



User Manual

**X-Ray Baggage Scanner
TW100100**

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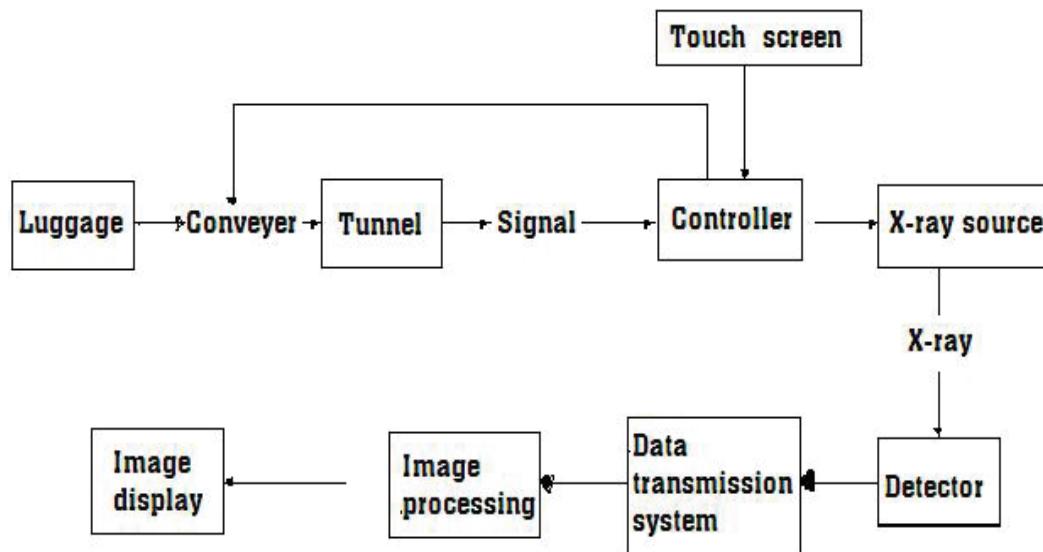
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Chapter I .System Principle and Technical Data

1.1 Operating principle

Our X-ray security check system 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 generation 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 operation principle is shown as below:



1.2 Technical data

☆Image Performance System:

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

Display: High-resolution 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

☆Operating Environment:

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

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

Operating voltage: 220VAC(±10%) 50±3Hz

Power consumption: 1.0KW(MAX.)

Noise level: <65dB

☆Special features:

★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 expeditely observing the magnifying area

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

1.3 Main purpose and applications

The new powerful model 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

Models 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.

2.2 Basic safety rules

Though our X-ray security check systems are 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 operation the X-ray security check system.
- 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 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 security check system should only be opened by qualified technologist.
- 7.Do not modify or change any parts of X-ray security check 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 thermovent of X-ray security check system 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

Our X-ray security check system 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 $0.1\mu\text{Gy}/\text{h}$, 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 security check system fully meets the safety requirements in X-ray national standards GB15208-2005.1.

The design of X-ray security check system 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) Conveyer
- (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



1.X-ray detector array kit

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 detector arrays form an L shape to smooth away the detecting dead angle. Vertical side (Named as "Side detection 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 detection panel, and sent to the industrial control computer for processing.

2.Electronic control boxy emission and monitors whether the X-ray control module is work mormaly. IF there is any unusual action, it will give an alarm automatically.

3.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 22"high-resolution display, which can display color image or Black/White 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.Conveyer

The conveyer includes:

- (1)Carrying-strap;
- (2)Electrical(Driving)roller in outlet end of conveyer;
- (3)Driven roll in inlet end of conveyer;
- (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 detection the luggage carried into the tunnel by the running conveyer 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(Color/Black), 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 10000images)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 Figure4.1:

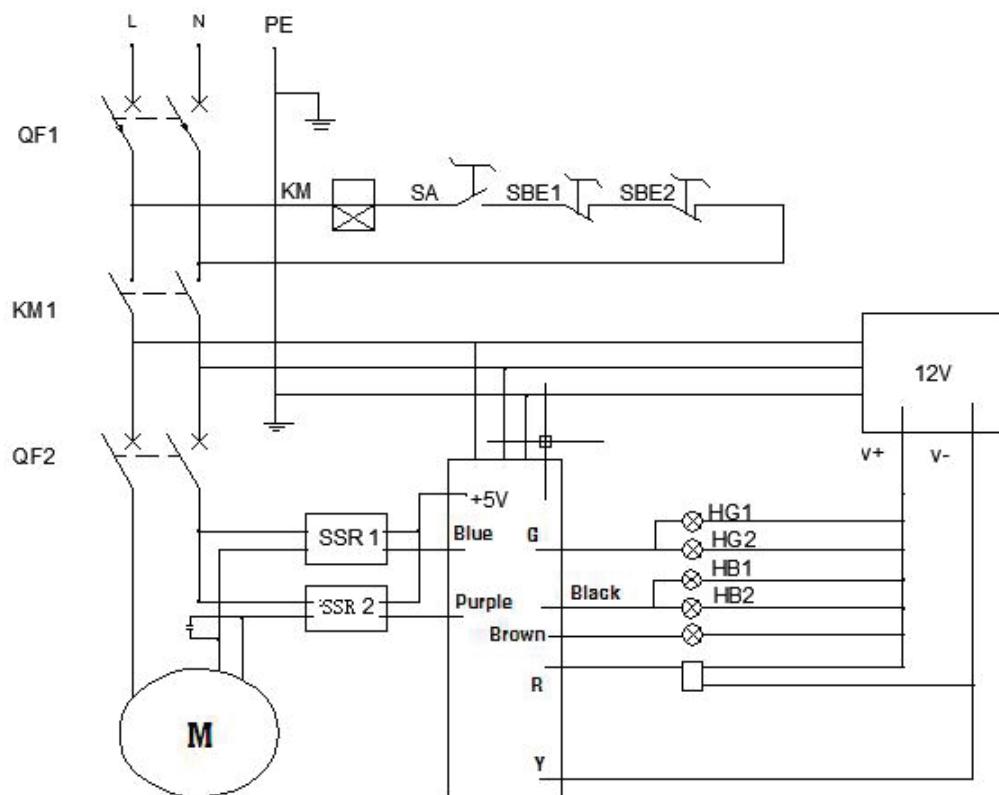


Figure 4.1 Original figure of electric control(1)

The electric part mainly realizes the following functions:

4.2. Over current protection

In figure4.1, 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 CHINT 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 Figure4.1,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 Figure4.1, 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 in 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 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 1.5 m² cable. Guide-track groove is installed on the zinc coated PCB, with wiring around using the wiring duct. As shown in Figure 4.2.



