SPECIFICAŢII TEHNICE (F4.1)

Numărul licitaţiei: ***ocds-b3wdp1-MD-1695378682396*** Data: ***16.10.2023***

Denumirea licitaţiei: **detectoroarelor de urme de explozive**

Co-dul CPV	Denumirea bunurilor	Modelul articolului	Ţara de origine	Producătorul	Specificarea tehnică deplină solicitată	Specificarea tehnică deplină propusă de către ofertant	Standar-de de referinţă
38544000-0	Detectoare de urme de explozive	NUCTECH ™ TR2000DC	China	NUCTECH ™	**Caracteristici principale:** • Tehnologie non-radioactivă • Concept flexibil si multi-level al software-ului **Aplicatii principale:** • Control de securitate pasagerii • Controlul de securitate al mărfurilor și poștei **SPECIFICATII TEHNICE:** • Tipul instrumentului: Detecție urme de explozivi • Tehnologia folosita: o Ion Mobility/Mass Spectrometry • Performanțele detecției: o Explozivi militari o Explozivi neconvenționali o Markeri o Narcotice standard o Precursori • Greutate: < 22 kg • Dimensiuni maxime: 550 x 465 x 450 mm • Temperatura de funcționare de la 0 °C + 40 °C • Umiditate: 5 - 95% rel. H. • Cerințe alimentare: o 100-240 V AC o 47 – 63 Hz o max. 400 W • Timpul de analiza: < 10 sec • Timp încălzire: < 20 min • Metoda de prelevare a probei: tampon • Sistemul de date: o Display color tactil min. 6 inc. cu rezoluție înaltă Imprimanta termica inclusa cu tipărirea rezultatelor și capacitatea de stocare până la cel puțin	**Caracteristici principale:** • Tehnologie non-radioactivă • Concept flexibil si multi-level al software-ului **Aplicatii principale:** • Control de securitate pasagerii • Controlul de securitate al mărfurilor și poștei **SPECIFICATII TEHNICE:** • Tipul instrumentului: Detecție urme de explozivi • Tehnologia folosita: o Ion Mobility Spectrometry, IMS deshis; • Performanțele detecției: o Explozivi militari o Explozivi neconvenționali o Markeri o Narcotice standard o Precursori • Greutate: < 12 kg • Dimensiuni maxime: 340 x 325 x 233 mm • Temperatura de funcționare de la -20 °C + 55 °C • Umiditate: 0 - 95% rel. H. • Cerințe alimentare: o 100-240 V AC o 47 – 63 Hz o max. 400 W • Timpul de analiza: 8 sec • Timp încălzire: 15 min • Metoda de prelevare a probei: tampon • Sistemul de date: o Display color tactil 10.4 inc. cu rezoluție înaltă Imprimanta termica inclusa cu tipărirea rezultatelor și capacitatea de stocare până la cel puțin	

					○ 200000 mostre; ○ Conexiuni LAN, USB 2.0 Capacitatea de stocare până la 100000 de probe;	○ 200000 mostre; ○ Conexiuni LAN(2 porturi), USB 2.0 (2 porturi) Capacitatea de stocare mai mult 100000 de probe;	

Semnat: _____ Concеariuc Ghenadii În calitate de: manager

Ofertantul: SA "Eximotor" Adresa: mun. Chişinău, str. Aerodromului 15/6

SPECIFICAŢII DE FORMARE A PREŢULUI

Numărul licitaţiei: ***ocds-b3wdp1-MD-1695378682396*** Data: ***16.10.2023***

Denumirea licitaţiei: **detectoroarelor de urme de explozive**

Co-dul CPV	Denumirea bunurilor	Unit de măsură	Canti-tatea	Preţ unitar (fără TVA)	Preţ unitar (cu TVA)	Suma fără TVA	Suma cu TVA	Termen de livrare
38544000-0	Detectoare de urme de explozive	buc	8	**513 465**	616 158	**4 107 720**	4 929264	45 zile din data semnarii contractului
	Tampoane de proba		80000					

Semnat:_____ Goncеariuc Ghenadii În calitate de: manager

Ofertantul: SA "Eximotor" Adresa: mun. Chişinău, str. Aerodromului 15/6

NUCTECH™ TR2000DC

Desktop Explosives and Narcotics Trace Detector

Introduction

NUCTECH™ TR2000DC is the latest desktop trace detector model based on Ion Mobility Spectrometry (IMS) and its patented non-radioactive ionization source, built on the 16-years-field-proven TR series. TR2000DC enables users to quickly detect & identify traces of explosive and drug substances sampled from passenger and cargo surfaces within several seconds.

Using the latest non-radioactive ionization technology, TR2000DC demonstrates its much higher sensitivity than conventional systems, while maintaining the accuracy via smart algorithms. TR2000DC is also designed with an intuitive software UI and an ergonomic Thumbprint Wand, ensuring the best user experience in the field.

Its reliable detection performance and operational efficiency makes it a powerful instrument deployed in aviation security, customs & borders, logistics, critical infrastructure, and other applications as a trustworthy part of NUCTECH integrated solutions.

Features

- No radioactive source
- Dual mode analysis
- Instant detection
- Extremely low false alarm rate
- Automatically self-calibrated
- Intuitive software UI
- 1-hour battery
- Support centralized management

Certifications

- ✓ ECAC approved
- ✓ STAC certified
- ✓ CAAC certified
- ✓ MPS certified
- ✓ CE and CSA certified

Technical Data

General Specification

Technical Principle	Ion Mobility Spectrometry (IMS)
Ionization Technology	Non-radioactive Ionization Source (NRIS)
Analyzing Mode	Explosive Mode, Narcotic Mode and Dual Mode
Detectable Explosives*	TNT, RDX, PETN, NG, AN, HMTD, HMX, Tetryl, TATP, UN, EGDN, etc.
Detectable Narcotics*	Cocaine, Heroin, THC, MA, Ketamine, MDMA, Morphine, Amphetamine, LSD, Ephedrine, Fentanyl, etc.
Calibration	Automatic internal calibration
Verification	Standard Verification Pen
Sampling Method	Particle sampling with reusable swabs by hand or patented Thumbprint Wand
Sensitivity*	Nanogram
False Alarm Rate	< 1%
Warm-up Time	< 20 minutes
Analysis Time	< 8 seconds
Cleanup Time	< 10 seconds (typical)

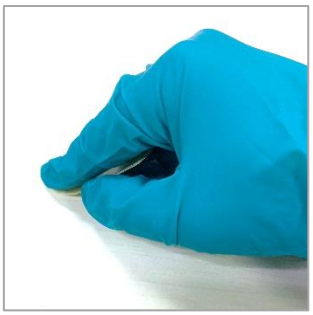
Functions and Configurations

User Interface	10.4” color touch-screen with easy software UI
Readout	Pass/Alarm with substance name, signal strength, original spectrum (configurable audio alarm)
Data Interface	Ethernet (2 ports), USB (2 ports) and VGA, supporting data transfer via USB or Ethernet
Data Storage	> 100,000 samples (expandable memory)
Printer	Built-in thermal printer or external USB printer

Installation Data

Dimensions	340mm(L)×325mm(W)×233mm(H)
Weight	< 12 kg
Power Supply	100-240V AC ±10%, 47-63 Hz
Battery	Rechargeable battery supporting 1 hour operation
Operating Temperature	-20℃ to +55℃
Operating Humidity	0 to 95% non-condensing
Operating Pressure	40 to 106 kPa

* Threat substances and sensitivity setting are subject to regulatory authority and customization



For more product information, visit www.nuctech.com

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Tel: (8610) 62780909
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TR2000DC-INTL-EN V22.01

NUCTECH

TR2000DC
Desktop Explosives and Narcotics Trace Detector
Technical Proposal

NUCTECH COMPANY LIMITED

Contents

TR2000DC Technical Proposal

1. Product Overview

The NUCTECH™ TR2000DC Desktop Explosives and Narcotics Trace Detector works on the latest Ion Mobility Spectrometry (IMS) technology with non-radioactive ionization sources to detect trace explosives and narcotics, which may be collected from all sorts of passenger and cargo surfaces.

Compared to conventional ETD with radioactive ionization sources, non-rad model TR2000DC is capable of providing much higher analytical sensitivity and faster speed in any checkpoints. Internal automatic calibration which periodically completes inside frees the users from frequent interference. It has a battery inside to support 1-hour standby to enable quick swapping in the field. Its regenerative filter material also reduces labor and minimizes the ownership cost. The system can be integrated with GPS, RFID, Wi-Fi and camera to link the detection result to identity of passengers and cargo, geographical records and network information.

TR2000DC aims at offering not only the greatest efficiency and economic benefits, but also a new idea of integrating the relevant pieces of information, to give our clients trustable security advice on a solid technological base.

TR2000DC Desktop Explosives and Narcotics Trace Detector

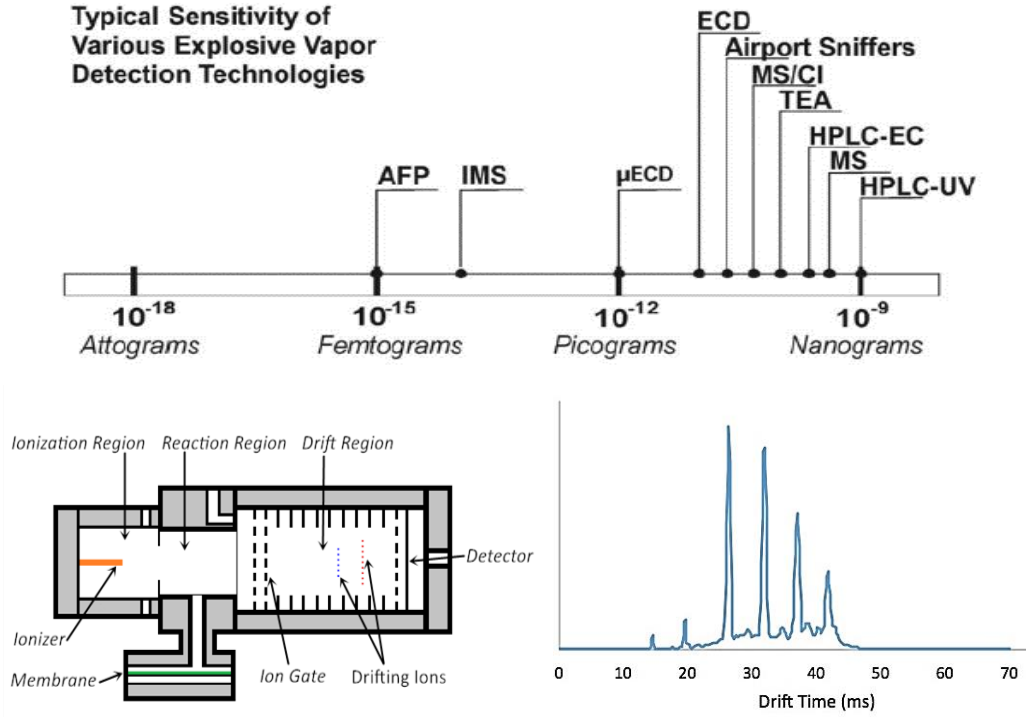
2. Technical Features

- ✓ Non-radioactive ionization source with safety, reliability and cost-effectiveness;
- ✓ Simultaneous dual-mode detection of trace explosives and narcotics;
- ✓ pg-ng sensitivity and improved resolution in Explosive and Narcotic modes;
- ✓ Upgradable substance library to cater to the newest international standard;
- ✓ Quick analysis of substance and fast cleaning process;
- ✓ Internal automatic calibration with no manual adjustment;
- ✓ Low false alarm rate due to new generation of detection algorithm and dopant;
- ✓ Built-in Printer, Ethernet and USB for data acquisition and remote management;
- ✓ 10.4” TFT touch screen to simplify the operation and enhance user experience;
- ✓ Hot plugging Battery supporting 1-hour operation;
- ✓ Effective UI reminder and wizard for consumable replacement and maintenance;
- ✓ Self-diagnosis function to detect regular malfunction to maintain availability;
- ✓ Modularized design with interchangeable spare parts, very easy to repair;

3. Technical Principle and System Structure

3.1 IMS Technical Principle

Ion Mobility Spectrometry (IMS) has become the most successful and widely used technology in Explosive Trace Detection (ETD), due to its fast analysis speed, high sensitivity, low false alarm rate, lightweight and ruggedness, which gives IMS an overwhelming optimality over other ETD technologies. IMS is commonly recognized by international regulators such as ECAC, DFT, STAC, TSA, CAAC, etc.

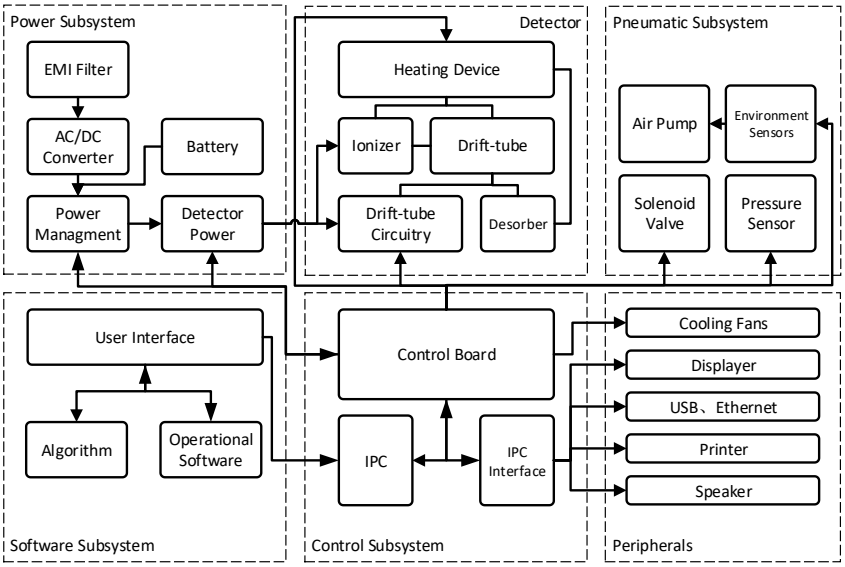


IMS instrument structure and IMS spectrum

When heated in sample inlet, explosives or narcotics molecules will be vaporized and pass through a membrane and enter the reaction region. Then positive or negative ions generated from ionization source interact with the sample molecules to form positive or negative sample ions. These ions are pulled into drift region by ion gates. In the drift region, the ions will “drift” (move) under a linear electric field, and be separated based on their different mobility, reaching the Faraday plate (detector) at different time to generate peak signals, i.e. IMS spectrum. By comparing it to a standard substance library, it’s possible to identify explosives and narcotics.

3.2 TR2000DC System Structure

TR2000DC is based on the latest advanced IMS technology and its system structure and function blocks are listed in the following figure:



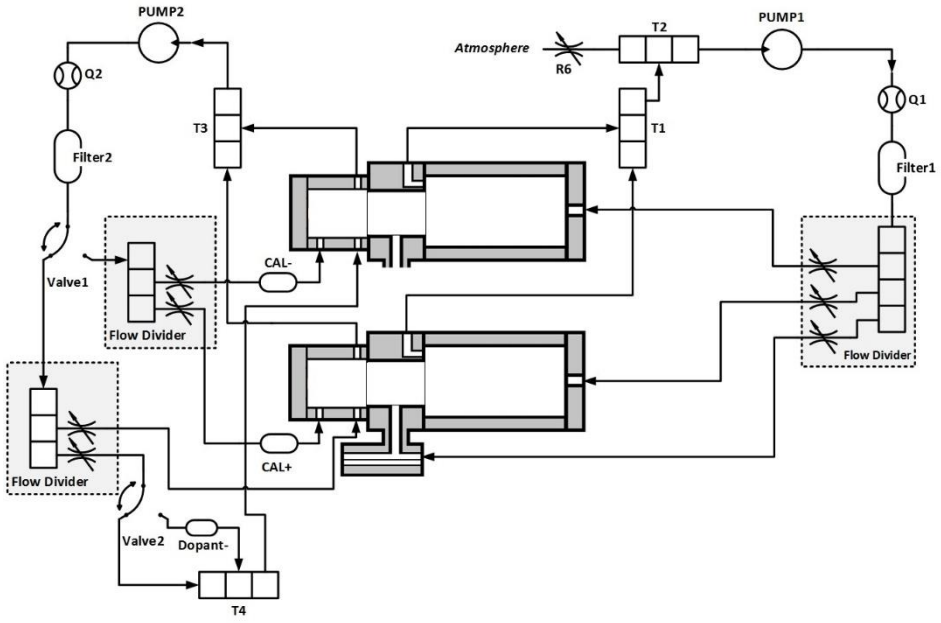
TR2000DC System Structure

3.2.1 Detector

Detector is the most core component in the TR2000DC, since it's responsible for sample thermal desorption, non-radioactive ionization, gate shutting, separation of ions and extraction of signal. An innovative dual-channel design is applied to enable the simultaneous positive and negative ions detection.

3.2.2 Pneumatic Subsystem

Pneumatic subsystem is second most important part of TR2000DC, it is basically made of air pumps, valves, pipes, filters, manifolds and sensors, supplying the detector with purified and flow-stable air, as well as sweeping away residual sample neutrals after detection.



Air flow diagram in the TR2000DC (Only for principle)

3.2.3 Control Subsystem

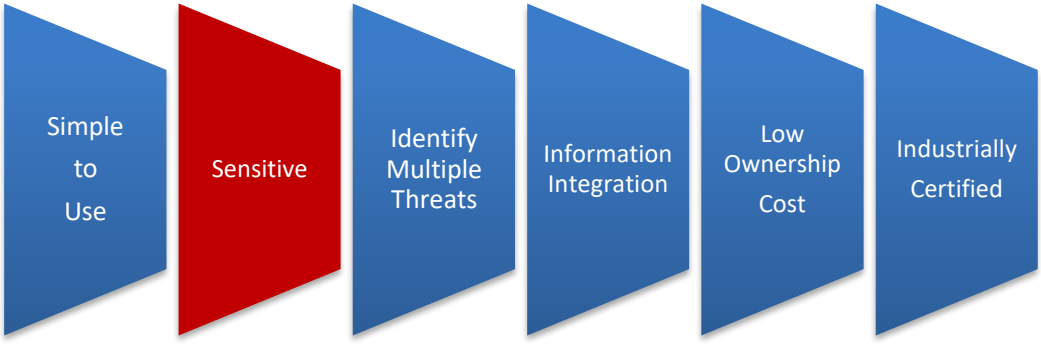
The functions of the control unit include acquiring detector signals from the drift tube, controlling the heating, air pumps, status indicators and fans and providing power supply.

3.2.4 Software Subsystem

Windows-based Operational Software is developed with functions such as Graphic User Interface (GUI), Data Acquisition (DAQ), detection algorithm and Detection result visualization, etc.

4. Concept of Product Design

The fundamental concept of TR2000DC can be simplified as several basic ideas.



4.1 Simple to Use

First and foremost, TR2000DC's operational procedures are largely simplified to minimize the learning cost of the operators, by introducing a graphic user interface (GUI), where operators can acquire the critical information to focus on their task, also by freeing them from conducting protocols that requires special training such as manual Calibration.

Graphic User Interface

4.2 Sensitive

Second, TR2000DC has a much higher detection sensitivity than ETDs based on Ni-63 source. A typical comparison is listed in the following chart.

Model	Ni-63 (Radioactive Source)			TR2000DC's non-radioactive source		
Substance	AN	TNT	TATP	AN	TNT	TATP
Sensitivity	200 ng	1 ng	100 ng	100 ng	250 pg	50 ng

* Detection sensitivity may vary according to manufacturing configuration

4.3 Identify Multiple Threats

4.3.1 Detection Targets

TR2000DC can identify a wide range of explosives and narcotics. The threat library is updatable and expandable to follow the growing needs of new threats detection demands.

Threat Category	Detectable Substance	Sensitivity
 Explosives	TNT, RDX, PETN, NG, AN, HMTD, HMX, TETRYL, TATP, UN, EGDN, DNT, Semtex, C4, Black Powder, etc.	Pico-Nanogram
 Narcotics	Cocaine, Heroin, THC, MA, Ketamine, MDMA, Morphine, Amphetamine, LSD, Ephedrine, Fentanyl, etc.	Nanogram

The threat library is programmable to adjust the detection capability to meet the needs of our clients. From the detectable substances, the administrators can customize the range and threshold of threats required to be identified and alarmed.

4.3.2 False Alarm Rate

With careful selection of dopants, signal from threats is preferably shown. Also, a new algorithm with multiple pattern recognition has been developed to improve accuracy. As a consequence, field false alarm rate is now less than 1%, completely suitable and desirable for field application.

4.4 Information Integration

To cater to the trend of internet and big data, TR2000DC is designed with capability to integrate with optional Wi-Fi, GPS, RFID, etc., linking the detection data to the identity of passengers and cargo, graphic or video information, geographical records and network information. Detection data will not stand alone anymore and there are many ways to analyze it. Information can be linked to Baggage Handling System (BHS), or uploaded to TR Cloud, offering clients a combination of insights to promote security.

4.5 Low Ownership Cost

TR2000DC effectively lowers the ownership cost in several ways.

4.5.1 Less Maintenance and More Availability

TR2000DC with a monthly-based maintenance period is designed to maximize the availability and avoid frequent manual maintenance to save labor cost.

No.	To-do list	Daily	Monthly	Every year	Every 2 years	Estimated time	Yearly Estimated
1	Verify	★	★	★	★	1 minutes	6.08 hours
2	CAL (Automatic)	★	★	★	★	1 minutes	6.08 hours
3	Change filter		★	★	★	10 minutes	10 minutes
4	Export data and reports			★	★	5 minutes*	5 minutes
5	Change dopant			★	★	10 minutes	5 minutes
6	Change POS Ionizer Electrode			★	★	1 hour	30 minutes
7	Change NEG Ionizer Electrode			★	★	1 hour	30 minutes
8	Change POS Calibrant			★	★	10 minutes	5 minutes
9	Change NEG Calibrant			★	★	10 minutes	5 minutes
10	Change Semi-permeable Membrane			★	★	4 hours	4 hours
11	Change Fan Dust Filter			★	★	10 minutes	5 minutes
Total Maintenance Time per year							<20 hours
Availability							> 99.7%

4.5.2 Adaptability and Reliability

The TR2000DC is built from the best proven TR products platform to cater to dedicated service more than 10 years. It can be used in harsh conditions and support stable working in extreme weather conditions. The estimated MTBF is no less than 20,000 hours.

The TR2000DC provides practical diagnostic tools for real-time monitoring of the key operating environmental conditions in the drift tube, such as pressure, temperature and gas flow speed. In case of software malfunction, users can sue to the backup DVD that contains a safe copy of software. Also it shares the most reliable modular hardware design, easy-to-maintain components layout, and interchangeable spare parts with plug-in type, which simplify the regular inspection and replacement in case of failure. Modules, input/output cables and even air-flow tubes are clearly marked to avoid ambiguity, fully assembled and supplied with professional manner.

4.6 Industrially Certified

4.6.1 Industrial Standards

The TR2000DC is in compliance with the following widely used technical standards and regulations:

- ✓ Meets the standard of *Explosives Trace Detection System, Civil Aviation Administration of China (CAAC)*
- ✓ Meets the standard of *GA/T 841-2009 General specification for trace narcotics/explosives detectors based on Ion Mobility Spectrometry, Ministry of Public Security (MPS)*
- ✓ Designed and manufactured to meet *Explosive Trace Detection (ETD) equipment, European Civil Aviation Committee (ECAC)* in Spring 2019
- ✓ Meets ISO 9001 Quality Management and Assurance standards

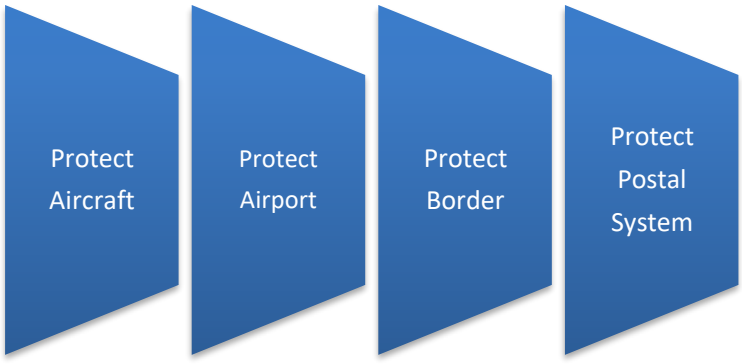
4.6.2 Operating Safety

- ✓ CE Certification
- ✓ Meets *Electrical Safety and EMC Standards, TESTING CNAS L0296, China National Computer Quality Supervising Test Center*

The TR2000DC is CE certificated, and is built in compliance with Safety of Machine Directive, Electromagnetic Compatibility Directive and other related applicable EU directives, by adopting reliable designs and using CE certified devices against any undue heating, vibration, mechanical shock, corrosion, EMI, power voltage fluctuation/transients and other problems. Also, the product is explicitly labeled with warnings in terms of high temperature, high voltage, etc. to protect the personnel during operation and maintenance.

5. Application in Security and Customs Screening

Based on its practical design concepts, TR2000DC has high potential in protecting valuable assets and stands out with comparative advantages in aviation security, customs & borders, postal service & logistics, transportation infrastructure and large-scale public activities, etc.



5.1 Application in Aviation Security

TR2000DC can be deployed at every passenger check tunnel to inspect the suspicious passengers and their carry-on luggage for explosives marked by X-ray scanners or metal detectors. Its high signal sensitivity supports detection of trace explosives within only a few seconds with quite high accuracy.

Moreover, TR2000DC can also be deployed at the entrances of the airport to randomly screen a large number of passengers. Since 2017 CAAC required every Chinese airport to establish an explosive screening checkpoint at the entrance to protect the airport, it may create an international industrial example for aviation security in other countries.

Similarly, TR2000DC can be utilized in checking cargos, i.e. check-in baggage. And airport security can even set up a temporal checkpoint at the final boarding gate, to rule out any potential threat, as the operators can move the instrument out there to set a temporal checkpoint.

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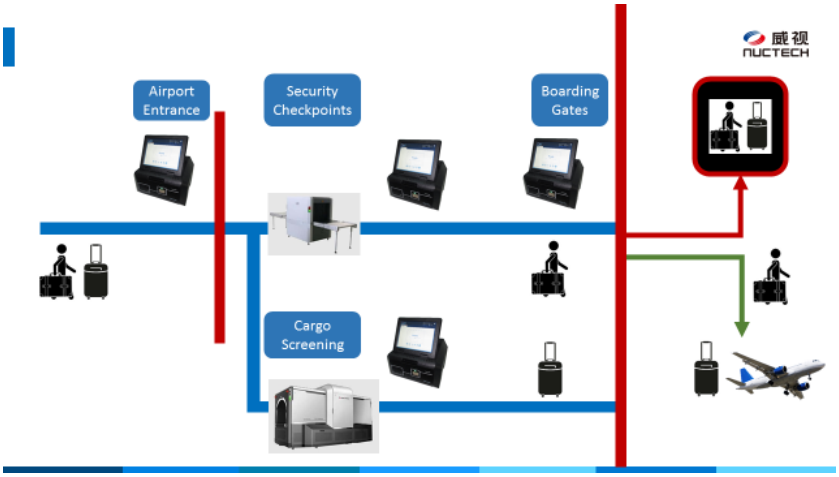

TR2000DC's application in aviation security

5.2 Application in Customs and Borders

TR2000DC can also play an important role in strengthening "Smart customs and borders" by detecting narcotics and explosives, when people are lining up before the border police, when baggage have just passed the CT scanners and when they are trying to pass the last customs gate.

Pico-nanogram detection sensitivity and high throughput features allows TR2000DC to quickly mark the suspicious passengers and their luggage. Then alarm information can be uploaded to border info. system, BHS and customs info. system. When several parts of information are put together, officers are able to focus the selected suspects to conduct a thorough inspection.

5.3 Application in Postal Service and Logistics

Postal and logistic system which inspect lots of stuff everyday now becomes extremely vulnerable against terrorist attack and illegal drug smuggling. For instance, Fentanyl has become a terrible problem in North America, since accidental exposure could immediately incur death to customs officers or emergency responders. In particular, when detecting Fentanyl, TR2000DC can be set as truncated alarm, which effectively protects the operators and first responders in the field.

6. Concept of Operations

6.1 Working Modes Available

TR2000DC has multiple working modes to meet various security demands.

Working Modes	Detection Targets
Dual Mode	Explosives and narcotics.
Explosive Mode	Explosives only.
Narcotic Mode	Narcotics only.

6.2 Startup and Preheating

After powered on, it takes less than 20 minutes to warm-up typically.

6.3 Calibration

TR2000DC is internally automatic calibrated. Upon completion of the preheating process, a CAL will be performed. For every 8 hours, an extra CAL can help improve the instrument's accuracy and lower the false alarm rate.

6.4 Verification

TR2000DC is configured with a verification pen to verify the detection availability.

6.5 Sample Collection

TR2000DC is equipped with low-cost reusable sampling swabs. Swab baker, as an effective auxiliary hardware, can help remove the moisture and impurities from the swab surface, used swabs without an alarm can be re-used for 10-20 times after being heated by the baker. When sampling, operators can hold the swab directly or load it to the sampling wand.

Sampling swab and Swab Baker

Sampling Wand and Particulate sampling

6.6 Analysis and Readout

Support by a large 10.4” LCD display monitor, the TR2000DC can deliver the analysis result in multiple types of explosives for easy readout with minimal interpretation.

- ✓ Pass indicator when there is no alarm
- ✓ Name of the detected substance
- ✓ Category of the detected substance
- ✓ Signal intensity/Credibility indicator of the detected substance
- ✓ IMS spectrum display (Histogram, spectrum or 3D spectrum)
- ✓ Configurable visual and audio alarm

6.7 Cleaning

TR2000DC is equipped with a smart cleaning program, as the system will automatically be cleaned in a minimal cycle which is decided by cleanness of the detector.

6.8 Data Management

Detection and operational records are saved automatically, and the storage capacity is no less than 80,000 samples. TR2000DC allocates an ID number for each analysis, with which users can easily query for details in the database. Data can also be exported to external memory card by USB interface or network transfer. TR2000DC has a build-in printer, able to print out each record.

6.9 Network Application

Based on Ethernet LAN port and TCP/IP protocol, TR2000DC can be easily connected to another information system. A set of standard connection protocols are presented and customization is supported.

