Menu Icon

There are various sub-menus on each main menu.

2. Move to Main-Menu

You can move to various main-menus like Product, Sorting, History, Preferences & etc.,

3. Help Icon

If you touch this icon, you will see help message on the screen.

4. Previous Menu Icon

If you touch this icon, you can go back to the previous menu but work in progress for some menu or input screen will not be saved.

5. Exit

If you touch this icon, you will move to the main screen and work in progress for some menu or input screen will not be saved.

It is the process on how to set up operational status of a metal detector for an inspecting product. In general, you can set up each product as the following order.

Order of Set-up metal detector for each product



You can set up registration number of the product to be selected. You can set up from 1 to 100. If you select the number where product setting data are already stored, the previous data will be erased.



You can register the name of the product. If you do not need to enter the name of the product, you can skip this process.



Detecting mode, phase and sensitivity of the product are set up automatically.

If you already know the values of phase and sensitivity in advance, you may skip this step and input the corresponding values in manual setup directly.

(This auto setup may not be available in some cases according to the specifications of the installation.)



Detecting mode, phase and sensitivity of the product are set up manually. If you already get enough detection sensitivity with the value set by auto setup, you may skip this process.

In general, you can use this manual set up for fine-tuning both phase and sensitivity of the product after auto setup.



You can set various values associated with passing method, detection speed and & detect interval and etc.,



You can set how rejecting action is made after metal is detected.

Product Change

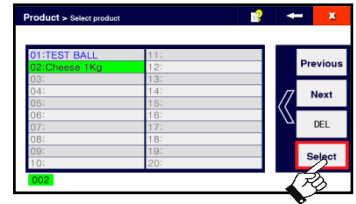


1) After selecting the product number in the product list, please touch the icon to change. After applying the selected product, please return to the previous screen.

2) When you register a new product, please touch the number at free. If you touch the number which has already been registered, the previous information will be changed to the value as set newly.

3) You can use this function when you are to change the product to test as a product that is already registered.

4) When you need to erase already registered product, you can do so by touching "DEL" icon after selecting the item number that you want to delete.



How to use shortcuts

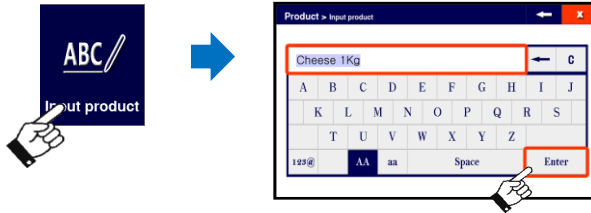


► If you touch **Main screen > Product number**, you can go directly to the screen of Product Change.

◆ Tip ...

- ◆ If you touch the product number on the main screen, you can go to the screen for Product Change
- ◆ If you touch the same number as the currently chosen product, it will be ignored.

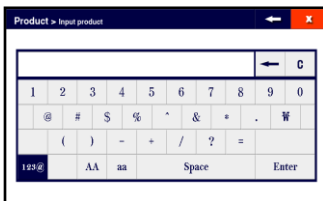
Input product : It is the function to register the name of a product.



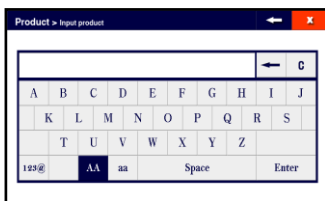
▶ Please touch the icon of **Product> Input product**.

Please input the name of a product, and then touch 'Enter'.
The product name entered is saved and returns to the previous screen.

You can change the keyboard for the input of English uppercase letter/lowercase letter/numbers and special characters.



<Keyboard for numbers and special characters>



<English uppercase letter keyboard>

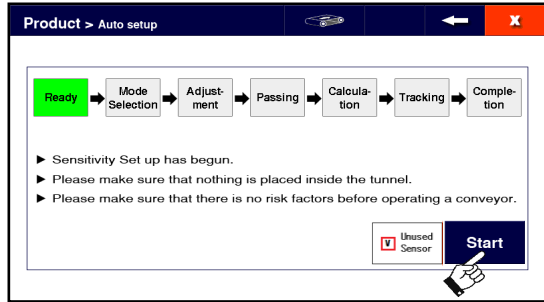


<English lowercase letter keyboard>

◆ Tip ...

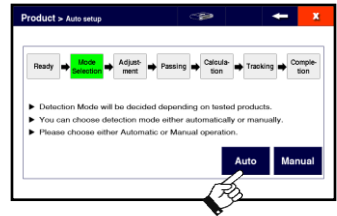
- ◆ Up to 10 letters of English/numbers and 10 letters of special characters can be set.

Auto setup : Test frequency, phase and sensitivity of the product can be set automatically.



▶ Please touch the icon of **Product > Auto setup**.

- 1) Please touch "Start" to start Auto setup.
The pharmaceutical type should check "unused sensor")



- 2) As a next step, please choose detecting mode by touching either **Auto** or **Manual**.
If you already know phase of the product in advance, you can use manual setup mode.

For the process of manual setup, Please refer to **manual setup of Mode Selection** at page 28.

- 3) Afterward, please follow the instructions on the screen. Depending on the properties of a product that passes, the passing numbers are progressed up to 3 to 12 times.

The higher properties (high salinity/water) of a product are , the more passing time will be required.

◆ Tip ...


- ◆ If you already know phase of the product in advance, you can use manual setup mode.
 - Please refer to **manual setup of Mode Selection at page 28**.
- ◆ You can make tracking Setup for the product of which properties change by time.
 - Please refer to **Tracking Setup at page 23**.
- ◆ After Auto setup is completed, you can switch to the screen of Input product.
 - please refer to **Input Product after completion of Auto setup**.

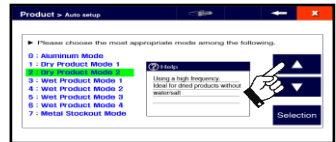
4) Auto setup of mode selection

Auto setup of detection can be used only for the following mode.

Detection mode	Test signal frequency	Properties of a product to test
Dry product 2	High level frequency	Products with no moisture and salinity

Manual setup of the detecting mode: You can proceed auto setup process swiftly by setting up detecting mode manually.

- 1) Please move to the desired mode by using of  (Up Down) icon.
- 2) If you touch the chosen mode, you can move to the next stage after saving the change.



The high sensitivity mode without water/salinity

Detection Mode	Help
Dry Product 2	A high-frequency signal to be used Suitable for a water and salt-free dry product

Tracking setup :

You can take advantage of tracking setup option in order to prevent any malfunction when you test products such as frozen food of which freezing status change so that its physical properties also change minutely.
(In the last step of the auto setup, it is displayed.)

