Product Name	GAOTek Portable Detection Handheld Tester
Product SKU	GAOTek-OET-140
Product URL	https://gaotek.com/product/gaotek-portable-detection-handheld-tester/

Contact us: sales@gaotek.com

Contents

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 auxiliary used with the ATP sampling swab.

2. Technical Parameters

Detection precision	2X10-16mol ATP
Lower limit of detection	≤1.0 CFU/ml
Detection range	0~9999 RLU （relative light unit）
Coliforms	≥1-106CFU
Detection time	15s
Detection interference	±5％or ±5 RLUs
Background value	≤2RLU
Detection mode	RLU or coliforms screening
Number of settable limits	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℃－40℃
Relative humidity range	20-85％
Battery	AA battery
Resting state （20℃）	6 months

3. Preparation for Use

3.1 Packing list

- 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.

ATP machine

Leather case

AA battery x 2pcs
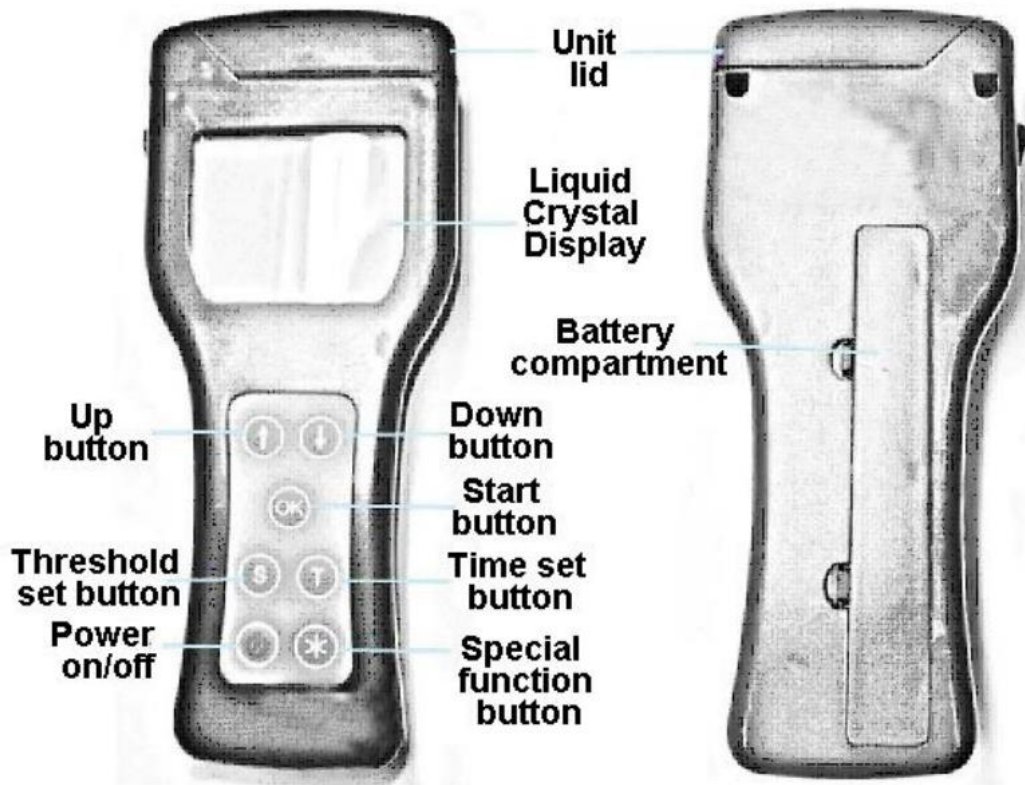

生物荧光检测仪

U Disk

Data line

ATP fluorescence detector
KSA-01
User Manual

User manual

3.2 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
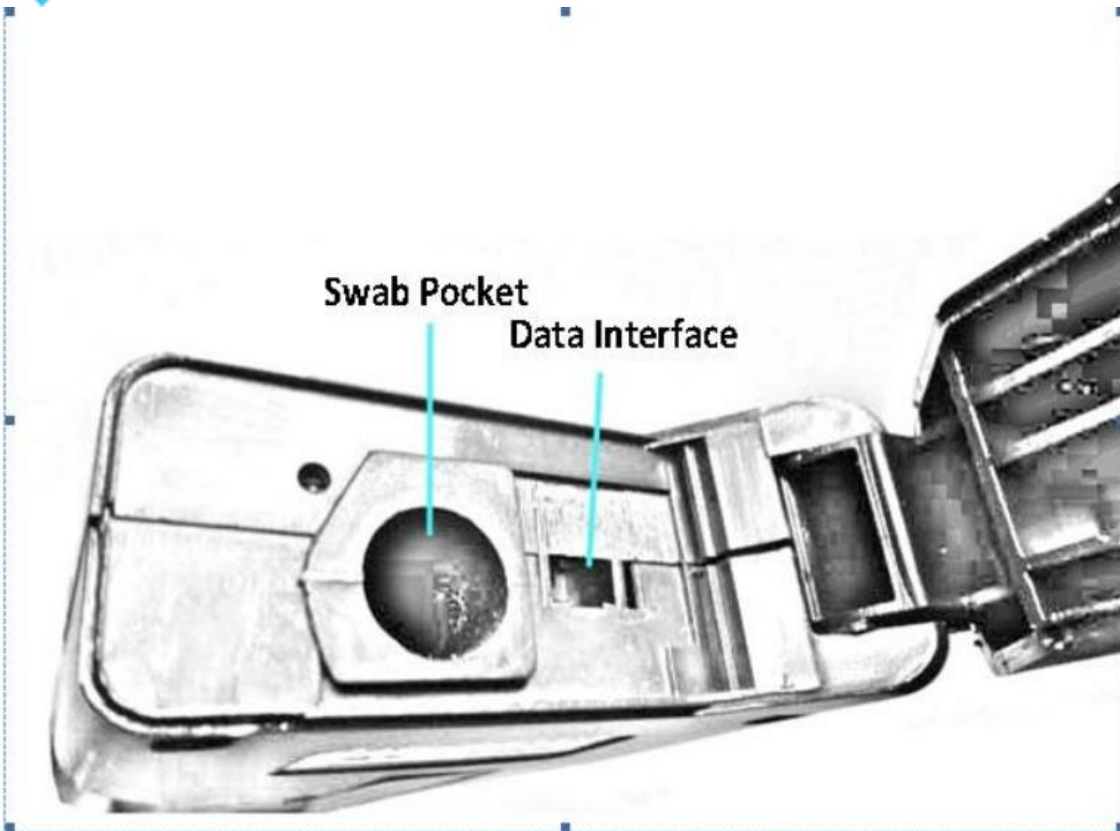
Start button: Start test

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

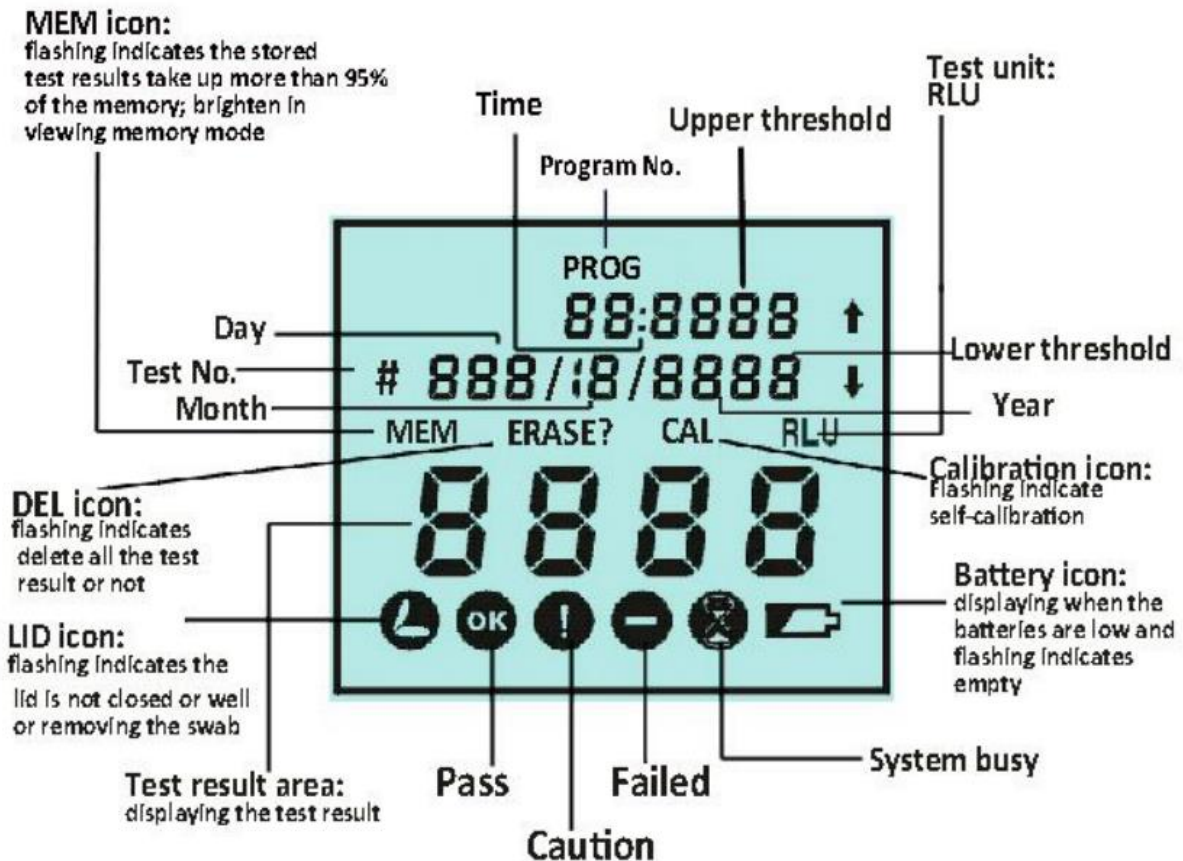Opening the lid reveals the following internal features:

Swab pocket: insert ATP sampling swab

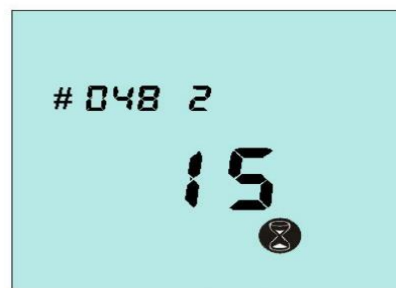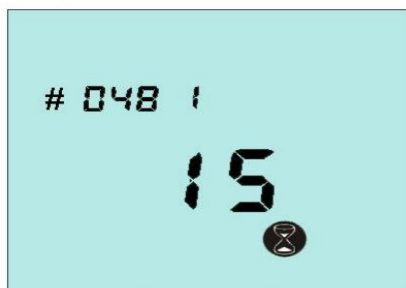**Data interface**: transfer the data to PC by data cable.

3.3 Instrument indication

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

MEM icon:
flashing indicates the stored test results take up more than 95% of the memory; brighten in viewing memory mode

Test unit: RLU

Time

Upper threshold

Program No.

PROG

88:8888 ↑

Day

Test No.

Month

888/18/8888 ↓

Lower threshold

Year

MEM   ERASE?   CAL   RLU

Calibration icon:
Flashing indicate self-calibration

DEL icon:
flashing indicates delete all the test result or not

8888

Battery icon:
displaying when the batteries are low and flashing indicates empty

LID icon:
flashing indicates the lid is not closed or well or removing the swab

🕐 OK ❗ ➖ ⌛ 🔋

System busy

Test result area:
displaying the test result

Pass

Failed

Caution

Saving introduction:

048 1   # 048 2

15   15
⌛   ⌛

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 1048th sample.

3.4 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.