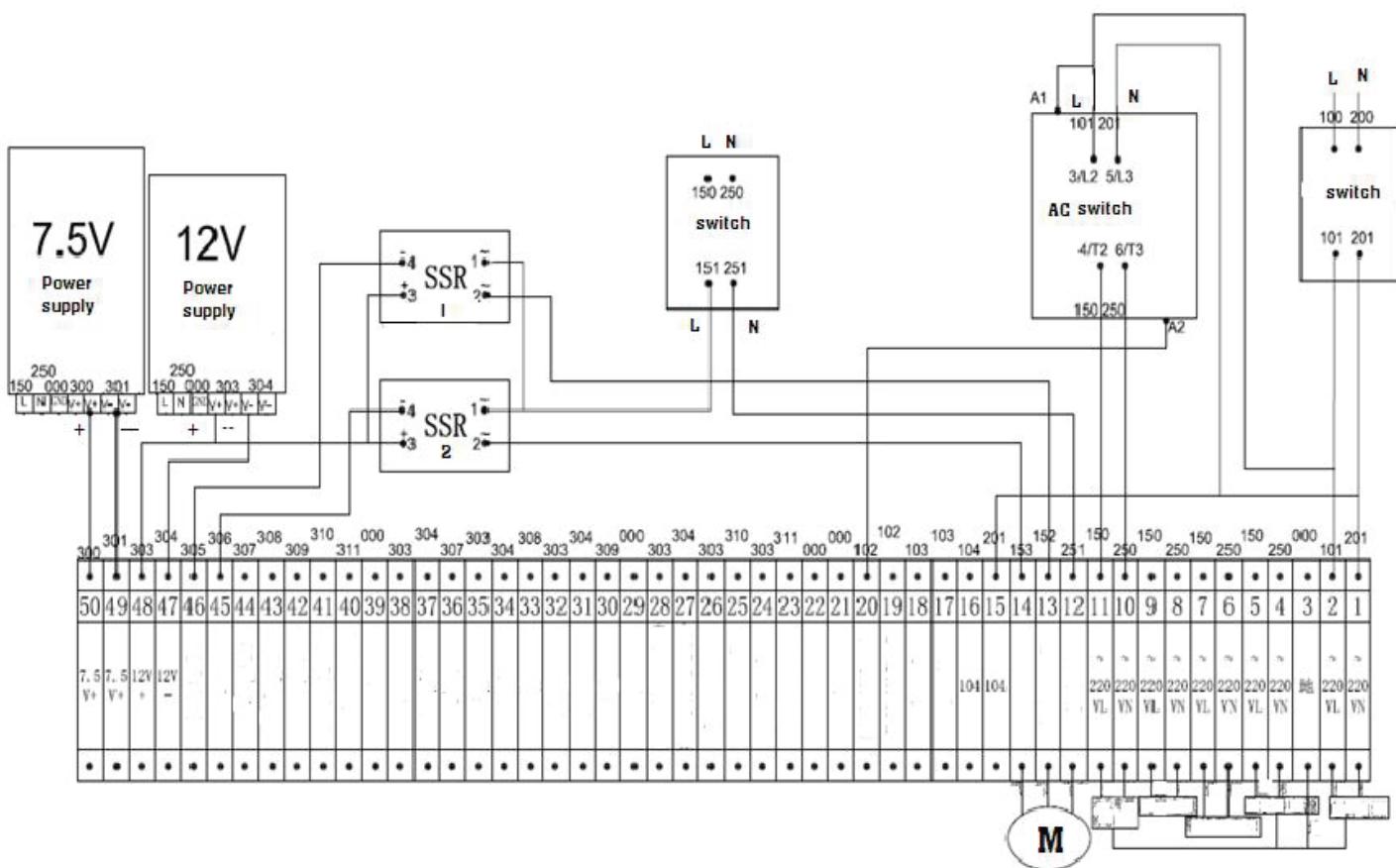


Figure 4.2.Connecting terminal modules



Chapter V Image Processing and Distinguish

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

5. 1. Start the device

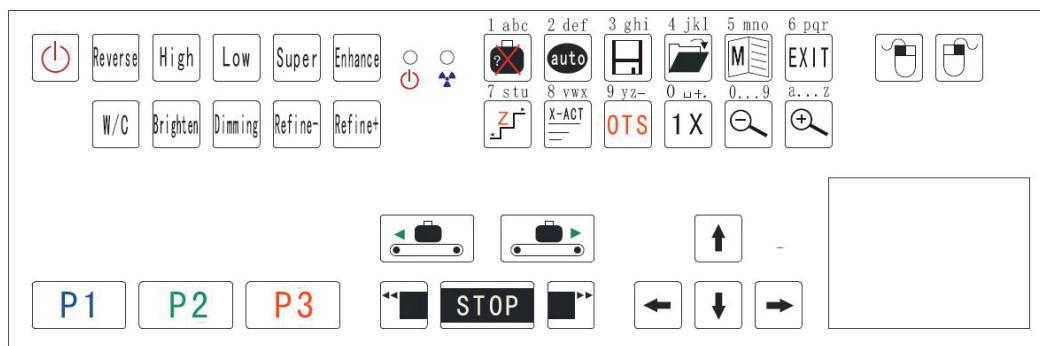
- Look around the appearance of the device and curtain, the conveyor belt, they must be intact, the device must be grounded, nothing in the channel of device.
- Link to the AC cable.
- Check three red buttons and they must be popped upwards (stop buttons on).
- Turn the key button to “ON” .

- Click the power button  to start the device.



- The power indicator on the keyboard light, the green indicators on the channels light.
- Login to the X-ray luggage scanner system software to enter the interface by “User:SA, password:12345678” .
- Open lead shade , look inside the channel, there is no obstacles in it. Press any key of keyboard to test its function is normal.
- Click: Refine-: press confirm; then click: Refine+: confirm too.
- Above over are completed, means initialize OK.
- Exterior of keyboard and key’ s function list.





1 abc	Functions : mark/save/print image , numeral “1”; letters “a/b/c”;
2 def	Functions: numeral “2”; letters “d/e/f”;
3 ghi	Functions: numeral “3”; letters “g/h/i”;
4 jkl	Functions: Pop-up query menu; numeral “4”; letters “j/k/l”;
5 mno	Functions: Pop-up main menu; numeral “5”; letters “m/n/o”;
EXIT	Functions: Back to the start; numeral “6”; letters “p/q/r”;
7 stu	Functions: numeral “7”; letters “s/t/u”;
X-ACT	Functions: numeral “8”; letters “v/w/x”;
OTS	Functions: numeral “9”; letters “y/z”, sign “-”;
0 u+.	Functions: back to the start size; numeral “0”; space key ; sign “+”;
0...9	Functions: click to zoom out;
a...z	Functions: click to zoom in ;

	Get the data.
	Adjust ray source.

console:



One display console



Dual displays console

5.2 Scan luggage

- Place luggage on the conveyor belt.
- Press “conveyor belt start” key, the belt go to a direction to send luggage into channel.
- X-ray indicator light, X-ray is scanning luggage.
- Luggage go through the channel, image move on screen. Operator use the console to operate device and check up on image.
- Look at images as below.

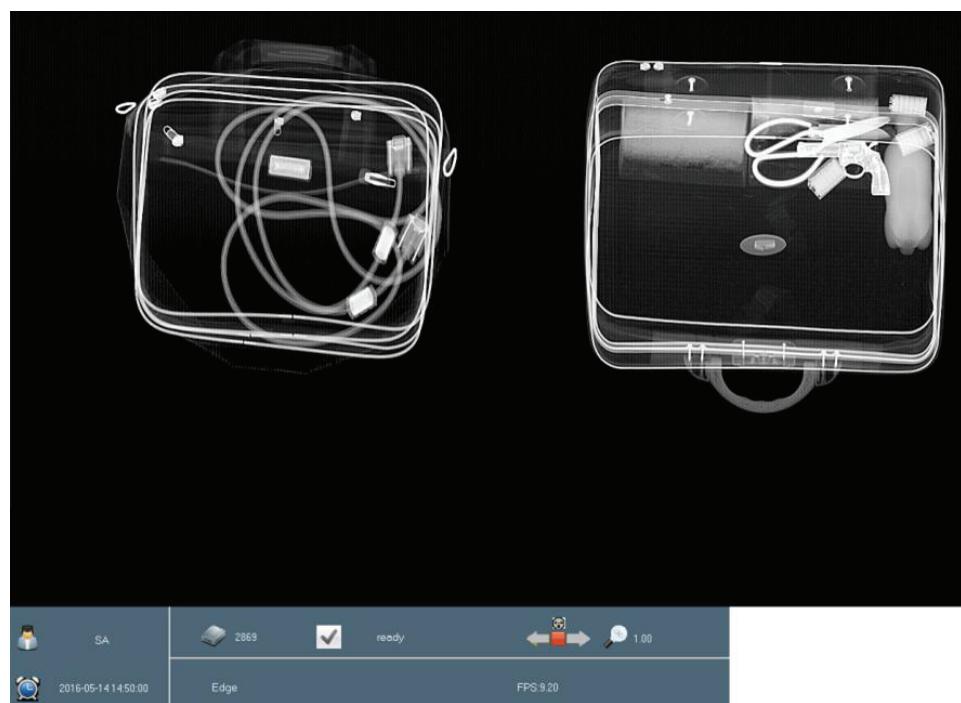
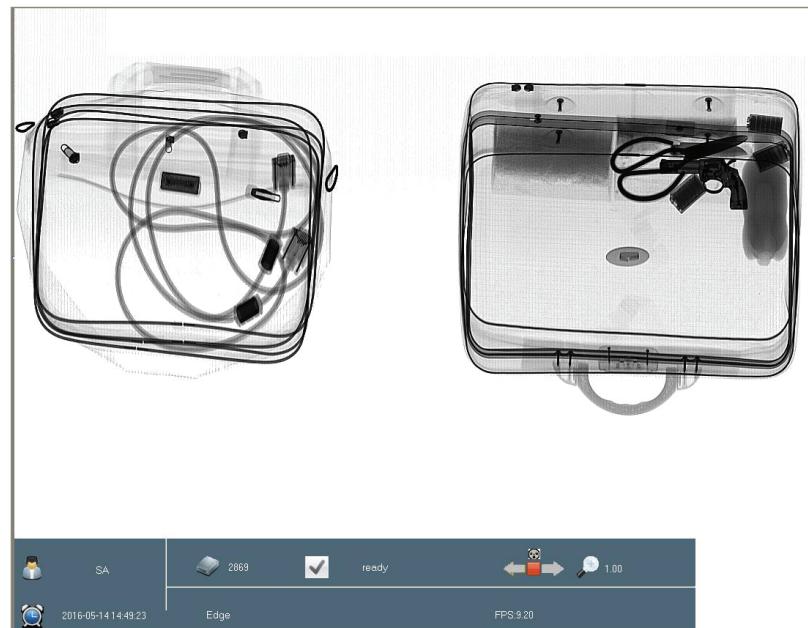




