anitoa

Ultra-Portable Real-Time Fluorescence Quantitative PCR Instrument

Maverick qPCR

Instruction Manual

Version（V2.1）

The instruction manual must be properly placed in the product box during shipment. The user is required to keep this manual in a safe place so that it can be consulted when needed.

All rights reserved. All information contained in this manual is subject to change without notice.

Manufacturer: Anitoa Biotechnology (Hangzhou) Co., Ltd.

Address: China-Australia Biomedical Industry Science and Technology Park, No.656 Binan Road, Binjiang District, Hangzhou, Zhejiang, China

Thank you for choosing our products. Please read this instruction manual carefully before use.

Anitoa warrants that the MQ4 Fluorescence PCR instrument you are using has been fully tested and meets the requirements of the instructions for use. The instructions and safety warnings given in this instruction manual must be followed in order to use the instrument, otherwise the warranty does not apply.

Software Description：

The software is a necessary tool for the operation of the instrument and Anitoa has the right to modify its functions or design, etc., in order to improve its operational performance and reliability, without prior or subsequent notification to the customer, and Anitoa has all the intellectual property rights for the modified version.

Responsibility Statement：

Anitoa is not responsible for direct or indirect incidental damages arising from non-compliance with the operating instructions or incorrect use of the MQ4 Real Time Fluorescence PCR instrument. Anitoa's responsibility is limited to the repair of the machine and the replacement of parts, and is not responsible for the results of the experiments.

Intellectual Property Statement:

The copyright for this manual and other proprietary information provided is owned by Anitoa. The information in this instruction manual may only be used for installation, training and service purposes as originally intended. Anitoa holds the copyright to the software referred to in this manual and grants the customer the right to use the software.

CONTENTS

Chapter 1 Important Notes **1**
1.1 Instrument Grounding 1
1.2 Placement of the Instrument 1
1.3 Operation Note 2
1.4 After-Sales Service 2
1.5 Packaging, Storage and Transportation Marking 3
1.6 Instrument Identification Information 4
1.7 FCC Statement 5
Chapter 2 Product Overview **6**
2.1 Product Usage 6
2.2 Product Features 6
2.3 Specification Model Description 7
2.4 Instrument Models 7
2.5 Main Technical Parameters 7
2.6 WIFI and BT 8
Chapter 3 Instrument Installation **11**
3.1 Environmental Conditions 11
3.2 Unpacking 11
3.3 Comparison of packing list 11
3.4 Power Cord Connection 12
3.5 Instrument Usage 12
Chapter 4 Software Operation Guide **14**
4.1 Launch Software 14
4.2 Experimental Setup 15
4.3 Save Template 17
4.4 Running Experiments 18
4.5 Experimental analysis 18
4.6 Data Export 21
Chapter 5 Instrument Maintenance **25**
5.1 Instrument Cleaning 25
5.2 Instrument Protection 25
5.3 Waste Disposal 25
5.4 Overheat Protection 25
5.5 Operation Requirements 26
Chapter 6 FAQ **27**

Chapter 1 Important Notes

The following basic safety measures must be observed during all phases of operation, maintenance and repair of this instrument. Failure to observe these measures or the warnings and precautions indicated in this manual will likely affect the basic protection provided by the instrument. It will also undermine the safety standards for which the instrument was designed and manufactured, as well as the intended scope of use of the instrument.

1.1 Instrument Grounding

To ensure the personal safety of the operator, please use the manufacturer's power adapter with a 10A three-prong grounded plug at the input. Use a ground socket matching the plug to ensure that the input power cable of the instrument is reliably grounded.

1) Use of power supply

Before the instrument adapter is connected to the power cord, you must ensure that the voltage (100 to 240 VAC, 50/60Hz, 5A) and frequency of the AC power supply are consistent with those required by the instrument adapter. When making the power cord connection, you must ensure that the instrument power switch is off. Do not touch the power switch and power cord with wet hands. It is prohibited to disconnect the power cord when the instrument is not powered off. It is forbidden to touch the power cord to the hot surface of the instrument. Do not clean the instrument when it is not disconnected. Please turn off the power when the instrument is no longer in use.

2) Power cord

The instrument should normally use the power cord supplied with it. If the power cord is broken, it must be replaced without repair. When replacing the power cord, it must be replaced with a power cord of the same type and size. When using this instrument, do not press anything on the power cord and do not place the power cord in a place where people move around.

3) Power cord plugging and unplugging

Power cord plugging and unplugging must be the correct handheld plug operating parts, plug insertion should ensure that the plug is completely, tightly inserted into the socket, pull out the plug do not hard pull, yank the power cord.

1.2 Placement of the Instrument

1) The instrument should not be placed in a location where it is difficult to cut off the power.

2) The instrument uses semiconductor cooling and fan-assisted heat dissipation, so when placing the instrument, ensure that there are no obstacles within 15 cm of the instrument.
3) The instrument should be placed in a place with low humidity, less dust and far from water sources (such as pools, water pipes, etc.), with good ventilation, no corrosive gases or strong magnetic fields, and avoid direct sunlight and strong light sources. Do not place the instrument in a humid or dusty place. The bench where the instrument is placed should be horizontal and stable.
4) High ambient temperature may affect the performance of the instrument or cause malfunction. Do not use the instrument in direct sunlight and strong light source, so as not to affect the fluorescence detection of the instrument, and should be far away from the heating, stove and all other heat sources.
5) Turn off the power when you stop working, and when you don't use the instrument for a long time, cut off the power, unplug it, and cover it with soft cloth or plastic film to prevent dust and foreign matter from entering.

1.3 Operation Note

1) During the test operation, avoid liquid dripping on the instrument.
2) The consumables and reagents used in the test should be disposed of according to the relevant standards, and should not be discarded or dumped at will.
3) If there are hazardous substances in the test, they should be operated only after relevant training before use.
4) After use, the hazardous substances should be properly handled and stored in strict accordance with the instructions for their use.
5) The test personnel who operate the instrument need to be trained and have relevant qualifications
6) When handling toxic, corrosive or infectious substances, safety goggles and gloves must be worn.
7) When the instrument is running and just after a period of operation, it is strictly prohibited to touch the metal module to avoid burns.
8) It is strictly forbidden to open the instrument during the operation of the machine, otherwise it will cause permanent damage to the instrument.

1.4 After-Sales Service

1) After receiving the instrument, please confirm the relevant content on the after-sales warranty card and contact the shipping unit if you have any questions.
2) After unpacking the instrument, please keep the packing box and packing materials properly for use in maintenance.
3) Before the instrument is sent to the maintenance department, the instrument must be disinfected.
4) After the instrument is delivered to the maintenance department and unpacked, the maintenance personnel must disinfect the instrument immediately.

1.5 Packaging, Storage and Transportation Marking

Table 1.5 Package storage and transportation identification

Symbol	Title	Description	Position
	Place carefully and gently	This symbol is used to indicate that the product is a precision instrument and should be handled carefully and gently.	On the packing carton
	Upward	This symbol is used to indicate that the instrument must be kept upward during handling, storage and use, and must not be placed sideways or upside down to avoid damage to the instrument.	On the packing carton
	Afraid of getting wet	This symbol is used to indicate that the instrument must not be stored in a humid environment or in a place where it will be splashed with liquid.	On the packing carton
	Stacking 5 layers	This symbol is used to indicate the maximum number of layers of vertical stacking overlap allowed for a box.	On the packing carton
	Anti-bumping	This symbol is used to indicate that the instrument should be handled, stored and used with care to avoid any impact on the performance of the instrument.	On the packing carton

1.6 Instrument Identification Information

Table 1.6 Instrument identification information

Symbol	Description	The location on the instrument where the symbol will appear
	Watch out for high temperatures	On the equipment
	Production date	On the equipment nameplate
	CE mark	On the equipment nameplate
	Pay attention to safety	On the equipment nameplate
IVD	In vitro diagnostic medical devices	On the equipment nameplate
	E-waste classification	On the equipment nameplate
REF	Product number	On the equipment nameplate
SN	Serial number	On the equipment nameplate
	Instruction manual	On the equipment nameplate
	Biological hazards	On the equipment nameplate

1.7 FCC Statement

This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Important Note:

Radiation Exposure Statement

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator and your body.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Chapter 2 Product Overview

This chapter mainly describes the usage, characteristics, specifications and performance parameters of MQ4 fluorescence quantitative PCR instrument.

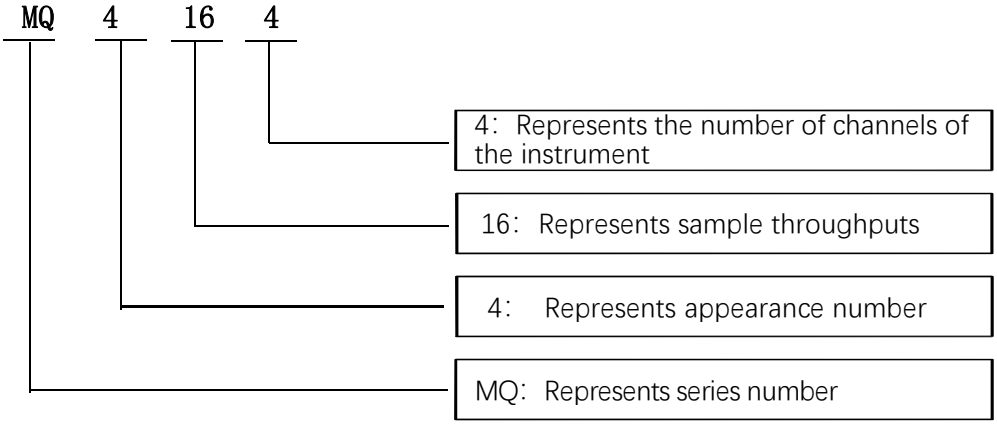
2.1 Product Usage

The MQ4 model is an ultra-portable qPCR instrument with a large 10″ touch screen for integrated operation. The product is developed based on our multi-channel fluorescence imaging optical system with CMOS bio-image sensor. The product can be widely used in universities and research institutes, CDC, Entry-Exit Inspection and Quarantine Bureau, Public Security Criminal Evidence Identification Center, veterinary stations, food companies and pharmaceutical companies.

