



NeedleFinder™

Digitized Metal Detection System

Operating Manual



Model: NF-1

Version 2.1

Mar 2008

NEEDLEFINDER OPERATING MANUAL

VERSION 2.0

DEC 2007

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ATTENTION:

**Read carefully the user manual before
connecting and operating this needle detector.**

ELECTRIC SAFETY NOTICE

To prevent fire or shock hazard, do not expose the unit to rain or moisture. To avoid electrical shock, do not open the control box or front panel. Refer servicing to qualified personnel only.

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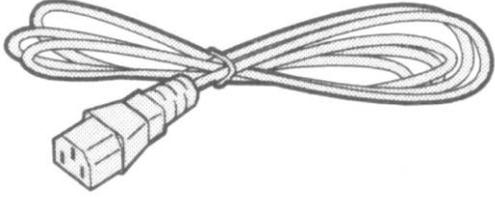
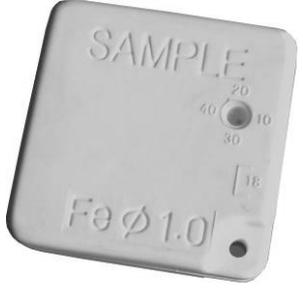
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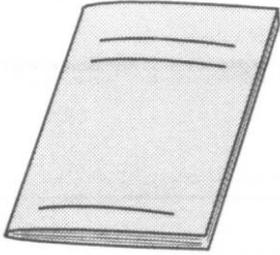
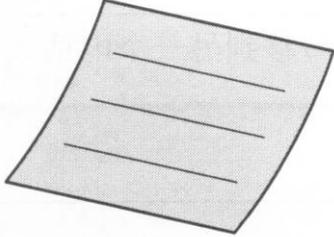
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1. PREPARATION

1.1. ATTACHED ACCESSORIES

	
<p>Power cable 1 pc</p>	<p>Spanner 1 pc</p>
	
<p>Fuse 2 pcs</p>	<p>Ferrous test sample 1 pc</p>
	
<p>Allen key 1 pc</p>	<p>Report Printer 1 pc</p>

	
Operating manual 1 pc	Warranty card 1 pc

- Contact your local dealer if any accessory is absent or damaged.
- Keep the original wooden packing for future use if any.
- The printer accessories include the printer, power supply changeover, software CD, operating manual and connection cable.

1.2. FUNCTIONAL PARTS

1.2.1. Machine Layout

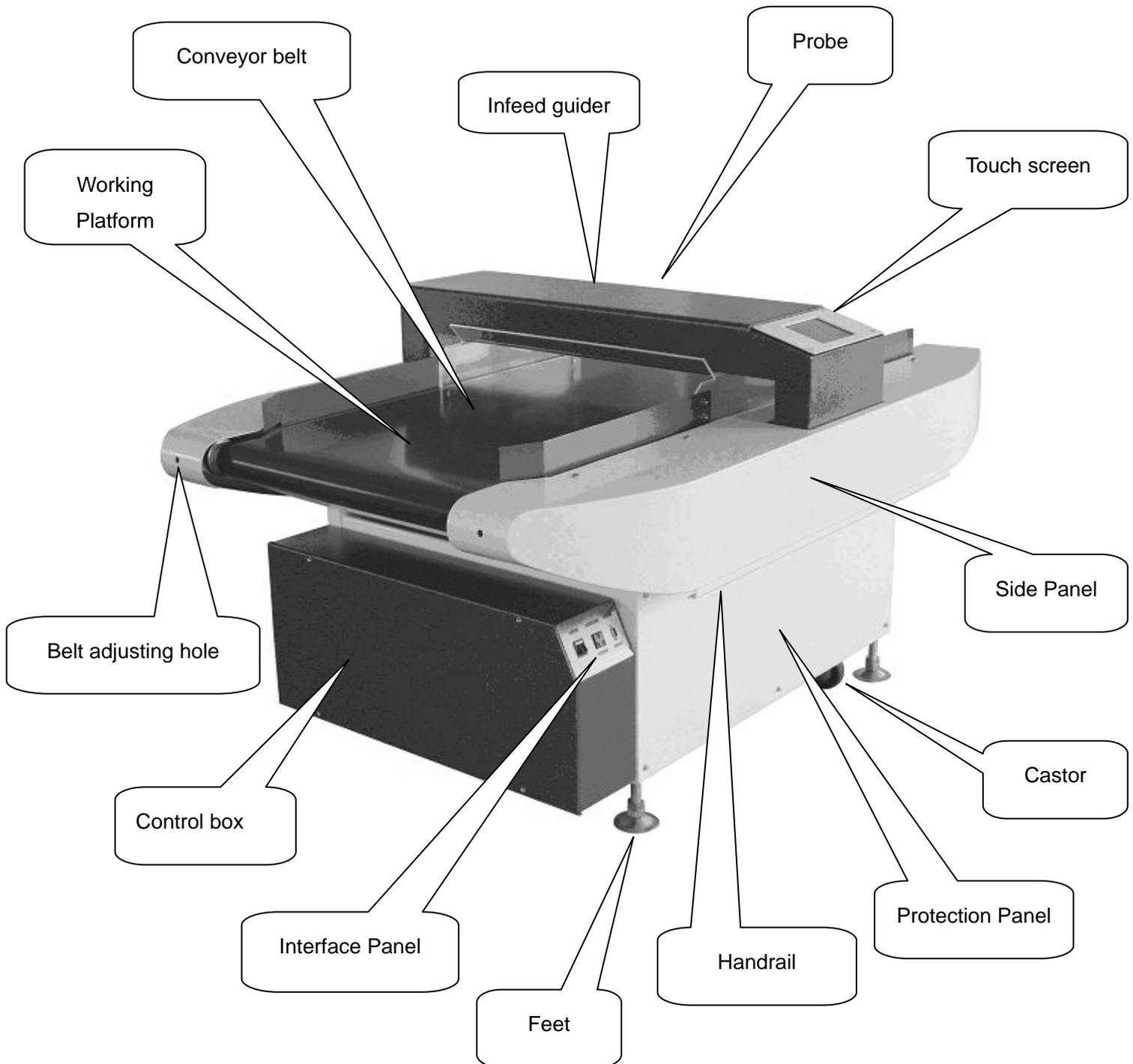


Fig. 1 Machine Layout

1.2.2. Interface Panel

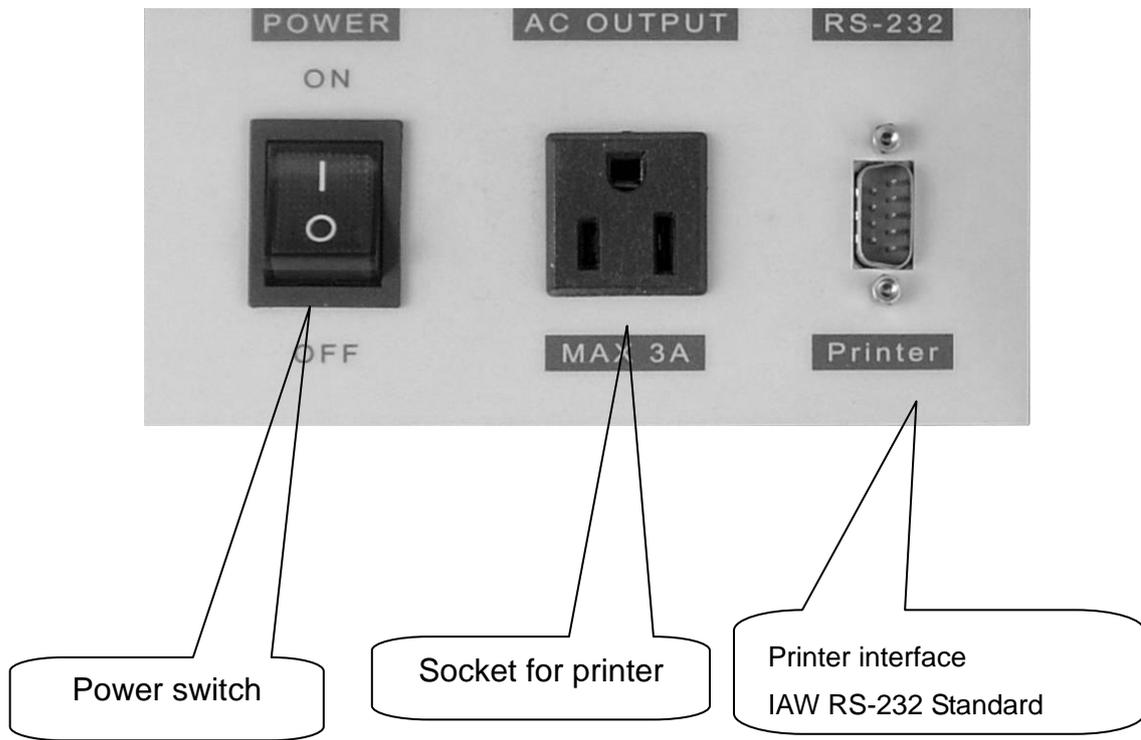


Fig. 2 Interface Panel

1.2.3. Installation and Fixture

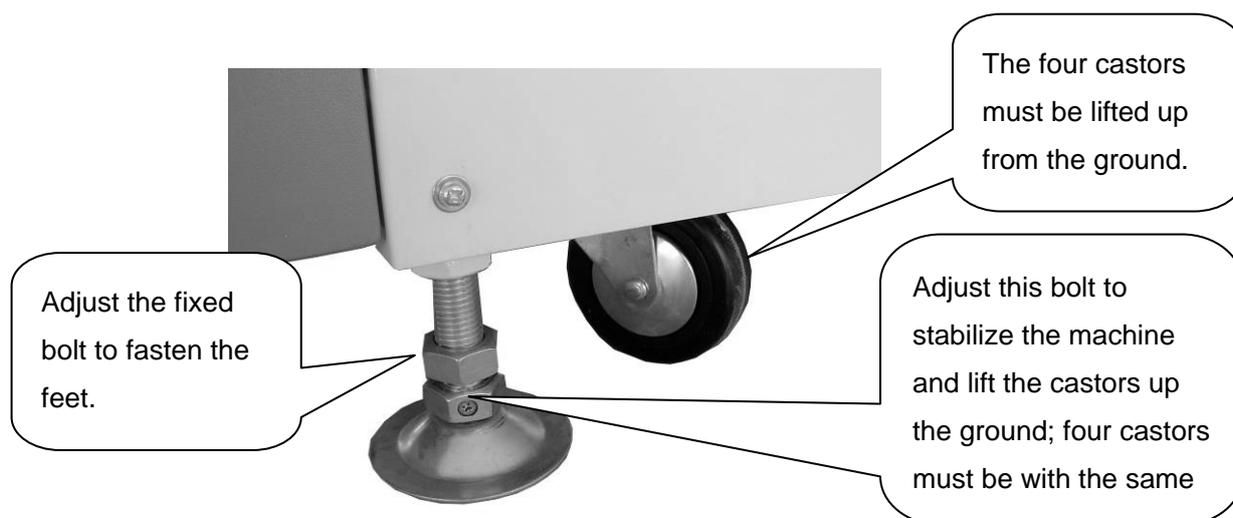


Fig. 3 Castor and Feet Adjustment

- Before operation, machine must be placed on a level ground without any potential vibration. The four fixed bolts must be adjusted until the whole machine is fitted steadily & horizontally and four castors must be lifted up from the ground. In addition, the fastening screw must be tightened. Otherwise, the conveyor belt may be deviated.
- Machine must not be placed on or near an iron platform or iron rack.
- Machine must be kept away from any devices that may produce magnetic signal such as clutch motor, sewing machine, fabric cutter, packing machine, air-con, transformer, high-voltage electric fan or any revolving device, which may produce electric and/or magnetic interference and thereby contribute to malfunctioning.
- Machine must be kept away from any big moving metals, e.g. trolley.
- Machine must be kept in a condition between 0°C and 40°C and must not be under 0°C the freezing point.
- Severe dust, metal powder, moisture or dew must not be present in the machine area.

1.2.4. Power Supply

- Voltage: AC100V-240V (single-phase); 50-60Hz (AC220V/50HZ standard motor will be supplied as default unless otherwise mentioned).
- A socket must be fitted with solid grounding (earth) connection. AC power supply must be compatible with the motor specifications.

Notes:

	<p>Do not share the socket with other electric devices. Check the power voltage before use.</p>
	<p>In case if an extension cable is required, do not share the socket with other electric devices to avoid potential damage or interference caused.</p>
	<p>Check the power voltage supply before use. If any doubt, consult with your local electricity provider. Wrong voltage can cause damage to the machine, which will void the warranty.</p>

1.2.5. Printer Connection

Connect the printer to the machine in the following procedures:

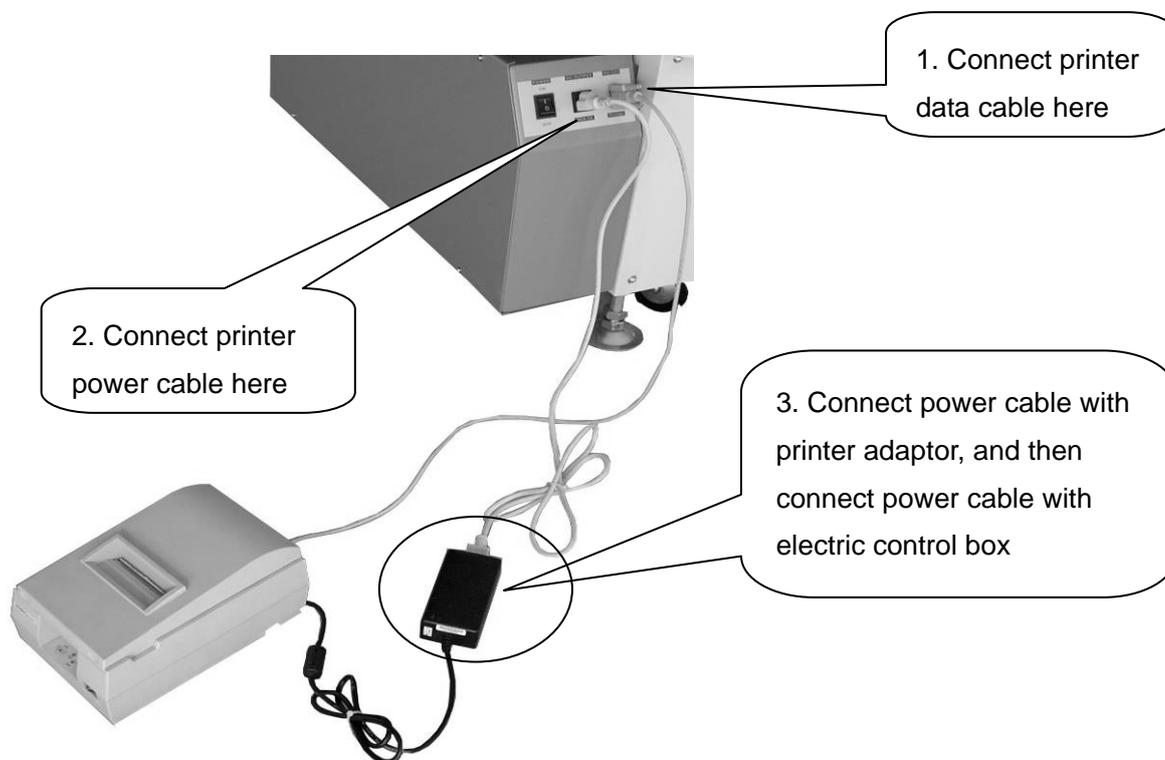


Fig. 4 Printer Connection

Note: Maximum allowable current for the printer socket shall be **3A**. Do not connect any other device's plug to the printer socket.

