



# **ATP USER INSTRUCTIONS**

---

# User Manual

**1. Principle of Operation**

**2. Preparation for Use**

**3. Basic Operation**

**4. Clock Setting**

**5. Result Thresholds**

**6. Sample Measurements and Test Results**

**7. Transferring the Test Results to PC**

**8. Instrument Beeps**

**9. Faults**

**10. Technical Parameters**

---

# ATP bioluminescence detecting system

## 1. Principle of Operation

ATP bioluminescence detector converts invisible ATP concentration to visible light output by bioluminescent chemistry technology, to display a quantitative result of microbial population indirectly. The result is a number from 0 to 9999 in Relative Light Units(RLUs). RLUs are not a kind of tangible unit of light measurement, but they can provide a real method to the ATP bioluminescent test. In this application, 1 RLU is roughly equivalent to 1fmol of ATP.

RLU value is compared with the result threshold set by user to offer an overall result, which is pass🟢, caution⚠️ or failed🔴

In order to ensure that you can get timely and accurate testing result by ATP bioluminescence detecting system, please note the following:

Before you begin, please read this user's manual carefully.

ATP bioluminescence detector should be auxiliarily used with the ATP sampling swab.

## 2. Preparation for Use

Before you begin, please ensure you have read this user's manual carefully and understood the system composition and method of application of this instrument. Please confirm the integrity of the product you bought according to the elements noted in the user's manual.



mainfram



front and back



AA batteries or  
rechargeable  
batteries



Data line



---

## Elements of ATP bioluminescence detecting system

**Liquid Crystal Display:** display test procedure and result

**Unit lid:** kill the light

**Lable:** display the instrument type and serial number

**Battery compartment:** fit two AA batteries

**Up button:** check last test result, and menu selection

**Down button:** check next test result, and menu selection

**Start button:** start test

**Threshold set button:** set threshold

**Time set button:** set time

**Power on/off button:** Power on/off the instrument

**Special function button:** Special function, such as enter delete  
interface

---

Opening the lid reveals the following internal features:

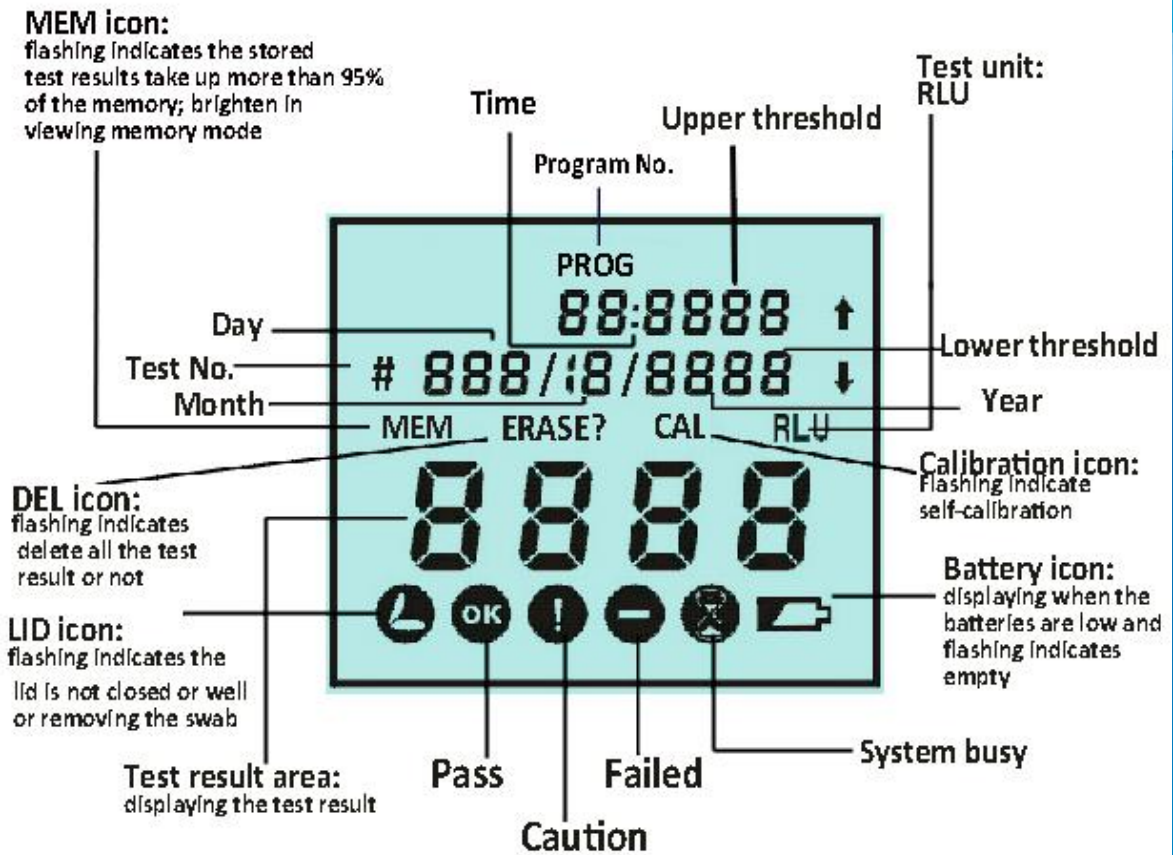


Swab pocket: insert ATP sampling swab

Data interface: transfer the data to PC by data cable.

