X ray Baggage Scanner
Model: AT5030C, AT6550, AT8065, AT10080, AT100100

USER MANUAL

Contents

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Preface

Giving a security check for the passengers' luggage in important passageway (such as airport, port, station, customs etc.) has become the welcome security measures internationally since 1970s. From 1980s, with the development of economy and the increase of people's living standards, working outside, sightseeing, study & communication are becoming more and more popular. To ensure the safety of passenger during the journey, traffic ports around the country start to forbid passengers carrying dangerous articles that are flammable and explosive on the vehicle. In the recent years, many conflicts become acute in the world, such as unequal status of country, serious polarization between the bourgeoisie and the proletariat, hegemonies, and nationalism movement after the cold war, which result in all kinds of frequent terrorist attacks around the world. In order to achieve their goals and enlarge the influence, some terrorists attack the airplanes and cars, causing great property loss and death. If dangerous articles in luggage are detected before getting on the vehicle, such incident may be avoided. Therefore, how to check the passengers' luggage in a simple and effective way is becoming very important for the safety of visitors and their properties.

X-ray Baggage Scanner is universally used nowadays in all kinds of security checks. Our X Ray Baggage Scanner, our machines take advantage of the X-ray penetration capability to realize the quick check for the luggage and articles without unpacking.

Our machines' X Ray Baggage Scanner is an advanced X-ray image detecting system. The system integrates the advantages of high-performance semiconductor detector, digital image processing technology, and computer image display, and provides users with reliable quality images. You can store as many high-resolution images as you like depending on the HD capacity. With reliable auto-alarm for dangerous articles and automatic error detection & maintenance, as well as the simple and personalized design of operation, the users can operate it more conveniently.

Because our machines' X Ray Baggage Scanner demands low dose of X-ray in a check, and the X-ray leakage is 0.16μGy/h, far lower than the international standard 5μGy/h, which is safe. Therefore, the device is safe to the operators, passengers and their commercial film.

The user manual contains the important information for safety use of machines X Ray Baggage Scanner. Read the user manual provided by the manufacturer carefully before using the device.

The update speed cannot follow that of the software, if there is difference with the present version, please understand. Only persons passed the train of radiation safety and system operation can operate the machines' X Ray Baggage Scanner. To avoid the radiation, please abide by the rules for radiation safety in any time.

In November, 2012

Chapter I. System Principle and Technical Data

1.1 Operating principle

Our machines' X-ray Baggage Scanner completes the check by sending the luggage to the crawler tunnel with the conveyer. Block the light barrier after the luggage have been sent to the tunnel, and then the detection signal is sent to control module to trigger X-ray source for generating X-ray. After that, a very narrow fan X-ray beam through the collimator penetrates the articles on the conveyer belt and lands on the detector; then, the detector change the X-ray to the electric signal. The weak current signal is quantized directly and sent to the industrial control computer through USB port for further processing. After complicated operation and imaging, a quality image is therefore formed. The operating principle is shown as below:
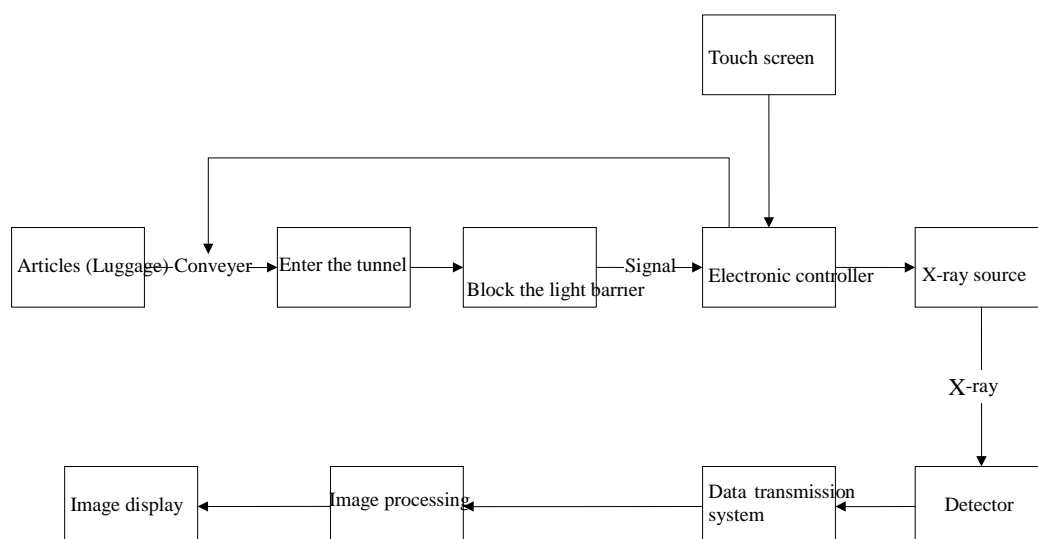
1.2 Technical data

☆Basic Data:

Conveyor speed:	0.22m/s
Resolution:	Φ0.101mm metal line
Steel penetration:	25 to 34mm steel plate
Film safety	For ISO 1600
Leakage radiation:	<0.05μGy/h

☆X-ray Generator:

Tube current:	0.4 ~1.2mA (Adjustable)
Tube voltage:	100--160kV (Adjustable)
Angle:	80°
Cooling/working periods:	Sealed oil bath with forced air/100%

☆Image Performance System:

     X-ray sensor: L type photo-diode array detector; 12bit

     Display: High-resolution 17" /19" color LCD display

     Color quality: 24-Bit real colors based on materials

     Edge enhancement: Object contour edge is more distinct

     Super image enhancement: Image detail is more distinct

High penetration display: Increase the contrast of bright area in image to make the area that is easy to penetrate appear more clearly

Low penetration display: Increase the contrast of dark area in image to make the area that is difficult to penetrate appear more clearly.

     Magnifier: Partial magnifying function

     Brightening/dimming: Increase/Decrease brightness of image

     Image recurrence: Display the previous twenty images and process any one of them

     Image restoration: Restore image to initial status

     Image storage: Real-time store any image and process it in operation status

☆Image Processing System:

     Pseudo color: Organic material is displayed as orange, inorganic material is displayed as blue, and mixture is displayed as green (Double energy)

     Sound-light alarm: Give sound and visible signal when conforming to the conditions

☆Operating Environment:

     Operating temperature/humidity: 0℃ ~ 45℃/20% ~ 95% (Non-condensing)

     Storage temperature/humidity: -20℃ ~ 60℃/20% ~ 95% (Non-condensing)

     Operating voltage: 220V AC ($\pm$10%)   50$\pm$3Hz

     Power consumption: 1.0KW (Max)

     Noise level: <58Db/65Db

☆Special features:

 ★Sound-light alarm: Give sound and visible signal when conforming to the conditions

 ★Network interface: Capable of connecting to LAN, and support multi-terminal check for baggage at same time

 ★Safety ray: Ray is transmitted under automatic control, avoiding the error

 ★One-key shutdown control: Just rotate the key to shut down the machine; it is safety, easy and convenient

★Eagle eye: Capable of expediently observing the magnifying area

★Self-diagnosis function: Give message automatically if malfunction for prompt maintenance

1.3 Elements of model and their meanings

AT □□□□

Height of tunnel (cm)
Width of tunnel (cm)

English short title of the company (L-type detector)
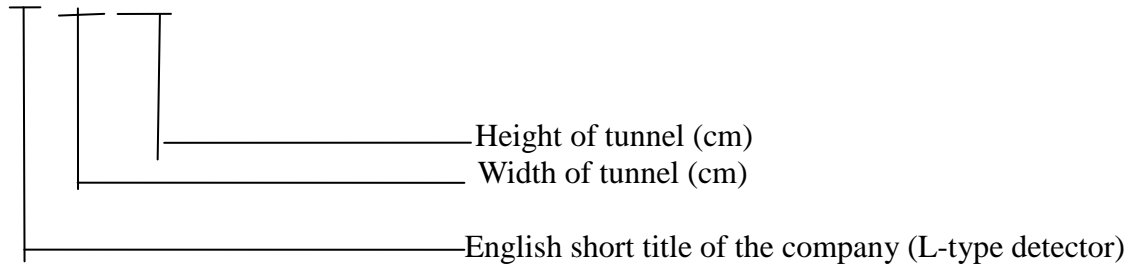
1.4. Main purpose and applications

The new powerful of our machines use the latest image technology, which gives higher resolution image for operator to detect all kinds of dangerous articles quickly and effectively. They are widely used in the security check of public areas, such as government agency, embassy, airport, conference center, exhibition center, scenic spot, sports area, post office, shopping mall, hotel, and school. They are fit for the detection of small package, suitcase, and handbag.

Chapter II Instructions for Operation Safety

2.1. Protection

Our machines are X-ray systems with radiation. We have tried our utmost efforts to ensure the safety of system in design that it can protect the security of operators and maintainer in any condition. However, the following safety rules should be followed during their use, installation, and maintenance.

Rules and conditions

1. GB 15208-2005 *Micro-dose X Ray Baggage Scanner*

2. GB 4208-93 *Degrees of protection provided by enclosure (IP code)*

3. GB 18871-2002 *Basic Standards for protection against ionizing radiation and for the safety of radiation sources*

4. *Law of the People's Republic of china on prevention and control of radioactive pollution*

2.2. Basic safety rules

Though X Ray Baggage Scanner is easy to operate, we still recommend you to read this user manual completely before starting the device, and follow the rules below:

1. If you have not used the device for over 6 months, please do not start it before the professional technologist restarts the X-ray generator; otherwise, the X-ray generator may be damaged.

2. You should know the relevant radiation protection rules before operating the X-ray Baggage Scanner.

3. If other person wants to operate the device, make sure he/she is a qualified operator, and knows all safety indications, laws, and regulations.

4. The installation, electrical connections and the change of machines and electrical parts should be done by experienced professional technologist only.

5. If the shell, cable, or conveyer belt of the device is damaged, please stop the operation immediately.

6. The shell plate and parts of X Ray Baggage Scanner should only be opened by qualified technologist.

7. Do not modify or change any parts that are related to the system safety. The installation, test, or maintenance of the device should only be done by persons who have passed the training.

8. The device is for checking the articles only. Do not use it for person or other living things.

9. Do not sit or stand on the conveyer belt.

10. Any part of the body is not allowed to be in tunnel when starting up the devices.

11. Make sure the luggage is not piled up in the tunnel or outlet! If the luggage blocks the tunnel,

please turn off the device before clearing.

12. Prevent the liquid spilling on the device. Turn off the device if such situation happens.

13. Do not block the thermo vent of the X Ray Baggage Scanner and the display.

14. The device should be connected to the ground before working. The main socket and the installation field should be equipped with reliable grounding equipment.

15. Try to avoid standing by the outlet and inlet of the device when it is working.

16. Stop the operation if the lead curtain is damaged or opened.

17. Though there are very few X-ray, non-operator should also try to be away from the device.

2.3. Security check for device

1. Check the lead curtain that used for preventing the leakage of X-ray in inlet and outlet of tunnel before starting the device. Change the curtain if it is damaged.

2. Check whether there are objects blocking the light barrier.

3. Check whether the conveyer belt is sound, whether there is spine or dirt that harms the luggage, and whether the conveyer is deviated or blocked.

4. Check whether there is damage on the shell panel, display, keyboard, and cable of the device.

5. Make sure all cover plates are covered.

2.4. Safety protection for X-ray

The X Ray Baggage Scanner takes some reliable protection measures for X-ray radiation, which effectively ensure the safety of operator and other persons.

These measures include:

1. The X-ray source of the system is the active component, which only gives out X-ray under high voltage. Therefore, there will be no X-ray when the device is not connected to the power supply, such as when it is in transportation and storage.

2. The X-ray amount of single detection is only 0.1μGy/h, the machine cabinet and collimator are shielded by lead plate, and the inlet/outlet is equipped with lead curtain; all these measures prevent the harm of X-ray effectively.

3. To ensure the safety of maintainer, two interlocked switches are used (The device does not .emit X-ray once any of the interlocked switches is cut). The device does not emit X-ray when the conveyer is stopped or when there is no articles in the tunnel, avoiding harming the maintainer.

4. Setting grounding in several places can effectively avoid the electric shock and the damage to device.

5. The device has multiple protections, such as overload and over current protection, which minimize the possibility of accident and risk.

6. Our X Ray Baggage Scanner fully meets the safety requirements in X-ray national standards

GB15208-2005.1.

The design of the X Ray Baggage Scanner can protect the safety of operators and maintainers in any time. The system has very low X-ray dose while ensuring enough penetration for checking the articles. It does not influence the sensitive materials, foods, medicine, and tapes for even several irradiations.

The device is equipped with large lead screen for preventing the leakage of X-ray. The lead curtain almost minimizes the radiation to zero. Besides, interlock switches are installed in X-ray emission place and the detector box. The control circuit is monitoring the interlock switches in case when any interlock switch is disconnected, the device will cut the AC power supply of X-ray controller, and therefore cut off the X-ray.

The X-ray source of the device does not emit X-ray after the power down.

2.5. Notice

⚠️1. Any device that emits X-ray will do harm to people. Please try to shorten the time of exposing in the radiation environment, and pay attention to the protection.

2. The external power grid and power supply should have good grounding that has connected to the ground.

Chapter III System Structure

3.1. System Composition
The system includes hardware and software.

1. Hardware

(1) X-ray generator controller

(2) X-ray detector

(3) Data collector

(4) Machine frame

2. Software

(1) Software for system control

(2) Software for image processing

3.2. System components and sub-components
The system components and sub-components include:

（1） X-ray source

（2） X-ray source control and driver

（3） X-ray detector array kit

（4） Electronic controller

（5） Industrial control machine

（6） Display

（7） Auxiliary relay

（8） Key switch

（9） Cooling fan

（10） Conveyor

（11） Light barrier

（12） Power panel

3.3. Functions of system components/sub-components
1. X-ray source

X-ray source includes three parts:

(1) High-voltage generator (Two voltage doublers and reactive circuits)

(2) X-ray tube

(3) Collimator

X-ray tube and the high-voltage generator made up by two voltage doublers and reactive circuits are

put in the shell with lead screen that is filled with oil. Cable WS9 offers filament and high-voltage driving signal for the X-ray source, and feeds back the sampling signal of high-voltage and anodic current to X-ray control and driving case to maintain the stability of high-voltage and anodic current during the detection. The collimator is used for changing the X-ray beam to fan beam.

2. X-ray detector array kit

Two detector arrays form an L shape to smooth away the detecting dead angle. Vertical side (Named as "Side detecting box" below) has 4 (8) detector panels, and horizontal side (Named as "Bottom detecting box" below) has 10 (12) detector panels, in which there are 32 tunnels for each panel. The high-energy analog signal is magnified and digitized on the detecting panel, and sent to the industrial control computer for processing.

3. Electronic control box

The control panel is in charge of receiving and forwarding the PC command from industrial control computer to control the motor to run or stop. It also monitors the status of light barrier, judges the entry/ exit of luggage, controls the X-ray emission, and monitors whether the X-ray control module is work normally. If there is any unusual action, it will give an alarm automatically.

4. Image processing system

The device has one digital image processing set, also called as industrial control computer. The industrial control computer receives the detector signal from X-ray source, and processes the sample detector data.

(1) Image processing

The device offers the basic image processing functions, such as edge enhancement, super image enhancement, pseudo color, and enlargement.

(2) Data storage and search

The device offers functions of storing and searching the image, as well as recording the operating situations of the operators.

5. Display

The system is equipped with 17" high-resolution display, which can display color image or B/W image as required. The PC computes the actual value of input information, and makes the direct response, realizing the device control and image processing.