If you touch the 'Select' button, you can go to the next step after setting the tracking mode. If you do not use this tracking mode, please touch the 'Continue' button.



Input name of the product after auto setup process

If you touch 'Input', you can go to the screen for 'Input Product'. If you have already input the product or want to do it later, please touch 'Close' button.



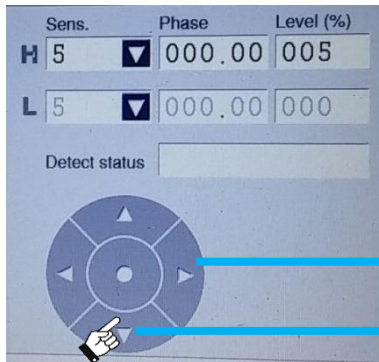
Manual setup: if you already know how to make fine-tuning, product phase and sensitivity after making auto setup, please proceed with this manual setup. Even in case of a particular product of which auto setup cannot be performed, please proceed with this manual setup.



Set up Phase

- 1) Please touch phase input window
- 2) If the cursor appears on the input window, please change the value using the arrow key.

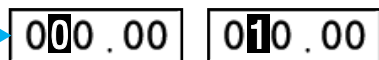
Please set up the value where the graph becomes the smallest by passing the product and observing the graph.



Right/ Left : Shift Change



Up/ Down button: Value Change



◆ Tip ...

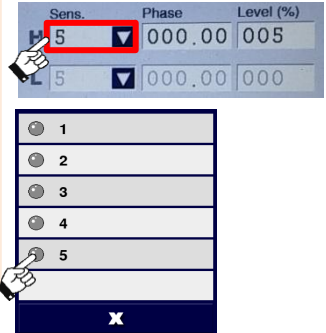
◆ Product Phase?

The value set to remove impact of the testing product. The more accurate this value, the smaller metal can be detected. You can set it as a value between 0 and 180.00. It is the best situation that there is no product impact so that no signal is detected on the graph even if the product is passed through.

Set up Sensitivity

If you choose the sensitivity to change, it will be returned to the manual setting screen after being saved. If you intend to close the window without saving it, please touch X. "1" is the minimum sensitivity and "5" is the maximum sensitivity.

Please make adjustments while reducing the sensitivity not to make the maximum value of the graph exceed 50% of the screen by passing the product through and observing the graphs of the detection.

**Detection Level**

Please adjust detection level appearing as a horizontal line on the graph. If the detected value exceeds the detection level, it can be determined as metal detection.

Yellow color uses setting area of 'H' as shown in the figure.

**◆ Tip ...****◆ What is the appropriate value set to detection level?**

Please set the detection level higher than the graph shown while passing testing products through.

If, due to the deviation between testing products, the height of the graph is not constant, please set it to be 2 to 3 times higher than the height of the graph, and if it is constant, please set it to be approximately 1.5 times higher. If you set the detection level close to the peak of the graph, the sensitivity gets higher, but if there is a deviation between products, the rate of malfunction will increase..

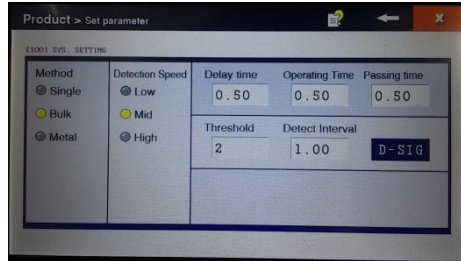
Setup Inspection-frequency

The pharmaceutical type supports only "D2" mode.

Frequency	Detection Mode	Help
D2	Dry Product 2	High-frequency signal to be used Suitable for a water and salt-free dry product

Settings of Detection Conditions and Sorting Time

: You can set each individual detecting conditions according to products



- ▶ Please touch the area of **Product>Detection Conditions**.

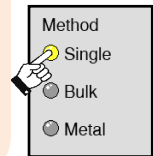
1) Please select **product passing method** to meet a product that you want to detect.

If there is space between products that are passing through, please select **Single**.

If there is no space between products that are passing through, please select **Bulk**.

And if you need to detect a product with no metallic parts such as deoxidizer, please select **Metal**.

If you choose **Bulk** as product passing method, you cannot count product quantity.

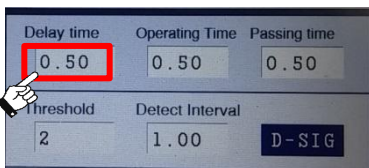
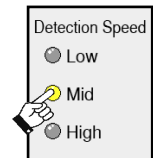


2) Please select **Detection Speed**

If a metal detector is a normal conveyor type, please choose **Low**.

If a metal detector is a pharmaceutical or fall type, please choose **Mid**.

And, If there is a special case requiring maximum detection speed, please select **High**. However, if you select High, the ambient noise removal software stops working internally so that the noise effects may be increased.

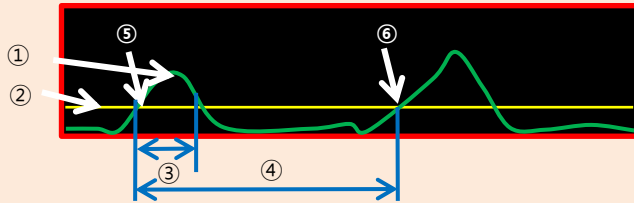


- 3) These are parameters required for sorting. You can set **Delay time/Operating time/Passing time, threshold/detect interval**, etc. additionally.

For the meaning of each parameter, see refer to the next page of this manual book.

4.) If you touch "D-SIG", a metal detector will be created a test detection signal for the reject test.

D-SIG



[Glossary]

If a metal detection graph was drawn in the form of the above graph,

- ① Metal Detection Value
- ② Detection Level-Setting Value
- ③ Detection Level-Exceeding Retention Time
- ④ Detect Interval
- ⑤ Detection Level-Exceeding Time Point 1
- ⑥ Detection Level-Exceeding Time Point 2

Each setting item has the following meanings:

