

X-ray Security Inspection Equipment

MCD - 5030 A

The user's manual

Statements were made by former

The Company's research and development of the channel-X-ray device is using a X-ray penetration capability of the baggage, cargo quickly without the out-of-box inspection system. Channel-X-ray device is advanced X-ray image detection system, the device has an integrated efficient semiconductor detectors, digital image processing and computer images to be displayed, and provide the user with an efficient and reliable and have a service features a high-quality image processing system. This device as hard drive capacity to store any more high-resolution images, with a solid dangerous goods automatic alarm function and automatic error detection maintenance functions, and a simple user friendly design, the user operation more convenient.

In order to make the masses of users of my company's production of the product with a comprehensive understanding of, and also in order to provide service personnel with the necessary repair information, the preparation of the channel-X-ray the user manual of the device. This manual provides a comprehensive channel-X-ray device, how they work, and how to do this, adjust, service and maintenance. The Installation and Use of this product, please read this manual and the user does not comply with the requirements of the device, the Company does not assume any responsibility.

The channel-X-ray system single check and beam leakage of the dose is very low, the icon for 5 $\mu\text{Gy/h}$, and my company provides the equipment of the leakage is less than 0.1 $\mu\text{Gy/h}$, the product for the operational staff, passengers and their carry-on all commercial film is absolutely safe. Even so, it is recommended to use this product, carefully read the user manual, this manual contains information about security with the channel-X-ray device for important information. The product should be the formal training of personnel to operate, in any case, the operator must be in strict compliance with radiation protection rules, in order to avoid exposure to radiation, only a radiation safety and operation of the system for training staff to use channel-X-ray device.

In view of the limited time available, the manual is bound to be omissions and deficiencies, and please the masses of users and experts to give inaccurate criticism.

The Company's products in continuous improvement, the manual changes, are subject to change without notice.

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Chapter 1 System Overview

1.1 Operation of the System

Channel-X-ray device is consist of baggage handling section, X beam source and control section, signal acquisition and transfer, image processing and electrical control section. Channel-X-ray device is with the help of the transfer belt is checked baggage-feed track channel. Items go to Channel, detection unit the information sent to the control unit, the control unit trigger X-ray source launch X rays. X-ray after collimator, formed a very narrow fan beam to penetrate on a conveyor belt of baggage items falling onto the detector, the detector to receive the X-ray into electrical signals, and these are very weak current signal is zoomed in quantified, through a universal serial bus transfer to industrial control computer for further processing, the complex arithmetic and image processing, high-quality images. The works shown in Figure 1.1 is shown below:

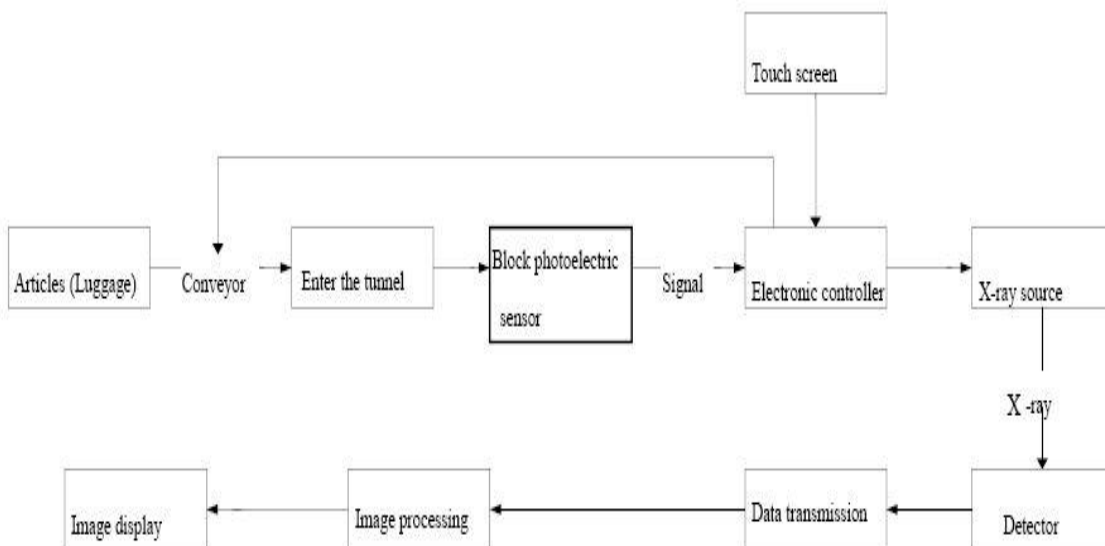


Figure 1.1 X ray Equipment operation schematic

1.2 Product Features

The product has the following characteristics, provides users with a fast, convenient service.

*Environmental friendly lead-free Curtain: Lead curtain looks after a specific processing, wear, and environmentally friendly, increase the using time

*The Network Interface: can be connected to your LAN, multiple terminal and check Baggage

*Ray more secure:-ray emission control to avoid misleading launch

*The key to shutdown control: off, simply turn the key, the device auto safety shut-down, simple and convenient.

*The image Dynamic processing functions: Some function keys in the dynamic,

real-time processing

1.3 Technical Specifications

The product's technical specifications are as follows:

☆ Basic Parameter indicators.

Channel size	500 * 300
Belt Speed	0.22 m/s Draper
rated load	170 kg
Penetration	≥ 10 mm steel
Roll Security	ISO 1600 roll security
Leakage dose	≤0.1 μGy/h

☆ X-ray generator.

beam direction	the bottom-up.
Tube voltage	80 - 160 kV (adjustable)
Beam divergence angle	80 degrees
Cooling/work cycle	sealed oil cooler/ 100%

☆ The system of image processing

X beam sensor	L-PV2 diode array detector, 12 bit depth
Display	high-resolution 17-inch monitor
Color Image Display	based on material quality, 24-bit true color display
Edge Enhancement	object contour edges more clearly
Super image enhancement	image detail more clearly
High Penetration display	To improve the contrast of the bright area in the image, so easy to penetrate more clear
Low Penetration display	To improve the contrast of the dark area in the image, so difficult to penetrate more clear
Magnifying glass	zoom To Area features, the dynamic Zoom
Display	
Highlight/DIM	increases the brightness of the image/dim the brightness of the image
Image pull back or pull ahead	the first 20 images, and of the current image can be any image processing
Image recovery	image displays the restore to the original state
Save the image	real-time save any images, and to make any image processing, Continuous Operation.

Color organic matter, mixtures appear in black and color, inorganic displayed in blue

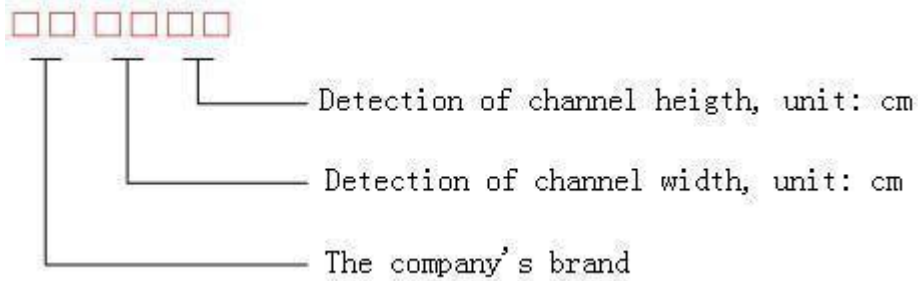
☆ Use of the Environment.

Operating temperature/humidity	0°C ~45°C/ 20% ~ 95% (non-condensing)
Storage temperature/humidity	-20°C ~60°C/ 20% ~ 95% (non-condensing)
Working Voltage	220 VAC (± 10 %) 50 ± 3Hz
Loss of Power	1.0 KW (maximum) , 0.3KW (working)

Noise Level

<55 dB

1.4 The Composition and Significance of the Model



1.5 Main Purpose and Scope of Application

Channel-X-ray device uses the latest imaging technology, the higher resolution, and the image sharper, can quickly and efficiently test a variety of dangerous goods, is widely used in government agencies, embassies, airports, conference centers, expo center, tourist attractions, sports and cultural facilities, post office, shopping centers, hotels, schools, and other security applications, suitable for bags, suitcases, bags, and other classes.

Chapter 2 Operating Safety Guidelines

2.1 Compliance with Regulatory Requirements

Channel-is a radiation of the X ray device, the design of the product, has been doing its utmost to ensure that the system use, installation and maintenance of the high level of security. Even in such a case, the device is in use, install, and repair, you must comply with the following safety rules:

- 1,GB 15208 - 2005 <The micro-dose X-ray device>
- 2,GB 4208 – 93 <The degree of protection of enclosure (IP code)>
- 3,GB 18871 – 2002 < Ionizing radiation protection and safety of radiation sources basic standards>
- 4,The CHINESE Law on Prevention and Control of Radioactive Pollution.

2.2 Basic Safety Rules

Although channel-X-ray device easy-to-operate, and we continue to recommend that you in before you turn on the computer read through manual, and to comply with the following rules:

- 1,More than 6 months without the use of the equipment, please do not turn it on! Must be a professional technician to X X-ray generator to re-start, it may cause X X-ray generator damage!
- 2,The operating channel of X-ray device, you should learn more about the application of radiation protection regulations!
- 3,If the other person to operate your channel-X-ray device, you must make sure that he is a qualified operator for all safety instructions, laws and regulations.
- 4,The channel of X-ray installation of the equipment, electrical connections, as well as the mechanical and electrical components of the replacement must only be handled by an experienced professional technicians .
- 5,If a channel-X-ray device in case parts, cable, or belt is damaged, it must be stopped immediately!
- 6,Channel-X-ray device Housing Panel and Parts can only be eligible for the professional technician, open!
- 7,No modification, change the security of the system in any part. For installation of the equipment, debugging, or repairs may only be done by trained and qualified personnel.
- 8,Channel-X-ray device can only be used to check items! Do not check for human or other creature!
- 9,Prohibiting sitting or standing on the belt.
- 10,Prohibits the start channel-X-ray device, any part of the body to enter the channel!
- 11,Ensure that the baggage detection channel or outlet port is not the stack! If the baggage blocking the Check the channel, the channel clean before first should be shut down.
- 12,To prevent the fluid flowing to the machine, in such a case should be immediately

shut down.

13, The channel-X-ray device and display the thermal port cannot be blocked!

14, Before the system works must be grounded. The power supply socket and install on-site must have a reliable grounding configuration.

15, The device, try to avoid standing in the Channel exports, near to the entrance.

16, Lead curtain damage or open, you cannot get the device.

17, Although X-ray dose is very small, but non-members of the staff or to be as far as possible away from the device.

2.3 Device Security Checks

Using the device, make sure to do the following safety checks:

1, The system power-on **MUST BE CHECKED BEFORE** channel entrance and exit to prevent X-ray leakage of lead-free curtain is intact, and if there is damage, replace it immediately.

2, Check for objects obstructing the light barrier.

3, Check that the belt is intact, and whether or not it is against the check Baggage stabs and smudges, conveyor belt for deviation or stuck.

4, Check your X-ray device Housing Panel, the monitor, the keyboard, and cable for damage.

5, Confirm that all of the covers have been covered.

2.4 X-ray Security

X-ray device, the X beam of radiation to the reliable protective measures to effectively ensure the operation and the test the safety of personnel. These measures are as follows:

1, The system uses the X-ray source is an active part, and it is only in the high-pressure, would be able to launch X rays, it does not power up, such as the transportation, save, you won't have any X ray.

2, The enclosure 4 Week and collimator is used lead-free board shield, access ports are fitted with lead curtains, have been effective in preventing X ray's injury.

3, In order to ensure that the maintenance staff security, the two interlock switch (any one interlock switch will not launch X-ray), conveyor stops and channel, no items X-ray also does not launch, the service personnel from X ray injury.

4, The device in more than one location set ground wire, you can effectively prevent electric shock and equipment damage.

5, The device Internal overload, over-current, over-protective, and will have an accident and dangerous to minimize the risk.

6, The X-ray security system is fully in line with X ray national GB 15,208 - 005.1 the security requirements.

In any case, Channel-X-ray device design can protect the personnel's operating and maintenance. The system has a very low X radiation dose, while at the same time to ensure that the object has enough penetration, photographic materials, food, drug and tapes are not affected, and even more exposure there is no harm done. The device

is equipped with a large lead shielding to prevent X radiation leaks. A lead curtain can reduce almost-ray external radiation to zero. The X-rays of the sunlight and the detector box, fitted with a safety interlock switch, the control circuit to monitor the interlock switch. The interlock switch, the device will be switched off automatically X-ray controller AC power to shut-off X rays. The device's X ray source in power cut cannot launch X rays.

2.5 Notice

1,Any a X-ray devices are harmful, therefore, to minimize exposure to radiation in the environment of the time, and that protection!

2,The external power supply, power supply, and it must be a good ground, must be true to the earth.

Chapter 3 System Architecture

3.1 System Composition

System consists of both hardware and software components.