6. Conveyor

The conveyor includes:

(1) Carrying-strap;

(2) Electrical (Driving) roller in outlet end of conveyor;

(3) Driven roll in inlet end of conveyor;

(4) Dragging roller in the running direction of two driving belts under the device

The electrical roller has one single-phase motor. The driving torque of motor is transmitted to roller surface by the gear reducer to form the force of driving the belt. The driven roll is used for adjusting the tension of belt.

7. Light barrier

There equips a pair of light barriers (Opposite-type photoelectric switch) in the inlet of tunnel for detecting the luggage carried into the tunnel by the running conveyor belt. If the luggage blocks the light barrier, the receiving end of light barrier will send a signal to the electronic controller, which will therefore inform the X-ray controller to emit the X-ray.

3.4. Software system

1. Operating environment

   Windows XP

2. Software compositions

   (1) Special driver

(2) User control interface

User control interface
- Control the system hardware and achieve the automatic data acquisition
- Read the data acquisition system in regular time
- Offer interface for image processing
- Analyze and process the output of image
- Offer user-friendly interface

Image processing is to process the received signal, and display it on the screen for operators' distinguish. EEH & NEG, pseudo color (C/B), and partial penetration enhancement (HIGH/LOW) functions are offered for the convenience of identifying the prohibited articles. Image processing functions, such as image recurrence and enlargement, as well as image storage function (able to save more than 12000 images) are also offered.

Chapter IV Operations and Parts of Electric Module

4.1. Electric control

Electric system is an important part of security check system; it offers power supply for the entire security check system as well as providing relevant electric protection when there is accident. The operators operate the device on the control table. The electric schematic diagram is shown in Figure 4.1:
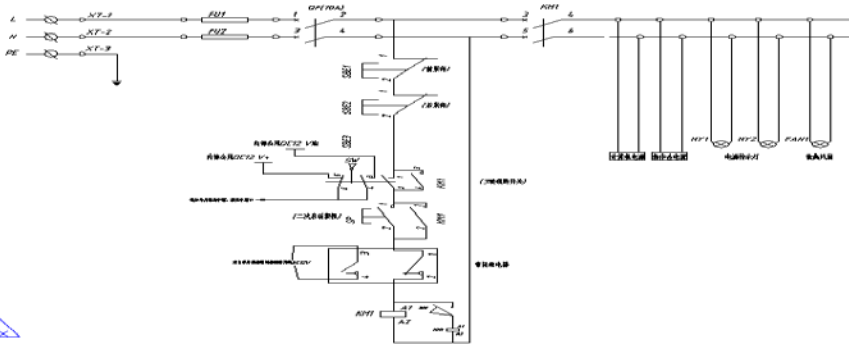
Figure 4.1 Original figure of electric control (1)

The electric part mainly realizes the following functions:

4.2. Over current protection

In Figure 4.1, FU1 and FU2 are 10A solid fuses and the actual power of the device is 1000W, this design allows the circuit to have the max power 2200W, which meets the actual requirement of the device. A circuit breaker is installed behind the fuse that when there is a short circuit in the back-end, it will release the circuit instantly to protect the device. The circuit breaker is CHNT QF, Model DZ47.

The short circuit is caused mainly by the aging insulating layer, loosened terminals, and the personal factor.

4.3. Emergency protection

In Figure 4.1, SBE1 and SBE2 are emergency stop buttons. The buttons are installed near the operator on the shell of device for cutting the power supply in case of the emergency. They are connected in the major loop of the control part. The selected model is of Φ22 and 10A, which meet the requirement of the device.

4.4. Privilege control

The device is operated by trained full-time staff only. Therefore, there require to have privilege control. Two schemes are used; one is for electric control, and the other is for software control. The electric control is achieved by controlling the SW key switch shown in Figure 4.1, which is connected in series in major control loop. You can choose 2 to open, or 1 to close the loop. Only people with the key switch can operate the device, thus preventing the mistake triggering by others.

4.5. Remote control

With remote start-up control, the control buttons can be installed on the control table separated away from the main device. The control table can be put in a room or a needed place while achieving remote control using the extended power line.

4.6. One-key shutdown control

In actual application, there will be error operations on the key switch. For example, the operators rotate the key switch in the reverse direction by mistake, causing the power failure of the major loop; or they touch the key unconsciously that causes the power failure of key switch. Such operations may have a great impact on the sudden power failure of the load, such as computer. The products designed by our company can achieve the safety shutdown by just revolving a key switch.

4.7. Positive & negative rotation control for motor

The motor is required to have positive & negative rotation during the normal operations. For example, if there is an article blocking the light barrier during the self-checking, the belt needs to be rotated positively or negatively based on the situation; or when the image is not clear enough and you want to have a clear image, you can return and use the positive and negative rotation. The circuit is done by using an intermediate reversing relay.

4.8. Thermal protection for motor

In actual application, the motor may have over current because of long time operations or overload. Therefore, it is necessary to protect the motor. The system will protect the motor when the current comes to a certain level.

4.9. Travel switch

Travel switch is mainly used for protecting the safety of human. The X-ray is harmful to human that when people touch the X-ray emission device, the X-ray emission should be stopped immediately for the safety. The travel switch is therefore installed beside the X-ray generator control device, and connected in series with X-ray generator to protect the device from short circuit.

4.10. Indicator

All indicators should be installed on the surface of the device for giving indications. They include X-ray indicator, alarm indicator, and power supply indicator.

1) Power supply indicator: Turn on the key switch to start the device. The yellow power supply indicator on the panel in front of the tunnel will be on immediately.

2) X-ray indicator: X-ray indicator is installed on the panel in inlet and outlet of the tunnel. X-ray is emitted when the articles enter the tunnel and blocks the light barrier, and then the red indicator is on.

3) Alarm indicator: There is one alarm indicator in inlet and outlet respectively. They flash and alarm when there is suspicious article.
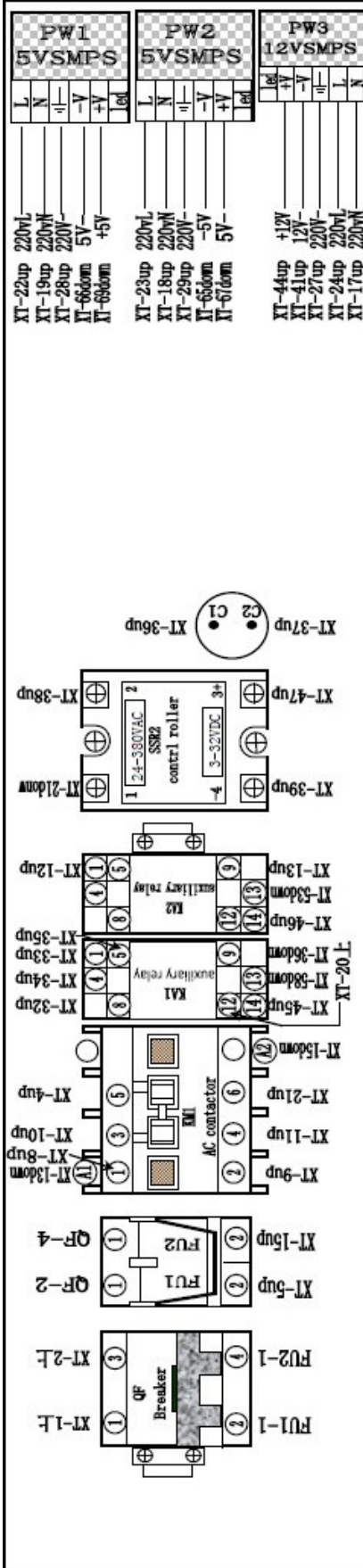
4.11. Connecting terminal module

All terminals are imported connecting terminals UK3.5, and the cable is 1.5m^2 cable. Guide-track groove is installed on the zinc coated PCB, with wiring around using the wiring duct. As shown in Figure 4.3.
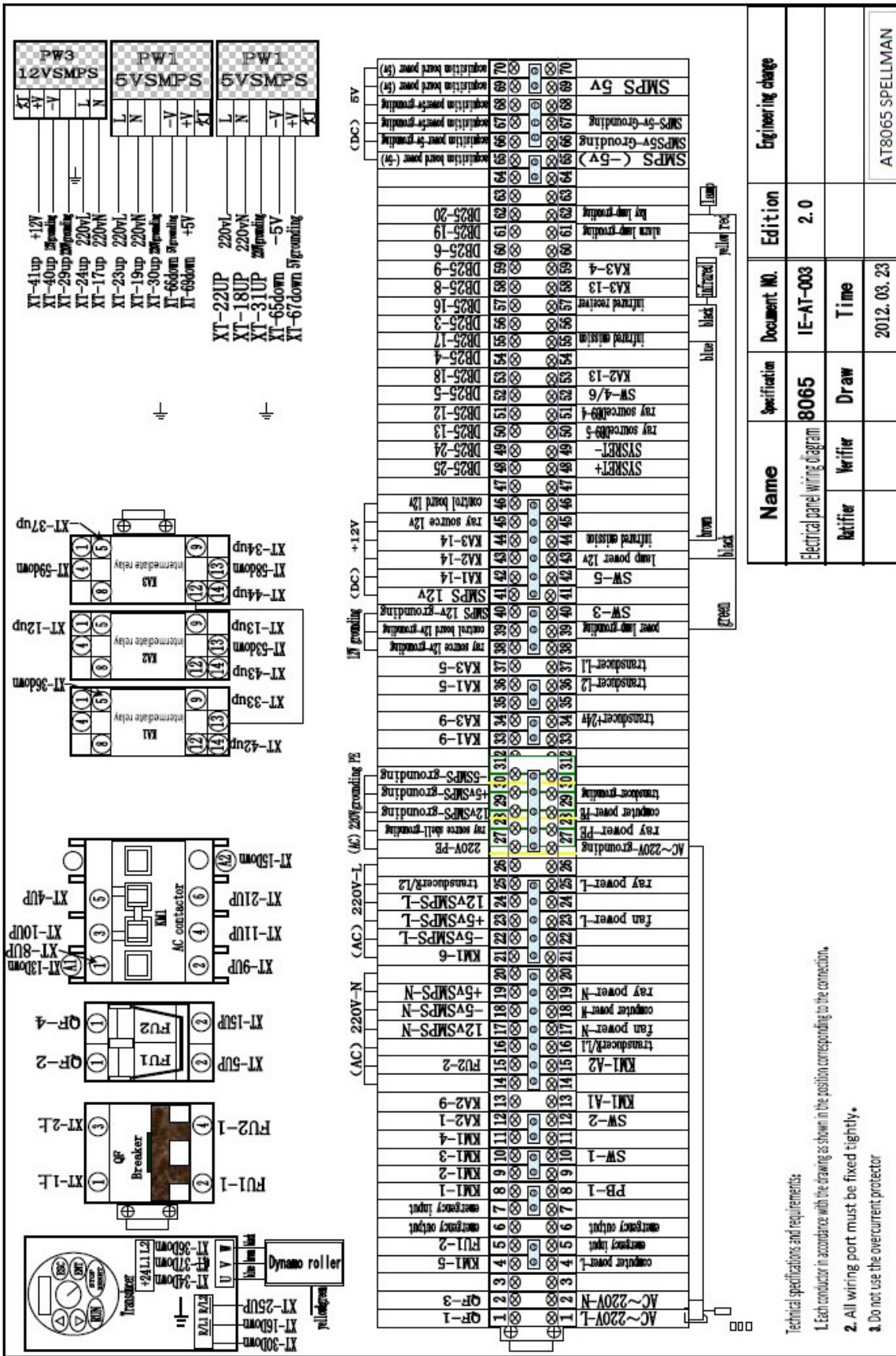
Electrical panel wiring diagram

Name	Specification	Document NO.	Edition
Electrical panel wiring diagram	6550 KV-tech	IE-AT-003	3.0

Ratifier	Verifier	Draw	Time
		Alex	2011.11.17

Engineering change

Security Electronic Equipment Co., Limited

PW1 5VSMPS
PW2 5VSMPS
PW3 12VSMPS

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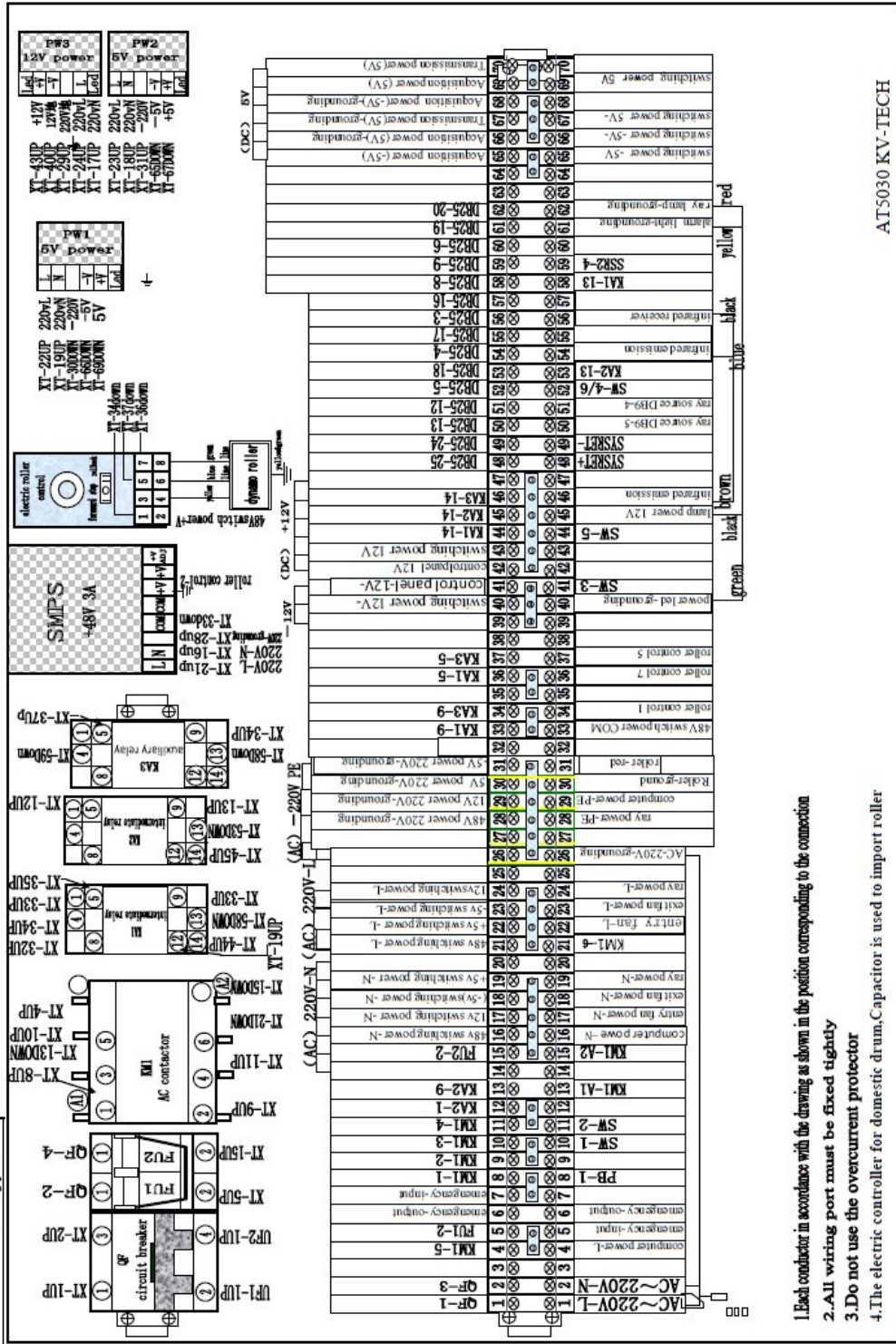
Technical specifications and requirements:
1. Each conductor in accordance with the drawing as shown in the position corresponding to the connection.
2. All wiring port must be fixed tightly.
3. Do not use the overcurrent protector
4. The electric controller for domestic drum, Capacitor is used to import roller