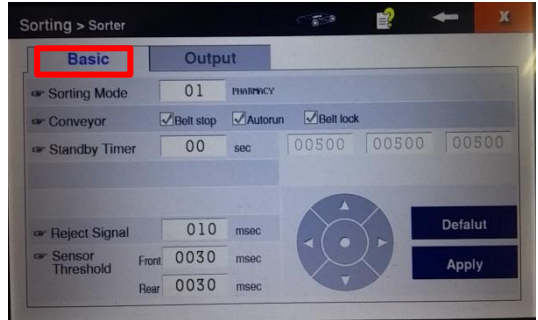
- ▶ **Delay time:** The time on whether to operate the rejecter after taking some time at the time of ⑤ when the detection signal ① exceeds the detection level (since the time of metal detection made).
(The setting of rejecter is made in sorting management menu/sorter setting).
- ▶ **Operating time:** The time set to run the rejecter for a certain time. For example, if the rejecter is set to the solenoid in the sorter setting, delay time is set to 1 second and operating time is set to 2 seconds, the metal detection will be made and after the delay for 1 second (delay time), the solenoid for rejecter will be running for only 2 seconds. (operating time).
- ▶ **Passing time:** The time set to be taken for the testing products to pass through the photo sensor installed at the entrance of the detection tunnel and completely out of the tunnel. This is only the value available when "Metal" (product passing method) was chosen. If product passing method is set to either Single or Bulk, this setting is not used.
- ▶ **Threshold:** It is the time set on if how much time exceeds at the time ⑤ when metal detection signal exceeds the detection level in the above figure, it should be admitted as a metal detection, and the unit is msec (1/1000 seconds). For example, if Threshold is set at 100 and detecting signal exceeds the detection level for 99msec, it is not recognized as a metal detection. This function is usually used in the environment with lots of pulse noise and it is set to a value of less than 20. **Unless otherwise you have a special reason, please keep it as basic value set at Ex-factory.**
- ▶ **Detect Interval:** It is time setting on how long next metal detection is set to ignore from the time of metal detecting. When a metal is detected in the position ⑤ of the above figure and then the signal exceeding the detection level is also input in the position ⑥, and if the time difference ⑤ and ⑥ is 1 second, and the value set to continuous detection is 2 seconds, the signal of ⑥ will not be accepted as a metal detection.

This function should be used only if operating time of the sorter is long or there are time constraints to recover its original position of the rejecter.

Basic Setting of the sorter : You can set the parameters required for sorting metal-detected products.



► Please touch the tab on **Sorting Mode>Sorter Setting > Basic Setting**



Sorting Mode

1) Please touch the input window and set the sorting mode. Basic sorting mode is 00, and in some cases, it may be delivered at the factory after being set to a different mode according to the specifications of the purchaser.
(The pharmaceutical type is 01.)
Normally, factory default value will be used.



Belt Stop

2) If you touch the area of the belt stop, you can switch between tick and not-tick. This function is not working on the pharmaceutical type.



Auto-Run

3) If you touch the area of auto-run, you can switch between tick and not-tick. This function is not working on the pharmaceutical type.



Belt lock

4) If you touch the area of the belt lock, you can switch between tick and not-tick. This function is not working on the pharmaceutical type.



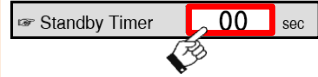
Standby Timer

5) When driving the conveyor, the machine will ignore metal detection signal for an amount of time set here.

Immediately after starting to transfer heavy-duty products, high vibration products, etc., you can use this function when trying to ignore metal detection operation for a period of time.

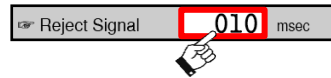
Normally, factory default value will be used.

This function is not working on the pharmaceutical type.

**Reject Signal**

6) You can adjust the length of the reject signal. The detection signal is output as long as the time set here from when the metal is detected. It is used when the signal of a certain length of time needs to be received from the device operating after receiving the signals of a metal detector such as PLC, Inverter and etc.,

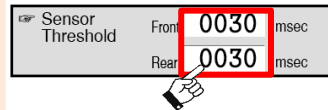
Normally, factory default value will be used.

**Sensor Threshold**

7) You can adjust the rate of sensitivity of photo sensor for the product detection. The general case to use these values by changing them is when you need to remove unstable recognition time of packaging materials by setting entry/transfer time to Front/Rear because the sensor recognition is not accurate at entry of photoelectric sensor due to transparency or translucency of the product's packing material.

Normally, factory default value will be used.

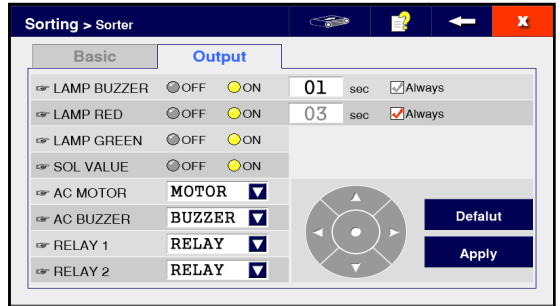
This function is not working on the pharmaceutical type.



Output port setting of sorter : You can set output parameters required for sorting metal-detected products.



▶ Please touch the area of **Sorting Management > Sorter Setting > Output Port Setting**.



LAMP BUZZER

1) You can set whether to use the buzzer of tower lamp and the operating time. The buzzer will ring as long as time is set. If you check 'ON', the buzzer continues to ring until you touch the 'Return' button on the main screen.



LAMP RED

2) You can set whether to use the red light of tower lamp and operating time. The lamp is lit as long as time is set. If you check 'ON', the lamp continues to be turned on until you touch the 'Return' button on the main screen.



LAMP GREEN

3) You can set whether to use the green light of tower lamp. If you check 'ON', the green lamp is lit when the power of a metal detector is turned on.



SOL VALUE

4) If you want to output the solenoid driving signal during the metal detection, please check 'ON'. The driving time will work on as long as working time is set in 'Setting of Detection Conditions'



OUTPUT PORT (AC MOTOR, AC BUZZER, RELAY 1,2)

5) You can synchronize each control signal and port. You can limit (OFF) the output signal of AC MOTOR, AC BUZZER, RELAY 1 and RELAY 2 port, or can synchronize with the signal of each SMPS, MOTOR, Buzzer, etc.

For example, if you synchronize RELAY1 with BUZZER,

RELAY1 will be ON while BUZZER sounds due to metal detection, and if BUZZER stops, RELAY1 will be OFF.

Taking advantage of this function, you can use it for the purpose of interlocking metal detector with other machines, or adding a separate sorter that a user will add.

☞ AC MOTOR	MOTOR	▼
☞ AC BUZZER	BUZZER	▼
☞ RELAY 1	RELAY	▼
☞ RELAY 2	RELAY	▼

◆ Tip ...

◆ **SMPS, MOTOR, BUZZER, RELAY to be interlocked?**

SMPS means the main power supply of a metal detector.

(You can select this when interlocking with the metal On/Off.)

MOTOR means conveyor drive motor.

(You can Select this when interlocking with the conveyor motor.)

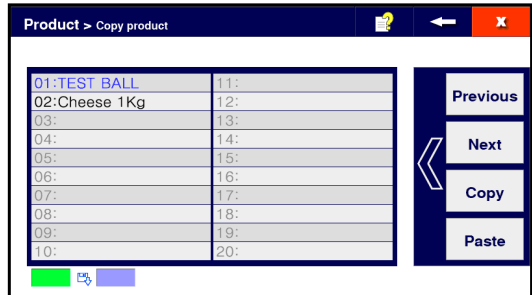
BUZZER means the buzzer built-in the tower lamp.

