



Laboratory Equipment Manufacturer  
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# **FSA-1510**

## **Multifunctional Food Safety Analyzer**

### **User's Manual**



**PLEASE READ THIS MANUAL CAREFULLY BEFORE OPERATION**

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## Symbols description

### Symbols on the instrument

	<p>This symbol means that the labeled item is hot while the instrument is in use. Don't touch the labeled item as you could be scalded. The symbol is labeled on the lamp support of optic system.</p>
	<p>This means that the labeled item could lead to personal injury and/or damage to the analyzer. The symbol is labeled beside the power outlet and some external interface.</p>
<b>SN</b>	<p>The symbols for "SERIAL NUMBER", The serial number shall be after or below the symbol, adjacent to it.</p>
	<p>The symbol means the product is in vitro diagnostic medical device.</p>
	<p>The symbol indicates the manufacturer and its address, after which are shown its name and address.</p>
	<p>The symbol indicates EU representatives of the manufacturer and their addresses, after which are shown their names and addresses.</p>
	<p>The symbol indicates biological pollution, marked in the part where the instrument contacts the clinical reagent. The symbol appears in black side and yellow background.</p>

### Symbols on the sales packaging

	<p>The symbol means that the environment of instruments must be dampproof in the course of transport, and instrument must be kept in a dry environment.</p>
	<p>This means that instrument should handle with care in the course of transportation, so as not to damage it.</p>
	<p>The symbol means the instrument packaged should not be upended at any time</p>
	<p>The symbol means that the level piled up can't exceed 8 layers, as not to damage instrument.</p>
	<p>The symbol indicates temperature range of the analyzers during storage and transportation.</p>

## Safety Precautions and Potential Hazards

### General

Before you start installing and working with the reader, you should read the safety precautions and regulations shown in this chapter.

### Operator Qualification

Please note that the operation with Multifunctional Food Safety Analyzer should be carried out only by the inspector who has undergone necessary training provided by the sales agent.

### Service Technician Qualification

To install, maintain and repair the instrument, a service technician has to be trained on the instrument by the manufacturer or their representative. A service technician is also expected to be familiar with the normal operation of the instrument as described in the User's manual and the special operations as described in the service manual.

### Electrical

To use analyser safely, pay attention to the following items:

To prevent the risk of electrical shock and/or damage to the instrument, **Operator** should not open the cover of the instrument. Only authorized personnel, for example, **service technicians**, may open the instrument to perform maintenance or repair.

Touching the main board when the power is on may cause severe injury or death. Any problem, please ask for helps from your supplier.

### Mechanical

There is no risk presented by the mechanical parts of the instrument when the instrument is closed. If the covers of the instruments are removed, mechanical parts could cause personal injury or the instrument may be damaged if the following advice is not being considered: **DO NOT** wear loose garments or jewellery that could catch in mechanisms. **DO NOT** put your fingers/hands into the pathway or any part while the instrument is in operation. **DO NOT** attempt mechanical repair unless the instrument is not in operation or OFF.

### Lamp

The source lamp becomes extremely hot during operation; never touch the lamp when it is on! If the lamp needs to be changed, always switch off the lamp by switching off the instrument and then wait until the lamp has cooled down.

### Chemical

The operator is responsible for taking all necessary precautions against hazards associated

with the use of clinical laboratory chemicals. Specific recommendations for each reagent used with the Reader are normally found on the manufacturer's package inserts or the on the product information sheets for each chemical. Wipe up any reagent spillage on the instrument immediately.

## **Biohazardous Materials**

As with all vitro diagnostic equipment, sample samples that are assayed on this system, as well as all waste from the waste container, should be treated as the potentially biohazardous. All materials and mechanical components associated with the sampling and waste system should be handled according to your facility's biohazard procedure. Use the personal protective equipment recommended by your facility when handling any of these components. Detailed recommendations:

### **- Samples**

Treat all samples as potentially biohazardous and infectious. If any sample is spit on the instrument, utilize the correct personal protective equipment (PPE- gloves, lab coat, etc...), wipe it up immediately and clean the contaminated with a disinfectant.

### **- Waste solutions and solid wastes**

Avoid direct contact with waste solution and/or solid waste. Both should be handled as potentially biohazardous.

Dispose of waste solution and/or solid waste according to the relevant governmental regulations.

Consult the reagent manufacturer for information on the concentrations of heavy metals and other toxic constituents in each reagent.

### **- Biohazardous parts**

Avoid direct contact with the microplate. Treat these parts as potentially biohazardous and /or infectious

### **- Reagents**

Avoid direct body-contact with reagents. Direct body-contact may result in irritation or damage to your skin. Refer to the manufacturer's reagent kit box and package inserts, or product information sheets for specific instructions.

Avoid direct body-contact with cleaning solution. Direct body-contact may result in skin irritation or damage. Refer to the manufacturer's kit box and package inserts, or product information sheets for specific instructions.

## **Additional Precautions**

### **- Flammables**

Avoid using dangerous flammable material around the instrument.

### **- Accuracy/Precision of the Measured Results**

For proper use of the instrument, measure control samples and monitor the instrument during the operation.

An incorrectly measured result may lead to an error in diagnosis, thereby posing a danger to the sample.

Treat all reagents according to the manufacturer's recommendations. Refer to the reagent kit box and package inserts, or product information sheets for specific instructions.

Make sure that the sample/reagent mixture does not contain any blood clots, dust or other insoluble contaminants. If insoluble contaminants are contained in the sample, correct measuring values may not be obtained.

### **- Application**

The instrument is designed for multifunctional food safety analyzer, involve pesticide residue detection, veterinary drug residues detection, antibiotic residues detection, organic pollutants measurement, natural toxins measurement, aquatic safety monitoring, and analysis of biological contaminants etc.

Please note that other types of analysis may not be applicable to the instrument.

### **- Operation and Maintenance**

During operation and maintenance of the instrument, proceed according to the instructors and do not touch any parts of the instrument other than those specified.

Never leave a Reagents/sample mixture in the microplate for longer than necessary. Always clean the microplate after a batch of measurement and keep the microplate cleanliness when not in use.

Verify the front covers closed while the instrument in operation.

Avoid touching the mechanism, such as the sipper mechanism inside the instrument, while the instrument is operating. This may cause operation stop or damage the instrument.

## 1. INSTALLATION

### 1.1 Unpacking

Unpack FSA-1510 carefully and check for any damage that may have been caused during transportation.

check the components::

- FSA-1510 instrument
- 1 Operator's manual
- 1 Packing list
- Accessories: panel pen, power cable, print cable, RS-232 serial cable,lamp, fuses

Keep the original package for future transportation

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***Notice: report any damage or missing to your local representative.***

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### 1.2 Environmental Requirements

Locate FSA-1510 to avoid exposure to excess dust, vibrations, strong magnetic fields, direct sunlight, draft, excessive moisture or large temperature fluctuations.

Leave sufficient clearance (10 cm) at both sides of the unit for adequate air circulation.

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***Notice: instrument be operated within an ambient temperature range of 0°C-40°C and humidity ≤85%.***

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### 1.3 Electrical Setup

Power requirements

- a.c.110-220V±10%
  - 50-60±1Hz
  - 120W
- 

***warning:***

- ***Ac power plug must be grounded at the main socket.***
  - ***The circuit used should be substantially free of large voltage transients such as large pumps, large centrifuges etc.***
  - ***If found smog, strange sound in instrument, please turn instrument off immediately and contact your dealer***
- 

Connect the supplied power cable to the rear of the instrument as shown. Plug the other end of the power cable into an AC outlet.

### 1.4 External Printer Connection

With both the instrument and the external printer off, connect the parallel cable to the rear of the instrument. Plug the other end of the parallel cable into the printer. Then plug power cable into printer. Install printer paper if needed.



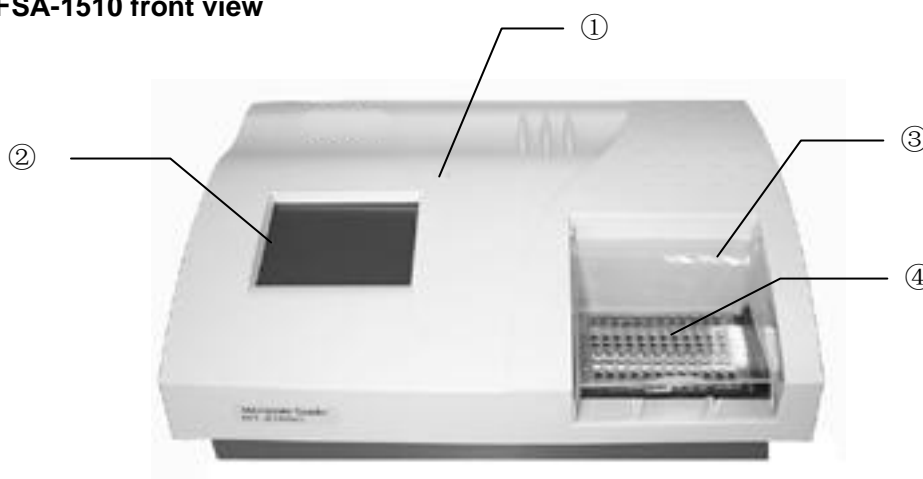
## 2. FUNCTIONAL DESCRIPTION

### 2.1 Introduction

- 1) FSA-1510 is a microprocessor –controlled, general purpose photometer system designed to read and calculate the result of assays, including contagion, tumorous mark, hemopathy, dyshormonism, which are read in microtiter plate.
- 2) Touch panel let your operation easily.
- 3) 100 pre-programmed tests.
- 4) Multiple calculations:
  - Absorbance mode (ABS)
  - Cut-Off mode
  - Single standard mode
  - Point to point mode
  - % Absorbance Multi-Point Mode
  - Linear regression mode
  - Exponent regression mode
  - Logarithm regression mode
  - Power regression mode
- 5) visualization mark plate, you can set blank, control, sample ,standard in any place, and run mostly 12 different tests in one 96 microplate.
- 6) Test time <5s/plate,and mix plate before test
- 7) Max save 100 program and 1000 samples' data and 10000 sample records.
- 8) generalization report , support multi-type printers.
- 9) information manage function : Department database, operator database, system log database.