7. Standard Configuration

Parts	Specifications	Quantity
Main Instrument	Nuctech™ TR2000DC	1
Calibration pen	Standard	1
Verification pen	Standard	1
Battery	Standard/96Wh	1
Sampling wand	Standard	1
Power cord	Depends on order	2
Filter pack	Standard	2
Swab	Standard / 350 pieces (minimum)	1
Swab baker	Standard	1
Maintenance Tool Kit	Standard	1
Technical Manual	Operation & Maintenance Manuals	1
Case	Standard	1

8. Consumables

Consumables are required to be replaced to maintain the TR2000DC in excellent performance, and the operations to change these consumables do not require any major dismantling for simplification. All consumables will be supplied during the warrantee and CAMC period.

Items	Specifications	Replacing Cycle	Remark
Swabs	Swab-04A	As demand	
Filter Pack	Filter Media-B	2 Packs/30 days	
Calibration Pen	Standard	1 year	
Verification Pen	Standard	1 year	
Semi-Permeable membrane	Standard	1 year	
Dopant	Standard	1 year	
Positive Mode Calibrant	Standard	1 year	
Negative Mode Calibrant	Standard	1 year	
Positive Ionizer Electrode	Standard	1 year	
Negative Ionizer Electrode	Standard	1 year	
Printing Roll	Standard	As demand	

9. Technical Specifications

General Specifications	
Technical Principle	Ion Mobility Spectrometry (IMS)
Ionization Technology	Non-radioactive Ionization Source (NRIS)
Analyzing Mode	Explosive Mode, Narcotic Mode and Dual Mode
Detectable Explosives	TNT, RDX, PETN, NG, AN, HMTD, HMX, TETRYL, TATP, UN, EGDN, DNT, Semtex, C4, Black Powder, etc.
Detectable Narcotics	Cocaine, Heroin, THC, MA, Ketamine, MDMA, Morphine, Amphetamine, LSD, Ephedrine, Fentanyl, etc.
Calibration Method	Automatic internal calibration
Verification Method	Standard Verification Pen
Sampling Method	Particulate Wiping
Sensitivity	Pico-Nanogram
False Alarm Rate	< 1%
Analysis Time	< 8 seconds
Cleaning Time	15 seconds (Typical)
Warm-up Time	< 20 minutes
Functions and Configurations	
User Interface	10.4” high resolution color touch-screen
Readout	Automatic Pass/Alarm with substance name, credibility indicator, spectrum and configurable sound
Communication Interface	Ethernet / USB / VGA
Data Storage Capability	40,000 samples, supporting backup via USB or Ethernet.
Printer	Built-in thermal printer
Installation Data	
Dimensions	340mm(L)×325mm(W)×233mm(H)
Weight	< 11.5 kg
Power Supply	100VAC～240VAC, 47-63 Hz, 210W
Battery Standby	Up to 1 hour in full operation
Storage Temperature	-20℃～+60℃
Operating Temperature	-20℃～+55℃
Operating Humidity	0～95% (non-condensing)
Operating Pressure	40-106 kPa

EUROPEAN CIVIL AVIATION CONFERENCE

CONFERENCE EUROPEENNE DE L'AVIATION CIVILE

When replying, please quote: EC 9/8.3/116 — 1071 19 September 2019

Subject: ECAC Common Evaluation Process of security equipment (CEP)

Explosive trace detection (ETD) equipment – Full Test results (2018-ETD-FT-007)

Dear Mr Renran Xu,

I refer to the ECAC Common Evaluation Process of security equipment (CEP) applied to explosive trace detection (ETD) equipment and to your submission of equipment for testing within this framework. In accordance with the ECAC Common Testing Methodology (CTM) for ETD equipment, TNO (the Netherlands) completed the Full Test of the following piece of equipment on 31 May 2019:

Model:	TR2000DC
System Hardware:	Detector CIL4.0 Firmware C1.2.0
Detection Algorithm:	D18.9.26
Auxiliary Hardware:	Sampling Swab: Type-04A Swab Baker: Type-02E
System Software:	Operation Software D2.6.2
CONOPS Version:	19.03

The results of the test were considered by the ECAC CEP Management Group. The ECAC CEP Management Group endorsed that this ETD meets the ECAC/EU Standard 1 performance requirements, for both fields of operation: passengers and cargo.[1]

This evaluation is valid only for the ETD equipment in the configuration described above, unless otherwise explicitly indicated.

I understand that the Test Centre provided you with relevant technical information on the test proceedings during a debriefing after the test completion.

Mr Renran Xu
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Shuangqing Road
Haidian District
100084 Beijing
People's Republic of China

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FAX: 33 (0) 1 76 73 98 57
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www.ecac-ceac.org

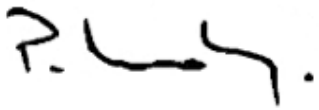
As per the CEP Administrative Arrangements, the report of the test results has been communicated, with the appropriate confidentiality protection, to all ECAC Member States.

The Q3 2019 test results of ETD equipment found to meet a standard will soon be published on the ECAC website. Furthermore, copies of the equipment lists with the CEP test results which feature on the ECAC website are regularly provided to ICAO, which in turn updates the lists of configurations on the ICAO AVSECPaedia secured section of its own website, for the benefit of the wider international community.

Mr Gaël Weidmann (gweidmann@ecac-ceac.org) and the ECAC Secretariat (cep@ecac-ceac.org) are of course available to provide you with any further information.

I look forward to the continued participation of your company in the ECAC Common Evaluation Process of security equipment.

Yours sincerely,



Patricia Reverdy
Acting Executive Secretary of ECAC

[1] As published in ECAC Doc 30, Part II (13th edition/May 2010) and mandated in the Commission Decision C(2015) 8005.

Nuctech™ TR2000DC

Desktop Explosives and Narcotics Trace Detector

Operation Manual

Statement

Welcome to use Nuctech TR2000DC Desktop Explosives and Narcotics Trace Detector. Before using this product for the first time, please carefully read the operation manual delivered with the product. This will help you better understand and use this product. For product configuration, please refer to the product-related contracts, product packaging list. The pictures in this manual are for reference only. The actual product appearance shall prevail.

Nuctech disclaims any responsibilities for any direct or indirect or consequential damages arising from or in connection with the installation, performance or use of the product. The Detector must be operated and maintained under the instruction from the manual in a safe and reasonable way, or the warranty will lapse.

The usage environment affects the detection performance of Nuctech Desktop Explosives and Narcotics Trace Detector. Users should use the device in the environment required in the operation manual and try to keep the environment clean, where the device is deployed. Performance degradation of the device due to poor usage environment shall not be treated as a reason for requiring Nuctech to perform the quality assurance obligation.

As committed to enhancing product functions and improving service quality constantly, Nuctech reserves the right to modify functions and components without any prior notice.

Contact us

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CONOPS Version: V21.07
Revision: 2021/07/28

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Contents

1 Safety and Regulation

This manual will use the following safety warning signs for high voltage, hot surface and other general warnings in device working locations.

	**High voltage warning!** **Caution, electric shock danger**
	**Hot surface warning!** **Caution, burning danger**
	**General warning!** **Please proceed under instruction**
	**General warning!** **Caution, flame damage**

1.1 Safety Instruction

TR2000DC Desktop Explosives and Narcotics Trace Detector adopts non-radioactive ionization source. No related licensing or special treatment is required during device usage. High voltage exists within local parts of the device. Untrained maintenance personnel shall not open the device shell for any operation. During daily operation, the sample inlet is in high temperature state, please be cautious during related operations.

1.2 Typographical Conventions

During the operations, users shall click the buttons on touch screen. Buttons names will be shown in angle brackets in this manual. For example, < OK > is a button name on touch screen.

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2 Overview

2.1 About TR2000DC

Nuctech TR2000DC Desktop Explosives and Narcotics Trace Detector is designed and manufactured independently by Nuctech Company Limited. This chapter provides an overview of the technical principle, product features and technical specifications of TR2000DC. Using trace detection technology based on Ion Mobility Spectrometry (IMS), it can carry out accurate detection for particles or vapor of trace explosives and narcotics, and report the substance's name. Due to its high sensitivity and high efficiency, this device is widely used for contraband detection in Customs, airports, seaports, border ports and crowd-gathered places, or applied as a tool for forensic evidence identification.

2.2 Technical Principle

TR2000DC uses a reliable trace detection technology based on Ion Mobility Spectrometry (IMS). The core component of the instrument is the detector. After the collected sample is inserted into the thermal desorber, it will pass through the semi-permeable membrane and enter the detector in gaseous form. In the ionization region of the detector, the air molecules are ionized. These reactant ions will continue to ionize the sample molecules, forming different ion clouds. When the ion gate is open, these ion clouds are dragged into the drift tube by electric field. In this drift region, the average drift velocity of ion clouds is related to their charge-to-mass ratio and the structure of molecules, their drift time drastically differentiate with each other. Consequently, contraband can be detected by matching this time and signal intensity to the standard substance library.

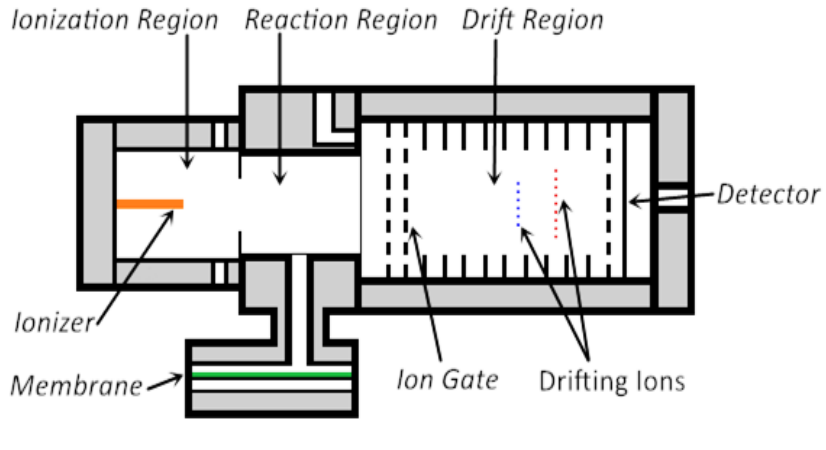

Figure 2.1 IMS Technical Principle

2.3 **Product Features**

- ✓ Non-radioactive ionization source with stability and long life.
- ✓ Simultaneous detection of explosives and narcotics without switching.
- ✓ High detection sensitivity and signal resolution for substance identification.
- ✓ Low false alarm rate due to new generation of algorithm and dopant.
- ✓ Quick analysis and fast cleaning process to promote efficiency.
- ✓ Automatic internal calibration with no extra manual operation.
- ✓ Upgradable substance library and operational software.
- ✓ 10.4” touch screen to simplify the operation and enhance user experience.
- ✓ Built-in 10/100M Base-T Ethernet port and USB port for data acquisition and integration with other ICT system(s).
- ✓ Intelligent self-diagnose system with UI notification and guidance.
- ✓ Effective UI wizard for consumable replacement and maintenance.
- ✓ Fast maintenance without power-off nor dismantling of bulk.
- ✓ Modularized system design to simplify repair.
- ✓ Built-in thermal printer.

2.4 **Technical Specifications**

Table 2-1 Technical Specifications

Item		**Specifications**
Detectable Substances*	Explosives	TNT, RDX, PETN, NG, AN, HMTD, HMX, Tetryl, TATP, UN, EGDN, etc.
	Narcotics	Cocaine, Heroin, THC, MA, Ketamine, MDMA, Morphine, Amphetamine, LSD, Ephedrine, Fentanyl, etc.
Sensitivity		Nano gram（10^{-9}-10^{-7}gram）
Warm-up Time		< 20 minutes
Data Storage		> 100,000 sets of records (expandable memory) Supporting backup via USB or Ethernet.
Device Interface		Ethernet/USB/VGA
Dimensions	Detector	340 mm x 325 mm x 233 mm (L x W x H)
	Packaging Case	660 mm x 500 mm x 350 mm (L x W x H)
Weight	Packaging Weight	About 22 kg
	Detector Weight	< 12 kg
Display		10.4" TFT-LCD Touch Screen
Power Supply and Battery		100VAC～240VAC, 50Hz/60Hz, 210W Hot-pluggable battery supporting 1-hour operation
Printer		Built-in printer
Environment parameters	Storage Temperature	-20℃ to +55℃
	Operating Temperature	-20℃ to +55℃
	Operating Humidity	0 to 95% (non-condensing)
	Operating Pressure	40 kPa to 106 kPa

* Threat substances and sensitivity setting are subject to regulatory authority and customization

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3 Device Components

3.1 About This Chapter

This chapter introduces the system structure, product appearance, consumables and accessories of TR2000DC Desktop Explosives and Narcotics Trace Detector.

3.2 System Structure

TR2000DC Desktop Explosives and Narcotics Trace Detector is integrated by a collection of subsystems as depicted in Figure 3.1.

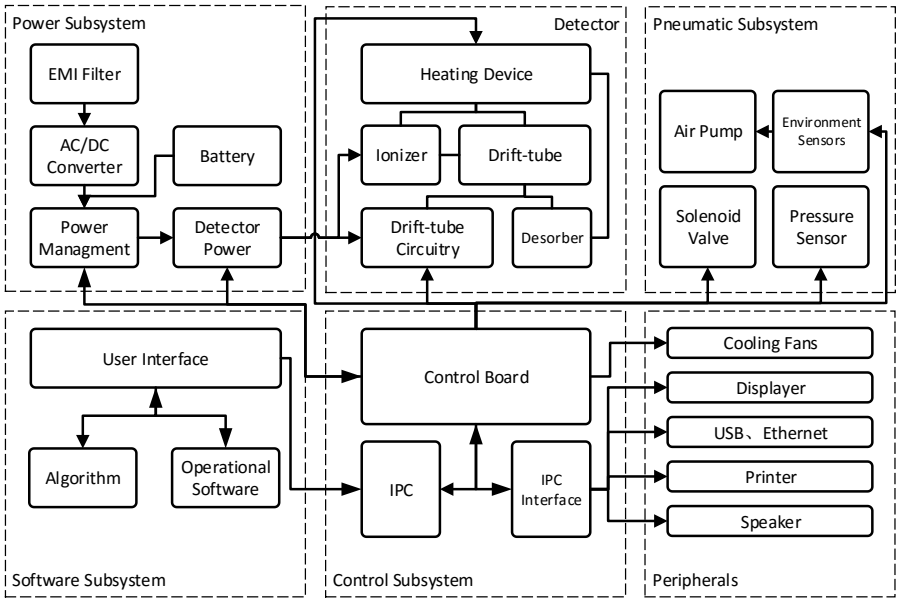


Figure 3.1 System Structure

3.2.1 Power Subsystem

Power subsystem incorporates EMI filter to withhold electric surge, AC/DC converter to transmit AC power to DC supply. Power management board controls the process of charging the battery and supplying other system with power. Detector power is a specialized high-voltage board to drive drift-tube and ionizer within the detector.

3.2.2 Detector

Detector is the most core component in the TR2000DC, since it's responsible for sample thermal desorption, non-radioactive ionization, gate shutting, separation of ions and extraction of signal. An innovative dual-channel design is applied to enable the simultaneous positive and negative ions detection.

3.2.3 Pneumatic Subsystem

Pneumatic subsystem is second most important part of TR2000DC, it is basically made of air pumps, valves, pipes, filters, manifolds and sensors, supplying the detector with purified and flow-stable air, as well as sweeping away residual sample neutrals after detection.

3.2.4 Control Subsystem

The functions of the control unit include acquiring detector signals from the drift tube, controlling the heating, air pumps, status indicators and fans and providing power supply.

3.2.5 Software Subsystem

Windows-based Operational Software is developed with functions such as Graphic User Interface (GUI), Data Acquisition (DAQ), detection algorithm and Detection result visualization, etc.

3.2.6 Peripherals

Peripherals include cooling fans, touch screen, USB ports, Ethernet, printer and speaker.

3.3 Product Appearance

Nuctech TR2000DC's physical appearance is shown in the following figures.

	As the inner temperature of sample inlet is very high, please do not touch inside nor insert any other article except sampling swabs.

Figure 3.2 Front Structure

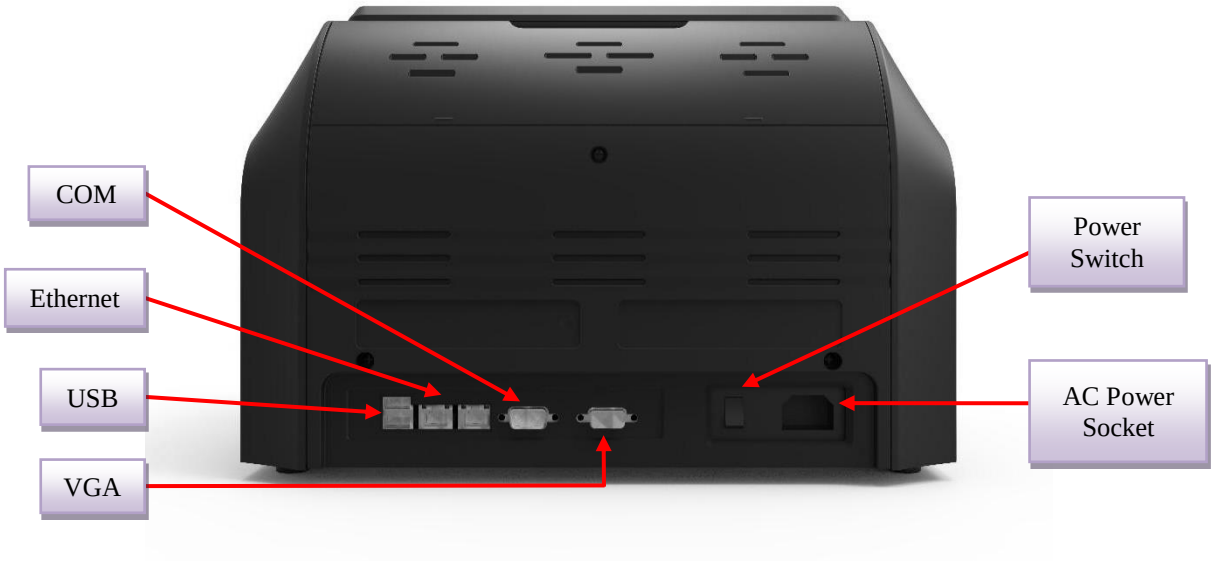


Figure 3.3 Rear Structure

3.4 Consumables

3.4.1 Sampling Swab

The detector is equipped with Swab-04A, as shown in Figure 3.4. The round front of the swab (one third of the total length) is used to wipe the surface of the object to collect particles during sampling. A swab needs to be placed in the instrument with the collected sample facing upward. Clean nitrile gloves are required during sampling with hand to avoid contamination. Swabs should be kept dry and clean. Store the swab box in a clean and dry place.

	Each sampling swab can be reused for 20 times maximum if it does not trigger an alarm, not broken and not visually contaminated. Don't put used swabs back into the swab box. Swabs that triggered alarms, used in Calibration and Verification should not be used again.

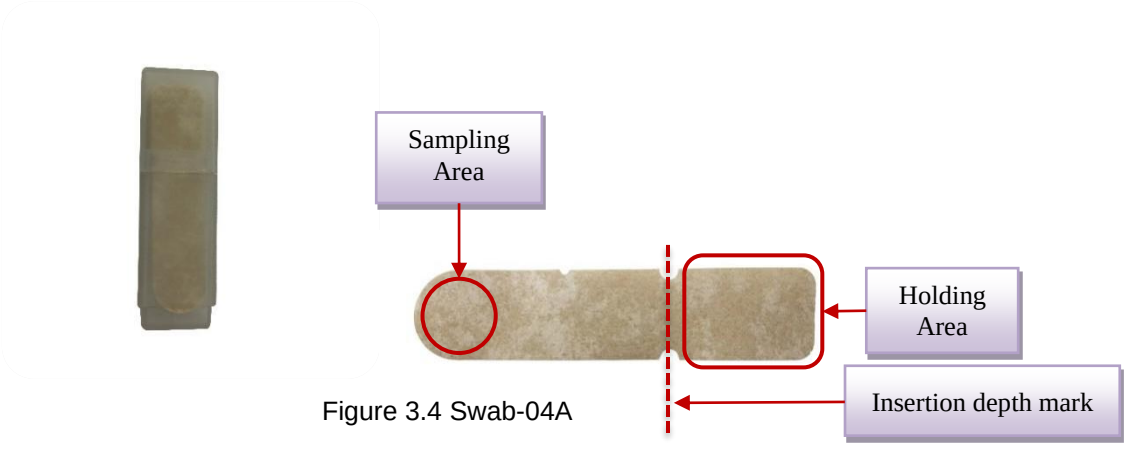


Figure 3.4 Swab-04A

3.4.2 Filter Media

The device is equipped with an extra filter pack that contains filter media for absorption of moisture and impurities in the air. The filter media is consumable and is packed in the factory. Please check Section 6.2 for replacement of filter media.

	Filters are normally replaced every 720 hours, but a 360-hour preventive maintenance is recommended in a highly humid area. If the device is heavily contaminated, please change the filter immediately.

Figure 3.5 Filter Media-B and Filter Container

3.4.3 Calibration Pen

TR2000DC is equipped with a calibration pen for standard or manual calibration. Please check Section 5.2 for further instruction.

	In general, the life cycle of one calibration pen is 12 months. It should be replaced when the deadline approaches. It's recommended to change the pen as a preventive maintenance every year.

Figure 3.6 Calibration Pen

3.4.4 Verification Pen

TR2000DC is equipped with a verification pen to verify the functionality and performance of the system. Please check Section 4.6 for further instruction.

	In general, the life cycle of one verification pen is 12 months. It should be replaced when the deadline approaches. It's recommended to change the pen as a preventive maintenance every year.

Figure 3.7 Verification Pen

3.4.5 Internal Calibrant

TR2000DC is equipped with replaceable internal calibrant both for positive and negative mode. Please check Section 6.2 for further instruction.

	Normal life cycle of one Internal Calibrant cartridge is 2 years. Please change it only when the notification is presented. It's recommended to change the cartridge as a preventive maintenance every year.

Figure 3.8 Calibrant's appearance

3.4.6 Dopant

TR2000DC is equipped with replaceable internal dopant both for positive and negative mode. Please check Section 6.2 for further instruction.

	Normal life cycle of one Dopant cartridge is 2 years. Please change it only when the notification is presented. It's recommended to change the cartridge as a preventive maintenance every year.

Figure 3.9 Dopant's appearance

3.4.7 Positive Ionizer electrode

The electrode of the positive ionizer is a replaceable consumable. Please check Section 6.2 for further instruction.

	Normal life cycle of one positive ionizer is 2 years. Please change it only when the notification is presented. It's recommended to change the ionizer as a preventive maintenance every year.

3.4.8 Negative Ionizer electrode

The electrode of the negative ionizer is a replaceable consumable. Please check Section 6.2 for further instruction.

	Normal life cycle of one negative ionizer is 2 years. Please change it only when the notification is presented. It's recommended to change the ionizer as a preventive maintenance every year.

3.4.9 Membrane

The membrane is a replaceable consumable. Please check Section 6.2 for further instruction.

	Normal life cycle of one membrane is 2 years. Please change it only when the notification is presented. It's recommended to change the membrane as a preventive maintenance every year. Inspection should be conducted every 6 mouths.

3.5 Accessories

3.5.1 AC Power Cable

The AC power cable is used to provide the TR2000DC with power supply, and the input voltage should be 100-240 VAC, 47-63 Hz.

Figure 3.10 AC power cable

3.5.2 Maintenance Tool kit

The maintenance tool kit contains some tools used for maintenance of the Nuctech TR2000DC including a special wrench for filter installation and an Allen wrench, as shown in the figure below.

Figure 3.11 Maintenance tool kit

3.5.3 Swab Baker

	As the inner temperature of Swab Baker is very high, please do not touch inside nor insert any other article except sampling swabs.

NUCTECH' patented Swab Baker is designed to sterilize and recycle the swabs. Heating the swabs over 200℃ help to remove moisture and impurities on the surface, and sterilize the swab, exterminating virus or germs, thus keeping them dry and clean, ensuring better detection performance. Taking a heated swab directly from the Baker is much faster than opening & closing the swab box. The Baker contains 4 rectangular cells that can hold a full box of swabs.

Figure 3.12 Portable Swab Baker

3.5.4 Sampling Wand

The detector is equipped with its patented sampling wand-Thumbprint Wand™, as shown in Figure 3.13. The sampling wand enables the users to collect sample from the target without direct contact. As an option, an RFID tag can be integrated on the Wand to enable the counting of the reusable times of the installed swab.

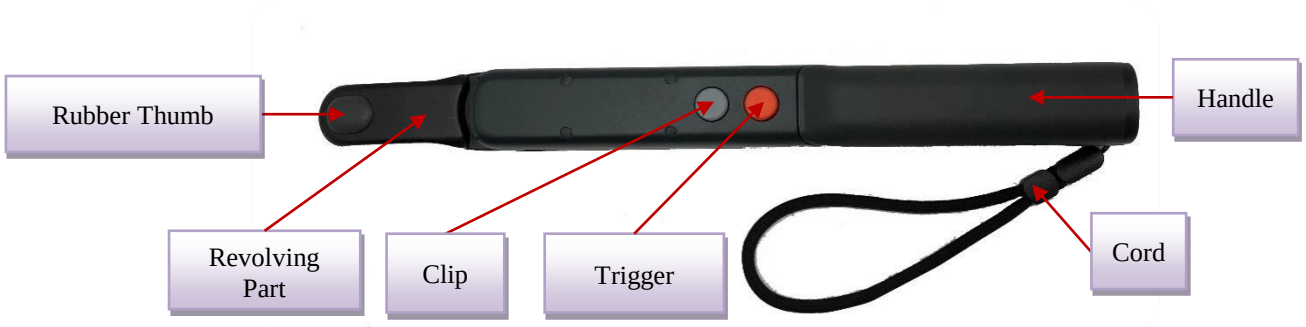


Figure 3.13 Thumbprint Wand™

Figure 3.14 Thumbprint Wand™ with optional RFID

3.5.5 Case

The Detector is equipped with a solid transportation case. The case is equipped with rollers and a retractable pull rod. Draw out the pull rod upward to the limit to fix the case or press the pull rod downward to collapse the pull rod. There are 4 latches on the case which can be released by pushing down the button in the arrow direction as shown in Figure 3.15.

Figure 3.15 Transportation Case and Latches

3.5.6 Battery

TR2000DC is equipped one battery, which is hot-swappable, and fully-charged battery supports 1 hour working without extra electricity supply.

Figure 3.16 Removing the Battery

4 Basic Operation

4.1 About This Chapter

This chapter introduces basic operations of TR2000DC Desktop Explosives and Narcotics Trace Detector.

4.2 Power on

4.2.1 Switch on the Device

⚠	It is highly recommended that the instrument only be used after a 24-hour cleaning when being deployed at a new site, due to an increase of the internal humidity or unexpected contamination after a long trip.

1. Plug the power cable connector of TR2000DC into the power socket.
2. Flip the power switch of TR2000DC. The Welcome screen will appear after the device is completely booted. TR2000DC offers a friendly user interface on the base of an easy touch screen.
3. Please click anywhere on the welcome screen to enter the user login interface.

4.2.2 Switch on the Swab Baker (optional)

⚠	It is highly recommended that the operator uses the Swab Baker together with the instrument in operation.

1. Switch on the Swab Baker. Ensure that the power indicator light is on.
2. Put the sampling swabs from the swab box into the Baker's grids.

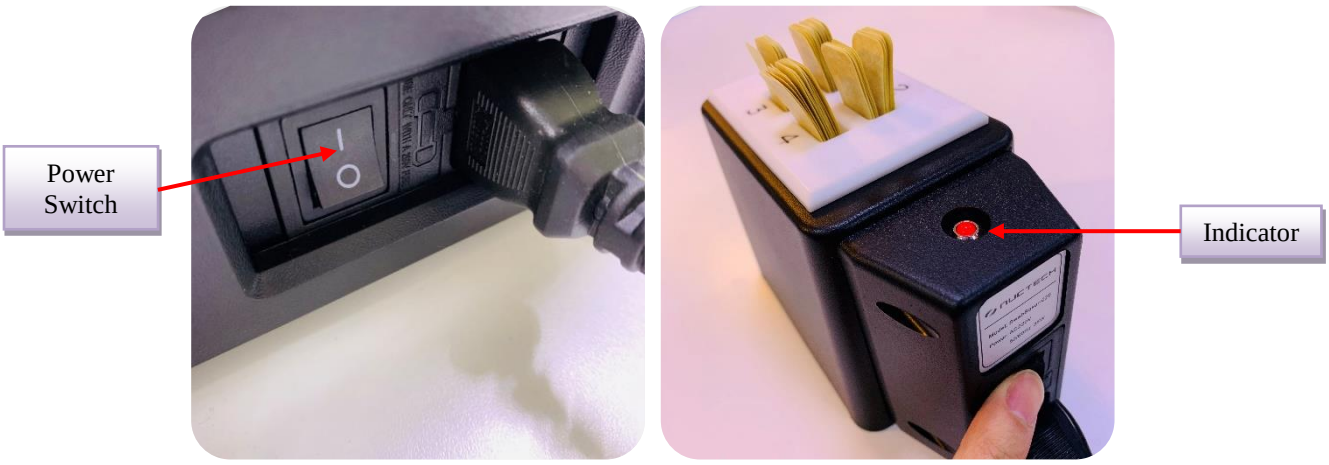


Figure 4.1 Power on the instrument and Swab Baker

Figure 4.2 Welcome Interface

4.3 Login

1. Please select the appropriate user according to your authorization. There are 3 default users, namely Operator, Manager and Superuser from the username drop-down menu. The default password of the operator is 001.
2. Click <OK> button to enter the main interface. If the user enters a wrong password, the system will prompt the user to re-enter. Click <backspace> to clear the entered password. click <Cancel> to return the welcome screen.