ETC means the solenoid. Select this when interlocking with the solenoid.

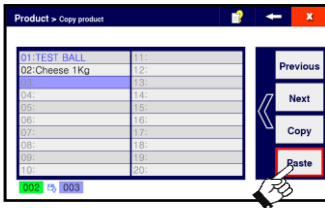
Copy product : You can copy and use the setting value of an existing product.



- ▶ Please touch **Product > Copy product**.

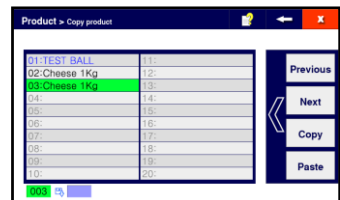


- 1) Please select the product number from the product list, and then touch **Copy**.



- 2) Please select the product number for copy from the product list, and then touch **Paste**.

- 3) When the copy is complete, the product name copied will be selected.



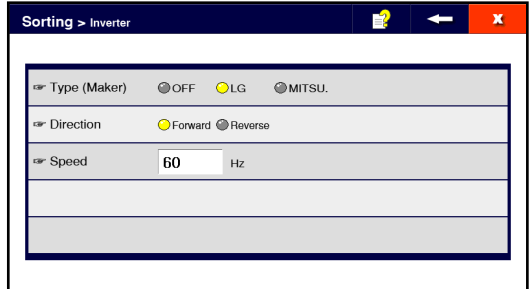
◆ Tip ...

- ◆ The information on quantity (production, detection) cannot be copied.
- ◆ When you set a product that has similar setting of sensitivity and phase with the product that has already been set, it would be convenient to use this function if you copy the setting state, and then fine-tune the sensitivity and phase by manual setting.

9

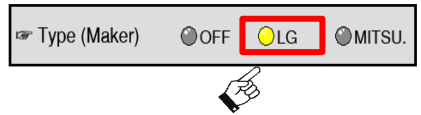
Convenient Functions – Inverter Setting

Inverter Setting : You can start, stop and control the speed through the serial communication with the inverter. (It is limited to inverter equipped model)



▶ Please touch **Sorting> Inverter**.

1) Please press one of the OFF/LG/MITSU (*TBD) icon. If it is a model with no inverter, please set it to OFF.



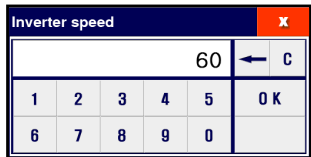
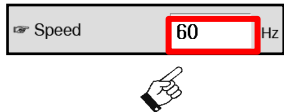
2) Please select the direction of the conveyor..



3) Please touch the area of Inverter Speed to bring up its input window.

4) Please enter the inverter speed in the input window of inverter speed, and then select OK.

The input range is from 0 to 60 Hz. Typically 0 means Stop and 60 is the highest speed.



Tip ...

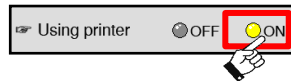
- ◆ The model of an inverter that is supported can be added/changed, depending on the supply and demand situation on parts of the manufacturer.

Printer setting : You can control the required data in using the printer. (Only for the models with a printer)



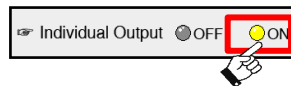
▶ Please touch **Sorting > Printer**.

1) Please touch **ON** for using the printer.

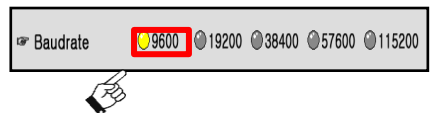


2) If you touch **ON** for Individual Output, you can print out its date, its product number and etc., for every metal detection.

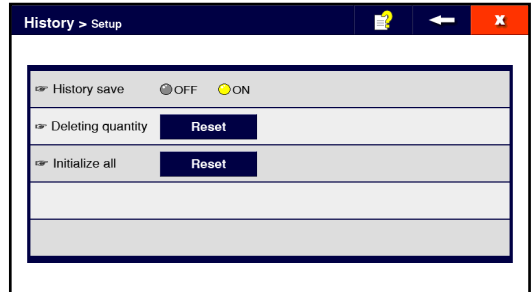
You can use this function only if Using printer is on.



3) Set the communication speed. Only if printer use is in ON, this can be changed.



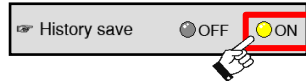
Detection history Setup: You can perform whether to save the detection history and the initialization of the history.



▶ Please touch **History> Setup**.

History save

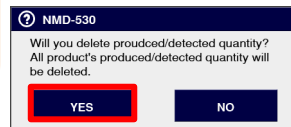
1) Detection history is saved only if History save is set to **ON**. The default value is **ON**.



Deleting quantity for production / detection

1) Please touch **Reset**.
2) If you touch **YES** on the right pop-up window on the bottom asking if you want to delete data or not, all products' production/detection quantity will be deleted.

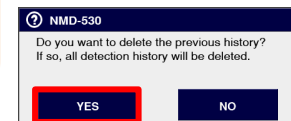
If you touch No, deleting process will be canceled.



Initialize All

1) Please touch **Reset**.
2) If you touch **YES** on the pop-up window on the bottom asking if you want to delete data, all detection history will be deleted.

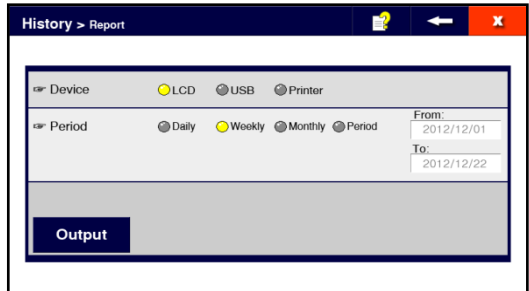
If you touch **No**, deleting process will be canceled.



Checking detection history: You can check detection history by designating period.



▶ Please touch **History> Report**



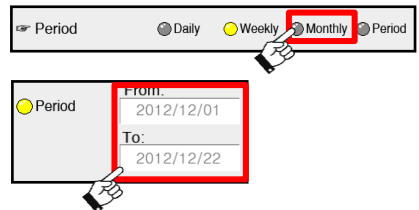
1) Please touch one of devices.
(LCD / USB / Printer)

LCD : Data is on the screen.
USB : Data is saved to USB Disk.
Printer : Data is printed out by printer.