2.2 Product Features

1) Efficient and fast: the use of ultra-fast temperature rise and fall system and unique chip technology, no specific supplies to achieve 30 min fast test.
2) Touch operation: large 10-inch LCD touch screen, integrated touch operation, no external computer, simple and convenient.
3) Lightweight and portable: the machine is small and portable (247 * 188 * 133 mm), weighing only 2.6 kg, easy to move, especially for the laboratory testing space limited places.
4) Stable and reliable: The whole machine has no moving parts, and the structure is sturdy and durable, so there is no need for regular calibration even after long time use.
5) Intelligent management: optional 4G module allows remote management or cloud management of experimental data as needed.
6) Multiple options: Support 2/4 fluorescence channels (more channels can be customized), suitable for most of current dyes, no cross interference between channels, no need for regular calibration maintenance.
7) Stable light source: independent LED light source for each fluorescence channel, stable and non-decaying LED light source, no need for regular replacement.
8) High sensitivity chip: unique "Ultra-Low-Light CMOS Image Sensor (CIS) Chips", millisecond speed shooting without row-by-row scanning, stable and reliable data. Highly integrated IC chip technology makes the instrument structure simple, stable and reliable, all digital circuitry anti-interference.

2.3 Specification Model Description



2.4 Instrument Models

Table 2.4 Instrument models

Model	Channel	Sample throughput
MQ4044	4 channels	4 wells
MQ4162	2 channels	16 wells
MQ4164	4 channels	16 wells

2.5 Main Technical Parameters

Table 2.5 Main technical parameters

Basic Performance	
Dimension	247*188*133mm
Bare Weight	2.6 kg
Power	DC 15V 9.6A
Noise Level	≤50dB
Communication Interface	TypeA
PCR System Performance	
Sample Volume	10 ~ 50ul
Applicable Consumables	Transparent 0.2ml single tube, 8*0.2ml row tube
Temperature Accuracy	≤ 0.5℃
Detection Repeatability	Ct CV≤ 2%

Fluorescence Detection System Performance		
Light Source	High Brightness LED	
Detector	Ultra-Low-Light CMOS Image Sensor (CIS) Chips	
Excitation Wavelength	F1: 470nm F3: 571nm	F2: 523nm F4: 624nm
Detection Wavelength	F1: 527nm F3: 612nm	F2: 564nm F4: 694nm

2.6 WIFI and BT

The XY8788 module provides a shared antenna interface ANT_WIFI/BT for WIFI and BT with an impedance of 50Ω . Customers can connect external PCB antenna, suction cup antenna or ceramic antenna through this interface to realize WIFI and BT functions.

2.6.1 WIFI overview

XY8788 module supports 2.4G/5G dual-band WLAN wireless communication, supports 802.11a, 802.11b, 802.11g, 802.11n and 802.11ac and other standards, the highest rate can reach 150Mbps. Its characteristics are as follows:

- Support Wake-on-WLAN (WoWLAN)
- Support ad hoc mode
- Support WAPI SMS4 hardware encryption
- Support AP (HotSpot 2.0) mode
- Support Wi-Fi Direct
- Support HT20 MCS7 and VHT80 MCS9

2.6.2 WIFI performance indicators

The following table lists the transmit and receive performance of XY8788 WIFI

Table 24: Transmission performance of WIFI

	standard	rate	Output Power
2.4G Hz	802.11b	1Mbps	17±2dBm
	802.11b	11Mbps	16±2dBm
	802.11g	6Mbps	15±2dBm
	802.11g	54Mbps	15±2dBm
	802.11n HT20	MCS0	14±2dBm
	802.11n HT20	MCS7	13±2dBm
	802.11n HT40	MCS0	10±2dBm
	802.11n HT40	MCS7	10±2dBm
5GHz	802.11a	6Mbps	10±2dBm
	802.11a	54Mbps	10±2dBm
	802.11n HT20	MCS0	10±2dBm
	802.11n HT20	MCS7	10±2dBm
	802.11n HT40	MCS0	10±2dBm
	802.11n HT40	MCS7	10±2dBm

Table 25: Receive performance of WIFI

	standard	rate	Sensitivity
2.4G Hz	802.11b	1Mbps	-87dBm
	802.11b	11Mbps	-87dBm
	802.11g	6Mbps	-91dBm
	802.11g	54Mbps	-76dBm
	802.11n HT20	MCS0	-90dBm
	802.11n HT20	MCS7	-73dBm
	802.11n HT40	MCS0	-87dBm
	802.11n HT40	MCS7	-68dBm
5GHz	802.11a	6Mbps	-90dbm
	802.11a	54Mbps	-74dbm
	802.11n HT20	MCS0	-88dbm
	802.11n HT20	MCS7	-69dbm
	802.11n HT40	MCS0	-86dbm
	802.11n HT40	MCS7	-66dbm

New-Mob Technology Co.,Ltd

Reference Specification

serial number	document number
1	IEEE 802.11n WLAN MAC and PHY, October 2009 + IEEE 802.11-2007 WLAN MAC and PHY PHY, June 2007
2	IEEE Std 802.11b, IEEE Std 802.11d, IEEE Std 802.11e, IEEE Std 802.11g, IEEE Std 802.11i: IEEE 802.11-2007 WLAN MAC and PHY, June 2007

2.6.3 BT overview

XY8788 module supports BT v2.1+EDR, 3.0+HS, v4.1+HS, V4.2 . The modulation mode supports GFSK, 8PSK, π/4QPSK.

- Supports up to 7 wireless connections.
- Up to 3.5 PICONET piconets are supported simultaneously.
- Support 1 -way SCO or eSCO connection(Synchronous Connection Oriented).

The first channel starts at 2402 MHz with one channel every 1 MHz to 2480 MHz. BT 4.0 channel width is 2 MHz spacing,

Holds 40 channels

Table 26: BT rate and version information

Version	data rate	Maximum application throughput	Remark
1.2	1Mbit/s	>80 Kbit/s	
2.0+EDR	3Mbit/s	>80 Kbit/s	
3.0+HS	24 Mbit/s	Please refer to 3.0+HS	
4.0	24 Mbit/s	Please refer to 4.0 LE	

Reference Specification

serial number	document number
1	Bluetooth Radio Frequency TSS and TP Specification 1.2/2.0/2.0 + EDR/2.1/2.1+EDR/3.0/3.0 + HS, August 6, 2009
2	Bluetooth Low 能源 RF PHY Test Specification, RF-PHY.TS/4.0.0, December 15, 2009

Chapter 3 Instrument Installation

This chapter describes the use and storage conditions of the MQ4 ultra-portable quantitative fluorescence PCR instrument, its construction, removal of the fixture, installation/uninstallation of the software, and preparation for power-up.

3.1 Environmental Conditions

1) Transportation and storage conditions of the instruments
   a. Environmental temperature: －20℃～55℃ ;
   b. Relative humidity: ≤85%
2) Working conditions requirements
   a. Environmental temperature: 15℃~35℃
   b. Environmental humidity: ≤85%
   c. Input voltage: DC 15V 9.6A

3.2 Unpacking

1) The outer packaging of the product is a cardboard box, filled with shock-absorbing foam inside, after unpacking, first check whether the items you receive are missing and damaged.

2) If the outer packaging of the product is obviously damaged during transportation, please do not use it and contact the seller in time.

3) Check the supplied accessories against the packing list (in the instruction manual) to see if they are complete.

4) If the instrument or accessories have been damaged or lost in transit, please inform the shipping company personnel and our customer service personnel.

3.3 Comparison of packing list

After opening the box, please check and accept the items in the box according to the packing list items, if you find that the items are damaged or missing, please contact the supplier immediately.

Table 3.4 Packing list

Annexes	Quantity
Fluorescence Quantitative PCR Instrument	1
Power Cord	1

Power Adapter	1
USB Cable	1
Instruction Manual	1
Factory Inspection Report	1
Warranty Card	1
Certificate of Conformity	1

3.4 Power Cord Connection

1) Connection of adapter: the adapter supplied with the instrument should be used to connect the adapter to the instrument.
2) Connection of power cord: the power cord supplied with the instrument should be used. When connecting, the instrument power switch should be in the off state, and then turn on the instrument switch after connecting.