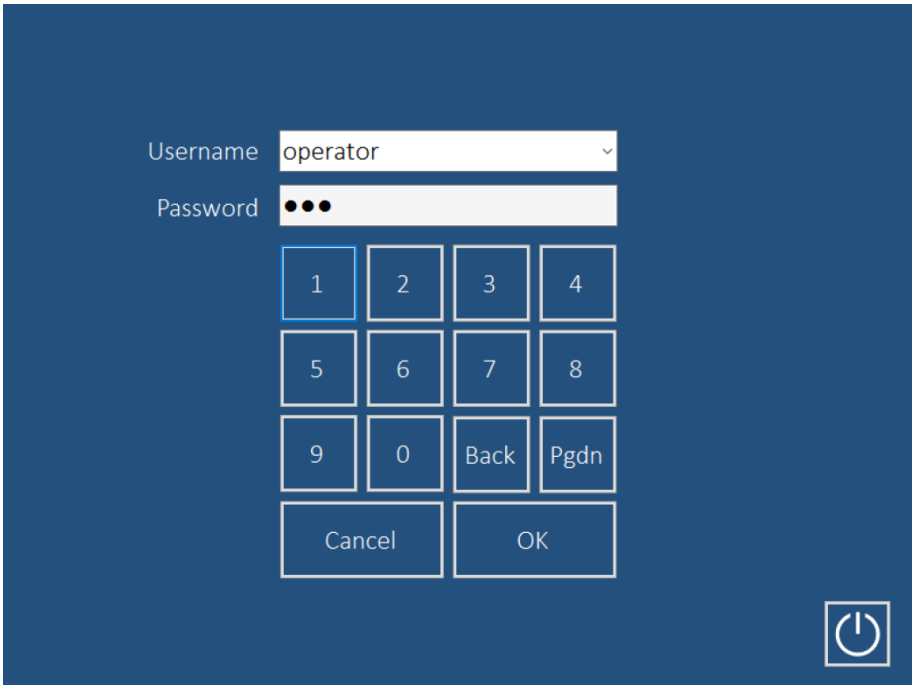


Figure 4.3 Log-in Interface

4.4 **Pre-heating**

The process of heating consists of two phases, preheating and balancing. During the preheating, the temperature of the heated detector rises rapidly. When the temperature reaches the preset value and gets stabilized, preheating will be completed.

Figure 4.4 Pre-heating

4.5 **Self-check**

After preheating process, the system performs the Self-check. The area with white background on the top of the main interface is the main information prompting area, where all alarms and the current assignments are displayed. therefore, users should pay more attention to this information prompting area during operations, refer to the figure below. When Self-check is completed, the system will conduct automatic internal calibration, please check Section 4.6 for detailed description.

Figure 4.5 Self-check

4.6 Calibration

Calibration (CAL) is an important standard operation for TR2000DC because CAL enables the system to continuously adapt to changing environment. TR2000DC allows operators to perform Auto Calibration and Standard Calibration (with CAL pen).

4.6.1 Auto Calibration

	Device will be automatically calibrated every 24 hours to remain operational. And the system will automatically calibrate itself when necessary.

An automatic calibration will be executed by the program after self-check. And normally this requires no manual operation. When it shows the green words “Calibrated”, users can proceed to do detection.

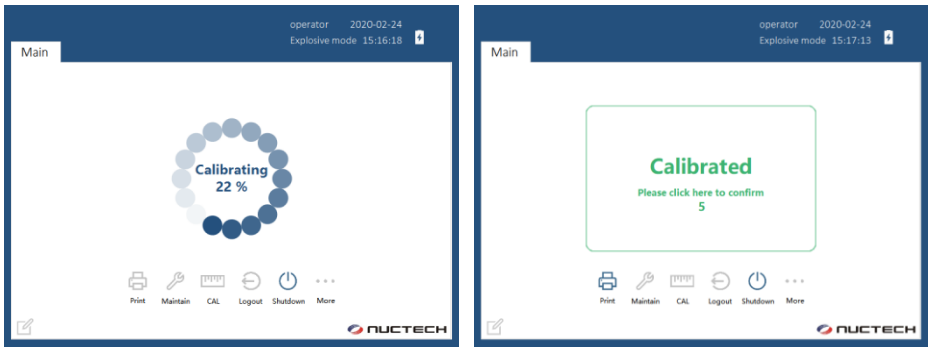


Figure 4.6 Auto Calibration after Self-Check

However, extra calibration is recommended in the following circumstances so as to ensure the optimal detection performance.

1. The system pops out a blue notification indicating calibration suggested.
2. The environment (e.g. pressure) has significantly changed.
3. After a 2-hour deep cleaning due to frequent false alarms.
4. After changing the filter material.

On any of these conditions, please Click<Calibrate> from Menu, or CAL from the shortcut on the main interface and then click <Auto>, system will run one calibration automatically. The calibration result will be delivered on the screen.

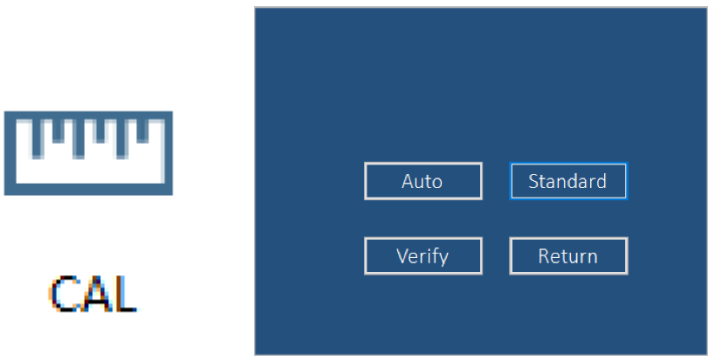


Figure 4.7 Perform extra Auto Calibration

4.6.2 Standard Calibration

	Please strictly follow the protocol and use the right tools when performing standard calibration. Please don't use the out-of-date calibration pen, otherwise it may result in wrong calibration to cause frequent false alarms.

In case Auto Calibration fails to complete, please use Calibration Pen and sampling swab to perform a standard calibration.

1. Please make a calibration swab. The mark of the length should be about 1cm on the swab sampling area, slightly for twice with the calibration pen. The valid sampling area during the calibration refers to the figure below.
2. When the detector is in the ready state, click <CAL> on the main interface, then we can see the calibration options, click <Standard>, then the system will indicate user to insert the calibration swab. Please insert the calibration swab and the system will finish the rest of the calibration automatically.
3. When the screen gives the prompt that calibration finished, click<Calibrated> button to confirm the result or wait 5 seconds, then the device start cleaning and recover to ready status.

If standard calibration fails, please try changing the filter or use another new pen. In case none of this works, please contact Nuctech technical support immediately.

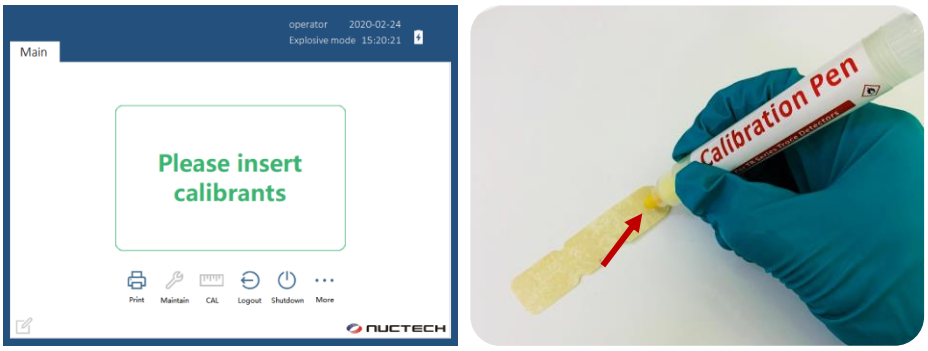


Figure 4.8 Prepare for a Standard Calibration

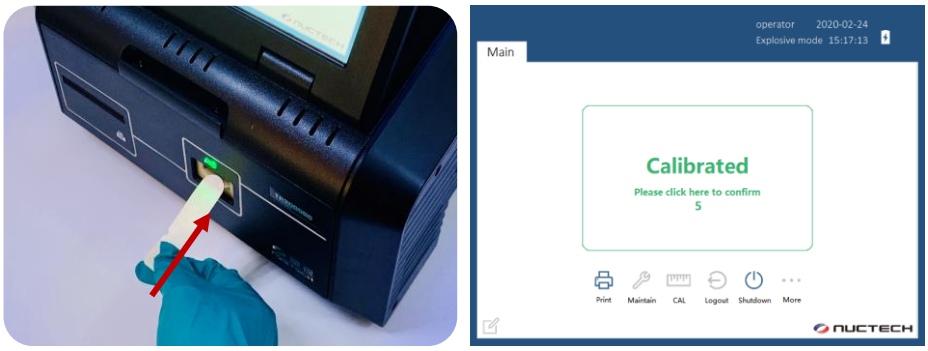


Figure 4.9 Perform a Standard Calibration

4.7 **Verification**

	It is highly recommended that the device be routinely verified every 24 hours.

After a successful calibration, users can verify the detection performance by conducting verification. Please follow the detailed instruction below.

1. Blank swab test to make sure the swab is not contaminated.
2. Make a mark of the length about 1cm on the swab sampling area slightly for twice with the verification pen. The valid sampling area during the calibration refers to the figure below.
3. When the device is in the ready state, click <CAL> on the main interface, then click <Verify>, system will indicate user to insert verification swab.
4. Please insert the verification swab and the system will carry out verification automatically.
5. Confirm the result or wait for 5 seconds, then the device start cleaning and recover to ready status.

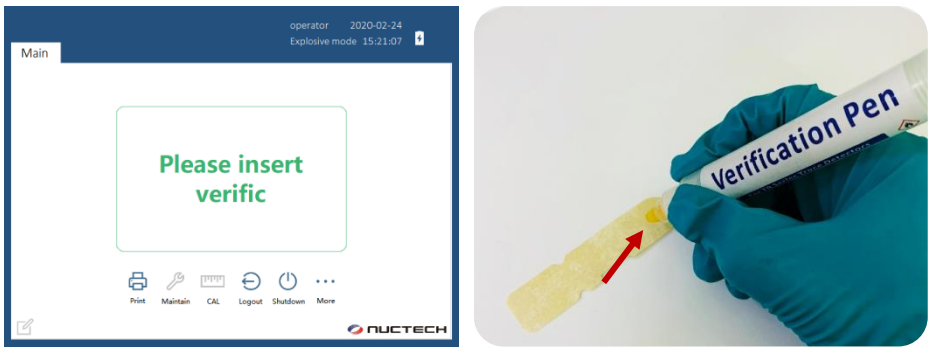


Figure 4.10 Prepare for a Verification

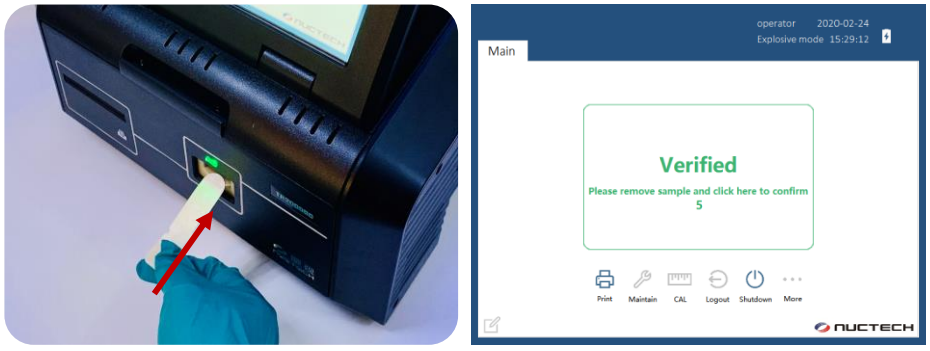


Figure 4.11 Perform a Verification

If verification failed, please try the following procedures,

- ✓ Get a new blank swab from the baker.
- ✓ Use verification pen, smear twice more than last time and verify again.
- ✓ If verification still fails, please check Section 8.3.

4.8 Detection

4.8.1 Blank Test (optional)

	Blank test is an optional procedure to make sure the system does not alarm on the swab prior to sampling and analysis, especially when operator takes the swab directly from the swab box.

When the detector is in ready status, operator should follow the procedures to conduct a blank test.

1. When the device is “Ready”, take out a swab from the swab box. Please remember to close the cover of the box to avoid contamination.
2. Please insert the swab into the sample inlet quickly and fully. If no alarm is triggered, the swab can be used for sampling.
3. If the test fails with an alarm, please perform another blank swab test on the same swab, if the blank swab test still fails for the second time, please throw away the swab.
4. On condition that swab blank test consistently fails, please check Section 6.1 for deep cleaning.

Figure 4.12 Perform a Blank test

Notes:

- ✓ Operator can skip the blank test when using a heated swab from the Baker.
- ✓ Swab Baker also frees the operator from frequently opening and closing the swab box, which increases efficiency and reduces cross-contamination.

4.8.2 Collect Samples

Sampling with Hand

	Wearing clean nitrile gloves is required during "Sampling with Hand" to avoid contamination when operator's fingers touch the swab.

1. When sampling, it's recommended that operator directly take the cleaned swab from the Swab Baker.
2. Operator can hold the swab with fingers. Please mind the position of the sampling area.
3. Operator should use its sampling area to press and wipe the surface to collect trace particles. Don't push too hard on the surface.

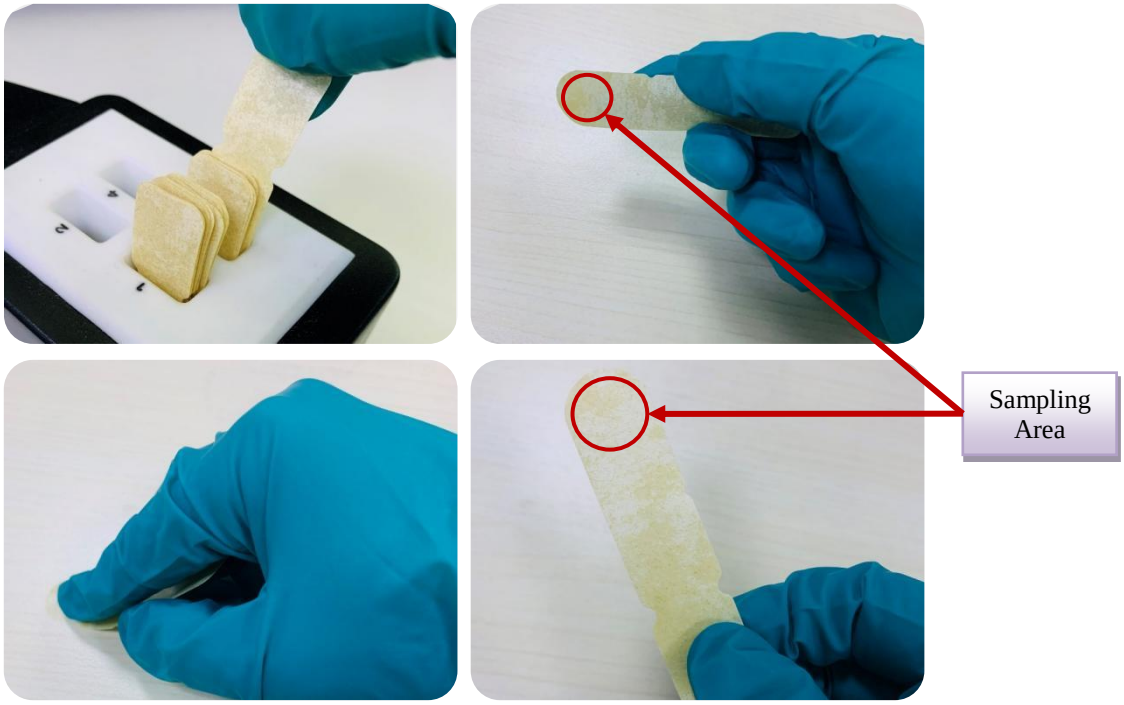


Figure 4.13 Particle sampling with Hand

Notes:

- ✓ If the sample is powder form, please do not directly feed discernible powders into the sample inlet to avoid deep contamination. Under this circumstance, please take a clean swab to wipe the package surface of the powders, and proceed to test the inner part of the package step by step.
- ✓ For liquid, please take a clean glass container, pour some liquid to inspect, dip the swab tip, take it out, wait for it to dry, and feed it into the inlet.

Figure 4.14 Don't directly put powder on the swab

Sampling with Wand

	Wearing clean nitrile gloves is only recommended, but not mandatory in "Sampling with Wand" to avoid cross contamination.

1. Load the swab: Press Trigger (the red one), the Revolving Part will rotate from vertical to horizontal stance. Then insert the swab into the slot on the top of the wand, while pressing Clip (the gray one), as shown in Figure 4.15. Release Clip (the gray one) and manually push the Revolving Part back.
2. Sampling with Wand: During sampling, wipe the object to collect trace particles with the sampling area on the front end of the swab. Don't push too hard on the surface.
3. Unload the swab: After sampling press Trigger to release the Revolving Part. Then press Clip and remove the swab.

Figure 4.15 Particle sampling with Thumbprint Wand™

Notes:

- ✓ After sampling with wand, operator has the option to insert the swab into the sample inlet without unloading the swab from the wand.
- ✓ The Wand with optional RFID can help count the reusable times of the swab.

4.8.3 Analyze the Sample

	The swab has to be introduced into the sample inlet in the right direction, with the sample area facing up and the swab should be fully inserted.

1. When the TR2000DC system is “Ready”, please insert the sampling swab with collected sample into the sample inlet quickly, and the system will automatically analyze the sample. Please make sure that the sample side of the swab faces upward direction.
2. If any contraband is detected, red alarm information will be quickly displayed with the substance’s name, category and signal intensity. And the system also generates an acoustic alarm via its speaker. If no contraband is detected, a green “Pass” sign will be displayed.
3. When the analysis is done, please remove the sampling swab immediately to avoid contamination of the sample inlet.
4. Operator should click the alarm result to <Confirm>, system will start the automatic cleaning. In case of a “Pass” result, the system will start cleaning automatically after 5 seconds if operator does not click to <Confirm>.
5. The swab with a “Pass” analysis result can be reused for sampling, but alarmed, broken or contaminated swabs should be discarded. Please follow the instruction of how many times left this swab can be reused.

Figure 4.16 Analysis and detection

Notes：

- ✓ As an option, the swab with a “Pass” result can be placed into the Baker again before the next sampling, avoiding contamination of the swab by the environment.

4.9 **Cleaning**

	Please do not manually terminate the cleaning process after a single analysis in normal cases.

Cleaning operation can clear the residual sampling substance or contaminant in the instrument to recover the performance rapidly. Cleaning is started by the system automatically after calibration or after an analysis cycle, referred to the figure below.

TR2000DC is equipped with a smart cleaning program, as the system will automatically adapt the total time of cleaning to the cleanness of the detector. The maximum clean time after a single analysis is 50 seconds (configurable), allowing the instrument to be effectively recovered in most cases.

Figure 4.17 Automatic cleaning

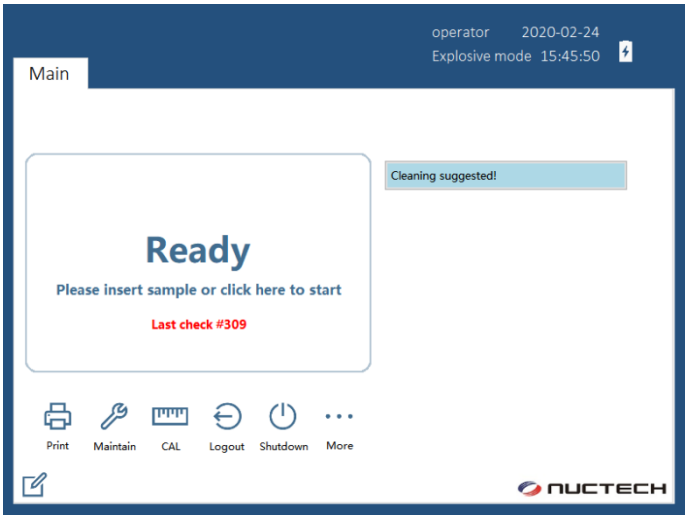


Figure 4.18 Contamination indication

Notes：

✓ If the system is not cleaned afterwards, a blue notification will emerge

indicating contamination detected. On this condition, please rest the instrument for a moment or change filters immediately. Please check Section 6.1 for details.

✓ Users are able to terminate the cleaning process by clicking “Cleaning” in the center, but this action may lead to enduring contamination.

4.10 **Menu**

Operators have access to the system menu. Please click <More> at the shortcut to open the menu. Inside the menu, there are icons of Calibration, Data, Options, Maintenance, About, Logout and Shutdown.

Figure 4.19 Operator’s menu

4.11 Statistics

Click <more>\<Data>\<Statistics>, users can check the daily, monthly and yearly statistics from the panel.

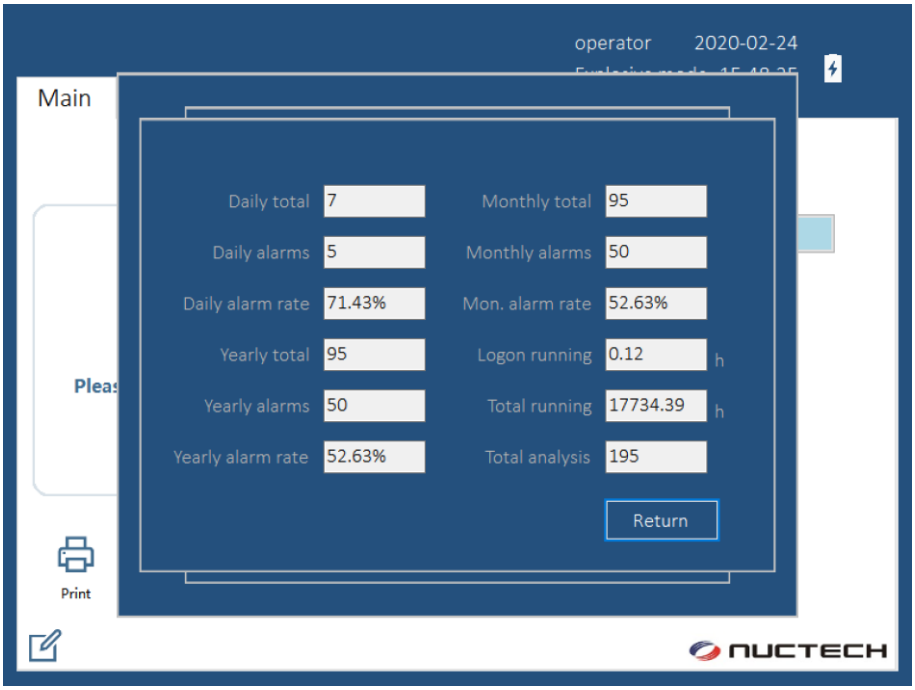


Figure 4.20 Statistics

4.12 Options

Click <more>\<Options>, operators can change the preference setting of the system including Language, alarming sound and volume.

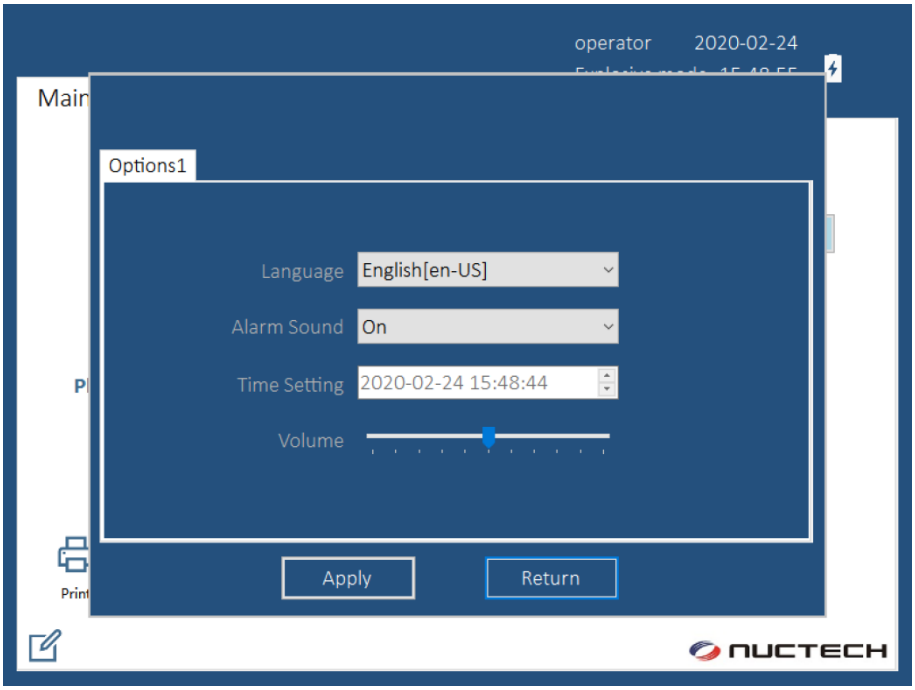


Figure 4.21 Options

4.13 Maintenance

Operators can enter the <Maintenance> to perform cleaning. But to change consumables they should request the permission of a staff with manager or superuser's password to authorize that process. Please check Chapter 6.2 for detailed description to change consumables.

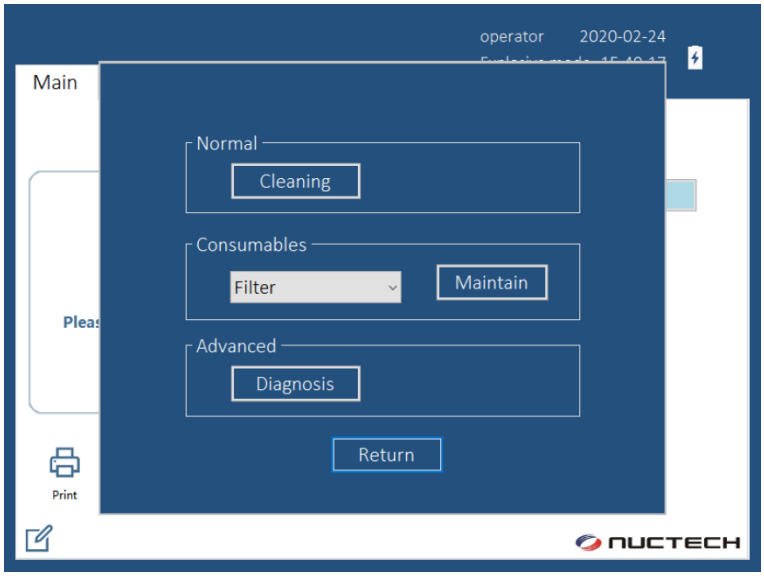


Figure 4.22 Maintenance panel

4.14 Product Information

TR2000DC's main product info can be checked in software. Please click < About> from the Menu, it shows the software version, algorithm version, firmware, detector version, serial No., production line and production date of the Detector.

Figure 4.23 Product information

Notes:

- ✓ The version information is subject to regulatory requirement, industrial certification and user customization, specified in other technical documents.

4.15 **Logout**

Users are free to log out the system whenever it is. Please click Logout from the menu to return to user login interface, as shown in Figure 4.24.

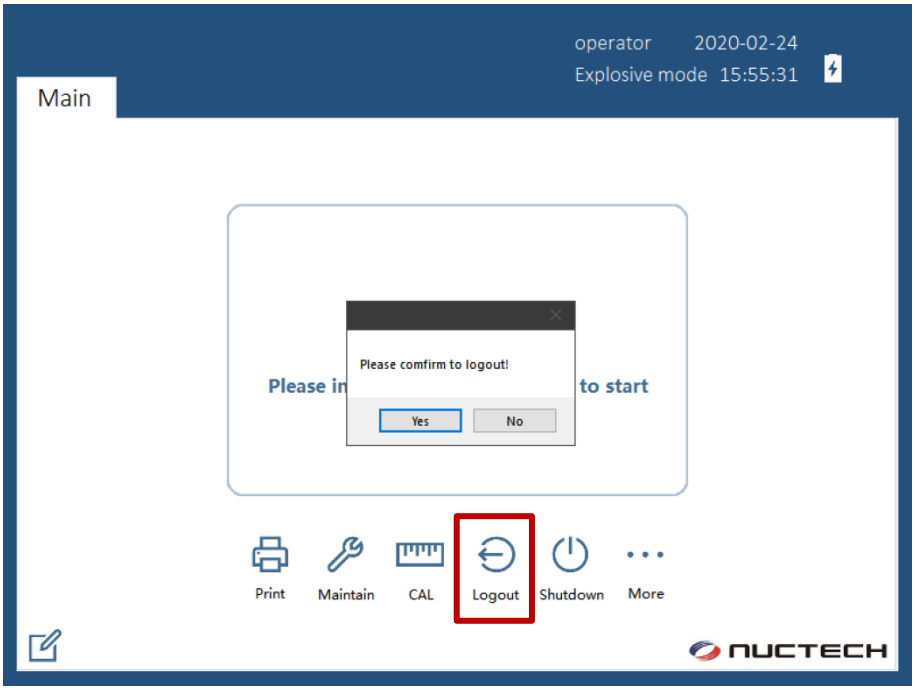


Figure 4.24 Logout confirmation

4.16 Shut Down

	The device may be damaged by turning off the main switch directly without shutdown operation from the menu.

1. Please click <Shutdown> on the menu interface, the system will pop up shutdown confirm prompt.
2. Please click <Yes> to shut down the system.
3. Only after the screen turns dark, please flip the main power switch to OFF.

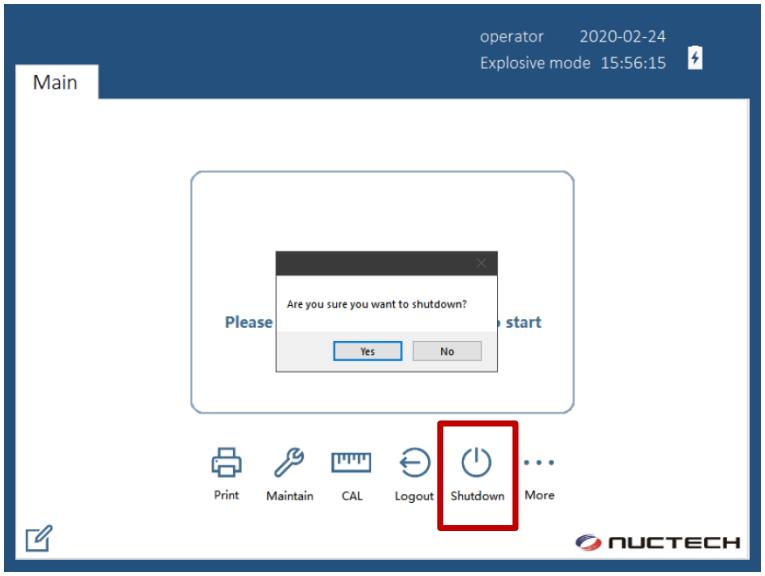


Figure 4.25 Shut down the system

Notes:

✓ Operators MUST NOT directly flip the power switch to turn off the system, because it may damage the software or even hardware. Please ensure the system shutdown in software before cutting off power.