Hardware components include the following:

- (1) X-ray a controller
- (2) X beam detector
- (3) Data acquisition
- (4) Mechanical
- (5) Industrial Control computer and display unit

Part of the software including:

- (1) Control portion of the system
- (2) Image processing part

System Block Diagram is as follows:

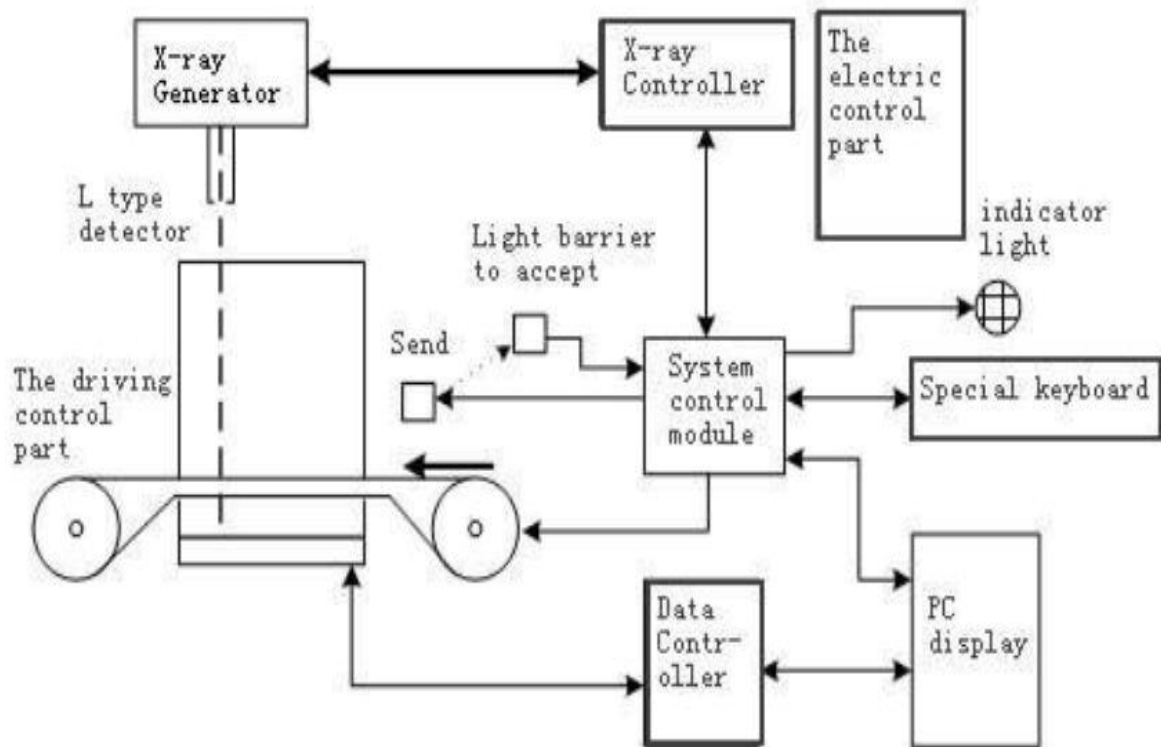


Figure 3.1 system diagram

3.2 System Components and Sub-assemblies

Included in the system of the components and sub-components are as follows:

- (1) X-ray source
- (2) X-ray source control and drive unit
- (3) X beam detector array.

-
- (4) Electronic Control Unit
 - (5) Industrial Controls
 - (6) Monitor
 - (7) intermediate relay
 - (8) Key switch
 - (9) Conveyor belt
 - (10) The visually impaired
 - (11) System power supply

3.3 System Sub-components Function Description

3.3.1 X-ray source

X-ray sources include 3 parts:

- (1) High Voltage Generator (two high-pressure doubly and feedback circuit)
- (2) X tube
- (3) Collimator

X-ray tube and the two voltage X and pressure feedback circuit consists of a high-pressure unit in the full of oil and lead shielding of the shell, the cable WS 9 to X ray source filament and high-voltage drive signal, and the high-voltage and anode current of a sampling signal feedback to X beam control and drive the chassis to maintain during the high-pressure and anode current stability. The collimator is role will be X beam the fan-shaped beam.

3.3.2 Detector array.

Two detector array form an L shape in order to solve the blind spot detection. Straight side (later known as the detection cartridge) and horizontal side (later known as the probe) the more than one detector plate, each containing 32 channels. High, Low Power Analog signal which is in the detection panel, then they are zoomed in to digital and delivered to industrial control computer for processing.

3.3.3 Electronic parts

Control panel is responsible for receiving industrial control of the computer in order to control the motor run and stop, and monitoring the disability status, determine if the baggage to enter and leave, control X-ray of the transmitter and close, monitoring X beam control module is working properly, such as unusual, and the automatic alarm.

3.3.4 Image processing system

Image Processing System is controlled by industrial control computer. Your computer receives the detector signal from the data acquisition system then dealing with data processing.

- (1) Image processing functions

The image-processing functions including edge enhancement, super image enhancement, color, anti-color display, a local penetration enhancement, image pull-back, zoom in, and so on.

- (2) Data storage and retrieval functions

Providing the image storage, retrieve the image and record operating personnel

function.

3.3.5 Display unit

The use of the 19-inch high-resolution display, depending on your needs, you might display a color image or black-and-white images.

3.3.6 Delivery unit

Delivery devices include:

- (1) Transfer belt.
- (2) The conveyor outlet port of an electric (driver) roller.
- (3) The conveyor inlet port of a change toward the roller.
- (4) Is located on the bottom two boot belt direction of the roller.

Electric roller contains a single phase motor, the motor of the drive torque the gear transmission to the surface of the roller, a drive belt for competitiveness, to roller for belt tension adjustment.

3.3.7 The Disability Unit

In the channel at the entrance with a light barrier Unit (the beam photoelectric switch), used to detect the conveyor forward into the channel of the baggage, if baggage blocking the light barrier, the visually impaired receive the output signal to electronic control unit, the control unit Notification-ray controller start launching X rays.

3.4 System Software

3.4.1 Software use

This software is the channel-X-ray device for image capture processing software, with image acquisition, image processing, image storage, function module test, and the ability to provide a user-friendly interface, easy to operate.

The software to transfer the signal in the complex data processing, the processed image is displayed on the screen and, at the same time, Software is provided with the edge enhancement, anti-color display, pseudo-color, partial penetration enhancement, image pull-back, zoom in, and more image-processing functions, for the operator of the prohibited items are identified.

3.4.2 Software operating environment

This software runs on PC and compatible with the operating system is WINDOWS XP, the software installed correctly, click directly on the software icon, you can enter the system software of the interface, the software you need.

3.4.3 Software

Software consists of the following two parts:

- (1) Private driver
- (2) The user control interface

User control interface	{	Control system hardware for data acquisition automation
		Timed reading data acquisition system
		For image processing provides the interface
		Analysis and processing of the display output
		Provides a user-friendly interface

Chapter 4 electrical structure

4.1 Electrical Control

Electrical System is a security system, an important part of primary to the whole of test power to the system, while the unexpected happens, to provide the system with the electrical protection, the device is operating in the console to control the electrical section of the diagram in Figure 4.1.

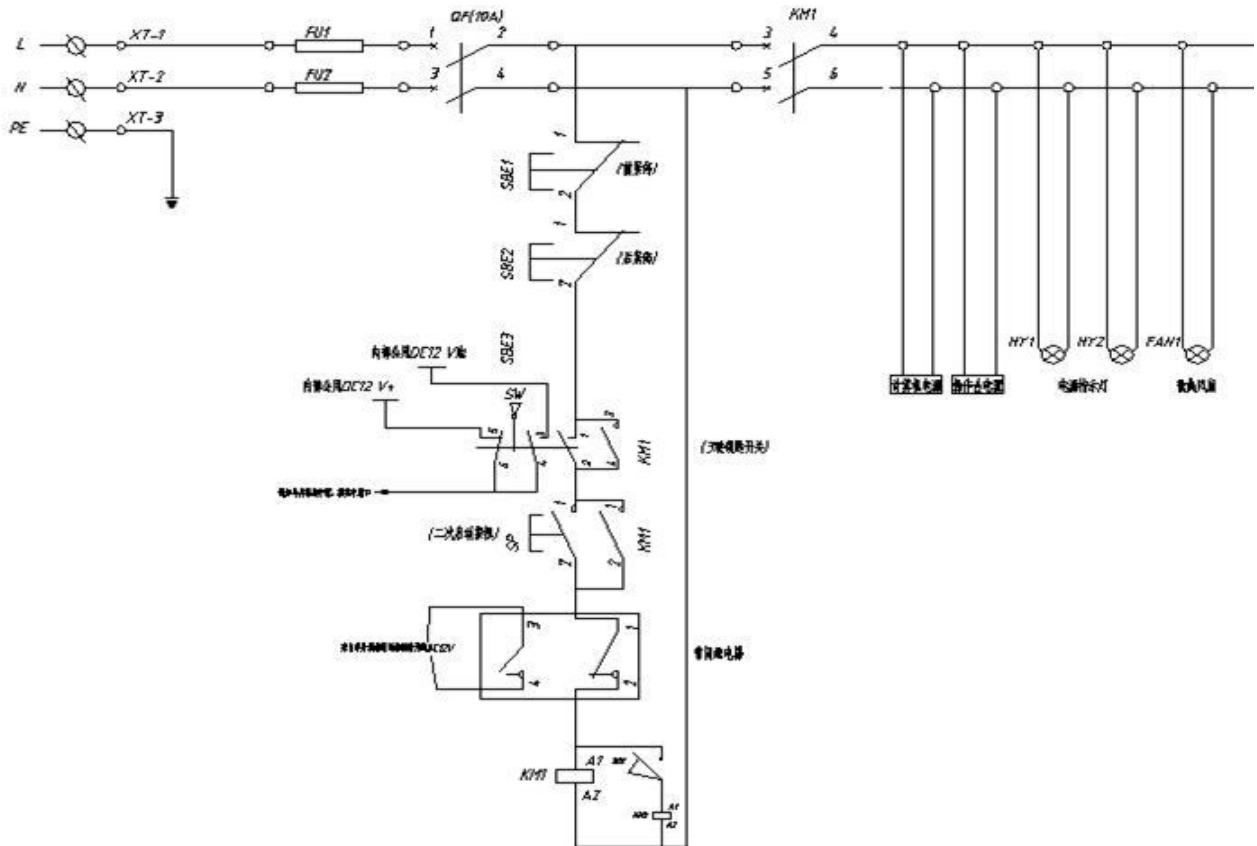


Figure 4.1 electrical schematic

Electrical part of the principal for the following features.

4.2 The Over-current Protection

Figure 4.1, the FU1, FU2 is 10A solid fuse, in the device's actual power is 1000W, design a maximum of 2200W, meet the maximum power requirements, located in the fuse followed by a circuit breaker, so that in the end the case of a short, instantly, to protect. The reason of internal short circuit is because insulation aging, terminal connection loose power circuit, and man-made factors.

4.3 Emergency Protection

Figure 4.1, the SBE1, SBE2, respectively to the stop button, and the switch is placed in the operating personnel and equipment in the enclosure, to prevent unexpected events occur, you can instantly switch OFF. The control part of the main loop, select the model to a diameter of 22, the

current 10A to meet the demand.

4.4 Access Control

This is a trained, full-time staff posts. Non-members of the staff cannot, therefore, there has to be a permissions to control, there are two programs, one in the electrical, two in the software, figure 4.1 SW in key switch to it in series to the main control circuit, select the two normally open and one normally closed switch. It is only with the key switch, you can use the device to prevent others from false triggering device.

4.5 Remote Start Control

Using the remote start control mode, the control button on the console, and the primary device to separate, and console can be placed in a room, or else a need to be in place by the power extension cable to extend control and the remote control.

4.6 The Key to Shutdown Control

In practical application, to the above key-operated switch in the case: the operator error, the key-operated switch reverse rotation, the power circuit. or accidentally and the key switch OFF. So the load, such as a computer, a sudden loss of power, the impact is large. I designed the product, the real when you switch off the device, and can be achieved only with the key switch a rotation, and will be able to safely shut down a key to shutdown feature.

4.7 Motor Pros and Cons in Control

In the course of normal use, there is a need to motor negative and positive turn, as a self-test, if there are objects blocking the visually impaired, belt to be required under the circumstances and negative turn, or when the object is, it is not clear that there is a need to carefully look, you need to back to invert. The part of the circuit is through an intermediate switch to the relay.

4.8 Motor Thermal Protection

Access to electricity because the time is too long or the load is too heavy, too, so that must be the motor protection, when the current reaches a certain level, for protection.

4.9 Travel Switch

Travel switch is mainly in order to protect human security settings, because ray is a dangerous, and when the human touch X rays of the transmitters, you need to X beam stop immediately launch, travel switch installed in the control X ray a unit next to the series to X-ray occurred inside unit, the short circuit protection.

4.10 The Light

The indicators will need to be installed on the device, the user has to indicate that role, and they are the X beam indicator, alarm indicator, and power indicator.

(1) The power-on light, turn the key switch, the system power-on, start device. channel on the front panel of the green power LED will light up immediately.

(2) X-Ray Light: X-ray indicator is installed in the path of the inlet and the outlet panel. Object

Access blocking light barrier, X-ray, the red light is on.

(3) Yellow alarm LED: at the entrance, and when there are suspicious items, flashing and alarm.

4.11 Terminal Module

In a system is connected to the terminal using a screw-type PCB terminals, through the COLD pressure terminals, surrounded with a line socket. Shown in Figure 4.2 is shown below.

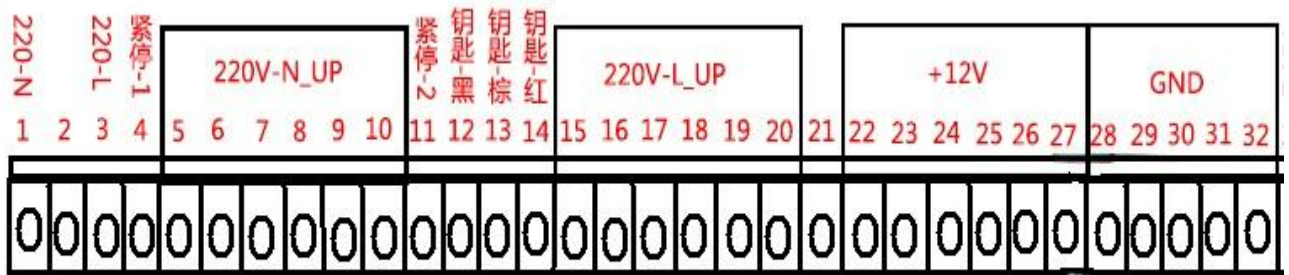


Figure 4.2 Terminal Module

Chapter 5 image processing and Software Operating Guide

5.1 Power-On

- z Turn the key in the key switch and turn it clockwise a quarter turn, press the green Start button to listen device start-up waiting to start.
- z Device Power on LED is lit.
- z System automatically enters the software application interface.
- z Program to automatically check the channel inside for any foreign objects. If there are obstructions, belt will turn to foreign material sent to Export. When an obstruction cleared, the entire software system initialization is complete.