3.5 Instrument Usage

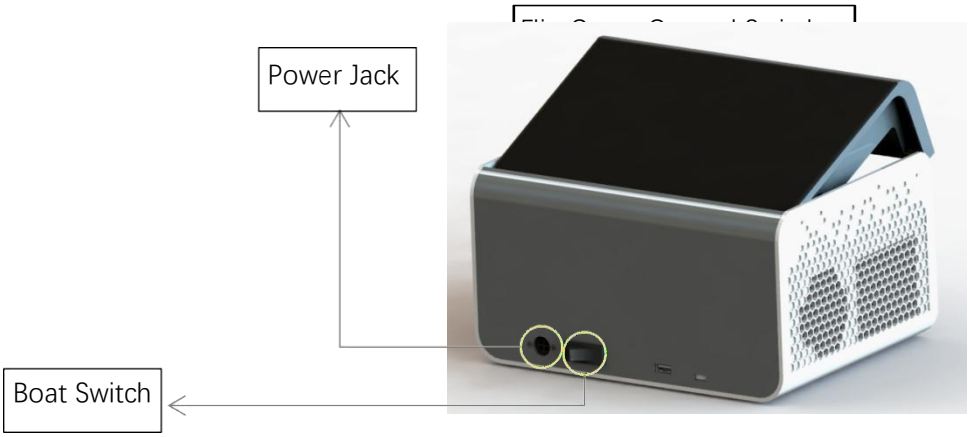


Figure 3.6-1 Back of the instrument

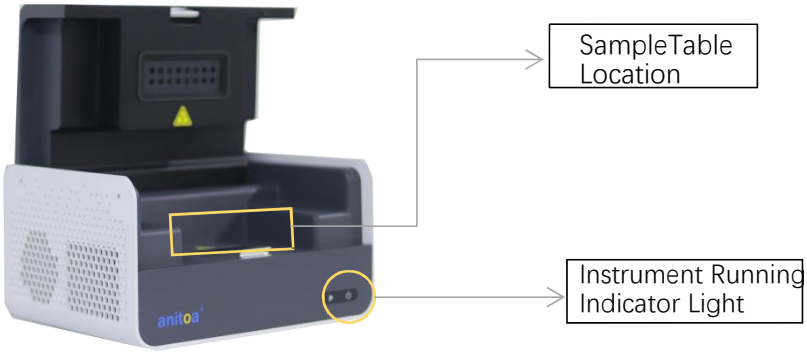


Figure 3.6-2 Front of the instrument

1) Insert the DC connector into the instrument interface, and the "click" sound means that the connector is in place
2) Open the main switch of the instrument (boat switch), and the red indicator of the instrument will light up
3) Open the cover of the instrument, and place the test tube with collected samples on the sample table in the picture
4) Close the flip cover and open the screen version software for use. The green indicator will light up after the instrument is started normally.

Chapter 4 Software Operation Guide

Anitoa qPCR software can be used to set up experiments, run experiments, collect data, analyze and manage experiments. The software contains four main functional modules, namely "User", "Test", "Results", and "System".

1) "User" module: mainly contains upload configuration, user management, image, and manufacturer settings.
2) "Test" module: mainly contains the new experiments, experimental parameters settings, running experiments, viewing and analyzing experimental results.
3) "Results" module: mainly contains experimental data analysis, upload, export, standard curve.
4) "System" module: mainly contains WLAN, language, virtual keyboard, date and time, display, and application language.

4.1 Launch Software

1) Launch the screen software "anitoa" to enter the login screen, as shown in Figure 4.1-1, and click the "Login" button.

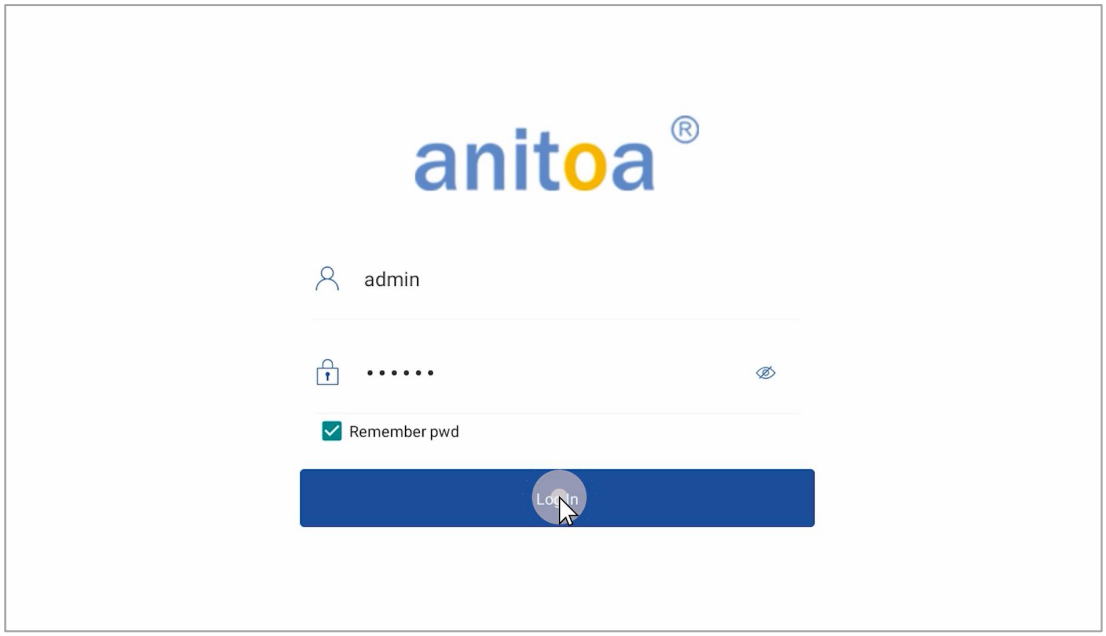


Figure 4.1-1 Login Interface

2) When asked if the USB connection is allowed, click < OK>, as shown in Figure 4.1-2

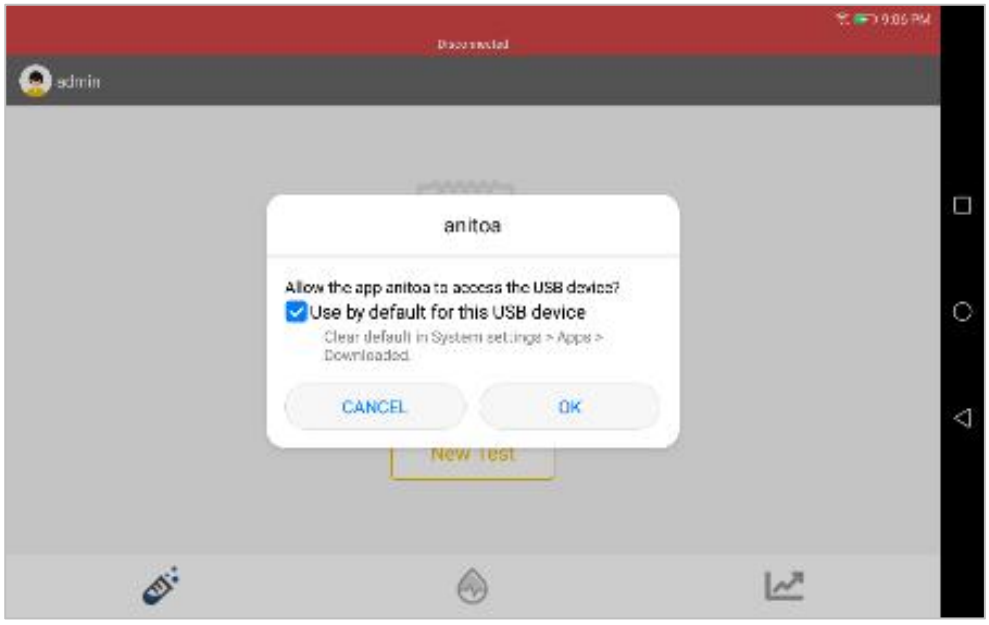


Figure 4.1-2 USB Access interface

4.2 Experimental Setup

1) In the test interface, click "New Experiment" (Figure 4.2-1) to enter the experiment settings 1

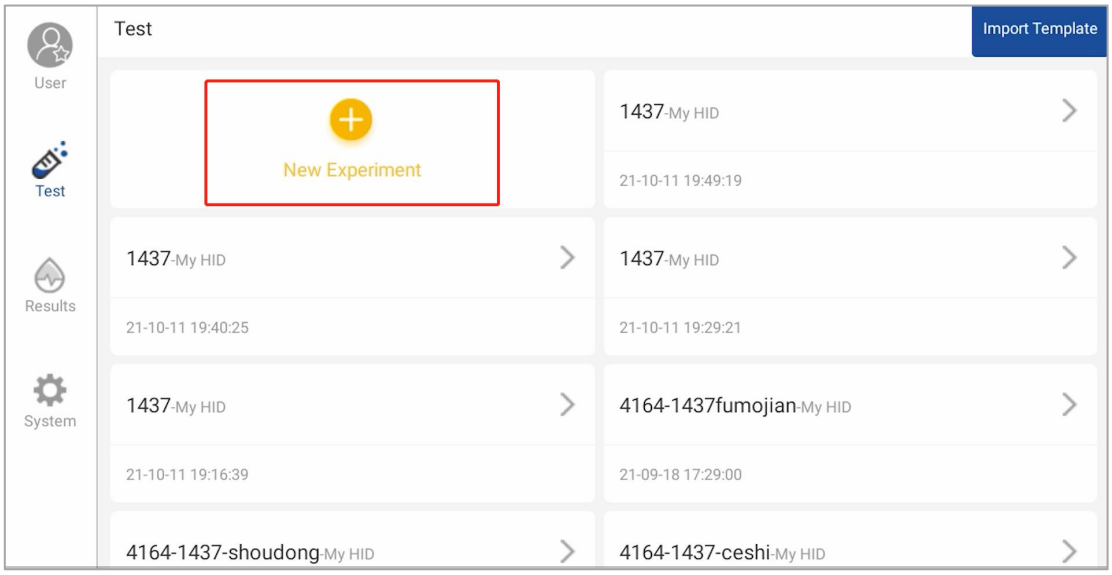


Figure 4.2-1 New experiment interface

2) In Experiment Setup 1 (Figure 4.2-2), enter the experiment name, select the corresponding channel, select the well position, and enter the sample information, etc., and click "Next" to enter Experiment Setup 2.