5 Advanced Operation

5.1 About this Chapter

This chapter mainly introduces the advanced operations of manager and Superuser on TR2000DC Desktop Explosives and Narcotics Trace Detector.

5.2 Login

⚠	Since admins and maintainers have higher-level system access to sensitive information, please keep their passwords and authorized personnel in custody.

Please select the appropriate user according to your authorization. Administrators should select the user name “manager” and maintainers should select “superuser”.

The default password of manager is 001.

The default password of superuser is 123456.

Click <OK> button to enter the main interface. If the user enters a wrong password, the system will prompt the user to re-enter. Click <backspace> to clear the entered password. click <Cancel> to return the welcome screen.

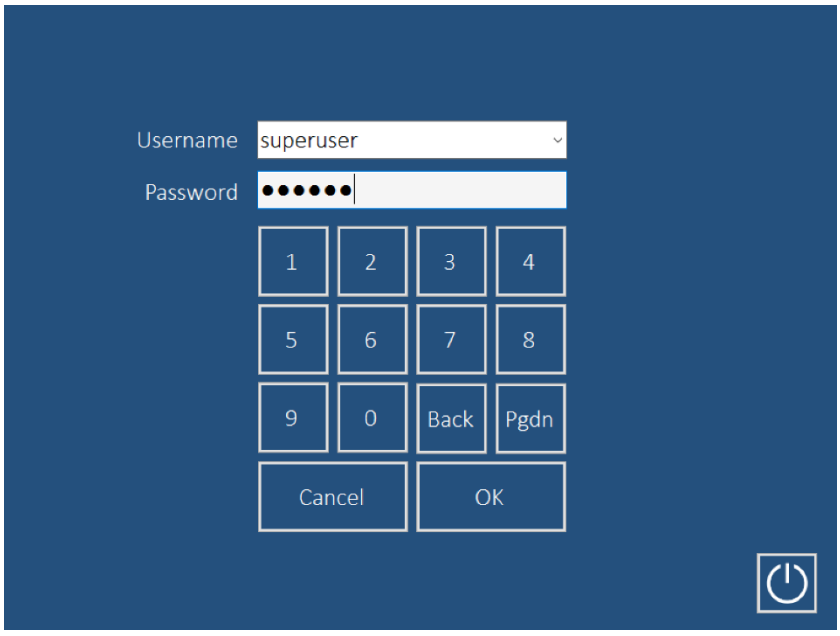


Figure 5.1 Login as Admin or Maintainer

5.3 Admin’s Menu

⚠	Since admins have higher-level system access to sensitive information, please keep their passwords and authorized personnel in custody.

After login as Manager click <more>, the admin’s menu will pop out. Admins have access to Calibration, checking system status, managing data, changing options, performing maintenance, viewing product information, logout and

shutdown. Please be advised that admins only have limited access in <Advanced> section.

Figure 5.2 Admin's menu

5.4 Maintainer's Menu

	Since maintainers have highest-level system access to sensitive information, please keep their passwords and authorized personnel in custody.

After login as Superuser click <more>, the maintainer's menu will pop out. Maintainers have access to Calibration, checking system status, managing data, changing options, performing maintenance, viewing product information, logout and shutdown. Please be advised that maintainers have full access to all sensitive technical parameters and configurations including viewing ionizer status and performing iRegerenation.

Figure 5.3 Maintainer's menu

5.5 Manual Calibration

	Maintainers have authorization to perform Manual Calibration. Please strictly follow the protocol and utilize the calibration pen. Wrong calibration will result in frequent false alarm. Please keep their passwords and authorized personnel in custody.

When both Automatic Calibration and Standard Calibration continues to fail, maintainers have authorization to perform Manual Calibration. Manual CAL requires maintainer to use the calibration pen to make a CAL swab and select the right peaks from the spectrum. Please follow the procedures as follows.

1. Please use the Calibration pen to make a calibration swab (4.6.2).
2. Click <CAL>\<Manual>, the manual CAL interface will pop out.
3. Insert the calibration swab into the sample inlet and wait.
4. When spectrum shows up, please select <Negative Calibrate>, and select the highest single peak between 9.0-11.0, click <Calibrate> and the system will indicate the calibration of negative mode.
5. When spectrum shows up, please select <Positive Calibrate>, and select the highest single peak between 9.0-11.0, click <Calibrate> and the system will indicate the calibration of positive mode.
6. Click <Return> to go back to the main interface.

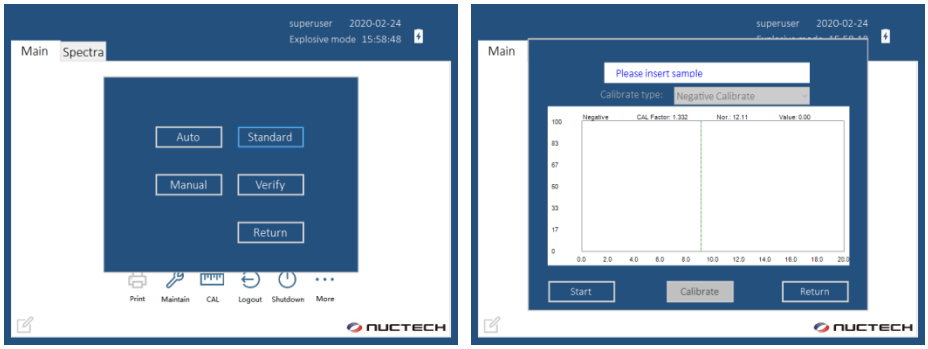


Figure 5.4 Prepare for a Manual Calibration

Figure 5.5 Insert a Calibration swab

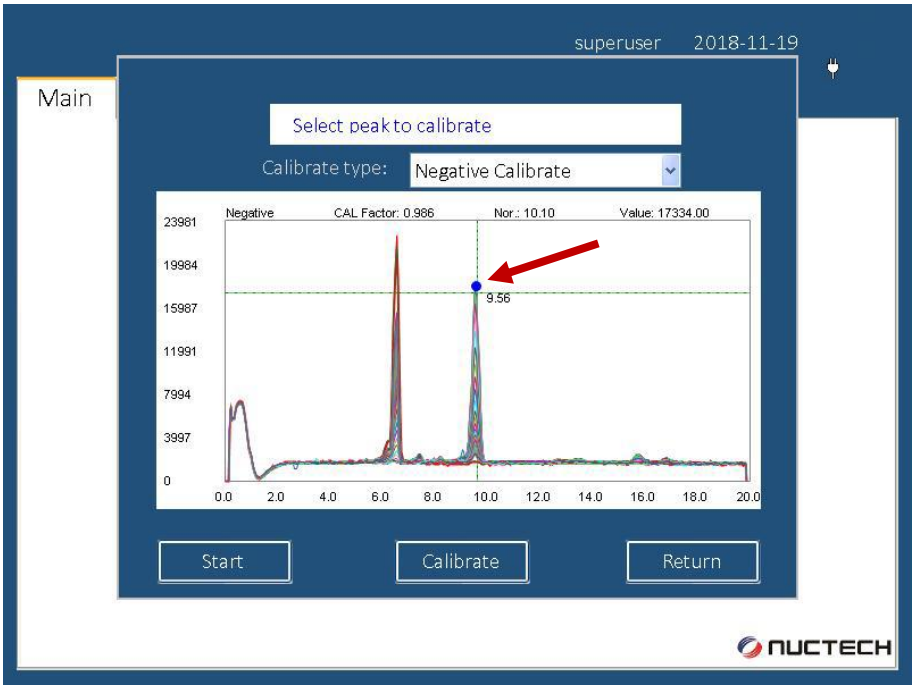


Figure 5.6 Select the Calibrant Peak in Negative Mode

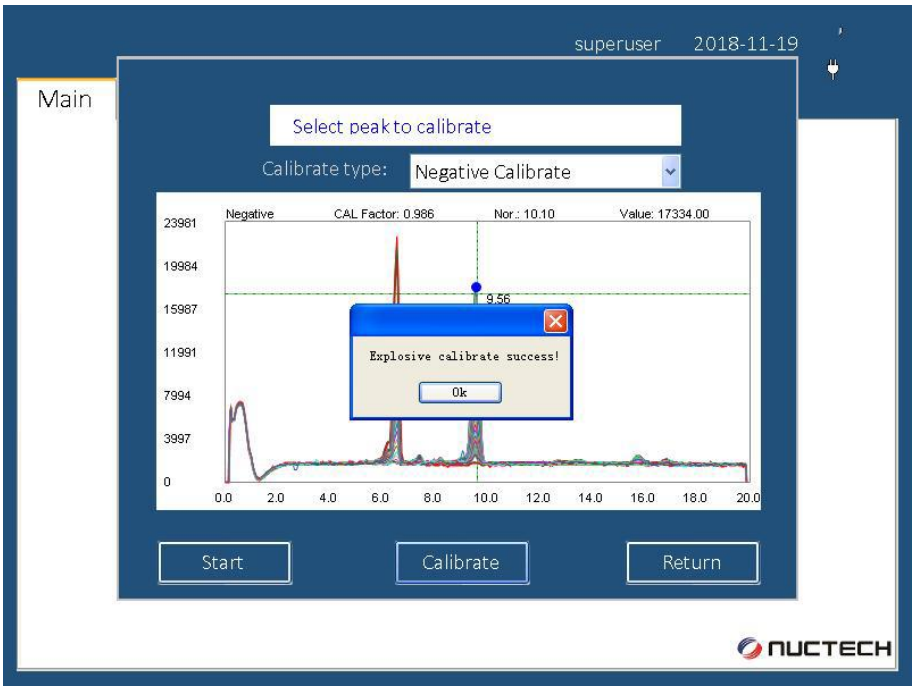


Figure 5.7 Calibrate the Negative Mode

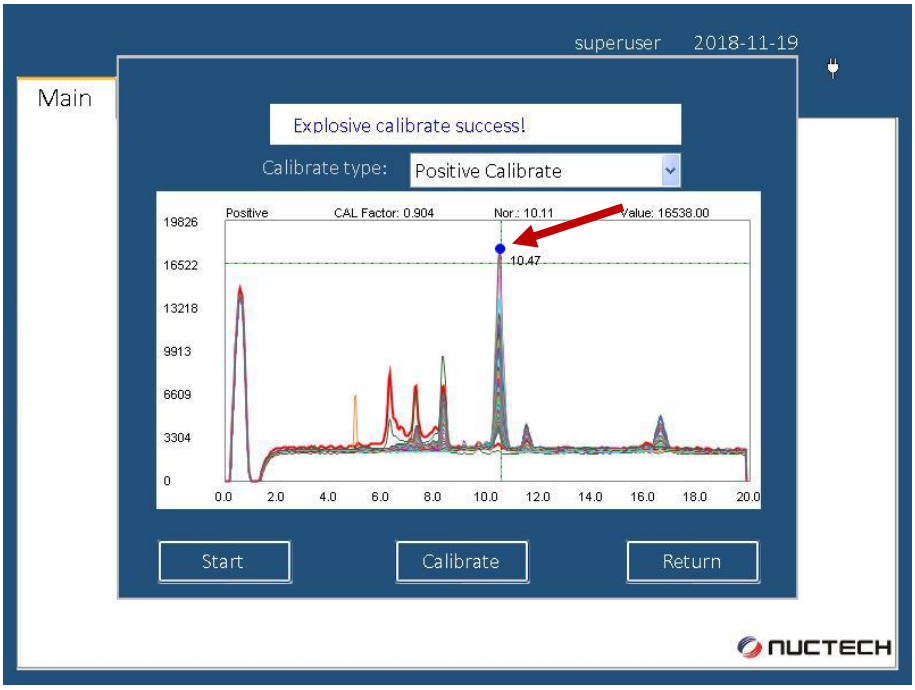


Figure 5.8 Select the Calibrant Peak in Positive Mode

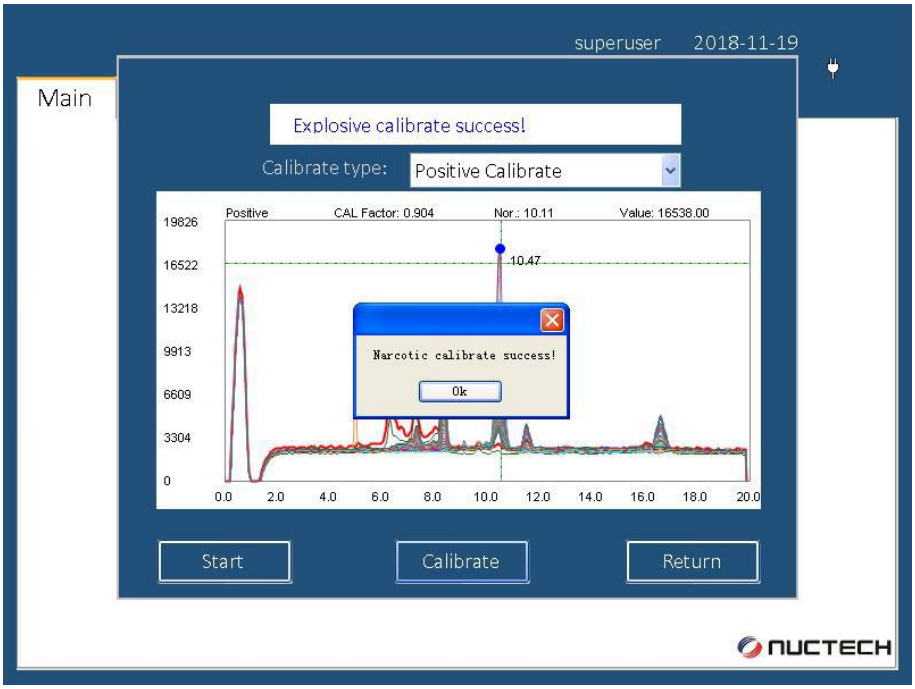


Figure 5.9 Calibrate the Positive Mode

5.6 System Status

	Since admins and maintainers have access to view system status including sensitive technical parameters, please keep their passwords and authorized personnel in custody.

Admins and maintainers are authorized to check the status of the device. Pleas click <Status> to check temperature and other environment parameters fed back from the sensors. Status also helps engineer to check and arrange after-sale maintenance service.

Notes：

- ✓ Maintainers can check the status to identify potential glitch.
- ✓ In <Temperature>, desorber is heated to 210℃ (default), pos tube to 150-160℃(default) and neg tube to 130-140℃(default).
- ✓ In <Pneumatics>, please note the flow rate of main pump and sampling pump should be higher than 0.3L/min.
- ✓ In <Pneumatics>, please note the internal pressure should be no less than the external pressure.
- ✓ In <Pneumatics>, please note the humidity index should be larger than 4.0.
- ✓ If the environment temperature is above +55℃, it may cause malfunction.
- ✓ If the environment humidity is above 50%, please do use the Swab Baker.
- ✓ If the pressure varies rapidly, please perform calibration when indicated.

Figure 5.10 Temperature information in Status

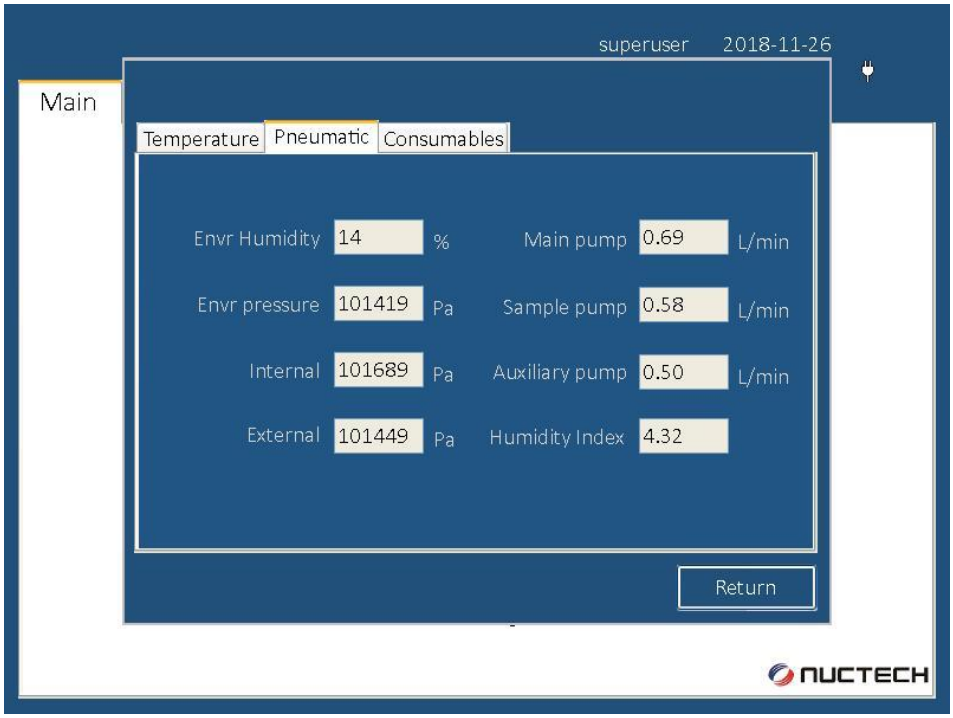


Figure 5.11 Pneumatic information in Status

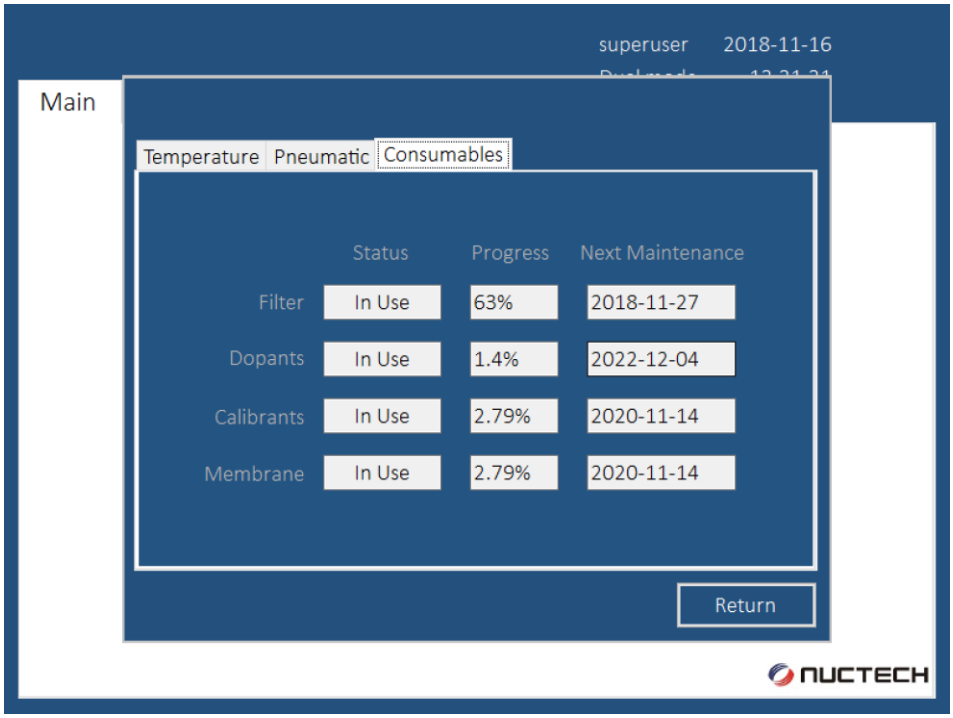


Figure 5.12 Consumable usage information in Status

5.7 Data Management

In the menu, click <More> and users can check the operation data including detection records, logs and statistis.

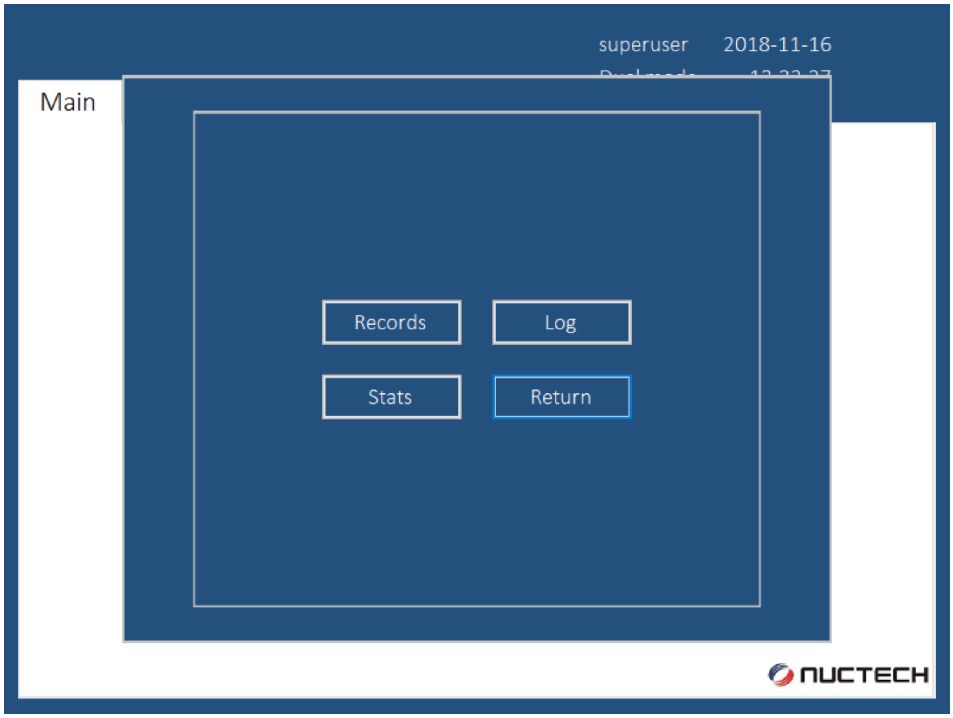


Figure 5.13 Accessing database panel

5.7.1 Records

	Since admins and maintainers have access to sensitive data, please keep their passwords and authorized personnel in custody.

Click <Data>\<Records>, users can check the detection records including detection, calibration and verification. They can view the detailed information and spectrum of a single analysis, and choose to delete, export and print it. The data can be exported to external memory card with USB interface for data backup. By clicking Export button, data can be outputted to do further analysis.

Nuctech TR2000DC will allocate an ID number for each analysis, and the ID number will appear on the main page when detection finished. With the ID number, users can easily find out the detection result in the device record data base. All saved data can be queried by keywords such as “Date & time”, “User ID”, “Alarm or not”, and all the comprehensive data information can be displayed on the screen.

Notes：

- ✓ In order to record the data effectively, it is recommended that set the data save option before detection as follows: click < More >, then click <Options> in the pop out window, and select the saved data type in the < Save option > drop-down list. If select < Save Alarm Data>, the device will save the detection results against detected contrabands only, if select < Save All

Data >, the device will save all the detection results, and if select <No Save>, the device will not save any detection results.

✓ According to the selected save option, the data query function mentioned above can only query the detection results have been saved, for example, if select the <Save Alarm Data> in the < Save option > drop-down list, we can only query and find out the detection results with contrabands, while the normal detection results can't be queried in the database.

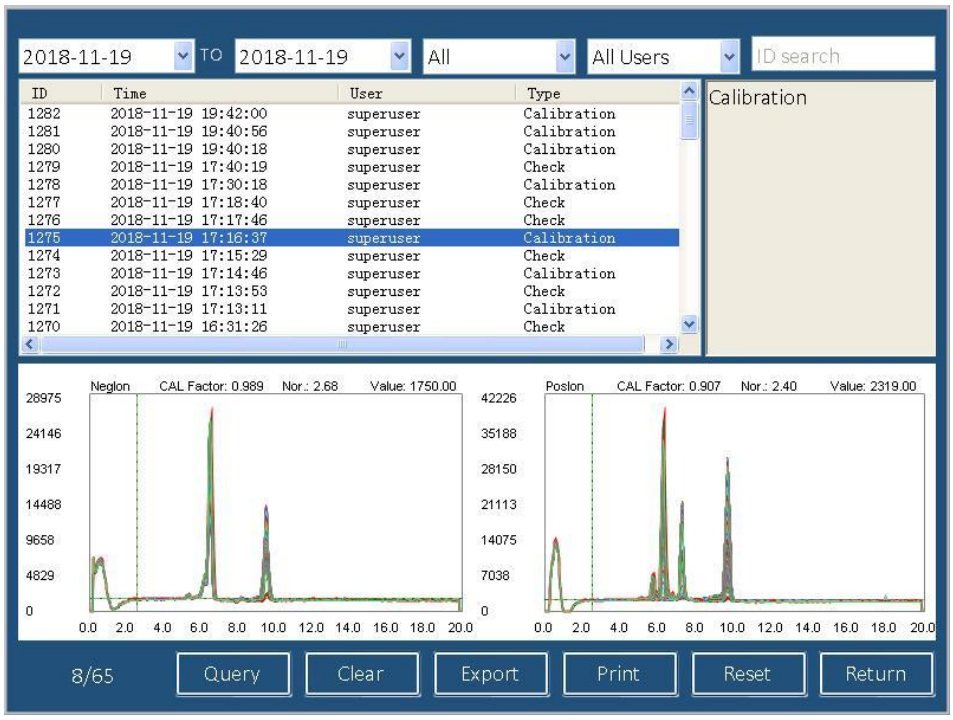


Figure 5.14 Query Detection Records

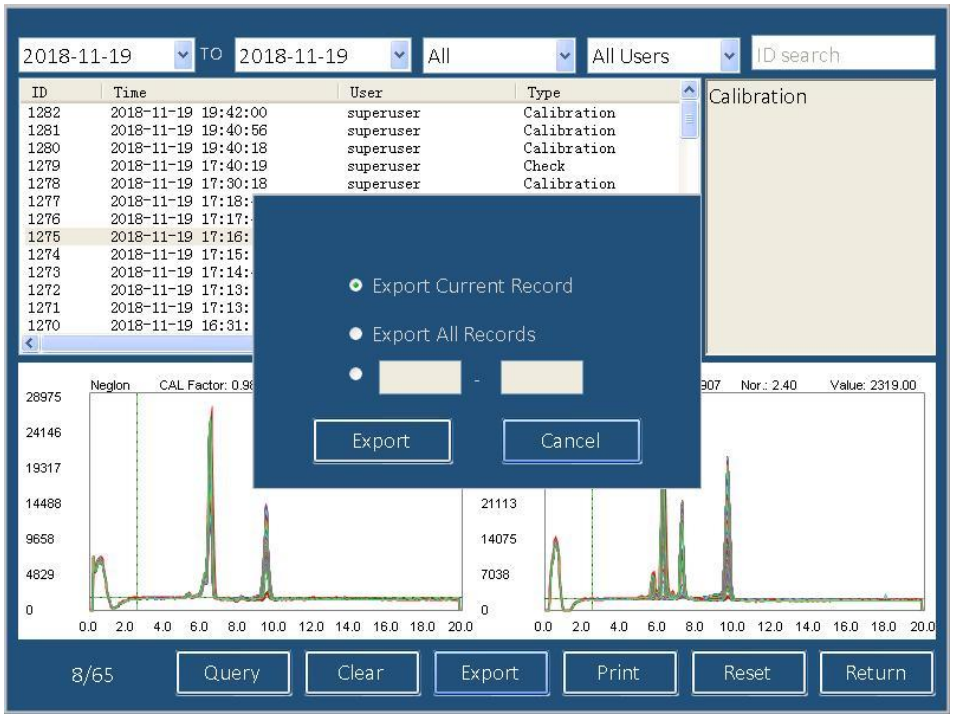


Figure 5.15 Export Detection Records

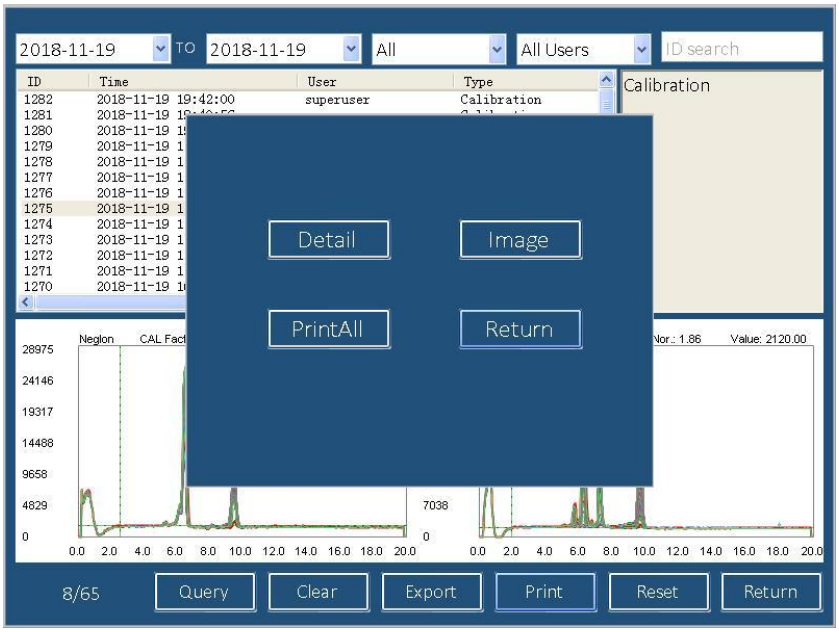


Figure 5.16 Print Detection Records

5.7.2 Logs

	Since admins and maintainers have access to sensitive logs information, please keep their passwords and authorized personnel in custody.

The log function allows to check all varieties of recorded operations including Login, Self-Check, Calibration, Verification, Detection, Cleaning, Upgrade, Clear, PC Connect, System Error, Changing Library, Diagnosis information, Maintenance, etc. The details of each operation are recorded.

Users can click <Query> to check list information and click <Details> to check alarmed spectrum, or to export logs to USB flash memory.