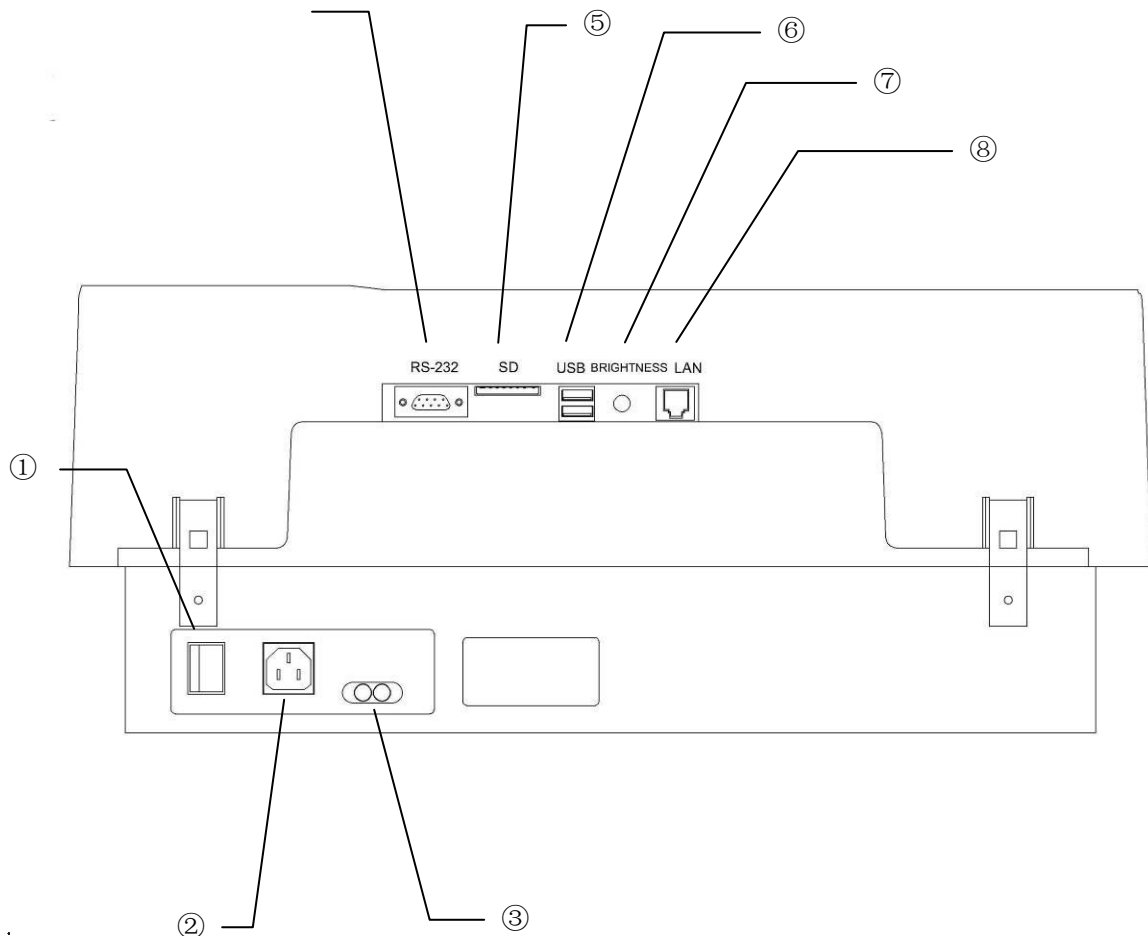
### 2.2 General Description 2.2.1

FSA-1510 front view



- ① power pilot lamp: It light when opens the instrument
- ② touch panel: display program
- ③ Plastic cover
- ④ Plate carrierer: Microplate in plate carrier

2.2.2 FSA-1510 rear view ④



- ① Power switch
- ② Socket
- ③ Fuses
- ④ RS-232 interface
- ⑤ SD interface
- ⑥ USB interface
- ⑦ Contrast adjust button
- ⑧ RJ45 interface

## 2.3 Technical Specifications

Measuring range:	0-4.500 A
Detection methods:	Fully automatic single and double-wavelength measurement, enzyme-linked immunosorbent assay, enzyme inhibition rate, kinetic, etc.
Calculating mode:	Absorbance, threshold, single-point calibration, point-to-point regression, multi-point percentage, linear regression, percentage logarithm, logarithmic curve, exponential curve, power curve, etc.
Detection channel:	8 channels
Wave length:	Four wave lengths including 410、450、492(or 490)、630nm are set, and additional four wave lengths are optional
Resolution:	0.001A (display), 0.0001A (internal calculation)
Display:	liquid crystal display
Operation mode:	Touch screen operation
Storage:	More than 100 test items, more than 10000 test results
Interface:	RS-232 bidirectional communicational interfaces, two USB interfaces ,SD card interface, Ethernet interface
Print:	External printer
Power supply:	a.c.110-220V±10%, 50-60±1Hz
Weight:	Approximately 8kg
Overall dimensions:	460mm(L)×330mm(W)×190mm(H)
Operational environment:	0℃~40℃; relative humidity≤85%
Storage:	-10℃~40℃; relative humidity≤85%

### 3. OPERATION INSTRUCTIONS

#### 3.1 Touch Panel & Pen

FSA-1510 has a touch panel; you can operator the instrument by pen.

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**warning:** *please use the pen to touch the panel.*

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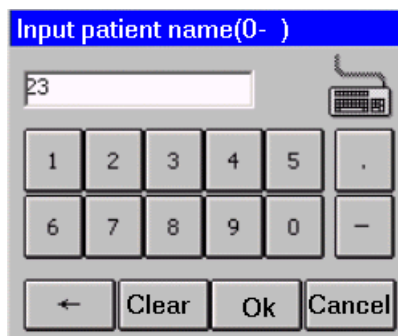


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
**Notice:** *You also can use a RS-232 mouse to operate the instrument.*

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#### 3.2 Digital Number Keyboard



Input integer (age), float number (abs value), digital number (phone code), press “OK” button to saved, or press “cancel” button to exit and no saved.

Edit : press  button to del a character before cursor. Press “clear” button to clear all characters.

#### 3.3 Character Soft Keyboard

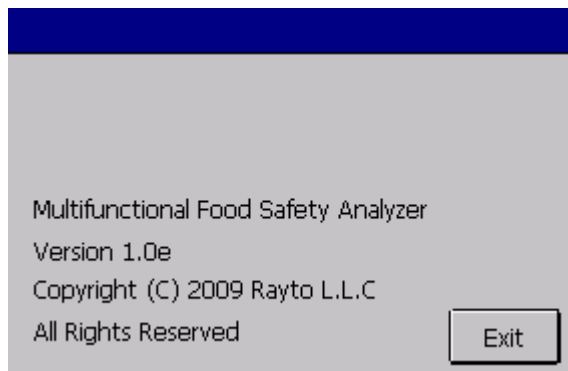
You can operator this keyboard like PC keyboard and move windows by dragging.



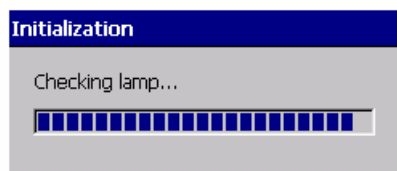
## 4. OPERATION

### 4.1 Power on

Switch the instrument on using power switch and wait 10 seconds , you will see such display:



instrument will self-check , and initialization data will be load:



Error report will be display if the instrument has not pass the self-check.

### 4.2 Main menu

After self-check,system display main menu:

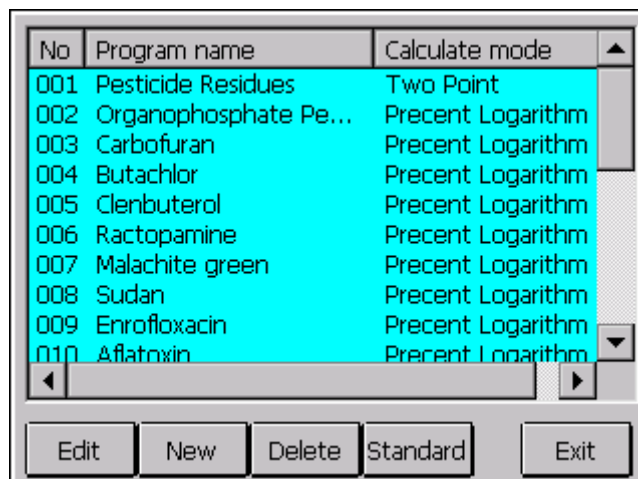


## 5. Program

Press “program” icon in main menu,



Program list will be display:



The FSA-1510 multifunctional food safety analyzer can set 100 test items, including 22 fixed items, which involve Food security analysis, pesticide residue detection, veterinary drug residues detection, antibiotic residues detection, organic pollutants measurement, natural toxins measurement, aquatic safety monitoring, and analysis of biological contaminants etc. 22 fixed items including: Pesticide Residues, Total Organophosphate Pesticides, Carbamate pesticides(Carbofuran), Herbicides Pesticides(Butachlor), Clenobuterol Hydrochloride, Ractopamine, Malachite green, Sudan, Enrofloxacin, Aflatoxin, Chloramphenicol, Diethylstilbestrol, Furaltadone, Nitrofurazone, Nitrofurantoin, Furazolidone, Sulfaquinoxaline, Sulfamethazine, Sulfadoxine-methoxy-pyrimidine, Methyl testosterone, five kinds of Residue of Sulfonamides(Sulfa 5 residues), three kinds of Residue of Sulfonamides(Sulfa 3 residues).