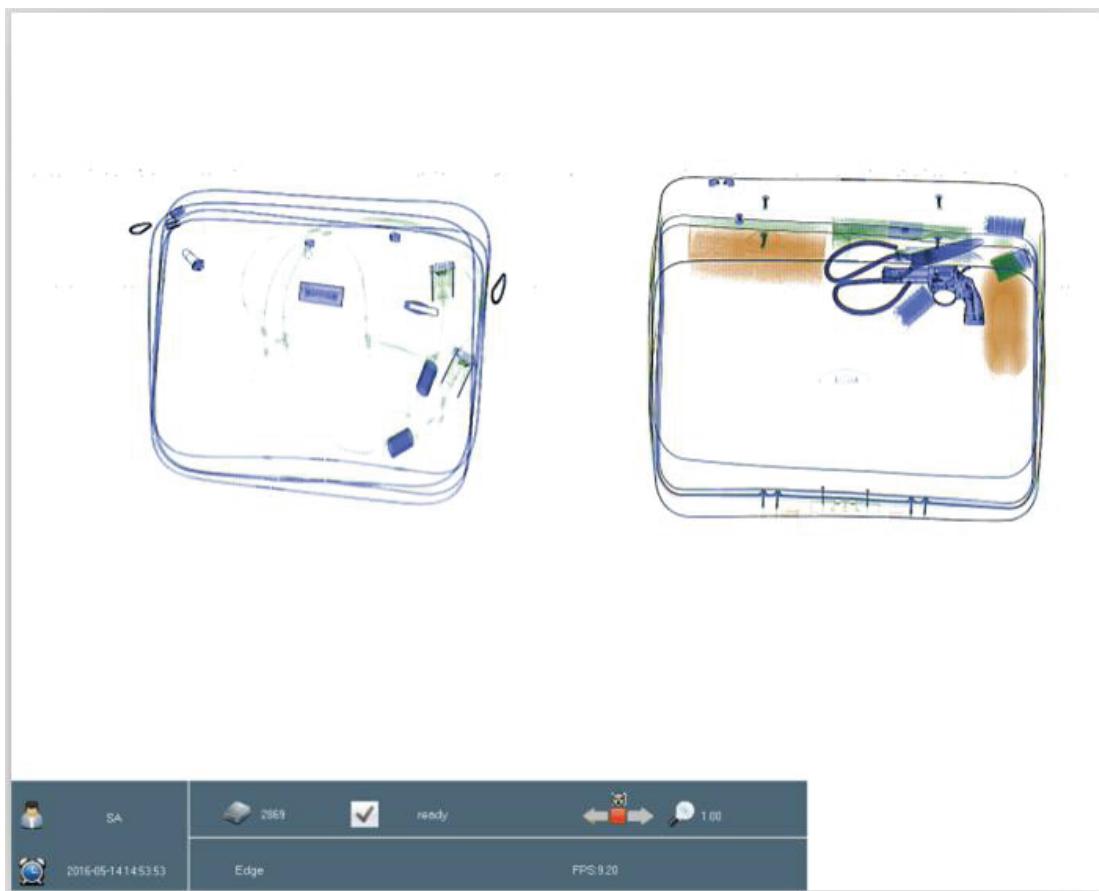
Operate console' s keyboard to check up on image .



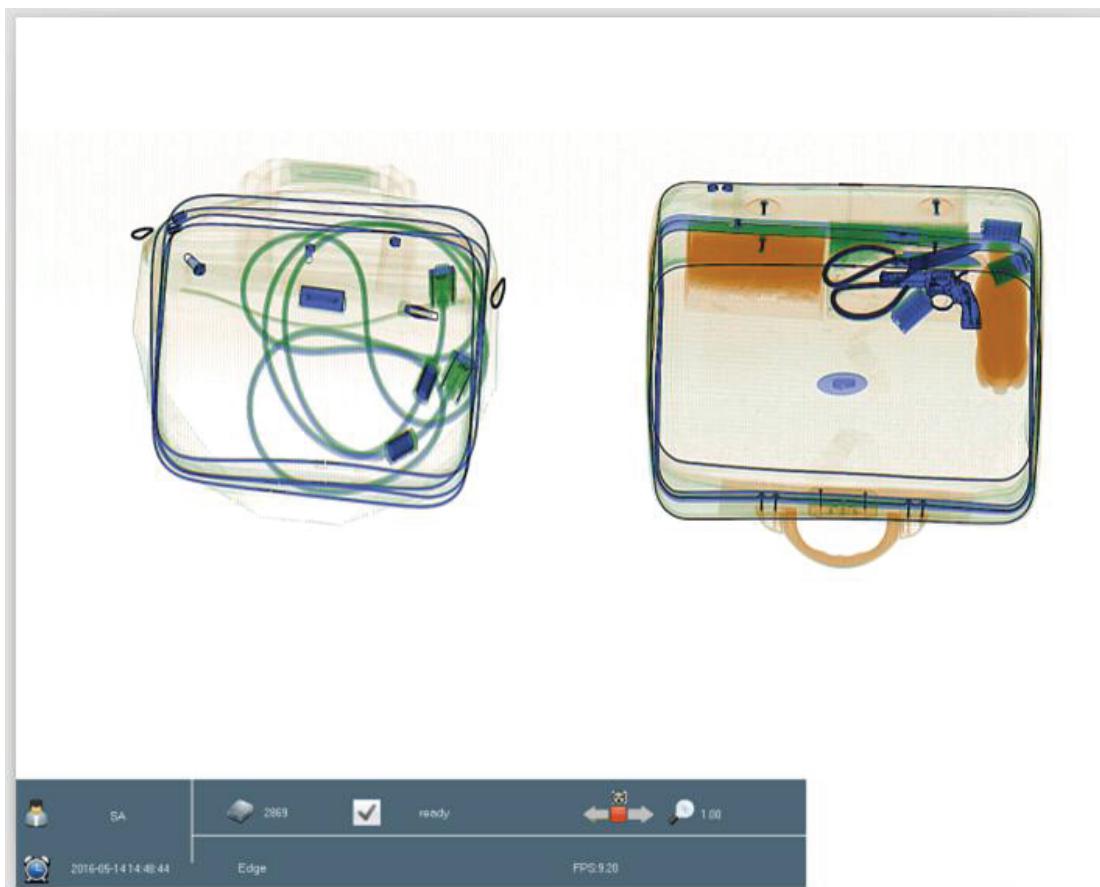
1) Anti-color: Always objects high absorption rate of X-ray displayed is dark color, objects low absorption rate of X-ray displayed is bright white. “Anti-color”key’s function is change dark-bright white color, that benefit you find small and dense objects(such as wire). Press “Reverse” key, the changes of image:



2) Better transparency: You can press it many times when it is necessary in view of the more thick objects, it is high penetration for luggage. Thick objects image is more clearly , thin objects become weakened. Press “High” key, the changes of image:



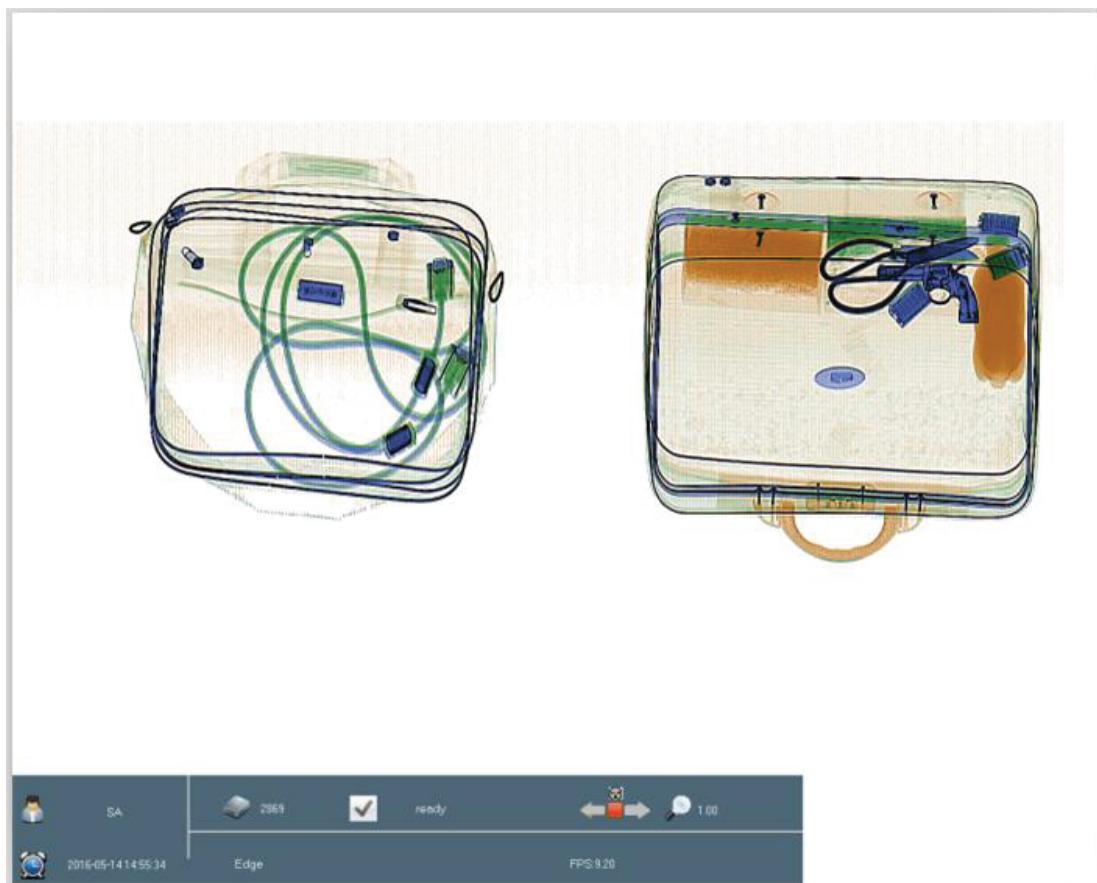
- 3) Low transparency: The thin objects and low density objects can be looked clearly. Press “low ” key, the changes of image:



- 4) Ultra-clear: Press “Super” key, the changes of image:



- 5) Contour intensified: It can produce image contour intensified effect. That make for object's shape is clearly visible. Press "Enhance" key, the changes of image:



- 6) Black-white / colorized: When the initial image is colorized, click “W/C” key, image is black and white; press the same key a second time, image is eliminated organic matter(organic matter is black and white, inorganic is blue); press the same key thirdly, image is eliminated inorganic(inorganic matter is black and white, organic is orange);in the fourth time ,back to the initial image. When you continue to press “W/C” key, the changes of image:

Black-white



eliminated organic matter



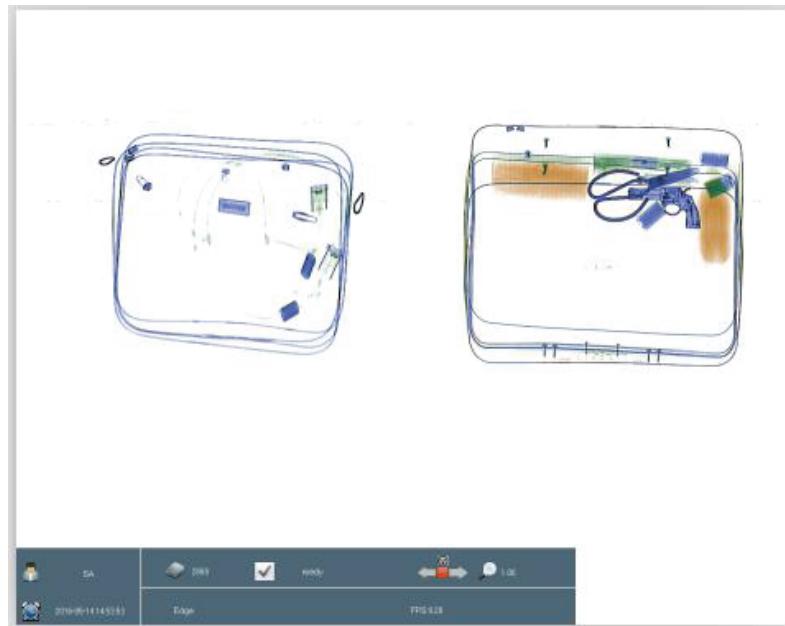
eliminated inorganic matter



the initial image



- 7) Brighten: When you continue to press “brighten” key, image change gradually from initial to bright.



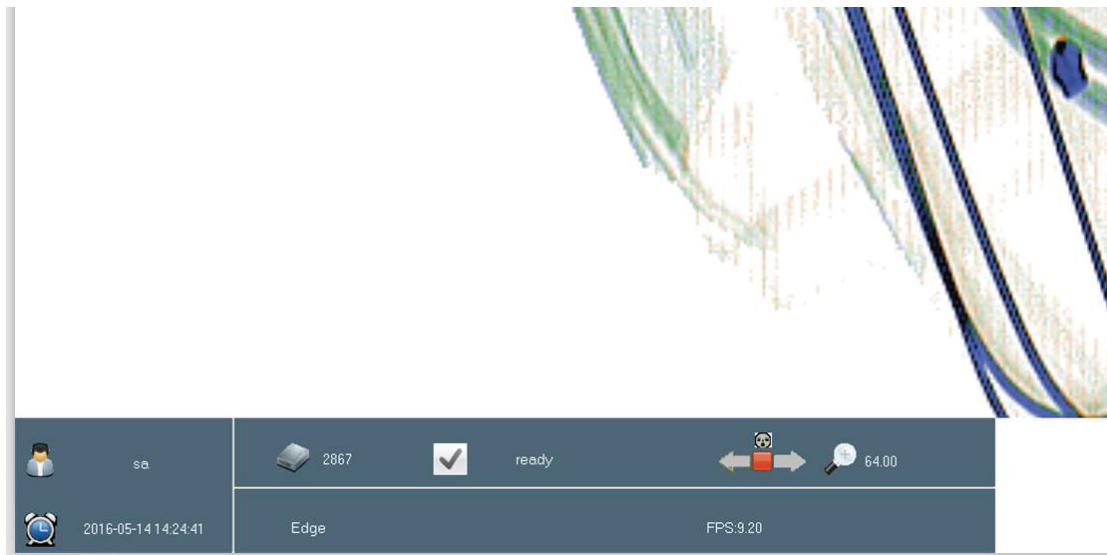
- 8) Dimming : Make image is close to black. Image change gradually from initial to dark.





: Enlarge image、reduce them after enlarge image、the original size image.

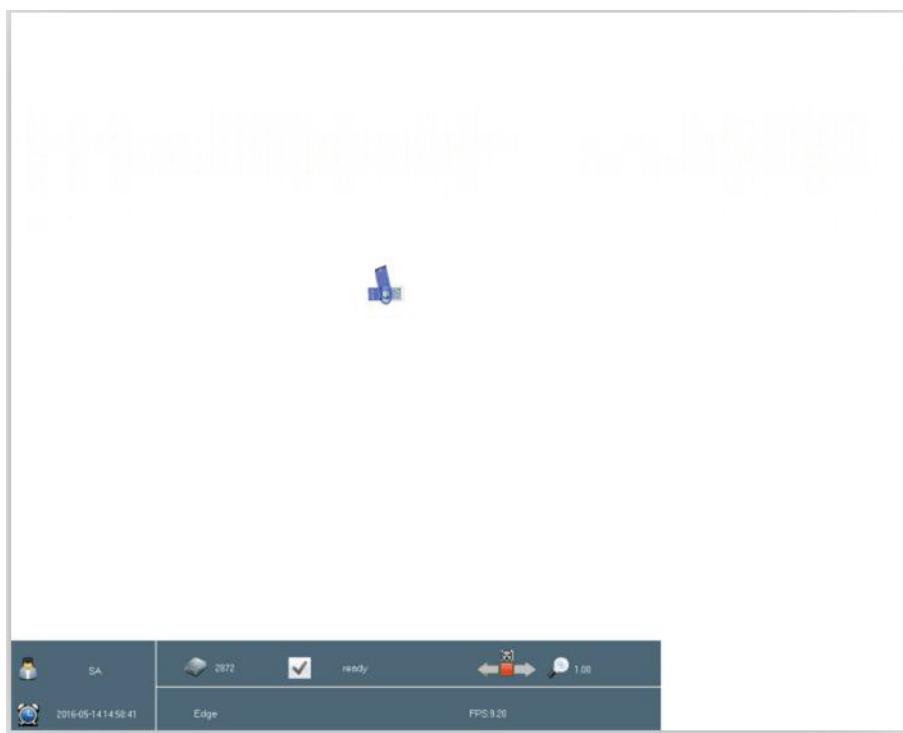
Enlarge image as below:



- 10) Back to the start: Gone back to the initial image after you click this key.
- 11) A U flash disk image example

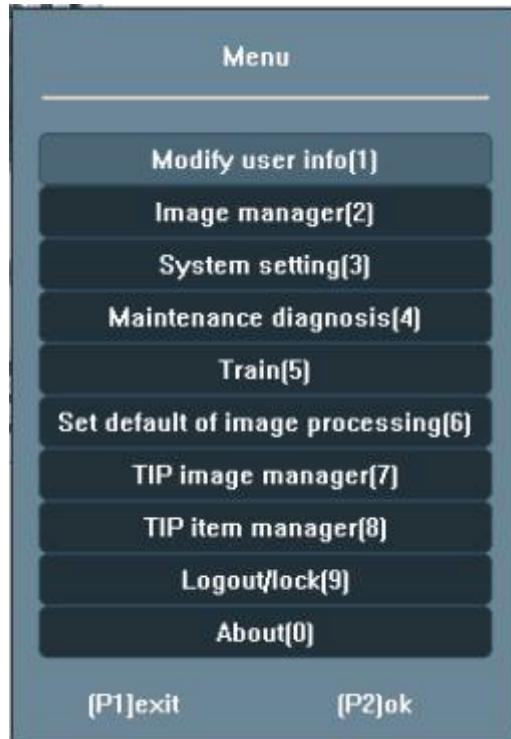
Please place the U disk on the belt and then click , the U disk image is looked . This way is for scanning any little item.