5.2 For Goods Check

- z To retrieve items on the belt.
- z Press the belt forward button, the control motor, initiate the transfer belt.
- z Once an object to enter the channel, the first covering the optical barrier to start X X-ray generator.
- z The items through the channel, the device for its progressive scan, the test image is real-time display on the monitor screen, the image from the right-to-left.

5.3 Image Processing

In order to allow the operator to be able to better identify the package is a tool, and lighters, firecrackers, and the liquid, and a typical prohibited items, the system software has also increased the image zoom, organic, inorganic, image edge enhancement, image anti-color, the image is highlighted, and a range of practical image processing functions, the user to image processing, such as figure 5.3, custom keyboard function key, and the key image processing, and it is easy to operate, the user error image processing when you press the key, you can simply press the "Back" button to return to the original image, choose several common image processing.

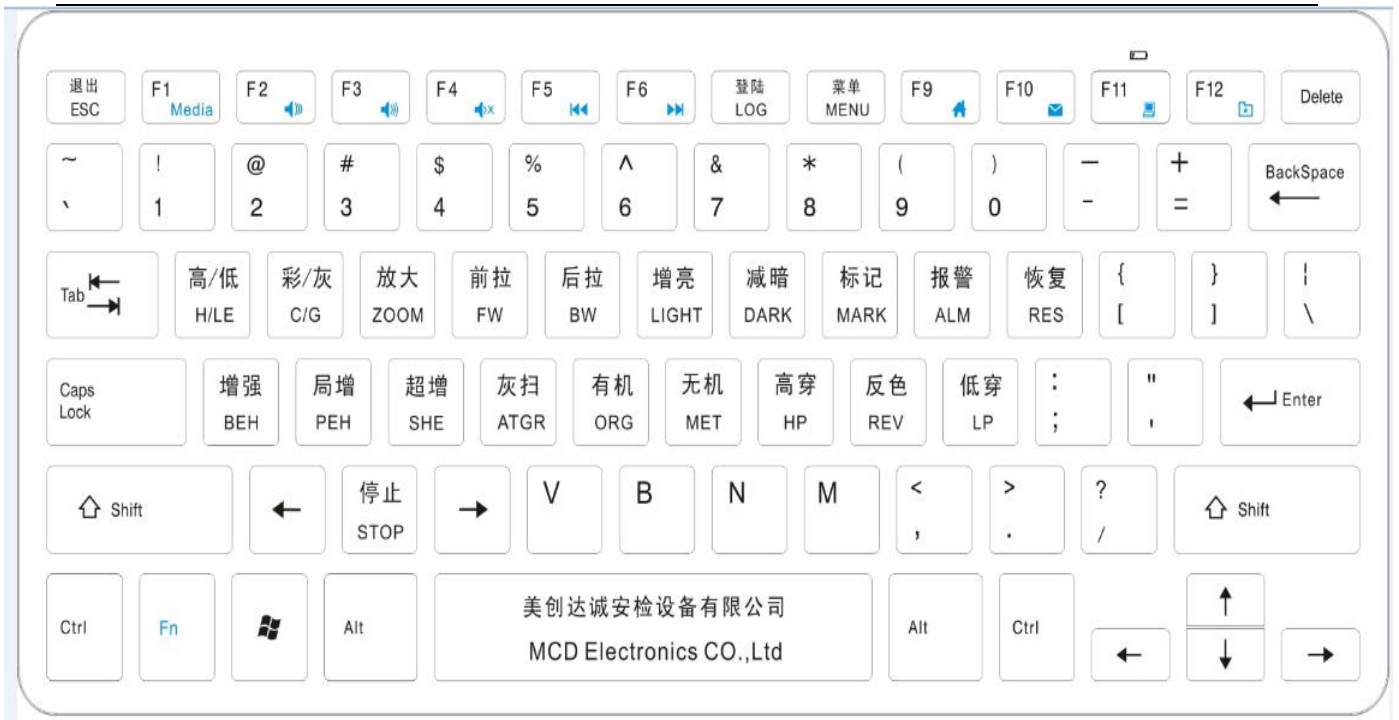


Figure 5.3 custom keyboard

5.3.1 Color/black-and-white display

Click on the color/black-and-white button, two colors can switch to select Display. Color images in 3-color image, the object is divided into 3 major categories, and the blue color of organic and inorganic substances, green mixtures, and the black (or red) indicates that material properties are not determined, generally difficult to penetrate the object. black-and-white image with 256 levels of gray, from pure black to pure white, grayscale display. The white (gray)the area of the image indicates that the object of X-ray absorption rate is low, the more the beam penetration. Absorption Rate different objects correspond to different shades of gray. When operating the "C/G" button, you can make a color image, and gray-scale image of the conversion.

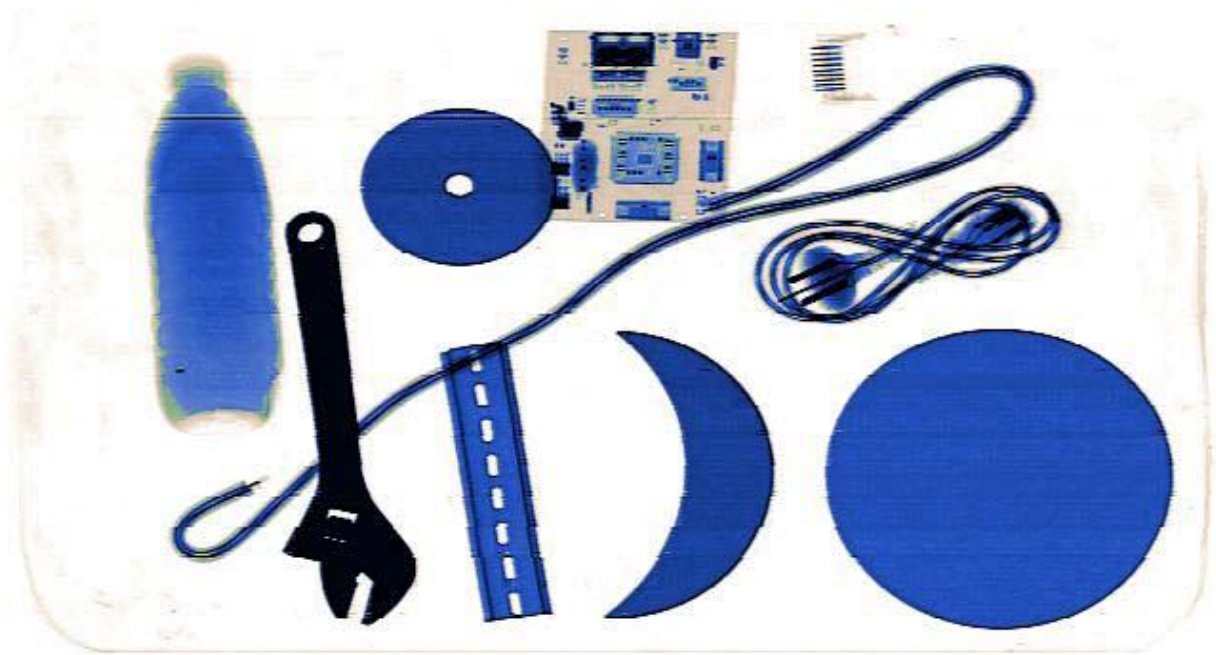


Figure 5.3.1 color chart

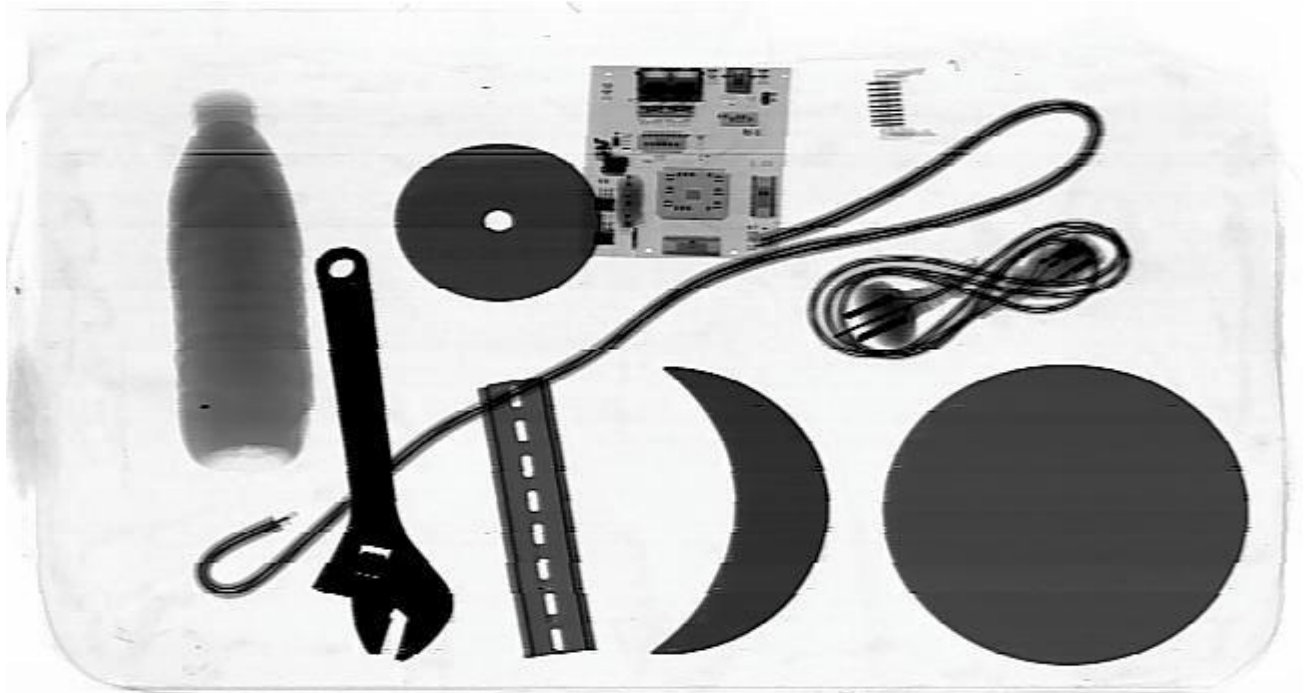


Figure 5.3.1 gray map

5.3.2 Image anti-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 “REV” 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.

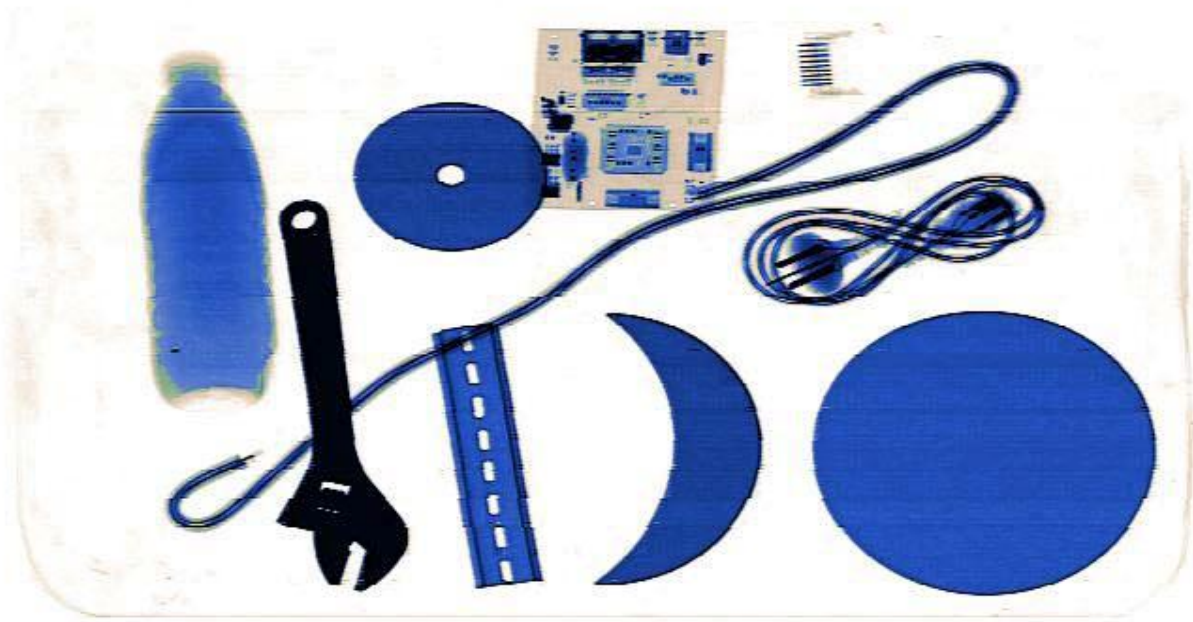


Figure 5.3.2 original image

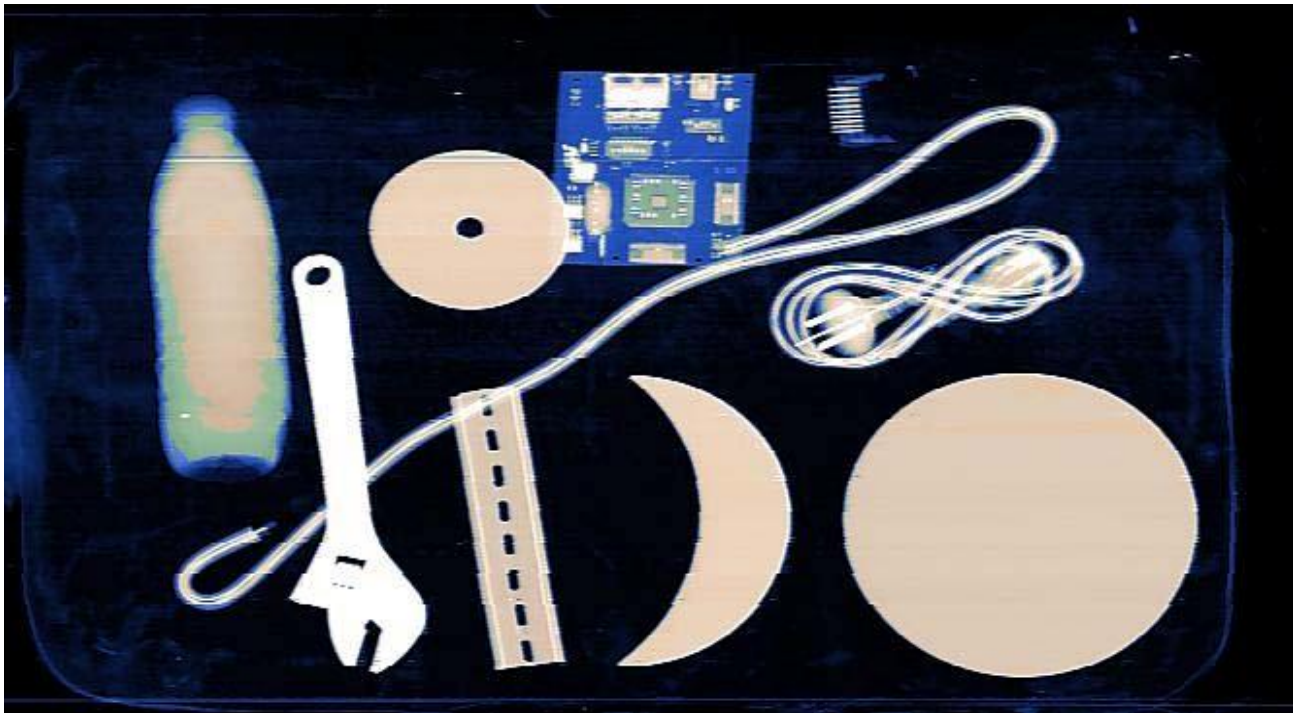


Figure 5.3.2 image anti-color chart

5.3.3 Edge enhancement(Increase)

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 "BEH" to enhance the penetration for the image to get the optimal contrast and lightness.