### 5.1 Mode setting

FSA-1510 support 9 calculation modes:

#### 5.1.1 ABS mode

FSA-1510 only display and print out absorbance of samples.

### 5.1.2 Cut-Off mode

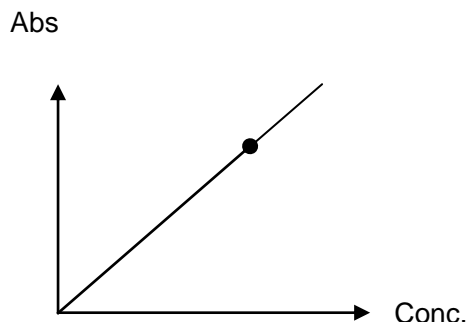
$$\text{Cut-Off formula: } Cov = X \times NC + Y \times PC + Fac$$

In this cut-off mode, where NC is the mean of the negative controls, PC is the mean of the positive controls, Cov is the cutoff absorbance. X, Y, Fac are coefficients that have any positive and negative numerical value (including 0 and 1) e.g. sample OD/NC $\geq$ 2.1 is positive, that X=2.1, Y=0, Fac=0.

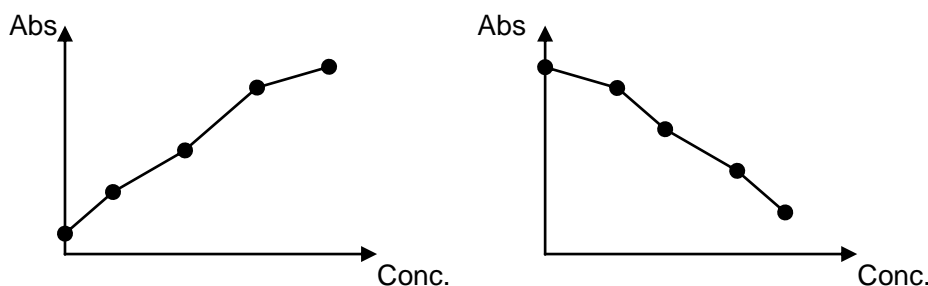
In regular cutoff mode, FSA-1510 award that sample is positive if sample OD/Cov>1.

### 5.1.3 Calculation mode

- 1) Single standard mode: A single calibrator material of known concentration is used so that concentrations of unknown samples may be calculated according to Beer's Law.

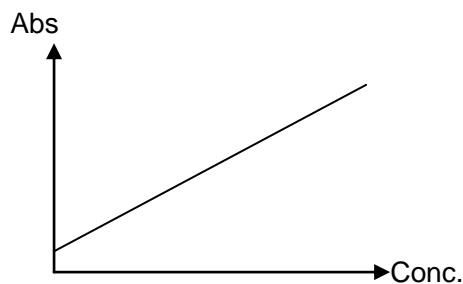


- 2) point to point mode: you can set 2-8 standards, the resulting calibrator curve is a series of lines connecting the calibrator points, which may be entered in ascending or descending order of absorbance.



- 3) %ABS: You can set 2-8 standards. The highest absorbance standard will be assigned a value of 100, and each sample and standard is reported as a percent of the absorbance of the highest calibrator. The resulting calibrator curve is a series of lines connecting the calibrator points, which may be entered in ascending or descending order of absorbance.
- 4) Linear regression mode: You can set 2-8 standards. This is a multi-point standard mode that calculates a best fit linear equation based upon the standard points.

Equations:  $Y = kX + b$ : This is used when the absorbance and the concentration is linear.



- 5) Index regression mode: You can set 2-8 standards. Equation:  $Y = ke^{bX}$ ; This is used

- when the natural log of the absorbance is plotted against the concentration.
- 6) Logarithm regression mode: you can set 2-8 standards. Equation:  $Y = kLnX + b$ ; This is used when the natural log of the concentration is plotted against the absorbance
  - 7) Exponent regression mode: You can set 2-8 standards. Equation:  $Y = kX^b$ ; This is used when the natural log of the absorbance is plotted against the natural log of the concentration.
  - 8) Percent Logarithm regression mode: You can set 2-8 standards. Equation:  $(A/A0\% = k \log C + b)$ ; This is used when the natural log of the absorbance is plotted against the natural log of the concentration.

#### 5.1.4 Calculation mode

Enzyme inhibition rate(Two point) and Kinetics, Calculation of inhibition ratio

Inhibition ratio (%) =  $(\Delta AC - \Delta AS) / \Delta AC \times 100\%$

$\Delta AC$ : Absorbance difference of blank

$\Delta AS$ : Absorbance difference of sample

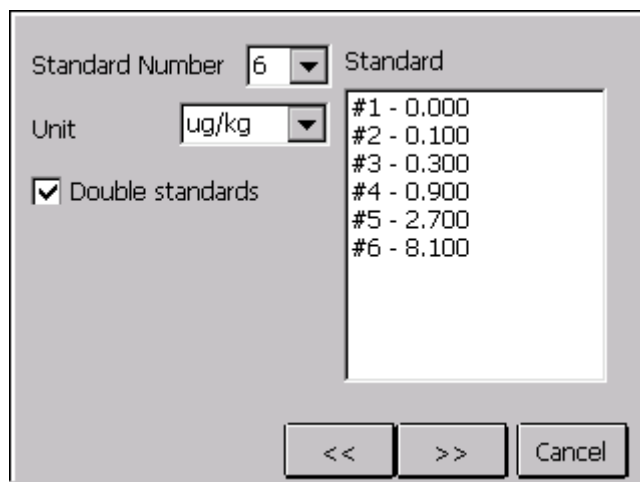
## 5.2 Edit Program Setting

Select existed program (it will be marked), press "Edit" button, it displays the following windows:

- Program: program name, don't input the name existed.
  - Reagent: Input reagent name, you can ignore it.
  - Wavelength
  - calibration mode
  - Double sample: If select it, samples must be pipetted into consecutive two wells, the mean absorbance reading will be used to calculate a single concentration.
  - Double blank: If select it, blank must be pipetted into consecutive two wells, the mean absorbance reading will be used to calculate a single concentration.
  - Blank: You can set range of the blank abs. If blank absorbance out of range, system will display: "blank abs is out of range."
- You can press button, come to next windows, or press button, come back this windows, you can press "cancel" button, exit program configuration windows.



## 1) Standards mode setting windows:



Standard Number 6 Standard

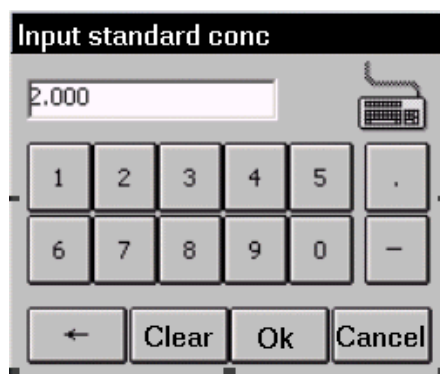
Unit ug/kg

Double standards

#1 - 0.000  
#2 - 0.100  
#3 - 0.300  
#4 - 0.900  
#5 - 2.700  
#6 - 8.100

<< >> Cancel

- Standard number: you can select up to 8.
- Concentration unit: you can select it from listing.
- Double standards: if select it, standards must be pipetted into consecutive two wells, the mean absorbance reading will be used to calculate a single concentration
- Standard conc.: double point standard conc. Listing, you can input standard concentration.



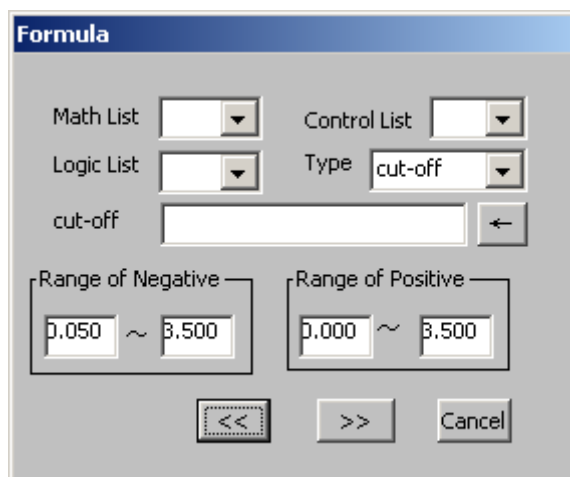

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**Notice: Standards may be entered in ascending order of absorbance. Standard 1 is the lowest concentration.**

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2) Cut-Off mode setting windows:

The new software of FSA-1510 supports the user-defined formula. The following figure is showing.