SSR2 control roller
24~380VAC 3~32VDC

KA2 auxiliary relay
KA1 auxiliary relay
KM1 AC contactor
QF Breaker
FU1 FU2

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PW3 12V power
PW1 5V power

+12V | 12V地 | 220vN | 220vL | 5V地 | +5V
XT-43上 | XT-42上 | XT-28上 | XT-22上 | XT-16下 | XT-23上 | XT-17上 | XT-30上 | XT-67下 | XT-69下

PW1 5V power

220vL | 220vN | 5V地 | 5V地 | 5V地
XT-24上 | XT-18上 | XT-29上 | XT-65下 | XT-66下

SSR2 AC SSR

Intermediate relay KJ2
Intermediate relay KJ3

KM1 AC contactor

QF circuit breaker

Each conductor in accordance with the drawing as shown in the position corresponding to the connection

1. All wiring port must be fixed tightly
2. Do not use the overcurrent protector

Acquisition power (5V) — switching power 5V
Acquisition power (5V) — switching power 5V
Acquisition power (-5V)-grounding — switching power -5V-
Transmission power (-5V)-grounding — switching power -5V-grounding
Acquisition power (-5V)-grounding — switching power -5V-grounding
Acquisition power (-5V) — switching power -5V

ray lamp-grounding — red
alarm light-grounding
DB25-6 — SSR2-4 — yellow
DB25-9 — KAI-13 — black
DB25-8
DB25-16 — infrared receiver
DB25-3 — infrared receiver
DB25-17
DB25-4 — KA2-13 — blue
DB25-18 — SW-4/6
DB25-5 — ray source DB9-4
DB25-12 — ray source DB9-5
DB25-13 — SYSRET-
DB25-24 — SYSRET+
DB25-25
control panel 12V — KA2-14 — brown
camera 12V — infrared emission
KAI-14 — lamp power 12V — black
SSR2-3 — SW-5
switching power 12V — KAI-14
SW-3 — switching 12V-grounding
control panel-12V — power led-grounding — green
SSR2-2 — camera 12V-grounding
C-2 — roller line NO.2
C-1 — KAI-9 — roller line NO.4
KAI-5 — roller line NO.3 — motor riller
KAI-4
KAI-1
KAI-8
SSR2-1 — roller — red — frame ground
5V power 220V-grounding — roller-grounding
-5V power 220V-grounding — computer power-PE
12V power 220V-PE — ray power-PE
220V-PE
X source shell-grounding — AC-220V-grounding
5switching power-L — ray power-L
5V switching power-L — fan power-L
12v switching power-L — ray source-L
KM1-6 — roller line NO.1
SSR2-1 — ray power-N
KAI-12 — fan power-N
(-5V)5switching power-N — computer power-N
5V switching power-N — ray source-N
12v switching power-N
FU2-2 — KM1-A2
KA2-9 — KM1-A1
KA2-1 — SW-2
KM1-4
KM1-3 — SW-1
KM1-2
KM1-1 — PB-1
emergency-input
emergency-output
emergency-output — emergency-input
KM1-5 — FU1-2 — computer power-L
QF-3 — AC~220V-N
QF-1 — AC~220V-L — AC~220V-L

AT-10080 & AT100100
SPELLMAN

SECURITY ELECTRONIC EQUIPMENT CO., LIMITED

Each conductor in accordance with the drawing as shown in the position corresponding to the connection

1. All wiring port must be fixed tightly

2. Do not use the overcurrent protector

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Figure 4.10 Connecting terminal modules

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Chapter V Image Processing and Distinguish

This chapter introduces the software operations of the device in details.

5.1. Start the device

- Insert the key in the key switch and rotate it clockwise; then, press the green button to start the device;
- Power supply indicator on the device is on, and then the waiting indicator is on.
- The system enters into the software application interface.
- The program checks the tunnel automatically to see whether there are foreign objects. The conveyor belt will run if there are foreign objects. The software system initiation is over when the foreign objects are cleaned.

5.2. Article check

- Put the articles to be detected on the conveyor belt.
- Press "Forward" button to control the operation of motor, and start the conveyor belt.
- The articles will block the light barrier once they enter the tunnel to start the X-ray generator.
- The device carries out the non-interlaced scanning for the articles when they are going through the tunnel. The relevant detected image is shown on the display immediately while, refreshing without stop, transferring from right to left.

Original Image:
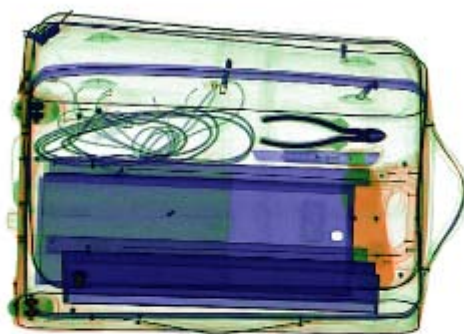
5.2.1. Reverse color:
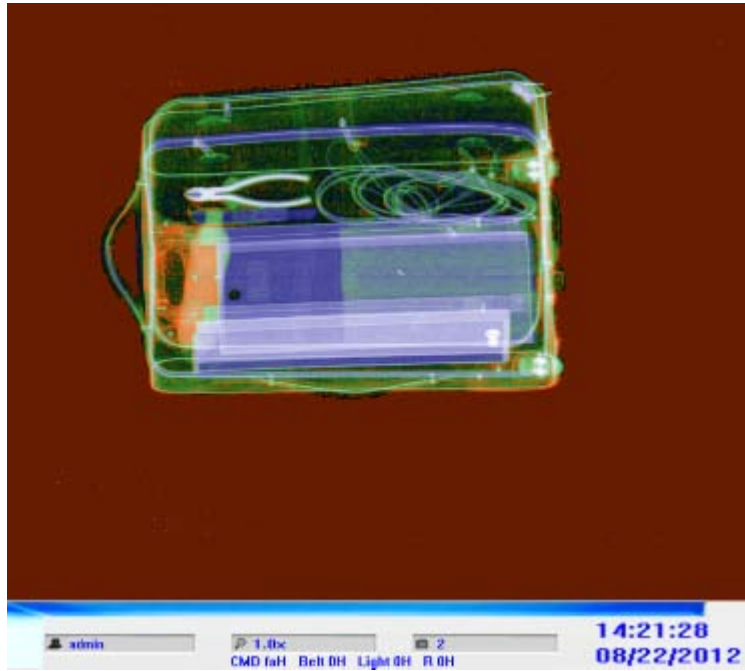
In the detected image, article that has high absorption rate for X-ray is generally shown as dark black while for article that has low absorption rate, it is shown as brilliant white. In reverse display, this condition is just reverse. You can click "Reverse color" button to swap the display of positive/negative film. In this way, small or thin articles (such as metal wire) with high density will be shown more clearly.

5.2.2. B&W/Color
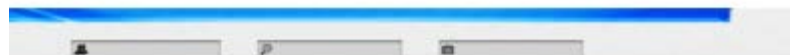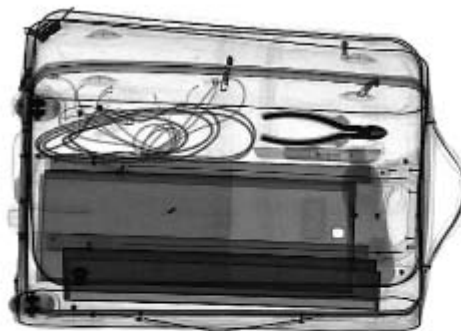
Color and B/W image are available. The default image obtained from scanning the articles is 256-level 8-bit gray images, whose gray scale is from black to white. The gray scale is in direct proportion to light strength of X-ray source and the actual X-ray absorption of scanned articles. Articles with

different absorption have different gray scales. You can click "Color/B/W" button to switch between color image and B/W image.

5.2.3. Penetration enhancement

When detecting some metal articles that are thick, such as can and winding, the X-ray image may be a little bit dim because they are hard to be penetrated by the X-ray. In this way, you can click "Edge enhancement" to enhance the penetration for the image to get the optimal contrast and lightness
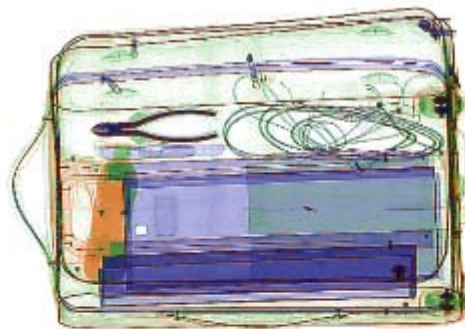
The organic matter is obviously (inorganic excluded)

The effect of this operation is inorganic (blue section) are shown in gray scale, orange (organic) highlighted . Facilitate the interpretation of the operator of the explosives, drugs and gasoline and other flammable materials
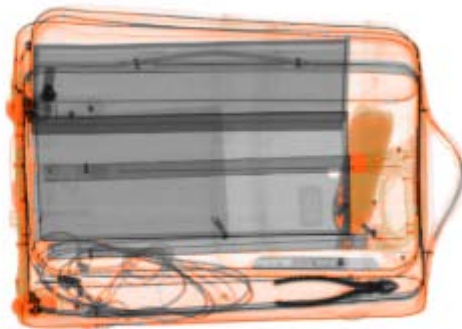
Inorganic substances are obviously (organic excluded)

Effect contrary to the above, Just is orange (organic matter) in grayscale, inorganic (blue) to highlight.

Facilitate the interpretation of the operator on the turret, guns and gas canisters and other items
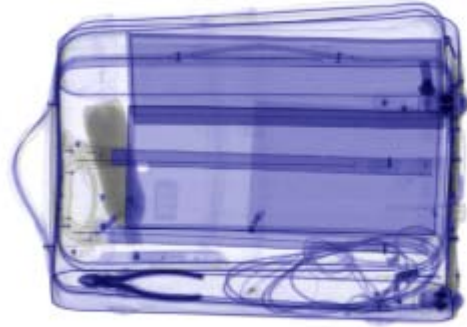
5.2.4. Image enlargement

Click "Image enlargement" button to enlarge the current image. It is also able to realize the movement observation.
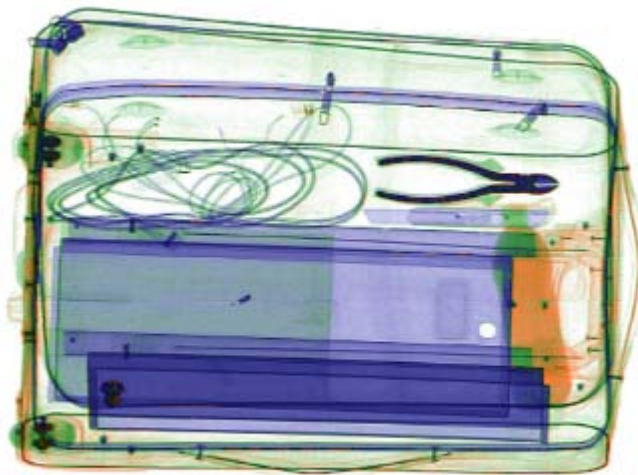
Enlargement Image

5.2.5Grayscale scanning (gray sweep)

Press this key image will automatically transform the gray-scale mapping will gradually lighten dark areas, while the bright area gradually darken. The operator easy to find a most suitable for the current image contrast and brightness effects

14:38:40
08/22/2012
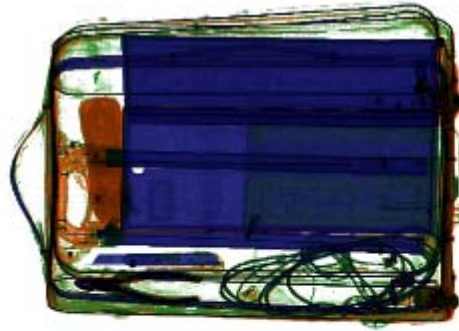
5.2.6High and low energy data

Press the Q key image will automatically transform the level of the image, the operator easy to find a most suitable image for best results.

Switching high-energy mode, lighter in color; low-energy mode display image colors more vivid
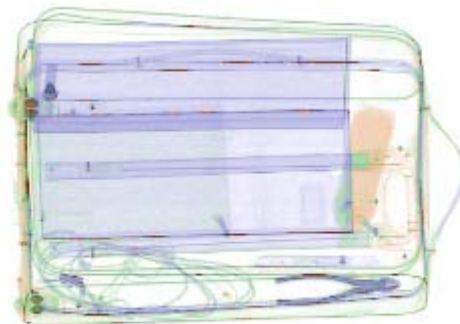
High energy data
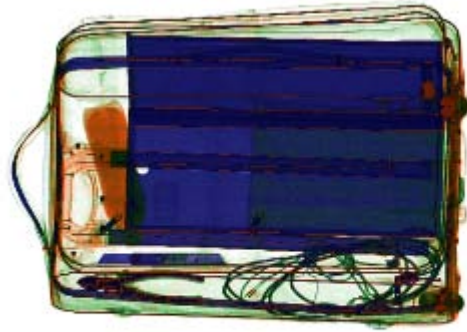
Low energy data

5.2.7 Alarm function image

By clicking the "Auto Alarm setting", Objects that cannot be penetrated and dangerous things will be marked by red frame when some suspicious images have been inspected.
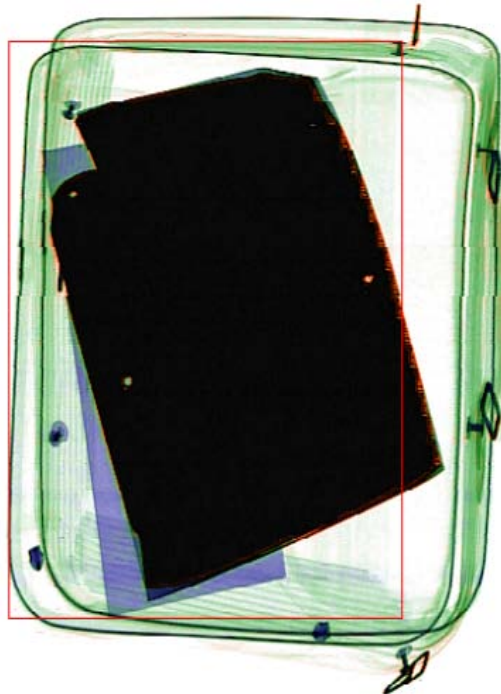
5.2.5. Shutdown

(A) Make sure there is no articles left on the conveyor belt. If it is necessary, run the belt forward or backward until there is no article on the belt.

(B) You can just left rotate the key switch to shut down the computer safely without any other operations. It is very simple, convenient, and personalized.

(C) Pull out the key, duty off or handover the work.