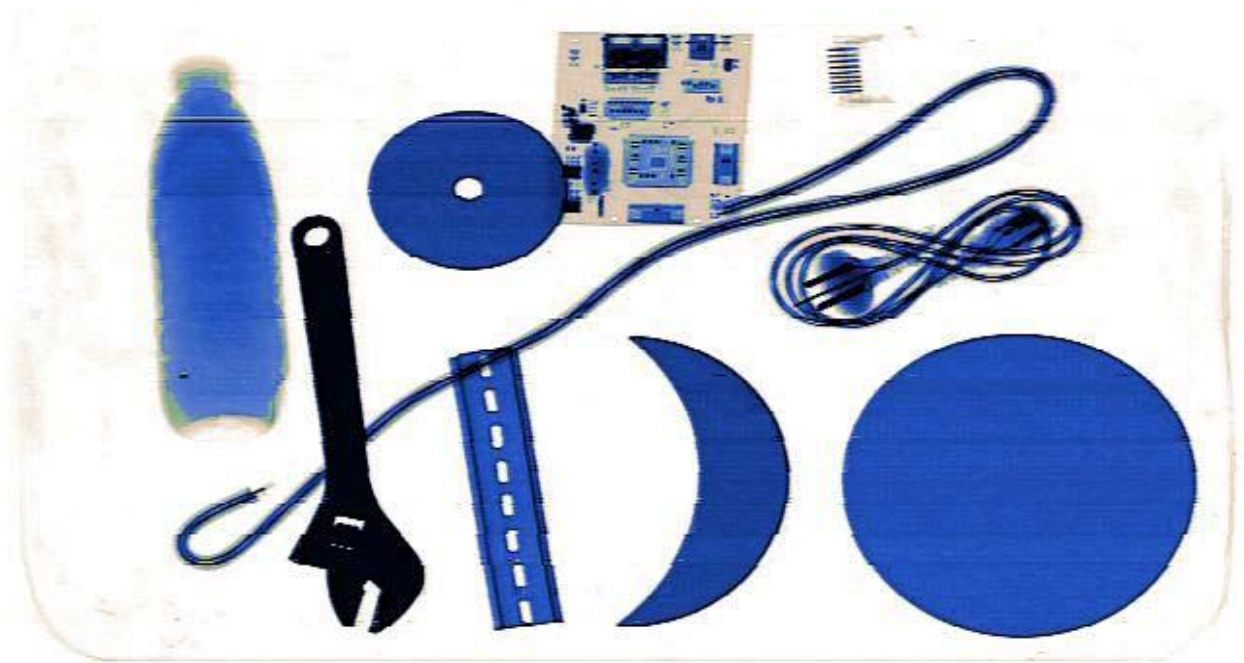


Figure 5.3.3 original image

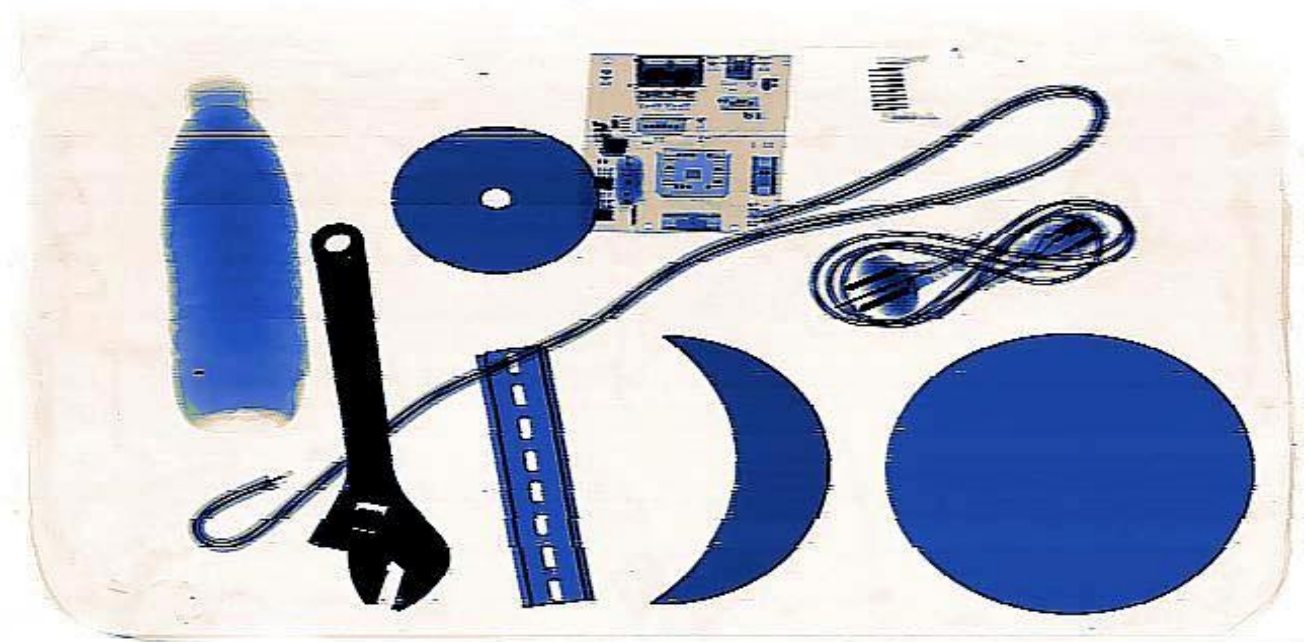


Figure 5.3.3 image edge enhancement effect diagram

5.3.4 Image partial enhancement (additional)

The image in a darker area to highlight to hide in thick object behind the object clearly shows, and the normal area of the image is not affected. Press the function key images to be automatically in the normal display, and partial enhancement between the switch. 2 press the (or the resume button) to stop the switch. Click "PEH" button to partial enhance the current image.

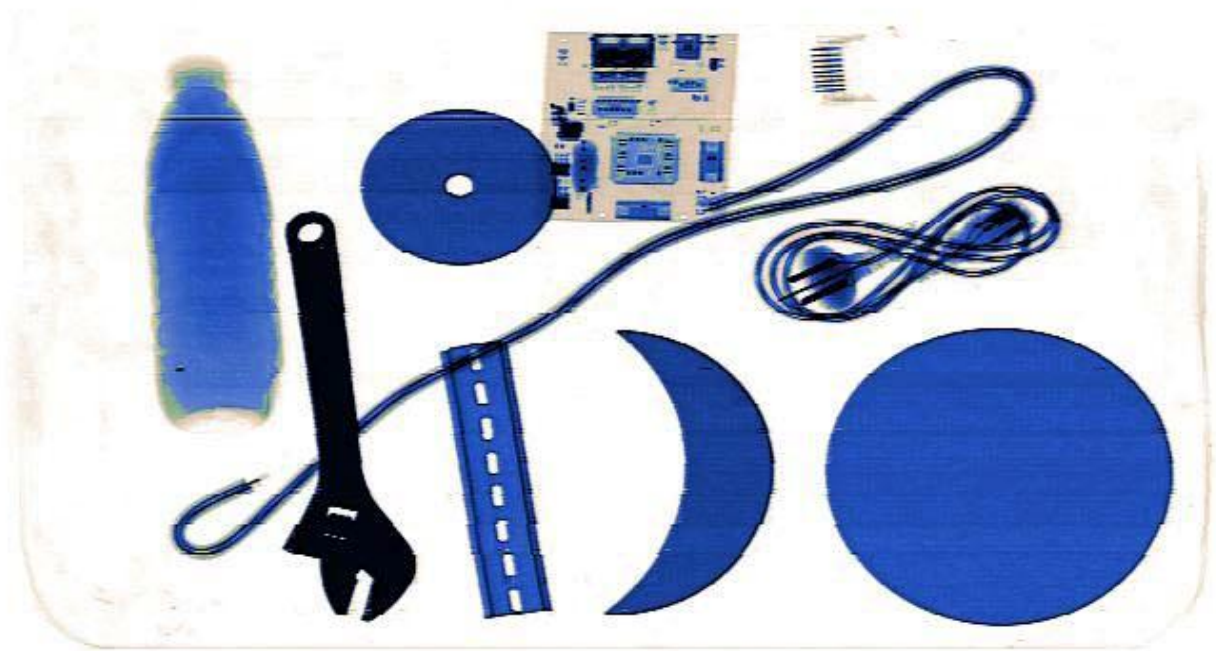


Figure 5.3.4 original image

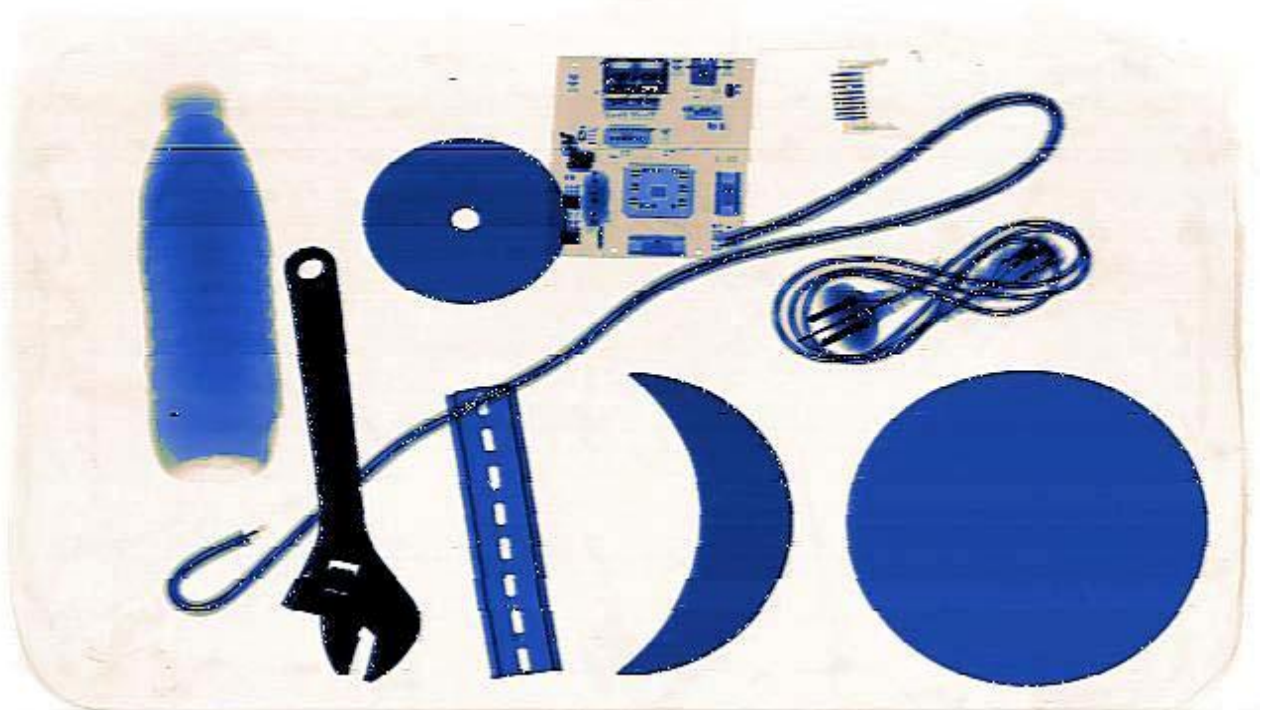


Figure 5.3.4 image partial enhancement effect diagram

5.3.5 High penetration (high-pass)

As Figure 5.3.5 shows, penetration of brightness light, the contrast is small, the high pass

through the light of the region to a suitable contrast display clearly shows high penetration area, but at the same time normal area is affected, and reduced contrast.