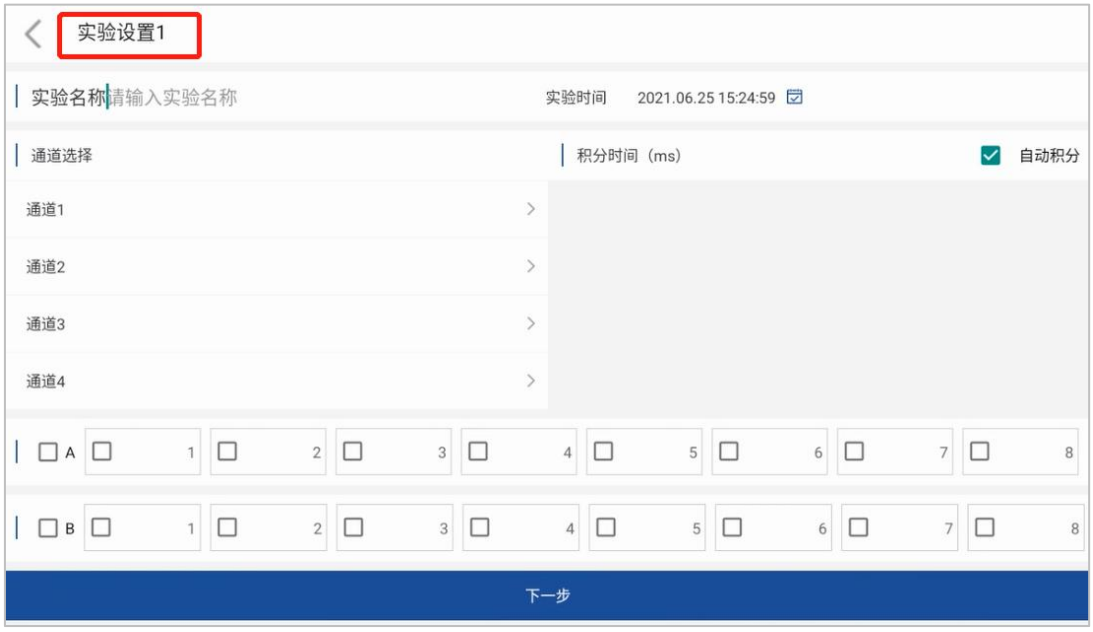


Figure 4.2-2 Experimental setup 1

3) In Experimental Setup 2 (Figure 4.2-3), set the reaction program (parameters such as reaction temperature, reaction time, number of cycles, photo stage, etc.)

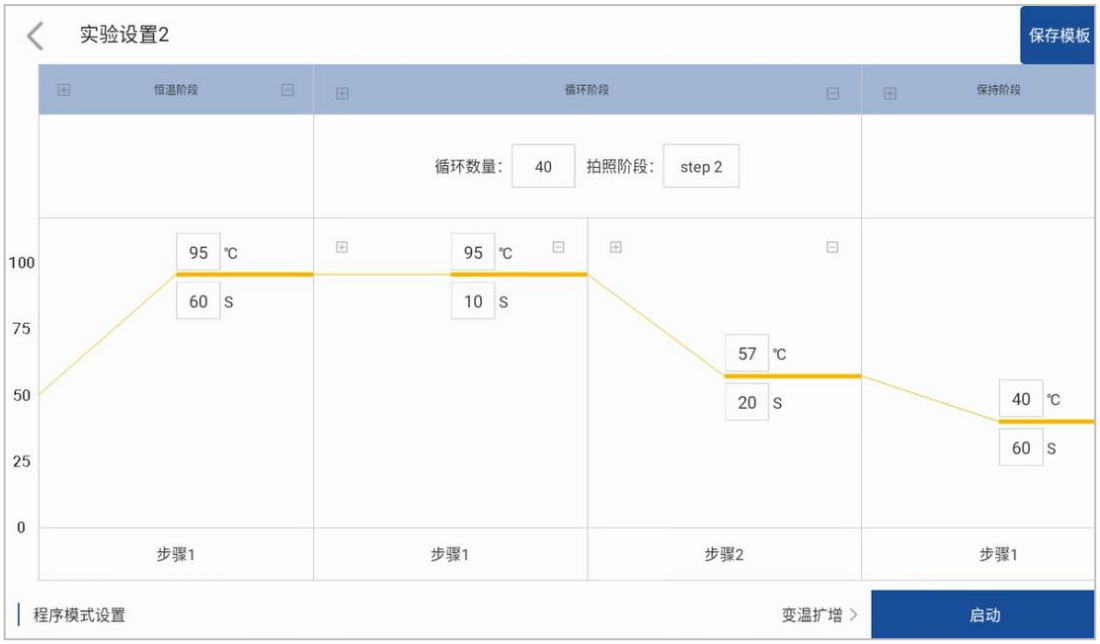


Figure 4.2-3 Experimental setup2

4.3 Save Template

1) Click the "Save Template" icon in the upper right corner to save the current template.

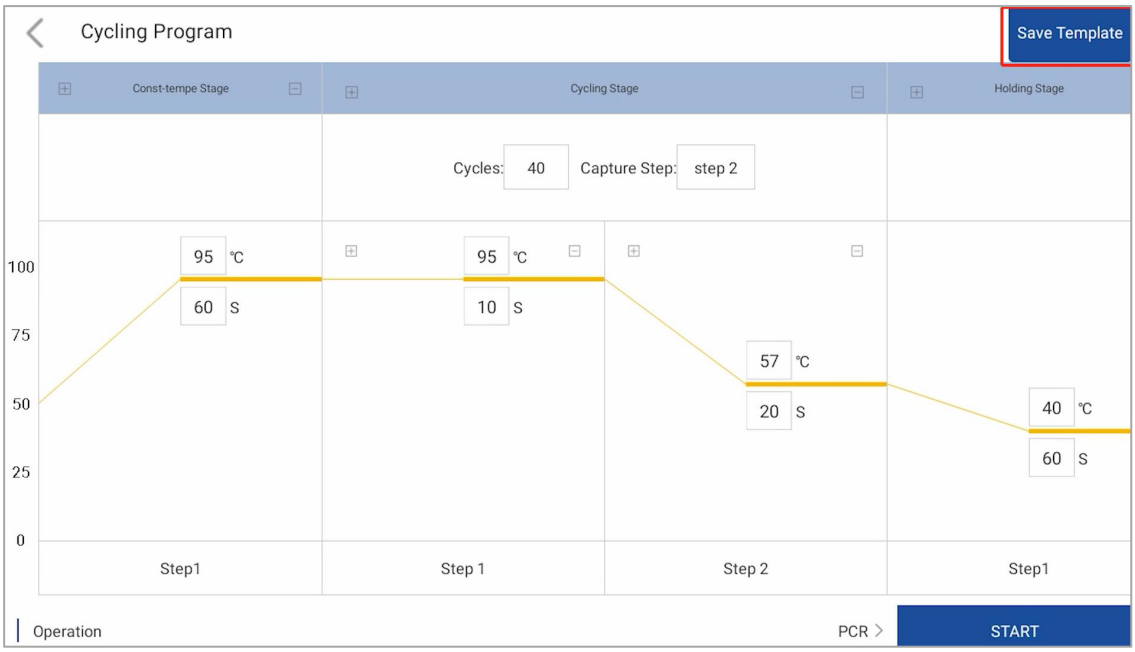


Figure 4.3-1 Program setting interface

2) The saved templates will appear in the "Test" screen for selection. Click "Import Template" in the upper right corner to import other experiment templates.

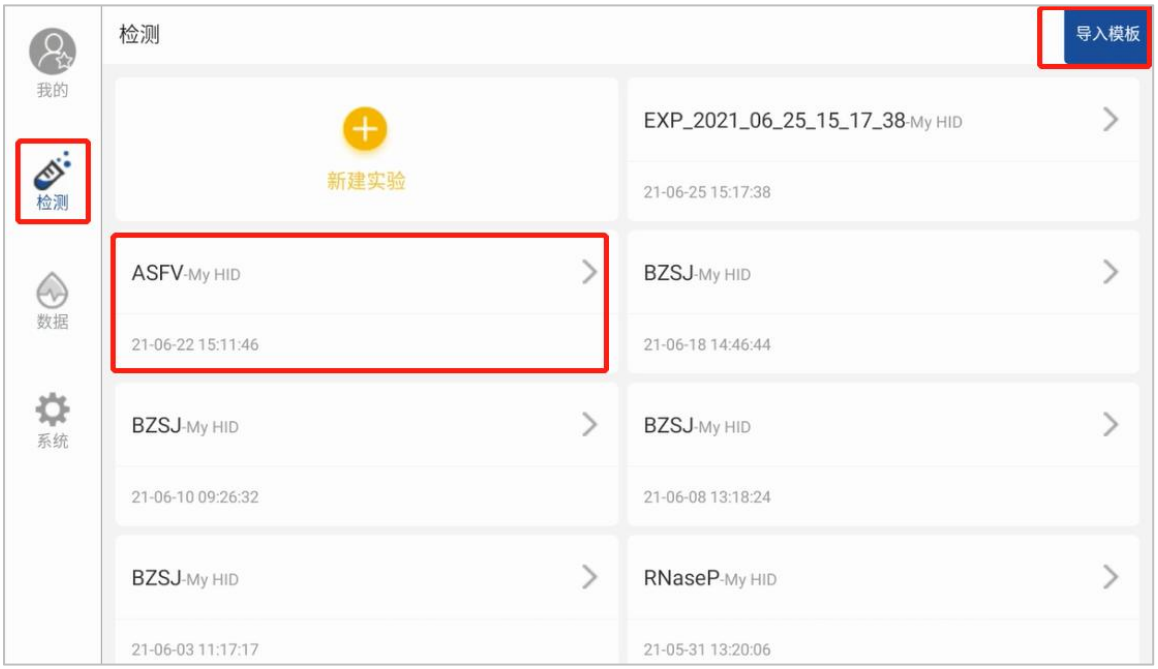


Figure 4.3-2 Template Page

4.4 Running Experiments

After the experiment setting is completed, click the "Start" button to start the experiment and enter the "Run" interface. Click "Force Stop" at the bottom right corner to stop the experiment.