2) Please touch one of viewing periods.
(daily/weekly/monthly/period)

If you choose period, you can designate viewing period like the right picture on the bottom.



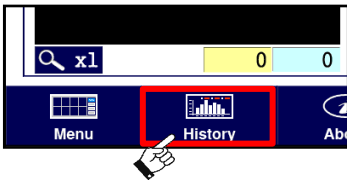
3) Please touch **Output**.

Right picture is the example of output from LCD screen.

- Please touch  
You can check detection data of before / after.
- Please touch  
When detection data exceed 10,
you can check detection data for 10 cases of before/after.

Checking Period	DATE: 12/01/08	NG : 2				
12/01/01 - 12/01/08	CODE	PROJ	TIME	NG	TOTAL	
→ Detection Quantity	0003	80	1	10:01:59	2	089
→ Production Quantity	0002	80	1	13:10:22	4	087
12/01						

Using the shortcut key for detection history



- ▶ If you touch **History** on the main screen, you can go to the detecting history screen

◆ Tip ...

- ◆ **Daily:** Total data from today at 00:00 to present time
- ◆ **Weekly:** Total data from this Monday at 00:00 to present time
- ◆ **Monthly:** Total data from the first day of this month at 00:00 to present time
- ◆ **Period:** Total data for a certain period from ~ to~, total date is within 1 year
- ◆ **In order to use this function, current date and time should be input.**
You can check current data and time on the top of the main screen.

Registering date and time: You can register date and time of system



- Please touch
Preferences> Date, Time, Language.

Date

- 1) Please touch the area of date.
- 2) Please input today's date on the right pop-up **System date** window on the bottom.

If you finish inputting all 6 digits, the newly changed data will be applied and it goes back to the previous screen automatically.

Time

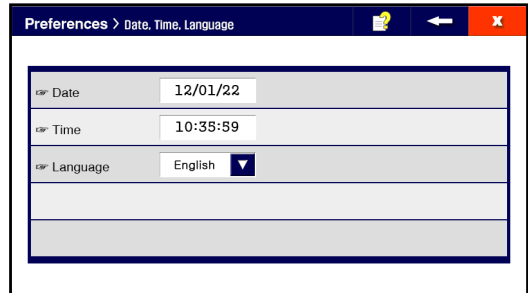
- 1) Please touch the area of time.
- 2) Please input present time on the right pop-up **System time** window on the bottom.

If you finish inputting all 6 digits, the newly changed time will be applied and it goes back to the previous screen automatically.

◆ Tip ...

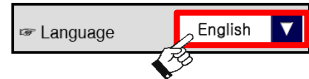
- ◆ **in case of changing System date, detection history should be initialized. System date is criteria of detecting history data management so that changing it will result in errors in data**

Language setting: You can set the language on the machine by country.



▶ Please touch **Preferences> Date, Time, Language.**

1) Please touch the language display area.

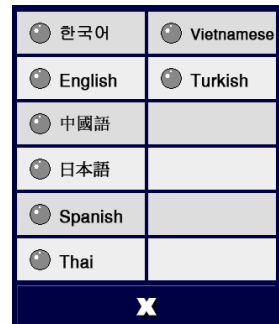


2) If you select the language to change, it will be saved and then be returned to the previous menu.

Since then, the language changed will be applied.

If you want to close the pop-up window without any change, touch X.

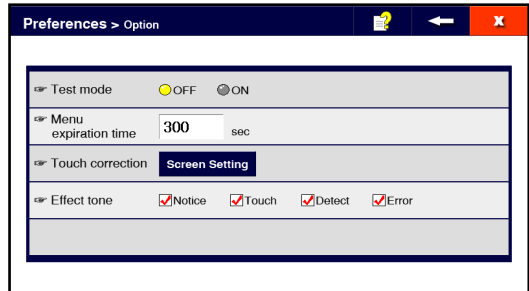
Supported languages are 7 kinds including languages including Korean, English, Chinese, Japanese, Spanish, Vietnamese, Turkish.



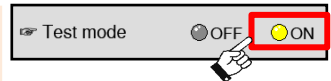
◆ **Tip ...**

- ◆ Other foreign language can be added through additional work upon request of customers.

Test Mode Setting: You can set Test Mode on and off.



▶ Please Touch **Preferences> Option**.



- 1) Please touch the area of **ON** in the test mode to set it on.
- 2) Please touch the area of **OFF** in the test mode to set it off.

Using the Shortcut Key

▶ Please touch and hold **test mode icon** on the top of the **main screen** to activate and deactivate **test mode**.



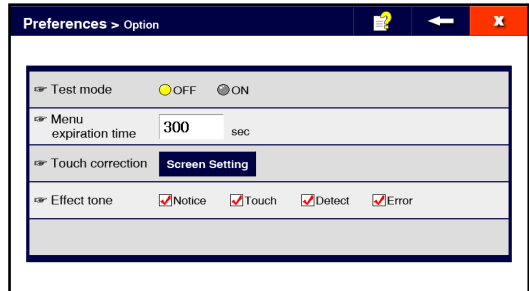
◆ Tip ...

- ◆ When test mode is on, metal detecting operation is still on but rejecting operation is on hold. (Sorting Operation: Conveyor Stop, Tower Lamp, Rejecter Operation, External Signal Output and etc.,)

Setting of Menu Expiration Time: When setting time elapses, menu screen will return to the main screen.

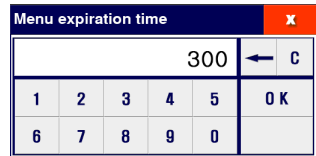


► Please touch
Preferences> Option.



1) Please touch the display area of **Menu expiration time** on the right-up screen.

2) If you input **Menu expiration time** and touch **OK** on the right-down screen, it saves setup parameters and return to the prior screen.



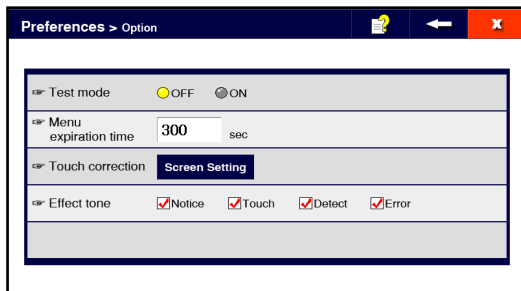
◆ **Tip ...**

- ◆ **Menu Expiration Time is not applied to some of menus (auto setup, manual setup).**

Touch correction: You can reset the touch coordinates of the LCD screen.



► Please touch the area of **Preferences> Option**

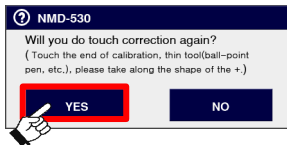


1) Please touch screen setting.