2. BASIC OPERATIONS

2.1. SELECT LANGUAGE

2.1.1. Setup procedure

startup → select Language

Switch on power then select language at startup display within 3 seconds

2.1.2. Display Description



2.1.3. Notes

Once the language is selected, it will be kept in memory unless otherwise changed. Two operating languages Chinese and English are provided in this machine for user's own selection. If a language is selected, the whole system will subsequently run in this language, and the printer will employ the same.

2.1.4. Caution

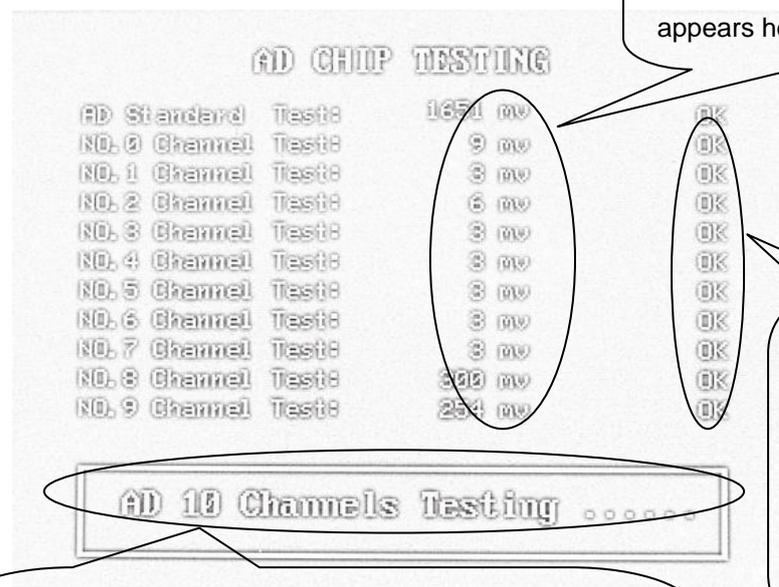
The selection must be completed within 3s upon display of LCD; otherwise, the system will return to the last language mode automatically. The system is capable of retaining the memory even power-failure might occur. If no selection is made after restart of the machine, the system will resume the previous language mode after 3 seconds.

2.2. AD CHIP TEST

2.2.1. Setup procedure

Startup → Select Language → AD Chip Testing

2.2.2. Display Description



The test value of standard voltage and each channel appears here

If all channels are normal, OK will be shown, otherwise ERROR will be shown

The test process is shown here. Only when all channels pass the test, Main Function Menu will be prompted. In case if test fails repeatedly, operator will be recommended to restart the machine.

2.2.3. Operation Guide

After selecting the language, the system automatically starts the AD chip test. If all channels pass the test, Test Successful message will be prompted and will move onto the Main Function Menu interface automatically. If the test result of standard voltage or one of the channels is abnormal, the test will continue. In abnormal situation, the standard voltage will be tested 5 times continuously and each channel will be tested 20 times continuously at most. If the results are still abnormal, a message *Err in AD 10 channels test, please restart the machine* will be prompted.

2.2.4. Notes

This function is to check if the AD chip is functioning normally. Passing the startup test ensures the machine works without fault.

2.2.5. Caution

When the startup test is under process, user should check if there is no metallic object near or inside the aperture or conveyor belt.

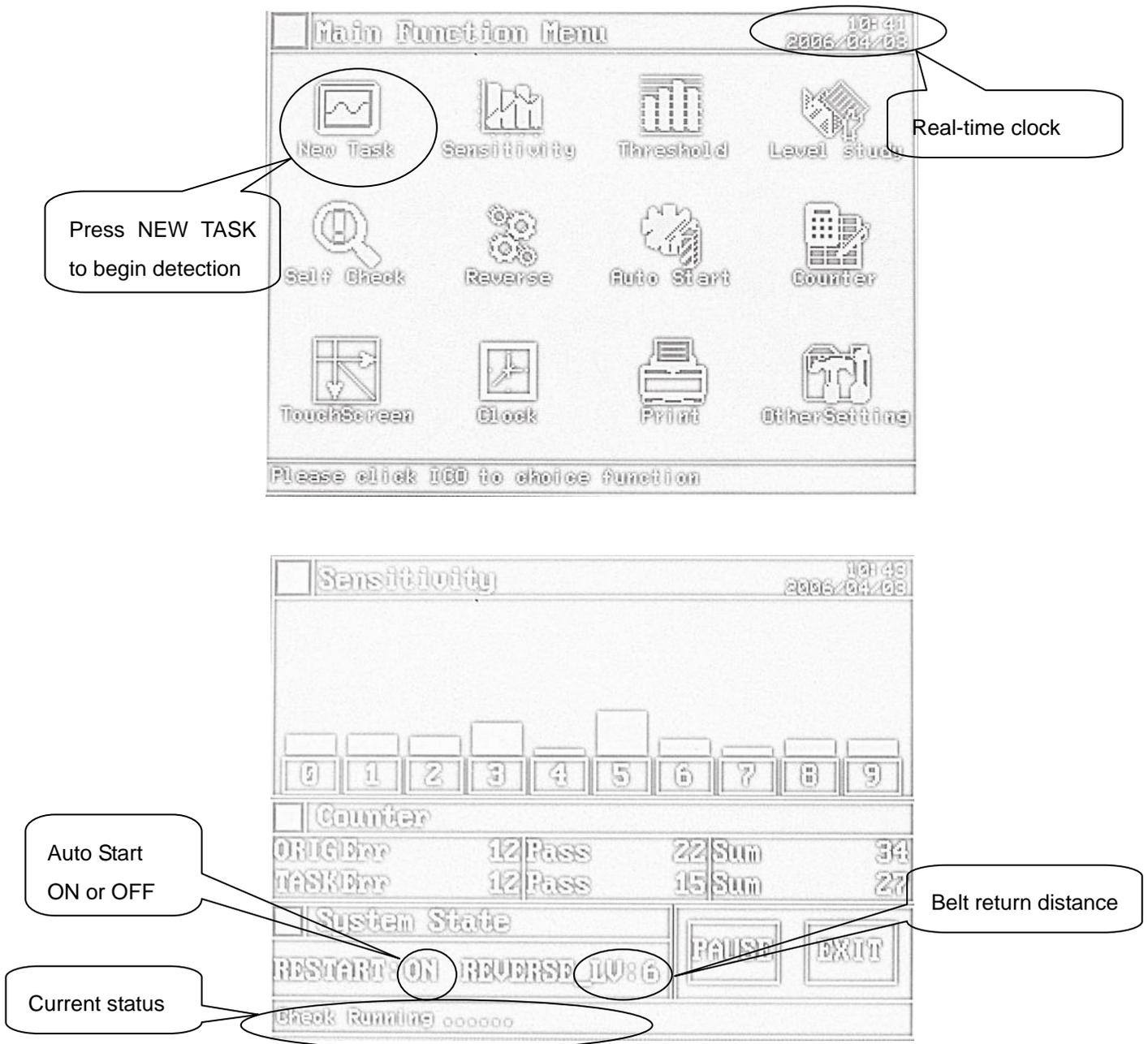
If the standard voltage shows ERROR repeatedly, then all AD chips may be faulty due to excessive high input voltage. If only one or few of them show ERROR, then some metallic objects may be interfering the detection probe or some channels has been damaged.

2.3. NEW TASK

2.3.1. Setup Procedure

Startup → Select Language → New Task

2.3.2. Display Description



2.3.3. Operation Guidance

Press NEW TASK icon in Function Menu on the display.

2.3.4. Notes

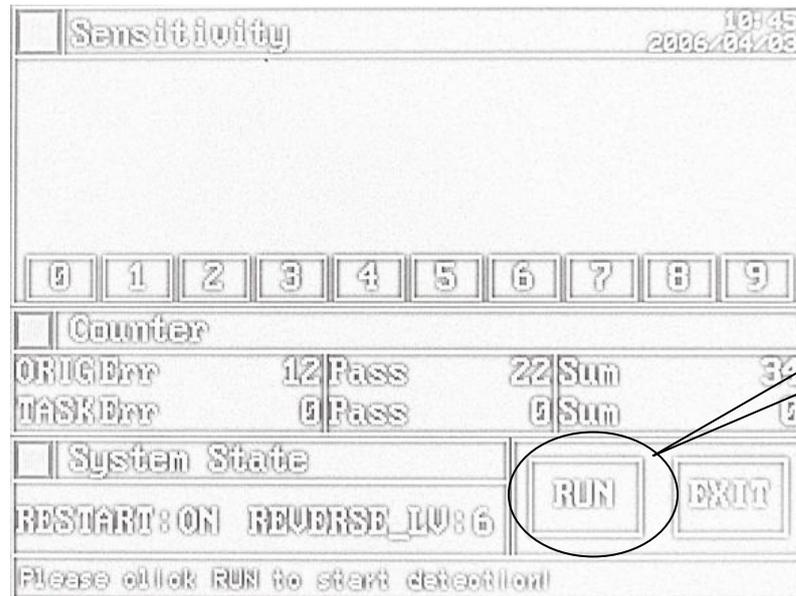
This function is to create a new task for detection. After pressing NEW TASK icon, the system will prompt the probe sensitivity for each channel. The operator can set up the sensitivity level for detecting metal contamination. In addition, the interface also indicates the current settings of Belt Retract, Auto-start, Real-time clock, Channel number and Product counter.

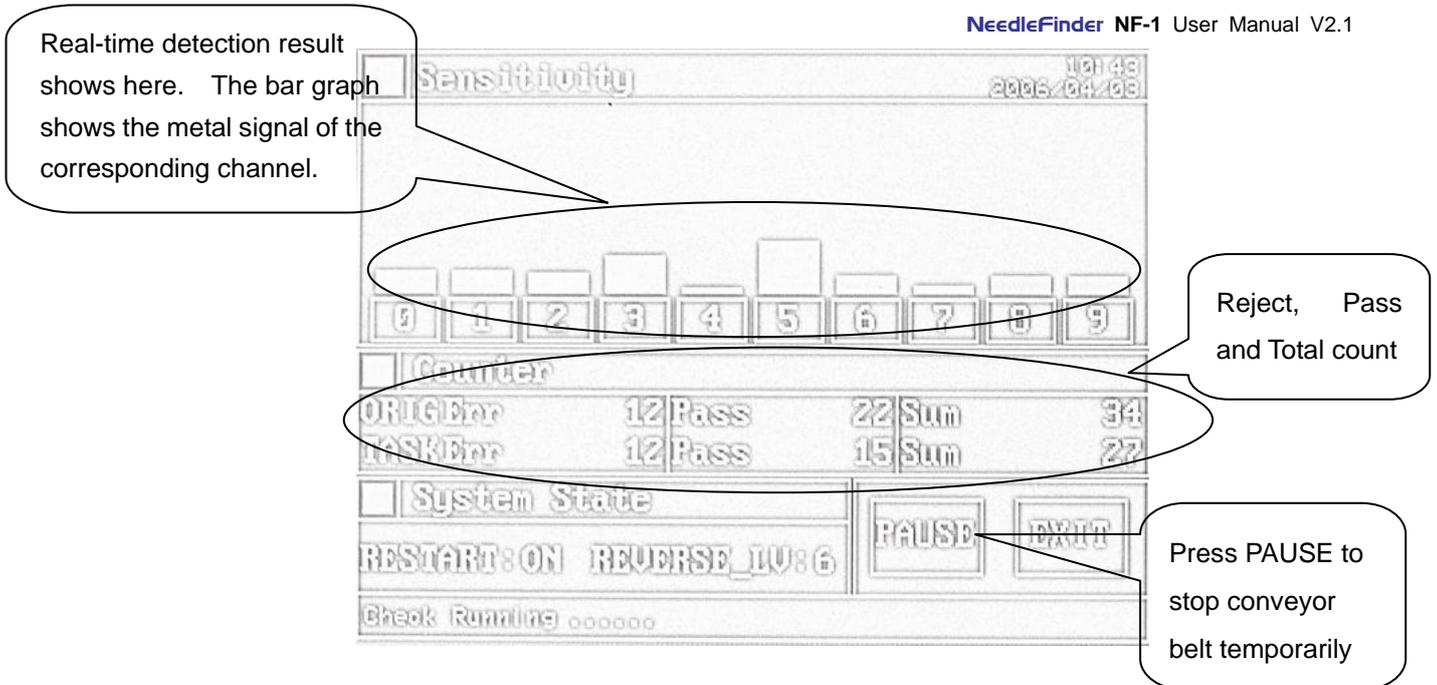
2.4. START DETECTION

2.4.1. Setup Procedure

Startup → Select Language → New Task → Run

2.4.2. Display Description





2.4.3. Operation Guidance

Press RUN to start motor and conveyor belt. Press PAUSE to stop motor and conveyor belt.

2.4.4. Notes

When metal contamination is detected, conveyor belt will retract, buzzer will sound, and probe indicator will show the channel number. If REVERSE and AUTO START are activated, the belt will retract and restart automatically at each reject.

2.4.5. Caution

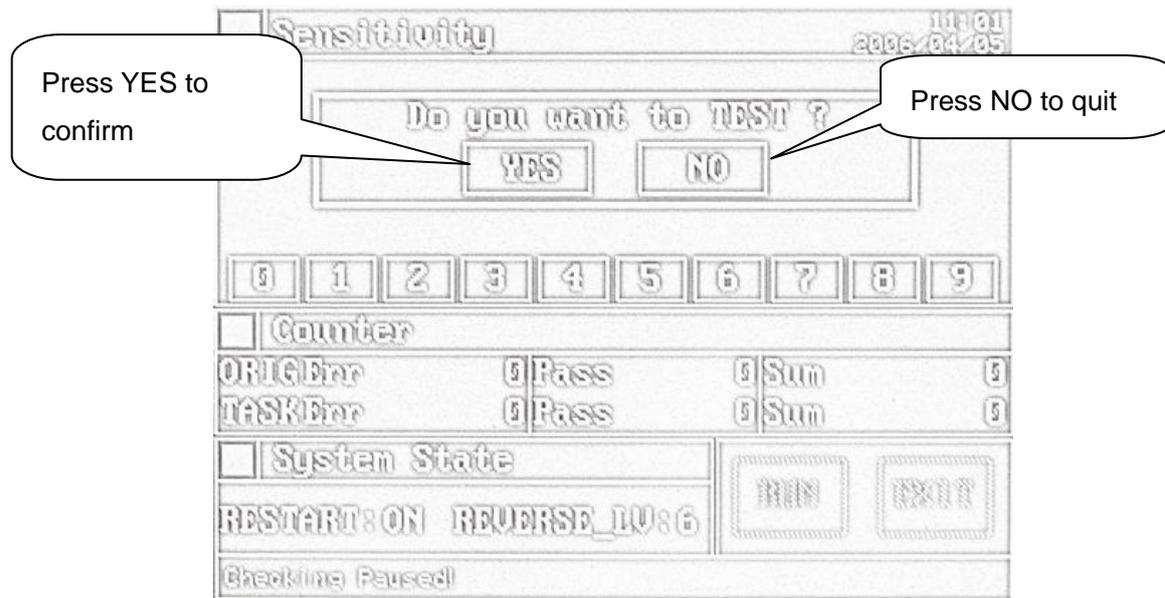
Press RUN to start detection. Conveyor belt will start. Wait until the Green Arrow sign shown on the indicator before testing other products. If COUNTER is activated, tested products must be at least 2cm in height in order to be seen by the sensor, otherwise, the products will not be counted. If COUNTER is deactivated, there is no minimum height required as long as the product can fit into the aperture. Under this setting, products will not be counted.