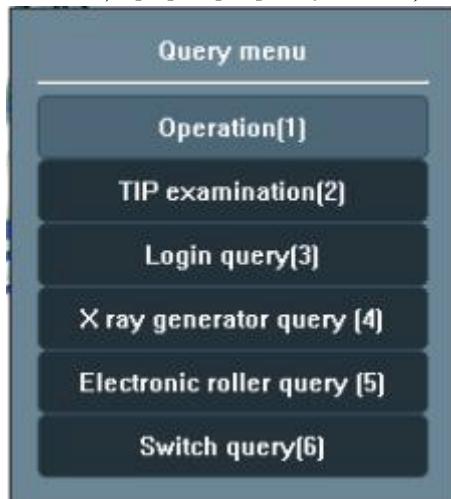
12) Main menu;

Click “5 ”, Pop-up main menu. The picture below is superuser permission;



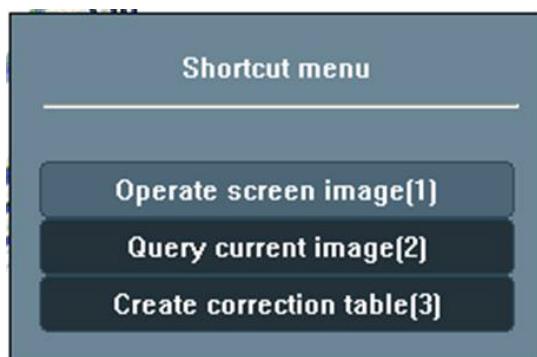
13) Query menu;

Click “4” , pop-up query menu;



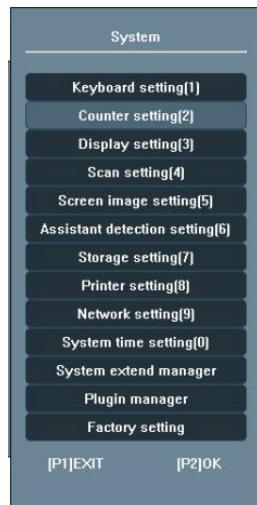
14) Shortcut menu;

Click “ ” , pop-up shortcut;



15) System setup menu;

Click “5” key, -then click “3” , pop-up system setup menu;



16) Change Users;

Click “5” key, then click “1”, pop-up “Users list”,

User management

User list

User name	User group	Description
sener	Manager gr...	test
sa	Admin group	Built in super user

Add user[1] Delete user [2] Modify user[3] Cancel[P1]

Edit user

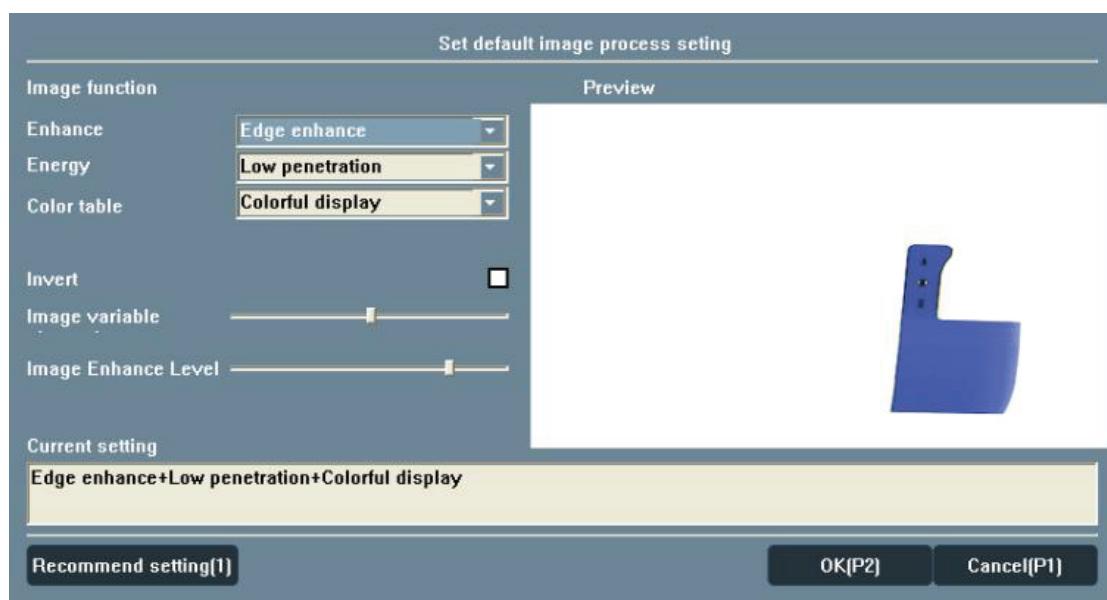
User ID	2
User name	sener
Old password	
New password	
Confirm	
Affiliated to	Management Group
Description	test

OK[P2] Cancel[P1]

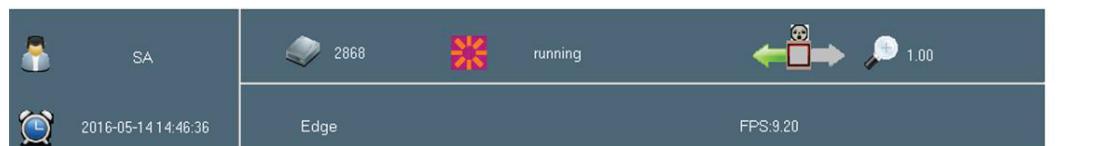


17) Setting Image-processing status;

Click “5” -then click “6”, pop-up “setting image-processing status”, like this picture;

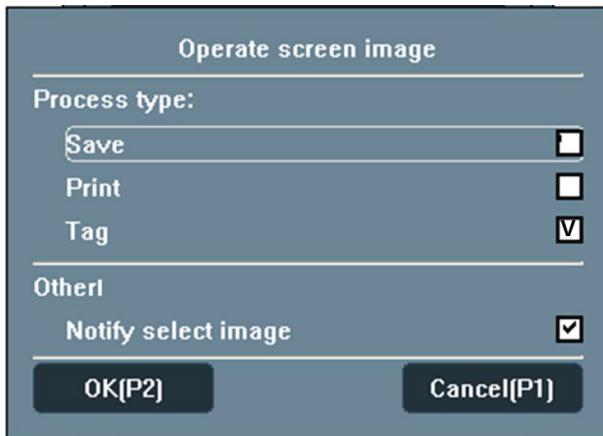


Sets successful, it will display at below the information bar of screen :

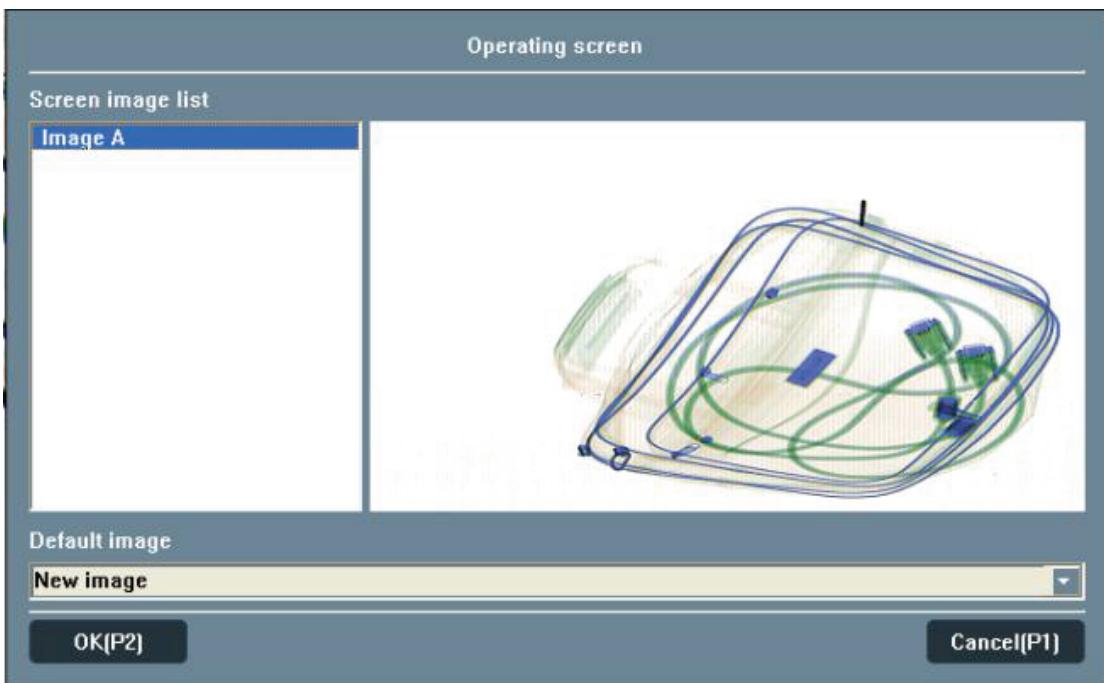


18) Operating screen images;

Click “5”, then click “3”, then click “5”, pop-up “setting operating screen images” ;