# Instrument indication

The numbers displayed on the top of LCD indicate measurement and time, and pressing the T button can switch the functions.



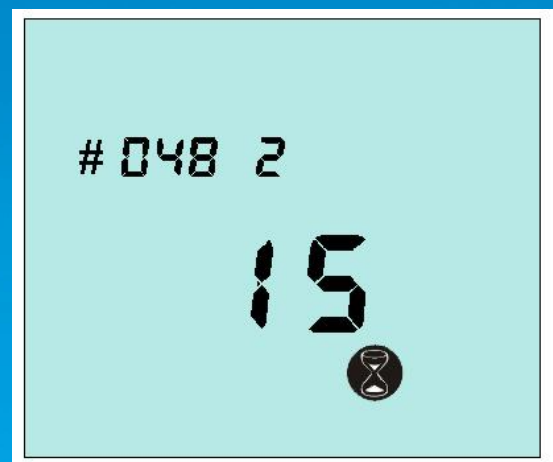
## Saving introduction:



The testing code is a three-digit number from 001 to 999. The number “1” after testing code refers to group one, and “2” refers to group two. For example, “048 2” can be regarded as the 1048<sup>th</sup> sample.

### Fitting the batteries

The instrument is designed to operate from 2 AA batteries. The batteries are fitted by opening the battery compartment cover on the back of the instrument, and inserting two batteries with the positive end towards top of the instrument. After fitting the batteries, the instrument powers on automatically, and enters into clock setting mode. Date and time setting is described in Section 4.



**Caution: be careful not to swap the batteries' poles over,**




---

for this may destroy the electronic system of instrument

**Tip: for better results, please use the batteries with good quality and replace them as soon as they become low.**

## **3. Basic operation**

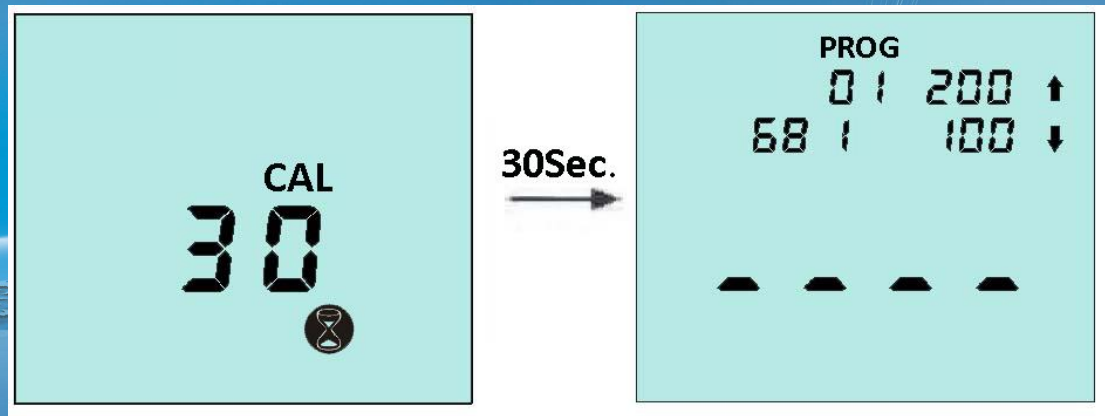
### **3.1 Power on the instrument**


Press the  button, and the instrument will beep once and display the startup picture. Afterwards, the instrument will perform an internal self-calibration check programme for 30 seconds.

**Tip: If the clock is not set, the instrument will enter the time and date set-up mode firstly (see section 4) and then perform its self-calibration when the clock is set.**

### **3.2 Internal self-calibration**

When the instrument is turned on (see section 3.1), it performs an internal self-calibration check, with the display counting down from 30 to 0 seconds:



**Tip:** During self-calibration, there must be no ATP Swab in the instrument and the lid must remain closed. If the  icon is flashing, close the lid.

The instrument will automatically perform the self-calibration routine (the flashing CAL icon) under the following circumstances;

- a) When the instrument is in continuous operation for a prolonged period of time (typically >30 minutes), and
- b) The instrument is used in an environment where the temperature changes significantly (typically >5°C).