2.5. TIMER SELF-TEST

The machine is programmed to perform a timer self-test (self calibration) every two hours repeatedly as default. For other options, press OTHER SETTING.

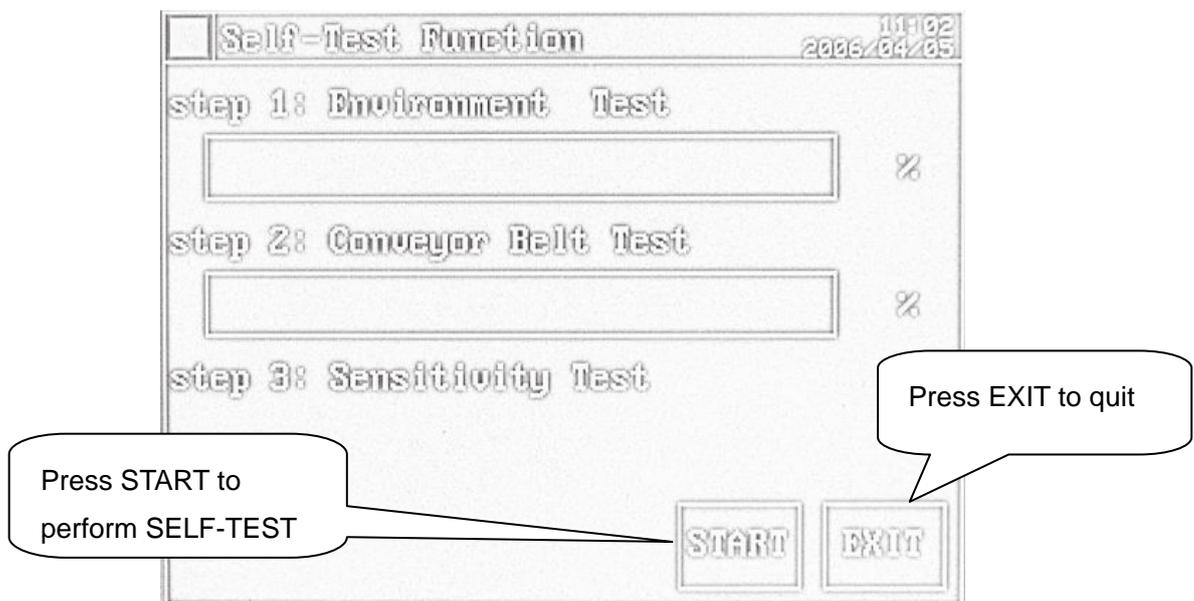
2.5.1. Display Description

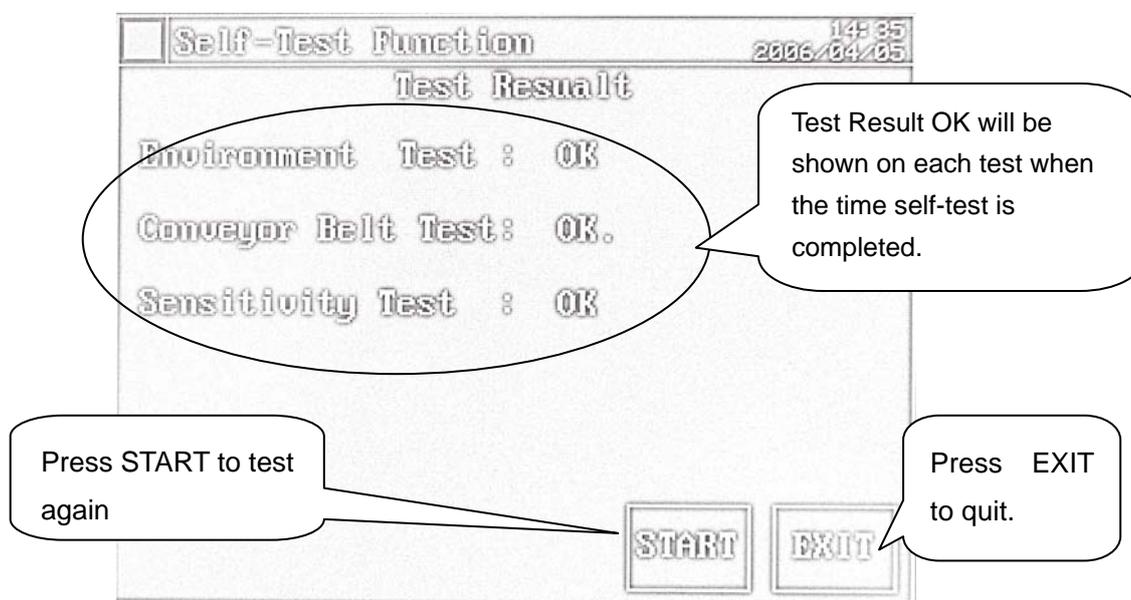
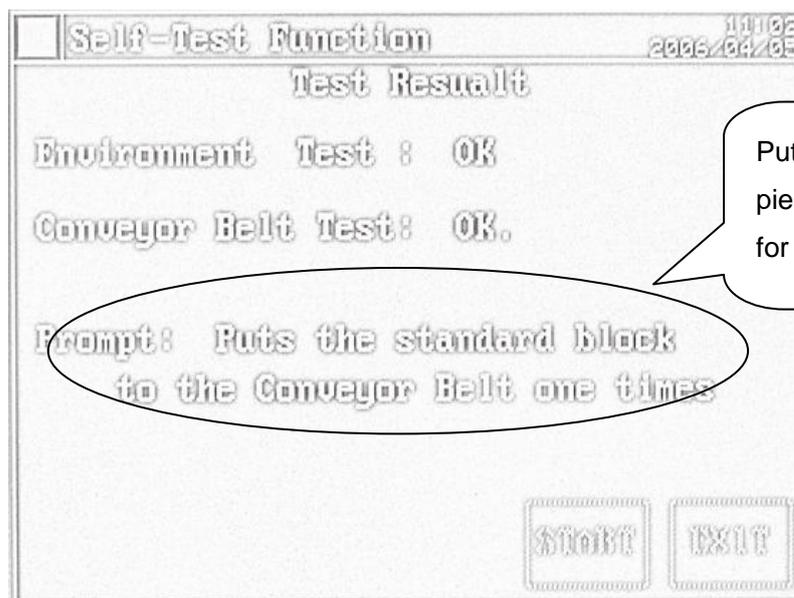
The time interval between each test is calculated on the actual motor-run time. Merely switching on the machine without starting conveyor, motor-run time is regarded idle.



After pressing YES, three tests will perform:

- Environment Test
- Conveyor Belt Test
- Sensitivity Test





2.5.2. Operation Guidance

Time interval is to be set from 0 to 4 hours. User will be alerted by audio and visual signal. Conveyor belt will stop automatically. A message *Do you want to test?* will be prompted on the display. After pressing YES, machine will then carry out three tests. If pressing NO, machine will return to normal task state.

The three tests are:

1. Environment Test
2. Conveyor Belt Test

3. Sensitivity Test

Important:

- Time interval is based on actual motor-run time. If motor is idle, real time interval can be longer.
- Timer self-test can be deactivated by selecting 0 in the Other Setting if desired.
- Three tests will be conducted in sequence. If first test fails, sensor ERROR message will be prompted. Press START to retry if needed. If first test passes, it will move onto second test. The conveyor belt will run automatically. If the belt is not metal-contaminated, Test Result will show OK ; otherwise, Abnormity will be shown. If second test fails, channel ERROR message will then be prompted. Press START to retry if needed. If both first and second test fail, a message *Whether continues to carry on?* will be prompted on the display. If press YES, the third test will begin.
- After the first two tests have passed, the three tests will continue. A ferrous test piece will be required to put onto the conveyor belt to check if the detection sensitivity is working normally.
- The buzzer will sound if ferrous test piece is detected. Otherwise, test result will show Abnormity instead of OK.

2.5.3. Notes

This function is to safeguard the machine and check if the machine is working normally at all working times. If machine is malfunctioning during operation, it will be reported timely by the TIMER SELF-TEST function. Corrective action can be taken accordingly.

2.5.4. Caution

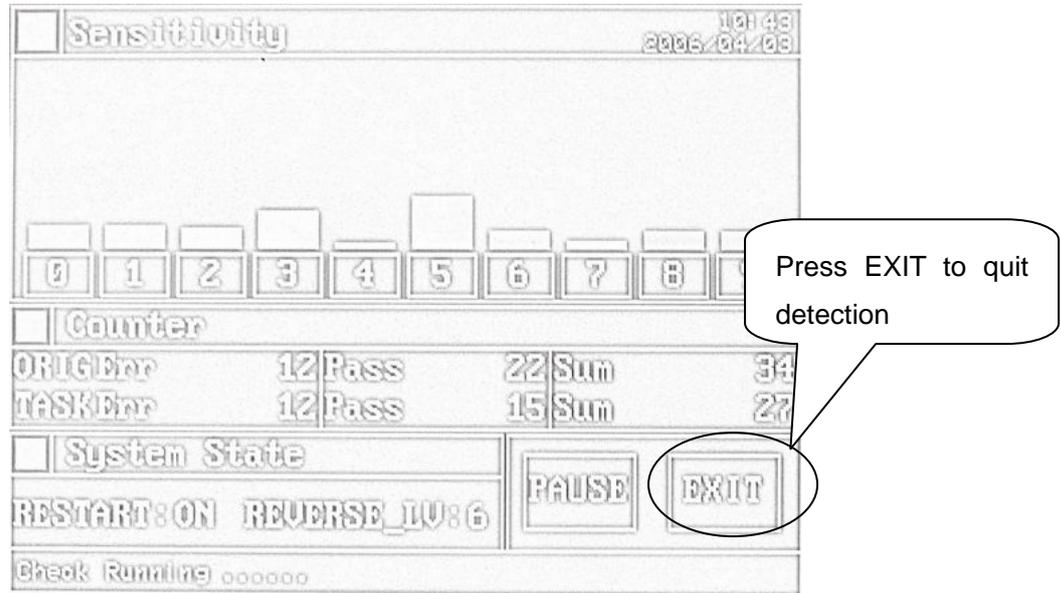
In the course of sensitivity test, the standard ferrous test piece should be used and must be high enough to reach the sensor line; otherwise, the test piece will be regarded unseen by the sensor and the conveyor belt will continue running until a test piece is detected.

2.6. STOP DETECTION

2.6.1. Setup Procedure

Startup → Select Language → New Task → Exit

2.6.2. Display Description



2.6.3. Operation Guidance

Press EXIT to end and quit detection.

2.6.4. Caution

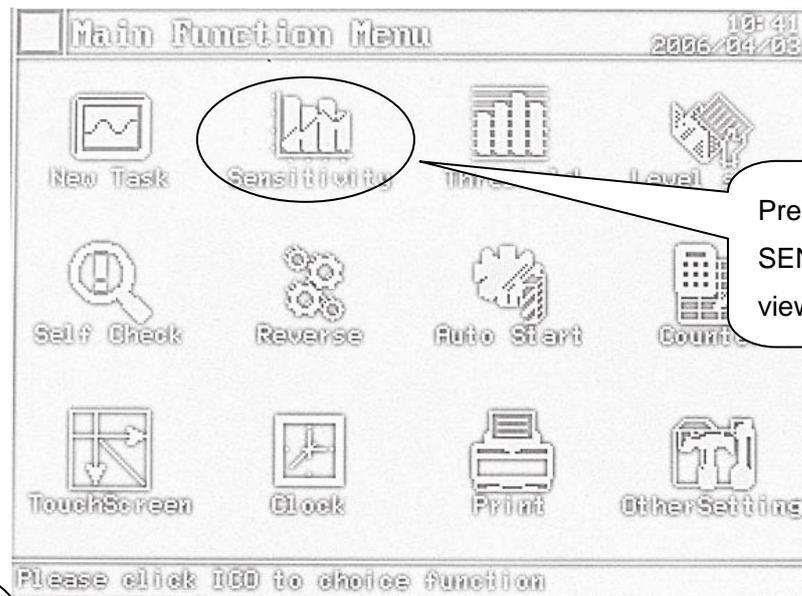
After pressing EXIT, the detection will end. All current data (TASK Err) will be reset to zero. However, the accumulative data (ORIG Err) will be saved. Accumulative data will only be reset manually by modifying in OTHER SETTING menu.

2.7. SENSITIVITY ADJUSTMENT

2.7.1. Setup Procedure

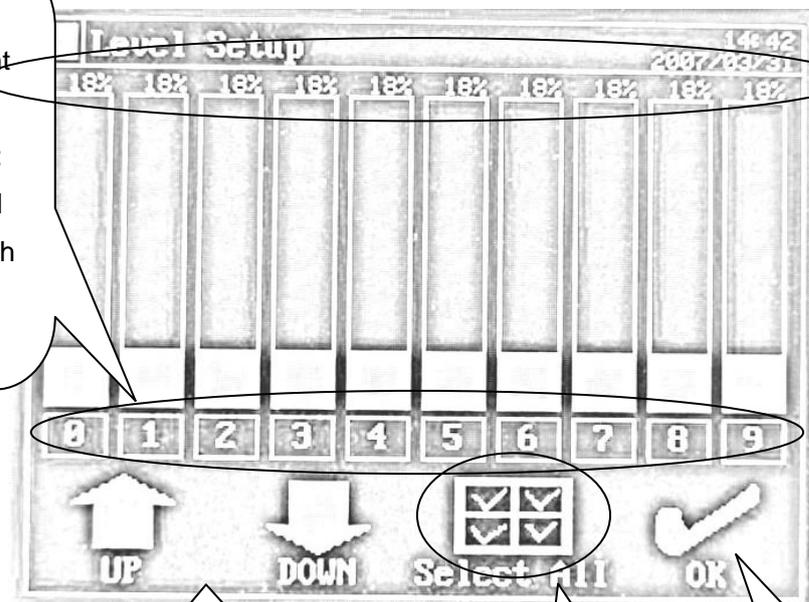
Startup → Select Language → Sensitivity

2.7.2. Display Description



Press
SENSITIVITY to
view sensitivity

Select individual channel for adjustment by pressing on the number 0 to 9. Note: it is not recommended to do so. Consult with your local agent for help.



Current sensitivity ratio setup of each detecting channel

After selecting, press UP / DOWN for adjustment.

Press SELECT ALL to highlight all channels.