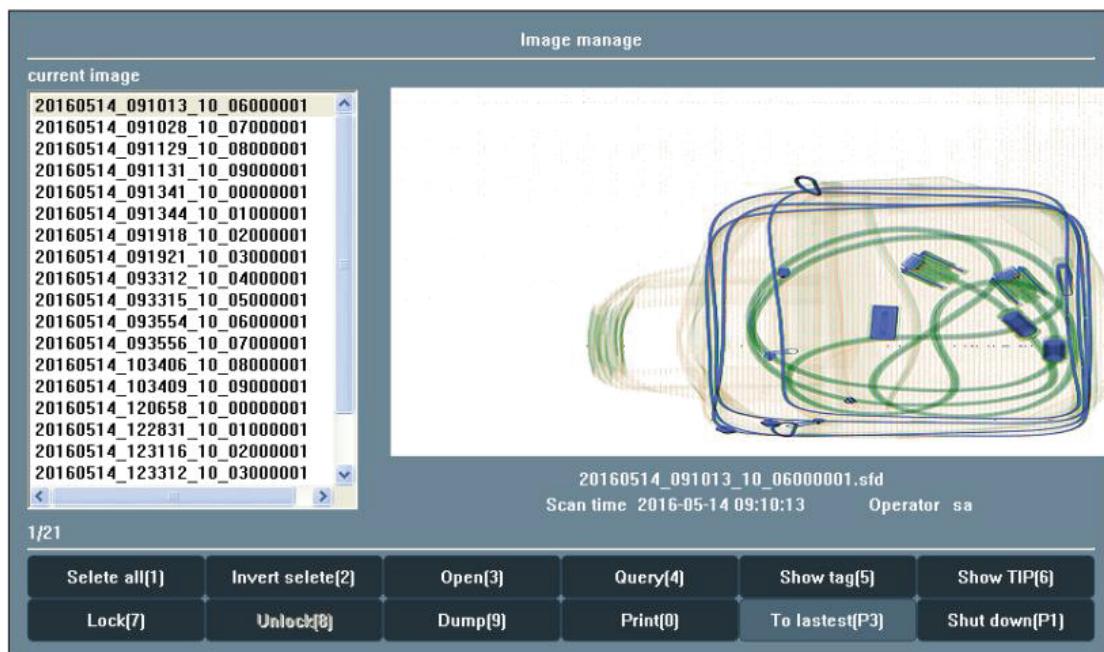


Click “1”, pop up shortcut function, select:print/save/mark image;



19) Images management;

Click “5”, then click “2”, pop up images management, like this;



Query :

Query

Category list

- Auto save image**
- Manual save image**

User sa

Time range This login

Image lock only

Image tag only

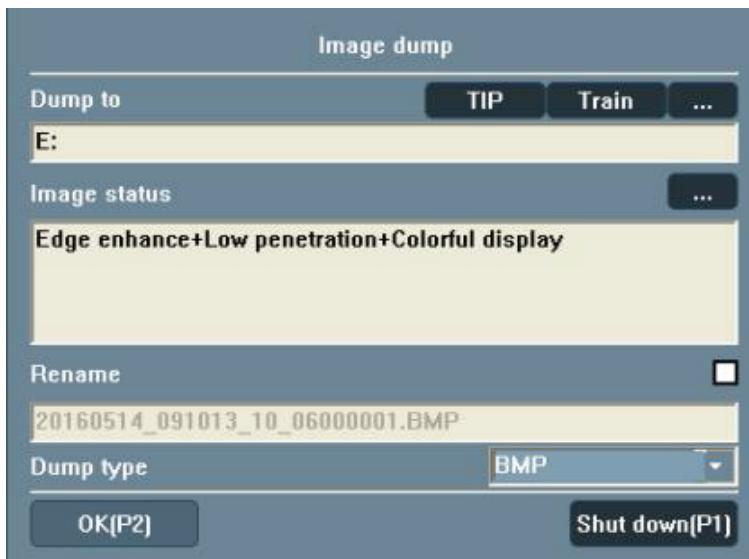
This login
one day
a week
custom

OK[P2]

CANCEL[P1]



Images save as:



Print image, show mark image, show TIP image, locking images/unlocking images, etc.

20) Deactivate / Lock / Shut down;



21) Query function;

Operation Query [1] : export / print action log;

Operation Query

User	Statistics time	Query[0]			
All user	2016-05-14				
Statistical period					
Day [in the month]					
User name	date	login count	Baggage c...	Tag count	
<input type="checkbox"/> sa	2016-5-12	0	1	0	
<input type="checkbox"/> sa	2016-5-13	0	4	0	
<input type="checkbox"/> sa	2016-5-14	0	8	0	

[Select all\[1\]](#) [Invert select\[2\]](#) [Putout\[3\]](#) [Print\[4\]](#) [Chart\[5\]](#) [Shut down \[P1\]](#)

Query TIP :

Query TIP examination

User	Statistics time	Query[0]
All user	2016-05-14	
Statistical period		
Day [in the month]		
User name	date	Baggage c... Tag count Dangerous ... Miss TIP co... TIP r

[Select all\[1\]](#) [Invert select\[2\]](#) [Putout\[3\]](#) [Print\[4\]](#) [Chart\[5\]](#) [Shut down \[P1\]](#)

Login query :



Login query

User All user	Begin time 2016-05-13	Query(0)
Statistical period Query	End time 2016-05-14	
User name	Login time	Logout time
Work time		

X-Ray generator query:

X ray generator query

Statistical period Hours [in the day]	Statistics time 2016-05-14	Query(0)
X ray generator ID	Hour	log on time
<input checked="" type="checkbox"/> 1	12	0.0081Hour



Electronic roller query:

Electronic roller query

Statistical period	Statistics time	Query[0]
<input type="button" value="Hours [in the day]"/>	<input type="button" value="2016-05-14"/>	

Electronic roller ID	Hour	log on time
<input type="checkbox"/> 1	9	0.0339Hour
<input type="checkbox"/> 1	12	0.0317Hour

<input type="button" value="Select all[1]"/>	<input type="button" value="Invert select[2]"/>	<input type="button" value="Putout[3]"/>	<input type="button" value="Print[4]"/>	<input type="button" value="Chart[5]"/>	<input type="button" value="Shut down [P1]"/>
--	---	--	---	---	---

Log on query:

Log on query

Statistical period	Statistics time	Query[0]
<input type="button" value="Day [in the month]"/>	<input type="button" value="2016-05-14"/>	

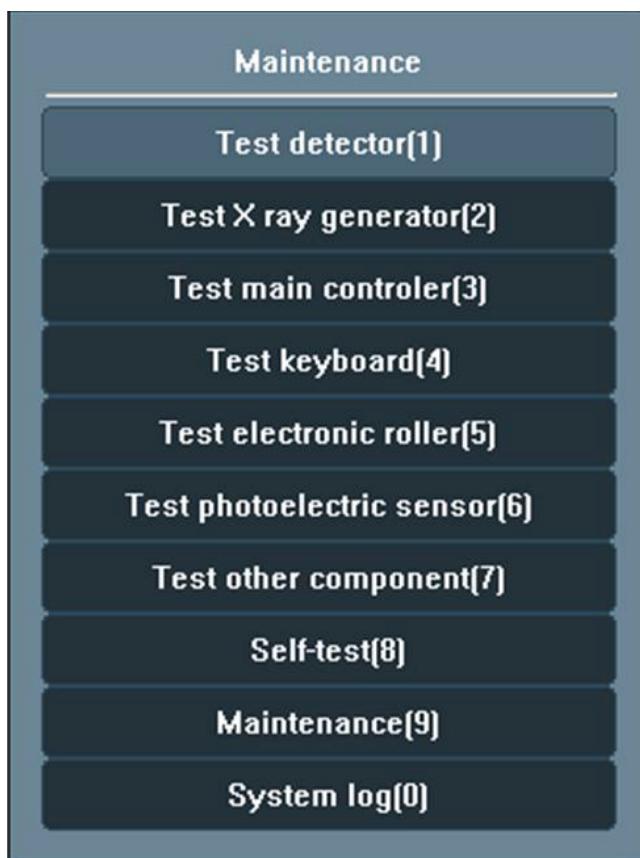
date	log on time
<input type="checkbox"/> 2016-5-13	1.9019Hour

<input type="button" value="Select all[1]"/>	<input type="button" value="Invert select[2]"/>	<input type="button" value="Putout[3]"/>	<input type="button" value="Print[4]"/>	<input type="button" value="Chart[5]"/>	<input type="button" value="Shut down [P1]"/>
--	---	--	---	---	---