If the E1 error code was showed in self-calibration, it means the the temperature is higher than operating temperature range, and it may caused by the reasons as followed:

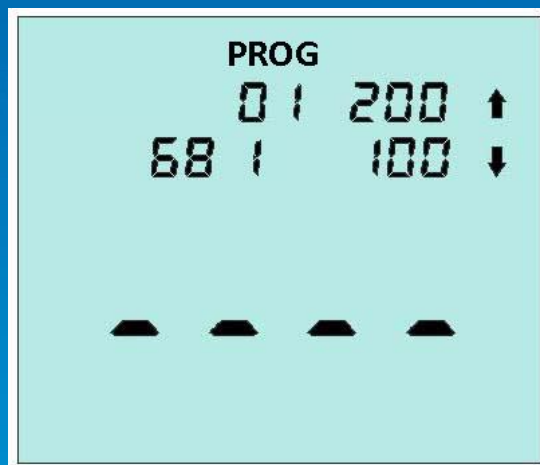
a) the operating temperature is higher than normal range,  
and

b) The instrument is stored at the temperature exceeding  
normal range: to make the instrument adopt to normal  
temperature range, and

c) the instrument is damaged or in fault.

### 3.3 Ready for use:

Once the instrument has successfully performed its  
self-calibration, it is ready to perform a measurement:



The detection procedure is described in Section 6.1

### 3.4 Power off the instrument

Press the  button. The instrument will beep once and the  
display will go blank.

**TIP:** the  button is disabled while the instrument is

performing a measurement.

### 3.5 Power Saving Standby Mode

If the unit is turned on and has stood by for more than 10 min(on operation for more than 10 min), it will automatically enter a power saving standby mode.


To turn the unit back on, please press the  button

### 3.6 Low Battery Indicator

The  icon indicates the state of the batteries

---


Not visible	High
Visible	Low, replace soon
Flashing	Flat, replace now

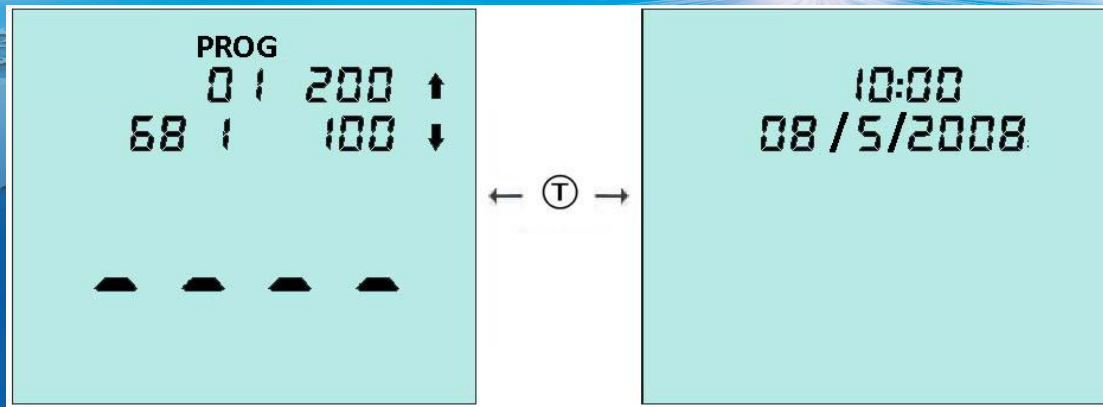
When the batteries are flat, the unit will flash the  icon,beep three times, and then automatically turn off.





**TIP:**if the batteries are too flat, the unit will not power on. Store the instrument in a cool dry place when not in use, as elevated temperatures will shorten the battery life.




## 4. Clock Setting


With the unit turned on and ready for a measurement, press  button to display the current date and time.



To change the time and date, press the  button. Then use the  and  buttons to change the flashing value, and the  button to accept each new value in turn.

**TIP:** press  button at any point will cancel this set-up mode, leaving the time and date unchanged.

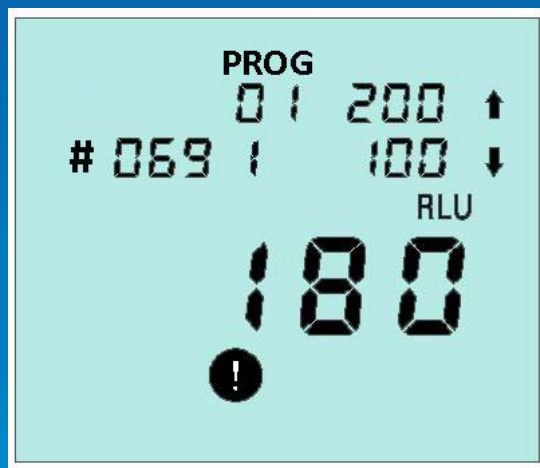
When batteries are fitted firstly or replaced, the instrument powers on automatically, and enters into clock set-up mode. Once the clock is set, the unit will continue with its internal self-calibration.

If the time is set incorrectly, the instrument will beep once and display wrong time after the  button is pressed, and return to clock set-up mode.





## 5. Result Thresholds

The instrument can store up to 100 thresholds (0 to 99), each of which defines a pair of upper and lower thresholds for the measurement result.

Note: the different thresholds indicate specific sanitary requirement of different testing sample. For the details how to choose the thresholds, please contact your local hygiene and epidemic prevention department, or set your own thresholds.











### 5.1 Changing the Thresholds Number


With the instrument turned on and ready for a measurement, the thresholds number can be changed by pressing the  button, and use the  and  buttons to change the flashing thresholds number, then press the  button to accept the new value.