Press OK to save and quit.

2.7.3. Operation Guidance

Press SENSITIVITY on the Main Function Menu to enter Sensitivity Setup Menu. Ten numbers (from 0 to 9) representing each sensor channel from left to right across the detection probe. Press SELECT ALL for choosing all channels for adjustment. Or simply press on the desired number for individual adjustment. After selecting the sensor number(s), press UP or DOWN to adjust the sensitivity ratio. More than one channel can be selected for adjustment if needed. Press OK to save and return to Main Function Menu.

2.7.4. Notes

Fine-tuning on each channel is to be conducted by user according to the specific need. Upper limit (= Threshold) of the sensitivity ratio adjustment is fixed. User can only lower the ratio (=sensitivity). Increasing the ratio (sensitivity) is not allowed. For example, if preset ratio is 76%, user can adjust between 1% and 76%, but 77% to 99% is not allowed. The higher the ratio, the higher the sensitivity.

- Preset ratio for 0.8mm is 92%
- Preset ratio for 1.0mm is 76%
- Preset ratio for 1.2mm is 58%

2.7.5. Caution

The sensitivity adjustment cannot exceed the preset THRESHOLD ratio. Threshold is selected from the Threshold Setup Menu.

2.8. ON-DEMAND SELF CHECK FUNCTION

On-Demand Self Check Function is different from Timer Self Test Function. On-Demand Self Check Function can be conducted at any moment in the day whenever desired. However, sensitivity test is not included in this On-Demand Self Check Function.

2.8.1. Setup Procedure

Startup → Select Language → Self Check → Start

2.8.2. Display Description

Main Function Menu (10:41, 2006/04/08)

Buttons: New Task, Sensitivity, Threshold, Level Study, Self Check, Reverse, Auto Start, Counter, TouchScreen, Clock, Print, OtherSetting.

Please click ICD to choice function

Self Test Function (10:52, 2006/04/08)

step 1: Environment Test [Progress bar] 56%

step 2: ConvayorBelt Test [Progress bar] %

Please Waiting, Self-Test running 000000

START button

ERR shows where the sensor is malfunctioning. The higher the percentage, the stronger the magnetic interference is present. 0% means normal.

Self Test Function (2006/04/08)

Test Result

Environment Test

Sensor0 : ERR	99%	Sensor5 : ERR	0%
Sensor1 : ERR	96%	Sensor6 : ERR	0%
Sensor2 : ERR	0%	Sensor7 : ERR	0%
Sensor3 : ERR	2%	Sensor8 : ERR	0%
Sensor4 : ERR	6%	Sensor9 : ERR	0%

START button, EXIT button

Self-Test finished

Press SELF CHECK here

Press START to begin SELF TEST

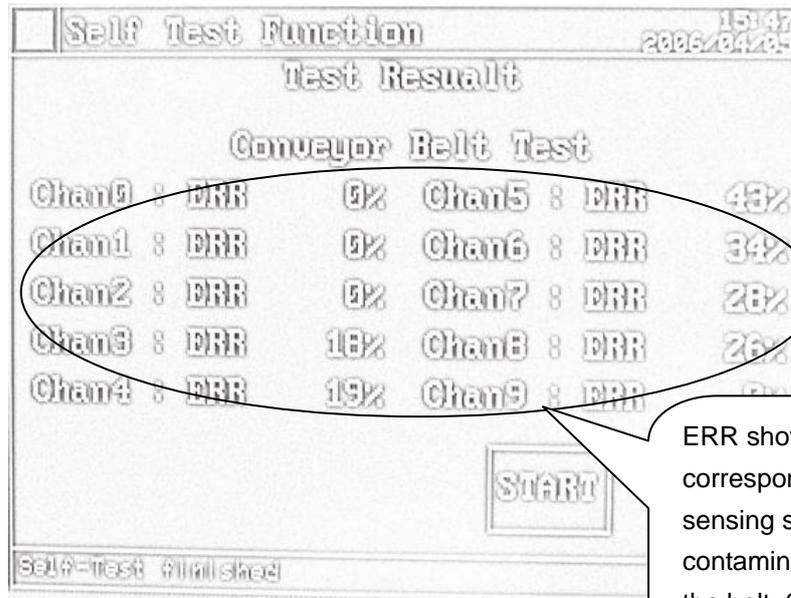
ERR shows where the sensor is malfunctioning. The higher the percentage, the stronger the magnetic interference is present. 0% means normal.

Environment Test >

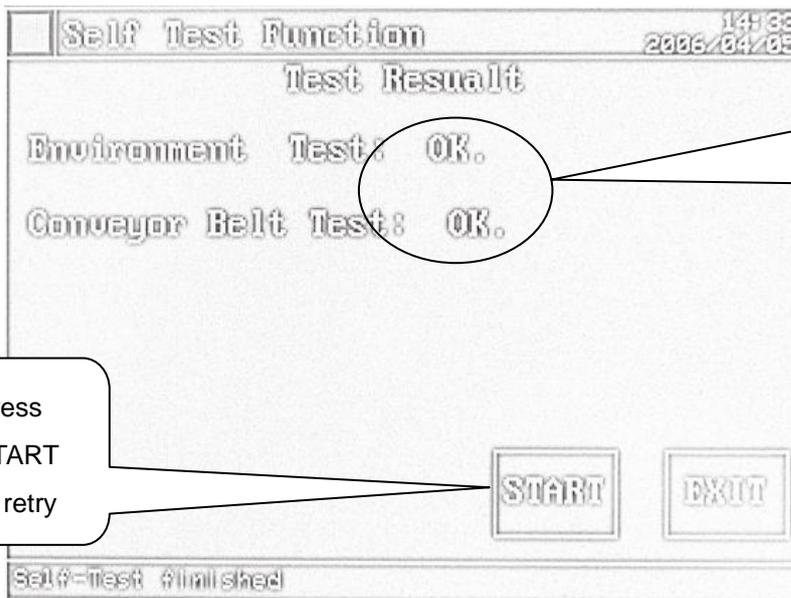
Press START to retry

Press EXIT to quit

Conveyor Belt Test >



ERR shows where the corresponding channel is sensing some metal contamination signal from the belt. 0% means normal.



Press START to retry

If SELF TEST passes, OK will appear.

Press EXIT to save and quit

2.8.3. Operation Guidance

Press SELF CHECK icon to enter Self Test Function. Press START to begin the tests. Press EXIT to quit.

2.8.4. Notes

This function is to test the environment (=ambient) interference as well as the potential metal contamination found on the conveying belt upon request. If the environment test fails in the first test, the second test will not begin. Test Result will be prompted to locate the problematic channel(s) if any. If the Auto Self Test Report

is activated (see PRINT function) already, report will be printed out automatically. If the first test passes, it will move on to the second test. Conveyor belt will begin to run automatically. If the second test fails, Test Result will be prompted to locate the problematic channel(s). Report can be printed.

2.8.5. Caution

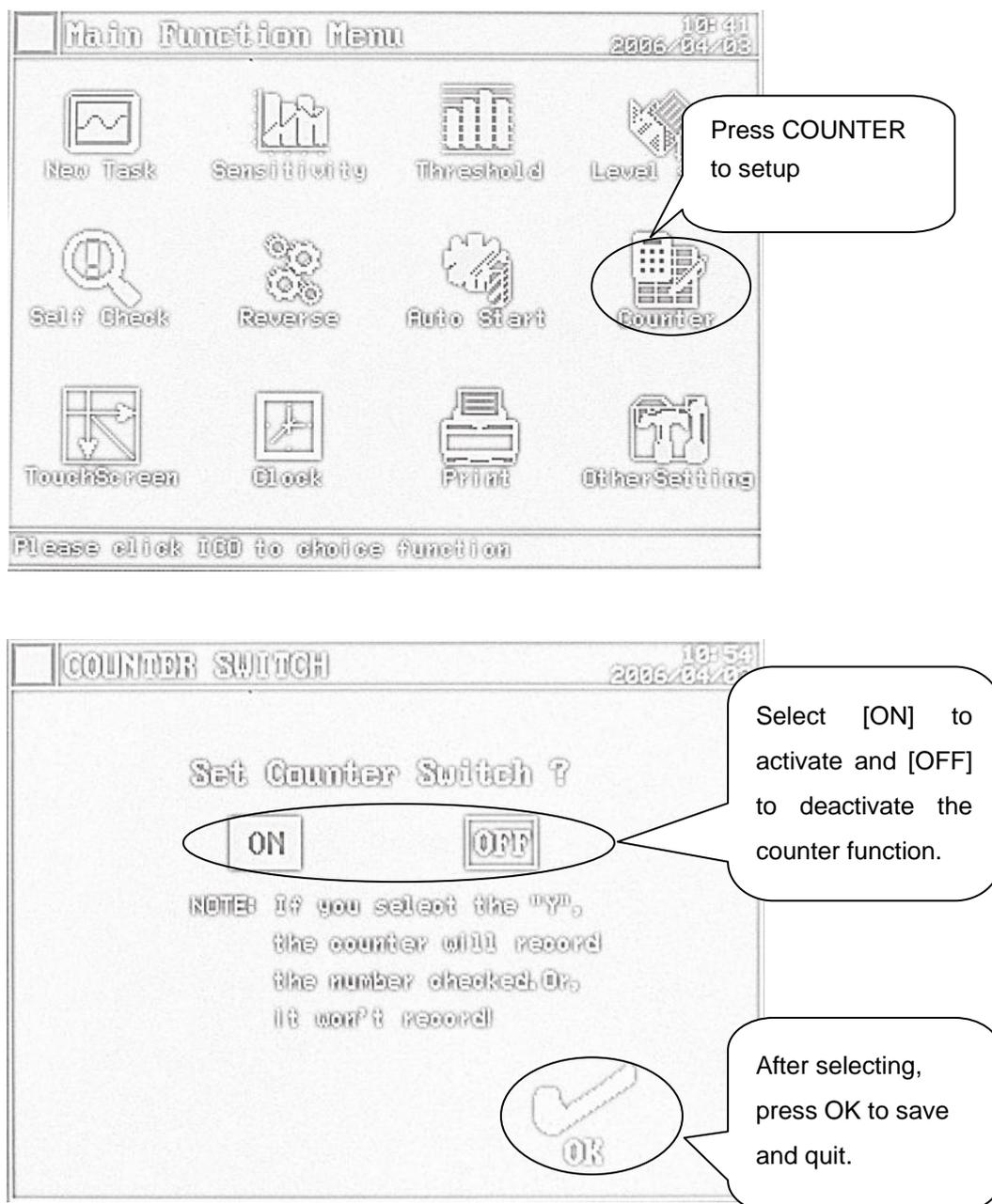
Prior to the test, the user shall clean the conveyor belt with a clean cloth and soapy water. Check if the machine is not placed on an uneven floor to cause tilting. In the course of detection, any moving metal around or near the machine will cause false alarm and should be kept away from.

2.9. COUNTER FUNCTION

2.9.1. Setup Procedure

Startup → Select Language → Counter

2.9.2. Display Description



2.9.3. Operation Guidance

Press COUNTER icon to enter Counter Switch Function. Press [ON] to activate the counter or [OFF] to deactivate the counter. After selecting, press OK to save the setting and quit.

2.9.4. Notes

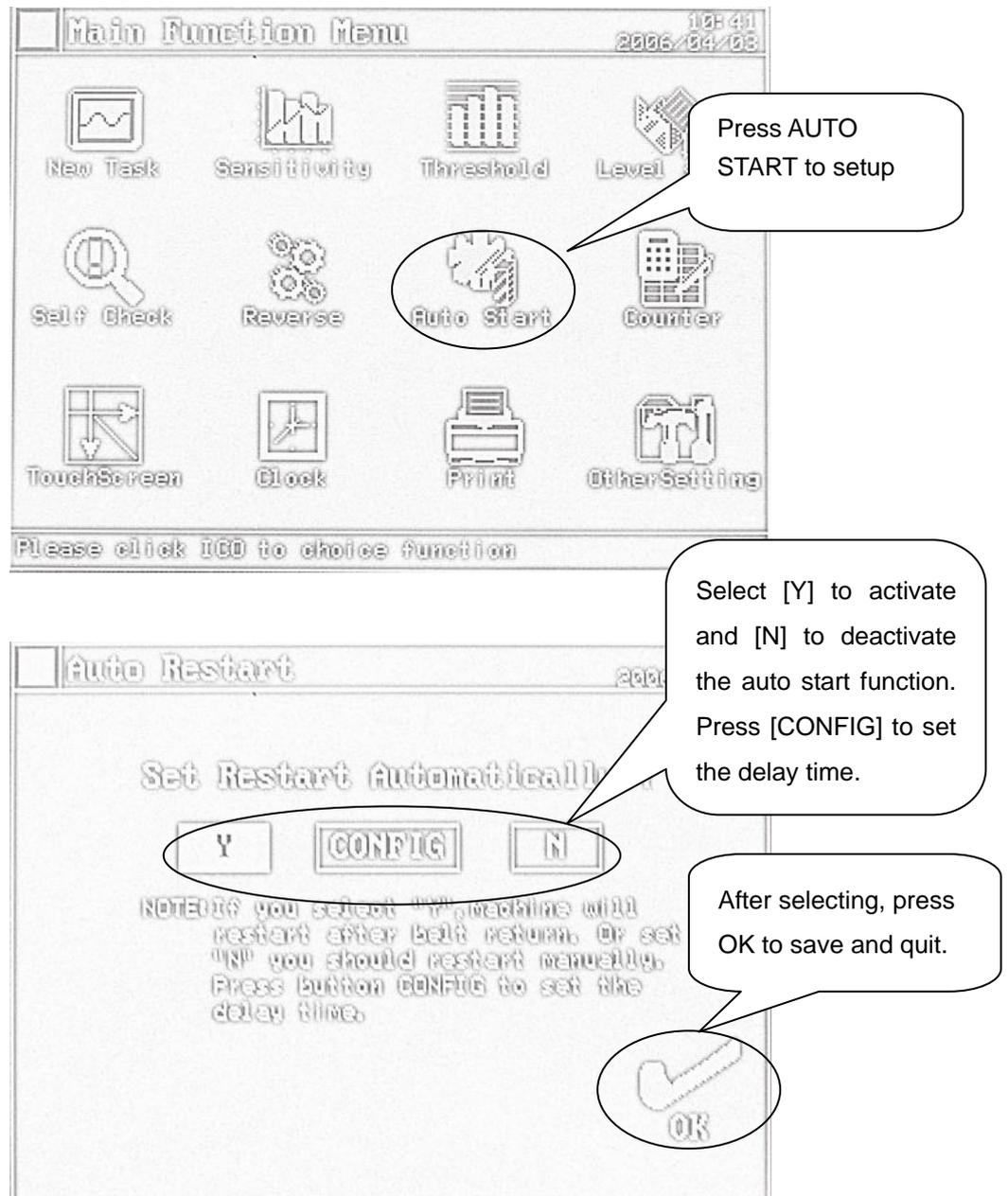
This function is to configure the counter setup. If counter function is activated, product count will function. Current and accumulative number of reject, pass and total will be counted. Report can be printed if needed (see PRINT function).