5.2.6. Menu functions
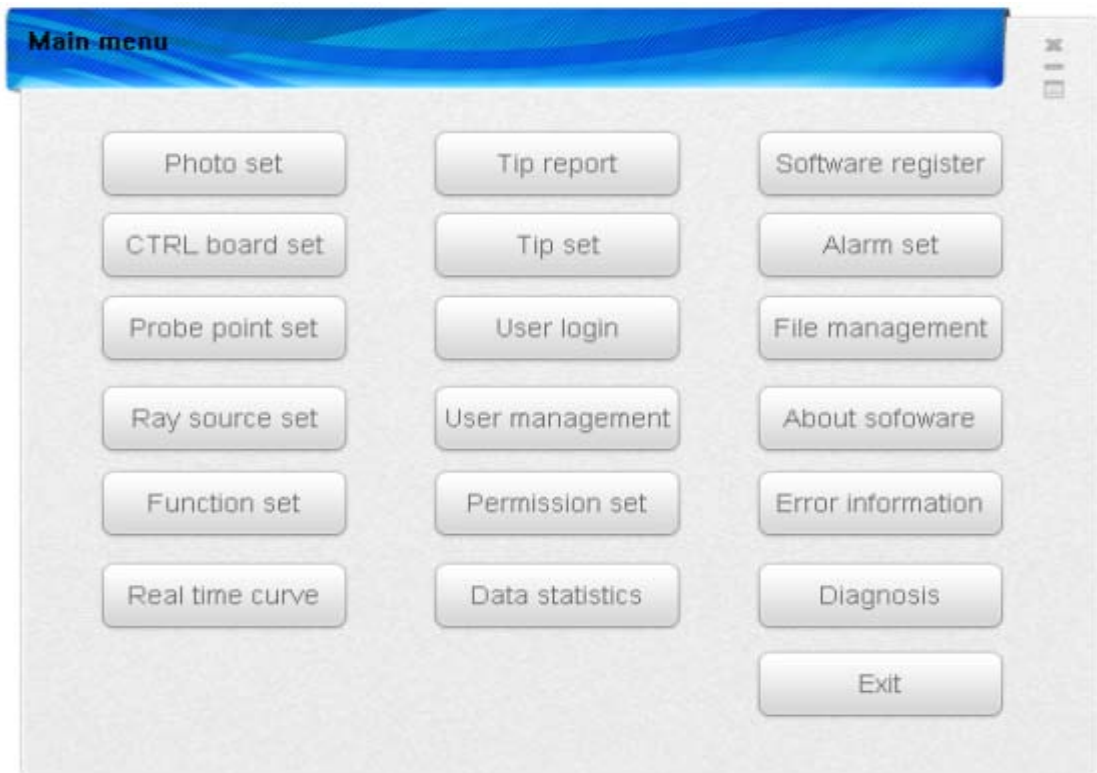
(A) Click the menu button on the menu desktop, and the above dialogue box is popped up, in which you can set your user name and the password

(B) You can log in the system after the user name and the password had been set. As shown in the above picture, the number column is for the user name.
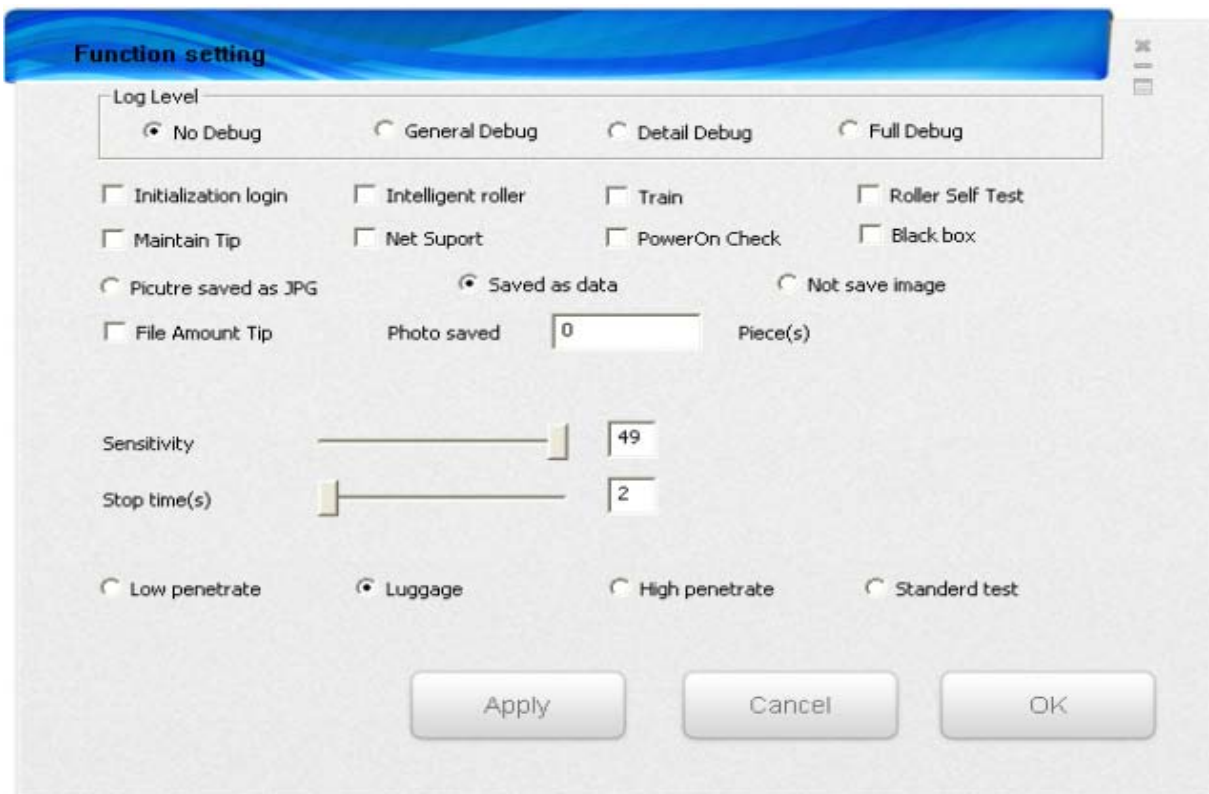
(C) **Log Level:** Logging software running state and problems failure, it is easy to inquiry.

Initialization Login: start to sign-on.(if you don't login ,you can't enter the software)

Intelligent Roller: The roller automatically start and stop.(it is controlled by a camera upon the belt)

Train: when it is training status, the software will display the stored images and the dangerous goods, the belt and the x-ray-Source can't be controlled.

Roller Self Test: Roller automatically checks if there is goods on the belt after started.

Maintain Tip: Automatically prompting for maintenance every week.

Net support: It can be connected to network, which can send jpg image to the appointed IP address.(it is usually used in Chinese Seagate)

Power on check: Automatically check if the hardware works well after the machine is started.

Black box: Automatically record the camera image and video of the bags.

There are 3 kind of saving methods, save as jpg, save as data, and not save

Picture saved as JPG: Pictures saved as jpg format.

Saved as Data: the Pictures saved as data format.

Not save image: Do not save the pictures.

File Amount Tip: if there are too much data is saved, the free disk will be exhausted. This will remind you the backup some data as jpg to free disk space. Photo saved _pieces .The amount that will show the File Amount tip.

Sensitivity: It is used in the intelligent Roller; it determines the camera's sensitivity.

Stop Time: It is used in the intelligent Roller, Which determines the delay time after the X-ray is closed. Which means when the roller will be automatically closed by the software?

Low Penetrate, Luggage, High Penetrate, Standard Test Kit, this selection means which kind of color will be shown on the image.

(D) <Real-time curve> is used for collecting the data from the detecting panel. This curve is assistant test software of diagnosis functions. The curve data has something to do with the image quality.

Photo settings

Pixel Begin   [0]   <   Pixel End   [0]   <   960

Target height   [0]   <=   704

Bag length   [170]

Roller Direction   ○ Forward rotation   ◉ Reverse rotation

Image   ○ Agree With Roller   ◉ Use Customer Settings

            ○ From left to right   ◉ From right to left

[Apply]   [Cancel]   [OK]

(E) <Image setup> is used for collecting the data from the detecting panel. This curve is assistant test software of diagnosis functions. The curve data has something to do with the image quality.

Permission set

Users   [aa ▼]   ○ Default   ○ All   ○ Custom

ID	UserPermission	
☐1	PhotoSet	
☐2	CtrlPanelStatuAndQuery	
☐3	CtrlPanelComSet	
☐4	PointSet	
☐5	XRaySet	
☐6	FunctionSet	
☐7	TimeCurve	
☐8	FileManage	
☐9	LogManage	
☐10	TipManage	
☐11	TipReportSystem	
☐12	AlarmSet	
☐13	UserManage	

[Apply]   [Cancel]   [OK]
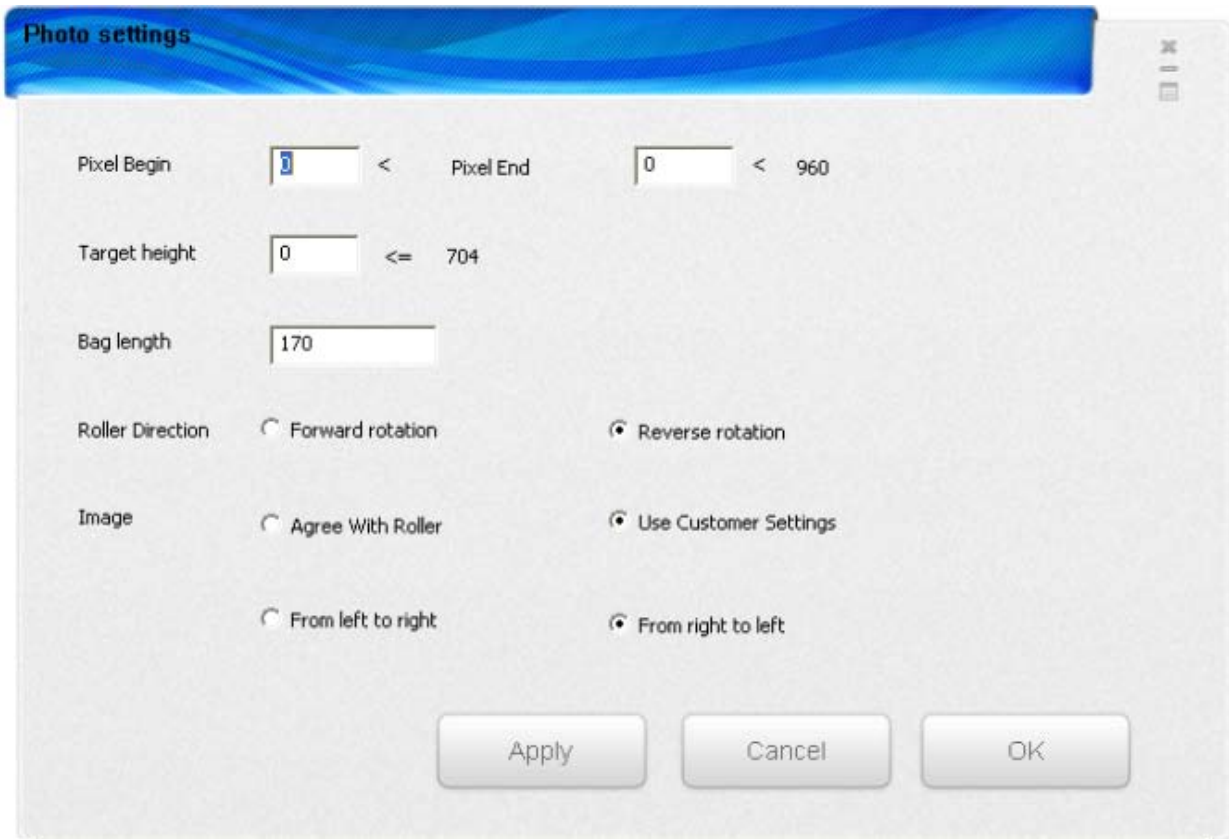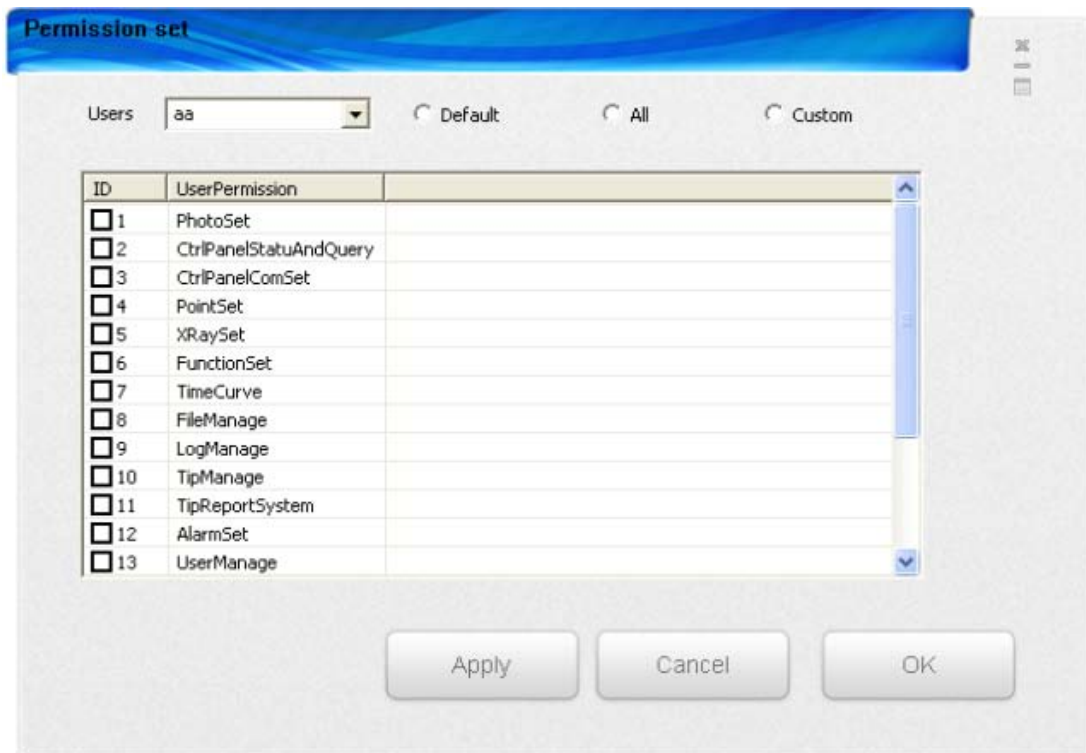
(F) <File setup> shows the history of image. You can find the original saved records based on the terms and conditions

Data statistics

System worked time: 2 Minute

Ray source worked time: 10 Minute

Baggage total number : 130

Baggage count: 0

Clear

OK
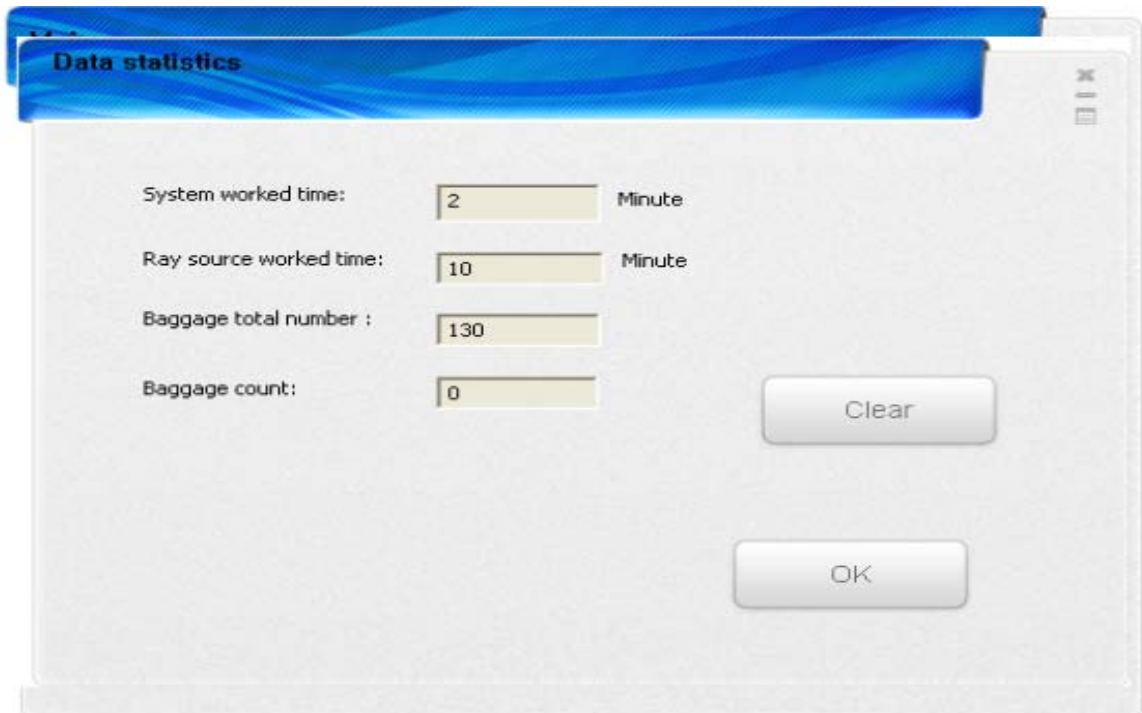
(G) <Data statistics> shows the relevant information, such as the version number and the package records.