---

**TIP: Pressing the  button again will exit this set-up mode, leaving the thresholds number unchanged.**

## **5.2 Changing the Thresholds Range**

Press the  button, use the  and  buttons to select the required thresholds number, and then press the  button. Afterwards, use the  and  buttons to first change the value of the upper threshold followed by the  button; and then to change the value of the lower threshold followed by the  button to store the new values:

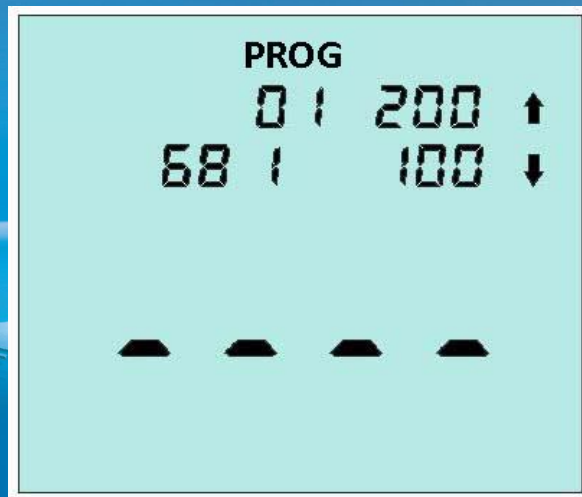
TIP: Pressing the  button at any point will exit this set-up mode, leaving both the thresholds number and thresholds value unchanged.

## **6. Sample Measurements and Test Results**

### **6.1 Sample Measurement**

With the instrument turned on and internal calibration done, the preparation of the new measurement is completed.





the thresholds number, the value of upper and lower threshold and test data number(68 indicates there are 68 test results saving in the instrument)

**TIP: When the stored test results take up more than 95% of the memory, the MEM icon will flash. When the memory is completely full, no more tests can be performed until the memory has been deleted or uploaded to the PC(see to section 6.3 and 7)**

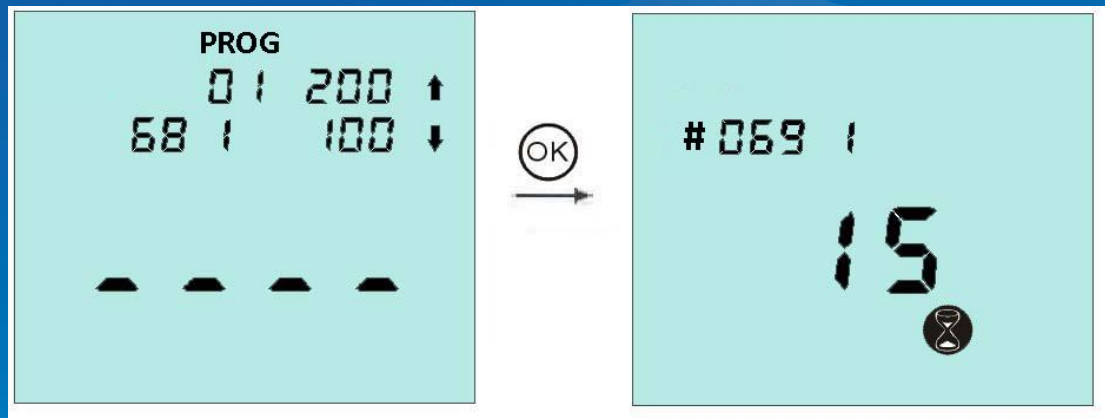
**To perform a sample measurement, follow the steps below:**

- 1.Activate the ATP swab**
- 2.Ensure that the outside of the swab is clean and dry**
- 3.Open the lid, insert the swab into the instrument, and close the lid.**





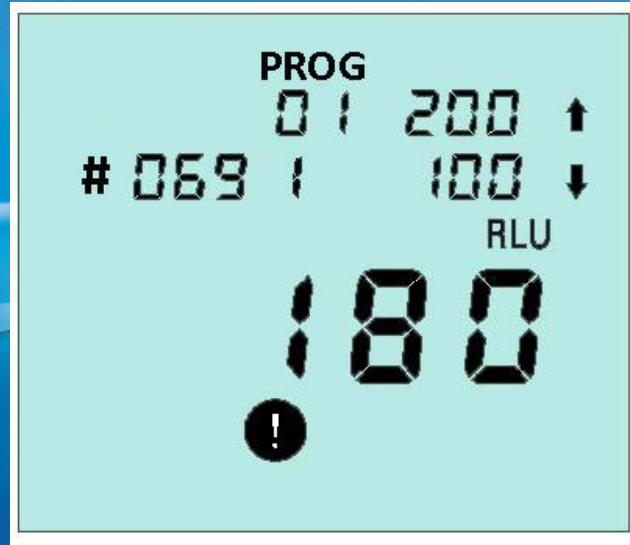
4. Press the  button and wait 15 seconds for the result to be displayed

While the measurement is being performed, the display shows the new test number while the timer counts down from 15 to 0 seconds:






**TIP:** For consistent results, always keep the unit upright and steady while it is performing a measurement to ensure that the liquid in the ATP swab device is at the bottom of the tube.