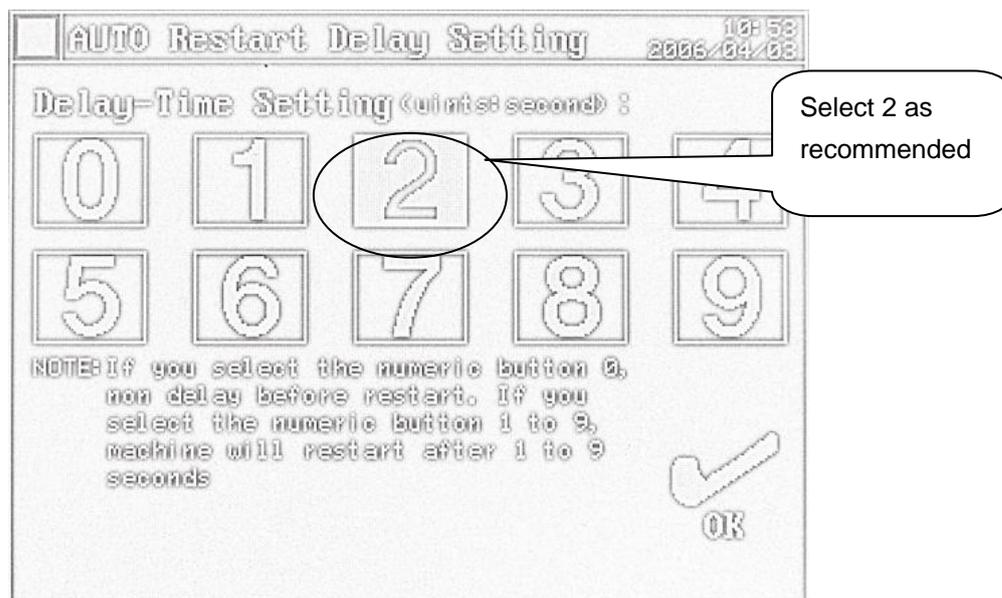
2.10. AUTO START FUNCTION

2.10.1. Setup Procedure

Startup → Select Language → Auto Start

2.10.2. Display Description





2.10.3. Operation Guidance

Press AUTO START icon to enter Auto Restart Function. Press [Y] to activate auto start or [N] to deactivate the auto start. Press [CONFIG] to set the delay time. 2 seconds delay time is the default. Press OK to save the setting and quit.

2.10.4. Notes

This function is to configure the auto start setup. If auto start function is activated, the conveyor belt will re-start automatically after 2 seconds when the buzzer sounds at each time. Delay time 2 seconds can be adjusted. Go to [CONFIG] if any adjustment. If auto start function is deactivated, the conveyor belt will not re-start until the operator presses [RUN] on the display to restart the conveyor belt.

2.10.5. Caution

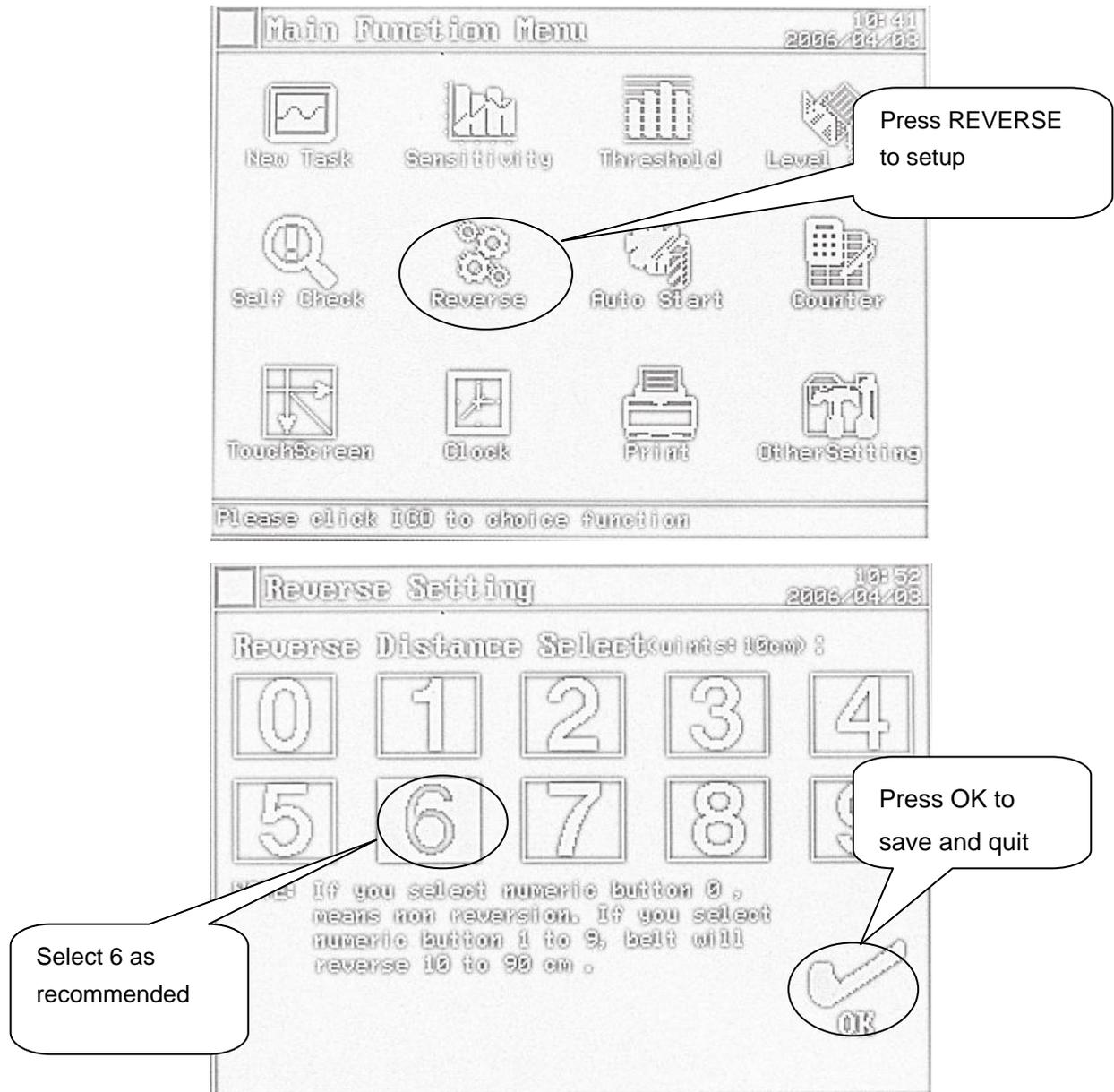
Delay time setting ranges from 0 to 9 seconds. 2 or 3 seconds is recommended.

2.11. RETRACT BELT FUNCTION

2.11.1. Setup Procedure

Startup → Select Language → Reverse

2.11.2. Display Description



2.11.3. Operation Guidance

Press REVERSE icon to configure Reverse setup. Retract distance setting ranges from 0 to 9 for selection. 6 (= 60cm) is recommended. After selecting, press OK to save the setting and quit.

2.11.4. Notes

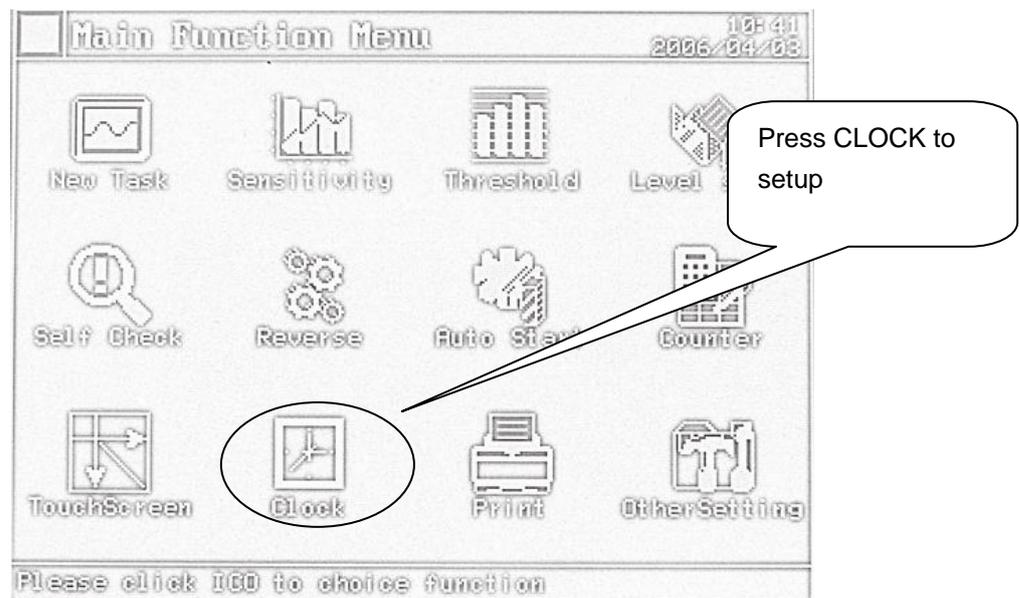
This function is to configure the retract belt setup. The retract distance ranges from 0 to 9, which means from 10cm to 90cm respectively. Selecting 0 means belt retract is OFF. If reverse setting is set at 6 as default, when the buzzer sounds in the course of detection, the conveyor belt will stop then retract automatically for 60cm from the detection probe. If reverse setting is set at 0 (= deactivated), when the buzzer sounds in the course of detection, the conveyor belt will stop but will not retract.

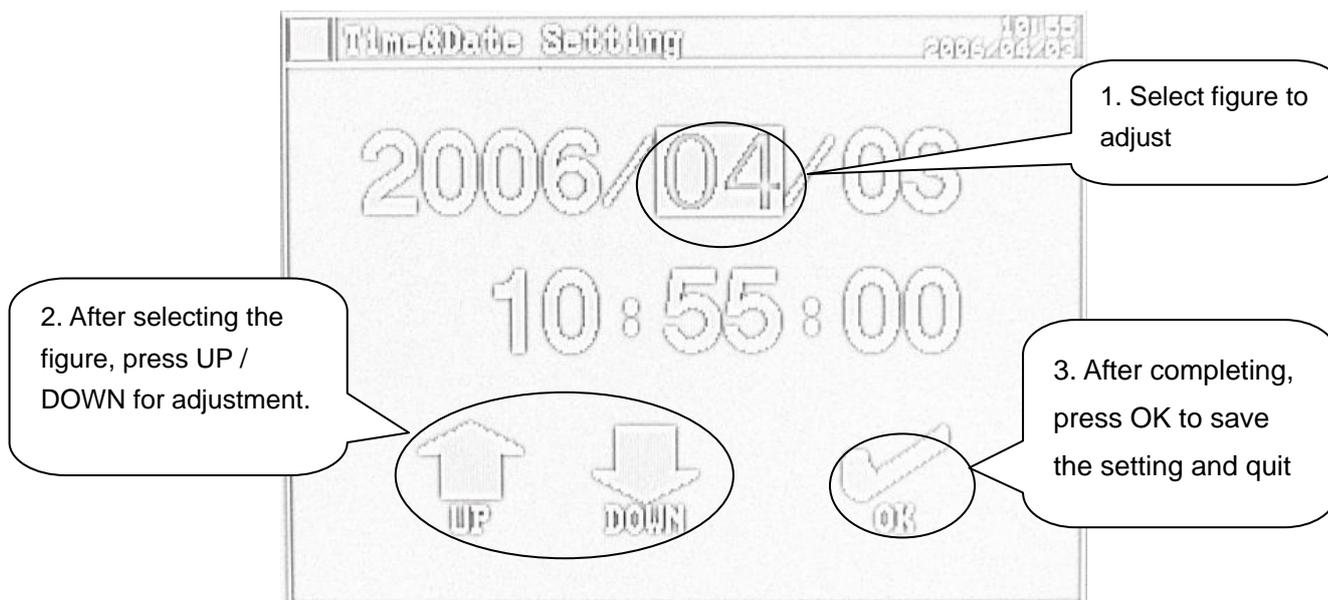
2.12. CLOCK & DATE FUNCTION

2.12.1. Setup Procedure

Startup → Select Language → Clock

2.12.2. Display Description





2.12.3. Operation Guidance

Press CLOCK icon to configure Time & Date setup. The date format is in YYYY/MM/DD (= year/month/day) and MM:SS (= minute: second). Select the time or date first, then press UP or DOWN until desired setting. After completion, press OK to save the setting and quit.

2.12.4. Notes

This function is to configure the date and time of the system. This time and date information will appear on all printed reports systematically.

2.12.5. Caution

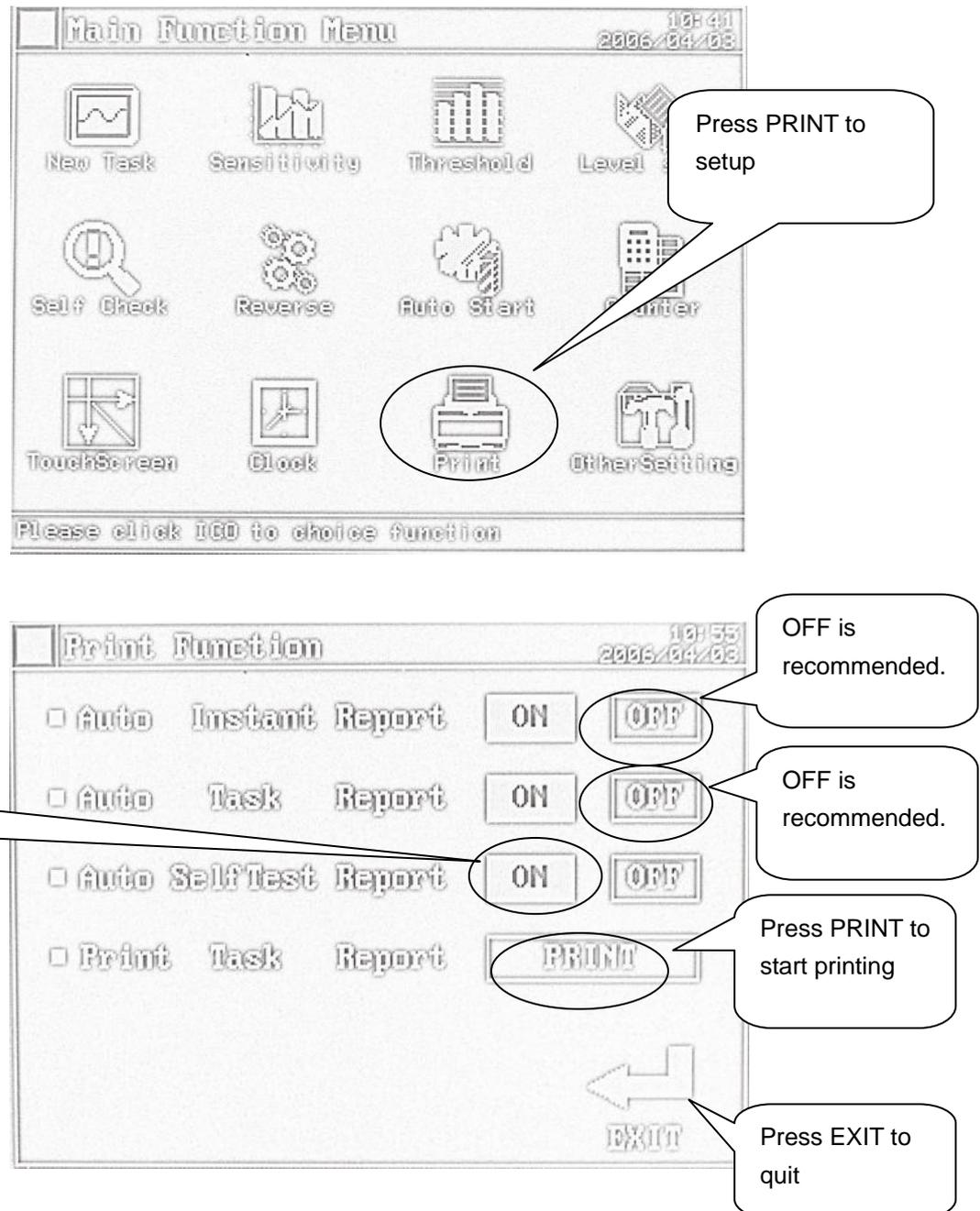
If the system time appears inaccurate repeatedly over time, check or replace the battery.