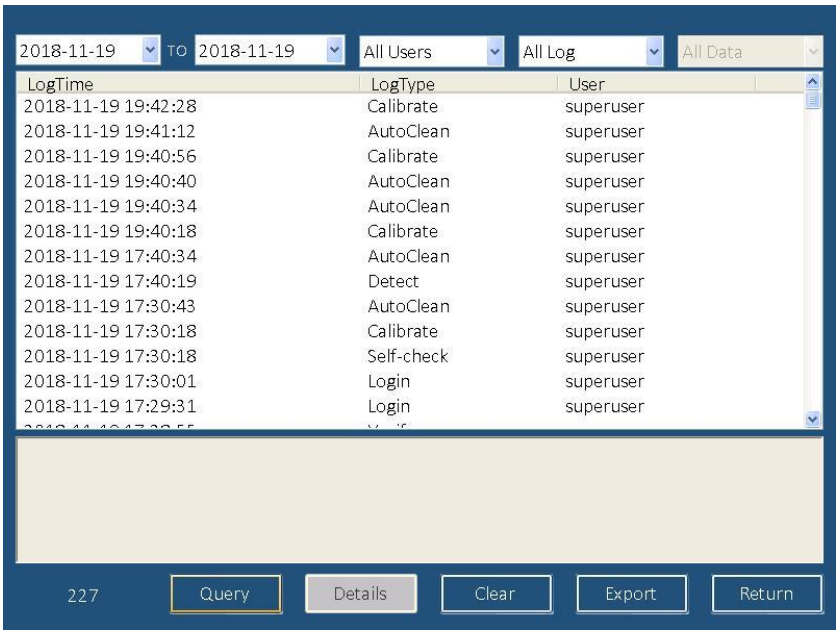


Figure 5.17 Query Operation logs

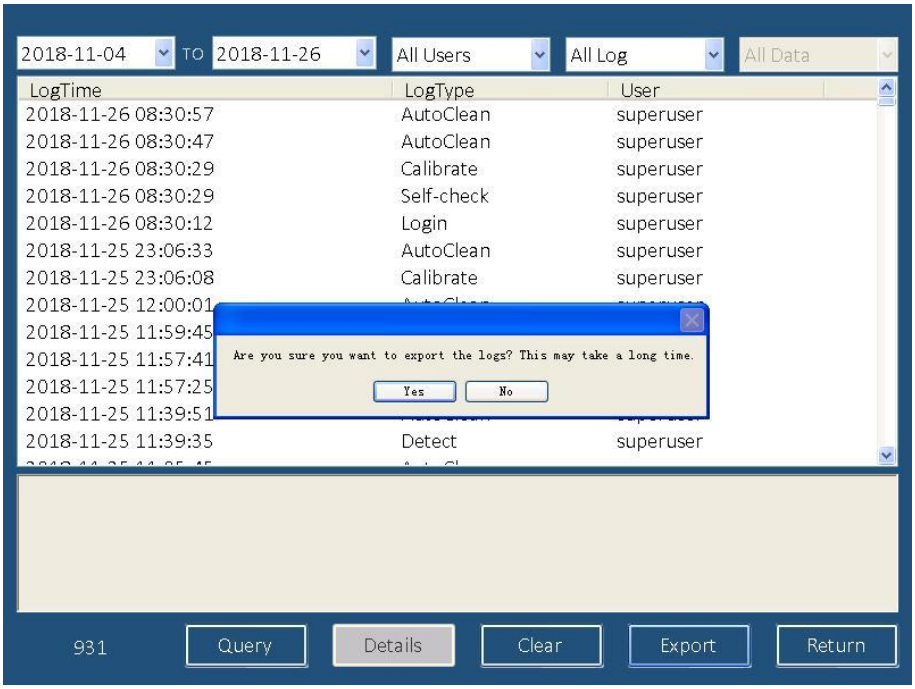


Figure 5.18 Export Operation logs

5.7.3 Statistics

Admins have access to view detection statistics, please read Chapter 4.11 for further instruction.

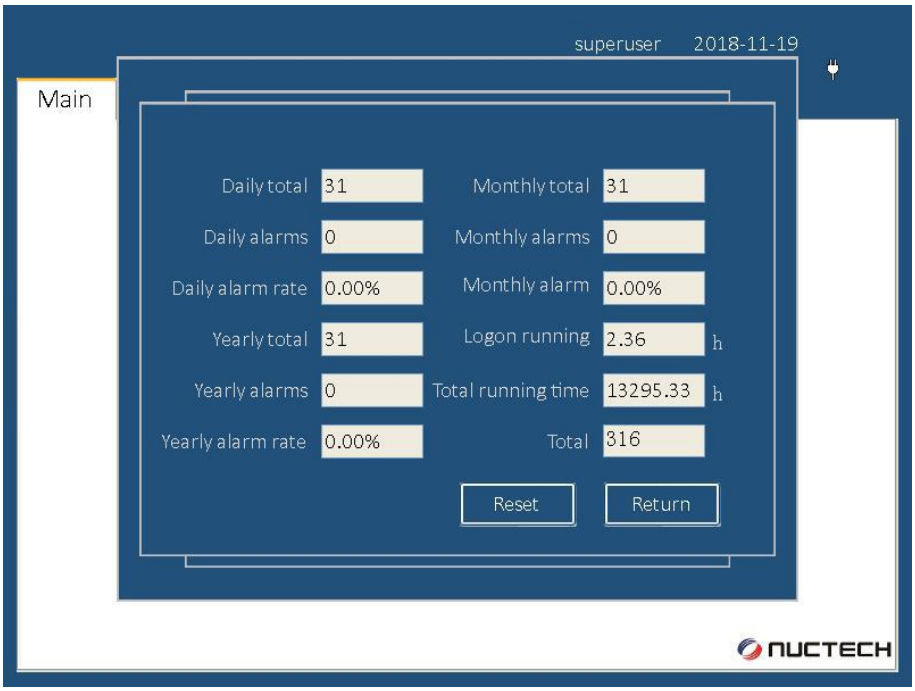


Figure 5.19 Statistics

5.8 Options

	Since admins and maintainers have access to system options, please keep their passwords and authorized personnel in custody.

Option is designed for customized needs. Please click <Options> in the main menu, and the setup dialog interface will pop up, as shown in Figure 5.20. After making changes, click <Apply>, and the system will prompt "System settings saved", click <OK>, and click <Return> to return to the main menu.

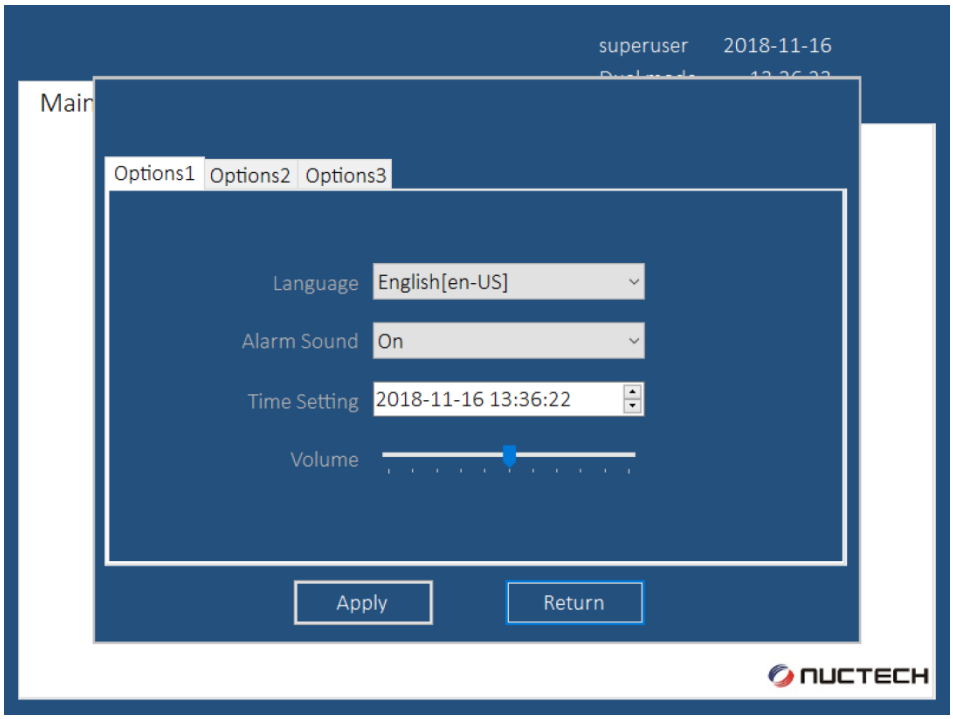


Figure 5.20 Options panel

5.8.1 Options 1

- ✓ **Language:** The first column on the setup dialog interface is Language. Now the detector supports simplified Chinese and English.
- ✓ **Alarm Sound:** The second column on the Setup dialog interface is Alarm Sound. Users can select "On" to enable alarm sound or "off" to disable it. By default, the alarm sound is on. If there is a contraband detected, the Detector will give an alarm from the speaker to attract users' attention.
- ✓ **Time Setting**: The fifth column on the setup dialog box is Time Setting. Users can select the display time of the Detector here. The time format is "year-month-day hours: minutes: seconds." Users can make changes based on local standard time.
- ✓ **Volume Control**: The sixth column on the setup dialog box is Volume Control. The volume can be adjusted by dragging the slider on the control bar.

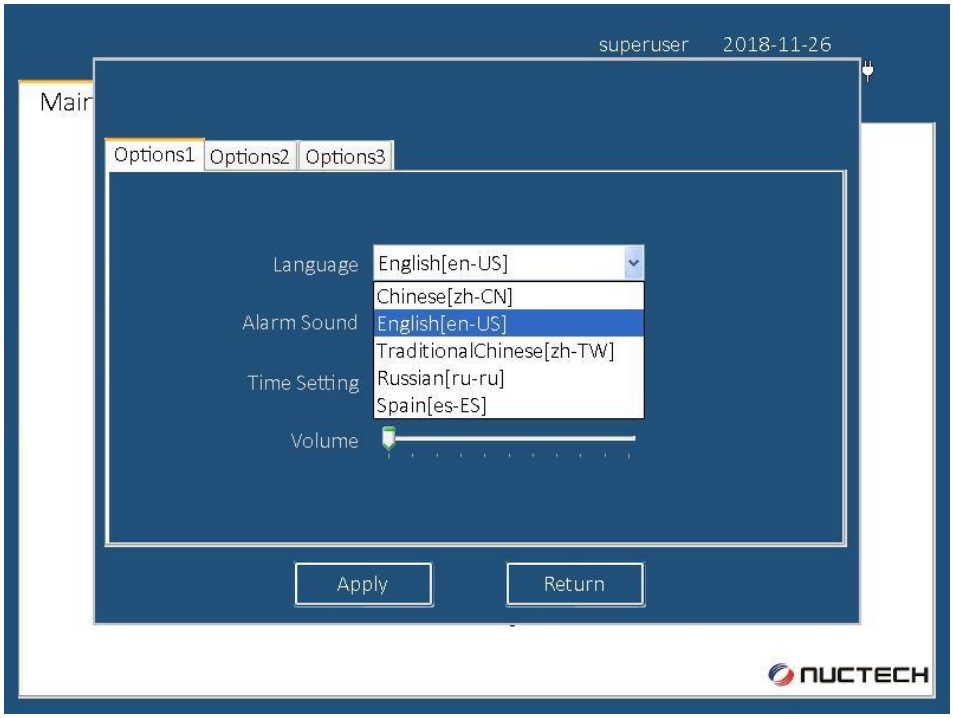


Figure 5.21 Changing Language

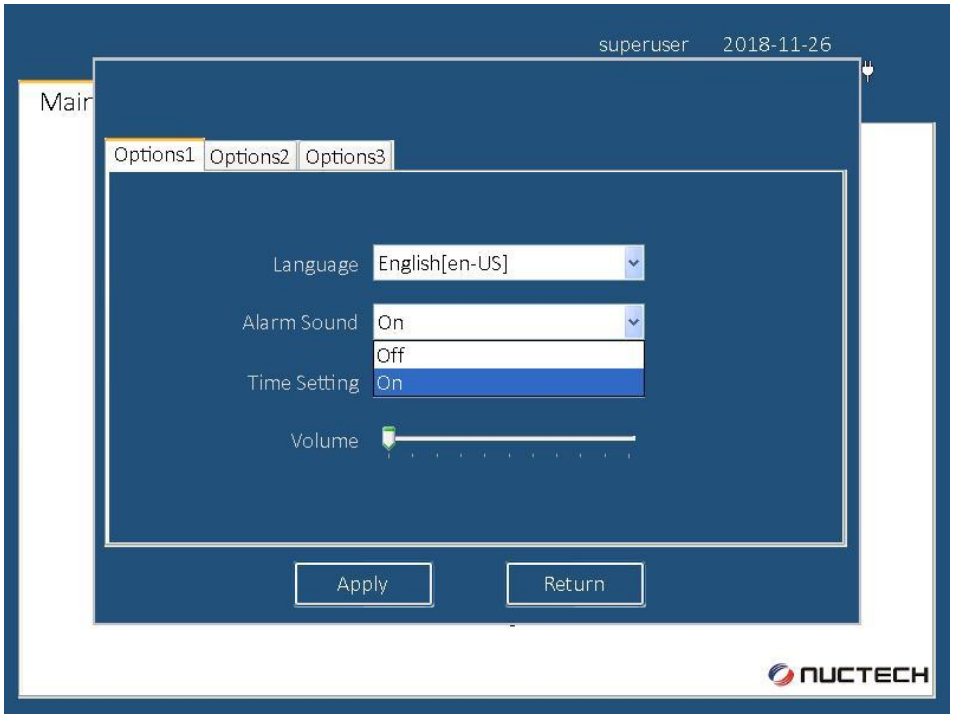


Figure 5.22 Toggle on/off Alarm sound

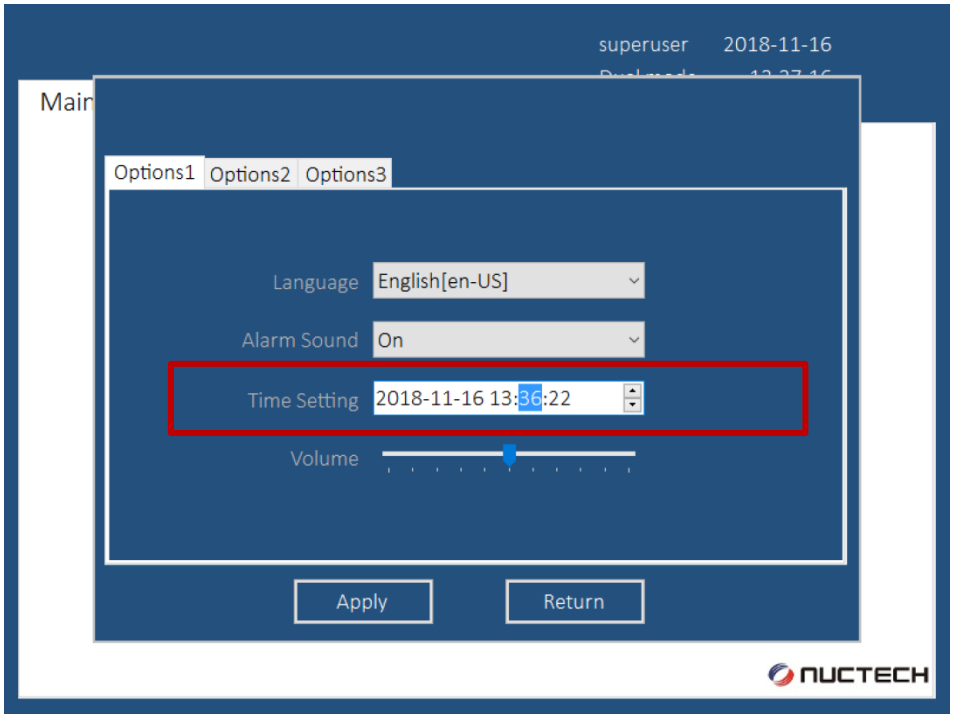


Figure 5.23 Setting Time

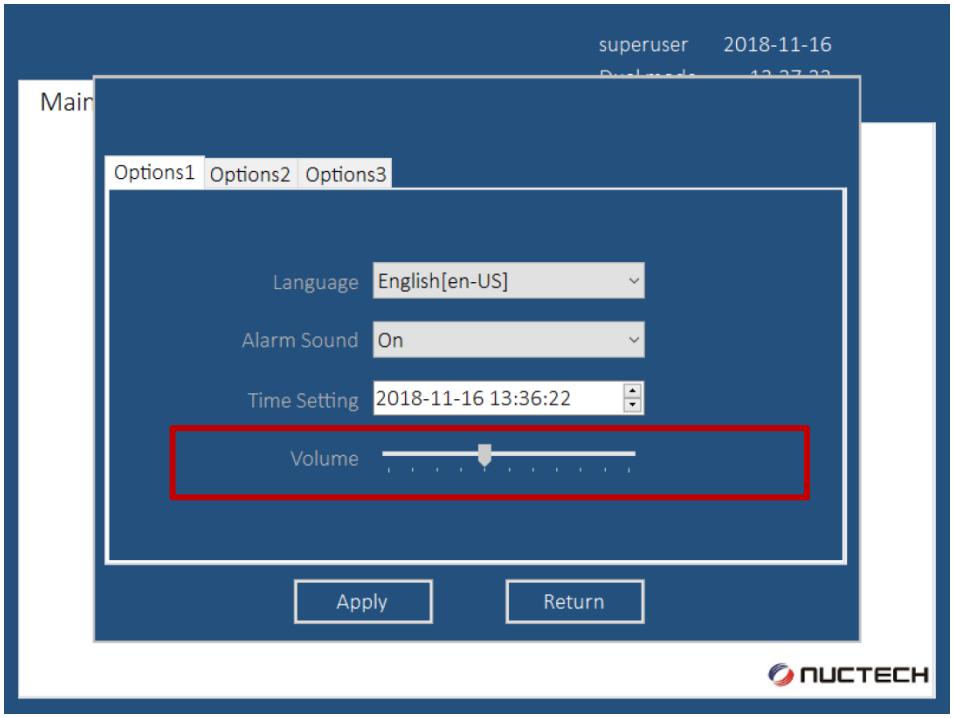


Figure 5.24 Adjusting Volume

5.8.2 Options 2

✓ **Save Option:** Users can choose saving all detection data, saving only the alarmed data or saving no data. They can also choose the months to save detection records and logs, to enable automatic clearing and printing.

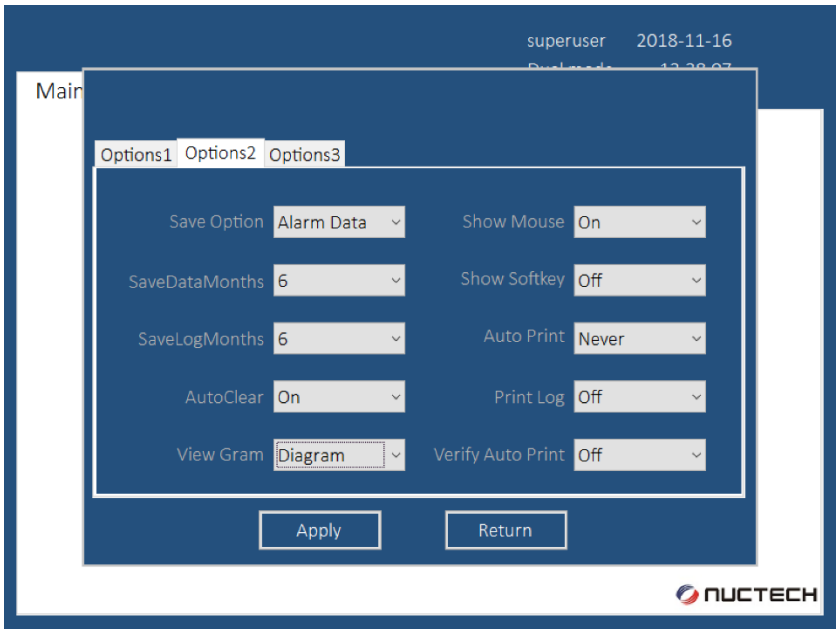


Figure 5.25 Changing Options 2

5.8.3 Options 3

✓ **Peripherals：** Maintainers have access to Options 3 to configure all kinds of expanded peripherals including Wi-Fi, GPS and RFID, which may be integrated into the system in field application.

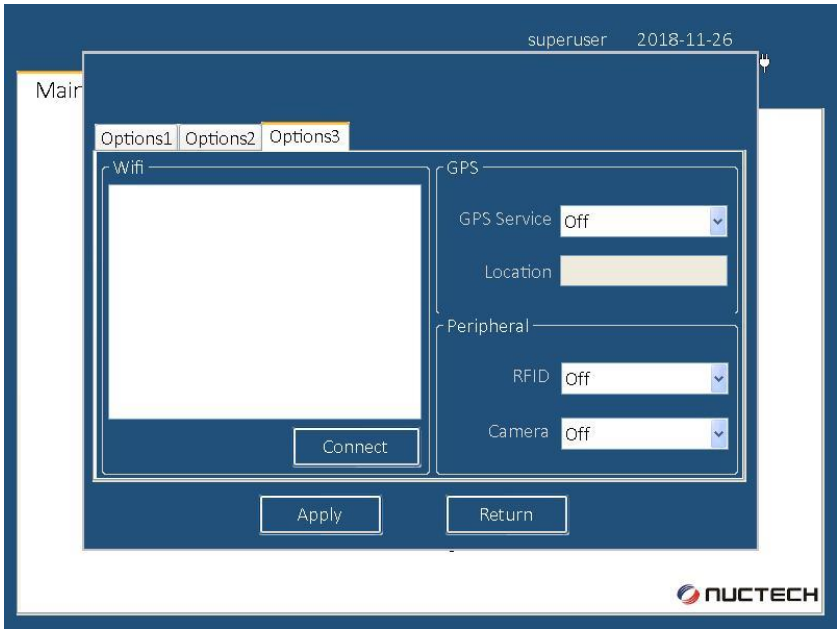


Figure 5.26 Changing Options 3

After completion of the setup above, click <Apply>, and "System settings saved" prompt will pop up, indicating that the new setting has been used. Click <Return> to return to the main menu.

5.9 Advanced (Administration)

	Since admins and maintainers have highest-level system access to advanced settings, please keep their passwords and authorized personnel in custody. Inappropriate modification in the Advanced section may compromise the device's functionality. Please strictly follow the service staff's directives when dealing with advanced options.

Click <Advanced> in the menu to enter the Advanced Settings page. The Substance Library, Device Parameters, User Management, System Upgrade, Sampling record, Real time Spectra, Database Backup, Log Management, Switching Mode, System Restore, Permission Management, Power-on Setting and Ionizer calibration options are available here.

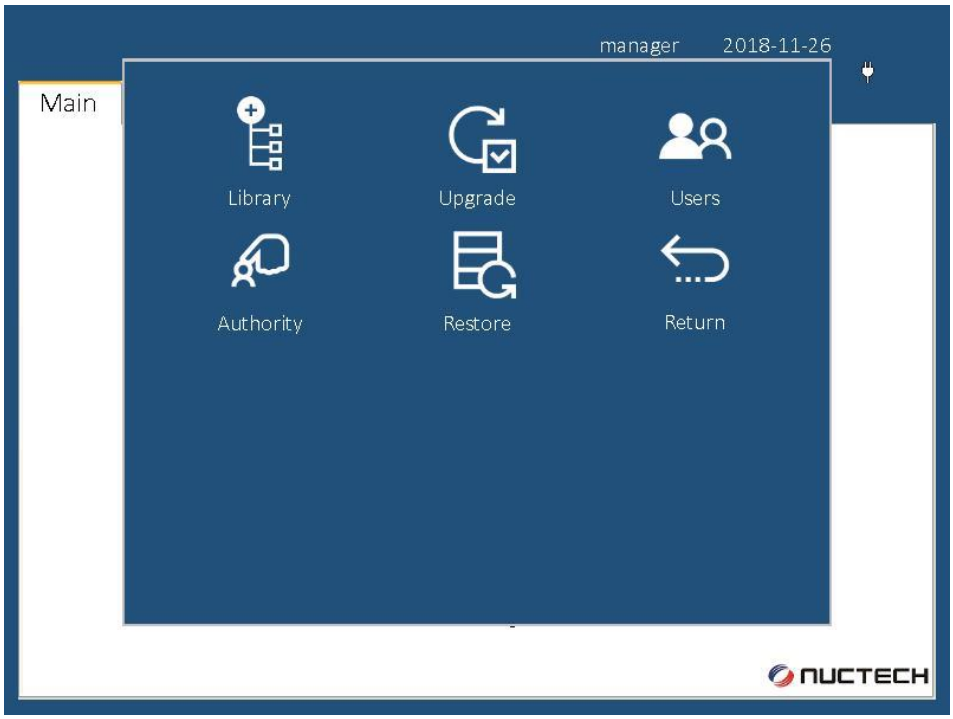


Figure 5.27 Advanced menu for Admins

5.9.1 Substance Library

	Since admins and maintainers have highest-level system access to view and update Substance Library, maintainers have authorization to edit library. please keep their passwords and authorized personnel in custody. Inappropriate modification in the Substance Library may compromise the device's functionality.

TR2000DC is equipped with newly designed detection software (algorithm), along with which an integrated substance library is that contains the core detection criteria for each kind of contraband. The library can be exported and upgraded by inserting a USB disk, and users can also print a list of the detectable substance.

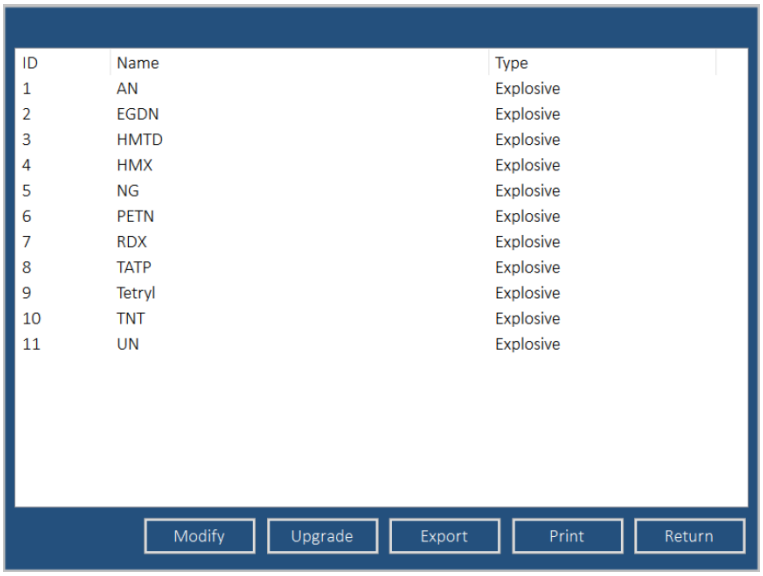


Figure 5.28 Substance Library list

5.9.2 System Upgrade

	Since admins and maintainers have access to upgrade the operation software, please keep their passwords and authorized personnel in custody. Inappropriate upgrade may compromise the device's functionality, so please follow the instruction from Nuctech technical support.

Users can upgrade the software by simply inserting the USB disk with an upgrading file. The operation will be automatically completed in a few seconds, but please restart the system to let the upgrade be effective.

When performing upgrade, please copy the upgrade pack into a USB flash memory and insert the disk at the back panel. Click <Upgrade> and wait for a few seconds, when the system indicates to reboot, please restart TR2000DC and the upgrade will be effective. Failure to upgrade will also be informed on the screen if there is something wrong with the flash memory.

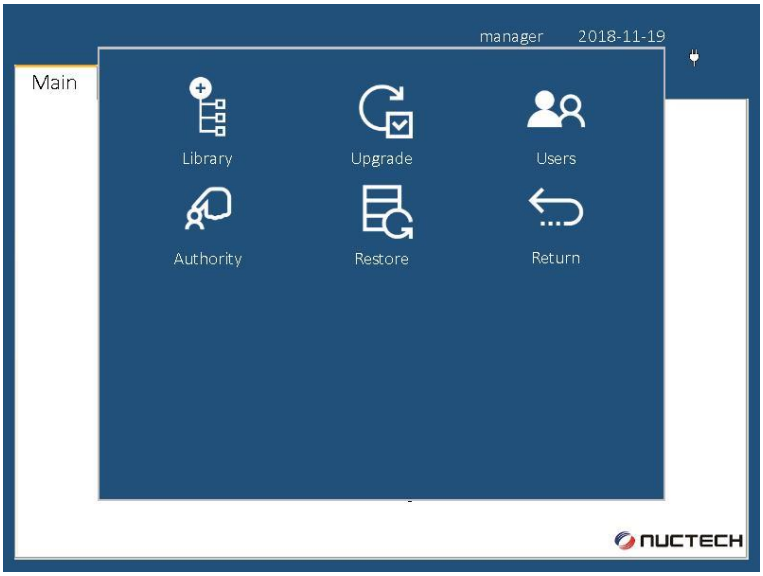


Figure 5.29 Upgrading operation software

5.9.3 User Management

	Since admins and maintainers have higher-level system access to manage use list, please keep their passwords and authorized personnel in custody.

Nuctech TR2000DC is integrated with functions to manager users. Please click <Users> in <Advanced> and the panel will pop out. Admins and Maintainers can edit the users below their administration level including add, delete, modify password. Once the change is done, please click <Save> to let the change be effective.

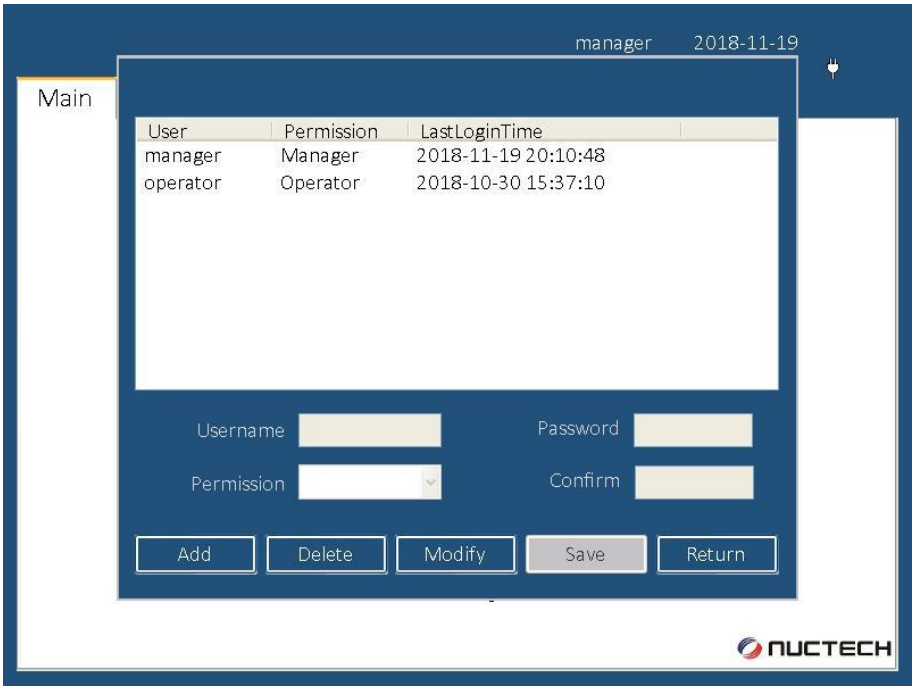


Figure 5.30 User Management interface

5.9.4 Authority

	Since admins and maintainers have access to manage authorization access of the users below their administration level, please keep their passwords and authorized personnel in custody.