2) Please touch **YES**.

If you want to cancel it, please touch **NO**.

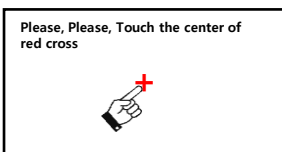
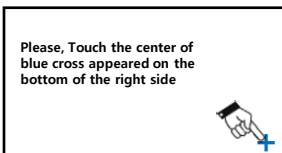
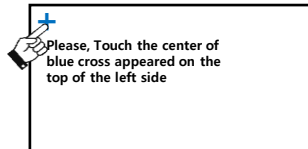


3) Please touch along “+ shape” by using of the thin end (such as ball point pen and etc.)

It should be done as the below order.

- Upper-Left corner
- Lower-Right corner
- Right Center

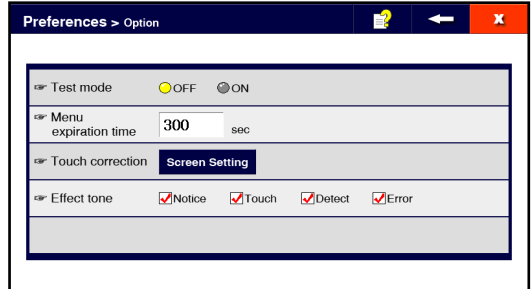
When this work is done, it saves correction value and returns to the main screen.



If touch calibration is not in a normal condition, machine operation might be impossible.

The machine is shipped after touch correction is made so that please do not change it unless otherwise there is a special case.

Effect Tone Setup: You can set whether or not to use effect tone.



▶ Please touch **Preferences> Option**.

Notice Sound

If you tick **Notice**, it beeps sound in the case of power on, work completion and etc.,



Touch Sound

If you tick **Touch**, it beeps sound when the button of LCD screen is pressed.



Detect Sound

If you tick Detect, it beeps sound when a metal is detected.

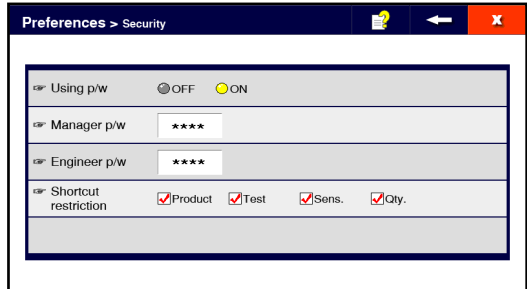


Error Sound

If you tick Error, it beeps sound in various situation of errors.



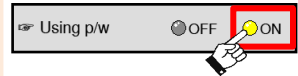
Security Setting: You can set whether or not to use passwords or change current password.



► Please touch preferences> Security.

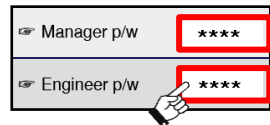
Using Password

You can set whether or not to use the password.
If you touch **ON**, you are required to login for entering the menu.



Administrator Password, Engineer Password

1) Please select which password you will change.



2) Please enter new password in the right pop-up window.

Once 5 digits of new password is entered, it will be saved and return to the prior screen.

The changed password is valid from the next menu entry.



◆ Tip ...

◆ If Using password is set to OFF, use of some of the menu is limited.

Shortcut Restriction: You can limit using shortcut key on the main screen.



► Please touch
Preferences> Security.

Preferences > Security	
Using p/w	OFF ON
Manager p/w	****
Engineer p/w	****
Shortcut restriction	<input checked="" type="checkbox"/> Product <input checked="" type="checkbox"/> Test <input checked="" type="checkbox"/> Sens. <input checked="" type="checkbox"/> Qty.

Product Change Shortcut Key

If you tick **Product**, you can go to product change menu directly by touching a product number on the top of the main screen.



Test Mode Shortcut Key

If you tick **Test**, you can change between **Test Mode** and Normal mode by pressing Test Mode icon on the top of the main screen.



Sensitivity Setting Shortcuts

If you tick **Sens.**, sensitivity and detection level can be modified on the main screen.



Quantity Initialization Shortcuts

If you tick **Q'ty**, production and detection quantity can be initialized on the main screen.



Network : You can set up Ethernet connection environment.



▶ Please touch **Preferences> Security**.

Preferences > network	
DHCP	<input type="radio"/> OFF <input checked="" type="radio"/> ON
Port number	8000
IP Address	192.168.000.005
Subnet mask	255.255.255.000
Gateway	192.168.000.001

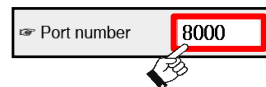
1) If the network supports IP Auto-setup function, IP setting to be assigned automatically is enabled.

You need to ask the network administrator for the appropriate IP setting value.



2) Select the Port setting window.

Enter a value in the pop-up window, and then if you touch OK, the setup parameters are saved to return to the previous screen.



Port					
8000					← C
1	2	3	4	5	OK
6	7	8	9	0	

3) Select IP Address, Subnet Mask and gateway in order.

Enter a value in each pop-up window. When you finish inputting 12-digit value, save the value and return the previous screen.

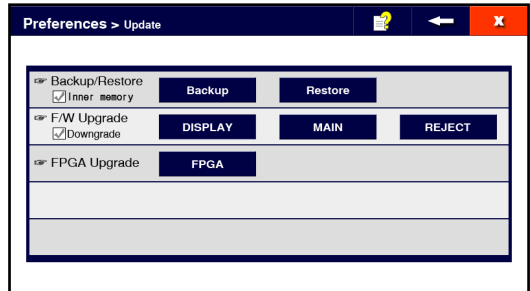
If **Import IP address automatically** is ON, input of the rest items except for ports will be limited.

IP Address	192.168.000.005
Subnet mask	255.255.255.000
Gateway	192.168.000.001

IP Address					
192.168.000.005					←
1	2	3	4	5	Clear
6	7	8	9	0	◀ ▶

Backup and recovery of data

:You can backup and restore all setting values for the machines and all registered products.



► Please touch
Preferences> Update.

Data Backup

1) Please decide the storage location, and then touch **Backup**.



- If you tick Inner memory, the data will be backup into the inner memory.
- If you do not tick Inner memory, the data will be backup into USB disk. In this case, please insert the USB disk first before data backup. (Serial number of the machine.DAT files) will be generated in the USB disk.

Ex) If serial number of the machine is 12345678, its file name will be "12345678.DAT".

Data Restoration

1) Please designate where data will be read from and then touch **Restore**.