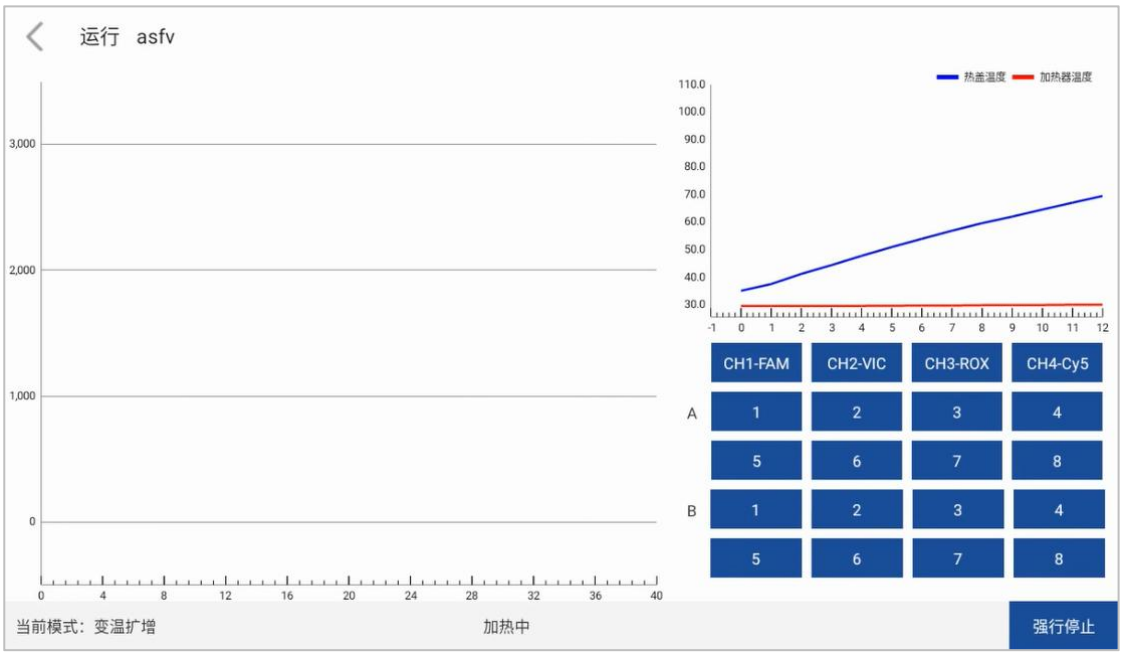


Figure 4.4-1 Running interface

4.5 Experimental analysis

1) Click the "Results" button on the main page to enter the "Data List" page, as shown in Figure 4.5-1.

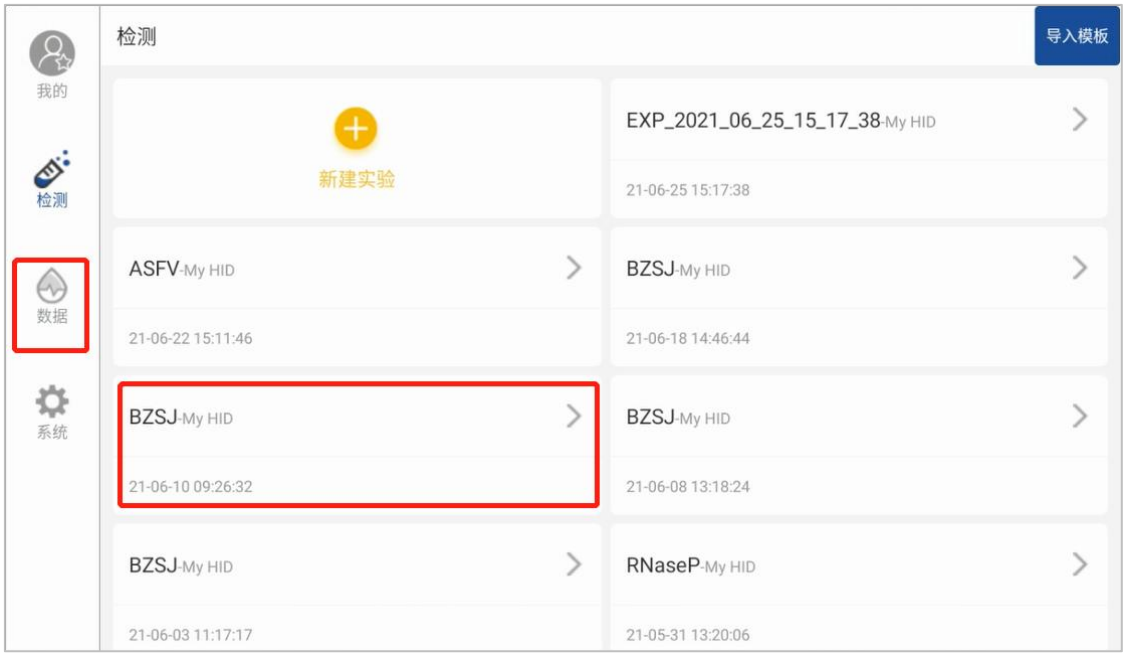
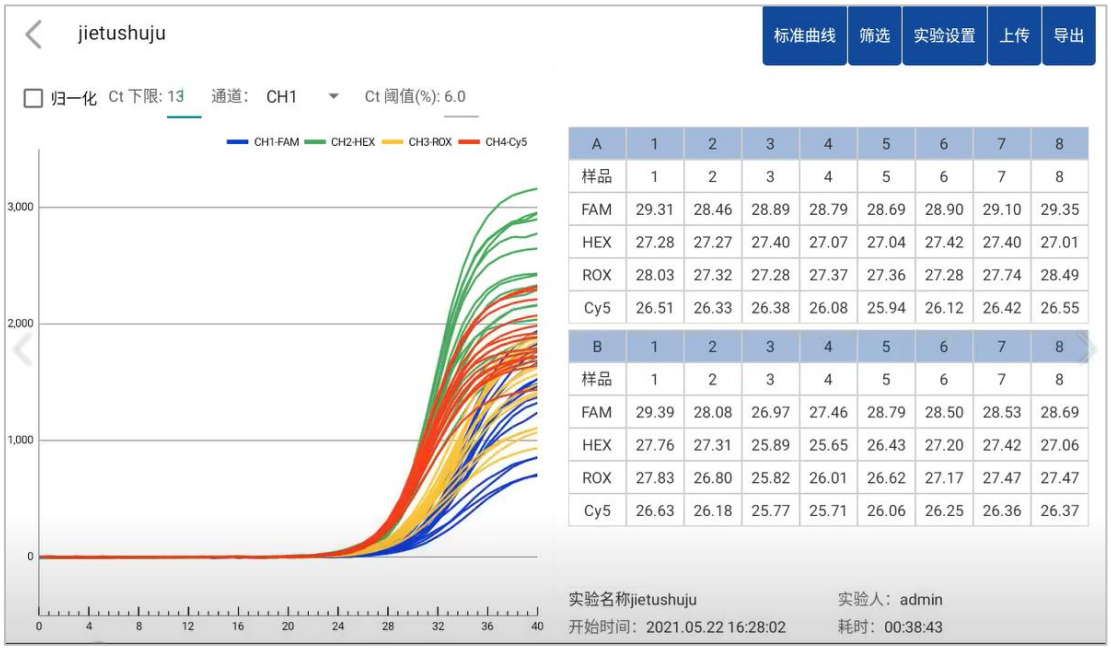


Figure 4.5-1 Data list page

2) To view the amplification curve: click on the experimental data and enter the "Result Analysis" page, as shown in Figure 4.5-2.