Click <Authority> from the <Advanced> to enter the authority management window, select the corresponding user in the left window, and the authority assigned to corresponding user can be seen in the right part of the interface, and the option with " √ " represents that the authority is available. to add an authority, check " √ " in the box. to disable a authority, remove the " √ " in the box.

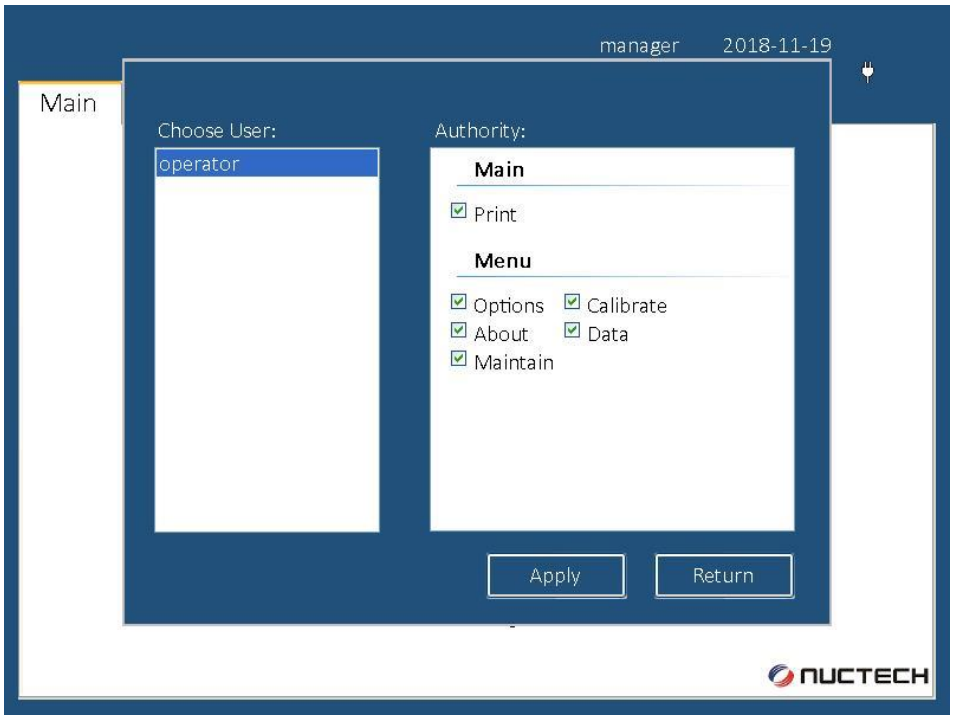


Figure 5.31 Authorization Management

Table 5-1 Default Authorization access

Access	Operator	Manager	Superuser
Password (Default)	001	123	123456
Print	√	√	√
Option	Option1	Option1 Option2	Option1 Option2 Option3
Calibration	Auto CAL Standard CAL	Auto CAL Standard CAL	Auto CAL Standard CAL Manual CAL
About	√	√	√
Data	No access	Records Logs	Records Logs
Maintenance	Manager or Superuser's Password required	√	√
Status	No access	√	√
Advanced	No access	Library (list) Upgrade Users Authority Restore	Library (edit) Parameters Spectra Upgrade Users Authority Restore Modes Ionizer Rebooting path

5.9.5 System Restore

	Since admins and maintainers have access to restore the operation software, please keep their passwords and authorized personnel in custody. Inappropriate restore may compromise the device's functionality, so please follow the instruction from Nuctech technical support.

Nuctech TR2000DC supports restoring the operation software to the previous version when the system encounters severe malfunction. In this case please click <Advanced>\<Restore>, the restoration will become effective after restart.

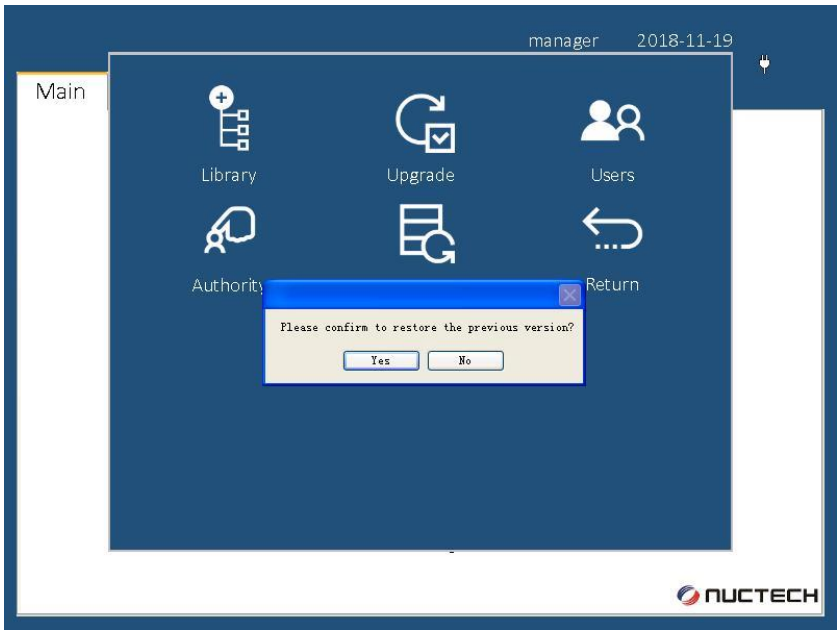


Figure 5.32 Restore the previous software version

5.10 Advanced (Maintenance)

5.10.1 Device Parameters

	Since maintainers have highest-level system access to change device parameter for maintenance purpose, please keep their passwords and authorized personnel in custody. Inappropriate modification may compromise the device's functionality. Please strictly follow the service staff's directives when dealing with advanced options.

Nuctech TR2000DC allows maintainers to check and modify device technical parameters for comprehensive maintenance and repair purpose. Click <Advanced>\<Parameters>, they can check and change Detection, Cleaning and Consumable parameters. Parameters will help Nuctech technical support arrange schedule of maintenance service.

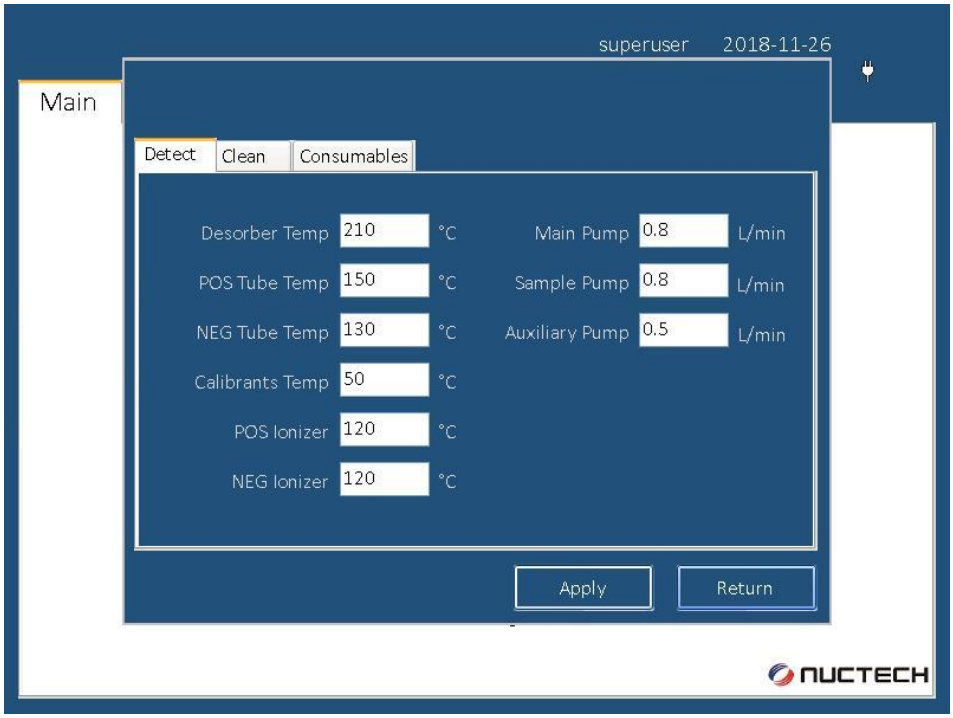


Figure 5.33 Detection parameters

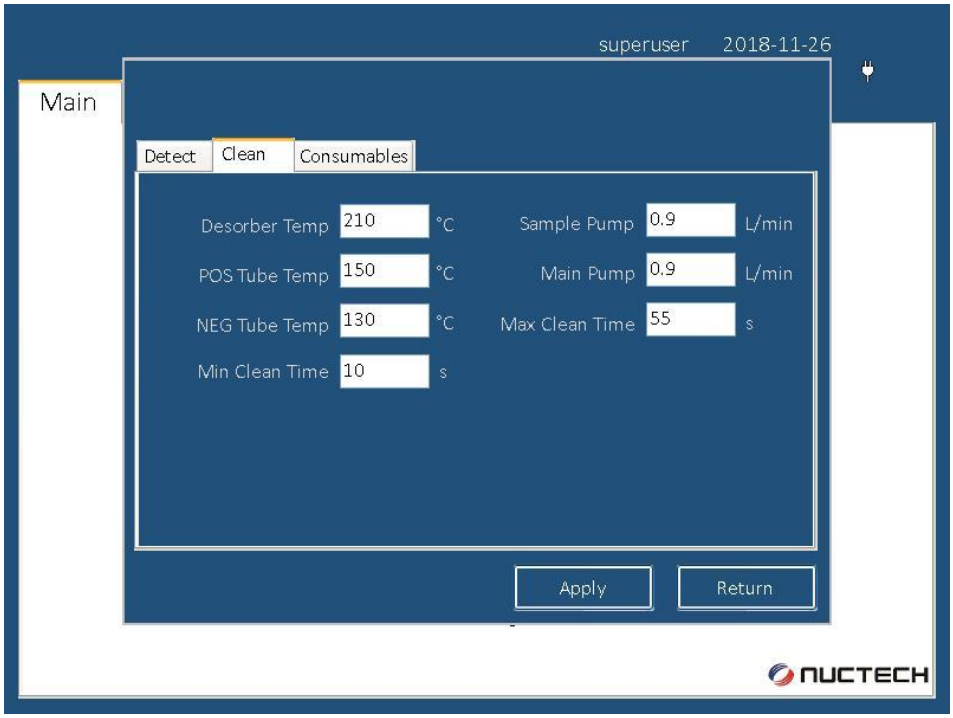


Figure 5.34 Cleaning parameters

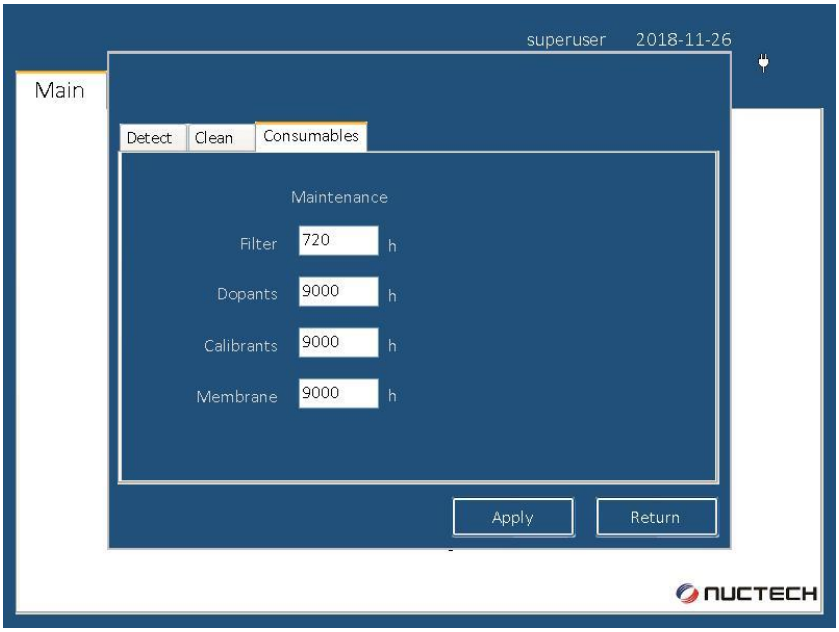


Figure 5.35 Consumable maintenance period

5.10.2 Spectra

	Since maintainers have highest-level system access to view real-time spectrum for maintenance purpose, please keep their passwords and authorized personnel in custody.

Nuctech TR2000DC allows maintainers to check real-time spectrum, which is directly extracted from the detector and a powerful tool for glitch diagnosis. Please click <Advanced>\<Spectra> to see the spectrum. As shown in the figure, the peaks are RIP from the purified air. If there is no such peak, it indicates that the system is contaminated and users should try cleaning or changing the filters.

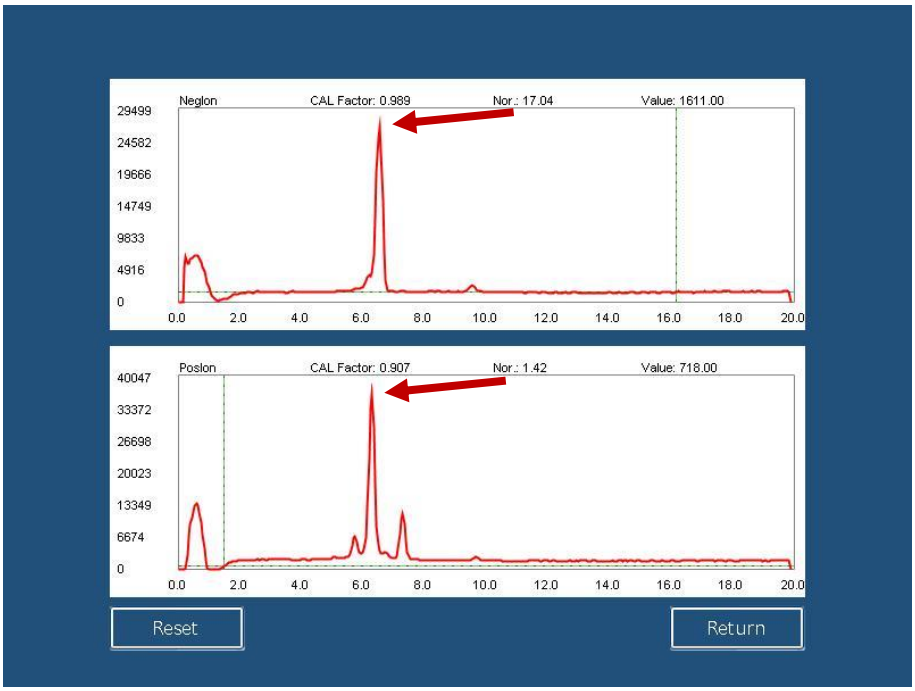


Figure 5.36 Real-time spectrum

5.10.3 Switching Modes

	Since maintainers have highest-level system access to change system mode, please keep their passwords and authorized personnel in custody.

Nuctech TR2000DC allows maintainers to change modes. Please click <Advanced>\<Modes> to access the panel. In detection modes, there are dual modes (Simultaneous detection of explosives and narcotics), explosive mode and narcotic mode available. Users can also select the detection sensitivity level among low, medium and high. Please be advised that high sensitivity may result in higher false alarming rate in the field. The setting is medium in default.

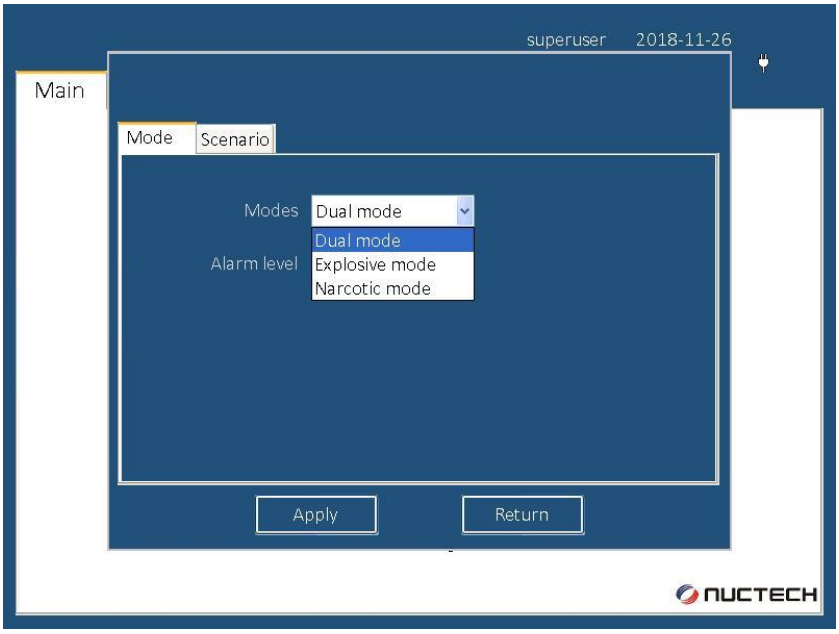


Figure 5.37 Switching detection mode

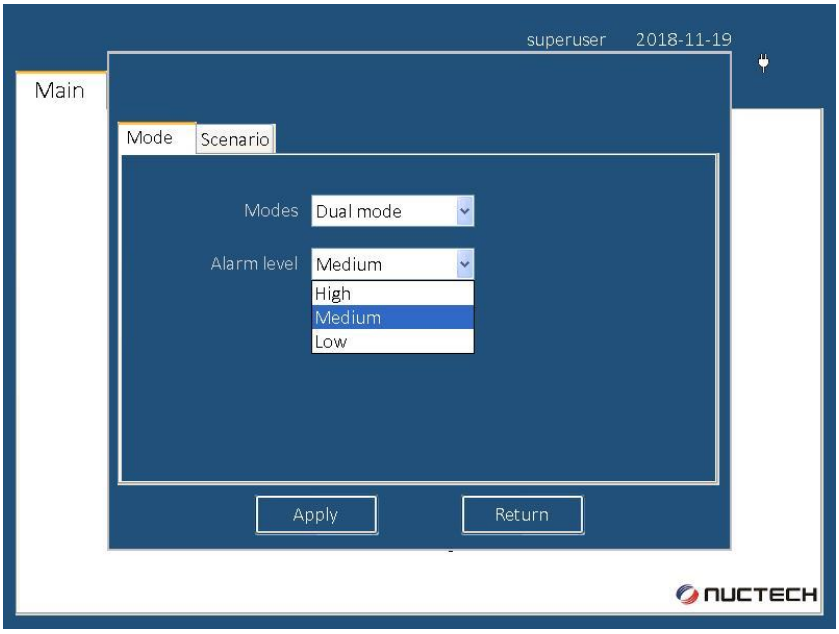


Figure 5.38 Changing detection sensitivity

5.10.4 Auto Boot

	Since maintainers have highest-level system access to change system rebooting path for maintenance and repair purpose, please keep their passwords and authorized personnel in custody.

Click <Auto Boot> from the Advanced Settings page, select "Explorer Shell" or "Custom Shell" in the pop-up window to set a different login mode. "Explorer Shell" allows to log into the Windows operating system, and "Custom Shell" allows to directly log into TR2000DC's operation software.

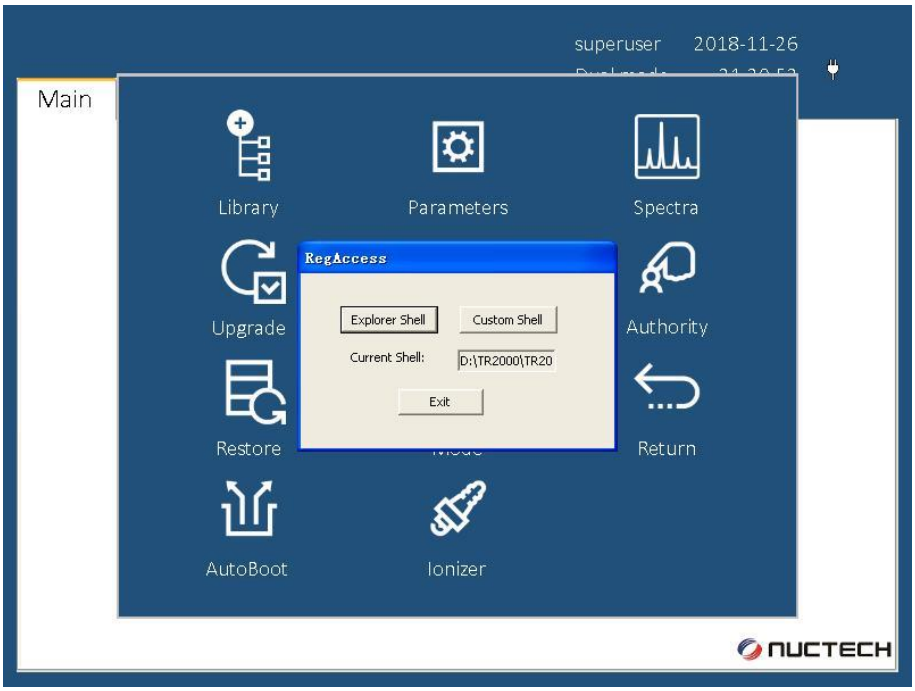


Figure 5.39 Changing rebooting path

Notes:

- ✓ Booting path is only for device maintenance and repair and shouldn't be changed in normal cases.
- ✓ After completing the maintenance, please make sure to select "Custom Shell".

5.10.5 Ionizer

	Since maintainers have highest-level system access to view and change ionizer parameters for maintenance and repair purpose, please keep their passwords and authorized personnel in custody. This function is extremely sensitive and should be conducted under Nuctech direct technical support.

Nuctech TR2000DC allows maintainers to view the ionizer status by accessing <Advanced>\<Ionizer>. In the panel, maintainers can see the operation parameter of the ionizers and understand whether they need to be replaced. The parameters should not be changed without Nuctech direct technical support.

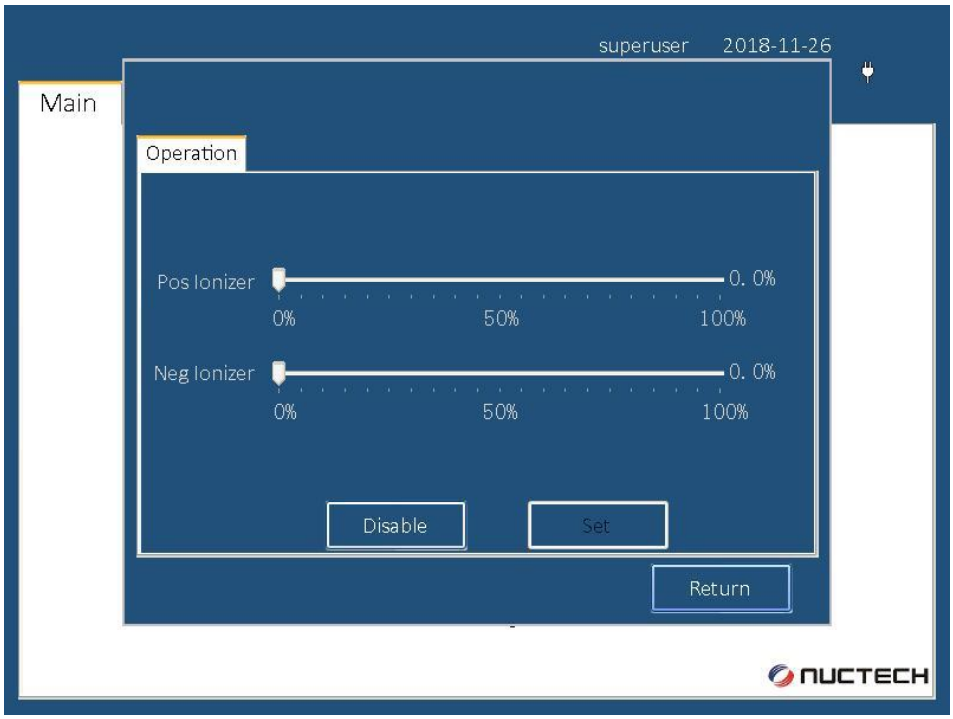


Figure 5.40 Ionizer operation parameter

Notes:

- ✓ Ionizer parameter is only for device maintenance and repair and shouldn't be changed in normal cases.
- ✓ If the parameter reaches 100%, it indicates the ionizer electrode should be replaced by a new one.

6 Maintenance

6.1 Cleaning

	It is recommended that a 1-hour deep cleaning be routinely conducted every day before operation.

System provides a deep cleaning alternative. In case of serious contamination indicated with blue notification, deep cleaning is an effective method to recover the performance of the device. Please follow the procedures below to start a deep cleaning.

1. Click <Maintain> in the menu, and then <cleaning>, interface like figure 6.1 will pop up.
2. In the pop-up dialog box, users can select the time required like 1 hour, 4 hours, Infinite time or customized. Managers can select the time flexibly. After selecting the cleaning time, click the <Clean> and the device will start deep cleaning.
3. During the process, cleaning can be aborted by touching the screen, below prompt will pop up, click <Yes> to stop deep cleaning or click <No> to continue the deep cleaning.
4. The system will be back to the "ready" state for the next detection.

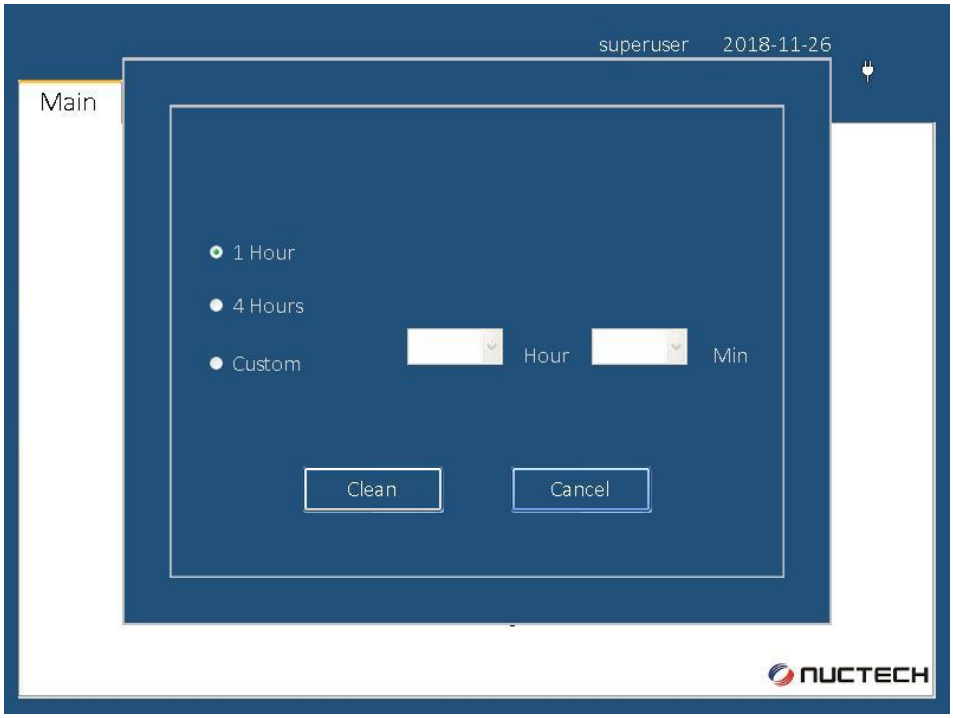


Figure 6.1 Cleaning Menu

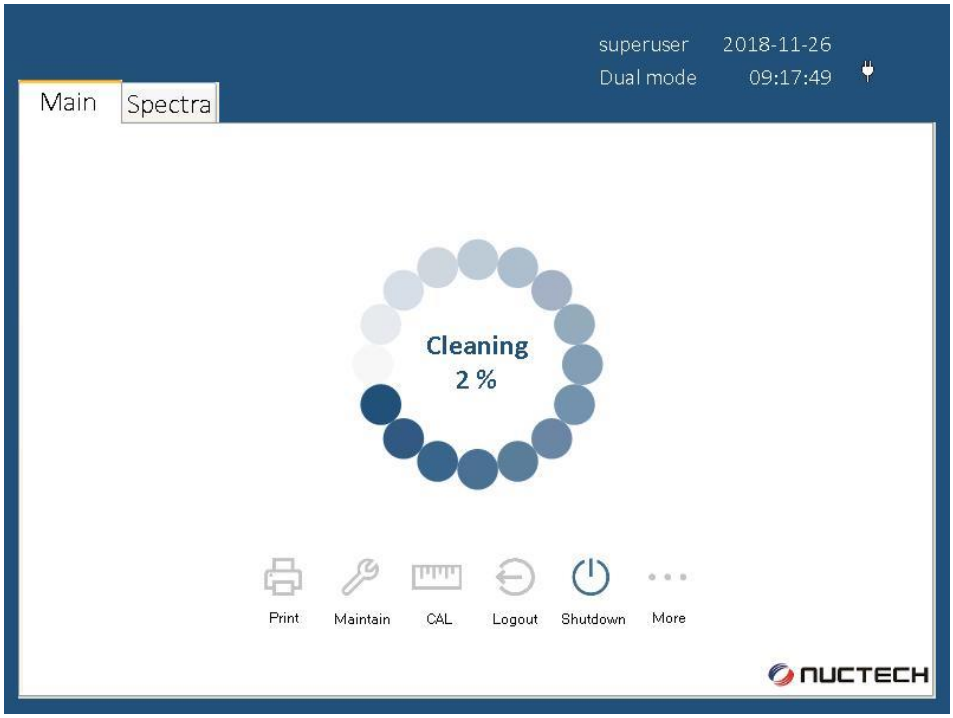


Figure 6.2 Cleaning

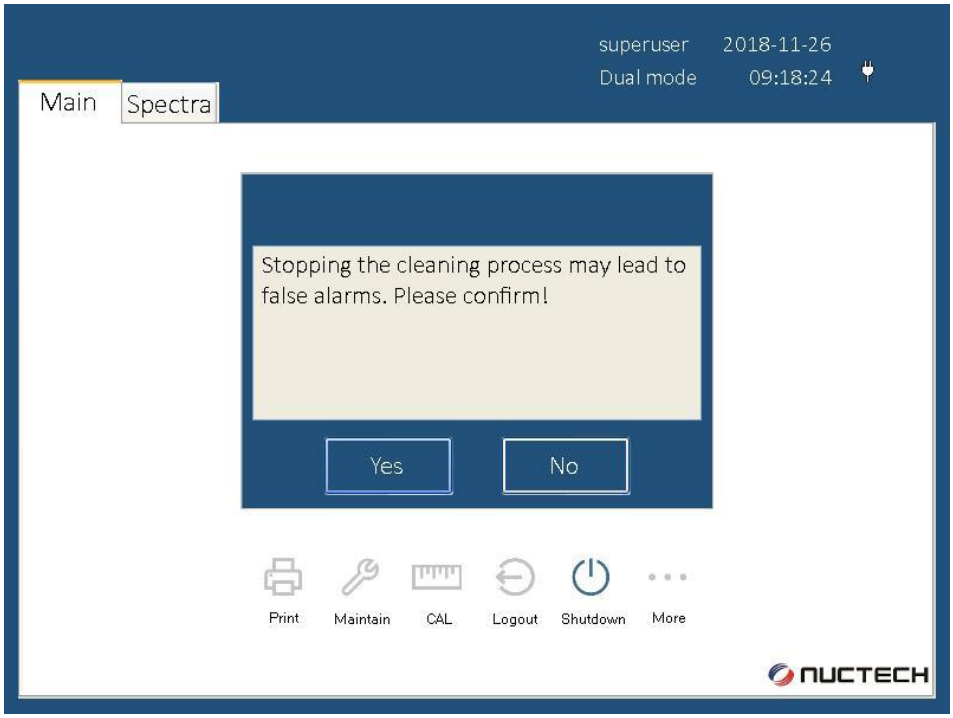


Figure 6.3 Stop Cleaning

6.2 Consumables

	Improper maintenance will compromise the device's functionality. Changing the consumables requires admin or maintainer's authorization. Please strictly follow the service staff's directives when dealing with advanced options.