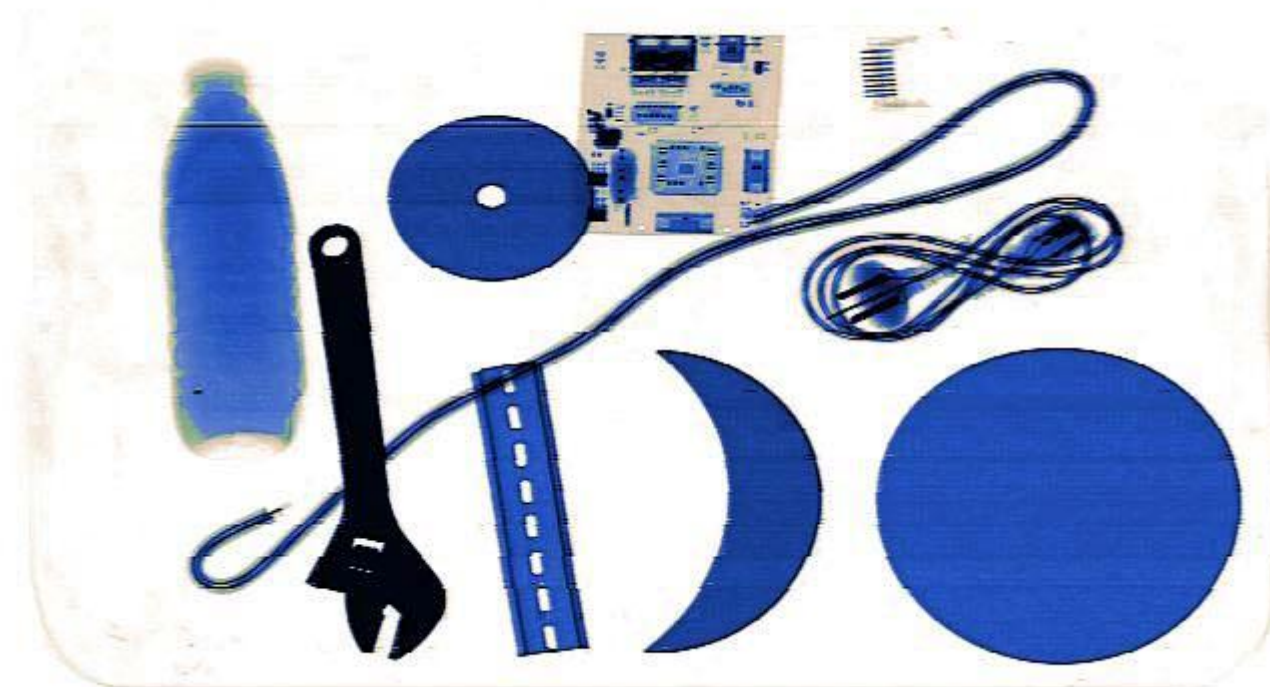


Figure 5.3.5 original image

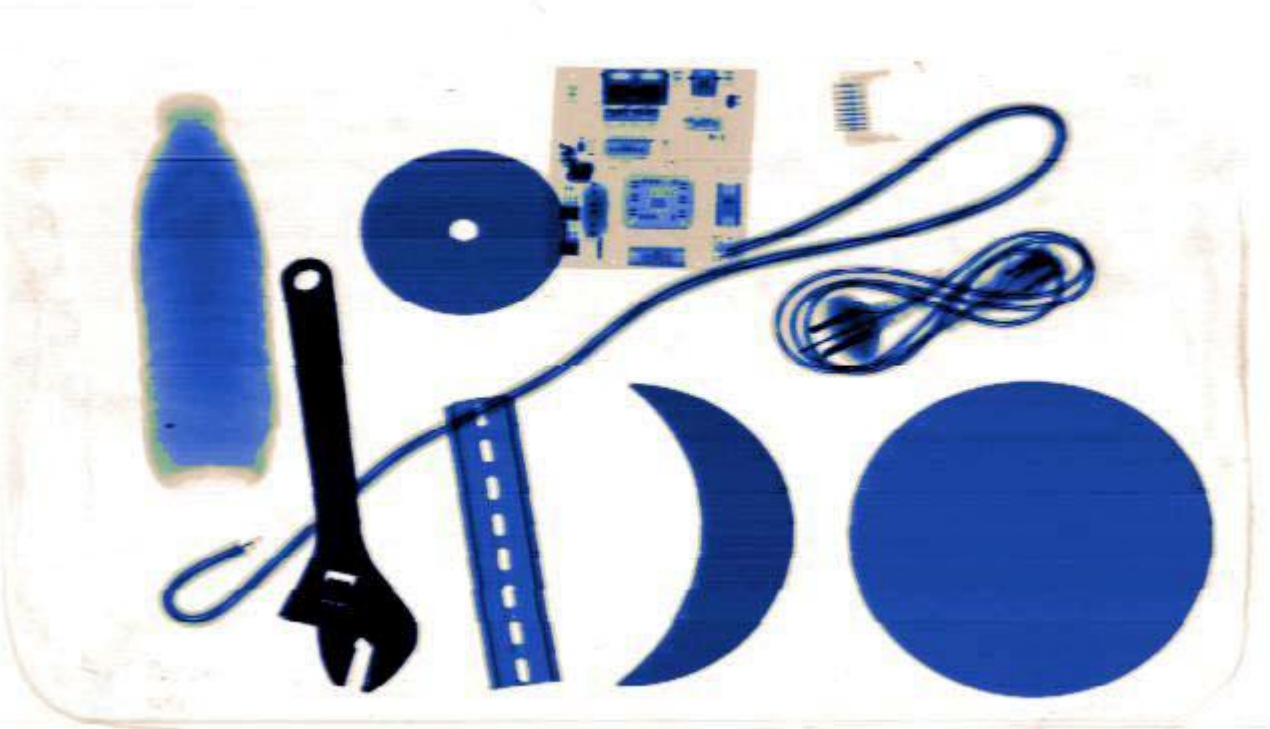


Figure 5.3.5 high penetration enhancing effect diagram

5.3.6 Low penetration (low-pass)

Click "HP" button to make current image more brighter, lower contrast. It will display as Figure 5.3.6 shows, that is not easy to observe, through the low-pass through, the regional highlight of the region contrast clearly shows the regional image, but normal area affected to reduce contrast.

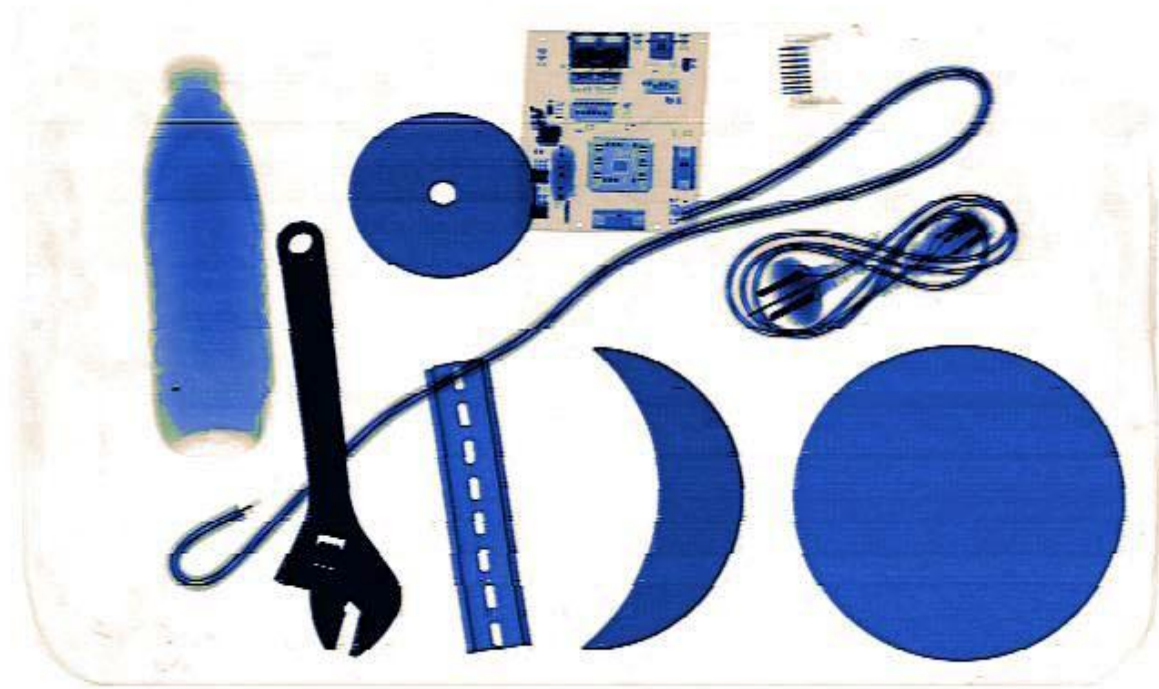


Figure 5.3.6 original image

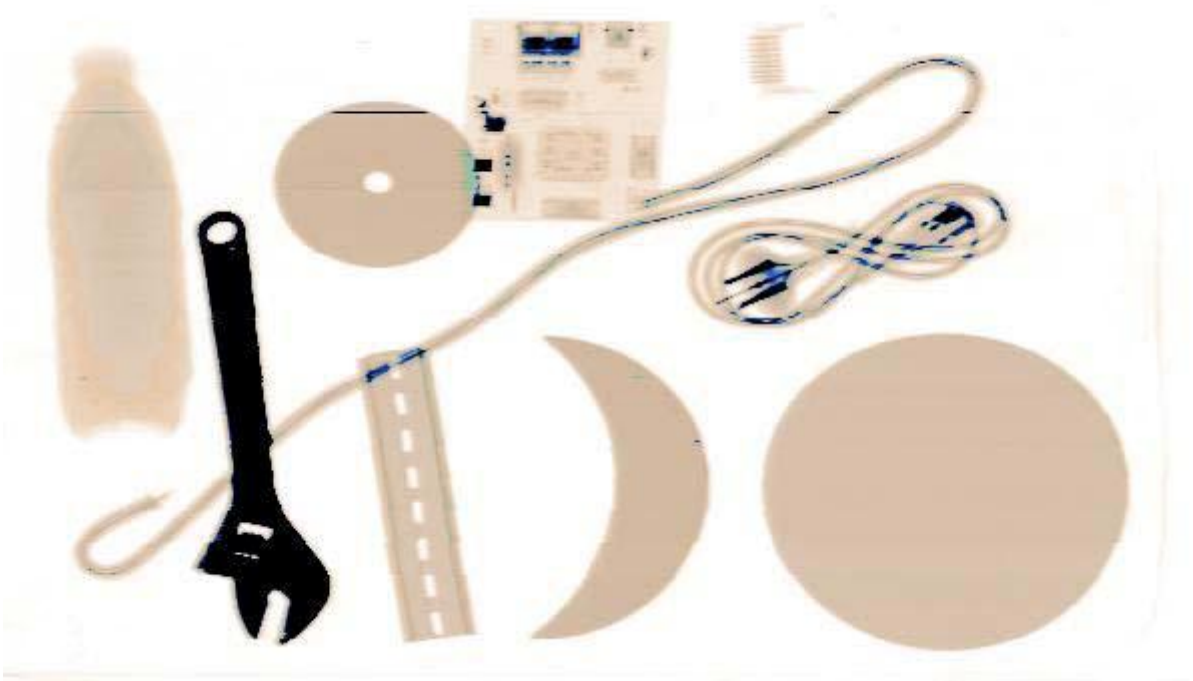


Figure 5.3.6 low penetration enhancing effect

5.3.7 Organic high light (organic)

MCD-5030A is a single energy probe, and there is no high and low energy switching and organic highlight, in blue, and the original image. Click "ORG" button.

5.3.8 Inorganic high light (inorganic)

MCD-5030A is a single energy probe, and there is no high and low energy switching and inorganic highlight, in blue, and the original image. Click "MET" button.

5.3.9 Image to enlarge

As shown in the figure, the image magnification function to the entire area of the image to zoom in, the user is only required to press down on the keyboard, the Zoom In button to zoom in package images, easily observe small contraband items. Click "ZOOM" button.