Math list: +, -, \*, /, %, (, ).

Control: NC, NC, NC1, NC2, NC3, NC4, NC5, NCx, PC, PC1, PC2, PC3, PC4, PC5, PCx, CR, CR1, CR2, CR3, CR4, CR5, CRx, BLK.

Logic list: >, <, <=, >=, AND, OR, = =.

Type: Cut-off, Val1, Val2, Val3, Val4, Val5, Val6, Val7, Val8, and Val9.

Cut-off: formula

Val: formula

**Note:** NC (PC, CR): Represents NC<sub>i</sub> and PC<sub>i</sub> when it acts as the range, other represents mean value (NC<sub>x</sub>, PC<sub>x</sub> and CR<sub>x</sub>)

NC<sub>x</sub>, PC<sub>x</sub> and CR<sub>x</sub>: mean value of N<sub>ci</sub>, P<sub>ci</sub> and C<sub>ri</sub>.

“\*” can not be omitted, such as 1.2\*NCx.

The “()” can not include the “AND, OR”

Invalid input:  $0.12 < NC < 0.4$

Valid input  $NC > 0.12$   
 $NC < 0.4$

“NC” and “PC” should not used with “OR” and “AND”

“NC1 < PC1 AND PC2 < NCx” is permitted.

#### For an example:

#### Reagent instruction: Vironostika HIV Uni-Form II Ag/Ab

The information following is from the reagent instruction.

#### 12 Results

##### Manual calculation

Calculations must be made separately for each strip holder.

NC = Absorbance of the negative control

PC1 = Absorbance of the anti-HIV-1 positive control

PC2 = Absorbance of the anti-HIV-2 positive control

PC3 = Absorbance of the HIV-1 antigen positive control

##### Qualification of NC values

- 1 NC must be  $< 0.250$  Eliminate any  $NC \geq 0.250$ .
- 2 Determine the mean (NCx) value of the remaining controls.
- 3 NC must be  $\leq 1.4NCx$ . Eliminate any  $NC > 1.4NCx$  and recalculate NCx.
- 4 NC must be  $\geq 0.6NCx$ . Eliminate any  $NC < 0.6NCx$  and recalculate NCx.
- 5 Repeat steps 3 and 4 until no more outlier is found.

##### Assay validity

An assay run is valid if

- 1 More than half the number of the negative controls remain;
- 2  $PC1 - NCx \geq 0.600$ ;
- 3  $PC2 - NCx \geq 0.600$  (if used);
- 4  $PC3 - NCx \geq 0.400$  (if used).

##### Cut-off value

If the test run is valid, calculate the cut-off value  $NCx + 0.100$ .

A test sample is reactive if sample absorbance is  $\geq$  cut-off value.

A test sample is no reactive if sample absorbance is  $<$  cut-off value.

##### Calculation example

NC = 0.089; 0.096; 0.088      NCx = 0.091

PC1 = 1.549

PC2 = 1.523

PC3 = 1.398

Eliminate any aberrant control:

NC  $\geq 0.250$

None eliminated

NC > 1.4NCx	$1.4(0.091) = 0.127$	None eliminated
NC < 0.6NCx	$0.6(0.091) = 0.055$	None eliminated

Ensure the following is within specified acceptance criteria:

PC1 - NCx  $\geq$  0.600       $1.549 - 0.091 = 1.458$       Pass

PC2 - NCx  $\geq$  0.600       $1.523 - 0.091 = 1.432$       Pass

PC3 - NCx  $\geq$  0.400       $1.398 - 0.091 = 1.307$       Pass

Calculate cut –off value:

Cut-off = NCx + 0.100 = 0.091 + 0.100 = 0.191

### Program: HIV-Ag/Ab

Full name: HIV-Ag/Ab

Reagent:

First wavelength: 450

Second wavelength: None or 630

Calibration mode: Cut-off

Double sample      Blank  $\leq$  0.050

Formula:

1. Type: Cut-off

Cut-off: NCx + 0.100

2.Type: Val1

Val1: NC < 0.25

3. Type: Val2

Val3: NC > 0.6NCx

4.Type: Val3

Val3: NC < 1.4NCx

5. Type: Val4

Val4: PC1 – NCx  $\geq$  0.600

6.Type: Val5

Val4: PC2 – NCx  $\geq$  0.600

7. Type: Val6

Val4: PC3 – NCx  $\geq$  0.400

Qualitative: positive threshold value

Negative < 1.000

Positive  $\geq$  1.000

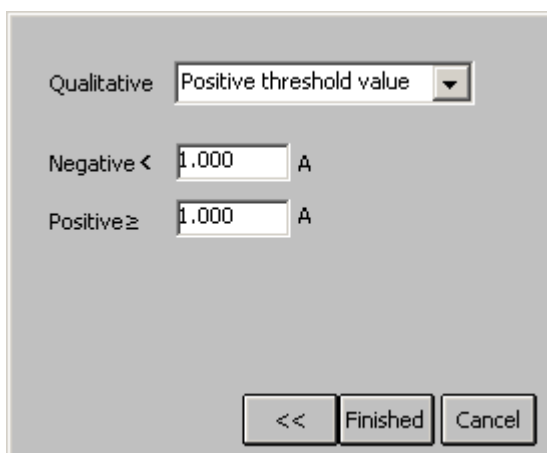
Normal: 0.000 – 1.000

Finished.

- Range of Negative and positive: if absorbance of negative control and positive control is out of range, FSA-1510 calculates as min or max abs.
- Double of controls: if select this, controls must be pipetted into consecutive two wells, the mean absorbance reading will be used to calculate a single concentration

Positive and negative setting windows

## 3) Positive and negative setting windows



Qualitative mode: In this option you can select regular cov, reverse cov, none.

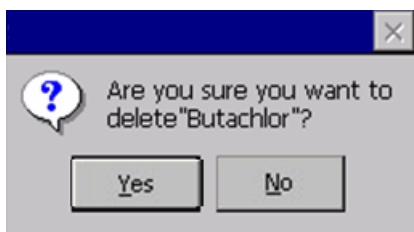
- Regular cov: Samples with values higher than the positive cutoff are labeled as positive. Sample with values lower than the negative cutoff are labeled as negative. Any samples with values falling between the negative cutoff and the positive cutoff are labeled as equivocal.
- Reverse cov: Samples with values lower than the positive cutoff are labeled as positive. Sample with values higher than the negative cutoff are labeled as negative.
- None: you can select none if you don't award negative or positive.  
Normal range: please input the values with reagent instruction  
Press "Finished" button, come back program listing windows.

### 5.3 Creating program

Press "new" button to create a new program, and then input the parameters. If the program name has existed, system will warn: "program exists."

### 5.4 Deleting program

Select one program in program listing, press "delete" button, system display windows:



Press "Yes" button to delete program. Press "NO" button to cancel.

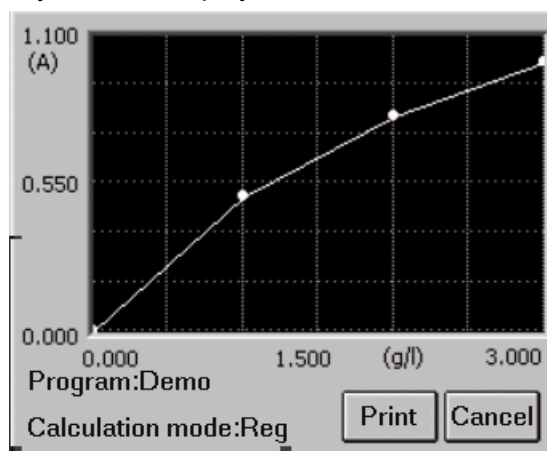
### 5.5 Standard

Standard test results and curve will be stored. Operator can review and print the results. Select one program in program listing, Press "standard" button, system display standard conc. and abs.

Calibrator	conc. (g/l)	Abs (A)
#1	0.000	0.000
#2	1.000	0.500
#3	2.000	0.800
#4	3.000	1.000

Program:Demo  
Calculation mode:Reg

Press "curve" button, system will display standard curve:



Press "print" button, system will print standard curve.