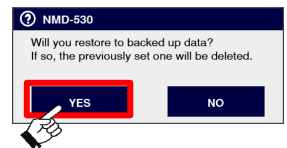
- If you check Inner memory, the data will be imported from the internal memory.
- If you do not tick Inner memory, the data will be read from the USB Disk. In this case, please insert the USB Disk first before the data restoration. (Serial number of the machine.DAT files) must exist in the root of the USB Disk.

Ex) If serial number of the machine is 12345678, its file name will be "12345678.DAT"

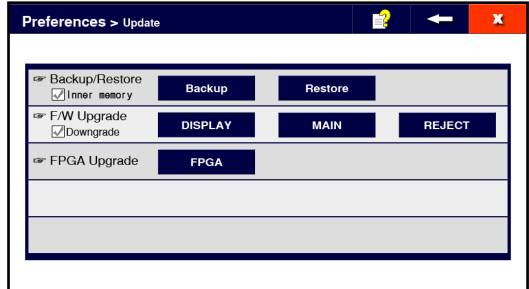
2) Please touch **YES**.

Once restoration is completed, please reboot the power.

If you want to cancel restoration, please touch **NO**.



Firmware Upgrade: You can upgrade/downgrade the internal program.



► Please touch **Preferences> Update**.

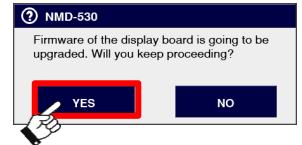
1) Please touch the board that you want to upgrade.

If you want to go back to the old version or stay the same version, please tick **Downgrade**.



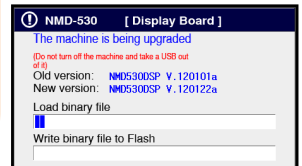
2) If you touch **YES**, a pop-up window that displays its progress will be displayed as the right-bottom pop-up window.

If you just want to cancel upgrade, please touch **No**.



3) Old and new version of firmware and upgrade process are displayed.

Once upgrade is completed, the machine will reboot automatically.



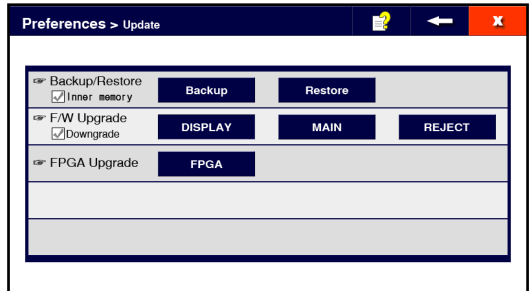
◆ **Tip ...**

- ◆ **During the upgrade, please do not turn off the power and disconnect the USB disk.**
- ◆ Before the upgrade, please insert the USB Disk.
- ◆ The relevant firmware must be in the root directory of the USB Disk.
Please make sure if the below files exist on the USB Disk before the work.
 - DISPLAY : NMD530DP.FWD
 - MAIN : NMD530CP.FWD
 - REJECT : NMD530RP.FWD

FPGA upgrade: You can upgrade the internal program.



► Please touch **Preferences > Update**.

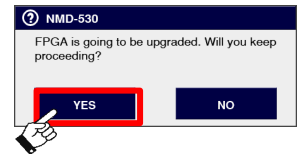


1) Please touch **FPGA**.



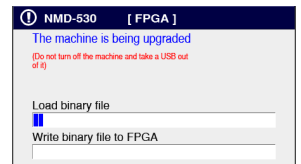
2) If you touch **YES**, a pop-up window that displays the progress will be displayed.

If you just want to cancel it, please touch **NO**.



3) The progress is displayed.

Once upgrade is completed, the machine will reboot automatically.



◆ Tip ...

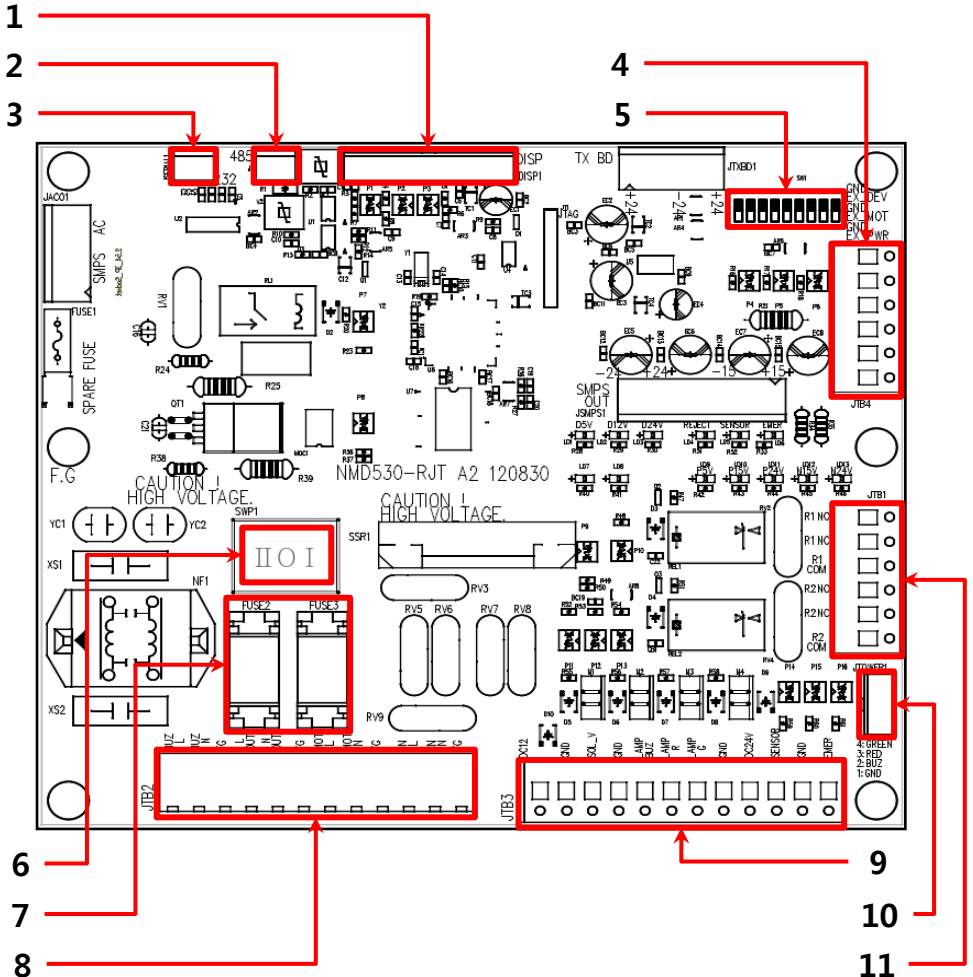
- ◆ **During the upgrade, please do not turn the power off and disconnect the USB Disk.**
- ◆ Before the upgrade, please insert the USB Disk.
- ◆ The relevant firmware must be in the root directory of the USB Disk. Please make sure if N530FPGA.FWD file exists before the upgrade.