A	1	2	3	4	5	6	7	8
样品	1	2	3	4	5	6	7	8
FAM	29.31	28.46	28.89	28.79	28.69	28.90	29.10	29.35
HEX	27.28	27.27	27.40	27.07	27.04	27.42	27.40	27.01
ROX	28.03	27.32	27.28	27.37	27.36	27.28	27.74	28.49
Cy5	26.51	26.33	26.38	26.08	25.94	26.12	26.42	26.55

B	1	2	3	4	5	6	7	8
样品	1	2	3	4	5	6	7	8
FAM	29.39	28.08	26.97	27.46	28.79	28.50	28.53	28.69
HEX	27.76	27.31	25.89	25.65	26.43	27.20	27.42	27.06
ROX	27.83	26.80	25.82	26.01	26.62	27.17	27.47	27.47
Cy5	26.63	26.18	25.77	25.71	26.06	26.25	26.36	26.37

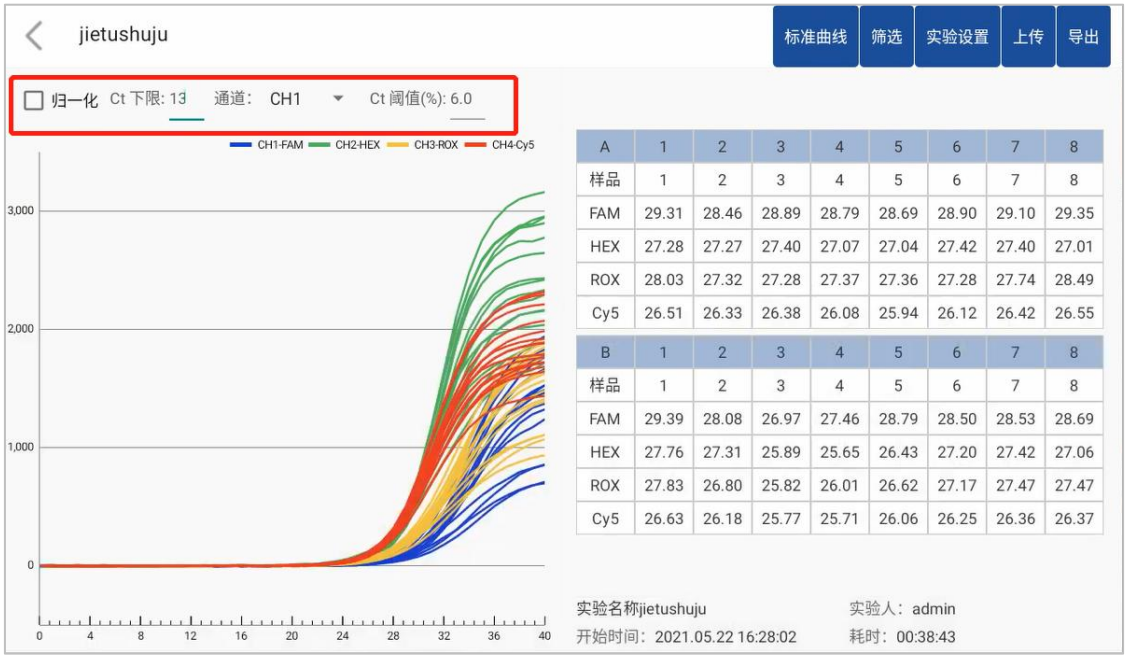
Figure 4.5-2 Result analysis interface

3) Experimental analysis

a. Adjust the baseline Ct lower limit.

b. Adjust Ct threshold percentage: default is 10% .

c. Normalization: Normalization of the amplification curve does not affect the results.



A	1	2	3	4	5	6	7	8
样品	1	2	3	4	5	6	7	8
FAM	29.31	28.46	28.89	28.79	28.69	28.90	29.10	29.35
HEX	27.28	27.27	27.40	27.07	27.04	27.42	27.40	27.01
ROX	28.03	27.32	27.28	27.37	27.36	27.28	27.74	28.49
Cy5	26.51	26.33	26.38	26.08	25.94	26.12	26.42	26.55

B	1	2	3	4	5	6	7	8
样品	1	2	3	4	5	6	7	8
FAM	29.39	28.08	26.97	27.46	28.79	28.50	28.53	28.69
HEX	27.76	27.31	25.89	25.65	26.43	27.20	27.42	27.06
ROX	27.83	26.80	25.82	26.01	26.62	27.17	27.47	27.47
Cy5	26.63	26.18	25.77	25.71	26.06	26.25	26.36	26.37

Figure 4.5-3 Experimental analysis interface

d. Click the "Filter" button in the upper right corner to enter the page in Figure 4.5-4 and select the well and channel for data analysis.

e. Click the "Result" button in the upper-right corner to return to the Figure 4.5-3 page.

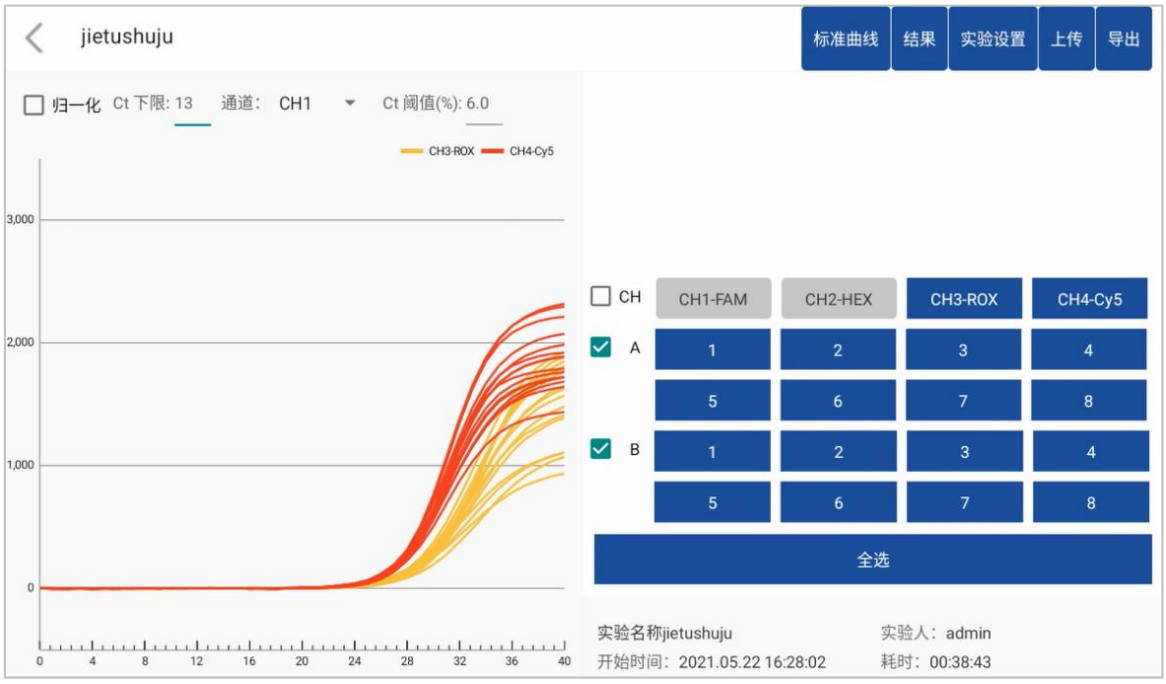


Figure 4.4-5 Data filtering screen

4) View standard curve

a. Click the Standard Curve button on the Data screen to enter the Standard Curve

interface (see Figure 4.5-4).

b. Manually enter the standard concentration, plot the standard curve, and calculate the concentration of the unknown sample based on the Ct value.

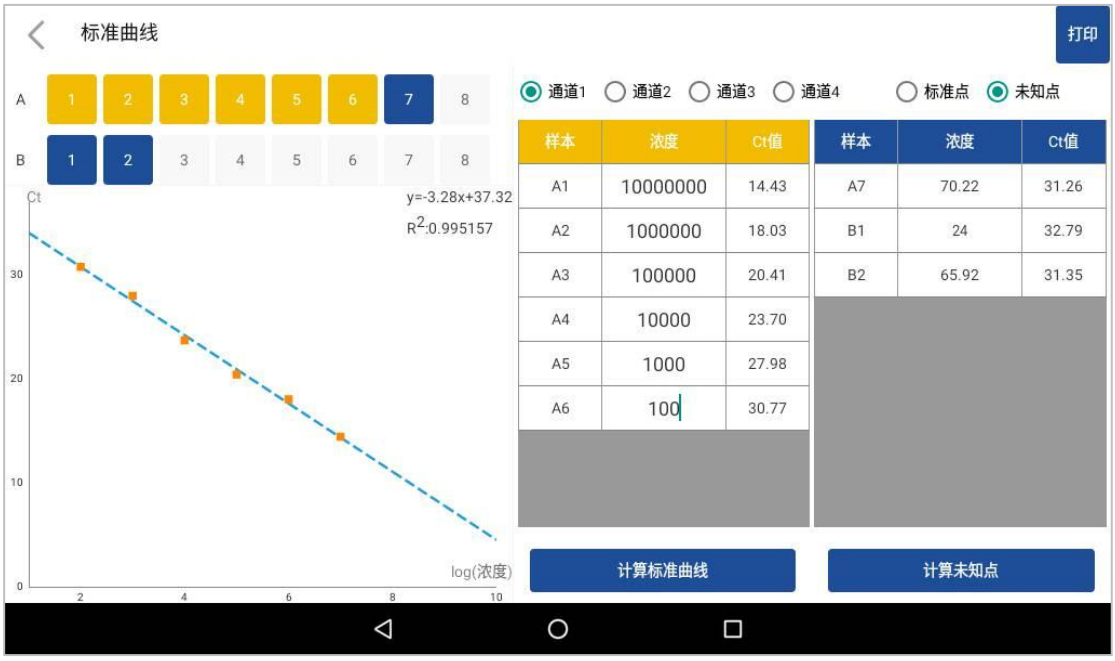


Figure 4.5-4 Standard curve interface

4.6 Data Export

1) Click the "Export" button on the experiment analysis interface to export the relevant information of the experiment. Currently, there are four export formats: PDF, CSV, JSON and JPG.