---

**Notice : Old standards will be deleted if modifying program setting.  
(Wavelength, calculate mode, standard number, standard conc.etc.)**

---

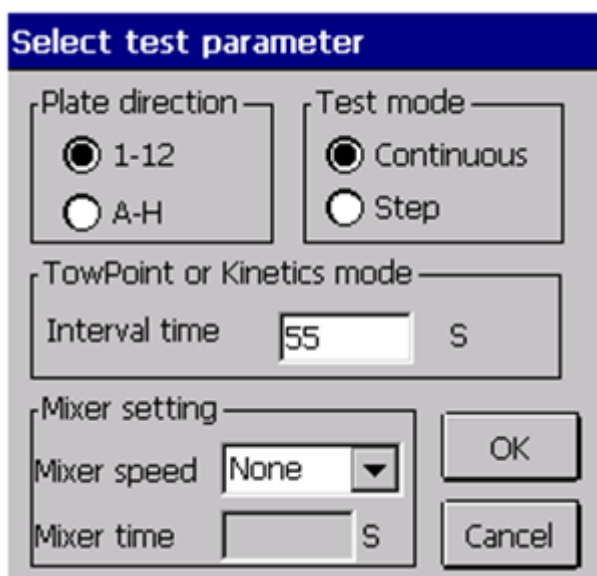
## 6. RUN THE TESTS

### 6.1. Plate Parameters Setting

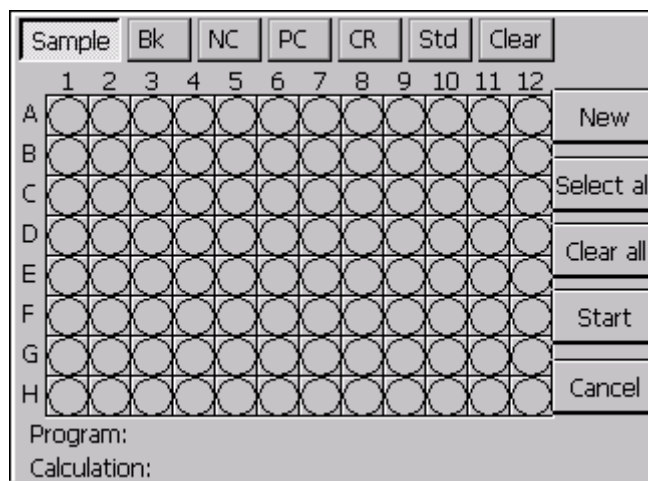
Press "test" icon in main



Pop up such windows:

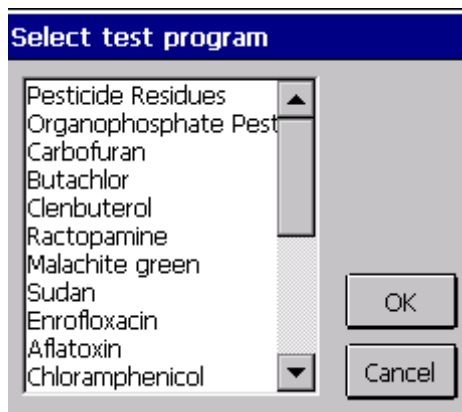


- Plate direction: A-H direction and 1-12 direction.
  - Test mode: You can select continue mode(<5 seconds= or step mode (<15 seconds =).
  - TowPoint or Kinetics mode: you can input the interval time which is the space rest between two running-test.
  - Mixer setting:
    - Mixer speed: you can select fast, normal, slow or none.
    - Mixer time: you can select 1-60 seconds.
- Press "Ok" button, come to next windows.



## 6.2. Select Test Program

FSA-1510 support 12 programs in one plate, first press “New” button, the following windows display:



select the program, press “OK” button.

---

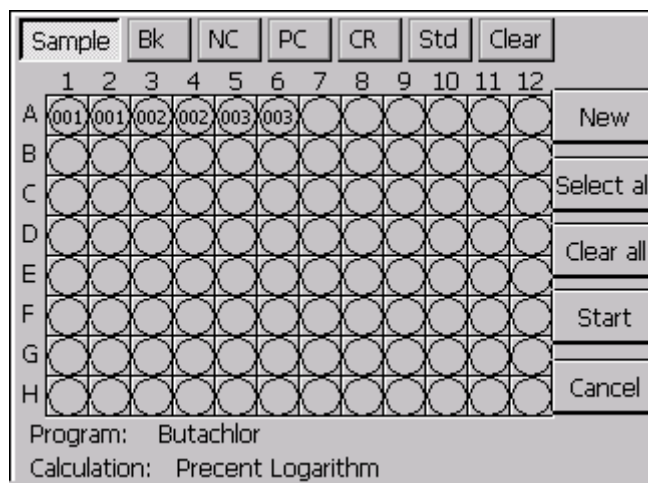
**NOTICE: if you test multi-programs in one plate, you must set the programs one by one. STD: standard CLR: clear**

---

## 6.3. Mark well

You can set each well's function. Select well's function firstly, and click the well which you will mark.





mark label: sample: 1–999  
 blank: B  
 negative controls: NC  
 positive controls: PC  
 standard: S1–S8  
 Quality Control: QC

### 6.3.1. Sample

Click the well which will be tested, then the well will be marked .If you modify sample No., please click that well again. A windows display:



Input sample No.again.If you input No. already exist, system display “sample NO. Already exist, input again.”

---

**Notice : One sample is marked by only one sample NO. In one day.  
 Negative controls: NC Positive controls: PC**

---

### 6.3.2. Blank

You can select blank well or no in different program. One program only set a blank well. Old blank value will be saved automatically and be used.

### 6.3.3. Negative controls

You must set one negative control in one program other than negative control factor is 0. .

### 6.3.4. Positive controls

You can see negative control setting. (Section)

### 6.3.5. Standard

This option is valid only when one program needs standards. If this program has old standards values, you can select set standards or not.

**Notice: If one program set standards and test good, new values of standards will cover old values.**

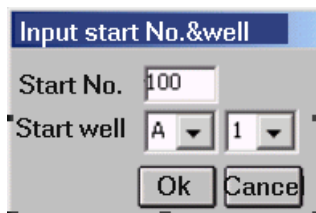
### 6.3.6. Clear

If you want delete marked wells, press “clear” button, then point wells that what you want.

## 6.4. Select All

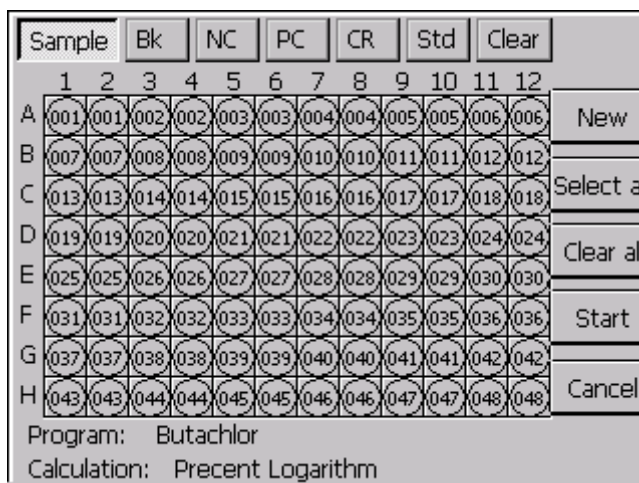
Use this button; you can quickly mark the sample wells.

Press “select all” button, display such windows:



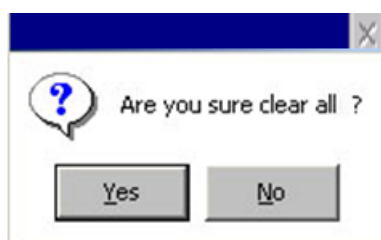
input start number (1-999) and start well(row number and line number),press “Ok” button. All wells in this plate will be marked samples. Start No. is that you input.

In this option all set program and wells will be deleted. You should set standards and controls after “select all”.



### 6.5. Clear All

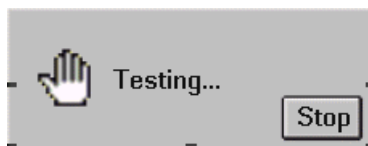
Press “Clear all” button, system display:



Press “yes” button, clear all well setting.

### 6.6. Test

Press “start” button, system will test the plate:



You can press “stop” button to stop the test.

### 6.7. Results

The test results will be displayed:

	1	2	3	4	5	6
A	001 0.040	002 0.800	003 0.090	004 0.080	NC 0.050	PC 0.600
B						
C						
D						
E						
F						
G						
H						

7-12>>      Result    Print    Cancel

1-6 columns abs results will be displayed, press **7-12>>** button, windows will display 7-12 columns abs results.

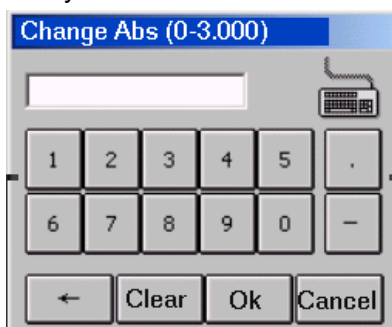
Sample: 001 is sample number, 0.040 is abs results.

---

**Notice: if abs results > 3.500A, will display 3.500\*, and calculate by 3.500, if abs < 0.000A, display 0.000\*, and calculation by 0.000.**

---

you can modify the well result by click the well:



Input abs value and press “ok” button.

**Notice: Standard or control abs change will affect all results in this program!**

### 6.8. Calculation Results

Press "result" button in abs result windows, display calibration results:

	1	2	3	4	5	6
A	-0.200	+4.000	-0.450	-0.400	NC	PC
B						
C						
D						
E						
F						
G						
H						

7-12>> Cancel

You can see the values and negative/positive mark display in every well. If the values in some well <0.0 , "\*" will be labeled to this well.

## 6.9. Printing

---

**Notice:** *QTA: quantitative analysis*  
*QLA: qualitative analysis*

---

Press "Print" button in testing windows, FSA-1510 will print all test results.

## 6.10. Storing Test Results

Press "cancel" button in Abs windows, the instrument will automatically store the test results in history database.

## 7. REPORT

### 7.1. Report form

Press “report” in main menu



System displays such windows:

Select report form:

- Report form: report by sample list or program list.
- Date range: today and all of days.

### 7.2. Report By Sample list

Select “sample”, press Ok button, display following windows:

◆	No	Date	Sample NO	Name ▲
	001	2003-06-09	001	
	002	2003-06-09	002	
	003	2003-06-09	003	
	004	2003-06-09	004	
	005	2003-06-09	005	
	006	2003-06-09	006	
	007	2003-06-09	007	
	008	2003-06-09	008	
	009	2003-06-09	009	
	010	2003-06-09	010	

Buttons: Edit, Delete, Preview, Print, Cancel

- 1) Select one sample
- 2) Mark multi-samples: You can mark all samples by pointing first line in the title bar.