Symptoms	Check List
Nothing is on the screen.	Please check if the power cord is correctly connected and try turning on the power by pressing the power switch on the side of the head
Metal cannot be detected.	<p>In case of a metal smaller than test piece used when setting the machine, it may not be detected.</p> <p>Please check whether to detect it by using of test piece provided when installing the machine.</p>
Even if there is no metal while products are passing through the tunnel, a metal is Detected.	<p>Please make sure if the phase and sensitivity are correctly set for the product to test.</p> <p>The exact phase and sensitivity setting for each product should be made, using the auto setup and manual setup function in order to prevent the product itself from being detected as metal.</p>
Even if there is not a product for test on the tunnel, a metal is detected	Please make sure if there is anything changed in surrounding environment from the time when installing. Especially, if there is any change in electromagnetic sources such as inverters, high-capacity motors, high-voltage power lines, abrupt changes in ambient temperature or environmental change to large metal structures around a metal detector, please try removing them and operating the machine again.

If you remove the cover of the power supply box, power supply circuit that supplies power to the metal detector head appears. In the power supply circuit, a terminal block that can process a signal in addition to the power supply is installed, so you can use it by connecting for each purpose.



Please work it for the safety after disconnecting power input line.



1. Head Input and Output

1	Metal detection signal input
2	POWER SWITCH signal input
3	CONVEYOR SWITCH signal input
4	Sensor signal output
5	GND
6	DC +15V output
7	DC -15V output
8	GND
9	DC +5V output
10	GND
11	RS232 RX Signal (power supply board <-> communication between metal detection heads)
12	RS232 TX Signal (power supply board <-> communication between metal detection heads)

2. RS232 Input and Output

1	RS232 RX	Printer control input signal
2	RS232 TX	Printer control output signal
3	GND	GND

3. RS485 Input and Output

1	RS485 RX	Inverter control input signal
2	RS485 TX	Inverter control output signal
3	GND	GND

4. External input signal

1	GND	GND
2	EXT_DEV	External device input signal. Active Low
3	GND	GND
4	EXT_MOT	External motor control input signal. Active Low
5	GND	GND
6	EXT_PWR	External power control input signal. Active Low



Please work it for the safety after disconnecting power input line.

5. DIP SWITCH

1	TEST MODE	Production testing function On/Off
2	Reserved 2	Special spare switch input
3	Reserved 3	Special spare switch input
4	Reserved 4	Special spare switch input
5	Reserved 5	Special spare switch input
6	Reserved 6	Special spare switch input
7	Reserved 7	Special spare switch input
8	HEAD ON	HEAD auto-start setting when the main power is ON

6. MAIN SWITCH

1	II	Force the motor power ON (metal detector OFF)
2	O	All OFF
3	I	Metal detector main power ON

The location of the number II will be used to drive only conveyor without working metal detector or drive conveyor in the case of conveyor failure.

7. Fuse

1	FUSE 2	For single-phase motor 180W input power : Standard (250V/3A), type (Ceramic fuse), length (20mm)
		For single-phase motor 360W input power : Standard (250V/5A), type (Ceramic fuse), length (20mm)
		For single-phase motor 720W input power : Standard (250V/10A), type (Ceramic fuse), length (20mm)
		For three-phase motor magnet input signals : Standard (250V/3A), type (Ceramic fuse), length (20mm)
2	FUSE 3	For head input and external output : Standard (250V/3A), type (Ceramic fuse), length (20mm)



Please work it for the safety after disconnecting power input line.

8. AC Input and Output

1	BUZ L	AC Buzzer connecting terminals Output in relay operation (prime power) Default: operating time output in metal detecting
2	BUZ N	
3	FG	
4	OUT L	Output when power is ON (prime power)
5	OUT N	
6	FG	
7	MOT L	Output when the motor drive (prime power)
8	MOT N	
9	FG	
10	IN L	Prime power input (AC 100V~240V)
11	IN N	
12	FG	

9. Option Input and Output

1	DC12V	DC 12V Output
2	GND	GND
3	SOL_V	Solenoid output. Output conditions are specified in the 'sorting setup'
4	GND	GND
5	LAMP BUZ	Buzzer Output (DC 24V only)
6	LAMP R	Red tower lamp signal output (DC 24V only)
7	LAMP G	Green Tower lamp signal output (DC 24V only)
8	GND	GND
9	DC24V	DC 24V output
10	SENSOR	Sensor signal input
11	GND	GND
12	EMER	Belt emergency stop switch input



Please work it for the safety after disconnecting power input line.

10. Tower lamp connections (DC 24V only)

1	GND	GND
2	LAMP BUZ	Buzzer output
3	LAMP R	Red lamp signal output
4	LAMP G	Green lamp signal output

- Power board connector: SMW250-04 (Maker: Yeonho Electronics)
- Tower lamp Connector: SMH250-04 (Maker: Yeonho Electronics)

11. Relay Output

1	R1 NO	Relay 1 Normal Open
2	R1 NC	Relay 1 Normal Closed
3	R1 COM	Relay 1 common terminal
4	R2 NO	Relay 2 Normal Open
5	R2 NC	Relay 2 Normal Closed
6	R2 COM	Relay 2 common terminal

The relay output can be used to control an external device in conjunction with a metal detector. The output conditions can be specified in the Sorting Management menu/Sorting Setup.



Please work it for the safety after disconnecting power input line.

Production method	CLOSED COIL TYPE
Operating Voltage	Single phase 220V / 60HZ AC (Exclude customized products)
Operating Voltage	Max 100W
Operating Temperature	0°C ~ 50°C
Frequency	Single 400KHz
Processing capacity	Max. 10,000 tablets (It is subject to size of the capsule.)
Number of registered products	Up to 100 pcs
Output Mode	Relay contacts, buzzer, tower lamps, solenoid drive signal, motor stop
Waterproof / Dustproof	IP-66 waterproof/dustproof standard
Other functions	<p>7 inch TFT LCD resistive touch panel</p> <p>128MByte detection history memory for storing</p> <p>Built-in USB removable disk access port (Detection history storage, built-in software upgrade).</p> <p>Built-in Ethernet Port (TCP / IP connectivity and remote monitoring support)</p> <p>Multi-language support: Korean, English, Japanese, Chinese</p> <p>Built-in serial communication port: RS-232C x 1, RS-485 x 1</p> <p>Built-in Help Screen for Operation Description</p> <p>Support for product input in Hangul (Korean language)</p> <p>Support for automatic product setting</p> <p>Support for automatic phase tracking</p>



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