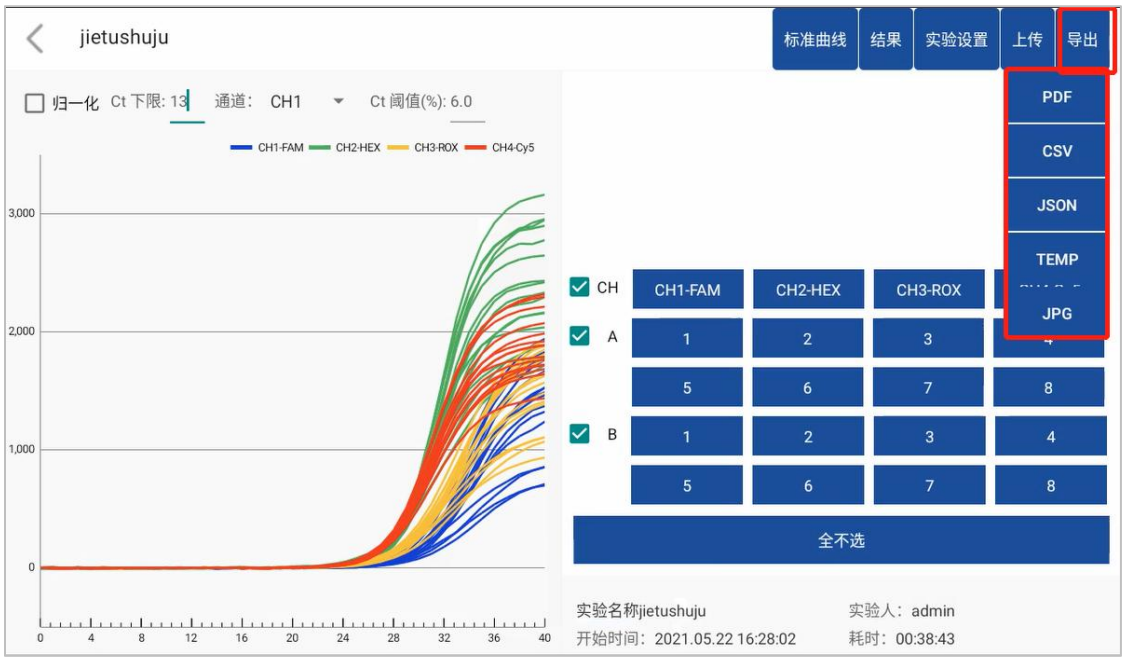


Figure 4.6-1 Data Export

2) Select one of the export formats, such as "PDF" to enter the PDF preview interface.

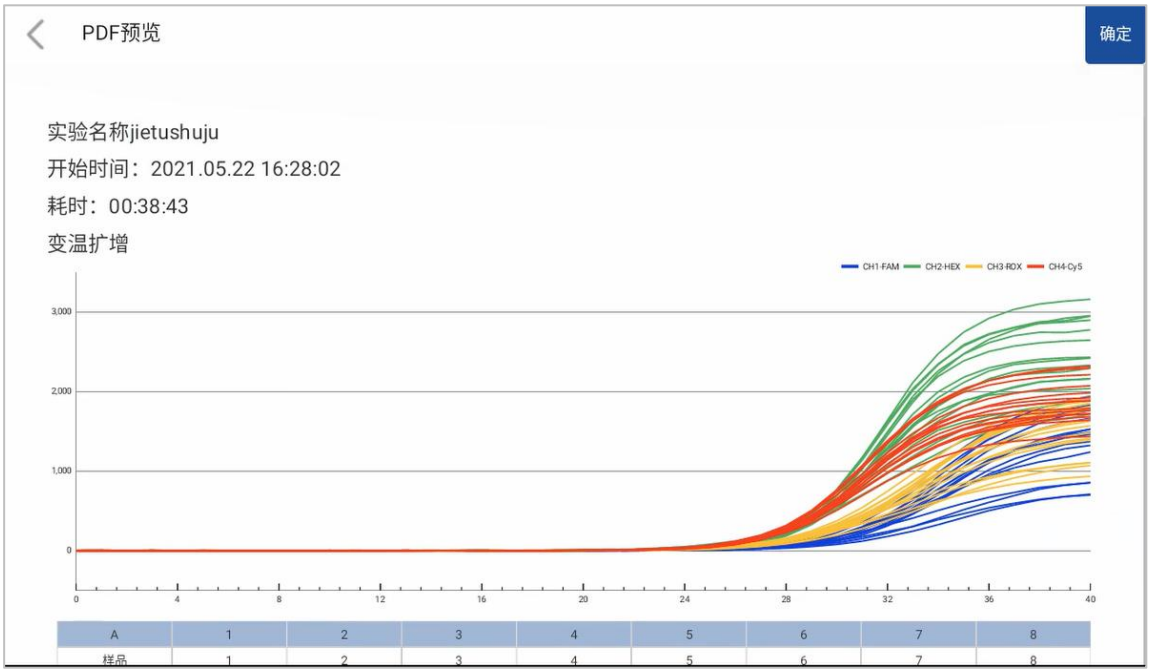


Figure 4.6-2 PDF preview page

3) Click on the upper right corner of the "OK" button, the pop-up "saved successfully, whether to print PDF documents"

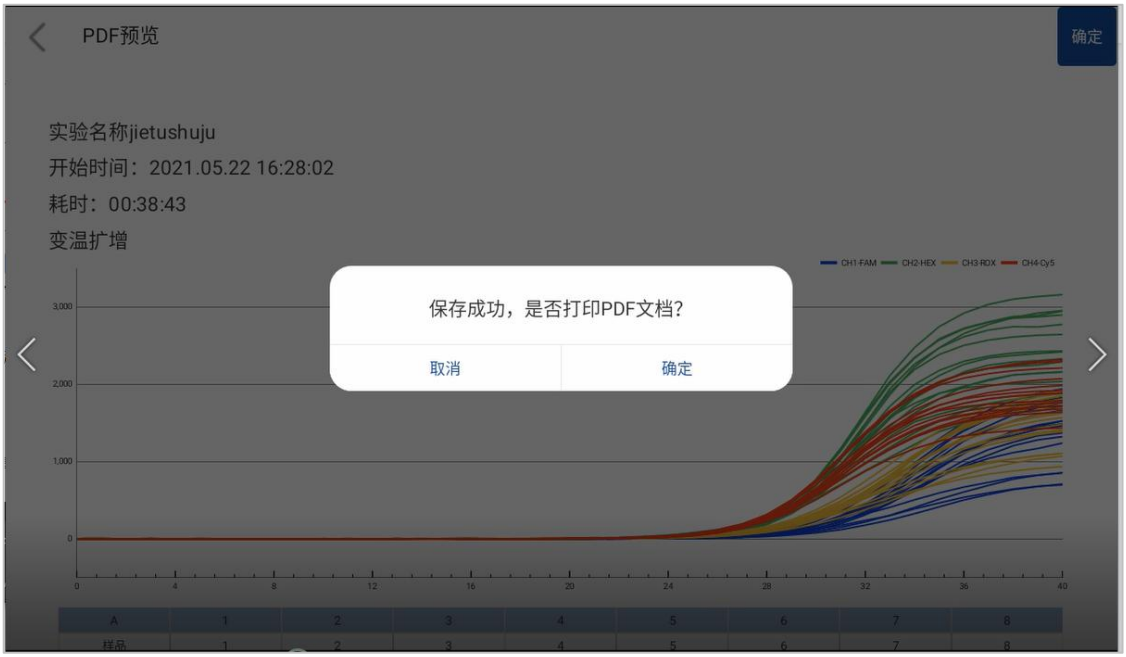


Figure 4.6-3 Whether to print the confirmation page

4) Click the "OK" button to enter the Figure 4.6-4 page

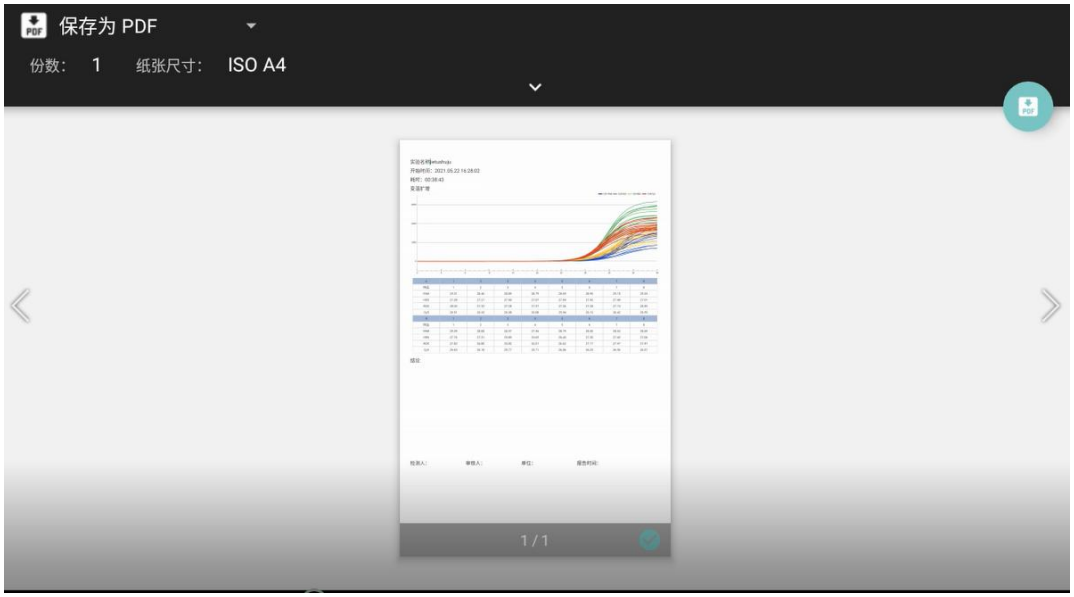


Figure 4.6-4 Save as PDF file page

5) Click the upper left corner of the "drop-down" button, "Save as PDF" or "Add Printer" option, as shown in Figure 4.6-5 (Note: The printer needs to support Android system)