4. Basic operation
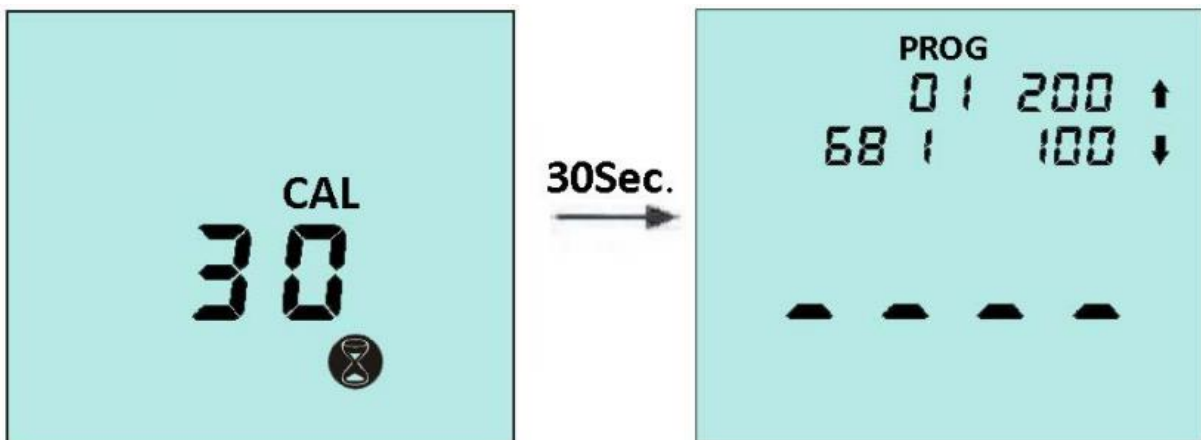
4.1 Power on the instrument

Press the ꓮ ⏻ 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.

4.2 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 temperature is higher than operating temperature range, and it may cause 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.

4.3 Ready for use :

Once the instrument has successfully performed its self-calibration, it is ready to perform a measurement:
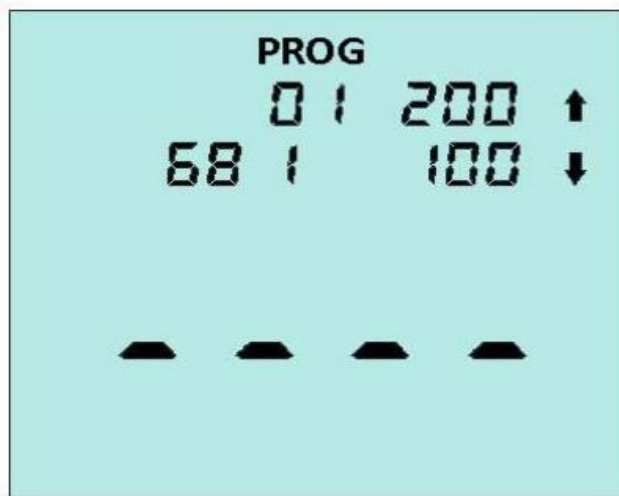
The detection procedure is described in Section 6.1

4.4 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.

4.5 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.

4.6 Low Battery Indicator

The 🔋 icon indicates the state of the batteries

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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.

5. Clock Setting

With the unit turned on and ready for a measurement, press button to display the current date and time.
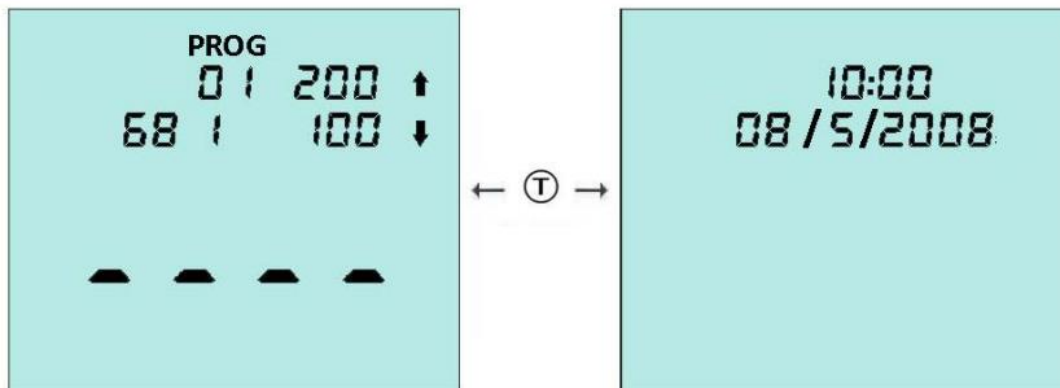
To change the time and date, press the ✳ button. Then use the ⬆ and ⬇ buttons to change the flashing value, and the ⓞⓚ button to accept each new value in turn.

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.

6. 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.

6.1 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.

6.2 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**.