Main menu

Software registration

Device number 181204393

Get Serial Number

Register SN

Register result SN Valid Date(days): 54

Register   OK
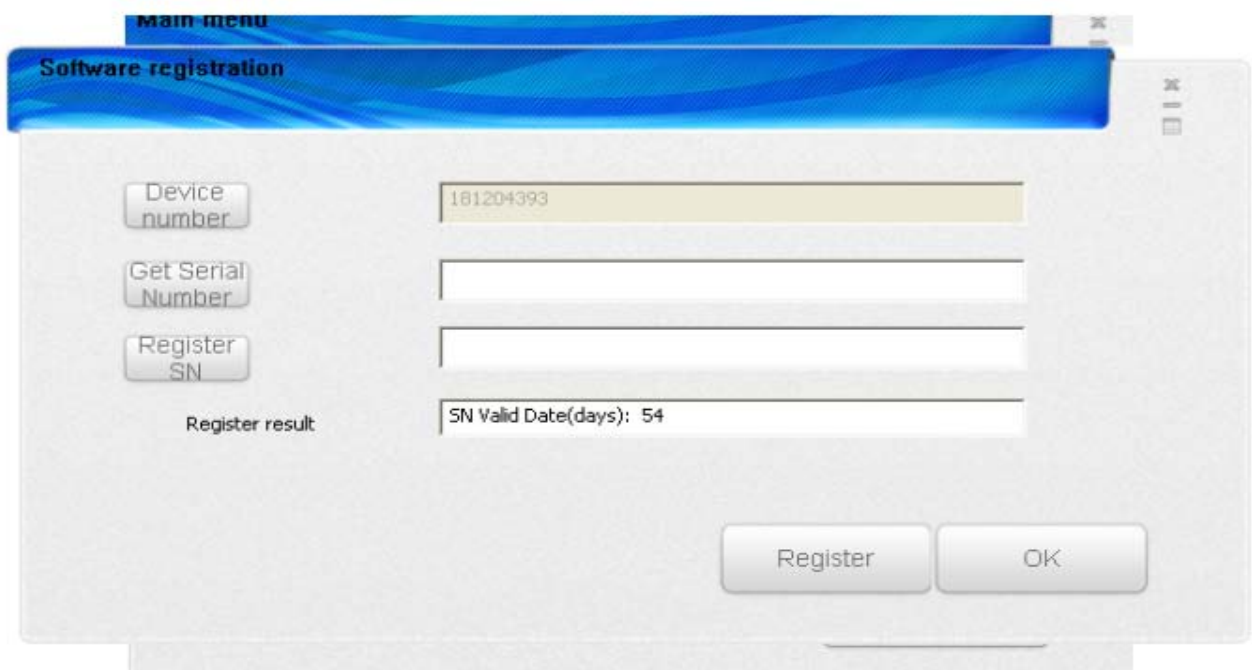
(H)"Device ID ": factory when debugging. "Get registration information: you can get with   registration information.

If the software registration information has expired, you can re- obtain registration information, and then sent to the manufacturers for the column number of re- registration.

Enter the device number - "Get registration information" - "reads the serial number " - "registered" - "OK" to complete the software registration. Note: A machine can only have one device number.

About software

Company name

Hot line

Customer

Software   V1.0-20120419-117

Device Type   BT10080

OK
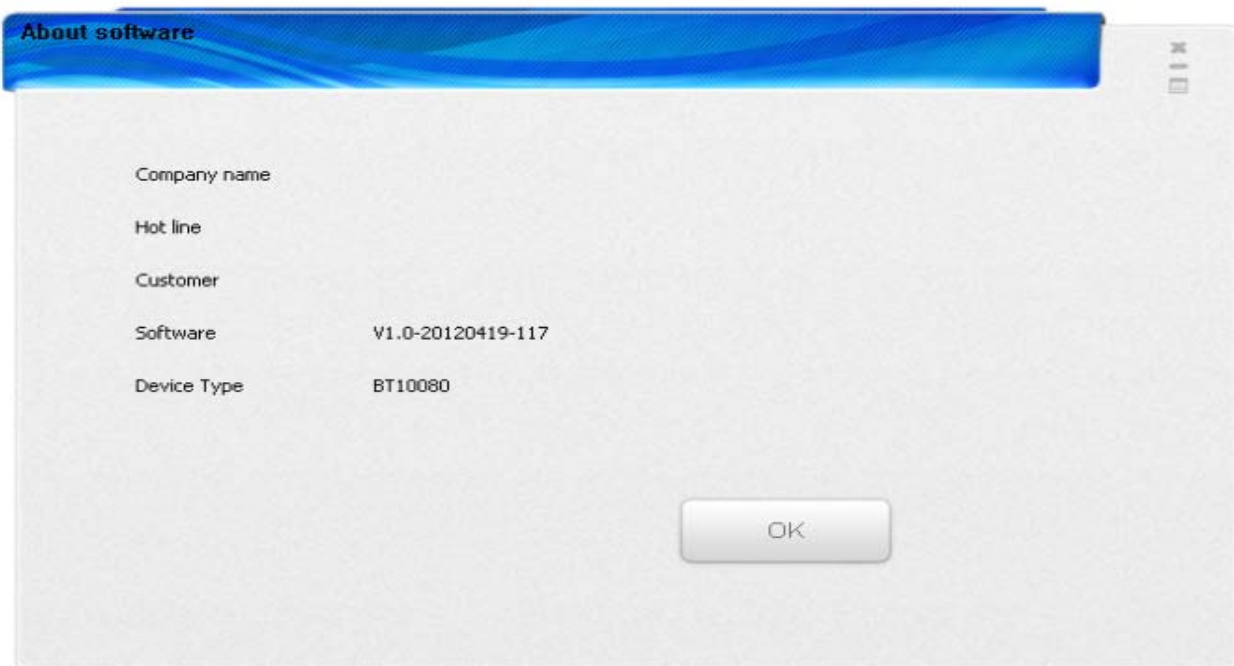
Software information and device model

Probe point setting

   High energy   Low energy

Probe point No.   0   Add->

Status   Delete<-

Valid Point   0=   32   959   =   960

Apply   Cancel   OK
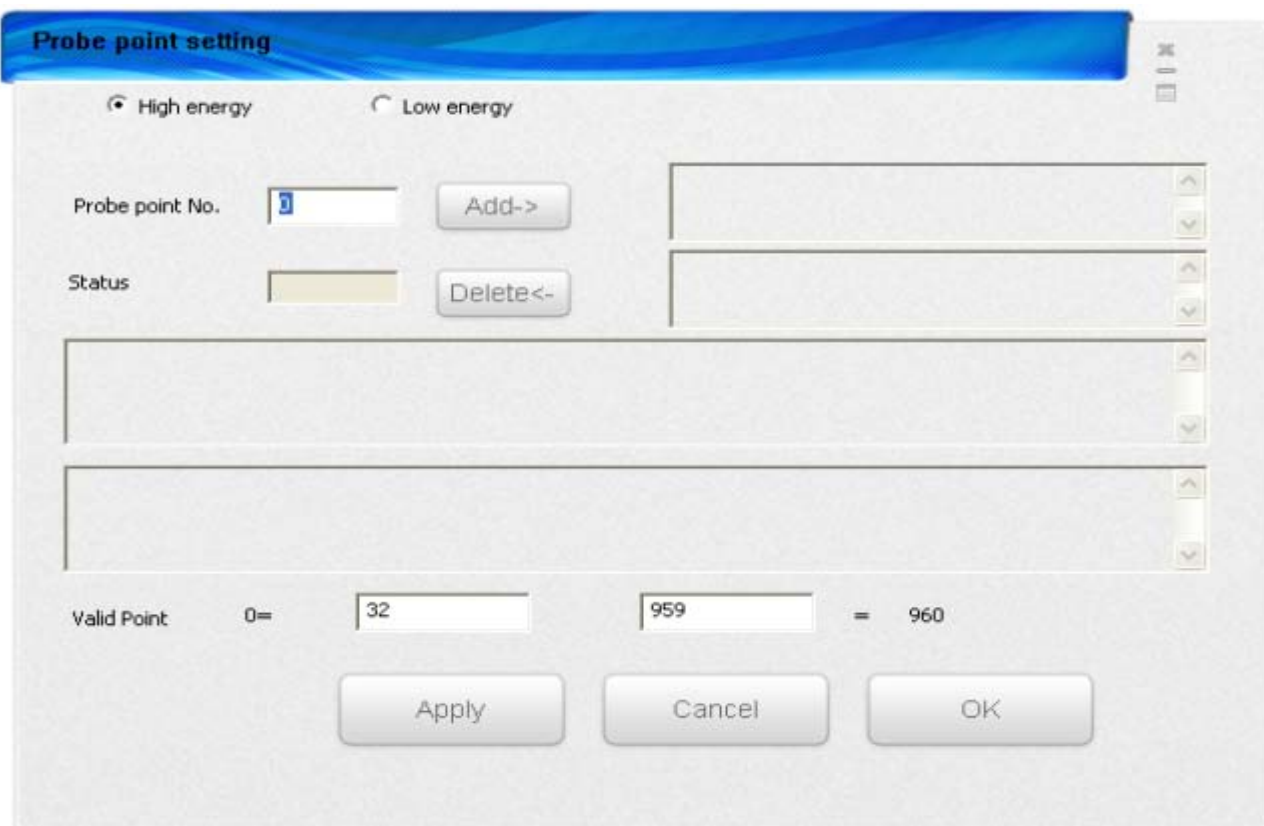
(J) Manually delete the level of detector dead pixels, dead pixels automatically deleted by the system shown in the display area. Effective exploration point settings can be set depending on the model, and then Apply to save the OK to exit.

1. Select high-energy or low energy, set the number of probe points need to be modified, select the "Add" you can delete the custom probe point, "delete" can be restored. Note: If the system automatically delete the bad points, may be caused by damp detector, the machine should be placed in ventilated, dry place. Dead pixel processing in the C: \ WINDOWS \ to find atscan18.ini or (atscan53.ini, atscan65.ini, atscan86.ini, atscan11.ini) files, to find fields bad sensor, for the dead pixels set to 0 to restore the system to remove dead pixels.

2. Input to effectively explore the point of setting range - "Apply" (to save) - "OK" (exit) .
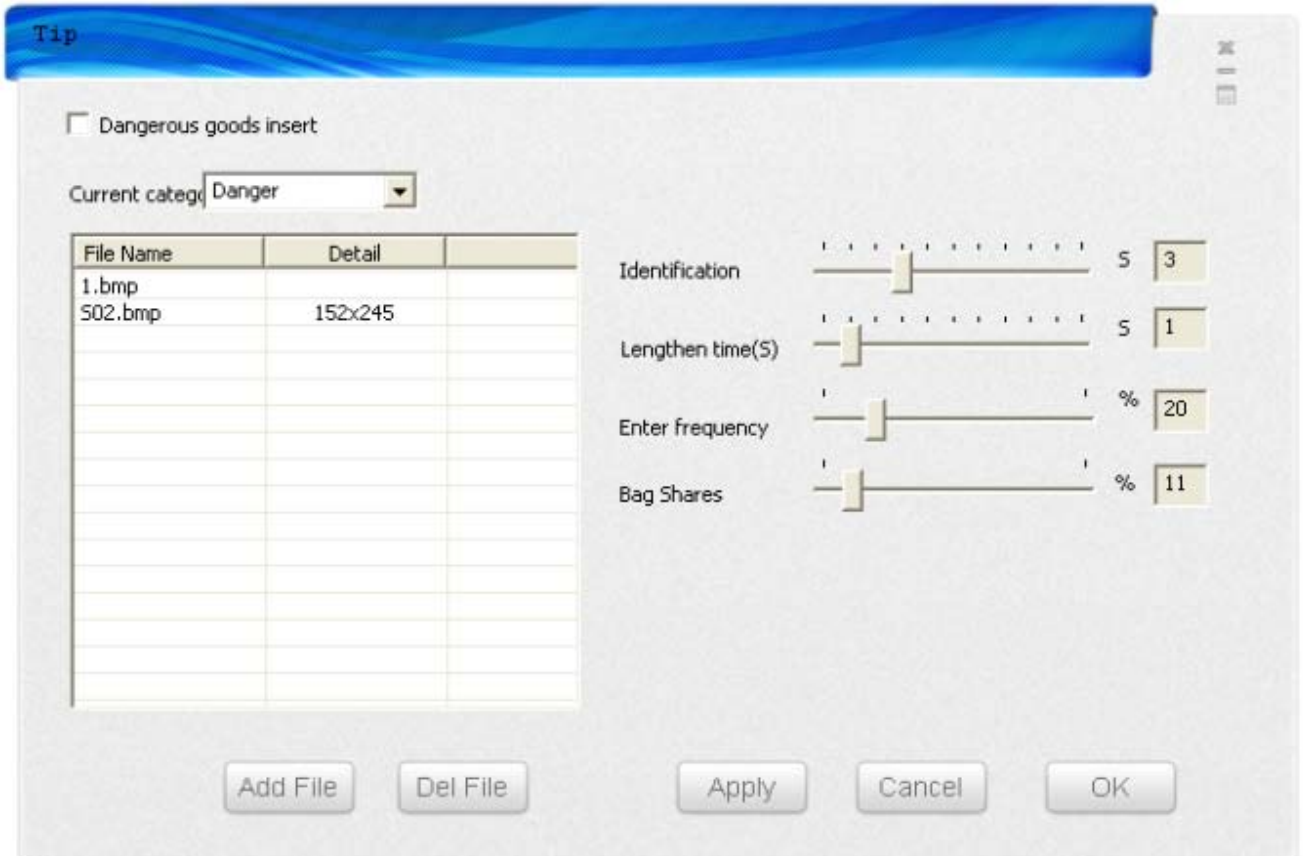
(K) For the training mode, to extend the time set for 2 , the recognition time is set greater than 2 is the best .

Operation steps:

(a) F8 to open the main menu - open the "tip " interface .

(b) Select the "dangerous goods into the open" -> set the recognition time, an extension of time, insert the frequency - "Apply" - "exit"

c. Then exit the menu, press the control key, you can see later in the training mode of dangerous goods is inserted.