### 7.2.1 Edit sample data

Select one sample, press “Edit” button, sample’s information windows pop up:

**Input sample information**

Date 02/04/2005

Sample NO. 005

Name

Branch

Sender

Operator

Ok

Cancel

Input the information. Press “Ok” button to save information, press “cancel” button to exit without save.

### 7.2.2 Preview report

Select a sample, press “preview” button, that sample’s data display in list.

Program name	Abs	Resu
HbcAb	0.100	0.952
HbeAb	0.120	0.571
HbeAg	0.100	0.595
HbsAb	0.440	1.905
HbsAg	0.090	0.450

Cancel

### 7.2.3 Delete sample data

Press “delete” button, windows pop up:



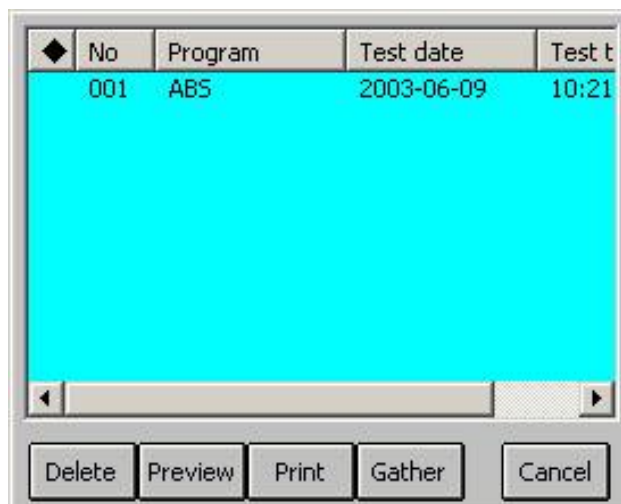
Press “yes” button, all marked sample data will be delete. Press “no” button, exit without save.

### 7.2.4 Print report

Press “print” button, all marked sample report will be print.

## 7.3 Print By Program list

Select “program”, press “ok” button, and pop up program list windows:



### 7.3.1 Preview report

Select one program, press “preview” button, and pop up preview windows:

Well	Sample	Abs	Result	Unit
A1	001	0.090	0.450	s/co
B1	002	0.170	0.850	s/co
C1	003	0.222	1.110	s/co
D1	004	0.167	0.835	s/co
E1	005	0.080	0.400	s/co
F1	NC	0.090		

### 7.3.2 Delete program

Press “delete” button and “yes” button, all marked program and test data will be delete.

### 7.3.3 Print report

Press “print” button, all marked program’s standard curve and test data will be print.

### 7.3.4 Gather print

FSA-1510 support gather print, you can quickly print all negative or positive sample data in one day. Press “gather” button, come to next windows:

**Input condition**

Date: 2009 / 07 / 15

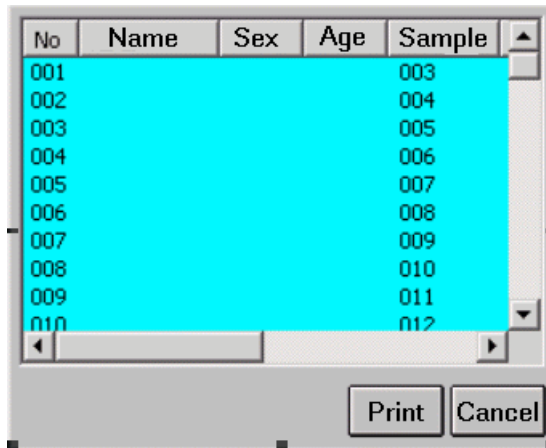
Program: Carbofuran

Result: Pos+

OK Cancel

Input date, select program and results from list, press “OK” button, all samples coincidence condition display in listing windows:





No	Name	Sex	Age	Sample
001				003
002				004
003				005
004				006
005				007
006				008
007				009
008				010
009				011
010				012

Press "print" button, all data will be printed.

## 8. Communication

### 8.1 Communication to PC

FSA-1510 can connect to pc, send data to pc. With software, you can store sample lists, print reports.

For more information regarding pc software, contact your dealer.

- 1) Connect serial cable to FSA-1510, and plug another end in pc COM1, turn on FSA-1510 and pc,

---

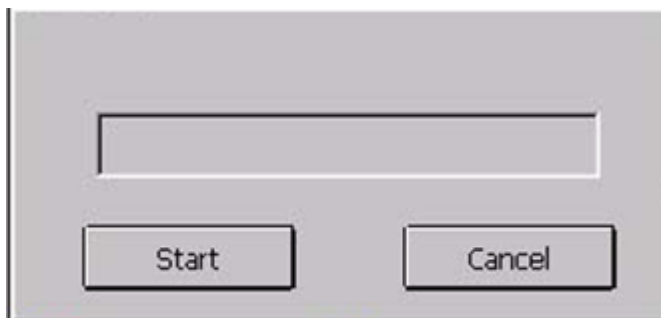
**Warning: FSA-1510 and PC don't open when connecting serial port, otherwise hardware will be wrong.**

---

- 2) Run pc external software, receive data.
- 3) Press "Data send" button in instrument



- 4) come to next windows, and press "start" button to send:



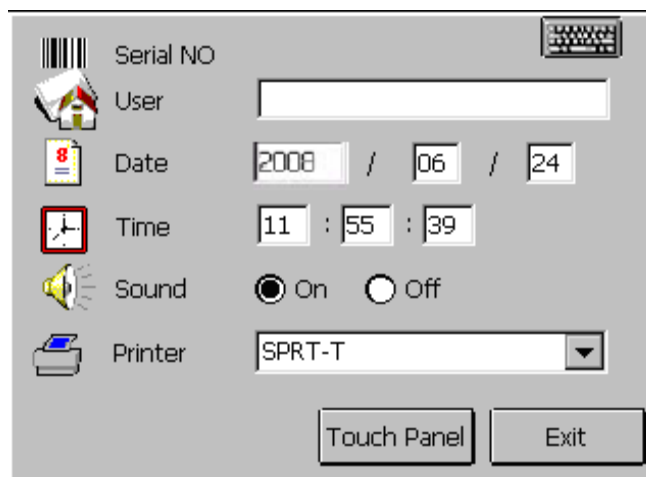
- 5) Sending data finished, press "Cancel" button to come back main menu.
- 6) The external software will receive the data.

## 9. SYSTEM SETTING

Press “system” button in main menu:



Come to the following windows:



- 1) Serial NO
- 2) Hospital: hospital name.
- 3) Date and time
- 4) Printer: FSA-1510 supports printers: PCL laser series, Epson ME 1+, SPRT-T, SPRT-RM, and HP P1007.

You can choose one of printers

---

**Notice: Printers might be changed. Please reference to printer list of system setting. If printer setting is wrong, maybe printer works error.**

---

- 5) Sound switching: Turn on or off the speaker
- 6) Touch panel calibration: You can calibration touch panel. Press “touch panel ” button, come to calibration windows:

Press the cross with pen .  
When the cross moves to next place  
point it again.

+

Press the cross center by pen, wait one second, the cross moves to next place automatically. You should continue press cross with pen again. The same operation repeats 5 times, system will display next windows:

---

***Notice: The cross doesn't move after pressing it. Please try it again.***

---

Get new value!

System will use new value when you  
point anywhere before 10 seconds.  
If you don't point anywhere,old value  
is availability.

Lasted time: 10 Seconds

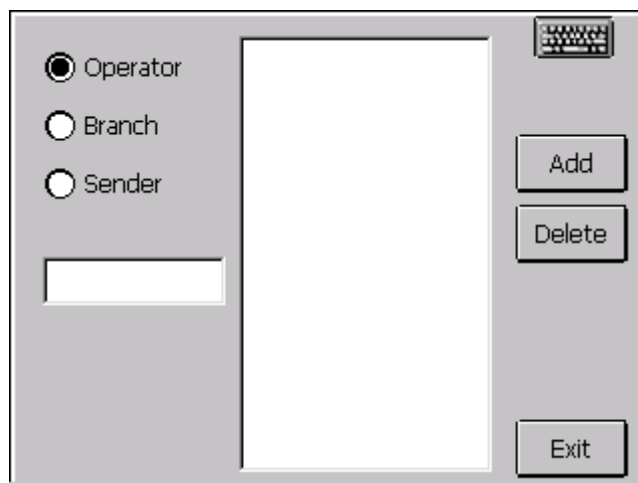
Please click anywhere in the panel, system will save new setting and come back system-setting windows.

## 9. INFORMATION MANAGEMENT

Press "Information" button in main menu:



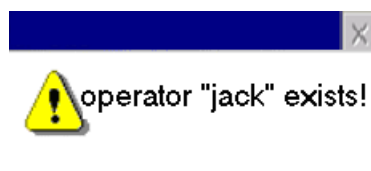
Come to the following windows:



FSA-1510 has operator database and department database. You can add or delete operators/department in those databases. FSA-1510 can store 100 records in those two databases.

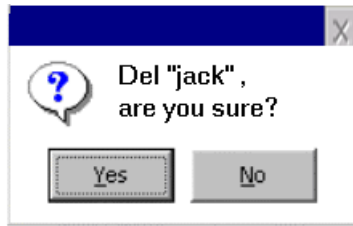
Select operator or department. For example operator database:

- 1) add record : input operator name in the edit and press "add" button. If this operator's name already exists, system will display windows:




If database reach high range, system will report, "operator's record is over."