When the measurement is complete, the new test reading and pass/caution/fail result (see section 5) are displayed. When the  icon flashes, take out the swab, and press the  button, and the instrument will get ready to the next measurement.





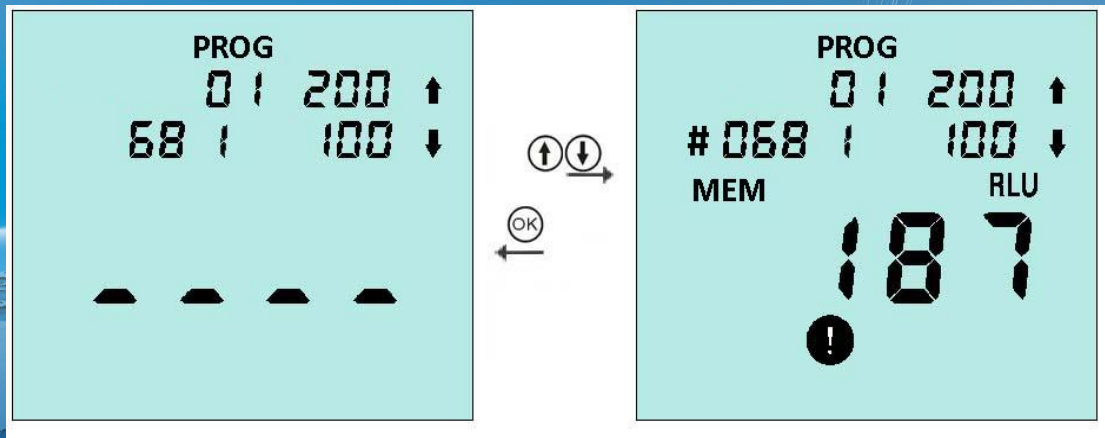
The indication of icons:

- 
- Test result  $\leq$  lower threshold 
  - Test result  $>$  lower threshold  $\leq$  upper threshold 
  - Test result  $>$  upper threshold 
- 

**TIP: After measurement, make sure to remove the swab to prevent the liquid leakage of swab and damage the instrument**

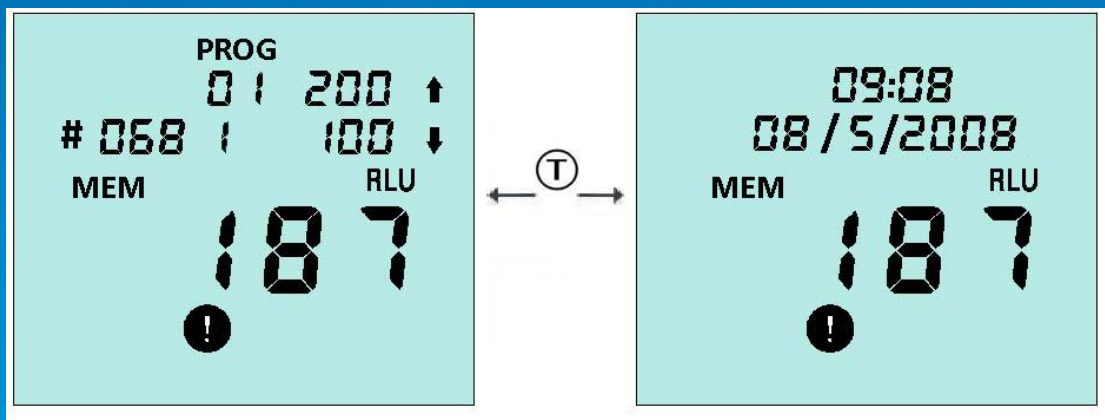
## 6.2 Viewing Stored Test Results

With the unit ready to perform a reading, the previous stored test results can be viewed by pressing the  and  buttons:




The display then shows the latest test result, with the MEM icon lit and the test number flashing. Press the button to scroll backwards through the stored test results and the button to scroll forwards.

Press the button to view the time and date that the test was performed.




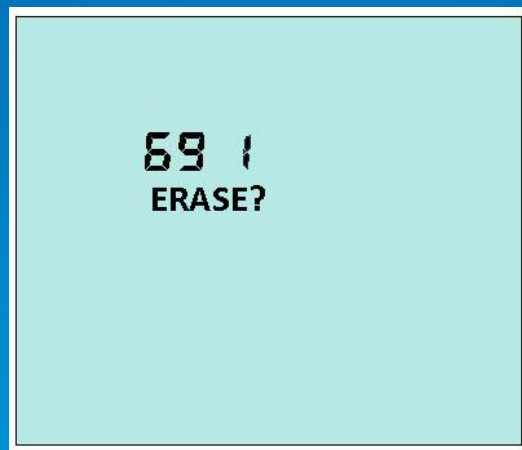
To exit the results review mode, please press the button.

## 6.3 Deleting the Results Memory

The results memory can be completely deleted by entering the results review mode (see section 6.2 above) and then pressing and holding down the  button for more than 2 seconds.