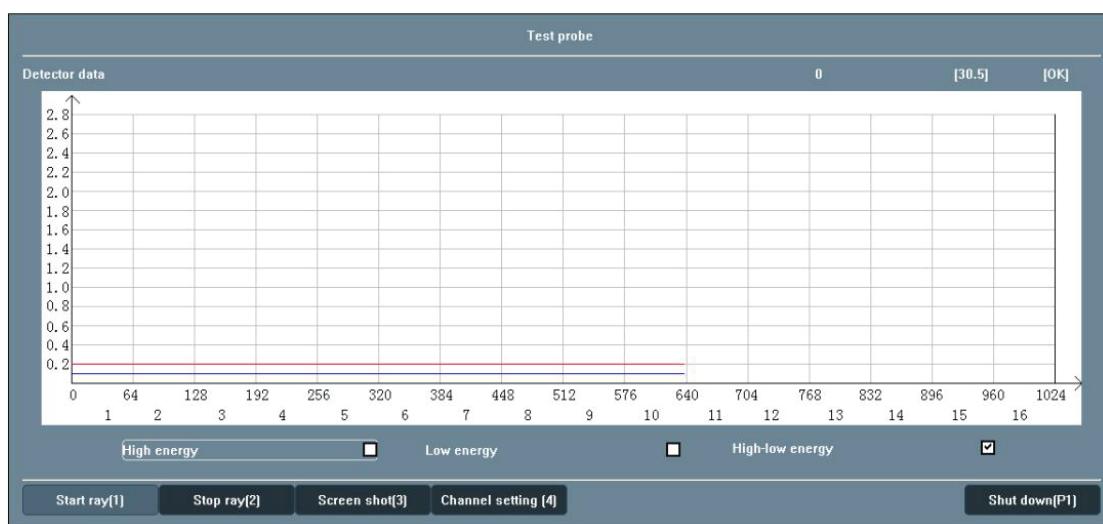


22) Maintenance;

Press 5 –then press 4 , pop-up maintemance menu:

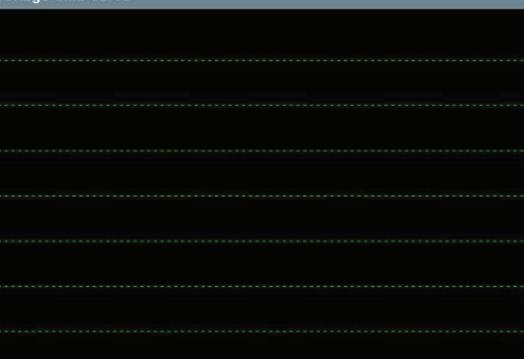
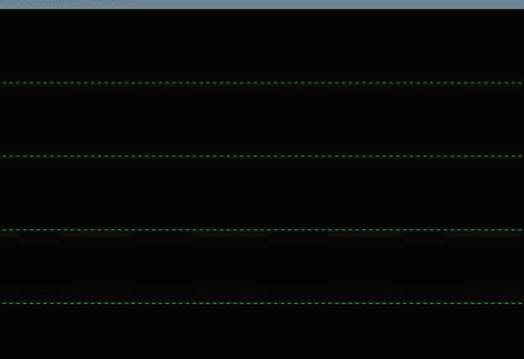


Test probe:



Test X-ray generator:

Test X-ray generator

Voltage time curve  <small>Model</small> <small>Model</small>	Current time curve  <small>Emit time</small> <small>Power on time</small>
<small>[27.0]</small> [OK]	
<input type="button" value="Emit ray[1]"/> <input type="button" value="Stop ray[2]"/> <input type="button" value="Communication test[3]"/> <input type="button" value="Replace[4]"/> <input type="button" value="Shut down[P1]"/>	

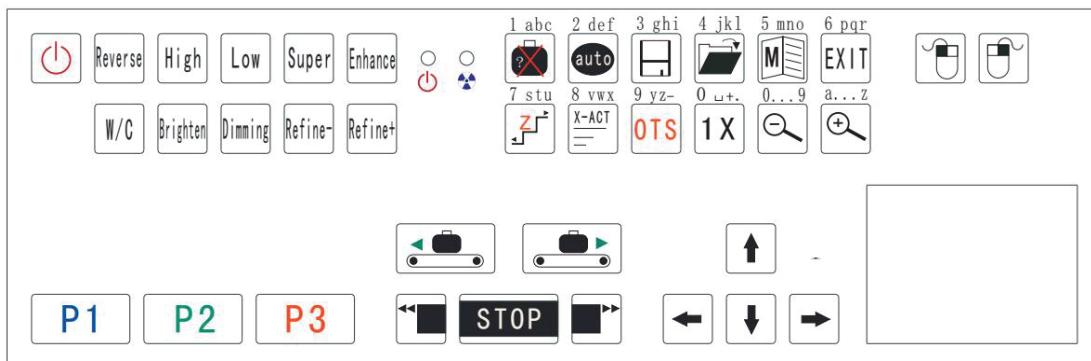
Test the main control:

Test the main control

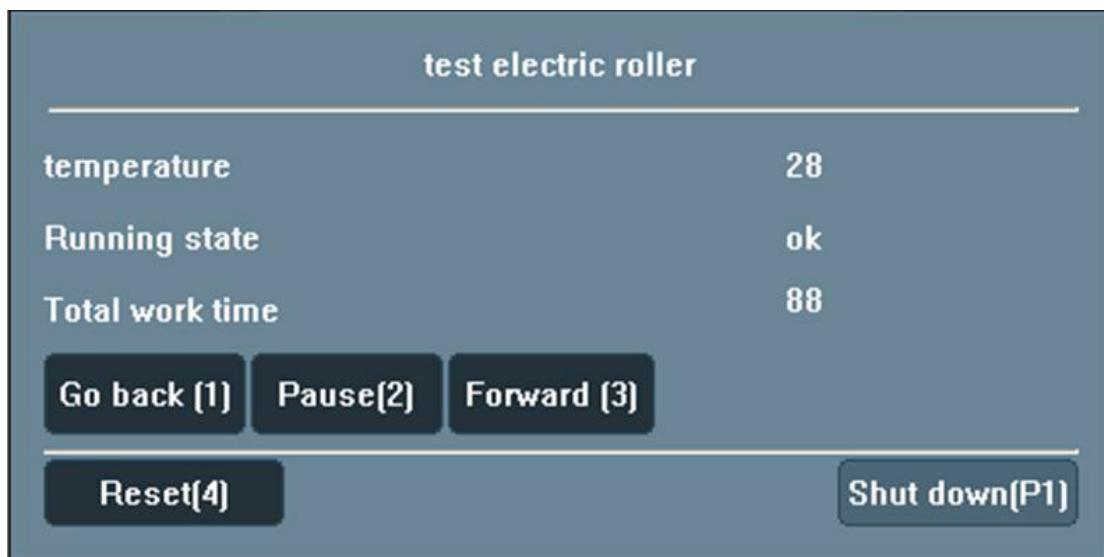
Protocol type Protocol version Current status Temperature Fault rate Broke count	2 9.5 ok 27 0.00 0
<input type="button" value="Advance[1]"/> <input type="button" value="Shut down[P1]"/>	



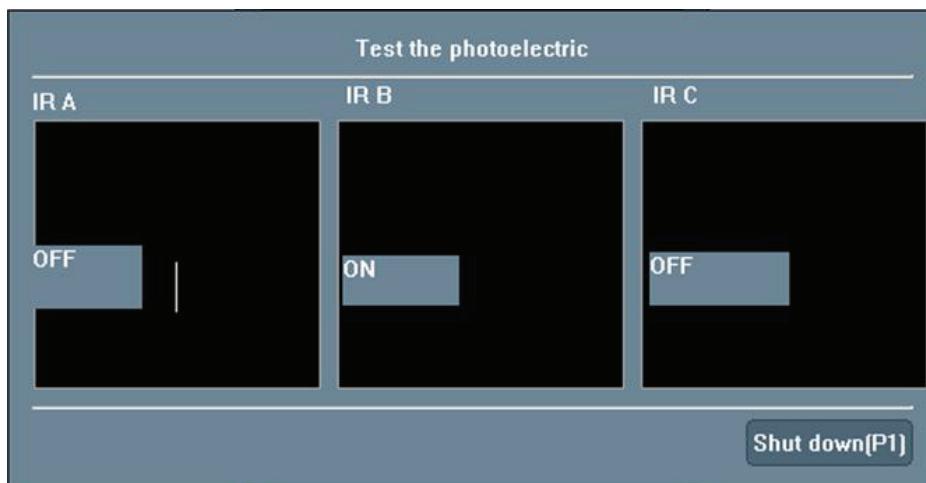
Test key board: click one key , this picture change color;



Test electric roller:



Test the photoelectric:



Test parts:

Hardware	state
Cooling fan	OK
Urgently stop switch	OK
L type safety inter lock	OK
Special keyboard	OK
Sound alarm	OK
light alarm	OK

Test item

Close operation

Test(1)

Shut down(P1)

Self diagnosis

Diagnosis report

[Cooling fan]Diagnosis finished,the result is successsed
 [L type safety inter lock]Diagnosis finished,the result is successsed
 [light alarm]Diagnosis finished,the result is successsed
 [Sound alarm]Diagnosis finished,the result is successsed
 [Special keyboard]Diagnosis finished,the result is successsed
 [Urgently stop switch]Diagnosis finished,the result is successsed

Start(1)

Putout(2)

Print(3)

Shut down(P1)



maintenance

Maintain log

Maintain

[Add\[1\]](#) [Edit\[2\]](#) [Delete\[3\]](#) [Maintenance register\[4\]](#) [Shut down\[P1\]](#)