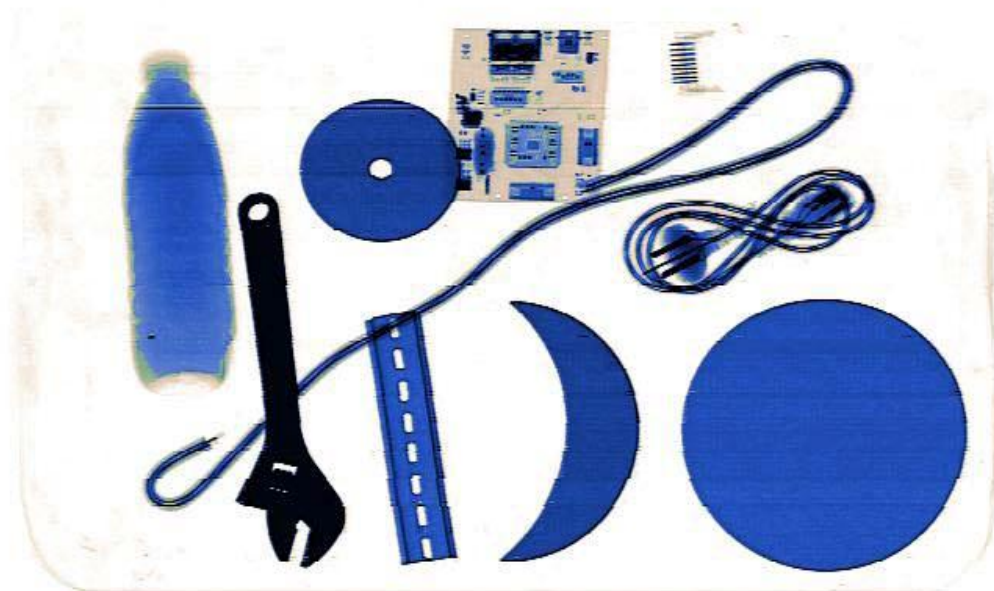


Figure 5.3.9 original image

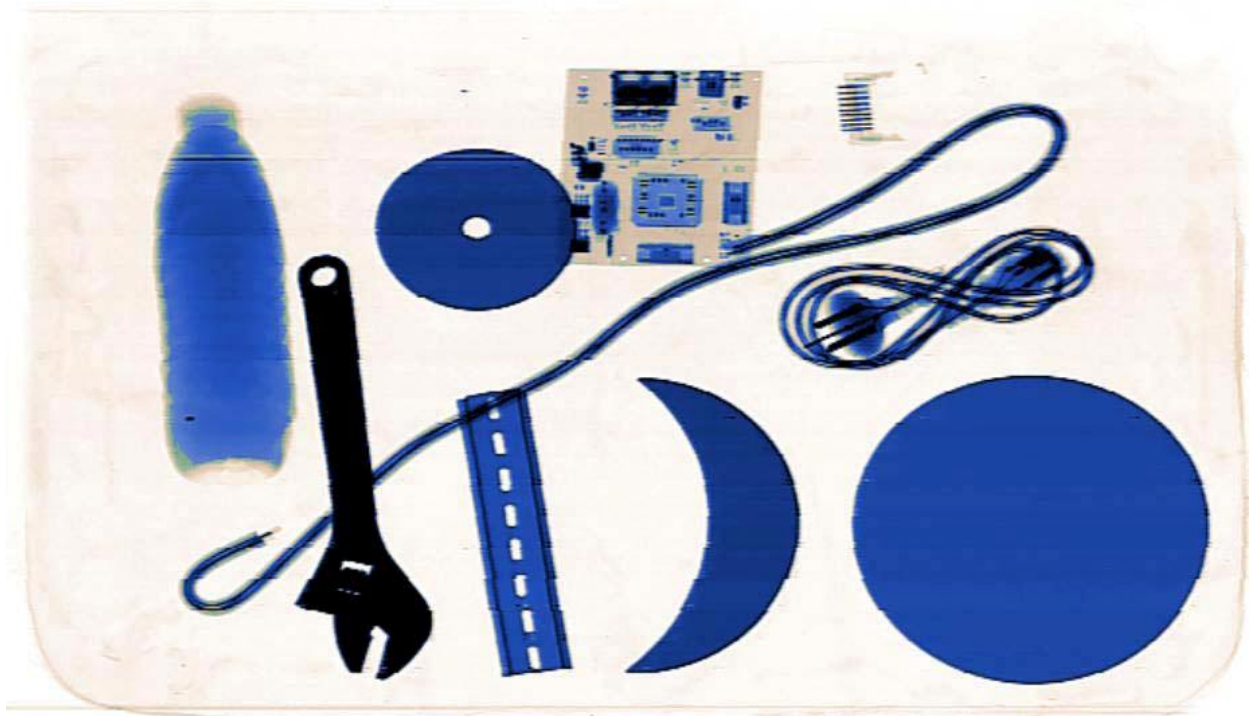


Figure 5.3.9 image zoom in effect

5.3.10 Grayscale scans (gray anti)

Press this key image will automatically change gray map, the dark area is bright and light at the same time, gradually dimmed. So the operator can easy to find the most suitable for the current image contrast and brightness. Click "ATGR" button.

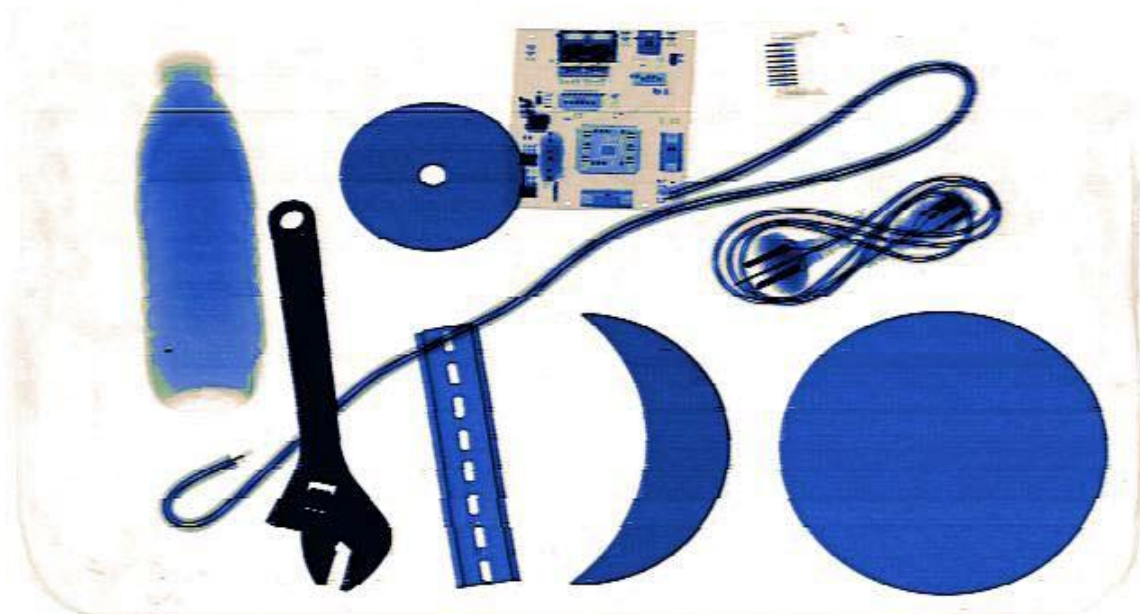


Figure 5.3.10 original image



Figure 5.3.10 grayscale scans figure

5.4 Shutdown Exit

Make sure the belt is not left any baggage. If necessary, the belt forward or backward movement. Go until you are sure the belt is not left any goods. Device Power On LED is lit.

z Direct left turn the key switch, the computer will shut down safely, and does not require any additional actions, simple, easy, and the design is very user friendly, the real meaning of the "one-off" feature.

z Remove the key, and after work or work during the transition.

5.5 Software Operating Guide

System software includes the image display screen and Menu, and the display screen, you can see the images, see the device status in the Action menu provides the image settings, the image retrieval, intelligent control, and so on.

5.5.1 Image display interface

Figure 5.5.1.1 is shown in the Image Display Interface is primarily used to display image packages through the display interface may also be intuitive to learn that the current Roller Movement, the data connection is working properly, and Ray is on information, such as, at the same time, the interface also provides a roller control button, when you click the button A or B , the drum up and running or the opposite direction, when the button C, the drum stops running.





Figure 5.5.1.1 image display interface

Figure 5.5.1.2 the roller stops running, beam off of the interface to display results.

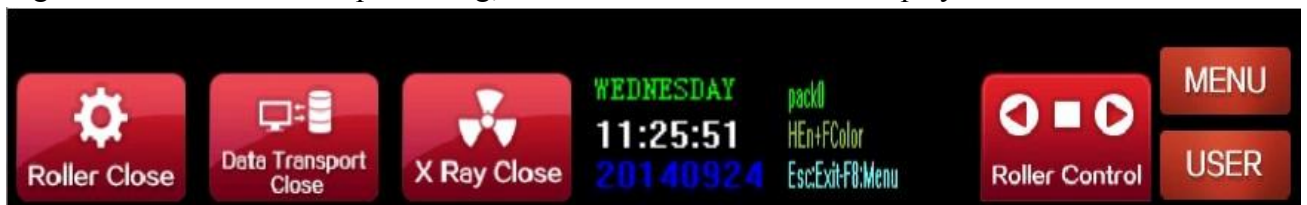


Figure 5.5.1.2 Status Display Interface

Figure 5.5.1.3 the roller is to run, Ray turned on the interface to display results.



Figure 5.5.1.3 Status Display Interface

5.5.2 Operating menu

When the user will need to modify the settings in the menu options, you must use a valid account to log-in software, modify the settings to take effect, the user modify the desired settings, you simply need to be in the corresponding function box, click the "Apply" button (or the "Settings" button) to exit the software, re-launch the software, and in the Actions menu contains mainly image set, the file settings, click Settings, etc. 7 sub menu.

5.5.3 User login

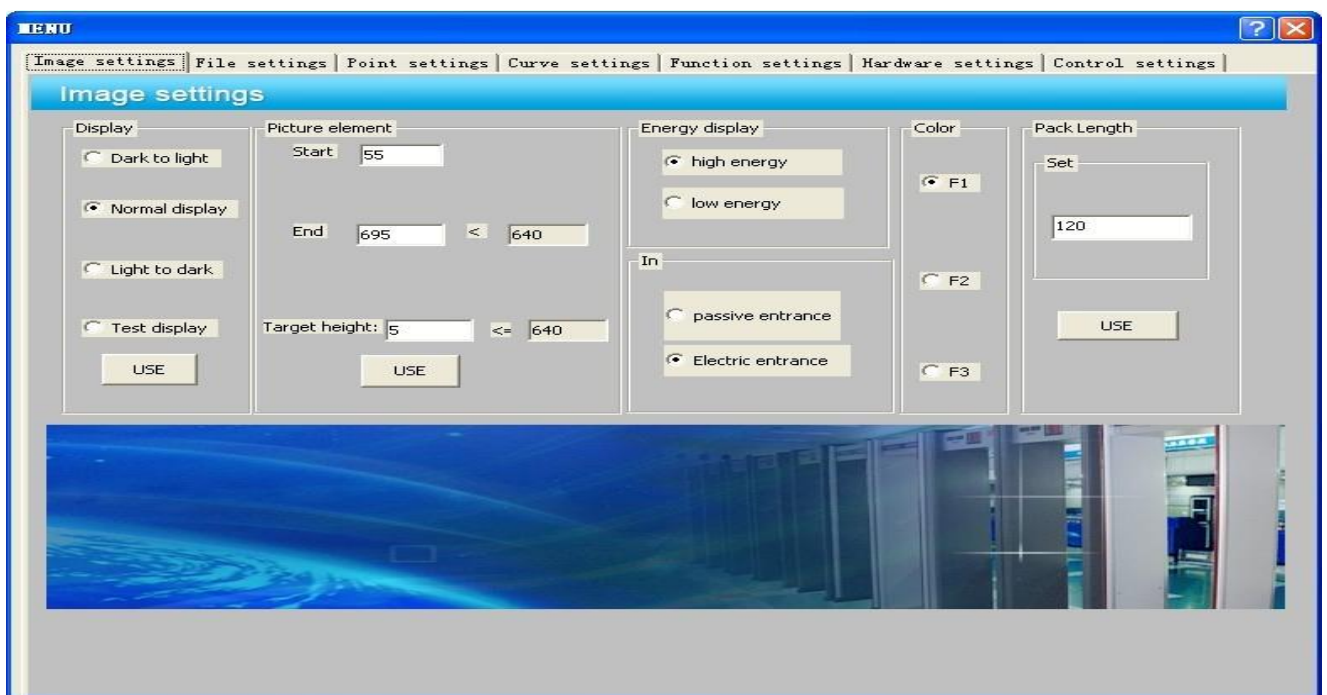
When the user in the image display screen, press on the keyboard F 7" button, the display screen will pop-up user login box (shown in Figure 5.5 3, and the user entered the correct number and password, and click on the Login button.If you donot know,please contact the sales man.



Figure 5.5.3 login screen

5.5.4 Image settings

User account to log-in software, the image is displayed on the screen by pressing on the keyboard F 8" press the key to display the menu screen. Figure 5.5 4 the Image settings menu interface, the Image settings menu the user can set the package of image, pixels starting point, end point package length, and so on.