The display then shows the total number of results that will be deleted, with the DELETE? Icon flashing.

The delete function is completed by pressing and holding down the  button for more than 2 seconds, or can be cancelled by pressing any other button.



## 7. Transferring the Test Results to PC

CD-ROM data processing software which is randomly equipped can be used to upload the stored results to PC.

### 7.1 Install transmission procedure software

Insert CD into PC, then install according to installation tips.



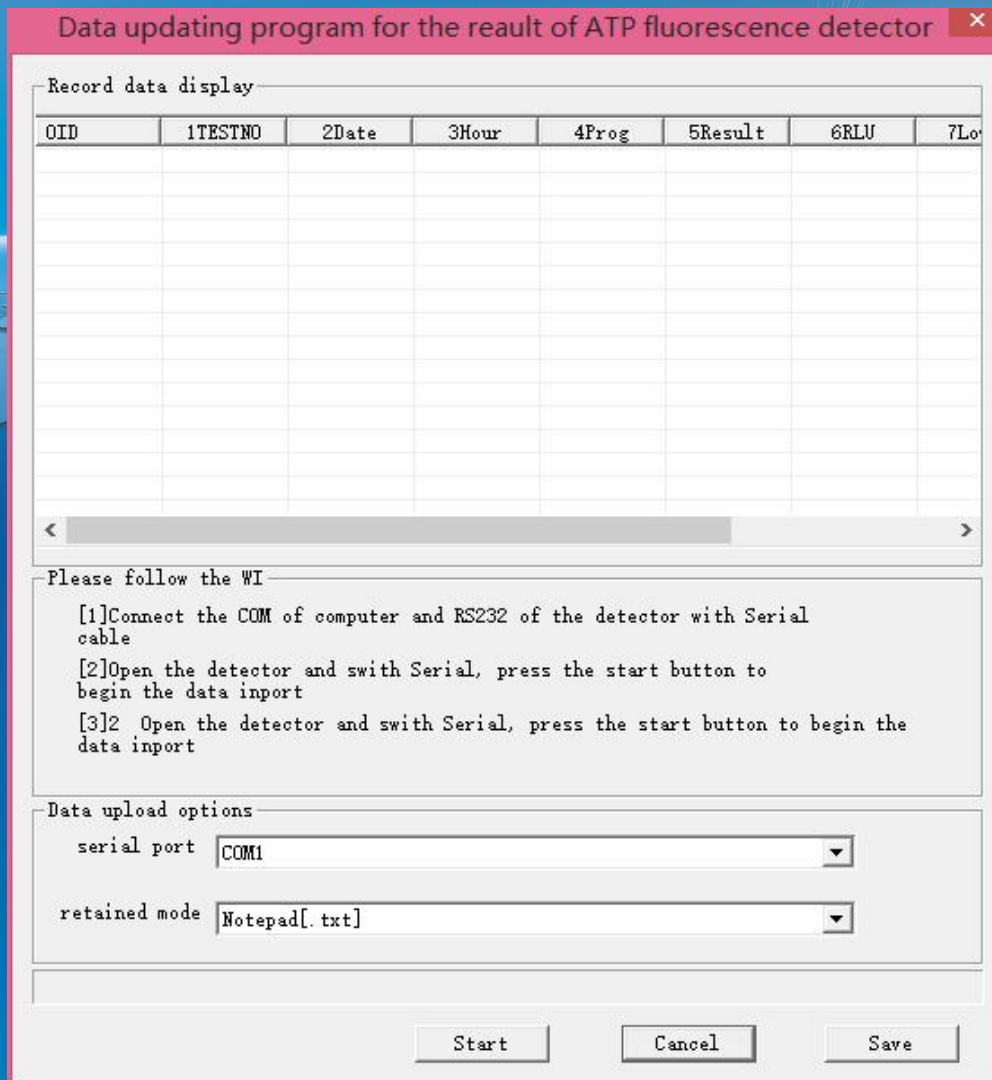
---

Tips: If installation program can not appear automatically,  
please open CD-ROM  
folder from “my computer”, then manually apply for installation.

After installing, please press transmission shortcut key for  
transferring.

## **7.2 Data transmission function**

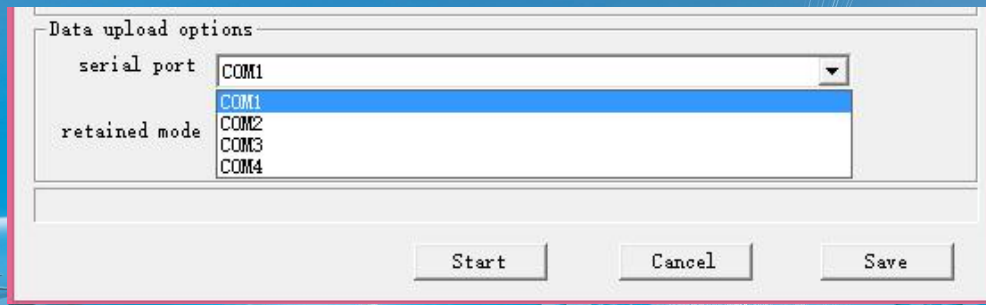
Run transfer function by “start” button, a dialogue box will be  
opened as follows:



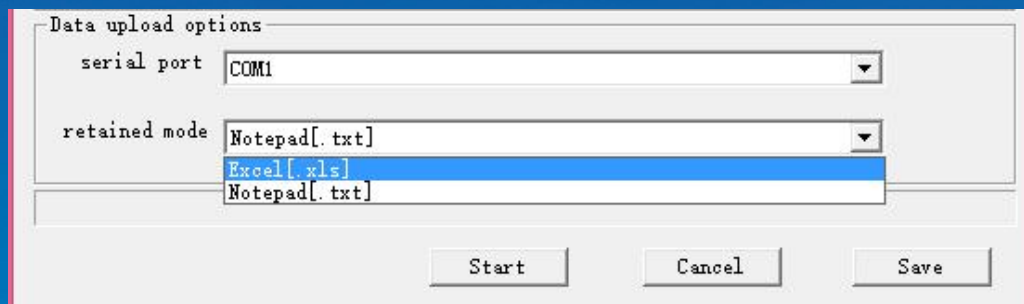
Connect the detector to a USB interface on the ccomputer using USB cable (provided by the unit);

- (1) Connect one joint of cable to USB Mini interface;
- (2) Connect the other joint of cable to USB port on the computer;

Next, choose appropriate connection port from alternative menus:




Then, choose a file store type, an Excel data document or a blank text document:



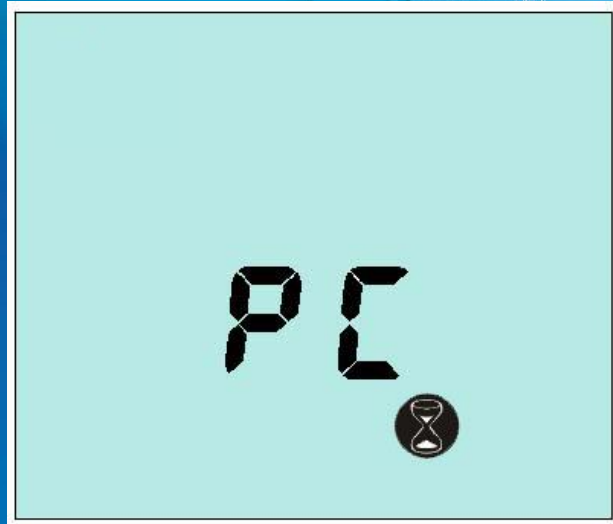
**Tips:** Excel document may be safer, because its data can not be modified, so you must install Microsoft Excel on the same computer, thereby saving the results as Excel form.

The next step is naming the report. The document name must be exclusive, and the used document name can not be reused.

In the end, press “” button to power on the instrument, and then select the start button in PC programme to start the transfer after self-inspection.

---

The apparatus will try to connect with the instrument, if successful, "PC" will be displayed on the LCD of instrument. The results can be transferred to and saved on PC at this moment, and 2000 results can be saved in 1 min.



Warning: Excel is forbidden during the transfer and saving of data, for the possibility of destroying data. After transfer done, take off the data line, and push back the black rubber lid to the in situ, and the unit lid can be closed tightly.

#### 7.4 Document type of data results

The transmissive detection results are saved on Excel document or text document (see chapter 7.2). Document forms are same:



Unit No.	Test ing No.	Date	Time	Limit No	Result	RL U	Low er limit	Upp er limit	Note
0188	1	6/05/07	09: 02	1	Pass	34	100	200	
0188	2	6/05/07	09: 08	1	Pass	46	100	200	
0188	3	6/05/07	09: 12	2	Guard	198	150	400	Secondary cleaning
0188	4	6/05/07	09: 27	2	Pass	87	150	400	
0188	5	6/05/07	16: 22	1	No pass	269	100	200	Focal monitoring
0188	6	6/05/07	16: 24	2	Pass	126	150	400	

The significance of the name of data region is as follows:

Unit No. —Unit serial number(see the labels behind the instrument)

Testing serial number —Testing No.

Date — Date of operation detection

Limit No. —Limit serial number for detection

RLU —RLUs reading detection result

Lower limit —Low (↓) set limit value

Upper limit —Upper (↑) set limit value

Note —Spare area

**If necessary, users can add comments of each result on the spare area.**

## 8. Instrument beeps

During normal use, the unit emits a variety of different beeping sounds:

### Beep type

### Possible causes

Short high-pitched tone

Unit turned on or off  
Sample measurement started  
Connect with PC  
Results memory being deleted

Long high-pitched tone

Unit self-calibration complete  
Sample measurement complete  
Results memory delete complete

Long low-pitched tone

Invalid date entered  
Invalid program threshold limits entered

## 9. Faults

In case of a fault, it is generally caused by battery; if the detector can not be turned on or turned off, or unit turns off unexpectedly, they are mainly caused by power off or loose battery; if there is a detector whose battery is in good condition, but it can not work normally, please contact with manufacturer for solution.