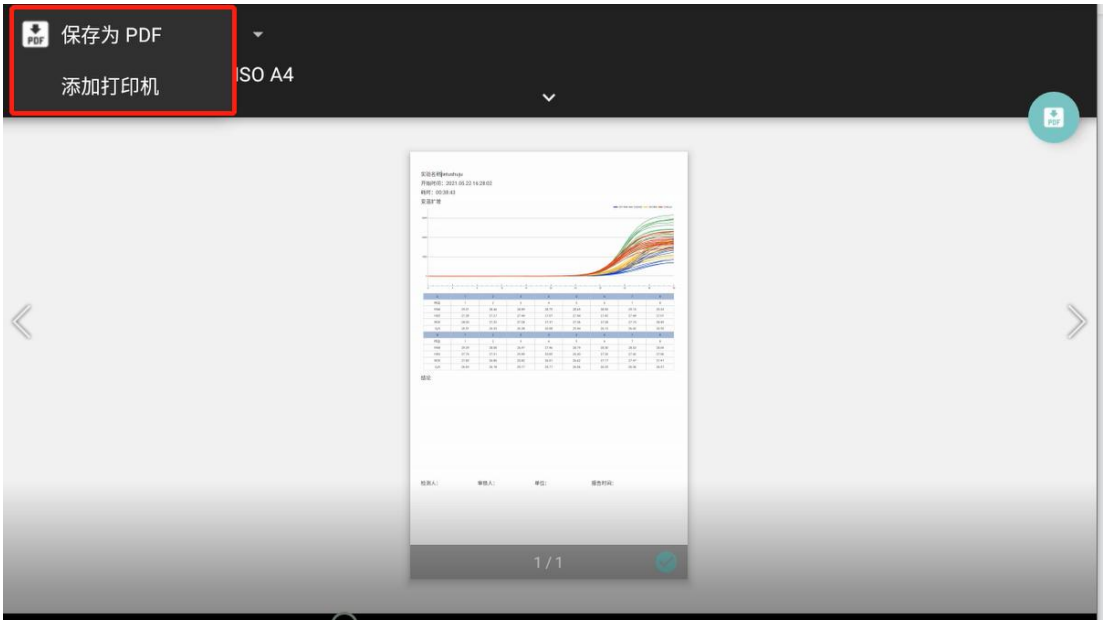


Figure 4.6-5 Whether to add a printer page

6) Click the "Save as PDF" option to save the file in the system directory, the storage path: /sdcard/anitoa/report

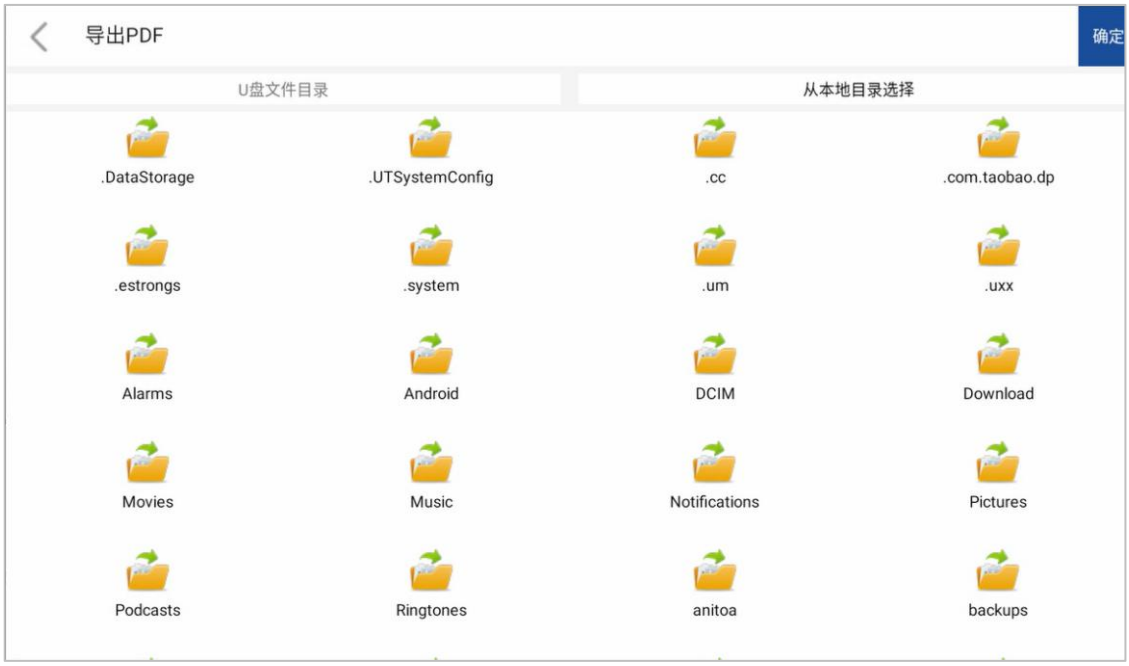


Figure 4.6-6 Save path

7) System save default path:

a. PDF path: /sdcard/anitoa/report

b. CSV path: /sdcard/anitoa/report

c. JSON path: /sdcard/anitoa/imageData

d. JPG path: /sdcard/anitoa/imageData

Chapter 5 Instrument Maintenance

5.1 Instrument Cleaning

(1) Instrument surface cleaning: The surface of the instrument should be scrubbed regularly with a soft cloth with 75% alcohol, and the instrument should be wiped dry after cleaning.

(2) Reaction wells cleaning:

a. It is recommended that the wells be cleaned once every 3 months as dust or impurities can affect PCR amplification and fluorescence detection.

b. To prevent dust from entering the reaction wells, the flip-top lid must be closed when the instrument is not in use.

c. If any reagent enters the sample hole, it should be wiped clean with a dust-free soft cloth with anhydrous ethanol.

d. ⚠The power must be turned off and the power cord unplugged before cleaning the instrument.

e. ⚠Do not pour liquids into the reaction module or inside the instrument.

f. ⚠Do not use corrosive solvents or organic solvents to scrub the instrument.

5.2 Instrument Protection

(1) Do not switch the instrument on and off frequently.

(2) Please use the adapter provided by the original manufacturer.

(3) ⚠Boiling water bath or low temperature holding (e.g. 4° C) on the instrument is prohibited.

(4) ⚠It is forbidden to disassemble the instrument by non-original maintenance personnel.

5.3 Waste Disposal

(1) After each experiment, there are a large number of amplification products in the test tube, which should be disposed of as soon as possible according to relevant regulations to avoid contaminating the laboratory and instruments.

(2) ☣Do not open the cover of the test tube after it is removed from the instrument, otherwise it will easily cause laboratory contamination.

5.4 Overheat Protection

(1) When the temperature value of the instrument temperature control module exceeds the set threshold (120° C), the device will automatically stop heating up and

force all ongoing operations to stop.

(2) After the above-mentioned failure of the heating system, the user should stop using the instrument and contact the manufacturer for repair in time.

5.5 Operation Requirements

(1) During the use of the instrument, the operator may be exposed to residual substances harmful to organisms or infectious substances, and the operator needs to be trained and have relevant qualifications.

(2) The operator should be aware of the hazards and use the instrument in an environment that is strictly in accordance with the relevant national PCR laboratory regulations.

Chapter 6 FAQ

No.	Failure Phenomenon	Cause Analysis	Processing
1	The screen shows a black screen	Screen motherboard damage	Must replace the screen motherboard, please contact with the supplier or manufacturer
		If the screen lock function is incorrectly operated, the screen enters the black screen standby mode	Close the lock screen, and enter the test interface directly after the startup
		Screen damage	Need to replace the screen, please contact the supplier or manufacturer
	Software prompts "Abnormal auxiliary heating	Auxiliary temperature selftest abnormal	Please restart the instrument first to confirm, if still can not solve please contact the supplier or manufacturer
	Abnormal heat-up curve of hot cover	Power supply problems	Verify that the power is plugged in properly
		Hot cover assembly problems	Please restart the instrument first to confirm, if still can not solve please contact the supplier or manufacturer
2	Unable to turn on	Power supply problems	Verify that the power is plugged in properly
		Switch or power cable damage	Please restart the instrument first to confirm, if still can not solve please contact the supplier or manufacturer
3	USB flash drive export failed	The USB disk is not in good contact	Reinsert the USB flash drive for confirmation
			Can try to use WIFI, Bluetooth export function
			If the problem persists, contact the supplier or manufacturer
4	HID connection exception	Screen communication exception	Please restart the instrument first to confirm, if still can not solve please contact the supplier or manufacturer
5	No experimental	Incorrect setting	Verify that the thermal cycling

	data after instrument operation	of experimental parameters	parameters and sample parameters are set correctly, and set the fluorescent markers
6	Report upload and print function exception	WIFI setting error	Please check if the instrument WIFI setting is correct, please connect to the network correctly
7	Test time and report time are not synchronized	Time synchronization without network connection	The default time is used when the device is not connected to the network. Please connect to the network for immediate time update
8	Software prompts "Please close the hot cover"	Instrument flip cover is not closed in place	Re-close the flap to ensure it is closed in place.