2.13. PRINT FUNCTION

2.13.1. Setup Procedure

Startup → **Select Language** → **Print**

2.13.2. Display Description



2.13.3. Operation Guidance

Press PRINT icon to enter Print Function. Press PRINT to begin printing.

Other settings are at user's own choice.

- If Auto Instant Report is selected ON, a print report will be produced automatically each time when the buzzer sounds. OFF is recommended.
- If Auto Task Report is selected ON, a print report will be produced automatically each time when EXITING a NEW TASK. OFF is recommended.
- If Auto Self Test Report is selected ON, a print report will be produced automatically each time when a SELF TEST is completed. ON is recommended.

2.13.4. Notes

This function is to configure the PRINT setup. If OFF is selected for Auto Instant Report, Auto Task Report and Auto Self Test Report, no print report will be produced automatically. Nonetheless, report can always be produced manually. When pressing PRINT under Print Function Menu, current task statistics will be printed.

2.13.5. Caution

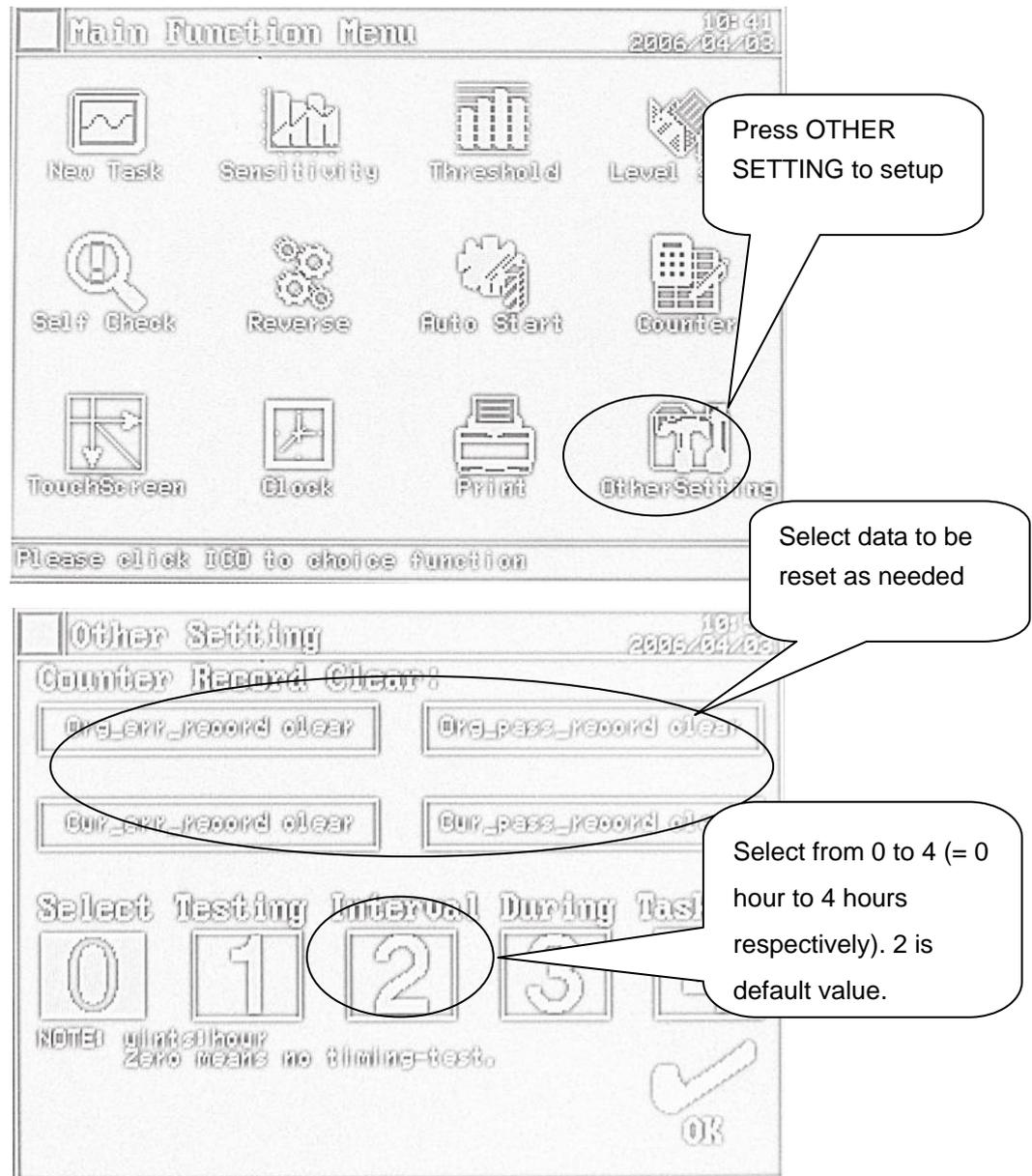
If Auto Instant Report is activated, reports will be produced repeatedly when every time the buzzer sounds. More print paper will be consumed in this case. Thus, the operator should set up the print function according to needs.

2.14. OTHER SETTING FUNCTION

2.14.1. Setup Procedure

Startup → Select Language → Other Setting

2.14.2. Display Description



2.14.3. Operation Guidance

Press OTHER SETTING icon to enter Other Setting menu. Current data and accumulative data can be reset to zero at the operator's own choice if needed. The time interval can be modified by selecting from 0 to 4, which means from 0 hour to 4 hours. Default setting is 2.

2.14.4. Notes

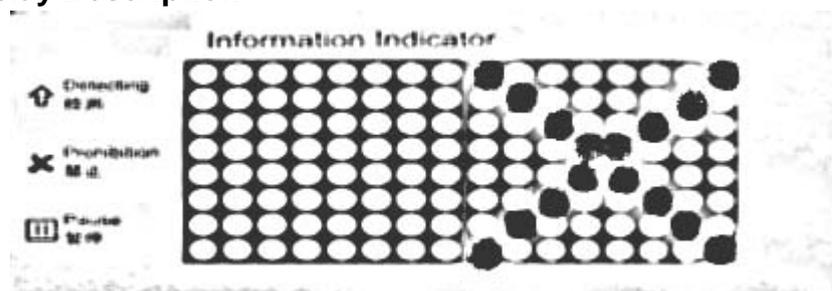
This function is to configure the product count setup and the time interval for timer self test. Select 0 for time interval to deactivate timer self check if any. Other value from 1 to 4 is to activate the timer self test function. For instance, if 2 is selected, the machine will perform a self test every two hours (i.e., actual motor-run time) automatically. See SELF TEST function.

2.14.5. Caution

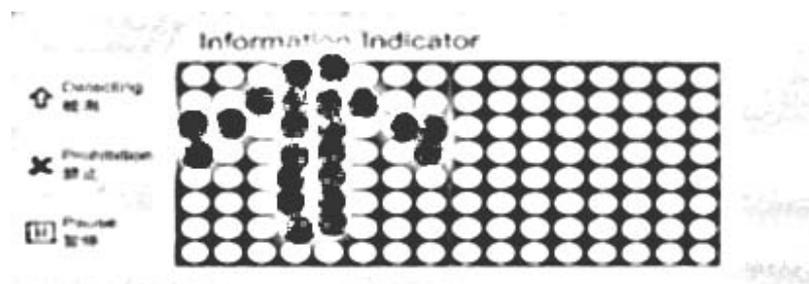
Timer interval should not be set at 0 for safety reason because every machine should be calibrated at a regular hourly basis to check if the detection ability is normal at all times.

2.15. PROBE INDICATOR

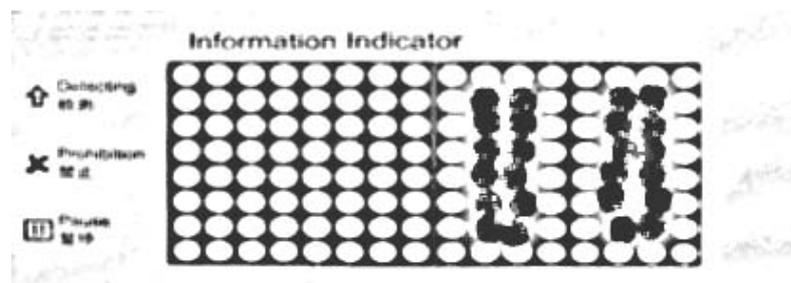
2.15.1. Display Description



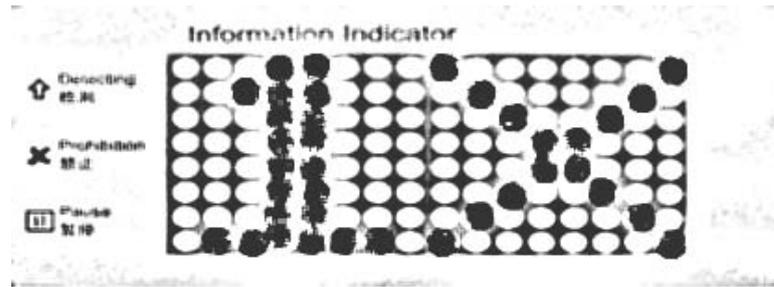
No product should be tested when a cross × sign appears.



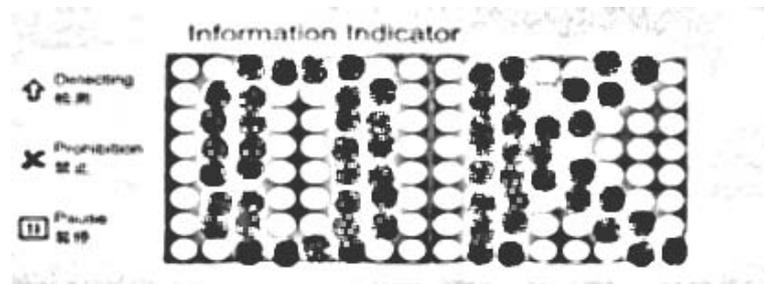
Product can be tested when an arrow ↑ sign appears.



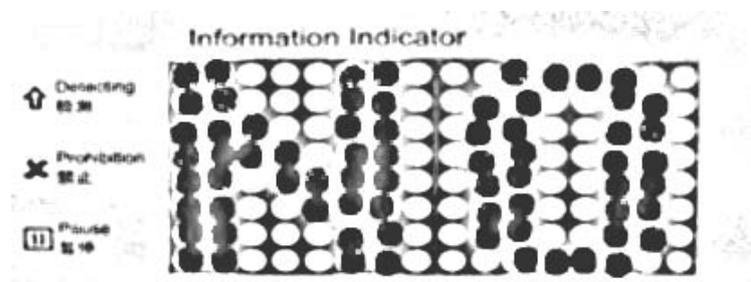
No product should be tested when a pause || sign appears.



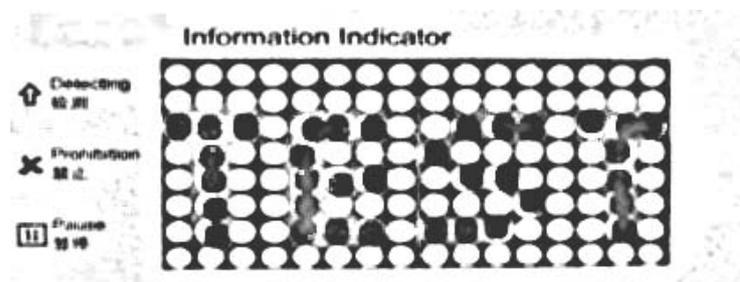
During detection process, a numeric 1X sign appears when the buzzer sounds. The digit shows the current location of detection channel ranging from 0 to 9 (from left to right across the detection probe). For instance, 1X means channel #1 is alerting. This means the metal contamination is likely to be located at channel #1, likewise for other digits.



OK sign appears every time when SELF TEST or TIMER SELF TEST passes.



NO sign appears every time when SELF TEST or TIMER SELF TEST fails.



TEST sign appears when TIMER SELF TEST is to begin. Simultaneously, the buzzer will sound and conveyor belt will stop. Operator will be prompted to activate the TIMER SELF TEST if desired by pressing YES to begin.

2.15.2. Notes

This function is to provide a clear visual signal to the operator for action to be taken.

2.15.3. Caution

When ✕ sign appears, operator must stop detection task.

3. ADVANCED OPERATIONS

3.1. TOUCH SCREEN CALIBRATION

3.1.1. Setup Procedure

Startup → Select Language → Touch Screen

3.1.2. Display Description

Press TOUCH SCREEN to setup

Main Function Menu
10:41
2006/04/03

New Task Sensitivity Threshold Level Study
Self Check Reverse Auto Start Counter
TouchScreen Clock Print OtherSetting

Please click ICD to choice function

Operator should click precisely on the + sign on the screen by using the stylus. After clicking three times on the + signs, a □ will appear, click on this □ to save the setting and quit.

3.1.3. Operation Guidance

Press TOUCHSCREEN icon to calibrate the touch screen setup. On the calibration display, a + sign will appear on the top left corner. Operator should click on this + sign to move onto next +. Three + will appear in total. An □ sign will appear after three + signs. Click on the □ sign to save the setting and quit. This calibration process will repeat if unsuccessful.

3.1.4. Notes

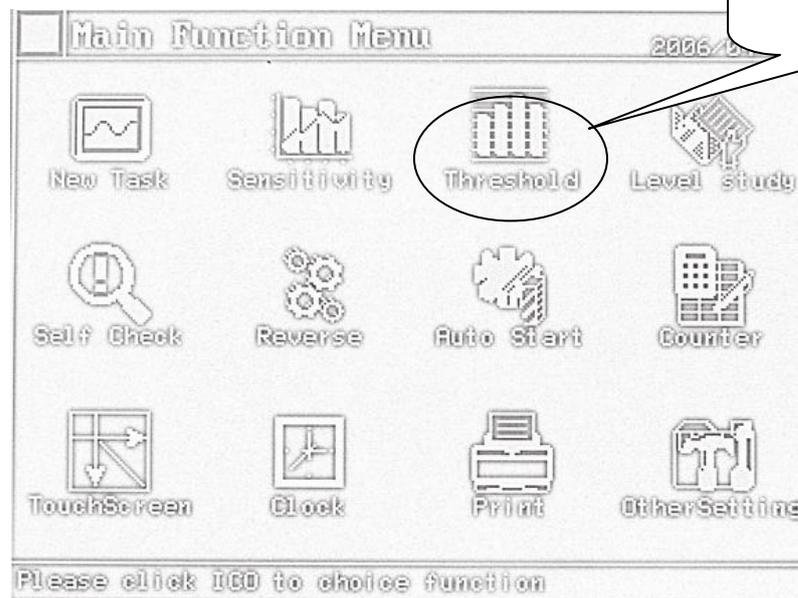
This function is to calibrate the touch screen functionality. This calibration will only be conducted when LCD screen appears malfunctioning or misplaced.