The followings are the typical cases and their possible causes.

- ✓ represent users can solve the problems by themselves
- ✗ represent the problems may be solved by technicians, please contact with manufacturer for solution.

## Cases

Unit turns off unexpectedly

Keypad button has no effect when pressed

Measurement reading always shows zero RLU, or is much lower or high than expected device

USB interface does not appear working condition

## Fault causes

√ Unit not used for more than 10 minutes and automatically turns off into standby mode

- √ Some buttons only work when selecting particular unit functions
- × Keypad or unit damaged or faulty

√ Incorrect use of      √ CariScreen Swab

√ CariScreen Swab devices are out-of- date

- √ Unit being used in an unstable environment turn off unit and then back on again
- √ Protective pocket dirty or severely scratched
- × Unit damaged or faulty

- √ inserted unit is incorrect
- × PC serial interface or system software error
- √ PC software installation error or select error
- × wire or interface damaged
- × Unit damaged or faulty



## 10. Technical Parameters

Detection precision:	$2 \times 10^{-16}$ mol ATP
Lower limit of detection:	$\leq 1.0$ CFU/ml
Detection range:	0~9999 RLU (relative light unit)
Coliforms:	$\geq 1-10^6$ CFU
Detection time:	15s
Detection interference:	$\pm 5\%$ or $\pm 5$ RLU
Background value:	$\leq 2$ RLU
Detection mode:	RLU or coliforms screening
Number of settable limit:	more than 100
Storage size:	more than 2000 detection results
USB interface:	the results can be transferred to PC computer
Instrument dimensions (W×H×D):	192mm×87mm×34mm
Instrument weight (Battery included) :	265 g
Range of operating temperature:	5°C—40°C
Relative humidity range:	20-85%
Battery:	AA battery
Resting state (20°C) :	6 months



## Remark:Limited value

After cleaning to the standards required for normal operation, the surface is inspected and the results recorded. The same wiping technique should be used for testing, and five different times should be selected for testing at the same location. This shows the standards that can be achieved after regular cleaning.

1. The limit values of the key points are as follows:

key point		the first time	the second time	The third time	The forth time	The fifth time
1	Pollution	524	857	489	763	615
2	clean	10	15	8	19	10
3	Strict clean	4	3	0	2	1

After the reference data of the key points is collected, the following operations can be used to obtain the RLU standards for the passing, warning, and failure of the routine inspection work:

1. By calculating the RLU average for cleaning or rigorous cleaning, this value is your standard limit.

12

For example: Clean =  $(10 + 15 + 8 + 19 + 10) / 5 = 12.4 \approx$

2. It is obtained by multiplying the pass value by 2 by the limit value.

For example: not passed =  $12.4 \times 2 = 24.8 \approx 25$

3. Alert The limit value is between passing and not passing the limit value. Some users choose not to set a warning value, while others set the non-limit value to be higher than the limit value.

Example of setting a warning value: Pass standard = 12

Caution Standard = 13 to 25

Fail standard (===26)

Third, the recommended limit value setting

When the instrument is first used, we have a set of recommended universal limits. These limit values are determined according to GB/T4789.2-2003 "Food Hygiene Microbiological Test - Total Number of Colonies", which is determined by SAS statistical software analysis to determine the total number of colonies and the regression equation of the ATP instrument for detecting RLU values.

## 2. Reference limit

ATP	Reference limit		
	Pass	the warning	not pass
RLU	<15	15—29	>30

## Deli counter

	Material	pass	fail
Weighing apparatus	stainless steel	8	30
Packaging material - cheese	stainless steel	8	30
Cutter - meat	stainless steel	8	30
Cutter-cheese	stainless steel	8	30
Preparation table	stainless steel	8	30
Auxiliary tools such as pliers	stainless steel	8	30



### Salad counter

	material	pass	fail
Chopping board	plastic	15	30
Preparation table	stainless steel	15	30
Salad bowl	plastic	15	30

### Barbecue product counter

	material	pass	Fail
Chicken fork	stainless steel	15	30
Preparation table	stainless steel	15	30
Service area	-	15	30
oven	stainless steel	15	30



### Restaurant

	material	pass	fall
Chopping board	plastic	15	30
Preparation table	stainless steel	15	30
Working surface	stainless steel	15	30
Auxiliary tools, such as a ladle	stainless steel	15	30

### Sandwich preparation area

	material	pass	fall
Knife	stainless steel	15	30
Working surface	stainless steel	15	30
Preparation board	plastic	15	30

### Raw meat area - meat products

	material	pass	Fail
Knife	stainless steel	15	30
Mincer	stainless steel	15	30
Working surface	stainless steel	15	30
Weighing apparatus	stainless steel	15	30

### Fish

	material	Pass	Fail
Chopping board	plastic	30	100
Preparation table	stainless steel	15	30
Knife	stainless steel	15	30

## Pizza

	material	Pass	Fail
Spice pot	stainless steel	15	30
Working surface	stainless steel	15	30
Preparation table	-	15	30