(d) Dangerous goods into , press the F1 key has been the discovery of dangerous goods and mark . Otherwise prompted to " focus " , if no dangerous goods by pressing F1 , is a miscarriage of justice , the system prompts " dangerous misjudgment by the focus . "

(e) the end of the training , please press the control key , the control system to stop F8 to open the main menu , the tip system reports menu , generate reports , view the training situation
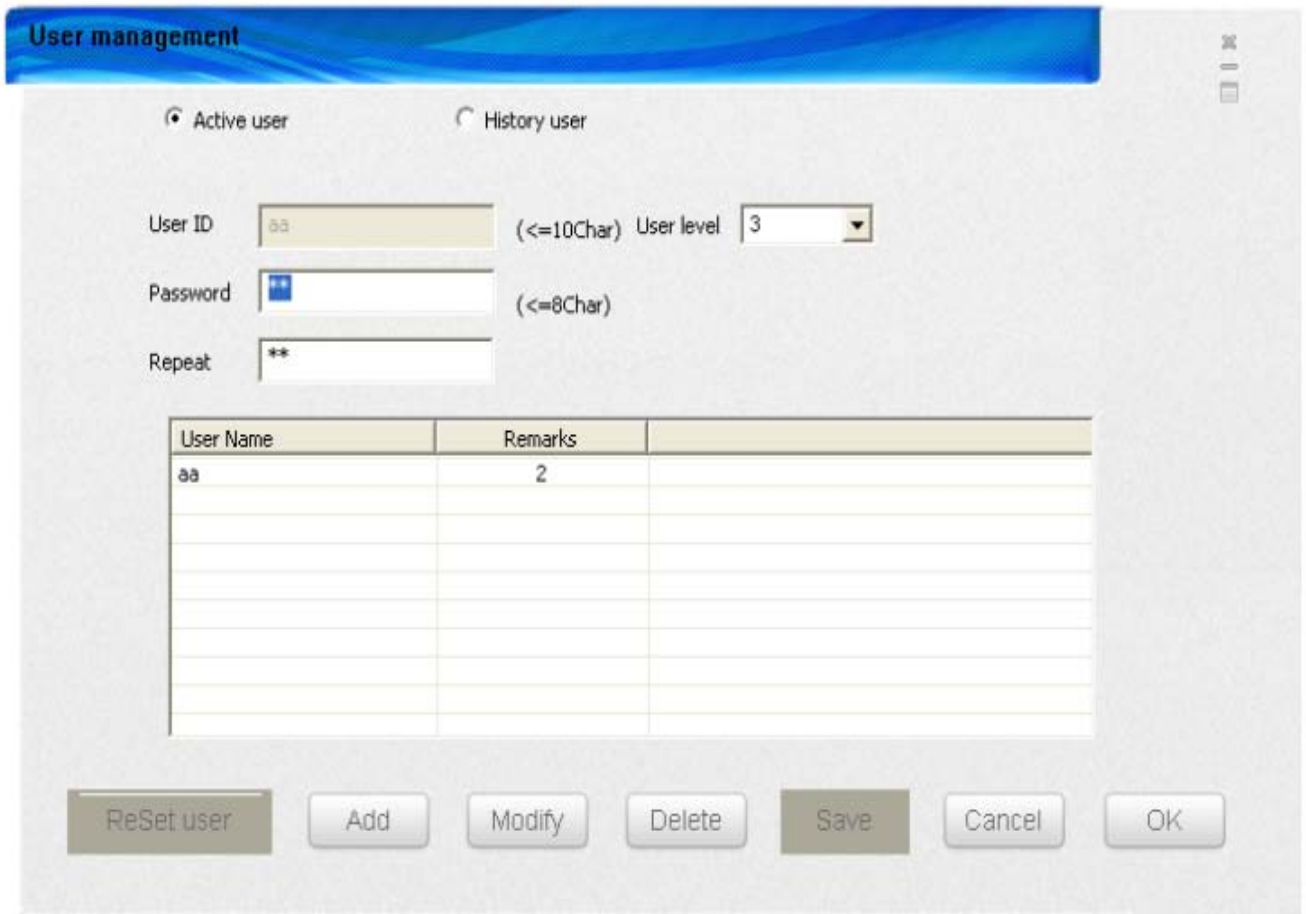
The system default for a valid user, the user can set the menu to add, modify and delete users . Press "Cancel" to cancel the current operation, "OK" to exit the menu.

To select the history of the user , you can view the user has been deleted , restore the user can remove users to modify the current effective user .

Steps:

1. "Add" - Enter the user password, setλ the user level - the "Save" - "OK."

2. "Modify" - enter the passwordλ you need to modify, level - the "Save" - "OK"

3. Historical user can view the history of user information.

Alarm setting

☑ Automatic Identification

☑ Alarm box   ☑ Alarm light   ☑ Alarm sound

Min horizontal size	8	(8~100Pixel)
Min vertical size	8	(8~100Pixel)
Sensitivety set	77	(%,55~100)
Min absorption rate	3000	(2000~3800)
Max absorption rate	100	(10~500)
Alarming time	500	(ms)

Apply   Cancel   OK
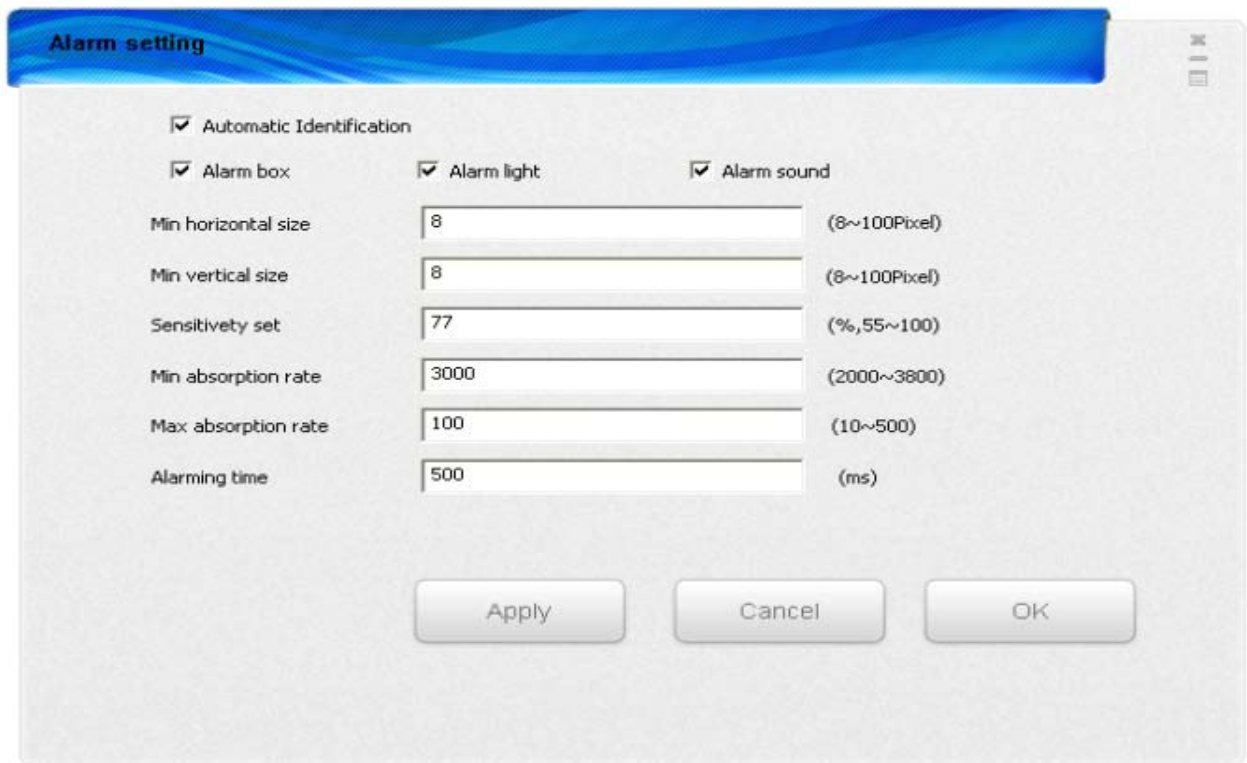
Alarm settings to achieve the function are: in case of alarm The function, as shown. In real time over packet, if the dangerous goods, explosives, fireworks, and not penetrate the other items, it will alarm.
steps: automatic identification "- " alarm box " , " alarm light " , " alarm tone " - set the parameters - " Apply " -" OK "

Control panel setting

Serial COM	COM3		Baud rate	38400
Check bit	NO		Data bit	8
Stop bit	1		Serial statsus	Open Success

Open serial   Close serial   OK
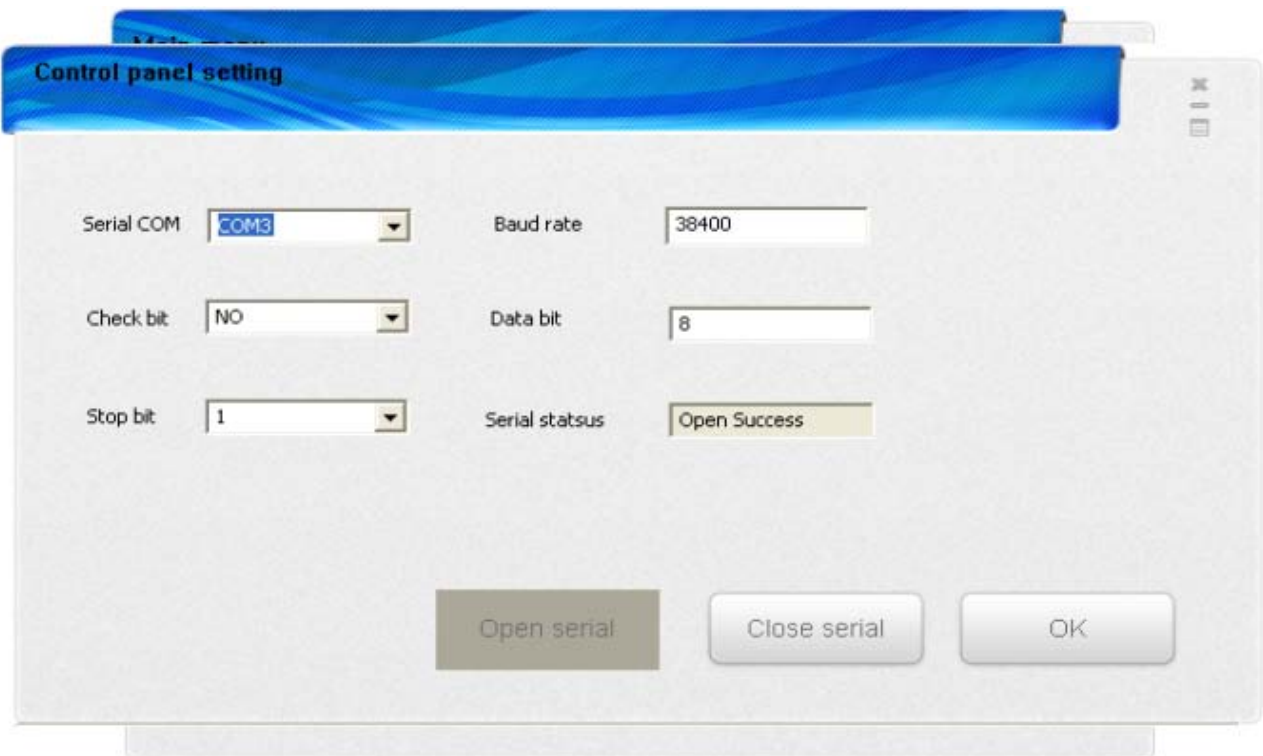
"Close the serial port", and select the modified Terminal serial port serial port com, then open the serial port if serial status displays: "successful open" and receive the serial port command, the set was successful, otherwise, try again, if it is not, please check if the hardware control panel is working
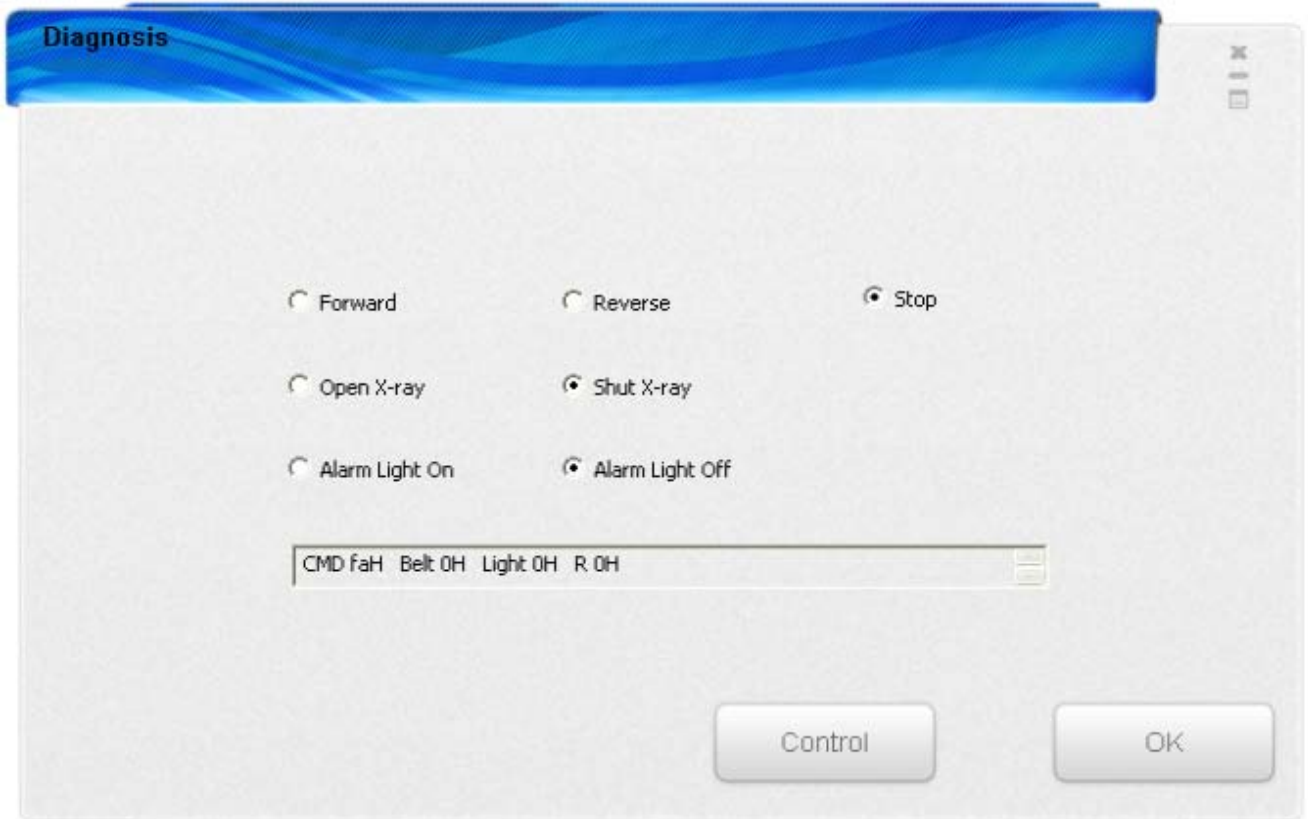
Diagnosis Operation steps:
 to select the appropriate options such as "reverse " - "Control ", to achieve the inversion of control roller ; and then "Stop " - "control" , you can achieve control of the drum to stop . Can also be combined, such as " reverse "ray light on " -" control", you can achieve the control of the roller reversal, open -ray light.
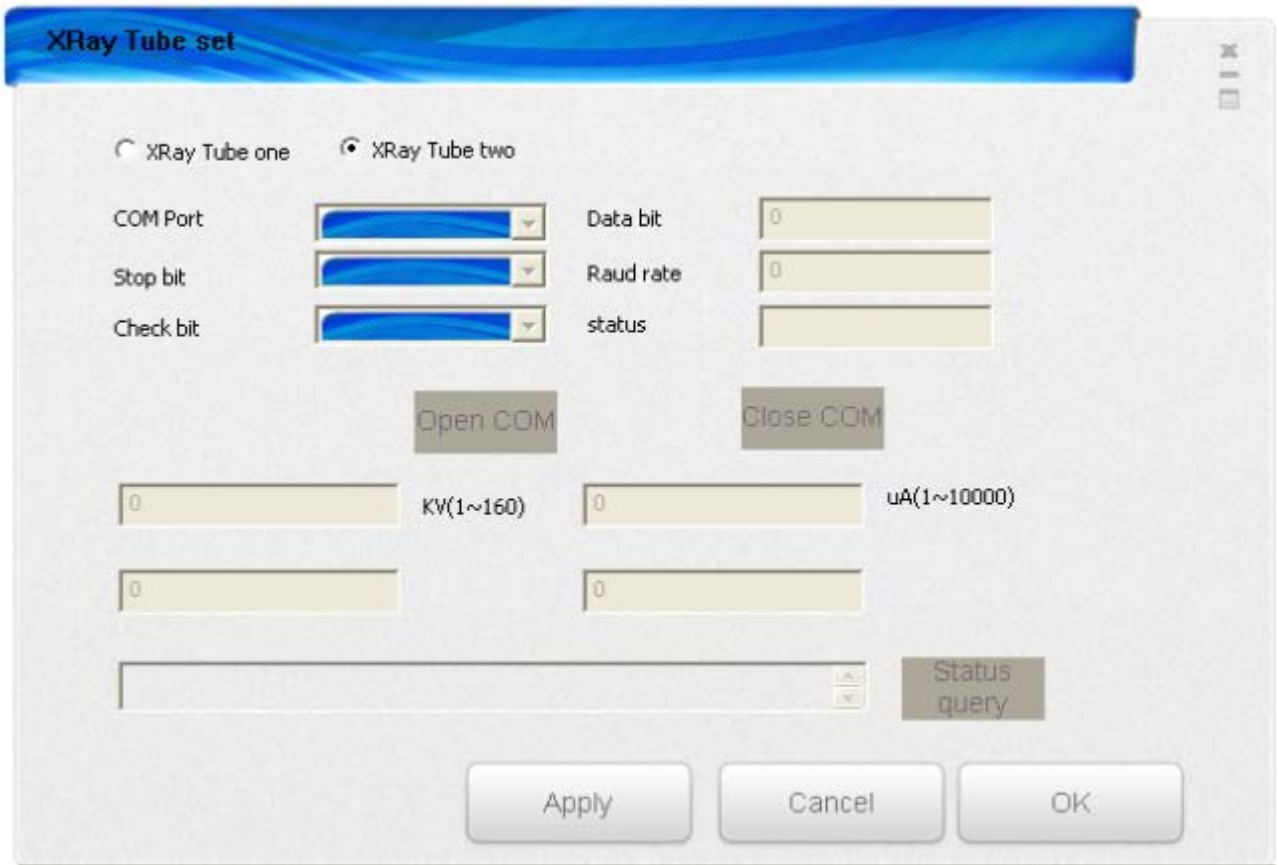
Ray source set

The menu settings ray source type, pay attention to the menu to be consistent with the actual hardware configuration, the system to work properly. Only set for 1:00 -ray source to the various parameter settings ray source using the default parameters work.