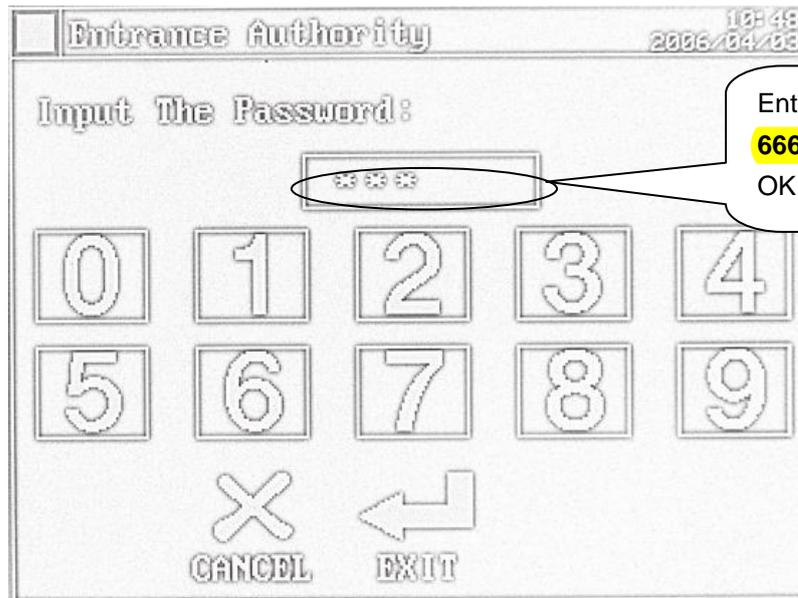
3.2. THRESHOLD ADJUSTMENT

3.2.1. Setup Procedure

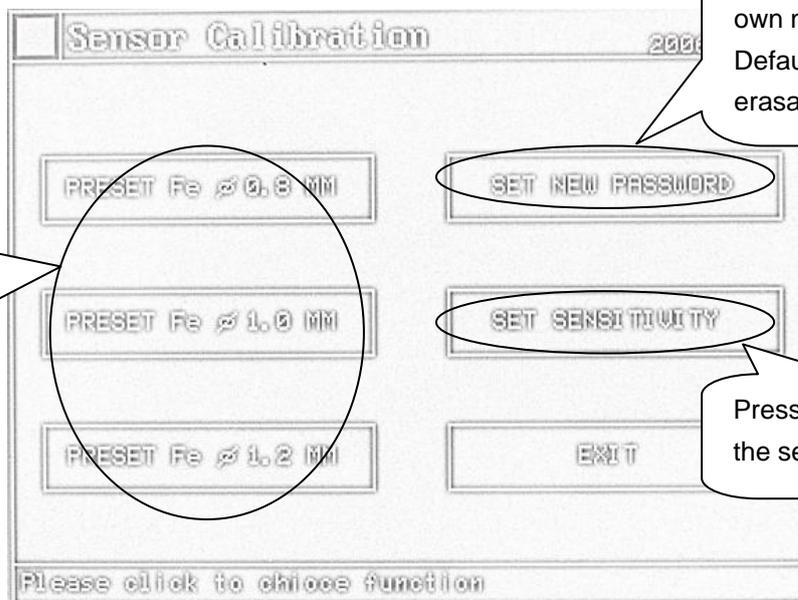
Startup → Select Language → Threshold →
 → Enter password → Select sensitivity

3.2.2. Display Description





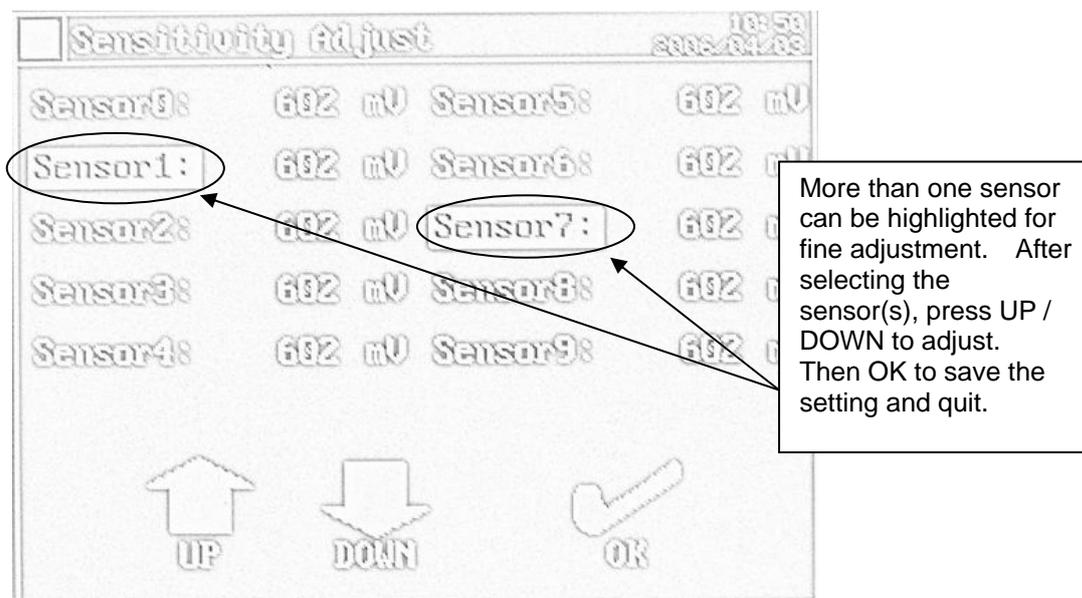
Enter default password **666666**. Then press OK to select sensitivity.



Three preset settings for user's own selection. **1.0mm is the default.**

Press here to set user's own new password. Default password is not erasable.

Press here to fine-tune the sensitivity level.



3.2.3. Operation Guidance

- Press THRESHOLD icon to configure the SENSITIVITY setup. Enter password when requested. Default password is **666666**. Three preset sensitivity (1) 0.8mm; (2) 1.0mm & (3) 1.2mm is available for selection.
- Press SET SENSITIVITY to setup your own sensitivity if other than preset settings is desired. Highlight the required sensors before adjusting. After highlighting, press UP to raise the **mV** value or DOWN to lower the **mV** value. Be aware that the lower the mV value, the higher the sensitivity or vice versa.

3.2.4. Notes

This function is to setup the sensitivity for detection. Sensitivity adjustment is password protected to avoid authorized access to this setup.

3.2.5. Caution

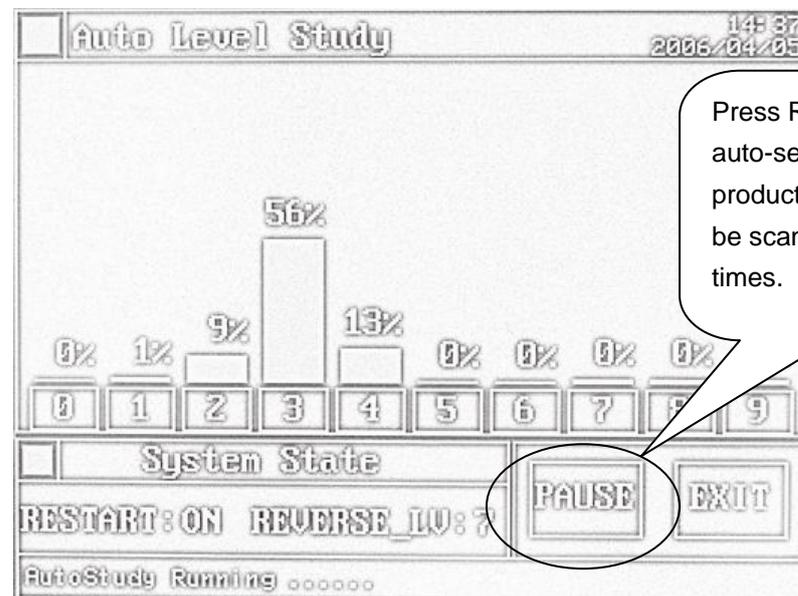
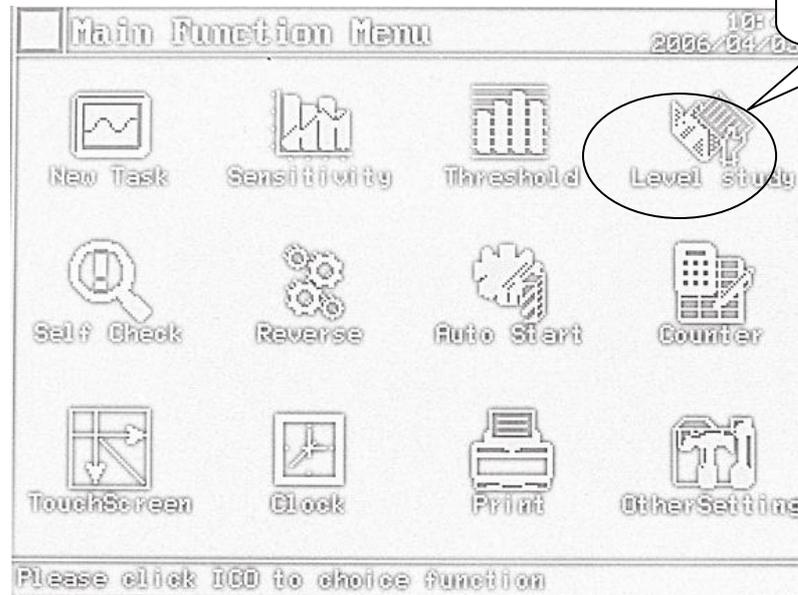
New password must be kept in a safe place. If new password is lost or forgotten, use default password **666666** to enter the sensitivity setup. Be aware that if wrong password is entered three times, the system will be locked and cannot function at all. Machine will be restarted.

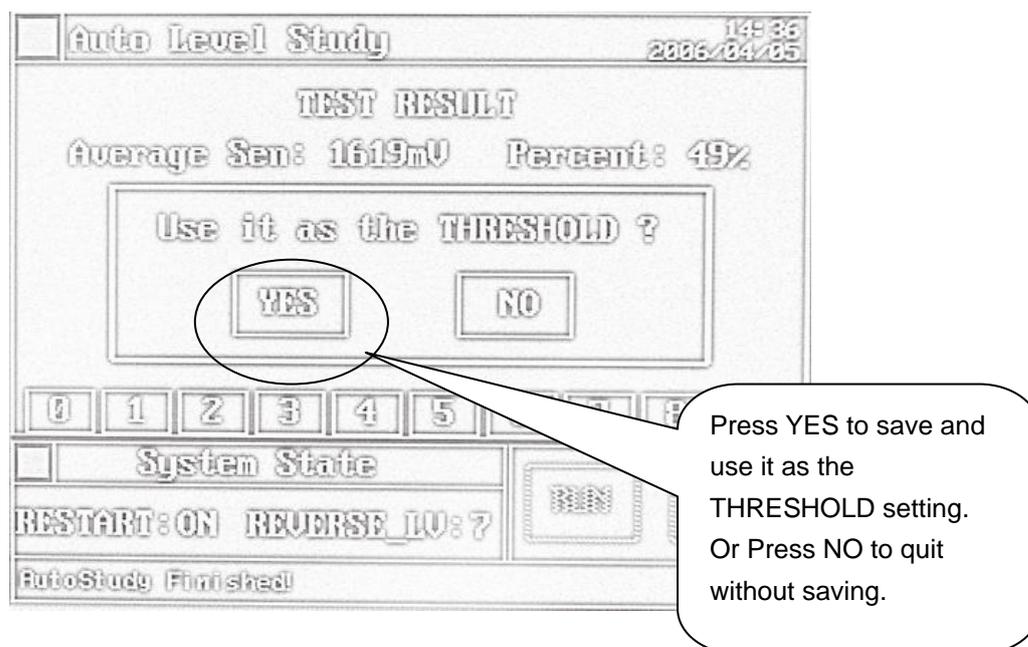
3.3. PRODUCT SENSITIVITY AUTO-SETUP

3.3.1. Setup Procedure

Startup → Select Language → Level Study

3.3.2. Display Description





3.3.3. Operation Guidance

- Press LEVEL STUDY icon to access to PRODUCT SENSITIVITY auto-setup.
- Press RUN to start conveyor.
- Put the product onto conveyor belt.
- Conveyor belt will run and retract as the product will be scanned three times automatically.
- In the course of scanning, product signal will be prompted each time.
- After three times of scanning, average signal will be prompted like Use it as the THRESHOLD. Press YES to accept the TEST RESULT and return to main function menu. Press NO to reject the TEST RESULT and re-do the test if necessary.

3.3.4. Notes

This function is to setup the sensitivity for detection automatically. In case if the product has inherent metal contamination, which is equivalent or over 1.2mm ferrous signal, the auto-setup will fail as the scanned signal is too high.

3.3.5. Caution

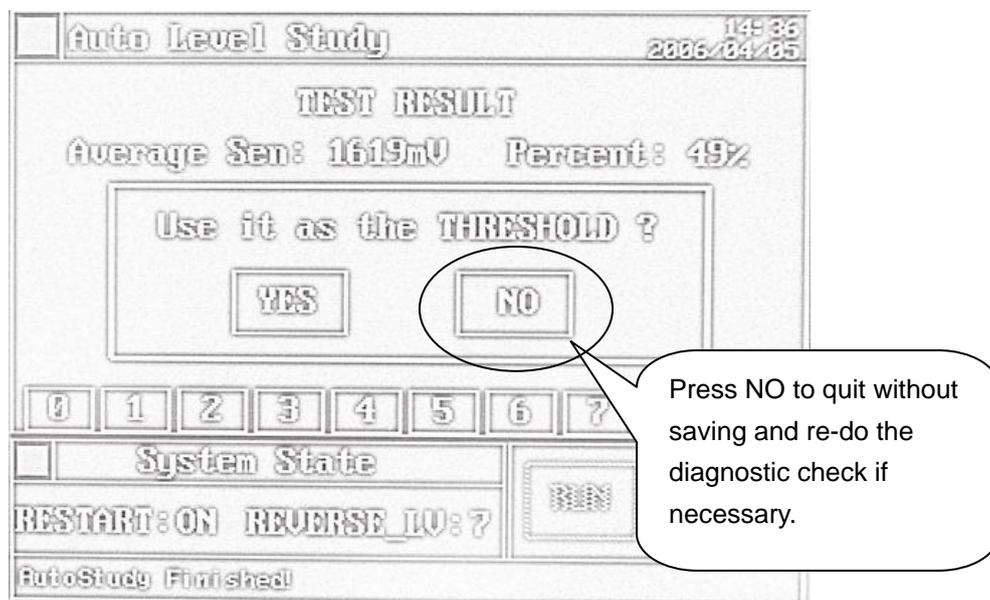
The scanned product **must be at least 2cm in height.** For example, if the scanned product is of zipper or button, etc. If so, a plastic tray can be of help. Put the scanned product onto the plastic tray before scanning if needed. Otherwise, the auto-setup will fail.