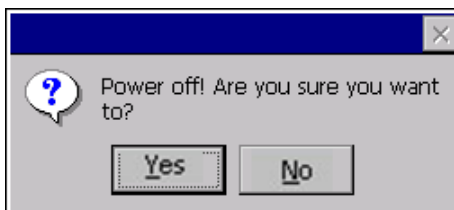
- 2) Deltree record: Select one operator in operators listing, press "Delete" button:



Press "Yes" button to deltree that record, press "No" button to cancel.

## 11. POWER OFF

Press “” button in main menu(in the right-bottom), display such windows:



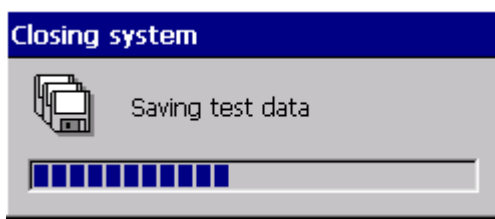
Press “yes” button, instrument will be turned off. Press “no” button, exit to main menu.

---

**Notice:** *If don't turn off instrument normally, results and parameters edit in this time will not be save.*

---

System will display such windows:



---

**Warning:** *Please keep power when turn instrument off. The instrument may fail to operate normally if the power is interrupted.*

---

When data saved, such windows will display:



Now you can turn the power switch off safely.

---

**Notice:** *Turn FSA-1510 off for at least 30 seconds and turn it on again.*

---

## 12. INSTRUMENT SERVICE

### 12.1 Maintenance

FSA-1510 is designed to be a maintenance free instrument. To insure optimum trouble free performance, the instrument should be kept dry and operated in an area free from excessive dust.

### 12.2 Cleaning The Instrument

- Keep working environment clean
- Use a slightly damp soft cloth to remove dirt or spills. For decontamination, 70% isopropanol is recommended.
- Use soft cloth to remove dirt or spills in LCD.

---

**Notice:** *Use other chemicals or abrasive cleaners are not recommended.*

---

### 12.3 Changing Part Of Instrument

#### 12.3.1 Changing the fuses

- 1) Disconnect power cord from mains supply before replacing fuses.
- 2) Open fuses box left in power, change fuses, close fuse box.  
Fuse specification: 250V/3.15A.
- 3) Turn the instrument on.

---

**Notice:** *Use the same fuse for replacing.*

---

#### 12.3.2 Changing the lamp

- 1) Turn the instrument off, open instrument cover by unscrewing the one screw on the front of the instrument.
- 2) Remove four screws of the optical assembly cover. Remove the cover.
- 3) Lift up the lamp with the terminal socket. Pull the terminal socket from the lamp contacts.
- 4) Refit the terminal socket to the contacts of the new lamp (OSRAM64607, 6V/20W). Place the new lamp in its place.
- 5) Close the optical assembly cover. Replace the screws.
- 6) Close the instrument cover. Turn FSA-1510 on again.

### 12.4 Troubleshooting

Symptom	Causes and Remedies
FSA-1510 does not Turn on	Check power supply cord Check fuses Check power voltage Turn FSA-1510 off for 30 seconds and turn it back on.



---

Lamp does not light	Check lamp Voltage Lamp is bad Change lamp
RAM check error	Turn FSA-1510 off for 30 seconds and turn it back on. Firstly turn FSA-1510 on and secondly turn printer on. Cable connect error, turn FSA-1510 off, open instrument cover, and reconnect cable between two pcb.
Lamp is too high	Filters install in wrong place.
Lamp is too low	Lamp is bad and changes it.
Motor does not work	Motor is bad Open the cover of the instrument, check motor.
Chopper wheel run faster	Chopper driver motor error Open the cover of the instrument, check chopper driver motor.
Filter does not come back zero place	Filter wheel error. Open the cover of the instrument, check sensor.
Plate does not come back original place	The plate may be does not place in right place. Check it.
Plate don't move	Driver Motor error, open cover, checks driver motor work or not.
Open COM port error Turn	Maybe use serial mouse. FSA-1510 off. Disconnect the mouse from instrument and turn on it again.
Printer don't work	Printer power works error. Check power is ok. Check ON/OFF button in printer. Check printer type in system setting right or not. Firstly turn FSA-1510 on then turn printer on. Check printer cable connect FSA-1510 right or not.
The printing is dim or incomplete	Change ink box, clean printer head. (See printer user manual)
The printing is jam	See printer user manual
Other printer error	See printer user manual

---

**Notice: For more information regarding service, contact you dealer.**

---

## 13. Spare parts replacement

### 13.1 Replacement of lamp

Loosen a screw in the middle of the front-end of the machine and lift the top cover of the machine. Loosen the screws of the two black light-masking boards on the right of the machine and remove the two light-masking boards. Loosen the fastening screw of the bulb and disconnect the power cord of the bulb. Replace it with a new bulb and restore the instrument.

Remove the screw,  
and then take out  
the lamp carefully



### 13.2 Replacement of filter

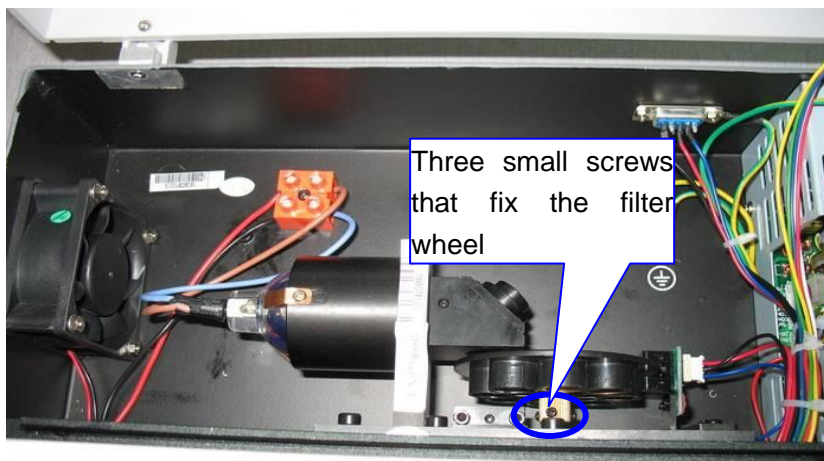
#### STEP 1: Install filters

1. Turn off the instrument normally.
2. Remove the only one screw and open the cover of the Reader.



Screw

3. Remove the four screws and take off the big black cover
4. Use a small cross screwdriver to loosen the three screws, which fix the filter wheel.



Three small screws  
that fix the filter  
wheel

Figure 1



Figure 2

5. Use the small allen key to remove these two screws.
6. Plug out the filter wheel motor and take out the filter wheel including filters.
7. Use a forceps to install filter (e.g.520nm) in #4. From #0 to #3 are the fixed filters, it should be moved.