6.2.1 Wizard to change consumables

TR2000DC is integrated with a smart program to remind users of when to change consumables. All the reminders will be presented in the notification center with red bars. During operation, if the main interface changes into red shining card indicating "Please maintain", please click the red notification on the right and read the detailed instruction.

Users don't need to switch off the device when changing the filter, dopant and calibrant. But shutdown is required before changing ionizer electrodes or semi-permeable membrane. Any completed maintenance operation will leave a record in the system log, ready for reference or inspection.

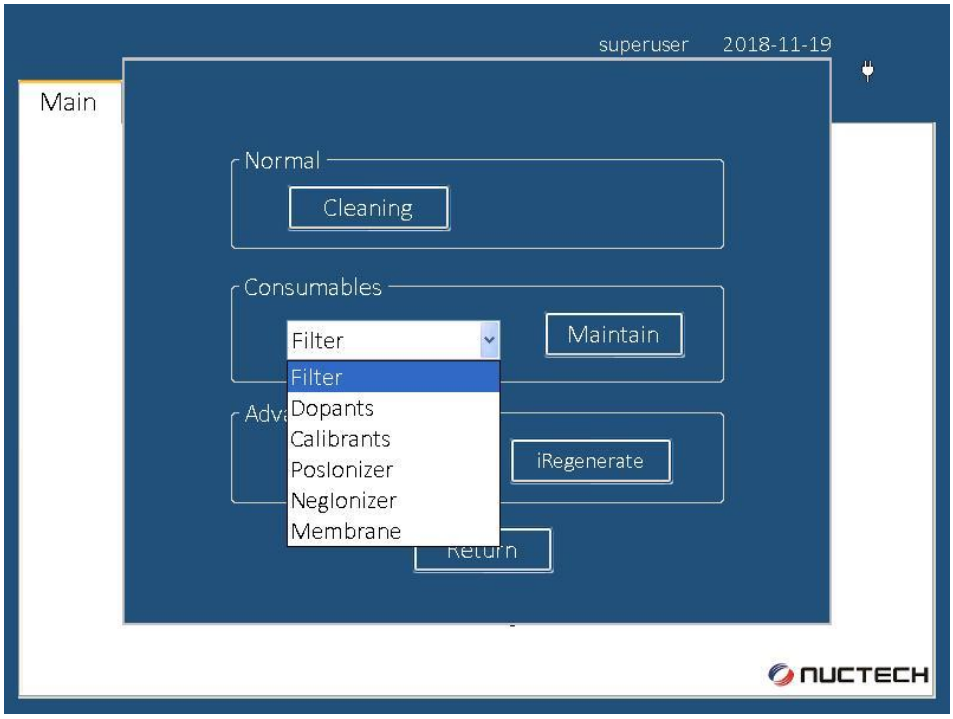


Figure 6.4 Maintenance Panel

6.2.2 Change Filter

	Filters should be changed every month when indicated. In case of severe contamination, please change them immediately. Failure to comply to maintenance protocol of filter will compromise the device's functionality. Please don't forget to confirm the maintenance in the software.

When the red notice "New Filter Cartridge Required" pops out on the right, please click it to start the maintenance. After entering maintenance interface, air pumps will be stopped, before clicking Completed button, please follow the instruction below.

1. Please lean the instrument against its left side, you will see the filter media can at the bottom.
2. Lift upwards the jump ring until it's totally loose.
3. Pull out the filter can, and then the other one.
4. Use the tool kit along with device delivery, open it and change it with new filter media.
5. Make sure enough filter pull back into the can and close it.
6. Slight pull the jump ring and Push the filter back, please make sure it's tightly fixed.
7. After finishing all the procedures above, please click Completed and the action of the maintenance will be recorded by the system. Users don't need to change the filter until the red notice appears.

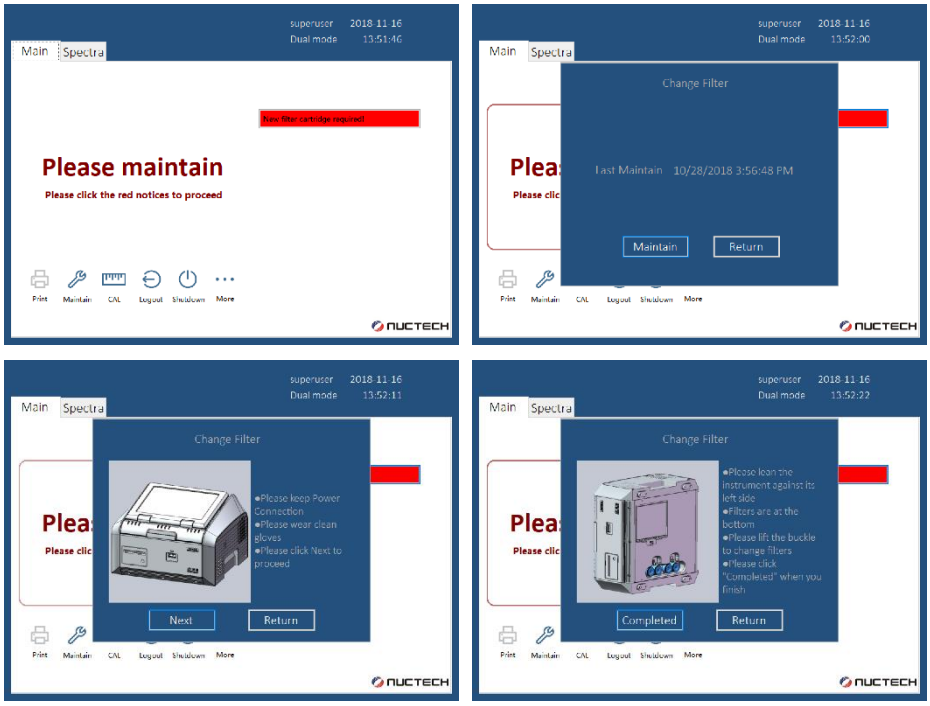


Figure 6.5 Wizard to change filter

Figure 6.6 Change filters

6.2.3 Change Dopant

	Dopants should be changed every 2 years. It's advised to do preventive maintenance every year when indicated. Failure to comply to maintenance protocol of filter will compromise the device's detection performance. Please don't forget to confirm the maintenance in the software.

When the red notice "New Dopant Cartridge Required" pops out on the right, please click it to start the maintenance. After entering maintenance interface, air pumps will be stopped, before clicking Completed button, please follow the instruction below.

1. Please use screwdriver to remove the dopant cartridge
2. Please install new dopant cartridge at location C
3. Please install new dopant cartridge at location D
4. After finishing all the procedures above, please click Completed and the action of the maintenance will be recorded by the system. Users don't need to change the filter until the red notice appears.

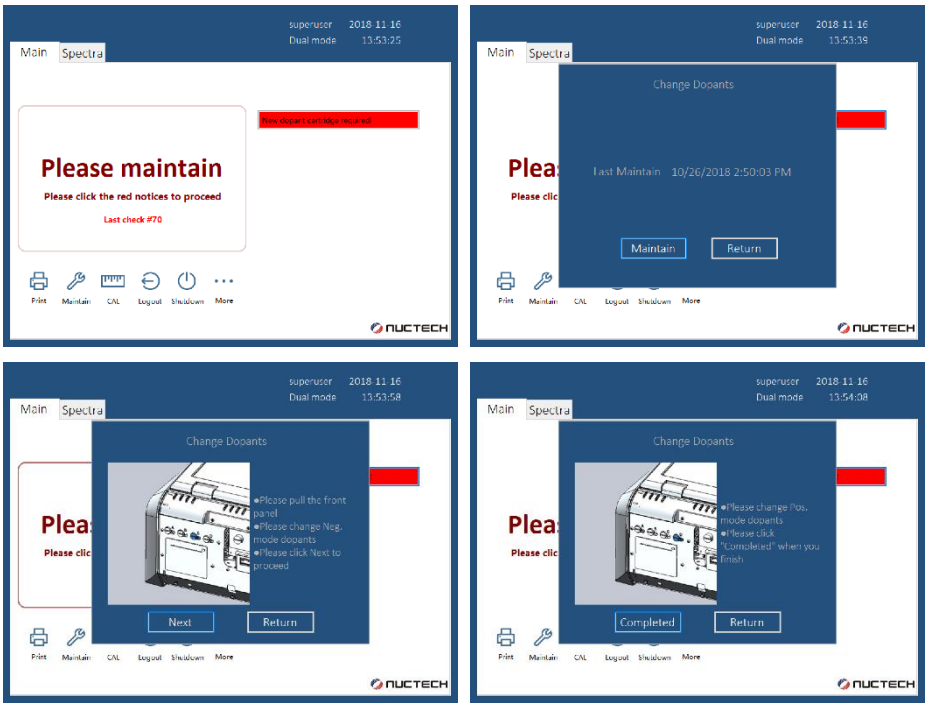


Figure 6.7 Wizard to change Dopants

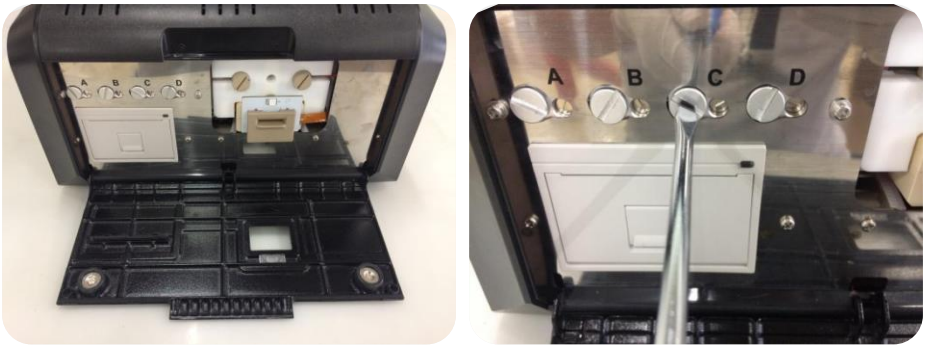


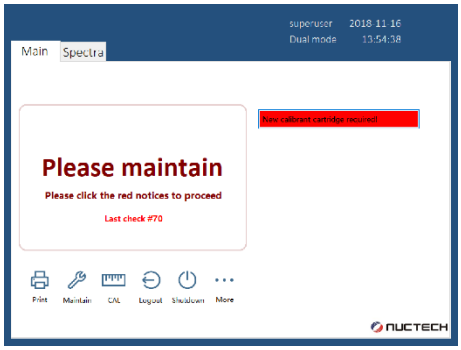
Figure 6.8 Changing Dopants

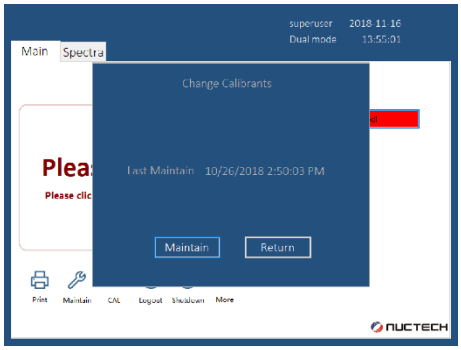
6.2.4 Change Calibrant

	Internal Calibrants should be changed every 2 years. It's advised to do preventive maintenance every year when indicated. Failure to comply to maintenance protocol of filter will compromise the function of Auto Calibration. Please don't forget to confirm the maintenance in the software.

When the red notice "New Calibrant Cartridge Required" pops out on the right, please click it to start the maintenance. After entering maintenance interface, air pumps will be stopped, before clicking Completed button, please follow the instruction below.

1. Please use screwdriver to remove calibrant cartridges at location A and B
2. Please install new positive calibrant cartridge at location A
3. Please install new negative calibrant cartridge at location B
4. After finishing all the procedures above, please click Completed and the action of the maintenance will be recorded by the system. Users don't need to change the filter until the red notice appears.





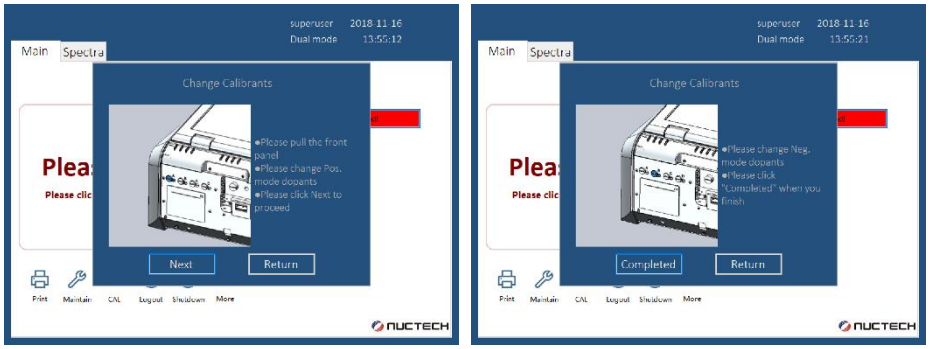


Figure 6.9 Wizard to change Calibrants

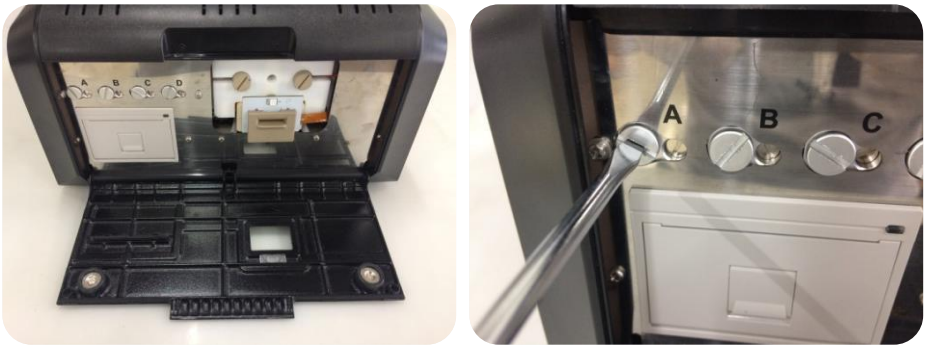


Figure 6.10 Changing Calibrants

6.2.5 Change Ionizer Electrode

	Ionizer Electrode should be changed every 2 years. It's advised to do preventive maintenance every year when indicated. Failure to comply to maintenance protocol of filter will compromise the detection performance. Improper maintenance of ionizer electrodes will compromise the device's functionality. Please don't forget to confirm the maintenance in the software.

When the red notice "POS Ionizer replacement required" or "NEG Ionizer replacement required" pop out on the right, please click it to start the maintenance. Please click Next and read the instruction carefully and memorize the key steps. Negative ionizer electrode is on the left side, with its positive counterpart installed on the right.

To change the Ionizer Electrode, the device must be shut down and cooled to room temperature if it's possible. After this please follow the instruction below strictly.

1. Please use screwdriver to remove the left or right cap indicated.
2. Please remove the red electric line at the end of the electrode with tweezers.
3. Please change an ionizer electrode at the indicated location.
4. Please re-install the red electric line and the cap.
5. After finishing all the procedures presented above. Users can turn on the device again. When the main interface will prompt "Please confirm the

PosIonizer Maintenance" or "Please confirm the NegIonizer Maintenance", please do remember to click "YES", this important action will help the system to reset the driving parameters of the ionizers.

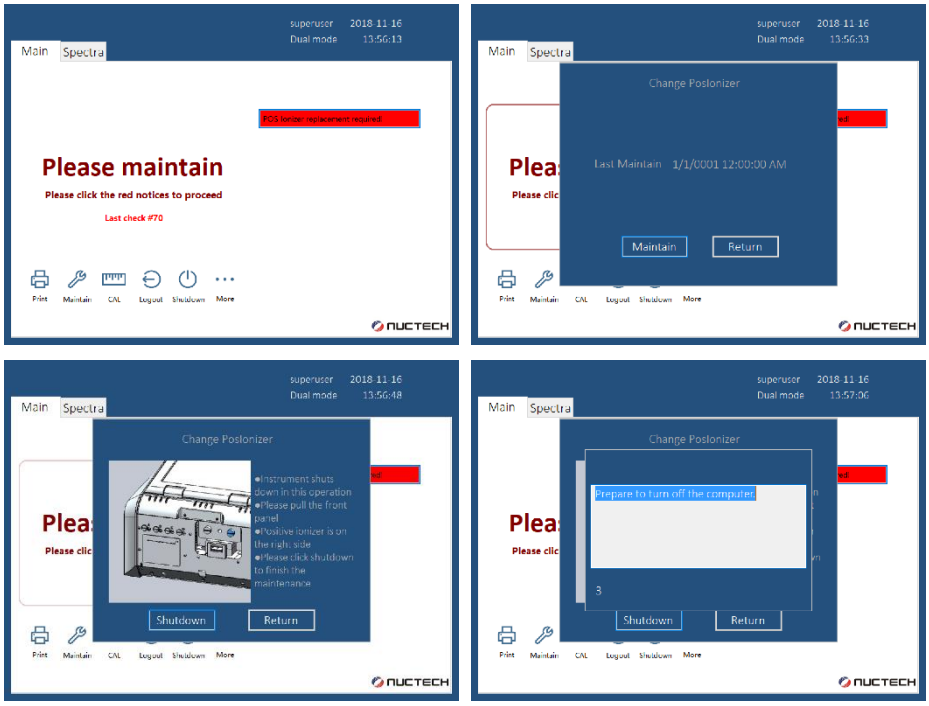


Figure 6.11 Wizard to change Ionizer Electrodes

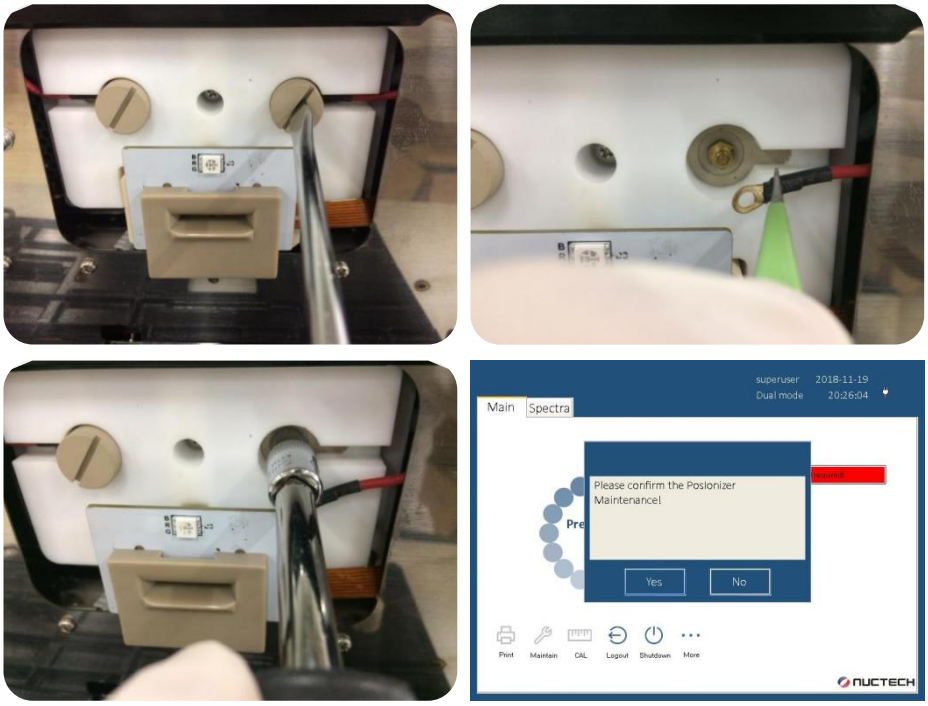


Figure 6.12 Change Ionizer Electrode and confirm afterwards

6.2.6 Change Membrane

	Membrane should be changed every 2 years. It's advised to do preventive maintenance every year when indicated. Improper maintenance of Membrane will compromise the device's functionality. Please don't forget to confirm the maintenance in the software.

The Membrane can be conveniently changed. Please click Next and read the instruction carefully and memorize the key steps. To change the membrane, device must be shut down first and strictly cooled to room temperature. Please follow the instruction below strictly.

1. Please use screwdriver to remove the bottom cover indicated.
2. Please remove the cover of the thermal desorber.
3. Please remove the bottom part of thermal desorber.
4. Please change the membrane.
5. Please re-install the bottom part of thermal desorber.
6. Please re-install the cover of the thermal desorber.
7. After finish all the procedures presented above. Users can turn on the device again. When the main interface will prompt "Please confirm the Membrane Maintenance", please do remember to click "YES", this important action will help the system to reset the timer to change another membrane.

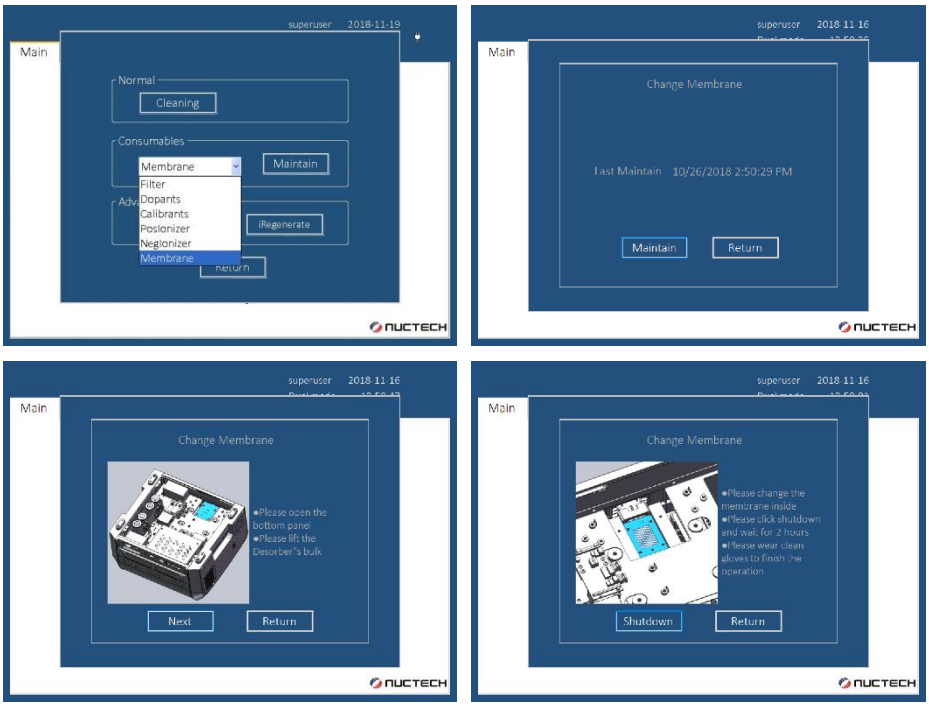


Figure 6.13 Wizard to change Membrane

Figure 6.14 Changing the membrane

6.2.7 Change Printing Roll

	Every printing roll supports 160 prints, please refill a new roll when the paper is used up.

After the printing paper is used up, new printing paper is required, and the replacement procedure is as follows:

1. Uncover the front panel of the host.
2. Lift upwards the bars switch in the center of the printer.
3. Open the paper loading panel of the printer.
4. Remove the empty paper roll.
5. Load new printing paper.
6. Close the panel of the printer and make sure leave enough extension.
7. Lift the front panel, make sure paper pass through the delivery hole on it.
8. Close the front panel of the host.

Figure 6.15 Changing printing roll

6.3 Diagnosis Report

TR2000DC is featured with a report system. Please insert the USB disk and simply download the “Operational Report” in a pdf format. This report that records the operational information can help us quickly diagnose with the instrument remotely. Please click <Report> from Menu, system will generate one PDF form Product Run Report with all operational information including the spectra.

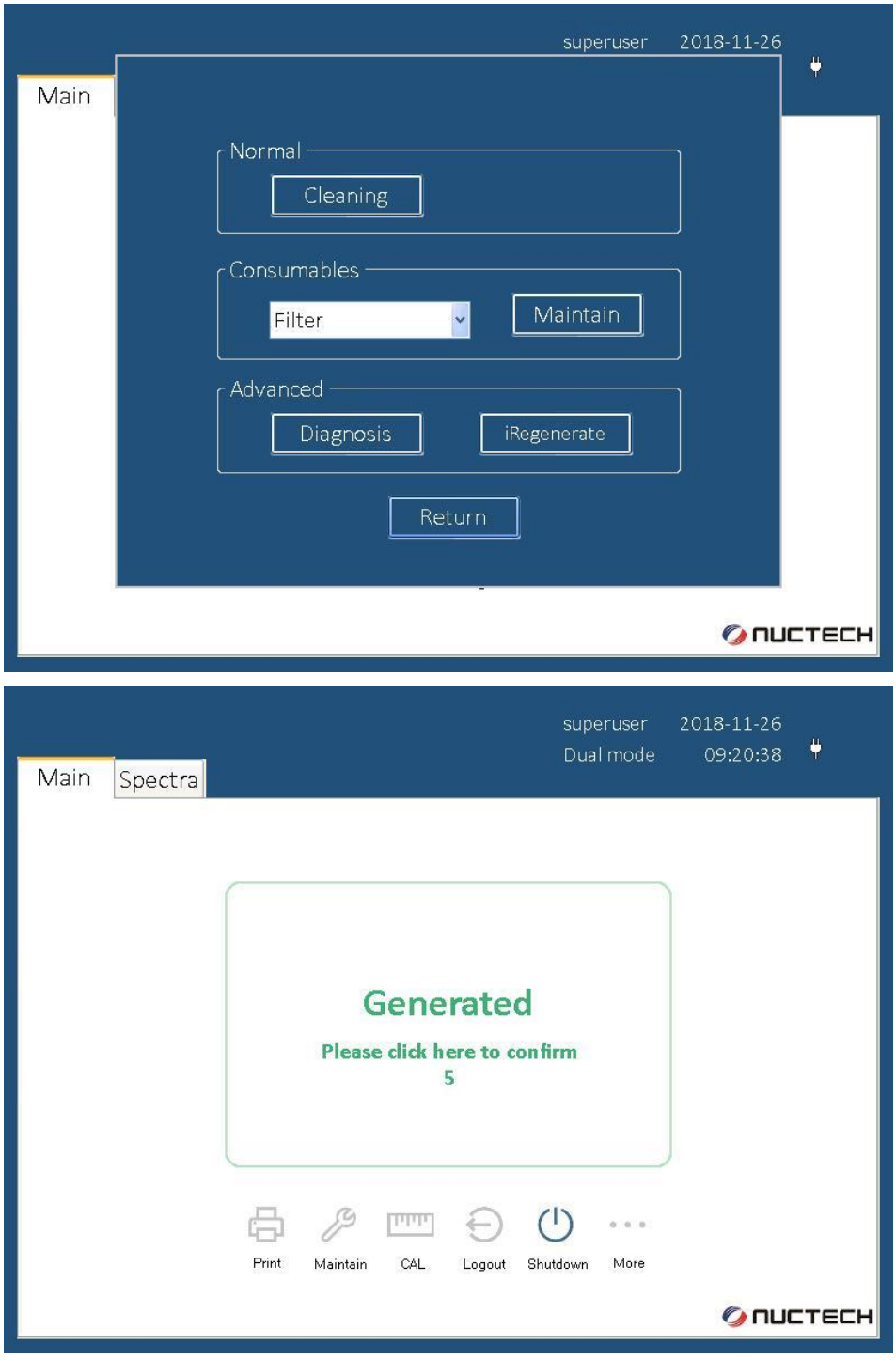


Figure 6.16 Generating diagnosis report

6.4 **iRegeneration**

	Since maintainers have higher-level system access to perform iRegneration, please keep their passwords and authorized personnel in custody. Inappropriate use of this function may compromise the device's performance. Please strictly follow Nuctech technical support directives when dealing with it.