7. Sample Measurements and Test Results

7.1 Sample Measurement

With the instrument turned on and internal calibration done, the preparation of the new measurement is compelled.
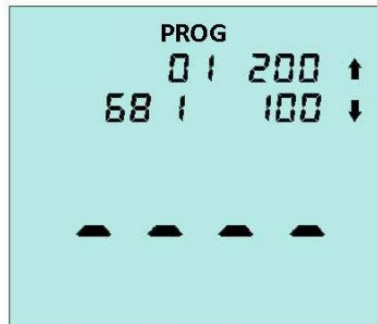
the thresholds number, the value of upper and lower threshold and test data number (68 indicates there are 68 test results saving in the instrument)

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 7.3 and 8)

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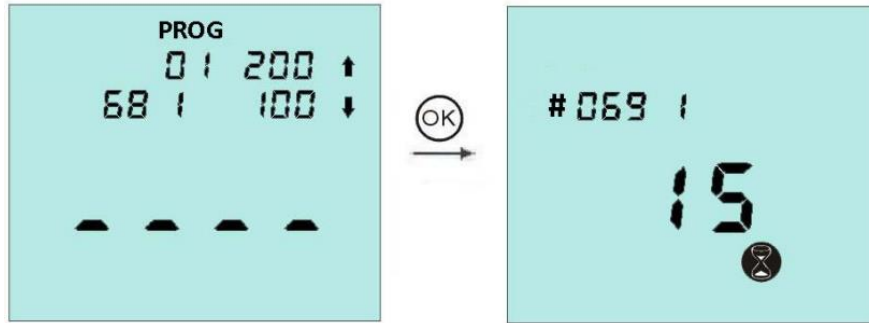
TIP: For consistent results, always keep the unit upright and steady while it is performing a measurement to ensure that the liquid in the ATP swab device is at the bottom of the tube.

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≤ lower threshold

Test result＞lower threshold ≤ 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

7.2 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:
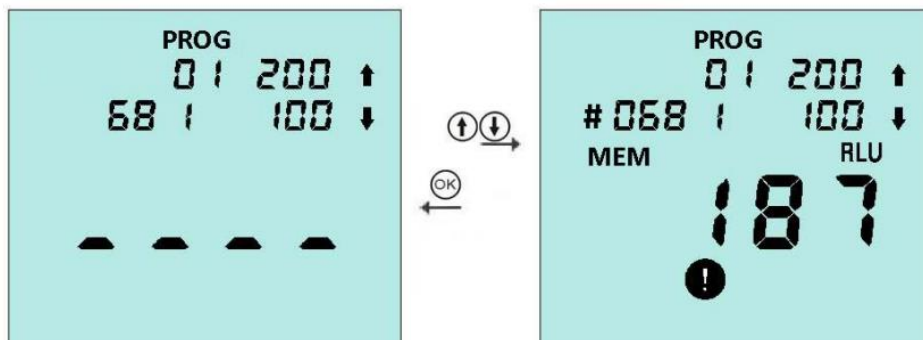
The display then shows the latest test result, with the MEM icon lit and the test number flashing. Press the button ⊕ to scroll backwards through the stored test results and the ⊕ button to scroll forwards.

Press the Ⓣ button to view the time and date that the test was performed.
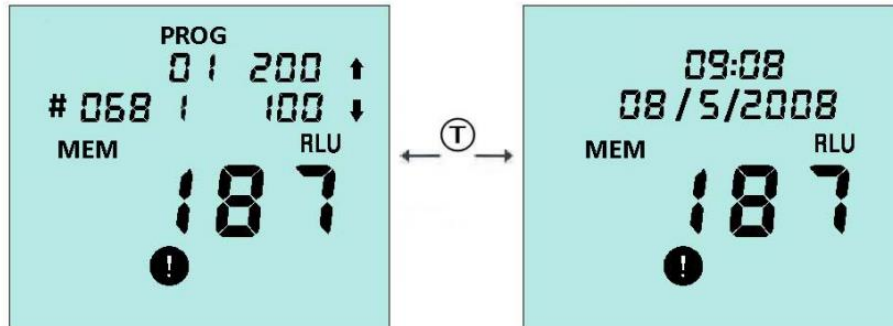
To exit the results, review mode, please press the ⓞⓚ button.

7.3 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 cancelled by pressing any other button.
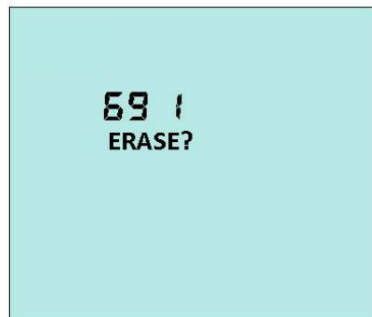
8. Transferring the Test Results to PC

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

8.1 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.