5.5.4 image Settings menu interface

5.5.5 File settings

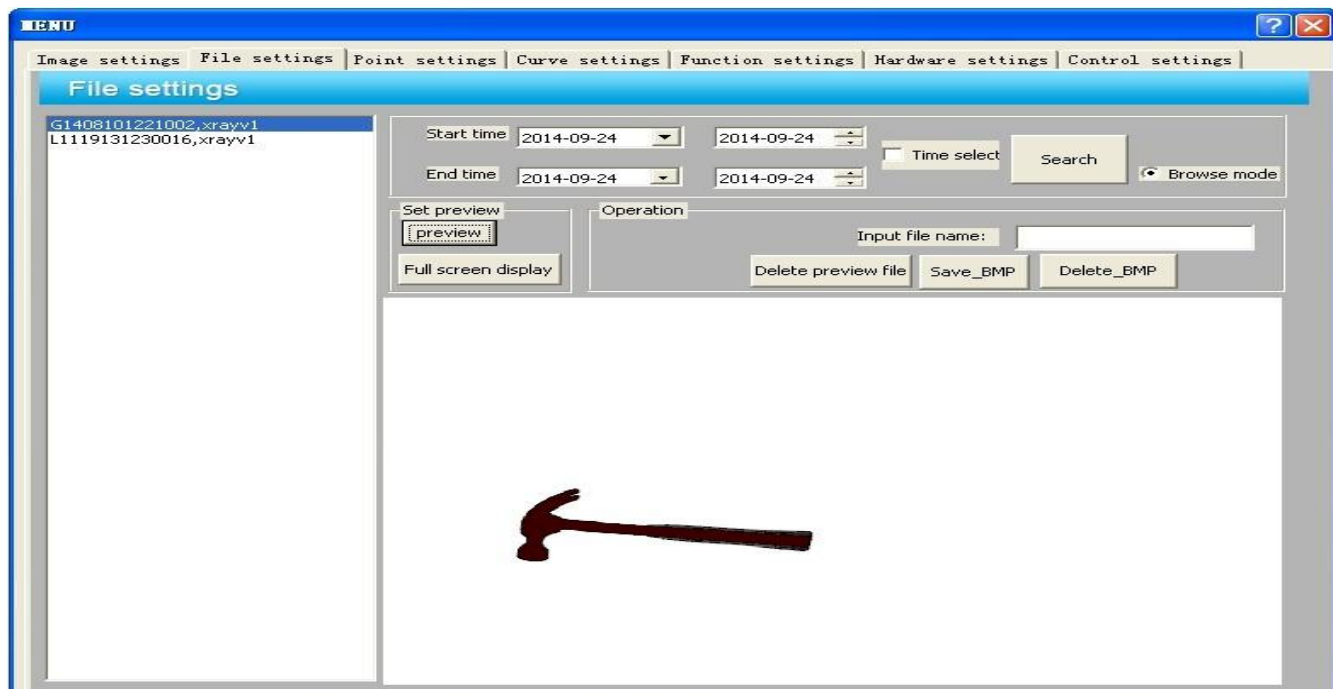


Figure 5.5.5 file Settings menu interface

5.5.6 Point settings

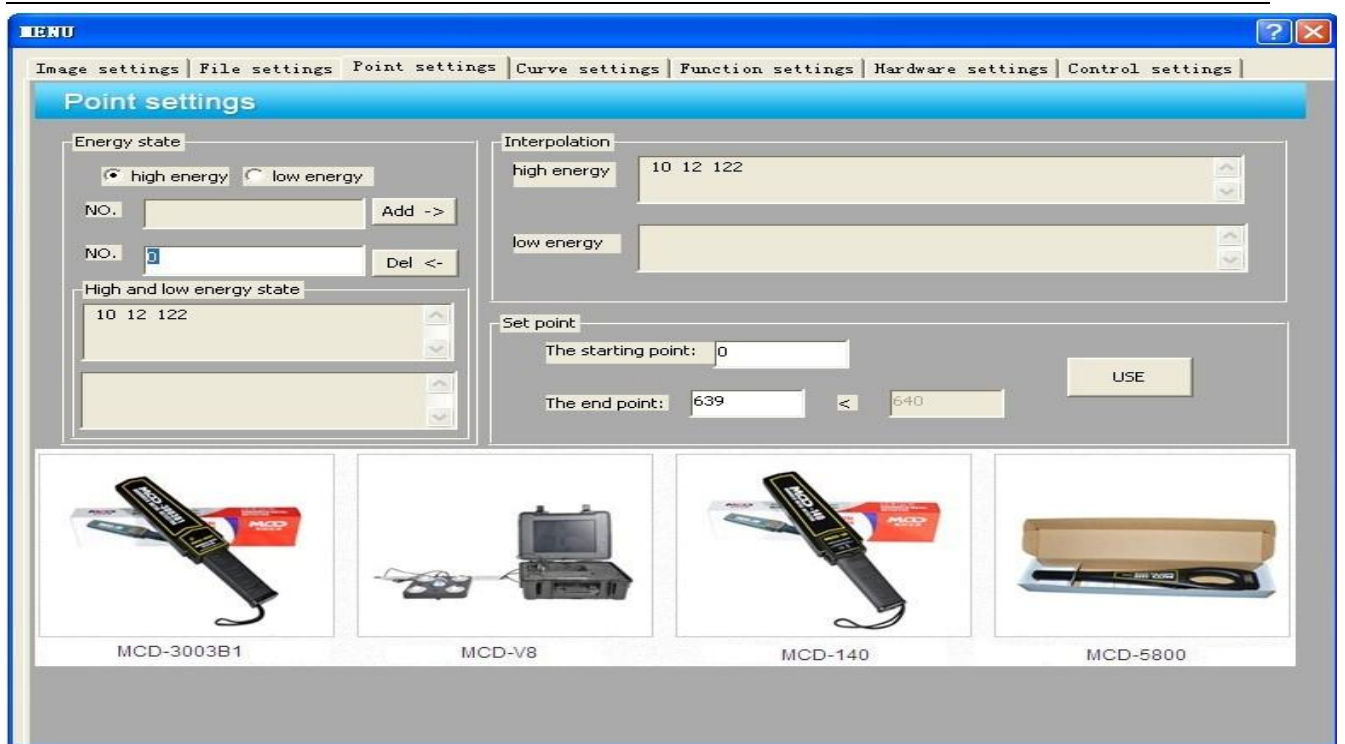


Figure 5.5.6 point settings menu interface

5.5.7 Curve settings

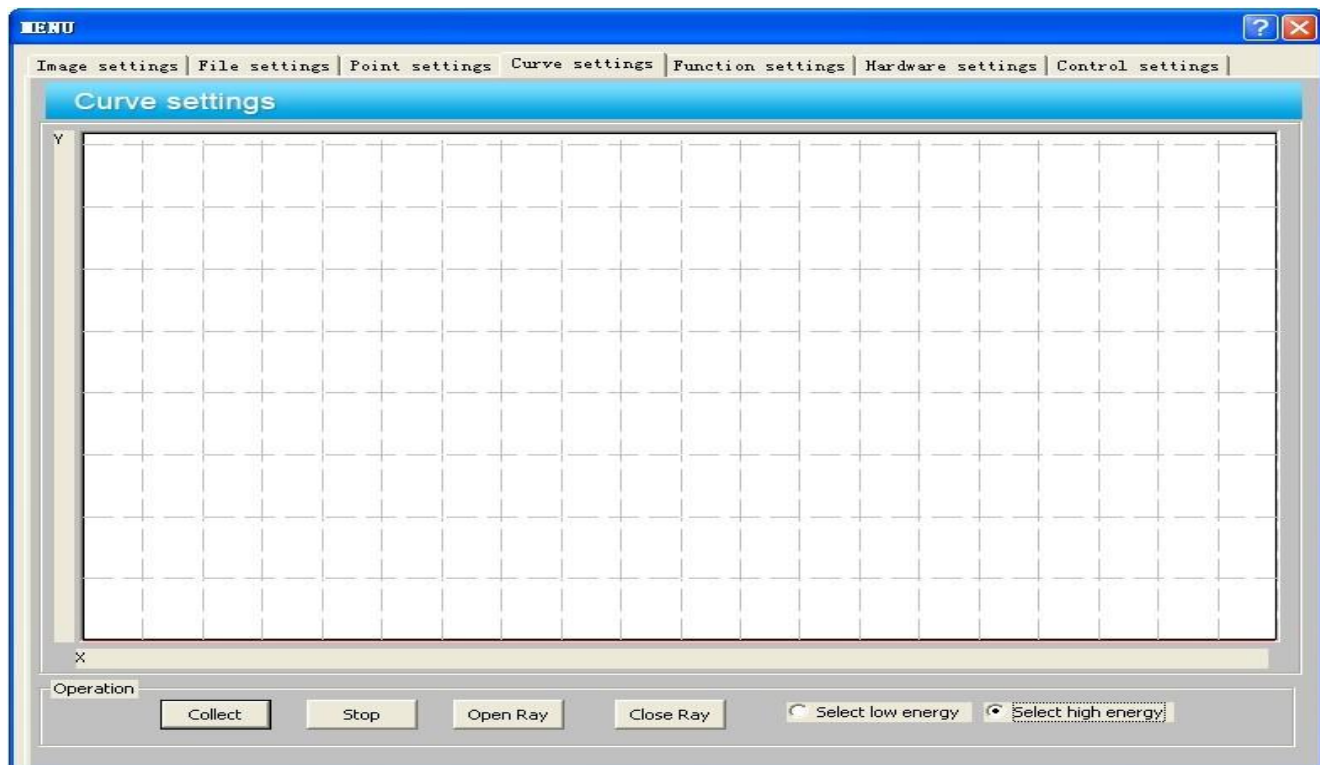


Figure 5.5.7 curve settings menu interface

5.5.8 Function settings

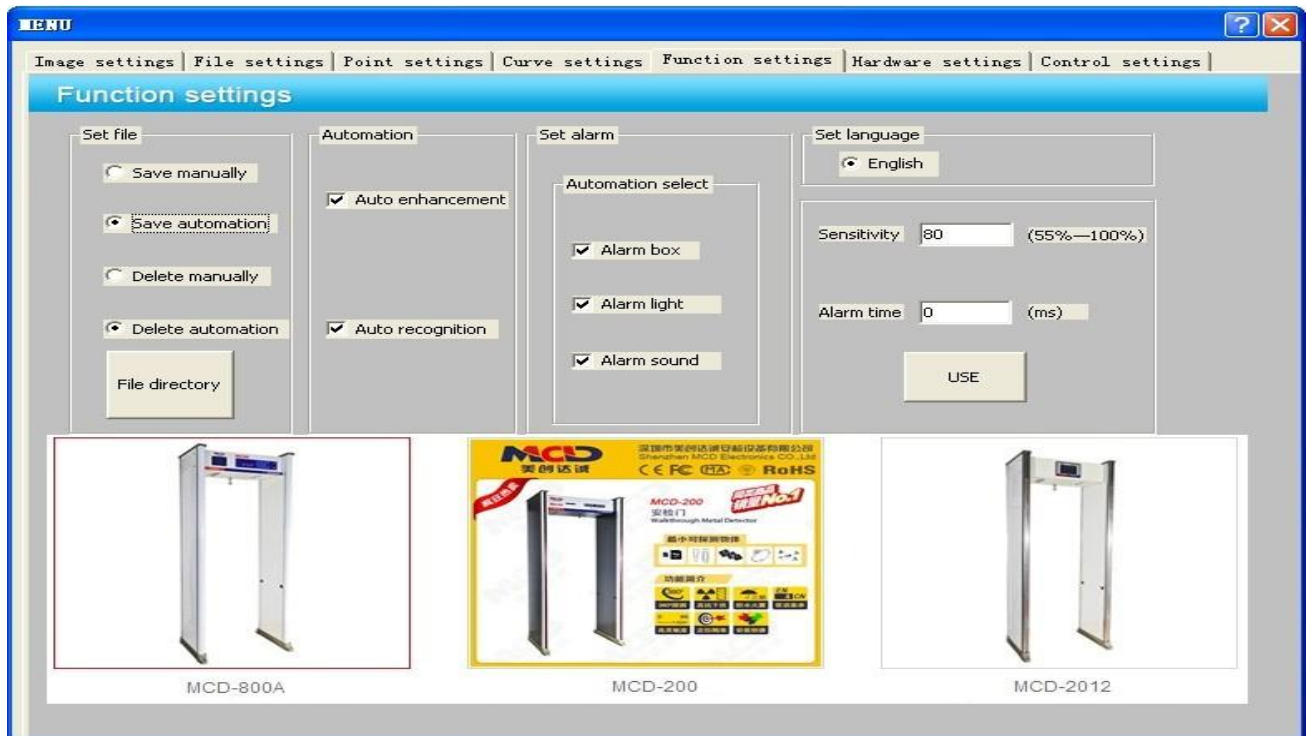


Figure 5.5.8 function settings menu interface

5.5.9 Hardware settings:

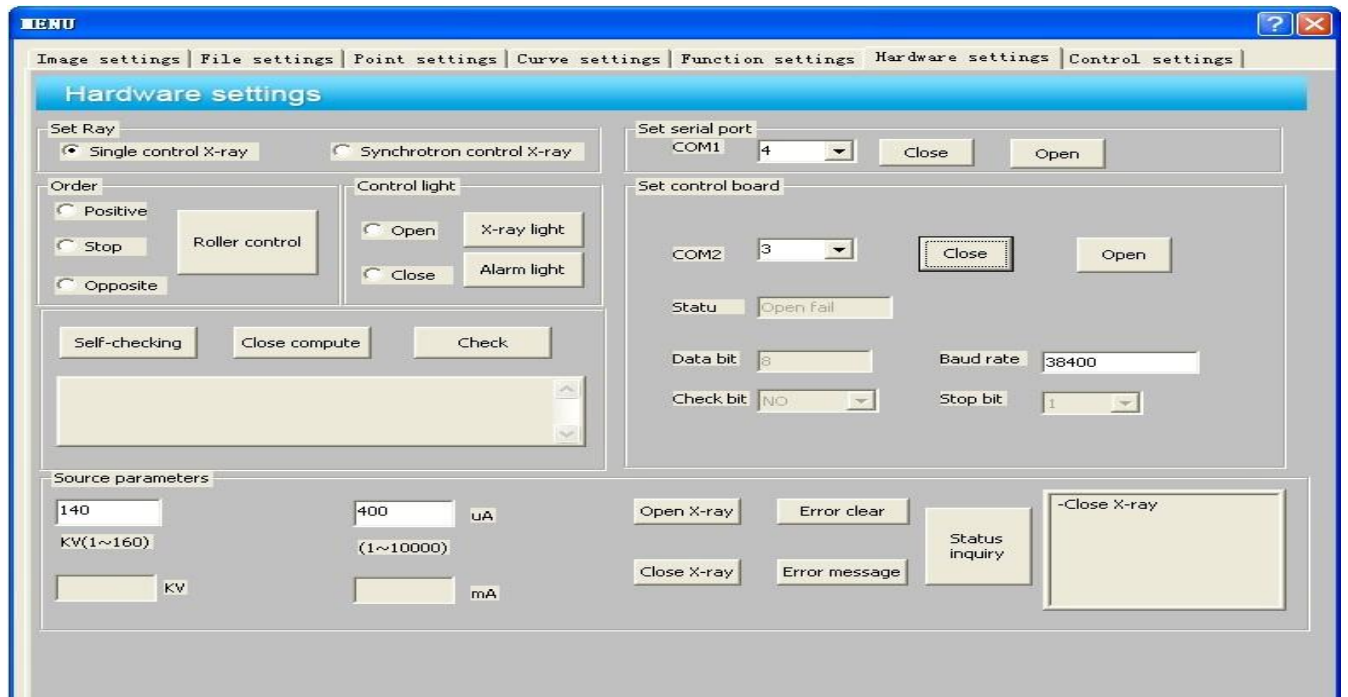


Figure 5.5.9 hardware settings menu interface

Chapter 6 maintenance and common troubleshooting

X-ray system is a high-tech power combined with the product. Therefore, the user not only to know about the machine's performance, structural principles and procedures, but also to be good at taking care of the routine maintenance and service work, in order to give full play to their effectiveness, and extended service life, and to ensure that equipment and personal security.

6.1 Routine Maintenance and Servicing

To ensure that the device's actual work situations and in the Instructions for technical indicators remain consistent, the device should be checked regularly and make the adjustments. Maintenance work must be trained, the company's authorized personnel. In the device's hardware maintenance process, and must be in the event of a power outage is possible.

1、 Normal maintenance work.