The gap of the wheel

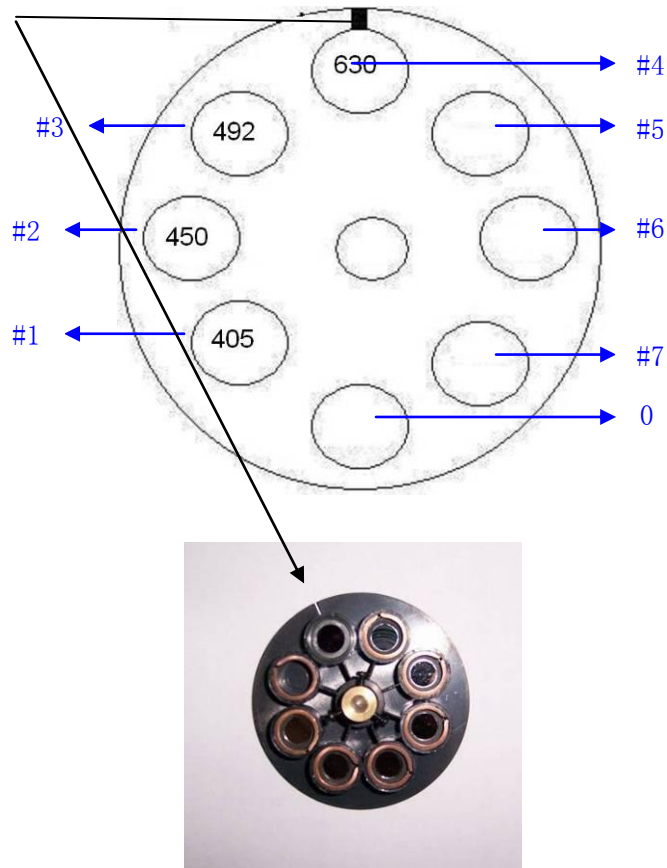


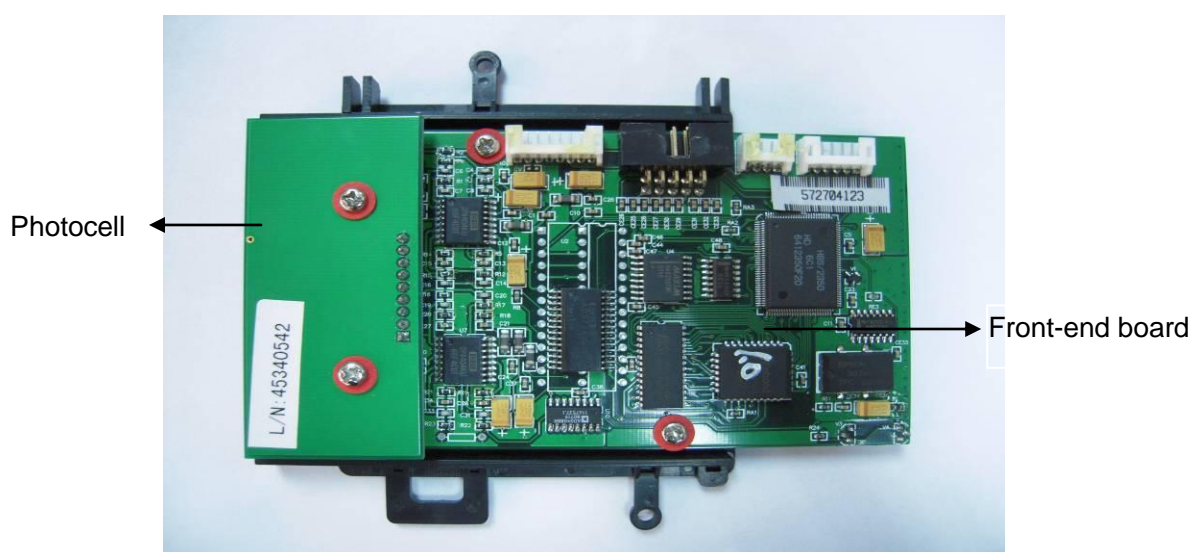
Figure 2

Note: Don't touch the filters with your finger.

8. Finish the install of filters, then install filter wheel with motor correctly. Remember to screw the three screws to fix the filter wheel.
9. Install the black cover, connect the power cable and turn on the instrument.

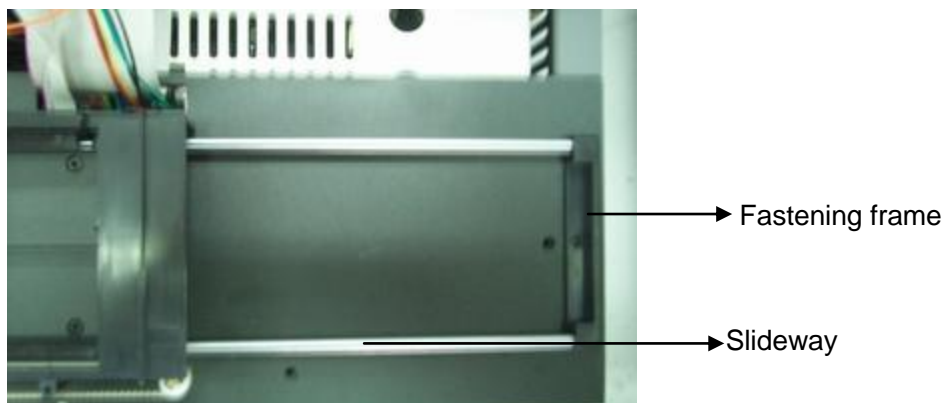
### 13.3 Replacement of front-end board

Open the top cover of the machine and remove the light-masking board. Disconnect the power cord and signal cord of the front-end board and remove the fastening screw. Please note where the power cord and the small signal cord, which come from beneath the board, are connected before removing the old front-end board. Wedge the new front-end board in its proper position and connect the power cord and the small signal cord properly. Fix the screw in place. Note that the Hall module at the bottom right corner shall not stick up.



### 13.4 Replacement of small cart

Open the top cover of the machine and remove the light-masking board. Remove the two fastening screws under the fastening frame of the cart slideway on the right of the small cart. Remove the fastening frame of the slideway and remove the slideway. Loosen the belt's fastening screw at the top left corner of the small cart and turn the small cart by 180 degrees. Remove the small cart's fastening screw and replace the small cart with a new one. Fix the screw in place and turn the small cart by 180 degrees to restore it. Tighten the fastening screw to adjust the belt to a proper elasticity. Restore the slideway and the fastening frame.



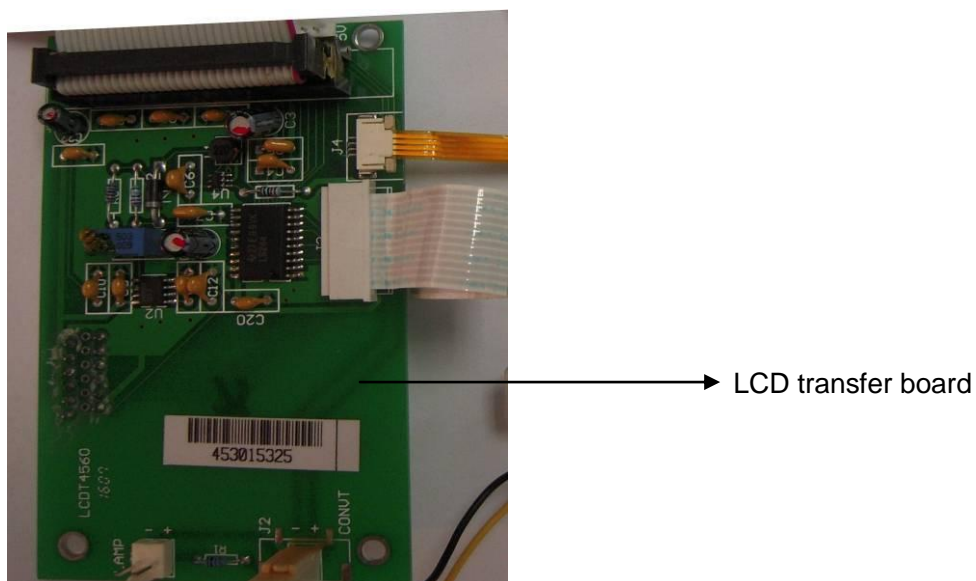
### 13.5 Replacement of drive board

Open the top cover of the machine and remove the light-masking board. Remove the internal hexagonal screw used to fasten the working table and loosen the 3 screws used to fasten the optical fiber. Lift the working table with care and disconnect the wiring on the drive board. Remove the screws and replace the drive board with a new one. Restore the machine. (Note to protect the optical fiber during replacement; protect against static electricity; note not to confuse light-filtering plate motor cable with the 5pin power supply unit cable; note not to omit the insulative pad in installation.)



### 13.6 Replacement of LCD transfer board

Open the machine covers and remove the light-masking board. Disconnect the wiring on the transfer board and loosen the fastening screw. Replace it with a new board and restore the instrument.



### 13.7 Adjustment of the spring fixer for matching microplates

Because little difference among the different Microplates, it is allowed to adjust the position of spring fixer for matching the different Microplates.

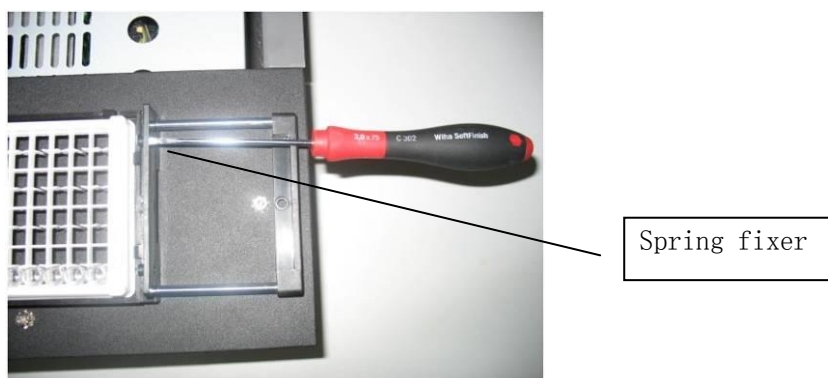
- 1) Load the Microplate in the plate holder.
- 2) Remove the big screw in the front middle of the instrument then open the instrument upper cover.
- 3) Adjust the spring fixer's position for ensure that the plate holder could hold the Microplate properly.

The figures are following:

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**Note :** *The tension of spring fixer— No vibration of microplate when vibrating around the Microplate; Easy to load the Microplate; No sound from the spring fixer when loading the Microplate.*

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### 13.8 How to install the plate to the plate holder

1. Install one side to holder first, see Figure 1



Figure 1

2. Press another side of the plate down carefully. See Figure 2&e Figure3.



Figure 2



Figure 3



## Appendix: The names and the contents of the toxic and harmful substances or elements in the product

### 1. The names and the contents of the toxic and hazardous substances or elements

Part name	Toxic / hazardous substance or element					
	Lead (Pb)	Mercury (Hg)	Cadmium (Cd)	Hexavalent chromium (Cr(VI))	Polybrominated biphenyls (PBB)	Polybrominated diphenyl ethers (PBDE)
Built-in PCB	✘	○	○	○	○	○
Casing	✘	○	○	○	○	○
Display screen	✘	○	○	○	○	○
Optoelectric component	✘	○	○	○	○	○
Internal wire	○	○	○	○	○	○
Accessories	✘	○	○	○	○	○

○: Contents of this toxic/hazardous substance in all homogenous material of the component are below limit stated as per SJ/T11363-2006 standard.

✘: Content of this toxic/hazardous substance at least in one homogenous material of the component is out of limit stated as per SJ/T11363-2006 standard.

### 2. ID Description

Environmental protection service life ID



ID meanings: This electronic information product contains certain toxic and harmful substances, and the environmental protection service life is 20 years, during the environmental protection service life, please feel free to use it, however, if beyond the environmental protection service life, please put it to the recycling system.