Xray source 1set steps: Select ray source1, View the serial port status "if successfully opened. You can go to see "real-time curve, in accordance with real-time curve operation, if they can see the curve waveform, then the serial port successfully opened -ray source 1 is set up correctly.

Another: x-ray source 1 can set the voltage, current, such as 140KV, 350uA, and other settings, and then Apply to save and exit the menu. Note if you change the voltage, current will impact the image of the first bag.

Log management

| Start date | 4/28/2012 ▼ | End date | 4/28/2012 ▼ | Query |

User	Date	Operate	Bag Number	

OK
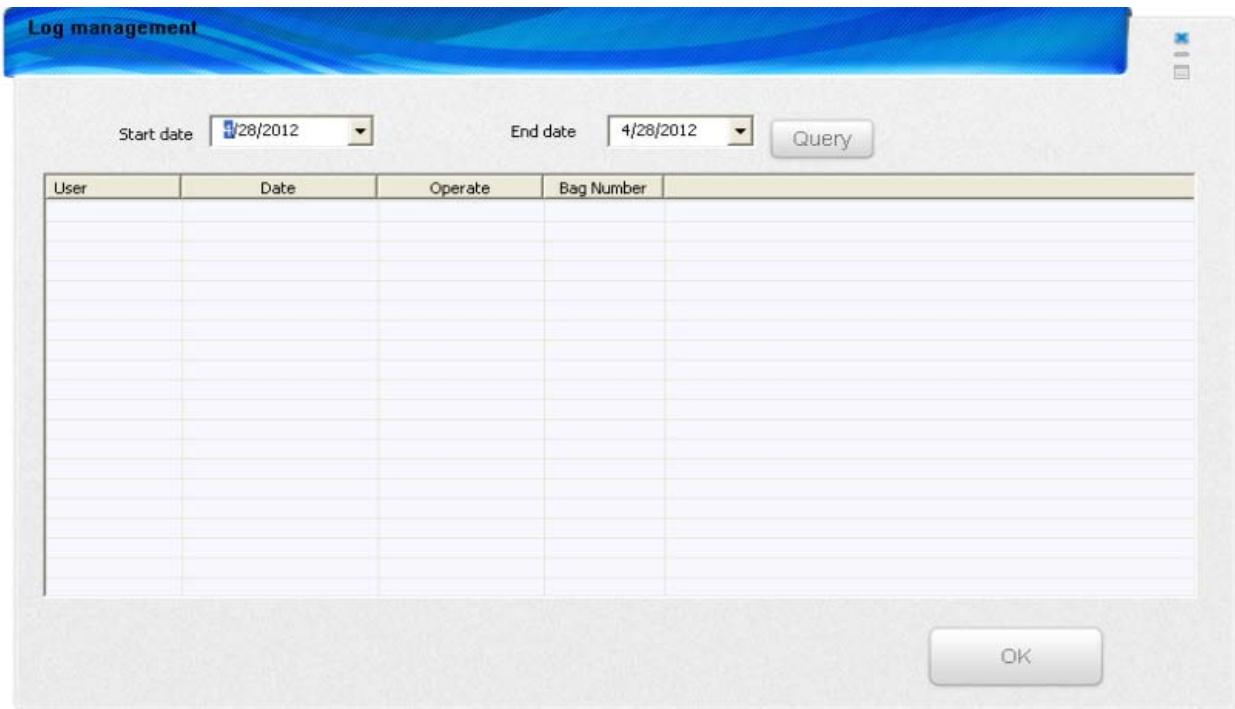
This function detected in a period of time, a user of the system in that menu, doing what settings, log information query set, to reduce the inconvenience caused because the setting does not . Steps: Set the start time, end time, and then query.

Permission set

| Users | aa ▼ | ○ Default | ○ All | ○ Custom |

ID	UserPermission		
☐1	PhotoSet		
☐2	CtrlPanelStatuAndQuery		
☐3	CtrlPanelComSet		
☐4	PointSet		
☐5	XRaySet		
☐6	FunctionSet		
☐7	TimeCurve		
☐8	FileManage		
☐9	LogManage		
☐10	TipManage		
☐11	TipReportSystem		
☐12	AlarmSet		
☐13	UserManage		

Apply   Cancel   OK
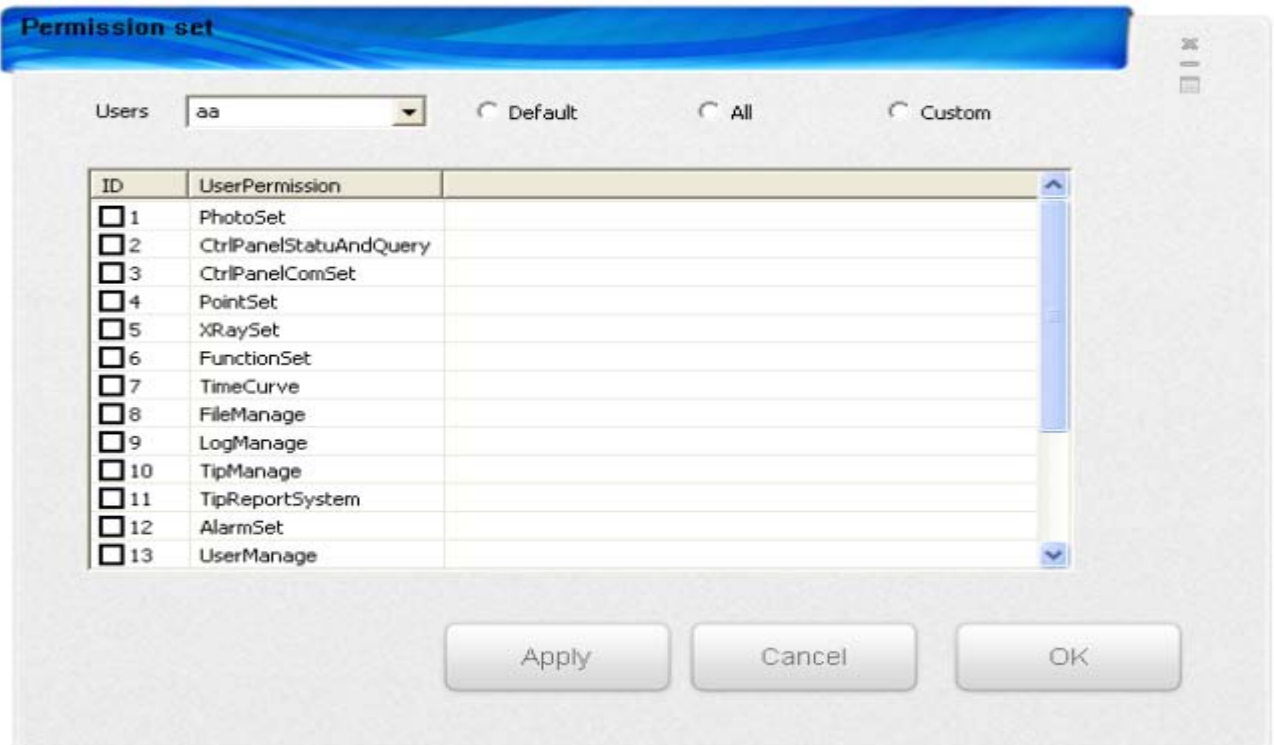
Permission:
Set user permissions according to user rating, you can set different default permissions; you can also customize the permissions.
Steps: Select User -"default permissions" or "Select All" or "Custom" - " Applications" - "OK" to complete the set user permissions

Chapter VI Maintenance and Troubleshooting

X-ray Baggage Scanner is the high-tech combination of machinery and electronics. Therefore, the users should not only get to know the technical performance, structure, principle, and the operating instructions of device, but also they should be good at the daily maintenance, which can fully show the performance of device, extend the useful life, and ensure the safety of device and human.

6.1. Daily maintenance

To make sure the actual operations to be consistent with the technical data in the user manual, the device should be checked and adjusted in the regular intervals.

The maintenance should be done by the trained person authorized by the company.

The maintenance of device hardware should be done after the power supply has been cut.

1. Normal maintenance

(1) The device should be installed in a dry place with good ventilation and less dust. Try to be away from high temperature, damp, or direct sunlight.

(2) Clean the dust with hairbrush and cleaner first when maintaining the device.

(3) If the components or connector lugs are loosened, fasten them immediately.

(4) When there is corrosion in some components, change the components if necessary.

(5) If there is a damaged component, find the reason, clear the failure, and change for a new component. The relevant parameters should be set before the component could be use normally.

(6) To prevent the electric leakage or accident, do not get any foreign objects or liquid inside the device during the maintenance.

Trouble-shooting procedure and methods

2. Details of maintenance

(1) Check the power supply indicator on the upper part of the device.

The yellow indicator is on when the device is electrified.

(2) Check the X-ray indicator on the upper part of the device.

The red indicator is on when the X-ray is emitting.

(3) Check the emergency stop button above the tunnel.

The device stops immediately when you press the emergency stop button. The device cannot be started again when the button has not reset.

(4) Check the key switch above the tunnel

The starting button can start the device only after the key switch is turned on. The X-ray stop button can cut the power supply of X-ray controller. If the key switch is not sensitive enough,

please change it for a new one.

(5) Check whether the touch screen is consistent with the screen image

For example, the image is zoomed out when you press the "Zoom out" key; the image changes correspondingly when you press the image processing keys.

(6) Check the light barrier of the inlet

Put an opaque object on the running conveyor belt, and the X-ray source can be turned on. After the power supply is cut, use the dry silk cloth to clean the lens of light barrier and the windows on the wall of tunnel.

(7) Check the driving roller

The driving roller will run in the scheduled direction or stop when you press the corresponding keys. The noise should be normal, and there should be no fuel leak.

(8) Check the travel switch on the detecting box and collimator

The X-ray emission stops when any one of the cover plates is disassembled.

(9) Check the conveyor belt

Check whether the conveyor belt is deviated from the motor.

(10) Check the thermo vent

Check whether the thermo vent is blocked; clear the dust on it.

6.2. Safety notice for maintaining & adjusting

1. To prevent the damage of device or the safety accident, do not get any foreign objects or water inside the device during the maintenance.

2. There are many parts, whose operating voltage is 220V, in the device. The normal maintenance should be done when the power supply is cut. If the operation requires to be connected with the power supply, it should be done by trained person while having the anti-electric-shock measures.

3. There are many precise electronic devices. Make the preparatory treatment to prevent static damaging the device before maintaining.

4. There are several places of lead sheath, which is used for preventing the X-ray leakage. You'd better wear the cotton glove during the operation. If you cannot wear the glove, make sure to wash your hand after the work.

5. Recheck the device carefully before connecting to the power supply to make sure the connection is correct.

6. Before starting the X-ray source, please cover the cover plate to avoid the X-ray damaging the human.

6.3. Changing the roller and conveyor belt

1. Cut the power supply first, and then disconnect the cable of the motor.

2. Disassemble the cover plate, and screw down the fixing bolt on conveyor and frame to demount the conveyor.

3. Loosen the tension bolt and release the belt, so that you can disassemble and change the driving roller or adjusting roller.

4. Change the conveyor belt

(1) Nip off the damaged adhesive tape and take it out.

(2) Carry out the pre-processing treatment for the new adhesive tape in the factory before the cold glue joint based on the perimeter of original adhesive tape.

(3) Carry out the cold glue joint technique for the new adhesive tape on site.

6.4. Changing and adjusting the light barrier

Adjust the light barrier as the following steps:

1. Cut the power supply of the device, and open the cover.
2. Disconnect the cable of the light barrier.
3. Screw down the two fixing bolts on the light barrier.
4. Change for a new light barrier, and fix it after adjusting the light barrier to a proper position.
5. Solder the cable outlet of light barrier to the connector based on the drawing.
6. Connect the cable
7. Cover the cover plate of the device

Connect the device to the power supply, start the conveyor, and put an opaque object on the conveyor belt to check whether the X-ray works normally.

6.5. Changing and adjusting X-ray resource

When changing or adjusting the X-ray source, please follow the following step:

1、Cut the power supply of the system and disassemble the cover

2、Disconnect the cable of X-ray source

3、Remove the fixing bolts of the X-ray source

4、Remove the limited block

5、Loosen the adjusting bolts

6、Take out the X-ray source

7、Install the new X-ray source according to the above steps

8、Do not screw up the fixing bolt and the limited block

10、Connect the device to the power supply

11、Enter the "Menu" and then "Configuration"

12、Adjust the adjusting bolts and handle on the right of X-ray source alternately to make the signal shown in the oscilloscope as high and even as possible.

13、Screw up the fixing bolts and limited block of the X-ray source after the adjustment. Make sure you have not influenced the correct wave shown on the oscilloscope during the screwing.

14、Cut the power supply of the system.

6.6 Preheating of X-ray tube in X-ray source

1. The purpose of preheating the X-ray tube

The purpose of preheating the X-ray tube is to decrease the failure rate of X-ray source, extend the useful life of X-ray tube, and enhance the reliability of the complete device. For MF X-ray source (including the X-ray source installed or uninstalled) that is used in X-ray Baggage Scanner of line scanning, if it is not used for over half a year or it is transported or vibrated fiercely for some reasons, it is essential to preheat the X-ray tube according to the preheating procedures.

When the device is installed and tested on site or the device is restarted after a long time, it is essential to preheat the X-ray tube strictly.

2. The preheating procedure

(1) Electrifying

(2) Initial adjusting

(3) Preheating

(4) Final adjusting

6.7. Common failure and the maintenance

This chapter gives the probable failure phenomenon, reasons, and the solutions.

For maintenance, please use the parts and spare parts manufactured by our company and offered for the specific conditions only.