System log:

System log

Log file list	Log content
Log-20150110 Log-20150112 Log-20150113 Log-20150114 Log-20150115 Log-20150116 Log-20150119 Log-20150121 Log-20150122 Log-20150123 Log-20150126 Log-20150127 Log-20150128 Log-20150130 Log-20150131	<div style="border-left: 1px solid #ccc; padding-left: 10px; margin-bottom: 10px;"> [12:34:59] sa login system successed [12:35:02] Application stoped [16:57:55] sa login system successed [16:58:16] Application stoped [17:01:40] sa login system successed [17:02:10] Application stoped </div> <div style="border: 1px solid #ccc; padding: 5px; background-color: #f9f9f9;"> Total file selected file format okl 6 Warning 0 Error 0 </div>

[Select all\[1\]](#) [Invert select \[2\]](#) [Stop refresh\[3\]](#) [Putout\[4\]](#) [Shut down\[P1\]](#)

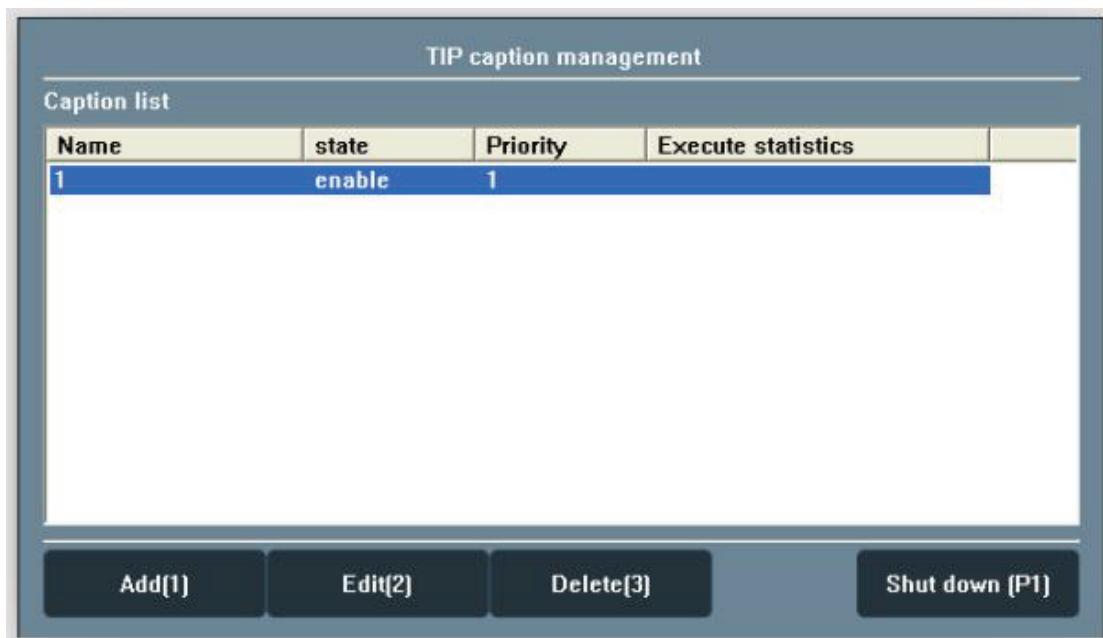


23) Train;



24) T I P function;

T I P caption management



Key setting

Key setting



Function	Button key	long press ...
Raw image	K1	enable
Edge enhance	K2	enable
Super enhance		
Sharp enhance	K2	
Smooth enhance		
Standard alternation		
High penetration		
Low penetration		

Available key: K1

Long press:

Buttons: Apply default[1] | Advance[2] | OK[P2] | Cancel[P1]

Counter setting

Counter setting

Total baggage counter	1128
Temporary baggage counter	2867
Reset temporary baggage counter	<input type="checkbox"/>
Panel display	Temporary bag

Buttons: Reset[0] | OK[P2] | Cancel[P1]

Show setting



Show setting

Material color tone Settings(1)

Default image handle setting(2)

Image horizontal flip	<input type="checkbox"/>
Image vertical flip	<input type="checkbox"/>
Show reference position	<input type="checkbox"/>
Show system status	<input checked="" type="checkbox"/>
Panel display time	system time
Max enlarge times	16

Confirm[P2] **Cancel[P1]**

color setting

color function	background	auto run
color 1	30	<input checked="" type="radio"/> off <input type="radio"/> on
alarm <input checked="" type="radio"/> off <input type="radio"/> on	alarm value 300	

OK[P2] **EXIT[P1]**

Scan setting

Scan setting

Scan direction A->B

Two-way scanning	<input checked="" type="checkbox"/>
Continuous scanning	<input checked="" type="checkbox"/>
Changed irection key	<input checked="" type="checkbox"/>
Auto rewind	<input checked="" type="checkbox"/>
Stop scan when tag image	<input checked="" type="checkbox"/>
Confirm before send ray	<input checked="" type="checkbox"/>
Check baggage channel when stop	<input checked="" type="checkbox"/>
Rewind on long press	<input type="checkbox"/>

Confirm[P2] **Cancel[P1]**



Auxiliary detection

Auxiliary detection

The registered function

- Manual tag image**
- Auto detect unpenetrable object**

Auto detect unpenetrable object

Enable	<input checked="" type="checkbox"/>
Auto stop	<input checked="" type="checkbox"/>
Display	default
Flash	1000
Border color	red
Border width(pixel)	2
Sound and light	4
Alarm volume	ln

Register[1] **OK[P2]** **Cancel[P1]**

Store setting

Store Setting

Image storage capacity

8000

Manual save image alarm

70%

Image storage

Arrange[1]
Default[2]
Created [3]
Delete [4]

OK[P2] **Cancel[P1]**



Printer setting

Printer setting

Available printer

Default printer

Do not show this dialog when printing

Set as default(P1)
OK(P2)
Cancel(P1)

Network setting

Network Setting

Network	Realtek PCIe GBE Family Controller
Auto obtain IP address <input checked="" type="checkbox"/>	
IP address	0 . 0 . 0 . 0
Subnet	0 . 0 . 0 . 0
Gateway	0 . 0 . 0 . 0
Host name	
Address	192.1.1.156
Position	

OK (P2)
Cancel(P1)

System time

System time

Current time	2016-05-14 14:16:28
2016-05-14	14:16:25

OK(P2)
Cancel(P1)

System extension



System extension

seri...	Name	Serial NO	Validity
0			
1			

Machine code

input[1] **putout [2]** **Input[3]** **Shut down[P1]**

Plug-in

Plug-in

Plug-in list

seri...	state	Name	Version
1	enable	Plugin#1	1.2
1	disable	Plugin#2	2.0

Enable[1] **Disable[2]** **Set up[3]** **Shut down[P1]**

Factory setting

Factory setting

Device <input type="text" value="SF6550"/>	Image process control <input checked="" type="checkbox"/> Auto test <input checked="" type="checkbox"/> Electronic balance control <input checked="" type="checkbox"/> Resource monitor control <input checked="" type="checkbox"/> Barcode scanner <input checked="" type="checkbox"/>
Language <input type="text"/>	

Restart[1] **Configuration editor[2]** **Command line[3]** **OK[P2]** **Cancel [P1]**

5.3 Cut off

Push  button, then shut off AC power.

Chapter VI Maintenance and Troubleshooting

X-ray security check system 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 components could be used 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 conveyer 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 pf light barrier and the windows on the wall of tunnel.

(1)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.

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

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

(3)Check the conveyer belt

Check whether the conveyer belt is deviated from the motor.

(4)Check the thermovent

Check whether the thermovent 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 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 supply to make sure the connections 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 conveyer 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 conveyer and frame to demount the conveyer.

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

4.Change the conveyer belt

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

(2)Carry out the pre-processing treatment for the new 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.
- 1.Screw down the two fixing bolts on the light barrier.
- 2.Change for a new light barrier, and fix it after adjusting the light barrier to a proper position.
- 3.Solder the cable outlet of light barrier to the connector based on the drawing.
- 4.Connect the cable
- 5.Cover the cover plate of the device

Connect the device to the power supply, start the conveyer, and put and opaque object on the conveyer 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 the limited block
- 9.Connect the device to the power supply
- 10.Enter the "Menu" and then "Configuration"
- 11.Adjust the adjusting bolts and handle on the right of X-ray source alternately to make the signal shown in the oscilloscope and even as possible.
- 12.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.
- 13.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. Fpr MF X-ray source(including the X-ray source installed or uninstalled) that is used in X-ray security check system 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 procedure
 - (2)Initial adjusting
 - (3)Preheating
 - (4)Final adjusting

6.7. Common failure and the maintenance

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

Before maintaining, please read the above chapters carefully.

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 reason:

- (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 ± 3 Hz.
- (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 conveyer 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 conveyer 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 conveyer belt.



Failure 2:The conveyer 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 conveyer 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($5V\pm5\%$; $12V\pm10\%$).

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 conveyer 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°C(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 5days 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 service 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.





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