If the red notice of "Low Ion Supply" pops out, users should pay attention to the lower performance due to reducing quantity of available ions. Normally, please change a new filter cartridge and conduct a 2-hour cleaning to regenerate enough ions. A blank test after changing filters & 2-hour cleaning & calibration will eliminate the message.

If the red notice of "Low Ion Supply" is still present, please click < iRegeneration > to reactivate the ionizers. In most cases, iRegeneration will succeed, followed by an auto calibration, and finally enter ready status. However, changing new ionizer electrodes will be required if iRegeneration frequently fails.

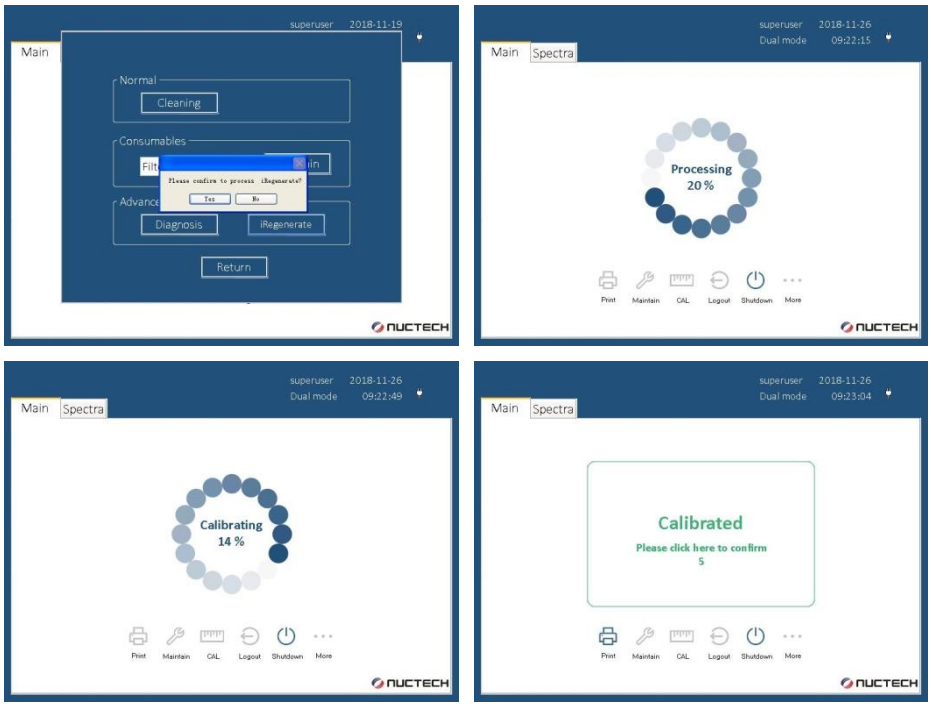


Figure 6.17 Perform iRegeneration to activate ionizers

Notes：

- ✓ Please don't perform iRegeneration without changing filters.
- ✓ Please don't perform iRegeneration without completing Cleaning for 2 hours.
- ✓ Please don't perform iRegeneration without completing blank tests.

7 Diagnosis System

7.1 Real-time Diagnosis

	TR2000DC is embedded with automatic diagnosis function. When the glitch takes place, e.g. temperature abnormal, indication will pop out immediately. Please follow Nuctech technical support directives.

TR2000DC enables automatic diagnosis. When the system is abnormal, such as temperature anomaly and ambient sensor parameter anomaly, the corresponding prompt will appear on the software interface, as shown in Figure 7.1.

At this point, please follow the solution procedures. If the prompt cannot be resolved after trial, the device can no longer be used, please follow Nuctech technical support directives.

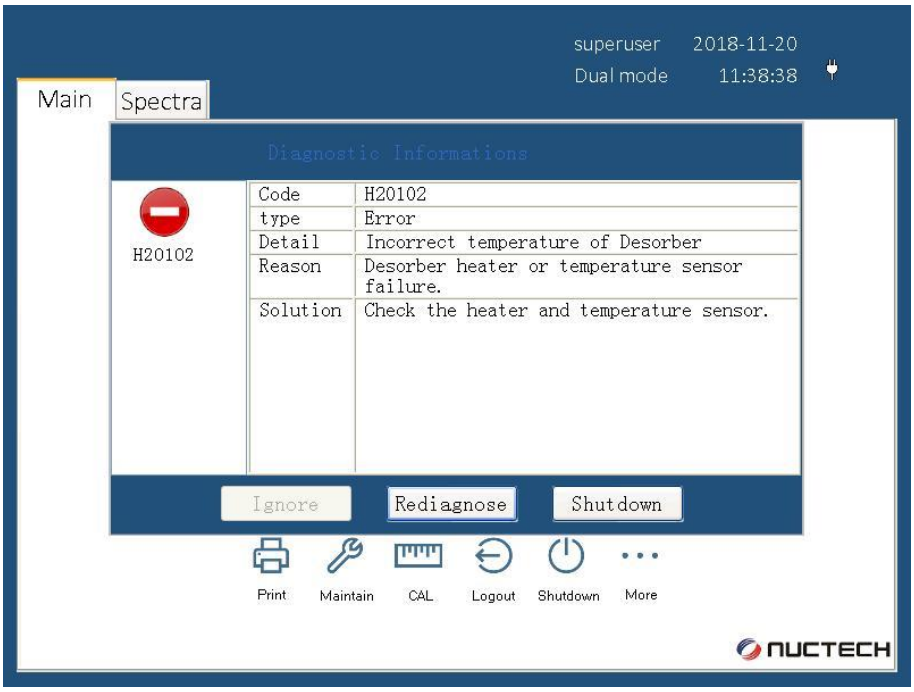


Figure 7.1 Diagnosis information

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8 FAQ

8.1 First installation

Filters in a new instrument might slowly become ineffective after a long-time storage. It's highly suggested that new filters be used during the first installation. This should be manually confirmed by the trained and authorized operator in the software, as the operation will activate a count-down timer of the next maintenance. On top of that, a 24-hour deep cleaning is normally required to remove the internal impurities, getting the instrument ready.

8.2 Fail to calibrate

During the first installation on a new site, auto calibration might probably fail due to a large variation in ambient pressure. And this should be confirmed by the users themselves to protect the instrument from being automatically but wrongly calibrated. So please use the "Calibration Pen" and conduct "Manual Calibration" on this condition. Once completed, the following calibrations can be finished automatically.

8.3 Fail to verify

Verification might fail due to internal contamination. Once the notification of contamination is shown, please mind the decline of detection performance. Then verification will be the last fail-safe to confirm the detection performance. However, if verification still fails when no notification of contamination is seen, please consider two possibilities, either calibration is needed, or the verification pen itself is used up.

8.4 Pressure applied to the swabs

Please do not swipe too hard, otherwise you may either break the crystals of the contraband substance or squeeze them into the swiped surface.

8.5 When to change the consumables

Filters must be changed periodically to maintain the performance of the instrument. Before changing the filters, please follow the red notification on the screen. The normal period is 720 hours, but a 360-hour maintenance will certainly enhance the performance of the detector. Filters can be conveniently changed while keeping the power on and this operation will be recorded. The completion of maintenance should manually be confirmed on the screen to reset the count-down timer.

When changing filters, please make sure the containers of filter materials are completely sealed, properly installed into the tunnel and firmly pushed to attach to the system. Otherwise, there will be an error pop-out indicating leakage.

Dopant affects the detection performance of several substances. The normal life cycle of a dopant cartridge is 2 years. A count-down timer will ensure the users to be notified before the dopant is used up. Please wear clean gloves when changing the dopant. The operation of maintenance is as simple as a 3-step procedure guided by the software.

Internal calibrant is only used in the operation of auto calibration, which is normally conducted every 12 hours. The life cycle of one cartridge is 2 years which is also monitored by an independent timer with a similar software wizard.

Due to the essence of corona discharge, positive and negative electrode in the ionizer also has their attrition, which is automatically monitored by the program. The normal life cycle would be 2 years. Once they are exhausted, please follow the red notification to change the electrode. The operation of maintenance is also a 3-step procedure, but please wait for the instrument to fully cool down first.

8.6 Frequent false alarm

Frequent false alarms may result from the increase of internal humidity or heavy contamination in the detector. In either case, it's highly suggested the maintenance procedures be strictly followed to change the filter and start a 2-hour deep cleaning. If this still doesn't help, please check #8.

8.7 Low Ion Supply

The performance of the ionizers is sensitive to electrode's attrition and the variation of internal humidity. TR2000DC is equipped with integrated sensors and a smart tuning algorithm that adapts the driving parameters of the ionizer to these changes. Normally there is no extra procedure to calibrate the ionizers. However, if improper maintenance (e.g. didn't not change filter for a long time) overwhelms the tuning capability, "Low Ion Supply" red notice may appear. Under this circumstance, please try a blank test first. If unresolved, please change the filter, do a 2-hour deep cleaning. If the problem is still there, please click < iRegenerate > to activate the ionizers.

8.8 Analysis doesn't start after inserting the swab

Optical sensor at the sample inlet might be interfered by dust accumulation. On this condition please try cleaning the sensor at first.

8.9 Something still wrong that can't be solved

TR2000DC is featured with a report system. Please insert the USB disk and simply download the "Operational Report" in a pdf format. This report that records the operational information can help us quickly diagnose with the instrument remotely. And we believe the customer service can be effectively improved.

8.10 Other advice to enhance the detection performance

Keeping the instrument power on actually enables the cleaning at the back end. Please wear clean gloves to avoid the interference by contaminants. Please pull out the used swab once the analysis is done before it proceeds to contaminate the instrument. Please change the filter in compliance with the instructed period.

8.11 **Troubleshooting**

No.	Problem	Description	Solution	Ref.
1	Frequent alarms	Frequent alarm shown as AN, TATP, etc.	Conduct a 30-min cleaning, if it still alarms please change filters, followed by a 1-hour cleaning. If it still alarms, please check <menu>\<status>\Main pump, Sampling pump. If the flow rate is 0, please inspect and change pumps and environment module. If it still alarms, please inspect and change the membrane.	6.1 5.6 6.2
2	Verification fails	Verification fails to complete	Conduct a 30-min cleaning, if it still alarms please change filters, followed by a 1-hour cleaning. Please inspect the spectra	6.1 5.10
3	Calibration fails	Auto CAL fails to complete	Conduct a 30-min cleaning, followed by a <Auto CAL>. Perform <Standard CAL> with the CAL pen, if <Auto CAL> fails. Please check <menu>\<status>\Main pump, Sampling pump. If the flow rate is 0, please inspect and change pumps and Environment module.	6.1 4.6 5.6
4	Filter depleted	Red notice indicating to change filters	Filters should be changed every 720 hours regardless of the service status. Please follow the instructions to change the filter and click <completed> to reset the timer. If you have already changed the filters in 48 hours, please click <completed> to reset the timer.	6.2
5	No analysis start	Fail to trigger an analysis after inserting the sampling swab into the inlet	Please inspect and clean the dust on the optical sensors of the Device indicator board. Please change the broken device indicator board and the FPC cable.	--
6	Software failure	Operational software fails to boot or suddenly exit	Please contact Nuctech technical support team to recover the operational software with safe flash memory, or change the IPC module.	--
7	Fail to power on	Unable to power on the instrument	Please contact Nuctech technical support team to change the IPC module.	--
8	Abnormal spectra	No peaks in spectra, <Verify>, <Auto CAL> and <Standard CAL> all fail with no explicit peak signal	Please change filters, followed by a 1-hour cleaning. If it still no signal, please inspect the Membrane and Ionizer Electrodes. If it still no signal, please contact Nuctech technical support team to change Detector Power.	6.1 6.2

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9 Figures

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10 Tables

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NUCTECH COMPANY LIMITED
Address: 2/F Block A, Tongfang Building, Shuangqinglu,
Haidian District, Beijing, PRC
Zip Code: 100084
Tel: (8610) 62780909
Fax: (8610) 62788896
Website: http://www.nuctech.com

统一社会信用代码

91110108710927548B

营业执照

(副 本)(5-1)

扫描二维码登录"国家企业信用信息公示系统"了解更多登记、备案、许可、监管信息

名　　称　同方威视技术股份有限公司

类　　型　其他股份有限公司(非上市)

法定代表人　陈志强

经营范围　许可项目：Ⅱ、Ⅲ类射线装置生产；Ⅱ、Ⅲ类射线装置销售；建设工程施工；电气安装服务；消毒剂生产（不含危险化学品）；消毒器械生产；消毒器械销售；第三类医疗器械经营。（依法须经批准的项目，经相关部门批准后方可开展经营活动，具体经营项目以相关部门批准文件或许可证件为准）一般项目：技术服务、技术开发、技术咨询、技术交流、技术转让、技术推广；仪器仪表制造；仪器仪表销售；软件开发；软件销售；信息系统集成服务；信息技术咨询服务；货物进出口；技术进出口；进出口代理；对外承包工程；机械设备租赁；汽车销售；消毒剂销售（不含危险化学品）；安防设备制造；安防设备销售；安全技术防范系统设计施工服务；智能机器人的研发；智能机器人销售；服务消费机器人制造；服务消费机器人销售；特殊作业机器人制造；工业机器人制造；工业机器人销售；工业机器人安装、维修；人工智能理论与算法软件开发；人工智能基础软件开发；人工智能应用软件开发；人工智能通用应用系统；人工智能行业应用系统集成服务；人工智能硬件销售；互联网数据服务；互联网销售（除销售需要许可的商品）。（除依法须经批准的项目外，凭营业执照依法自主开展经营活动）（不得从事国家和本市产业政策禁止和限制类项目的经营活动。）

注册资本　18500万元

成立日期　2000年12月19日

营业期限　2000年12月19日至 长期

住　　所　北京市海淀区双清路清华大学同方大厦A座2层

登记机关　北京市海淀区市场监督管理局

2022 年07 月29 日

国家企业信用信息公示系统网址:http://www.gsxt.gov.cn

市场主体应当于每年1月1日至6月30日通过国家企业信用信息公示系统报送公示年度报告。

国家市场监督管理总局监制

Unified Social Credit Code
91110108710927548B

Business License

(copy) (5-1)

Scan the QR code and log in the "National Enterprise Credit Information Publicity System" to learn more about registration, filing, licensing and supervision information.

Name	Nuctech Company Limited
Type	Other company limited by shares (unlisted)
Legal Representative	Chen Zhiqiang
Scope of Business	Licensed items: producing Category II & III radiation devices; selling Category II & III radiation devices; undertaking construction engineering; providing electrical installation services; producing disinfectant (excluding hazardous chemicals); disinfection equipment production; selling disinfection equipment; and operating medical apparatus and instruments of category III. (For items which shall be approved according to law, the business activities cannot be conducted until the approval is obtained from the relevant authorities. The specific business items shall be subject to the approval documents or licenses of relevant departments) General items: technical services, technical development, technical consultation, technical exchange, technology transfer, and technology promotion; instrument manufacturing; sales of instruments and meters; software development; software sale; information system integration services; consulting services of information technology; import & export of cargoes; import and export of technologies; import and export agency; foreign contracted projects; leasing mechanical equipment; selling automobiles; selling disinfectant (excluding hazardous chemicals); manufacturing security equipment; selling security equipment; providing design and construction services of safety technology prevention system; research and development of intelligent robot; selling intelligent robot; manufacturing service consumption robot; selling service consumption robot; manufacturing special operation robot; manufacturing industrial robot; selling industrial robot; installing and maintaining industrial robot; developing AI theory and algorithm software; developing AI basic software; developing AI application software; developing AI general application system; application system integration services in AI industry; selling AI hardware; providing Internet data services; and selling on Internet (except sales of goods that require a license). (For items which shall be approved according to law, the business activities shall be carried out independently according to the law with the business license) (The company shall not conduct any business activities that have been prohibited or restricted by the State or the city's industrial policy.)
Registered Capital	RMB 185,000,000
Date of Establishment	December 19, 2000
Business Term	Long term as from December 19, 2000
Address	2/F Block A, Tongfang Building, Tsinghua University, Shuangqing Road, Haidian District, Beijing

Beijing Trans-ocean Information Consulting Co., Ltd. 北京传世比邻信息咨询有限公司 翻译专用章 1101140105714

Registration Authority

Beijing Haidian Administration for Market Regulation (seal)

July 29, 2022

National Enterprise Credit Information Publicity System website: http:// www.gsxt.gov.cn

The market subject submits the annual report for publicity from January 1 to June 30 of each year, via the National Enterprise Credit Information Publicity System.

Supervised by State Administration for Market Regulation

CCCI

QUALITY MANAGEMENT SYSTEM CERTIFICATE

Registration No. 02122Q11372R8L

This is to certify that the quality management system of

Nuctech Company Limited

social credit code : 91110108710927548B
Registration Address: 2/F, Block A, Tongfang Building, Tsinghua University, Shuangqing Road, Haidian District
Office/Production Address: Road 18th, Yuanlin Road, Miyun County Economic Development Zone, Beijing, P.R. China

is in conformity with

GB/T 19001-2016/ISO 9001:2015

This certificate is valid for the following scope:

Related design, development (including software development), production, installation, debugging, system integration, after-sales service, market development and technical services of the company's radiation detection system; related design, development (including software development), production, construction, installation, debugging, maintenance, system integration, market development and technical services of security protection system engineering; computer information system integration

The certification's condition of multi-sites organization refer to Appendix (1)

The certificate changed on November 2, 2022
This certificate is valid to November 28, 2025

The scope which needs administrative permission shall be in accordance with valid license.
In the case that the organization regularly receives surveillance assessments, the certificate shall be valid when used together with the Notice for Maintenance of Use of Certificates and Logos.
Information about the certificate can be queried on the official website of CNCA（www.cnca.gov.cn）.

Huaxia Certification Center, Inc.

At: Taiji Commercial Building, No.211 Beisihuan Zhonglu,
Haidian District, Beijing, P.R. China
http://www.cccl.com.cn

General Manager:

Date of Issue: October 17, 2022

MEMBER OF MULTILATERAL RECOGNITION ARRANGEMENT IAF

CNAS

中国认可
国际互认
管理体系
MANAGEMENT SYSTEM
CNAS C021-M

CCCI

质量管理体系认证证书

注册号: 02122Q11372R8L

兹证明

同方威视技术股份有限公司

统一社会信用代码：91110108710927548B

注册/办公地址：中国·北京市·海淀区双清路清华大学同方大厦 A 座 2 层

生产地址：中国·北京市·密云经济开发区园林路 18 号

质量管理体系符合标准

GB/T 19001-2016/ISO 9001:2015

认证范围如下:

公司辐射检测系统相关的设计、开发（含软件开发）、生产、安装、调试、系统集成、售后服务、市场开发及技术服务；安全防范系统工程的相关设计、开发（含软件开发）、生产、施工、安装、调试、维护、系统集成、市场开发及技术服务；计算机信息系统集成

多现场组织认证概况见附件（1）

换证日期： 2022 年 11 月 2 日

本证书有效期至 2025 年 11 月 28 日

认证范围涉及法律法规要求的行政许可、资质许可、强制性认证的，证书与资质共同使用有效。

在正常接受年度审核的情况下，与年度监督保持通知一并使用有效。

本证书信息可在国家认证认可监督管理委员会官方网站（www.cnca.gov.cn）上查询。

华夏认证中心有限公司

中国北京市海淀区北四环中路 211 号太极大厦

http://www.ccci.com.cn

总 经 理：

颁证日期： 2022 年 10 月 17 日

MEMBER OF MULTILATERAL RECOGNITION ARRANGEMENT IAF

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质量管理体系认证证书

注册号: 02122Q11372R8L

同方威视技术股份有限公司

附 件 1

1、 名称：同方威视技术股份有限公司密云生产基地
办公/生产地址：北京市密云经济开发区园林路 18 号
范围：辐射检测、安全防范系统的生产

2、 名称：同方威视技术股份有限公司
办公地址：北京市海淀区双清路清华大学同方大厦 A 座 2 层
生产地址：北京市密云经济开发区园林路 18 号
范围：公司辐射检测系统相关的设计、开发（含软件开发）、生产、安装、调试、系统集成及售后服务、市场开发及技术服务；安全防范系统工程的相关设计、开发（含软件开发）、生产、施工、安装、调试、维护、系统集成、市场开发及技术服务；计算机信息系统集成

注：证书附件与主证书同时使用时方为有效。

换证日期： 2022 年 11 月 2 日
本证书有效期至 2025 年 11 月 28 日

华夏认证中心有限公司
中国北京市海淀区北四环中路 211 号太极大厦
http://www.ccci.com.cn

总 经 理：

颁证日期： 2022 年 10 月 17 日

中国认可
国际互认
管理体系
MANAGEMENT SYSTEM
CNAS C021-M

CCCI

QUALITY MANAGEMENT SYSTEM CERTIFICATE

Registration No. 02122Q11372R8L

Nuctech Company Limited

Appendix 1

1、 Name:Nuctech Company Limited Miyun Production Base
Office/Production Address:No. 18 Yuanlin Road, Miyun Economic Development Zone, Beijing
Scope:Production of radiation inspection and security & protection system

2、 Name:Nuctech Company Limited
Office Address: 2/F, Block A, Tong Fang Building, Shuangqing Road, Haidian District, Beijing City
Production Address: Road 18th, Yuanlin Road, Miyun County Economic Development Zone, Beijing City
Scope: Radiation inspection system with design, development (including software development), production, installation, test, system integration and after-sales service, market development and technical services; security & protection system engineering with design, development (including software development), production, construction, installation, test, maintenance, system integration and technical service, market development and technical services; computer information system integration

Note: Any certificate appendix(es) shall be valid together with the certificate when using.

The certificate changed on November 2, 2022
This certificate is valid to November 28, 2025

Huaxia Certification Center, Inc.

At: Taiji Commercial Building, No.211 Beisihuan Zhonglu, Haidian District, Beijing, P.R. China
http://www.ccci.com.cn

General Manager:

Date of Issue: October 17, 2022

MEMBER OF MULTILATERAL RECOGNITION ARRANGEMENT IAF

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批准管理体系认证注册通知

同方威视技术股份有限公司：

根据贵组织提出的《管理体系认证审核申请表》和与我中心签订的《管理体系认证审核合同书》，我中心派出审核组对贵组织的管理体系文件及现场进行了审核。经我中心认证决定人员审议通过，并经总经理批准，现准予向贵组织颁发**环境**管理体系认证证书，并给予注册。

贵组织在获得我中心管理体系认证注册后，须按规定的时间接受监督审核，第一次监督审核从初审末次会议时间[1]起10个月以内（再认证为第12个月以内）进行，以后的监督审核与上一次间隔时间最长为12个月。

认证证书和标志的使用方式见XQCCB423《认证证书和标志的使用规定》。

兴原认证中心有限公司

2022年11月17日

注：1）末次会议时间见初审或再认证《审核计划》。

2）请在www.xqcc.com.cn“获证企业登录”中输入单位名称和密码27548B，查询和下载贵单位的审核报告、电子版认证证书以及年度监督审核结论通知（接受年度监督审核后）。

环境管理体系认证证书

注册号：0350122E20828R7L

兹　证　明

同方威视技术股份有限公司

注册地址：北京市海淀区双清路清华大学同方大厦A座2层

统一社会信用代码：91110108710927548B

管 理 体 系 符 合

GB/T 24001-2016 / ISO 14001:2015 标准

该管理体系适用于

辐射检测产品和工程项目的研究、开发、设计、生产、销售、安装和服务【涉及场所：北京市海淀区双清路清华大学同方大厦A座2层（含国内维护站），北京市密云县园林路18号密云基地】***

颁证日期：2022 年 11 月 17 日

有效期最长可至：2025 年 11 月 16 日[注]

签 发 人：

兴原认证中心有限公司

证书专用章

（北京市海淀区土地三街9号嘉华大厦C座7层）

MEMBER OF MULTILATERAL RECOGNITION ARRANGEMENT IAF

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CNAS C035-M

注：在证书有效期内，获证组织须按规定接受年度监督审核，保持认证资格。通过扫描二维码可获知证书的有效状态。该证书信息还可在国家认证认可监督管理委员会官方网站（www.cnca.gov.cn）和兴原认证中心有限公司官方网站（www.xqcc.com.cn）上查询。

ENVIRONMENTAL MANAGEMENT SYSTEM CERTIFICATE

Registration No. 0350122E20828R7L

This is to certify that the environmental management system of

NUCTECH COMPANY LIMITED

2/F Block A, Tongfang Building, Shuangqinglu, Haidian District, Beijing PRC

Social Credit Code: 91110108710927548B

is in conformity with

GB/T 24001-2016 / ISO 14001:2015 Standard

This certificate is valid to

The Research, Development, Design, Production, Sell, Installation and Service of Radiation Inspection Products and Engineering Projects (Site Covered: 2/F Block A, Tongfang Building, Shuangqinglu, Haidian District, Beijing PRC. (Including On-Site Maintenance Stations), miyun bases, no.8, yuanlin road, miyun county, Beijing).

Date of issue: November 17, 2022
Date of expiry at most: November 16, 2025

Representative: *WangHonglin*

XINGYUAN CERTIFICATION CENTRE CO., LTD. (XQCC)
FOR CERTIFICATE
(7FL, Tower C, Jiahua Plaza, No.9 Shangdi 3 St., Haidian, Beijing)

MEMBER OF MULTILATERAL RECOGNITION ARRANGEMENT IAF

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NOTE: This certificate shall be maintained by regular surveillance audit.
The validity of the certificate can be verified by scanning QR code.
The information of the certificate can be available in http://www.cnca.gov.cn, the website of CNCA, and in our website http://www.xqcc.com.cn.

LGAI Technological Center, S.A.
Campus UAB - Ronda de la Font del Carme s/n
E-08193 Bellaterra (Barcelona)
T +34 93 567 20 00
F +34 93 567 20 01
www.applus.com

CE CERTIFICATE

No. 16/32301959

CERTIFICATE OF CONFORMITY

LGAI-Technological Center, S.A. CERTIFIES that the documentation included in the Construction Technical File of:

DESKTOP EXPLOSIVES AND NARCOTICS TRACE DETECTOR

Brand: NUCTECH
Model: TR2000DC

Manufactured and delivered to market by:

NUCTECH COMPANY LIMITED
2/F Block A, Tong fang Building, Shuangqinglu, Haidian District, Beijing PRC

Is in compliance with Electromagnetic Compatibility Directive 2014/30/EU and **Low Voltage Directive 2014/35/EU** and tested according to EN61010-1:2010, EN 61326-1:2013 as described in:

Evaluation report No.: 16/32301958

It confirms that the listed equipment complies with the requirements of the directives, referring only to the Technical File supplied to LGAI Technological Center, S.A. for its evaluation.

After preparation of the necessary technical documentation, as well as the EC declaration of conformity, the required CE marking can be affixed on the product.

Bellaterra, December, 14th, 2016

Applus
LGAI Technological Center, S.A.

Xavier Ruiz Peña
Product Conformity B.U., Director

TR2000DC Technical Specifications

General Specifications	
Technical Principle	Ion Mobility Spectrometry, IMS
Ionization Source	Non-radioactive ionization source
Sampling Method	Particulate swiping
Warm-up Time	20 minutes typically
Explosives & Narcotics Detection Performance	
Positive & negative ions analyzing mode	Simultaneous explosives & narcotics detection in dual modes
Detectable explosives	TNT, C4, Tetryl, DNT, NG, PETN, RDX, Semtex, HMX, AN, TATP and black powder, etc.
Detectable narcotics	Cocaine, Heroin, Morphine, Amphetamine, MDMA, methamphetamine, pethidine, THC and Ketamine, etc.
Sensitivity	Nanogram
Analysis Time	8 seconds or less typically
Calibration	Automatic internal calibration
Functions and Configurations	
User Interface	10.4” touch-screen
Readout	Automatic Pass/Alarm conclusion Substances identification with selectable characteristic spectrum display Configurable visual and audio alarm
Printer	Built-in printer
Data Storage Capability	Data storage capability up to 10,000 sets, support for backup via USB or Ethernet.
Communication Interface	LAN / USB / VGA
Installation Data	
Dimensions	340mm(L)×325mm(W)×233mm(H)
Operating environment	-20℃～+55℃， < 95% (non-condensing)
Weight	12 kg
Power Supply	100VAC～240VAC, 50Hz/60Hz, 210W
Built-in Battery	Up to 1 hour in full operation

统一社会信用代码

91110108710927548B

营业执照

(副 本)(5-1)

扫描二维码登录"国家企业信用信息公示系统"了解更多登记、备案、许可、监管信息

名　　称　同方威视技术股份有限公司

类　　型　其他股份有限公司(非上市)

法定代表人　陈志强

经营范围　许可项目：Ⅱ、Ⅲ类射线装置生产；Ⅱ、Ⅲ类射线装置销售；建设工程施工；电气安装服务；消毒剂生产（不含危险化学品）；消毒器械生产；消毒器械销售；第三类医疗器械经营。（依法须经批准的项目，经相关部门批准后方可开展经营活动，具体经营项目以相关部门批准文件或许可证件为准）一般项目：技术服务、技术开发、技术咨询、技术交流、技术转让、技术推广；仪器仪表制造；仪器仪表销售；软件开发；软件销售；信息系统集成服务；信息技术咨询服务；货物进出口；技术进出口；进出口代理；对外承包工程；机械设备租赁；汽车销售；消毒剂销售（不含危险化学品）；安防设备制造；安防设备销售；安全技术防范系统设计施工服务；智能机器人的研发；智能机器人销售；服务消费机器人制造；服务消费机器人销售；特殊作业机器人制造；工业机器人制造；工业机器人销售；工业机器人安装、维修；人工智能理论与算法软件开发；人工智能基础软件开发；人工智能应用软件开发；人工智能通用应用系统；人工智能行业应用系统集成服务；人工智能硬件销售；互联网数据服务；互联网销售（除销售需要许可的商品）。（除依法须经批准的项目外，凭营业执照依法自主开展经营活动）（不得从事国家和本市产业政策禁止和限制类项目的经营活动。）

注册资本　18500万元

成立日期　2000年12月19日

营业期限　2000年12月19日至 长期

住　　所　北京市海淀区双清路清华大学同方大厦A座2层

登记机关　北京市海淀区市场监督管理局

2022 年07 月29 日

国家企业信用信息公示系统网址:http://www.gsxt.gov.cn

市场主体应当于每年1月1日至6月30日通过国家企业信用信息公示系统报送公示年度报告。

国家市场监督管理总局监制