Any device failure caused by non-authorized maintenance or damage caused by using other parts instead of the parts of the company, the company will not take any responsibility.

We reaffirm that all maintenance and adjustment are done by qualified maintainer. The device should be connected to the power supply only when all circuit boards are inserted properly. Please note that you should cut the power supply when you are drawing or inserting the printed boards. The following chapters show the reasons and the solutions in classified failures based on the failure phenomenon.

6.7.1. Power supply

Failure 1: The system cannot be electrified.

Probable reasons:

(1) The power supply is not correct.

(2) There is no key switch or the key switch is not switched on.

(3) The fuse is broken.

(4) The circuit breaker is open.

(5) Emergency stop button is in locking status.

(6) The AC contactor is broken.

(7) The connection of terminals is loosened.

Solutions:

(1) Check the local power supply, and make sure it is 220+10% /-15% V, and 50±3Hz.

(2) Insert the key switch and rotate it clockwise to the switch on position.

(3) Change for a new fuse.

(4) Close the circuit breaker.

(5) Reset by revolving the emergency stop button clockwise.

(6) Change the AC contactor.

(7) Check the connection and reconnect the line.

Note: Make sure the device works normally before electrifying the system.

Failure 2: The power supply indicator does not light.

Probable reasons:

(1) The device has not started.

(2) The cable of indicator is not connected.

(3) The connection of terminals is loosened.

(4) The indicator is broken.

Solutions:

(1) Start the device.

(2) Connect the cable of the indicator.

(3) Check the connection and reconnect the line.

(4) Change the indicator.

Failure 3: The system cannot be electrified, but with no other functions.

Probable reasons:

(1) The power supply of electronic controller or X-ray source controller is not connected.

(2) Contactor KM2 is broken.

(3) The switching power supply is broken.

(4) Network interface cable is not connected.

(5) The serial port cable that connected to the industrial control computer is not connected.

Solutions:

(1) Insert the plug of electronic controller or X-ray source controller into the corresponding sockets.

(2) Change the contactor.

(3) Change the switching power supply.

(4) Connect the network interface cable to the industrial control computer.

(5) Connect the serial port cable to the industrial control computer.

Note: Incorrect voltage output may damage the parts of device. Cut the power supply when changing or adjusting the parts.

6.7.2. System control

Failure 1: The conveyor does not run functionally.

Probable reasons:

(1) RS232 line is not connected.

(2) The electronic controller is broken.

(3) The starting capacitor is broken.

(4) The cable connection is loosened.

(5) The driving roller is broken.

(6) The conveyor belt is blocked.

Solutions:

(1) Connect the RS232 line properly.

(2) Change the electronic controller.

(3) Change the starting capacitor.

(4) Check the connection and tighten the cable again.

(5) Change the driving roller.

(6) Adjust the conveyor belt.

Failure 2: The conveyor belt does not stop.

Probable reasons:

(1) The electronic controller is broken.

(2) CPU board failure

Solutions:

(1) Change the electronic controller.

(2) Restart the industrial control computer.

6.7.3. X-ray control

Before maintaining this part, please eliminate all failures that related to power supply and system control. There are two kinds of failures concerning the X-ray control.

Failure 1: X-ray source does not emit X-ray

Probable reasons:

(1) There are no articles in the tunnel, or the articles have not blocked the light barrier.

(2) The cover plate on which the interlock switch is installed is open.

(3) The power plug of X-ray source controller is not inserted in the socket.

(4) The AC contactor is broken.

(5) The X-ray source is broken.

(6) The X-ray source controller is broken.

(7) The cable of X-ray source is not properly connected.

(8) The light barrier is not properly connected.

(9) The light barrier is broken.

(10) The driving roller has not started.

(11) The electronic controller is broken.

Solutions:

(1) Put large and light-tight articles in the tunnel.

(2) Cover the cover plate in the position of interlock switch.

(3) Plug in the power plug of X-ray source controller.

(4) Change the AC contactor KM2.

(5) Change the X-ray source.

(6) Change the X-ray source controller.

(7) Reconnect the cable of X-ray source.

(8) Check the cable of light barrier and connect it correctly.

(9) Change the light barrier.

(10) Start the driving roller.

(11) Change the electronic controller.

Failure 2: The X-ray indicator does not light

Probable reasons:

(1) X-ray has not emitted.

(2) Electronic control panel is broken.

(3) The cable is not properly connected.

(4) The indicator is broken.

Solutions:

(1) Put the articles on the conveyor belt, and start the roller to emit the X-ray

(2) Change the electronic control panel

(3) Check the cable and connect it correctly

(4) Change the indicator

6.7.4. Image display

Before image system searching the failure, make sure the electric and machinery part of the X-ray generator are properly adjusted. Make sure the power supply of system meets the requirement (5V, ±5%; 12V, ±10%).

Failure 1: The display does not work when the system is electrified.

Probable reasons:

(1) The power supply of display is not connected.

(2) The signal line of display is not connected.

Solutions:

(1) Connect the display to the power supply

(2) Connect the signal line of display

Failure 3: The industrial control computer checks the program after starting up, but the display shows the vertical stripes.

Probable reasons:

(1) Signal processing board

(2) Connecting line

Solutions:

(1) Change the signal processing board

(2) Change the connecting line

Failure 4: There is no image during the luggage check.

Probable reasons:

(1) The serial port connecting line between control panel and industrial control computer

(2) Control panel

(3) Light barrier

Solutions:

(1) Change the serial port cable

(2) Change the control panel

(3) Change the light barrier

Failure 5: There appear horizontal lines during the luggage check. (It is normal to have three to six dark lines in the image, in which the conveyor belt has two dark lines.)

Probable reasons:

(1) Detector or the detecting panel

Solutions:

(1) Change the detector or the corresponding detecting panel

Chapter VII Storage and After-sales Service

7.1. Condition & term of storage and the notice

When the device requires to be disassembled before delivery, repeat the reverse process of installation.

The system should be stored in a clean and dry place, because overheating and damp may damage the parts of the system. If the device is not used in a long time, please store it in the original packing box.

1. Storage environment

The device should be able to be stored for 15 weeks on the following conditions during the transportation or in the state of storage packing.

Storage temperature: -20 ~ +60℃ (Non-condensing)

Storage humidity: 20% ~ 95%

2. For device that demands to be stored for a long time, there should have a good storage condition. The storehouse should be clean and dry with good ventilation, and there should be no corrosive gas around. The relative humidity should be less than 80%. The device should be stored in the packing box.

7.2. Guarantee

We put technical support and after-sales service in the first place, and try to provide quality service for our customers.

7.3. Acceptance

1. Inform the company when you have received the device, then the company will send the professional engineer to assist your unpacking acceptance and the installation. To be responsible for you, the engineer should check the device and parts one by one according to the contract and packing list. If there is any damage, error, or short of parts, the engineer should assist you to deal with the claim, or advice the company to correct or make up the parts. The engineer should install and test the device according to the technical specifications.

2. The user should cooperate with the engineer during the installation and test to make sure the system can be put into operation as soon as possible.

3. Acceptance standards: The device is checked and accepted according to the standards and methods in the contract.

4. Term of acceptance: The acceptance should be made within 5 days after the installation and test. The user signs the acceptance report, with the signature date set as the start date of warranty period. The company has no responsibility if the date is expired.

7.4. Technical support and training

Technical training includes basic operation training and image recognition training. The company offers the customers free basic operation training.

1. Purpose: To let the users get to know about the system composition of the device, and allow them to master the operations on electromechanical parts and the matching software, while having an elementary assessment for the quality of device.

2. Time: Time can be arranged based on the customer's requirements and actual condition.

3. Place: The operation training is arranged on site of operating area in principle.

7.5. After-sales service

Thank you for choosing our devices. We are ready to offer high-class after-sales service.

The services include:

1. Choose the close appointed repair unit if you want to have a maintenance service.

2. If there is any question or difficulty in maintenance, please contact the local repair center.

The guarantee service is not applicable to the security check devices in one of the following conditions. However, they can be repaired with some charge.

1. The trademark or the series number of the device or parts is torn or changed.

2. The device is damaged by improper use, maintenance, or storage.

3. The device is damaged by unavoidable force.

4. The device has been maintained by non-appointed repair unit or personally.

5. The device has been combined or assembled with devices from other companies, unless obtaining the written agreement of the company.

1.6.1 The standard image:

Color images using three colors: blue, orange, green. The blue represents iron, steel , atomic number inorganic , such as iron, steel and other metals; orange on behalf of the atomic number of smaller organic compounds , such as water , Plexiglas , plastic , etc. ; green represents between organic and inorganic objects, such as aluminum . Figure 5.13 shows the imaging results of the standard modules.
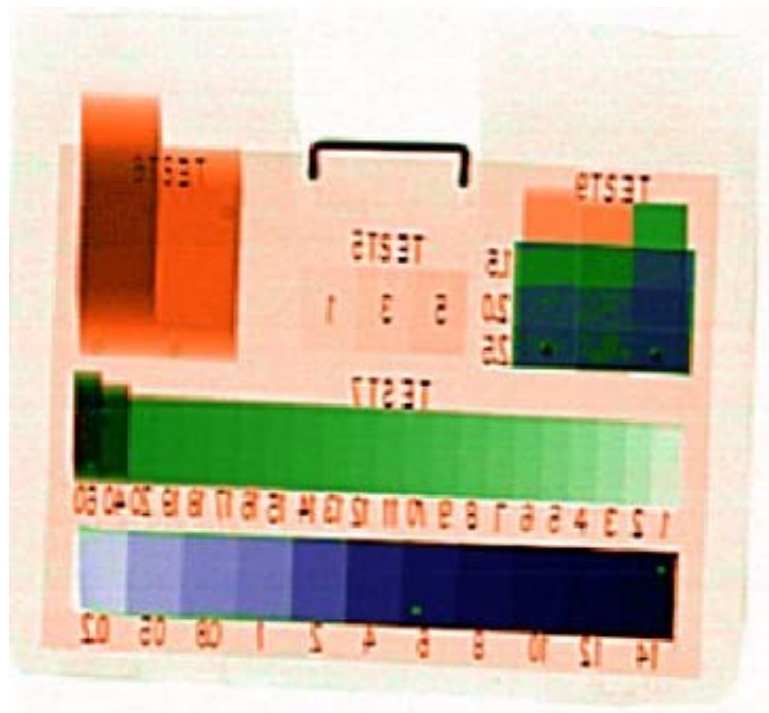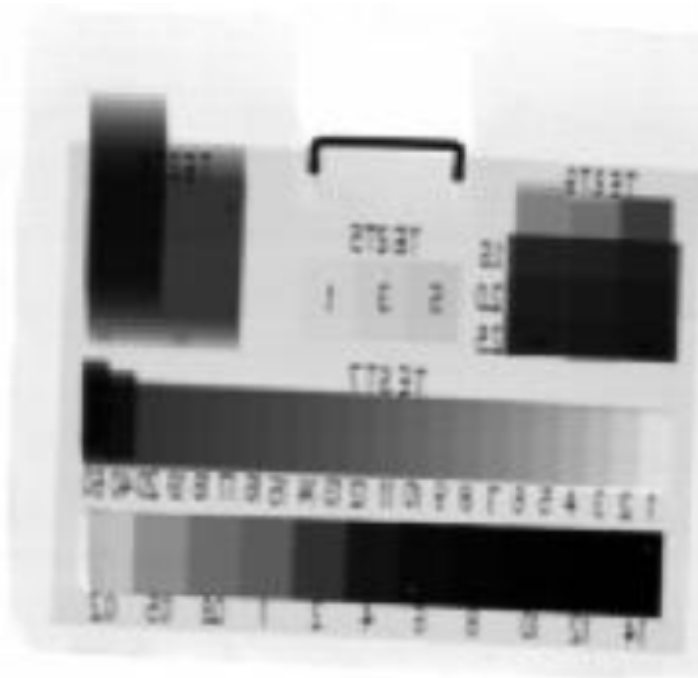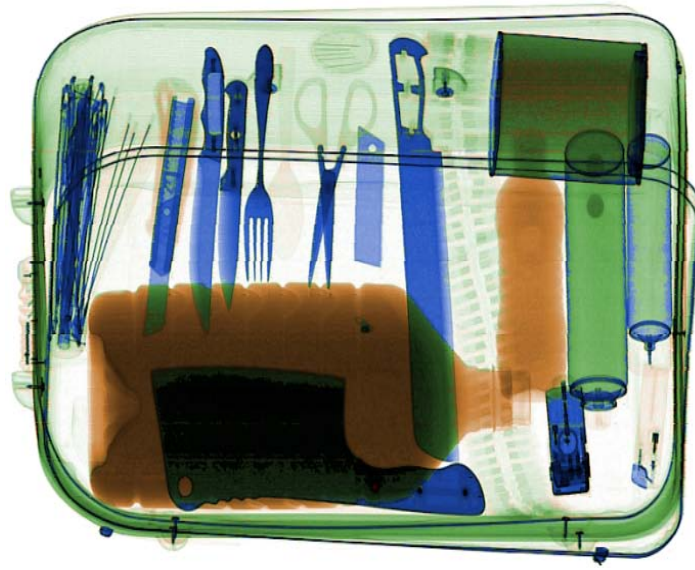
1.6.2 The typical image of the contraband:

Including: knives, lighters, firecrackers, liquid, and its imaging results shown in Figure 1.14

1.6.3 Typical images of small items:

Typical of small items such as needles, pins, etc. The following figure shows images of various sizes of needles.
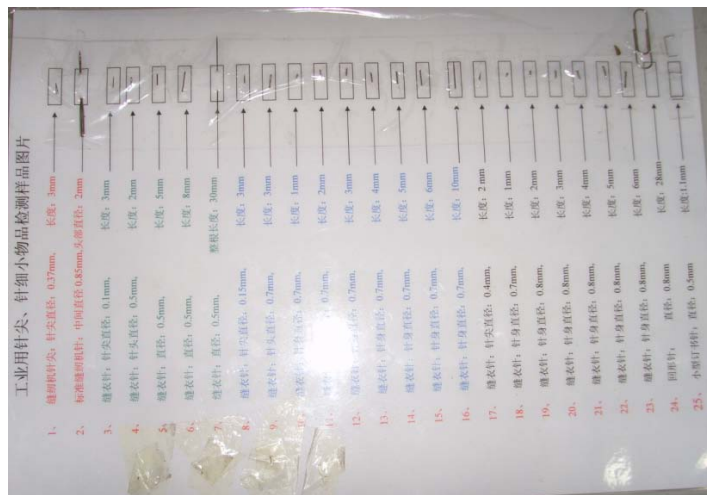
Figure 5.16 is a typical picture of small needles in shoes (needles of 0.3 - 1.0mm):

Daily used keyboard operation and image display and processing:

EXIT	To exit the X ray system
F1, F2, F3	Same function as computer keyboard
F4	For future promotion
F5	For future promotion
F6	For future promotion
F7	Login in software (password protect)
F8	Login in main menu
TAB	For future promotion
Empty	Shift to next form when input data
Number: 1,2,3,---, 9,0	For number input
H/LE	High energy/ Low energy
C/G	Color image / Black & white image
ZOOM	Zoom image
FW	Turn to the former image
BW	Turn to the next image
LIGHT	Make the image brighter
DARK	Make the image darker
MARK	For future promotion
ALM	For future promotion
RES	Back to original image
BEH	Enhance image edge
PEH	High density part enhance
SEH	Strong enhance image
ATGR	Different gray level image
CRG	Organic only
MET	Inorganic only
HP	High penetration image
LP	Low penetration image
REV	Reverse color of image
Left arrow ◄	For future bidirectional function (Not OK yet)
Middle dash ▬	Stop the conveyor
Right arrow ►	Start the conveyor
DEL	To delete input
ENTER	Confirm
Direction arrow	Shift the image when zoom it.