8.2 Data transmission function

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

Data updating program for the reault of ATP fluorescence detector ✕

Record data display

OID	1TESTNO	2Date	3Hour	4Prog	5Result	6RLU	7Lo

Please follow the WI

[1]Connect the COM of computer and RS232 of the detector with Serial cable

[2]Open the detector and swith Serial, press the start button to begin the data inport

[3]2 Open the detector and swith Serial, press the start button to begin the data inport

Data upload options

serial port `COM1` ▼

retained mode `Notepad[.txt]` ▼

Start   Cancel   Save

Connect the detector to a USB interface on the computer 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:
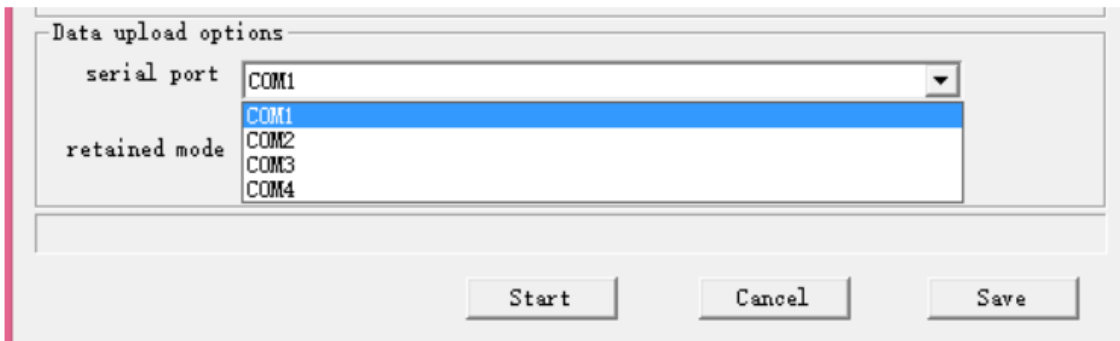
Then, choose a file store type, an Excel data document or a blank text document:
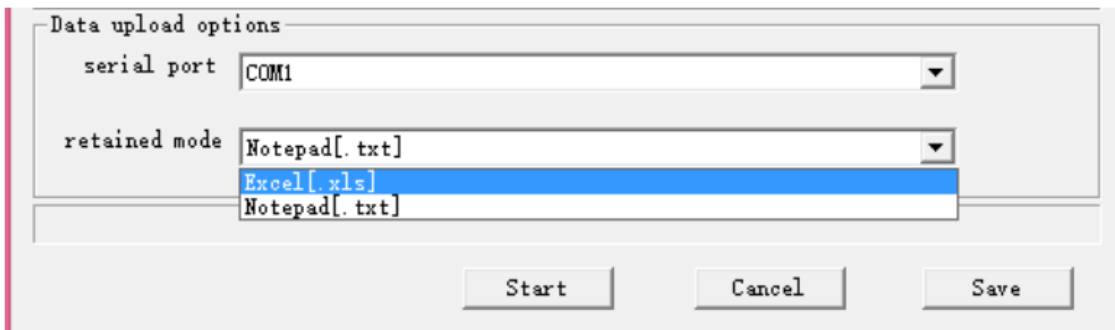
Tips: Excel document may be safer, because its data cannot be modified, so you must install Microsoft Excel on the same computer, thereby saving the results as Excel form.

The next step is naming the report. The document name must be exclusive, and the used document name cannot 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" 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.

8.3 Document type of data results

The transmissive detection results are saved on Excel document or text document (see chapter 8.2). Document forms are same:

Unit No.	Testing No.	Date	Time	Limit No.	Result	RLU	Lower limit	Upper 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

9. 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

10. Faults

In case of a fault, it is generally caused by battery; if the detector cannot 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 cannot 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	Fault causes
Unit turns off unexpectedly	√ Unit not used for more than 10 minutes and automatically turns off into standby mode
Keypad button has no effect when Pressed	√ Some buttons only work when selecting particular unit functions × Keypad or unit damaged or faulty
Measurement reading always shows zero RLU, or is much lower or high than expected	√ Incorrect use of CariScreen Swab device √ 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
USB interface does not appear working condition	√ 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

GAO Group

GAORFID.com

GAOTek.com

Toll Free (USA & Canada)

1-877-585-9555

All Other Areas +1 (289) 660-5590

sales@gaotek.com