3.3.6. PRODUCT DIAGNOSTIC SCAN

Not only this auto-setup function is to setup the sensitivity automatically, but also it can be used to perform the diagnostic check for products or other trimmings (e.g. buckles, zippers, button, hangtag, etc.)

3.3.6.1. Operation Guidance

- Press LEVEL STUDY icon to access to PRODUCT SENSITIVITY auto-setup.
- Press RUN to start conveyor.
- Put the product or trimmings onto the conveyor belt to be scanned
- Conveyor belt will run and retract as the product will be scanned.
- In the course of scanning, product ferrous signal will be prompted each time. Bar graph will be shown. **The higher the percentage, the higher the ferrous signal.**
- After three times of scanning, average signal will be prompted like Use it as the THRESHOLD. Press NO to reject the TEST RESULT and re-do the diagnostic check if necessary.
- Note: Do NOT press YES or the sensitivity setting will be altered and stored.



3.3.6.2. Notes

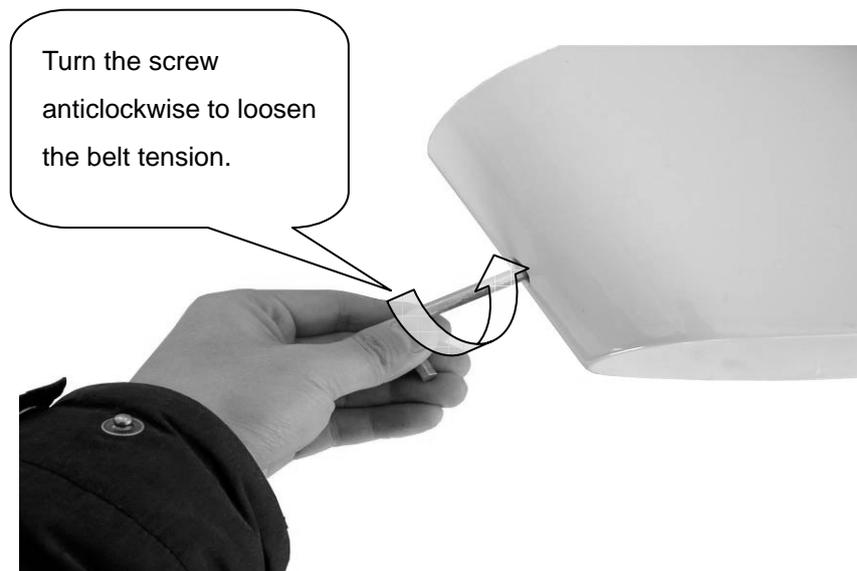
Under this function, products or trimmings will be scanned as its ferrous signal will be prompted each time in the bar graph display. Ferrous-free products are likely to have less than 5% scanned signal. If the scanned signal is over 50%, it is likely to cause detection difficulty. If the scanned signal is below 10%, it is regarded detector-friendly product. If the scanned signal is over 99%, it is regarded rejected item or simply it contains too much ferrous and should not be used for needle detection at all.

4. MAINTENANCE

4.1. CONVEYOR BELT ADJUSTMENT

4.1.1. Operation Guidance

- In case of *deviation* of the conveying belt, adjust the screw (see below picture) by using an Allen key as seen in below picture. The screws are located on the infeed side of conveyor, where the operator places the product onto the conveyor for detection. If the belt deviates toward right, tighten the right screw clockwise (or *slightly loosen the left screw*) for a half-turn (180°). If the belt still cannot return to the center, adjust the screw clockwise for another half-turn (180°). ***Be noted that when the front and the back rollers are parallel to each other, the belt will tend to deviate or move towards the loose side.***
- In case if the conveyor belt appears curvy or uneven, the belt should be loosened slightly.



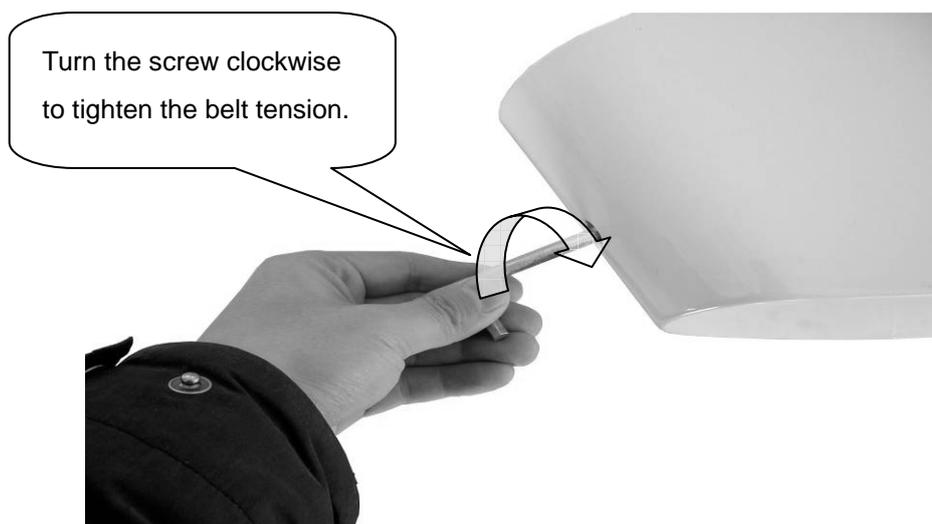


Fig. 5 Conveyor Belt Adjustment

4.2. SAFETY NOTES

4.2.1. Important Safety Notes

The following safety measures shall be taken for the machine operation to reduce the risks of fire accident, electric shock or human injury.

1. Read and understand all notes.
2. Operate in accordance with alarms and notes on the machine.
3. Disconnect the machine power before cleaning. Do not use liquid or spray cleaner. Use wet cloth with or without soapy liquid / detergent.
4. Keep the machine away from water.
5. The machine must be laid on the floor horizontally to avoid potential damage or human injury.
6. Machine working environment must be ventilated. Avoid over-heating of the machine. Keep the machine away from radiator or non-ventilating position.
7. Power supply voltage must comply with the machine. If any doubt, contact your local dealer or power supply bureau.
8. Grounding of the machine is imperative to avoid risks of damage or human injury. The machine is equipped with a standard plug having grounding function. User must use sockets with grounding. Other plugs or sockets without grounding will void the warranty of the machine.
9. No pressing on the power cable. Installation position of the machine shall ensure no trample on the power cable and no stumble against humans.
10. Never overload the wall socket or the extension cable to avoid possible fire accident / electric shock.
11. Do not insert any object or any part of the body into the machine to avoid machine

- failure or working accident.
12. Never remove the machine in case of electric shock. When inspection is required, please contact local dealer or after-sales service center. Removal or takedown of the enclosure may cause danger if you touch the voltage or other dangerous parts. Incorrect re-assembly may cause machine failure or electric shock accident.
 13. Disconnect the plug and contact local dealer and after-sales service center when the following circumstances happen:
 - a) When the power cable or plug are damaged or worn;
 - b) When liquid is sprayed in the machine;
 - c) When the liquid undergoes rain or water;
 - d) When the machine undergoes high temperature or fire accident;
 - e) The machine fails to work even when the operation procedure is according to the user manual;
 - f) When the machine has fallen or the machine is damaged;
 - g) Dramatic change of the machine performance during operation.
 14. Avoid operating the machine under lightning; otherwise, it may be damaged.



4.3. OTHER PRECAUTIONS

- Keep the machine away from electric appliance that may produce magnetic interference, e.g. electric welding machine, transducer, etc.
- Keep the machine away from dust, high temperature and vibration.
- Never expose the machine directly under sunlight.
- Never pile heavy articles on the machine.
- Never use wet hands to touch the plug.
- It is suggested that exclusive stylus pen should be used to operate the touch-screen and avoid use sharp article to touch the screen.
- Test the machine with a standard ferrous test piece before use. The machine buzzer will sound and the belt will stop under normal operation.
- The machine can detect ferrous metal and / or product with iron content.

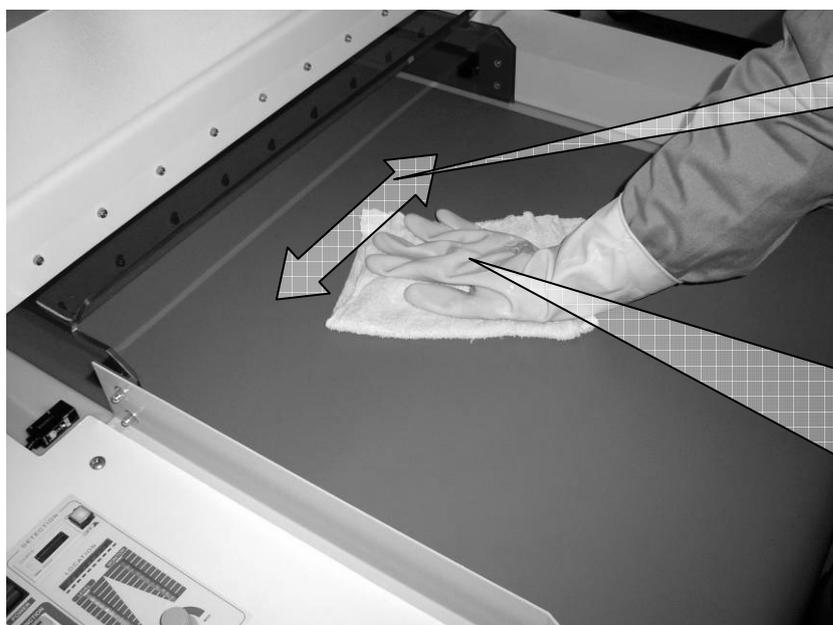
However, non-ferrous items such as aluminum, copper, etc. will not be detected.

- The machine will react to the moving metals. So, operator shall not wear metal ornamental article in the course of machine operation.

4.4. ROUTINE MAINTENANCE

- Keep the conveyor belt clean and dust-free and metal-free at all times. Check if any broken needles, rust, iron filings, small iron puncture, metal fragment, oil stains, etc, are found on the conveyor belt on a regular basis. Clean the belt with a wet cloth with non-abrasive detergent or soapy water.
- Make sure no metal fragments are kept inside the aperture to avoid metal disturbance.

Guidance for cleaning the belt



Clean the belt horizontally

When using cleaner or rust remover, operator must wear protective gloves. Do not touch directly the liquid with hands to avoid skin injury



When cleaning, the cloth must pass across the belt from one side to another. In addition, the cloth must move up and down, right and left. During cleaning, power must be off.

Fig. 6 Cleaning of Conveyor Belt

4.5. TROUBLESHOOTING

Problem	Possible reason(s)	Solutions
Machine failure	• No power supply	• Check the mains, the socket, the plug, the cable connection.
	• Fuse is blown	• Replace 10A fuse (inside the control box)
	• Power switch failure	• Replace this type of switch
Conveyor belt failure	• The belt is too loose	• Tighten the screw slightly
	• Electric wire is loose	• Check the wire connection
	• Relay is damaged	• Check the socket cable or replace the relay
	• Driving plate is damaged	• Replace the driving plate
	• belt is deviating	• For deviating towards right, tighten the right screw clockwise or slightly loosen the left screw for half circle of the infeed side. If the belt still is not returning to the center, adjust the screw clockwise for another half-circle or vice versa.
	• Belt is curled	• Adjust the belt • Loosen the belt. • Note: Slight deviation will not affect the operation since guard ring for the belt is mounted on the support axle.
	• The belt is metal contaminated.	• Clean the belt thoroughly in and out • Replace the belt when necessary
False alarm	• Interference around the machine	• Remove all potential interference or keep away from interference source • Relocate the machine or change the machine orientation.
	• The machine is not installed properly	• Check the machine bolt on the floor. Machine must be laid horizontally on the solid floor.
	• Sensitivity too high	• Lower the sensitivity accordingly.
	• Roller bearing is carrying magnetic signal	• Replace new bearing

Trouble	Possible reason(s)	Trouble-shooting
Detection failure	<ul style="list-style-type: none"> • Sensitivity setting is too low • Strong magnetic interference on power supply 	<ul style="list-style-type: none"> • Increase the sensitivity accordingly. • Remove interference from the machine. • Check power cable connection to ensure the wiring position inside the plug is correct. Check grounding cable. • Relocate the machine.
Counter failure	<ul style="list-style-type: none"> • Tested products are too thin or too low to activate the infrared sensor (less than 2 cm) • Tested products are translucent or transparent • Photo-sensor emitting signal is not received properly • Photo-sensor emitter is damaged 	<ul style="list-style-type: none"> • Fold the tested product • Add more pieces together for detection so that the height reaches the counting sensor. • Deactivate the counter function • Adjust the direction of the sensor • Replace the sensor
Other troubles		<ul style="list-style-type: none"> • Refer to the user manual instruction • Contact your local dealer or after-sales service provider

4.6. SPECIFICATIONS

4.6.1. DETECTION STANDARD

Aperture height	Detection sensitivity	Remarks
100 mm	Ferrous sphere \varnothing 0.8 mm	Standard
120 mm	Ferrous sphere \varnothing 1.0 mm	Customized
150 mm	Ferrous sphere \varnothing 1.2-1.5 mm	Customized
200 mm	Ferrous sphere \varnothing 1.5-2.0 mm	Customized

4.6.2. MACHINE PARAMETERS

1. Power source: AC 100V - 240V \pm 10% (single phase); 50-60 Hz.
2. Standard motor AC220V/50Hz will be supplied unless otherwise requested when ordering.
3. Power consumption: 140W approximately
4. Aperture width: 650 mm
5. Belt speed: 32m/min (50 Hz) or 40m/min (60 Hz)
6. Detection method: magnetic induction
7. Detection sensitivity: ferrous sphere \varnothing 0.8 mm (MAX)
8. Alarm method: buzzer, LED indicator
9. Machine dimensions: 1,650 mm(L) \times 1100 mm(w) \times 900 mm(H)
10. Net weight: 220 Kg

4.6.3. TAILOR-MADE APERTURE SIZE

Tailor-made aperture size is available at production. Available aperture height ranging from **80 to 300mm** and aperture width ranging from **650 to 2000mm** can be manufactured upon buyer's request when ordering. It is subject to manufacturer's final confirmation.

Note:

The above specification or parameters are based on the standard test condition. The sensitivity can be affected by inherent product (e.g. trimmings) and workplace condition. We bear no responsibility in case of metal chips found during metal detection process.

4.7. CONTACT US

4.7.1. HEAD OFFICE

HCL ASIA LTD.

Unit 14, 6/F., Worldwide Industrial Centre,

43-47 Shan Mei Street, Fotan, Shatin, Hong Kong

Tel: +852 27420018 Fax: +852 27420053

Email: info@hcl-asia.com.hk www.hcl-asia.com.hk

4.7.2. LOCAL AGENT