- z Equipment should be installed in the air, dust, dry environment, and have high temperature, humidity and direct sunlight, direct sunlight.
- z Maintenance, to dust, with a brush and vacuum cleaner dust clean.
- z Find element or terminal is loose, to immediately tighten.
- z Where the parts rust, if necessary, to replace it.
- z If you have components is damaged, you should determine the cause and correct the problem, and then the replacement of the device. Device After replacement, and the associated parameters are to be adjusted, and then to normal use.
- z When maintenance is not let foreign objects or liquids to enter the equipment to prevent leakage or cause an accident.

2、 maintenance, and service-specific content.

- z Check that the device on the power-on light.

In the device at power up, the green light is on.

- z Check the device on the X beam indicator:

Beam Time of the launch, the red light is on.

- z Check the emergency stop button.

Press the emergency stop button, the device can be powered down. button does not reset, the device will not start up again.

- z Check the channel on the key switch.

Keep Key switch ON, start button to start device. Beam Stop button to be able to beam the power of the controller. If the key switch is becoming is not sensitive enough, to be replaced

- z Check that the touch screen is on and the screen image that is displayed.

Press the zoom key, the image to be able to zoom in, press the Image Processing to display the image to be able to do the appropriate transformation.

- z The entrance of the visually impaired.

In the run of the conveyor belt on the opaque objects, beam is turned on. device is powered down, with a dry, silk is the barrier of the lens and the channel on the wall of the glass cloth.

- z Check electric roller:

Press the corresponding key, electric rollers can in a predetermined direction running and stopped.

Roller noise is normal and does not leak.

-
- z Check detection and collimator travel switch:
Remove any one cover, Ray will be able to stop firing.
 - z Check that the belt of deviation
Check that the belt is in relation to motor is off.
 - z Check to see if the heat sinks.
Check to see if the heat sink Port is blocked, and remove the dust.

6.2 Maintenance and Safety Considerations

- z During the course of a repair, there is no foreign material, water droplets from entering device to avoid damage to the equipment or security incidents.
- z You have a lot of work for voltage V 220 of the device, the service must be in the event of a power outage, and if you want to live, must be done by trained personnel, and to do a good job in prevention and electrical shock.
- z The device has a large number of sophisticated electronic devices, the pre-service to do a good job preventing electrostatic damage the device.
- z Many devices are used to prevent RADIATION LEAKAGE OF THE LEAD SHIELD layer and the operation is the best with cotton gloves, you can't wear gloves, after the conclusion of the work immediately wash your hands.
- z Power on the unit should be carefully checked, verify the wiring correct, there is no right or wrong, short of.
- z On beam, to cover plate to prevent beam of radiation caused the injury.

6.3 Replacing the Roller and Conveyor Belts

- z Equipment should be first off, and then disconnect power cable from the motor.
- z Remove the outer cover plate, remove the screw that secures the conveyor to the frame mounting bolts and remove the delivery.
- z Relax tension bolts, loosen belt to the electric roller, or the offset roller to remove replaced.
- z Conveyor belt replacement:
 - (1) The damaged tape cut out.
 - (2) The original tape in circumference tape factory to the new tape with a cold glue before the pre-processing.
 - (3) On-site assembled new tape for cold glue process.

6.4 Replace and Adjust Light Barrier

Adjust the troubleshooting steps are as follows:

- z Device Disconnect the power, open the hood.
- z Disconnect the optical barrier cable.
- z Unscrew the two optical barrier retaining bolts.
- z Replace it with a new optical barrier, by adjusting the barrier in the lower and upper position to adjust the light barrier position, fixed firmly
Rely on.
- z Move the cursor with the cable outlet in accordance with sheet soldered connectors.
- z Connect the cable.

-
- z Replace the unit cover.
 - z Turn on the power to the conveyor belt, the belt on an opaque object, the test beam can be opened correctly.

6.5 Replacing and Adjusting X-ray Source

The Replacement and Adjustment X beam source, perform the following step:

- z Power-off the system, remove equipment housing
- z Disconnect from X-ray source cable
- z Remove X-ray source tighten screws
- z Remove stop
- z Loosen the adjusting bolt
- z The X-ray source, the
- z According to the above sequence of steps install new X-ray source
- z Do not tighten the captive screw and stop
- z Power on the system
- z To access the main menu, then go to the "Device Configuration" menu
- z Alternately adjust X beam source the right adjusting screw and handle
- z End Of The adjusting procedure, tighten-ray source tighten the screw, stop
- z Power-off the system

6.6 X-ray Source of the Tube

X tube the tube of the purpose, in order to reduce X-ray source of the failure rate, extended X tube life, increase the use of reliability. The period of suspension in more than half of the, or for a variety of reasons after the bumps or vibration in-line scan X-ray device with the MF X-ray source (including fitted to the machine and has not yet been fitted to the machine's X-ray source) and are to be strictly in accordance with the managed program for X tube of the tube. The on-site installation and debugging and the idle time is re-enabled, strict X tube of the tube.

X tube of the tube, including the following:

- (1) power-on process
- (2) initial adjustments
- (3) the tube
- (4) final adjustment

6.7 Common Problems and Troubleshoot

This section describes possible symptoms, causes, and troubleshooting methods. X-ray device of the repair, and can only be used by my company's production and situation-specific and provide the parts and spare parts. The manufacturer any of the licensed outside of the repair of the failure of the machine or use my outside of your company repair parts as a result of the injury, My company does not bear any responsibility.

We reaffirm that all repairs and adjustments should be devoted by the qualified service personnel. The device only when all of the circuit board connector to the correct position, to power. Please note: disconnect, the printed circuit board, be sure to turn off the power. Now according to the following symptoms to classify the cause of the failure analysis and

troubleshooting methods.

6.7.1 Power supply failure

Problem 1: The system does not power on

Possible reasons:

- (1) The local power supply is correct.
- (2) No Key Switch or not to turn the key switch ON.
- (3) Fuse blown.
- (4) Circuit breaker is in the open position.
- (5) Emergency stop switch is in the locked state.
- (6) The AC contactor is damaged.
- (7) Terminal loose.

Troubleshooting methods:

- (1) Check the local power supply is $220 + 10\% / 15\%V$, $50 + /- 3$ Hz range.
- (2) Plug in the key switch and turn it clockwise to the ON position.
- (3) Replace the fuse.
- (4) Close the circuit breaker.
- (5) In a clockwise turn the emergency stop button to reset.
- (6) Replace the AC contactor.
- (7) Check the wiring and re-connect.

Note: The system power-on, verify that the device is normal.

Fault 2: The Power light does not light

Possible reasons:

- (1) The device does not start.
- (2) Light cable is not connected.
- (3) Terminal loose.
- (4) Light damage.

Troubleshooting methods:

- (1) Restart the device.
- (2) The indicator cable.
- (3) Check the wiring and re-connect.
- (4) Replace the LED.

Problem 3: The system can be powered on, but no other features

Possible reasons:

- (1) Electronic controller or beam source power supply to the controller is not plugged into the wall socket.
- (2) Contactor KM 2 damage.
- (3) Switch power supply is damaged.
- (4) The port is not connected
- (5) And the control unit is connected serial port cable is not connected.

Troubleshooting methods:

- (1) The electronic controller or beam source controller plugs into the appropriate socket.
- (2) Replace contactor.
- (3) Replace the switch power supply.

(4) Connect the Ethernet port to the PC.

(5) Serial port cable to the PC.

Note: Do not correct the output voltage can damage devices, the Replacement and Adjustment, power supply should be disconnected.

6.7.2 System control

Problem 1: Conveyor Belt cannot forward

Possible reasons:

(1) RS 232 cable is not connected.

(2) Electronic Control is damaged.

(3) Start capacitor damage.

(4) Cable loose.

(5) Electric roller is damaged.

(6) Belt is stuck.

Troubleshooting methods:

(1) Correctly connected RS 232 line.

(2) Replace electronic controller.

(3) Replace the capacitor.

(4) Check the cable connections, re-tighten the cable.

(5) Replace Electric rollers.

(6) Adjust drive belt.

Fault 2: Conveyor Stop

Possible reasons:

(1) Electronic Control is damaged.

(2) CPU board

Troubleshooting methods:

(1) Replace electronic controller.

(2) Restart the PC.

6.7.3 X beam control

The repair of the part, you should exclude all of the power and control system of the failure, and X beam control-related failure.

Problem 1: X-ray source does not launch

Possible reasons:

(1) Channel, there are no items or items not blocking light barrier.

(2) The interlock switch position the cover is open.

(3) Beam source controller power plug is not plugged in.

(4) The AC contactor is damaged.

(5) X-ray source damage.

(6) Beam source control is damaged.

(7) X-ray source cable is not connected correctly.

(8) The barrier is not properly connected.

(9) Light barrier damage.

(10) Motorized roller is not running.

(11) Electronic controller damage.

Troubleshooting methods:

- (1) Channel in place sufficiently large and opaque objects.
- (2) Cover interlock switch position of the cover.
- (3) Plug in the radiation source controller power plug.
- (4) Replace the AC contactor KM 2.
- (5) Replace X-ray source.
- (6) Replace-ray source controller.
- (7) Re-connect X-ray source cable.
- (8) Check that the light barrier cable and is connected correctly.
- (9) Replace the optical barrier.
- (10) Start electric rollers.
- (11) Replace electronic controller.

Fault 2: X-Ray Light does not light

Possible reasons:

- (1) X ray not launch
- (2) Electronic control panel is damaged
- (3) Cable is not correctly connected
- (4) beam light damage

Troubleshooting methods:

- (1) The belt placed after starting roller-ray
- (2) Replace electronic control panel
- (3) Verify that the cable is connected correctly
- (4) Replace the LED

6.7 4 Image display

In the Image system fault-finding,confirm X X-ray generator in the electrical and mechanical has been adjusted.Confirm that the system power supply voltage requirements($5V, \pm 5\%;12V,\pm 10\%$).

Problem 1: system power on the monitor screen is not lit

Possible reasons:

- (1) Monitor power supply does not turn on
- (2) Monitor signal cable is not connected

Troubleshooting methods:

- (1) Power on the monitor
- (2) Connect the monitor signal cable

Fault 2: The machine is running, the application running on the monitor displays vertical lines

Possible reasons:

- (1)Signal Processing Board
- (2)Cable

Troubleshooting methods:

- (1) Replace Signal Processing Board
- (2) Replace cable

Fault 3: Baggage Check Period No image

Possible reasons:

- (1) Control Board in conjunction with the PC serial port cable
- (2) Control panel
- (3) Light barrier
- (4) Operating system failure

Troubleshooting methods: (1)

Replace Serial port cable (2)

Replace the control panel

(3) Replace the visually impaired

(4) Re-install the operating system, re-install the software

Problem 4: at the Baggage Check during horizontal (note that the image has a 3-6,dark lines are often, belt itself has 2 dark lines)

Possible reasons: probe or probe panel.

Troubleshooting methods: Replace the probe or the probe panel.

6.8 Storage Conditions, Storage Duration, and Notes

When the device is shipped to be removed, repeat the installation of the reverse process.

System should be stored in a clean, dry place, and the heat and moisture can damage system components. If not used for a long time, and should be stored in the original packaging.

Device storage environmental conditions are:

1,In the transport or storage package status, the device must be able to do not exceed the following range of environmental conditions, on 15 the following week.

Storage Temperature: -20 to +60°C (non-condensing).

Humidity: 20% To 95%;

2,Need for long-term storage device, there should be good storage conditions, the treasury should be clean, dry, and well-ventilated and away from corrosive gases, relative humidity is not more than 80 per cent, the device should be in the box.

Chapter 7 of the after-sales service

7.1 Production Plant Guarantee

We have the technical support and after-sales service in the first place, and strive to provide high quality services.

7.2 Equipment Acceptance

1, The user receives the device notifies the Company, the Company will arrange a Professional technical support engineers assist the equipment out of the box and the equipment installation and debugging. technical support engineer should be in the spirit of the user is responsible for the spirit, conscientiously contract and packing slip one by one with an inventory and accessories. If there is damage and mistakes, and a technical support engineer to assist you with the claim, or to immediately notify the company's correct, complete, and the technical specifications of the equipment installation and commissioning.

2, The installation of the equipment and during debugging, the user should give positive support to ensure that the system as soon as possible.

3, The device acceptance criteria: the contract in accordance with the criteria and method acceptance.

4, The device acceptance Period: The equipment installation is complete the 5 days in which to complete the acceptance, the user sign the acceptance report, and will now be the warranty start date. Overdue company would not be liable.

7.3 Technical Support and Training

Technical training is divided into basic training and image recognition skills training. Company provides users with free access to basic training.

1, Purpose: To enable users to understand the system, and a basic understanding electrical equipment part of the operation and supporting the operation of the software. While the quality of equipment in the initial evaluation.

2, Time: According to the requirements of customers and the actual situation.

3, Location: Training Principle in which the device is used to live.

7.4 After-sales Services

Thank you very much for your choice of our equipment, our company will provide you with quality after-sales service, you can enjoy services include:

1, near you my secretary authorized service units for repair.

2, if you have any questions and maintenance difficulties, please first and in the provinces (municipalities) of the repair center contact.

It is one of the following equipment, is not covered by your warranty.

1、 Equipment or accessories for trademark nameplate or series number has been removed or modified.

2、 Because of the user's use, maintenance, custody damaged.

3、 By force majeure cause damage.

4、 Non-designated service units or private Remove Manual Repair.

5、 With a number of non-The company provides a combination or assembly, unless you have been given the company's express written approval.

The Product Certification

Thank you for your company's use of my company for the following products:

Product Name: X-ray device

Product Model Number: MCD-5030C

Product Number:

The model number of the Product in accordance with the " GB 208.1 - 2005 micro-dose X-ray device " standard, a rigorous test.

Conclusions: qualified to allow factory

Inspection: _____

Date of inspection: 201 Day, Month, or year.

Quality Control Department

The Product Warranty.

Thank you for your use of the product.

The model number is:

5030 C

quantity:

During use, please follow the instructions in the normal operation.

Within the warranty period, the Company will repair at no charge.

Quality Control Department

